Natural

Natural Security

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ADABAS & NATURAL

This document applies to Natural Version 9.3.4 and all subsequent releases.

Specifications contained herein are subject to change and these changes will be reported in subsequent release notes or new editions.

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Preface

Structure and Terminology Of Natural Security	Basic concepts of Natural Security.
Natural Security On Different Platforms	Considerations for the use of Natural Security on different platforms, and the differences between these platforms.
First Steps After the Installation	Steps which have to be performed after Natural Security has been installed for the first time.
Logging On	Rules that apply when a user logs on to Natural under Natural Security.
Finding Your Way In Natural Security	Various aspects of handling the Natural Security user interface.
Administrator Services	Descriptions of the functions of the Administrator Services section of Natural Security.
User Maintenance	User security profiles, their components, and the functions used to create and maintain them.
Library Maintenance	Library security profiles, their components, and the functions used to create and maintain them.
Protecting Libraries	How to control the access of users to protected libraries.
Protecting Environments	How to make library protection environment-specific.
Protecting DDMs On z/OS	How to control the use of DDMs on z/OS computers.
Protecting DDMs On Linux and Windows	How to control the use of DDMs on Linux and Windows.
Protecting Utilities	How to control the use of Natural utilities.
Protecting the Natural Development Server Environment and Applications	How to control the use of the Natural Development Server environment, and Natural Development Server base applications and compound applications.
Protecting the Natural Development Environment in Eclipse	How to control the use of the server and navigator views used by a Natural development environment in Eclipse in conjunction with NaturalONE.
Protecting Natural RPC Servers and Services	How to control the use of Natural remote procedure calls in a client/server environment.
Protecting External Objects	How to control the use of external objects.
Mailboxes	How to create, maintain and use mailboxes.
Retrieval	How to review the existing security profile definitions and their effects.
Countersignatures	How Natural Security administrators control each other.
Functional Security	How to restrict the availability of functions and make different functions available for different users.
Natural Security In Batch Mode	How to use Natural Security in batch mode.

Transferring Security Data To Another System File	How to transfer Natural Security data from one system file to another.
User Exits	Information on the available user exits.
Application Programming Interfaces	The subprograms for performing Natural Security functions from outside the Natural Security library `SYSSEC`.
Add-On Products And Plug-Ins	Considerations for the protection of various add-on products and plug-ins.

1 About this Documentation

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- Online Information and Support 2
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Document Conventions

Convention	Description
Bold	Identifies elements on a screen.
`Monospace font`	Identifies service names and locations in the format *`folder.subfolder.service`*, APIs, Java classes, methods, properties.
`Italic`	Identifies: Variables for which you must supply values specific to your own situation or environment. New terms the first time they occur in the text. References to other documentation sources.
`Monospace font`	Identifies: Text you must type in. Messages displayed by the system. Program code.
{ }	Indicates a set of choices from which you must choose one. Type only the information inside the curly braces. Do not type the { } symbols.
|	Separates two mutually exclusive choices in a syntax line. Type one of these choices. Do not type the | symbol.
[ ]	Indicates one or more options. Type only the information inside the square brackets. Do not type the [ ] symbols.
...	Indicates that you can type multiple options of the same type. Type only the information. Do not type the ellipsis (...).

Online Information and Support

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- Download products, updates and fixes.
- Search the Knowledge Center for technical information and tips.
- Subscribe to early warnings and critical alerts.
- Open and update support incidents.
- Add product feature requests.

Data Protection

Software AG products provide functionality with respect to processing of personal data according to the EU General Data Protection Regulation (GDPR). Where applicable, appropriate steps are documented in the respective administration documentation.

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2 Structure And Terminology Of Natural Security

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This section describes the basic concepts of Natural Security.

It covers the following topics:

About This Documentation

This documentation describes all functions and aspects of usage of Natural Security. It applies to Natural Security on all supported platforms.

This documentation is intended for users of Natural Security, that is, users who are to be defined in Natural Security as users of type *Administrator*. You should be familiar with and have a good general understanding of Natural.

For information on how to install Natural Security, see the Natural *Installation* documentation.

For information on changes, enhancements and new features provided with the current version, see the Natural *Release Notes*.

Caution: The user ID `DBA` should not be used for testing purposes. As indicated in the *Installation* documentation, the user ID `DBA` should only be used for the initial definition of Natural Security administrators and for recovering the Natural Security environment. If you have multiple versions of Natural Security on a shared FSEC system file, you should use only the latest version for the maintenance of your security data. If you maintain the data with an older version, the consistency of the data cannot be guaranteed, particularly as far as items introduced with later versions are concerned.

What is Natural Security

Natural Security is a comprehensive system to control and check the access to a Natural environment. Natural Security enables you to protect your Natural environment against unauthorized access and improper use.

You may define exactly who will be allowed to do what. You may restrict the use of whole libraries and Natural utilities, as well as individual programs, functions and DDMs. You may further define the conditions and times of use. Thus you may provide a custom-made Natural environment for each individual user.

This is accomplished by defining objects and the relationships between these objects. An object is defined to Natural Security by creating a *security profile* for it.

There are four main types of objects which can be defined under Natural Security:

- users

- libraries
- DDMs/files
- utilities

Users

Users can be either people or terminals - or groups of people and/or terminals - who use Natural under Natural Security. When a user is defined, a *user type* classification has to be made. This classification pre-determines the user's possibilities of using libraries.

People may be defined as one of the following user types:

- MEMBER
- PERSON
- ADMINISTRATOR

Terminals may be defined as the user type:

TERMINAL

Users of the above types may be joined in groups which will be defined as the user type:

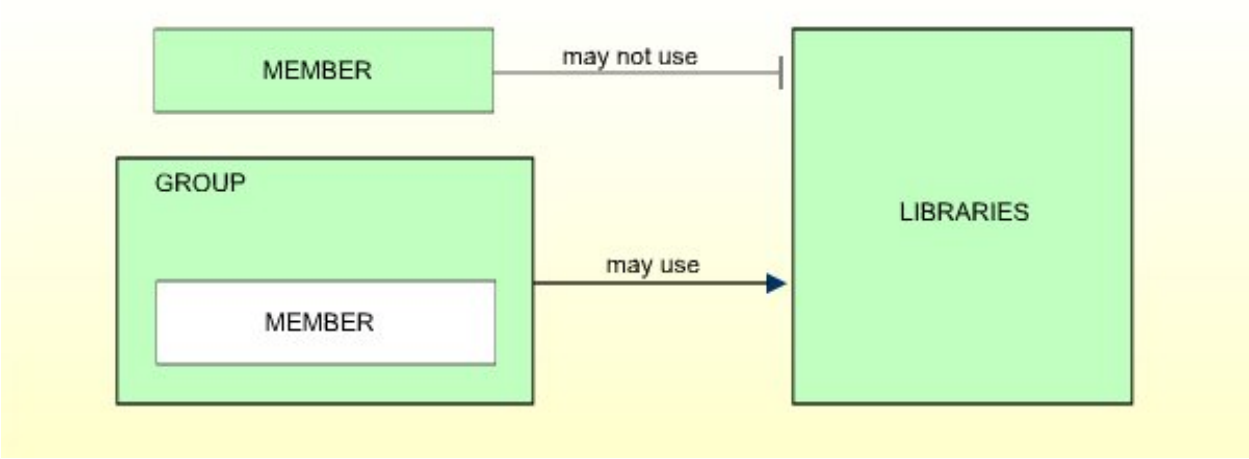
GROUP

In addition, the following special-purpose user types are available:

- External User
- Batch User

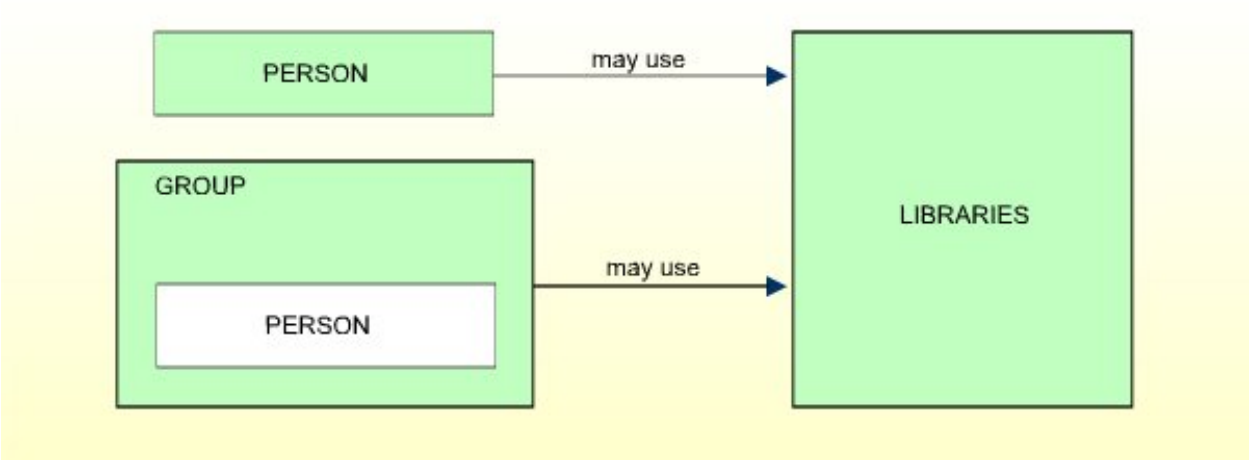
User Type MEMBER

MEMBERs cannot use libraries directly. They may only use libraries through membership in GROUPs. Therefore they have to be assigned to at least one GROUP so as to be able to use any library. Normally, this is the standard user type which will apply to most people.



User Type PERSON

PERSONs may use libraries directly. They may also be assigned to GROUPs. Thus, they may use libraries either directly or through membership in GROUPs. This user type is designed for people who are to have special, individually defined access rights to libraries.

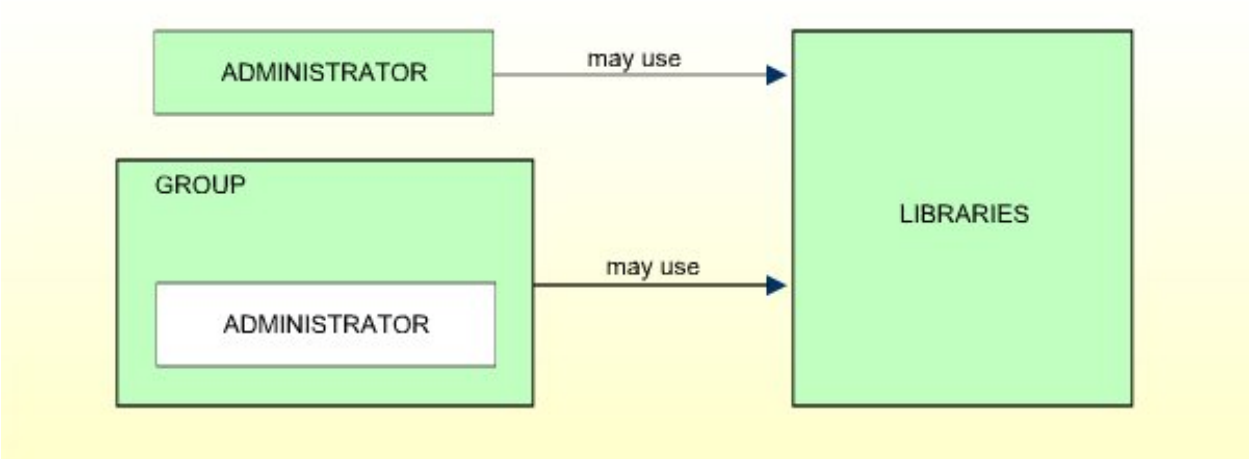


User Type ADMINISTRATOR

ADMINISTRATORs may use libraries directly. They may also be assigned to GROUPs. Thus, they may use libraries either directly or through membership in GROUPs. In this respect they are like PERSONs.

However, only ADMINISTRATORs may maintain Natural Security, that is, create and modify the security profiles of objects and the relationships between these objects.

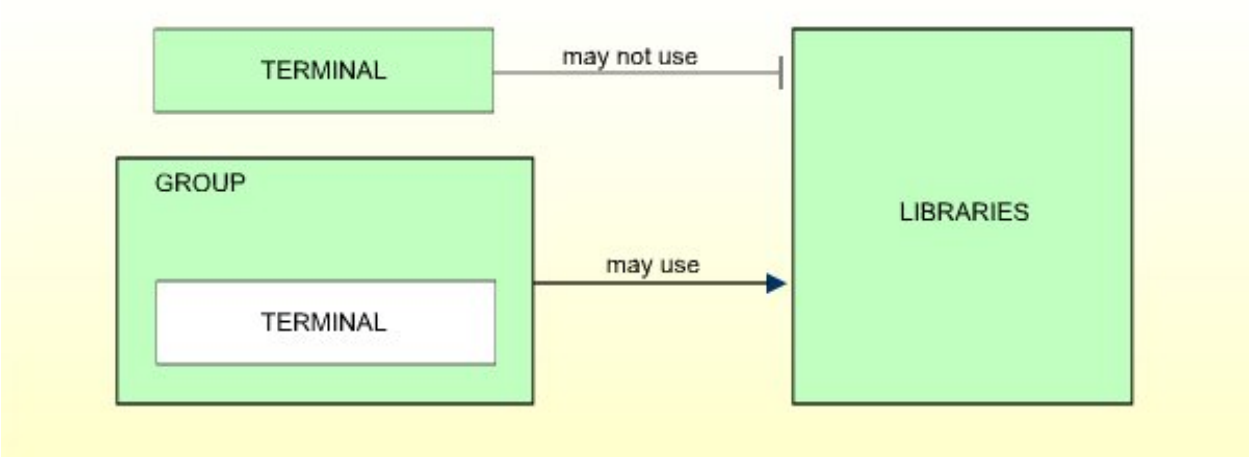
This user type is only for those users who are to be system administrators of Natural Security.



User Type TERMINAL

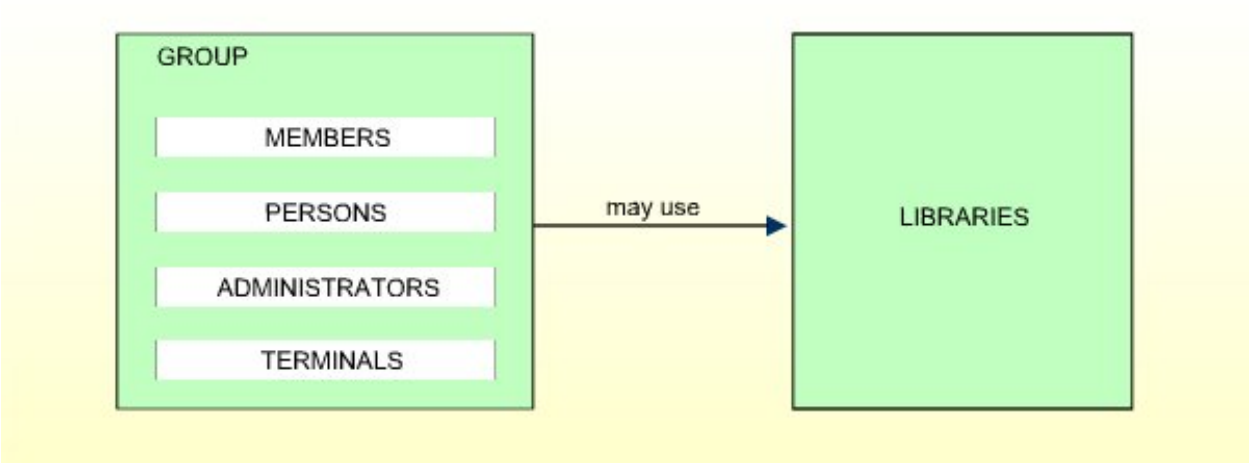
This user type applies to terminals only. Terminals do not necessarily have to be defined. The definition of terminals becomes relevant only in connection with libraries which are to be used from certain terminals only.

TERMINALs cannot use libraries directly, but only through membership in GROUPs. Therefore, TERMINALs have to be assigned to at least one GROUP.



User Type GROUP

GROUPs may be created to allow easier Natural Security maintenance. A GROUP may contain users of any of the other user types. Users may be contained in more than one GROUP.



Access rights to libraries may be defined for a GROUP and will then apply for all users contained in the same GROUP, thus saving the effort of having to define them for each user individually. (For ADMINISTRATORs and PERSONs contained in GROUPs, individual access rights different from those of the GROUPs they are in may optionally be defined.)

Special-Purpose User Types

- External User
- Batch User

External User

The user type External User is only relevant if user authentication is performed via an LDAP server.

There exists only one user security profile of this user type. It is used if user authentication is performed via an LDAP server and the user ID, as authenticated by the LDAP server, is not defined in Natural Security. In this case, the External User profile is assigned automatically to this user ID after a successful logon; that is, the user accesses Natural under the conditions defined in the External User profile.

The External User cannot use libraries directly, but only through membership in GROUPs. Therefore the External User profile has to be assigned to at least one GROUP to be able to use any library.

To create the security profile for the External User, you do not use the Add User function, but the field **NSC user ID** in the LDAP security profile. For further details, see ***Components of an LDAP Security Profile*** in the section *Authentication Options (LDAP)*.

Batch User

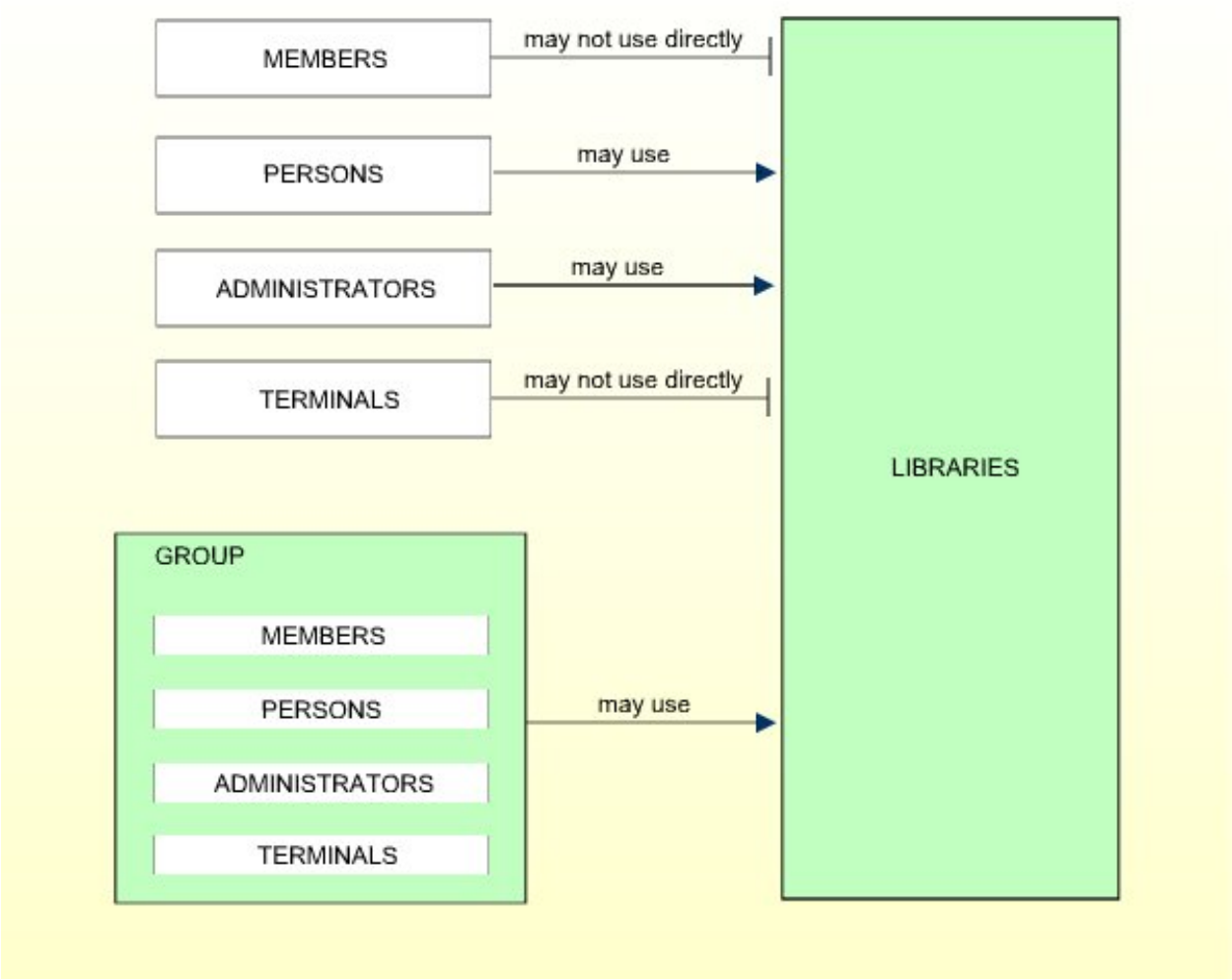
The user type Batch User is only relevant if users are to use Natural in batch mode under different conditions than online. For details, see ***Batch User Security Profiles*** in the section *Natural Security In Batch Mode*.

Which User Type for Which User

It is generally best to initially define all people as MEMBERs. If need be, a MEMBER may at a later stage be changed to a PERSON. MEMBERs and PERSONs may be "promoted" to become ADMINISTRATORs.

Every user should be assigned to at least one GROUP. It is recommended that GROUPs be used as much as possible, as this will not only reduce Natural Security maintenance considerably, but also provide for a more consistent protection setup.

To recapitulate, the user types basically differ from each other as far as their access to libraries is concerned. The possible relationships are summarized in the following diagram:



Libraries

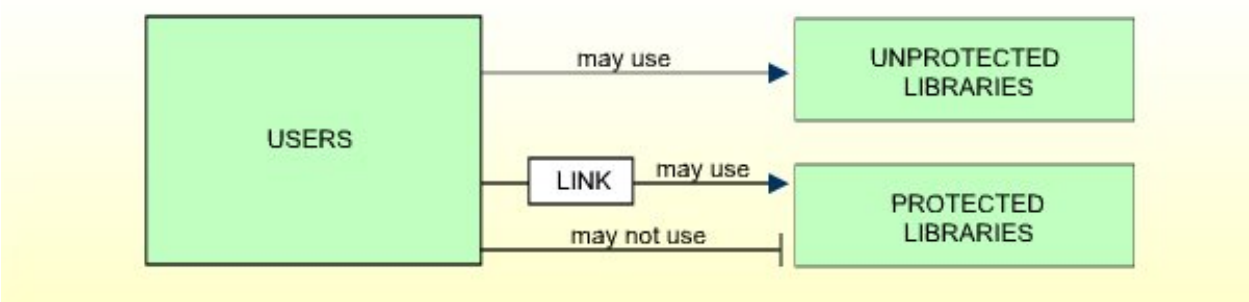
Libraries are Natural libraries which contain sets of source programs and/or object modules which perform a particular function.

Libraries may be defined as *protected* or *unprotected*.

- *Unprotected* libraries may be used by any user without a special relationship having to be defined. (Remember that only users of type ADMINISTRATOR or PERSON may use libraries directly. MEMBERs and TERMINALs may use libraries only through membership in a GROUP.)
- *Protected* libraries may be used only by users who have a special relationship to the libraries. This special relationship is called *link*.

Links Between Users and Libraries

A *link* is the relationship between a user (user type ADMINISTRATOR, PERSON, or GROUP) and a protected library which allows the user to use the library.



The various types of library protections and links to libraries are described in the section ***Protecting Libraries***.

DDMs and Files

The protection of DDMs is different depending on the platform you use. This is because with Natural on non-z/OS platforms, DDMs are stored in libraries, whereas with Natural on z/OS computers, DDMs are stored in an FDIC system file and not directly related to a library. See also the section ***Natural Security On Different Platforms***.

On z/OS computers, a DDM must be defined as a *file* to Natural Security before it can be used under Natural Security, that is, a so-called *file security profile* must be created for the DDM. On non-z/OS platforms, a *DDM security profile* is created, which is subordinate to the security profile of the library containing the DDM.

For every DDM, a *status* classification has to be made in Natural Security. This status determines if the DDM can be used, that is, referenced in a database access statement within a Natural program.

File Status on z/OS

On z/OS, a DDM has only one *file status* (which is set in its file security profile), which may be one of the following:

PUBLIC	The DDM is not protected. It can be used - that is, read and updated - by any library.
ACCESS	The DDM is protected as far as update is concerned. It can be read by any library. It may, however, be updated only by libraries which have been *linked* to it.
PRIVATE	The DDM is protected. It can be used only by libraries which have been *linked* to it. Such a link may be defined as “read” (that is, read only) or “update” (which implies read).

For details, see the section ***Protecting DDMs On z/OS***.

Internal and External Status on Non-z/OS

On non-z/OS platforms, a DDM has an *internal status* and an *external status*.

The internal status controls the use of the DDM *within* the library in which it is contained. It may be one of the following:

PUBLIC	The DDM can be read and updated by all programs within the library.
ACCESS	The DDM can be read, but not updated, by all programs within the library.
PRIVATE	The DDM cannot be used by any program within the library.

The external status controls the use of the DDM by *other* libraries - provided that the library containing the DDM is used as a steplib by other libraries. It may be one of the following:

PUBLIC	The DDM is *not* protected. It can be used - that is, read and updated - by any library.
ACCESS	The DDM is protected as far as update is concerned. It can be read by any library. It may, however, be updated only by libraries which have been *linked* to it.
PRIVATE	The DDM is protected. It can be used only by libraries which have been *linked* to it. This *link* may be defined as “read” (that is, read only) or “update” (which implies read).

For details, see the section ***Protecting DDMs On Linux And Windows***.

Utilities

With Natural Security, you can control the use of various Natural utilities. This utility protection is function-oriented, which means that you can allow or disallow the functions of a utility individually.

You control the use of a utility by defining *utility profiles* for it. Various types of hierarchically layered utility profiles allow you to define exactly who will be allowed to use which function.

Moreover, for utilities which affect the contents of individual libraries, you can determine for which libraries a utility function is to be allowed and for which not. This, you can also define differently for individual users.

For details, see the section ***Protecting Utilities***.

Applications

Applications are *base applications* and *compound applications*, which are created and maintained in the Natural Studio's application workspace and used in conjunction with the Natural Development Server.

If the Natural Development Server is installed at your site, you can control the access to base and compound applications with Natural Security. To do so, you define security profiles for the applications and establish links between users and applications.

For details, see the section ***Protecting Natural Development Server Applications***.

RPC Servers

In a client/server environment, you can use Natural Security to protect the use of Natural remote procedure calls. You can protect Natural RPC servers as well as the way in which Natural RPC *service requests* issued by clients are handled by these servers.

To control the access to Natural RPC servers and their handling of service requests, Natural Security provides several options to be set; in addition, you can define security profiles for Natural RPC servers to be protected.

For details, see the section ***Protecting Natural RPC Servers and Services***.

Other Object Types

Apart from users, libraries, DDMs/files, utilities and applications, there are other types of objects which can be defined under Natural Security. However, these other objects are not essential for protecting your Natural environment with Natural Security. Other object types are:

- **External Objects:**
  These are objects of various types which are used by Predict and other products (see the section *External Objects* for details).
- **Mailboxes:**
  These are information screens which may be used to broadcast messages to Natural users (see the section *Mailboxes* for details).

Profile Parameters

Several Natural profile parameters are influenced by Natural Security. The following list provides an overview of these profile parameters and their corresponding settings in Natural Security.

Profile Parameter	Corresponding Setting in Natural Security
CF	**CF** in **Session Parameters** section of library security profiles.
CLEAR	**CLEAR** in **Session Parameters** section of library security profiles.
DC	**DC** in **Session Parameters** section of library security profiles.
DU	**DU** in **Session Parameters** section of library security profiles.
EJ	**EJ** in **Session Parameters** section of library security profiles.
ETA	**Error** in **Transactions** section of library security profiles.
ETID	**Default ETID** in user security profiles.
FDIC	The settings in the **Library File** section of library security profiles.
FS	**FS** in **Session Parameters** section of library security profiles.
FUSER	The settings in the **Library File** section of library security profiles.
IA	**IA** in **Session Parameters** section of library security profiles.
ID	**ID** in **Session Parameters** section of library security profiles.
IM	**IM** in **Session Parameters** section of library security profiles.
LS	**LS** in **Session Parameters** section of library security profiles.
LT	**Processing loop limit** in **Security Limits** section of library security profiles.
MADIO	**Maximum number of Adabas calls** in **Security Limits** section of library security profiles.
MAXCL	**Maximum number of program calls** in **Security Limits** section of library security profiles.
MT	**Maximum amount of CPU time** in **Security Limits** section of library security profiles.

Profile Parameter	Corresponding Setting in Natural Security
OPRB	**Adabas open** in **Session Parameters** section of library security profiles.
PS	**PS** in **Session Parameters** section of library security profiles.
RPC	The settings in the **Natural RPC Restrictions** section of library security profiles.
SA	**SA** in **Session Parameters** section of library security profiles.
SF	**SF** in **Session Parameters** section of library security profiles.
SL	**SL** in **Session Parameters** section of library security profiles.
SLOCK	**SLOCK** in **Session Parameters** section of library security profiles.
SM	**Programming Mode** in **General Options** section of library security profiles.
STEPLIB	**Steplibs** in **Additional Options** section of library security profiles
TD	**Time Differential** in user security profiles.
ULANG	**Language** in user security profiles.
WH	**WH** in **Session Parameters** section of library security profiles.
ZD	**ZD** in **Session Parameters** section of library security profiles.

3 Natural Security On Different Platforms

- Supported Platforms 22
- Using Natural Security on Multiple Platforms 23

This section covers the following topics:

Supported Platforms

Natural Security is available on the following platforms:

- z/OS computers,
- Linux,
- Windows.

Natural Security is available as a full version and as a runtime version.

Full Version

Normally, Natural Security is installed as a full version comprising the complete functionality of Natural Security. The full version can be installed on all platforms - except on some Windows platforms (as listed in the Natural *Release Notes*), where only the runtime version is available.

The full version comprises the entire runtime functionality as well as the full administrative and maintenance functionality. In the application `SYSSEC` it provides all functions for the online administration and maintenance of Natural Security data, and for the creation and evaluation of access logs, as well as application programming interfaces for the retrieval and maintenance of Natural Security data.

Runtime Version

On those Windows platforms which are not suited to the stand-alone operation of Natural, Natural Security is installed as a runtime-only version, which only contains the functionality necessary to enable user authentication and access control of Natural resources: it includes the logon procedure, which performs user authentication and verification of access rights when a user logs on to a Natural session, plus the procedures which perform access control to check whether a user has permission to perform the desired functions within a Natural session. In addition, retrieval functions provided by the Natural Security **application programming interfaces** are available.

As the runtime version does not include any maintenance capability, it requires access to a Natural Security system file (FSEC) on another platform. Thus, a runtime version can only be used in combination with a full version installed on one of the other platforms.

Using Natural Security on Multiple Platforms

This section covers the following topics:

- Central FSEC System File
- Protection of Programming Objects
- Protection of DDMs
- Character Translation in Client/Server Environments
- Configuring Entire Net-Work

Central FSEC System File

In a heterogeneous, multiple-platform Natural environment, the administration and retrieval of Natural Security data has to be taken into consideration. It is possible to set up a separate Natural Security system file (FSEC) for each installation, and maintain each FSEC system file independently.

It is also possible to set up a single FSEC system file in which all Natural Security data are stored centrally. The Natural Security installations have to be connected in a network with Entire Net-Work. Access to the centrally stored security data is handled by Entire Net-Work by means of remote database calls.

If the multiple-platform configuration does not include z/OS, the FSEC system file can be located and the Natural Security data maintained on any of the (full version) installations; however, it is recommended that you maintain them on the installation where the FSEC system file is local.

If the multiple-platform configuration includes z/OS, the FSEC system file must be located and the Natural Security data maintained on the z/OS. On the non-z/OS installations, the maintenance of Natural Security data is then automatically disabled. This includes maintenance via Natural Security's **application programming interfaces**.

The accessibility of an FSEC system file in a multiple-platform configuration is as follows:

Location of FSEC	Accessible from
z/OS	z/OS, Linux and Windows
Linux	Linux and Windows
Windows	Linux and Windows

In a heterogeneous environment, the following has to be considered concerning the protection of programming objects and DDMs:

Protection of Programming Objects

In a heterogeneous production environment using a central z/OS FUSER system file, a library which does not exist on the z/OS FUSER system file but in the file system on another platform would not be known to Natural Security on z/OS. To be able to define "non-existent" modules contained in such a library, the **Disallow/Allow Modules** function provides the subfunction **Free List of Modules** (which is described in the section *Library Maintenance*).

With the option **Module Protection Mode** (described in the section *Administrator Services*), it is possible to make Natural Security's protection of programming objects uniform across all z/OS and non-z/OS platforms.

Protection of DDMs

Natural's storage location for DDMs is not the same on all platforms: on z/OS computers, DDMs are stored in an FDIC system file, whereas on Linux and Windows, DDMs are contained in libraries like other Natural objects. Therefore, Natural Security's handling of the DDM protection is also different:

- On z/OS computers, DDMs are treated as separate objects (called "files"), which have their own security profiles.
- On the non-z/OS platforms, the protection of DDMs is subordinate to the protection of libraries, and DDM security profiles are subordinate to library security profiles.

For further information, see ***DDM/Files*** in the section *Structure And Terminology Of Natural Security*.

In a heterogeneous environment where a central FSEC system file on z/OS is used, all DDMs on the non-z/OS platforms must be transferred to the library `SYSTEM` in order to enable their use under Natural Security.

FDDM Profile Parameter

If a system file as the central location for DDM storage (outside of libraries) is specified with the Natural profile parameter `FDDM` on a non-z/OS platform, the protection of non-z/OS DDMs and the maintenance of their security profiles is performed in the same way as with z/OS DDMs.

Character Translation in Client/Server Environments

If Natural Security is used on multiple platforms in a client/server environment, and a logon is performed on a client which uses a different character code than the server, Natural Security has to translate the logon data from ASCII to EBCDIC or vice versa on the server. For this character translation, Natural Security uses the following translation tables:

- On z/OS, it uses the translation table `NTTABA2` in the Natural configuration module `NATCONFG`.
- On non-z/OS platforms, it uses the sections `ISO8859_1->EBCDIC` and `EBCDIC->ISO8859_1` of the Natural configuration file `NATCONV.INI`.

If these do not suit your requirements, you may have to adjust them. For further information, see the Natural *Operations* documentation for the relevant platform.

Configuring Entire Net-Work

Entire Net-Work's translation process is centered around the format and length of each field specified in the search and format buffers that are passed with each Adabas call, along with special translation definition parameters. When a request goes through the network conversion routines, each individual field is translated according to the format and length defined for it in the associated search or format buffer.

To avoid the errors `NAT0824` and `NAT0825`, add translation definitions for the following fields for the DBID and FNR of the z/OS FSEC system file with format `X`:

- LW
- LC
- LQ
- LV
- LS

This prevents values from being either translated or swapped.

For further information, see *Special Handling Of Field Format "X"* in the section *Heterogeneous Platform Considerations* of the Entire Net-Work *Installation and Operations for z/OS* documentation.

4 First Steps After Installing Natural Security

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- Step 2 - Define Administrators 29
- Step 3 - Define System Libraries 30

This section describes the steps which you have to perform after you have installed Natural Security for the very first time:

These steps need only be performed after an initial installation of Natural Security, that is, if the version you have installed is your first version of Natural Security on this FSEC system file. They need not be performed after the installation of a new Natural Security version on an existing FSEC system file.

Step 1 - Change the Password of the User DBA

To change the password of the user DBA:

1. Invoke Natural in the environment where Natural Security has been installed.
2. On the Natural Security logon screen (or logon dialog box), enter the library ID `SYSSEC`, the user ID `DBA`, the password `DBA`, and a new password, and press ENTER.
3. Enter the new password again and press ENTER to confirm the password change.

Password Rules

The new password for the user DBA must comply with the following rules:

- Its length must be 8 characters.
- It must contain at least one upper-case letter.
- It must contain at least one number.
- It must contain at least one special character.
- It must not contain the character sequence `DBA`.
- Every character may appear only once within the password.

Installation Verification

The fact that you were able to perform this step also means that Natural Security is operational. No further verification is required.

Step 2 - Define Administrators

Create a user security profile for each person who is to be a Natural Security administrator, and then link each Natural Security administrator to the library `SYSSEC`.

The following is an *example* of how to do this.

To define an administrator:

1. On the Natural Security logon screen (or logon dialog box), type the library ID `SYSSEC`, the user ID `DBA` and the new password (as set in Step 1 above).

   The Natural Security **Main Menu** is displayed.
2. Select **Maintenance**.

   A window is displayed.
3. Mark the object type **User** with a character or with the cursor.

   The **User Maintenance** selection list is displayed.
4. In the command line of this selection list, enter the command `ADD`.

   A window is displayed.
5. Choose a user ID for your Natural Security administrator. For example, if the administrator's name were “Arthur Dent”, you could choose “AD” as his user ID. The following steps in this example will use this ID.
6. Enter the user ID `AD` and the user type `A`.

   The **Add User** screen is displayed.
7. Enter the user name “Arthur Dent” and set **Private Library** to `N` (and press ENTER).
8. Press PF3.

   The user “Arthur Dent” is now defined to Natural Security under the user ID “AD”. The **User Maintenance** selection list is displayed again.

To link the administrator to SYSSEC:

1. In the **Co** column of the **User Maintenance** selection list, mark the user “AD” with the function code `LL`.

   A window is displayed.
2. Enter the library ID `SYSSEC`.

The **Link User To Libraries** selection list is displayed.

3 In the **Co** column of the selection list, mark the library `SYSSEC` with the function code `LK`.

The user "Arthur Dent" is now linked to the library `SYSSEC`.

4 In the command line, enter the command `LOGOFF`.

The Natural Security logon screen (or logon dialog box) is displayed.

Now you can log on to `SYSSEC` with the user ID "AD" and the password "AD". When you log on with the new user ID for the first time, you must change the password (by typing in a new password in addition to the user ID and password).

Deleting the User DBA

Once you have successfully defined administrators, it may be advisable to delete the user DBA to make sure that the user ID "DBA" cannot be used by unauthorized users to gain access to `SYSSEC`.

To delete the user DBA:

1 Log on to `SYSSEC` with the user ID `AD`.

2 Go to the **User Maintenance** selection list as described above.

3 On the list, mark the user DBA with the function code `DE`.

4 A window is displayed in which you enter the user ID `DBA`.

The user DBA is now deleted.

Step 3 - Define System Libraries

Create security profiles for all system libraries of Natural and Natural subproducts installed at your site. To do so, use the Natural Security function **Definition of System Libraries**, which is described in the section *Administrator Services*.

5 Logging On Natural Security

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- Automatic Logon 36
- Logon Customization 37
- Ending a Natural Session 39

This section describes the rules which apply when a user logs on to Natural under Natural Security.

It covers the following topics:

Logon Procedure

Note: If a user invokes Natural under Natural Security and the FNAT system file specified in the parameter file/module used is a non-Security system file, Natural cannot be started, and the user will receive an appropriate error message.

The logon procedure is used by Natural Security to ensure that the user who is logging on to Natural is authorized for the library requested.

A logon must be executed successfully before any Natural session can be started.

A logon screen (on z/OS computers and Linux) or logon dialog box (under Windows) is provided for the user to enter the information required for the logon.

Logon Screen and Logon Dialog Box

When Natural Security is installed, the Natural Security logon screen will be displayed whenever a user invokes Natural.

Under Windows, the logon screen is displayed as a dialog box (for the sake of consistency, however, it will also be referred to as “logon screen”).

The logon screen requests the user to enter the following:

Field	Explanation
Library ID	The ID of the library to be used. To determine which libraries are available, the user may enter his/her user ID in the user ID field and an asterisk (*) in the library ID field: a list of all libraries available to the user will be displayed. The list contains all non-protected libraries and all protected libraries to which the user is linked (either directly, or via a group whose security profile is activated). The list also contains all libraries available to the user's terminal (if the terminal is defined to Natural Security. To view a list of all libraries available to the terminal, the user may enter an asterisk (*) in the library ID field without entering a user ID.) **Note:** For a logon from the Natural Studio in a client environment via the Natural Development Server to a Map Environment on a z/OS server, the specification of an asterisk (*) as library ID is not possible.
User ID	The ID by which the user is defined to Natural Security. The ID of a group must not be entered. A terminal ID must not be entered either.

	If a user ID is entered, a password must also be entered. If no user ID is entered, no password is required. If no user ID is entered, Natural Security will use the ID of the terminal being used. In this case the terminal has to be defined to Natural Security; otherwise the logon will be rejected.
Password	The password specified in the user's security profile. If no password has been specified in the user's security profile, the password will be identical to the user ID (when a newly defined user logs on for the first time and the password is identical to the user ID, the user must change his/her password by entering a new password in the New Password field).
New Password	A new password can only be entered in this field, if a valid password is entered in the Password field. If a valid password has been entered in the Password field and the user wishes/has to change that password, the user enters a new password in this field. This new password then replaces the old one and will from then on be the valid password for the user. **Note:** If the user authentication is performed via an LDAP server, this field is not available.

Passwords

By default, Natural Security uses “regular” passwords of up to 8 characters. However, it also supports the use of *passphrases*, that is, passwords which are longer than 8 characters. The use of passphrases is activated by the option **Passphrases active** in the ***User Preset Values*** section of *Administrator Services*.

Unless otherwise stated, the term *password* in the Natural Security documentation applies to passwords of any length.

In a user's security profile, a Natural Security administrator may set or change the user's password. The administrator may also set a time interval, after which the user will be forced to change his/her password when logging on. See **New Password** and **Change after** *nnn* **days** in ***Components of a User Security Profile***.

If a user has forgotten his/her password, he/she has to contact the Natural Security administrator, who then specifies a new password in the user's security profile. This will then be the valid password for the user (which he/she may change again in the logon screen).

Several rules can be applied to the usage of passwords. For this purpose, various options are available in the ***User Preset Values*** section of *Administrator Services*.

Rejected Logon

A logon to a library will be rejected if:

- the user is not defined to Natural Security;
- the user's security profile is currently inactive (due to **Activation Dates** settings);
- the user is defined as user type “Member” and has not been assigned to a group;
- the user is defined as user type “Member”, and the security profile of the group to which he/she is assigned is currently inactive (due to **Activation Dates** settings);
- the library is not defined to Natural Security;
- the time window restrictions defined in the library's security profile do not permit use of the library at the time of the logon;
- the library is protected and the user is not linked to the library;
- the library is protected and the user is linked to it, but the link has been temporarily locked;
- the library is protected, and the group via which the user is linked to the library is currently inactive (due to **Activation Dates** settings in the group security profile);
- a non-existent startup transaction is specified in the library's security profile;
- the NEXT/MORE line is not allowed nor a startup transaction specified in the library's security profile.

Logon Without Library ID

If no library ID is entered in the logon screen, the default library specified in the user's security profile will be invoked.

If no default library is specified in the user's security profile, the **Privileged Groups** specified in the user's security profile will be checked (in order of entry) for a default library.

If none of the **Privileged Groups** has a default library either, the user's **private library** will be invoked.

If neither default libraries nor a private library exist, the user must enter a library ID when he/she logs on.

RESTART and FIN as Library IDs

If `RESTART` is entered as the library ID, the last RESTARTable library to which the user was logged on will be invoked (for details on the "RESTART" option, see ***Transactions*** in the section *Components of a Library Security Profile*).

Note: The ID of the last RESTARTable library to which a user was logged on is shown in the field **Last Library** in the user security profile.

If `FIN` is entered as the library ID, the Natural session will be terminated.

Successful Logon

After a successful logon to a library, the startup transaction specified in the library's security profile is invoked. If no startup transaction is specified there, the Natural main menu is invoked.

Note: Internally, Natural Security performs an `END OF TRANSACTION` statement after a successful logon if any of the following applies:

- the user's password has been changed during the logon procedure;
- a logon error has occurred during the logon procedure;
- the **Logon recorded** option in the user's or the library's security profile is set to `Y`;
- the **Restart** option in the library security profile is set to `Y`;
- the general option **Lock User Option** in Administrator Services is set to `X`.

LOGON Command

If the first logon to a library at the beginning of a Natural session was successful, a user may change from one library to another by using the Natural system command `LOGON`.

See also the Natural *System Commands* documentation for information on the `LOGON` system command.

The `LOGON` command takes the following parameters:

- If no parameter is specified, the default library will be invoked (either the user's or one of the privileged group's); if no default library is specified, the Natural Security logon screen will be invoked. For example:

```
LOGON
```

- If one parameter is specified, it will be interpreted as a library ID. For example:

```
LOGON LIBX
```

```
LOGON *
```

- If two parameters are specified, the first will be interpreted as a user ID, the second as a password. For example:

```
LOGON USERX PASSWX
```

- If three parameters are specified, the first will be interpreted as a library ID, the second as a user ID, the third as a password. For example:

```
LOGON LIBX USERX PASSWX
```

- If four parameters are specified, the first will be interpreted as a library ID, the second as a user ID, the third as a password, the fourth as a new password. For example:

```
LOGON LIBX USERX PASSWX NEWPASSX
```

LOGON Command Errors

If an error is detected during logon processing, Natural Security will display an error message.

If the `LOGON` command has been issued from a library, Natural Security will invoke the error transaction defined for that library. If no error transaction is defined, the logon screen will be invoked.

Automatic Logon

Users would normally have to log on twice, first to the operating system and second to Natural. To eliminate the need for a second logon, you may set the Natural profile parameter `AUTO` to `AUTO=ON` (see Natural *Parameter Reference* documentation).

As a result, an internal Natural Security logon procedure will be invoked, which uses the operating-system login name (as contained in the Natural system variable `*INIT-USER`) as the user ID, but no password (on the assumption that this has been verified by the operating-system logon procedure). The Natural Security logon screen will be suppressed. A logon with a user ID other than the operating-system login name will not be possible.

If `AUTO=ON` is used, the user has no possibility of specifying a library ID. The library to which the user will be logged on is determined by the same rules as described under ***Logon Without Library ID*** above. This means that automatic logon is only possible if a default library is specified (for the user or one of his/her Privileged Groups) or the user has a private library.

If you combine `AUTO=ON` with specifying a default library in a user's security profile and with specifying a startup transaction for that library, the user will receive the first screen of the default library immediately after invoking Natural without having to pass any intermediate screens (default libraries are described under ***Components of a User Security Profile*** in the section *User Maintenance*, startup transactions under ***Transactions*** in the section *Library Maintenance*).

If `AUTO=ON` is set, the system command `LOGOFF` has the same result as the system command `FIN` (see ***How to End a Natural Session*** below).

If `AUTO=ON` is set, and after the initial automatic logon the user tries to log on to another library and causes a logon error, the error transaction for the current library will be invoked. If no error transaction is specified, an error message will be issued and then the startup transaction (if specified) for the current library will be invoked.

Note: With Natural Single Point of Development, the user must always specify his/her user ID and password in the Map Environment dialog, even if `AUTO=ON` is set.

Logon Customization

This section describes the options available for logon customization:

- Customizing the Logon Screen or the Logon Dialog Box
- Logon-Related User Exits
- APIs for Access Verification and User Authentication

Customizing the Logon Screen or the Logon Dialog Box

You can change the layout of the logon screen / dialog box to suit your requirements.

By default, the logon screen / dialog box is invoked by the user exit `LOGONEX1`.

- Logon Screen on z/OS Computers and Linux
- Logon Dialog Box on Windows
- Logon Screen / Dialog Box for Passphrases
- Logon Screen / Dialog Box with LDAP (on Linux and Windows only)

- Source/Object Names of Logon Screen / Dialog Box

Logon Screen on z/OS Computers and Linux

The source code of the logon screen is the map NOGONM1,which is provided in the library SYSSEC.

To customize the logon screen:

1. Make a copy of NOGONM1 and store it under the name LOGONM1.
2. Modify LOGONM1 to suit your requirements, and catalog it.
3. Copy the cataloged object LOGONM1 into the library SYSLIB.

Should LOGONM1 be missing from SYSLIB, the Natural Security installation procedure will automatically copy the object module NOGONM1 from SYSSEC to SYSLIB and store it there under the name LOGONM1. This ensures that a default logon screen is always present if no customized one is used.

Logon Dialog Box on Windows

For the logon dialog box on Windows, the customization procedure is the same as described above - except that the source/object names are different; see table below.

Logon Screen / Dialog Box for Passphrases

If the option **Passphrases active** in ***User Preset Values*** is set to Y or A, the logon screen / dialog box is invoked by the user exit LOGONEX0 instead of LOGONEX1. The customization procedure is the same as described above - except that the source/object names are different; see table below.

Logon Screen / Dialog Box with LDAP (on Linux and Windows only)

If the **Authentication Type** is set to "LDAP" in the **LDAP security profile**, the logon screen / dialog box is invoked by the user exit LOGONSX1 instead of LOGONEX1. The customization procedure is the same as described above - except that the source/object names are different; see table below.

Source/Object Names of Logon Screen / Dialog Box

Logon Screen / Dialog Box Invoked by User Exit	Source in Library SYSSEC	Object in Library SYSLIB
LOGONEX1	NOGONM1 (map)	LOGONM1
	NOGONGM1 (dialog box)	GLOGONM1
LOGONEX0 (if authentication option is not active)	NOGONMX1 (map)	LOGONMX1
	NOGONGO1 (dialog box)	GLOGONO1
LOGONEX0 (if authentication option is active)	NOGONMZ1 (map)	LOGONMZ1
	NOGONGX1 (dialog box)	GLOGONX1

Logon Screen / Dialog Box Invoked by User Exit	Source in Library SYSSEC	Object in Library SYSLIB
LOGONSX1	NOGONSM1 (map)	LOGONSM1
	NOGONGS1 (dialog box)	GLOGONS1

Logon-Related User Exits

In addition to those mentioned above, Natural Security provides several other user exits which may be used to customize the logon procedure. See ***Logon-Related User Exits***.

APIs for Access Verification and User Authentication

Natural Security provides several application programming interfaces (APIs) which can be used for access verification and user authentication. See ***Application Programming Interfaces.***

Ending a Natural Session

The following Natural system commands may be used to end a Natural session under Natural Security:

Command	Explanation
LOGOFF	This command terminates a Natural session and invokes the logon screen. To leave the logon screen, you enter FIN as the library ID. If the profile parameter AUTO=ON is set (see ***Automatic Logon*** above), the LOGOFF command has the same effect as the FIN command.
LOGON (without parameters)	This command terminates a Natural session and starts the logon procedure, invoking either a default library or the logon screen (if no default library is defined). See also ***Automatic Logon*** above.
FIN	This command terminates a Natural session and is used to leave Natural altogether.

Caution: Natural Security cannot protect your Natural environment against unauthorized use if Natural users leave their terminals unattended whilst being logged on to Natural. Therefore, users should be reminded to use the LOGOFF command before they leave their terminal. Unauthorized persons will then be confronted with the Natural Security logon screen and may only use what has been defined for them to use under Natural Security.

In library security profiles, you can specify a non-activity time limit, after which a logoff will be executed automatically.

6 Finding Your Way In Natural Security

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- Pressing the ENTER Key 43
- Invoking the Online Help 43
- Displaying Possible Values for a Field 43
- Handling a List 44
- Direct Commands 48

This section provides information on handling Natural Security.

It covers the following topics:

Invoking a Function

You can invoke Natural Security functions from within the Natural Security library `SYSSEC` or from outside of `SYSSEC`.

Within `SYSSEC`:

- You can invoke a function by selecting it from a Natural Security menu or **selection list**.
- You can invoke a function by issuing a **direct command**.

Outside of `SYSSEC`:

- You can invoke a function via one of the **application programming interfaces** provided.
- You can invoke a function by issuing a **direct command**.

Profile Security

Regardless of how you invoke a function, Natural Security's administrator/owner settings will always apply; that is, you can only apply functions to those security profiles you are allowed to maintain.

Functional Security

All `SYSSEC`-specific commands are defined in the command processor `NSCCMD01`. You can disallow Natural Security functions by disallowing the corresponding commands in `NSCCMD01`. For details on `NSCCMD01`, see the section ***Functional Security for Library SYSSEC***.

If functions are disallowed in `NSCCMD01`, the corresponding menu items will not be visible on the Natural Security menus. This means that within `SYSSEC` you only see the functions you are allowed to use.

Aborting a Function

Do not use the Natural terminal command `%%` to abort a Natural Security function, as this may cause inconsistencies in your Natural Security data.

Pressing the ENTER Key

To tell Natural Security to perform a particular action, you enter the appropriate function code, command, etc. and then press the ENTER key.

So, if the Natural Security documentation tells you to "enter a function code", this means, "type in the function code and press ENTER".

If a function requires that you press another key, this is explicitly mentioned in the Natural Security documentation.

Invoking the Online Help

To invoke online help for a Natural Security function:

- Enter a question mark (?) as a function code on screens with a function code input field; or
- Press PF1 on any Natural Security screen.

An explanation of a given screen and the information necessary to proceed will be displayed.

Note: If certain items displayed on a Natural Security screen are not directly relevant for the execution of the function concerned, these items are not always explained in this documentation. In these cases, you will find the corresponding explanations in the online help.

Displaying Possible Values for a Field

If you are not sure what you can enter in an input field on a Natural Security menu or selection screen, enter an asterisk (*) in the field. A window will be displayed listing all the possible values for the field. You can then select the desired value from that list.

Handling a List

This section covers the following topics:

- Selecting the Range of Objects to be Listed
- Scrolling a List
- Selecting an Object from a List

Selecting the Range of Objects to be Listed

When you invoke the Maintenance or Retrieval subsystem for a certain object type (user, library, etc.), a list of these objects will be displayed. Normally such a list will contain all objects.

For example, to list all users defined to Natural Security, you mark the object type **User**.

```
+-------------MAINTENANCE-------------+
!  Please select one type of object:  !
!                                     !
!  X User                             !
!  _ Application                      !
!  _ Library                          !
!  _ File                             !
!  _ Mailbox                          !
!  _ Utility                          !
!                                     !
!                                     !
!                                     !
! Start Value .. _________________    !
! Type/Status .. ____                 !
+-------------------------------------+
```

The contents of the above selection window may vary depending on the platform and the types of external objects available. If the list of object types exceeds the size of the window, you can use PF7 and PF8 to scroll within the window.

If you do not want a list of all objects but would like only certain objects to be listed, you may use the option **Start Value**.

For users, applications, libraries and files, you may also use the option **Type/Status** - either alone or in combination with the **Start Value** option. For other objects, only the **Start Value** option is available.

Start Value

In this field you may enter a start value, which may consist of one or more characters, or of one or more characters followed by an asterisk (*). The option to enter a value followed by an asterisk is referred to as *asterisk notation* throughout the Natural Security documentation.

For example, to list all users, starting from the first user whose ID begins with “TOM”, you mark the object type **User** and enter the following:

```
Start Value .. TOM
```

For example, to list only those users whose IDs begin with “TOM”, you mark the object type **User** and enter the following:

```
Start Value .. TOM*
```

Type/Status

In this field you may enter a user type, application type, library protection status, or a file status on z/OS.

User Type

User type may be one of the following:

G	Group
M	Member
P	Person
A	Administrator
T	Terminal
B	Batch User

Library Protection Status

Library protection status may be one of the following:

NN	Not protected.
LN	Not protected, but linkable for one group.
YN	People-protected only.
NY	Terminal-protected only.
YY	People- or terminal-protected.
YA	People- and terminal-protected.

PN	For private libraries: same as YN.
PY	For private libraries: same as YY.
PA	For private libraries: same as YA.

(The above **protection combinations** are explained in the section *Protecting Libraries*.)

File Status

File status may be one of the following:

PRIV	Private.
ACCE	Access.
PUBL	Public.
UNDF	Undefined; that is, DDMs for which no file security profiles have been created (*).
DEFI	Defined; that is, all PRIV, ACCE, and PUBL files (*).
NDDM	File security profiles for which no DDMs exist (*).
DDM	All PRIV, ACCE, PUBL and UNDF files (*)

* This is not an actual file status, but for selection purposes only.

If you do not select a file status, all PRIV, ACCE, and PUBL files will be listed.

Application Type

Application type may be one of the following:

B or BASE	Base applications.
C or COMP	Compound applications.

If you do not select an application type, both base and compound applications will be listed.

Example 1 - Type/Status option:

To list all users of user type “Member”, you mark the object type **User** and enter the following:

```
Type/Status .. M
```

Example 2 - Combining Start Value and Type/Status:

To list only users of user type “Member” whose IDs begin with “T”, you mark the object type **User** and enter the following:

```
Start Value .. T*
Type/Status .. M
```

Scrolling a List

Once a list of objects is displayed, you may scroll it backwards and forwards in the following manner:

- To scroll a list one page forward, you press PF8 (+).
- To scroll a list one page backward, you press PF7 (-).
- To scroll a list to its beginning, you press PF19 (- -).
- To scroll a list to a specified start value, you may use the *intensified* field above the IDs, in the same way as described above for the **Start Value** field.
- For a list of users or applications, you can also use the *intensified* field above the **Type** column in the same way as described above for the **Type/Status** field. For a list of libraries, the same is true for the field above the **Protection Status** column. These fields display the currently valid type/status selection criterion.

```
11:38:39                    *** NATURAL SECURITY ***                2022-08-31
                              - User Maintenance -

Co User ID  User Name                         Type Message
__ ________ ________________________________ ____ ______________________
__ AAZ      ABDUL ALHAZRED                   A
__ AD       ARTHUR DENT                      A
__ AH       ALICE HARGREAVES                 M
__ ER       ELLEN RIPLEY                     M
__ LL       LOCKE LAMORA                     M
__ TN       THURSDAY NEXT                    A
__ VV       VINCENT VEGA                     P
```

Selecting an Object from a List

To select an object from a list for a function, you simply type in the appropriate function code for the function next to the object in the left-hand column (entitled **Co**) of a selection screen.

If you do not remember the function code for the function you wish to perform, enter an asterisk (*) in the **Co** column. A window will be displayed which shows all the function codes available; in the window, you can then select the desired function code.

Direct Commands

This section covers the following topics

- About Direct Commands
- Commands to Invoke a Function
- Commands to Invoke a Selection List
- Special Commands
- Issuing a Command Outside of SYSSEC

About Direct Commands

Once you are familiar with Natural Security and know how to find your way from menu to menu, you may be interested in invoking the function you want directly. This is done by using *direct commands*.

You can enter a direct command on any Natural Security screen which provides a *command line*:

```
Command ===>
Enter-PF1---PF2---PF3---PF4---PF5---PF6---PF7---PF8---PF9---PF10--PF11--PF12---
      Help        Exit                                                Canc   ↩
```

If you enter a direct command which is invalid, you will receive an appropriate error message. If you enter a command which is incomplete, you will be prompted to specify the missing item(s).

After a function invoked by a direct command has been executed, the screen from which that function would “normally” be invoked will be displayed - *not* the screen on which the command had been entered.

There are three types of direct commands:

- **commands to invoke a function**,
- **commands to invoke a selection list**,
- **special commands**.

Commands to Invoke a Function

General Command Syntax

Generally, a direct command which is used to invoke a function consists of the following components, which you specify in the following order:

```
function  object-type  object-ID  parameters
```

First, you specify a *function*. Possible functions are:

ADD	Add security profile.
COPY	Copy security profile.
MODIFY	Modify security profile.
RENAME	Rename security profile.
DELETE	Delete security profile.
DISPLAY	Display security profile.
EDIT	Edit group members.
LINK	Link object to another object.
XREF	Cross-reference object.

After the function, you specify an *object-type* (for example, USER, LIBRARY).

After the object type, you can specify an *object-ID* (for example, a user ID or library ID).

After the ID, you can specify one or more *parameters* (for example, a user type).

Parameters for Security-Profile Components

For the functions DISPLAY and MODIFY, several *parameters* are available which allow you to directly access those components of a security profile which are not on the main security-profile screen, but on one of profile's **Additional Options** screens. These are:

For all *object-types*:

Parameter	Security-Profile Component
DIR	Maintenance Information.
NOTES	Security Notes.
OWNERS	Owners.

For *object-type* USER:

Parameter	Security-Profile Component
MAILBOXES	Mailboxes.
ACTIVATION	Activation Dates.
FUNCSEC	Functional Security.
PRIVLIB	Private Library (only for user types A and P).
SESSION	Session Options (only for user types A and P).

For *object-type* LIBRARY:

Parameter	Security-Profile Component
MAILBOXES	Mailboxes.
TIMEW	Time Windows.
STEPLIBS	Steplibs.
FUNCSEC	Functional Security.
USEREXIT	User Exit.
OPTIONS	Security Options.
LIMITS	Security Limits.
PARAMETERS	Session Parameters.
RPC	Natural RPC Restrictions.
COMMANDS	Command Restrictions.
EDITORS	Editing Restrictions.
STATEMENTS	Statement Restrictions.
MODULES	Disallow/Allow Modules.
DDMSTATUS	Set Status of DDMs.

Abbreviating a Command

You may abbreviate the *function* component of a direct command as you please, as long as the abbreviation uniquely identifies the function.

You may abbreviate the *object-type* component of a direct command to 2 characters.

Examples:

`DISPLAY USER ADE`	This command causes the security profile of user ADE to be displayed.
`DISPLAY US ADE,DIS USER ADE,DI US ADE`	Each of these three commands also causes the security profile of user ADE to be displayed.
`DE US ADE`	This command invokes the **Delete** function for user ADE.
`D US AE`	This command is *invalid*, because `D` does not uniquely identify a function; it could stand for `DISPLAY` or `DELETE`.

Several Natural system commands are available within Natural Security; they must also be taken into consideration as far as the unique identification of a function is concerned.

Command Examples

`ADD`	If you enter this command on a **Maintenance** selection list, the Add function for that type of object will be invoked. If you enter it somewhere else, the command is incomplete, because no object type was specified.
`ADD US`	The **Add User** window will be invoked for you to enter a user ID and user type.
`ADD US CMOT`	The **Add User** window will be invoked for you to enter a user type.
`ADD US CMOT M ANKH`	The **Add User** screen for user CMOT of user type "Member", using default profile ANKH as the basis of the user security profile to be created, will be invoked for you to define the user.
`MODIFY`	This command is incomplete, because no object type was specified after the function.
`MODIFY LIB`	This command displays the **Library Maintenance** selection list, as no library ID was specified.
`MOD LIB BOOKS`	The security profile of library BOOKS will be displayed for modification.
`CO US ESME`	The **Copy User** window will be displayed for you to enter the user ID of the new user.
`CO US ESME OGG`	The **Copy User** screen for user OGG will be invoked with the security profile of user ESME copied into the security profile of user OGG. The copying is without links.
`CO US ESME OGG Y`	The **Copy User** screen for user OGG will be invoked with the security profile of user ESME copied into the security profile of user OGG. The copying is with links.
`EDIT US DOC`	Invokes the Edit Group Members function for the group DOC.

`XREF MAIL MAIL1`	Invokes the Cross-Reference function for mailbox MAIL1.
`LK LI ODDS US`	The **Link Users To Library** screen will be invoked for users to be linked to library ODDS; the list will contain all users.
`LINK US IW LI`	The **Link User To Libraries** screen will be invoked for user IW to be linked to libraries; the list will contain all libraries.

Commands to Invoke a Selection List

The following commands can be used to invoke a selection list:

Command	Function
`MAINTENANCE` *`object-type object-ID parameters`*	If you specify only the command itself, the object selection window for maintenance functions will be displayed. If you specify an *`object-type`* after the command, the maintenance selection list for that type of object will be displayed. If you specify an *`object-type`* and an *`object-ID`* after the command, the maintenance selection list for that type of object will be displayed, and the *`object-ID`* will be used as start value for the list. After the *`object-ID`*, you can specify one or more *`parameters`* (for example, user type) as further selection criteria for the maintenance selection list to be displayed.
`RETRIEVAL` *`object-type object-ID parameters`*	If you specify only the command itself, the object selection window for retrieval functions will be displayed. In the same manner as for the `MAINTENANCE` command (see above), you can specify an *`object-type`*, *`object-ID`* and *`parameters`* with this command.

Special Commands

Apart from commands which invoke a particular function or selection list (as described above), and several Natural system commands (which are described in the Natural *System Commands* documentation), the following special commands are available (underlining indicates the shortest abbreviation possible):

Command	Function
`ADMIN`	Invokes the **Administrator Services** menu.
`ADMIN_A`	Invokes the Administrator Services function **General NSF Options** (only available with Natural SAF Security).
`ADMIN_B`	Invokes the Administrator Services function **Authentication Options**.
`ADMIN_D`	Invokes the Administrator Services function **Library Preset Values**.
`ADMIN_E`	Corresponds to the command `ERROR`.

Command	Function
ADMIN_G	Invokes the Administrator Services function **Set General Options**.
ADMIN_I	Invokes the Administrator Services function **Application Programming Interfaces**.
ADMIN_L	Corresponds to the command LOGREC.
ADMIN_N	Invokes the Administrator Services function **Maintenance Log Records**.
ADMIN_P	Invokes the Administrator Services function **Set PF-Keys**.
ADMIN_S	Invokes the Administrator Services function **Definition of System Libraries**.
ADMIN_U	Invokes the Administrator Services function **User Default Profiles**.
ADMIN_V	Invokes the Administrator Services function **User Preset Values**.
ADMIN_X	Invokes the Administrator Services function **Utility Defaults/Templates**.
ADMIN_Y	Invokes the Administrator Services function **Library Default Profiles**.
ADMIN_1	Invokes the Administrator Services function **Environment Profiles**.
ADMIN_2	Invokes the Administrator Services function **SAF Online Services**.
ADMIN_3	Invokes the Administrator Services function **Definition of Undefined Libraries**.
CUSTOM1 CUSTOM2 CUSTOM3 CUSTOM4 CUSTOM5	These commands invoke Natural programs of the same names. You can write your own programs of these names to perform whatever functions you require; this allows you to invoke such functions from within Natural Security.
ERRDEL	Deletes all logon/countersign error records (see also *Direct Command ERRDEL* in the section *Administrator Services*).
ERROR	Invokes the **Logon/Countersign Errors Menu**.
LOGDEL	Deletes all logon records (see also *Deleting All Logon Records - Direct Command LOGDEL* in the section *Administrator Services*).
LOGFILE	Invokes the Administrator Services function **Log File Maintenance**.
LOGREC	Invokes the **Logon Records Menu**.
MENU	Invokes the Natural Security **Main Menu**.
. (period)	Terminates the given processing level and displays the screen of the next higher processing level (the same as PF3).

Issuing a Command Outside of SYSSEC

You can also issue a Natural Security direct command from outside of the Natural Security library SYSSEC. This allows you to perform a Natural Security function from anywhere in your Natural session without having to log on to the library SYSSEC.

To do so, you enter the direct command - prefixed by SYSSEC - in the Natural command line.

For example:

```
SYSSEC MOD LIB XYZ
```

When you leave the screen invoked by the direct command, you will be returned to the Natural screen from which you have issued the command.

Note: When you issue a direct command which invokes a function, you have to specify the full command, that is, you must not omit any command component necessary to invoke the actual function (and not only a selection screen or start-value window). For example, the command `COPY USER ABC` would be incomplete, because the new user ID is missing.

7 Administrator Services

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The Administrator Services subsystem provides several functions which apply to Natural Security as a whole and to all security profiles.

This section covers the following topics:

Access to Administrator Services

Access to the Administrator Services subsystem is controlled a) by the owner specifications in the security profile of the Natural Security library `SYSSEC`, and b) by the command processor `NSCCMD01`:

- If no owner are specified in the security profile of `SYSSEC`, every user of type "Administrator" may access the Administrator Services subsystem.
- If owners are specified in the security profile of `SYSSEC`, the field **Functional Security Defined** for the command processor `NSCCMD01` in `SYSSEC` determines who may access the Administrator Services subsystem:
  - If this field is set to `Yes` (this is the default), only the owners of `SYSSEC` may access Administrator Services.
  - If this field is set to `All`, every user of type "Administrator" may access Administrator Services.

  In either case, the functional security specifications made in the library security profile of `SYSSEC` and in the Administrators' user security profiles determine which Administrator Services functions may be used.

For information on owners in library security profiles, see the sections ***Library Maintenance*** and ***Countersignatures***. For information on the command processor `NSCCMD01`, see the section ***Functional Security for Library SYSSEC***.

Invoking Administrator Services

To invoke Administrator Services:

1 On the **Main Menu**, select **Administrator Services**.

  If you are allowed **access to Administrator Services**, the **Administrator Services Menu** will be displayed.

2 The **Administrator Services Menu** consists of two screens. With PF7 and PF8, you can switch between the two screens. They provide the following functions:

Administrator Services Menu 1:

- **General Options** (*)

- Authentication Options
- PF-Keys
- Logon/Countersigns Errors
- Logon Records
- Maintenance Log Records
- SAF Online Services

Administrator Services Menu 2:

- Environment Profiles
- User Default Profiles (*)
- Library Default Profiles (*)
- User Preset Values
- Library Preset Values
- Utility Defaults/Templates (*)
- Definition of System Libraries
- Definition of Undefined Libraries
- Application Programming Interfaces

You should study the functions marked above with (*) before you start defining objects to Natural Security. The other Administrator Services functions are not directly related to defining objects to Natural Security.

General Options

Before you start defining objects to Natural Security, it is advisable to specify a number of options which apply to the Natural Security system as a whole.

To invoke General Options:

1 On the **Main Menu**, select **Administrator Services**.

If you are allowed access to Administrator Services, the **Administrator Services Menu 1** will be displayed.

2 On this menu, select **General Options**.

The **Set General Options** screen will be displayed.

3 The **Set General Options** screen consists of two screens. With PF7 and PF8 you can switch between the two screens. They provide the following options:

General Options - Screen 1:

- **Transition Period Logon**
- **Activate Security for Development Server File**
- **Maximum Number of Logon Attempts**
- **Suppress Display of Logon Messages**
- **Lock User Option**
- **User Password / Passphrase History**
- **Free Access to Functions via APIs**
- **Minimum Number of Co-Owners**
- **Deletion of Non-Empty Libraries Allowed**
- **Overwriting of Defaults Possible**
- **Display DBID/FNR of FSEC**
- **Exit Functions with Confirmation**
- **Logging of Maintenance Functions**

General Options - Screen 2:

- **Store Logon and Error Data on Separate System Files**
- **Concurrent Modifications Without Notification**
- **Private Libraries in Public Mode**
- **Suppress Mailboxes in Batch Mode**
- **Environment Protection**
- **Access To Current FSEC**
- **Force Impersonation for Natural Development Server**
- **Record Each User's Initial Logon Daily**
- **Enable Error Transaction Before NAT1700/1701 Logoff**
- **Logoff in Error Case if *STARTUP is Active**
- **Set *APPLIC-NAME Always to Library Name**
- **Allow Deletion of Users Who Are Owners/DDM Modifiers**

The individual options are described below.

Transition Period Logon

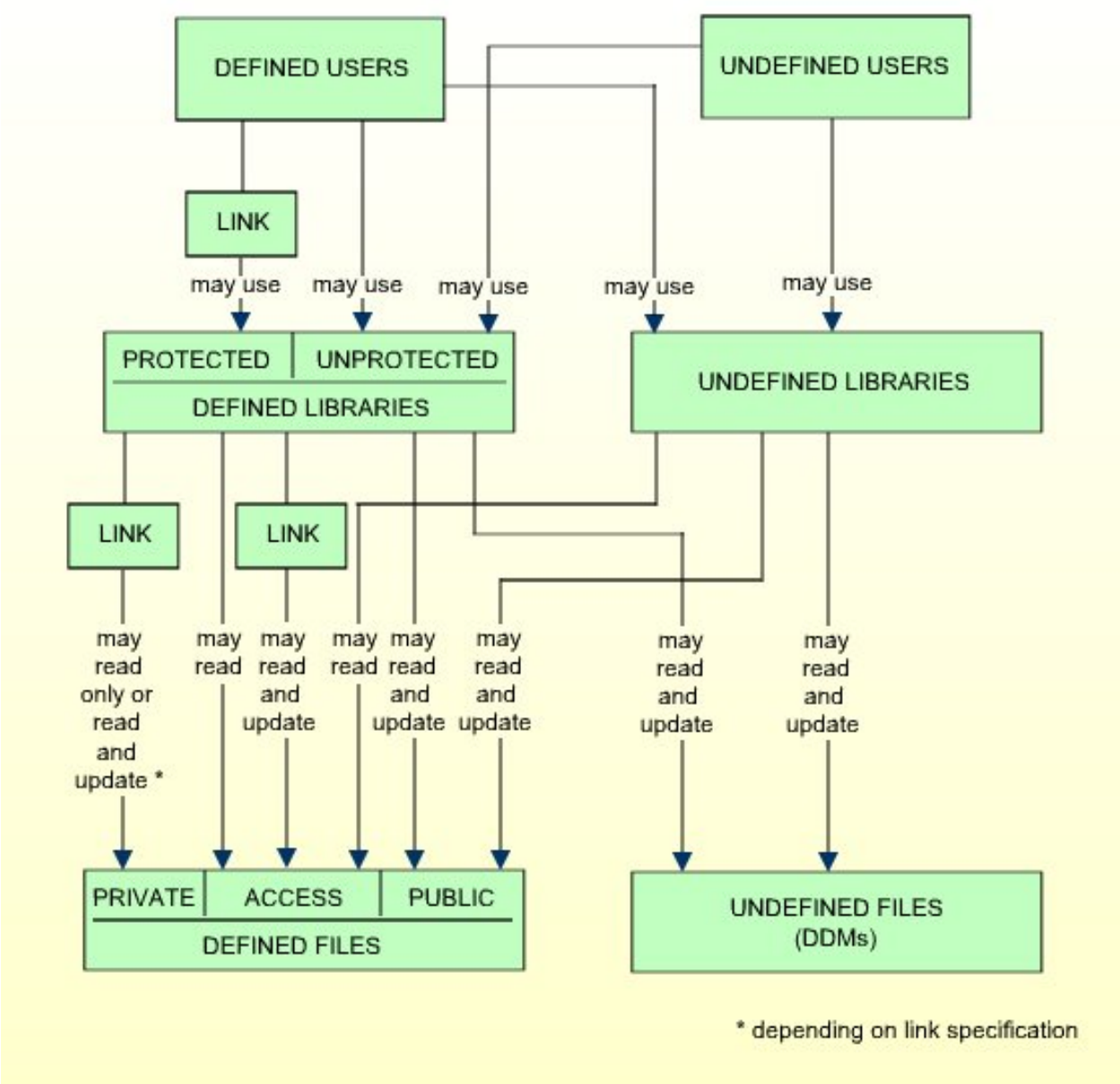
This option allows a smooth transition from an unprotected Natural environment to one protected by Natural Security.

Y	■ Users not yet defined to Natural Security may log on to libraries which are not yet defined to Natural Security or which are defined as unprotected. ■ Libraries not yet defined to Natural Security may be accessed by any (defined or undefined) user. ■ Undefined libraries may access DDMs which are not yet defined to Natural Security as well as files of status PUBLIC and ACCESS. ■ Undefined DDMs may be accessed by any (defined or undefined) library.
N	Only users defined to Natural Security may use Natural. Any library not defined to Natural Security cannot be used.

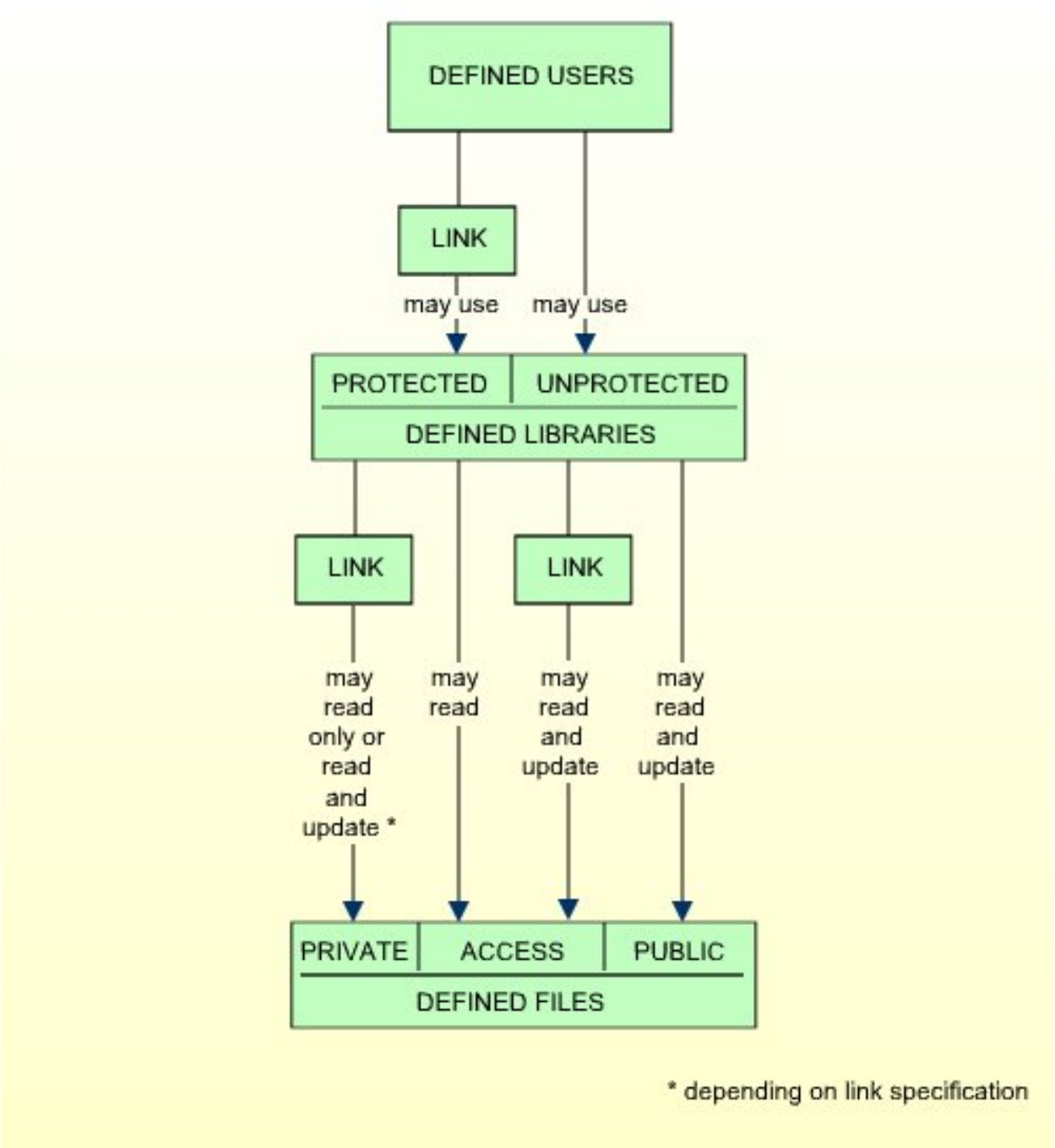
The effects of the **Transition Period Logon** settings are illustrated below.

If you have had an unprotected Natural installation and now have installed Natural Security for the first time, it is advisable to set the **Transition Period Logon** to `Y` so as to ensure that work with Natural may continue while users and libraries are defined to Natural Security. Once all objects and links are defined, the **Transition Period Logon** should be set to `N`.

