# Natural

## Release Notes for Natural Version 9.2 for Linux and Cloud

Version 9.2.1

October 2022

ADABAS & NATURAL

This document applies to Natural Version 9.2.1 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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# 1 Release Notes for Natural Version 9.2 for Linux and Cloud

These Release Notes summarize the new features, changes and enhancements that are provided with Natural Version 9.1. The following topics are covered:


| |
|---|
| **Release Information for Natural Version 9.2.1** |
| **Release Information for Natural Version 9.1.4** |
| **Release Information for Natural Version 9.1.3** |
| **Release Information for Natural Version 9.1.2** |
| **Release Information for Natural Version 9.1.1** |


For information on the supported operating system platforms and other requirements for the current version of Natural, see *System Requirements* in the *Installation* documentation.

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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:<br><br>Variables for which you must supply values specific to your own situation or environment.<br>New terms the first time they occur in the text.<br>References to other documentation sources. |
| `Monospace font` | Identifies:<br><br>Text you must type in.<br>Messages displayed by the system.<br>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

### Product Documentation

You can find the product documentation on our documentation website at **https://documentation.softwareag.com**.

In addition, you can also access the cloud product documentation via **https://www.softwareag.cloud**. Navigate to the desired product and then, depending on your solution, go to “Developer Center”, “User Center” or “Documentation”.

### Product Training

You can find helpful product training material on our Learning Portal at **https://knowledge.softwareag.com**.

### Tech Community

You can collaborate with Software AG experts on our Tech Community website at **https://tech-community.softwareag.com**. From here you can, for example:

- Browse through our vast knowledge base.
- Ask questions and find answers in our discussion forums.
- Get the latest Software AG news and announcements.
- Explore our communities.
- Go to our public GitHub and Docker repositories at **https://github.com/softwareag** and **https://hub.docker.com/publishers/softwareag** and discover additional Software AG resources.

### Product Support

Support for Software AG products is provided to licensed customers via our Empower Portal at **https://empower.softwareag.com**. Many services on this portal require that you have an account. If you do not yet have one, you can request it at **https://empower.softwareag.com/register**. Once you have an account, you can, for example:

- 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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## Strategy Regarding the Legacy-Unix Platforms

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The end-of-maintenance date (EOM) for Software AG support of the Legacy-Unix platforms is December 31, 2024. For the period from December 31, 2024 to December 31, 2025 Software AG will offer options for non-standard sustained support on the Legacy-Unix platforms for customers who are unable to rehost by the regular EOM date. Both dates apply to all Software AG A&N products (excluding CONNX, which will still be available on Legacy-Unix).

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- RedHat Enterprise Linux®
- SUSE Linux Enterprise

Please be assured that Software AG is prepared to offer assistance in planning and executing your rehosting from the Legacy-Unix platform to an alternative platform.

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| Natural HP-UX® | 9.1.1, October 2018 | 31.12.2024 | 31.12.2025 |
| Natural AIX® and Solaris® | 9.1.3, April 2021 | 31.12.2024 | 31.12.2025 |

# Changes and Enhancements


- Adabas Database
- Application Programming Interfaces
- DDM Editor
- Object Handler
- SQL Databases
- SORTSZE Parameter
- SYSRPC
- Objects Cataloged with Versions Below Natural Version 5
- Natural Security


## Adabas Database

Natural now supports Multi-Fetch-Factor on statement level for Adabas. This extends the functionality of the statements `READ`, `HISTOGRAM` and `FIND`. For more information about using the Multi-Fetch-Factor on statement level please see *Programming Guide* > *Accessing Data in an Adabas Database* > *MULTI-FETCH Clause*.

## Application Programming Interfaces

The following Natural application programming interfaces (APIs) are new in the `SYSEXT` system library:

| API | Task | Enhancement |
|---|---|---|
| `USR8220N` | Trigger termination of a Natural RPC server on server side. | The description of the API is more detailed. |
| `USR8225N` | Provide access to message ID and correlation ID in Natural RPC clients. | This API enables you to maintain message ID and correlation ID of Entire X in an RPC client or server environment.<br><br>See *Maintain Message ID and Correlation ID of EntireX* in *Operating a Natural RPC Environment*. |
| `USR9175N` | Ping, terminate, or trace a Natural RPC server. | This API can now get or set the trace level for a Natural RPC server in addition to the previous capabilities to ping or to terminate it. |
| `USR9178N` | Maintain local store clock value | This API maintains local store clock values. It supports store clock with sliding window (1971 - 2114).<br><br>Additional to the API, copycodes are provided for maintaining local store clock values. |

### DDM Editor

Starting with Natural version 9.2, extended ISNs are supported for VSAM DDMs. For this, a new file attribute 'Extended File' can be specified. See also *Natural for Windows > Editors > Saving and Cataloging a DDM > Additional Options for VSAM Files*.

