software AG

Natural

Release Notes for Natural Version 8.3 for UNIX

Version 8.3.8

October 2016

ADABAS & NATURAL

Table of Contents

1 Release Notes for Natural Version 8.3 for UNIX

These Release Notes summarize the new features, changes and enhancements that are provided with Natural Version 8.3. The following topics are covered:

> **Note:** With the October 2015 release, Natural for UNIX has the same version number as NaturalONE, which is 8.3.6. There is no version 8.3.5 for Natural.

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

Update Information for Version 8.3.1, January 2014

The *Release Information for Natural Version 8.3.1* erroneously stated that the handling of the `TF` parameter was changed. This information has been removed. Other than previously announced, it is not possible to use the asterisk notation for the database ID and file number of the test database. The `TF` parameter works as documented. As a workaround, you can use the Natural API `USR2005N`: when you specify `-1` for the file numbers, each file in the production database is mapped to the file with the same file number in the test database.

2 Release Information for Natural Version 8.3.1

Installation

System Requirements

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

Software AG Installer

Natural for UNIX is now installed using the Software AG Installer. For more information, see the *Installation* documentation.

When installing with the user "root", you are no longer prompted for an "SAG user". Owner and group of the installed Natural files will always be "root" and will not be set to the "SAG user".

Changed Directory Structure

The *version* directory has been removed.

The *nat* directory has been renamed to *Natural*.

Environment Variables

The Software AG Installer now uses `$NAT_HOME` for the directory in which Natural is installed (`<install-dir>`/*Natural*).

The environment variables `NATDIR` and `NATVERS` are no longer required for starting Natural.

The Natural utilities which have used these environment variables have been adapted. The Object Handler now provides `NATROOT` as a new valid input value.

Natural now determines from which directory it has been started and automatically uses the appropriate local configuration file (*natural.ini*). By default, *natural.ini* is located in the *Etc* directory which is located within the Natural installation directory. If required, you can still set the environment variables `NATDIR` and `NATVERS`, for example, to simplify the start of Natural in your environment or to ensure compatibility with your existing shell scripts in the Natural Version 8.3 environment.

Changed Port Number for the Natural Web I/O Interface

The default port number which is used by the Natural Web I/O Interface daemon has changed from 2800 to 2900.

Compilers Used to Build Natural

With Natural for UNIX Version 8.3.1, 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 8.3

Applications that were created with Natural for UNIX Version 3.1 and above can be executed with Version 8.3.

New Features

Application Programming Interfaces

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

API	Description
USR8208	This API terminates an EntireX Broker of version 5 or above by using the Command and Information Service of EntireX Broker. It also returns version information on the EntireX Broker and the Command and Information Service itself. For older versions, the same method as in USR2075N is used.

Changes and Enhancements

Printing to Entire Output Management (NOM)

It is now possible to print to an Entire Output Management container file without using the spool of the operating system. The enhancements described below are available for this purpose.

In the parameter file, you can now define "NOM" as the output medium for a report. See *Report Assignments* in the *Configuration Utility* documentation.

In the global configuration file, you can now define NOM printer profiles. See *Printer Profiles* in the *Configuration Utility* documentation.

Using the `DEFINE PRINTER OUTPUT` *operand1* statement, you can now assign additional reports with the name "NOM".

For more information on how to print from Natural to Entire Output Management, see the Entire Output Management documentation.

Change in Return Code Handling

The return code handling of batch Natural processing has been changed:

- A `TERMINATE` *nnn* statement now causes *nnn* to be always set as the return code of a Natural run.
- The return code set by a `TERMINATE` statement now overrides the return code 61 which is set due to a runtime error.
- Error message NAT9987 now appears in the file identified by Natural parameter `CMPRINT` if a Natural run was stopped by a `TERMINATE` statement.

Review your batch procedures and check whether there are dependencies related to the above mentioned changes.

New Exit Code

A new exit code 91 is available. It is issued when a connection to the Natural Web I/O Interface is not available. See also *Natural Exit Codes* in the *Operations* documentation.

CATALL Command

To improve the migration of Natural applications, the sequence in which the system command `CATALL` catalogs the Natural objects has been changed. The following table compares the new sequence with the old sequence as used in Version 6.3.