Conditions of use under Transition Period Logon = Y:



Conditions of use under Transition Period Logon = N:



Activate Security for Development Server File

This option only appears if the Natural Development Server is installed and the current Natural session uses a development server file. It is only relevant if you wish to control the access to base and compound applications on the development server file. For details, see the section ***Protecting Natural Development Server Applications***.

Y	Security for the development server file is active: The application security profiles for base and compound application defined in Natural Security take effect and control the access to the Natural Development Server objects *base applications* and *compound applications* on the development server file. The FSEC system file which is being used when this option is set to `Y` will be defined to the development server file. This development server file can then only be used in a Natural Security environment. All security checks made by the Natural Development Server in the Natural Studio's application workspace will be performed using the security definitions on that FSEC system file. If you set this option to `Y`, this will also activate Predict Security (if not already activated in Predict, by setting the Predict parameter **Protect Predict File** on the **General Defaults > Protection** screen to `Y`). Please note that the activation of Predict Security will not only affect the access to base and compound applications, but may also cause other Predict Security settings not related to applications to take effect. The database ID and file number of the development server file for which the option is activated will be shown on the **Set General Options** screen.
N	Security for the development server file is not active. Application security profiles are not evaluated.

Maximum Number of Logon Attempts

1 - 9	You may specify how many attempts to log on users shall have. After *n* unsuccessful logon attempts, the logon procedure will be terminated, the user “thrown out”, and a logon-error record written (for information on logon-error records, see ***Logon Errors*** below).

Suppress Display of Logon Messages

This option may be used to suppress the display of the messages NAT0853 and NAT0854, which indicate that a logon to a library has been successful. By default, one of these messages is displayed after every successful logon to a library.

Y	Messages NAT0853 and NAT0854 will not be displayed.
N	Messages NAT0853 and NAT0854 will be displayed.

Lock User Option

This option may be used to prevent users from trying to misuse other users' user IDs and passwords. It applies to the **logon procedure** and to the **countersignatures** feature.

Y	**Logon:** For logon attempts, the following applies: Once a user has reached the **maximum number of logon attempts** without entering the correct password, the respective user will be locked, that is, the user ID will be made "invalid". The following will be locked: ■ all Natural Security user IDs which were tried out, ■ the user's operating-system login name (as identified by the Natural system variable `*INIT-USER`), if a Natural Security user security profile exists whose ID corresponds to that name. **Countersignatures:** For countersign attempts, the following applies: After too many invalid passwords (the maximum number of logon attempts also applies here) on a countersign screen, the user who invoked the respective function (as identified by his/her Natural Security user ID) will be locked.
F	**Logon:** For logon attempts, "F" has the same effects as `Y` - in addition, the Natural session is terminated when the user is locked. **Countersignatures:** For countersign attempts, "F" has the same effect as `Y`.
X	**Logon:** For logon attempts, `X` has the same effects as `F`- except that Natural Security "remembers" unsuccessful attempts across sessions: With `Y` and `F`, the counters of logon attempts for the user IDs which were tried out unsuccessfully is reset when the user aborts the logon procedure. With `X`, however, these error counters are kept for logon procedures in subsequent sessions, thus reducing the number of subsequent logon attempts with these user IDs. This means that the chances of someone gaining access with another user's ID are reduced considerably. With `X`, the error counter for a user ID is only reset after a successful logon. **Countersignatures:** For countersign attempts, `X` has the same effect as `Y`. A user's error counters can be displayed by pressing PF16 in his/her security profile. A list of all users whose error counters are greater than `0` can be obtained with the application programming interface **NSCXRUSE**.
Z	**Logon:** For logon attempts, `Z` has the same effects as `X` - in addition, the following applies: If the user ID corresponding to the value of the Natural system variable `*INIT-USER` is locked, the Natural session *cannot be started with any user ID* (neither with `AUTO=ON` nor with `AUTO=OFF`). Therefore this setting

	should not be used in environments where multiple user sessions are started with the same `*INIT-USER` value. **Countersignatures:** For countersign attempts, `X` has the same effect as `Y`.
N	The Lock User feature is not active.

Natural RPC Service Calls

For logon attempts to libraries via Natural RPC service calls, this option only takes effect if the **Lock user option** in the *Library Preset Values* is set to "*". For Natural RPC service calls, the following applies:

- The settings `Y` and `F` have the same effect as `X`.
- When locking occurs, the client user IDs which are locked will not include the ID as contained in the system variable `*INIT-USER`.

User Password / Passphrase History

This option corresponds to the option **User password / passphrase history** set in the *User Preset Values*.

Free Access to Functions via APIs

You may specify who may access Natural Security maintenance and retrieval functions from outside Natural Security via the application programming interfaces (APIs) provided. For details on these APIs, see the section *Application Programming Interfaces*.

Y	Maintenance and retrieval functions may be accessed from outside Natural Security via the APIs by anybody who may use the APIs. If you set this option to `Y`, you can protect each maintenance/retrieval function separately using functional security (see the section *Functional Security*).
R	Retrieval functions (but not maintenance functions) may be accessed from outside Natural Security via the APIs by anybody who may use the APIs. If you set this option to `R`, you can protect each retrieval function separately using functional security (see the section *Functional Security*).
N	Maintenance and retrieval functions may be accessed from outside Natural Security only by users (of type "Administrator") who may also use the Natural Security library `SYSSEC`. With the APIs, they may only perform those functions they are also allowed to perform within `SYSSEC`, and only under the same conditions under which they may perform them in `SYSSEC`.

Maintenance functions are all functions of the subprograms `NSCFI`, `NSCLI`, `NSCOB` and `NSCUS` - except their Display functions.

Retrieval functions are:

- all functions of the subprograms `NSCCHCK`, `NSCDEF`, `NSCDU`, and `NSCXR` and of the subprograms whose names begin with `NSCDA`,
- the Display functions of the subprograms `NSCFI`, `NSCLI`, `NSCOB` and `NSCUS`.

Minimum Number of Co-Owners

0 - 3	You may specify the minimum number of co-owners for each owner of a security profile. The number set here will be valid for all security profiles and cannot be modified individually.

For an explanation of co-owners, see the section ***Countersignatures***; leave the value set to `0` until you have read that section.

Deletion of Non-Empty Libraries Allowed

This option determines whether a library's security profile can be deleted if the library contains any source or object modules.

Y	A library's security profile can be deleted even if the library contains any source or object modules. When you try to delete a library security profile, Natural Security will issue a warning if the library is not empty. This option only affects the deletion of a library's *security profile*; the Natural library itself and the modules it contains are not deleted.
N	A library's security profile cannot be deleted as long as the library itself still contains any source or object modules.

Overwriting of Defaults Possible

This option determines whether the values set on the **Preset User Values** and **Preset Library Values** screens may be overwritten in individual security profiles.

Y	The specifications made on the **Preset** screens may be overwritten in the individual security profiles.
N	The specifications made on the **Preset** screens cannot be overwritten in any security profile. They will be valid for all libraries/users without exception.

The preset values are described under ***User Preset Values*** and ***Library Preset Values*** respectively.

Display DBID or FNR of FSEC

This option determines whether the database ID and file number of the current Natural Security system file (FSEC) are to be displayed on the menu and selection screens within the library SYSSEC.

Y	The database ID and file number of the current Natural Security system file (FSEC) will be displayed on the menu and selection screens within the library SYSSEC. They will be displayed in the top right-hand corner below the current date.
N	The database ID and file number of the FSEC file will not be displayed in SYSSEC.

Exit Functions with Confirmation

This option determines how Natural Security reacts when you leave a function by pressing PF2, PF3, PF12 or PF15.

Y	When you leave a function in Natural Security by pressing PF2, PF3, PF12 or PF15, a window will be displayed in which you have to specify whether the modifications you made before pressing the key are to be saved or not or whether you wish to return to the function.
N	When you leave a function by pressing PF2, PF3 or PF15, the modifications you made before pressing the key will be saved. When you leave a function by pressing PF12, the modifications you made before pressing the key will *not* be saved.

For details on the functions assigned to these keys, see the section ***PF-Keys***.

Logging of Maintenance Functions

This option allows you to ascertain who has modified which security profiles and Administrator Services settings.

"Modify" in this context comprises all maintenance functions applied to a security profile (including Add, Copy, Delete, Link, etc.); it also includes the transfer of a security profile with the programs SECULD2 and SECLOAD.

Y	Log records are written for modifications to security profiles and Administrator Services settings.
N	Modifications are not logged.

When you set this option to Y, a window will be displayed in which you can specify the following:

Log file DBID/FNR	The database ID and file number of the file in which the log records are to be stored.
	
	This file must have been loaded, as described in the installation documentation for Natural Security. On z/OS platforms, the FDT of this file must have been loaded using the appropriate installation job provided with *System Maintenance Aid*. On non-z/OS platforms, it must have been created with the Natural utility SYSPCI: In SYSPCI, select the product **Natural Security** and then the option **Create new Adabas file**.
	
	Note: Once **Logging of Maintenance Functions** has been activated, you cannot change the log file assignment. You have to deactivate the option, before you can assign another database ID or file number.
	
	Should the log file become inaccessible, and prevent you from deactivating the logging of maintenance functions, you can use the Natural system command `INPL` with code `R` (Recover) and option `A` (Adjust) to change the log file assignment. As parameters for the command, you specify the database ID and file number of the current (inaccessible) log file and of its desired new location. Batch-mode input for this operation would be as follows:
	
	`//CMSYNIN DD *`
	`R,A`
	`old-DBID,old-FNR,new-DBID,new-FNR`

Logging even if no actual modification	`Y` = Modifications are also logged if nothing has actually been changed; that is, if a security profile or Administrator Services setting has been invoked for modification, but no actual change has been made to the profile/setting. `N` = Modifications are only logged if a profile/setting has actually been changed.
Logging of changes to	Possible values: `N`, `Y`, and (for user security profiles and library security profiles) `X`. You mark with `Y` the object types whose modifications are to be logged: ■ Administrator Services settings (*), ■ user security profiles, ■ library security profiles (including special-link profiles), ■ file security profiles, ■ application security profiles, ■ mailbox security profiles, ■ various types of external object security profiles. (*) “Administrator Services settings” in this context means all functions listed on the **Administrator Services Menu** (except **Application Programming Interfaces**). **Related Profiles** Whenever a security profile is modified, Natural Security automatically adjusts related security profiles to ensure the consistency of all Natural Security definitions. For example, if you modify a group profile to remove a user from the group, Natural Security will

	automatically modify the user security profile to remove that group from the list of the user's Privileged Groups, if necessary. These automatic adjustments of related profiles are also logged. **Utility Profiles** Modifications to utility security profiles are not logged separately. Instead, default profiles and templates are handled under "Administrator Services settings", library-specific utility profiles under "library security profiles", and user-specific and user-library specific utility profiles under "user security profiles". **Extended Logging for User and Library Security Profiles** You can mark "user security profiles" and "library security profiles" with `X` (instead of `Y`) for the following additional data to be logged. For user security profiles: ■ When the **Copy User** function is used with the **with links** option, any relationship which the copying has established between the user and other objects is logged. ■ When the **Delete User** function is used, any relationship which existed between the user and other objects and which was removed by the deletion is logged. For library security profiles: ■ When the **Copy Library** function is used with the **with links** option, any relationship which the copying has established between the library and other objects is logged. ■ When a link between a group and a library is maintained, a list of the group's members is logged. ■ When a maintenance functions affects the **Disallow/Modules** section of a library security (or special-link) profile, information on the changed status of any module is logged.

To change the above specifications once you have activated the writing of log records, you press PF4 on the **Set General Options** screen.

To view the log records, you use the function **Maintenance Log Records** (see below).

Store Logon and Error Data on Separate System Files

This option can be used to store some Natural Security data on separate system files.

Y	The following data can be stored on separate system files: ■ logon records, as written by the function **Logon Records**; ■ logon/countersign error records, as written by the function **Logon/Countersign Errors**; ■ maintenance log records, as written by the function **Logging of Maintenance Functions**. If you set this field to `Y` and press PF5, a screen will be displayed on which you specify the database IDs and file numbers of these system files. On z/OS platforms, the FDTs of these files must have been loaded using the appropriate installation job provided with *System Maintenance Aid*. On non-z/OS platforms, these files must have been created with the Natural utility SYSPCI: In SYSPCI, select the product **Natural Security** and then the option **Create new Adabas file** (but not the **Initialize** option!).
N	All Natural security data are stored on the same FSEC system file.

Note: If you use an Adabas utility to change the database ID or file number of one of these system files, you have to set this field to `N` *before* the change, and then set it to `Y` again after the change to make the new system file known to Natural Security.

Concurrent Modifications Without Notification

This option determines how Natural Security reacts in a situation in which two administrators simultaneously modify the same security profile. Such a situation would occur as follows:

1. Administrator 1 invokes a security profile for modification.
2. Administrator 2 invokes the same security profile for modification.
3. Administrator 1 leaves the function after having made his/her modifications - the modifications are applied to the security profile. This means that, at this point, Administrator 2 is working on data which are “out of date”, but is not aware of this fact.
4. Administrator 2 leaves the function after having made his/her modifications. Now there are two possible reactions by Natural Security:
   - The modifications made by Administrator 2 are applied - unknowingly overwriting the modifications made by Administrator 1.
   - Administrator 2 receives a window, informing him/her that the security profile in question was in the meantime modified by another administrator. He/she can then contact the other administrator to discuss the changes made, and can then decide to either cancel his/her own modifications or apply them, thus overwriting the modifications made by Administrator 1.

This option determines which of these two reactions is to be taken; that is:

Y	The modifications will be applied in any case.
N	A window will be displayed in which the administrator can choose to: ■ cancel his/her modifications, ■ apply his/her modifications, ■ return to the security profile in question.

This option only applies to concurrent modifications made to security profiles of users, libraries, special links and mailboxes.

Private Libraries in Public Mode

This option determines whether private libraries are to be available in *private mode* or in *public mode*.

Y	Private libraries are available in public mode.
N	Private libraries are available in private mode for exclusive use by the users with the same IDs (not recommended).

See ***Private Library*** in the section *User Maintenance* for further information. Please read that section *before* you set this option.

Suppress Mailboxes in Batch Mode

This option determines whether or not mailboxes are output in batch mode.

Y	Mailboxes are not output in batch mode.
N	Mailboxes are output in batch mode.

For information on mailboxes, see the section ***Mailboxes***.

Environment Protection

This option determines if Natural environments - that is, system-file combinations - are protected.

N	Environments protection is not active: Users can access any environment. Natural Security will not perform any access-authorization checks regarding the environment.
Y	Environments protection is active: Users can only access environments for which security profiles are defined. By default, access to a library in a defined environment is allowed for all users. For individual libraries and users, you can disallow access to an environment.

If you change the setting of this option, you have to restart your Natural session for the change to take effect.

For details on environment protection, see the section *Protecting Environments*.

Access To Current FSEC

This field determines whether the Natural Security data stored on this FSEC system file may be accessed from a Natural Security session running with another FSEC system file.

N	The data cannot be accessed.
U	The data can be accessed via the application programming interfaces (APIs) which are provided in the library SYSEXT. This only applies to APIs where an FSEC system file can be specified.

Force Impersonation for Natural Development Server

This option is only relevant for the Natural Development Server (NDV). It controls how access to an NDV server is handled.

It is assumed that access to the operating system on which an NDV server is running is controlled by an SAF-compliant external security system. User authentication (verification of user ID and password) is performed by this external security system. After a successful authentication, it generates an *accessor environment element* (ACEE) for the user, which is available for subsequent authorizations.

N	A user can access an NDV server either by using the ACEE generated by the external security system, or directly by using his/her Natural Security user ID and password.
Y	A user can access an NDV server only with the ACEE generated by the external security system. Without an ACEE, access to an NDV server is not possible. This ensures that the external security system's user authentication cannot be bypassed. If the user has an ACEE, no further authentication checks are performed when he/she logs on to the NDV server.

Record Each User's Initial Logon Daily

This option may be used to detect unused user IDs, that is, user security profiles which have not been used for a long time. This may be helpful when you decide to delete user security profiles which are no longer used.

N	Initial logons are not recorded daily.
Y	Each user's initial logon at the start of the Natural session is recorded daily. The date of a user's most recent initial logon is displayed in his/her security profile (by pressing PF16 on the main user security profile screen). Please note that only logons which occur while this option is active can be recorded.

When this option is set to Y, you can use the application programming interface NSCXRUSE to obtain a list of users who have not logged on since a specified date.

Enable Error Transaction Before NAT1700 or NAT1701 Logoff

This option determines whether or not the current Natural application's relevant ON ERROR statement and/or error transaction will be processed in the event of Natural errors NAT1700 (**time window** exceeded) and NAT1701 (**non-activity time limit** exceeded).

The error transaction is determined by the value of Natural system variable *ERROR-TA.

N	When error NAT1700 or NAT1701 occurs, both the application's ON ERROR statements and error transaction will be ignored; Natural Security will perform a logoff, regardless of whether there is any ON ERROR statement or error transaction.
S	When error NAT1700 or NAT1701 occurs, the application's relevant ON ERROR statement will be processed before Natural Security performs a logoff. Any error transaction will be ignored.
E	When error NAT1700 or NAT1701 occurs, the application's error transaction will be processed before Natural Security performs a logoff. Any ON ERROR statement will be ignored.
G	When error NAT1700 or NAT1701 occurs, the application's relevant ON ERROR statement will be processed, and if no ON ERROR statement is encountered, the error transaction will be invoked, before Natural Security performs a logoff.

This option only takes effect on z/OS computers. On non-z/OS platforms, Natural Security always reacts as if it had been set to G (regardless of the actual setting).

Logoff in Error Case if *STARTUP is Active

This option determines the course of action to be taken in the case of a Natural runtime error occurring within the ON ERROR condition of a startup transaction (*STARTUP).

When a runtime error occurs within the ON ERROR condition of a startup transaction, Natural's error processing might lead to the startup transaction being executed again. This would cause an error-loop situation. To prevent such a loop, you can set this option.

Y	In the case of a runtime error caused by a startup transaction, a LOGOFF command will be executed at the point when the startup transaction would be due for execution in the course of Natural's error processing.
N	In the case of a runtime error caused by a startup transaction, the Natural system variable *STARTUP will be set to blanks, and Natural's error processing will proceed.

If no startup transaction is defined, this option has no effect.

Set *APPLIC-NAME Always to Library Name

This option determines the value of the Natural system variable `*APPLIC-NAME`.

Y	`*APPLIC-NAME` contains the name of the library to which the user is logged on, regardless of whether the user is logged on via a special link or not.
N	`*APPLIC-NAME` contains the name of the library to which the user is logged on. If the user is logged on via a special link, it contains the special-link name instead.

Allow Deletion of Users Who Are Owners or DDM Modifiers

This option determines whether a user security profile can be deleted if the user is still specified either as owner in any security profile or as DDM modifier in any DDM/file security profile.

This option can only be set if owners are assigned to the Natural Security library `SYSSEC`.

N	Security profiles of users who are owners or DDM modifiers *cannot* be deleted. This ensures that the deletion does not cause any undesired owner or DDM modifier constellation.
O	Security profiles of users who are owners or DDM modifiers *can* be deleted. They can only be deleted by administrators who are owners of the library `SYSSEC`.
A	Security profiles of users who are owners or DDM modifiers *can* be deleted. They can only be deleted by the administrator (or group of administrators) whose ID is specified in the field **By Administrator**.

If this option is set to "O" or "A" and the security profile of a user is deleted, his/her ID is automatically removed from any security profiles where he/she is specified as owner or DDM modifier. Nonetheless, it may be advisable before the deletion to use the **Cross-Reference User** function to ascertain which profiles/DDMs would be affected, and after the deletion to make sure the changed owner/co-owner and DDM modifier/co-modifier configurations still suit your requirements.

Authentication Options (LDAP)

This section describes the options available for the authentication type LDAP (Light Directory Authentication Protocol). Before you use these options, you should be familiar with the corresponding information in the *Software GmbH security eXtensions* (SSX) documentation.

An LDAP server is a server which uses the Light Directory Authentication Protocol. If user authentication it to be performed via an LDAP server, this requires that the SSX security libraries were installed as part of the Natural Security installation procedure.

User authentication via an LDAP server is possible for online and batch sessions on Linux and Windows (including the Natural Development Server). It is activated by setting the field **Protection Level** in the LDAP master security profile to `1` (see below).

If an LDAP server is to be used, it has to be defined to Natural Security by creating a security profile for it.

- Types of LDAP Security Profiles
- Invoking LDAP Security Profile Maintenance
- Creating and Maintaining LDAP Security Profiles
- Reviving an Archived Security Profile
- Components of an LDAP Security Profile

Types of LDAP Security Profiles

You can define the following types of LDAP security profiles:

- a master profile,
- an alternative profile,
- multiple archived profiles.

By default, only one LDAP security profile - the master profile - can be defined. The master profile is the one for the LDAP server which is actually used for the authentication.

In addition to the master profile, you can define an alternative profile for another LDAP server. This alternative server will be used for the authentication in the following situations:

- the server defined in the master profile is not available at authentication time, or
- the authentication performed by the master server has failed.

Before you can define an alternative profile, you have to set the field **Allow alternative profile** in the master profile to `Y`.

Both the master profile and the alternative profile, once defined, are either active or not active. To activate them, you set the field **Protection Level** in the LDAP master security profile to `1`; to deactivate them, you set it to `0` (see below).

In addition to the master profile and alternative profile, you can define archived profiles, that is, further LDAP security profiles which will be archived and are inactive. This allows you to define additional LDAP servers for future use or for test purposes.

Invoking LDAP Security Profile Maintenance

To invoke LDAP security profile maintenance:

1 On the **Main Menu**, select **Administrator Services**.

If you are allowed **access to Administrator Services**, the **Administrator Services Menu 1** will be displayed.

2 On this menu, select **Authentication Options**.

The **Authentication Types** selection list will be displayed, listing all existing LDAP security profiles.

The **Pr Ty** column indicates the profile type and activation status:

- `M1` = master profile - active.
- `M3` = master profile - active - Natural Security authentication if LDAP fails.
- `A1` = alternative profile - active.
- `A3` = alternative profile - active - Natural Security authentication if LDAP fails.
- `M0` = master profile - not active.
- `A0` = alternative profile - not active.
- `Ar` = archived profile.

3 From this selection list, you invoke all functions to create and maintain LDAP security profiles, as described below.

Creating and Maintaining LDAP Security Profiles

To create a new LDAP security profile:

1 On the **Authentication Types** selection list, you press `PF5` or enter the direct command `ADD`.

2 A window will be displayed, in which you specify the following:

- **Profile type** - When you create your first LDAP profile, you can specify whether you want it to be the master profile or to be archived.

  If a master profile already exists, you can specify whether the new profile is to be the alternative profile or to be archived.
- **Profile ID** - For an alternative or archived profile, you have to specify an ID (for the master profile, the ID is always `* LDAP *`).
- **Copy from * LDAP *** - For an alternative or archived profile, you can choose to copy the components from the master profile.

The first screen of the LDAP security profile will be displayed.

The items you can define in it are described below under *Components of an LDAP Security Profile*.

To maintain an existing LDAP security profile:

- On the **Authentication Types** selection list, you can invoke one of the following functions by marking a profile with one of the following function codes (possible code abbreviations are underlined) in column **Co**:

Code	Function
MO	Modify security profile.
DE	Delete security profile.
DI	Display security profile.
AR	Archive security profile.
RV	Revive security profile.

Reviving an Archived Security Profile

You can revive an archived profile as either master profile or alternative profile.

To revive an archived LDAP security profiles:

1. On the **Authentication Types** selection list, mark the profile with function code `RV`.
2. The **Revive Profile** *`profile-ID`* screen will be displayed. Select one of the following options:
   - **Revive as master profile** - The current master profile will be archived, and the revived profile will become the new master profile.

     The ID of the revived profile will become `* LDAP *`. When you select this option, you will be prompted to specify the ID under which the old master profile is to be archived.
   - **Revive as alternative profile** - The current alternative profile will be archived, and the revived profile will become the new alternative profile.

     When you select this option, you will be prompted to specify the ID under which the revived profile is to be the new alternative profile, and the ID under which the old alternative profile is to be archived. The new IDs are optional, you can also keep the existing IDs.
   - **Revive as master profile with exchange** - The current alternative profile will be archived, the current master profile will become the new alternative profile, and the revived profile will become the new master profile.

The ID of the revived profile will become `* LDAP *`. When you select this option, you will be prompted to specify new IDs for the other two exchanged profiles. For the old master profile, you have to specify a new ID. For the old alternative profile, this is optional, you can also keep the existing ID.

Components of an LDAP Security Profile

The screens referring to the master profile are entitled **General LDAP Options**. The screens referring to an alternative or archived profile are entitled **Profile** *`profile-ID`* **Options**.

The items you can define as part of an LDAP security profile are described below. Some items can only be defined in the master profile; they apply to all profiles and will be displayed in alternative/archived profiles where applicable, but their settings can only be modified in the master profile.

Field	Explanation
LDAP Options 1	
Profile ID	The Natural Security ID of the LDAP security profile. The ID of the master profile cannot be modified, it is always `* LDAP *`. The IDs of alternative and archived profiles can be freely chosen and may be up to 8 characters long. You can change IDs when you archive and revive LDAP security profiles.
Profile name	You may specify a name for the profile, which may be up to 32 characters long.
Authentication type	`LDAP` (cannot be modified).
Protection level	Possible values: ■ `0` = User authentication is performed by Natural Security. ■ `1` = User authentication is performed via an LDAP server. This applies to Natural online and batch sessions on Linux and Windows. After successful user authentication, all Natural Security settings apply to defined users (for undefined users, see **NSC user ID** below). Please note that with LDAP, the password specification is case-sensitive and a password change is not possible. **Caution:** If you log on to `SYSSEC` as user DBA, the user authentication for this user is always performed by Natural Security, even if the protection level is set to `1`. Please remember that with LDAP, the password specification is case-sensitive; however, the password for the user DBA is saved in upper case by default. ■ `3` = Same as protection level `1`, except if LDAP authentication fails, then the user will be authenticated further with Natural Security. **Note:** If LDAP authentication is active, the user ID and password fields are case-sensitive.

Field	Explanation
LDAP Options 1	
Allow alternative profile	This field is only available in the master profile. If you want to be able to use an alternative profile in addition to the master profile, set this field to `Y`.
Error record if alternative used	This field is only available if **Allow alternative profile** (see above) is set to `Y`. If you want a logon error record to be written every time the LDAP server defined with the alternative profile is used for authentication instead of the one defined in the master profile, you set this field to `Y`. These logon error records allow you to check which LDAP server - master or alternative - was actually used for the authentication. For details on logon error records, see ***Logon/Countersign Errors***.
Alternative profile / Archived profile	These fields indicate if the profile is an alternative or archived profile. They are only displayed where applicable.
Natural Security system	`FSEC` (cannot be modified).
Support user names as IDs	This option allows the logon using the user name (as specified in the user security profile) as user ID. This option has three prerequisites. If it is activated (by marking this field with `Y`), an additional screen is displayed on which you have to perform the following checks to ensure that these prerequisites are met: ■ Adabas FDT FSEC system file: In the FDT of the FSEC system file, the field with the Adabas short name `LI` must be defined as a descriptor. This check verifies if this is the case. If it is not, contact your Adabas administrator. ■ Scan FSEC for uniqueness of names: ■ `X` = All user security profiles will be checked for duplicate or blank user-name entries. ■ `D` = The result of the check is displayed: a list of all profiles in which the user-name entry is either blank or not unique. ■ `W` = The result list is written to work file 1. (This requires that the work file has been set at the start of the Natural Security session.) ■ `B` = The result of the check is both displayed and written to work file 1. ■ Logon exit LOGONSX1 in SYSLIB: The user exit **LOGONSX1** must be contained in the library `SYSLIB`. This check verifies if this is the case. If this option is used, the Natural system variable `*USER-NAME` will contain the user name used as ID for the logon, and the system variable `*USER` the corresponding user ID as defined in the user's security profile.

Field	Explanation
LDAP Options 1	
NSC user ID	This option controls the access of users not defined to Natural Security. ■ N = The general option **Transition Period Logon** determines to which libraries an undefined users may log on. ■ E = An undefined user may only log on to unprotected libraries (but not to undefined libraries), regardless of the **Transition Period Logon** setting. ■ Y = An undefined user cannot log on to any library, regardless of the **Transition Period Logon** setting. ■ P = For all undefined users, access to libraries is determined by a user security profile with the ID `* LDAP *` and user type E. Access to a (protected or unprotected) library is only possible by adding this ID to a group which is linked to the library. The ID itself cannot be specified explicitly in the logon procedure. See also ***External User***. If you set this field to P, this user security profile will be added automatically. The user security profile is deleted if you change the value of this field from P to another value. Modification of this user security profile is performed in user maintenance. However, the full set of user maintenance functions is not available for this user security profile.
Log file path	The complete path to the file to which the log data are written if the logging of the LDAP-server communication is active. If the specified path contains the character string *USER, this will be replaced by the current value of the Natural system variable *USER.
Log level	This field is used to activate the logging of the LDAP-server communication. Possible values: ■ 0 = Logging is not active. ■ 1 and 2 = Logging is active for errors. ■ 3 and 4 = Logging is active for information. ■ 5 and 6 = Logging is active for debugging information. For further information, see the *Software GmbH security eXtensions* (SSX) documentation.
LDAP Options 2	
LDAP host	The IP address or domain name of the LDAP server.
LDAP port	The port number of the LDAP server. The default is 389.
LDAP server type	The LDAP server type. Possible types are: ■ OpenLDAP ■ ActiveDirectory ■ SunOneDirectory

Field	Explanation	
LDAP Options 1		
SSL connection	Mark this field with `X` if the LDAP connection is made via an SSL-secured port (by default, this is port 636). You can mark either this field or the one below, but not both.	
Start TLS connection	Mark this field with `X` to attempt to set up an encrypted communication over the plain LDAP port if the LDAP server supports this. You can mark either this field or the one above, but not both.	
Technical user support	On LDAP servers which do not support anonymous requests, you can use the technical user credential files to search for and find LDAP users securely. For information on technical user support, see *Creating Technical User Credential Files* in the *Software AG Security eXtensions* (SSX) documentation. The function `createTechUserCreds` described in that documentation is used to create the property and key-value files of a technical user. The paths to these files have to be specified in the following fields:	
	Path to output file	In this field, you specify the complete path to the file containing the “technical user's” user ID and encrypted password.
	Path to key file	In this field, you specify the complete path to the file containing the key value used to decrypt the “technical user's” password.
	Support AUTO=ON	If this field is set to blank and the Natural session is started with `AUTO=OFF`, this requires that the technical user's credentials are successfully verified. Mark this field with `X` if you want user IDs to be verified by LDAP for Natural sessions started with the Natural profile parameter `AUTO=ON`. This option requires that the “technical user” has been defined. If this option is set, the “technical user” is checked against the key value, and if the check is successful, the session will be started with `AUTO=ON` and no password check will be done by the authentication server.
LDAP Options 3		
Default domain	The default domain name.	
LDAP person DN	The Personal Bind Distinguished Name of the node where the user entries are located. Example: `ou=user,ou=germany,dc=sag` where `ou` denotes the organizational unit and `dc` denotes the domain component.	
Attribute name user ID	The attribute name which contains the user ID.	

Field	Explanation
LDAP Options 1	
Object class person	The object class which denotes a user.

PF-Keys

To invoke this function:

1 On the **Main Menu**, select **Administrator Services**.

If you are allowed **access to Administrator Services**, the **Administrator Services Menu 1** will be displayed.

2 On this menu, select **PF-keys**.

The **Set PF-Keys** screen will be displayed.

3 On this screen, you can assign functions and names to keys, as described below.

Functions can be assigned to certain keys only. Names can be assigned to all keys.

PF-Key Functions

The functions assigned to the following PF-keys cannot be modified:

Key	Function	Explanation
PF01	Help	If you press PF1 on any Natural Security screen, help information for that screen will be displayed.
PF02	Previous Menu	This key returns you to the menu screen from which you have invoked the current processing level. By default, the modifications you made before leaving a function with PF2 will be saved; see also the general option **Exit Functions with Confirmation** above.
PF03	Exit	This key causes a given processing level to be terminated and the screen of the next higher processing level to be displayed. By default, the modifications you made before leaving a function with PF3 will be saved; see also the general option **Exit Functions with Confirmation** above.
PF04	Additional Options	On a security profile screen, you can press this key (instead of marking the Additional Options field on the screen with Y) to display the **Additional Options** selection window for a security profile.

Key	Function	Explanation
PF05		Various functions on different screens (as described where appropriate).
PF06	Flip	The PF-key lines at the bottom of the Natural Security screens display either PF-keys 1 to 12 or PF-keys 13 to 24. By pressing PF6, you can switch from one display to the other.
PF07	Previous Page (-)	This key scrolls a displayed list one page backward.
PF08	Next Page (+)	This key scrolls a displayed list one page forward.
PF12	Cancel	This key causes a given processing level to be terminated and the screen of the next higher processing level to be displayed. By default, the modifications you made before leaving a function with PF12 will *not* be saved; see also the general option **Exit Functions with Confirmation** above.
PF13	Refresh	This key undoes all modifications you have made on a screen but which have not yet been saved. The fields on the screen will be reset to the values they had before you changed them.
PF14		(reserved for future use)
PF15	Menu	This key invokes the Natural Security **Main Menu**. By default, the modifications you made before leaving a function with PF15 will be saved; see also the option **Exit Functions with Confirmation** above.
PF16 to PF17		Various functions on different screens (as described where appropriate).
PF18		(reserved for future use)
PF19	First Page (- -)	This key scrolls a displayed list to its beginning.
PF20 to PF24		(reserved for future use)

Note: The CLR key has the same function as PF12.

PF09, PF10, PF11, PA1, PA2

You can assign a function to each of these keys yourself. The function assigned can then be invoked within Natural Security by pressing the appropriate PF-key (or PA-key).

One of the following functions can be assigned to a PF-key (or PA-key):

- a Natural system command,
- a Natural terminal command,
- a Natural program.

To assign a function to a key, you enter a command or program name in the **Function** column of the **Set PF-Keys** screen next to a key number.

PF-Key Names

You may name all PF-keys, including those whose function assignments you cannot change. The names may be up to 5 characters long and can be entered in the **Name** column of the **Set PF-Keys** screen.

The assigned names will appear in the PF-key lines which are displayed at the bottom of each Natural Security screen:

```
Enter-PF1---PF2---PF3---PF4---PF5---PF6---PF7---PF8---PF9---PF10--PF11--PF12---
      Help  PrevM Exit  AddOp       Flip  -     +                      Canc
```

If no name is displayed for a PF-key, this indicates that the function assigned to this key is not applicable to the screen displayed.

The lines display either the keys PF1 to PF12 or the keys PF13 to PF24. By pressing PF6, you can switch from one display to the other, and back again.

Logon and Countersign Errors

The Logon/Countersign Errors functions serve two purposes:

- You can view *logon errors*, that is, unsuccessful attempts to log on to Natural.
- You can view - and unlock - *locked users*, that is, users whose IDs have been made invalid due to logon or countersign errors (if the **Lock User Option** is active).

Logon Errors

In **General Options**, you can specify the **Maximum number of logon attempts** by entering a number *n* in the range from 1 to 9 (the default is 5). Every time a user makes *n* consecutive unsuccessful logon attempts, the user will be "thrown out" and a *logon error record* will be written by Natural Security.

A logon error record contains detailed information on each of the *n* logon attempts that led to the record being written (for example, which user and library IDs were entered by the user). You can view these records with the **Logon Error Processing** functions. This serves the following purposes:

- You can see whether unauthorized people have tried to gain access to Natural.
- You can see what users do wrong when they try to log on. Users may then be informed how to log on correctly.
- You can see whether users have been given the appropriate access rights. For example, a user may try to log on to an library he/she is not - but should be- allowed to use. You can then make the necessary adjustments to the security profiles and links concerned.

The recording by Natural Security of logon errors cannot be switched off.

Utility Access Errors

Natural Security also records unsuccessful attempts to access a Natural utility. These *utility access error records* can also be viewed with the Logon/Countersign Errors functions.

Note: The term *logon errors (records)* as used in the text below also comprises *utility access errors (records)*, unless explicitly indicated otherwise.

Locked Users

If the **Lock User Option** (see *General Options*) is active, users may be "locked" due to logon or countersign errors:

- **Logon errors:**
  Once a user has reached the maximum number of logon attempts without entering the correct password, the user will be locked.
- **Countersign errors:**
  After entering too many invalid passwords on a countersignature screen, the user who invoked the function requiring the countersignatures will be locked. (For information on countersignatures, see the section ***Countersignatures***.)

With the function **List/Unlock Locked Users** you can see which users have been locked due to logon or countersign errors. You can also unlock them again.

Countersign errors are only recorded if the **Lock User Option** is active, whereas logon errors are always recorded (regardless of the **Lock User Option**).

Invoking Logon and Countersign Errors

To invoke Logon/Countersign Errors:

1. On the **Main Menu**, select **Administrator Services**.

   If you are allowed **access to Administrator Services**, the **Administrator Services Menu 1** will be displayed.

2. On this menu, select **Logon/countersign errors**.

   The **Logon/Countersign Errors Menu** will be displayed. It provides the following functions:

   - List error records
   - Delete error records
   - Display individual error records

- List/unlock locked users

The individual functions are described below.

Options on the Logon/Countersign Errors Menu

When selecting one of these functions, you can specify the following options:

Option	Explanation	
Order of Records	This option determines the order in which the logon error records will be listed:	
	T	The records will be in order of terminal IDs (as defined by the Natural system variable `*INIT-ID`. For logon errors related to Natural RPC and Natural Web I/O service requests, `RPCSRVRQ` and `NWOSRVRQ` respectively will be used instead of the `*INIT-ID` value).
	TY	Same as `T` for utility access error records only.
	P	The records will be in order of user IDs (as defined by the Natural system variable `*INIT-USER`).
	PY	Same as `P` for utility access error records only.
	D	The records will be listed in order of dates (that is, the dates when the errors occurred).
	DT	Same as `D`, and evaluating the Start Value field to restrict the list to certain terminal IDs (`*INIT-ID`).
	DP	Same as `D`, and evaluating the Start Value field to restrict the list to certain user IDs (`*INIT-USER`).
	This option has no impact on the **List/Unlock Locked Users** function.	
Start Value	If you wish to list not all, but only a certain range of logon error records or locked users, you can specify a start value. For possible options, enter a question mark (?) in this field. Special start values (for Order of Records = T): ■ `RPCSRVRQ` - to list logon errors which occurred in conjunction with Natural RPC service requests. ■ `NWOSRVRQ` - to list logon errors which occurred in conjunction with Natural Web I/O service requests. This field is ignored for Order of Records = D.	
Date from ... to	You can use these two fields if you wish to list only records of logon/countersign errors which occurred on a certain date or within a certain range of dates. For possible selection options, enter a question mark (?) in one of the fields. If **Date from** contains a wildcard (*, >, or <), the following applies: ■ **Date to** and **Time to** are ignored.	

Option	Explanation
	■ If **Time from** contains a specific time, only errors which occurred at this time on each day of the date range will be listed. If this is not desired, use a wildcard in **Time from** to specify a time range. Special values for **Date from**: YEAR - List only errors which occurred in the current year . MONTH - List only errors which occurred in the current month. TODAY - List only errors which occurred on the current day. YESTERDAY - List only errors which occurred on the day before the current day.
Time from ... to	You can use these two fields if you wish to list only records of logon/countersign errors which occurred in a specific period of time. For possible selection options, enter a question mark (?) in one of the fields. If the field **Date from** contains a specific date, the **Time from** value refers to the time on this date. If **Date to** contains a specific date, the **Time to** value refers to the time on this date. If **Time from** contains a wildcard (*, >, or <), **Date to** and **Time to** are ignored.
FUSER DBID/FNR	If you wish to list only records of logon errors which occurred in conjunction with logon attempts to a specific FUSER system file, you specify its database ID and file number in these fields.

List Error Records

This function displays a list of logon error records.

The list can be scrolled as described in the section *Finding Your Way In Natural Security*.

You can change the range of error records listed by entering selection criteria in the input fields above the list. For possible options, enter a question mark (?) in the respective input field(s).

In addition, the following special PF-key functions are available:

Key	Explanation
PF06	List only utility access error records. (Press again to revert to the list of all error records.)
PF09	List the error records sorted by terminal ID (*INIT-ID).
PF10	List the error records sorted by user ID (*INIT-USER).
PF11	List the error records sorted by date.

To display detailed information on an error record, you mark it with code DI. The **Error History** of the selected error will be invoked (as with the **Display Individual Error Records** function; see below).

Delete Error Records

This function displays a list of logon error records, like the **List Error Records** function described above. The options for handing the list are same as for the **List Error Records** function. In addition, you can delete logon error records.

It is recommended that logon error records be deleted periodically to save space on the FSEC system file.

- To delete individual error records, you mark them with code `DE`.
- To delete all error records displayed on the current page, you press PF4.
- To delete all existing error records, you use the direct command `ERRDEL` (see below).
- To selectively delete large numbers of error records, you can use the application programming interface `NSCADM`.

If an error record has been deleted, this will be indicated by *##* in the first column of the list.

Direct Command ERRDEL

To delete *all* logon/countersign error records at once, you enter the direct command `ERRDEL` in the command line.

Display Individual Error Records

This function displays the **Error History** of logon error records one by one.

To delete an error record, you press PF4 on its **Error History** screen.

List or Unlock Locked Users

This function is only applicable if the **Lock User Option** (see *General Options*) is active. It displays a list of those users whose security profiles have been "locked" due to logon or countersign errors. The list is in alphabetical order of user IDs. On the list you can then unlock individual users.

When you invoke the **List/Unlock Locked Users** function, the **List Locked Users** screen will be displayed.

The list can be scrolled as described in the section ***Finding Your Way In Natural Security***.

You can change the range of users listed by entering selection criteria in the input fields above the list. For possible options, enter a question mark (?) in the respective input field(s).

The column **Lock** of the **List Locked Users** screen indicates the type of error which caused the user to be locked:

Type of error	Information displayed next to the type
C = Countersign error	The ID of the owner whose password was entered incorrectly, and the ID of the object which the locked user attempted to modify.
L = Logon error	The error numbers.
X = Logon of user after his/her user ID was automatically unlocked.	One of the above, depending on the original type of error.

For information on automatic unlocking, see the option **Automatically unlock users after** in *User Preset Values*.

The following functions are available by marking an entry on the **List Locked Users** screen with one of the following function codes:

Function code	Function
DI	Display more detailed information on an entry.
UL	Unlock a user. A window will be displayed in which you confirm the unlocking by entering a Y. (Not applicable to errors of type X.)
DE	Delete entry. (Only applicable to errors of type X.)

Note: You can also use the function **Modify User** (see *User Maintenance*) to unlock a locked user.

Logon Records

Logon records allow you to see which users have been using which libraries.

You can specify the option **Logon recorded** in the security profile of each library and each user (see the sections *Library Maintenance* and *User Maintenance* respectively).

A logon record will be written by Natural Security:

- every time a user logs on to a library in whose security profile the **Logon recorded** option is set to Y;
- every time a user in whose security profile the **Logon recorded** option is set to Y logs on to any library.

If the general option **Transition Period Logon** is set to Y, a logon record will also be written every time an undefined user logs on (regardless of the setting of the option **Logon recorded**), and every time a user logs on to an undefined library.

If the user security profile item **ETID** is set to S in the **User Preset Values**, a logon record - with time-stamp-related ETID - will also be written every time a user logs on to Natural (this is only

possible if the FSEC system file is not read-only). In this case, however, the logon record only tells you which ETID was used by which user ID, but it contains no library information.

Similarly, an access record will be written by Natural Security every time a users invokes a utility in whose default security profile the option **Access recorded** is set to `Y`.

You may view these logon/access records by using the "Logon records" functions.

Note: Unless explicitly indicated otherwise, the term "logon records" as used in the text below means both logon records and access records.

Invoking Logon Records

To invoke Logon Records:

1 On the **Main Menu**, select **Administrator Services**.

If you are allowed **access to Administrator Services**, the **Administrator Services Menu 1** will be displayed.

2 On this menu, select **Logon Records**.

The **Logon Records Menu** will be displayed. It provides the following functions:

- List logon records
- Delete logon records
- Delete logon records but last

The individual functions are described below.

Options on the Logon Records Menu

When you select one of these functions, you can specify the following selection options:

Option	Explanation	
Order of Records	U	List logon records in alphabetical order of user IDs.
	UX	Same as `U`, but listing only logon records of undefined users.
	L	List logon records in alphabetical order of library IDs.
	LX	Same as `L`, but listing only logon records to undefined libraries.
	Y	List utility access records in alphabetical order of utility names.

Option	Explanation	
	UY	List utility access records in alphabetical order of user IDs.
	LY	List utility access records in alphabetical order of library IDs.
	UE	List ETID-related logon records in alphabetical order of user IDs.
	EU	List ETID-related logon records in ascending order of ETIDs.
	D	List logon records in chronological order of the date/time when the logons occurred.
Start Value	If you wish to list not all, but only a certain range of logon records, you can specify a start value. For possible options, enter a question mark (?) in this field.	
ETID Start Value	In this field you can specify a start value in hexadecimal format (for Order of Records = `UE` and `EU` only).	
Date from ... to	You can use these two fields if you wish to list only logon records of logons which occurred on a certain date or within a certain range of dates. For possible selection options, enter a question mark (?) in one of the fields. If **Date from** contains a wildcard (*, >, or <), the following applies: ■ **Date to** and **Time to** are ignored. ■ If **Time from** contains a specific time, only logons which occurred at this time on each day of the date range will be listed. If this is not desired, use a wildcard in **Time from** to specify a time range. Special values for **Date from**: `YEAR` - List only logons which occurred in the current year . `MONTH` - List only logons which occurred in the current month. `TODAY` - List only logons which occurred on the current day. `YESTERDAY` - List only logons which occurred on the day before the current day.	
Time from ... to	You can use these two fields if you wish to list only logon records of logons which occurred in a specific period of time. For possible selection options, enter a question mark (?) in one of the fields. If the field **Date from** contains a specific date, the **Time from** value refers to the time on this date. If **Date to** contains a specific date, the **Time to** value refers to the time on this date. If **Time from** contains a wildcard (*, >, or <), **Date to** and **Time to** are ignored.	
FUSER DBID/FNR	If you wish to list only logon records of logons to a specific FUSER system file, you specify its database ID and file number in these fields.	

List Logon Records

This function displays a list of logon records.

The list can be scrolled as described in the section *Finding Your Way In Natural Security*.

You can change the range of logon records listed by entering selection criteria in the input fields above the list. For possible options, enter a question mark (?) in the respective input field(s).

In addition, the following special PF-key functions are available:

Key	Explanation
PF06	List only utility access records. (Press again to revert to the list of all logon records.)
PF09	List the logon records sorted by user ID.
PF10	List the logon records sorted by library ID.
PF11	List the logon records sorted by date.

Delete Logon Records

This function displays a list of logon records, like the **List Logon Records** function described above. The options for handing the list are same as for that function. In addition, you can delete logon records.

It is recommended that logon records be deleted periodically to save space on the FSEC system file.

- To delete individual logon records, you mark them with code `DE`.
- To delete all logon records displayed on the current page, you press PF4.

  If you have invoked the Delete Logon Records function by pressing PF4:Del+ instead of ENTER on the Logon Records Menu, pressing PF4 on the list will automatically scroll to the next page immediately after the deletion, without your having to press PF8.
- To delete all existing logon records, you use the direct command `LOGDEL` (see below).
- To selectively delete large numbers of logon records, you can use the application programming interface `NSCADM`.

If a logon record has been deleted, this will be indicated by *##* in the first column of the list (except with PF4:Del+).

Direct Command LOGDEL

To delete *all* logon records at once, you enter the direct command `LOGDEL` in the command line.

Delete Logon Records But Last

This function corresponds to the **Delete Logon Records** function described above. However, the only delete option available is to press PF4. If you do so, all logon records displayed on the current page will be deleted - except the latest entry for each user ID on the current page.

Maintenance Log Records

This set of functions can only be used if the general option **Logging of Maintenance Functions** has been activated. If this option has been activated, *log records* are written when security profiles and Administrator Services settings are modified. The writing of log records allows you to ascertain who has modified which security profiles and Administrator Services settings. "Modify" in this context comprises all maintenance functions applied to a security profile (including Add, Copy, Delete, Link, etc.); it also includes the transfer of a security profile with the programs SECULD2 and SECLOAD.

To view the log records, you use the "Maintenance log records" functions.

To invoke these functions:

1 On the **Main Menu**, select **Administrator Services**.

If you are allowed **access to Administrator Services**, the **Administrator Services Menu 1** will be displayed.

2 On this menu, select **Maintenance Log Records**.

A menu will be displayed, from which you can select the following functions:

- Display Status of Logging Function
- List Administrator Services Maintenance Logs
- List Security Profile Maintenance Logs
- Log File Maintenance

- List Last Logon Records

Display Status of Logging Function

This function displays the following information:

- for which types of objects log records are written,
- the number of log records that have been written for each type of object,
- whether the option "Logging even if no actual modification" is set or not.

Note: For this function, you only enter the function code; the other options on the menu have no effect.

List Administrator Services Maintenance Logs

This function displays a list of the log records that have been written for modifications to Administrator Services settings.

Menu Options for this Function	Explanation
Modifier	To list only the modifications performed by a specific administrator, you specify his/her user ID in this field.
Date from/to	By default, these fields both contain the current date; that is, only the log records written today are listed. To list older log records, you change the date values in these fields as desired.
Time from/to	To list only log records written within a certain period of time, you specify the desired time range (format `hours:minutes:seconds`) in these fields.
Ascending/Descending	You can choose whether you want the log records to be listed in ascending or descending chronological order.

Note: The other options provided on the menu are not applicable to this function; they take no effect if specified.

On the list displayed, the following information is provided for each log record: the Administrator Services function performed, the ID of the user who made the modification, and the date and time of the modification.

On the list, you can mark a log record with any character: the screen on which the modification was made will then be displayed; on that screen, fields whose values were changed are displayed intensified. The screen also shows the Natural Security version and FSEC system file with/on which the modification was made.

List Security Profile Maintenance Logs

This function displays the log records that have been written for modifications to security profiles.

Menu Options for this Function	Explanation
Object type	In this field, you specify the type of object (USer, LIbrary, etc.) whose modified security profiles you wish to be listed. If you leave the field blank or enter a question mark (?), a window will be displayed in which you can select the desired object type. If you enter an asterisk (*), all log records for all security profiles will be listed.
Start value	In this field, you can enter an object ID as start value for the list to be displayed.
Modifier	To list only the modifications performed by a specific administrator, you specify his/her user ID in this field.
Date from/to	By default, these fields both contain the current date; that is, only the log records written today are listed. To list older log records, you change the date values in these fields as desired.
Time from/to	To list only log records written within a certain period of time, you specify the desired time range (format hours:minutes:seconds) in these fields.
Function	By default, log records written for all maintenance functions performed are listed. To list only log records written for a specific function (for example, Modify, Delete. Rename), you specify the desired function is this field. Functions can be abbreviated to the first two letters (for example, MO for Modify). For a selection list of available functions, you enter a question mark (?) in this field.
Ascending/Descending	You can choose whether you want the log records to be listed in ascending or descending chronological order.
Display modification	With this option, you can display intensified the actual modifications that were made in the security profiles; same as PF2 on the security profile screen (see below).

On the list displayed, the following information is provided for each log record: the function performed on the security profile, the ID of the security profile, the ID of the user who made the modification, and the date and time of the modification.

On the list, you can mark a log record with any character: the security profile in which the modification was made will then be displayed. If you press PF2 on the security profile screen, the fields whose values were changed will be displayed intensified (and, if applicable, a message will indicate whether an actual modification was made or not). The screen also shows the Natural Security version and FSEC system file with/on which the modification was made.

Log File Maintenance

On z/OS and Open Systems, this function can only be used in batch mode.

This function allows you to write/read the contents of the log file to/from a work file.

Log records have to be written to a work file when the log file becomes full. Thus, the work file serves as an "archive" for the log records.

The work files to be used are Work File 1 and Work File 5. On Linux and Windows, Work File 5 must be a file with the extension ".sag".

The output reports will be written to the print files `CMPRT01` and `CMPRT02`.

When you invoke this function, you will be prompted to specify the database ID and file number of the log file. If you later wish to specify another log file, you press PF5 on the **Log File Maintenance** menu.

When you invoke this function, the **Log File Maintenance** menu is displayed, from which you can select the following functions:

Code	Function	Explanation
`LI`	List Log Records	This function is used to list the contents of the log file. The output contains the same information as displayed by the function List Security Profile Maintenance Logs: a list of all modified profiles/settings, as well as every profile concerned (indicating the profile components which were modified). The output consists of two reports: ■ the **List of History Log Entries** report will be written to print file `CMPRT01`, ■ the **Detail History Log Entries** report will be written to print file `CMPRT02`.
`LX`	List Log Records Extended	Same as List Log Records - in addition, this function displays the additional data which are logged if extended logging is activated for user or library security profiles; see *Extended Logging* under ***Logging of Maintenance Functions***.
`WR`	Write Log Records to Work File	This function is used to write log records from the log file to Work File 5 (without deleting them from the log file).
`WD`	Write Log Records to Work File and Delete	This function is used to write log records from the log file to Work File 5, and delete them from the log file.
`RA`	Read Log Records from Work File	This function is used to read log records from Work File 5 onto the log file.
`SA`	Scan Work File	This function is used to scan the contents of Work File 5.

The Log File Maintenance function can also be invoked with the direct command `LOGFILE`.

Possible object types to be entered on the **Log File Maintenance** menu are:

Code	Object Type
*	all
AD	administration functions
AA	all (base and compound) applications
AB	base applications
AC	compound applications
DD or FI	DDMs/files
LI	libraries
MA	mailboxes
US	users

For object-type codes of external objects, see *Types of External Objects*.

Other parameters that can be specified on the **Log File Maintenance** menu are:

Parameter	Explanation
Start value	You can specify a start value for the objects to be written/read.
Date from/to	If you wish to process only log records that were created in a specific period of time, you can specify a range of dates in these fields.
Work File 1	The name of Work File 1.
Work File 5	The name of Work File 5.

Example:

To write log records from the log file to Work File 5, the CMSYNIN batch input file would contain the following commands:

```
LOGFILE
FIN
```

The CMOBJIN batch input file might contain the following specifications:

```
SYSSEC,DBA,PASSWORD
22,241
WR,US,,2002-07-01,2002-07-25
```

The first line must contain the library ID SYSSEC and the user ID and password of the respective Natural Security administrator.

The second line must contain the database ID and file number of the log file from which the records are read.

The third line must contain the function code and object type (possible values are the same as on the **Log File Maintenance** menu) - optionally followed by various parameters (whose sequence and possible values correspond to those of the corresponding fields on the **Log File Maintenance** menu).

When you scan or read the work file, you have to specify the following parameter in the JCL:

```
WORK=((5),OPEN=ACC)
```

Sample Batch Job 1 for z/OS - Writing Log Records to Work File:

```
//DBA       JOB DBA,CLASS=K,MSGCLASS=X
//**
//** WRITE LOGGING OF MAINTENANCE DATA TO WORK FILE 5
//** DELETE RECORDS FROM LOG FILE
//**

//NSCnnBAT EXEC PGM=NATBATnn,REGION=2400K,
// PARM=('IM=D,FNAT=(22,210),INTENS=1,FSEC=(22,240),',
//       'MT=0,MAXCL=0,MADIO=0,AUTO=OFF,WORK=((5),OPEN=ACC)')
//STEPLIB DD   DSN=PRODNAT.LOAD,DISP=SHR
//DDCARD   DD  DISP=SHR,DSN=PRD.NATnn.JOBS(ADADB22)
//CMPRINT  DD  SYSOUT=X
//CMWKF05   DD DSN=NSC.LOG.WKF05,
//    DISP=(NEW,CATLG),DCB=(RECFM=VB,LRECL=4624,BLKSIZE=4628),
//    SPACE=(TRK,(5,2))
//CMSYNIN   DD *
SYSSEC,DBA,password
LOGFILE
22,241
WD,US,,2002-07-01,2002-07-25
.
FIN
/*
//*
```

In the above example, the log records of all user security profiles modified between 1st and 25th July 2002 are written to Work File 5, and are then deleted from the log file.

Sample Batch Job 2 for z/OS - Writing Log Record Reports to Printers:

```
//DBA       JOB DBA,CLASS=K,MSGCLASS=X
//**
//** LIST LOG RECORDS-WRITE REPORTS OF MAINTENANCE DATA TO PRINTER
//**
//NSCnnBAT EXEC PGM=NATBATnn,REGION=2400K,
// PARM=('IM=D,FNAT=(22,210),INTENS=1,FSEC=(22,240),',
//       'MT=0,MAXCL=0,MADIO=0,AUTO=OFF')
//STEPLIB  DD  DSN=PRODNAT.LOAD,DISP=SHR
//DDCARD   DD  DISP=SHR,DSN=PRD.NATnn.JOBS(ADADB22)
//** CMWKF01   DD DISP=SHR,DSN=NSC.LOG.WKF01
//** CMWKF05   DD DISP=SHR,DSN=NSC.LOG.WKF05
//CMPRINT  DD SYSOUT=X
//CMPRT01  DD SYSOUT=X
//CMPRT02  DD SYSOUT=X
//CMSYNIN  DD *
LOGFILE
FIN
/*
//CMOBJIN  DD *
SYSSEC,DBA,password
22,241
LI,AD,,2002-06-06,2002-06-06
LI,US,MILL*,2002-05-01,2002-05-31
.
/*
//*
```

In the above example, the log records of all Administrator Services settings modified on 6th June 2002 and of all user security profiles modified in May 2002 are written to the print files `CMPRT01` (list of log records) and `CMPRT02` (detailed log records information).

Sample Batch Job 3 for z/OS - Reading Log Records from Work File:

```
//DBA       JOB DBA,CLASS=K,MSGCLASS=X
//**
//** READ LOGGING OF MAINTENANCE DATA FROM WORK FILE 5
//** INTO LOG FILE
//**
//NSCnnBAT EXEC PGM=NATBATnn,REGION=2400K,
// PARM=('IM=D,FNAT=(22,210),INTENS=1,FSEC=(22,240),',
//       'MT=0,MAXCL=0,MADIO=0,AUTO=OFF,WORK=((5),OPEN=ACC)')
//STEPLIB DD   DSN=PRODNAT.LOAD,DISP=SHR
//DDCARD   DD  DISP=SHR,DSN=PRD.NATnn.JOBS(ADADB22)
//CMPRINT  DD  SYSOUT=X
//CMWKF05  DD  DSN=NSC.LOG.WKF05,DISP=(SHR)
//CMSYNIN   DD *
SYSSEC,DBA,password
```

```
LOGFILE
22,241
RA,US,,2002-07-01,2002-07-25
.
FIN
/*
//*
```

In the above example, the log records of all user security profiles modified between 1st and 25th of July 2002 are read from Work File 5 and thus restored on the log file.

See also the section *Natural Security In Batch Mode*.

List Last Logon Records

Note: This function is independent of the logging of maintenance functions. Internally, however, it uses the same log file.

This function evaluates the logon records that have been written by Natural Security (see *Logon Records*). It allows you to ascertain:

- when each user logged on last,
- which users have not logged on within the last *n* days.

When you invoke the function, a window will be displayed in which you enter a number of days :

- If you enter a `0`, you will get a list of logon records showing the latest logon record written for each user.
- If you enter any other value *n*, you will get a list of logon records of those users who have not logged on in the last *n* days, showing for each of those users the last logon record written before the specified time interval.

The logon records are listed in chronological order.

Note: For this function, the fields **Object Type**, **Start Value** and **Date from/to** on the menu have no effect.

SAF Online Services

SAF Online Services provide several functions for monitoring the SAF server.

SAF Online Services are only available on z/OS computers; they are only available if Natural SAF Security (or any other SAF-related product) is installed.

Before you can use SAF Online Services, you have to define a utility security profile for the utility SYSSAFOS (which contains the SAF Online Services).

To invoke SAF Online Services:

1 On the **Main Menu**, select **Administrator Services**.

If you are allowed **access to Administrator Services**, the **Administrator Services Menu 1** will be displayed.

2 On this menu, select **SAF Online Services**.

The **Online Services** menu will be displayed, which provides the following functions:

- System Parameters
- System Statistics
- User Statistics
- Zap Maintenance
- Storage Display
- System Tracing
- Refresh Server

System Parameters

This function displays the parameter settings as defined in the system parameter module. The following information is displayed:

Item	Explanation
Authorization	Displays the different resource authorization checks performed by the SAF server that are related to Natural on z/OS, EntireX Communicator, Adabas, Entire Net-Work and Adabas SQL Server.
Class/Type	Shows the names of the different SAF general resources Classes or Types. These contain either the default or any override values which have been defined in the system parameter module.
Universal	This indicates a particular check is designated universal. If selected, then failure to define a particular resource profile will result in all users having access to it. Natural Program execution authorization cannot be designated universal.

Item	Explanation
Buffered	Displays for each type of check the maximum number of positive checks that the SAF server can buffer on behalf of each user.
Logging	This indicates the SMF logging level required when performing security checks. `0` signifies logging ASIS, that is, in accordance with the default for the security Class/Type; "1" indicates an override setting of `NONE`.
Active	Designates the particular authorization checks that are active. This applies only to checks performed by z/OS Natural as all other checks are activated by the installation process.
Env (Environment)	Indicates that an environment code, based on the Natural system files, is used to prefix certain resource profiles. Applies only to authorization checks performed by z/OS Natural.
Storage (k)	The size of the buffer in kilobytes which can be used for caching positive security checks in the address space of the SAF server.
Server DBID	Shows the database ID used by the SAF server.
Encrypt Req.	Indicates whether security requests passed between different SAF server components are communicated encrypted.
Encrypt Stg.	Indicates whether storage maintained within the Natural environment is kept in an encrypted state.
Messages	SAF server message level: Level `0` gives only error message, "1" reports security violations, and "3" generates an audit trail of all checks.
Cmd Log	Indicates whether command logging is turned on.
Buffer	Indicates whether security checks will be cached by the SAF server.
JCL check	Indicates whether CA-JCL check processing is available within the Natural environment.
Prefix Prog	Indicates whether Natural program names are prefixed with the name of the current application library when performing authorization checks. *Not applicable to Natural SAF Security.*
Protect Obj	Indicates whether program objects are protected within the Natural environment. Users require ALTER access to a particular application in order to modify its program objects. *Not applicable to Natural SAF Security.*
Log SYSMAIN	Indicates whether logging of all SYSMAIN operation is required. *Not applicable to Natural SAF Security.*
SYSMAIN/Lib	Indicates whether authorization checks for SYSMAIN functions will include access to the relevant Natural application libraries. *Not applicable to Natural SAF Security.*
Cmd Line	Indicates whether the Natural command line is protected. Users require CONTROL access in order to enter commands in the Natural command line.
ETID	Indicates whether Natural will generate a unique ETID.
Edit/Lib	Indicates whether Natural will prevent editing of objects located in another Natural application library. *Not applicable to Natural SAF Security.*
Clear/Ed	Indicates whether Natural will clear the edit area when logging onto another Natural application library. *Not applicable to Natural SAF Security.*

Item	Explanation
Ext Name	Indicates whether Natural will take the user name from SAF. Specifically, the field `*USER-NAME` will be taken from RACF or CA-ACF2.
Ext Group	Indicates whether Natural will take the group name from SAF. That is, the field `*GROUP` will be taken from RACF, CA Top Secret, CA-ACF2.
Log API	Indicates whether SMF logging is performed when executing the Natural API.
Env API	Indicates whether authorization checks performed by the Natural API will be prefixed by an environment code based on the Natural system files.

System Statistics

This function displays statistical information on the SAF server. The following information is displayed:

Item	Explanation
Authorization	Displays the different resource authorization checks performed by the SAF server related to Natural for z/OS, EntireX Communicator, Adabas, Entire Net-Work and Adabas SQL Server.
Check (+ve)	Indicates the number of authorization checks performed against the security system for each check type. The count indicates authorizations for which access was permitted and can include universal checks.
Check (-ve)	Indicates the number of authorization checks performed against the security system for which access was denied.
Check saved	Shows the number of authorization checks that were optimized by the SAF server because the result was already known.
Overwritten	Number of times positive authorization results were overwritten in the SAF server's cache because more recent information took its place in the buffer. Increase the number of items buffered if this count is excessive for any particular check type.
Lngth	Number of bytes reserved to cache resource profiles belonging to each type of authorization check. This value is generated automatically by the system.
Active Users	Number of users currently active in the SAF server.
High Watermark	High watermark value for number of users present in the SAF server.
Max Users	Maximum of users that can be accommodated.
Overwritten	Number of times a user area was reclaimed and allocated to another user. Increase the total buffer size if this count becomes excessive.
Authenticated	The total number of successful authentication checks performed.
Denied	The number of unsuccessful authentication checks.

User Statistics

This function displays statistical information on the currently active users. The function displays a list of users. When you select a user from the list, statistical information on this user will be displayed. The individual items correspond to those of the same names as described above for **System Statistics**.

Zap Maintenance

This function displays a list of ZAPs applied to the SAF server.

Storage Display

This function displays the storage of the SAF server's address space.

System Tracing

This function displays a list of the 256 most recent trace events.

Refresh Server

This function is used to restart the SAF server. It ensures that all data held in the SAF server's own buffer are flushed, including the settings of **NSF Options**, the **System Statistics**, cached security checks and user information. In addition, any data held by the security system itself in the address space of the SAF server are flushed when this function is executed.

User Default Profiles

Before you use default profiles, you should be familiar with the “normal” way of defining users as explained in the section ***User Maintenance***.

When you add new users, you can either type in every item of every user security profile by hand, or you can use a pre-defined user default profile as a template for the creation of a user security profile. When you have to define numerous users whose security profiles are to be very similar to one another, you can define in a default profile the items which are to be the same for many users, and then use this default profile as the basis for the individual security profiles. By using default profiles, you can thus reduce the amount of work required to define users to Natural Security.

You create a default profile as described below, and then use it as a template for a user security profile as described in the section ***User Maintenance***.

How to Create a User Default Profile

To create a default profile:

1 On the **Main Menu**, select **Administrator Services**.

If you are allowed **access to Administrator Services**, the **Administrator Services Menu 1** will be displayed.

2 Press PF8.

3 On the **Administrator Services Menu 2**, select **User Default Profiles**.

The **Default User Profiles** selection list will be displayed.

4 In the command line of this screen, enter the command `ADD`.

The **Add User Default Profile** window will be displayed.

5 In this window, enter the *user ID* and *user type* of the default profile.

For information on user IDs and user types, see the section ***User Maintenance***.

The **Add User Default Profile** screen will be displayed.

6 On this screen you define a user default profile.

The **Add User Default Profile** screen corresponds more or less to the **Add User** screen for the same user type. The individual items you may define as part of a user security profile are described under ***Components of a User Security Profile***. However, please note that you can define some items only in an individual security profile, but not in a default profile.

Default profiles are maintained like individual user security profiles (as described in the section ***User Maintenance***).

How to Use a User Default Profile

When you add a new user, you can specify the ID of a default profile which is to be used as a template for the user security profile you are creating.

The *user type* of the default profile must be the same as that of the security profile you use it for.

When you use a default profile to add a new user, the items from the default profile are copied into the user security profile - except the user ID, user name and the owners.

In the user security profile, you can overwrite the items copied from the default profile, and specify further items.

Note: To define numerous users who are to have identical security profiles, you can also use the **"Multiple Add User"** function (which is described in the section *User Maintenance*).

Library Default Profiles

Before you use default library security profiles, you should be familiar with the "normal" way of defining libraries as explained in the section *Library Maintenance*.

When you add new libraries, you can either type in every item of every library security profile by hand, or you can use a pre-defined default library security profile as a template for the creation of a library security profile. When you have to define numerous libraries whose security profiles are to be very similar to one another, you can define in a default profile the items which are to be the same for many libraries, and then use this default profile as the basis for the individual security profiles. By using default library security profiles, you can thus reduce the amount of work required to define libraries to Natural Security.

You create a default profile as described below, and then use it as a template for a library security profile as described in the section *Library Maintenance*.

How to Create a Library Default Security Profile

To create a library default security profile:

1 On the **Main Menu**, select **Administrator Services**.

If you are allowed **access to Administrator Services**, the **Administrator Services Menu 1** will be displayed.

2 Press PF8.

3 On the **Administrator Services Menu 2**, select **Library Default Profiles**.

The **Default Library Profiles** selection list will be displayed.

4 In the command line of this screen, enter the command `ADD`.

The **Add Default Library Profile** window will be displayed.

5 In this window, enter the *`library ID`* of the default profile (for information on **library IDs**, see the section *Library Maintenance*).

The **Add Default Library Profile** screen will be displayed.

6 On this screen, you define a default library security profile.

The **Add Default Library Profile** screen corresponds more or less to the **Add Library** screen. The individual items you may define as part of a library security profile are described under *Components of a Library Security Profile*. However, please note that you can define some items only in an individual security profile, but not in a default profile.

Default profiles are maintained like individual library security profiles (as described in the section *Library Maintenance*).

How to Use a Library Default Security Profile

When you add a new library, you can specify the ID of a default profile which is to be used as a template for the library security profile you are creating.

When you use a default profile to add a new library, the items from the default profile are copied into the library security profile - except the library ID, library name and the owners.

In the library security profile, you can overwrite the items copied from the default profile, and specify further items.

User Preset Values

Before you start defining users to Natural Security, you can use this function to pre-define the values of several items that are part of a user security profile. When you then create a user security profile, the items in the profile you are creating are already pre-set to these values.

To invoke this function:

1 On the **Main Menu**, select **Administrator Services**.

   If you are allowed **access to Administrator Services**, the **Administrator Services Menu 1** will be displayed.

2 Press PF8.

3 On the **Administrator Services Menu 2**, select **User Preset Values**.

   The first **Preset User Values** screen will be displayed.

Preset User Values consists of three screens:

- General User Profile Options
- Password Options
- Passphrase Options

To navigate between them, you use PF7 (General options), PF8 (Password options) and PF9 (Passphrase options).

All options are explained below.

Some of the options also appear in the security profile of every user, where their values will be preset to those you specify on the **Preset User Values** screen. If the general option **Overwriting**

of defaults possible is set to `Y`, you may overwrite these values in individual user security profiles. Other options do not directly correspond to user security profile fields, but apply to user security profiles in general.

Note: To ascertain in which user security profiles the value of a specific components differs from the corresponding preset value, you can use the application programming interface **NSCADM**.

General User Profile Options

Item	Explanation	
ETID	You may specify which value is to be used as ID for End of Transaction data (ETID). For Natural Security to be able to supply ETIDs, the Natural session must be started with the Natural profile parameter `ETID` being set to `OFF`.	
	`S`	This setting applies to all users; it cannot be changed in individual user security profiles. An ETID for every user will be generated by Natural Security at the start of his/her Natural session. Such an ETID consists of `S`, followed by a time-stamp (the rightmost 7 bytes of the value of the Natural system variable `*TIMESTMP` at session start), and uniquely identify the user session. It will remain in effect until the user ends his/her Natural session. In the individual user security profiles, this is indicated by the **Default ETID** field being prefixed with `S>`; any not time-stamp-related ETID value shown in that field will then not be used. To use a time-stamp-related ETID for a single user only, you specify `*TIMSTMP` in the **Default ETID** field of the individual user security profile. If time-stamp-related ETIDs are used, a logon record containing the ETID will be written by Natural Security every time a user logs on to Natural. To ascertain which ETID has been used by which user ID, you can view the **logon records**, or use the application programming interface **NSCADM**. See also *Logon Records*. For service requests in an RPC client/server environment, you can also use time-stamp-related ETIDs; see *Components of an RPC Server Profile*.

Item	Explanation	
		Note: With ETID set to `S`, the Natural system variable `*ETID` contains binary, non-printable data; this may affect your applications if they evaluate the `*ETID` value. For the display, you may consider using an edit mask; e.g. `EM=(H(8))`.
	`F`	Same as `S`, except that no logon records are written.
	`G`	ETIDs will be generated by Natural Security during the logon procedure from the following components: ■ The 1st byte is single character that identifies the environment from which Natural is invoked (B=Batch, C=Color, P=PC, T=TTY, V=Video, X=BTX). ■ The 2nd to 5th bytes is a unique string of alphanumeric characters that identifies the user (this string is generated when a user is defined to Natural Security). Only these 4 bytes are displayed in the user's security profile. ■ The 6th to 8th byte is a unique string of alphanumeric characters that identifies the library (this string is generated when a library is defined to Natural Security).
	`U`	The ID by which a user is defined to Natural Security, i.e. the value of the Natural system variable `*USER`, will be used as ETID. If the **Automatic Logon** feature (which is described in the section *Logging On*) is used, the value of `*USER` will be identical to that of `*INIT-USER`.
	`I`	The value of the Natural system variable `*INIT-USER` will be used as ETID.
	`T`	The value of the Natural system variable `*INIT-ID` will be used as ETID.
	`N`	ETIDs will not be used.
	If you do not remember the possible values you may specify, enter a question mark (?) or an asterisk (*) in the field: a window will be displayed; in the window, mark the desired value with a character or with the cursor; the value will then be written into the ETID field. See the Natural *System Variables* documentation for details on the above-mentioned system variables.	
Private library for administrator/person	Determines whether the user, if he/she is of type “Person” or “Administrator”, may have a personal (“private”) library.	
Passphrases active	This option applies to user security profiles in general.	

Item	Explanation
	Passphrases are passwords which are longer than 8 characters. This option enables the use of passphrases. ■ N = Passphrases cannot be used. Only "regular" passwords (up to 8 characters) are be used. ■ A = Both passphrases and "regular" passwords can be used. ■ Y = Passphrases are used exclusively. If this option is set to A or Y, the logon-related user exit LOGONEX0 is used instead of LOGONEX1.
Change password after *nnn* days	You can specify a time interval (number of days) after which users are forced to change their passwords during the logon procedure. The maximum value is 365 days. To display a message to users warning them of their impending password expiration, you use the option **Message before password expiration** (see below).
Message before password expiration	This option applies to user security profiles in general. You can use it to have a message displayed to users whose password is about to expire. The number you specify here determines how many days - possible values are 1 to 10 - before his/her password expiration is due a user is to a receive message, indicating that his/her password will expire. The message (NAT1691) will be displayed after the initial logon to Natural. This only applies to users in whose security profiles a time interval for password change is set (option **Change after** *nnn* **days** in a **user security profile**.)
Password change possible after	This option applies to user security profiles in general. You can specify a time interval (*nn* hours, *nn* minutes) after which a user can change his/her password again. When a user has changed his/her password, he/she has to wait until the specified time has elapsed before he/she can change it again.
Automatically unlock users after	This option applies to user security profiles in general. If the **Lock User Option** is active, users may be "locked" due to logon or countersign errors. To *manually* unlock a locked user, you use the function **List/Unlock Locked Users**. With this option, you can specify a time interval after which a locked user is unlocked *automatically*. In this case, a locked user ID will be unlocked *nn* hours and *nn* minutes after which the locking occurred.

Password Options

These options apply to "regular" passwords of up to 8 characters. For passwords which are longer than 8 characters, see **Passphrase Options** below.

Item	Explanation
Minimum password length	This option applies to user security profiles in general. A user password must not consist of fewer characters than the number specified here. Possible values: 1 - 8. When you set this length, please bear in mind that by default passwords are identical to user IDs (see the section ***User Maintenance***).
Password case-sensitive	This option applies to user security profiles in general. It determines whether or not Natural Security is to distinguish between lower-case and upper-case characters in user passwords: ■ `N` = Natural Security internally converts all alphabetical characters in passwords to upper-case. ■ `Y` = Natural Security distinguishes between lower-case and upper-case characters in passwords. **Note:** If you set this option to `Y`, make sure that any password input fields used also distinguish between lower-case and upper-case. This may affect the logon screen, the user exit `LOGONEX1`, any logon-related Natural Security application programming interfaces, or Natural's RPC-logon-related application programming interfaces.
User password history	This option can be used to exercise more control over the usage of passwords. ■ `N` = Password history is not active for any user. ■ `*` = Password history is not active generally. It can be activated for individual users by setting the field **Password History** in individual user security profiles to `Y`. ■ `Y` = Password history is active for all users. The activation of password history has the following effects: ■ This option is marked as read-only in **User Preset Values** when it is set to `Y` or `*`. ■ The last *nn* passwords used by a user are recorded by Natural Security. They cannot be used again by the user. You set the number of passwords to be recorded in the window displayed when you activate this option. Possible values: 1 - 10. ■ A user is forced to change his/her password at logon when it has been changed by an administrator in the user's security profile. ■ You can use the options below to define certain rules to which passwords must conform.
The following options can only be used if **User Password History** (see above) is set to `Y` or `*`.	

Item	Explanation
Maximum number of stored passwords	This corresponds to the field in the **User Password History** activation window: The last *nn* passwords used by a user are recorded by Natural Security. They cannot be used again by the user. Possible values: 1 - 10. This is marked as read-only in **User Preset Values** when **User Password History** is active.
Password mask	You can define a "mask" to which passwords must conform; that is, you can define for each position in a password what is has to consist of: ■ `A` - In this position, an alphabetical character (if **Password case-sensitive** is set to `N`) or an upper-case alphabetical character (if **Password case-sensitive** is set to `Y`) has to be specified. ■ `a` - In this position, a lower-case alphabetical character must be specified (this only possible if **Password case-sensitive** is set to `Y`). ■ `N` - In this position, a number must be specified. ■ `E` - In this position, a special character (that is, neither an alphabetical character nor a number) must be specified. ■ `*` - In this position, any character can specified. For example, `***NNN` means that the first three characters can be any characters, while the second three have to be numbers. The length of the mask must correspond to the **Minimum Password Length** (see above).
Each character only once	If this value is set to `Y`, passwords must not contain a character twice. For example, `THIRST` would not be allowed, because it contains two T's.
Disallow double characters	If this value is set to `Y`, passwords must not contain double characters. For example, `LITTLE` would not be allowed, because of the double T.
Check password for pattern	If this value is set to `Y`, a password must not be the same as the current value of the Natural system variable `*USER`. Moreover, a new password must not be too similar to the old one: a new password will be rejected if its last three characters are identical to those of the old password.
PF5 (PHist) key	You can press PF5 (PHist) key to modify the password history flag. Only the `Y` and `*` flag values can be modified using PF5. The **Maximum number of stored passwords** cannot be modified using PF5.
The following options are only available if **Password case-sensitive** (see above) is set to `Y`. The sum of these four values must correspond to the **Minimum Password Length** (see above):	
Minimum no. of upper-case letters	In this field, you can specify how many upper-case alphabetical characters a password must contain at least.
Minimum no. of lower-case letters	In this field, you can specify how many lower-case alphabetical characters a password must contain at least.

Item	Explanation
Minimum no. of numeric characters	In this field, you can specify how many numeric characters a password must contain at least.
Minimum no. of special characters	In this field, you can specify how many special characters a password must contain at least.