### Object Handler

The `UNLOAD` and `LOAD` commands of the Object Handler now provide extended field information for the Adabas FDTs (Field Definition Tables). The enhancements include, but are not limited to new options for edit masks (like `NATDATE` and `NATTIME`) and for system fields (like `SESSIONID`).

### SQL Databases

Natural now supports the MySQL and PostgreSQL SQL database types. Entire Access 9.2.1 is a prerequisite for using the new databases.

For more information about creating a DDM from an SQL database, see *Editors > DDM Services > Creating DDMs > <CREATE> from SQL*.

### SORTSZE Parameter

The upper limit of the SORTSZE parameter in Natural for Linux and Cloud and Natural for Windows has been increased from 2048 to 8192 KB. For more information, refer to *Natural for Linux and Cloud > Parameter Reference > SORTSZE*.

### SYSRPC

You can now get or set the trace level for the Natural RPC server trace with server commands.

For more information, see the TI, Tn, and T* line commands in *SYSRPC Utility > Server Command Execution > Line Commands: Server Command Execution*.

### Objects Cataloged with Versions Below Natural Version 5

As of Natural 9.2.1, the execution of Natural objects cataloged with versions below Natural Version 5 will no longer be supported. A recatalog with Natural Version 5 or higher is required.

In order to identify Natural objects cataloged with versions below Natural Version 5, you can use the new Natural system command `SYSLVERS`. For more information, please refer to the System Commands part of this documentation.

## Natural Security

The following enhancements are provided with Natural Security Version 9.2.1:


- Password Rules for User “DBA”
- Administrator Services – Maintenance Log Records
- Protecting a Natural Server Used in Eclipse – Development Mode Options
- Natural RPC – Support of User Names as User IDs
- SECLOAD – Importing External Security Data


### Password Rules for User “DBA”

The first step after the installation is the change of the password for the administrator user ID “DBA”. To improve password security, the new password for the user “DBA” can no longer be freely chosen. As of this version, it 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.

For details, see *Natural Security* > *First Steps After the Installation*.

### Administrator Services – Maintenance Log Records

The menu for the processing of maintenance log records provides several new options:

- **Time from/to** – This option allows you to list only log records written within a specific period of time.
- **Function** – This option allows you list only log records written for a specific maintenance function (for example, Modify, Delete, Rename).
- **Ascending/Descending** – This option allows you to list log records in either ascending or descending chronological order.
- **Display modification** – This option allows you to display intensified the actual modifications in the security profiles.

For details, see *Natural Security* > *Administrator Services* > *Maintenance Log Records*.

#### Protecting a Natural Server Used in Eclipse – Development Mode Options

The new option **Commands priv-mode lib**. allows you to control the use of Natural system commands for private-mode libraries.

For details, see *Natural Security > Protecting the Natural Development Environment in Eclipse > Protection With Development Mode Options*.

#### Natural RPC – Support of User Names as User IDs

The option to log on with the user name as user ID has already been available in conjunction with user authentication via an LDAP server. Now, this option also is supported in conjunction with Natural RPC service requests which use LDAP.

For details, see *Natural Security > Administrator Services > Authentication Options (LDAP)*.

#### SECLOAD – Importing External Security Data

The SECLOAD program for loading Natural Security data now allows you to import user identification data from an external security system (LDAP) and load them to a Natural Security system file. As part of the import process, Natural Security user profiles are created automatically for the user data imported.

For details see *Natural Security > Transferring Security Data To Another System File > Transferring User Data From an External Security System*.

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| Natural AIX® and Solaris® | 9.1.3, April 2021 | 31.12.2024 | 31.12.2025 |

# Security

This section covers important security information.


- JDOM Vulnerability
- NEWSFEED Control Deprecated


## JDOM Vulnerability

The version of JDOM included in Natural for Ajax 9.1.4 contains the following vulnerability:

An XXE issue in SAXBuilder in JDOM through 2.0.6 allows attackers to cause a denial of service via a crafted HTTP request.

**https://nvd.nist.gov/vuln/detail/CVE-2021-33813**

Natural for Ajax uses the vulnerable SAXBuilder class only for XML created internally in the Natural and/or Natural for Ajax products. It switches off Entity expansion in all places where possible. Consequentially, the vulnerability does not apply, except for one area that needs to be pointed out:

When a Natural screen is exchanged between the Natural Web I/O server and the Natural for Ajax java framework in the application server, the Natural for Ajax java framework will load the XML with Entity expansion switched on.