	New Sequence as of Version 8.3.1	Old Sequence in Version 6.3
1	DDMs	DDMs
2	Global data areas	Global data areas
3	Local data areas	Local data areas
4	Parameter data areas	Parameter data area
5	Copycodes [*]	Classes
6	Texts [*]	Maps
7	Functions	Dialogs
8	Subprograms	Subroutines
9	Subroutines	Subprograms
10	Helproutines	Functions
11	Maps	Adapters
12	Adapters	Helproutines
13	Programs	Programs
14	Classes	
15	Dialogs	

[*] Copycodes and texts are processed as of Version 8.3.

Object Handler

Compact Mode
> The Object Handler now provides the compact mode, which can be used to perform unload, load or scan functions in only two steps. In compact mode, you can specify all basic processing instructions in two input maps. Additional input maps for further processing instructions can still be used but are optional to call. You can start a function in compact mode but also continue in compact mode during advanced-user or wizard processing to skip any remaining processing steps.

> For further information, see the section *Compact Mode* in *Object Handler* in the *Tools and Utilities* documentation.

New Profile Handling
> The handling of the Object Handler profile has been enhanced. Now the internal Object Handler command `PROFILE` provides functionality to set individual parameters in the Object Handler profile.

For further information, see *Profile Settings* in the *Object Handler* documentation.

New Option

The Object Handler now provides the new option `Report-Option-1` that allows you to restrict the report data to error messages only or to split the report into the success messages and into error messages (in batch mode only).

New Profile Parameters

The Object Handler provides the following new profile parameters:

- **Default-Report-Option-1**

  Allows you to define the default setting for the option `Report-Option-1`. For further information, see *Default-Report-Option-1* in the *Object Handler* documentation.

- **Default-Report-Direct-Command**

  Allows you to define the default report form in direct command mode (batch and online mode). For further information, see `Default-Report-Direct-Command` in the *Object Handler* documentation.

XRef Setting in Utility Profiles of Natural Security Checked

The load function of the Object Handler now checks the setting of the XREF option against the setting of the new Natural Security **Xref option** for utility profiles when loading cataloged objects in the internal format. See *XREF option with Natural Security* in the *Object Handler* documentation for more information.

The `OBJHEX02` user exit routine has been enhanced accordingly: the new `CAT-REJECTED-XREF` parameter contains the number of cataloged Natural objects that were rejected because of XRef reasons (no XRef data, not documented in Predict, invalid `FDIC` system file).

New Report Mode

For direct commands, the Object Handler provides the new report option `REPORT-MODE` to select a layout for the reports to be written. You can choose between a short report to display the most relevant data in the first 80 columns of the report line, and a large report (default) to display data as in previous Natural versions. You can change the default with the `Default-Report-Mode` profile parameter of the Object Handler.

Process Statistics about Object Types - New User Exit Routine

The Object Handler now also provides statistics about the types of Natural object (for example, programs or subroutines) processed during an unload, a load or a scan function. The new statistics are displayed on an extra report screen when the option `Display-Statistics` (see *Profile Parameters* in the *Object Handler* documentation) is active or when the `SHOW STATISTICS` command is issued (see *Commands for Navigation and Special Functions* in the *Object Handler* documentation).

You can obtain and further process the statistics data on the object types by using the new `OBJHEX04` user exit routine. See also *User Exit Routines Available* in the *Object Handler* documentation.

Natural Development Server

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

The following changes and enhancements are provided with Natural Development Server Version 8.3.1.

New Start Option

A new optional start option is available which defines the types of clients which are permitted to connect to the server:

```
-c[lient][=]<type>
```

where `<type>` can be one of the following:

Type	Description
NAT	Only Natural for Windows (Natural Studio) clients are permitted to connect to this server.
ONE	Only NaturalONE clients are permitted to connect to this server.
ANY	Both Natural for Windows (Natural Studio) and NaturalONE clients are permitted to connect to this server.

If this start option is not specified, the server will use `ANY` as the default. If a client which is not permitted tries to connect to the server, error `NAT7742` will be issued, indicating that the current IDE is not permitted.

See also *Starting the Development Server* in the Natural Development Server documentation for UNIX, which is available separately.

Renamed File

The file *NDVSERVER.LOG* (located in the subdirectory *Natural\Prof*), which is used to terminate the started Natural development servers, has been renamed to *NDVSERVER.PRU*. Existing entries inside the *NDVSERVER.LOG* file are not migrated to *NDVSERVER.PRU*.

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 8.3.1, an enhanced Natural RPC Version 6.3.4.9 is delivered. This version only contains error corrections. New functionality is not provided.

Natural Security

The following enhancements are provided with Natural Security Version 8.3.1.