Passphrase Options

These options are only available if the general user security profile option **Passphrases active** (see above) is set to `Y` or `A`. They apply to passphrases, that is, passwords which are longer than 8 characters.

Note: Passphrases are always case-sensitive.

Item	Explanation
Minimum passphrase length	This option applies to user security profiles in general. A passphrase must not consist of fewer characters than the number specified here. Possible values: 9 - 128.
User passphrase history	This option can be used to exercise more control over the usage of passphrases. ■ `N` = Passphrase history is not active for any user. ■ `*` = Passphrase history is not active generally. It can be activated for individual users by setting the field **Password History** in individual user security profiles to `Y`. ■ `Y` = Passphrase history is active for all users. The activation of passphrase history has the following effects: ■ This option is marked as read-only in **User Preset Values** when it is set to `Y` or `*`. ■ The last *nn* passphrases used by a user are recorded by Natural Security. They cannot be used again by the user. You set the number of passphrases to be recorded in the window displayed when you activate this option. Possible values: 1 - 10. ■ A user is forced to change his/her passphrase at logon when it has been changed by an administrator in the user's security profile. ■ You can use the options below to define certain rules to which passphrases must conform.
The following options can only be used if **User Passphrase History** (see above) is set to `Y` or `*`.	
Maximum number of stored passphrases	This corresponds to the field in the **User Passphrase History** activation window: The last *nn* passphrases used by a user are recorded by Natural Security. They cannot be used again by the user. Possible values: 1 - 10. This is marked as read-only in **User Preset Values** when **User Passphrase History** is active.

Item	Explanation
Blanks allowed within passphrase	If this value is set to Y, passphrases may include blanks.
Check passphrase for pattern	If this value is set to Y, a passphrase must not contain the current value of the Natural system variable *USER. Moreover, a new passphrase must not be too similar to the old one: it will be rejected if its last three characters are identical to those of the old one.
Minimum no. of upper-case letters	In this field, you can specify how many upper-case alphabetical characters a passphrase must contain at least.
Minimum no. of lower-case letters	In this field, you can specify how many lower-case alphabetical characters a passphrase must contain at least.
Minimum no. of numeric characters	In this field, you can specify how many numeric characters a passphrase must contain at least.
Minimum no. of special characters	In this field, you can specify how many special characters a passphrase must contain at least.
PF5 (PHist) key	You can press PF5 (PHist) key to modify the passphrase history flag. Only the Y and * flag values can be modified using PF5. The **Maximum number of stored passphrases** cannot be modified using PF5.

Library Preset Values

Before you start defining libraries to Natural Security, you can use this function to pre-define the values of several items that are part of a library security profile. When you then create a library security profile, the items in the profile you are creating are already pre-set to these values.

To invoke this function:

1 On the **Main Menu**, select **Administrator Services**.

If you are allowed **access to Administrator Services**, the **Administrator Services Menu 1** will be displayed.

2 Press PF8.

3 On the **Administrator Services Menu 2**, select **Library Preset Values**.

The **Preset Library Values** screen will be displayed, containing library security profile items.

With PF5, you can invoke another screen with **further library options**.

The items are explained below.

Library Profile Items

Some of these items also appear in the security profile of every library, where their values will be preset to those you specify on the **Preset Library Values** screen. If the general option **Overwriting of defaults possible** is set to `Y`, you may overwrite these values in the individual library security profiles. Other items do not directly correspond to library security profile fields, but are options which apply to library security profiles in general.

Item	Explanation
Active cross-reference for Predict	Determines whether an active cross-reference in Predict is generated for a library. If you specify an asterisk (*) here, this applies to all libraries: The generation of active cross-references will be determined by the value of the Natural profile parameter `XREF`, regardless of the **Cross-reference** setting in individual library security profiles.
Logon recorded	Determines whether logons to a library are recorded.
Natural programming mode	Determines whether the programming mode can be changed with the Natural profile/session parameter `SM`. If you specify an asterisk (*) here, this applies to all libraries: The programming mode will be determined by the value of the Natural profile parameter `SM`, regardless of the **Programming mode** setting in individual library security profiles.
Restart	Determines whether an Adabas OPEN command with or without End of Transaction ID (ETID) is executed during the logon procedure.
Maintenance with Natural utilities	Determines who may maintain the contents of the library with Natural utilities.
Clear source area by logon	Determines whether the editor's source work area is cleared automatically when a user logs on from the library to another library.
Execute startup transaction in batch	Determines whether the startup transaction specified in the library security profile is executed in batch mode.
Steplibs	Allows you to specify the libraries which are to be the steplib libraries for the library. You can specify the name of the first steplib in the Steplibs field on the **Preset Library Values** screen. To specify more than one steplib, enter an asterisk (*) in the field or press `PF4`: a window will be displayed in which you can specify up to 9 steplibs.
Profile parameters for undefined libraries	This is an option which applies to undefined libraries in general. For libraries for which no security profiles have been defined yet, the following settings will be determined by the corresponding Natural profile parameters: `NC` = Allow system commands.
RPC Server Session Options (Natural RPC Restrictions)	
Close all databases	Controls the logon-/logoff-dependent closing of databases opened by remote subprograms in a library.

Item	Explanation
Logon option	Determines which logon data are evaluated when a library is accessed via a Natural RPC service call.
Logon recorded	This is not only a preset value. It also applies as default value if the corresponding field in the library security profile is set to *. If this is the case, it determines whether access to a library is to be recorded or not when the library is accessed via a Natural RPC service call.
Lock user option	For details on this feature, see also the **Lock User Option** under *General Options*. This is not only a preset value. It also applies as default value if the **Lock User** option in the security profile of the Natural RPC server is set to *. If this is the case, it controls the locking of users when they attempt to access a library on that server via a Natural RPC service call: ■ N = No locking of users will be performed. ■ X = Once a user has reached the **maximum number of logon attempts** without supplying the correct password, he/she will be locked, that is, the user ID will be made "invalid". Natural Security "remembers" unsuccessful attempts across sessions: The error counters for the client user IDs which were tried out unsuccessfully are kept for access attempts in subsequent sessions, thus reducing the number of subsequent attempts with these IDs. The error counter for a user ID is only reset after a successful logon. ■ * = The locking of users is controlled by the **Lock User Option** in the General Options section of Administrator Services.

Further Library Options

With PF5 on the library security profile items screen, you can invoke another screen with these further library options:

- Module Protection Mode
- Disable Rename and Delete of Library Node
- NDV Startup Inactive
- Development Mode
- Natural Client Access
- Library FDIC Assignment Enabled
- Pass Natural User ID (*USER) to Adabas

- INIT-LIB for undefined user ID(s)

Module Protection Mode

This option applies to all libraries. It affects the way in which the **Disallow/Allow Modules** settings in library security profiles are evaluated.

*	The evaluation of the **Disallowed/Allowed** settings depends on the platform: ■ **On z/OS computers:** When a module is invoked for execution, the **Disallowed/Allowed** setting for this module in the current library's security profile is only evaluated if the module is contained in that library. ■ **On other platforms:** When a module is invoked for execution, the **Disallowed/Allowed** setting for this module in the current library's security profile is *always* evaluated, regardless of whether the module is contained in the current library or another library (steplib).
L	The evaluation of the **Disallowed/Allowed** setting is the same on any platform: When a module is invoked for execution, the **Disallowed/Allowed** setting for this module in the current library's security profile is only evaluated if the module is contained in that library. Setting this option to `L` may be useful if you transfer a Natural application from z/OS to a non-z/OS platform and wish to keep you module protection unchanged.

Disable Rename and Delete of Library Node

This option can be used to prevent the inadvertent deletion/renaming of a library in the mapped environment of the Natural Development Server. It applies to the actions Rename and Delete in the context menu of the library node in the mapped environment (see ***Tree-View Actions*** in the section *Protecting the Natural Development Server Environment and Applications*).

Y	The actions Rename and Delete are disabled. They cannot be selected from the context menu of the library node.
N	The actions Rename and Delete are available in the context menu of the library node.

Note: Setting this option to `Y` cannot prevent that a library disappears from the tree view if the objects it contains are deleted (either from within the library or with utilities from outside the library).

NDV Startup Inactive

This option can be used to suppress the execution of **startup transactions** for logons to libraries in a mapped environment on a Natural Development Server client (see also *Map Environment and Library Selection* in the section *Protecting the Natural Development Server Environment and Applications*

Y	Startup transactions are not executed in a mapped environment. The name of the startup transaction, as specified in the security profile of the library to which a logon is performed, is not written into the Natural system variable `*STARTUP`.
N	The execution of startup transactions in a mapped environment is not restricted.

This option only takes effect in mapped environments on Natural Development Server clients.

Development Mode

For Natural projects, NaturalONE supports two development modes: shared mode and private mode. This option determines how Natural Security controls the Natural server actions triggered by the Eclipse Navigator view actions used by the Natural projects.

*****	NaturalONE development modes are not supported by Natural Security. The actions are controlled by a number of library security profile and utility profile settings.
Y	NaturalONE development modes are supported by Natural Security. The actions are controlled by development mode options, which you can set when you enter a `Y` in this field and then press PF5. For details, see ***Protecting the Navigator View*** in the section *Protecting the Natural Development Environment in Eclipse*.

Natural Client Access

This option determines which types of clients are permitted to connect to the Natural Development Server:

N	Only Natural for Windows (Natural Studio) clients are permitted to connect to the server.
O	Only NaturalONE clients are permitted to connect to the server.
A	Both Natural for Windows (Natural Studio) and NaturalONE clients are permitted to connect to the server. This is the default.
P	Natural for Windows (Natural Studio) and NaturalONE clients are *not* permitted to connect to the server.

See also *Starting the Natural Development Server* in the environment-specific sections of the *Natural Development Server* documentation.

Library FDIC Assignment Enabled

This option determines if the FDIC system file can be set in library security profiles and special-link profiles. It also determines if the FUSER system file and the **Cross-reference** option can be set in special-link profiles.

N	With this setting, the following applies: ■ The FDIC file cannot be set in library security profiles and special-link profiles. ■ The FUSER file can only be set in library security profiles, but not in special-link profiles. ■ The **Cross-reference** option can only be set in library security profiles, but not in special-link profiles.
Y	With this setting, the following applies: The FDIC file, the FUSER file, and the **Cross-reference** option can be set in both library security profiles and special-link profiles.

The display of the corresponding fields in library security profiles and special-link profiles depends on how this option is set.

Once you set this option to `Y`, you can only reset it to `N` if no FDIC specification exists in any library or special-link profile, and no FUSER specification in any special-link profile.

For details on how to set the FUSER and FDIC files and the **Cross-reference** option, see *Library File* and *General Options* under ***Components of a Library Security Profile***.

Pass Natural User ID (*USER) to Adabas

This option determines which user ID is passed to Adabas to be used as Adabas login ID.

N	The user ID contained in the Natural system variable `*INIT-USER`.
Y	The user ID contained in the Natural system variable `*USER`.

This option only takes effect in non-z/OS environments. In z/OS environments, the `*USER` value is always used as Adabas login ID.

Note: `*USER` is assigned to the Adabas Open command. If the user ID can be changed during the login process, it is necessary to set **NSC Library Profile** > **Security Options** > **Close Database by Logon** to `Y` for non-RPC sessions and the option **Close All Databases** to `Y` or `F` (Force) for Natural RPC sessions.

INIT-LIB for undefined user ID(s)

This option assigns the NSC library ID as default library ID for an undefined user ID that does not match the Natural Library ID naming convention. An NSC library security profile defined as public library and a Transition Period Logon option set to `Y` are required before you set this option.

```
Value = library ID (A8)
```

Definition of System Libraries

This function is used as part of the installation procedure for an initial installation of Natural Security. It allows you to automatically create library security profiles for system libraries (that is, libraries whose names begin with SYS) of Natural and its subproducts.

If you use this function, you have to set the Natural profile parameter `MADIO` to a value of at least `2000`.

You should not apply this function to SYS libraries containing Natural utilities, as it is recommended that utilities be protected as described in the section ***Protecting Utilities***.

To define system libraries:

1. On the **Main Menu**, select **Administrator Services**.

   If you are allowed **access to Administrator Services**, the **Administrator Services Menu 1** will be displayed.

2. Press PF8.

3. On the **Administrator Services Menu 2**, select **Definition of System Libraries**.

   A list of the system libraries of Natural and all Natural subproducts installed at your site will be displayed. For each system library, a library-specific security profile is provided in which all the necessary components are already defined appropriately.

4. On the list, you can either mark with `AD` individual libraries to which you wish their pre-defined profiles to be applied one by one, or you can choose to have the pre-defined profiles applied to all product system libraries simultaneously by marking the corresponding product with `AD`.

For further information, see the Natural Security installation description in the Natural *Installation* documentation.

Definition of Undefined Libraries

This function is used to create library security profiles for undefined libraries, that is, libraries which exist on the current FUSER system file, but for which no library security profiles have been created.

This function corresponds to that provided by the `SHOW` command, as described under ***Listing Undefined Libraries*** in the section *Library Maintenance*.

To define undefined libraries:

1 On the **Main Menu**, select **Administrator Services**.

If you are allowed **access to Administrator Services**, the **Administrator Services Menu 1** will be displayed.

2 Press PF8.

3 On the **Administrator Services Menu 2**, select **Definition of Undefined Libraries**.

A list of all undefined will be displayed. It corresponds to the one you get when you issue the command `SHOW UNDF` on the **Library Maintenance** selection list.

4 Proceed as described under ***Listing Undefined Libraries*** in the section *Library Maintenance*.

8 User Maintenance

- Before you Define Users 122
- Components of a User Security Profile 122
- Creating and Maintaining User Security Profiles 133

This section describes how to create and maintain *user security profiles*.

It covers the following topics:

Before you Define Users

Before you begin to define users to Natural Security, it is recommended that you take a few preparatory steps:

- Make a list of all people in your organization who are using Natural.
- Divide them into groups according to the work they do and in view of the Natural libraries they are to use. The division of your company into departments may be a guideline. People using the same libraries should be in the same groups. (People may be in more than one group.)

It is recommended that groups be used as much as possible, as this will not only reduce Natural Security maintenance considerably, but also provides for a more consistent protection setup.

The definition of users to Natural Security and the assignment of users to groups is best done in the following order:

1. Create a group security profile; that is, define a user of type “Group”.
2. Create individual user security profiles; that is, define users (typically of type “Member”).
3. Assign Members to the Group; that is, modify the group security profile.

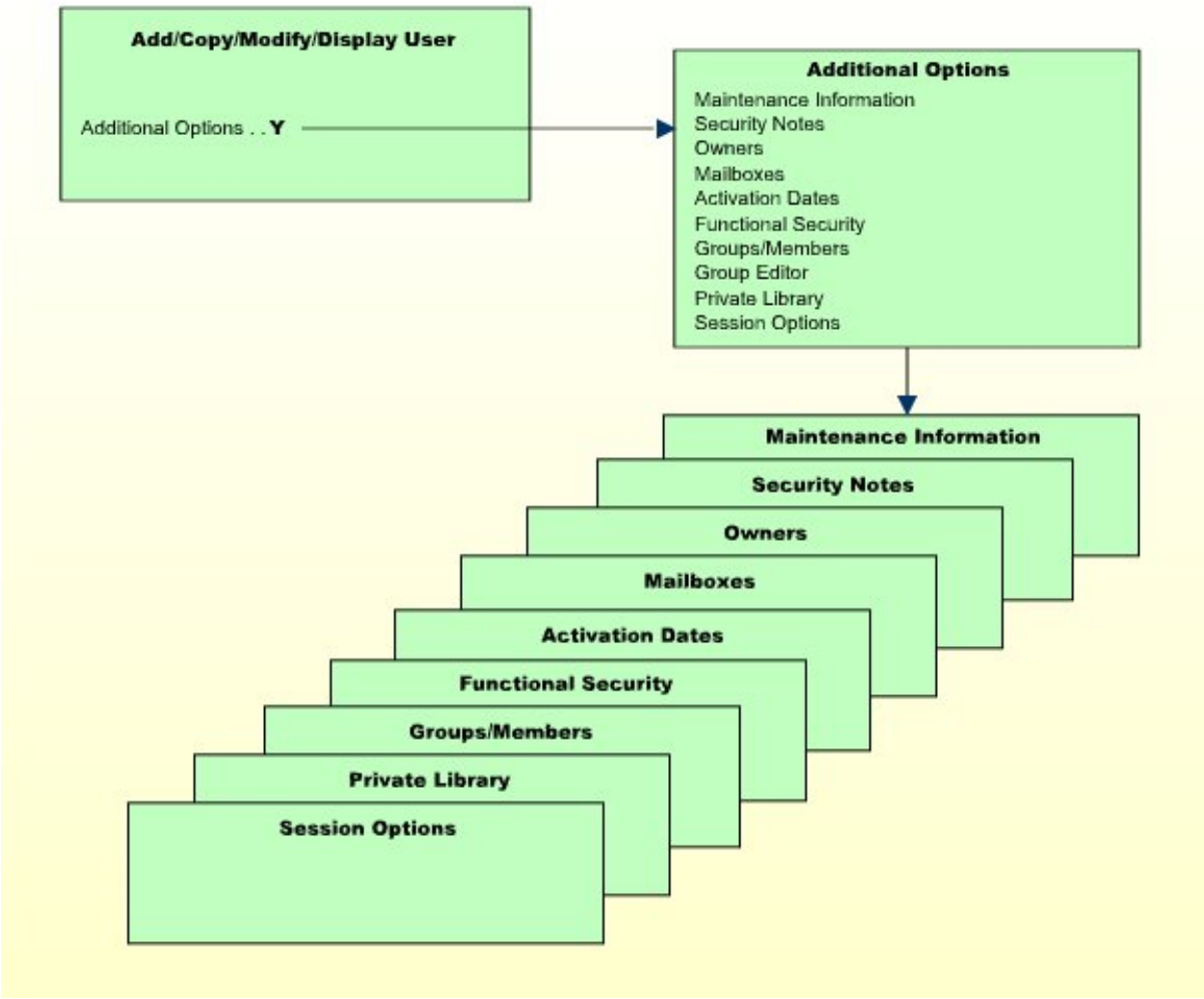
Components of a User Security Profile

This section covers the following topics:

- Overview of User Security Profile Components
- Components on Main User Security Profile Screen

- Additional Options Field

Overview of User Security Profile Components



Components on Main User Security Profile Screen

The following type of screen is the “basic” user security profile screen, which is displayed when you invoke one of the functions Add, Copy, Modify, Display for a user security profile:

```
15:27:08                    *** NATURAL SECURITY ***               2022-08-08
                                - Modify User -

                                                Modified ..          by
User ID ...... AD
User Name .... ARTHUR DENT____________________
User Type .... A (A=Administrator, P=Person, M=Member)

Privil. Groups           Libraries                  Password
--------------      -------------------      ----------------------
DOC_____            Default .. SYSSEC__      New Password ________
________            Last .....               Change after 666 days
________            Private Library ... Y    Password History .. N
________                                     Individual Lock ... F
________
                           ETID                  Characteristics
No. groups   3      -------------------      --------------------------------
                    Default ..  AR1R  G      Logon recorded .... N
                    Last .....               Batch User ID ..... ________
                                             Language .......... _0
                    Batch ....               Time Differential   + __ h __ min
                                             Time Zone
                                             ________________________________


Additional Options ... N

Enter-PF1---PF2---PF3---PF4---PF5---PF6---PF7---PF8---PF9---PF10--PF11--PF12---
      Help  PrevM Exit  AddOp PrLib Flip                                Canc
```

The individual items you may define as part of a user security profile are explained below.

The items of a user security profile may vary depending on the user type. For each item explained below, the user types concerned are indicated in brackets. If no user types are indicated, the item applies to users of every type.

Field	Explanation
User ID (display only)	The ID of the user as specified when the user security profile was created.
User Name	The name of the user, which may be up to 32 characters long. This name should be identical to the corresponding entry in Predict (if installed).
User Type	G = Group M = Member A = Administrator P = Person, T = Terminal B = Batch User

Field	Explanation
	E = External User
Privileged Groups (all except G)	You may enter the IDs of up to five groups to which the user belongs. By this, you may influence the order in which Natural Security scans for a link to a library: ■ For users of type "Member" the following applies: When the user tries to log on to a protected library, the privileged groups entered in his/her security profile are checked (in order of entry) for a link to the library before the other groups to which the user belongs are checked (in alphabetical order) for a link to the library. ■ For users of type "Administrator" and "Person" the following applies: When the user tries to log on to a protected library to which he or she is not linked directly, the privileged groups entered in his/her security profile are checked (in order of entry) for a link to the library before the other groups to which the user belongs are checked (in alphabetical order) for a link to the library. ■ For "Terminal"s, the following applies: When a user tries to log on to a protected library by means of the terminal ID (that is, without entering a user ID), the privileged groups in the terminal's security profile are checked (in order of entry) for a link to the library before the other groups to which the terminal belongs are checked (in alphabetical order) for a link to the library. The privileged groups may also be used to influence the order in which Natural Security searches for utility profiles to apply; see ***Which Utility Profile Applies?*** in the section *Protecting Utilities* for details. You may enter a group in the Privileged Groups list only after the user has been added to the group. If you remove a group from the user's Privileged Groups list, the user will *not* be deleted as a member of that group.
Members (G)	You may enter the IDs of the first five users to belong to this group. If the number of users belonging to the group exceeds five, use the **Edit Group Members** function. You can assign users to a group only after they have been defined to Natural Security. After a user ID entered, its user type will be displayed.
No. groups (all except G; display only)	The total number of groups to which the user belongs (including the Privileged Groups). Via **Additional Options** (see below), you can obtain a list of all these groups.
No. members (G; display only)	The number of users who belong to the group. Via **Additional Options** (see below), you can obtain a list of all these users.
Sum members (G; display only)	This field is only displayed if the group contains another group. It shows the sum of all users contained in the group. This includes users who are members of the group itself, and users which are contained in another group that is a member of the group.
Libraries	
Default	In this field, you may enter the ID of a default library.

Field	Explanation
	■ For users of type “Administrator”, “Person”, or “Member” the following applies: The default library specified in a user's security profile will be invoked automatically when the user logs on to Natural without entering a library ID. ■ For “Terminal”s, the following applies: The default library specified in a terminal's security profile will be invoked automatically when a user logs on to Natural by means of the terminal without entering a library ID. ■ For “Group”s, the following applies: The library specified in a group's security profile will be invoked automatically when a user logs on to Natural without entering a library ID if the user has no default library specified in his/her own security profile, and if the group is among the privileged groups listed in the user's security profile.
Last (all except G and E; display only)	The last RESTARTable library to which the user was logged on. (The Restart option in a library security profile determines whether a library can be RESTARTed.)
Private Library (A, P, E)	This option determines whether the user may have a **private library** (see below).
ETID	
Default (all except G)	This field displays the ID to identify End of Transaction data (ETID). ■ If this field is prefixed with `S>`, this indicates that time-stamp-related ETIDs for all users are generated by Natural Security at session start. In this case, the actual ETID value shown in the user security profile will not be used. See `ETID=S` under ***User Preset Values*** in the section *Administrator Services* for details. ■ If the ETID displayed is followed by a `G`, this indicates that it has been generated by Natural Security as described for ETID=G under ***User Preset Values***. If it has not been generated and you wish it to be generated, enter a `?` in the Default ETID field. ■ Other possible ETID values (user ID, TP user ID or terminal ID) are described under ***User Preset Values***. **Note:** ETIDs can only be supplied by Natural Security if the Natural session is started with the Natural profile parameter `ETID` being set to `OFF` or its default value.
Last (all except G and E; display only)	The ETID which was last generated/set for the user. **Note:** If the **Batch** field (see below) contains a value, the **Last** field is not updated in a batch-mode environment.
Batch (A, P, M, E)	If the user's Natural session is running in batch mode, this field determines the ETID to be used for the session. Possible values for this field are: ■ `*INIT-US(ER)`, `*USER`, `*INIT-ID`, `*INITPGM` (= `*INIT-PROGRAM`). - The value of the corresponding Natural system variable will be used as ETID. This value will be used for the entire batch session, even with libraries which are defined with

Field	Explanation
	Restart=N. Any time-stamp-related ETID will not be used, even if the ETID field in ***User Preset Values*** is set to S. ■ If this field is blank, the ETID in the field **Default** (see above) is used in batch mode as well.
Password	
New Password (A, P, M)	You may enter a password for the user to be used when he or she logs on. This password may be modified by the user (during the logon procedure) or by an owner of the user's security profile (in the security profile). If no password is entered here, Natural Security will assume the password to be identical to the user ID. The minimum length of the password is set in the ***User Preset Values*** section of Administrator Services.
Change after *nnn* days (A, P, M)	In this field, you may specify a time interval after which the user will be forced to change his or her password during the logon procedure. For example, if you set the time interval to 007, the user has to enter a new password on the logon screen every 7 days. If the user fails to do so, he or she cannot log on. If you wish to prevent the user from changing the password, set this field to 999; the user will then not be able to change his/her password at the logon. If you leave this field blank, the user can change his/her password as often as he/she likes. You can have a message displayed to users warning them of their impending password expiration; see the option **Message before password expiration** in the ***User Preset Values*** section of Administrator Services.
Password History	This field is only available if **User Password History** is set to * in the *User Preset Values*. In this case, you can use this field to activate the User Password History feature for an individual user. Possible values: ■ N = Password History is not active for this user. ■ Y = Password History is active for this user. For details, see the corresponding values of the field **User Password History** (which is described in the *User Preset Values* section of *Administrator Services*
Individual Lock	This field is only available if **User Password History** is set to * in the *User Preset Values*. In this case, you can use this field to activate the Lock User Option for an individual user. Possible values:

Field	Explanation
	■ N = The Lock User feature is not active for this user. ■ F = The Lock User feature is active for this user. For details, see the corresponding values of the **Lock User Option** (which is described in the *General Options* section of *Administrator Services*).
Characteristics	
Logon recorded	All logons by the user to any library will be recorded. See ***Logon Records*** in the section *Administrator Services* for information on logon records.
Batch User ID (all except T and B)	If the Natural system variable *DEVICE is set to BATCH, the following applies: You may enter the ID of a batch user security profile. Before you can enter a batch user ID, a security profile for this batch user ID must have been defined. In batch mode, a user logs on with his/her "normal" user ID and password. Natural Security will then use the batch user ID specified in the user's security profile, and the conditions of use defined for that batch user ID will apply. If no batch user ID is specified in the user's security profile, the "Privileged Groups" specified in the user's security profile will be checked (in order of entry) for a batch user ID. If none of the Privileged Groups has a batch user ID either, the user's own user ID will be used. **Note:** This option only applies if the Natural system variable *DEVICE is set to BATCH; otherwise, this option has no effect.
Language (all except T)	This corresponds to the Natural system variable *LANGUAGE and controls the usage of Natural error messages. You may enter a numeric value from 1 to 60. Each value represents one language (for example, 1 stands for English). If you set the value to 0, the value of the Natural profile parameter ULANG applies. For further information, see the system variable *LANGUAGE and the profile parameter ULANG (in the Natural *System Variables* and *Parameter Reference* documentation respectively).
Time Differential (all except B and E)	This only applies to an environment in which remote nodes are used in a computer network. It corresponds to the Natural profile parameter TD (see Natural *Parameter Reference* documentation). You can enter a value from -23 to +23 for hours, and 00 or 59 for minutes. The values indicate the number of hours/minutes added to/subtracted from computer centre time to obtain local time. The default value is 0 (which means that computer centre time will be used). If, for example, your location time is 5 hours ahead of computer centre time, you may set the value to +5 if you wish to use actual local time instead of computer centre time.

Field	Explanation
	You can also specify an asterisk (*); this has the same effect as the profile parameter setting `TD=AUTO` (that is, the time differential will be computed automatically be comparison of physical and logical machine times). You can use either **Time Differential** or **Time Zone** (described below), but not both.
Time Zone (all except B and E)	This only applies to an environment in which remote nodes are used in a computer network. You can enter the name of a time zone. A time zone of this name must be defined in the `NTTZ` macro of the Natural configuration module `NATCONFG`. The definition in the `NTTZ` macro determines the number of hours/minutes added to/subtracted from computer centre time to obtain local time. You can use either **Time Zone** or **Time Differential** (described above), but not both.

Additional Options Field

If you mark the field **Additional Options** on the basic security profile screen with `Y`, a window will be displayed from which you can select the following options:

- **Maintenance Information**
- **Security Notes**
- **Owners**
- **Mailboxes**
- **Activation Dates**
- **Functional Security**
- **Groups/Members**
- **Group Editor**
- **Private Library**
- **Session Options**
- **Development Mode**

The options for which something has already been specified or defined are marked with a plus sign (+).

Some options are only available for certain user types.

You can select one or more items from the window by marking them with any character. For each item selected, an additional window/screen will be displayed (in the order of the items in the selection window).

The **Private Library** screen can also be invoked directly by pressing PF5 on the basic security profile screen.

The individual options are explained below.

Additional Option	Explanation
Maintenance Information (display only)	In this window, the following information is displayed: ■ the date and time when the security profile was created, the ID of the administrator who created it, and (if applicable) the IDs of the co-owners who countersigned for the creation; ■ the date and time when the security profile was last modified, the ID of the administrator who made the last modification, and (if applicable) the IDs of the co-owners who countersigned for the modification.
Security Notes	In this window, you may enter your notes on the security profile.
Owners	In this window, you may enter up to eight IDs of administrators. Only the administrators specified here will be allowed to maintain this user security profile. If no owner is specified, any user of type "Administrator" may maintain the security profile. For each owner, the number of co-owners whose countersignatures will be required for maintenance permission may optionally be specified in the field after the ID. For information on owners and co-owners, see the section ***Countersignatures***.
Mailboxes	In this window, you may enter up to five mailbox IDs. For information on mailboxes, see the section ***Mailboxes***.
Activation Dates (all except T and B)	In this window, you may define dates as of which or until when the security profile shall be valid. The message "This security profile is currently not active." is displayed if the security profile is not yet or no longer or temporarily not valid, which means that the corresponding user ID cannot be used before or after a certain date or within a certain period of time.
Functional Security (all except T and E)	In this window, you may define functional security for the user with respect to the command processors defined in the libraries the user has access to. This is only relevant if command processors have been created with the Natural utility SYSNCP. See the section ***Functional Security*** for details.
Groups/Members (display only)	If you mark this field, a list of all groups to which the user belongs will be displayed. If the user is a Group, a list of all users who belong to the Group will be displayed.
Group Editor (G)	If you mark this field, the Edit Group Members function will be invoked. This function is explained under ***Editing Group Members*** below.

Additional Option	Explanation
Private Library (A, P, E)	A user may have a "personal" library whose ID is the same as his/her user ID. Such a library is called a `private library`. Private libraries can be made available in two modes: ■ **Public mode:** In this mode, private libraries are treated like any other libraries, that is, their use can be controlled in the same way as that of "normal" libraries. The only difference is that if a private library is protected (which is the default), the user with the same ID can access it without having to be linked to it, while other users need a link to it (see ***Protecting a Private Library*** in the section *Protecting Libraries*). ■ **Private mode:** In this mode, a private library can only be accessed by the user who is directly attached to it, that is, whose user ID is the same as the library ID. Not even a Natural Security administrator has access to it. (The only way for an administrator to gain access to a private library is by modifying the user's password in the user's security profile and then logging on to the private library with the user's user ID and the new password.) Thus, such a private library provides a certain degree of seclusion for the user; and possible misuse of this seclusion is hard to eliminate. Therefore it is recommended that this mode *not* be used. The mode is set with the general option **Private libraries in public mode** (described in the section *Administrator Services*) and applies to all private libraries. For information on **creating and maintaining a private library**, see the section *Library Maintenance*. As far as access to DDMs/files is concerned, there is no difference between private libraries and "normal" libraries. **Note:** Unless explicitly stated otherwise, what is said in the Natural Security documentation about libraries also applies to private libraries.
Session Options (A, P, G, E)	**See below.**
Development Mode (A, P, G, E)	See ***User Development Mode Options*** in the section *Protecting the Natural Development Environment in Eclipse*.

Session Options

Option	Explanation
Unlock Objects	This option controls the use of the Natural system command `UNLOCK`, which is used in conjunction with the Natural Development Server. You can specify one of the following values: ■ `N` = The user cannot use the `UNLOCK` command. ■ `Y` = The user can use the `UNLOCK` command, but only for his/her own programming objects (that is, objects locked under his/her user ID). This is the default value. ■ `F` = The user can use the `UNLOCK` command for any locked programming object.
Environment Protection (display only)	This field is only relevant if environment protection is active (that is, if the general option **Environment Protection** is set to `Y`); it indicates if there are environments which the user is not allowed to access: ■ `N` = The user can access any environment for which a security profile is defined. ■ `Y` = Access to at least one defined environment is disallowed for the user. For details on environment protection, see the section ***Protecting Environments***.
Suspend Line Protection	This field determines whether or not the user is allowed to use the Natural Studio program editor function **Suspend Line Protection**: ■ `Y` = The user may use the function. ■ `N` = The user cannot use the function.
Profile Maintenance	This field controls the maintenance authorization for the profiles used by the Natural system command `LIST` and the Natural Object Handler utility: ■ `U` = The user may only modify his/her own user-specific parameters of the two profiles (this is the default). ■ `G` = The user may modify the general parameters of the two profiles as well as his/her own user-specific ones. ■ `N` = The user cannot modify any of the two profiles' parameters. The `LIST` profile is described under *Defining an Individual List Profile* in the `LIST` section of the Natural *System Commands* documentation. The Object Handler profile is described under *Profile Settings* in the *Object Handler* section of the Natural *Utilities* documentation.
Natural Client Access	This field determines which types of clients are permitted to connect to the Natural Development Server: ■ `N` = Only Natural for Windows (Natural Studio) clients are permitted to connect to the server. ■ `O` = Only NaturalONE clients are permitted to connect to the server. ■ `A` = Both Natural for Windows (Natural Studio) and NaturalONE clients are permitted to connect to the server. This is the default.

Option	Explanation
	■ P = Natural for Windows (Natural Studio) and NaturalONE clients are *not* permitted to connect to the server. See also *Starting the Natural Development Server* in the environment-specific sections of the *Natural Development Server* documentation.

Creating and Maintaining User Security Profiles

This section describes the functions used to create and maintain user security profiles.

It covers the following topics:

- Invoking User Maintenance
- Adding a New User
- Adding Multiple New Users
- Selecting Existing Users for Processing
- Copying a User
- Modifying a User
- Renaming a User
- Deleting a User
- Displaying a User
- Editing Group Members
- Copying a User's Links

Invoking User Maintenance

To invoke user maintenance:

1 On the **Main Menu**, select **Maintenance**.

A window will be displayed.

2 In the window, mark the object type **User** with a character or with the cursor.

The **User Maintenance** selection list will be displayed.

3 From this selection list, you invoke all user maintenance functions as described below.

Adding a New User

The Add User function is used to define new users to Natural Security, that is, create user security profiles.

When you add a new user, you have to specify:

- a user ID,
- a user type,
- the ID of a default profile (optional).

User ID

The user ID is used by Natural Security to identify the user. It may be 1 to 8 characters long. The ID must be unique among all user IDs and library IDs defined to Natural Security. For user IDs, the same naming conventions apply as for **library IDs** (see the section *Library Maintenance*).

- If the user is an individual, usually an ID is chosen which is related to the user's name.
- If the user is a terminal, the ID must be identical to the terminal ID by which the terminal is defined to the computer (ask your system programmer).
- If the user is a group, choose whatever ID you like.

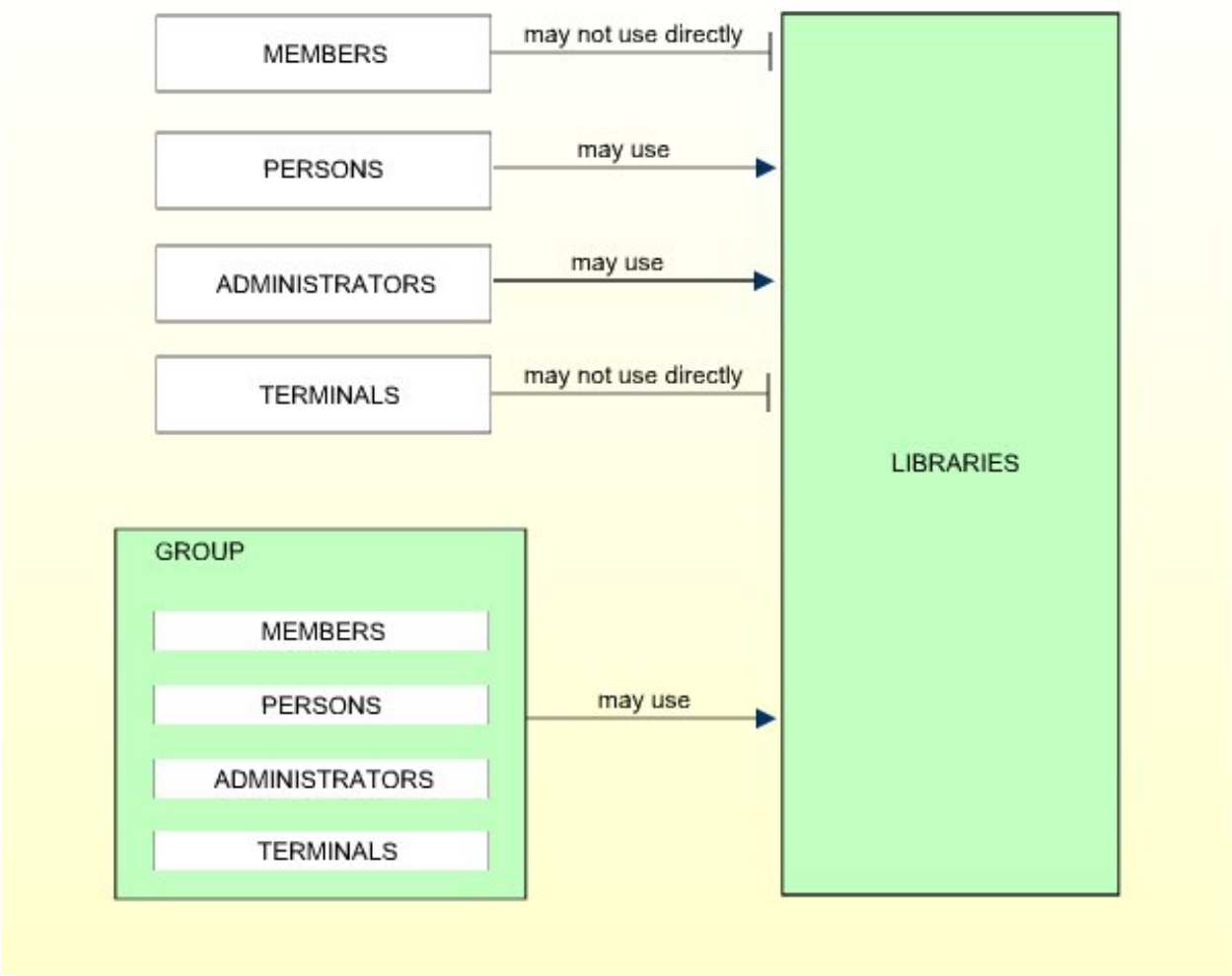
User Type

When you add a user, you specify the code for one of the following user types:

Code	User Type
G	Group
M	Member
P	Person
A	Administrator
T	Terminal
Special-purpose user types:	
B	Batch User (see ***Batch User Security Profiles*** in the section *Natural Security In Batch Mode*).
E	External User (this user type cannot be explicitly specified; see the field **NSC user ID** under ***Components of an LDAP Security Profile*** in the section *Authentication Options (LDAP)*).

If the user to be defined is a group, the user type must be `G`. If the user to be defined is a terminal, the user type must be `T`. If the user to be defined is an individual, the user type should be `M` (except individuals who are Natural Security administrators and have to be user type `A`).

The access rights of different types of users to libraries are summarized in the following diagram:



If you have doubts about the correct user type specification, please refer to ***Users*** in the section *The Structure And Terminology Of Natural Security*.

Once an individual has been defined, you can later change his/her user type classification (as explained under ***Upgrading and Downgrading Users*** below.

Default Profile

When you add a new user, you can either type in every item within the user security profile by hand; or you can use a pre-defined user default profile as a template for the security profile you are creating.

Before you use default profiles, you should be familiar with the “normal” way of defining users (that is, without default profile).

Default profiles are created and maintained in the Administrator Services subsystem.

The `user type` of the default profile you specify must be the same as that of the user security profile you are creating.

If you specify the ID of a default profile in the **Add User** window, the items from the default profile will be copied into the user security profile - except the user ID, user name and the owners.

On the **Add User** screen, you can then overwrite the items copied into the user security profile and specify further items.

For further information, see ***User Default Profiles*** in the section *Administrator Services*.

Note: To define numerous users with identical security profiles, you can also use the Multiple Add User function (see ***Adding Multiple New Users***).

How to Add a New User

In the command line of the **User Maintenance** selection list, you enter the command `ADD`.

A window will be displayed. In this window, you enter the following:

- a user ID,
- a user type,
- the ID of a default profile (optional).

The **Add User** screen for the specified user type will be displayed. On this screen, you define a security profile for the user.

The **Add User** screen and the subsequent screens/windows that are part of a user security profile as well as the individual items you may define are described under ***Components of a User Security Profile***.

When you add a new user, the owners specified in your own user security profile will automatically be copied into the user security profile you are creating.

Adding Multiple New Users

Before you use the Multiple Add User function you should be familiar with the “normal” way of defining users (as described under ***Adding a New User*** above).

The Multiple Add User function allows you to define large numbers of users to Natural Security in a fast and easy way. You can use this function to define numerous users who are to have identical security profiles.

In the command line of the **User Maintenance** selection list, you enter the command `ADDM`.

A window will be displayed. In this window, enter a `user ID` and a `user type` specification (and, optionally, the ID of a `default profile`).

The **Multiple Add User** screen for the specified user type will be displayed. On this screen you may define a security profile for the user.

The **Multiple Add User** screen and the subsequent screens/windows that are part of a user security profile as well as the individual items you may define are described under *Components of a User Security Profile*.

When you add a new user, the owners specified in your own user security profile will automatically be copied into the user security profile you are creating.

To create multiple user security profiles

1 On the first screen (and any additional screens/windows), you define a security profile for one user.

2 Once you have finished typing in the items to be defined and are back on the **Multiple Add User** screen without any additional screens/windows being active, press ENTER. The first user is now defined.

3 Then press PF5 - the same security profile will be displayed again omitting the user ID and user name entries. Type in a user ID and the name of the next user and press ENTER. The second user is now defined.

4 Then press PF5 - the same security profile will be displayed again omitting the user ID and user name entries. In this manner, you may continue to define more users all with identical security profiles.

5 To leave the Multiple Add User function, press PF3.

Selecting Existing Users for Processing

When you invoke **User Maintenance**, a list of all users that have been defined to Natural Security will be displayed.

If you do not want a list of all existing users but would like only certain users to be listed, use the **Start Value** and **Type/Status** options as described in the section *Finding Your Way In Natural Security*.

On the **Main Menu**, select **Maintenance**. A window will be displayed.

In the window, mark the object type **User** with a character or with the cursor (and, if desired, enter a start value and/or user type).

The **User Maintenance** selection list will be displayed:

```
11:11:11                    *** NATURAL SECURITY ***                 2022-08-31
                              - User Maintenance -

 Co User ID  User Name                          Type Message
 __ ________ ________________________________ ____ ______________________
 __ AAZ      ABDUL ALHAZRED                   A
 __ AD       ARTHUR DENT                      A
 __ CDW      CHARLES DEXTER WARD              A
 __ CZ       CODY ZAMORA                      P
 __ DI       DAVID INNES                      A
 __ EW       ESMERALDA WEATHERWAX             M
 __ HC       HAGBARD CELINE                   A
 __ HW       HENRY WILT                       A
 __ IW       IRENE WILDE                      M
 __ LL       LOCKE LAMORA                     M
 __ PE       PALMER ELDRITCH                  M
 __ PR       PRECIOUS RAMOTSWE                M
 __ SV       SAM VIMES                        M
 __ TN       THURSDAY NEXT                    P
 __ VV       VINCENT VEGA                     M

 Command ===>
 Enter-PF1---PF2---PF3---PF4---PF5---PF6---PF7---PF8---PF9---PF10--PF11--PF12---
       Help        Exit              Flip  -     +                      Canc
```

For each user, the user ID, user name and user type are displayed.

The list can be scrolled as described in the section *Finding Your Way In Natural Security*.

The following user maintenance functions are available (possible code abbreviations are underlined):

Code	Function
CO	**Copy user**
MO	**Modify user**
RE	**Rename user**
DE	**Delete user**
DI	**Display user**
EG	**Edit group members**
LA	**Link user to applications**
LL	**Link user to libraries**
LO	**Link user to external objects**
LR	**Link user to RPC servers**
CP	**Copy user's links**
EP	**Protect environments for user**
MD	**Modify DDM restrictions in user's private library** (this function is not available on z/OS)

To invoke a specific function for a user, mark the user with the appropriate function code in column **Co**.

You can select various users for various functions at the same time; that is, you can mark several users on the screen with a function code. For each user marked, the appropriate processing screen will be displayed. You can then perform for one user after another the selected functions.

Copying a User

The Copy User function is used to define a new user to Natural Security by creating a security profile which is identical to an already existing user security profile.

- What is Copied?
- How to Copy
- Copying Without Links
- Copying With Links

What is Copied?

All components of the existing security profile will be copied into the new security profile - *except*:

- the user name (see *How to Copy* below),
- the password,
- the ETID (which identifies End of Transaction data),
- the owners (these will be copied from your own user security profile into the new user security profile you are creating).

Whether the groups entered in the **Privileged Groups** column and any links to libraries are copied depends on whether you copy with or without links (see below).

How to Copy

1. On the **User Maintenance** selection list, mark the user whose security profile you wish to duplicate with function code `CO`.
2. A window will be displayed in which you specify the following:

Field	Explanation
To user	Enter the ID of the new user.
User name	This field shows the name of the existing user. Overwrite it with the name of the new user.

With links	With this option, you can, in addition to the user security profile, also copy its links, utility profiles and groups. N = See *Copying Without Links* below. Y = See *Copying With Links* below.

3. The **Copy User** screen will be displayed showing the new security profile.

   Its components which you may define are described under *Components of a User Security Profile*.

Copying Without Links

If you select **With links = N**:

- The groups entered in the **Privileged Groups** column of the existing user will not be copied into the new user security profile.
- Any links defined for the existing user will not apply to the new user.
- Any user-specific and user-library-specific utility profiles for the existing user will not apply to the new user.

Copying With Links

If you select **With links = Y**:

- Any links that existed for the existing user are copied for the new user, and you have the option to cancel the links you wish not to apply for the new user.
- The new user will be added to all groups in which the existing user is contained (and all access right of the groups to libraries then also apply for the new user), and you have the option to delete the new user from any of these groups;
- Any user-specific and user-library specific utility profiles that existed for the existing user are copied for the new user.

The procedure is as follows:

1. Once you have made any changes to the copied security profile and then leave the **Copy User** screen by pressing PF3, a list of libraries is displayed: the list contains all libraries to which the existing user is linked directly.
2. On the list, you may mark individual libraries with CL to cancel any links you wish *not* to apply for the new user. To all libraries you do not mark, the new user will automatically be linked in the same manner - normal or special link - as the existing user.
3. Once you have established all direct links and then leave the list of libraries by pressing PF3, a list of groups is displayed: it contains all groups in which the existing user is contained.

4. On the list you may mark with `CL` the groups to which you wish the new user *not* to be added; the new user will automatically be added to all groups you do not mark. If any of the groups to which the new user is added is entered as **Privileged Groups** in the security profile of the existing user, they will automatically also be entered as **Privileged Groups** in the new user security profile.

Modifying a User

The Modify User function is used to change an existing user security profile.

To do so:

1 On the **User Maintenance** selection list, mark the user whose security profile you wish to change with function code `MO`.

2 The **Modify User** screen will be displayed, showing the security profile.

Its components which may define or modify are described under *Components of a User Security Profile*.

Upgrading and Downgrading Users

If need be, you may change the user type classification of an individual.

To change the user type, first type in the new user type and press ENTER to obtain the appropriate **Modify User** screen before you further modify the security profile, because the **Modify User** screens for the different user types are not identical to one another.

Upgrading a User

You may "promote" a MEMBER to become a PERSON or an ADMINISTRATOR; and you may "promote" a PERSON to become an ADMINISTRATOR.

Downgrading a User

You may downgrade an ADMINISTRATOR to become a PERSON or a MEMBER; and you may downgrade a PERSON to become a MEMBER.

- Before you can downgrade a user from ADMINISTRATOR to PERSON, you have to remove him/her as owner from every security profile in which he/she is specified as owner. As long as an ADMINISTRATOR is still owner of any security profile, he/she cannot be downgraded.
- Before you can downgrade a user from ADMINISTRATOR to MEMBER, you have to perform the following:
  - Remove him/her as owner from every security profile in which he/she is specified as owner. As long as an ADMINISTRATOR is still owner of any security profile, he/she cannot be downgraded.

  - Cancel all direct links from the user to libraries/external objects. As long as the user is linked to any library or external object, he/she cannot become a MEMBER.
  - Delete the ADMINISTRATOR's private library (if defined). As long as the user has a private library, he/she cannot become a MEMBER.
- Before you can downgrade a user from PERSON to MEMBER, you have to cancel all direct links from the user to libraries/external objects. As long as the user is linked to any library or external object, he/she cannot become a MEMBER. In addition, you have to delete the PERSON's private library (if defined). As long as the user has a private library, he/she cannot become a MEMBER.

User Locked?

When the **Lock User Option** (see *Administrator Services*) is active, it may occur that the user security profile has been locked.

If the security profile is locked, this will be indicated on the **Modify User** screen by the message:

```
This user is currently locked due to logon/countersign error!
```

If you enter a `Y` in the **Unlock? (Y/N)** field, a window will be displayed which provides detailed information on how and when the locking occurred. In that window you may also unlock the security profile.

Note: You can also view and unlock locked users with the **List/Unlock Locked Users** function (see *Administrator Services*).

Renaming a User

The Rename User function allows you to change the user ID of an existing user security profile.

To do so:

1. On the **User Maintenance** selection list, mark the user whose ID you wish to change with function code `RE`.
2. A window will be displayed in which you enter a new ID for the user (and, optionally, change the user's name).

The following users cannot be renamed:

- an administrator who is an owner of one or more security profiles,
- a user who is specified as DDM modifier in one or more DDM/file security profiles.

Deleting a User

The Delete User function is used to delete an existing user security profile.

To do so:

1 On the **User Maintenance** selection list, you mark the user you wish to delete with function code `DE`.

2 The **Delete User** window will be displayed.

- If you decide against deleting the user security profile, leave the window by pressing ENTER without having typed in anything.
- To delete the user security profile, enter the user's ID in the window to confirm the deletion.

Depending on the setting of the general option **Allow Deletion of Users Who Are Owners/DDM Modifiers** (see *Administrator Services*), it may not be possible to delete a user security profile if the user is specified as owner in any security profile or as DDM modifier in any DDM/file security profile.

If you mark more than one user with `DE`, a window will be displayed in which you are asked whether you wish to confirm the deletion of each user security profile by entering the user's ID, or whether all users selected for deletion are to be deleted without this individual confirmation. Be careful not to delete a user accidentally.

Note: If you delete a Group security profile, this will *not* delete the individual security profiles of the users assigned to this Group.

Displaying a User

The Display User function is used to display an existing user security profile.

To do so:

1 On the **User Maintenance** selection list, mark the user whose security profile you wish to view with function code `DI`.

2 The **Display User** screen will be displayed, showing the security profile.

Its components are explained under *Components of a User Security Profile*.

User Locked?

When the **Lock User Option** (described in the section *Administrator Services*) is active, it may occur that the user security profile has been locked.

If the security profile is locked, this will be indicated on the **Display User** screen by the message:

```
This user is currently locked due to logon/countersign error!
```

If you enter a `Y` in the **Lock Info (Y/N)** field, a window will be displayed which provides detailed information on how and when the locking occurred.

Editing Group Members

The Edit Group Members function is used to assign users to or delete users from a group.

As long as the number of users assigned to a group does not exceed 5, the group members may be maintained in the **Members** column of the group's security profile by using the Modify User function. For larger groups, membership maintenance has to be done with the Edit Group Members function.

Note: The number of group members you can maintain with the Edit Group Members function is restricted by internal storage limitations set by the Natural profile parameter `ESIZE`. To maintain a larger number of group members, you use the application interface program **NSCUS**. With NSCUS, you can maintain groups of up to 99,999 members.

Invoking the Edit Group Members Function

You can invoke the Edit Group Members function in two ways:

- On the **User Maintenance** selection list, mark the group you wish to edit with function code `EG`.
- In a group's security profile, mark the option **Group Editor** in the **Additional Options** window with any character.

The **Edit Group Members** screen will be displayed:

```
>                      > +   Gr ELGRUPO                  Size 7    Line 1
  ALL  User ID             User Name                Type        Status
       -------- -------------------------------- ---- --------------------
       AD       ARTHUR DENT                        A
       AT       TIFFANY ACHING                     M
       MT       MERCY THOMPSON                     M
       RM       RACHEL MORGAN                      P
       TAK      THE ANALOG KID                     M
       TW2112   WEINRIB'S TERMINAL                 T
       UBG      UNBEARABLE BOY GROUP               G
```

The **Edit Group Members** screen is a modified Natural program editor. When you invoke it, the users already contained in the given group are read into the source area. The list of group members is in alphabetical order of user IDs. For each user, the user ID, user name and user type are displayed.

Editing the List of Group Members

To edit the list, you can use the Natural program editor scrolling commands, line commands and editor commands (as described in the Natural *Editors* documentation).

To add a user to the group, add the user ID to the list. To delete a user from the group, delete the user ID from the list.

Remember that users have to be defined to Natural Security before they can be added to a group.

It does not matter in which order you specify new user IDs: when you catalog the list of group members (see below), they will automatically be sorted alphabetically.

To add *all* users contained in one group to the group you are editing, enter the command `INCLUDE` *`group-ID`* in the command line of the **Edit Group Members** screen. All users contained in the group whose ID you specify with the `INCLUDE` command will then be added to the list. They will be included before the user who is displayed in the top line of the screen.

Alternatively, you can have a group within a group; that is, you add the group ID to the list of group members you are editing.

Saving Your Modifications

Modifications are only processed in the source area until you catalog them. To do so, you enter the command `CATALOG` in the command line, or press PF3. This command first invokes a procedure which checks for duplicate IDs. If all IDs are unique, the edited list of members will be entered in the group's security profile.

To invoke the checking procedure only, you use the command `CHECK`.

When you catalog the list of group members, the user exit `NSCUSEX2` is invoked. It displays a list of the group's members, indicating which members have been added to the group and which have been removed from it.

To leave the **Edit Group Members** screen, enter a period (.) in the command line.

Copying a User's Links

The Copy User's Links function is used to copy links from one existing user security profile to another one of the same user type.

You can individually select the links to be copied. In addition to links, you can copy group memberships (including **Privileged Groups** specifications) and functional security definitions.

To copy:

1 On the **User Maintenance** selection list, mark the user whose links you wish to copy with function code `CP`.

2 A window will be displayed in which you enter the ID of the user to which you wish to copy links.

   In addition, you can restrict the selection of link types in the window:

   - Library links
   - Groups/Members
   - Utility links
   - Functional security
   - File links (if the user has a private library)
   - Environment links
   - External object links

   By default, all the above are selected. To deselect one type, you remove the `X`.

3 A list of all the first user's existing links (of the selected types) will be displayed.

   The listed links are not automatically preselected for copying. In the **Co** column of the list, you have to mark with function code `CO` each link you wish to be copied from the one user to the other.

   You can mark one or more links per screen. For each link marked, a message indicating if it has been copied will be displayed. If a link cannot be copied, this will also be indicated. For example, if the user already has a link to a specific object, this cannot be replaced by a link copied from the other user.

9 Library Maintenance

- Components of a Library Security Profile 148
- Creating and Maintaining Library Security Profiles 175

A library is defined to Natural Security by creating a *library security profile*. The library security profile determines the conditions under which the library may be used.

This section covers the following topics:

Components of a Library Security Profile

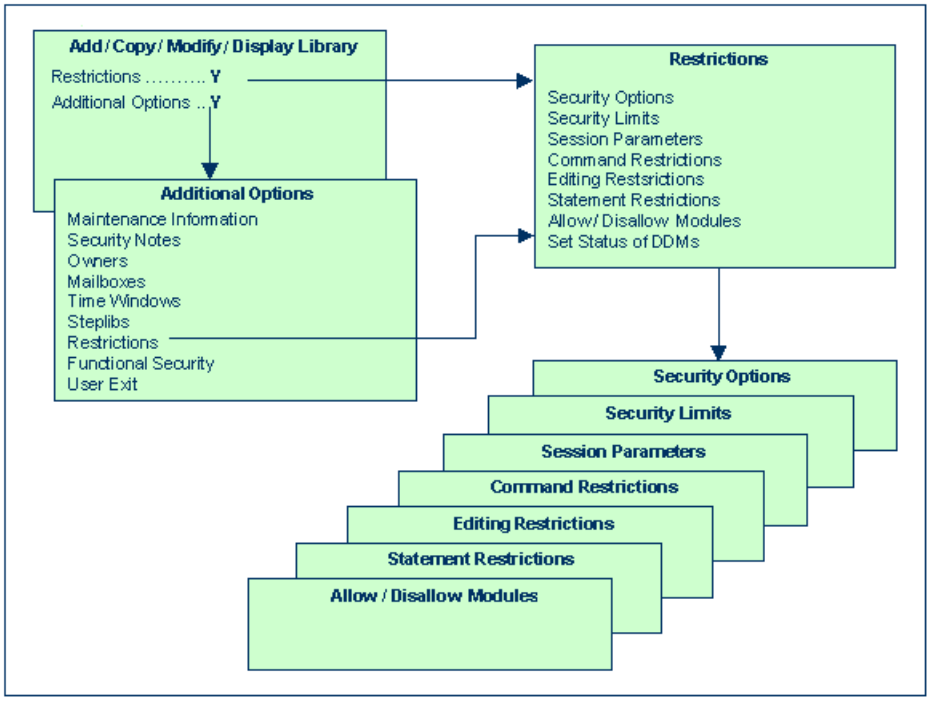
This section covers the following topics:

- Overview of Components
- Components on Main Library Security Profile Screen
- General Options
- Library File
- Library ETID
- Transactions
- Additional Options

Restrictions:

- **Security Options**
- **Security Limits**
- **Session Parameters** (including RPC Restrictions)
- **Command Restrictions**
- **Editing Restrictions**
- **Statement Restrictions**
- **Allow/Disallow modules**
- **Set Status of DDMs**
- **Development Mode**

Overview of Components



Components on Main Library Security Profile Screen

The following type of screen is the "basic" library security profile screen, which is displayed when you invoke one of the functions Add, Copy, Modify, Display for a library security profile:

```
15:52:08                    *** NATURAL SECURITY ***                 2021-12-31
                               - Modify Library -

                                            Modified .. 2021-12-12 by SAG
Library ID ..... TESTLIB
Library Name ... ________________________________

    General Options            Library File                Transactions
-----------------------   -----------------------   ---------------------------
People-protected .... N   DBID ........ ______       Startup .......... ________
Terminal-protected .. N   FNR ......... ______       Batch execution .. Y
Restrictions ........ Y   Password .... ________    Restart .......... ________
Logon recorded ...... N   Ciphercode .. ________    Error ............ ________
Utilities ........... O   Read Only ... _
Programming mode .... R                              User exit ........ ________
Cross-reference ..... N
Restart ............. N


Additiional Options ... N




Enter-PF1---PF2---PF3---PF4---PF5---PF6---PF7---PF8---PF9---PF10--PF11--PF12---
      Help  PrevM Exit  AddOp Restr Flip                                 Canc
```

The individual items you may define as parts of a library security profile are explained below.

Field	Explanation
Library ID (display only)	The ID of the library as specified when the library security profile was created.
Library Name	You may enter a name for the library, which may be up to 32 characters long.

General Options

Field	Explanation
People-protected/Terminal-protected	You may specify whether the library is to be `people-protected` and/or `terminal-protected` in order to restrict the use of the library. The possible combinations of protection are described under ***Protected Libraries*** in the section *Protecting Libraries*.
Restrictions	Special restrictions may be defined for the library, as described under ***Additional Options*** below. ■ If no restrictions are defined, the system profile defined in the Natural parameter module applies.

Field	Explanation	
	■ If restrictions are defined, the value of this field is automatically set to `Y`. If you set it to `N` again, any specification you have made in the restrictions will automatically be deleted!	
Logon recorded	This option determines whether logons to the library are to be recorded or not.	
	Y	Every time a user logs on to the library, a logon record will be written by Natural Security. You may review the activities of users by viewing these logon records (see ***Logon Records*** in the section *Administrator Services* for further information).
	N	Logons to the library will not be recorded.
Utilities	For consistent control of Natural utility usage, *utility profiles* should be used; they are described in the section ***Protecting Utilities***. This option applies to the following Natural utilities: ■ SYSERR - if no utility profile is defined for this utility; ■ SYSMAIN - if no utility profile is defined for SYSMAIN; or if the Session Option **Utilities Option** is set to `Y` or `O` in the default security profile of the SYSMAIN utility. ■ SYSOBJH - if the Session Option **Utilities Option** is set to `Y` or `O` in the default security profile of the SYSOBJH utility. Under this condition, this option determines who may use the utility to process the contents of the library. Possible values are:	
	N	No protection - The library's contents may be processed by any user.
	O	Permission for Owners - The library's contents may be processed only by the *owners* of the library security profile. If no owner is specified, any user of type “Administrator” may do so. In the case of a private library, in addition to the owners, the user with the same ID as the library ID may also process the library's contents. In batch mode, an owner who requires a countersignature from a co-owner cannot process the contents of the library (as countersignatures are not possible in batch mode).

Field	Explanation	
		In online mode, if the Session Option **Utilities Option** is set to `O` in the default security profile of SYSMAIN or SYSOBJH, and an owner requires a countersignature, the countersignature prompt will be suppressed and the library excluded from SYSMAIN/SYSOBJH processing.
	P	Permission under Protection rules - The library's contents may be processed under *protection rules*, that is, only by users who are allowed to log on to the library. For private libraries in private mode, the following applies: The user with the same ID as the library ID may process the library's contents; anyone else may process it only after entering that user's password (on a countersignature screen provided for that purpose). In batch mode, please note that a user cannot process the contents of another user's private library in private mode (as no password can be entered in batch mode).
	If the Natural system command `SCAN` is allowed for the library (see ***Command Restrictions*** below), this option also applies to the **`SCAN` command**.	
Programming mode	Natural programming mode:	
	S	(= Structured mode) - The programming mode to be used cannot be changed with the Natural parameter `SM`, and structured mode will invariably be in effect.
	R	(= Reporting mode) - The setting of the Natural profile/session parameter `SM` (see Natural *Parameter Reference* documentation) determines the mode to be used.
	See also **Natural programming mode** in ***Library Preset Values***.	
Cross-reference	This option determines whether an active cross-reference in Predict (if installed) will be generated for the library.	
	Y	Yes - An active cross-reference will be generated.
	N	No - An active cross-reference will not be generated.
	F	Force - An active cross-reference will be forced.

Field	Explanation	
	D	Doc - Objects to be cataloged must be documented in Predict. However, no active cross-reference will be generated.
	See the Predict documentation for details on active cross-references.	
Restart	Y	The library may be re-invoked by entering `RESTART` as the library ID on the logon screen; an Adabas OPEN command with End of Transaction ID (ETID) will be executed during the logon procedure.
	N	The library cannot be "RESTARTed". The ETID specified in Natural Security will not be used for the Adabas OPEN command.
Version control (display only)	This field only applies on z/OS computers and if the library is under control of Predict Application Control. This field indicates the version control status of the library. If the library is controlled by Predict Application Control, the database ID (DBID) and file number (FNR) of the FDIC system file in which the library's Predict data are stored are also displayed.	

Library File

These items concern:

- the database file where the source programs and object modules contained in the library are to be stored (FUSER).
- the database file where the Predict active cross-references related to the library are to be stored (FDIC).

The FDIC settings can only be specified if the option **Library FDIC Assignment Enabled** is set to `Y` in **Administrator Services > Library Preset Values**.

The FUSER and FDIC values specified here in the library security profile take precedence over the corresponding values of the Natural profile parameters `FUSER` and `FDIC` which apply at the start of the Natural session. For values not specified here in the library security profile, the corresponding values of the `FUSER` and `FDIC` profile parameters apply.

For Natural system libraries - that is, all libraries whose IDs begin with "SYS" (except the library `SYSTEM`) - you cannot make any specifications here. For these libraries, the specifications of the Natural profile parameter `FNAT` apply.

For libraries which are under the control of Predict Application Control, you cannot make any FDIC specifications here. For these libraries, the specifications of the Natural profile parameter `FDIC` apply.

Field	Explanation
FUSER	
DBID/FNR	The database ID and file number of the FUSER file.
Password ([1])	If the library file is password-protected, the Adabas password (for VSAM files, the VSAM DDname) must be entered in this field to enable Natural to access the file.
Cipher code ([1])	If the library file is ciphered, the Adabas cipher code (for VSAM files, the VSAM password) must be entered in this field to enable Natural to access the file.
Read-only	If you wish the library file to be read-only, mark this field with an `X` (this corresponds to the `RO` option of the `FUSER` profile parameter).
FDIC	
DBID/FNR	The database ID and file number of the FDIC file. If you specify `0` as database ID here, the DBID value of the `FDIC` profile parameter applies.
Password ([1])	If the FDIC file is password-protected, the Adabas password (for VSAM files, the VSAM DDname) must be entered in this field to enable Natural to access the file.
Cipher code ([1])	If the FDIC file is ciphered, the Adabas cipher code (for VSAM files, the VSAM password) must be entered in this field to enable Natural to access the file.
Read-only	If you wish the FDIC file to be read-only, mark this field with an `X` (this corresponds to the `RO` option of the `FDIC` profile parameter).

([1]) The **Password** and **Cipher code** fields only apply on z/OS computers, they have no effect under Linux and Windows. To prevent unauthorized access or exposure of sensitive information, each entered value will be masked with an asterisk (*).

For the Natural Development Server environment and Natural servers used in Eclipse, see also the following sections:

- ***Map Environment and Library Selection*** under *Protecting the Natural Development Server Environment and Applications*;
- ***Map Environment and Library Selection*** under *Protecting the Natural Development Environment in Eclipse*.

Note: For the use of the Natural utility SYSMAIN, the following applies: If FDIC values are specified in the security profile of a library, and the library is selected as source or target library in a SYSMAIN function, no other FDIC values can be used for this library in SYSMAIN.

Library ETID

Field	Explanation
ETID (display only)	This field contains the library-specific component of the ID for End of Transaction data. For details on ETIDs, see ***Components of a User Security Profile***.

Transactions

Field	Explanation	
Startup	You can enter the name of a startup transaction; this transaction will always be invoked immediately after a successful logon to the library. See also the Natural system variable `*STARTUP`. The name of the startup transaction will be placed in the Natural system variable `*STARTUP`. If it is also executed in batch mode, its name will only be placed into `*STARTUP` if "Batch execution" (see below) is set to "S".	
Batch execution	This field only applies if the Natural system variable `*DEVICE` is set to `BATCH` (otherwise its value has no effect). It determines whether the startup transaction specified in the library security profile (see above) is also executed in batch mode. You can specify one of the following values:	
	`Y`	The startup transaction will also be executed (once) in batch mode.
	`S`	The startup transaction will also be executed in batch mode; in addition, its name will be placed in the Natural system variable `*STARTUP`.
	`N`	If the NEXT/MORE line is allowed for the library (see *Security Options* below), the startup transaction will *not* be executed in batch mode. If the NEXT/MORE line is *not* allowed, the startup transaction will also be executed (once) in batch mode.
	See also *Natural Security In Batch Mode*.	
Restart	You can enter the name of a restart transaction; this transaction will always be invoked when the library is reinvoked by entering `RESTART` as the library ID on the logon screen.	
Error	You can enter the name of an error transaction. This transaction will be invoked after the occurrence of an execution time error (if the program does not contain an `ON ERROR` statement, or if it does contain an `ON ERROR` block which is not exited with a `FETCH`, `STOP`, `TERMINATE` or `RETRY` statement); if the Natural profile parameter `SYNERR=ON` is set, the error transaction may also handle syntax errors. For further information on error transactions, see *Using an Error Transaction Program* in the Natural *Programming Guide*.	

Field	Explanation
	Note: If no error transaction is specified here, the program specified with the Natural profile parameter `ETA` (described in the Natural *Parameter Reference* documentation) will receive control when an error occurs. If an error occurs during an initial logon, the program specified with the `ETA` parameter will also receive control (for other logon errors, the error transaction specified in the library *from which* you log on to another library applies).

User Exit

With each library security profile and special-link profile, you can store 250 bytes of additional data of your choice.

These additional data can be stored/read by means of a user exit subprogram which must contain a `CALLNAT` statement (with five parameters as described below) which in turn invokes one of the following subprograms:

Subprogram	Function
`SNAASEXT`	Store additional library data.
`SNAAREXT`	Read additional library data.
`SNAUSEXT`	Store additional special-link data.
`SNAUREXT`	Read additional special-link data.

These four subprograms are contained in the Natural Security library `SYSSEC`.

In the **User Exit** field of the library security profile or special-link profile, you enter the name of the user exit that invokes one of the above subprograms.

To invoke the user exit, you mark **User Exit** with `Y` in the **Additional Options** window (see below).

If you wish to handle the additional data from within a library, you can also invoke the above subprograms by means of a user exit from a library itself. In this case you must copy the subprograms into that library (by using the SYSMAIN utility). When invoked from a library, each subprogram will check and ensure that only data concerning that library or the specified link are read/stored.

In the security profiles of the Natural system libraries, that is, all libraries whose IDs begin with SYS (except the library `SYSTEM`), you cannot specify a user exit.

SNAASEXT

`SNAASEXT` is used to store additional library data. It must be invoked with the following five parameters:

Parameter	Format/Length	Contents passed to SNAASEXT	Contents returned from SNAASEXT
1st	A8	none	Library ID
2nd	A32	none	Library name
3rd	D	none	Date of latest modification
4th	A250	**Data to be stored**	same as passed
5th	B2	none	Return code

SNAAREXT

SNAAREXT is used to read additional library data. It must be invoked with the following five parameters:

Parameter	Format/Length	Contents passed to SNAAREXT	Contents returned from SNAAREXT
1st	A8	none	Library ID
2nd	A32	none	Library name
3rd	D	none	Date of latest modification
4th	A250	none	**Data read**
5th	B2	none	Return code

When you invoke SNAAREXT or SNAASEXT from a library security profile in SYSSEC, the data will refer to the library you are currently maintaining. When you invoke them from outside SYSSEC, the data will refer to the library from which you invoke the subprogram.

SNAUSEXT

SNAUSEXT is used to store additional special-link data. It must be invoked with the following five parameters:

Parameter	Format/Length	Contents passed to SNAUSEXT	Contents returned from SNAUSEXT
1st	A8	none	Library ID
2nd	A8	User ID (must only be filled if SNAUSEXT is invoked from outside SYSSEC)	User ID
3rd	D	none	Date of latest modification
4th	A250	**Data to be stored**	same as passed
5th	B2	none	Return code

SNAUREXT

SNAUREXT is used to read additional special-link data. It must be invoked with the following five parameters:

Parameter	Format/Length	Contents passed to SNAUREXT	Contents returned from SNAUREXT
1st	A8	none	Library ID
2nd	A8	User ID (must only be filled if SNAUREXT is invoked from outside SYSSEC)	User ID
3rd	D	none	Date of latest modification
4th	A250	none	**Data read**
5th	A2/B2	*	Return code *

* When you invoke SNAUREXT from outside SYSSEC, you may read several special links to the library by using the 2nd parameter as start value and specifying one of the following operators in the 5th parameter (A2): EQ, =, GT, >, LT, <, GE, >=, LE, <=. These operators determine the read condition as compared against the 2nd parameter. Return code (B2) 0 indicates that the specified special link has been found; any other value indicates that no such link has been found.

When you invoke SNAUREXT or SNAUSEXT from a special-link profile in SYSSEC, the data will refer to the link you are currently maintaining. When you invoke them from outside SYSSEC, the data will refer to the link between the specified user ID and the library from which you invoke the subprogram.

Additional Options

If you mark the field **Additional Options** on the basic security profile screen with Y, a window will be displayed from which you can select the following options:

- **Maintenance Information**
- **Security Notes**
- **Owners**
- **Mailboxes**
- **Time Windows**
- **Steplibs**
- **Restrictions**
- **Functional Security**
- **User Exit**

The options for which something has already been specified or defined are marked with a plus sign (+).

You can select one or more items from the window by marking them with any character. For each item selected, an additional window/screen will be displayed (in the order of the items in the selection window).

The **Restrictions** window can also be invoked directly by pressing PF5 on the basic security profile screen.

The individual options are explained below.

Additional Option	Explanation
Maintenance Information (display only)	In this window, the following information is displayed: ■ the date and time when the security profile was created, the ID of the administrator who created it, and (if applicable) the IDs of the co-owners who countersigned for the creation; ■ the date and time when the security profile was last modified, the ID of the administrator who made the last modification, and (if applicable) the IDs of the co-owners who countersigned for the modification.
Security Notes	In this window, you can enter your notes on the security profile.
Owners	In this window, you can enter up to eight IDs of administrators. Only the administrators specified here will be allowed to maintain this security profile. If no owner is specified, any user of type "Administrator" may maintain the library. For each owner, the number of co-owners whose countersignatures will be required for maintenance permission may optionally be specified in the field after the ID. For an explanation of owners and co-owners, see the section ***Countersignatures***.
Mailboxes	In this window, you can enter up to five mailbox IDs. For information on mailboxes, see the section ***Mailboxes***.
Time Windows	In this window, you can specify up to five time windows, outside of which the library cannot be used. When the end of a time window is reached, the application contained in the library will automatically be terminated and Natural Security will perform a logoff. Depending on the general option **Enable Error Transaction Before NAT1700/1701 Logoff**, the application's `ON ERROR` handling and/or error transaction may be processed before the logoff. For example, if a time window is set to `0815 - 1300`, a user may log on to the library only between 08:15 h and 13:00 h; if a user is still logged on to the library at 13:00 h, the application contained in the library will be terminated.
Steplibs	In this window, you can enter the IDs of the libraries which are to be the steplib libraries (concatenated libraries) for the library. The libraries whose IDs you specify must be defined in Natural Security. Multiple steplibs allow you to make different modules available to different libraries and also restrict the general availability of modules without having to have multiple copies of the same module in multiple libraries; that is, each module has to exist only once, but you can nonetheless make it available to several libraries, but not to others.

Additional Option	Explanation
	For example, the modules that are to be available to all libraries can be contained in a general steplib which is specified in all library security profiles, while modules that are to be available only to some libraries can be contained in another steplib which is specified only in some library security profiles. Moreover, by specifying different special links to a library (see *Linking Users to Libraries* in the section *Protecting Libraries*), you can allow different users of the same library the use of different steplibs. You can specify up to 8 steplibs, plus a value for the Natural system variable `*STEPLIB`: When a programming object is requested in the library but not found in it, the 8 steplibs are searched - in the order in which they are specified in the library security profile - for that object. If the requested object cannot be found in any of the 8 steplibs, the `*STEPLIB` library will be searched for it. If it cannot be found in that library either, the library `SYSTEM` will be searched for it (without `SYSTEM` having to be specified as a steplib in a library security profile). If no value is specified in any of the 8 steplib fields in the library security profile, the 8 steplibs specified with the Natural profile parameter `STEPLIB` will be used instead. If no value is assigned to `*STEPLIB` in the library security profile, the `*STEPLIB` value of the Natural profile parameter `STEPLIB` will be used instead. **Note:** 1. Owner logic applies to the specification of a steplib; that is, if owners are specified in a library security profile (see above), only these owners will be allowed to enter the library as steplib in the profile of another library. 2. For Natural system libraries (that is, libraries whose IDs begin with SYS) - except library `SYSTEM` - you cannot specify a `*STEPLIB` library. For these libraries, an internal system steplib is used as `*STEPLIB` library. 3. If you use the library `SYSTEM` as steplib only, `SYSTEM` itself need not be defined as a library to Natural Security. **Dynamic Change of Steplib Table at Runtime** The table of steplibs as outlined above is fixed and cannot be changed by the application itself; this means that the same steplib table applies to all users who use the library. Via the Natural application programming interface (API) `USR4025N` (contained in the library `SYSEXT`), however, it is possible to dynamically change individual entries in the steplib table. To make use of this possibility, you have to adjust the steplib table as follows: Instead of an actual steplib ID, you specify `********` (8 asterisks) in a field of the steplib window. At runtime, the actual steplib ID for this position is then supplied by the application via the API. You can specify `********` in one or more fields of the steplib table. The API only overwrites those fields in the steplib table which contain `********`; any fields containing actual steplib IDs (or blanks) are not affected by the API.

Additional Option	Explanation
	Dynamic steplib assignment is only possible for the steplibs which are last in the sequence of steplibs. This means that in the steplib table, after any field(s) containing `********`, there must be no field containing an actual steplib ID. Thus it is possible, for example, to have a setup where the 1st to 4th steplibs are fixed as specified in the library security profile, and the 5th and 6th steplibs are supplied dynamically by the API. **DBID, FNR, Password and Cipher Code** Next to each steplib name, you can enter a database ID (DBID), file number (FNR), password and cipher code in the steplib window of a library window. If you assign `99999` as DBID value for a steplib in the steplib window of a library security profile, the DBID value specified in the library security profile of the steplib will be used. The same applies to FNR, password and cipher code values. If you assign no DBID value (or `0`) for a steplib in the steplib window of a library security profile, the DBID value of that library will be used. The same applies to FNR, password and cipher code values. By marking a steplib name with the cursor and pressing PF5 in the steplib window of a library security profile, you can copy the actual values of DBID, FNR, password and cipher code from the steplib profile into the steplib window. For the `*STEPLIB` library specified in a library security profile, the DBID, FNR, password and cipher code values of that library security profile apply.
Restrictions	As part of the restrictions, you can define: ■ **Security Options** ■ **Security Limits** ■ **Session Parameters** (including RPC Restrictions) ■ **Command Restrictions** ■ **Editing Restrictions** ■ **Statement Restrictions** ■ **Allow/Disallow modules** ■ **Set Status of DDMs** ■ **Development Mode** These items are described below.
Functional Security	In this window, you can define functional security for the command processors of the library. This is only relevant if command processors have been created with the Natural utility SYSNCP. See the section *Functional Security* for details.
User Exit	If a user exit is specified in the **Transactions** column of the main library security profile screen, you can activate that user exit by marking this field.