However, the loaded XML is created from within the Natural/NWO server internally - it is not an external XML file. The vulnerability is only exposed should it be possible to tamper this XML during the exchange between Natural and Natural for Ajax.

In local environments, i.e. when Natural and Natural for Ajax are running on the same machine, this is not the case. An example, in which the vulnerability would not be exposed, is when running NaturalONE with the local runtime and the local Tomcat server.

When running Natural and Natural for Ajax on different machines we highly recommend securing this Natural screen exchange by setting "Use SSL" in the session configuration. A secure connection is then established between Natural for Ajax and the Natural Web I/O Interface server that prevents attackers from exploiting this vulnerability.

### NEWSFEED Control Deprecated

The NEWSFEED control is now deprecated. It requires *rome-0.9.jar*. The *rome-0.9.jar* is not packaged with Natural for Ajax anymore. The *rome-0.9.jar* uses JDOM, which in the current versions has the vulnerability as described in the previous section.

## Changes and Enhancements


- Adabas Multi-Fetch Mode
- Handling of Numeric Constant Parameters for Helproutines
- Natural Profiler Utility


### Adabas Multi-Fetch Mode

The multi-fetch mode has been enhanced with two new Natural profile parameters `MFBS` and `MFMR`. For more information see the *Programming Guide* > *Adapting the Multi-Fetch Parameters* or *Parameter Reference* > *MFBS* , *MFMR*.

### Handling of Numeric Constant Parameters for Helproutines

As of Natural 9.1.3 fix 1, the internal generated format of numeric constants as parameters for helproutines has changed from integer to packed due to compatibility reasons with Natural for Mainframe. If you recatalog a program containing such a constant, a runtime error `NAT0936` can occur.

To check if your parameters will cause an error, you can:

1. Use the compile option `COMPOPT PCHECK=ON`. If the parameter check fails, an error NAT0936 will be thrown at compile time.
2. In this case, you must change the parameter definition to the correct packed format or specify the `BY VALUE [RESULT]` clause.

**Example:**

A program calls a helproutine in the following way:

```
INPUT #P1 (HE='HELPR1', 123)
```

If the program is cataloged and the parameter in the helproutine is defined as:

```
1 #H1 (I2)
```

it will receive a runtime error NAT0936.

If the parameter in the helproutine is defined as:

```
1 #H1 (P3)
```

or as:

```
1 #H1 (I2) BY VALUE
```

the program runs successfully.

For more information see the *Programming Guide* > sections *Passing Parameters to Helproutines* and *Numeric Constants*.

### Natural Profiler Utility

The Natural Tools and Utilities in NaturalONE offers a new rich GUI interface for the Natural Profiler. The Natural Profiler page lists all Profiler resources of a given library. For a selected Profiler resource, the properties and statistics of the profiling are displayed. Functions are available for consolidate or evaluate Profiler data, to analyze monitored programs, or to delete a resource file.

For more information, see *NaturalONE*, available at **documentation.softwareag.com**. See section *Using NaturalONE* > *Using Natural Tools and Utilities* > *Rich GUI Interface of the Natural Profiler*.

## Natural Security

The following enhancements are provided with Natural Security Version 9.1.4:

- Administrator Services - Maintenance Log Records
- Authentication Options – Multiple LDAP Security Profiles
- Support User Names as User IDs

- Application Programming Interfaces (APIs)

### Administrator Services - Maintenance Log Records

The menu for the processing of maintenance log records provides a new option which allows you to list log records in either ascending or descending chronological order. This applies to the log records listed by the functions List Administrator Services Maintenance Logs and List Security Profile Maintenance Logs.

For details, see *Natural Security > Administrator Services > Maintenance Log Records*.

### Authentication Options – Multiple LDAP Security Profiles

For user authentication via an LDAP server, only a single LDAP security profile could be defined for one LDAP server. Now you can define multiple LDAP security profiles for multiple LDAP servers. This allows you more flexibility when switching from one LDAP server to another. In conjunction with this enhancement, the user interface of the Authentication Options section in Administrator Services has been revised and expanded. For details, see Authentication Options.

For details, see *Natural Security > Administrator Services > Authentication Options (LDAP)*.

### Support User Names as User IDs

The option to log on with the user name as user ID has already been available in conjunction with user authentication via an LDAP server (see *Natural Security > Administrator Services > Authentication Options (LDAP)*). Now this is also possible when logging on to the mapped environment in an Eclipse environment in conjunction with NaturalONE accessing a non-mainframe Natural Development Server which uses LDAP (see *Natural Security > Protecting the Natural Development Environment in Eclipse*).

### Application Programming Interfaces (APIs)

- Improved Error Information
- New API for Maintenance Log Records

#### Improved Error Information

The return codes returned by several application programming interfaces (in the field PRC) refer to Natural error numbers. In several cases, the same return code / error number was used for different error situations, and the texts of the corresponding error messages were not always specific enough to identify the cause of the error.

