

# Special Considerations for Administrators

This section describes the security aspects of the SYSMAIN utility and the user exit routines supplied for SYSMAIN.

- File Security
  - Natural Security
  - User Exit Routines
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## File Security

The file security (that is, passwords and cipher codes) relates to the security that has been defined for a system file in an Adabas or a VSAM environment. If file security has been defined for a system file, you need to specify a password, cipher code and/or VSAM name for the source and/or target system file required before you perform a SYSMAIN function. Otherwise, Adabas or VSAM will issue an appropriate error message. You do not have to provide security information for the default system files assigned to the Natural session at the start of the SYSMAIN utility.

### To specify passwords and cipher codes

1. From any SYSMAIN utility menu, invoke a security window for the required system file by using either a PF key or a special command as indicated in the table below:

System File	Command	PF Key	Objects/Data Affected
FUSER, FNAT	SET FNAT	PF12	- programming objects - debug environments - error messages - profiles
FDIC	SET FDIC	PF11	- rules - DL/I subfiles - DDMs - XRef information
FSEC	SET FSEC	PF10	- Natural Security profile

The security window that appears for the specified system file looks similar to the example of the FUSER and FNAT system files below:

```

+-----+
!   --- Security for the Natural System Files ---   !
!                                                    !
!   Specify the password(s), cipher(s) and VSAM FCT !
!   name(s) for the source/target file(s) below:   !
!                                                    !
!   - Source -                                     - Target -   !
! Library .... OLDLIB                               Library .... NEWLIB   !
! Database ... 10                                   Database ... 10       !
! File ..... 32                                    File ..... 32        !
!                                                    !
! Password ...                                     Password ...         !
! Cipher .....                                     Cipher .....         !
! VSAM Name .. _____                           VSAM Name .. _____ !
+-----+

```

2. In the window, enter the appropriate password(s), cipher code(s) and/or VSAM name for the required source and/or target system file.

**Note:**

The **Library** field is applicable only when processing programming objects, debug environments or error messages.

Once file security is defined, the SYSMAN utility uses this security information for all subsequent processing. If you then require that the default security information (obtained at the initialization of the session) be used, you must re-invoke the corresponding security window and clear the password, cipher code and/or VSAM name fields. The passwords and cipher codes are non-display, so even though the fields *appear* to be empty, they should be cleared again.

## Natural Security

Two aspects must be considered when using the SYSMAN utility within a Natural Security environment:

- Defining the Natural Security Environment
- Restricting Use of SYSMAN under Natural Security

### Defining the Natural Security Environment

The source and target libraries can be within one Natural Security environment or within two different Natural Security environments. These environments must be defined to the SYSMAN utility.

The definition of the Natural Security environment(s) to be used is specified with the special command SET FSEC.

By default, the current FSEC settings assigned at the start of the Natural session are used. If you change these settings (in the window **Security for Natural Security (FSEC) Files**), they remain in effect until they are changed by the next SET FSEC process. In batch mode or direct command mode, the SEC keyword should be used to specify the file security and assignments of the request.

Once the source and target environments have been determined, SYSMAN verifies both the source and target libraries with Natural Security. (The source and/or target database and file must correspond to the database ID (DBID) and file number (FNR) specified in the library security profile; if these values are not specified, default values are taken from the security profile.)

## Restricting Use of SYSMAIN under Natural Security

The use of the SYSMAIN utility itself can be restricted, or the use of the source and target libraries to be handled with the SYSMAIN utility can be restricted. The use of SYSMAIN functions when invoked via the application programming interface MAINUSER can be controlled separately. See *Protecting Utilities* in the *Natural Security* documentation for details.

## User Exit Routines

The user exit routines of the SYSMAIN utility are used to provide information on each object being processed or control function processing. A user exit routine is a Natural subprogram, which is invoked with a CALLNAT statement.

The source codes of the subprograms and the data areas they use are stored as source objects under the names SM-UX-*nn* (*nn* = 01 to 11) in the library SYSMAIN. To make a user exit routine available, you have to catalog the corresponding source object under the name MAINEX*nn*, either in the library SYSMAIN or in one of its steplibs.

### Note:

The names of source objects and cataloged objects of user exit routines are different to ensure that the overwriting of the source objects by an update installation does not affect the cataloged objects.

You can change or expand any of the user exit routines as necessary.

Use of these exits results in additional overhead to the SYSMAIN utility, depending on the code logic. It is necessary, however, always to return control to SYSMAIN when exit processing is completed.