Security Options

If you mark **Security Options** in the **Restrictions** selection window with any character, the **Security Options** window will be displayed. In this window, you can set the following options:

Option	Explanation	
Allow NEXT/MORE line	Y	Allows the use of the Natural main menu.
	N	Suppresses the Natural main menu; when a user logs on to the library, the startup transaction specified for the library will be invoked instead (if no startup transaction is specified, the logon procedure will be invoked; see also the Natural system variable `*STARTUP`).
Allow system commands	Y	Allows the use of Natural system commands in the library. To disallow individual commands, you use the **Command Restrictions** section of the library security profile (see below).
	N	Disallows the use of all system commands in the library. (This does not affect the system commands `FIN`, `LAST`, `LASTMSG`, `LOGOFF`, `LOGON`, `MAINMENU`, `RENUMBER`, `RETURN`, `SETUP` and `TECH`; they can always be used.)
Execution of update programs	Y	Programs that update the database can be executed in the library.
	N	Programs that update the database cannot be executed in the library.
Device	If this field is left blank, use of the library will not be restricted to any operation mode or device. If you enter a value, use of the library will be restricted to one specific device or operation mode. The possible values of this option correspond to those of the Natural system variable `*DEVICE`. These are different on z/OS and non-z/OS platforms (as described in the Natural system variables documentation).	
Clear source area by logon	N	The editor source work area will *not* be cleared when a user logs on from the library to another.
	Y	The work area of the editor will be cleared automatically when a user logs on from the library to another.
PC download/ PC upload	Y	Modules contained in the library can be downloaded from the z/OS to a personal computer and uploaded from a personal computer to the z/OS respectively.
	N	Download and upload of modules will not be possible.
	This option only applies to z/OS computers; it has no effect under Linux and Windows.	
Close databases by logon	Y	All databases that have been accessed during the current Natural session will be closed automatically when a user logs on from the library to another.

Option	Explanation	
	N	No databases will be closed when a user logs on from the library to another.
	When you set this option, you should also review the setting of the Natural profile parameter `DBCLOSE`. The use of this option requires that either an ETID value other than blanks is used or the Natural session is started with the profile parameter `DBOPEN=ON`.	

Security Limits

If you mark **Security Limits** in the **Restrictions** selection window with any character, the **Security Limits** window will be displayed. In this window, you can set the following limits:

Limit	Explanation
Non-activity logoff limit	The maximum time (in seconds) which may elapse after the last terminal communication. If this time is exceeded, a new logon procedure will be invoked as soon as the next input is received from the terminal. Depending on the general option **Enable Error Transaction Before NAT1700/1701 Logoff**, the application's `ON ERROR` handling and/or error transaction may be processed before Natural Security performs the logoff. Possible values are `0 - 99999`. If you wish no limit to be in effect, set this field to `0`.
Maximum transaction duration	The maximum time (in seconds) permitted for a single Adabas transaction. This feature can be used to prevent the blockage of resources for an excessive time. If the time is exceeded, the current transaction will be backed out. Possible values are `0 - 99999`. If you wish no limit to be in effect, set this field to `0`. The Natural system variable `*TIME-OUT` contains the time remaining before a time-out will occur. (The Adabas `TT` parameter (Adabas transaction time limit) will be checked separately).
Maximum number of source lines	The maximum number of source-code lines permitted for a user-written Natural program. If the line limit is exceeded, the Natural syntax checker will issue an appropriate error message. Possible values are `0 - 99999`.
Maximum amount of CPU time (MT)	The maximum amount of CPU time (in seconds) to be used (as in the Natural profile parameter `MT`, described in the Natural *Parameter Reference* documentation). If you set this field to `0`, the limit is determined by the value of the Natural profile parameter `MT`.

Limit	Explanation
	If you wish the highest possible limit to be in effect, set this field to the maximum value (9999999). If you wish no limit to be in effect, set this field to 9999999999. This field only applies to z/OS computers; it has no effect under Linux and Windows.
Maximum number of Adabas calls (MADIO)	The maximum number of Adabas calls permitted between two screen I/O operations (as in the Natural profile parameter MADIO, described in the Natural *Parameter Reference* documentation). If the number specified is exceeded, the Natural program will be interrupted and an appropriate error message displayed. If you set this field to 0, the limit is determined by the value of the Natural profile parameter MADIO. If you wish the highest possible limit to be in effect, set this field to the maximum value (65534 for z/OS, 32767 for other platforms). If you wish no limit to be in effect, set this field to 99999.
Maximum number of program calls (MAXCL)	The maximum number of program calls permitted between two screen I/O operations (as in the Natural profile parameter MAXCL, described in the Natural *Parameter Reference* documentation). If the number specified is exceeded, the Natural program will be interrupted and an appropriate error message displayed. If you set this field to 0, the limit is determined by the value of the Natural profile parameter MAXCL. If you wish the highest possible limit to be in effect, set this field to the maximum value (65534 for z/OS, 32767 for other platforms). If you wish no limit to be in effect, set this field to 99999.
Processing loop limit (LT)	The maximum number of records which may be read in any given processing loop of the library (as in the Natural profile parameter LT, described in the Natural *Parameter Reference* documentation). If you set this field to 0, the limit is determined by the value of the Natural profile parameter LT. If you wish the highest possible limit to be in effect, set this field to the maximum value (2147483647). If you wish no limit to be in effect, set this field to 9999999999. **Note:** If the limit value is changed within the Natural session (with a SET GLOBALS statement or GLOBALS command), it must not exceed the value of the Natural profile parameter LT.

Session Parameters

If you mark **Session Parameters** in the **Restrictions** selection window with any character, the **Session Parameters** screen will be displayed.

On this screen, you can specify values for the following Natural session parameters, which will override the default parameter values set during Natural installation:

Parameter	Short Description
DC	Character for decimal point notation
CF	Character for terminal commands
CLEAR	Processing of CLEAR key in NEXT mode
IA	Input assign character
IM	Input mode
ID	Input delimiter character
SA	Sound terminal alarm
DU	Dump generation
EJ	Page eject
FS	Default format/length setting for user-defined variables
WH	Wait for record in hold status
ZD	Zero-division check
LS	Line size
PS	Page size for Natural reports
SL	Source line length (on z/OS only)
SF	Spacing factor

If a parameter value is blank (or `0` for a parameter which takes numeric values), the corresponding default value applies.

For information on the individual session/profile parameters, see the Natural *Parameter Reference* documentation.

Moreover the screen provides the following fields:

Field	Explanation
Adabas open (OPRB)	You can specify the contents of the record buffer used with the Adabas `OPEN` command. If so, a restricted `OPEN` will be executed, which means that only files included in the record buffer may be referenced. If no record buffer contents are specified, all accessible files may be referenced (see also the Adabas *Command Reference* documentation). If this field is set to `NOOPEN`, no Adabas `OPEN` command will be executed.

Field	Explanation
	If this field is left blank, an OPRB parameter specified dynamically when invoking Natural applies for this library (see the Natural *Parameter Reference* documentation for details on the profile parameter OPRB).
Spool profile	You can specify the name of the spool profile. This is only applicable if Natural Advanced Facilities is installed; see the *Natural Advanced Facilities* documentation for details.
Adabas password	You can specify the Adabas password used for access to the Adabas data files (not system files) referenced by the library. This is only relevant if the corresponding files are password-protected under Adabas Security. The password specified in the security profile applies to all database access statements for which neither an individual password is specified nor a PASSW statement applies. It applies within the library in whose security profile it is specified, and also remains in effect in other libraries you subsequently log on to and in whose security profiles no password is specified. See also the PASSW statement in the Natural *Statements* documentation.
SLOCK	This field applies on z/OS only; on other platforms, its setting will be ignored. This field controls source locking and determines how concurrent updates of Natural source members in the library are to be handled. Its possible values PRE, SPOD, POST and OFF corresponds to those of the Natural profile parameter SLOCK. If this field is left blank, the profile parameter SLOCK as set for the current Natural session applies for this library. See the Natural *Parameter Reference* documentation for details on the SLOCK parameter.

Natural RPC Restrictions

When you press PF8 on the **Session Parameters** screen, another screen will be displayed in which you can set various restrictions that apply when subprograms contained in the library are executed by means of Natural RPC in a client/server environment.

Field	Explanation
Expiration Criteria	The following criteria determine how often / how long subprograms in the library can be executed by means of Natural RPC. When one of the criteria is reached, the criteria can be reset either by means of the Natural application programming interface USR1071N or by the user newly logging on to the library.
Use Count	Determines how many times remote subprograms can be executed. A value of 0 means that no such limit is in effect.
Number of Days	Determines for how many days remote subprograms can be executed. The days are counted beginning with the logon to the library. A value of 0 means that no such limit is in effect.

Field	Explanation	
Number of Hours/Minutes	Determines for how many hours/minutes remote subprograms can be executed. The time is counted beginning with the logon to the library. A value of `0` means that no such limit is in effect.	
Allow Overwriting by User Exit USR1071N	Y	The above expiration criteria in the library security profile, as well as the user ID and password from the client logon procedure, can be overwritten by criteria specified with the Natural application programming interface `USR1071N`.
	N	No data can be set/overwritten by the Natural application programming interface `USR1071N`.
Server Session Options:		
Close All Databases	This option allows you to control the logon-/logoff-dependent closing of databases. It affects all databases which have been opened by remote subprograms contained in the library:	
	N	The databases are *not* closed when a logon/logoff to/from the library is performed.
	Y	The databases are closed when a *logon* to the library is performed. If **Impersonation** is activated in the **RPC server profile**, `Y` has the same effect as `F` (see below).
	F	The databases are closed when a *logon* to the library is performed, and when a *logoff* from the library is performed.
	This option is only relevant if the option `LOGONRQ=ON` is set in the Natural profile parameter `RPC` or `NTRPC` macro. If you wish to have one user-queue element per client session for each database accessed by the RPC server, it is recommended that you set `LOGONRQ=ON` and **Close All Databases** to `Y` or `F`. The use of this option requires that either an ETID value other than blanks is used or the Natural session is started with the profile parameter `DBOPEN=ON`.	
Logon Option	This option determines which logon data are evaluated by Natural Security when the library is accessed via a Natural RPC service request:	
	N	Natural RPC user ID and password are evaluated. (*)
	E	Natural RPC user ID and password are evaluated. (*) In addition, it is checked if the Natural RPC user ID is identical to the EntireX user ID.
	A	Only the Natural RPC user ID is evaluated (similar to the Natural profile parameter `AUTO=ON`, but for this library only).

Field	Explanation	
	S	Only the Natural RPC user ID is evaluated (similar to the Natural profile parameter `AUTO=ON`, but for this library only). In addition, it is checked if the Natural RPC user ID is identical to the EntireX user ID.
	(*) If impersonation is active for the Natural RPC server, the password is not evaluated (as this will be performed by an external security system). For details, see ***Validation of an RPC Service Request*** in the section *Protecting Natural RPC Servers and Services*.	
Logon Recorded	This option determines whether logons to the library are recorded when the library is accessed via Natural RPC service requests:	
	N	Logons to the library via Natural RPC service requests are not recorded.
	Y	Logons to the library via Natural RPC service requests are recorded. Every time a user accesses the library via a Natural RPC service request, a logon record will be written by Natural Security. You may review the activities of users by viewing these logon records (see ***Logon Records*** in the section *Administrator Services* for further information).
	L	The value of the option **Logon recorded** in the General Options section of the library security profile determines whether logons to the library via Natural RPC service requests are to be recorded or not.
	*	The value of the option **Logon recorded** option in the **Library Preset Values** of Administrator Services determines whether logons to libraries via Natural RPC service requests are to be recorded or not.
Lock User Option	This option determines whether the Lock User feature is to be active when the library is accessed via Natural RPC service requests:	
	N	The Lock User feature is not active for access attempts to the library via Natural RPC service requests.
	X	The Lock User feature is active for access attempts to the library via Natural RPC service requests. Once a user has reached the **maximum number of logon attempts** without supplying the correct password, he/she will be locked, that is, the user ID will be made “invalid”. Natural Security “remembers” unsuccessful attempts across sessions: The error counters for the client user IDs which were tried out unsuccessfully are kept for access attempts in subsequent sessions, thus reducing the number of subsequent attempts with these IDs. The error counter for a user ID is only reset after a successful logon.

Field	Explanation	
	*	The value of the Lock User option in the security profile of the Natural RPC server determines whether or not the Lock User feature is active for access attempts to libraries on that server via Natural RPC service requests. See ***Components of a Server Profile*** in the section *Protecting Natural RPC Servers And Services*.
	For details on the Lock User feature, see also the **Lock User Option** in the General Options section of *Administrator Services*.	

The Natural application programming interfaces `USR1071N` mentioned above is contained in the library `SYSEXT`.

For further information on Natural RPC with Natural Security, see the section ***Protecting Natural RPC Servers and Services*** in the Natural Security documentation, and the sections *Using Natural RPC With Natural Security* and *Logon To A Server Library* in the *Natural RPC* documentation.

Command Restrictions

If you mark **Command Restrictions** in the **Restrictions** selection window with any character, the **Command Restrictions** screen will be displayed. On this screen, you may allow or disallow the use of individual Natural system commands.

By default, all commands shown on the **Command Restrictions** screen are marked with `Y`, which means that all commands are allowed.

- Mark with `Y` each command you wish to be available for use in the library.
- Mark with `N` each command you wish *not* to be used in the library.

For the `SCAN` command, you can specify the following settings:

- `Y` - The command is allowed.
- `N` - The command is not allowed.
- `R`- The command is allowed; however, its Replace option is not allowed.
- `B` - The command is allowed; however, its Replace option is only allowed in batch mode (that is, if the Natural system variable `*DEVICE` is set to `BATCH`).
- `O` - The command is allowed; however, its Replace option is only allowed online (that is, if `*DEVICE` is set to any value other than `BATCH`).

Note: Settings `R`, `B` and `O` are only available on z/OS computers.

For information on the individual commands, see the Natural *System Commands* documentation.

Those commands which are displayed intensified on the **Command Restrictions** screen use the Natural syntax checker and consequently Natural statements (which may also be allowed/disallowed individually; see *Statement Restrictions* below).

Restricting the Use of the SCAN Command

You can either disallow the system command `SCAN` altogether for a library via the **Command Restrictions** (as described above), or you can control its use via the **Utilities** option:

- If **SCAN** is marked with `N` on the **Command Restrictions** screen, the `SCAN` command cannot be used in the library (regardless of the Utilities option).
- If **SCAN** is marked with `Y` on the **Command Restrictions** screen, the **Utilities** option (in the General Options part of the library security profile) determines who may use the `SCAN` command in the library. The Utilities option may take one of the following values:

N	No protection - The `SCAN` command may be used in the library by any user.
O	Permission for Owners - Only the owners of the library may use the `SCAN` command; if no owner is specified, any user of type "Administrator" may use it. In a private library in private mode, in addition to the owners, the user with the same ID as the library ID may use the `SCAN` command. In batch mode, please note that an owner who requires a countersignature from a co-owner cannot use the `SCAN` command (as countersignatures are not possible in batch mode).
P	Permission under Protection rules - The People/Terminal protection of the library applies: Only users who may use the library - and only under the conditions under which they may use it - may use the `SCAN` command. For a private library in private mode, the following applies: The user with the same ID as the library ID may use the `SCAN` command; anyone else may use it only after entering that user's password (on a countersignature screen provided for that purpose). In batch mode, please note that a user cannot use the `SCAN` command in another user's private library in private mode (as no password can be entered in batch mode).

Linux Shell Commands

You can also allow or disallow the execution of Linux shell commands from within a Natural program. These commands are executed from within a Natural program by invoking the Natural user exit `SHCMD` via the statement `CALL SHCMD` being issued by the program.

To allow/disallow the execution of shell commands from within a program in the library, you mark `CALL SHCMD` on the **Command Restrictions** screen as follows:

- `Y` = Shell commands can be executed.
- `N` = Shell commands *cannot* be executed.

Editing Restrictions

If you mark **Editing Restrictions** in the **Restrictions** selection window with any character, the **Editing Restrictions** window will be displayed. In this window, you may allow or disallow the editing of Natural objects of certain object types.

By default, all object types shown in the **Editing Restrictions** window are marked with `Y`, which means that objects of all types may be edited.

- Mark with `Y` each type of object whose editing you wish to be allowed in the library.
- Mark with `N` each type of object whose editing you wish *not* to be allowed in the library.

For information on Natural object types, see the Natural *Programming Guide*; for information on the Natural editors, see the Natural *Editors* documentation.

To disallow editing altogether, you may disallow the use of the `EDIT` command (see ***Command Restrictions***). When you disallow the `EDIT` command, all object types in the **Editing Restrictions** window are automatically marked with `N`. When you allow the `EDIT` command again, all object types in the **Editing Restrictions** window are automatically marked with `Y` again.

Statement Restrictions

If you mark **Statement Restrictions** in the **Restrictions** selection window with any character, the **Statement Restrictions** screen will be displayed. On this and the next screen, you may allow or disallow the use of individual Natural statements. To get from this screen to the next and back again, you press `PF7` and `PF8` respectively.

By default, all statements shown on the **Statement Restrictions** screen are marked with `Y`, which means that all statements are allowed.

- Mark with `Y` the Natural statements you wish to be allowed for use in the library.
- Mark with `N` the Natural statements you do *not* wish to be used in the library.

For the `FIND` statement and other database access statements, you may also allow/disallow individual clauses.

Any Natural statement which is not listed on the **Statements Restrictions** screen is always allowed (for example, the statement `END`).

The **Statement Restrictions** take effect when a programming object is syntax-checked at compilation.

Disallow/Allow Modules

With this option, you can restrict the use of modules (programming objects) in a library, that is, you can disallow/allow that they can be executed or invoked for execution.

This option may be evaluated differently on different platforms, depending on the option **Module Protection Mode**, as described in the section *Administrator Services*.

In the **Restrictions** selection window, besides the field you mark to select **Disallow/Allow Modules**, there is a second field in which you can enter one of the following:

X	This causes all modules to be allowed; individual modules cannot be disallowed (the **Disallow/Allow Modules** screen will not be invoked). If you enter an `X`, do not at the same time mark the selection field.
D	All modules are initially allowed, and you may disallow individual modules.
A	All modules are initially disallowed, and you may allow individual modules.

Note: For the Display function, you can only mark the selection field; regardless of the setting of the second field, the **Disallow/Allow Modules** screen will be displayed showing the list of allowed/disallowed modules.

If you mark **Disallow/Allow Modules** in the **Restrictions** selection window with any character and enter a `D` or `A` in the second field, the **Disallow Modules** screen or **Allow Modules** screen respectively will be displayed:

```
11:13:46                    *** Natural Security ***                 2021-12-31
                               - Disallow Modules -
   Library  SKYLIB                          0 Module names not held in user buffer
   Module   T Status                 Mark   Module   T Status                 Mark
   ---------------------------------------  ---------------------------------------
   #CADMIUM P ALLOWED                   _   HELLO    P ALLOWED                   _
   #DANZA   P ALLOWED                   _   HOTTA    P ALLOWED                   _
   #FIFO    P ALLOWED                   _   MEHEECO  P ALLOWED                   _
   #GRACE   P ALLOWED                   _   MOONROOF P ALLOWED                   _
   #PRESTO  P ALLOWED                   _   SAHARA   P ALLOWED                   _
   #TEMPEST P ALLOWED                   _   SCIPIO   P ALLOWED                   _
   CALDANDO P ALLOWED                   _   SKYLARK  P ALLOWED                   _
   CANNBALL P ALLOWED                   _   WESTWAY  P ALLOWED                   _
   CARILLON P ALLOWED                   _   WESTWIND N ALLOWED                   _
   ELCIELO  P ALLOWED                   _   XANGO    M ALLOWED                   _
  *********************  Module Names held in User Buffer  **********************
    ________         ________         ________         ________         ________
    ________         ________         ________         ________         ________
  ------------------------------------------------------------------------------
  Reposition to .. ________    Display module names not held in UB .. _


  Enter-PF1---PF2---PF3---PF4---PF5---PF6---PF7---PF8---PF9---PF10--PF11--PF12---
        Help  PrevM Exit  AddOp Restr Flip  -     +     Free  Stepl       Canc
```

Column **T** on the **Disallow/Allow Modules** screen indicates the object types of the modules:

P	Program
N	Subprogram
S	Subroutine
H	Helproutine
G	Global data area
L	Local data area
A	Parameter data area
M	Map
C	Copycode
3	Dialog
4	Class
7	Function
8	Adapter

On the **Disallow/Allow Modules** screen, mark with `D` the modules contained in the library you wish to be disallowed; mark with `A` the modules contained in the library you wish to be allowed. The first ten module names marked will be held in the user buffer.

In addition, the following subfunctions are available:

Module Names Held in User Buffer	If you wish modules to be disallowed/allowed and their names to be held in the user buffer, type in their names into the ten fields provided on the **Disallow/Allow Modules** screen. If you type in a value followed by an asterisk (*), all module names beginning with that value will be disallowed/allowed and held in the user buffer. Those disallowed/allowed module names not held in the user buffer may be displayed by marking the **Display module names not held in User Buffer** field with any character. Unmark it to return to the **Disallow/Allow Modules** screen. If possible, the number of allowed/disallowed modules should not exceed 10; that is, all allowed/disallowed module names should be held in the user buffer; module names not held in the user buffer will cause a reduction in performance, as the Natural Security data file will have to be additionally accessed to check whether a module whose name is not held in the user buffer is allowed or not.
Allowing/Disallowing "Non-Existent" Modules (PF9)	The **Disallow/Allow Modules** screen of a library security profile displays a list of all modules contained in the corresponding library. However, there may be modules which currently are not physically available (for example, because the corresponding database is not active, or the modules have not yet been written), and which would therefore not appear in the list of modules. Or in a heterogeneous production environment using a central z/OS FUSER system file, the library may exist not on the z/OS FUSER system file but in the file system on another platform. If you were to define a library security profile for such a library, Natural Security on the z/OS computer would not know of that library, and the list of modules would therefore be empty. To enable you to disallow/allow such “non-existent” modules, the **Allow/Disallow Modules** function provides the subfunction **Free List of Modules**. With this subfunction, you can predefine modules which are not physically present on the current FUSER system file. To invoke the subfunction, you press PF9 on the **Disallow/Allow Modules** screen. The **Free List of Modules** window will be displayed. In this window, you manually enter the names of modules and allow/disallow them.
Steplibs (PF10)	This subfunction does not apply on z/OS computers. With this subfunction, you can disallow/allow modules in the library's steplibs. To invoke the subfunction, you press PF10 on the **Disallow/Allow Modules** screen. A list of all the library's steplibs will be displayed. On the list, you select the library whose modules you wish to disallow/allow. Then, the list of modules contained in the selected steplib will be displayed, which you can then disallow/allow individually. When you disallow/allow modules in a steplib in this way, this does not mean you actually disallow/allow these modules in the library security profile of the steplib. The steplib modules are only disallowed/allowed with respect to usage by the

	library whose profile you are currently maintaining (that is, the library from within whose library security profile you have invoked the subfunction).

Set Status of DDMs

This option only affects DDMs for which no security profiles have been defined. It allows you to set the status of all new DDMs to PUBLIC. On z/OS, this applies to the file status; on Linux and Windows, this applies to both the internal and the external status of DDMs.

In the **Restrictions** window, you can specify one of the following values for this option:

UNDF	The status of all DDMs without security profiles is undefined.
PUBL	The status of all DDMs without security profiles is PUBLIC.

By default, this option is set to `UNDF`, which means that DDMs for which no security profiles have been defined cannot be used.

If you set this option to `PUBL`, the status of all DDMs for which no security profiles have been defined is assumed to be PUBLIC, which means that these DDMs can be used. This allows you to use these DDMs without having to define security profiles for them.

For further information, see the sections ***Protecting DDMs On z/OS*** and ***Protecting DDMs On Linux and Windows***.

Development Mode

See ***Library Development Mode Options*** in the section *Protecting the Natural Development Environment in Eclipse*.

Creating and Maintaining Library Security Profiles

This section describes the functions used to create and maintain library security profiles.

It covers the following topics:

- Invoking Library Maintenance
- Adding a New Library
- Listing Undefined Libraries
- Selecting Existing Libraries for Processing
- Copying a Library
- Modifying a Library
- Renaming a Library
- Deleting a Library
- Displaying a Library

- Creating and Maintaining a Private Library

Invoking Library Maintenance

To invoke library maintenance:

1 On the **Main Menu**, select **Maintenance**.

2 A window will be displayed in which you mark the object type **Library** with a character or with the cursor.

The **Library Maintenance** selection list will be displayed.

3 From this selection list, you invoke all library maintenance functions as described below.

Adding a New Library

The Add Library function is used to define new libraries to Natural Security, that is, create library security profiles.

Note: To create library security profiles for system libraries of Natural and its subproducts more easily, you can use the Administrator Services function **Definition of System Libraries**, which provides predefined security profiles for most system libraries.

To add a new library security profile:

1 In the command line of the **Library Maintenance** selection list, enter the command `ADD`.

2 A window will be displayed in which you enter a library ID and, optionally, the ID of a default profile:

Library ID	Library IDs are used by Natural Security to identify libraries and their security profiles. A library ID may be 1 to 8 characters long, it must start with an upper-case alphabetical character, and it must be unique. It may consist of the following characters: upper-case alphabetical characters, numeric characters, hyphen (-) and underscore (_). It must not contain blanks. Before you start defining libraries, it may be advisable to conceive a logical system of library IDs that are related to the library names; this will help you to identify libraries more easily when maintaining them in Natural Security.
Default Profile	When you add a new library, you can either type in every item within the library security profile by hand; or you can use a pre-defined default library security profile as the basis for the security profile you are creating. Before you use default library security profiles, you should be familiar with the “normal” way of defining libraries (that is, without default profile).

	Default profiles are created and maintained in the Administrator Services subsystem. If you specify the ID of a default profile in the **Add Library** window, the items from the default profile will be copied into the library security profile. On the **Add Library** screen, you can overwrite the items copied from the default profile, and specify further items. For further information on default library security profiles, see **Library Default Profiles** in the section *Administrator Services*.

3 The **Add Library** screen will be displayed. On this screen, you may define a security profile for the library.

The **Add Library** screen and the subsequent screens/windows that may be part of a library security profile as well as the individual items you may define are described under ***Components of a Library Security Profile***.

When you add a new library, the owners specified in your own user security profile are automatically copied into the library security profile.

Listing Undefined Libraries

Note: In a non-z/OS environment, the use of the `SHOW` command requires that work file 3 has been defined in your Natural parameter module, because internally the command uses the corresponding function of the Natural Object Handler utility.

An undefined library is a library which exists on the system file, but for which no library security profile has been created in Natural Security.

To ascertain which libraries are undefined, you can use the `SHOW` command. This will expand the **Library Maintenance** selection list so that it also includes undefined libraries.

The syntax for the `SHOW` command is as follows:

```
SHOW ALL [FILE=(database-id,file-number,password,ciphercode)]
```

or

```
SHOW + [FILE=(database-id,file-number,password,ciphercode)]
```

With `FILE` you specify the system file whose undefined libraries are to be listed. If you omit the `FILE` specification, the undefined libraries on the current FUSER file will be listed.

The system file to which the expanded list of libraries refers is shown at the top of the **Library Maintenance** selection list. The **Message** column of the selection list indicates which of the listed libraries are undefined.

Instead of entering the `SHOW ALL` command (without `FILE` specification) in the command line of the **Library Maintenance** selection list, you can also press PF16.

If you want to list only the undefined libraries, you either enter the command `SHOW UNDF` (with or without `FILE` specification) in the command line, or enter `UNDF` in the protection status field (**Prot.**).

To revert the **Library Maintenance** selection list to the standard display of only defined libraries, you press PF16 again or enter the following command in the command line:

```
SHOW -
```

Note: To list undefined libraries, you can also use the application programming interface **NSCXR** (with object-type code `SF` (system file)).

To create a security profile for one undefined library:

1. On the **Library Maintenance** selection list, you mark the library with function code `AD` or `AP`.
2. With `AP`, a window will be displayed in which you can specify the ID of a **default profile** (see above). With `AD`, this window will be skipped and no default profile used.
3. The **Add Library** screen will be displayed - as with Step 3 above.

To create security profiles for multiple undefined libraries:

- On the **Library Maintenance** selection list, you either mark each of the libraries with function code `AD` or `AP`; or you press PF10 to simultaneously select all undefined libraries on the currently displayed page of the **Library Maintenance** selection list (corresponds to marking them all with `AP`).

  Steps 2 and 3 will then be repeated for one of the marked/selected libraries after another.

Note: To define undefined libraries, you can also use the Administrator Services function **Definition of Undefined Libraries**.

Selecting Existing Libraries for Processing

When you invoke **Library Maintenance**, a list of all libraries that have been defined to Natural Security will be displayed.

If you do not want a list of all existing libraries but would like only certain libraries to be listed, use the **Start Value** and **Type/Status** options as described in the section *Finding Your Way In Natural Security*.

On the **Main Menu**, select **Maintenance**. A window will be displayed.

In the window, mark the object type **Library** with a character or with the cursor (and, if desired, type in a start value and/or protection status).

The **Library Maintenance** selection list will be displayed:

```
12:47:45                    *** NATURAL SECURITY ***                 2021-12-31
                              - Library Maintenance -

 Co Library ID Library Name                        Prot. Message
 __ __________ ________________________________ _____ ______________________
 __ KETEST                                       YN
 __ KEX        TEST APPL-KE                      YN
 __ KE1        KETEST                            NN
 __ KJH                                          NN
 __ KK-APPL                                      NN
 __ KKAPP                                        NN
 __ KKAPPC                                       NN
 __ KKAPP1                                       NN
 __ KKAPP2                                       NN
 __ KKAPP3                                       NN
 __ KKAPP4                                       YN
 __ KKAPP7                                       NN
 __ KKITEST                                      NN
 __ KKPAC                                        NN
 __ KKPROD                                       NN

 Command ===>
 Enter-PF1---PF2---PF3---PF4---PF5---PF6---PF7---PF8---PF9---PF10--PF11--PF12---
       Help        Exit              Flip  -     +                       Canc
```

For each library, the ID, name and protection status are displayed.

The list can be scrolled as described in the section *Finding Your Way In Natural Security*. The list can be expanded to also include undefined libraries, as described under *Listing Undefined Libraries* above.

The following library maintenance functions are available (possible code abbreviations are underlined):

Code	Function
AD	Add library without default profile (only possible if the selection list has been expanded; see *Listing Undefined Libraries*)
AP	Add library, optionally with default profile (only possible if the selection list has been expanded; see *Listing Undefined Libraries*)
CO	**Copy library**
MO	**Modify library**
RE	**Rename library**
DE	**Delete library**
DI	**Display library**

Code	Function
LU	**Link users to library**
LF	**Link library to files** (this function is only available on z/OS computers)
MD	**Modify DDM restrictions in library** (this function is only available on Linux and Windows)
EP	**Protect environments**
RA	**Restrict access to Natural RPC services**

To invoke a function for a library, mark the library with the appropriate function code in column **Co**.

You may select various libraries for various functions at the same time; that is, you can mark several libraries on the screen with a function code. For each library marked, the appropriate processing screen will be displayed. You may then perform for one library after another the selected functions.

Copying a Library

The Copy Library function is used to define a new library to Natural Security by creating a security profile which is identical to an existing library security profile.

- What is Copied?
- How to Copy
- Copying With Links

What is Copied?

All components of the existing security profile will be copied into the new security profile - *except* the owners (these will be copied from your own user security profile into the new library security profile).

In addition to duplicating a library security profile, you can choose to also copy its links and utility profiles, as well as the actual library itself; this depends on the options described below.

How to Copy

1. On the **Library Maintenance** selection list, mark the library whose security profile you wish to duplicate with function code CO.
2. A window will be displayed in which you specify the following:

Field	Explanation
To library	Enter the ID of the new library.
Library name	This field shows the name of the existing library. Overwrite it with the name of the new library.
With links	Enter `Y` or `N`. With this option, you can, in addition to the library security profile, also copy its links, utility profiles and files/DDMs; see *Copying With Links* below.
With Natural objects	Enter `Y` or `N`. With this option, you can duplicate the actual library itself. This means that a new library will be created on the FUSER system file, and all Natural programming objects contained in the existing library will be copied into this new library. (Internally this option uses the `MAINUSER` application programming interface of the Natural utility SYSMAIN.)

3. The **Copy Library** screen will be displayed, showing the new library security profile.

   Its components you may define are described under *Components of a Library Security Profile*.

Copying With Links

If you select **With links = N**:

- Any links defined for the existing library will not apply to the new library.
- Any library-specific and user-library-specific utility profiles for the existing library will not apply to the new library.

If you select **With links = Y**:

- Any links that exist for the existing library are copied for the new library, and you have the option to cancel the links you wish not to apply to the new library.
- Any library-specific and user-library specific utility profiles that exist for the existing library are copied for the new library.

The procedure with **With links = Y** is as follows:

1. Once you have made any changes to the copied security profile and then leave the **Copy Library** screen by pressing PF3, a list of users is displayed: it contains all users which are linked to the existing library.
2. On the list, you may mark individual users with `CL` to cancel any links you wish *not* to apply to the new library. All users you do not mark will automatically be linked to the new library in the same manner - normal or special link - as the existing library.
3. Once you have established all user links and leave the list of users by pressing PF3, a list of files is displayed: it contains all files/DDMs to which the existing library is linked.

4. On the list, you may mark individual files/DDMs with `CL` to cancel any links you wish *not* to apply to the new library. To all files/DDMs you do not mark the new library will automatically be linked in the same manner - read or update link - as the existing library.

Modifying a Library

The Modify Library function is used to change an existing library security profile.

To do so:

1 On the **Library Maintenance** selection list, you mark the library whose security profile you wish to change with function code `MO`.

2 The security profile of the selected library will be displayed.

Its components which you may define or modify are described under ***Components of a Library Security Profile***.

Renaming a Library

The Rename Library function allows you to change the library ID of an existing library security profile.

To do so:

1 On the **Library Maintenance** selection list, you mark the library whose ID you wish to change with function code `RE`.

2 A window will be displayed in which you enter a new ID for the library (and, optionally, change its name).

Depending on the setting of the general option **Deletion of non-empty libraries allowed** (see *Administrator Services*), it may not be possible to rename a library security profile if the library contains any sources or object modules.

With Natural Objects

When you rename a library security profile, this option allows you to also change the name of the actual library. This means that the library will be renamed on the FUSER system file, and all Natural programming objects contained in the library will be stored under the new library name. (Internally this option uses the `MAINUSER` application programming interface of the Natural utility SYSMAIN.)

Deleting a Library

The Delete Library function is used to delete an existing library security profile.

To do so:

1 On the **Library Maintenance** selection list, mark the library you wish to delete with function code `DE`.

2 The **Delete Library** window will be displayed.

- If you decide against deleting the library security profile, leave the window by pressing ENTER without having typed in anything.
- To delete the library security profile, enter the library's ID in the window to confirm the deletion.

When you delete a library, all existing links to the library will also be deleted.

Depending on the setting of the general option **Deletion of Non-empty Libraries Allowed** (see *Administrator Services*), it may not be possible to delete a library security profile if the library still contains any sources or object modules.

If you mark more than one library with `DE`, a window will be displayed in which you are asked whether you wish to confirm the deletion of each library security profile by entering the library's ID, or whether all libraries selected for deletion are to be deleted without this individual confirmation. Be careful not to delete a library accidentally.

With Natural Objects

When you delete a library security profile, this option allows you to also delete the actual library itself. This means that the library - and all Natural programming objects it contains - will be deleted from the FUSER system file. (Internally this option uses the `MAINUSER` application programming interface of the Natural utility SYSMAIN.)

Displaying a Library

The Display Library function is used to display an existing library security profile.

To do so:

- On the **Library Maintenance** selection list, mark the library whose security profile you wish to view with function code `DI`.

  The security profile of the selected library will be displayed. Its components are described under *Components of a Library Security Profile*.

Creating and Maintaining a Private Library

- Defining a Private Library
- Maintaining a Private Library
- Deleting a Private Library

Defining a Private Library

The library ID by which a private library is defined to Natural Security is identical to the respective user ID. Therefore private libraries can only be created for users whose user IDs conform to the naming conventions for library IDs.

To define a private library to Natural Security:

1. In the user's security profile, mark the field **Private Library** with `Y` (on the **Add User**, **Copy User** or **Modify User** screen) (marking this field does not cause any default private library security profile to be created).
2. In the **Additional Options** window, select **Private Library**; or press PF5 on the main user security profile screen.

   A **Private Library** screen will be displayed. It is identical to a "normal" library security profile screen (except when private libraries are used in private mode, in which case the screen does not contain the fields **People-protected** and **Terminal-protected**). On this screen and the subsequent screens/windows you define the security profile for the private library.

Maintaining a Private Library

In private mode, maintenance of existing private library security profiles is performed via **User Maintenance**.

In public mode, private libraries also appear on the **Library Maintenance** selection list along with the other libraries, that is, they can be maintained like "normal" libraries with the library maintenance functions described above.

Deleting a Private Library

If private libraries are used in public mode, you delete a private library like any other library (see *Deleting a Library*).

If private libraries are used in private mode, you delete a private library by marking the **Private Library** field in the user's security profile with `N`. A window will be invoked in which you confirm the deletion by typing in the library ID.

Depending on the setting of the general option **Deletion of Non-empty Libraries Allowed** (see *Administrator Services*), it may not be possible to delete a private library if it still contains any source or object modules.

10 Protecting Libraries

- Protected Libraries 186
- Linking Users to Libraries 188
- Which Conditions of Use are in Effect 192

This section describes how to control the access of users to protected libraries.

It covers the following topics:

Protected Libraries

A library may be protected by specifying the values of **People-protected** and **Terminal-protected** in the **General Options** column of the library's security profile.

Protection Combinations

The possible combinations of **People-protected** and **Terminal-protected** are listed below:

Protection	Explanation
People: N, Terminal: N	The library is not protected. It may be used by any person from any terminal. The terminal need not be defined to Natural Security. The user must be defined to Natural Security. The user ID must be entered on the logon screen in order to be able to log on to the library.
People: L, Terminal: N	This is identical to the above combination - with the following addition: Although the library is not protected, it is possible to link a group to the library. Only one group can be linked to the library, and the link must be a special link. This special link only applies to users of type “Administrator” contained in the group. This feature is only intended to allow administrators different access to an unprotected library for maintenance purposes. (The special link to such a library can only be established via the function “Link users to library” which is invoked from the **Library Maintenance** selection list.) **Note:** When an administrator processes the library's contents with a Natural utility under a condition under which the **Utilities** option in the library security profile would apply, Natural Security will react as if this option were set to `N`.
People: Y, Terminal: N	The library may be used only by persons who are linked to the library or are in a group that is linked to the library. It may be used from any terminal. The terminal need not be defined to Natural Security. The user (and the group if need be) must be defined to Natural Security. The user ID must be entered on the logon screen in order to be able to log on to the library.
People: N, Terminal: Y	The library may be used by any person, but it may only be used from a terminal which is defined to Natural Security and is contained in a group which is linked to the library. No user ID is required on the logon screen to log on to the library.
People: Y, Terminal: Y	The library may be used either by people linked to the library or from a terminal which is contained in a group which is linked to the library. In other words, by entering his or her user ID on the logon screen, a linked person may use the library from any terminal; people who are not linked to the library may only use the library from a linked terminal.

Protection	Explanation
People: Y, Terminal: A	The library may be used only by people from linked terminals: The person must be defined to Natural Security and must be in a group which is linked to the library (or may be linked directly, if user type "Administrator" or "Person"); the terminal must also be defined to Natural Security, and it must be contained in a group which is linked to the library. The user ID and library ID must be entered on the logon screen in order to be able to log on to the library.
People: P, Terminal: N	This combination only applies to **private libraries** in public mode. The user with the same ID as the library ID may use the library without requiring a link to it. Otherwise, this combination is identical to "People: Y, Terminal: N" (see above).
People: P, Terminal: Y	This combination only applies to **private libraries** in public mode. The user with the same ID as the library ID may use the library without requiring a link to it. Otherwise, this combination is identical to "People: Y, Terminal: Y" (see above).
People: P, Terminal: A	This combination only applies to **private libraries** in public mode. The user with the same ID as the library ID may use the library without requiring a link to it. Otherwise, this combination is identical to "People: Y, Terminal: A" (see above).
People: N, Terminal: A	This combination is not possible!
People: L, Terminal: Y	This combination is not possible!
People: L, Terminal: A	This combination is not possible!

Changing a Protection Combination

Please take care when you change an existing combination of **People-protected** and **Terminal-protected**. If the change results in a "lower" protection level, certain links will automatically be cancelled by Natural Security according to the following rules:

Change from	to	Effect on Links
any protection combination	People: N, Terminal: N	All existing links to the library will be cancelled.
	People: N, Terminal: Y	All direct links of "Administrator" and "Person"s will be cancelled. Links of "Group"s to the library will remain.
	People: Y, Terminal: N	No links will be cancelled.
	People: Y, Terminal: Y	No links will be cancelled.
People: N, Terminal: Y	People: Y, Terminal: Y	No links will be cancelled. However, all people contained in "Group"s which are linked to the library may now also log on the library!

Protecting a Private Library

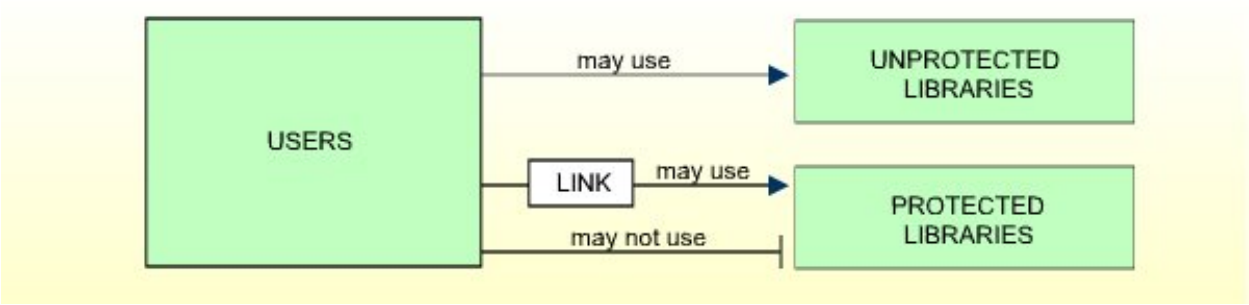
The user with the same user ID as the library ID always has access to his/her **private library**.

In public mode, other users' access to someone's private library is determined by the settings of the fields **People-protected** and **Terminal-protected** in the security profile of the private library. Possible values for the field **People-protected** are `P` (which is the default value, and which corresponds to `Y` in other library security profiles) and `N` (which is the same as in other library security profiles). Possible values for the field **Terminal-protected** are the same as for other libraries (`Y`, `N` or `A`). The possible protection combinations are described above.

In private mode, no other user has access to someone else's private library.

Linking Users to Libraries

To allow a user access to a protected library, a *link* has to be established between the user and the library.



Only users of types “Administrator”, “Person”, and “Group” can be linked to a library.

Users of types “Administrator” and “Person” can be linked to a library either directly or via a “Group”.

Users of types “Member” and “Terminal” can be linked to a library only via a “Group”; that is, they must be assigned to a “Group”, and the “Group” be linked to the library.

Two functions are available to establish and maintain links between users and libraries:

- a User Maintenance function to link *one user* to *one or more libraries*,
- a Library Maintenance function to link *one or more users* to *one library*.

Both functions are described below.

Linking a Single User to Libraries

To link one user to one or more libraries:

1 On the **User Maintenance** selection list, mark the user you wish to link with function code LL.

2 A window will be displayed, providing the following options:

- **Start value** - You can enter a start value for the list of libraries to be displayed (as described in the section *Finding Your Way in Natural Security*).
- **Selection criterion** - N = none: all libraries will be listed; L = linked: only libraries to which the user is already linked (normal and special links, including temporarily locked ones) will be listed; U = unlinked: only libraries to which the user is not yet linked will be listed.

3 Then the **Link User To Libraries** selection list will be displayed, showing the list of libraries. It includes all protected libraries; that is, if you link a user of type "Person" or "Administrator", it includes all libraries with "People-protected" set to Y; if you link a user of type "Group", it includes all libraries with at least one of the two protection values set to Y. The list can be scrolled as described in the section *Finding Your Way in Natural Security*.

On the list, you mark the libraries to which you wish to link the selected user.

In the **Co** column, you may mark each library with one of the following function codes (possible code abbreviations are underlined):

Code	Function
LK	Link - The user may use the library with the security profile of the library being in effect.
SL	Special Link - The user may use the library with a special security profile to be defined for the link; the link profile will take precedence over the library security profile. See *Special Links* below.
CL	Cancel - An existing link or special link will be cancelled.
TL	Temporarily Locked - An existing link or special link will be suspended until it is re-established. A suspended link or special link can be re-established by marking the library concerned with LK or SL again. When a special link is re-established, the original link security profile will be re-established, too.
DL	Display Special Link - The security profile of an existing special link between the user and the library will be displayed.
DI	Display Library - The security profile of the library will be displayed.
LD	Modify DDM Restrictions in Special Link Profile (This function is not available on z/OS computers. It corresponds to function MD as described under *Creating And Maintaining DDM Security Profiles*).

You can mark one or more libraries on the screen with a function code.

4 For each library marked, the selected functions will be executed one after another. When processing is completed, a message will be displayed stating the link situation now in effect for each library.

Linking Multiple Users to a Library

To link one or more users to one library:

1 On the **Library Maintenance** selection list, mark the library to which you wish to link users with code `LU`.

2 A window will be displayed, providing the following options:

- **Start value** - You can enter a start value for the list of users to be displayed (as described in the section *Finding Your Way in Natural Security*).
- **Selection criterion** - `N` = none: all users will be listed; `L` = linked: only users which are already linked to the library (normal and special links, including temporarily locked ones) will be listed; `U` = unlinked: only user which are not yet linked to the library will be listed.

3 Then the **Link Users To Library** selection list will be displayed, showing the list of users. It includes all users of types “Group”, “Administrator”, and “Person”. It can be scrolled as described in the section *Finding Your Way in Natural Security*.

On the list, you mark the users you wish to be linked to the selected library.

In the **Co** column, you may mark each user with one of the following function codes (possible code abbreviations are underlined):

Code	Function
`LK`	Link - The user may use the library with the security profile defined for the library being in effect.
`SL`	Special Link - The user may use the library with a special security profile to be defined for the link; the link profile will take precedence over the library security profile. See *Special Links* below.
`CL`	Cancel - An existing link or special link will be cancelled.
`TL`	Temporarily Locked - An existing link or special link will be suspended until it is re-established. A suspended link or special link can be re-established by marking the user concerned with `LK` or `SL` again. When a special link is re-established, the original link security profile will be re-established, too.
`DL`	Display Special Link - The security profile of an existing special link between the user and the library will be displayed.
`DI`	Display User - The security profile of the user will be displayed.
`LD`	Modify DDM Restrictions in Special Link Profile

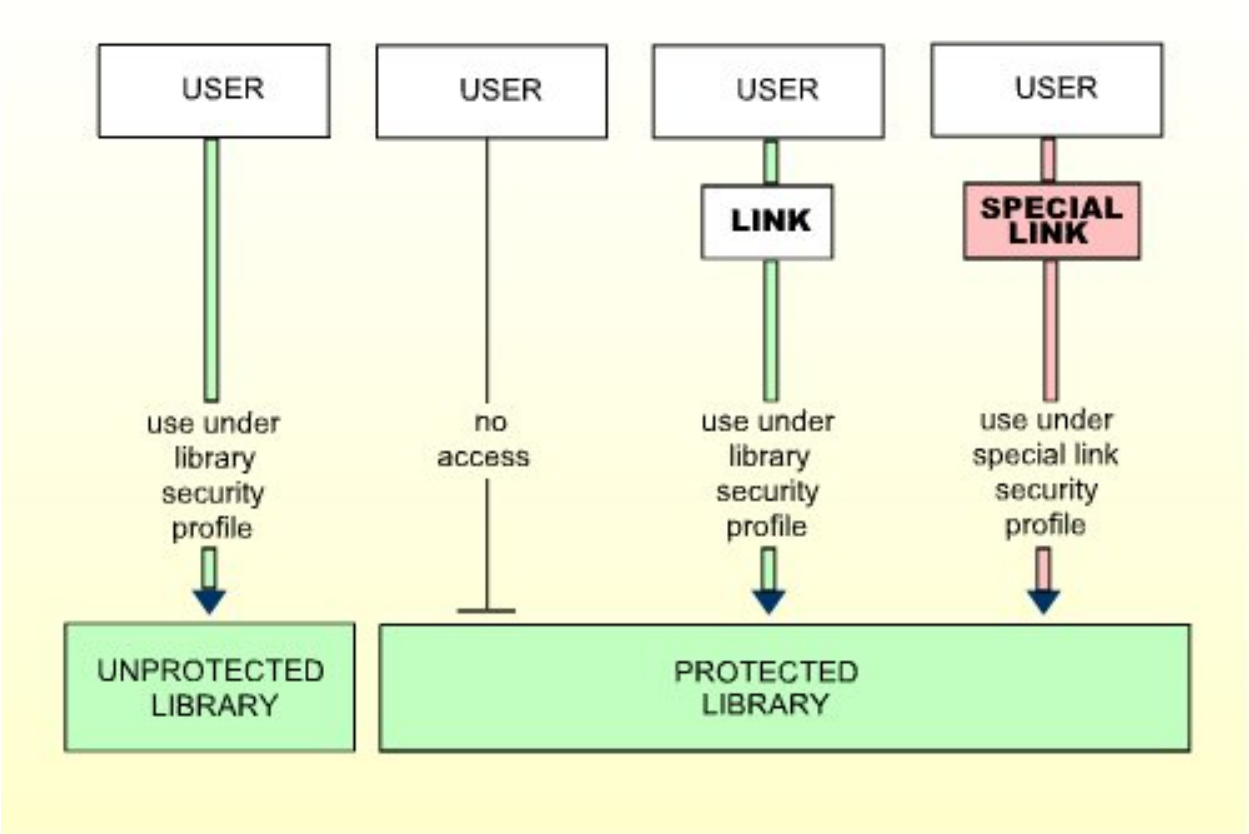
Code	Function
	(This function is not available on z/OS computers. It corresponds to function MD as described under *Creating And Maintaining DDM Security Profiles*).

You can mark one or more users on the screen with a function code.

4 For each user marked, the selected functions will be executed one after another. When processing is completed, a message will be displayed stating the link situation now in effect for each user.

Special Links

If a library security profile determines the conditions under which the library may be used generally, the special-link security profile determines the conditions under which the user (or group of users) thus linked may use the library. This means that by using special links you may define for different users different conditions of use of the same library.



The items you define in a special-link profile take precedence over the corresponding items in the library security profile.

Some items cannot be set in special-link profiles. For these, the settings specified in the library security profile apply.

Creating a Special Link

If you mark a user/library with `SL`, you may define the security profile for this special link on the screens which will be displayed. The default settings which appear on the **Special Link** security profile screens are taken from the security profile of the library.

The components of a special-link security profile correspond with those you may define as part of a library security profile (see ***Components of a Library Security Profile*** in the section *Library Maintenance*).

Modifying a Special Link

To modify an existing special-link security profile, mark the respective user/library with `SL` again on the **Link Users To Library or Link User To Libraries** screen: the **Special Link** security profile screen will be invoked for modification.

Displaying a Special Link

To view the security profile of a special link, mark the respective user/library with `DL` on the **Link Users To Library or Link User To Libraries** screen: the **Special Link** security profile screen will be displayed.

Which Conditions of Use are in Effect

When a user logs on to a protected library, Natural Security will execute a number of checks to determine under which conditions the user may use the library. If none of the checks are positive, the logon will be rejected.

The following checks will be executed in the following order:

Library Protection	Checks Performed
1. People: Y Terminal: N	First: Check whether the user is linked directly to the library; if the user is linked with a special link, the conditions defined in the special-link security profile will be in effect; if the user is linked with an ordinary link, the conditions defined in the library security profile will be in effect. Second: Check whether the user is in a group which is linked to the library; if the user is contained in more than one group, these groups will be checked in the following order: first the Privileged Groups in the user's security profile will be checked in order of entry, then the other groups will be checked in alphabetical order; the first linked group found will be selected; if the group is linked with a special link, the conditions defined in the

Library Protection	Checks Performed
	special-link security profile will be in effect; if the group is linked with an ordinary link, the conditions defined in the library security profile will be in effect.
2. People: N Terminal: Y	Check whether the terminal is in a group which is linked to the library; if the terminal is contained in more than one group, these groups will be checked in the following order: first the Privileged Groups in the terminal's security profile will be checked in order of entry, then the other groups will be checked in alphabetical order; the first linked group found will be selected; if that group is linked with a special link, the conditions defined in the special-link security profile will be in effect; if that group is linked with an ordinary link, the conditions defined in the library security profiles will be in effect.
3. People: Y Terminal: Y	If the user logs on *with a user ID*, the same checks as under 1. will be executed. If the user logs on *without specifying a user ID*, the same checks as under 2. will be executed.
4. People: Y Terminal: A	The same checks as under 1. will be executed.

Note: The terminal must be in a group which is linked to the library, but the conditions of use are determined by the user's link.

PROFILE Command

When logged on to a library, a user may enter the Natural system command `PROFILE` to ascertain which conditions of use are currently in effect.

When you enter the `PROFILE` command, the **Security Profile** screen is displayed, showing the following information:

User	
ID	The user's ID.
Name	The user's name.
Type	The user type.
Link ID	The current value of the Natural system variable `*GROUP`. An asterisk (*) next to the ID indicates that the group's/user's link to the current library is a Special Link.
ETID	The current value of the Natural system variable `*ETID`.
Library	
ID	The ID of the current library.
Name	The name of the current library.
Steplibs	The steplibs of the current library.

User	
Transactions	
Startup	The current value of the Natural system variable `*STARTUP`.
Restart	The name of the restart transaction.
Error	The current value of the Natural system variable `*ERROR-TA`.

Additional Options

If you mark the field **Additional Options** on the **Security Profile** screen with `Y` or press PF4, a window will be displayed from which you can select the following items of information:

- Security options
- Security limits
- Session parameters
- Command restrictions
- Editing restrictions
- Statement restrictions
- Time windows
- System files
- Natural version

The options where something is defined for the current user are marked with a plus sign (+).

You can select one or more items from the window by marking them with any character. For each item selected, an additional window/screen will be displayed (in the order of the items in the selection window).

Utility Access Rights

If you press PF5, the **NSC Utility Access Rights** window will be displayed, providing an overview of the utility functions which you are allowed to use in each library.

- If you have issued the `PROFILE` command from within a utility, the window lists the functions available in that utility.
- If you have issued the `PROFILE` command elsewhere, the window lists all utilities along with information on whether some or all functions of a utility are allowed/disallowed for a specific library. (The notation `<others>` in the Library field of the window indicates all libraries for which nothing specific has been defined.) To obtain more detailed information on the utility functions allowed for a particular library, you can select one or more libraries from the window by marking them with any character.

11 Protecting Environments

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- Components of an Environment Profile 198
- Allowing and Disallowing Access to Libraries in Environments 201
- Allowing and Disallowing Users Access to Environments 203

This section covers the following topics:

About Environment Protection

Natural Security allows you to make users' access to a library environment-specific. A Natural *environment* is determined by the combination of the system files FNAT, FUSER, FSEC and FDIC. You define a security profile for each environment (that is, for each system-file combination) you wish to protect, and control users' access to it. You can also make a library accessible in some environments, but not in others.

A logon to another environment occurs when a users logs onto a library located on another FUSER system file (as specified by the **Library File** DBID/FNR in the library security profile).

Whenever a user logs on to a library in another environment, Natural Security will check whether:

- access to the library is allowed in that environment, and
- the user is authorized to access that environment.

Such a check is performed not only when a user explicitly logs on to a library, but also when the user invokes a function which implicitly accesses another library or processes the contents of another library.

Activating Environment Protection

Environment protection is activated by setting the general option **Environment Protection** to `Y`.

If environment protection is active, the following applies:

- Access to undefined environments is not possible.
- For every environment to be accessed, an environment security profile has to be defined.
- By default, access to a library is allowed in any defined environment.
- By default, access to a defined environment is allowed for all users.
- For individual defined environments, you can disallow access to a library.
- For individual users, you can disallow access to a defined environment.

To deactivate environment protection, you set the general option **Environment Protection** option to `N`.

Note: If environment protection is active, the user ID DBA may be used to log on to the library SYSSEC, even if the environment is undefined. This makes it possible to define new environments.

Defining Environment Profiles

The Administrator Services function **Environment Profiles** is used to define environment profiles, that is, security profiles for the individual system-file combinations.

To invoke this function:

1. On the **Main Menu**, select **Administrator Services**.

   If you are allowed **access to Administrator Services**, the **Administrator Services Menu 1** will be displayed.

2. Press PF8.
3. On the **Administrator Services Menu 2**, select **Environment Profiles**.

   The **Environment Maintenance** selection list will be invoked.

Environment Maintenance Selection List

The **Environment Maintenance** selection list displays a list of all environment profiles which have been defined.

The list can be scrolled as described in the section *Finding Your Way In Natural Security*.

For each environment profile, either its system-file combination (database IDs and file numbers of system files FUSER, FDIC, FSEC and FNAT) or its ID is displayed; with PF4 you can switch between the two displays. In addition, each environment profile's alias (AL) and protection status (P) are displayed.

Protection Status

The protection status can be:

I	The environment profile is inactive (both NSC Protection = N and NSF Protection = N in the environment profile).
N	Access to the environment is evaluated by Natural Security (NSC Protection = Y in the environment profile).
S	Access to the environment is evaluated by the SAF server (NSF Protection = Y in the environment profile).

Available Functions

The following functions are available:

Code	Function
AD	Add a new environment profile. (You can also invoke this function by entering AD in the Command line.)
CO	Copy environment profile.
MO	Modify environment profile.
RE	Rename environment profile.
DE	Delete environment profile.
DI	Display environment profile.
EP	Protect environment.

To invoke a function for an environment, you mark the environment with the appropriate function code in column **Co**.

You may select various environments for various functions at the same time; that is, you can mark several environments on the screen with a function code. For each environment marked, the selected functions will then be executed one after another.

Components of an Environment Profile

When you add a new environment or modify an existing one, the **Define Environment Profile** screen will be displayed. The items you can define as part of an environment profile on this screen and any subsequent screens/windows are:

Field	Explanation
Environment ID	You specify a descriptive name for the environment profile.
Alias	You can specify a one-character alias for the environment profile. An alias can be shared by multiple environment profiles. By specifying the same alias in several environment profiles, you can form groups of environments.

Field	Explanation
	For example, you can use aliases like: D - for all development environments, T - for all test environments, P - for all production environments. This will make the maintenance of environment profiles easier, because you can use the alias as selection criterion on the **Environment Maintenance** selection list to list all profiles which have the same alias. For Natural SAF Security the following applies: The alias is used in the external security system to define the resources related to the system-file combination of this environment. The rules defined for an alias in the external security system apply to all system-file combinations in whose environment profiles this alias is specified.
General Options	You specify by which system the environment is to be protected: ■ **NSC Protection:** If set to Y, this activates the environment for validation by Natural Security, as described in this documentation. ■ **NSF Protection:** If set to Y, this activates the environment for validation by the SAF server, as described in the *Natural SAF Security* documentation. This validation requires that the option **Protect Environment** in the General NSF Options is set to Y (see *Natural SAF Security* documentation). If both are set to N, the environment profile is not active, that is, it is treated as if it were not defined.
System Files	You define the environment by specifying the database IDs and file number of each system file (FUSER, FDIC, FSEC, FNAT). This combination of system files identifies the environment, and must be unique. Once entered, the values of these fields cannot be changed. If you press PF9 on the main environment profile screen, a window will be displayed showing the system-file combination of your current Natural session. In the window, you can mark with any character the system files you wish to be part of the environment whose profile you are creating.

Additional Options

If you either mark the field **Additional Options** with Y or press PF4, a window will be displayed from which you can select the following options:

- Maintenance Information
- Security Notes
- Owners
- Session Options

The options for which something has already been specified or defined are marked with a plus sign (+).

You can select one or more items from the window by marking them with any character. For each item selected, an additional window will be displayed:

Additional Option	Explanation
Maintenance Information (display only)	The following information is displayed: ■ the date and time when the security profile was created, the ID of the administrator who created it, and (if applicable) the IDs of the co-owners who countersigned for the creation; ■ the date and time when the security profile was last modified, the ID of the administrator who made the last modification, and (if applicable) the IDs of the co-owners who countersigned for the modification.
Security Notes	You may enter your notes on the security profile.
Owners	You may enter up to eight IDs of administrators. Only the administrators specified here will be allowed to maintain this environment security profile or allow/disallow users' access to it. If no owner is specified, any user of type “Administrator” may do so. For each owner, the number of co-owners whose countersignatures will be required for maintenance/link permission may optionally be specified in the field after the ID. For an explanation of owners and co-owners, see the section *Countersignatures*.
Session Options	
TEST Command	With this option, you can control the use of the Natural system command `TEST` in the environment. Possible values are: ■ `Y` = The `TEST` command can be used without any restrictions. ■ `P` = The `TEST` command can be used with the following restrictions: the debugger commands `MODIFY VARIABLE`, `ESCAPE ROUTINE`, `ESCAPE BOTTOM` and `STOP` cannot be used. ■ `N` = The use of the `TEST` command is disallowed altogether. This option only applies to environments on z/OS computers.

Allowing and Disallowing Access to Libraries in Environments

By default, when environment protection is active, access to a library is allowed in any environment. For individual environments, you can disallow access to a library.

When access to a library is disallowed in at least one environment, the fact that the library is “environment-protected” will be indicated in the library's security profile.

Two functions are available to disallow/allow environment-specific access to libraries:

- an Environment Maintenance function to disallow/allow access to one or more libraries for one environment,
- a Library Maintenance function to disallow/allow access to one library for one or more environments.

Both functions are described below.

Protecting a Single Environment for Multiple Libraries

To allow/disallow access to one more libraries for one environment:

1 On the **Environment Maintenance** selection list, mark the environment you wish to protect with `EP`.

2 A window will be displayed with the following fields:

- **Protect for users/libraries:** Enter an `L`.
- **Start value:** You can enter a start value for the list of libraries to be displayed (as described in the section *Finding Your Way in Natural Security*)
- **Select only disallowed ones:** If you select this option, the list of libraries to be displayed will only include those libraries for which access in the environment is currently disallowed.

3 The **Disallow/Allow Libraries** screen will be displayed, showing the list of libraries. The list can be scrolled as described in the section *Finding Your Way In Natural Security*.

On the list, you mark the libraries for which you wish to disallow/allow access in the environment. In the **Co** column, you may mark each library with one of the following function codes:

Code	Function
ED	Disallow - The library cannot be accessed in that environment.
EA	Allow - The library can be accessed in that environment.

You can mark one or more libraries on the screen with a function code.

4 For each library marked, the selected functions will then be executed one after another. When processing is completed, a message will indicate the access situation now in effect for each library.

Protecting Multiple Environments for a Single Library

To allow/disallow access to one library for one or more environments:

1 On the **Library Maintenance** selection list, mark the desired library with function code EP.

2 A window will be displayed in which you have the following options:

Option	Explanation
Disallow/allow	D = Access to the library is initially allowed for all environments, and you can disallow it for individual ones. A = Access to the library is initially disallowed for all environments, and you can allow it for individual ones. When you later invoke this function and change the value of this option, the "allowed/disallowed" status of all environments will be changed for this library.
Sorted by environment ID / Sorted by alias	By marking one of these two fields with a character, you can choose to have the list of environments to be displayed sorted by environment IDs or by aliases. The latter allows you to simultaneously allow/disallow access for all environments which have the same alias (see below).
Start value	In one of these two fields, you can enter a start value (as described in the section *Finding Your Way in Natural Security*) for the list of environments to be displayed. Depending on how the list is to be sorted, you can specify either the database ID / file number of the environments' FNAT system file or a one-character alias as start value.
Select only disallowed/allowed ones	If you select this option, the list of environments to be displayed will only include - depending on the above option **Disallow/allow** - either those for which access is allowed or those for which it is disallowed.

3 The **Disallow/Allow Environments** screen will be displayed, showing the list of environments. For each environment, either its system-file combination (database IDs and file numbers of system files FUSER, FDIC, FSEC and FNAT) or its ID is displayed; with PF4 you can switch between the two displays. It addition, each environment profile's alias (AL) and protection status (P) are displayed.

The list can be scrolled as described in the section *Finding Your Way In Natural Security*.

On the list, you mark the environments for which you wish disallow/allow access to the library. In the **Co** column, you may mark each environment with one of the following function codes:

Code	Function
ED	Disallow - The library cannot be accessed in that environment.
EA	Allow - The library can be accessed in that environment.

You can mark one or more environments with a function code.

4 For each environment marked, the selected functions will then be executed one after another. When processing is completed, a message will indicate the access situation now in effect for each environment.

If the list is sorted by alias, you do not mark individual environments. Instead, you mark an alias, and the selected function will be applied to all environments which have that alias.

Allowing and Disallowing Users Access to Environments

By default, when environment protection is active, access to an environment is allowed for all users. For individual users you can disallow access to an environment.

Access to an environment can only be allowed/disallowed for users of types “Group”, “Administrator” and “Person”. For users of types “Administrator” and “Person” it can be allowed/disallowed either directly or via a “Group”. For users of types “Member” and “Terminal”, it can only be allowed/disallowed for the “Group” to which they are assigned.

When access to at least one environment is disallowed for a user, the session option **Environment Protection** in the user's security profile is automatically to Y.

Two functions are available to disallow/allow users' access to environments:

- an Environment Maintenance function to disallow/allow access of one or more users to one environment,
- a User Maintenance function to disallow/allow access of one user to one or more environments.

Both functions are described below.

Protecting a Single Environment for Multiple Users

To protect an environment for one or more users:

1 On the **Environment Maintenance** selection list, mark the environment you wish to protect with EP.

2 A window will be displayed with the following fields:

- **Protect for users/libraries:** Enter a U.
- **Start value:** You can enter a start value for the list of users to be displayed (as described in the section *Finding Your Way in Natural Security*).
- **Select only disallowed ones:** If you select this option, the list of users to be displayed will only include those users for whom access to the environment is currently disallowed.

3 The **Disallow/Allow Users** screen will be displayed, showing the list of users.

By default, it contains only users of type Group. To switch between a list of Groups and a list of all three user types, you press PF5.

The list can be scrolled as described in the section *Finding Your Way In Natural Security*.

On the list, you mark the users for whom you wish to disallow/allow access to the environment. In the **Co** column, you may mark each user with one of the following function codes:

Code	Function
ED	Disallow - The user cannot access the environment.
EA	Allow - The user may access the environment.

You can mark one or more users on the screen with a function code.

4 For each user marked, the selected functions will then be executed one after another. When processing is completed, a message will indicate the access situation now in effect for each user.

Protecting Multiple Environments for a Single User

To protect one or more environments for a user:

1 On the **User Maintenance** selection list, mark the user for whom you wish to protect environments with function code EP.

2 A window will be displayed providing the following options:

- **Start value:** You can enter a start value for the list of environments to be displayed (as described in the section *Finding Your Way in Natural Security*); as start value, you use the database ID / file number of the environments' FNAT system file.
- **Select only disallowed environments:** If you select this option, the list of environments to be displayed will only include those environments to which access is currently disallowed for the user.

3 The **Disallow/Allow Environments** screen will be displayed, showing the list of environments. For each environment, either its system-file combination (database IDs and file numbers of system files FUSER, FDIC, FSEC and FNAT) or its ID is displayed; with PF4 you can switch between the two displays. It addition, each environment profile's alias (AL) and protection status (P) are displayed.

The list can be scrolled as described in the section *Finding Your Way In Natural Security*.

On the list, you mark the environments the access to which you wish to disallow/allow for the user. In the **Co** column, you may mark each environment with one of the following function codes:

Code	Function
ED	Disallow - The user cannot access the environment.
EA	Allow - The user may access the environment.

You can mark one or more environments on the screen with a function code.

4 For each environment marked, the selected functions will then be executed one after another. When processing is completed, a message will indicate the access situation now in effect for each environment.

12 Protecting DDMs On z/OS

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- Creating and Maintaining File Profiles 213

As explained in the section ***Natural Security On Different Platforms***, the protection of DDMs with Natural Security is different on z/OS computers from that on other platforms. This section describes how to control the use of DDMs (files) on *z/OS computers*. The control of DDMs on other platforms is described in the section ***Protecting DDMs On Linux And Windows***.

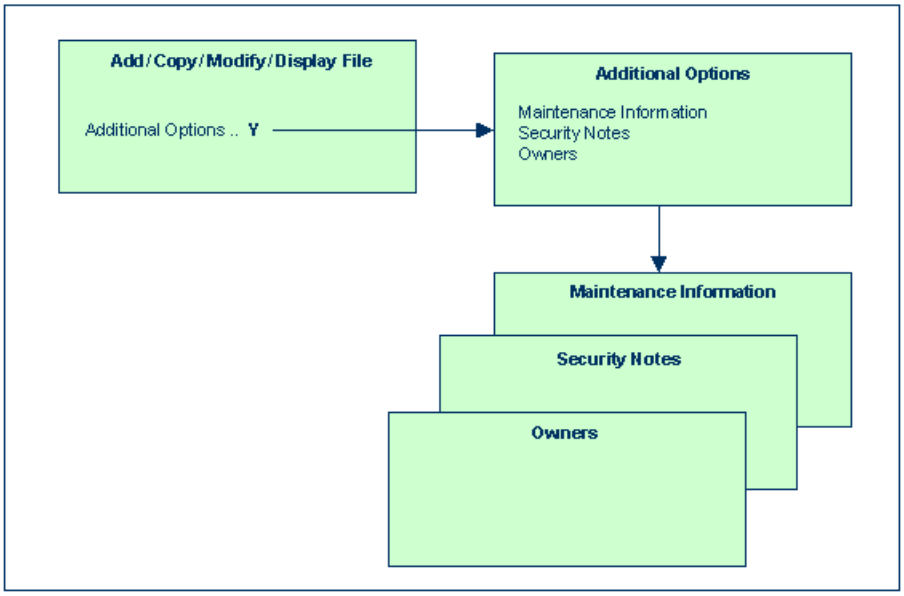
This section covers the following topics:

In Natural Security on z/OS computers, DDMs are called "files". To define DDMs to Natural Security, you use the File Maintenance functions of Natural Security.

Before You Begin

A DDM must have been generated (in Predict, or with the Natural utility SYSDDM), before it can be defined as a file to Natural Security.

Components of a File Profile



The following type of screen is the “basic” file security profile screen, which is displayed when you invoke one of the functions Add, Copy, Modify, Display for a file security profile:

```
10:25:36                    *** Natural Security ***                 2022-09-09
                                  - Modify File -

 File ID .. EMPLOYEES                          Modified .. 2022-09-09 by SAG
 DBID .....    10
 FNR ......    16
 Status ... PUBL  (PUBL, ACCE, PRIV)

 -- DDM Modifiers --
    ________   _
    ________   _
    ________   _
    ________   _
    ________   _
    ________   _
    ________   _
    ________   _


 Additional Options ... N


 Enter-PF1---PF2---PF3---PF4---PF5---PF6---PF7---PF8---PF9---PF10--PF11--PF12---
       Help  PrevM Exit  AddOp       Flip                                Canc
```

The individual items you may define as part of a file security profile are explained below.

Field	Explanation
File ID (display only)	The ID by which the file is defined to Natural Security and for which a DDM exists in the Natural system file. The file ID by which a file is defined to Natural Security must be identical to that of the DDM. A file ID may be up to 32 characters long and must be unique among all file IDs defined to Natural Security.
DBID / FNR (display only)	The database ID and file number of the database file referenced by the DDM. These values are taken from the DDM and written into the security profile.
Status	You may set the file status to one of the following: ■ `PUBL` = Public (not protected) ■ `ACCE` = Access (update-protected) ■ `PRIV` = Private (read- and update-protected) When you create a file security profile, the file status will, by default, be set to `PUBL`. See ***File Status*** below for details.
DDM Modifiers	You may enter up to eight IDs of users; only these users will then be allowed to maintain the DDM in Predict (or with Natural's SYSDDM utility). If you do not specify any DDM modifier, the owners of the security profile (see ***Additional Options*** below) may maintain

Field	Explanation
	the DDM. If neither DDM modifiers nor owners are specified, maintenance of the DDM is not restricted. Next to the ID of each DDM modifier, you may optionally specify a number from 1 to 3; this number determines how many of the other DDM modifiers specified must countersign for maintenance permission (the countersignature logic which applies to DDM maintenance permission is analogous to that of owners and co-owners as described in the section ***Countersignatures***).

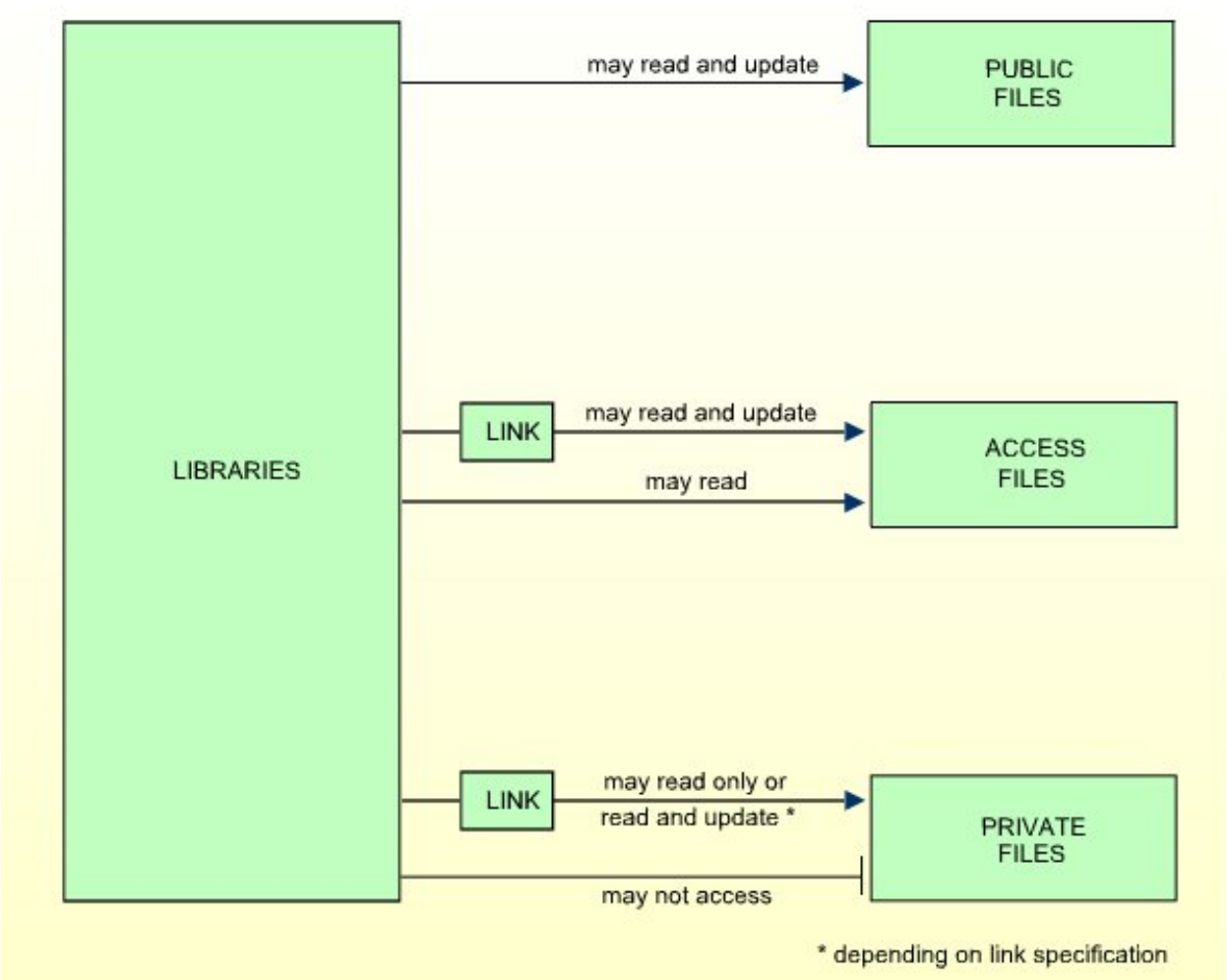
File Status

The file status of a file may be one of the following:

`PUBL`	PUBLIC: The file is *not* protected. It may be read and updated by any library.
`ACCE`	ACCESS: The file is protected as far as update is concerned. It may be read by any library. However, it may be updated only by libraries that have been linked to the file.
`PRIV`	PRIVATE: The file is protected. It may be accessed only by libraries that are linked to it. A link to a PRIVATE file may be specified as “read”(that is, read only) or “update” (which implies read).

The check whether a program may use a file is done when the program is *compiled*.

The following diagram illustrates the possible relationships between libraries and files in dependence of the file type:



To allow a library access to a file with status PRIVATE or ACCESS, a *link* has to be established between the library and the file. For information on how to link libraries to files, see ***Linking Libraries to Files*** below.

Additional Options

If you mark the field **Additional Options** on the basic security profile screen with `Y`, a window will be displayed from which you can select the following options:

- Maintenance Information
- Security Notes
- Owners

The options for which something has already been specified or defined are marked with a plus sign (+).

You can select one or more items from the window by marking them with any character. For each item selected, an additional window will be displayed:

Additional Option	Explanation
Maintenance Information (display only)	The following information is displayed: ■ the date and time when the security profile was created, the ID of the administrator who created it, and (if applicable) the IDs of the co-owners who countersigned for the creation; ■ the date and time when the security profile was last modified, the ID of the administrator who made the last modification, and (if applicable) the IDs of the co-owners who countersigned for the modification.
Security Notes	You may enter your notes on the security profile.
Owners	You may enter up to eight IDs of administrators. Only the administrators specified here will be allowed to maintain this file security profile or link libraries to it. If no owner is specified, any user of type "Administrator" may maintain and link the security profile. For each owner, the number of co-owners whose countersignatures will be required for maintenance/link permission may optionally be specified in the field after the ID. For an explanation of owners and co-owners, see the section *Countersignatures* .

Creating and Maintaining File Profiles

This section describes the functions used to create and maintain file profiles.

It covers the following topics:

- Invoking File Maintenance
- Selecting a File or DDM for Processing
- Add File
- Copy File
- Modify File
- Delete File
- Display File

- Linking Libraries To Files

Invoking File Maintenance

To invoke file maintenance:

1 On the **Main Menu**, select **Maintenance**.

A window will be displayed.

2 In the window, mark the object type **File** with a character or with the cursor.

The **File Maintenance** selection list will be displayed.

3 From this selection list, you invoke all file maintenance functions as described below.

Selecting a File or DDM for Processing

When you invoke **File Maintenance**, a list of all files that have been defined to Natural Security will be displayed.

If you do not want a list of all existing files but would like only certain files to be listed, you may use the **Start Value** and **Type/Status** options as described in the section *Finding Your Way In Natural Security*.

On the **Main Menu**, select **Maintenance**. A window will be displayed.