This has been rectified: Different new return codes / error numbers have been introduced for different error situations. In addition, the corresponding message texts have been enhanced to provide more specific information on the errors in question.

For details, see *Natural Security* > *Application Programming Interfaces*.

#### New API for Maintenance Log Records

The new application programming interface NSCXLI allows you to display a single maintenance log record.

For details, see *Natural Security* > *Application Programming Interfaces*.

## Notice of Future Changes

The following will be changed in upcoming releases of Natural:

#### Objects Cataloged with Versions Below Natural Version 5

As already noticed in the previous release the following will be changed in the next release of Natural:

The execution of Natural objects cataloged with versions below Natural Version 5 will no longer be supported. A recatalog with Natural Version 5 or higher is required.

In order to identify Natural objects cataloged with versions below Natural Version 5, the new Natural system command `SYSLVERS` may be used. Please refer to the documentation of Natural System commands for further details.

## Removed Features

#### Discontinued Support for Natural Profiler MashApps

The classic MashZone which was used by the Profiler MashApps, is no longer supported by Software AG. Therefore, the Profiler MashApps and the corresponding interfaces are no longer delivered and supported.

The new Profiler Rich GUI can be used to visualize the Profiler data in a graphical, interactive browser interface in a similar way as the previous Profiler MashApps. For more information, see *NaturalONE* > *Using NaturalONE* > *Using Natural Tools and Utilities* > *Rich GUI Interface of the Natural Profiler*.

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# Installation

### Installation of fixes during a first-time installation

It is now possible to install fixes with the Software AG installer during a first-time installation. See also the documentation of the *Software AG Installer* for further details.

### Post-Installation steps for specific product fixes

After installing the fixes for Natural ApplinX Interface and Natural Web I/O Interface, it is necessary to execute a script with sudo rights to finalize the fix installation. Please ensure to read the readmes for these fixes for further details on this topic.

# New Features

The following new features are available with this version:


- SYSLVERS Utility
- Application Programming Interfaces


### SYSLVERS Utility

The new utility `SYSLVERS` can be used to list objects which have been cataloged within a selected Natural version range.

For further details, see `SYSLVERS` in Tools and Utilities.

### Application Programming Interfaces

The utility `SYSEXT` provides the following new application programming interface (API):

| API | Description |
|---|---|
| USR3004N | This API is used to maintain the internal fast locate table. Options are available to activate, deactivate or clear the fast locate table. The current state and statistical data can be retrieved.<br><br>For more information, see *Maintaining the Fast Locate Table* in the section *Fast Locate* in the *Operations* documentation. |

# Changes and Enhancements

The following changes and enhancements are available with this version:


- PECK Parameter
- ECHECK Parameter
- PCHECK Parameter
- Improved Buffer Pool Search Performance
- *NET-USER Variable
- Adabas Support
- Object Handler


## PECK Parameter

A new Natural profile parameter has been added which controls whether a compilation check with the ECHECK or PCHECK option of the COMPOPT system command (see COMPOPT in the *System Commands* documentation) terminates after a syntax error is detected in the object source. In addition, PECK determines how the syntax errors are reported.

The default option is L. With the PECK option, compilation will not stop at PCHECK/ECHECK errors. Instead, it collect them. This can be viewed using the LASTMSG command.

Available options are: L, WL, F, WF, S and WS.

For further details, see PECK in the *Parameter Reference*.

## ECHECK Parameter

A new option has been added to the COMPOPT system command which checks for the existence of an object that is specified in an object calling statement, such as FETCH [RETURN/REPEAT], RUN [REPEAT], CALLNAT, PERFORM, INPUT USING MAP, PROCESS PAGE USING, function call and helproutine call.

The existence check is based on a search for the cataloged object or for the source of the object when it is invoked by a RUN [REPEAT] statement.

Available options are ON and OFF.

The default value is OFF.

For further details, see ECHECK in the *Parameter Reference* and the COMPOPT system command in the *System Commands* documentation.

### PCHECK Parameter

The behavior of the PCHECK parameter has changed for function calls. A parameter check between a function call and a function prototype is performed independently of the PCHECK option. Similarly, a parameter check between a function call and a function GP is also performed independently of the PCHECK option.

PCHECK=ON

- After a function call and function prototype parameter check, an additional check is done between the function call and the function GP (if present).
- If an (IR=) clause is present, a parameter check between the return data type of the function GP and (IR=) is done.

PCHECK=OFF

- After a function call and function prototype parameter check, no additional check is done between the function call and the function GP (if present).
- No check is done for a return datatype of an (IR=) clause and function GP.