As the SYSMAIN utility uses ET logic with Adabas files, the use of user exit routines can lengthen the transaction time limit (Adabas parameter TT). Furthermore, the definition of the Adabas transaction should not be altered, which means that you should not issue any ET/BT commands or END/BACKOUT TRANSACTION statements. SYSMAIN is responsible for the issuing of all END TRANSACTION statements. The exception to this rule is in a situation where a user terminates the normal completion of any SYSMAIN function with the user exit routines. If this is the case, you must issue a BACKOUT TRANSACTION before terminating.

If the return code is set to a non-zero value, this overrides any error given by SYSMAIN. When an error is received from an exit, it is placed in the message field and displayed or printed as appropriate. The exception is automated processing, because processing is completed with minimum terminal I/O.

The individual user exit routines are described in the following section:

- MAINEX01 - First User Exit Routine for Object Interrogation
- MAINEX02 - Second User Exit Routine for Object Interrogation
- MAINEX03 - User Exit Routine for Request Interrogation
- MAINEX04 - User Exit Routine for Modification of File Assignments
- MAINEX05 - User Exit Routine for Verification of Direct Commands

- MAINEX06 - User Exit Routine for SYSMAIN Initialization
- MAINEX07 - User Exit Routine for SYSMAIN Termination
- MAINEX08 - User Exit Routine for Nothing Found in Batch Mode
- MAINEX09 - User Exit Routine for Abnormal Termination in Batch Mode
- MAINEX10 - User Exit Routine for Command Errors in Batch Mode
- MAINEX11 - User Exit Routine for Setting Special Flags to SYSMAIN

### MAINEX01 - First User Exit Routine for Object Interrogation

Function	Interrogate the current value settings of the data elements associated with an object <i>before</i> the object is processed by SYSMAIN.
Remarks	<p>Any object passed to MAINEX01 can be rejected by setting the RESP-CODE parameter to a non-zero value.</p> <p>If any additional logic is to be performed, the transaction may <i>not</i> be at end-of-transaction status and so no END TRANSACTION or BACKOUT TRANSACTION statement should be issued.</p> <p>Control must be returned to SYSMAIN.</p>
Parameters	<p>PARM-AREA1 (A250) SYSMAIN parameter area (fixed values).</p> <p>PARM-AREA2 (A250) SYSMAIN parameter area (variable values).</p> <p>RESP-CODE (B1) Response code to be returned to SYSMAIN.</p> <p><b>Note:</b> Only the RESP-CODE parameter can be modified.</p>
Local Data Area	SM-UX-L

### MAINEX02 - Second User Exit Routine for Object Interrogation

Function	Interrogate the current value settings of the data elements associated with an object <i>after</i> the object has been processed by SYSMAIN.
Remarks	Any object passed to MAINEX02 can be rejected by setting the RESP-CODE parameter to a non-zero value.  If any additional logic is to be done, the transaction may <i>not</i> be at end-of-transaction status and so no END TRANSACTION or BACKOUT TRANSACTION statement should be issued.  Control must be returned to SYSMAIN.
Parameters	PARM-AREA1 (A250) SYSMAIN parameter area (fixed values). PARM-AREA2 (A250) SYSMAIN parameter area (variable values). RESP-CODE (B1) Response code to be returned to SYSMAIN.  <b>Note:</b> Only the RESP-CODE parameter can be modified.
Local Data Area	SM-UX-L

### MAINEX03 - User Exit Routine for Request Interrogation

Function	Interrogate any request made to SYSMAIN in terms of a direct command or information entered online in menu mode. MAINEX03 obtains control <i>before</i> SYSMAIN processes the command.
Remarks	Any command passed to MAINEX03 can be rejected by setting the RESP-CODE parameter to a non-zero value.  Additional logic can be added, but it is your responsibility to issue any necessary END TRANSACTION requests to the database.  Control must be returned to SYSMAIN.
Parameters	PARM-AREA (A250) Command string. RESP-CODE (B1) Response code to be returned to SYSMAIN.  <b>Note:</b> Only the RESP-CODE parameter can be modified.