In the window, mark the object type **File** with a character or with the cursor (and, if desired, type in a start value and/or file status). The **File Maintenance** selection list will be displayed:

```
12:50:20                    *** Natural Security ***                 2022-09-09
                                - File Maintenance -

 Co File ID                            Status Message
 __ ________________________________ ______ ______________________
 __ ANGLOFILE                          PUBL
 __ AUTOMOBILES                        PUBL
 __ CLIENTES                           PUBL
 __ DELINCUENTES                       PUBL
 __ EMPLEADOS                          PUBL
 __ FAHRZEUGE                          PRIV
 __ FINANCE                            PUBL
 __ IMPUESTOS                          PUBL
 __ INVOICE                            PUBL
 __ MITARBEITER                        PUBL
 __ NAILFILE                           PUBL
 __ NEWFILE                            PUBL
 __ OLDFILE                            PUBL
 __ OTRASCOSAS                         PUBL
 __ PRO-FILE                           PUBL

 Command ===>
 Enter-PF1---PF2---PF3---PF4---PF5---PF6---PF7---PF8---PF9---PF10--PF11--PF12---
       Help        Exit              Flip  -     +                       Canc
```

For each file, the file ID and file status are displayed.

The list can be scrolled as described in the section *Finding Your Way In Natural Security*.

Status as Selection Criterion

If you wish to list only DDMs of a specific status, you can specify one of the following selection criteria in the **Status** field above the list:

PUBL	All DDMs of status PUBLIC.
ACCE	All DDMs of status ACCESS.
PRIV	All DDMs of status PRIVATE.
DEFI	Defined; that is, all DDMs of status PRIV, ACCE, and PUBL (*).
UNDF	Undefined; that is, all DDMs whose status is not PRIV, ACCE or PUBL (*).
DDM	All defined and undefined DDMs (*).
NDDM	DDM security profiles for which no corresponding DDMs exist (*).

* This is not an actual DDM status, but for selection purposes only.

The default status for selection is DDM; that is, *all* DDMs will be listed.

Selecting a Function

The following file maintenance functions are available (possible code abbreviations are underlined):

Code	Function
AD	**Add file**
CO	**Copy file**
MO	**Modify file**
DE	**Delete file**
DI	**Display file**
LL	**Link libraries to file**

To invoke a specific function for a file, mark the file with the appropriate function code in column **Co**.

You may select various files for various functions at the same time; that is, you can mark several files on the screen with a function code. For each file marked, the appropriate processing screen will be displayed. You may then perform for one file after another the selected functions.

Add File

This function is used to define DDMs to Natural Security, that is, create new file security profiles.

To do so:

1 On the **Main Menu**, select **Maintenance**.

A window will be displayed.

2 In the window, mark object type **File** with a character, and enter UNDF in the **Type/Status** field (and, if desired, enter a start value).

The **File Maintenance** selection list will be displayed, listing all files with file status "Undefined" (that is, all DDMs that have been generated but not yet been defined to Natural Security).

The list can be scrolled as described in the section *Finding Your Way In Natural Security*.

3 On the **File Maintenance** selection list, mark the DDM for which you wish to create a file security profile with function code AD.

The **Add File** screen will be displayed.

4 The individual items you may define on this screen and any additional windows that may be part of a file security profile are described under *Components of a File Profile*.

When you add a file, the owners specified in your own user security profile are automatically copied into the file security profile.

Copy File

This function is used to define a new file to Natural Security by creating a security profile which is identical to an already existing file security profile.

- What is Copied?
- How to Copy
- Copying With Links

What is Copied?

All components of the existing file security profile will be copied into the new file security profile - *except*:

- the file number and database ID (these are taken from the DDM),
- the owners (these will be copied from your own user security profile into the new file security profile).

Whether any links are copied depends on whether you choose to copy with or without links (see below).

How to Copy

1. On the **File Maintenance** selection list, mark the file whose security profile you wish to duplicate with function code `CO`.
2. A window will be displayed in which you specify the following:

Field	Explanation
To file	Enter the ID of the new file.
With links	Enter `Y` or `N`. With this option, you can, in addition to the file security profile, also copy its links; see *Copying With Links* below.

3. The **Copy File** screen will be displayed, showing the new file security profile.

   Its components you may define are described under *Components of a File Profile*.

Copying With Links

If you select **With Links = N**, any links of libraries to the existing file will not apply to the new file.

If you select **With Links = Y**, any links of libraries to the existing file are copied for the new file, and you have the option to cancel the links you wish not to apply for the new file. The procedure is as follows:

1. Once you have made any changes to the copied file security profile and then leave the **Copy File** screen by pressing PF3, a list of libraries is displayed: it contains all libraries linked to the existing file.
2. On the list, you may mark individual libraries with CL to cancel any links you wish *not* to apply for the new file. All libraries you do not mark will automatically be linked to the new file in the same manner - read or update link - as the existing file.

Modify File

This function is used to change an existing file security profile.

To do so:

1 On the **File Maintenance** selection list, mark the file whose security profile you wish to change with function code MO.

2 The security profile of the selected file will be displayed.

Its components which you may define or modify are described under *Components of a File Profile*.

Delete File

This function is used to delete an existing file security profile.

To do so:

1 On the **File Maintenance** selection list, mark the file whose security profile you wish to delete with function code DE.

2 The **Delete File** window will be displayed.

- If you decide against deleting the file security profile, leave the window by pressing ENTER without having typed in anything.
- To delete the file security profile, enter the file's ID in the window to confirm the deletion.

When you delete a file, all existing links to the file will also be deleted.

When you delete a file security profile, the DDM itself will not be deleted. The file ID will remain in the **File Maintenance** selection list with the file status set to “Undefined”.

If a DDM is uncataloged in `SYSDDM`, deleted with `SYSMAIN`, or scratched in `SYSDIC` (Predict), the corresponding Natural Security file profile will automatically be deleted.

If you mark more than one file with `DE`, a window will be displayed in which you are asked whether you wish to confirm the deletion of each file security profile by entering the file's ID, or whether all files selected for deletion are to be deleted without this individual confirmation. Be careful not to delete a file accidentally.

Display File

This function is used to display an existing file security profile.

To do so:

1. On the **File Maintenance** selection list, mark the file whose security profile you wish to view with function code `DI`.
2. The security profile of the selected file will be displayed. Its components are described under ***Components of a File Profile***.

Linking Libraries To Files

To allow a library access to a file, a *link* has to be established between the library and the file.

Two functions are available to establish and maintain these links:

- a Library Maintenance function to link *one library* to *one or more files*,
- a File Maintenance function to link *one or more libraries* to *one file*.

Both functions are described below. Possible link types are summarized at the end of this section.

For information on links to private-mode libraries, see ***Private-Mode Libraries*** in the section *Protecting the Natural Development Environment in Eclipse*.

Linking a Single Library to Files

The Library Maintenance function "Link Library to Files" displays a list of files with file status ACCESS and PRIVATE. On the list you mark the files to which you wish to link the given library.

To do so:

1 On the **Library Maintenance** selection list, mark the library you wish to link with function code LF.

2 A window will be displayed, providing the following options:

- **Start value** - You can enter a start value (as described in the section *Finding Your Way in Natural Security*) for the list of files to be displayed.
- **Selection criterion** - N = none: all files will be listed; L = linked: only files to which the library is already linked will be listed; U = unlinked: only files to which the library is not yet linked will be listed.

3 Then the **Link Library To Files** selection list will be displayed, showing the list of files.

The list can be scrolled as described in the section *Finding Your Way In Natural Security*.

In the **Co** column, you may mark each file with one of the following function codes (possible code abbreviations are underlined):

Code	Function
RE	Read-Link - The library thus linked may only read the file, but not update it.
UP	Update-Link - The library thus linked may read and update the file.
CL	Cancel - An existing link will be cancelled.
DI	Display File - The file security profile will be displayed.

You can mark one or more files with a function code.

4 For each file marked, the selected functions will be executed one after another. When processing is completed, a message will be displayed stating the link situation now in effect between the library and each file.

Linking Multiple Libraries to a File

The File Maintenance function “Link Libraries to File” displays a list of libraries that have been defined to Natural Security. On the list you mark the libraries you wish to be linked to the given file.

To do so:

1 On the **File Maintenance** selection list, mark the file to which you wish to link libraries with function code `LL`.

2 A window will be displayed, providing the following options:

- **Start value** - You can enter a start value (as described in the section *Finding Your Way in Natural Security*) for the list of libraries to be displayed.
- **Libraries/Private libraries** - `L` = the list will include either all libraries including private ones (if private libraries are used in public mode) or all libraries except private ones (if private libraries are used in private mode); `U` = the list will include only users' private libraries.
- **Selection criterion** - `N` = none: all libraries will be listed; `L` = linked: only libraries which are already linked to the file will be listed; `U` = unlinked: only libraries which are not yet linked to the file will be listed.

3 Then the **Link Libraries To File** selection list will be displayed, showing the list of libraries.

The list can be scrolled as described in the section *Finding Your Way In Natural Security*.

In the **Co** column, you may mark each library with one of the following function codes (possible code abbreviations are underlined):

Code	Function
`RE`	Read-Link - The library thus linked may only read the file, but not update it.
`UP`	Update-Link - The library thus linked may read and update the file.
`CL`	Cancel - An existing link will be cancelled.
`DI`	Display Library - The library security profile will be displayed.

You can mark one or more libraries with a function code.

4 For each library marked, the selected functions will be executed one after another. When processing is completed, a message will be displayed stating the link situation now in effect between the file and each library.

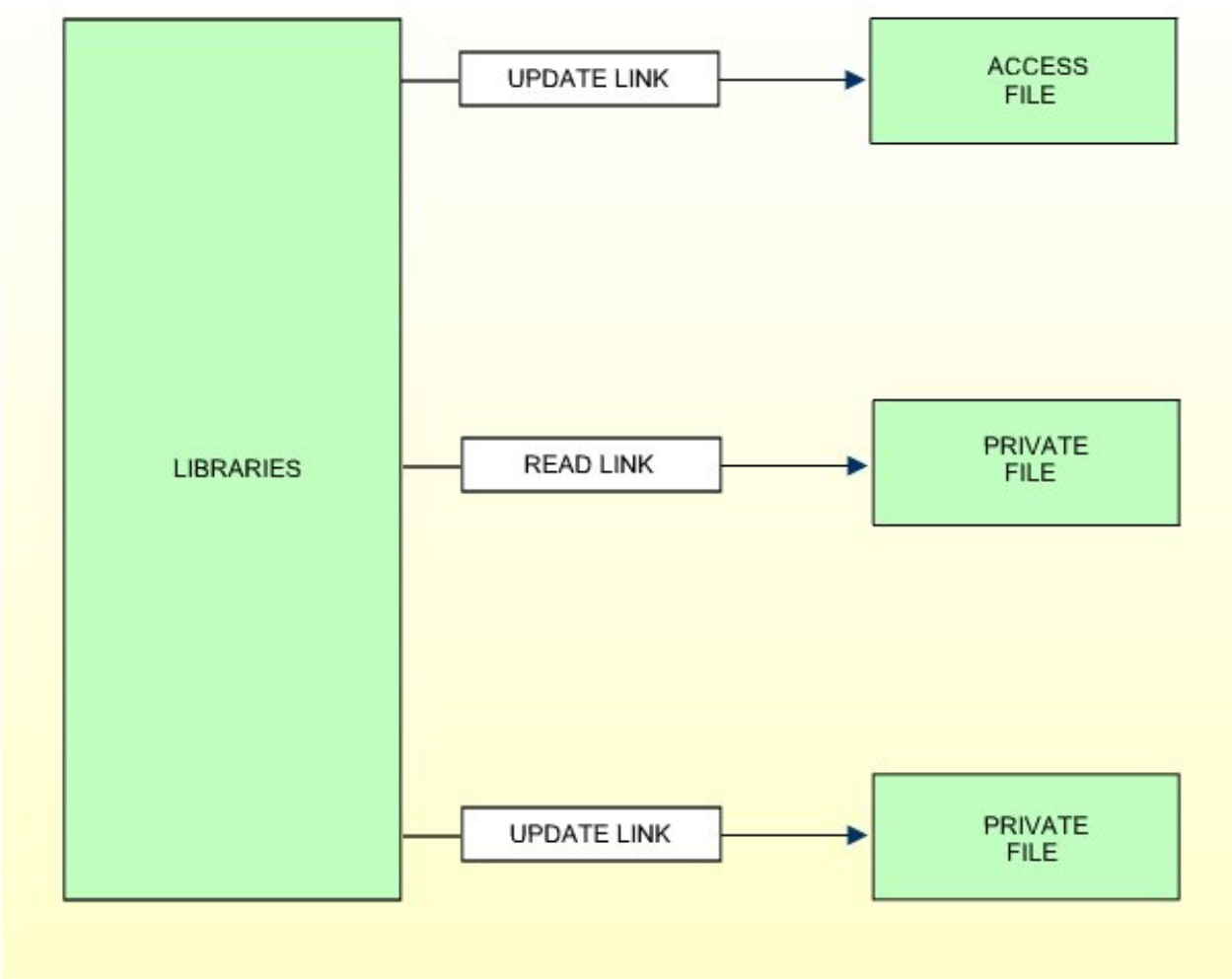
Possible Link Types

A link can only be established to a PRIVATE or ACCESS file. No link is required to read or update a PUBLIC file.

A link to a PRIVATE file can be specified as read-link (`RE`) or update-link (`UP`).

A link to an ACCESS file can only be specified as update-link (`UP`); no link is required to read an ACCESS file.

The following figure shows all possible link types:



13 Protecting DDMs On Linux And Windows

- Specifying a System File as the Central Location for DDMs 224
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- Add DDM Profile 232
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- Linking a Library to a Protected DDM 236

As explained in the section ***Natural Security On Different Platforms***, the protection of DDMs with Natural Security is different on z/OS computers from that on other platforms. This section describes how to control the use of DDMs under *Linux* and *Windows*. The control of DDMs on z/OS computers is described in the section ***Protecting DDMs On z/OS***.

This section covers the following topics:

Specifying a System File as the Central Location for DDMs

With the Natural profile parameter `FDDM` (see Natural *Parameter Reference* documentation), you can specify a system file as the central location on which DDMs are to be stored (outside of libraries). If the `FDDM` parameter is set, DDM security profiles can only be created and maintained for DDMs contained in the library `SYSTEM` on that system file. Existing security profiles/settings/links for DDMs contained in other libraries are not lost, but they are visible within Natural Security and have no effect.

If a central system file for DDMs is specified with the `FDDM` parameter, the protection of Linux and Windows DDMs and the maintenance of their security profiles is performed in the same way as with the File Maintenance functions for z/OS DDMs described in the section ***Protecting DDMs On z/OS***.

If no system file for DDMs is specified with the `FDDM` parameter, DDM protection and maintenance is performed as described below.

Status of a DDM

Before a DDM can be used under Natural Security, its *status* must be defined in Natural Security. This status determines if the DDM can be used, that is, referenced in a database access statement (for example, `READ`, `FIND`, `HISTOGRAM`, `STORE`, `UPDATE`, `DELETE`) within a program.

Note: Program in this context means any type of Natural programming object that can contain database access statements; that is, programs, subprograms, subroutines etc.

A DDM whose status is not defined, cannot be referenced.

For every DDM that is to be used, two status classifications have to be made in Natural Security:

- an *internal status* and
- an *external status*.

Internal Status

The internal status controls the use of the DDM *within* the library in which it is contained.

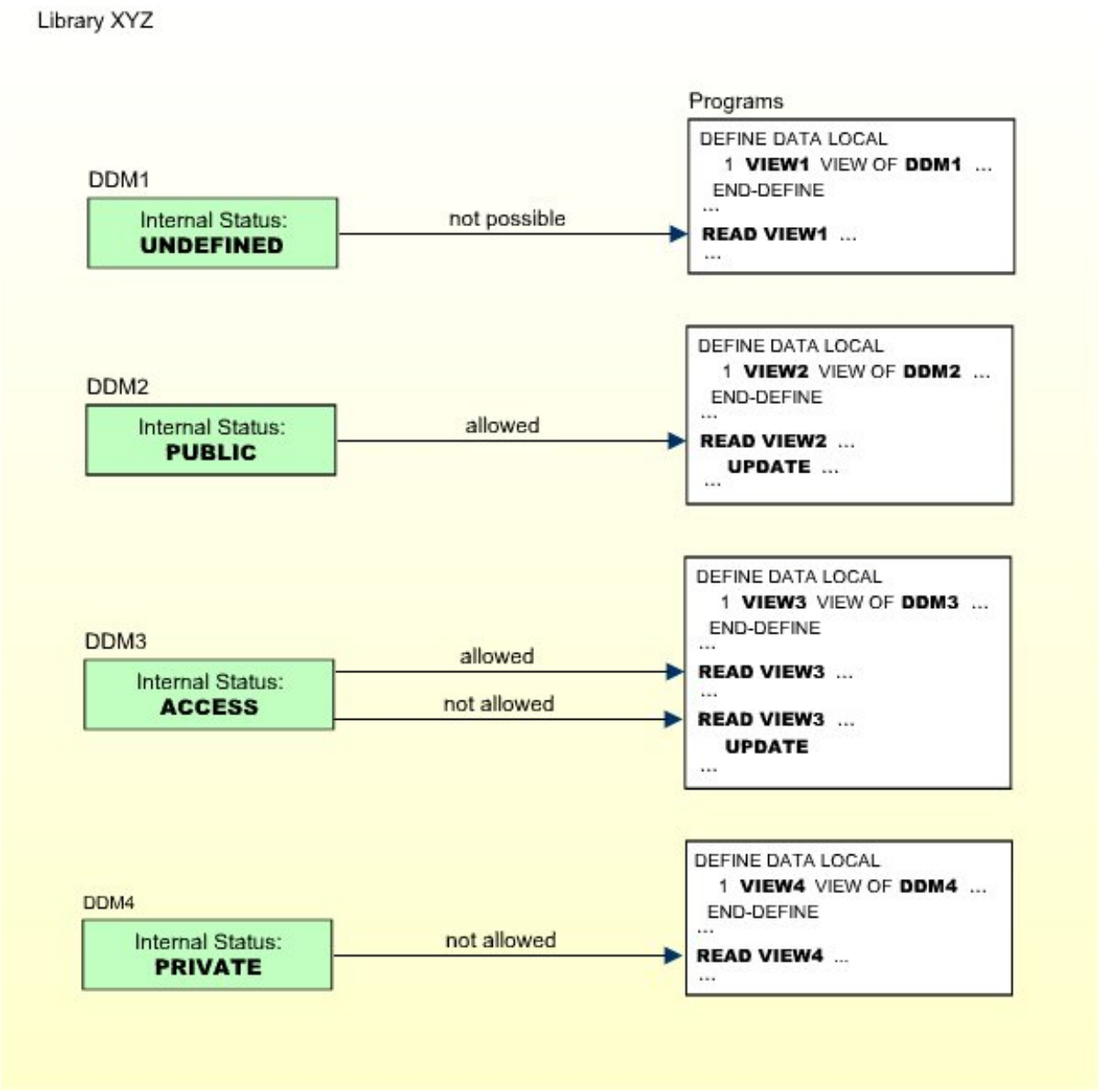
The internal status of a DDM may be one of the following:

PUBLIC	The DDM can be read and updated by all programs within the library.
ACCESS	The DDM can be read, but not updated, by all programs within the library.
PRIVATE	The DDM cannot be used by any program within the library.

The internal status only applies within the library in which the DDM is contained.

The check whether a program may use a DDM is made when the program is *compiled*.

The following diagram shows how the internal status affects the use of a DDM within a library:



External Status

The external status controls the use of the DDM *by other libraries*.

This requires that the library containing the DDM is used as a steplib by these other libraries. Libraries for which the library containing the DDM is not a steplib, cannot use the DDM anyhow.

The external status of a DDM may be one of the following:

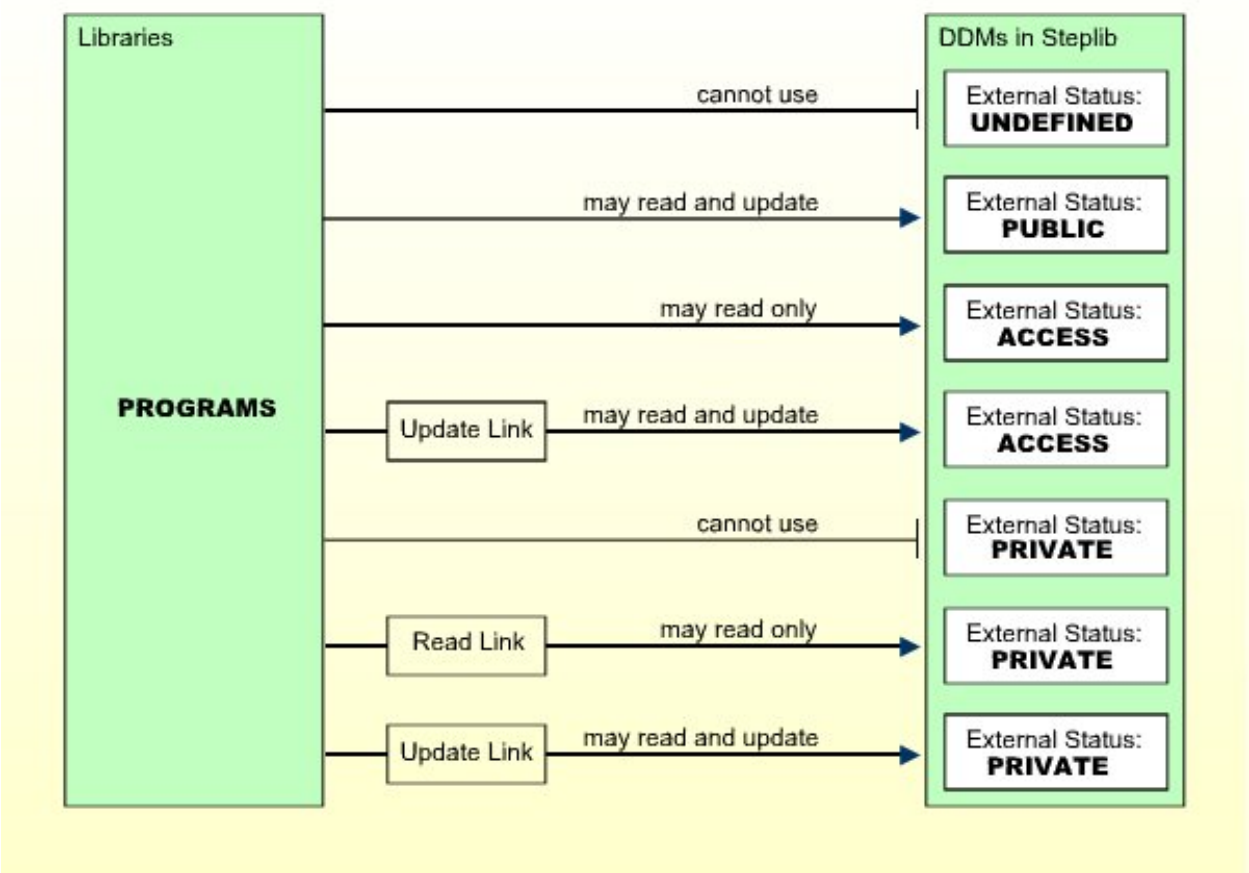
PUBLIC	The DDM is *not* protected. It can be used - that is, read and updated - by any library.
ACCESS	The DDM is protected as far as update is concerned. It can be read by any library. It may, however, be updated only by libraries which have been *linked* to it.
PRIVATE	The DDM is protected. It can be used only by libraries which have been *linked* to it. This *link* may be defined as “read” (that is, read only) or “update” (which implies read).

The external status of a DDM is only relevant if the library that contains the DDM is used as steplib by other libraries.

To allow a library to use a protected DDM in one of the library's steplibs, you have to define a *link* between the library and the DDM.

A link to a DDM whose external status is PRIVATE can be defined as “read link” or “update link”. A link to a DDM whose external status is ACCESS can only be an “update link”.

The possible relationships between libraries and DDMs in a steplib are shown in the following diagram:



Note: A link can only be established to a DDM whose external status is ACCESS or PRIVATE, because no link is required to read or update a DDM whose external status is PUBLIC.

The check whether a program may use a DDM in a steplib is made when the program is *compiled*.

For information on how to link a library to a DDM, see ***Linking a Library to a Protected DDM*** below.

The Initial Status of a DDM

The initial internal and external status of a newly generated DDM depends on the option **Set Status of DDMs**, which is set in the **Restrictions** window of the library security profile (see *Components of a Library Security Profile* in the section *Library Maintenance*).

This option affects all DDMs in the library for which no security profiles have been defined.

By default, this option is set to `UNDF`; that is, both the internal and the external status of a new DDM are undefined to start with. Before a new DDM can be used by any program, you have to create a security profile for it and define its internal and external status in the profile.

If you set the option to `PUBL`, both the internal and external status of all newly generated DDMs are automatically set to PUBLIC. This means that new DDMs can be used by any program within the same library and in libraries that use the library as steplib. If you do not wish to restrict the use of these DDMs, you need not create security profiles for them or make any further security specifications. If you wish to restrict the use of one of these DDMs, you have to define a security profile for it, and in the profile, change the internal and external status as desired.

If you reset the option **Set status of DDMs** from `PUBL` to `UNDF`, the internal and external status of all PUBLIC DDMs without security profiles will be reset to being undefined.

DDM Security Profiles

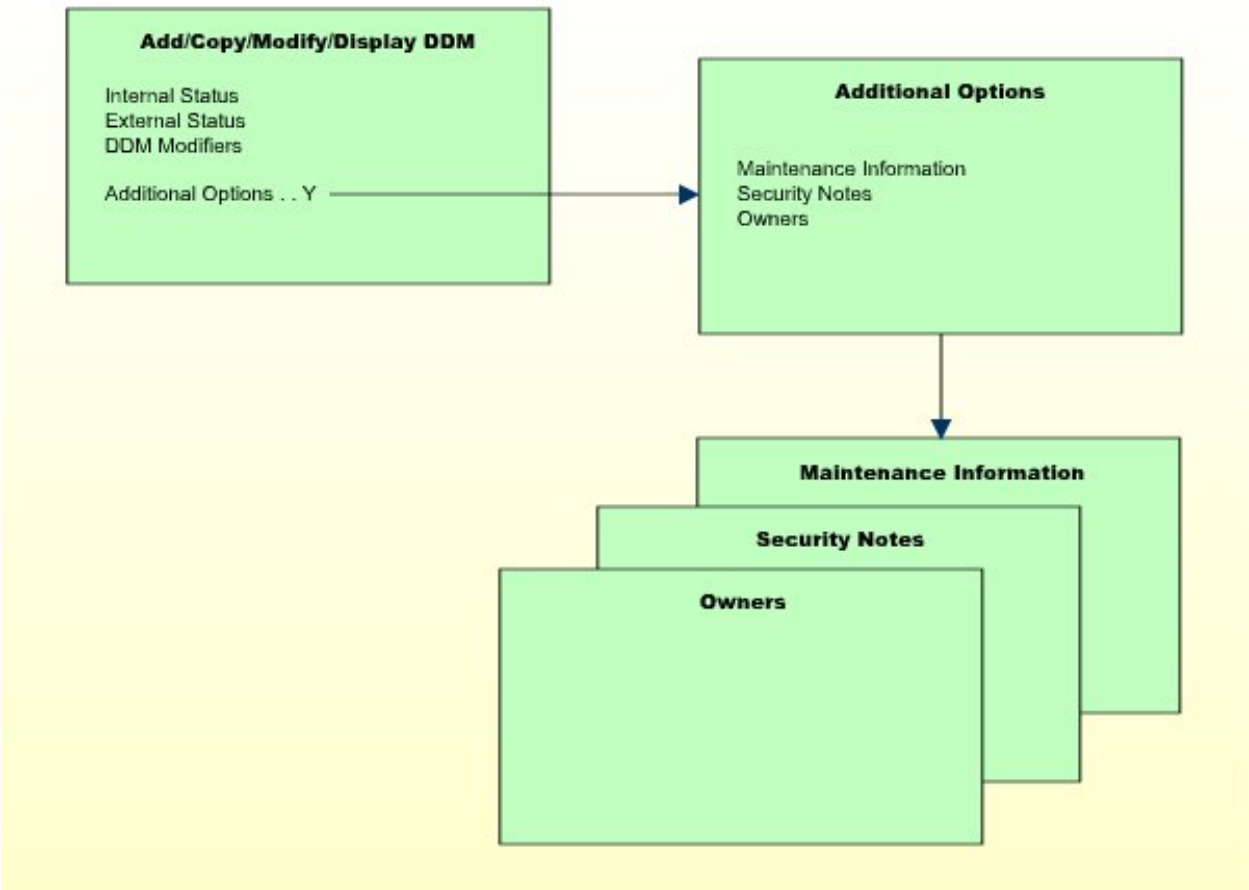
Unless the *initial status* of a DDM is automatically set to PUBLIC (see above), you have to define a security profile for every DDM that is to be used.

Apart from the internal and external status of a DDM, you can also specify some other options in a DDM security profile:

- You can restrict maintenance of the DDM itself to specific users (DDM modifiers).
- You can restrict maintenance of the DDM security profile to specific users (owners).
- You can enter notes on the security profile.

These options are explained below.

Components of a DDM Security Profile



Field	Explanation
DDM Name (display only)	The name under which the DDM was generated.
DBID / FNR (display only)	The database ID and file number of the database file referenced by the DDM.
Internal Status / External Status	See *Status of a DDM* above for an explanation. Possible values are: ■ `PUBL` = PUBLIC ■ `ACCE` = ACCESS ■ `PRIV` = PRIVATE When you create a DDM security profile, the internal and external status will, by default, be set to `PUBL`.

Field	Explanation
DDM Modifiers	You may enter up to eight IDs of users; only these users will then be allowed to maintain the DDM in Predict (or with Natural's DDM Services). If you do not specify any DDM modifier, the owners of the security profile (see *Additional Options* below) may maintain the DDM. If neither DDM modifiers nor owners are specified, maintenance of the DDM is not restricted. Next to the ID of each DDM modifier, you may optionally specify a number from 1 to 3; this number determines how many of the other DDM modifiers specified must countersign for maintenance permission (the countersignature logic which applies to DDM maintenance permission is analogous to that of owners and co-owners; see the section *Countersignatures*).

Additional Options

If you mark the field **Additional Options** on the basic DDM security profile screen with `Y`, a window will be displayed from which you can select the following options:

- Maintenance Information
- Security Notes
- Owners

The options for which something has already been specified or defined are marked with a plus sign (+). You can select one or more items from the window by marking them with any character. For each item selected, an additional window will be displayed:

Additional Option	Explanation
Maintenance Information (display only)	The following information is displayed: ■ the date and time when the security profile was created, the ID of the administrator who created it, and (if applicable) the IDs of the co-owners who countersigned for the creation; ■ the date and time when the security profile was last modified, the ID of the administrator who made the last modification, and (if applicable) the IDs of the co-owners who countersigned for the modification.
Security Notes	You may enter your notes on the security profile.
Owners	You may enter up to eight IDs of administrators. Only the administrators specified here will be allowed to maintain this DDM security profile or link libraries to it. If no owner is specified, any user of type “Administrator” may maintain and link the security profile.

Additional Option	Explanation
	For each owner, the number of co-owners whose countersignatures will be required for maintenance/link permission may optionally be specified in the field after the ID. For an explanation of owner and co-owners, see the section *Countersignatures*.

Creating and Maintaining DDM Security Profiles

Note: If the Natural profile parameter `FDDM` is set, DDM security profiles can only be created and maintain for DDMs contained in the library `SYSTEM`.

To create or maintain DDM security profiles:

1. On the **Library Maintenance** selection list, mark a library with the code `MD` (or, in the case of a private library - if private libraries are used in private mode - you mark the user with the same ID on the **User Maintenance** selection list with the code `MD`).
2. A window will be displayed in which you can enter a start value for the list of DDMs (as described in the section *Finding Your Way In Natural Security*).
3. Then a list of the DDMs contained in the library will be displayed.

   For each DDM, the DDM name, the library ID, and the internal and external status are displayed.

   If a security profile exists for a DDM, this is indicated in column **P**: `X` = Both DDM security profile and corresponding DDM exist; `N` = DDM security profile exists, but no corresponding DDM; *`blank`* = neither DDM security profile nor corresponding DDM exist.

   The list can be scrolled as described in the section *Finding Your Way In Natural Security*.

External Status as Selection Criterion

If you wish to list only DDMs of a specific status, you can specify one of the following selection criteria in the External Status field above the list:

`PUBL`	All DDMs of status PUBLIC.
`ACCE`	All DDMs of status ACCESS.
`PRIV`	All DDMs of status PRIVATE.
`DEFI`	Defined; that is, all DDMs of status `PRIV`, `ACCE`, and `PUBL` (*).

UNDF	Undefined; that is, all DDMs whose status is not PRIV, ACCE or PUBL (*).
DDM	All defined and undefined DDMs (*).
NDDM	DDM security profiles for which no corresponding DDMs exist (*).

* This is not an actual DDM status, but for selection purposes only.

The default status for selection is DDM; that is, *all* DDMs will be listed.

Selecting a Function

From the DDM list, you invoke all functions for creating and maintaining DDM security profiles. The following functions are available (possible code abbreviations are underlined):

Code	Function
AD	**Add DDM Profile**
CO	**Copy DDM Profile**
MO	**Modify DDM Profile**
DE	**Delete DDM Profile**
DI	**Display DDM Profile**
CU	**Copy Profile/Link to All Special Links**

To invoke a specific function for a DDM, mark the DDM with the appropriate function code in column **Co**.

You may select various DDMs for various functions at the same time; that is, you can mark several DDMs on the screen with a function code. For each DDM marked, the appropriate processing screen will be displayed, and you can perform for one DDM after another the selected functions.

Add DDM Profile

With this function, you define a DDM to Natural Security, that is, create a new DDM security profile.

To do so:

1 On the DDM selection list, enter UNDF in the field **Ext. Status**.

Only those DDMs in the library which have not yet been defined to Natural Security will be listed.

The list can be scrolled as described in the section *Finding Your Way In Natural Security*.

2 On the list, mark the DDM for which you wish to create a security profile with function code `AD`.

The **Add DDM** screen will be displayed.

3 The individual items you may define on this screen and any additional windows that may be part of a DDM security profile are described under *Components of a DDM Security Profile*.

When you add a DDM, the owners specified in the security profile of the library in which the DDM is contained are automatically copied into the DDM security profile.

Copy DDM Profile

With this function, you can define a DDM to Natural Security by creating a security profile which is identical to an already existing DDM security profile in the same library.

- What is Copied?
- How to Copy
- Copying With Links

What is Copied?

All components of the existing DDM security profile will be copied into the new DDM security profile - *except*:

- the file number and database ID,
- the owners (the owners will be copied from your own user security profile into the new DDM security profile).

Whether any links are copied depends on whether you choose to copy with or without links (see below).

How to Copy

1. On the DDM selection list, mark the DDM whose security profile you wish to duplicate with function code `CO`.
2. A window will be displayed in which you specify the following:

Field	Explanation
To DDM	Enter the name of the new DDM.
With links	Enter `Y` or `N`. With this option, you can, in addition to the DDM security profile, also copy its links; see *Copying With Links* below.

3. The new DDM security profile will be displayed. Its components which you may define or modify are described under *Components of a DDM Security Profile*.

Copying With Links

If you select **With Links = N**, any links of libraries to the existing DDM will not apply to the new DDM.

If you select **With Links = Y**, any links of libraries to the existing DDM are copied for the new DDM, and you have the option to cancel the links you wish not to apply for the new DDM. The procedure is as follows:

1. Once you have made any changes to the copied DDM security profile and then leave the **Copy DDM** screen by pressing `PF3`, a list of libraries is displayed: it contains all libraries linked to the existing DDM.
2. On the list, you may mark individual libraries with `CL` to cancel any links you wish *not* to apply for the new DDM. All libraries you do not mark will automatically be linked to the new DDM in the same manner - read or update link - as the existing DDM.

Modify DDM Profile

With this function, you can change an existing DDM security profile.

To do so:

1 On the DDM selection list, mark the DDM whose security profile you wish to change with function code `MO`.

2 The DDM security profile will be displayed. Its components which you may define or modify are described under *Components of a DDM Security Profile*.

Delete DDM Profile

With this function, you can delete an existing DDM security profile.

To do so:

1 On the **DDM Maintenance** selection list, mark the DDM you wish to delete with function code `DE`.

2 A window will be displayed.

- If you decide against deleting the DDM security profile, leave the window by pressing ENTER without having typed in anything.
- To delete the DDM security profile, enter the DDM name in the window to confirm the deletion.

When you delete a DDM security profile, all existing links to it will also be deleted.

When you delete a DDM security profile, the DDM itself will not be deleted. The DDM name will remain in the DDM selection list with the internal status set to either `UNDF` (undefined) or `PUBL` (public), depending on the option **Set Status of DDMs** in the library security profile (this option is described in the section *Library Maintenance*).

Note: When a DDM itself is deleted (in Predict, or with Natural's DDM Services or SYSMAIN utility), the corresponding DDM security profile will not be deleted. To list the DDM security profiles without DDMs in a library, you enter `NDDM` as selection criterion for the list of DDM security profiles.

If you mark more than one DDM with `DE`, a window will be displayed in which you are asked whether you wish to confirm the deletion of each DDM security profile by entering the DDM name, or whether all DDM security profiles selected for deletion are to be deleted without this individual confirmation. Be careful not to delete a DDM profile accidentally.

Display DDM Profile

With this function, you can display an existing DDM security profile.

To do so:

1 On the DDM selection list, mark the DDM whose security profile you wish to view with function code `DI`.

2 The DDM security profile will be displayed. Its components are described under *Components of a DDM Security Profile*.

Copy Profile/Link to All Special Links

This function performs the following:

- It copies an existing DDM security profile from this library into the security profiles of all existing special links to the library. This ensures that for this DDM you have the same DDM security profile within the library security profile and all its special-link profiles.
- It copies an existing link between a DDM and a people-protected library, so that the same kind of link (read-link or update-link) is simultaneously established between the DDM and all users who have a special link to that library.

To do so:

- On the DDM selection list, mark the DDM whose link/profile you wish to copy with function code `CU`.

  A message will be displayed stating that it has been copied.

Linking a Library to a Protected DDM

If the Natural profile parameter `FDDM` is not set, you link a library to protected DDMs in a steplib as follows:

1. Invoke the DDM selection list of that library (as described under *Creating and Maintaining DDM Security Profiles*).
2. In the **Library** field above the list, enter an asterisk (*). A window will be displayed listing all steplibs defined for the library.
3. Mark the steplib which contains the DDM(s) to which you wish to link the library. A list of all DDMs in the selected steplib with external status ACCESS and PRIVATE will be displayed. The list can be scrolled as described in the section *Finding Your Way In Natural Security*.
4. In the **Co** column of the list, you mark one or more DDMs with one of the following function codes listed below.

If the Natural profile parameter `FDDM` is set, a library can only be linked to protected DDMs contained in the steplib `SYSTEM`. This is done as follows:

1. Invoke the DDM selection list of that library (as described under *Creating and Maintaining DDM Security Profiles*).

2. A list of all DDMs in the steplib `SYSTEM` with external status ACCESS and PRIVATE will be displayed. The list can be scrolled as described in the section ***Finding Your Way In Natural Security***.
3. In the **Co** column of the list, you mark one or more DDMs with one of the following function codes:

Code	Function
`RE`	Read-Link - The library thus linked may only read the DDM, but not update it.
`UP`	Update-Link - The library thus linked may read and update the DDM.
`CL`	Cancel - An existing link will be cancelled.
`CU`	Copy - An existing link between a DDM and a people-protected library will be copied, so that the same kind of link (read-link or update-link) is simultaneously established between the DDM and all users who have a special link to that library.

A link to a PRIVATE DDM can be specified as read-link (`RE`) or update-link (`UP`). A link to an ACCESS DDMs can only be specified as update-link (`UP`), because no link is required to read an ACCESS DDM.

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This section describes how you can control with Natural Security the use of various Natural utilities.

It covers the following topics:

About Utility Protection

The utility protection provided by Natural Security, as described in this section, is function-oriented, which means that it is based on the concept that you can allow or disallow individual functions of a utility. You control the use of a utility by defining *utility profiles* for it, in which you allow/disallow its functions. The utilities that can be protected in this manner are listed below.

To invoke a Natural utility, you usually enter the utility name as a system command (for example, to invoke the SYSERR utility, you enter the system command `SYSERR`). If a utility is invoked in this way, one of the utility profiles defined for this utility applies and controls the use of the utility - thus providing consistent protection of the utility.

Invoking a utility does not change the library you are currently in; that is, when you exit the utility, you are still in the same library from which you invoked the utility. See also the section *Utility Activation* in the Natural *Utilities* documentation.

To control the use of a utility, you need not define a library security profile for the library which contains the utility. A library security profile for a utility is only relevant if the utility requires access to programs in other libraries (for example, user exits contained in steplibs).

If a library security profile is defined for a library containing a utility, and you log on to a utility library, the same logon rules apply as for a logon to any other library (as described in the section ***Logging On***). From within the utility library, the utility may be invoked either by entering the utility name as system command (as from any other library) or by the startup transaction `MENU` (if defined in the utility's library security profile) being executed. In the latter case, however, a `LOGOFF` command will be performed when you exit the utility.

The utilities SYSERR and SYSMAIN process the contents of libraries; if the use of these utilities is not controlled by utility profiles, the **Utilities** option in the library security profile of the library processed applies.

Which Utilities Can Be Protected?

The use of the following Natural utilities can be controlled with utility profiles:

- **PROFILER**
- **SYSBPM**
- **SYSCP - Code Page Administration**
- **SYSDB2 - Tools for DB2**
- **SYSDDM**
- **SYSERR**
- **SYSMAIN**
- **SYSOBJH - Object Handler**
- **SYSPARM**
- **SYSPCI**
- **SYSRPC**
- **ZIIP**

Utility Profiles

This section covers the following topics:

- Types of Utility Profiles
- Default Utility Profile
- User-Specific Utility Profiles
- Library-Specific Utility Profiles
- User-Library-Specific Utility Profiles
- Which Utility Profile Applies?
- When Does a Utility Profile Take Effect?
- Available System Commands

- Where to Define Profiles

Types of Utility Profiles

Basically, a utility profile consists of a list of the utility's functions, each of which can be allowed or disallowed by marking it with “A” or “D” respectively.

For each utility listed under ***Which Utilities Can Be Protected?*** (see above), you can define:

- a default profile,
- user-specific profiles,
- library-specific profiles,
- user-library-specific profiles.

Each utility is treated individually; that is, any utility profiles only apply to the utility they are defined for, and not to any other utilities.

Note: If the use of a utility is protected by a utility profile, the Natural profile parameter settings `MADIO=0` and `MAXCL=0` apply automatically.

Default Utility Profile

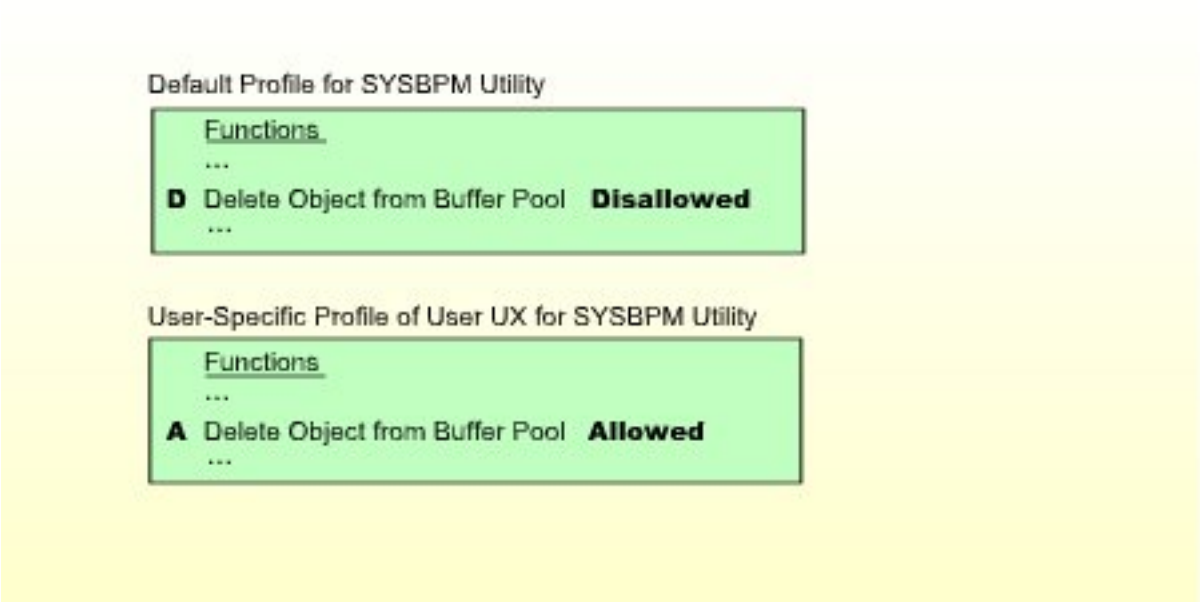
The *default profile* of a utility applies for all users (except those for which user-specific profiles are defined). It determines which of the utility's functions the users may use and which not.

User-Specific Utility Profiles

If an individual user is to use (or not to use) other functions than the other users, you can define a *user-specific utility profile*.

Such a profile only applies to this user, it overrides the default profile, and determines which of the utility's functions this particular user may use and which not.

Example:



In this example, the SYSBPM function **Delete Object from Buffer Pool** is disallowed for all users - except for the user UX, for whom it is allowed. This means that UX is the only user who may delete objects from the buffer pool.

User-specific utility profiles can be defined for users of types “Group”, “Administrator” and “Person”.

A user-specific utility profile can only be defined if a default profile (or a template) has been defined for that utility. (Templates are described under *Defining Default Profiles* below.)

Library-Specific Utility Profiles

Several utilities affect individual Natural libraries (for example, SYSERR can be used to maintain error messages that belong to a specific library). Generally, the utility's default profile applies to all affected libraries.

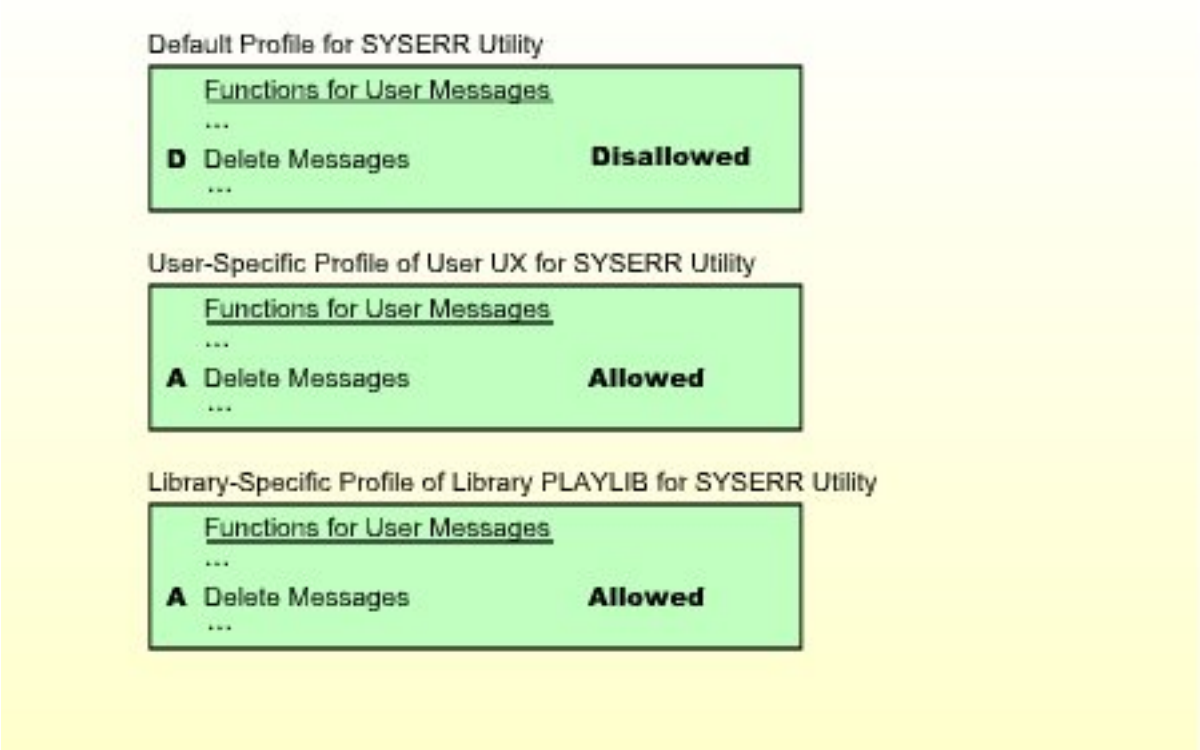
However, if some of the utility's functions are only to be allowed/disallowed for a particular library, you can define a *library-specific utility profile*.

Such a profile only applies to this library, it overrides the default profile as well as any user-specific profiles for that utility, and determines which of the utility's functions may be applied to this library and which not.

Example 1:

In this example, the SYSERR function **Delete messages** is allowed for all libraries - except for the library MYLIB, for which it is disallowed. This means that all users can delete user error messages from any library, except from library MYLIB. No-one can delete messages from MYLIB. (If any user-specific profiles were defined for SYSERR, they would apply to all other libraries, but not to library MYLIB.)

Example 2:



In this example, the SYSERR function **Delete messages** is disallowed for all libraries - except for the library PLAYLIB, for which it is allowed. For the user UX, the function **Delete messages** is allowed for all libraries. This means that all users can delete error messages from library PLAYLIB. However, no user - except user UX - can delete messages from any other library. User UX is the only user who may delete messages from any library (including PLAYLIB). Please note that user UX's permission to delete messages from PLAYLIB depends on the library-specific profile, not the user-specific profile.

Library-specific utility profiles can be defined for the following utilities: SYSBPM, SYSDDM, SYSERR, SYSMAIN, SYSOBJH.

A library-specific utility profile can only be defined if a default profile has been defined for that utility.

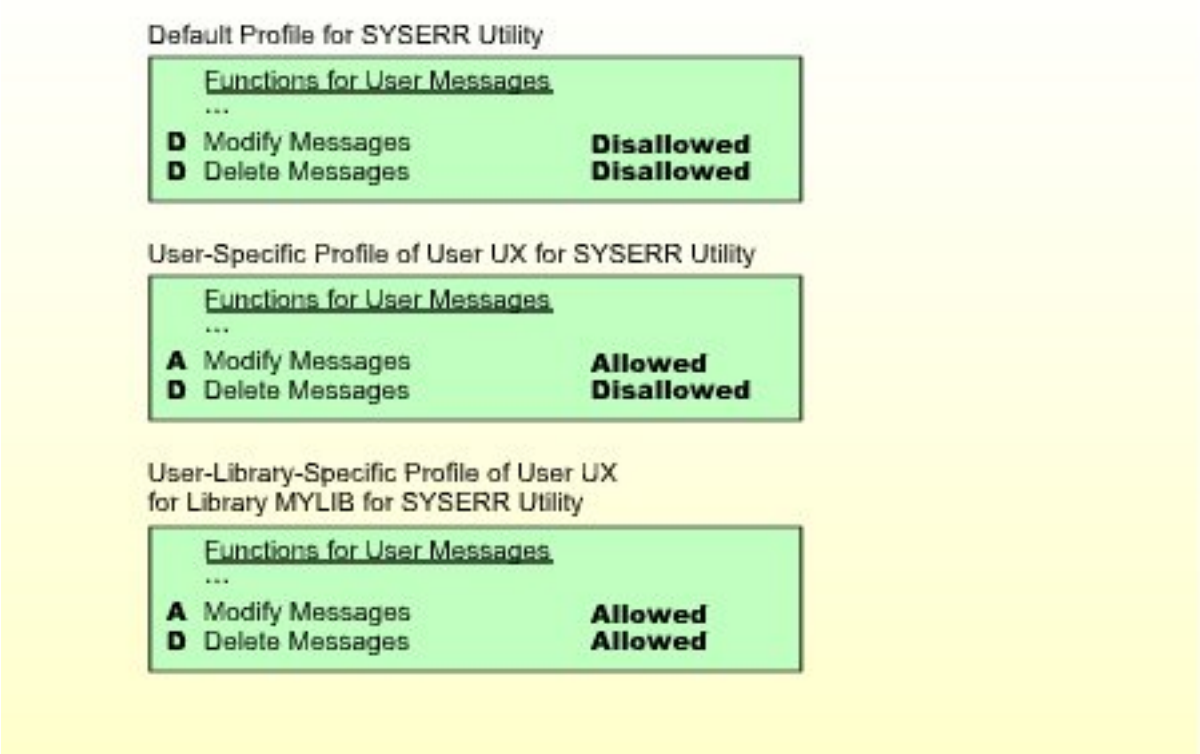
User-Library-Specific Utility Profiles

As described above, several utilities affect individual Natural libraries. Two kinds of situations may occur in which a `user-library-specific utility profile` may have to be defined:

- A *user-specific* utility profile determines which of a utility's functions a particular user may use, regardless of the libraries which are affected by the functions (provided that no *library-specific* profiles are defined for this utility). However, if this user is to have different function usage permissions for a particular library affected by the utility's functions, you can define these in a *user-library-specific* utility profile.
- A *library-specific* utility profile determines which of a utility's functions may be used when applied to a particular library; for this library, it applies for all users (regardless of any *user-specific* profiles). However, if a particular user is to have different function usage permissions for this library, you can define these in a *user-library-specific* utility profile.

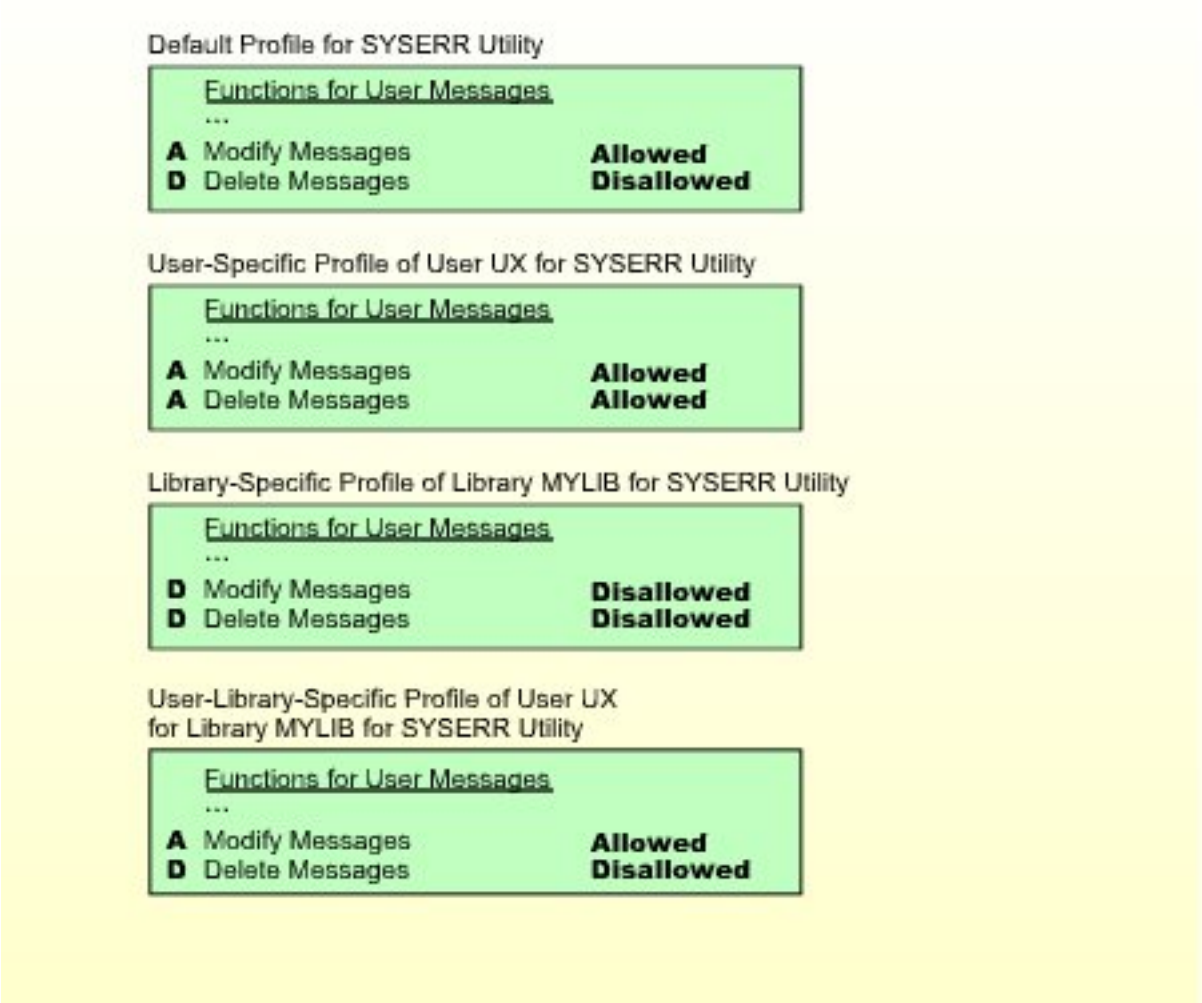
A *user-library-specific* profile only applies for one user and one library, it overrides the library-specific utility profile of that library as well as the user-specific profile of that user, and it determines which of the utility's functions the user may use for this library.

Example 1:



In this example, the SYSERR function **Delete messages** is disallowed for all users (due to the default profile). The SYSERR function **Modify messages** is also disallowed for all users (due to the default profile) - except for user UX, for whom it is allowed (due to his/her user-specific profile). Also, for the user UX both functions are allowed for the library MYLIB (due to the user-library-specific profile). This means that no user can modify or delete any error messages from any library. The only exception is user UX: User UX may modify messages from any library; moreover, user UX may delete messages from library MYLIB (but not from any other library). Please note that user UX's permission to modify messages from MYLIB depends on the user-library-specific profile, not the user-specific profile.

Example 2:



This example results in the following setup:

- Error messages of library MYLIB may only be modified by user UX.
- Error messages of any other library may be modified by any user.
- Error messages of library MYLIB cannot be deleted by any user.
- Error messages of any other library may only be deleted by user UX, but not by any other user.

User-library-specific utility profiles can be defined for the following utilities: SYSBPM, SYSDDM, SYSERR, SYSMAIN, SYSOBJH.

A user-library-specific utility profile can only be defined for a user for which a user-specific utility profile has been defined.

Which Utility Profile Applies?

When a user tries to use a utility function, Natural Security searches for the appropriate utility profile to determine whether the user is allowed to perform the function.

As shown below, you can influence the search sequence with the Session Options **Privileged Groups** and ***GROUP Only**, which can be set in a utility's default profile.

If ***GROUP Only** is set to `N`, Natural Security searches for the following utility profiles in the following order:

1. the *user-library-specific* profile
   a. of the *user* for the library affected (only if the user is of type `A` or `P`);
   b. of a *privileged group* for the library affected (only if **Privileged Groups** is set to `Y`);
   c. of the *current group* in which the user is contained for the library affected;
   d. of *another group* in which the user is contained for the library affected;
2. the *library-specific* profile of the library affected;
3. the *user-specific* profile
   a. of the *user* (only if the user is of type `A` or `P`);
   b. of a *privileged group* (only if **Privileged Groups** is set to `Y`);
   c. of the *current group* in which the user is contained;
   d. of *another group* in which the user is contained;
4. the utility's *default* profile.

If ***GROUP Only** is set to `Y`, Natural Security searches for the following utility profiles in the following order:

1. the *user-library-specific* profile
   a. of the *user* for the library affected (only if the user is of type `A` or `P`);
   b. of the *current group* in which the user is contained for the library affected;
2. the *library-specific* profile of the library affected;
3. the *user-specific* profile
   a. of the *user* (only if the user is of type `A` or `P`);
   b. of the *current group* in which the user is contained;
4. the utility's *default* profile.

For the search, the user and current group are determined by the current values of the Natural system variables `*USER` and `*GROUP` respectively. Privileged groups are the groups which are specified as **Privileged Groups** in the user's security profile; their IDs are processed in the sequence

in which they are specified in the user security profile. IDs of other groups are processed in alphabetical order.

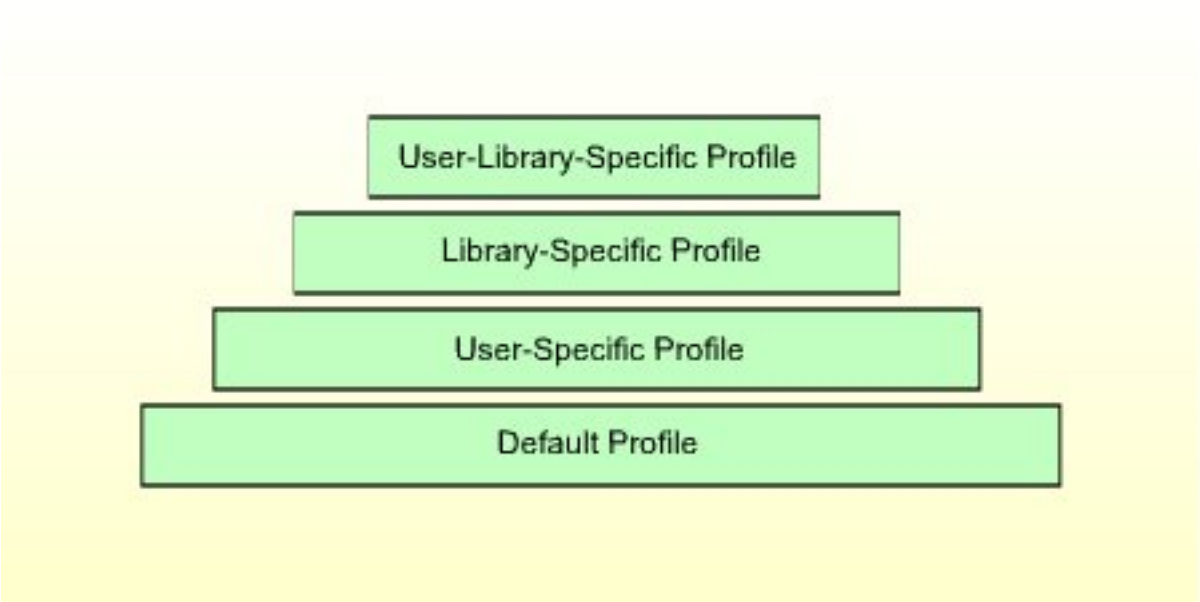
The first profile encountered in this search determines whether the user is allowed to perform the function.

If none of the above profiles exists and the utility function affects the contents of a library, the **Utilities** option in the library security profile applies.

A user may obtain information about the utility profile which currently applies by using the Natural system command `PROFILE` (see also the ***PROFILE Command*** in the section *Protecting Libraries*).

The following diagram shows the hierarchy of the utility profiles.

Hierarchy of Utility Profiles



Example:

Assume the following situation: User UX (user type `A`), who is contained in group GX, wants to copy programming objects with the SYSMAIN utility from library LIB1 to library LIB2.

First, Natural Security checks if the user may copy programming objects with SYSMAIN *from library LIB1*; that is, if the Copy function for Programming Objects is allowed:

1. It checks the *user-library-specific* profile of user UX and library LIB1 for SYSMAIN.
2. If no such profile exists, it checks the *user-library-specific* profile of user GX and library LIB1 for SYSMAIN.
3. If no such profile exists, it checks the *library-specific* profile of library LIB1 for SYSMAIN.
4. If no such profile exists, it checks the *user-specific* profile of user UX for SYSMAIN.
5. If no such profile exists, it checks the *user-specific* profile of user GX for SYSMAIN.
6. If no such profile exists, it checks the *default* profile of SYSMAIN.

Then, Natural Security checks if the user may copy programming objects with SYSMAIN *into library LIB2*; that is, if the Copy function for Programming Objects is allowed:

1. It checks the *user-library-specific* profile of user UX and library LIB2 for SYSMAIN.
2. If no such profile exists, it checks the *user-library-specific* profile of user GX and library LIB2 for SYSMAIN.
3. If no such profile exists, it checks the *library-specific* profile of library LIB2 for SYSMAIN.

4. If no such profile exists, it checks the *user-specific* profile of user UX for SYSMAIN.
5. If no such profile exists, it checks the *user-specific* profile of user GX for SYSMAIN.
6. If no such profile exists, it checks the *default* profile of SYSMAIN.

When Does a Utility Profile Take Effect?

As the various Natural utilities and their functions differ greatly from one another, the time when Natural Security checks whether a user may use a requested utility function differs from utility to utility, and from function to function.

Available System Commands

When a user uses a utility under the control of a utility profile, the only Natural system commands available to the user within the utility are: `FIN`, `LOGON`, `MAIL` and `PROFILE`; all other system commands cannot be used. The reason for this is to preclude any "loopholes" in the protection established by the utility profiles.

Where to Define Profiles

To define *default profiles*, you use the Administrator Services section of Natural Security (as described under ***Defining Default Profiles*** below).

To define *all other utility profiles*, you use the Utility Maintenance section of Natural Security (as described under ***Defining Individual Profiles - Utility Maintenance*** below).

Defining Default Profiles

On the **Main Menu**, select **Administrator Services**.

If you are allowed **access to Administrator Services**, the **Administrator Services Menu 1** will be displayed.

Press PF8.

On the **Administrator Services Menu 2**, select **Utility Defaults/Templates**.

The **Define Utility Defaults/Templates** screen will be displayed, listing all the utilities for which profiles can be defined.

The status of a utility (as indicated in the **Message** field) can be one of the following:

Status	Meaning
Nothing defined	No profile is defined for the utility. If a utility function affects the contents of a library, its use is controlled by the **Utilities** option in the library security profile.
Default defined	A default profile has been defined for the utility. This default profile applies for all users for which no individual user-specific profile is defined. The Utilities option in library security profiles is ignored for this utility.
Template defined	A profile has been defined for the utility. However, this profile can only be used as a template to define individual user-specific utility profiles. If a utility function affects the contents of a library, its use is controlled by the **Utilities** option in the library security profile - except for those users for which a user-specific utility profile is defined.

Whether a default profile is a "real" profile or only a template is determined by the field **Applies as Default Profile** (see below) within the profile.

Caution: To avoid the applicability of utility profiles and the Utilities option in library security profiles getting mixed up, you should always define a default profile (not only a template) for a utility if you intend to define user-specific profiles for that utility.

On the **Define Utility Defaults/Templates** screen, you can mark a utility with one of the following function codes:

Code	Function
AD	Define a default profile or template for the utility.
MO	Modify the utility's existing default profile or template.
DE	Delete the utility's existing default profile or template.
DI	Display the utility's existing default profile or template.

When you mark a utility with code DE, a window will be displayed in which you confirm the deletion by entering the utility name. When you delete a utility's default profile or template, all other profiles for that utility - that is, user-specific, library-specific and user-library-specific utility profiles - will also be deleted.

When you mark a utility with code AD, MO or DI, its default profile or template will be displayed.

The default profile/template for each utility provides several options, which correspond to functions of the utility concerned. The options for each utility are described under *Components of Utility Profiles* below.

You can *allow* or *disallow* each option by marking it with A or D respectively. Initially, all options are disallowed.

With PF16 and PF17, you can set all options in a utility profile simultaneously to A or D respectively.

Note: Natural Security performs consistency checks on the combinations of allowed and disallowed options - impossible combinations of A and D are automatically rejected.

Moreover, each profile provides the following field, which determines whether the profile is a "real" default profile or only a template:

Applies as Default Profile

Y	Default Profile - The profile applies for all users for which no individual utility profile is defined.
N	Template - The profile does not apply for any user. It can only be used as a template for the definition of individual user-specific utility profiles.

Once this field is set to Y and any user-specific or library-specific profiles have been defined for that utility, you *cannot* reset it to N. This is to ensure consistent utility protection.

Defining Individual Profiles - Utility Maintenance

Natural Security's Utility Maintenance is used to perform all functions related to the maintenance of individual utility profiles: user-specific profiles, library-specific profiles and user-library-specific profiles.

The components of an individual profile correspond to those of the corresponding default profile; they are described under ***Components of Utility Profiles*** below.

Note: Owner logic applies to the creation/maintenance of individual utility profiles.

This section covers the following topics related to utility profile creation/maintenance:

- Invoking Utility Maintenance
- Utility Maintenance Functions
- Adding a User-Specific Utility Profile
- Modifying/Displaying a User-Specific Utility Profile
- Deleting a User-Specific Utility Profile
- Adding a Library-Specific Utility
- Modifying/Displaying a Library-Specific Utility Profile
- Deleting a Library-Specific Utility Profile
- Adding a User-Library-Specific Utility Profile
- Modifying/Displaying a User-Library-Specific Utility Profile

- Deleting a User-Library-Specific Utility Profile

Invoking Utility Maintenance

To invoke utility maintenance:

1 On the **Main Menu**, select **Maintenance**.

A window will be displayed.

2 In the window, mark the object type **Utility** with a character or with the cursor.

The **Utility Maintenance** selection list will be displayed.

It shows all utilities for which either a default profile or a template has been defined. For each utility, the following information is displayed:

Field	Explanation
Default	Indicates whether a default profile has been defined for this utility (`YES/NO`). `NO` means that only a template has been defined.
User	Indicates whether any user-specific profiles exist for this utility (`YES/NO`).
Library	Indicates whether any library-specific profiles exist for this utility (`YES/NO`).
User-Lib.	Indicates whether any user-library-specific profiles exist for this utility (`YES/NO`).

Utility Maintenance Functions

From the **Utility Maintenance** selection list, you invoke all functions for the creation, modification, deletion and display of individual utility profiles.

The following functions are available:

Code	Function
DD	Display default profile or template. This function displays the default profile (or the template) defined for a utility.
Functions for *user-specific* utility profiles:	
DU	Display user-specific profiles. This function displays a list of existing user-specific profiles for a utility. From the list, you can select the profiles to be displayed.
AU	Add or maintain user-specific profiles. This function displays a list of users (of types A, P and G). From the list, you can select the users for which you wish to define user-specific profiles for a utility.

Code	Function
MU	Maintain user-specific profiles. This function displays a list of existing user-specific profiles for a utility. From the list, you can select the profiles to be maintained.
Functions for *library-specific* utility profiles:	
DL	Display library-specific profiles. This function displays a list of existing library-specific profiles for a utility. From the list, you can select the profiles to be displayed.
AL	Add or maintain library-specific profiles. This function displays a list of libraries. From the list, you can select the libraries for which you wish to define library-specific utility profiles.
ML	Maintain library-specific profiles. This function displays a list of existing library-specific profiles for a utility. From the list, you can select the profiles to be maintained.
Functions for *user-library-specific* utility profiles:	
DX	Display user-library-specific profiles. This function displays a list of existing user-library-specific profiles of a specific user for a utility. From the list, you can select the profiles to be displayed.
AX	Add or maintain user-library-specific profiles. This function displays a list of libraries. From the list, you can select the libraries for which you wish to define user-library-specific utility profiles for a specific user.
MX	Maintain user-library-specific profiles. This function displays a list of existing user-library-specific profiles of a specific user for a utility. From the list, you can select the profiles to be maintained.

Add or Maintain or Maintain

The “Add or Maintain” functions (codes `AU`, `AL`, `AX`) display lists of all users/libraries, comprising those for which utility profiles exist as well as those for which no utility profiles have been defined. They allow you to add new utility profiles as well as modify, delete and display existing utility profiles.

The “Maintain” functions (codes `MU`, `ML`, `MX`) display lists of only those users/libraries for which utilities profiles exist. They allow you to modify, delete and display existing utility profiles.

You can “switch” directly from “Add or Maintain” to “Maintain” by reducing the displayed list from a list of all users/libraries to a list of only those with existing profiles. To do so, you mark with `X` the selection criterion field `U` (user-specific profile exists), `L` (library-specific profile exists), or `U-L` (user-library-specific profile exists) respectively in the heading of the list.

However, if you know beforehand that you are going to only maintain existing profiles but not add any new ones, it is recommended (for better performance) that you directly use codes MU, ML and MX respectively.

Start Values

Each of the functions listed displays a list of items (users, libraries, profiles). When you invoke a function, a window will be displayed in which you can enter a start value for the list of items to be displayed.

For functions related to *user-library-specific* profiles, the ID of the user whose user-library-specific profiles are to be listed must also be specified in the start value window.

Subfunctions

When you invoke one of the functions listed, you get a list of items (users, libraries or utility profiles).

On this list, you mark one or more items with a code to invoke a subfunction to be performed on the item.

The available subfunctions (Add, Modify, etc.) differ depending on the function invoked.

For a list of available subfunctions, you enter a question mark (?) in the field **Co**.

Information Displayed

Add/Maintain/Display User-Specific Utility Profiles

On the selection list of users displayed with function codes AU, DU and MU, the following information is displayed for each user:

Type	Indicates the user type (A, P or G).
U	An X indicates that the user has a user-specific profile for this utility.
U-L	An X indicates that the user has one or more user-library-specific profiles for this utility.

Add/Maintain/Display Library-Specific Utility Profiles

On the selection list of libraries displayed with function codes AL, DL and ML, the following information is displayed for each library:

Prot.	Indicates the "people-protected" and "terminal-protected" settings as defined in the library security profile.
Link	(empty)
L	An `X` indicates that the library has a library-specific profile for this utility.
U	An `X` indicates that the library has one or more user-library-specific profiles for this utility.

Add/Maintain/Display User-Library-Specific Utility Profiles

On the selection list of libraries displayed with function codes `AX`, `DX` and `MX`, the following information is displayed for each library:

Prot.	Indicates the "people-protected" and "terminal-protected" settings as defined in the library security profile.
Link	Indicates whether the user is linked to the library (`LK` = normal link, `SL` = special link).
U-L	An `X` indicates that the user has a user-library-specific profile for this library for this utility.
L	An `X` indicates that the library has a library-specific profile for this utility.

Adding a User-Specific Utility Profile

A user-specific utility profile can only be defined for a utility for which either a *default profile* or a *template* exists.

To add a user-specific utility profile:

1 Mark the desired utility on the **Utility Maintenance** selection list with `AU`.

A window will be displayed in which you can enter a start value for the list of users to be displayed. Then a list of users (of types A, P and G) will be displayed.

2 On that list, mark the desired user with `AD`.

The user-specific profile for the utility will be displayed for you to define.

The options you can allow or disallow within the profile are the same as in the corresponding default profile or template (see ***Components of Utility Profiles*** below).

The initial "allowed/disallowed" settings in the user-specific profile are taken from the default profile or the template.

Modifying/Displaying a User-Specific Utility Profile

To modify or display a user-specific utility profile:

1 Mark the desired utility on the **Utility Maintenance** selection list with `MU` or `DU` respectively.

A window will be displayed in which you can enter a start value for the list of user-specific profiles to be displayed. Then a list of existing user-specific profiles for the selected utility will be displayed.

2 On that list, mark the desired profile with `MO` (modify) or `DU` (display) respectively.

The profile will be displayed for modification/display.

The options in the profile are the same as in the corresponding default profile or template (see *Components of Utility Profiles* below).

Deleting a User-Specific Utility Profile

To delete a user-specific utility profile:

1 Mark the desired utility on the **Utility Maintenance** selection list with `MU`.

A window will be displayed in which you can enter a start value for the list of user-specific profiles to be displayed. Then a list of existing user-specific profiles for the selected utility will be displayed.

2 On that list, mark the desired profile with `DE`.

3 A window will be displayed in which you confirm the deletion.

When you delete a user-specific utility profile, all *user-library-specific* utility profiles for this user for this utility will also be deleted.

Adding a Library-Specific Utility

A library-specific utility profile can only be defined for a utility for which a *`default profile`* (not only a template) has been defined.

To add a library-specific utility profile:

1 Mark the desired utility on the **Utility Maintenance** selection list with `AL`.

A window will be displayed in which you can enter a start value for the list of libraries to be displayed. Then a list of libraries will be displayed.

2 On that list, mark the desired library with `AD`.

The library-specific profile for the utility will be displayed for you to define.

The options you can allow or disallow within the profile are the same as in the corresponding default profile (see *Components of Utility Profiles* below).

The initial "allowed/disallowed" settings in the library-specific profile are taken from the default profile.

Modifying/Displaying a Library-Specific Utility Profile

To modify or display a library-specific utility profile:

1. Mark the desired utility on the **Utility Maintenance** selection list with `ML` or `DL` respectively.

   A window will be displayed in which you can enter a start value for the list of library-specific profiles to be displayed. Then a list of existing library-specific profiles for the selected utility will be displayed.

2. On that list, mark the desired profile with `MO` (modify) or `DL` (display) respectively.

   The profile will be displayed for modification/display.

The options in the profile are the same as in the corresponding default profile (see *Components of Utility Profiles* below).

Deleting a Library-Specific Utility Profile

To delete a library-specific utility profile:

1. Mark the desired utility on the **Utility Maintenance** selection list with `ML`.

   A window will be displayed in which you can enter a start value for the list of library-specific profiles to be displayed. Then a list of existing library-specific profiles for the selected utility will be displayed.

2. On that list, mark the desired profile with `DE`.
3. A window will be displayed in which you confirm the deletion.

Adding a User-Library-Specific Utility Profile

A user-library-specific utility profile can only be defined for a user for which a *user-specific profile* for that utility exists.

To add a library-specific utility profile:

1 Mark the desired utility on the **Utility Maintenance** selection list with `AX`.

A window will be displayed in which you enter the ID of the user for whom a user-library-specific profile is to be defined; also, you can enter a start value for the list of libraries to be displayed. Then a list of libraries will be displayed.

2 On that list, mark the desired library with `AD`.

The user-library-specific profile for the specified user for this library will be displayed for you to define.

The options you can allow or disallow within the profile are the same as in the corresponding default profile (see ***Components of Utility Profiles*** below).

The initial "allowed/disallowed" settings in the user-library-specific profile are taken from the corresponding library-specific profile; if no such profile exists, they are taken from the corresponding user-specific profile.

Modifying/Displaying a User-Library-Specific Utility Profile

To modify or display a library-specific utility profile:

1 Mark the desired utility on the **Utility Maintenance** selection list with `MX` or `DX` respectively.

A window will be displayed in which you enter the ID of the user whose user-library-specific profile(s) are to be listed; also, you can enter a start value for the list of profiles to be displayed. Then a list of existing user-library-specific profiles of the specified user for the selected utility will be displayed.

2 On that list, mark the desired profile with `MO` (modify) or `DX` (display) respectively.

The profile will be displayed for modification/display.

The options in the profile are the same as in the corresponding default profile (see ***Components of Utility Profiles*** below).

Deleting a User-Library-Specific Utility Profile

To delete a user-library-specific utility profile:

1 Mark the desired utility on the **Utility Maintenance** selection list with `MX`.

A window will be displayed in which you enter the ID of the user whose user-library-specific profile(s) are to be listed; also, you can enter a start value for the list of profiles to be displayed. Then a list of existing user-library-specific profiles of the specified user for the selected utility will be displayed.

2 On that list, mark the desired profile with `DE`.

3 A window will be displayed in which you confirm the deletion.

Components of Utility Profiles

A utility profile provides several options which correspond to the functions of the utility concerned. These options are the same in every profile related to that utility: default profile, user-specific, library-specific and user-library-specific profiles.