PCHECK-dependent checks return Natural error with 9XX. For example, NAT0935, NAT0936, NAT0966, NAT0969 and so on., whereas PCHECK-independent checks return the errors NAT0648 and NAT0651.

For further details, see PCHECK in the *Parameter Reference*.

### Improved Buffer Pool Search Performance

An internal fast locate table is now used to allow execution of fast locate calls for objects loaded into the buffer pool. Fast locate calls improve load performance of objects that are frequently re-loaded or searched in steplib libraries.

Use of the fast locate table depends on the setting of the BPSFI profile parameter. The fast locate table can also be actived or deactived with the new application programming interface USR3004N (see ***Application Programming Interfaces***).

For more information, see *Fast Locate* in the *Operations* documentation.

### *NET-USER Variable

The `*NET-USER` system variable now works as documented.

**Note:** Applications that have been using the `*NET-USER` system variable so far may need to be changed.

For detailed information refer to `*NET-USER` in section *Natural Environment-Related System Variables* of the *System Variables* documentation.

### Adabas Support

#### Keywords ADA and ADA2 are Handled Synonymously

The former distinct database types ADA and ADA2 have been comprised into one database type.

The keywords ADA and ADA2 are handled synonymously now. ADA can be used in all situations where formerly ADA2 was required.

For detailed information refer to *Adabas Database Management Interfaces ADA and ADA2* in section *Accessing Data in an Adabas Database* of the *Programming Guide* documentation.

#### Support of Adabas ADATCP

Natural has been enhanced to support Adabas ADATCP when accessing Adabas databases. For detailed information refer to section *Natural and Adabas Access* > *Adabas ADATCP Access*.

### Object Handler

The properties that can be specified for processing Natural library objects have been enhanced. You can now use the new **Check date for object kind** option to search for save or catalog dates of Natural objects for a given date or date range. This option is described in *Natural Library Object Properties* in the section *Object Handler*.

The corresponding `DATECHECK` option of an Object Handler direct command is described for the *`select-clause`* in the section *Object Handler*.

# Natural Development Server

Natural Development Server is released with the same version number as Natural for UNIX. In addition, the following has been enhanced:

- SSL
- List Natural Mainframe Objects in the Studio Views

### SSL

The name of the certificate file has changed from *server.cert.crt* to *ndv.server.cert.crt* and the name of the key file has changed from *server.cert.key* to *ndv.server.cert.key*.

### List Natural Mainframe Objects in the Studio Views

When a huge number of objects are contained in a library, the listing of these objects in the Natural Studio views can take a long time. With Natural for Mainframes version 9.1.2 on z/OS, a new hyperdescriptor is provided that can significantly improve the database access required for this purpose. The installation of the hyperdescriptor is described in *NaturalONE in a Nutshell* > *Performance Aspects* in the NaturalONE documentation.

# Natural RPC (Remote Procedure Call)

Natural RPC (Remote Procedure Call) is available as a separate subcomponent of Natural. It has its own version number. This measure takes into account that Natural RPC is a cross-platform component and makes it possible to provide new Natural RPC versions independent of new Natural versions for the various platforms supported.

With Natural Version 9.1.3, an enhanced Natural RPC Version 9.1.3 is delivered. This version contains error corrections. In addition, the following new functionality is provided.

- Extended Password Length


### Extended Password Length

It is now possible to use passwords with a length of up to 128 characters.

## Natural Security

The following enhancements are provided with Natural Security Version 9.1.3:


- Library Profiles - FDIC DBID Zero
- File/DDM Profiles - Copying With Links
- DDM Profiles - Selection List
- Natural Development Environment - DDMs in Natural Server View
- Natural Development Environment - Support of SYSLSO Command


### Library Profiles - FDIC DBID Zero

In the Library File section of library profile, you can now specify `0` (zero) as the FDIC database ID: this means that the DBID value of the FDIC profile parameter will apply.

### File/DDM Profiles - Copying With Links

The file/DDM maintenance functions *Copy File* and *Copy DDM Profile* provide the new option **With Links**. It allows you to also copy the links of libraries from the "old" file/DDM profile to the "new" one. Both functions allow you to select which links you wish to copy and which not.

### DDM Profiles - Selection List

The information displayed on the DDM selection list has been enhanced: Column **P**, which indicates whether a DDM security profile exists, now differentiates between DDM security profiles with and without corresponding DDMs. See *Creating and Maintaining DDM Security Profiles*.

### Natural Development Environment - DDMs in Natural Server View

The display of DDMs in the Natural Server view in an Eclipse environment under Natural Security has been changed: DDMs are no longer represented as a separate node, but are now displayed as a group node under the library node. See *Protecting the Natural Server View* under *Protecting the Natural Development Environment in Eclipse*.