### MAINEX04 - User Exit Routine for Modification of File Assignments

Function	Override the database, file, password and cipher codes for the Natural system file(s).
Remarks	<p>MAINEX04 is invoked <i>before</i> any request is processed or validated by SYSMAIN. When control is passed to MAINEX04, you are at end-of-transaction status; therefore you have to set the RESP-CODE parameter to a non-zero value if you wish to reject the request.</p> <p>Control must be returned to SYSMAIN.</p>
Parameters	<p>PARM-AREA (A250) SYSMAIN parameter area.</p> <p>RESP-CODE (B1) Response code to be returned to SYSMAIN.</p>
Local Data Area	SM-UX-L4

### MAINEX05 - User Exit Routine for Verification of Direct Commands

Function	Verify any direct command entered during online processing of SYSMAIN. In addition, the special characters used to indicate a system command can be overwritten.
Remarks	<p>MAINEX05 is invoked <i>before</i> any direct command issued within SYSMAIN is processed. For example, MAINEX05 enables you to interrogate any of the SET commands (see <i>Special Commands Issued to SYSMAIN</i>) and also prevent them from being issued. You can verify these commands and reject them by returning a non-zero value in the RESP-CODE parameter. You are at end-of-transaction status when control is passed to MAINEX05.</p> <p>A system command entered within SYSMAIN has to be preceded by two slashes (/); see also <i>Using the SYSMAIN Command Line</i>. With MAINEX05, you can define two other special characters for this purpose; to do so, you assign the desired characters to the CMD-DEL parameter. If CMD-DEL is set to blanks, SYSMAIN uses the default value of two slashes (/). Control must be returned to SYSMAIN.</p>
Parameters	<p>COMMAND (A68) Current command issued in SYSMAIN.</p> <p>CMD-DEL (A3) Special character for system commands.</p> <p>RESP-CODE (B1) Response code to be returned to SYSMAIN.</p>

### MAINEX06 - User Exit Routine for SYSMAIN Initialization

Function	Obtain control at initialization of a SYSMAIN session.
Remarks	<p>MAINEX06 is invoked at the start of the SYSMAIN session, where you can override some of the SYSMAIN default settings, as for example, prompts for confirmation of a request like deleting, moving or replacing an object.</p> <p>All parameters are verified. If they are invalid, the default settings are used.</p> <p>Control must be returned to SYSMAIN.</p>
Parameter Data Area	SM-UX-L6

**MAINEX07 - User Exit Routine for SYSMAIN Termination**

Function	Obtain control at termination of a SYSMAIN session.
Remarks	MAINEX07 is invoked at termination of a SYSMAIN session to decide whether control is to be kept by SYSMAIN or not.
Parameters	USER-AREA (A50) Area for free usage.

**MAINEX08 - User Exit Routine for Nothing Found in Batch Mode**

Function	Determine further processing if no objects are found for a command in batch mode.
Remarks	MAINEX08 is invoked if no objects are found that meet the specified criteria for a specific command executed in batch mode. If this is the case, control may, but need not, be returned to SYSMAIN. If control is returned to SYSMAIN, SYSMAIN will continue processing with the next command.
Parameters	CMD (A250) Command string.

**MAINEX09 - User Exit Routine for Abnormal Termination in Batch Mode**

Function	Determine action to be taken in case of error in batch mode.
Remarks	MAINEX09 is invoked if SYSMAIN processing in batch mode leads to an error. If this is the case, control may, but need not, be returned to SYSMAIN. If control is returned to SYSMAIN, SYSMAIN will be terminated with condition code 45.  <b>Note:</b> Errors NAT4810, NAT4818, NAT4867, NAT4868 and NAT4893 cannot be handled by this user exit routine.
Parameters	CMD (A250) Command string. ERROR-CODE (N4) Number of error which caused termination.

**MAINEX10 - User Exit Routine for Command Errors in Batch Mode**

Function	Determine action to be taken in case of command error in batch mode.
Remarks	MAINEX10 is invoked if an error is detected in a SYSMAIN command in batch mode. If this is the case, control may, but need not, be returned to SYSMAIN. If control is returned to SYSMAIN, SYSMAIN will continue processing with the next command.
Parameters	CMD (A250) Command string. ERROR-CODE (N4) Number of error which caused termination.

**MAINEX11 - User Exit Routine for Setting Special Flags to SYSMAIN**

Function	Special settings user exit routine.
Remarks	MAINEX11 is invoked at the start of the SYSMAIN session, where you can set some special SYSMAIN flags, as for example, display of MAINUSER messages in batch.  See the source object of the user exit routine (SM-UX-11) for the available flags.  Control must be returned to SYSMAIN.
Parameters	FLAGS (A250) Flag string (redefined).