The individual options are described below for each utility:

- PROFILER Utility Profiles
- SYSBPM Utility Profiles
- SYSCP - Code Page Administration - Utility Profiles
- SYSDB2 - Tools for DB2 - Utility Profiles
- SYSDDM Utility Profiles
- SYSERR Utility Profiles
- SYSMAIN Utility Profiles
- SYSOBJH - Object Handler - Utility Profiles
- SYSPARM Utility Profiles
- SYSPCI Utility Profiles
- SYSRPC Utility Profiles
- ZIIP Utility Profiles

- Additional Options

PROFILER Utility Profiles

The profiles for the PROFILER utility provide several options. Each option corresponds to the PROFILER function of the same name. By allowing/disallowing an option you determine whether the user may use the corresponding function.

SYSBPM Utility Profiles

The SYSBPM utility is only available with Natural on z/OS computers.

The profiles for the SYSBPM utility provide several options. Each option corresponds to the SYSBPM function/command of the same name. By allowing/disallowing an option you determine whether the user may use the corresponding function/command.

SYSCP - Code Page Administration - Utility Profiles

The profiles for the SYSCP utility (Natural Code Page Administration) provide several options. Each option corresponds to the Natural Code Page Administration function of the same name. By allowing/disallowing an option you determine whether the user may use the corresponding function.

SYSDB2 - Tools for DB2 - Utility Profiles

The SYSDB2 utility (Natural Tools for DB2) is only available with Natural on z/OS computers.

The profiles for the SYSDB2 utility provide several options. Each option corresponds to the Natural Tools for DB2 function/command of the same name. By allowing/disallowing an option you determine whether the user may use the corresponding function/command.

SYSDDM Utility Profiles

The SYSDDM utility is only available with Natural on z/OS computers and Linux (on Linux it is called “DDM Services”).

The profiles for the SYSDDM utility provide several options. Each option corresponds to the SYSDDM function of the same name. By allowing/disallowing an option you determine whether the user may use the corresponding function.

SYSERR Utility Profiles

The profiles for the SYSERR utility provide the following options:

Option	Explanation
Add New Messages	Determine whether the user may use the SYSERR functions of the same names.
Delete Messages	
Display Messages	
Modify Messages	
Print Messages	
Scan in Messages	
Select Messages from a List	
Translate Messages into Another Language	

You can allow/disallow these options separately for:

- user messages (PF7),
- Natural system messages (PF8).

In addition, by pressing PF8 again, you can allow/disallow the use of the following SYSERR direct commands:

Command	Explanation
EXPORT	Possible values for each command: ■ A = Command is allowed for all users. ■ R = Command is restricted: it is allowed for Natural Security administrators only. ■ D = Command is disallowed for all users.
IMPORT	
LAYOUT	
NEXT	
RESTART	
SAMPLE	
SHIFT	
TRACE	
USER	

SYSMAIN Utility Profiles

As the SYSMAIN utility is not identical on all platforms, some SYSMAIN options/functions may not be available on some platforms.

The SYSMAIN utility can be invoked in two ways:

- with the command `SYSMAIN`,
- via the application programming interface `MAINUSER`.

By default, utility profiles defined for the SYSMAIN utility apply to both ways. However, it is possible to define a separate set of utility profiles which control the use of SYSMAIN functions when invoked via `MAINUSER`. See **MAINUSER API** under *Additional Options* below for details.

The profiles for the SYSMAIN utility provide the following options:

Option	Explanation
Programming Objects	This general setting in the first column of the screen determines whether the user may use SYSMAIN at all for this type of object. If this is set to `D` (disallowed), all subordinate function specifications for this object type must also be set to `D`.
Debug Environments	
User Messages	
DDMs	
Natural Messages	
Profiles	
Rules	
Resources	
Predict Sets (on z/OS only)	

In addition, you can allow/disallow the following functions for each object type individually:

Option	Determines whether the user may use:
Co	The SYSMAIN function `COPY` for this type of object.
De	The SYSMAIN function `DELETE` for this type of object.
Fi	The SYSMAIN function `FIND` for this type of object.
Im	The SYSMAIN function `IMPORT` for this type of object.
Li	The SYSMAIN function `LIST` for this type of object.
Mo	The SYSMAIN function `MOVE` for this type of object.
Ren	The SYSMAIN function `RENAME` for this type of object.
Rep	The SYSMAIN function `REPLACE` for this type of object.
FNAT	The SYSMAIN function `SET FNAT` for this type of object.
FSEC	The SYSMAIN function `SET FSEC` for this type of object. (*)
FDIC	The SYSMAIN function `SET FDIC` for this type of object. (*)

(*) These options can be set in the default profile and in user-specific profiles, but not in library-specific or user-library-specific profiles.

SYSOBJH - Object Handler - Utility Profiles

The profiles for the SYSOBJH utility (Natural Object Handler) provide the following options:

Option	Explanation
Unload	Determine whether the user may use the Object Handler functions of the same names.
UnDeLi	
Load	
Delete	
Scan	

In addition, you can allow/disallow the above functions for each object type individually:

Option	Determines whether the function may be applied to:
Nat	Natural programming objects.
Err	Error messages.
CPr	Command processors.
NRe	Natural-related objects.
Ext	External objects.
FDT	Adabas FDTs.
MfD	z/OS DDMs.
MfR	Mainframe-related objects.
App	Applications.
Further Function-Related Options	
Del (*)	This option determines whether the Object Handler parameter `DELETEALLOWED` may be specified for the function.
Par (*)	This option determines whether Object Handler parameters may be specified for the function.
Rep	This option determines whether the Object Handler parameter `REPLACE` may be specified for the function.

(*) These options can only be set in user-specific profiles; their settings in the user-specific profiles also apply to the library-specific and user-library-specific profiles.

Note: In library-specific and user-library-specific profiles, options applying to object types which are not library-related cannot be allowed/disallowed.

Also, the profiles for SYSOBJH provide the following general options:

Option	Explanation
Admin	Determines whether the user may use the **Admin** section of the Object Handler.
FSEC	Determines whether the user may specify the Object Handler parameters of the same names.
FDIC	
Transfer only	■ Y = Only the transfer format may be used (processes only sources). ■ N = Transfer and internal formats may be used (processes sources and cataloged objects).

In the profiles for SYSOBJH, you can also allow/disallow the following Object Handler direct commands:

Command	Explanation
Navigation Commands:	
GO	Determine whether the user may use the Object Handler direct commands of the same names.
- GO HOME	
- GO UNLOAD	
- GO LOAD	
- GO SCAN	
- GO RESTART	
- GO ADMIN	
- GO VIEW	
- GO FIND	
Configuration Commands:	
SET	Determine whether the user may use the Object Handler direct commands of the same names.
- SET TRACE ON	
- SET TRACE WORKFILE	
- SET TRACEFILE	
- SET FREE ON/OFF	
- SET EXECUTIONMSG ON/OFF	
- SET ADVANCEDCMD ON/OFF	
Show Commands:	
SHOW	Determine whether the user may use the Object Handler direct commands of the same names.
- SHOW LAST RESULT	
- SHOW LAST MESSAGE	
- SHOW PROFILE	
- SHOW REPORT	
- SHOW STATUS	
- SHOW TRACE	

Command	Explanation
Other Commands:	
CHANGE WORKPLAN LIBRARY	Determine whether the user may use the Object Handler direct commands of the same names.
CLEAR	
INIT	
READ PROFILE (*)	
SETTINGS	

(*) The use of this command also depends on the user-profile option **Profile Maintenance** (described in the section *User Maintenance*).

SYSPARM Utility Profiles

The SYSPARM utility is only available with Natural on z/OS computers.

The profiles for the SYSPARM utility provide several options. Each option corresponds to the SYSPARM function of the same name. By allowing/disallowing an option you determine whether the user may use the corresponding function.

SYSPCI Utility Profiles

The SYSPCI utility is only available with Natural on Linux and Windows.

The profiles for the SYSPCI utility provide several options. Each option corresponds to the SYSPCI function of the same name. By allowing/disallowing an option you determine whether the user may use the corresponding function.

SYSRPC Utility Profiles

The profiles for the SYSRPC utility provide several options. Each option corresponds to the SYSRPC function of the same name. By allowing/disallowing an option you determine whether the user may use the corresponding function.

ZIIP Utility Profiles

ZIIP is in fact a Natural system command. Due to its complexity, however, Natural Security handles it like a utility. ZIIP is only available with Natural on z/OS computers.

The utility profiles for ZIIP provide several options. Each option corresponds to the ZIIP function of the same name. By allowing/disallowing an option you determine whether the user may use the corresponding function.

Additional Options

The following Additional Options are part of the default security profiles of all utilities. They can only be set in the *default* profiles, but not in individual user-specific, library-specific or user-library-specific profiles. For each utility, the Additional Options settings apply to all utility profiles related to that utility.

If you press PF4 on a basic utility default profile screen, a window will be displayed from which you can select the following options:

- Maintenance Information
- Security Notes
- Owners
- Session Options

The options for which something has already been specified or defined are marked with a plus sign (+).

You can select one or more items from the window by marking them with any character. For each item selected, an additional window will be displayed:

Additional Option	Explanation
Maintenance Information (display only)	In this window, the following information is displayed: ■ the date and time when the security profile was created, the ID of the administrator who created it, and (if applicable) the IDs of the co-owners who countersigned for the creation; ■ the date and time when the security profile was last modified, the ID of the administrator who made the last modification, and (if applicable) the IDs of the co-owners who countersigned for the modification.
Security Notes	In this window, you may enter your notes on the security profile.
Owners	In this window, you may enter up to eight IDs of administrators. Only the administrators specified here will be allowed to maintain this utility security profile. If no owner is specified, any user of type “Administrator” may maintain the security profile. For each owner, the number of co-owners whose countersignatures will be required for maintenance permission may optionally be specified in the field after the ID. For an explanation of owners and co-owners, see the section *Countersignatures*.
Session Options	See below.

Session Options

If you mark **Session Options** in the **Additional Options** window with any character, the **Session Options** window will be displayed, where you can set the following options:

Option	Explanation
Access Recorded	This option determines whether users' access to the utility is to be recorded or not. ■ `Y` = Every time a user invokes the utility, a record will be written by Natural Security. You may review the use of the utilities by viewing these access records (see ***Logon Records*** in the section *Administrator Services* for further information). ■ `N` = Access to the utility is not recorded.
Privileged Groups	With this option, you can influence the order in which Natural Security searches for the appropriate utility profile to apply. It determines whether or not utility profiles defined for groups which are specified as **Privileged Groups** in a user security profile are part of the search order. See the section ***Which Utility Profile Applies?***. ■ `Y` = User-library-specific and user-specific profiles of privileged groups are part of the search order. ■ `N` = Privileged groups have no influence on the search order. If the option ***GROUP Only** (see below) is set to `Y`, this option must be set to `N`.
*GROUP Only	With this option, you can influence the order in which Natural Security searches for the appropriate utility profile to apply: ■ `Y` = User-library-specific and user-specific profiles of the current group (as determined by the value of the Natural system variable `*GROUP`) are part of the search order, but those of any other group in which the user is contained are not. ■ `N` = User-library-specific and user-specific profiles of *all* groups in which the user is contained are part of the search order. See the section ***Which Utility Profile Applies?*** for details. If this option is set to `Y`, the option **Privileged Groups** (see above) must be set to `N`.
MAINUSER API	This option is only available for the SYSMAIN utility. It controls the use of SYSMAIN functions invoked via the application programming interface (API) `MAINUSER`. If you set this option to `Y`, a separate entry named MAINUSER will be created on the **Define Utility Defaults/Templates** screen. With this, you can create a separate set of utility profiles to allow/disallow the use of SYSMAIN functions when invoked via the MAINUSER API. These profiles are independent of the "normal" SYSMAIN utility profiles which control the use SYSMAIN functions when invoked via the `SYSMAIN` command. The components of the MAINUSER utility profiles are the same as those of the **SYSMAIN utility profiles**.
Utilities option	This option is only available for the utilities SYSMAIN and SYSOBJH. It can be used to apply the **Utilities** option in library security profiles to these utilities.

Option	Explanation
	■ Y = The **Utilities** option in a library security profile determines who may use SYSMAIN/SYSOBJH to process the contents of the library. ■ O = Same as Y. In addition, if the **Utilities** option in a library security profile is set to O and an owner requires a countersignature, the countersignature prompt will be suppressed; instead, the library will be excluded from SYSMAIN/SYSOBJH processing. ■ N = The **Utilities** option in library security profiles has no effect for SYSOBJH; it has no effect for SYSMAIN if no utility profile is defined for SYSMAIN.
Xref option	This option is only available for the utilities SYSMAIN on z/OS computers and SYSOBJH. It determines how Predict cross-reference data related to the objects processed with these utilities are handled. ■ * = The **Cross-reference** option in library security profiles applies (this is the default). ■ N = The Xref option as set in the utility itself applies. ■ Y = An object and its cross-reference data can only be processed if cross-reference data exist for it. ■ D = An object can only be processed if it is documented in Predict; any existing cross-reference data are processed as well. ■ F = An object and its cross-reference data can only be processed if the object is documented in Predict and if cross-reference data exist for it. ■ S = An object can be processed regardless of whether it has cross-reference data or not; any existing cross-reference data are processed as well.
Enable Unrestricted Use of Libraries	This option is only available for the SYSMAIN utility. It can be used to allow users of type Administrator unrestricted use of libraries with SYSMAIN. ■ N = Administrators have no special rights for the use of libraries with SYSMAIN. ■ Y = Administrators may apply SYSMAIN functions to *all* libraries defined in Natural Security - *regardless* of any access restrictions that may exist for these libraries. For an Administrator to be able to do so, the option **Process All Libraries** (see below) has to be set to A in his/her user-specific SYSMAIN utility profile.
User-specific SYSMAIN utility profiles only:	
Process All Libraries	This option can only be set in user-specific SYSMAIN utility profiles of users of type Administrator, and only if the option **Enable Unrestricted Use of Libraries** (see above) is set to Y in the SYSMAIN default profile. ■ N = The user may use SYSMAIN functions to process the contents of libraries only within the limits of the access restrictions in effect. ■ A = The user may use SYSMAIN functions to process the contents of *all* libraries defined in Natural Security - *regardless* of any access restrictions that may exist for these libraries.

15 Protecting the Natural Development Server Environment and Applications

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This section covers the following topics:

Protecting the Natural Development Server Environment

This section describes how to protect the Natural Development Server environment with Natural Security, and how the security definitions on the FSEC system file attached to the server environment affect actions on the server.

It covers the following topics:

- Client and Server Actions
- Map Environment and Library Selection
- Protectable Functions in the Mapped Environment

Client and Server Actions

Generally, you have to distinguish between:

- Natural actions which are processed in the server environment,
- Natural actions which are only processed in the client environment.

When a Natural Development Server runs under control of Natural Security, only actions on the server can be protected by Natural Security. The conditions of use established by Natural Security which apply to a user's session on the *server* are *not* transferred to a *client* session.

Also, remember that some actions performed on a Natural Development Server client (mapped environment) generate a call to the Natural Development Server server, while others do not. Only if a client action causes an action on the Natural Development Server, this resulting server action will come under the control of Natural Security.

Map Environment and Library Selection

The function “Map Environment” is controlled by the Natural Security settings that apply to the FNAT system file on which this function is executed. When the function is executed, Natural Security performs a logon, according to the rules as described in the section ***Logon Procedure***. The logon will be to the user's default library, therefore the security settings have to be such that the user is able to log on to his/her default library.

Note: Once the environment has been mapped, a logon with another user ID is not possible within the mapped environment.

Once the environment has been mapped, the tree view in the mapped environment lists all non-empty libraries on the system file (FUSER/FNAT) assigned to the mapped environment which are

accessible by the user. Libraries in whose security profiles a different FUSER file or FDIC file is specified (under **Library File**) are not listed.

When the user selects one of these libraries from the tree view, a logon to this library is performed - according to the rules as described in the section ***Logon Procedure***. Thus it may be possible, for example, that a startup transaction is executed. If the execution of startup transactions is not desired, it can be suppressed by setting the option **NDV Startup Inactive** (see *Library Preset Values* in the section *Administrator Services*).

The user can only select a library from the tree view; any other library selection (for example, via the system command `LOGON *`) is not possible.

Within a library in the mapped environment, some functions can be protected by Natural Security, others cannot be protected. Which functions these are is described below.

Protectable Functions in the Mapped Environment

The use of the following functions in a library within the mapped environment can be protected as follows:

- Tree-View Actions
- Transfer Operations
- Command-Line Actions
- System Commands
- Commands LIST DDM and EDIT DDM
- Menu-Bar Functions

Tree-View Actions

Note: Several of the tree-view actions listed below are controlled by SYSMAIN utility profiles. If, however, no utility profiles for SYSMAIN are defined, these actions are controlled by the **Utilities** option in the library security profile of the library processed.

Location in Tree View	Action	Controlled by
System-file node	List library	The action as such is always allowed and cannot be disallowed. For what is listed, see *Map Environment and Library Selection* above.
	Find object	*`Client action not validated by the server.`*
Library node	Open source	Command Restrictions (`LIST` command) in library security profile*.
	New source	Command Restrictions (`EDIT` command) and Editing Restrictions in library security profile*.
	Catall	Command Restrictions in library security profile*.
	Find object	Command Restrictions (`SCAN` command) in library security profile*.

Location in Tree View	Action	Controlled by
	Rename **	The action as such is always allowed and cannot be disallowed. However, a library security profile for the library of the new name must exist (unless the general option **Transition Period Logon** is set to `Y`). Also, for the library contents to be transferred, the option **Mo** (Move) **from library** and **to library** for all object types must be allowed in the SYSMAIN utility profile.
	Delete **	Option **De** (Delete) for object type in SYSMAIN utility profile.
	Cut	Option **Mo** (Move) **from library** for object type in SYSMAIN utility profile.
	Copy	Option **Co** (Copy) **from library** for object type in SYSMAIN utility profile.
	Drag	Option **Co** (Copy) or **Mo** (Move) **from library** for object type in SYSMAIN utility profile.
	Paste / Drop	Option **Co** (Copy) or **Mo** (Move) **to library** for object type in SYSMAIN utility profile.
Group node	Open	Command Restrictions (`LIST` command) in library security profile*.
	New	Editing Restrictions in library security profile*.
	Catall	Command Restrictions in library security profile*.
	Find	Command Restrictions (`SCAN` command) in library security profile*.
	Delete	Command Restrictions in library security profile*.
	Cut	Option **Mo** (Move) **from library** for object type in SYSMAIN utility profile.
	Copy	Option **Co** (Copy) **from library** for object type in SYSMAIN utility profile.
	Drag	Option **Co** (Copy) or **Mo** (Move) **from library** for object type in SYSMAIN utility profile.
	Paste / Drop	Option **Co** (Copy) or **Mo** (Move) **to library** for object type in SYSMAIN utility profile.
Object node	Open	Editing Restrictions in library security profile*.
	List	Command Restrictions in library security profile*.
	Catalog	Command Restrictions in library security profile*.
	Stow	Command Restrictions in library security profile*.
	Execute	Command Restrictions in library security profile*.
	Debug	Command Restrictions in library security profile*.
	Find	Command Restrictions (`SCAN` command) in library security profile*.
	Rename	Command Restrictions in library security profile*.
	Delete	Command Restrictions in library security profile*.
	Cut	Option **Mo** (Move) **from library** for object type in SYSMAIN utility profile.
	Copy	Option **Co** (Copy) **from library** for object type in SYSMAIN utility profile.
	Drag	Option **Co** (Copy) or **Mo** (Move) **from library** for object type in SYSMAIN utility profile.

Location in Tree View	Action	Controlled by
	Paste / Drop	Option **Co** (Copy) or **Mo** (Move) **to library** for object type in SYSMAIN utility profile.

* or special-link security profile

** These actions can be made unavailable in the context menu of the library node by the option **Disable Rename and Delete of Library Node** (described in the section *Administrator Services*).

Location in Tree View	Action	Controlled by
DDM node	Open	Option **List** in SYSDDM utility profile. (*)
	New	Option **Gen** in SYSDDM utility profile. (*)
	Cut	Option **Mo** (Move) **from library** for DDM in SYSMAIN utility profile.
	Copy	Option **Co** (Copy) **from library** for DDM in SYSMAIN utility profile.
	Paste	Option **Co** (Copy) or **Mo** (Move) **to library** for DDM in SYSMAIN utility profile.
Object node	Open	Option **Edit** in SYSDDM utility profile. (*)
	Stow	Option **Cat** in SYSDDM utility profile. (*)
	Cat	Option **Cat** in SYSDDM utility profile. (*)

(*) If no SYSDDM utility profile is defined, the **Command Restrictions** in the SYSDDM *library* security profile apply.

Transfer Operations

Transfer operations (for example, “Move”, “Copy”) and delete operations of any supported Natural object are controlled by the SYSMAIN utility profiles (unless no utility profiles for SYSMAIN are defined, in which case they are controlled by the **Utilities** option in the library security profile of the library processed). Exception: the transfer of DDMs is controlled by the SYSDDM utility profiles.

The following actions are controlled by the following **SYSMAIN utility profile** options and are validated by the server (except as indicated):

Action	Option in SYSMAIN Utility Profile	Corresponding Item in Context Menu
List	Li	-
Find	*Client action not validated by the server.*	-
Copy	Co	Copy
Move	Mo	Cut and Paste
Delete	De	Delete
Rename	Ren	-

Action	Option in SYSMAIN Utility Profile	Corresponding Item in Context Menu
Import	*Client action not validated by the server.*	-

These options can be allowed/disallowed for each type of object individually.

Command-Line Actions

Note: Some of the command-line actions listed below are controlled by SYSMAIN utility profiles. If, however, no utility profiles for SYSMAIN are defined, these actions are controlled by the **Utilities** option in the library security profile of the library processed.

The following actions, when entered in the Natural Studio command line, are controlled by the following Natural Security settings and are validated by the server (except as indicated):

Action	Controlled by
Edit object	Editing Restrictions in library security profile*.
List object	Command Restrictions in library security profile*.
Scratch	Option **De** (Delete) for object type in SYSMAIN utility profile.
Uncat	Option **De** (Delete) for object type in SYSMAIN utility profile.
Purge	Option **De** (Delete) for object type in SYSMAIN utility profile.
Save	Command Restrictions in library security profile*.
Cat	Command Restrictions in library security profile*.
Stow	Command Restrictions in library security profile*.
Compopt	Command Restrictions in library security profile*.
Scan	Command Restrictions in library security profile*.
Unlock	Session Option **Unlock Objects** in user security profile.

* or special-link security profile

System Commands

Only Natural system commands which are processed on the server can be protected by Natural Security. Their use is controlled by the Command Restrictions in the library security profile (or special-link security profile). This comprises the following system commands: `AIV`, `CATALL`, `CATALOG`, `CHECK`, `CLEAR`, `COMPOPT`, `EXECUTE`, `GLOBALS`, `HELP`, `LIST`, `MAIL`, `PROFILE`, `READ`, `REGISTER`, `RETURN`, `RUN`, `SAVE`, `SCAN`, `SETUP`, `STOW`, `TEST`, `UNREGISTER`, `UPDATE`, `XREF`.

Commands LIST DDM and EDIT DDM

If DDMs are stored on a system file specified with the Natural profile parameter `FDIC` or `FDDM`, the following applies: In the Natural Studio, the command `EDIT DDM` is also available from within a user-created library. This means that it is not necessary to expand the DDM node in the tree view to be able to edit a specific DDM. However, the use of the commands `LIST DDM` and `EDIT DDM` in a server environment can only be restricted via the security profile of the Natural **SYSDDM utility**.

Menu-Bar Functions

The use of the function **Development Tools > Error Messages**, invoked from the menu bar, is controlled by the SYSERR utility profiles.

The use of the function **Development Tools > Object Handler**, invoked from the menu bar, is controlled by the SYSOBJH utility profiles.

Protecting Natural Development Server Applications

This section describes how you can control access to base applications and compound applications with Natural Security.

It covers the following topics:

- Application Protection
- Components of an Application Profile
- Invoking Application Maintenance
- Selecting an Application for Processing
- Adding a New Application Profile
- Copying an Application Profile
- Modifying an Application Profile
- Renaming an Application Profile
- Deleting an Application Profile
- Displaying an Application Profile

- Linking Users to Applications

Application Protection

This section covers the following topics:

- What are Applications?
- Prerequisites
- General Concept
- Naming Conventions
- Hierarchies of Application Profiles
- Information for Predict Users
- Defining and Activating Application Security

What are Applications?

Applications are *base applications* and *compound applications* which are created and maintained in the Natural Studio's application workspace and used in conjunction with the Natural Development Server.

For information on base and compound applications, please refer to the *Natural Development Server* documentation.

Unless otherwise indicated, the term “application” within the Natural Security documentation comprises both base applications and compound applications.

Prerequisites

For the protection of applications on the development server file, the following prerequisites must be met:

- The Natural Development Server must be installed at your site (as described in the *Natural Development Server* installation documentation).
- A development server file must be defined; this definition is part of the Natural Development Server installation procedure.
- The FSEC system file used must contain the application profiles `* Base Application *` and `* Compound Application *`; these two profiles are automatically created and stored on the FSEC file by both the Natural Security installation procedure and the Natural Development Server installation procedure.
- The current Natural Security session must use a development server file.

General Concept

The protection of applications is only relevant in conjunction with the Natural Development Server. If you do not use the Natural Development Server, you need not concern yourself with application protection in Natural Security.

If you use the Natural Development Server, you should use Natural Security to control the access to applications on the development server file.

By protecting an application, you control users' access to it; that is, you control whether users are allowed to read, add, modify or delete the application in the Natural Studio's application workspace. These access rights are defined in an application security profile.

Application protection in Natural Security only affects access to an application as such; it has no effect on access to the Natural programming objects contained in the libraries that may be part of the application.

Naming Conventions

Application IDs in Natural Security must conform to the application naming conventions which are defined in the Natural Development Server. Natural Security will check if they do.

Hierarchies of Application Profiles

The installation procedures of both Natural Security and the Natural Development Server automatically create two application security profiles with the application IDs `* Base Application *` and `* Compound Application *`. These are the basic security profiles which apply to all base applications and compound applications respectively for which no individual security profiles are defined. The default access settings in the two basic profiles are all preset to `N`; you can change them to suit your requirements.

The Natural Development Server naming conventions allow you to set up a hierarchy of application profiles: If you create an application security profile for an application whose ID is a certain character string, the profile will apply to all applications whose IDs begin with that character string. Thus, you need not define a profile for every single application.

For example, if you defined a base application security profile with the ID “A”, it would apply to all base applications whose IDs begin with “A” (such a `APPLX`, `AA01`, `ABC`, `ADE` etc.). A profile with the ID “ABC” would in turn apply to, for example, `ABCA`, `ABCXYZ` etc.

Asterisk as Default Access

Such a profile hierarchy can be employed to allow/disallow at different levels the individual **default access** methods (see below) to be defined within the application profiles. If a default access in an application profile is set to “*”, the setting in the profile at the next higher level applies for this access method.

For example, let us assume the following base application profiles with the following settings:

ID	Settings in Profile			
* Base Application *	Read=Y	Add=Y	Modify=Y	Delete=N
A	Read=*	Add=N	Modify=*	Delete=Y
ABC	Read=*	Add=*	Modify=N	Delete=*
ABCXYZ	Read=*	Add=N	Modify=*	Delete=N

The following settings would apply:

ID	Applicable Settings	Explanation
ABCXYZ	Read is allowed.	The Read setting is determined by `* Base Application *`.
	Add is not allowed.	The Add setting is determined by `ABCXYZ` itself.
	Modify is not allowed.	The Modify setting is determined at the next higher level by `ABC`.
	Delete is not allowed.	The Delete setting is determined by `ABCXYZ` itself.
ABC	Read is allowed.	The Read setting is determined by `* Base Application *`.
	Add is not allowed.	The Add setting is determined at the next higher level by `A`.
	Modify is not allowed.	The Modify setting is determined by `ABC` itself.
	Delete is allowed.	The Delete setting is determined at the next higher level by `A`.
ADE	Read is allowed.	As no security profile is defined for this application, its settings are determined by the application defined at the next higher level, that is, by `A`.
	Add is not allowed.	
	Modify is allowed.	
	Delete is allowed.	
A	Read is allowed.	The Read setting is determined by `* Base Application *`.
	Add is not allowed.	The Add setting is determined by `A` itself.
	Modify is allowed.	The Modify setting is determined by `* Base Application *`.
	Delete is allowed.	The Delete setting is determined by `A` itself.

Information for Predict Users

The hierarchy described above corresponds to the hierarchy you can set up for Predict documentation objects. In fact, base and compound applications correspond to Predict documentation objects of type “system”, subtypes “-B” and “-O” respectively (as described in the Predict documentation).

Base and compound applications also appear as Predict documentation objects types “SY-B” and “SY-O” in Natural Security's subsystem for **external objects**. It is therefore possible to maintain application profiles either in the external objects maintenance subsystem or in the application maintenance subsystem. However, it is strongly recommended that you only use the application subsystem - but not the external objects subsystem - to maintain application profiles.

Defining and Activating Application Security

Within Natural Security, application protection is performed in two steps:

- the definition of the necessary security profiles and links,
- the activation of these profiles and links.

Definition of Security Profiles and Links

To control access to an application, you would define the following security profiles and links:

- You have to create a security profile for the *library SYSDIC* (if not already defined). In the library security profile of `SYSDIC`, the option **People-protected** must be set to `Y`.
- You create a *security profile for the application*, and in the profile define the access rights that are to apply to most users.
- You create a *group security profile* for all users who are to have access to applications, and add all these users to the group.
- You *link* the group *to the library SYSDIC*. Without this link, access to applications is not possible. The ID of this link is also used as session profile ID by the Natural Development Server.
- If some users are to have restricted or extended access rights, you create another group security profile for each group of users who are to have the same access rights, and add the users to the groups accordingly.
- You then *link* these other groups *to the application*, defining their access rights in the link profile.
- You also have to *link* each of these groups *to the library SYSDIC*.

Activation of Security Profiles and Links

To activate the application profiles (and related link profiles) and the protection mechanisms involved, you set the option **Activate Security for Development Server File** to `Y` (**Administrator Services Menu > General Options**). As long as this option is set to `N`, applications on the development server file are not protected against unauthorized access. It is recommended that you first create all the application profiles, group profiles and links you need, before you set this option to `Y`.

Components of an Application Profile

Components of a Base Application Profile

The following type of screen is the “basic” profile screen which is displayed when you invoke one of the functions Add, Copy, Modify, Display for a base application security profile:

```
14:15:03                    *** NATURAL SECURITY ***                 2021-12-31
                           -Modify Base Application -

                                                Modified .. 2021-12-15 by SAG

Base Application ... XYZ-BASE


------ Default Access -------                           Library  DBID  FNR  NSC
Y R Read                                                 LIBA       123   10  N
* A Add                                                  LIBB       123   11  P
Y M Modify                                               LIBC       345   33  P
N D Delete





Additional Options ... N


Enter-PF1---PF2---PF3---PF4---PF5---PF6---PF7---PF8---PF9---PF10--PF11--PF12---
      Help  PrevM Exit  AddOp MaLib Flip                                Canc
```

The individual items you may define as part of a base application security profile are explained below.

Field	Explanation	
Default Access	In this column, you can allow/disallow access methods for the application object in the Natural Development Server. The possible access methods are:	
	R	Read the application.
	A	Add the application.
	M	Modify the application.
	D	Delete the application.
	For each access method, you can specify one of the following values:	
	Y	The access method is allowed.
	N	The access method is not allowed.

Field	Explanation	
	*	The setting in the application security profile at the next higher level in the hierarchy (see ***Hierarchies of Application Profiles*** above) determines whether the access method is allowed or not.
	If you set Read access to N, Add, Modify and Delete access will automatically be set to N. If you set Add, Modify or Delete access to Y, Read access will automatically be set to Y. If you set Read access to *, you can only set Add, Modify and Delete access to N or *, but not to Y. The access methods allowed/disallowed in the application profile will apply to all users for which no special access is defined via a link (for information on links, see ***Linking Users to Applications*** below).	
Library (display only)	The IDs of the libraries which are linked to the application in the Natural Development Server. Up to 10 libraries are displayed at a time. If there are more, you can use PF7 and PF8 to scroll within the list of libraries. By pressing PF5, you can invoke **Library Maintenance** for the libraries displayed. (When you invoke Library Maintenance from here, it comprises only those functions relevant for the maintenance of the libraries linked to the application, and you can only maintain these libraries.)	
DBID / FNR (display only)	For each library, the database ID and file number of its FUSER system file are displayed.	
NSC (display only)	For each library, information on its Natural Security definition is displayed:	
	blank	The library is not defined in Natural Security.
	N	The library is defined as not protected (that is, neither people-protected nor terminal-protected).
	P	The library is defined as people-protected or terminal-protected, or both.
	U	The library is a user's private library.
	?	The library is defined in Natural Security, but the FUSER DBID/FNR specification in the library security profile does not match the one defined in the application security profile.

Components of a Compound Application Profile

The following type of screen is the “basic” profile screen which is displayed when you invoke one of the functions Add, Copy, Modify, Display for a compound application security profile:

```
14:16:05                    *** NATURAL SECURITY ***                 2021-12-31
                        - Modify Compound Application -

                                                Modified .. 2021-09-15 by SAG

Compound Application ... XYZ-COMP


------ Default Access -------              Base Application                NSC
Y R Read                                   ABCB0012-BASE-APPL               X
* A Add                                    ABCB0015-BASE-APPL
Y M Modify                                 ABCB0019A01                      X
N D Delete





Additional Options ... N


Enter-PF1---PF2---PF3---PF4---PF5---PF6---PF7---PF8---PF9---PF10--PF11--PF12---
      Help  PrevM Exit  AddOp MaBAp Flip                                Canc
```

The individual items you may define as part of a compound application security profile are explained below.

Field	Explanation	
Default Access	In this column, you can allow/disallow access methods for the application object in the Natural Development Server. The possible access methods are:	
	R	Read the application.
	A	Add the application.
	M	Modify the application.
	D	Delete the application.
	For each access method, you can specify one of the following values:	
	Y	The access method is allowed.
	N	The access method is not allowed.

Field	Explanation	
	*	The setting in the application security profile at the next higher level in the hierarchy (see ***Hierarchies of Application Profiles*** above) determines whether the access method is allowed or not.
	If you set Read access to N, Add, Modify and Delete access will automatically be set to N. If you set Add, Modify or Delete access to Y, Read access will automatically be set to Y. If you set Read access to *, you can only set Add, Modify and Delete access to N or *, but not to Y. The access methods allowed/disallowed in the application profile will apply to all users for which no special access is defined via a link (for information on links, see ***Linking Users to Applications*** below).	
Base Application (display only)	The IDs of the base applications which are contained in the compound application. Up to 10 base applications are displayed at a time. If there are more, you can use PF7 and PF8 to scroll within the list of base applications. By pressing PF5, you can invoke Application Maintenance for these base applications.	
NSC (display only)	X	The base application is defined in Natural Security.
	blank	The base application is not defined in Natural Security.

Additional Options

If you mark the field **Additional Options** on the basic security profile screen with Y, a window will be displayed from which you can select the following options:

- Maintenance Information
- Security Notes
- Owners

The options for which something has already been specified or defined are marked with a plus sign (+).

You can select one or more items from the window by marking them with any character. For each item selected, an additional window will be displayed:

Additional Option	Explanation
Maintenance Information (display only)	The following information is displayed: ■ the date and time when the security profile was created, the ID of the administrator who created it, and (if applicable) the IDs of the co-owners who countersigned for the creation; ■ the date and time when the security profile was last modified, the ID of the administrator who made the last modification, and (if applicable) the IDs of the co-owners who countersigned for the modification.
Security Notes	You may enter your notes on the security profile.
Owners	You may enter up to eight IDs of administrators. Only the administrators specified here will be allowed to maintain the security profile. If no owner is specified, any user of type "Administrator" may maintain the security profile. For each owner, the number of co-owners whose countersignatures will be required for maintenance permission may optionally be specified in the field after the ID. For an explanation of owners and co-owners, see the section *Countersignatures*.

Invoking Application Maintenance

Application maintenance can only be invoked if the **prerequisites** described above are met.

To invoke application maintenance:

1 On the **Main Menu**, select **Maintenance**.

A window will be displayed.

2 In the window, mark the object type **Application** with a character or with the cursor.

The **Application Maintenance** selection list will be displayed.

3 From this selection list, you invoke all application maintenance functions as described below.

Selecting an Application for Processing

When you invoke **Application Maintenance**, a list of all application profiles that have been defined to Natural Security will be displayed.

If you do not want a list of all existing application profiles, but would like only certain applications to be listed, you may use the **Start Value** and **Type/Status** options as described in the section *Finding Your Way In Natural Security*.

On the **Main Menu**, select **Maintenance**. A window will be displayed.

In the window, mark the object type **Application** with a character or with the cursor (and, if desired, enter a start value and/or application type). The **Application Maintenance** selection list will be displayed:

```
14:49:01                    *** NATURAL SECURITY ***                 2021-12-31
                          - Application Maintenance -

 Co Application                        Type Status Access  Message
 __ ___________________________________ ____  ____ ________ _______________________
 __ * Base Application *               Base  NApp RAM
 __ A                                  Base  Defi * *D
 __ ABC                                Base  Defi ** *
 __ ABCB0014-BASE-APPL                 Base  Defi RAMD
 __ ABCB0015-BASE-APPL                 Base  NApp RA
 __ ABCB0016-BASE-APPL                 Base  Defi RAMD
 __ ABCB0017-BASE-APPL                 Base  NApp RAM
 __ ABCXYZ                             Base  Defi * *
 __ ABCXYZ1                            Base  Defi RA
 __ ABCXYZ2                            Base  Defi R***
 __ * Compound Application *           Comp  NApp R
 __ COMP                               Comp  Defi RAMD
 __ COMP-APPLIC                        Comp  Defi R**
 __ COMP-APPLIC-DEP                    Comp  Defi RAM*


Command ===>
Enter-PF1---PF2---PF3---PF4---PF5---PF6---PF7---PF8---PF9---PF10--PF11--PF12---
Help        Exit              Flip  -     +                       Canc
```

For each application, the application ID, Type (`Base` or `Comp`(ound)), Status and Default Access Definition are displayed.

The list can be scrolled as described in the section *Finding Your Way In Natural Security*.

Status as Selection Criterion

If you wish to list only certain applications, you can specify one of the following selection criteria in the **Status** field above the list (possible abbreviations are underlined):

blank	All application security profiles - regardless of whether or not a corresponding application exists.
ALL	All applications - regardless of whether or not a corresponding security profile has been defined.
DEFI	Defined; that is, applications for which security profiles have been defined.
UNDF	Undefined; that is, applications for which no security profiles have been defined.
NAPP	No application; that is, application security profiles for which no corresponding applications exist.

The default is *blank*; that is, all application security profiles will be listed.

Selecting a Function

The following application maintenance functions are available (possible code abbreviations are underlined):

Code	Function
AD	**Add application**
CO	**Copy application**
MO	**Modify application**
RE	**Rename application**
DE	**Delete application**
DI	**Display application**
LU	**Link users to application**

To invoke a function for an application, mark the application with the appropriate function code in column **Co**.

You may select various objects for various functions at the same time; that is, you can mark several applications on the screen with a function code. For each application marked, the appropriate processing screen will be displayed. You may then perform for one application after another the selected functions.

Adding a New Application Profile

To define an application to Natural Security, you create a security profile for it.

You can create security profiles for applications which already exist on the development server file. But it is also possible to create application security profiles for applications which do not yet exist on the development server file, that is, before the corresponding applications themselves are defined on the development server file.

To add a profile for an existing application:

1 On the **Application Maintenance** selection list, enter `UNDF` in the field **Status**.

   Only those applications which have not yet been defined to Natural Security will be listed. (The list can be scrolled as described in the section *Finding Your Way In Natural Security*.) The application IDs displayed are those by which the applications are defined in on the development server file.

2 On the list, mark the application for which you wish to create a security profile with function code `AD`.

3 The **Add Application** screen will be displayed.

The items you may define on this screen and any additional windows that may be part of an application security profile are described under ***Components of an Application Profile***.

To add a profile for a non-existing application:

1. In the command line of the **Application Maintenance** selection list, enter the command `ADD`.
2. A window will be displayed in which you enter an *ID* for the application. This ID must conform to the naming conventions for applications which are defined in the Natural Development Server. Natural Security will check if the ID conforms to these naming conventions.

   Depending on where you have invoked the window from, you may also have to specify the desired type of application (base or compound).
3. After you have entered a valid ID (and specified the application type), the **Add Application** screen will be displayed.

   The items you may define on this screen and any additional windows that may be part of an application security profile are described under ***Components of an Application Profile***.

When you add a new application profile, the owners specified in your own user security profile are automatically copied into the application security profile.

Copying an Application Profile

The Copy Application function is used to define a new application to Natural Security by creating a security profile which is identical to an already existing application security profile.

All components of the existing security profile will be copied into the new security profile - *except* the owners (these will be copied from your own user security profile into the new application security profile).

Any *links* from users to the existing application will *not* be copied.

To copy an application profile:

1. On the **Maintenance** selection list, mark the application whose security profile you wish to duplicate with function code `CO`.
2. A window will be displayed in which you enter the ID of the new application. The ID must conform to Natural Development Server naming conventions.
3. After you have entered a valid ID, the new security profile will be displayed.

   Its components which you may define or modify are described under ***Components of an Application Profile***.

Modifying an Application Profile

The Modify Application function is used to change an existing application security profile.

To do so:

1 On the **Application Maintenance** selection list, mark the application whose security profile you wish to change with function code `MO`.

2 The security profile of the selected application will be displayed.

Its components which you may define or modify are described under *Components of an Application Profile*.

Renaming an Application Profile

The Rename Application function allows you to change the application ID of an existing application security profile.

To do so:

1 On the **Application Maintenance** selection list, mark the application whose ID you wish to change with function code `RE`.

2 A window will be displayed in which you enter a new ID for the application profile. The ID must conform to Natural Development Server naming conventions.

When you rename an application security profile, the application itself will not be renamed.

Deleting an Application Profile

The Delete Application function is used to delete an existing application security profile.

To do so:

1 On the **Application Maintenance** selection list, you mark the application whose profile you wish to delete with function code `DE`.

2 The **Delete Application** window will be displayed.

- If you decide against deleting the application security profile, leave the window by pressing ENTER without having typed in anything.
- To delete the application security profile, enter the application's ID in the window to confirm the deletion.

When you delete an application profile, all existing links to the application profile will also be deleted.

When you delete an application security profile, the application itself will not be deleted. The application ID will remain in the **Application Maintenance** selection list with the Status set to `UNDF` (undefined).

If you mark more than one application with `DE`, a window will be displayed in which you are asked whether you wish to confirm the deletion of each application security profile with entering the application's ID, or whether all applications selected for deletion are to be deleted without this individual confirmation. Be careful not to delete an application accidentally.

Note: If an application is deleted in the Natural Development Server, the corresponding Natural Security application profile will not be deleted, but its Status will be set to `NAPP` (no application).

Displaying an Application Profile

The Display Application function is used to display an existing application security profile.

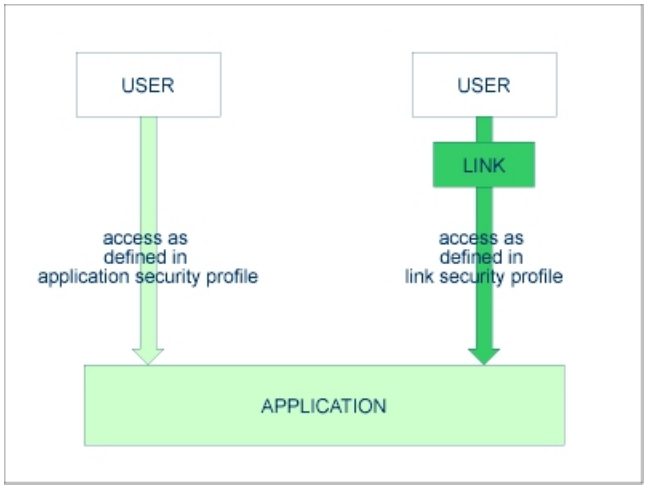
To do so:

- On the **Application Maintenance** selection list, mark the application whose security profile you wish to view with function code `DI`.

  The security profile of the selected application will be displayed. Its components are explained under *Components of an Application Profile*.

Linking Users to Applications

The access methods allowed/disallowed in an application security profile apply to all users who are not linked to the application. If you wish to allow an individual user more or less access methods, you can *link* the user to the application and in the link's security profile define which access methods are to be available for this particular user. This means that by using links you may define for different users different access rights to the same application.



Only users of types “Administrator”, “Person” and “Group” can be linked to an application. An “Administrator” or “Person” can be linked to an application either directly or via a “Group”. Users of types “Member” and “Terminal” can be linked to an application only via a “Group”; that is, they must be assigned to a “Group”, and the “Group” be linked to the application.

Two functions are available to establish and maintain links between users and applications:

- an User Maintenance function to link *one user* to *one or more applications*,
- an Application Maintenance function to link *one or more users* to *one application*.

Both functions are described below.

Linking a Single User to Applications

To link one user to one or more applications:

1 On the **User Maintenance** selection list, mark the user you wish to link with function code `LA`.

2 A window will be displayed in which you can select the type of applications (base, compound, or both) to which you wish to link the user.

In addition, the window provides the following options:

- **Start value** - You can enter a start value (as described in the section *Finding Your Way in Natural Security*) for the list of applications to be displayed.
- **Selection criterion** - `N` = none: all applications will be listed; `L` = linked: only applications to which the user is already linked will be listed; `U` = unlinked: only applications to which the user is not yet linked will be listed.

3 Then the **Link User To Applications** selection list will be displayed, showing the list of applications.

The list can be scrolled as described in the section *Finding Your Way In Natural Security*.

On the list, you mark the applications to which you wish to link the user.

In the **Co** column, you may mark each application with one of the following function codes (possible code abbreviations are underlined):

Code	Function
LK	Link - The user may use the application with a special security profile to be defined for the link; the link profile will take precedence over the application profile. See *Creating and Modifying a Link Security Profile* below.
CL	Cancel - An existing link will be cancelled.
DI	Display Application - The application security profile will be displayed.
DL	Display Link - The link security profile will be displayed.

You can mark one or more applications on the screen with a function code.

4 For each object marked, the selected functions will be executed one after another. When processing is completed, a message will be displayed stating the link situation now in effect between the user and each application.

Linking Multiple Users to an Application

To link one or more users to one application:

1 On the **Application Maintenance** selection list, mark the application to which you wish to link users with code LU.

2 A window will be displayed, providing the following options:

- **Start value** - You can enter a start value (as described in the section *Finding Your Way in Natural Security*) for the list of users to be displayed.
- **Selection criterion** - N = none: all users will be listed; L = linked: only users which are already linked to the application will be listed; U = unlinked: only users which are not yet linked to the application will be listed.

3 Then the **Link Users To Application** selection list will be displayed, showing the list of users. It includes all users of types “Group”, “Administrator” and “Person”.

The list can be scrolled as described in the section *Finding Your Way In Natural Security*.

On the list, you mark the users you wish to be linked to the application.

In the **Co** column, you may mark each user with one of the following function codes (possible code abbreviations are underlined):

Code	Function
LK	Link - The user may use the application with a special security profile to be defined for the link; the link profile will take precedence over the application profile. See *Creating and Modifying a Link Security Profile* below.
CL	Cancel - An existing link will be cancelled.
DI	Display User - The user security profile will be displayed.
DL	Display Link - The link security profile will be displayed.

You can mark one or more users on the screen with a function code.

4 For each user marked, the selected functions will be executed one after another. When processing is completed, a message will be displayed stating the link situation now in effect between each user and the application.

Creating and Modifying a Link Security Profile

To create or modify a link security profile

1 On the **Link User To Applications** selection list, mark an application with LK.

Or:

On the **Link Users To Application** selection list, mark a user with LK.

2 A screen will be displayed on which you define the security profile for this link.

The default settings which appear in the link security profile are taken from the security profile of the application.

The components of a link security profile correspond with those of an application security profile (see *Components of an Application Profile*). In addition, you can set **Activation Dates**; they are in analogy to the Activation Dates in a user security profile (see *Components of a User Security Profile*).

Instead of allowing/disallowing the access methods in the link security profile, you can also enter/delete the corresponding letters (R, A, M, D) in the appropriate positions in the **Access** column of the **Link User To Applications** or **Link Users To Application** selection list.

16 Protecting the Natural Development Environment in Eclipse

- Protecting the Natural Server View 298
- Protecting the Navigator View 301

This section describes how to control the use of the Natural Server view and Eclipse Navigator view used by Natural in an Eclipse environment in conjunction with NaturalONE.

It covers the following topics:

To display the Natural Server view and Eclipse Navigator view options and actions allowed/disallowed for a specific library and user, you can use the application programming interface `NSCONE`.

Protecting the Natural Server View

This section describes how to protect with Natural Security a Natural server used in Eclipse, and how the security definitions on the FSEC system file attached to the server environment affect actions on the server.

It covers the following topics:

- Map Environment and Library Selection
- Protectable Functions in the Mapped Environment

Map Environment and Library Selection

The function **Map Environment** is controlled by the Natural Security settings that apply to the FNAT system file on which this function is executed. When the function is executed, Natural Security performs a logon, according to the rules as described in the section ***Logon Procedure***. The logon will be to the user's default library, therefore the security settings have to be such that the user is able to log on to his/her default library.

When logging on to the mapped environment, it is possible to use 32-digit user names as IDs for the logon. This requires that the option **Support user names as IDs** is set in the LDAP security profile for the server used; see the section ***Authentication Options (LDAP)***. The user name must be defined as **User Name** in the user security profile in Natural Security. Please remember that user IDs in NaturalONE are case-sensitive.

Note: Once the environment has been mapped, a logon with another user ID within the mapped environment is not possible.

Once the environment has been mapped, the server view in the mapped environment lists all non-empty libraries on the FUSER system file assigned to the mapped environment which are accessible by the user. Libraries in whose security profiles a different FUSER file or FDIC file is specified (under **Library File**) are not listed.

When the user selects one of these libraries from the server view, a logon to this library is performed - according to the rules as described in the section ***Logon Procedure***. Thus it may be possible, for example, that a startup transaction is executed. The user can only select a library from the tree view; any other library selection (for example, via the system command `LOGON *`) is not possible.

Within a library in the mapped environment, some functions can be protected by Natural Security, others cannot be protected. Which functions these are is described below.

The Natural Security data used by the Natural Server view are cached and will only be refreshed when the Natural server is mapped again.

Note: If a startup transaction is defined for any library in the Natural Server view, it must meet the conditions described under *Startup Transactions* in the section *Using an Existing Natural Development Server Environment* of the *NaturalONE Installation* documentation.

Protectable Functions in the Mapped Environment

The use of the following functions in a library within the mapped environment can be protected as follows:

- Server-View Actions

Disallowed actions are disabled in the context menus of the Natural Server view.

Server-View Actions

Note: Several of the server-view actions listed below are controlled by SYSMAIN utility profiles. If, however, no utility profiles for SYSMAIN are defined, these actions are controlled by the **Utilities** option in the library security profile of the library processed.

Location in Server View	Action	Controlled by
System-file node	Unlock	Session Option **Unlock Objects** in user security profile.
Library node	Open	Command Restrictions (`LIST` or `EDIT` command) in library security profile*.
	Add to New Project / Add to Existing Project	Option **Co** (Copy) **from library** for object type in SYSMAIN utility profile.
	Rename (**)	The action as such is always allowed and cannot be disallowed. However, a library security profile for the library of the new name must exist (unless the general option **Transition Period Logon** is set to `Y`). Also, for the library contents to be transferred, the option **Mo** (Move) **from library** and **to library** for all object types must be allowed in the SYSMAIN utility profile.
	Delete (**)	Option **De** (Delete) for object type in SYSMAIN utility profile.
	Copy	Option **Co** (Copy) **from library** for object type in SYSMAIN utility profile.
	Paste	Option **Co** (Copy) or **Mo** (Move) **from library** for object type in SYSMAIN utility profile.

Location in Server View	Action	Controlled by
Programming objects		
Group node for programming objects	Open / Add to New Project / Add to Existing Project	Command Restrictions (`LIST` or `READ` command) in library security profile*.
	Delete	Command Restrictions in library security profile*.
	Copy	Option **Co** (Copy) **from library** for object type in SYSMAIN utility profile.
	Paste	Option **Co** (Copy) or **Mo** (Move) **from library** for object type in SYSMAIN utility profile.
Object node for programming objects	Open / Add to New Project / Add to Existing Project	Editing Restrictions in library security profile*.
	Catalog	Command Restrictions in library security profile*.
	Stow	Command Restrictions in library security profile*.
	Execute	Command Restrictions in library security profile*.
	Rename	Command Restrictions in library security profile*.
	Delete	Command Restrictions in library security profile*.
	Copy	Option **Co** (Copy) **from library** for object type in SYSMAIN utility profile.
	Paste	Option **Co** (Copy) or **Mo** (Move) **from library** for object type in SYSMAIN utility profile.
	Edit	Option **Co** (Copy) **from library** for object type in SYSMAIN utility profile.
	List	Option **Co** (Copy) **from library** for object type in SYSMAIN utility profile.
DDMs		
Group node for DDMs	Add to New Project / Add to Existing Project	Option **Edit** in SYSDDM utility profile (***) *and* option **Co** (Copy) **from environment** for DDM in SYSMAIN utility profile.
	Copy	Option **Co** (Copy) **from environment** for DDM in SYSMAIN utility profile.
	Delete	Option **Delete** in SYSDDM utility profile. (***)
	Move	Option **Mo** (Move) **from environment** for DDM in SYSMAIN utility profile.
	Open	Option **List** in SYSDDM utility profile. (***)
	Paste	Option **Co** (Copy) **to environment** for DDM in SYSMAIN utility profile.
Object node for DDMs	Add to New Project / Add to Existing Project	Option **Edit** in SYSDDM utility profile (***) *and* option **Co** (Copy) **from environment** for DDM in SYSMAIN utility profile.
	Catalog	Option Cat in SYSDDM utility profile. (***)

Location in Server View	Action	Controlled by
	Copy	Option **Co** (Copy) **from environment** for DDM in SYSMAIN utility profile.
	Delete	Option **Delete** in SYSDDM utility profile. (***)
	Edit	Option **Edit** in SYSDDM utility profile (***) *and* option **Co** (Copy) **from environment** for DDM in SYSMAIN utility profile.
	Move	Option **Mo** (Move) **from environment** for DDM in SYSMAIN utility profile.
	Paste	Option **Co** (Copy) **to environment** for DDM in SYSMAIN utility profile.
	Stow	Option **Cat** in SYSDDM utility profile. (***)

* or special-link security profile

** These actions can be made unavailable in the context menu of the library node by the option **Disable Rename and Delete of Library Node** (described in the section *Administrator Services*).

*** If no SYSDDM utility profile is defined, the Command Restrictions in the SYSDDM *library* profile apply.

Protecting the Navigator View

Note: Do not confuse the term *private-mode library* as used in this section with the term *private library* as used in the section *User Maintenance*. They refer to separate features which are not related with each other.

For Natural projects, NaturalONE supports two development modes: shared mode and private mode. They are set in NaturalONE and are described in the section *Different Modes for Developing Natural Applications* of the *NaturalONE Introduction* documentation. For these, so-called "development mode options" can be set in Natural Security. They determine how Natural Security controls the use of Natural server actions triggered by the Eclipse Navigator view actions. You have two possibilities:

- Protection Without Development Mode Options
- Protection With Development Mode Options

The form of protection is determined by the option **Development Mode**, which is set in the **Library Preset Values** section of Administrator Services.

Protection Without Development Mode Options

If the library preset value **Development Mode** is set to asterisk (*), the use of the following server actions triggered by the actions in the Eclipse Navigator view can be protected by the following Natural Security definitions:

Location in Navigator View	Action	Controlled by	In private mode also controlled by
Project node	Upload	Command `SAVE` in Command Restrictions in library (or special-link) security profile.	Option **Co** (Copy) **from library** for object type in SYSMAIN utility profile.
	Update	Command `STOW` in Command Restrictions in library (or special-link) security profile.	
	Build Project		
	Rebuild Project		

Disallowed actions are not disabled in the context menus of the Navigator view; the appropriate Natural Security restrictions are only evaluated when the user attempts to perform an action.

If the development mode in NaturalONE is set to private mode, the security definitions for the original library also apply to all its private-mode libraries.

Protection With Development Mode Options

If the library preset value **Development Mode** is set to `Y`, the server actions triggered by the actions in the Eclipse Navigator view can be protected in Natural Security by development mode options - taking into consideration the development mode set in NaturalONE - as described in this section.

You can specify:

- General Development Mode Options
- User Development Mode Options
- Library Development Mode Options
- Examples of Development Mode Settings

In general, specifications made for individual libraries have priority over specifications made for individual users.

General Development Mode Options

If you set the library preset value **Development Mode** to `Y` and then press PF5 on the **Preset Library Values** screen, the **General Development Mode Options** screen will be displayed. On this screen you can set the following options:

Field	Explanation	
Development mode	This option determines which development mode can be set for the Natural project in NaturalONE:	
	M	Mixed mode: Both shared mode and private mode are allowed for the project. This is the default and the option which offers the most flexibility.
	S	Only shared mode is allowed for the project.
	P	Only private mode is allowed for the project.
	This option does not apply to Natural projects which already exist in NaturalONE when it is set, but only to new Natural projects created afterwards. If this option is set to `M`, you can allow a specific development mode for individual users and libraries in their security profiles. If this option is set to `S` or `P`, this applies to all users and libraries within the project, and it cannot be changed for individual users or libraries.	
Prefix for private mode	This option determines which prefix is used for the library IDs of private-mode libraries defined in Natural Security:	
	Undefined	The prefix defined in the Natural Preferences of NaturalONE is used.
	<Project>	The first 6 characters of the project name (as defined in NaturalONE) are used as prefix.
	<Library ID>	The first 6 characters of the library ID are used as prefix.
	<User ID>	The first 6 characters of the user ID are used as prefix.
	<string>	A specified string of up to 6 characters is used as prefix. You specify this string in a field which will be displayed when you select this option. The string must correspond to the rules for library IDs (see *Adding a New Library*)
Navigator View Actions		
The following two options only apply if private mode is set for the Natural project in NaturalONE:		
Upload	This option controls the use of the Upload action in the project:	
	*	The Update action is only allowed if the option **Co** (Copy) **from library** for the object type is allowed in the SYSMAIN utility profile, and if the `SAVE` command is allowed in the Command Restrictions of the library (or special-link) security profile.
	Y	The Upload action is allowed.
Update/Build/Rebuild	This option controls the use of the actions Update, Build and Rebuild in the project:	

Field	Explanation	
	*	The actions Update, Build Project and Rebuild Project action are only allowed if the option **Co** (Copy) **from library** for the object type is allowed in the SYSMAIN utility profile, and if the commands `CHECK`, `CATALOG` and `STOW` are allowed in the Command Restrictions of the library (or special-link) security profile.
	Y	The actions Update, Build Project and Rebuild Project action are allowed.
Server View Options		
The following three options apply in general and cannot be changed for individual users or libraries:		
General profile active	This option determines the applicability of the following general development mode options: **Development mode**, **Prefix for private mode**, **Upload** and **Update/Build/Rebuild**:	
	Y	If a development mode option is not defined in a user security profile or library security profile, the corresponding general development mode option applies for the user/library.
	N	Only the development mode options defined in the user security profiles and library security profiles apply.
ETID	This option determines which ETIDs are used if the Natural server session is started with `ETID=OFF`.	
	N	Only the development mode options defined in the user security profiles and library security profiles apply.
	F	ETIDs will be generated by Natural Security; this corresponds to the user preset value **ETID** being set to `F`.
Private-mode library	This option determines if security profiles for private-mode libraries are created automatically by Natural Security.	
	N	Security profiles for private-mode libraries are not created automatically.
	Y	Security profiles for private-mode libraries are created automatically.
	F	Same as `Y`. In addition, each private-mode library is linked automatically to all files/DDMs to which the original library is linked. This applies to links which exist for the original library at the time when its private-mode libraries are created. If links for the original library are added/modified/removed later, you can use library maintenance function `LF` to manually adjust the link situation for the private-mode libraries.
	For further details on private-mode libraries, see below.	

Field	Explanation	
Natural Server Actions		
SYSLSO command	This option controls the use of the `SYSLSO` command, which determines the library search order for private-mode libraries.	
	A	The `SYSLSO` command can be executed both online and in batch mode (this is the default).
	B	The `SYSLSO` command can only be executed in batch mode.
	O	The `SYSLSO` command can only be executed online.
	N	The use of the `SYSLSO` command is not allowed.
	*	The use of the `SYSLSO` command is controlled by the corresponding option in the user and library security profiles.
	For information on the `SYSLSO` command, see the *NaturalONE* documentation.	
Commands priv-mode lib.	This option controls the use of Natural system commands for private-mode libraries.	
	*	The use of system commands is controlled by the settings in user security profiles and library security profiles (this is the default).
	A	All system commands are always allowed in private-mode libraries, regardless of the Command Restrictions set in the corresponding library or special-link profile.

Private-Mode Libraries

Security profiles for private-mode libraries appear on the **Library Maintenance** selection list. They are marked with `PM` in the **Prot.** column.

The security profile of a private-mode library cannot be changed. Apart from the library ID and library name, its components are identical to those of the original library.

The only library maintenance functions available for private-mode libraries are: `DI` (Display), `DE` (Delete) and `LF` (Link library to files). With the latter, you cannot change an existing link, but only display or cancel it.

A logon using the library ID of a private-mode library is not possible.

When a user deletes a private-mode library in the Navigator view, the corresponding security profile created by Natural Security is automatically deleted, too.

When you change the link of an original library to a file, the existing links of all private-mode libraries to this file are automatically changed accordingly.

LSO Container Libraries

LSO (library search order) container libraries are described under *Using Private-mode Libraries in Batch* in the section *Working in a Team* of the *NaturalONE in a Nutshell* documentation.

When LSO container libraries are generated in NaturalONE, security profiles for them are created automatically by Natural Security.

Security profiles for LSO container libraries appear on the **Library Maintenance** selection list. They are marked with `PO` in the **Prot.** column.

The security profile of an LSO container library cannot be changed. Apart from the library ID and library name, its components are identical to those of the original library.

The only library maintenance functions available for LSO container libraries are: `DI` (Display) and `DE` (Delete).

A logon using the library ID of an LSO container library is not possible.

User Development Mode Options

If the library preset value **Development Mode** is set to `Y`, the Additional Options section of user security profiles is expanded to include **User Development Mode Options**. Here you can set the following options for this user:

Field	Explanation	
Development mode	This option can only be set if the *general* development mode option **Development mode** is set to `M`; and it only applies to libraries in which the **Development mode** option is set to `M`. For these libraries, it determines which development mode applies for this user:	
	M	Mixed mode: Both shared mode and private mode are allowed for this user.
	S	Only shared mode is allowed for this user.
	P	Only private mode is allowed for this user.
Prefix for private mode	Same as in **General Development Mode Options**, but only for this user.	
Navigator View Actions	These two options only apply if private mode is in effect:	
Upload	Same as in **General Development Mode Options**, but only for this user.	
Update/Build/Rebuild	Same as in **General Development Mode Options**, but only for this user.	
Natural Server Actions		
SYSLSO command	If the *general* development mode option **SYSLSO command** is set to a value other than `*`, this value also applies for this user and cannot be overwritten here. If it is set to `*`, you can specify a value here:	
	A	The `SYSLSO` command can be executed both online and in batch mode by this user (this is the default).

Field	Explanation	
	B	The SYSLSO command can only be executed in batch mode by this user.
	O	The SYSLSO command can only be executed online by this user.
	N	The use of the SYSLSO command is not allowed for this user.
Commands priv-mode lib.	If the *general* development mode option **Commands priv-mode lib.** is set to A, this value also applies for this user and cannot be overwritten here. If it is set to *, you can specify a value here:	
	Y	All system commands are allowed for this user in private-mode libraries derived from this library
	*	The Command Restrictions of the library security profile or special-link profile apply.

Library Development Mode Options

If the library preset value **Development Mode** is set to Y, the Restrictions section of library security profiles is expanded to include **Library Development Mode Options**. Here you can set the following options for this library:

Field	Explanation	
Development mode	This option can only be set if the *general* development mode option **Development mode** is set to M (see above). In this case, this option determines which development mode can be set for this library in NaturalONE:	
	M	Mixed mode: Both shared mode and private mode are allowed for this library.
	S	Only shared mode is allowed for this library.
	P	Only private mode is allowed for this library.
Prefix for private mode	Same as in **General Development Mode Options**, but only for private-mode libraries derived from this library.	
Navigator View Actions	These two options only apply if private mode is in effect:	
Upload	Same as in **General Development Mode Options**, but only for private-mode libraries derived from this library.	
Update/Build/Rebuild	Same as in **General Development Mode Options**, but only for private-mode libraries derived from this library.	
Natural Server Actions		
SYSLSO command	If the *general* development mode option **SYSLSO command** is set to a value other than *, this value also applies for this library and cannot be overwritten here. If it is set to *, you can specify a value here:	

Field	Explanation	
	A	The `SYSLS0` command can be executed both online and in batch mode in this library (this is the default).
	B	The `SYSLS0` command can only be executed in batch mode in this library.
	O	The `SYSLS0` command can only be executed online in this library.
	N	The use of the `SYSLS0` command is not allowed in this library.
Commands priv-mode lib.	If the *general* development mode option **Commands priv-mode lib.** is set to `A`, this value also applies for this library and cannot be overwritten here. If it is set to `*`, you can specify a value here:	
	Y	All system commands are allowed for private-mode libraries derived from this library.
	*	The Command Restrictions of the library security profile or special-link profile apply.

Examples of Development Mode Settings

The following table shows some examples of the effects of various combinations of development mode options:

If the following specifications are made ...			... the following applies to the library in question:
General Development Mode Options	**User Development Mode Options**	**Library Development Mode Options**	

`Development mode: M`
 	
`Prefix: Undefined`
	`Development mode: M`
	
	`Prefix: Undefined`
		`Development mode: M`
		
		`Prefix: Undefined`
			The development mode is determined by the settings in NaturalONE.
			
			If it is private mode, the prefix defined in NaturalONE is used.

`Development mode: M`
 	
`Prefix: Undefined`
	`Development mode: M`
	
	`Prefix: <string>`
		`Development mode: M`
		
		`Prefix: Undefined`
			The development mode is determined by the settings in NaturalONE.
			
			If it is private mode, the prefix defined in NaturalONE is used.

`Development mode: M`
 	
`Prefix: Undefined`
	`Development mode: M`
	
	`Prefix: Undefined`
		`Development mode: M`
		
		`Prefix: <User ID>`
			The development mode must be set to “private mode” in NaturalONE.
			
			The user ID is used as prefix for the private-mode libraries derived from the library.

If the following specifications are made ...			... the following applies to the library in question:
General Development Mode Options	**User Development Mode Options**	**Library Development Mode Options**	

`Development mode: M`
 	
`Prefix: Undefined`
	`Development mode: P`
	
	`Prefix: <string>`
		Options not set.	The development mode must be set to “private mode” in NaturalONE.
			
			The specified character string is used as prefix for the private-mode libraries derived from the library.

17 Protecting Natural RPC Servers and Services

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This section describes the various aspects of Natural remote procedure call protection.

It covers the following topics:

For general information about Natural remote procedure calls, please refer to the Natural RPC documentation.

RPC Service Requests

In a client/server environment, you can use Natural Security to protect the use of Natural remote procedure calls. You can protect Natural RPC servers as well as the way in which Natural RPC service requests issued by clients are handled.

An RPC service request is a request from a client to a Natural RPC server for a Natural subprogram to be invoked which is located in a library on the server.

When a remote `CALLNAT` is executed, and the Natural RPC Logon Option is set on the client, the following data are passed to the Natural RPC server for validation:

- the name of the subprogram to be invoked;
- the ID of the library on the server which contains the subprogram to be invoked;
- the Natural RPC user ID and password (that is, the Natural user ID and password supplied with the Natural RPC service request);
- the EntireX user ID (validation depends on **Logon Option**; see below).

See also the section *Using Security* in the *Natural RPC* documentation.

RPC Server Settings in Natural

The following Natural profile parameters on a Natural RPC server should be reviewed if the server is to be protected by Natural Security:

Profile Parameter	Explanation
RPC	The settings for a Natural session which is started as a Natural RPC server are determined by the Natural profile parameter `RPC`. For a server to be protected by Natural Security, two subparameters of the `RPC` profile parameter are of particular relevance: `SRVNAME` and `LOGONRQ`. `SRVNAME` specifies the name of the server. This is the name which has to be used as the ID for a corresponding security profile.

Profile Parameter	Explanation
	LOGONRQ determines whether the server is to accept only secured service requests or both public and secured service requests: ■ A public request is a service request whose Natural RPC user ID and password are *not* validated; instead, the user ID which was used to start the server session (as contained in the Natural system variable *USER) will be used for the service request. ■ A secured request is s service request whose Natural RPC user ID and password are validated. For a server to be protected by Natural Security so that only secured requests are accepted, set the LOGONRQ subparameter to ON.
FSEC	With the profile parameter FSEC, you determine the FSEC system file to be associated with the Natural RPC server.
ETID	If you start the server session and specify an actual value with the profile parameter ETID, all service requests to the server will use the same specified ETID. If you start the server session with the profile parameter ETID=' ' (blank), no ETID can be supplied by Natural Security. If you start the server session with the profile parameter ETID=OFF, the ETIDs to be used by the service requests will be determined by the setting of the **ETID** option in the security profile of the RPC server (see ***Components of an RPC Server Profile*** below). By setting this option to S (or F), you can ensure an ETID handling, with appropriate database open/close processing, which allows you to uniquely identify each service request's database transactions. If you start a server with replicas, the ETID parameter must be set to OFF or ' ' (blank).
AUTO	The profile parameter AUTO (automatic logon) is only evaluated when the server session is started. For subsequent service requests to the running server, the AUTO parameter is ignored. If you start the server session with AUTO=OFF, you should assign a library via the profile parameter STACK=(LOGON *library-ID* ,...)

RPC Server Settings in Natural Security

Generally, the Natural Security user security profiles and library security profiles on the FSEC system file assigned to the Natural RPC server session determine the access rights to the requested library on the server.

Specifically for the protection of Natural RPC servers, Natural Security provides the following options:

- In the security profile of a library, you can set various options which apply when the library is accessed via a Natural RPC service request. These options are described under ***Natural RPC Restrictions*** in the section *Library Maintenance*.

- You can define security profiles for Natural RPC servers, as described below in the section *Security Profiles for Natural RPC Servers*.
- In the **Library Preset Values** section of Administrator Services, you can set various **Natural RPC Server Session Options**, which control the logon to libraries via Natural RPC service requests.

Validation of an RPC Service Request

This section covers the following topics:

- Supported RPC Server Situations
- Security Data to Be Supplied by the Client
- Impersonation
- Validation on the Natural RPC Server
- Logon Mode
- Summary of Checks Based on Settings in Security Profiles

Supported RPC Server Situations

The following situations are supported by Natural Security:

- Natural RPC server protected by Natural Security only: The Natural RPC user ID is validated.
- Natural RPC server protected by Natural Security and EntireX Security: The Natural RPC user ID and the EntireX user ID are validated.

Security Data to Be Supplied by the Client

- Natural Clients
- Non-Natural Clients

Natural Clients

Security data are supplied by the Natural client if the Natural RPC Logon Option is set. In this case the following applies:

- The Natural RPC user ID and password to be used for the service request have to be specified via the Natural application programming interface `USR1071N` (contained in the library `SYSEXT`). To ensure that this user ID and password are available when needed, executing `USR1071N` should be one of the first tasks performed by an application on the client. If `USR1071N` is not executed and the client runs under Natural Security, the user ID and password from the Natural Security logon on the client are used instead.

If the **Impersonation** option is set to `A` in the RPC server security profile and the server has been started with `ETID=OFF`, the user ID on the client is specified via the Natural application programming interface `USR4371N` (contained in the library `SYSEXT`). In addition, `USR4371N` can be used to set the ETID for the service request.

- The EntireX user ID is supplied via the Natural application programming interface `USR2071N`.
- The library ID to be used for the service request has to be specified via the Natural application programming interface `USR4008N` (contained in the library `SYSEXT`). If `USR4008N` is not executed, the ID of the client library in which the `CALLNAT` statement was executed is used instead.

Note: If the Natural RPC passwords used for a service request may contain special characters, make sure that the Natural character translation tables `NTTABA1` and `NTTABA2` on the Natural RPC server have been adjusted accordingly.

Non-Natural Clients

Please refer to the client's remote procedure call documentation for information on how to supply the required security data with an RPC service request issued by a non-Natural client to a

- Natural RPC server protected by Natural Security;
- Natural RPC server protected by Natural Security and EntireX Security.

Impersonation

For user authentication on the Natural RPC server, two modes are possible:

- validation with impersonation,
- validation without impersonation.

Impersonation assumes that access to the operating system on which a Natural RPC server is running is controlled by an SAF-compliant external security system. User authentication (verification of the Natural RPC user ID and - optionally - the password) is performed by this external security system. Impersonation means that after the authentication has been successful and the user's identity is established, any subsequent authorization checks will be performed based on this identity. This includes authorization checks for access to external resources (for example, databases or work files).

Impersonation is only possible if the Natural RPC server runs under z/OS in batch mode, or under CICS. Impersonation can be used if an SAF-compliant external security system is used, and user authentication is to be performed by this external security system.

Impersonation is activated by the **Impersonation** setting in the security profile of the Natural RPC server (see *Components of an RPC Server Profile* below).

Validation on the Natural RPC Server

Validation Without Impersonation

If impersonation is not active for the Natural RPC server, Natural Security will perform a logon to the requested library, using the Natural RPC user ID. The logon is performed according to the Natural Security logon rules and the security settings defined on the FSEC system file associated with the server.

One check performed during the logon is based on the evaluation of the Natural RPC Restrictions > **Logon Option** in the security profile of the requested library. This option determines whether only the Natural RPC user ID or both the user ID and the password are to be verified by the Natural Security logon procedure:

- If the **Logon Option** is set to `N` or `E`, both the user ID and the password are verified.
- If the **Logon Option** is set to `A` or `S`, only the user ID is verified - assuming that the password has already been verified (similar to the Natural profile parameter `AUTO=ON`).
- In addition, if the **Logon Option** is set to `E` or `S`, Natural Security checks if the Natural RPC user ID is identical to the EntireX user ID. If both IDs are not identical, the service request will be rejected.

After a successful logon, the requested subprogram will be executed.

If the processing of the service request includes an access to an external resource (for example, a database or work file), the external user ID which was used to start the Natural RPC server will be used to check the authorization for such an access.

Validation With Impersonation

Impersonation can be used if the user authentication is performed by an SAF-compliant external security system.

If impersonation is active for the Natural RPC server, the Natural server front-end passes the Natural RPC user ID and password (or the user ID only) to the external security system for verification.

After a successful user authentication by the external security system, Natural Security will perform a logon to the requested library. For this logon, Natural Security uses the Natural RPC user ID, but will not perform any password verification for this user. The logon is performed according to the Natural Security logon rules and the security settings defined on the FSEC system file associated with the server.

One check performed during the logon is based on the evaluation of the Natural RPC Restrictions > **Logon Option** in the security profile of the requested library: If the **Logon Option** is set to `E` or `S`, Natural Security checks if the Natural RPC user ID is identical to the EntireX user ID. If both IDs are not identical, the RPC service request will be rejected.

After a successful logon, the requested subprogram will be executed.

If the processing of the service request includes an access to an external resource (for example, a database or work file), the Natural RPC user ID will be used to check the authorization for such an access.

Logon Mode

If you use a Natural RPC server which provides services performed by subprograms contained in a single library, you can use the **Logon Mode** option in the security profile of the Natural RPC server to improve performance. This reduces the number of database accesses to the Natural Security system file FSEC.

The library on the server is set at the start of the server session, and will remain unchanged until the end of the server session. Service requests for any other library will be rejected. If the library is unprotected (People-protected = `N`), the user's authorization to access the library is not checked. If the library is protected (People-protected = `Y`), the user's authorization to access the library is checked. After a successful check, the user's conditions of use of the library are determined by the library security profile. Even if a special link exists between the user and the library, any settings in the special-link profile will be ignored.

Note: When you set **Logon Mode** to `S` to improve performance, please be aware that other Natural Security settings also influence performance, in particular the **Logon recorded** option in user and library security profiles. Moreover, the performance of ETID-triggered handling of database transactions cannot be optimized.

Summary of Checks Based on Settings in Security Profiles

This section summarizes the checks which are performed by Natural Security depending on settings in security profiles when a service request is issued to a Natural RPC server. The following steps are performed:

1. User authentication is performed (see the section ***Validation on the Server*** above).
2. RPC server profile > the **Logon Mode** option is evaluated at the start of the Natural RPC server session (see the section ***Logon Mode*** above).
3. Library profile > General Options > the **People-protected** option is evaluated.
4. Library profile > Natural RPC Restrictions > the **Logon Option** is evaluated (see the section ***Validation on the Server*** above): Depending on its setting, it is checked whether the Natural RPC user ID is identical to the EntireX user ID.
5. RPC server profile > the **Service Protection** option is evaluated at the start of the Natural RPC server session.

Security Profiles for Natural RPC Servers

Default Profile

The installation procedure of Natural Security automatically creates a default security profile with the server ID "*". This profile applies to all Natural RPC servers for which no individual security profiles are defined. You can change the settings in this default profile to suit your requirements.

Note: Should there be no default RPC server profile "*" in your FSEC system file (this may be the case because the file was not available at the installation), execute the program `NSCRPCAC` in the library `SYSSEC`. This program creates the default server profile.

Asterisk Notation for Server IDs

If you do not wish to define a security profile for every single server, you can use asterisk notation for the server ID: If you create a server security profile an choose as server ID a character string followed by an asterisk (*), the profile will apply to all servers whose IDs begin with that character string. For an individual server within such a range, you may still define an individual security profile.

For example, if you defined a server security profile with the ID "A*", it would apply to all servers whose IDs begin with "A" (such a `ARPC1`, `AA01`, `ABC`, `ADE` etc.). A profile with the ID "ABC*" would in turn apply to, for example, `ABCA`, `ABCXYZ` etc.

Server Profile Components and Functions

The **components** of server security profiles and the **functions** used to create and maintain them are described below.

Some Natural Security functions use the code `RP` to represent the object type "Natural RPC servers".

Components of an RPC Server Profile

The following type of screen is the primary profile screen which is displayed when you invoke one of the functions Add, Copy, Modify, Display for the security profile of a Natural RPC server:

```
11:55:00                    *** NATURAL SECURITY ***                 2021-12 31
                            - Modify NatRPC Server -

                                              Modified .. 2021-12-31 by SAG

NatRPC Server ... RPCS01
Description ..... ________________________________


--------------- Options -------------
Impersonation ............ (N,Y,A): Y
Lock User ................ (N,X,*): X
ETID ................ (N,*,S,F,C): S
Logon Mode ................. (N,S): S
Domain separator .................: _
Service protection ......... (R,*): *



Additional Options ... N


Enter-PF1---PF2---PF3---PF4---PF5---PF6---PF7---PF8---PF9---PF10--PF11--PF12---
      Help  PrevM Exit  AddOp       Flip                                Canc
```

The individual items you may define as part of a Natural RPC server's security profile are explained below.