### Natural Development Environment - Support of SYSLSO Command

The use of the NaturalONE command SYSLSO, which determines the library search order for private-mode libraries, can now be controlled by Natural Security. See *Protecting the Navigator View* under *Protecting the Natural Development Environment in Eclipse*.

## Removed Features

Features that have been removed, which had been announced in the Release Notes for Version 9.1.2 and are no longer available with Version 9.1.3:

### Database Servers Supported via Entire Access

As announced in the previous release, Entire Access does no longer support the database servers Informix and Sybase. No new features, patches or updates related to Informix and Sybase will be provided as of this release.

## Notice of Future Changes

The following will be changed in upcoming releases of Natural:

### Objects Cataloged with Versions Below Natural Version 5

The execution of Natural objects cataloged with versions below Natural Version 5 will no longer be supported. A recatalog with Natural Version 5 or higher is required.

In order to identify Natural objects cataloged with versions below Natural Version 5, the new Natural system command `SYSLVERS` may be used. Please refer to the documentation of Natural System commands for further details.

# 6 Release Information for Natural Version 9.1.2


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# New Features

The following new features are available with this version:


- Profile Parameters
- Support of External Sort
- Docker Support


## Profile Parameters

The following parameters are now available:

| Parameter | Description |
|---|---|
| SHAPED | This new session and profile parameter controls conversion of unshaped characters to correctly display text in a bidirectional language format. |

## Support of External Sort

This version of Natural supports the use of the DMExpress Syncsort Version 9.1 and IRI CoSort libraries. To use these libraries, you have to link them to your Natural nucleus as described in *Re-Linking a Natural Nucleus* in the *Installation* documentation.

For CoSort libraries, please ensure the Runtime Monitoring is set to (level 0). Steps involved can be found in *Cosort Version 9.5 Overview Booklet* under the *System Tuning* section. Once linked to your Natural nucleus, you can use Syncsort or CoSort options when issuing a SORT statement.

Refer to *Using External Sort Programs* in the section SORT in the *Statements* documentation for further details.

## Docker Support

There are two additional Natural docker use cases available:

- Natural with Applinx
- Natural with Applinx and Natural Security (NSC)

For detailed information see *Building a Natural Docker Image* in the *Installation* documentation.

## Changes and Enhancements

The following changes and enhancements are available with this version:


- Adabas MULTI-FETCH Support
- DEFINE DATA as Source Format for Data Areas


### Adabas MULTI-FETCH Support

The Adabas multi-fetch functionality is now also supported for the database type `ADA2`. For detailed information refer to *MULTI-FETCH Clause* in section *Accessing Data in an Adabas Database* of the *Programming Guide* documentation.

### DEFINE DATA as Source Format for Data Areas

**Note:** The following only applies when using Natural for UNIX as a development server and NaturalONE as a client.

Starting with Natural Version 9.1.2., all types of data area sources (local, parameter and global) will be saved using the `DEFINE DATA` format. This means that a data area source only consists of a `DEFINE DATA` statement followed by data definitions and comments.

For details refer to DEFINE DATA in the *Statements* documentation. For further recommendations, please refer to *Data Area Editor* in the *Editors* documentation.

## Natural Development Server

Natural Development Server is released with the same version number as Natural for UNIX. In addition, the following has been enhanced:


- SSL Support


### SSL Support

It is now possible to establish SSL-secured connections to Natural Development (NDV) servers (running on version 9.1.2 or above).

## Natural RPC (Remote Procedure Call)

Natural RPC (Remote Procedure Call) is available as a separate subcomponent of Natural. It has its own version number. This measure takes into account that Natural RPC is a cross-platform component and makes it possible to provide new Natural RPC versions independent of new Natural versions for the various platforms supported.

With Natural Version 9.1.2, an enhanced Natural RPC Version 9.1.2 is delivered. This version contains error corrections. New functionality is not provided.

## Natural Security

The following enhancements are provided with Natural Security Version 9.1.2:


- Maximum Number of Logon Attempts
- Lock User Option
- User Preset Values
- Authentication Options (LDAP)
- Application Programming Interfaces (APIs)
- SECLOAD


### Maximum Number of Logon Attempts

The Administrator Services general option **Maximum Number of Logon Attempts** has been changed: its maximum value, which used to be "5", is now "9". The default value continues to be "5".

Remember that the setting of this option also applies to the following application programming interfaces: `NSC---P`, `NSC--PH`, `NSC---SP`, `NSC----P` and `NSC--PHS`.

### Lock User Option

The Administrator Services general option **Lock User Option** provides an additional value "Z". It corresponds to "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`).