Field	Explanation	
Impersonation	Impersonation is only relevant if an SAF-compliant external security system is used for user authentication. Impersonation is described above under *Validation of an RPC Service Request*. This option activates impersonation for the server:	
	N	Impersonation is not active.
	Y	Impersonation is active - with verification of the user ID and the password.
	A	Impersonation is active - with verification of the user ID, but not the password.
	Impersonation is only possible if the server runs under z/OS in batch mode, or under CICS. If it does not, the setting of this option will be ignored.	
Lock User	This option only applies to libraries in whose security profiles the Lock User option (in the *Natural RPC Restrictions* section of the library security profile) is set to *. For these libraries, it controls the locking of users when they attempt to access these libraries on the server via Natural RPC service calls:	
	N	The Lock User feature is not active.
	X	The Lock User feature is active for access attempts to libraries on the server via Natural RPC service calls. Once

Field	Explanation	
		a user has reached the **maximum number of logon attempts** without supplying the correct password, he/she will be locked, that is, the user ID will be made "invalid". Natural Security "remembers" unsuccessful attempts across sessions: The error counters for the client user IDs which were tried out unsuccessfully are kept for access attempts in subsequent sessions, thus reducing the number of subsequent attempts with these IDs. The error counter for a user ID is only reset after a successful logon.
	*	The value of the **Lock user option** in the ***Library Preset Values*** of Administrator Services determines whether or not the Lock User feature is active for access attempts to libraries via Natural RPC service calls.
	For details on the Lock User feature, see also the ***Lock User Option*** in the General Options section of *Administrator Services*.	
ETID	This option only applies to secured service requests passed from Natural clients to the Natural RPC server. It determines which ETIDs are to be used for these clients during the server session:	
	N	The **Default ETID** as defined in the user security profile of the Natural client determines the ETID to be used.
	S	A time-stamp-related ETID will be generated for every service request that accesses the Natural RPC server under the control of Natural Security. The ETID is generated when the server is accessed, and will remain in effect until the service request has been processed. Logons to the server are recorded. For information on time-stamp-related ETIDs, see also **ETID** under *User Preset Values* in *Administrator Services*.
	F	Same as `S`, except that logons to the Natural RPC server are not recorded.
	C	The ETID is supplied by the client, using as ETID the password value provided by the application programming interface `USR1071N` (see also ***Security Data to be Supplied by the Client***) . ETID=C is only possible if the field **Impersonation** is set to `A`.
	*	The setting of the **ETID** option in the *User Preset Values*, which applies to the user security profile, will determine the ETID to be used.
	If this option is set to any value other than `N`, it is recommended that the RPC server session be started with the Natural profile parameter `ETID=OFF`. For public service requests, this option has no effect; for them, the ETID of the Natural RPC server, as established at the start of the server session, is used.	
Logon Mode	This option can be used if only one library on the Natural RPC server is accessed:	

Field	Explanation	
	N	No special logon mode applies.
	S	Static Mode applies: The library on the Natural RPC server is set at the start of the server session. It will remain unchanged until the end of the server session. The server will only process service requests for this one library. Any service request with a different library ID will be rejected. If this option is set, the conditions of use of the library are determined by the library security profile. Even if a special link exists between the user and the library, any special-link profile will be ignored.
	Provided that the Natural RPC server provides services performed by subprograms contained in a single library, you can use this option to improve performance. See also ***Validation of an RPC Service Request*** above.	
Domain Separator	This field is only relevant if ■ your external security system uses a so-called "domain separator" character to separate the domain name from the user ID, and ■ the **Logon Option** in the security profile of the requested library is set to `E` or `S`, which means that it is checked whether the Natural RPC user ID is identical to the EntireX user ID. The ensure that this check is performed correctly, you have to specify the domain character in this field: The check is then applied to the first 8 characters after the domain separator.	
Service Protection	This option is used to restrict access to the Natural RPC server:	
	*	Access is not restricted: All users may access the server.
	R	Access is restricted: Only users who are linked to the server profile may access the server. In addition, you can restrict the access to be possible only via specific services (subprograms). See ***Allowing/Disallowing Services*** for further information.
	Before you can reset this field from `R` to `*`, you have to delete the list of allowed services you may have specified via *Allowing/Disallowing Services*.	

Additional Options

If you either mark the field **Additional Options** with `Y` or press PF4, a window will be displayed from which you can select the following options:

- Maintenance Information
- Security Notes
- Owners

The options for which something has already been specified or defined are marked with a plus sign (+).

You can select one or more items from the window by marking them with any character. For each item selected, an additional window will be displayed:

Additional Option	Explanation
Maintenance Information (display only)	In this window, the following information is displayed: ■ the date and time when the security profile was created, the ID of the administrator who created it, and (if applicable) the IDs of the co-owners who countersigned for the creation; ■ the date and time when the security profile was last modified, the ID of the administrator who made the last modification, and (if applicable) the IDs of the co-owners who countersigned for the modification.
Security Notes	In this window, you may enter your notes on the security profile.
Owners	In this window, you may enter up to eight IDs of administrators. Only the administrators specified here will be allowed to maintain this server security profile. If no owner is specified, any user of type "Administrator" may maintain the security profile. For each owner, the number of co-owners whose countersignatures will be required for maintenance permission may optionally be specified in the field after the ID. For information on owners and co-owners, see the section *Countersignatures*.

Creating and Maintaining RPC Server Profiles

This section describes the functions used to create and maintain security profiles for Natural RPC servers.

It covers the following topics:

- Invoking Maintenance for Natural RPC Servers
- Adding a New Server Profile
- Selecting Existing Server Profiles for Processing
- Copying a Server Profile
- Modifying a Server Profile
- Renaming a Server Profile
- Deleting a Server Profile

- Displaying a Server Profile

Invoking Maintenance for Natural RPC Servers

To invoke Natural RPC server maintenance:

1 On the **Main Menu**, select **Maintenance**.

A window will be displayed.

2 In the window, mark the object type **Natural RPC Server** with a character or with the cursor.

The **Natural RPC Server Maintenance** selection list will be displayed.

3 From this selection list, you invoke all Natural RPC server maintenance functions as described below.

Adding a New Server Profile

To define a Natural RPC server to Natural Security, you create a security profile for it.

To do so:

1 In the command line of the **Natural RPC Server Maintenance** selection list, enter the command `ADD`.

2 A window will be displayed in which you enter an *ID* for the server.

This ID corresponds to the server name as specified with the Natural profile parameter `RPC` (see ***RPC Server Settings in Natural*** above), and must conform to the naming conventions for Natural RPC servers. Asterisk notation for the server ID is possible, as described under ***Security Profiles for Natural RPC Servers*** above.

3 After you have entered a valid ID, the **Add Natural RPC Server** screen will be displayed.

The items you may define on this screen and any additional windows that may be part of a server security profile are described under ***Components of an RPC Server Profile***.

When you add a new server profile, the owners specified in your own user security profile are automatically copied into the server security profile.

Selecting Existing Server Profiles for Processing

When you invoke **Natural RPC Server Maintenance**, a list of all Natural RPC server profiles that have been defined to Natural Security will be displayed.

If you do not want a list of all existing profiles, but wish only certain servers to be listed, use the **Start Value** option as described in the section *Finding Your Way In Natural Security*.

On the **Main Menu**, select **Maintenance**. A window will be displayed.

In the window, mark the object type **Natural RPC Server** with a character or with the cursor (and, if desired, enter a start value). The **Natural RPC Server Maintenance** selection list will be displayed:

```
14:34:42                    *** NATURAL SECURITY ***                 2021-12-31
                          - NatRPC Server Maintenance -            FSEC (47,11)

Co NatRPC Server                     Description           P Message
__ ________________________________ ____________________ _ ____________________
__ A_NATRPC_SERVER_PAYROLL           Department Duckville  R
__ ADE_RPC                           Arch. Department Ge.. R
__ BEST_SERVER                       Third party logistics R
__ DOBANCO_SRV1                      Credit transfer Ban.. R
__ EMPLOYEES_SRV1                    Headquarter Server P1 *
__ ESSENHEIM_SRV1                    Location Essenheim    R
__ NATURAL_RPC_SERVER_NAME_32_BYTES Test SRVNAME          *
__ RPC_TIME                          8 * 7 Support         R
__ RPC_TIME_LONG_LIFE                24 * 7 Support        *
__ RPC_TIME_LONG_LIFE_B              24 * 7 Support Backup *
__ TEST_SRV0                         QA env. 1             *
__ TEST_SRV1                         QA env. 2             R
__ TEST_SRV2                         QA env. 3             *
__ UHE_SRV                           Developer Test env.   *
__ WWESRV                                                  *
Command ===>
Enter-PF1---PF2---PF3---PF4---PF5---PF6---PF7---PF8---PF9---PF10--PF11--PF12---
      Help        Exit              Flip  -     +                       Canc
```

For each server, the server ID is displayed.

The list can be scrolled as described in the section *Finding Your Way In Natural Security*.

Selecting a Function

The following maintenance functions are available for Natural RPC server profiles (possible code abbreviations are underlined):

Code	Function
CO	**Copy server profile**
MO	**Modify server profile**
RE	**Rename server profile**
DE	**Delete server profile**
DI	**Display server profile**
LU	**Link users to server profile**

To invoke a function for a server profile, mark the server with the appropriate function code in column **Co**.

You may select various server profiles for various functions at the same time; that is, you can mark several servers on the screen with a function code. For each server marked, the appropriate processing screen will be displayed. You may then perform the selected functions for one server profile after another.

Copying a Server Profile

The Copy Server Profile function is used to define a new Natural RPC server to Natural Security by creating a security profile which is identical to an already existing Natural RPC server security profile.

All components of the existing security profile will be copied into the new security profile - *except* the owners (these will be copied from your own user security profile into the new server security profile).

Any *links* from users to the existing server will *not* be copied.

To copy a server profile:

1. On the **Natural RPC Server Maintenance** selection list, mark the server whose security profile you wish to duplicate with function code CO.
2. A window will be displayed in which you enter the ID of the new server.

   The ID corresponds to the server name as specified with the Natural profile parameter RPC (see **RPC Server Settings in Natural** above), and must conform to the naming conventions for Natural RPC servers. Asterisk notation for the server ID is possible, as described under *Security Profiles for Natural RPC Servers* above.
3. After you have entered a valid ID, the new security profile will be displayed.

Its components which you may define or modify are described under *Components of an RPC Server Profile*.

Modifying a Server Profile

The Modify Server Profile function is used to change an existing Natural RPC server security profile.

To do so:

1. On the **Natural RPC Server Maintenance** selection list, mark the server whose security profile you wish to change with function code `MO`.
2. The security profile of the selected server will be displayed.

   Its components which you may define or modify are described under *Components of an RPC Server Profile*.

Renaming a Server Profile

The Rename function allows you to change the server ID of an existing Natural RPC server security profile.

To do so:

1. On the **Natural RPC Server Maintenance** selection list, mark the server whose ID you wish to change with function code `RE`.
2. A window will be displayed in which you enter a new ID for the server profile.

   The ID corresponds to the server name as specified with the Natural profile parameter `RPC` (see *RPC Server Settings in Natural* above), and must conform to the naming conventions for Natural RPC servers. Asterisk notation for the server ID is possible, as described under *Security Profiles for Natural RPC Servers* above.

Deleting a Server Profile

The Delete Server Profile function is used to delete an existing Natural RPC server security profile.

To do so:

1. On the **Natural RPC Server Maintenance** selection list, mark the server whose profile you wish to delete with function code `DE`.
2. The **Delete Server Profile** window will be displayed.

- If you decide against deleting the server security profile, leave the window by pressing ENTER without having typed in anything.
- To delete the server security profile, enter the server ID in the window to confirm the deletion.

If you mark more than one server profile with DE, a window will be displayed in which you are asked whether you wish to confirm the deletion of each server security profile with entering the server ID, or whether all server profiles selected for deletion are to be deleted without this individual confirmation. Be careful not to delete a server profile accidentally.

Displaying a Server Profile

The Display Server Profile function is used to display an existing Natural RPC server security profile.

To do so:

- On the **Natural RPC Server Maintenance** selection list, mark the server whose security profile you wish to view with function code DI.

  The security profile of the selected server will be displayed.

  Its components are explained under *Components of an RPC Server Profile*.

Allowing/Disallowing Services

If access to a Natural RPC server is restricted by the option **Service Protection** in the server profile (see *Components of an RPC Server Profile*), you use the functions described below to allow/disallow users access to services (subprograms) on the server.

You can:

- Allow/Disallow via RPC Server Maintenance or User Maintenance

- Allow/Disallow via Library Maintenance

Allow/Disallow via RPC Server Maintenance or User Maintenance

To allow/disallow a service:

1 On the **Natural RPC Server Maintenance** selection list, mark the desired server with function code LU. This is only possible for servers in whose security profiles **Service Protection** is set to R (as indicated by the column **P** on the selection list).

A window will be displayed in which you specify if the list of users to be displayed is to contain all users (U), only linked users (L), or only user who are not linked (N).

Then the list of users will be displayed.

Or:

On the **User Maintenance** selection list, mark the desired user (user type A, P or G) with function code LR.

A list of all servers with **Service Protection** set to R will be displayed.

2 The lists can be scrolled as described in the section *Finding Your Way In Natural Security*.

3 In the **Co** column, mark each user/server with one of the following function codes:

Code	Function
*A	Allow access - The user may access the server. The access is not restricted to specific subprograms (apart from disallowed modules; see below).
RA	Restrict access - The user can access the server only via explicitly allowed services (subprograms). The use of certain subprograms in a library can be restricted generally via the **Disallow/Allow Modules** section of a library or special-link profile. These restrictions apply within and without an RPC server context. That is, if a subprogram is disallowed in the library or special-link profile, it cannot be allowed in an RPC server context. However, you can further restrict access to subprograms in an RPC server context. Access to the server is then only possible via the subprograms explicitly allowed: If you mark a user with function code RA, a window will be displayed, and you allow a subprogram by specifying its subprogram and library ID. If there already are allowed subprograms, a list of these subprograms will be displayed: ■ To allow further subprograms, press PF5. A window will be displayed in which you specify the desired subprogram and library ID (for a selection list of library IDs, you can enter an asterisk (*)). ■ To disallow a subprogram, mark it with DE on the list.
DA	Disallow access - The user cannot access the server.

Allow/Disallow via Library Maintenance

To allow/disallow a service:

1 On the **Library Maintenance** selection list, mark the desired library with function code RA.

2 A window will be displayed in which you specify:

- U to get a list of all users (user types A, P and G) who may use the library (if the library is people-protected = Y, the list contains only users who are linked to it); or
- R to get a list of all RPC servers in whose security profiles **Service Protection** is set to R.

The lists can be scrolled as described in the section *Finding Your Way In Natural Security*.

If you selected U, proceed as follows:

1 On the list of users, mark a user with RA.

2 A list of all servers in whose security profiles **Service Protection** is set to R will be displayed.

Mark a server with the function code RA.

3 A list of all services (subprograms) in the library which the user is allowed to access will be displayed.

- To allow further services, press PF5. A window will be displayed in which you specify the desired subprogram.
- To disallow a service, mark it with DE on the list.

If you selected R, proceed as follows:

1 On the list of servers, mark a server with the function code RA.

2 A list of all users (user types A, P and G) and the services (subprograms) in the library which they are allowed to access will be displayed.

- To allow further services, press PF5. A window will be displayed in which you specify the desired user ID and subprogram (for a selection list of user IDs, you can enter an asterisk (*)).
- To disallow a service, mark it with DE on the list.

Other RPC-Related Features

User Exit LOGONEX4

The Natural Security user exit `LOGONEX4` is invoked by the Natural Security RPC logon program after a successful logon of a Natural RPC client to a Natural RPC server. For details, see ***RPC-Related User Exit*** in the section *User Exits*.

Password Change via RPC Service Request - User Exit USR2074N

The Natural user exit `USR2074N`, contained in the library `SYSEXT`, allows you to change the user password via a Natural RPC service request.

18 Protecting External Objects

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- Components of an External Object's Security Profile 333
- Creating and Maintaining External Object Security Profiles 336
- Linking Users to External Objects 341

This section covers the following topics:

Types of External Objects

With Natural Security, you can control the use of various types of objects used by:

- Predict Objects
- Other Objects

The term *external objects* used in the Natural Security documentation comprises all the object types listed below.

Predict Objects

The following are Predict object types (they are described in the Predict documentation):

- documentation objects (*PRD-Docu-Object) (PO)
- external objects (*PRD-Ext-Object) (PE)
- functions (*PRD-Function) (PF)
- 3GL libraries (*PRD-3GL-Library) (PL)

The two-letter codes in parentheses are the corresponding object-type codes as used by some Natural Security functions.

Caution: For documentation objects of types “base application” and “compound application” (SY-B and SY-O), it is strongly recommended that instead of Natural Security's subsystem for external objects you use the application maintenance subsystem; see the section ***Protecting Natural Development Server Applications***

Other Objects

The following types of objects are used by various other products (they are described in the corresponding product documentation):

- batch jobs (JB)
- datasets (DS)
- nodes (ND)
- operations (OP)
- printers (PR)
- volume serials (VS)
- VTAM applications (VT)

The two-letter codes in parentheses are the corresponding object-type codes as used by some Natural Security functions.

IDs for External Objects

IDs are used by Natural Security to identify external objects and their security profiles. The ID of an external object must be unique amongst all IDs of objects of the same type defined to Natural Security.

The length of the IDs and other naming conventions that may apply to external objects differ from object type to object type; please refer to the respective product documentation for information.

Asterisk Notation

For the ID of an external object, you can use asterisk notation: if you create a security profile for an external object and choose as ID a character string followed by an asterisk (*), the security profile will apply to all objects of that type whose IDs begin with that character string. For single objects (or ranges of objects) within such a range you may still define individual security profiles.

For example, you can create a security profile for a batch job with ID “ADAX”, which will apply to batch job ADAX; moreover, you can create a security profile for a batch job with ID “ADA*”, which will apply to all other batch jobs whose IDs begin with “ADA”; further, you can create a security profile for a batch job with ID “A*”, which will apply to all other batch jobs whose IDs begin with “A”; and, you can also create a security profile for a batch job with ID “*”, which will apply to all other batch jobs for which no individual security profiles are defined.

Components of an External Object's Security Profile

The following type of screen is the “basic” security profile screen for an external object, which is displayed when you invoke one of the functions Add, Copy, Modify, Display for an external object's security profile:

```
11:31:46                    *** NATURAL SECURITY ***                 2021-12-31
                                 - Modify Dataset -

                                                   Modified .. 2021-12-12 by SAG

  Dataset ........... XYZ.SYS.SOURCE


  ------ Default Access -------
  N I Info
  N R Read
  N A Alter
  N D Delete





  Additional Options ... N


  Enter-PF13--PF14--PF15--PF16--PF17--PF18--PF19--PF20--PF21--PF22--PF23--PF24---
        Refr        Menu
```

This screen varies slightly from object type to object type.

The individual items you may define as part of an external object's security profile are explained below.

Default Access

In this column, you can allow/disallow general access methods for the external object. The possible access methods differ from object type to object type, as shown below:

Access to Predict Documentation Objects, External Objects and 3GL Libraries:	
R	Read
A	Add
M	Modify
D	Delete
Access to Predict Functions:	
E	Execute
Access to Batch Jobs:	
I	Display
S	Submit

Access to Predict Documentation Objects, External Objects and 3GL Libraries:	
A	Alter
D	Delete
Access to Datasets:	
I	Info
R	Read
A	Alter
D	Delete
Access to Nodes, Printers, VTAM Applications:	
U	Use
Access to Operations:	
P	Passive
A	Active
Access to Volume Serials:	
I	Info
C	Allocate
A	Alter
D	Delete

The individual access methods are the same as those described in the corresponding product documentation.

Mark with `Y` the access methods that are to be allowed; mark with `N` the access methods that are not to be allowed.

The access methods allowed/disallowed here will apply to all users for which no special access is defined via a link (for information on links, see *Linking Users to External Objects* below).

Additional Options

If you mark the field **Additional Options** on the basic security profile screen with `Y`, a window will be displayed from which you can select the following options:

- Maintenance Information
- Security Notes
- Owners

The options for which something has already been specified or defined are marked with a plus sign (+).

You can select one or more items from the window by marking them with any character. For each item selected, an additional window will be displayed:

Additional Option	Explanation
Maintenance Information (display only)	The following information is displayed: ■ the date and time when the security profile was created, the ID of the administrator who created it, and (if applicable) the IDs of the co-owners who countersigned for the creation; ■ the date and time when the security profile was last modified, the ID of the administrator who made the last modification, and (if applicable) the IDs of the co-owners who countersigned for the modification.
Security Notes	You may enter your notes on the security profile.
Owners	You may enter up to eight IDs of administrators. Only the administrators specified here will be allowed to maintain the security profile. If no owner is specified, any user of type "Administrator" may maintain the security profile. For each owner, the number of co-owners whose countersignatures will be required for maintenance permission may optionally be specified in the field after the ID. For an explanation of owners and co-owners, see the section *Countersignatures*.

Creating and Maintaining External Object Security Profiles

This section describes the functions used to create and maintain security profiles for external objects.

It covers the following topics:

- Invoking Maintenance for External Objects
- Adding a New External Object
- Selecting Existing External Objects for Processing
- Copying an External Object
- Modifying an External Object
- Renaming an External Object
- Deleting an External Object

- Displaying an External Object

Invoking Maintenance for External Objects

To invoke external object maintenance:

1 On the **Main Menu**, select **Maintenance**.

A window will be displayed.

2 In the window, mark one type of external object with a character or with the cursor.

The **Maintenance** selection list for the selected object type will be displayed.

3 From this selection list, you invoke all maintenance functions as described below.

Adding a New External Object

The Add External Object function is used to define external objects to Natural Security, that is, create security profiles for them.

To add a new external object:

1 In the command line of the external object **Maintenance** selection list, enter the command `ADD`.

A window will be displayed.

2 In this window, enter an **ID** for the object.

The **Add** screen for the specified object type will be displayed.

3 On this screen, you may define a security profile for the external object.

The individual items you may define on this screen and any additional windows that may be part of an external object's security profile are described under ***Components of an External Object's Security Profile***.

When you add a new external object, the owners specified in your own user security profile are automatically copied into the external object's security profile.

Selecting Existing External Objects for Processing

When you invoke Maintenance for an external object, a list of all external objects of this type for which a security profile exists will be displayed.

If you do not want a list of all existing external objects but would like only certain external objects to be listed, use the **Start Value** option as described in the section *Finding Your Way In Natural Security*.

On the **Main Menu**, select **Maintenance**. A window will be displayed.

In the window, mark one type of external object with a character or with the cursor (and, if desired, enter a start value). The selection list for the selected object type will be displayed; for example:

```
13:11:23                    *** NATURAL SECURITY ***                 2021-12-31
                            - Dataset Maintenance -

 Co Dataset                                                Message
 __ ______________________________________________________ ______________________
 __ XYZ.S
 __ XYZ.SYS

 Command ===>
 Enter-PF1---PF2---PF3---PF4---PF5---PF6---PF7---PF8---PF9---PF10--PF11--PF12---
       Help        Exit              Flip  -     +                       Canc
```

The list can be scrolled as described in the section *Finding Your Way In Natural Security*.

The following maintenance functions are available for external objects (possible code abbreviations are underlined):

Code	Function
CO	**Copy**
MO	**Modify**
RE	**Rename**
DE	**Delete**
DI	**Display**
LU	**Link user**

The individual functions are described below.

To invoke a specific function for an external object, mark the object with the appropriate function code in column **Co**.

You may select various objects for various functions at the same time; that is, you can mark several objects on the screen with a function code. For each object marked, the appropriate processing screen will be displayed. You may then perform for one object after another the selected functions.

Copying an External Object

The Copy function is used to define a new external object to Natural Security by creating a security profile which is identical to an already existing external object's security profile.

All components of the existing security profile will be copied into the new security profile - *except* the owners (these will be copied from your own user security profile into the new security profile).

Any links that exist to the existing external object will *not* be copied.

To copy an external object:

1. On the **Maintenance** selection list, mark the external object whose security profile you wish to duplicate with function code CO.
2. A window will be displayed in which you enter the ID of the new external object.
3. The **Copy** *object* screen will be displayed, showing the new security profile.

   Its components which you may define or modify are described under *Components of an External Object's Security Profile*.

Modifying an External Object

The Modify function is used to change an existing external object's security profile.

To do so:

1 On the **Maintenance** selection list, mark the external object whose security profile you wish to change with function code `MO`.

2 The **Modify** *`object`* screen will be displayed, showing the security profile.

Its components which you may define or modify are described under ***Components of an External Object's Security Profile***.

Renaming an External Object

The Rename function allows you to change the ID of an existing external object's security profile.

To do so:

1 On the **Maintenance** selection list, mark the external object whose ID you wish to change with function code `RE`.

2 A window will be displayed in which you enter a new ID for the external object.

Deleting an External Object

The Delete function is used to delete an existing external object's security profile.

To do so:

1 On the **Maintenance** selection list, mark the external object you wish to delete with function code `DE`.

A **Delete** window will be displayed.

2
- If you decide against deleting the external object's security profile, leave the window by pressing ENTER without having typed in anything.
- To delete the external object's security profile, enter its ID in the window to confirm the deletion.

When you delete an external object, all existing links to the external object will also be deleted.

If you mark more than one external object with `DE`, a window will be displayed in which you are asked whether you wish to confirm the deletion of each external object's security profile with en-

tering the object's ID, or whether all external objects selected for deletion are to be deleted without this individual confirmation. Be careful not to delete an external object accidentally.

Displaying an External Object

The Display function is used to display an existing external object's security profile.

To do so:

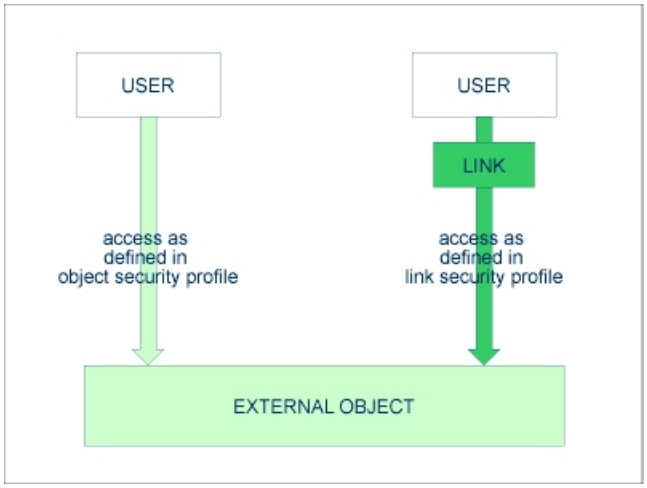
- On the **Maintenance** selection list, mark the external object whose security profile you wish to view with function code `DI`.

  The **Display** *`object`* screen will be displayed, showing the security profile. Its components are explained under *Components of an External Object's Security Profile*.

Linking Users to External Objects

The access methods allowed/disallowed in an external object's security profile apply to all users who are not linked to the external object.

If you wish to allow an individual user more or less access methods, you can *link* the user to the external object and in the link's security profile define which access methods are to be available for this particular user. This means that by using links you may define for different users different access rights to the same external object.



Only users of types “Administrator”, “Person” and “Group” can be linked to an external object. “Administrator”s and “Person”s can be linked to an external object either directly or via a “Group”. Users of types “Member” and “Terminal” can be linked to an external object only via a “Group”; that is, they must be assigned to a “Group”, and the “Group” be linked to the external object.

Two functions are available to establish and maintain links between users and external objects:

- a User Maintenance function to link *one user* to *one ore more external objects*,
- an External Object Maintenance function to link *one or more users* to *one external object*.

Both functions are described below.

Linking a Single User to External Objects

To link one user to one or more external objects:

1 On the **User Maintenance** selection list, you mark the user you wish to link with function code LO.

2 A window will be displayed in which you mark with the cursor or with a character the type of external object to which you wish to link the user.

In addition, the window provides the following options:

- **Start value** - You can enter a start value for the list of objects to be displayed (as described in the section *Finding Your Way in Natural Security*).
- **Selection criterion** - N = none: all objects will be listed; L = linked: only objects to which the user is already linked will be listed; U = unlinked: only objects to which the user is not yet linked will be listed.

3 Then the **Link User to** *objects* selection list will be displayed, showing the list of objects. For example:

```
16:04:48                    *** NATURAL SECURITY ***                 2021-12-31
                             - Link User to Dataset -                         ↩
                                                                              ↩
 User ID .... AD          User Name .... ARTHUR DENT                         ↩
                                                  Access                      ↩
 Co Dataset                                       IRAD     Message            ↩
__ ___________________________________________ ________ ______________________
__ XYZ.S                                          I_______                   ↩
__ XYZ.SYS                                        I_A_____                   ↩
                                                                              ↩
                                                                              ↩
                                                                              ↩
                                                                              ↩
                                                                              ↩
                                                                              ↩
                                                                              ↩
                                                                              ↩
                                                                              ↩
                                                                              ↩
                                                                              ↩
 Enter-PF1---PF2---PF3---PF4---PF5---PF6---PF7---PF8---PF9---PF10--PF11--PF12---
       Help        Exit              Flip  -     +                       Canc ↩
 Command ===> ____________________________________________________________________
```

The list can be scrolled as described in the section *Finding Your Way In Natural Security*.

On the list, you mark the external objects to which you wish to link the user. In the **Co** column, you may mark each object with one of the following function codes (possible code abbreviations are underlined):

Code	Function
LK	Link - The user may use the external object with a special security profile to be defined for the link; the link profile will take precedence over the external object's profile (see *Creating and Modifying a Link Security Profile* below).
CL	Cancel - An existing link will be cancelled.
DI	Display Object - The object's security profile will be displayed.
DL	Display Link - The link security profile will be displayed.

You can mark one or more objects with a function code.

4 For each object marked, the selected functions will then be executed one after another. When processing is completed, a message will be displayed stating the link situation now in effect between the user and each object.

Linking Multiple Users to an External Object

To link one or more users to one external object:

1 On the **Maintenance** selection list of an external object, you mark the object to which you wish to link users with code LU.

2 A window will be displayed, providing the following options:

- **Start value** - You can enter a start value for the list of users to be displayed (as described in the section *Finding Your Way in Natural Security*).
- **Selection criterion** - N = none: all users will be listed; L = linked: only users already linked to the object will be listed; U = unlinked: only users not yet linked to the object will be listed.

3 Then the **Link Users to** *object* selection list will be displayed. For example:

```
13:21:12                    *** NATURAL SECURITY ***                  2021-12-31
                             - Link Users to Dataset -                         ↩
                                                                               ↩
 Dataset ........... ABC.S                                                     ↩
 Default Access .... I                                                         ↩
                                                  Access                       ↩
 Co User ID  User Name                          T IRAD     Message             ↩
__ ________ ________________________________ _ ________ ______________________
 __ AD       ARTHUR DENT                        A I_A_____                    ↩
 __ ADMIN1   BUNGALOW BILL                      A I_AD____                    ↩
 __ ADMIN2   MARIA ALVAREZ                      P I_______                    ↩
 __ ADMIN3   SARA SANDOVAL                      A I_______                    ↩
 __ ADMIN4   ALOYSIUS PENDERGAST                A IRA_____                    ↩
 __ ADMIN5   JACK SPARROW                       A __AD____                    ↩
 __ ADSON    BRIAN OF NAZARETH                  A I_______                    ↩
 __ AGROUP   CUALQIER GRUPO                     G I__D____                    ↩
 __ HC       HAGBARD CELINE                     P I_______                    ↩
 __ KG       KARL GLOGAUER                      P IR______                    ↩
 __ MW       MIA WALLACE                        A I_______                    ↩
 __ NH       NATHANIEL HAWKEYE                  A ___D____                    ↩
                                                                               ↩
 Command ===> ____________________________________________________________
 Enter-PF1---PF2---PF3---PF4---PF5---PF6---PF7---PF8---PF9---PF10--PF11--PF12---
       Help        Exit              Flip  -     +                       Canc
```

The list includes all users of types “Group”, “Administrator” and “Person”. It can be scrolled as described in the section *Finding Your Way In Natural Security*.

On the list, you may mark the users you wish to be linked to the external object. In the **Co** column, you may mark each user with one of the following function codes (possible code abbreviations are underlined):

Code	Function
LK	Link - The user may use the external object with a special security profile to be defined for the link; the link profile will take precedence over the external object's profile (see *Creating and Modifying a Link Security Profile* below).
CL	Cancel - An existing link will be cancelled.
DI	Display User - The user security profile will be displayed.
DL	Display Link - The link security profile will be displayed.

You can mark one or more users with a function code. For each user marked, the selected functions will then be executed one after another. When processing is completed, a message will be displayed stating the link situation now in effect between the user and each object.

Creating and Modifying a Link Security Profile

To create or modify a link security profile:

1 On the **Link User to** *objects* screen, mark an external object with LK.

Or:

On the **Link Users to** *object*, mark a user with LK.

2 A screen will be displayed on which you define the security profile for this link.

The default settings which appear in the link security profile are taken from the security profile of the external object.

The components of a link security profile correspond with those of an external object's security profile (see *Components of an External Object's Security Profile*). In addition, you can set **Activation Dates**; they are in analogy to the Activation Dates in a user security profile (see *Components of a User Security Profile*).

Access Methods

Instead of allowing/disallowing the access methods in the link security profile, you can also enter/delete the corresponding letter in the appropriate position in the **Access** column of the **Link User to** *objects* or **Link Users to** *object* selection list.

19 Mailboxes

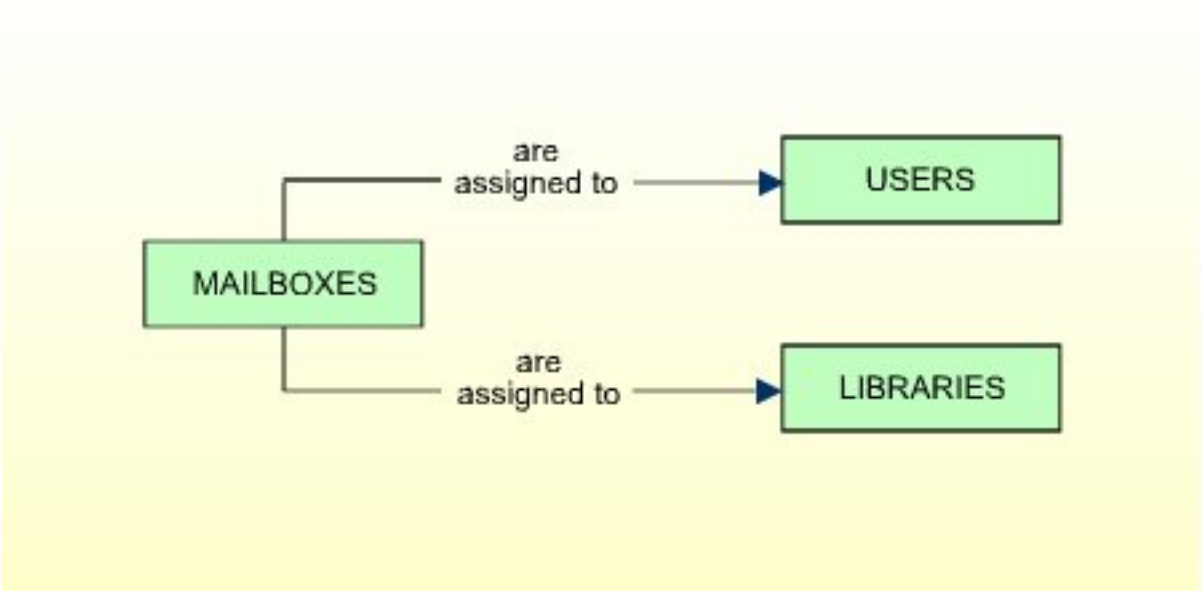
- What is a Mailbox? 348
- Broadcasting a Message 348
- Receiving a Message 349
- Mailbox ID 350
- Components of a Mailbox Security Profile 350
- Creating and Maintaining Mailbox Security Profiles 353

This section covers the following topics:

What is a Mailbox?

A mailbox is an information screen which may be used to broadcast messages to Natural users. It can best be described as a notice board.

Mailboxes may be assigned to users and/or to libraries.



When a user logs on to a library, the mailboxes assigned to his or her security profile, as well as the mailboxes assigned to the security profile of the library, will be displayed to the user.

You create a mailbox by defining it to Natural Security, that is, creating a security profile for it.

Broadcasting a Message

Everybody specified as a *mailer* in a mailbox security profile may use the mailbox. If a group is specified as a mailer, every user contained in the group may use the mailbox. If no mailer is specified, any user may use the mailbox.

A mailer can invoke a mailbox with the Natural system command `MAIL` (provided that the mailer is logged on to a library for which command mode is allowed).

Examples:

`MAIL FUGAZI`	This command invokes the message screen of the mailbox `FUGAZI`.
`MAIL ?`	This command displays a list of all mailboxes which the mailer may use; the mailer can then select a mailbox from the list.

Once the desired mailbox is invoked, the mailer may enter a message, add text to or delete text from an existing message, or change the **Valid from/to** dates.

Mailers have access only to the message screen of a mailbox, not to the mailbox security profile. Owners may also broadcast messages, as they have access to a mailbox message screen via the security profile. However, it is only mailers who may use the `MAIL` command.

Receiving a Message

Once a mailbox is defined, it may be assigned to users and libraries by entering the mailbox ID in the **Mailboxes** window (under **Additional Options**) of the respective user security profiles and library security profiles.

Owner logic applies to the assigning of mailboxes; that is, if owners are specified in the mailbox security profile (see *Components of a Mailbox Security Profile* below), only these owners will be allowed to assign the mailbox to a user or library.

Mailboxes will be displayed to a user immediately after every successful logon to a library. The following mailboxes will be displayed to the user in the following order:

1. all mailboxes assigned to the user;
2. all mailboxes assigned to the library;
3. all mailboxes assigned to the group via which the user is logged on (if the library is people-protected and the user is linked via a group);
4. all mailboxes assigned to the user's terminal and all mailboxes assigned to the group via which the terminal is linked (if the library is terminal-protected (**Terminal-protected** set to `A`)).

If one mailbox would have to be displayed more than once to a user (for example, if the same mailbox is assigned to the user's own security profile as well as to that of the group via which he/she is linked), it will only be displayed once; a repeated display will be suppressed.

The display of mailboxes cannot be suppressed by the user.

A mailbox will not be displayed

- if it is empty, that is, if it contains nothing but blanks;
- if the **Valid from** date has not yet been reached, or the **Valid to** date has passed.

Mailbox ID

Mailbox IDs are used by Natural Security to identify mailboxes and their security profiles.

A mailbox ID may be up to 8 characters long, it must start with an alphabetical character, and it must be unique amongst all mailbox IDs defined to Natural Security.

Before you start defining mailboxes, it may be advisable to conceive a logical system of mailbox IDs; this will help you to identify mailboxes easier when doing Natural Security maintenance.

Mailbox for Initial Logon

The mailbox ID `1INITIAL` serves a special purpose: if you define a mailbox with this mailbox ID, it will be displayed to every user after a successful initial logon to Natural.

The mailbox `1INITIAL` need not be assigned to any user or library.

Components of a Mailbox Security Profile

The following screen shows an example of a mailbox security profile:

```
13:00:00                    *** NATURAL SECURITY ***                    2021-12-31
                               - Modify Mailbox -

 Mailbox ID: MAIL2112                            Created: 2002-09-14 by: SAG
 Mailb.Name: MAILBOX YYZ_____________________  Modified: 2021-10-12 by: SAG
 Last mailed on .. 2021-06-11 at: 12:00:58 by: IW
 Valid from ...... 1999-12-31 to  2699-12-31

 ------------- Mailbox Security Notes -------------  Mailers-    -- Owners --
 ____________________________________________________ AD______    ________   _
 ____________________________________________________ HW______    ________   _
 ____________________________________________________ IW______    ________   _
 ____________________________________________________ ________    ________   _
 ____________________________________________________ ________    ________   _
 ____________________________________________________ ________    ________   _
 ____________________________________________________ ________    ________   _
 ____________________________________________________ ________    ________   _
 ____________________________________________________ ________
 ____________________________________________________ ________
 ---------------------------------------------------- ---------   -------------


 Enter-PF1---PF2---PF3---PF4---PF5---PF6---PF7---PF8---PF9---PF10--PF11--PF12---
       Help  PrevM Exit  AddOp       Flip                                Canc
```

The individual components of a mailbox security profile are explained below.

The following items of information are entered by Natural Security:

Field	Explanation
Mailbox ID	The ID by which you have defined the mailbox to Natural Security.
Created/by	The date when the security profile was created, and the ID of the administrator who created the security profile.
Modified/by	The date when the security profile was last modified, and the ID of the administrator who made the latest modification.
Last mailed on/at/by	The date, time and user ID of the latest modification of the mailbox message screen and/or the **Valid from/to** dates.
Valid from/to	The period of time in which the mailbox is displayed to users when they log on. These dates can be set on the mailbox message screen, not on the security profile screen.

You may specify the following items as part of a mailbox security profile:

Field	Explanation
Mailbox Name	In this field, you may specify a name for the mailbox; this name may be up to 32 characters long.
Mailbox Security Notes	In these lines, you may enter your notes on the security profile.
Mailers	You may enter up to 10 IDs of users (of any user type) who may use the mailbox to broadcast messages, that is, modify the contents of the mailbox message screen. If no mailers are specified, any user may use the mailbox.
Owners	You may enter up to 8 IDs of administrators. Only the administrators specified here will be allowed to maintain the mailbox security profile and assign the mailbox to users/libraries. If no owner is specified, any user of type “Administrator” may do so. For each owner, the number of co-owners whose countersignatures will be required for maintenance/assignment permission may optionally be specified in the field after the ID. For an explanation of owners and co-owners, see the section *Countersignatures*.

If you press PF4 on the **Add Mailbox** screen, the message screen of the mailbox will be displayed:

```
13:00:27                *** Mailbox Message Screen ***                2021-12-31

         Mailbox ID ... MAIL2112      Valid from 2021-05-24 to 2699-12-31
         Last mailed on 2021-06-11 at 12:00:58 by IW
         +-------------------------------------------------------------+
         I THERE IS UNREST IN THE FOREST                               I
         I THERE IS TROUBLE WITH THE TREES                             I
         I FOR THE MAPLES WANT MORE SUNLIGHT                           I
         I AND THE OAKS IGNORE THEIR PLEAS                             I
         I                                                             I
         I                                                             I
         I                                                             I
         I                                                             I
         I                                                             I
         I                                                             I
         I                                                             I
         I                                                             I
         I                                                             I
         I                                                             I
         I                                                             I
         +-------------------------------------------------------------+
```

Valid from/to	These dates may be set if a message in only relevant for a certain period of time, and the mailbox is therefore only to be displayed to users at logon within this period of time. If a “from” date is specified, the mailbox will only be displayed beginning on this day. If a “to” date is specified, the mailbox will no longer be displayed after this day. Any mailer (or owner) may specify these dates. The format in which the dates have to be specified depend on the setting of the Natural profile parameter `DTFORM`.

Creating and Maintaining Mailbox Security Profiles

This section describes the functions used to create and maintain mailbox security profiles.

It covers the following topics:

- Invoking Mailbox Maintenance
- Adding a New Mailbox
- Selecting Existing Mailboxes for Processing
- Copying a Mailbox
- Modifying a Mailbox
- Renaming a Mailbox
- Deleting a Mailbox
- Displaying a Mailbox

Invoking Mailbox Maintenance

To invoke mailbox maintenance:

1. On the **Main Menu**, select **Maintenance**.
2. A window will be displayed in which you mark the object type **Mailbox** with a character or with the cursor.
3. The **Mailbox Maintenance** selection list will be displayed.

   From this selection list, you invoke all mailbox maintenance functions as described below.

Adding a New Mailbox

The Add Mailbox function is used to define a new mailbox to Natural Security, that is, create a mailbox security profile.

To add a new mailbox security profile:

1 Enter the command `ADD` in the command line of the **Mailbox Maintenance** selection list.

2 A window will be displayed in which you enter a **mailbox ID**.

3 The **Add Mailbox** screen will be displayed. On this screen you may define a security profile for the mailbox. The items you may define or specify are explained under *Components of a Mailbox Security Profile*.

When you add a new mailbox, the owners specified in your own user security profile are automatically copied into the mailbox security profile.

Selecting Existing Mailboxes for Processing

When you invoke **Mailbox Maintenance**, a list of all mailboxes that have been defined to Natural Security will be displayed.

To list not all existing mailboxes, but only certain ones, use the **Start Value** option as described in the section *Finding Your Way In Natural Security*.

On the **Main Menu**, select **Maintenance**. A window will be displayed.

In the window, mark the object type **Mailbox** with a character or with the cursor (and, if desired, enter a start value).

The **Mailbox Maintenance** selection list will be displayed:

```
11:35:19                    *** NATURAL SECURITY ***                 2021-12-31
                              - Mailbox Maintenance -

 Co Mailbox ID Mailbox Name                      Message
 __ __________ ________________________________ ______________________
 __ MAILAZ     MAILAZ
 __ MAILB      MAILBOX B
 __ MAILF      MAIL-FINANCE
 __ MAILLP     PLEASE MR POSTMAN
 __ MAILLP1    CHAIN MAIL
 __ MAILLP2
 __ MAILSAG    MAILBOX FOR SAG
 __ MAILTM
 __ MAIL1
 __ MAIL10     NEWS AT 10
 __ MAIL11
 __ MAIL12
 __ MAIL13
 __ MAIL14
 __ MAIL2112   MAILBOX YYZ

 Command ===>
 Enter-PF1---PF2---PF3---PF4---PF5---PF6---PF7---PF8---PF9---PF10--PF11--PF12---
       Help        Exit              Flip  -     +                       Canc
```

For each mailbox, its ID and name are displayed.

The list can be scrolled as described in the section *Finding Your Way In Natural Security*.

The following mailbox maintenance functions are available (possible code abbreviations are underlined):

Code	Function
CO	**Copy mailbox**
MO	**Modify mailbox**
RE	**Rename mailbox**
DE	**Delete mailbox**
DI	**Display mailbox**

To invoke a specific function for a mailbox, you mark the mailbox with the appropriate function code in column **Co**.

You may select various mailboxes for various functions at the same time; that is, you can mark several mailboxes on the screen with a function code. For each mailbox marked, the appropriate processing screen will be displayed. You may then perform for one mailbox after another the selected functions.

Copying a Mailbox

The Copy Mailbox function is used to define a new mailbox to Natural Security by creating a security profile which is identical to an existing mailbox security profile.

All components of the existing security profile will be copied into the new mailbox security profile - *except* the owners (these will be copied from your own user security profile into the new mailbox security profile).

To copy a mailbox:

1 On the **Mailbox Maintenance** selection list, mark the mailbox whose security profile you wish to duplicate with function code `CO`.

2 A window will be displayed in which you enter the ID and the name of the new mailbox.

3 The **Copy Mailbox** screen will be displayed showing the new security profile.

Its components which you may define or modify are explained under ***Components of a Mailbox Security Profile***.

Modifying a Mailbox

The Modify Mailbox function is used to change an existing mailbox security profile.

To do so:

1 On the **Mailbox Maintenance** selection list, mark the mailbox whose security profile you wish to change with function code `MO`.

2 The **Modify Mailbox** screen will be displayed, showing the security profile.

It components which you may modify are explained under ***Components of a Mailbox Security Profile***.

Renaming a Mailbox

The Rename Mailbox function is used to change the mailbox ID of an existing mailbox security profile.

To do so:

1 On the **Mailbox Maintenance** selection list, mark the mailbox whose ID you wish to change with function code `RE`.

2 A window will be displayed in which you enter a new ID for the mailbox (and, optionally, change its name).

Deleting a Mailbox

The Delete Mailbox function is used to delete an existing mailbox.

To do so:

1 On the **Mailbox Maintenance** selection list, mark the mailbox you wish to delete with function code DE.

2 The **Delete Mailbox** window will be displayed.

- If you decide against deleting the mailbox, leave the window by pressing ENTER without having typed in anything.
- To delete the mailbox, enter the mailbox ID in the window to confirm the deletion.

When you delete a mailbox, the mailbox ID will simultaneously be removed from the security profiles of the users and libraries it has been assigned to.

If you mark more than one mailbox with DE, a window will be displayed in which you are asked whether you wish to confirm the deletion of each mailbox with entering the mailbox ID, or whether all mailboxes selected for deletion are to be deleted without this individual confirmation. Be careful not to delete a mailbox accidentally.

Displaying a Mailbox

The Display Mailbox function is used to view an existing mailbox security profile.

To do so:

1 On the **Mailbox Maintenance** selection list, mark the mailbox you wish to be displayed with function code DI.

2 The **Display Mailbox** screen will be displayed, showing the security profile of the selected mailbox.

Its components are explained under *Components of a Mailbox Security Profile*.

3 To view the message screen of the mailbox, press PF4 on the **Display Mailbox** screen.

20 Retrieval

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- Invoking Retrieval Functions 360
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- Cross-Reference Library 361
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- Cross-Reference Utility 362
- Cross-Reference Application 363
- Cross-Reference External Object 363
- Cross-Reference Mailbox 364
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This section covers the following topics:

Purpose of Retrieval Functions

The Retrieval subsystem of Natural Security can be used to retrieve information on the objects defined to Natural Security and on the existing relationships between these objects. It allows you to review the existing security profile definitions and their effects.

With Retrieval, you cannot do any Natural Security maintenance; you may only look at things.

Invoking Retrieval Functions

To invoke retrieval functions:

1 On the **Main Menu**, select **Retrieval**.

2 A window will be displayed in which you mark an object type with a character or with the cursor (and, if you wish, use the **Start Value** and **Type/Status** options as described in the section *Finding Your Way In Natural Security*).

The selection list for that object type will be displayed.

The list can be scrolled as described under *Finding Your Way In Natural Security*.

3 From the list, you can invoke the following retrieval functions (possible code abbreviations are underlined):

Code	Function	Explanation
DI	Display	These functions are the same as those described in the appropriate maintenance sections for each object type.
XR	Cross-Reference	These functions are described below for each object type.

To invoke a specific function for an object, you mark the object with the appropriate function code in column **Co** on the selection list.

You may select various objects for various functions at the same time; that is, you can mark several objects on the screen with a function code. For each object marked, the appropriate processing screen will be displayed. You may then perform for one object after another the selected functions.

Cross-Reference User

This function allows you to obtain information about a user.

To do so:

1 On the **User Retrieval** selection list, mark the user in question with function code `XR`.

2 A window will be displayed in which you can select one or more of the following items by marking them with any character:

Item	Information Displayed
Applications	A list of all base and compound applications to which the user is linked.
Libraries	A list of all libraries available to the user.
Linked Libraries	A list of all libraries to which the user is linked (directly or via a group).
DDMs / Files	A list of all DDMs to which the user's private library is linked.
Groups / Members	A list of all groups to which the user belongs. If the user is a group, a list of all users contained in that group.
Owned Objects	A list of all security profiles of which the user is an owner.
DDM Modifier	A list of all DDM/file security profiles in which the user is specified as “DDM Modifier”.
External Objects	A list of all external objects to which the user is linked.
Command Processors	The functional security specifications for each command processor for which functional security is defined for the user.
Utilities	A list of all user-specific and user-library specific utility profiles defined for the user.

Cross-Reference Library

This function allows you to obtain information about a library.

To do so:

1 On the **Library Retrieval** selection list, mark the library in question with function code `XR`.

2 A window will be displayed in which you can select one or more of the following items by marking them with any character:

Item	Information Displayed
DDMs / Files	A list of all DDMs to which the library is linked.
Users	A list of all users who are linked to the library.
Command Processors	The functional security specifications for each command processor in the library for which functional security is defined.
Utilities	A list of all library-specific and user-library specific utility profiles defined for the library.

Cross-Reference File

This function is only available on z/OS computers. It allows you to ascertain which libraries are linked to a file.

To do so:

1 On the **File Retrieval** selection list, mark the file in question with function code `XR`.

2 A window will be displayed in which you can select one or both of the following items by marking them with any character:

Item	Information Displayed
Libraries	A list of all libraries which are linked to the file.
Private Libraries	A list of all users whose private libraries are linked to the file.

Cross-Reference Utility

This function allows you to ascertain which utility profiles exist for a utility.

To do so:

1 On the **Utility Retrieval** selection list, mark the utility in question with function code `XR`.

2 A window will be displayed in which you can select one or more of the following items by marking them with any character:

Item	Information Displayed
Library-Specific Profiles	A list of all library-specific profiles defined for this utility (as well as the utility's default profile).
User-Specific and User-Library-Specific Profiles	A list of all user-specific profiles and user-library-specific profiles defined for this utility.
All Profiles	A list of all user-specific profiles, library-specific profiles and user-library-specific profiles, as well as the default profile defined for this utility.

Cross-Reference Application

This function allows you to ascertain which users are linked to an application.

To do so:

- On the **Application Retrieval** selection list, mark the application in question with function code `XR`.

  A list of all users who are linked to the application will be displayed.

Cross-Reference External Object

This function allows you to ascertain which users are linked to an external object.

To do so:

- On the **Retrieval** selection list for a type of external object, mark the object in question with function code `XR`.

  A list of all users who are linked to the external object will be displayed.

Cross-Reference Mailbox

This function allows you to ascertain which users and libraries a mailbox is assigned to.

To do so:

1 On the **Mailbox Retrieval** selection list, mark the mailbox in question with function code `XR`.

2 A window will be displayed in which you can select one or both of the following items by marking them with any character:

Item	Information Displayed
Libraries	A list of all libraries to which the mailbox is assigned.
Users	A list of all users to which the mailbox is assigned.

Retrieval in Batch Mode - Program RETRIEVE

You can obtain all retrieval information for all objects of a certain object type at the same time. For this purpose, the library `SYSSEC` provides the program `RETRIEVE`. This program performs the Display and Cross-Reference functions for all objects of a certain object type; that is, it shows Display and Cross-Reference information for all selected objects.

The following information can be obtained:

- Output 1: a list of all selected objects, with basic information about each object.
- Output 2: display of security profiles of the selected objects.
- Output 3: cross-reference information about the selected objects.
- Output 4: display of security profiles of special links between users and libraries.

Various input parameters allow you to restrict the functions to a certain range of objects, and to determine the sequence in which the information is to be output. The input parameters for `RETRIEVE` are:

Parameter	Explanation	
1st Parameter	Object type: US for users, LI for libraries, FI for files (on z/OS only), MA for mailboxes, or the corresponding code for a type of external object.	
2nd Parameter	■ User type (for object type US): A = Administrator, P = Person, M = Member, G = Group, T = Terminal, B = Batch User. ■ File status (for object type FI): PUBL = Public, ACCE = Access, PRIV = Private.	
3rd Parameter	Start value: An object name (optionally with asterisk notation) to obtain information on a certain range of objects only.	
4th and 5th Parameters	Date from/to: A range of dates to obtain information only on objects created/last modified within a specific period of time.	
6th Parameter	Function: Determines which information is output, and the output sequence:	
	S	Output 1.
	A	Output 1, then Output 2 & 3 for one object, then Output 2 & 3 for the next object, etc.
	AE	Output 1, then Output 2, 3 & 4 for one object, then Output 2, 3 & 4 for the next object, etc.
	X	Output 3.
	XE	Output 3 & 4 for one object, then Output 3 & 4 for the next object, etc.
	D	Output 1, then Output 2 for every object.
	Z	Output 1, then Output 2 for every object, then Output 3 for every object.
	ZE	Output 1, then Output 2 for every object, then Output 3 for every object, then Output 4 for every object.

The program RETRIEVE is primarily intended for use in batch mode. However, by issuing the direct command RETRIEVAL, you can also invoke it online: a menu will be displayed for you to specify the selection options.

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This section covers the following topics:

Using Owners

The benefit of using *owners* for security profiles is that the work and responsibility of doing Natural Security maintenance may be distributed amongst several Administrators instead of resting in the hands of just one person.

This distribution may be done according to criteria of significance/sensitivity of objects, regional, branch or departmental aspects, or whatever suits your specific Natural environment.

The number of Administrators should be kept low, and the system by which you assign owners should be clearly structured.

It is also possible to specify a Group as an owner. All Administrators contained in the Group will then be authorized to maintain the security profile. (As only users of type “Administrator” may do Natural Security maintenance anyhow, users of other user types contained in that Group will not be affected by this.)

Using Countersignatures

It is the Natural Security Administrators who control all users' access rights to libraries. The question may well be asked, “Who controls the Administrators?” The answer is, “They can control each other.” This may be achieved by the use of *countersignatures*.

A security profile may have up to 8 owners. Without countersignatures, each of these owners may modify, delete, link, or edit the security profile unhindered.

If this is not desired, the countersignatures feature may be used: next to each owner of a security profile you may enter a number (1, 2 or 3); an owner must then obtain this number of countersignatures from other owners of the security profile, before he/she can gain access to the security profile. In this way, an owner cannot execute any alterations without the knowledge and consent of other owners.

Countersignatures are given by the co-owners entering their user *passwords* on the **Countersignatures** screen; this screen is displayed automatically when a function is invoked that requires countersignatures from co-owners of the security profile concerned.

Note: If the **Lock User Option** is active, entering a wrong password on the **Countersignatures** screen may result in the user who has invoked the screen being locked.

Example of Countersignatures:

In the security profile of user IW the following owners are specified:

```
+----------------------------OWNERS-----------------------------+
! User ID ........... IW                                         !
!                                                                !
! AD                                                             !
! HW       + 1                                                   !
! JC       + 2                                                   !
!                                                                !
!                                                                !
!                                                                !
!                                                                !
!                                                                !
!                                                                !
!----------------------------------------------------------------+
```

Only the three Administrators specified may modify the security profile.

The owner situation is the following:

- Owner AD may modify the security profile unhindered, that is, without having to obtain a countersignature from any of the other owners.
- Owner HW may only modify the security profile with the consent of one of the other owners (this need not be one specific owner but can be any one of the others).
- Owner JC may only modify the security profile with the consent of two, that is, all other owners of the security profile.
- Any other Administrators cannot modify the security profile, as they are not owners of the security profile.

Let us imagine that owner HW wishes to modify the security profile of user IW. On the **User Maintenance** selection list, he marks user IW with code `MO`. The **Countersignatures** screen will be displayed:

```
13:10:14                    *** NATURAL SECURITY ***                2021-12-31
                                - Modify User -

User ID .. IW


           Group ID  User ID     Password            Added       Modified
           --------  --------    --------            ---------- ----------
        1.           AD______    ________        On: 1999-08-13 2021-01-18
        2.           JC______    ________            13:08:15   13:09:10
        3.           ________    ________        By: AD         AD
        4.           ________    ________
        5.           ________    ________
        6.           ________    ________
        7.           ________    ________
        8.           ________    ________



SYSSEC5588: 1 authorized owner must enter his/her password.

Enter-PF1---PF2---PF3---PF4---PF5---PF6---PF7---PF8---PF9---PF10--PF11--PF12---
      Help        Exit                                                   Canc
```

All other owners of the security profile are listed on the screen. One of them must enter his/her password.

If none of the other owners are available in person, they may communicate (for example, AD may reveal his password to HW, which HW may then enter on the **Countersignatures** screen; AD should then change his password immediately afterwards).

Once the correct password of one co-owner (either AD or JC) has been entered, the **Modify User** screen with the security profile of user IW will be invoked for Administrator HW to execute the intended modifications.

Groups as Owners

If Groups are specified as owners, the following cases may occur:

- An Administrator is an owner of a security profile and also contained in a Group which is an owner of the security profile. In this case the countersignature requirements specified for the Administrator him-/herself apply.
- An Administrator is not an owner of a security profile him-/herself, but is contained in two or more Groups which are owners of the security profile. In this case the countersignature requirements specified for the Group with the fewest countersignatures apply.

If two or more Groups have equally few countersignatures, their alphabetical order is decisive.

Note: In the above cases an Administrator may be an owner more than once. This implies that he/she may provide him-/herself with one or more of the countersignatures required.

Groups as Co-Owners

If a Group appears as a co-owner on the **Countersignatures** screen, any one of the Administrators contained in the Group may countersign.

To select one Administrator from a Group, enter a question mark (?) in the **User ID** field next to the **Group ID** on the **Countersignatures** screen. A list of all Administrators contained in the Group will be displayed, from which you may select the one whose countersignature you wish to obtain.

Please note that a Group counts as one co-owner, and one co-owner cannot provide more than one countersignature. If, for example, two countersignatures are required, these may not both be obtained from members of the same Group.

However, one Administrator may countersign more than once if he/she appears more than once as a co-owner on the **Countersignatures** screen, i.e. in his/her own right and/or as a member of one or more Groups.

User Security Profiles of Administrators

When an Administrator wishes to create any new security profiles (that is, to use an Add or Copy function), the owner situation of his/her own security profile applies:

- If the Administrator's security profile has no owners assigned, he/she may create new security profiles unhindered.
- If the Administrator's security profile has owners assigned but these do not include the Administrator, he/she must obtain the countersignatures of all owners of his/her security profile, before he/she may create any new security profiles.
- If the Administrator is one of the owners of his/her own security profile and has a number of co-owners specified, the Administrator must obtain this number of countersignatures from other owners of his/her security profile, before he/she may create any new security profiles.

Caution: Owners and countersignatures should be assigned with the utmost care, as it may be difficult, if not impossible, to cancel an undesired owner/co-owner configuration. “Experimenting” with this feature can also result in your locking yourself out from access to a security profile.

Deferred Countersigning

Deferred countersigning allows you to perform a maintenance function, and obtain the required countersignature later.

This functionality is also referred to as “time-independent countersigning” (TIC).

Applicability

Deferred countersigning is possible:

- if the number of co-owners whose countersignature you need is 1;
- for the following maintenance functions: Add, Modify, Rename and Delete of user security profiles and library security profiles.

The following explanation uses the term “modify” for easier reading; however, the explanation also applies to the other functions mentioned.

Note: With the current version of Natural Security, deferred countersigning is available for the functions mentioned above. With subsequent versions, it is planned to make it available for further functions.

How Deferred Countersigning Works

When you attempt to modify a security profile and the **Countersignatures** screen is invoked, but none of the other owners of the security profile is available to supply his/her password, you may defer the countersigning. This means that you can proceed with your intended modification and obtain the other owner's countersignature afterwards.

To do so, you press PF5 (Defer) on the **Countersignatures** screen.

The security profile to be modified will be invoked, and you can make your changes to it.

When you have finished modifying the security profile, it will appear in the object **Maintenance** selection list with an indication that a countersignature is still pending for the modification. The modification will not become active until the countersignature is provided.

Until the co-owner supplies or refuses his/her countersignature, there will be two versions of the security profile:

- the *active* unmodified version,
- a *temporary* version which includes your modifications.

On the **Maintenance** selection list, you can perform the following functions on the security profile:

Code	Function
DI	Display the active version of the security profile.
DT	Display the temporary version of the security profile. The modifications are highlighted in it.
MT	Modify the temporary version of the security profile.
RT	Revoke the countersignature request.

The co-owner can perform the following functions on the security profile:

Code	Function
DI	Display the active version of the security profile.
DT	Display the temporary version of the security profile. The modifications are highlighted in it.
CT	Invoke the **Countersignatures** screen to confirm the modifications.
RT	Revoke the countersignature request.

Until the countersignature is supplied or revoked, maintenance functions other than those listed above cannot be applied to the security profile.

When the countersignature is supplied by the co-owner, the modifications will be applied, that is, the active version of the security profile will be removed, and the temporary version will become the active version.

If the countersignature request is revoked - either by yourself or the co-owner - the temporary version of the security profile will be removed, and only the active version will continue to exist. Any information concerning the request will be removed.

Note: The owner/co-owner specifications in a security profile *cannot* be changed via deferred countersigning.

Listing Profiles with Pending Countersignatures

To list only those security profiles of a specific object type for which countersignatures are pending, you enter the command `SHOW TIC` (TIC = time-independent countersigning) in the command line of the object **Maintenance** selection list.

To revert to the normal selection-list display, you enter the command again.

Renamed and Deleted Security Profiles

If you defer the countersigning for the renaming of a security profile, the profile will appear in the object **Maintenance** selection list under both the old ID and the new ID.

If you defer the countersigning for the deletion of a security profile, the profile will remain in the object **Maintenance** selection list until the countersignature is supplied.

Inaccessible Security Profiles

If a security profile has become completely inaccessible - that is, if an owner/co-owner configuration has been set up which does not allow any administrator to access the security profile - the Natural system command `INPL` can be used as a last resort to recover the security profile.

You enter the `INPL` command; then, on the INPL menu, you enter Code `R` and Replace option `O`. In the next window, you enter the object type and the ID of the security profile to be recovered. This deletes all owner entries from the security profile.

If you use the above INPL option in batch mode, work file 1 must be the Natural Security INPL file.

Example of Batch-Mode Input for Security-Profile Recovery:

```
//CMSYNIN DD *
R,O
U,AD
.
```

22 Functional Security

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This section covers the following topics:

Command Processors

Command processors are used to control the way in which commands/functions are executed in a library. They are created with the Natural utility SYSNCP. In a command processor, you define commands - that is, keywords and keyword combinations - and the actions to be performed in response to these commands being entered by the users.

Functional Security for a Command Processor

Natural Security allows you to define *functional security* for each command processor in a library: you can determine which of the keywords and keyword combinations defined in the processor are to be allowed or not allowed in the library, thus restricting the availability of certain functions within the library. Moreover, you can define user-specific functional security; that is, you can make different functions available for different users of the same command processor in a library.

This is done via the **Functional Security** options in the security profiles of libraries and users, as described below. The functional security defined for a command processor in a library security profile applies to all users of the command processor in that library. In addition, in a user security profile you can define different functional security for an individual user of a command processor in a library, which then takes precedence over the specifications in the library security profile.

Status of a Command Processor

In Natural Security, a command processor can have the following status:

Undefined	The command processor has been created with SYSNCP, but no functional security is defined for it.
Defined	The command processor has been created with SYSNCP and functional security is defined for it.
Modified	The command processor has been modified with SYSNCP after functional security was defined for it. In this case, you may have to update the functional security for the command processor; this is done by marking the field **Functional Security Defined** with `UP` and then adjusting the security specifications. To update the functional security for *all* "modified" command processors in the library, you can use the application programming interface `NSCLI` (function code `UC`). **Note:** If a command processor is modified with SYSNCP, it has to be recataloged in order for the modifications to be reflected in Natural Security.

Unresolved	The command processor has been deleted with SYSNCP, but functional security is still defined for it. In this case, you should also delete the functional security for the command processor (by marking the field **Functional Security Defined** with `DE`).

Allowing/Disallowing Keywords

By default, all keywords defined in a command processor are disallowed, which means that none of the commands defined in the processor can be executed.

If you wish to make only relatively few functions available, you can leave this default unchanged so that generally all keywords are disallowed, and you can then allow the use of individual keywords and keyword combinations (commands). If you wish to make most functions available and only restrict the use of relatively few functions, you can change the default so that generally all keywords are allowed and you can then disallow the use of individual keywords and keyword combinations.

Defining Functional Security for a Library

If you mark the option **Functional Security** in the **Additional Options** window of a library security profile (see *Components of a Library Security Profile*), the **Functional Security** window will be displayed:

```
   Library ID ................... XYZLIB__
   Command Processor ............ ________

__ Functional security defined ..
__ Keyword default ..............
__ Keyword exceptions ...........
__ Command exceptions ...........
   Type of command exceptions ...
```

In this window, you can define functional security for any command processor that has been created in that library.

In the **Command Processor** field of the window, you enter the name of the processor you wish to define for the library.

If you do not know the name of the processor you want, enter an asterisk (*) in the **Command Processor** field: a list of all processors that are contained in that library will be displayed; from the list, you select a processor by marking it with any character or the cursor.

By default, no functional security is defined for a command processor: the **Keyword Default** is set to "Disallowed", and no **Keyword Exceptions** or **Command Exceptions** are defined; which means that none of the commands defined in the processor can be executed.

Functional Security Defined

This field may take the following values:

No	This indicates that the default settings for **Keyword Default** and **Keyword/Command Exceptions** apply.
Yes	This indicates that some of the default settings have been changed.
???	This indicates that the status of the command processor is either "modified" or "unresolved" (see *Status of a Command Processor* above).

To delete all functional security definitions that have been made for the command processor, you mark this field with `DE`.

Keyword Default

This field may take the following values:

Disallowed	By default, all keywords specified in the processor are disallowed (and you may allow individual keywords and keyword combinations via **Keyword Exceptions** and **Command Exceptions**).
Allowed	By default, all keywords specified in the processor are allowed (and you may disallow individual keywords and keyword combinations via **Keyword Exceptions** and **Command Exceptions**).

To change the value from "Disallowed" to "Allowed", or vice versa, mark the **Keyword Default** input field with any character.

You can only change the **Keyword Default** if neither **Keyword Exceptions** nor **Command Exceptions** are defined; so, if necessary, you have to reset the allowed/disallowed status of all **Command Exceptions** and **Keyword Exceptions** to their default settings (as explained below) before you can change the **Keyword Default**.

If you mark the **Keyword Default** field, with `PU`, the status of the command processor will be set to "public". This means that you can define keyword and command exceptions, but they will not take effect. To activate the command processor for the keyword/command exceptions to take effect, you mark the **Keyword Default** field with `RL` (release).

Keyword Exceptions

This field may take the following values:

No	This indicates that the **Keyword Default** applies to all keywords; that is, all keywords are either allowed or disallowed.
Yes	If the **Keyword Default** is set to "Disallowed", this indicates that individual keywords are allowed; if the **Keyword Default** is set to "Allowed", this indicates that individual keywords are disallowed.

By default, all keywords are either allowed or disallowed, depending on the setting of the **Keyword Default**.

To change this default status for individual keywords, mark the **Keyword Exceptions** input field with any character(s) - except `DE`. Depending on the **Keyword Default**, either the **Allow Keywords** screen or the **Disallow Keywords** screen will be displayed, listing all keywords that have been defined in the processor:

```
14:18:03                    *** NATURAL SECURITY ***                2021-12-31
                             - Disallow Keywords -

Library .. SYRINX      Command Processor .. PROC2112

Keyword          Type   A/D
________________ ______  _
ACCESS           Action  A
ADD              Action  A
ADDMULTIPLE      Action  A
ADMIN            Action  A
CONVERT          Action  A
COPY             Action  D
DELETE           Action  D
DISPLAY          Action  A
DUMMY1           Action  A
DUMMY2           Action  A
DUMMY3           Action  A
DUMMY4           Action  A
EDIT             Action  A


Enter-PF1---PF2---PF3---PF4---PF5---PF6---PF7---PF8---PF9---PF10--PF11--PF12---
      Help  PrevM Exit  AddOp       Flip                                Canc
```

The list can be scrolled as described in the section *Finding Your Way In Natural Security*.

In the **A/D** column, mark the keywords to be disallowed with `D` and those to be allowed with `A`.

Any status that is different from the **Keyword Default** status will be displayed intensified.

To reset the disallowed/allow status of all keywords to the **Keyword Default** setting, mark the **Keyword Exceptions** input field with `DE` (delete). A window will be displayed in which you enter `Y` to confirm the deletion.

Command Exceptions

This field may take the following values:

No	This indicates that all initial default settings apply.
Yes	This indicates that individual default settings have been changed.

If any of the keywords that make up a command is disallowed, the command will, by default, be disallowed. If all of the keywords that make up a command are allowed, the command will, by default, be allowed.

To change this default status for individual commands, mark the **Command Exceptions** input field with any character(s) - except `DE`. The **Allow/Disallow Commands** screen will be displayed, listing all commands that have been defined in the processor:

```
14:19:13                    *** NATURAL SECURITY ***                 2021-12-31
                          - Allow/Disallow Commands -

Library .. SYRINX      Command Processor .. PROC2112

Action           Object           (unused)         A/D
________________ ________________ ________________  _
ACCESS           DATASET                            A
ACCESS           JOB                                A
ACCESS           NODE                               A
ACCESS           OPERATIONS                         A
ACCESS           PRINTER                            A
ACCESS           VOLUME_SERIAL                      A
ACCESS           VTAM_APPLICATION                   A
ADD              DATASET                            A
ADD              FILE                               A
ADD              JOB                                A
ADD              LIBRARY                            A
ADD              MAILBOX                            A
ADD              NODE                               A


Enter-PF1---PF2---PF3---PF4---PF5---PF6---PF7---PF8---PF9---PF10--PF11--PF12---
      Help  PrevM Exit  AddOp       Flip                                Canc
```

The list can be scrolled as described in the section *Finding Your Way In Natural Security*.

In the **A/D** column, mark the commands to be disallowed with `D` and those to be allowed with `A`.

Any status that is different from the default status will be displayed intensified.

To reset the status of all commands to their default allowed/disallowed settings, mark the **Command Exceptions** input field with `DE` (delete). A window will be displayed in which you enter `Y` to confirm the deletion.

Type of Command Exceptions

If any Command Exceptions are defined, this field may take the following values:

Allowed	This indicates that one or more of the commands that were initially disallowed have been allowed.
Disallowed	This indicates that one or more of the commands that were initially allowed have been disallowed.
Allowed/ Disallowed	This indicates that one or more of the initially disallowed commands have been allowed and also one or more of the initially allowed commands have been disallowed.

Defining Functional Security for a User

Generally, the functional security defined for a command processor in a library security profile applies to all users of the processor in that library. If you wish to define different functional security for an individual user, you may do so in the user's security profile. The specifications in the user security profile will then take precedence over the specifications in the library security profile.

By default, the functional security specifications as defined for the processor in the library security profile apply.

To change any of these specifications for an individual user, mark the option **Functional Security** in the **Additional Options** window of the user's security profile (see *Components of a User Security Profile*); the **Functional Security** window will be displayed:

```
   User ID ....................... ABC
   Library ID .................... ________
   Command Processor ............ ________

__ Functional security defined ..
__ Keyword default ..............
__ Keyword exceptions ...........
__ Command exceptions ...........
   Type of command exceptions ...
```

In this window, you can define user-specific functional security for a command processor in a library.

In the **Library ID** field of the window, enter the ID of the library in which the processor is contained, and in the **Command Processor** field, enter the name of the command processor you wish to define for the user.

Functional Security Defined

This field may contain the following values:

No	This indicates that for this user the functional security as defined for the processor in the library security profile applies.
Yes	This indicates that for this user functional security different from that defined for the processor in the library security profile has been defined.
???	This indicates that the status of the command processor is either "modified" or "unresolved" (see *Status of a Command Processor* above).

To reset the user-specific specifications to those as defined for the processor in the library security profile, mark the **Functional Security Defined** input field with `DE` (delete). A window will be displayed in which you enter `Y` to confirm the deletion.

Keyword Default/Keyword Exceptions/Command Exceptions/Type of Command Exceptions

For these fields, the same applies as described under *Defining Functional Security for a Library* above.

Functional Security for Library SYSSEC

The command processor `NSCCMD01` is provided for the Natural Security library `SYSSEC`.

Natural Security *always* uses this command processor for the handling of functions within `SYSSEC`. It is not possible to use another command processor with `SYSSEC`.

By default, `NSCCMD01` is defined with **Keyword Default** set to "Allowed" and no **Keyword Exceptions** or **Command Exceptions**; that is, all Natural Security functions are allowed.

You cannot modify command processor `NSCCMD01` itself (as it is only provided in object form). However, if desired, you can control the use of functions within `SYSSEC` by modifying the functional security aspects of `NSCCMD01` in the library security profile of `SYSSEC` and in the user security profiles of Natural Security administrators.

For example, if you wish an administrator to only look at security profiles but not modify them, you would disallow for that administrator all action keywords but `DISPLAY`; or, if you wish an administrator to only deal with security profiles of users, but not security profiles of any other type of object, you would disallow for that administrator all object keywords but `USER`.

The keywords in `NSCCDM01` correspond to the Natural Security commands as listed under ***Direct Commands*** in the section *Finding Your Way In Natural Security*.

Caution: Do not set the **Keyword Default** for command processor `NSCCMD01` to "Disallowed" - unless you define *immediately* afterwards **Keyword Exceptions** that allow you to use all the Natural Security functions you need. If you set the **Keyword Default** for `NSCCMD01` to "Disallowed" and then leave the **Functional Security** window, all Natural Security functions would be disallowed; that is, no one would be able to use Natural Security anymore. To make Natural Security accessible again, it would then be necessary to execute an `INPL` command with the `RECOVER` option.

Functional Security Defined

For the command processor `NSCCMD01`, the field **Functional Security Defined** may also take the value "All". This determines the **access to Natural Security's Administrator Services** subsystem.

To switch between the values "Yes" and "All", you mark the field with `OW` or `AL` respectively.

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This section covers the following topics:

About Batch Mode

Before you use Natural Security in batch mode, you should be familiar with the general considerations concerning the use of Natural in batch mode as described in the Natural *Operations* documentation.

Please also observe the batch-mode particularities of the underlying operating system.

If you want to process a job in batch mode under Natural Security, the Natural system variable `*DEVICE` must be set to `BATCH`.

Logon in Batch Mode

This section contains information on:

- Logon Input Data in Batch Mode
- Password Change in Batch Mode
- Automatic Logon in Batch Mode
- Startup Transaction in Batch Mode
- Mailboxes in Batch Mode

Logon Input Data in Batch Mode

When you use Natural Security in batch mode, the logon procedure is started automatically. Input for the `LOGON` command must be provided as follows:

On z/OS in delimiter mode (IM=D), and on all other platforms:

```
%*
library-ID,user-ID,password
```

On z/OS in forms mode (IM=F):

```
library-ID user-ID
%*
password
```

In forms mode, the *`library-ID`* must be 8 bytes long; if it is less than 8 characters long, the remaining bytes must be filled with blanks.

The input mode on z/OS is set with the Natural profile parameter `IM` (see Natural *Parameter Reference* documentation).

The specification of `%*` prevents the password from being printed.

If the logon procedure is to be initialized via dynamic parameters, the `LOGON` command must be specified with the profile parameter `STACK` as follows:

```
STACK=(LOGON library-ID user-ID password)
```

If no input data are specified for the `LOGON` command, the Natural batch session will be terminated.

Note: Under Windows in batch mode, the map `LOGONM1` instead of the dialog box `GLOGONM1` is displayed as logon screen.

Password Change in Batch Mode

To change the password in batch mode, input for the `LOGON` command must be provided as follows:

On z/OS for delimiter mode (IM=D), and on all other platforms:

```
%*
library-ID,user-ID,password,new-password
%*
,,,new-password
```

On z/OS for forms mode (IM=F):

```
library-ID user-ID
%*
password new-password
%*
new-password
```

For forms mode, *`library-ID`* and *`password`* must be 8 bytes long; if they are shorter, the remaining bytes must be filled with blanks. The *`new-password`* in the last line must be preceded by 8 blanks.