### User Preset Values

The value for the user profile component **Change password after** *nnn* **days** can now be pre-defined in the **User Preset Values** section of Administrator Services.

### Authentication Options (LDAP)

Two enhancements to Administrator Services **Authentication Options**:

- User authentication via an LDAP server is now also possible for the Natural Development Server.
- The components of the LDAP security profile provide a new option **Start TLS connection**. It can be used to attempt to set up an encrypted communication over the plain LDAP port if the LDAP server supports this.

### Application Programming Interfaces (APIs)

The application programming interface `NSCADM` has been enhanced and can now be used to also process logon/countersign error records.

### SECLOAD

The `SECLOAD` program for loading Natural Security data provides a new option **Expire passwords for loaded user profiles**. It can be used to enforce a password expiration for all loaded user profiles (user types A, P, M), which means that these users will have to change their passwords at the next logon.

## Documentation

The following documentation changes have been applied with this version:


- SQL Statements Revised


### SQL Statements Revised

The section *Using Natural SQL Statements* and the descriptions of the `DELETE`, `INSERT`, `SELECT` and `UPDATE` SQL statements have been revised with this release.

# Notice of Future Changes

The following will be changed in upcoming releases of Natural:


- Database Servers Supported via Entire Access


### Database Servers Supported via Entire Access

With an upcoming release of Entire Access, we will discontinue the support of the database servers Informix and Sybase. No new features, patches or updates related to Informix and Sybase will then be provided any longer. Only updates and patches that have been developed already will still be available.

Any concern regarding the discontinuation of this support, please address to your global support organization.

# 7 Release Information for Natural Version 9.1.1


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# Installation

### System Requirements

The system requirements for the current version of Natural are now listed in the *Installation* documentation.

Please also refer to the system requirements for specific information concerning Oracle Solaris 11.3.

### Compilers Used to Build Natural

With Natural for UNIX Version 9.1.1, different compiler versions were used to build and test Natural. For detailed information, see *Compilers Used to Build Natural* in the *Installation* documentation.

# Migrating Applications to Version 9.1

Applications that were created with Natural for UNIX Version 3.1 and above can be executed with Version 9.1.

# New Features

### Natural in a Docker Container

As of Natural 9.1.1, it is possible to execute Natural in a Docker container. For detailed information see *Building a Natural Docker Image* in the *Installation* documentation.

### System Variables

The following system variables are now available:

| Variable | Description |
|---|---|
| *EDITOR | The new *EDITOR system variable returns information on whether the Natual program, data area and map editors are enabled (activated). |

## Changes and Enhancements

### AT BREAK Statement

The behavior of an ESCAPE in an AT BREAK statement has been changed due to compatibility reasons with Natural for Mainframe.

When an ESCAPE ROUTINE or ESCAPE BOTTOM is processed in an AT BREAK statement, the AT BREAK processing is stopped. If there are multiple AT BREAK blocks in the processing loop, no further AT BREAK statement is executed for the current processing loop.

When the processing loop is terminated and an ESCAPE ROUTINE or ESCAPE BOTTOM is processed in the final AT BREAK processing, the AT BREAK processing is stopped and no further AT BREAK block is executed.

Refer to AT BREAK in the *Statements* documentation for further details.

### EXAMINE Statement

The syntax of the EXAMINE statement has been enhanced with the following effects:

- An EXAMINE statement with a multi-character wild character (* or %) at the beginning or at the end of the search-pattern, matches now only to the next delimiter (if delimiters are used). This can lead to a different result.
- In general, a mirrored EXAMINE now delivers the mirrored result. That means, if you swap the characters (first to last, etc.) of the inspected field and of the search-pattern, and change the direction from FORWARD to BACKWARD, the resulting field contains the swapped value of the non-mirrored EXAMINE.

Refer to EXAMINE in the *Statements* documentation for further details.

### ETID Parameter

The behavior of the ETID parameter has been changed. If the ETID is not specified, neither in NATPARM nor dynamically, Natural uses the setting of *INIT-USER to fill the ETID. This also applies now, if Natural Security is used.

If you want to use the ETID from Natural Security, you have to set the ETID parameter to OFF.

Refer to *ETID - Adabas User Identification* in the *Parameter Reference* documentation for further details.

### CATALL Command

The option to automatically renumber the source-code lines of sources that were saved or stowed is now deactivated by default. If you want to use automatic renumbering, you now have to activate this option. Refer to CATALL in the *System Commands* documentation for further details.

### Statistical Information in NATBPMON

When using the Buffer Pool Monitor (NATBPMON), additional statistics (hot fix level, read-only and swap status) are displayed when issuing the STATUS command in NATBPMON. Refer to *Statistical Information About the Buffer Pool* in the *Operations* documentation for details.

### Profiler Utility

**Summary of Executed Source Lines**

The Natural Profiler utility now provides the option to generate a summary of source lines executed in a Natural object. The summary shows how many events occurred during execution of a source line and the CPU and elapsed time spent executing the line.

For more information, see *Line Summary* in the section *Using the Profiler Utility in Batch Mode*.

**Transaction Response Time Evaluation**

The Natural Profiler utility now provides the option to evaluate transactions and generate a transaction summary. The summary shows how many events occurred during execution of the transaction and the response time used by the transaction.

For more information, see *Transaction Summary* in the section *Using the Profiler Utility in Batch Mode*.

## Natural Development Server

Natural Development Server is released with the same version number as Natural for UNIX.

## Natural RPC (Remote Procedure Call)

Natural RPC (Remote Procedure Call) is available as a separate subcomponent of Natural. It has its own version number. This measure takes into account that Natural RPC is a cross-platform component and makes it possible to provide new Natural RPC versions independent of new Natural versions for the various platforms supported.

With Natural Version 9.1.1, an enhanced Natural RPC Version 9.1.1 is delivered. This version contains error corrections.In addition, the following new functionality is provided.


- SYSRPC Utility


### SYSRPC Utility

**Service Directory Maintenance: Cursor Now Placed at Inserted Lines**

The `I` insert line command of the **Service Directory Maintenance** now places the cursor at the position where new items can be entered for a selected node.

For more information, see *Line Commands* in the section *Commands for Service Directory Maintenance*

## Natural Security

The following enhancements are provided with Natural Security Version 9.1.1:


- Administrator Services
- Unlocking Locked Users
- Password Phrases
- Password Rules
- Passing Natural User ID to Adabas
- Authentication Options

- Application Programming Interfaces (APIs)

### Administrator Services

The menu structure of Administrator Services has been revised slightly. In particular, **User Preset Values** and **Library Preset Values** are now two separate menu items.

### Unlocking Locked Users

**User Preset Values** provide a new option **Automatically unlock users after** *nn* **hours,** *nn* **minutes**. If you use the Lock User Option, you had to unlock every locked user manually. With this option, you can specify a time interval after which locked users are unlocked automatically: A locked user ID will then be unlocked *nn* hours and *nn* minutes after which the locking occurred.

### Password Phrases

In addition to "regular" passwords of up to 8 characters, Natural Security now also supports the use of *password phrases*, that is, passwords which are longer than 8 characters. The use of password phrases is activated by the new option **Password phrases active** in the **User Preset Values** section of *Administrator Services*.

Several **Password Phrase Options** are available to control the use password phrases.

In conjunction with password phrases, the new logon-related user exit `LOGONEX0` is used instead of `LOGONEX1`; see *Logon-Related User Exits*.

See also *Application Programming Interfaces (APIs)* below.

### Password Rules

In the **Password Options** section of **User Preset Values**, the option **Minimum no. of non-alphabetical characters** has been replaced by the two new options **Minimum no. of numeric characters** and **Minimum no. of special characters**.

### Passing Natural User ID to Adabas

A new option **Pass Natural User ID (*USER) to Adabas** is available in the **Libary Preset Values** section of *Administrator Services*. It determines which user ID is passed to Adabas to be used as Adabas login ID: the value of the Natural system variable *USER or that of the Natural system variable *INIT-USER.

### Authentication Options

User authentication via an LDAP server is now also possible with `AUTO=ON`: If technical user support is defined and the Natural session is started with the Natural profile parameter `AUTO=ON`, the user ID is LDAP-verified.

The following components of the LDAP security profile have been changed:

- **LDAP Options 1:** The field **Log level**, which could be set to **0** (logging not active) and **1** (logging active), now provides a value range of **0 to 6** for selective logging of various items.
- **LDAP Options 2:** The **Technical user support** fields **Credential** and **Key value** have been renamed to **Path to output file** and **Path to key file** respectively.
- **LDAP Options 3:** The field **Default separator** has been removed.

### Application Programming Interfaces (APIs)

For the handling of password phrases, two new APIs are available:

- NSC--PH can be used to check password phrases.
- NSC--PHS can be used to check and change password phrases.

The existing API NSC-US has been enhanced: The parameter `PPARM4` can be used to set a password phrase in a user security profile (see example program `PGMUS001`).

To set the user ID and password phrase for an Natural RPC service request, you use the new API `USR9171` provided in the library `SYSEXT`.

## Removed Features

The following changes apply with Natural Version 9.1:

### Disabled Editors

The Natural program, data area and map editor have been disabled in your environment by default. For more information, see *Disabled Natural Editors* in the *Editors* documentation.