Automatic Logon in Batch Mode

If you use automatic logon (Natural profile parameter `AUTO=ON`) in batch mode, the value of the Natural system variable `*INIT-USER` will be taken as user ID. By default, `*INIT-USER` in batch mode contains the name of the batch job under which the Natural session. A user security profile for this batch job name must be defined in Natural Security. A logon with another user ID is not possible.

On z/OS computers under z/OS, the value of `*INIT-USER` is determined by the parameter `USERID` in the Natural z/OS batch interface. Depending on the setting of this parameter, this value can be supplied by the security access control block (ACEE) of the security package being used (for example, RACF or ACF2), or by the `USER` parameter in the job card.

Startup Transaction in Batch Mode

When you log on to a library in batch mode, the setting of the switch **Batch execution** in the library security profile determines whether the startup transaction specified in the library security profile will be executed or not. See **Transactions** (under *Components of a Library Security Profile* in the section *Library Maintenance*) for details.

Mailboxes in Batch Mode

When you log on in batch mode, it depends on the setting of the general option **Suppress mailboxes in batch mode** (see *Administrator Services*) whether mailboxes are displayed or not.

Batch User Security Profiles

In addition to creating security profiles for users of types `A`, `P`, `M`, `G` and `T`, you can also create user security profiles of type `B` (for "batch"). They are created in the same way as other user security profiles (see ***Adding a New User*** in the section *User Maintenance*) You can then enter the user ID of such a batch user in the field **Batch User ID** of a user security profile.

Before a batch user ID can be entered in a user security profile, a security profile for this batch user ID must have been defined.

Several users may share the same batch user ID; that is, the same batch user ID can be entered in the security profiles of several users. Thus, the same conditions of use can apply to several users in batch mode, and these conditions have to be defined only once.

A batch user ID cannot be used for a logon in online mode.

In batch mode, a user logs on with his/her "normal" user ID and password. Natural Security will then use the batch user ID specified in the user's security profile, and the conditions of use defined for that batch user ID will apply.

If no batch user ID is specified in the user's security profile, the **Privileged Groups** specified in the user's security profile will be checked (in order of entry) for a batch user ID. If none of the Privileged Groups has a batch user ID either, the user's own user ID will be used.

A batch user security profile cannot be linked directly to a library, it must be linked via a Group; that is, it must be contained in a Group, and the Group be linked to the library.

Countersignatures in Batch Mode

Countersignatures cannot be processed in batch mode. This means that security profiles which require a countersignature for maintenance permission are excluded from batch-mode processing.

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This section describes how to transfer Natural Security data from one system file to another.

It covers the following topics:

About Security Data Transfer

The transfer of Natural Security data from one system file to another is only relevant if you use more than one Natural Security system file.

A Natural Security system file is specified with the Natural profile parameter `FSEC` (see Natural *Parameter Reference* documentation).

The library `SYSSEC` contains two programs for the transfer of Natural Security data from one system file to another: `SECULD2` and `SECLOAD`:

- `SECULD2` is used to unload data from one system file to a work file.
- `SECLOAD` is used to load the data from the work file onto the other system file.

The selection of data to be transferred is done with `SECULD2`. `SECLOAD` will always attempt to transfer the complete work file. However, `SECLOAD` will check whether the data to be transferred are consistent with the data already stored on the system file. Inconsistent data will not be loaded.

The programs `SECULD2` and `SECLOAD` you use must both be of the same Natural Security version. Moreover, it is recommended that the latest available version of `SECULD2` and `SECLOAD` be used.

An FSEC system file can be shared by all supported Natural Security versions. This means that you can continue to use an existing FSEC file and need not create a new FSEC file for a new Natural Security version. However, should you decide to use a new FSEC file for a new Natural Security version and wish to transfer existing security data to this new file, you unload/load the data using the standard `SECULD2/SECLOAD` transfer procedure.

Both `SECULD2` and `SECLOAD` can only be invoked from *within* the library `SYSSEC`.

Using SECULD2

To invoke `SECULD2`, you enter the command `SECULD2` in the command line of any Natural Security screen. The **SECULD2** menu will be displayed.

To select the type of data to be transferred, you enter one of the following function codes on the **SECULD2** menu:

Function Code	Type of Data to be Unloaded
*	All security data.
D	All security data with deletion (all data will be loaded onto the work file and be deleted from the system file).
O	Objects defined in Natural Security (users, libraries, utility profiles, etc.).
L	Links between users and objects.
F	Links between libraries and files (this function is only available on z/OS).
C	Components of library security profile (this function is not available on z/OS).
P	Default profiles (user or utility profiles).
W	Process **workplan**.

In addition to the function code, you can specify the following on the **SECULD2** menu:

Transfer Format	With this option, you specify to which work file the selected data are to be written: ■ `Y` = The data will be written to Work File 1 in alphanumeric form (this is the default for non-z/OS environments). Work File 1 can be used for any form of transfer supported by `SECULD2/SECLOAD`. This requires that the work file is of text (ASCII) format and has a file extension. If it had no file extension (or the file extension `.sag`), the data would be loaded in binary form and could not be processed by `SECLOAD`. ■ `N` = The data will be written to Work File 5 in binary form (this is the default for z/OS environments). Work File 5 can only be used if the data are to be transferred to another system file on the same hardware platform.
Object Type	If you select function code `O`, `L` or `P`, you also have to specify the type of object/link to be unloaded. If you select function code `C`, you also have to specify the type of components (DDM profiles) to be unloaded. For a selection list of possible types, enter a question mark (?) in this field. If you select function code `W`, you specify the ID of the workplan in this field.
Start Value	You can specify an ID to unload a certain object or range of objects. See also **Range** below. **Start Value** is not applicable to function codes `*` and `D`.
Range	This field determines how the value specified in the Start Value field is to be treated: ■ If you leave the **Range** field blank, the value in the **Start Value** field will be treated as an actual start value; that is, the range of objects to be unloaded will begin with the one whose object ID begins with to the value specified as **Start Value**.

	■ If you enter an asterisk (*) in the **Range** field, the range of objects to be unloaded will comprise only those whose object IDs begin with the value specified as **Start Value**. ■ If you enter a plus sign (+) in the **Range** field, the range of objects to be unloaded will consist only of the one whose object ID is specified as **Start Value** - or, in the case of links, will include only those whose object ID is specified as **Start Value**.
Link ID	This field can only be used in conjunction with function code `L`. You can specify a user ID to unload only links of a certain user or range of users. To select a range of links, you use see **Range** field (see below).
Range	This field can only be used in conjunction with function code `L`. It determines how the value specified in the **Link ID** field is to be treated: ■ If you leave the **Range** field blank, the value in the **Link ID** field will be treated as an actual start value; that is, the range of links to be unloaded will begin with the one whose user ID corresponds to the value specified as **Link ID**. ■ If you enter an asterisk (*) in the **Range** field, the range of links to be unloaded will only include those whose user IDs begin with the value specified as **Link ID**. ■ If you enter a plus sign (+) in the **Range** field, the range of links to be unloaded will only include those whose user ID corresponds to the value specified as **Link ID**.
Number	You may specify the number of objects to be transferred. (This option is not applicable to function codes `*` and `D`.)
Date from/to	You may specify two dates to unload only objects which were created/last modified in that period of time. (This option is not applicable to function code `D`.)
Work File	You specify the name of the work file to which the data are to be written. If you use Work File 5, the work-file name must end with ".sag". This field is not available on z/OS.
Ty	The type of work file: ■ `D` = Default. ■ `N` = Entire Connection work file. This field is not available on z/OS.

Using a Workplan

If you need to perform the same unload operation at regular intervals, you can use a so-called "workplan". Instead of having to make all the unload specifications every time on the **SECULD2** menu, you need to make them only once in a workplan. You then use function code `W` and only specify the ID of the workplan in the field **Object type** on the **SECULD2** menu.

A workplan is a Natural object of type "text", which has to be contained in the library `SYSSEC`.

The contents of the text member has to be as follows:

```
- START-SECULD-WORKPLAN
UNLOAD       ________
TRANSFER     _
OBJECT-TYPE  ________
OBJECT-ID    ________________________________
OBJECT-RANGE _
LINK-ID      ________________________________
LINK-RANGE   _
NUMBER       __
DATE-FROM    __________
DATE-TO      __________
- END-SECULD-WORKPLAN
```

SECULD2 evaluates the text specified after the keywords - indicated by the lines above - as follows:

Keyword	Explanation
`- START-SECULD-WORKPLAN`	Indicates the beginning of the text data to be processed by `SECULD2`.
`UNLOAD`	You can specify one of the following: ■ `ALL` = corresponds to function code `*`. ■ `DELETE` = corresponds to function code `D`. ■ `OBJECT` = corresponds to function code `O`. ■ `LINK` = corresponds to function code `L`. ■ `FILE` = corresponds to function code `F`. ■ `PROFILE` = corresponds to function code `P`.
`TRANSFER`	Corresponds to the SECULD2 menu field **Transfer Format**.
`OBJECT-TYPE`	Corresponds to the SECULD2 menu field **Object Type**.
`OBJECT-ID`	Corresponds to the SECULD2 menu field **Start Value**.
`OBJECT-RANGE`	Corresponds to the SECULD2 menu field **Range** for objects.
`LINK-ID`	Corresponds to the SECULD2 menu field **Link ID**.
`LINK-RANGE`	Corresponds to the SECULD2 menu field **Range** for links.
`NUMBER`	Corresponds to the SECULD2 menu field **Number**.
`DATE-FROM`	You can specify one of the following: ■ a date (in the format `YYYY-MM-DD`) as in the SECULD2 menu field **Date from**; ■ `TODAY` = the current date will be used; ■ `LAST` *`nnn`* = objects created/last modified in the last *`nnn`* days; that is, the current day plus the *`nnn`* previous days; *`nnn`* can be `1` to `999`.

Keyword	Explanation
DATE-TO	You can specify a date (in the format YYYY-MM-DD) as in the SECULD2 menu field **Date to**. If TODAY or LAST *nnn* is specified after DATE-FROM, any specification after DATE-TO will be ignored.
- END-SECULD-WORKPLAN	Indicates the end of the text data to be processed by SECULD2.

If you want to perform multiple unload operations with a single workplan, you specify multiple groups of keywords/texts after - START-SECULD-WORKPLAN and before - END-SECULD-WORKPLAN:

```
- START-SECULD-WORKPLAN
UNLOAD       ________
TRANSFER     _
etc. ...
UNLOAD       ________
TRANSFER     _
etc. ...
- END-SECULD-WORKPLAN
```

A sample workplan T-WPLAN1 is provided in the library SYSSEC.

Using SECLOAD

To invoke SECLOAD:

1 Enter the command SECLOAD in the command line of any Natural Security screen.

2 You will then be prompted to make the following specifications:

Load NSC Data in Transfer Format from Work File 1	■ Y = The data will be read in the transfer format from Work File 1 (this is the default for non-z/OS environments). ■ N = The data will be read from Work File 5 (this is the default for z/OS environments).
User-Defined Conversion Table	You can determine whether or not a conversion table is to be used (Y/N). The conversion table used is provided by the API subprogram NSCCONV, which is contained in the library SYSSEC. You can adjust the table to suit your requirements. For details, see the source of NSCCONV.
Simulate Loading	This option can be used to ascertain whether all data from the work file can be loaded, before you actually load them. When this function is executed, the data are loaded into the system file, and then, upon completion of the function, immediately deleted from it again.

	When activating this function, you select what type of load report you want as a result of the simulation: ■ N = Simulation not active. ■ A = Simulation with load report listing All records. ■ R = Simulation with load report listing only Rejected records. ■ L = Simulation with load report listing only Loadable records.
Work File	You specify the name of the work file from which the data are to be written. This field is not available on z/OS.
Type of Work File	■ D = Default. ■ N = Entire Connection work file. This field is not available on z/OS.
Expire passwords for loaded user profiles	This option can be used to enforce a password expiration for loaded user security profiles (user types A, P, M). ■ Y = The passwords for loaded user security profiles will be reset to being identical to the corresponding user IDs. At the next logon, these users will have to change their passwords. ■ N = No password expiration is applied in conjunction with the loading of user security profiles. This option does not apply to loaded user security profiles in which the option **Change after** *nnn* **days** is set to 999. For these, the existing passwords will continue to be valid.
Import from file of external security system	This option can be used to load user security data from an external security system to a Natural Security system file. See *Transferring User Data From an External Security System* below.

Note: Data which are inconsistent or which already exist on the target system file will not be loaded. To ascertain why data were not loaded, please refer to the load report.

Transferring Data to Another Hardware Platform

With SECULD2 and SECLOAD, you can also transfer security data from one hardware platform to another.

To do so:

1 Enter a Y in the **Transfer Format** field of the **SECULD2** menu.

2 By pressing PF4, you can then invoke an additional window in which you can specify the following optional parameters:

Target Environment	The operating system (as in the Natural system variable `*OPSYS`) of the target environment.
Target FSEC DBID/FNR	The database ID and file number of the FSEC system file to which the data are to be transferred. `SECLOAD` will compare these specifications with the DBID/FNR of the actual FSEC file to which the data are to be loaded: if they are not the same, the data cannot be loaded. In this way, you can prevent an uncontrolled loading of security data. Otherwise anybody who got hold of the work file, could load it anywhere.
Conversion EBCDIC-ASCII	You can determine whether EBCDIC-ASCII conversion is to be performed (`Y/N`). The conversion is performed by the API subprogram `NSCCONV`, which is contained in the library `SYSSEC`. For details, see the source of `NSCCONV`.
User-Defined Conversion Table	You can determine whether or not a conversion table is to be used (`Y/N`). The conversion table used is provided by the API subprogram `NSCCONV`, which is contained in the library `SYSSEC`. You can adjust the table to suit your requirements. For details, see the source of subprogram `NSCCONV`.

The data will then be written, in alphanumeric form, to Work File 1, from where they can be loaded with `SECLOAD`.

Note: When data are transferred from a z/OS platform to another platform, `SECLOAD` also checks if library IDs conform to the naming conventions for libraries (as described under the system command `LOGON` in the Natural *System Commands* documentation).

Transferring User Data From an External Security System

This option is not available on z/OS.

With `SECLOAD`, you can also import user identification data from an external security system, and load them to a Natural Security system file.

This is possible for external data from an LDAP server (for information on LDAP, see ***Authentication Options (LDAP)***).

To import external user data:

1 On the **SECLOAD** menu, you specify the following:

Load NSC Data in Transfer Format from Work File 1	Mark this option with `Y`.
Work File	Specify the full path of the work file to be imported. The specified file must have the extension `.ldif`, it must have been created with the command `ldapsearch`, and it must contain the string `dn: uid=`.
Import from file of external security system	Mark this option with `Y`.

Optionally, you can use the option **Simulate loading** if you want to check if the data from the work file can be imported before you actually import them.

The other entries on the **SECLOAD** menu are ignored for the import of external user data.

2 The **Import External Security Data (LDAP)** screen will be displayed, on which you specify the following:

Result report	The import function produces a result report. Select how you want this report to be output: ■ `DI` = Display online. ■ `DW` = Display online and write to work file 2. ■ `WW` = Write to work file 2.
Work file 2	The name of the work file to which the result report is to be written.
User default profile	When the user data are imported, a Natural Security user security profile is automatically created for every user ID imported. All these user security profiles will be created using the same user default profile as a template. In this field, you have to specify the ID of the default profile to be used. For a selection list of default profiles, you enter a question mark (?) in this field, or a start value with asterisk notation. For information on default profiles, see ***User Default Profiles***.
User ID prefix	If the option **Support user names as IDs** is set in the LDAP security profile used, the *user IDs* from the external security system will be written as *user names* into the Natural Security user security profiles created. The 8-character Natural Security *user IDs* for these user security profiles will be generated by Natural Security, using a prefix followed by a generated number. In this field, you have to specify the prefix of 1 to 3 characters.

Transferring Data in Batch Mode

SECULD2/SECLOAD in Batch Mode on z/OS

Example jobs for executing SECULD2 and SECLOAD in batch mode on z/OS computers are shown below.

Example 1 of SECULD2 Job:

In this example, all users whose IDs begin with ADE and who were last modified between 1st January and 10th June 2008, and the library TESTLIB will be transferred to the work file CMWKF05.

```
//SECULD2 JOB DEMO,CLASS= ,MSGCLASS= ,REGION=2048K
//*******************************************************
//ULD      EXEC PGM=NATBATnn,
// PARM='DBID=10,FNR=5,FSEC=(,8),FDIC=(,9),IM=D,MT=0,MAXCL=0,MADIO=0'
//STEPLIB  DD DISP=SHR,DSN=NATURAL.Vnn.LOAD
//         DD DISP=SHR,DSN=ADABAS.Vnn.ADALOAD
//DDCARD   DD *
ADARUN PROGRAM=USER,SVC=249,DATABASE=10,MODE=MULTI
/*
//CMPRINT  DD SYSOUT=*
//CMWKF05  DD UNIT=TAPE,VOL=SER=NATSEC,DSN=NSC.ULD,
// DCB=(RECFM=VB,LRECL=4624,BLKSIZE=4628,DEN=3),DISP=(,KEEP)
//CMSYNIN  DD *
SYSSEC,DBA,PASSWORD
SECULD2
O,N,US,ADE,*,,,,2008-01-01,2008-06-10
O,N,LI,TESTLIB,1
.
FIN
/*
```

Example 2 of SECULD2 Job:

In this example, all users whose IDs begin with “ADE” will be transferred to the work file CMWKF01. If the “Transfer” option is specified as Y, the job must contain a line for additional parameters (see *Transferring Data to Another Hardware Platform* above). In this example, no additional parameter specifications are made (that is, they are either not specified or specified as N) .

```
//SECULD2 JOB DEMO,CLASS= ,MSGCLASS= ,REGION=2048K
//*********************************************************
//ULD      EXEC PGM=NATBATnn,
// PARM='DBID=10,FNR=5,FSEC=(,8),FDIC=(,9),IM=D,MT=0,MAXCL=0,MADIO=0'
//STEPLIB  DD DISP=SHR,DSN=NATURAL.Vnn.LOAD
//         DD DISP=SHR,DSN=ADABAS.Vnn.ADALOAD
//DDCARD   DD *
ADARUN PROGRAM=USER,SVC=249,DATABASE=10,MODE=MULTI
/*
//CMPRINT  DD SYSOUT=*
//CMWKF01  DD UNIT=TAPE,VOL=SER=NATSEC,DSN=NSC.ULD,
// DCB=(RECFM=VB,LRECL=4624,BLKSIZE=4628,DEN=3),DISP=(,KEEP)
//CMSYNIN  DD *
SYSSEC,DBA,PASSWORD
SECULD2
O,Y,US,ADE,*
,,,N,N
.
FIN
/*
```

Example 3 of SECULD2 Job:

In this example, all libraries whose IDs begin with "SF" will be transferred to the work file `CMWKF01`. The target environment is a PC, and the database ID and file number of the target FSEC system file are 89 and 356.

```
//SECULD2 JOB DEMO,CLASS= ,MSGCLASS= ,REGION=2048K
//*********************************************************
//ULD      EXEC PGM=NATBATnn,
// PARM='DBID=10,FNR=5,FSEC=(,8),FDIC=(,9),IM=D,MT=0,MAXCL=0,MADIO=0'
//STEPLIB  DD DISP=SHR,DSN=NATURAL.Vnn.LOAD
//         DD DISP=SHR,DSN=ADABAS.Vnn.ADALOAD
//DDCARD   DD *
ADARUN PROGRAM=USER,SVC=249,DATABASE=10,MODE=MULTI
/*
//CMPRINT  DD SYSOUT=*
//CMWKF01  DD UNIT=TAPE,VOL=SER=NATSEC,DSN=NSC.ULD,
// DCB=(RECFM=VB,LRECL=4624,BLKSIZE=4628,DEN=3),DISP=(,KEEP)
//CMSYNIN  DD *
SYSSEC,DBA,PASSWORD
SECULD2
O,Y,LI,SF,*
WNT-X86,89,356,N,N
.
FIN
/*
```

Example 1 of SECLOAD Job:

In this example, the data will be read from work file 5 (CMWKF05).

```
//SECLOAD JOB  DEMO,MSGCLASS= ,CLASS= ,REGION=2048K
//**************************************************
//LOAD     EXEC PGM=NATBATnn,
// PARM='DBID=7,FNR=23,FSEC=(,24),FDIC=(,25),EJ=OFF,MT=0,IM=D,MADIO=0,MAXCL=0'
//STEPLIB  DD DSN=NATURAL.Vnn.LOAD,DISP=SHR
//         DD DSN=ADABAS.Vnn.ADALOAD,DISP=SHR
//CMPRINT  DD SYSOUT=*
//DDCARD   DD *
ADARUN PROGRAM=USER,SVC=249,DATABASE=7,MODE=MULTI
/*
//CMWKF05  DD UNIT=TAPE,VOL=SER=NATSEC,DSN=NSC.ULD,DISP=SHR
//CMSYNIN  DD *
SYSSEC,DBA,PASSWORD
SECLOAD
N,N,N,N
FIN
/*
```

Example 2 of SECLOAD Job:

In this example, the data will be read from work file 1 (CMWKF01).

```
//SECLOAD JOB  DEMO,MSGCLASS= ,CLASS= ,REGION=2048K
//**************************************************
//LOAD     EXEC PGM=NATBATnn,
// PARM='DBID=7,FNR=23,FSEC=(,24),FDIC=(,25),EJ=OFF,MT=0,IM=D,MADIO=0,MAXCL=0'
//STEPLIB  DD DSN=NATURAL.Vnn.LOAD,DISP=SHR
//         DD DSN=ADABAS.Vnn.ADALOAD,DISP=SHR
//CMPRINT  DD SYSOUT=*
//DDCARD   DD *
ADARUN PROGRAM=USER,SVC=249,DATABASE=7,MODE=MULTI
/*
//CMWKF01  DD UNIT=TAPE,VOL=SER=NATSEC,DSN=NSC.ULD,DISP=SHR
//CMSYNIN  DD *
SYSSEC,DBA,PASSWORD
SECLOAD
Y,N,N,N
FIN
/*
```

SECULD2/SECLOAD in Batch Mode under Linux

To execute SECULD2 and SECLOAD in batch mode under Linux, you have to provide input in the batch-mode files as follows:

The input file assigned to CMSYNIN has to contain the following:

```
SECULD2
FIN
```

In the input file assigned to CMOBJIN you specify the data to be transferred; for example:

```
SYSSEC,DBA,PASSWORD,,
O,Y,US,ADE*,,,,,2008-02-01,2008-02-28
,,,N,N
.
```

This example assumes that the session was started with AUTO=OFF. With AUTO=ON, you omit the user ID and password from the first line.

The result of the data transfer will be shown in the output file assigned to CMPRINT.

For general information, see the batch-mode section in the Natural *Operations* documentation for Linux.

25 User Exits

- Logon-Related User Exits 406
- RPC-Related User Exit 409
- Other User Exits 409

This section describes the user exits available with Natural Security. It contains information on:

Logon-Related User Exits

The following logon-related user exits are available:

- LOGONEX0
- LOGONEX1
- LOGONEX2
- LOGONEX3
- LOGONEX5
- LOGONSX1

Note: The user exit LOGONEX4 is not related to Natural Security's regular logon handling, but is only relevant in in conjunction with a logon of an RPC client to a Natural RPC server in an RPC environment. It is described under *RPC-Related User Exit* below.

General Information on Sources and Objects

LOGONEX0, LOGONEX1, LOGONEX2, LOGONEX3, LOGONEX5 and LOGONSX1 are Natural subprograms which have to be stored in the library SYSLIB to be invoked.

The corresponding sources and object modules of these user exits are available in the library SYSSEC under the following names:

User Exit in SYSLIB	Sources and Object Modules in SYSSEC
LOGONEX0	NOGONEX0
LOGONEX1	NOGONEX1
LOGONEX2	NOGONEX2
LOGONEX3	NOGONEX3
LOGONEX4	NOGONEX4
LOGONEX5	NOGONEX5
LOGONSX1	NOGONSX1

You can modify each of the user exits to suit your requirements. To do so, you make a copy of NOGONEX*n* (*n* = 0, 1, 2, 3 or 5), store it under the name LOGONEX*n*, make your adjustments to it, and then copy it into SYSLIB.

To ensure that the user exits are always present in SYSLIB, Natural Security proceeds as follows: The installation procedure, after loading all modules into their respective libraries, checks whether there already is a subprogram LOGONEX*n* contained in SYSLIB. If there is, it will be left untouched. If there is not, the object module of NOGONEX*n* will automatically be copied from SYSSEC

to SYSLIB and stored there under the name LOGONEX*n*. At the same time, this ensures that your customized versions of the user exits are not accidentally overwritten by an installation procedure.

The above also applies to the user exit LOGONSX1/NOGONSX1.

LOGONEX0

If the option **Passphrases active** in ***User Preset Values*** is set to Y or A, LOGONEX0 (instead of LOGONEX1) is invoked by the Natural Security logon program.

Unless modified, LOGONEX0 invokes the Natural Security logon screen (map LOGONMX1 or dialog box GLOGONMX1; see ***Logon Screen / Logon Dialog Box***). By modifying LOGONEX0 you can invoke your own logon screens.

LOGONEX0 supports the use of *passphrases*, that is, passwords which are longer than 8 characters.

LOGONEX1

If the option **Passphrases active** in ***User Preset Values*** is set to N, LOGONEX1 (instead of LOGONEX0) is invoked by the Natural Security logon program.

Unless modified, LOGONEX1 invokes the Natural Security logon screen (map LOGONM1 or dialog box GLOGONM1; see ***Logon Screen / Logon Dialog Box***). By modifying LOGONEX1 you can invoke your own logon screens.

LOGONEX1 only supports the use of "regular" passwords of up to 8 characters.

LOGONEX2

LOGONEX2 is invoked by the Natural Security logon program under any of the following conditions:

- when # is entered as the library ID (or is passed from LOGONEX1 as library ID);
- when no library ID has been specified for the logon and neither a default library nor a private library exists which could have been invoked (see also ***Logon Without Library ID*** in the section *Logging On*).

When LOGONEX2 is invoked, the user ID and password have already been checked and found valid by the logon program. At this point, the Natural system variable *USER contains a valid value, which may be used.

Unless modified, LOGONEX2 consists of nothing but an END statement. On return to the logon program, a valid library ID must be passed to the logon program, otherwise the logon will be rejected. Moreover, it is possible to return one of possibly several IDs using which a user is linked to a library.

As the user ID/password check has already established the validity of the user-specific logon data when LOGONEX2 is invoked, LOGONEX2 may be used to implement additional user-specific procedures

or to request user-specific data. For example, the application programming interface SECNOTE may be invoked to read user security notes.

When the logon program invokes LOGONEX1 or LOGONEX2, it passes the parameters PUSERDUMMY1 and PUSERDUMMY2 to the subprograms. Both parameters are provided for your use; their format/length is A8. You may assign values to these parameters in LOGONEX1 and subsequently use these values in LOGONEX2, as they are passed without modification from one subprogram to the other.

LOGONEX3

LOGONEX3 is invoked by the Natural Security logon program under any of the following conditions:

- if there are mailboxes to be displayed;
- if at least one of the parameters PUSERDUMMY1 or PUSERDUMMY2, passed from LOGONEX1 or LOGONEX2 respectively, is not blank.

LOGONEX3 is invoked immediately after a successful logon and before control is passed from the logon program to the library invoked; when LOGONEX3 is invoked, logon processing is completed except for the display of the mailboxes.

If LOGONEX3 is left unmodified, it performs the subprogram calls necessary for the display of mailboxes.

You may modify LOGONEX3 for one of the following purposes:

- to suppress the display of mailboxes;
- to have non-library-specific processing to be carried out immediately after a successful logon but before any library-specific transactions are executed.

LOGONEX5

LOGONEX5 is invoked by the Natural Security logon program whenever the system command LOGOFF is executed.

LOGONSX1

This user exit is only available on Linux and Windows.

If the **Authentication Type** is set to "LDAP" in the **LDAP security profile**, LOGONSX1 - instead of LOGONEX1 - is invoked by the Natural Security logon program.

Unless modified, LOGONSX1 invokes the Natural Security logon screen (map LOGONSM1 or dialog box GLOGONS1; see ***Logon Screen / Logon Dialog Box***).

By modifying LOGONSX1 you can invoke your own logon screens.

RPC-Related User Exit

The user exit LOGONEX4 is a Natural subprogram which is only used in an RPC environment. It is invoked by the Natural Security RPC logon program after a successful logon of an RPC client to a Natural RPC server.

Note: The logon of an RPC client to a Natural RPC server does *not* cause any of the user exits described under ***Logon-Related User Exits*** (see above) to be invoked.

Invoking LOGONEX4 is always the last task performed by the logon program when all other logon processing has been completed, and before an RPC service is performed. At this time, the user ID and password have already been checked and found valid by the logon program, and the Natural system variables *USER and *LIBRARY-ID contain valid values, which may be used.

In conversational mode, the user exit is invoked when the conversation is started.

The input parameters for the user exit are the library ID and subprogram name. The output parameter of the user exit is a return code; this may be used to terminate the RPC logon with a non-zero return code. If this is the case, Natural issues error NAT1696 with reason code 10.

A sample source module for LOGONEX4 is available in the library SYSSEC under the name NOGONEX4. To invoke the user exit, its object module has to be stored under the name LOGONEX4 in the library SYSTEM on the FNAT system file assigned to the RPC server. After copying it to this library, the RPC server has to be restarted.

Once the user exit has been invoked, it remains active until the end of the RPC server session.

To deactivate the user exit, you have to first terminate the RPC server, and then remove the object LOGONEX4 from the library SYSTEM.

Do *not* remove LOGONEX4 while an RPC server session using that FNAT system file is still active, because this would make the RPC server session inoperable (error NAT0082 would be issued at the next logon to the RPC server).

Other User Exits

The library SYSSEC contains several other user exits:

User Exit	Function
NSC*XX*EX1	where *XX* is the object type: US = user, LI = library, SF = environment, DD = DDM, FI = file, UT = utility, OB = external object, MA = mailbox. The object-type-specific NSC*XX*EX1 user exit is invoked immediately after a maintenance function for an object of this type has been performed.
NSCUSEX2	This user exit is invoked when you use the function **Edit Group Members** and CATALOG the changes you have made. It displays a list of the group's members, indicating which members have been added to the group and which have been removed from it.
NSC*XX*EX3	where *XX* is the object type: US = user, LI = library, DD = DDM, FI = file, OB = external object, MA = mailbox. The object-type-specific NSC*XX*EX3 user exit is invoked when a maintenance function for an object of this type has been invoked and after data have been entered - but before these data are validated and processed by Natural Security. The sources of NSC*XX*EX3 are supplied under the names ESC*XX*EX3. The activate one of them, you have to catalog it under the name NSC*XX*EX3 in the library SYSSEC.

The parameters of these user exits are not modifiable.

For details, see the source codes of the user exits themselves.

II Application Programming Interfaces

This section describes the application programming interfaces (APIs) available with Natural Security:

- About Subprograms
- Subprograms for Access Verification and User Authentication
- Subprograms for Administrator Services
- Subprograms for Object Maintenance
- Subprograms for Retrieval

26 About Subprograms

Natural Security provides several application programming interfaces (APIs). They are Natural subprograms and can be divided into four categories:

- subprograms for access verification and user authentication;
- subprograms to perform Natural Security Administrator Services functions from outside the Natural Security library `SYSSEC`;
- subprograms to perform Natural Security maintenance functions from outside the Natural Security library `SYSSEC`;
- subprograms to perform Natural Security retrieval functions from outside the Natural Security library `SYSSEC`.

Each subprogram to be used has to be copied into the library in which it is to be executed, or into one of the steplibs concatenated to that library.

Note: The subprograms (with the exception of `SECNOTE`) cannot be invoked from any of the logon-related user exits described in the section ***User Exits***.

To list the APIs:

1 On the **Main Menu**, select **Administrator Services**.

If you are allowed **access to Administrator Services**, the **Administrator Services Menu 1** will be displayed.

2 Press PF8.

3 On the **Administrator Services Menu 2**, select **Application Programming Interfaces**.

A list of the interface subprograms along with relevant examples will be displayed. You can filter the result using the following search fields:

- **Example**: Search for a specific group of examples.

- **Interface**: Search for a required API interface.
- **Description**: Filter examples by descriptive keywords.

Return Code

Several of the subprograms contain the field `PRC`. It contains the return code. This will be `0` if the function was performed successfully. Any other return code *nnnn* corresponds either to a Natural Security error number or, if prefixed with a hyphen (-), to a Natural system error number. You can display the corresponding message by entering the Natural system command:

- `HELP U`*nnnn* for a Natural Security message, in the library `SYSSEC`; or
- `HELP` *nnnn* for a Natural system message.

27 Subprograms for Access Verification and User Authentication

- NSC---L 416
- NSCCHCK 417
- NSCDEF 417
- NSC---P 418
- NSC----P 418
- NSC--PH 419
- NSC--PHS 419
- NSC---SP 420
- NSCSSX 421

These subprograms can be used for the following.

Subprograms for Access Verification

Subprogram	Description
NSC---L	Check if logon to a library is allowed, and which modules in a library are available to a user.
NSCCHCK	Check if access to external object is allowed.
NSCDEF	Check if object is defined to Natural Security.

Subprograms for User Authentication

Subprogram	Description
NSC---P	Check if password is valid.
NSC----P	Check if password is valid, and change it.
NSC--PH	Check if passphrase is valid.
NSC--PHS	Check if passphrase is valid, and change it.
NSC---SP	Check if password is valid - in RPC server environments.
NSCSSX	Check if password is valid - in an LDAP user authentication context.

NSC---L

The subprogram NSC---L is used to:

- check whether a specific user is allowed to log on to a specific library;
- ascertain which modules in a library are available to a user.

It is invoked as follows:

```
CALLNAT 'NSC---L' PAPPLID PUSERID PRC PPARM1 PNSC-MESSAGE
```

Example programs PGM---L and PGM---LM of how to invoke this subprogram are provided in source form in the library SYSSEC. They include descriptions of the individual CALLNAT parameters.

Example Program	Description
PGM---L	Check whether a specific user is allowed to log on to a specific library.
PGM---LM	Check whether a specific user is allowed to execute a module in a library.

NSCCHCK

The subprogram NSCCHCK is used to check whether a specific user is allowed to access a specific external object.

It is invoked as follows:

```
CALLNAT 'NSCCHCK' PCLASSID PUSERID POBJID PACCESS-TYPE PRC PPARM1 PNSC-MESSAGE
```

An example program PGMCHCK of how to invoke this subprogram is provided in source form in the library SYSSEC. It includes descriptions of the individual CALLNAT parameters.

Example Program	Description	Code
PGMCHCK	Check whether a specific user is allowed to access a specific external object.	DS, JB, ND, OP, PR, VA, VS

Code	Function
DS	Dataset
JB	Batch jobs
ND	Nodes
OP	Operations
PR	Printers
VA	VTAM applications
VS	Volume serials

NSCDEF

The subprogram NSCDEF is used to check whether a specific object is defined under Natural Security, that is, whether a security profile for the object exists.

It is invoked as follows:

```
CALLNAT 'NSCDEF' POBJID POBJTYPE PRC PNSC-MESSAGE PPARM1
```

An example program PGMDEF of how to invoke this subprogram is provided in source form in the library SYSSEC. It includes descriptions of the individual CALLNAT parameters.

Example Program	Description
PGMDEF	Check whether a certain object is defined under Natural Security (whether a security profile for the object exists).

NSC---P

The subprogram NSC---P is used to check if the password supplied together with a user ID is valid.

Note: To perform this function in a Natural RPC server environment, is it recommended that NSC---SP (see below) be used instead. To check a *passphrase*, use NSC--PH (see below).

NSC---P is invoked as follows:

```
CALLNAT 'NSC---P' PUSERID PPASSWORD PUSER_NAME PRC PNSC-MESSAGE
```

An example program PGM---P of how to invoke this subprogram is provided in source form in the library SYSSEC. It includes descriptions of the individual CALLNAT parameters.

Example Program	Description
PGM---P	Check the password of a specific Natural Security user.

Note: For the execution of this subprogram, the general option **Maximum Number of Logon Attempts** applies, that is, each invalid password will be considered an unsuccessful logon attempt.

NSC----P

The subprogram NSC----P is used to check if the password supplied together with a user ID is valid; in addition, it is used to change the password.

Note: To perform this function for a *passphrase*, use NSC--PHS (see below).

NSC----P is invoked as follows:

```
CALLNAT 'NSC----P' PUSERID PPASSWORD(*) PUSER_NAME PPARM PRC PNSC-MESSAGE
```

An example program PGM----P of how to invoke this subprogram is provided in source form in the library SYSSEC. It includes descriptions of the individual CALLNAT parameters.

Example Program	Description
PGM----P	Check and change the password of a specific Natural Security user.

Note: For the execution of this subprogram, the general option **Maximum Number of Logon Attempts** applies, that is, each invalid password will be considered an unsuccessful logon attempt.

NSC--PH

The subprogram NSC--PH is used to check if the passphrase supplied together with a user ID is valid.

It is invoked as follows:

```
CALLNAT 'NSC--PH' PUSERID PPASSWORD_PHRASE PUSER_NAME PRC PNSC-MESSAGE PNSC-MESSAGE_2
```

An example program PGM--PH of how to invoke this subprogram is provided in source form in the library SYSSEC. It includes descriptions of the individual CALLNAT parameters.

Example Program	Description
PGM--PH	Check the passphrase of a specific user ID.

Note: For the execution of this subprogram, the general option **Maximum Number of Logon Attempts** applies, that is, each invalid passphrase will be considered an unsuccessful logon attempt.

NSC--PHS

The subprogram NSC--PHS is used to check if the passphrase supplied together with a user ID is valid; in addition, it is used to change the passphrase.

It is invoked as follows:

```
CALLNAT 'NSC--PHS' PUSERID PPASSWORD_PHRASE(*) PUSER_NAME PPARM PRC PNSC-MESSAGE ↩
PNSC-MESSAGE_2
```

An example program PGM--PHS of how to invoke this subprogram is provided in source form in the library SYSSEC. It includes descriptions of the individual CALLNAT parameters.

Example Program	Description
PGM--PHS	Check and change the passphrase of a specific Natural Security user.

Note: For the execution of this subprogram, the general option **Maximum Number of Logon Attempts** applies, that is, each invalid passphrase will be considered an unsuccessful logon attempt.

NSC---SP

The subprogram NSC---SP is only to be used in Natural RPC server environments. On the whole, it corresponds to NSC---P (described above). It is used to check if the password supplied together with a user ID is valid.

It is invoked as follows:

```
CALLNAT 'NSC---SP' PUSERID PPASSWORD PLIBRARYID PUSERNAME PPARM1 PRC PNSC-MESSAGE
```

An example program PGM---SP of how to invoke this subprogram is provided in source form in the library SYSSEC. It includes descriptions of the individual CALLNAT parameters.

Example Program	Description
PGM---SP	Check the password of a specific Natural Security user. This Natural Security API can be used in a Natural server session (that is,when *SERVER-TYPE is not blank) as well as in a non-Natural server session.

Note: For the execution of this subprogram, the general option **Maximum Number of Logon Attempts** applies, that is, each invalid password will be considered an unsuccessful logon attempt. In addition, Natural Security will react as if the **Lock User Option** were set to X, that is, it will "remember" unsuccessful logon attempts across sessions. Unlike the **Lock User Option**, however, the locking of user IDs will not include the user ID as contained in the Natural system variable *INIT-USER. When the maximum number of logon attempts is exceeded, the Natural RPC server session will *not* be terminated.

NSCSSX

The subprogram NSCSSX is only available on Windows and Linux. It is used to check if the password supplied together with the user ID is valid.

A prerequisite for the use of this subprogram is that the user authentication via an LDAP server has been activated; see *Authentication Options (LDAP)*.

NSCSSX is invoked as follows:

```
CALLNAT 'NSCSSX' PUSERID PPASSWORD PNSC-USERID PNSC-USERNAME PNSC-USERTYPE PPARM ↩
PRC PNSC-MESSAGE
```

An example program PGMSSX01 of how to invoke this subprogram is provided in source form in the library SYSSEC. It includes descriptions of the individual CALLNAT parameters.

Example Program	Description
PGMSSX01	Verify the password of a specific user ID.

Note: For the execution of this subprogram, the general option **Maximum Number of Logon Attempts** applies, that is, each invalid password will be considered an unsuccessful logon attempt.

28 Subprograms for Administrator Services

- NSCADM 424
- NSCSSXMN 425
- NSCXLI 426
- NSCXLO 427

These subprograms can be used to perform various Administrator Services functions:

Subprogram	Description
NSCADM	Display General Options; process (ETID-related) logon records; process logon/countersign error records; remove/re-establish maintenance/retrieval sections for individual object types; display users in whose security profiles a value differs from a preset value; list and unlock locked user IDs.
NSCSSXMN	Archive/revive LDAP security profile.
NSCXLI	Display a single maintenance log record.
NSCXLO	Display list of maintenance log records.

NSCADM

The subprogram NSCADM is used to:

- display the settings of **General Options** in Administrator Services;
- process **logon records**, which is particular relevant for ETID-related logon records;
- process **logon/countersign error records**;
- remove/re-establish Natural Security maintenance/retrieval sections for: base/compound application profiles and RPC server profiles;
- compare a preset value (as set in the **User Preset Values**) with the corresponding actual value in user security profiles to obtain a list of all user security profiles in which the value differs from the preset value;
- list locked user IDs, and unlock a user ID.

NSCADM is invoked as follows:

```
CALLNAT 'NSCADM' PVERSION PPARM PPARM1(*) PLENGTH PRC PNSC-MESSAGE
```

Example programs PGMADM01 - PGMADM07 are provided in source form in the library SYSSEC. Further descriptions of CALLNAT parameters are included.

Example Program	Description	Code
PGMADM01	Return general default and options.	GDO, NSF (only z/OS), SSX (only Linux and Windows)
PGMADM02	List and delete logon records.	LR, DR

Example Program	Description	Code
PGMADM03	Process Natural Security object type descriptions (delete description of Application entity, display description of Application entity, update description of Natural RPC entity).	DI, DE, UP
PGMADM04	Obtain a list of Natural Security user profiles in which the value of a field differs from the corresponding preset value.	PR
PGMADM05	Maintain time-stamp related ETID logon records. (It is possible to select those logons which occurred in a Natural RPC environment).	LR
PGMADM06	List and unlock user IDs.	AE
PGMADM07	List and delete logon/countersign error records.	LE, DE

The parameter PPARM is used as a function code:

Code	Function
GDO	Display general options.
NSF	Display NSF options.
LR	List logon records.
DR	Delete logon records.
LE	List logon error/countersign error.
DE	Delete logon error/countersign error.
DI	Display maintenance/retrieval sections for base/compound application and RPC server profiles.
DE	Delete maintenance/retrieval sections for base/compound application and RPC server profiles.
PR	Compare preset-value.
LI	List locked user IDs.
UL	Unlock a user ID.

NSCSSXMN

The subprogram NSCSSXMN is only available on Windows and Linux. It is used to archive and revive an LDAP security profile.

A prerequisite for the use of this subprogram is that the LDAP security profile exists in archived or revived form; see *Authentication Options (LDAP)*.

NSCSSXMN is invoked as follows:

```
CALLNAT 'NSCSSXMN' PFUNCTION PPROFILE-ID PRC
```

An example program PGMSSX02 of how to invoke this subprogram is provided in source form in the library SYSSEC. It includes descriptions of the individual CALLNAT parameters.

Example Program	Description	Code
PGMSSX02	Maintain authentication profiles (LDAP).	AR, RV

The parameter PFUNCTION is used as a function code:

Code	Function
AR	Archive security profile.
RV	Revive security profile.

NSCXLI

The subprogram NSCXLI is used to display a single maintenance log record, created by Natural Security if the general option **Logging of Maintenance Functions** is active.

NSCXLI is invoked as follows:

```
CALLNAT 'NSCXLI' PFUNCTION PSELECT-TYPE POBJ-ID POBJ-ID2 PTIMESTMP PPARM PRC ↩
PNSC-MESSAGE PLOG-HEADER XPARM1 PPARM1 XPARM2 PPARM2 XPARM3 PPARM3 XPARM4 PPARM4 ↩
XPARM5 PPARM5 XPARM6 PPARM6 XTEXT PTEXT
```

Example programs PGMXLI01 - PGMXLI10 of how to invoke this subprogram are provided in source form in the library SYSSEC. They include descriptions of the individual CALLNAT parameters.

Example Program	Description	Code
PGMXLI01	Read the maintenance log record of a file.	RI
PGMXLI02	Read the maintenance log record of a file. Display only the modified data of this record.	RI
PGMXLI03	Read the maintenance log record of a library.	RI
PGMXLI04	Read the maintenance log record of a library. Display only the modified data of this record.	RI
PGMXLI05	Read the maintenance log record of a mailbox.	RI
PGMXLI06	Read the maintenance log record of a mailbox. Display only the modified data of this record.	RI
PGMXLI07	Read the maintenance log record of a user.	RI
PGMXLI08	Read the maintenance log record of a user. Display only the modified data of this record.	RI
PGMXLI09	Read the maintenance log record of an external object.	RI
PGMXLI10	Read the maintenance log record of an external object.	RI

Code	Function
RI	Read one record.

NSCXLO

The subprogram NSCXLO is used to read maintenance log records, which are created by Natural Security if the general option **Logging of Maintenance Functions** is active.

NSCXLO is invoked as follows:

```
CALLNAT 'NSCXLO' PFUNCTION PSELECT-TYPE PSTART-OBJ-ID PFROMTIMESTMP PTOTIMESTMP PRC ↩
PPARM PPARM1(*) PNSC-MESSAGE
```

An example program PGMXLO01 of how to invoke this subprogram is provided in source form in the library SYSSEC. It includes descriptions of the individual CALLNAT parameters.

Example Program	Description	Code
PGMXLO01	Retrieve security profile maintenance logs.	RI

Code	Function
RI	Read one record.

29 Subprograms for Object Maintenance

- NSCFI 430
- NSCLI 431
- NSCMA 433
- NSCOB 433
- NSCUS 434
- NSCUT 435

These subprograms can be used to perform maintenance functions on security profiles of various object types:

Subprogram	Description
NSCFI	Maintenance functions for files.
NSCLI	Maintenance functions for libraries.
NSCMA	Maintenance functions for mailboxes.
NSCOB	Maintenance functions for external objects.
NSCUS	Maintenance functions for users.
NSCUT	Maintenance functions for utilities.

The use of the subprograms for object maintenance is controlled by the general option **Free Access to Functions via APIs** (described in the section *Administrator Services*).

NSCFI

This subprogram is only available on z/OS computers, and it can only be applied to file security profiles. For DDM security profiles, you use the subprogram NSCLI (see below).

The subprogram NSCFI is used to perform maintenance/retrieval functions for file security profiles from outside of the library SYSSEC.

It is invoked as follows:

```
CALLNAT 'NSCFI' PFUNCTION PFILEID PFILEID2 PRC PPFKEY(*) PPARM PPARM1 PPARM2 PTEXT(*) ↩
PNSC-MESSAGE
```

An example program PGMFI001 of how to invoke this subprogram is provided in source form in the library SYSSEC. It includes descriptions of the individual CALLNAT parameters.

The example program is only available in a z/OS environment.

Example Program	Description	Code
PGMFI001	Perform file maintenance functions.	AD, CL, CO, DE, DI, MO, RE, UP

The first parameter (PFUNCTION) has to be filled with the function code for the desired function. The following functions are available:

Code	Function
AD	Add file.
CL	Cancel link between library and file.
CO	Copy file.
DE	Delete file.
DI	Display file.
MO	Modify file (including all **components** of its security profile).
RE	Establish read-link between library and file.
UP	Establish update-link between library and file.

NSCLI

The subprogram NSCLI is used to perform maintenance/retrieval functions for library security profiles from outside of library SYSSEC.

It is invoked as follows:

```
CALLNAT 'NSCLI' PFUNCTION PLIBID PLIBID2 PLIBTYPE PRC PPFKEY(*) PPARM PPARM1 PPARM2 ↩
PTEXT(*) PPARM3 PPARM4 PPARM5 PPARM6 POPRB(*) PNSC-MESSAGE
```

Example programs PGMLI001 - PGMLI006 of how to invoke this subprogram, as well as example programs PGMDDM01 - PGMDDM02 of how to invoke it with function code MD are provided in source form in the library SYSSEC. They include descriptions of the individual CALLNAT parameters.

The example programs PGMDDM01 - PGMDDM02 are only available on Windows and Linux.

Example Program	Description	Code
PGMLI001	Maintain a library profile (general options).	AD, CO, DI, DL, MO, LK, RE, SL, TL
PGMLI002	Maintain a library profile (cancel link user-library, delete library, get ETID).	CL, DE, ET
PGMLI003	Allow and disallow modules.	DM, MM
PGMLI004	Maintain a library profile (command processors)	AC, DC, LC, MC, MK, UC
PGMLI005	Maintain an entry steplib table as well as *STEPLIB.	ST
PGMLI006	Retrieve and maintain library profiles with Adabas password.	SL, MO
PGMDDM01	Maintain a DDM profile.	MD
PGMDDM02	Maintain a DDM profile.	MD, LD

The first parameter (PFUNCTION) has to be filled with the function code for the desired function. The following functions are available:

Code	Function
AD	Add library.
CL	Cancel link between user and library.
CO	Copy library.
DE	Delete library.
DI	Display library.
DL	Display special link between user and library.
DM	Display allowed/disallowed modules.
ET	Get library ID via ETID.
LK	Link user to library.
MD	Maintain DDM profile; see also below (this function is not available on z/OS).
MM	Modify allowed/disallowed modules.
MO	Modify library (including all **components** of its security profile).
SL	Establish special link between user and library.
TL	Temporarily lock link between user and library.
UC	Update all “modified” command processors in the library.

If PFUNCTION is filled with function code MD, the PSUBFUNC part of the parameter PPARM has to be filled with the code for the desired subfunction. The following subfunctions are available:

Code	Subfunction
AD	Add DDM profile.
CL	Cancel link between library and DDM profile.
CO	Copy DDM profile.
DE	Delete DDM profile.
DI	Display DDM profile.
MO	Modify DDM profile.
RE	Establish read-link between library and DDM profile.
UP	Establish update-link between library and DDM profile.

NSCMA

The subprogram NSCMA is used to perform maintenance/retrieval functions for mailbox security profiles from outside of the library SYSSEC.

It is invoked as follows:

```
CALLNAT 'NSCMA' PFUNCTION POBJID POBJID2 PRC PPFKEY(*) PPARM PPARM1 PPARM2 PTEXT1(*) ↩
PTEXT2(*) PNSC-MESSAGE
```

Example programs PGMMA001 - PGMMA002 of how to invoke this subprogram are provided in source form in the library SYSSEC. They include descriptions of the individual CALLNAT parameters.

Example Program	Description	Code
PGMMA001	Maintain mailbox profile.	AD, DI, MO, CO, RE
PGMMA002	Delete mailbox profile.	DE

The first parameter (PFUNCTION) has to be filled with the function code for the desired function. The following functions are available:

Code	Function
AD	Add mailbox.
CO	Copy mailbox.
DE	Delete mailbox.
DI	Display mailbox.
MO	Modify mailbox (including all **components** of its security profile).
RE	Rename mailbox.

NSCOB

The subprogram NSCOB is only available on z/OS computers. It is used to perform maintenance/retrieval functions for external object security profiles from outside of library SYSSEC.

It is invoked as follows:

```
CALLNAT 'NSCOB' PFUNCTION PCLASSID POBJID POBJID2 PRC PPFKEY(*) PPARM PPARM1 PPARM2 ↩
PTEXT(*) PNSC-MESSAGE
```

Example programs PGMOB001 - PGMOB002 of how to invoke this subprogram are provided in source form in the library SYSSEC. They include descriptions of the individual CALLNAT parameters.

Example Program	Description	Code
PGMOB001	Maintain external object profile (general options).	AD, CO, CL, DE, DI, DL, LK, MO
PGMOB002	Maintain external object profile (cancel link external object user, delete external object)	CL, DE

The first parameter (PFUNCTION) has to be filled with the function code for the desired function. The following functions are available:

Code	Function
AD	Add external object.
CL	Cancel link between user and external object.
CO	Copy external object.
DE	Delete external object.
DI	Display external object.
DL	Display link between user and external object.
LK	Link user to external object.
MO	Modify external object (including all **components** of its security profile).

NSCUS

The subprogram NSCUS is used to perform maintenance/retrieval functions for user security profiles from outside of library SYSSEC.

Note: NSCUS cannot be used for private libraries which may be attached to user security profiles; for maintenance/retrieval of private libraries, you use subprogram NSCLI.

NSCUS is invoked as follows:

```
CALLNAT 'NSCUS' PFUNCTION PUSERID PUSERID2 PRC PPFKEY(*) PPARM PPARM1 PPARM2 PTEXT(*) ↩
PPARM3 PPARM4 PNSC-MESSAGE
```

Example programs PGMUS001 - PGMUS004 of how to invoke this subprogram are provided in source form in the library SYSSEC. They include descriptions of the individual CALLNAT parameters.

Example Program	Description	Code
PGMUS001	Maintain user profile (general options).	AD, AM, CO, CP, DI, MO, RE
PGMUS002	Maintain user profile (delete user profile, find user via ETID).	DE, ET
PGMUS003	Maintain user groups.	AD, DE, LI
PGMUS004	Maintain user DEFAULT profile.	AD, CO, DE, DI, MO

The first parameter (PFUNCTION) has to be filled with the function code for the desired function. The following functions are available:

Code	Function
AD	Add user.
AM	Multiple add user.
CO	Copy user.
DE	Delete user.
DI	Display user.
EG	Edit group members.
ET	Get user ID via ETID.
MO	Modify user (including all **components** of his/her security profile).

Note: The user maintenance function **Copy User's Links** is not available via NSCUS.

For function code EG, the following subfunctions are available:

Code	Subfunction
AD	Add users to a group.
DE	Delete users from a group.
LI	List group members.

NSCUT

The subprogram NSCUT is used to perform maintenance/retrieval functions for utility security profiles from outside of library SYSSEC.

It is invoked as follows:

```
CALLNAT 'NSCUT' PFUNCTION PUTILITY PUSER PLIBRARY PRC PPFKEY(*) PPARM PPARM1 PPARM2 ↩
PTEXT(*) PNSC-MESSAGE
```

An example program PGMUT001 of how to invoke this subprogram is provided in source form in the library SYSSEC. It includes descriptions of the individual CALLNAT parameters.

Example Program	Description	Code
PGMUT001	Maintain a library-specific utility profile, a user-specific utility profile, a user-library-specific utility profile, or display a default utility profile.	AD, DE, DI, MO

The first parameter (PFUNCTION) has to be filled with the function code for the desired function. The following functions are available:

Code	Function
AD	Add utility.
DE	Delete utility.
DI	Display utility.
MO	Modify utility (including all **components** of its security profile).

Note that the components of the security profiles are different for each utility; see also the source of PGMUT001.

30 Subprograms for Retrieval

- NSCDA 438
- NSCDA-C 439
- NSCDA-P 439
- NSCDA-S 440
- NSCDAU 440
- NSCDAUC 440
- NSCDAUP 441
- NSCDAUS 441
- NSCDU 442
- NSCONE 442
- NSCXR 443
- NSCXRIER 448
- NSCXRUSE 449
- NSCXRUTC 449
- SECNOTE 450

These subprograms can be used to obtain various kinds of information:

Subprogram	Description
NSCDA	Display library security profile.
NSCDA-C	Display command restrictions of library security profile.
NSCDA-P	Display security options, security limits and session parameters of library security profile.
NSCDA-S	Display statement restrictions of library security profile.
NSCDAU	Display special-link security profile.
NSCDAUC	Display command restrictions of special-link security profile.
NSCDAUP	Display security options, security limits and session parameters of special-link security profile.
NSCDAUS	Display statement restrictions of special-link security profile.
NSCDU	Display user security profile.
NSCONE	Display NaturalONE profile.
NSCXR	Cross-reference functions.
NSCXRIER	Display individual logon error records.
NSCXRUSE	Display users with logon error counters and unused user IDs.
NSCXRUTC	Display utility functions allowed for a user.
SECNOTE	Display security notes of user, library or special-link security profile.
NSCFI, NSCLI, NSCMA, NSCOB, NSCUS, NSCUT	The display functions (function code DI - Display security profile) of these subprograms are considered to be retrieval functions.

The use of the subprograms for retrieval is controlled by the general option **Free Access to Functions via APIs** (described in the section *Administrator Services*).

NSCDA

The subprogram NSCDA is used to display the security profile of a library.

It is invoked as follows:

```
CALLNAT 'NSCDA' PAPPLID PPARM PRC PTYPE PPARM1 PPARM2 PPARM3 PTEXT(*) PNSC-MESSAGE
```

An example program PGMDA of how to invoke this subprogram is provided in source form in the library SYSSEC. It includes descriptions of the individual CALLNAT parameters.

Example Program	Description
PGMDA	Display the security profile of an application or a private library.

NSCDA-C

The subprogram NSCDA-C is used to display the **Command Restrictions** part of a library security profile.

It is invoked as follows:

```
CALLNAT 'NSCDA-C' PAPPLID PRC PTYPE PPARM1 PNSC-MESSAGE
```

An example program PGMDA-C of how to invoke this subprogram is provided in source form in the library SYSSEC. It includes descriptions of the individual CALLNAT parameters.

Example Program	Description
PGMDA-C	Display command restrictions in the security definition of a library or private library.

NSCDA-P

The subprogram NSCDA-P is used to display the **Security Options**, **Security Limits** and **Session Parameters** parts of a library security profile.

It is invoked as follows:

```
CALLNAT 'NSCDA-P' PAPPLID PRC PTYPE PPARM1 POPRBS(*) PNSC-MESSAGE
```

An example program PGMDA-P of how to invoke this subprogram is provided in source form in the library SYSSEC. It includes descriptions of the individual CALLNAT parameters.

Example Program	Description
PGMDA-P	Display the security options, limits and session parameters in the security definition of an application or private library.

NSCDA-S

The subprogram NSCDA-S is used to display the **Statement Restrictions** part of a library security profile.

It is invoked as follows:

```
CALLNAT 'NSCDA-S' PAPPLID PRC PTYPE PPARM1 PNSC-MESSAGE
```

An example program PGMDA-S of how to invoke this subprogram is provided in source form in the library SYSSEC. It includes descriptions of the individual CALLNAT parameters.

Example Program	Description
PGMDA-S	Display the statement restrictions in the security definition of an application or private library.

NSCDAU

The subprogram NSCDAU is used to display the security profile of a special link.

It is invoked as follows:

```
CALLNAT 'NSCDAU' PAPPLID PUSERID PRC PPARM1 PPARM2 PPARM3 PTEXT(*) PNSC-MESSAGE
```

An example program PGMDAU of how to invoke this subprogram is provided in source form in the library SYSSEC. It includes descriptions of the individual CALLNAT parameters.

Example Program	Description
PGMDAU	Display the security profile of a special link.

NSCDAUC

The subprogram NSCDAUC is used to display the **Command Restrictions** part of a special-link security profile.

It is invoked as follows:

```
CALLNAT 'NSCDAUC' PAPPLID PUSERID PRC PPARM1 PNSC-MESSAGE
```

An example program PGMDAUC of how to invoke this subprogram is provided in source form in the library SYSSEC. It includes descriptions of the individual CALLNAT parameters.

Example Program	Description
PGMDAUC	Display the security profile of a special link.

NSCDAUP

The subprogram NSCDAUP is used to display the **Security Options**, **Security Limits** and **Session Parameters** parts of a special-link security profile.

It is invoked as follows:

```
CALLNAT 'NSCDAUP' PAPPLID PUSERID PRC PPARM1 POPRBS(*) PNSC-MESSAGE
```

An example program PGMDAUP of how to invoke this subprogram is provided in source form in the library SYSSEC. It includes descriptions of the individual CALLNAT parameters.

Example Program	Description
PGMDAUP	Display the security options, limits and session parameters in the security definition of a special link.

NSCDAUS

The subprogram NSCDAUS is used to display the **Statement Restrictions** part of a special-link security profile.

It is invoked as follows:

```
CALLNAT 'NSCDAUS' PAPPLID PUSERID PRC PPARM1 PNSC-MESSAGE
```

An example program PGMDAUS of how to invoke this subprogram is provided in source form in the library SYSSEC. It includes descriptions of the individual CALLNAT parameters.

Example Program	Description
PGMDAUS	Display the statement restrictions in the security definition of a special link.

NSCDU

The subprogram NSCDU is used to display a user security profile.

It is invoked as follows:

```
CALLNAT 'NSCDU' PUSERID PPARM PRC PPARM1 PPARM2 PPARM3 PTEXT(*) PNSC-MESSAGE
```

An example program PGMDU of how to invoke this subprogram is provided in source form in the library SYSSEC. It includes descriptions of the individual CALLNAT parameters.

Example Program	Description
PGMDU	Display a user security profile.

NSCONE

The subprogram NSCONE is used to display a NaturalONE profile, that is, the Natural Server view and Eclipse Navigator view options and actions allowed/disallowed for a specific library and user.

It is invoked as follows:

```
CALLNAT 'NSCONE' PFUNCTION PUSER PGROUP PLIBRARY PFUSER(*) PRC PPARM PPARM1 PPARM2 ↩
PPARM3 PNSC-MESSAGE ↩
```

An example program PGMONE01 of how to invoke this subprogram is provided in source form in the library SYSSEC. It includes descriptions of the individual CALLNAT parameters.

Example Program	Description	Code
PGMONE01	Display a NaturalONE profile for a specific library ID and user ID.	DI

Code	Function
DI	Display NaturalONE profile.

NSCXR

The subprogram NSCXR is used to perform cross-reference functions for security profiles from outside of library SYSSEC.

It is invoked as follows:

```
CALLNAT 'NSCXR' POBJ-TYPE POBJ-ID PLINK-ID PRC SUB-TYPE PPARM PPARM2(*) PNSC-MESSAGE
```

Example programs PGMXR001 - PGMXR021 of how to invoke this subprogram are provided in source form in the library SYSSEC. They include descriptions of the individual CALLNAT parameters.

Example Program	Description	Code
PGMXR001	List Natural Security objects in alphabetical order.	DS, DD, FI, LI, MA, JB, ND, NV, OP, PR, RP, US, UT, VS, VT
PGMXR002	Get cross-reference data for a library.	LI
PGMXR003	Get cross-reference data for users.	US
PGMXR004	Get cross-reference data for files and link information.	FI
PGMXR005	Get cross-reference data for mailboxes.	MA
PGMXR006	List logon records.	LR
PGMXR007	List logon error records.	LE
PGMXR008	Get cross-reference data for steplibs.	ST
PGMXR009	Get a list of users belonging to a batch user ID.	US
PGMXR010	Get Xref data for a library ID - user ID (specific link).	LI
PGMXR011	Get XRef data for a library.	LI
PGMXR012	Get libraries and users where the NCP is defined.	CP
PGMXR013	Get cross-reference data for Utility profiles.	UT, LI, US
PGMXR014	Translate Natural Security object name to a Natural Security object ID.	LI, US
PGMXR015	Find libraries on the current FNAT/FUSER system file which are not defined to Natural Security.	SF
PGMXR016	Translate Natural Security 2-character object-type code to the corresponding Natural Security object type.	Any 2-character object-type code.
PGMXR017	List for a specified object class: Natural Security object IDs or user IDs with access exceptions.	DS, PR
PGMXR018	Get the Xref status of a specified module in a library for all user IDs who may have access to this library. Additionally, an option is provided to list the group members.	LI
PGMXR019	Get cross-reference data for users.	US

Example Program	Description	Code
PGMXR020	Get Xref data for time differential and time zone defined in user profiles with type A, G, M, P.	US
PGMXR021	Retrieve Natural Security library and Natural Security special link profiles with FDIC and FUSER assignments.	LI

The first parameter (POBJ-TYPE) has to be filled with the code for the type of object for which a function is to be performed:

Code	Object Type
US	User.
LI	Library.
DD	DDM (this object type is not available on z/OS).
FI	File (this object type is only available on z/OS).
MA	Mailbox.
LE	Logon error record.
LR	Logon record.
ST	Steplib.
UT	Utility.
CP	Command processor.
PE	Predict external object (this object type is only available if Predict is installed).
PF	Predict function (this object type is only available if Predict is installed).
PL	Predict 3GL library (this object type is only available if Predict is installed).
PO	Predict documentation object (this object type is only available if Predict is installed).
SF	System file.

For the individual object types listed above, the following functions can be performed by filling the parameter SUB-TYPE with one of the following function codes:

Function Available for Every Object Type:	
Code	**Function**
TR	Translate the 2-character object-type code into the corresponding object type.

Functions Available for a User (US):	
Code	**Function**
*	List all users.
A	List all users of type Administrator.
P	List all users of type Person.
M	List all users of type Member.

Functions Available for a User (US):	
Code	**Function**
T	List all users of type Terminal.
G	List all users of type Group.
B	List all users of type Batch.
GR	List all groups the user belongs to.
GP	List all privileged groups the user belongs to.
GM	List all users contained in the group.
BU	List all users in whose security profiles the batch user ID is specified.
NI	Retrieve the user ID belonging to a specified user name.
L*	List all users and all libraries to which they are linked directly.
LA	List all libraries available to the user.
LL	List all libraries to which the user is linked.
LD	List all libraries to which the user is linked directly.
LG	List all libraries to which the user is linked by means of a group.
LP	List all libraries to which the user is linked by means of a privileged group.
OW	List all security profiles owned by the user.
DD	List all DDMs available to the user (this function is not available on z/OS).
DL	List all DDMs available to the user by means of a special link (this function is not available on z/OS).
FI	List all files to which the user's private library is linked (this function is only available on z/OS).
UT	List all utility profiles which apply to the user.
TD	Retrieve the **Time Differential** and **Time Zone** settings of the user's security profile.

Functions Available for a Library (LI):	
Code	**Function**
*	List all libraries and users' private libraries.
L	List all libraries.
U	List all users' private libraries.
NI	Retrieve the library ID belonging to a specified library name.
DD	List all DDMs to which the library is linked (this function is not available on z/OS).
LD	List all DDMs to which the library is linked by means of a special link (this function is not available on z/OS).
FI	List all files to which the library is linked (this function is only available on z/OS).
NO	List allowed/disallowed modules.
SM	Retrieve information on users' access rights to a single module in the library.
US	List all users linked to the library.

Functions Available for a Library (LI):	
Code	**Function**
UT	List all utility profiles which apply to the library.
CP	List all command processors for the library that have a specific status.
GL	List all library security profiles in which an FDIC or FUSER specification is made.
GD	List all library security profiles in which an FDIC specification is made.
GU	List all library security profiles in which an FUSER specification is made.

Functions Available for a DDM (DD):	
Code	**Function**
*	List all defined DDMs (that is, DDMs for which security profiles exist).
UN	List all undefined DDMs (that is, DDMs for which no security profiles exist).
DD	List all defined and undefined DDMs.
P	List all DDMs with external status PUBLIC.
A	List all DDMs with external status ACCESS.
U	List all DDMs with external status PRIVATE.
ND	List all DDM security profiles for which no corresponding DDMs exist.
LI	List all libraries which are linked to the DDM.
US	List all users which are linked to the DDM.
SL	List all DDM definitions in special-link security profiles.
X	List all DDM definitions in library and special-link security profiles.

Functions Available for a File (FI):	
Code	**Function**
PU	List files of type PUBLIC.
AC	List files of type ACCESS.
UP	List files of type PRIVATE.
DD	List files with existing DDM.
ND	List files with no DDM.
UN	List undefined files.
LI	List libraries to which the specified file is linked.
US	List users whose private libraries are linked to the specified file.

Functions Available for a Mailbox (MA):	
Code	**Function**
LI	List all libraries to which the mailbox is assigned.
US	List all users to which the mailbox is assigned.

Functions Available for Logon Error Records (LE):	
Code	**Function**
P	List logon error records, in order of TP user IDs.
T	List logon error records, in order of terminal IDs.

Functions Available for Logon Records (LR):	
Code	**Function**
L	List logon records, in order of library IDs.
U	List logon records, in order of user IDs.
D	List logon records, in order of logon date.
LX	List logon records to undefined libraries (in order of library IDs).
UX	List logon records of undefined users (in order of user IDs).

Functions Available for Steplibs (ST):	
Code	**Function**
*	List all steplibs.
LK	List protected steplibs.
NN	List public steplibs.
SL	List special-linked steplibs.

Functions Available for Utilities (UT):	
Code	**Function**
LI	List all library-specific utility profiles defined for the utility.
US	List all user-specific utility profiles defined for the utility.
UT	List all utility profiles defined for the utility.
blank	List all utility profiles defined for all utilities.

Functions Available for Command Processors (CP):
For a command processor, NSCXR will list all libraries and users for the command processor (without any SUB-TYPE specification being required).

Functions Available for Predict Objects (PE, PF, PL, PO):
For each of the four Predict object types, NSCXR will list all objects of that type (without any SUB-TYPE specification being required).

Functions Available for System Files (SF):	
Code	**Function**
FN	List all libraries of the current FNAT system file which are not defined in Natural Security.
FU	List all libraries of the current FUSER system file which are not defined in Natural Security.

Function Available for External Objects:	
Code	**Function**
LU	List all users who are linked to the external object.

NSCXRIER

The subprogram NSCXRIER is used to display individual logon error records (similar to the Logon/Countersign Errors function **Display individual error records**).

It is invoked as follows:

```
CALLNAT 'NSCXRIER' POBJID PPARM PPARM1(*) PRC PNSC-MESSAGE
```

An example program PGMXRIER of how to invoke this subprogram is provided in source form in the library SYSSEC. It includes descriptions of the individual CALLNAT parameters.

Example Program	Description
PGMXRIER	List Natural Security error records.

NSCXRUSE

The subprogram NSCXRUSE is used in conjunction with the **Lock User Option** set to X to obtain a list of users whose logon error counters are greater than 0.

It is also is used in conjunction with the general option **Record Each User's Logon Daily**. When this option is active, NSCXRUSE can be used to display the IDs of users who have not logged on to Natural since a specified date.

NSCXRUSE is invoked as follows:

```
CALLNAT 'NSCXRUSE' POBJ-TYPE POBJ-ID PRC PSUBTYPE PPARM PPARM2(*) PNSC-MESSAGE
```

An example program PGMXRUSE of how to invoke this subprogram is provided in source form in the library SYSSEC. It includes descriptions of the individual CALLNAT parameters.

See also the subprogram NSC---SP.

Example Program	Description	Code
PGMXRUSE	List Natural Security user profile in alphabetical order where a logon error count is greater 0.	US

NSCXRUTC

The subprogram NSCXRUTC is used in to obtain a list of all utility functions which are allowed for a user.

It is invoked as follows:

```
CALLNAT 'NSCXRUTC' PFUNCTION PUTILITY-ID PUSER PNEXT-VALUE PPARM PPARM-D(*) PRC ↩
PNSC-MSG
```

An example program PGMXRUTC of how to invoke this subprogram is provided in source form in the library SYSSEC. It includes descriptions of the individual CALLNAT parameters.

Example Program	Description	Code
PGMXRUTC	Get a list of all utility functions allowed for a user.	DI

SECNOTE

The subprogram SECNOTE is used to display the **Security Notes** part of a security profile. It can be applied to a user, group, library or special-link security profile.

The object module of SECNOTE is stored in the library SYSTEM. The source code of SECNOTE is not available.

SECNOTE has to be invoked with the following parameters:

Parameter	Explanation
PTYPE (A1)	With this parameter, you specify the type of object whose **Security Notes** are to be read. Valid values for PTYPE are: ■ U = User. The current content of the Natural system variable *USER determines which user's Security Notes will be read. ■ L = Library. The current content of the Natural system variable *APPLIC-ID determines which library's Security Notes will be read. ■ G = Group. The current content of the Natural system variable *GROUP determines which user's/group's Security Notes will be read. ■ S = Special Link. The current contents of the Natural system variables *GROUP and *APPLIC-ID determine which special link's Security Notes will be read.
PNOTES (A60/8)	On return from SECNOTE, this parameter contains the **Security Notes**.
PRC (N4)	This parameter contains the return code from SECNOTE: ■ 0 = Security Notes have been read. ■ 860 = PTYPE contains an invalid code. ■ 806 = Library does not exist (is not defined to Natural Security). ■ 861 = User has no special link to library. ■ 873 = User does not exist (is not defined to Natural Security).

The above-mentioned system variables are described in the Natural *System Variables* documentation.

III Add-On Products and Plug-Ins

31 Add-On Products and Plug-Ins

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- SYSAOS under Natural Security 456

This section contains information on the protection of various Natural add-on products by Natural Security and the handling of plug-ins in a Natural Security environment. It contains information on:

Plug-Ins under Natural Security

The Natural Studio user interface is extensible by plug-ins. If plug-ins are used in an environment protected by Natural Security, the following prerequisites must be met:

Library Security Profiles for System Libraries

For the Natural Plug-in Manager (which is a plug-in itself) and for every plug-in to be used, a library security profile has to be defined. For plug-ins delivered together with Natural Studio, pre-defined system-library profiles are provided. To activate these, you use the Administrator Services function **Definition of System Libraries**.

The following plug-in system libraries are provided:

Library	Contents
SYSEXPLG	Plug-in Example.
SYSPLCGC	Program Generation.
SYSPLMAN	Plug-in Manager.
SYSPLMFE	z/OS Navigation.
SYSPLNEE	Metrics Calculation / Engineer Xref Viewing.
SYSPLPDC	Object Description.
SYSPLPGC	Schema Generation.
SYSPLWEB	Web Interface.
SYSPLWIZ	Application Wizard.
SYSPLXRC	Xref Evaluation.

User Security Profiles

When a user activates a plug-in, Natural Studio starts a second Natural session with automatic logon (profile parameter `AUTO=ON`). For the automatic logon to be successful, a user who is to use a plug-in must have either a default library or a private library specified in his/her security profile.

Natural Parameter File

When a user activates a plug-in, Natural Studio starts a second Natural session using the parameter file NATPARM. If the user's Natural session uses a parameter file other than NATPARM, the system-file specifications for FNAT, FSEC and FUSER in the NATPARM parameter file must match those of the parameter file used by the user session in a Natural Security environment.

SYSDIC under Natural Security

On z/OS computers, the Predict library SYSDIC may be defined and its use controlled by Natural Security.

Library Security Profile for SYSDIC

To be able to use under Natural Security those Predict functions which use Adabas Online Services (AOS) facilities, that is, to enable Natural Security protection, you have to perform the following steps:

1. Create a security profile for the library SYSDIC (Add Library).
2. Define the library SYSDIC as people-protected, and link to it those users (or user groups) who are to be Predict/AOS administrators.
3. Execute the program NSCPRDAX in the library SYSSEC. This program writes the user exit NSCPRD01 into the SYSDIC library security profile.
4. Invoke the **Modify Library** function for the library SYSDIC. Even if you do not change anything in the security profile, you must perform this step to confirm the entry of the user exit, because otherwise Natural Security would consider the execution of NSCPRDAX an illegal manipulation of SYSDIC's security profile, and no-one would be able to log on to SYSDIC.

After the user exit has been written into the security profile, no Predict functions will be available until Predict security profiles are defined.

The user exit cannot be removed manually from the SYSDIC library security profile. To remove it, you execute the program NSCPRDDX in the library SYSSEC, and then invoke the **Modify Library** function for confirmation (as with Step 4 above).

Database Security Administrators

When you select **User Exit** from the **Additional Options** of `SYSDIC`'s library security profile, an additional screen **Predict/AOS Security Profile** is displayed. On this screen, you specify who is to be AOS security administrator for which database. The users (or groups of users) specified may then use the AOS-related Predict functions for these databases.

For each database, you can only specify one AOS security administrator. This may be a user of type “Administrator”, “Person”, “Member”, or a “Group” (it need not be a Natural Security administrator). The user must be linked to the library `SYSDIC` before he/she can be specified as AOS security administrator.

Further Information

For further information on Predict and its AOS-related functions, and on Predict under Natural Security, please refer to the Predict documentation.

SYSAOS under Natural Security

On z/OS computers, the Adabas Online Services library `SYSAOS` may be defined and its use controlled by Natural Security.

Library Security Profile for SYSAOS

To be able to use the Security Maintenance section of Adabas Online Services under Natural Security, that is, to enable Natural Security protection for Adabas Online Services, you have to perform the following steps:

1. Create a security profile for the library `SYSAOS` (Add Library).
2. Define the library `SYSAOS` as people-protected, and link to it those users (or user groups) who are to be Adabas Online Services database administrators.
3. Execute the program `NSCAOSIX` in the library `SYSSEC`. This program writes the user exit `NSCAOSE1` into the `SYSAOS` library security profile.
4. Invoke the **Modify Library** function for the library `SYSAOS`. Even if you do not change anything in the security profile, this step is necessary to confirm the entry of the user exit, because otherwise Natural Security would consider the execution of `NSCAOSIX` an illegal manipulation of `SYSAOS`'s security profile, and no-one would be able to log on to `SYSAOS`.

After the user exit has been written into the security profile, no Adabas Online Services functions will be available until Adabas Online Services security profiles are defined.

The user exit cannot be removed manually from the SYSAOS library security profile. To remove it, you execute the program NSCAOSDX in the library SYSSEC, and then invoke the **Modify Library** function for confirmation (as with Step 4 above).

Note: Previous versions of Natural Security supplied the user exit NSCAOS01, which can still be used instead of NSCAOSE1. With NSCAOS01, however, a maximum of only 72 database profiles can be maintained with Adabas Online Services, while up to 400 can be maintained with NSCAOSE1. Unlike NSCAOSE1, NSCAOS01 does not allow you to assign more than one user group as an administrator to the default database (see below). The program used to write NSCAOS01 into the library security profile of SYSAOS is called NSXAOSAX. Otherwise, what is said above about NSCAOSE1 also applies to NSCAOS01.

Database Security Administrators

When you select **User Exit** from the **Additional Options** of SYSAOS's library security profile, an additional screen **Adabas Online Services Security Profile** is displayed. On this screen, you specify who is to be Adabas Online Services security administrator for which database. The users (or groups of users) specified may then use the Security Maintenance section of Adabas Online Services for these databases.

For each database, you can only specify one Adabas Online Services security administrator. This may be a user of type “Administrator”, “Person”, “Member”, or a “Group” (it need not be a Natural Security administrator). The user must be linked to the library SYSAOS before he/she can be specified as Adabas Online Services security administrator.

Adabas Online Services uses the database profile for database ID 999 as a default profile, which applies to all databases for which no individual database profiles are defined. With the user exit NSCAOSE1, you can assign more than one group of Adabas Online Services security administrators to database 999. To do so, you specify ******** (8 asterisks) as the administrator ID for database 999 in the SYSAOS library security profile. The administrators for database 999 are then determined by the database profile in Adabas Online Services. As Adabas Online Services allows you to define more than one profile per database, you can define multiple profiles for database 999, each with a different group of administrators.

Further Information

For further information on Adabas Online Services, please refer to the Adabas documentation.