Administrator Services

Password History
> The field **User password history** in **Library and User Preset Values > User Profile Items** can now be set to asterisk (*) to allow the activation of password history for individual users.

User Profiles

Batch ETID
> The security profiles for users of types A, P, M and E provide a new **ETID Batch** field. This field is used to specify an ETID for a Natural batch-mode session, if this is to be different from the one used for an online session. See *Components of a User Profile* in the *Natural Security* documentation for more information.

Additional Options - Groups/Members
> The **Groups/Members** field is now also available for users other than groups in the user maintenance functions Add User, Copy User and Modify User.

Library Profiles

Copy With Links
> The **Copy Library** function, when used with the **With Links** option, now handles DDMs correctly as documented.

DDM Profiles

Copy Function Enhanced

The function **Copy Link to All Special Links** (function code `CU`) has been enhanced and re-named; in addition to copying a DDM's links, it now also copies a DDM profile to all special links. See **Copy Profile/Link to All Special Links** in the *Natural Security* documentation for details.

Environment Profiles

User ID "DBA"

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.

Utility Profiles

SYSOBJH

A new **Xref option** is provided to control how Predict cross-reference data related to objects processed with the SYSOBJH utility are handled. See *Additional Options* under *Protecting Utilities* in the *Natural Security* documentation for more information.

Natural Development Server - Client Access

With Natural Development Server Version 8.3.1, a new start option is provided which defines the types of clients permitted to connect to the server. This option is also supported by Natural Security. The new Natural Security option **Natural client access** can be set in library preset values, user profiles (types Administrator, Person and Group), library profiles and special link profiles. It defines the types of clients permitted to connect to the server.

Possible values are:

Value	Description
N	Only Natural for Windows (Natural Studio) clients are permitted to connect to this server.
O	Only NaturalONE clients are permitted to connect to this server.
A	Default. Both Natural for Windows (Natural Studio) and NaturalONE clients are permitted to connect to this server.
P	Natural for Windows (Natural Studio) and NaturalONE clients are *not* permitted to connect to this server.

If a client which is not permitted tries to connect to a library, error `NAT7742` will be issued, indicating that the current IDE is not permitted.

Application Programming Interfaces

NSCXRUTC
The new application programming interface NSCXRUTC can be used to obtain a list of all utility functions which are allowed for a user.

Documentation

MOVE ALL Statement

The `MOVE ALL` statement is now documented with the `MOVE` statement: see *Syntax 9 - MOVE ALL*. As a result, you can no longer select `MOVE ALL` from the *Quick Reference* selection box of the *Statements* overview page.

LIST COUNT System Command

The `LIST COUNT` system command is now documented with the `LIST` system command: see *Syntax Overview* and *Displaying Numbers and Sizes of Objects*. As a result, you can no longer select `LIST COUNT` from the *Quick Reference* selection box of the *System Commands* overview page.

Removed Features

The features to be removed which have been announced in the Release Notes for Version 6.3 are no longer available with Version 8.3:

Remote Debugging

Remote debugging (that is debugging a native Natural for UNIX application from a Windows computer) is no longer supported. The Windows client is no longer delivered. Debugging a UNIX application is now only possible with NaturalONE, or with Natural for Windows (Natural Studio) when you are working in a remote UNIX environment using SPoD. Using the NaturalONE debugger, it is possible, for example, to debug Natural RPC applications or to debug workplace applications which have been created with Natural for Ajax.

See also *Debugging* in *Using Natural*.

Natural Web Interface

`SYSWEB` is no longer supported. It is no longer delivered on the product CD.

The interface `SYSWEB3` is now to be used instead of `SYSWEB`. If you have not already done so, you have to update your programs written for `SYSWEB` to run with the `SYSWEB3` interface. See *Migrate Natural Web Interface SYSWEB to SYSWEB3* in the *Web Technology* documentation for further information.

Versioning Software

`NATNCVC` is no longer be supported.

It is recommended that you use Local Versioning which is available with Natural Studio when you are working in a remote UNIX environment using SPoD. Using Local Versioning, you can use the source control system Concurrent Versions System (CVS) or Subversion (SVN) from within your Natural environment. To use this functionality, you must have the Subversion or CVS client part (*svn.exe* or *cvs.exe*) installed on your PC and you must have access to a Subversion or CVS repository server which has been installed locally or on a server. When you search the internet, you can find these Subversion or CVS components on several download sites. For detailed information on Local Versioning, see *Natural Studio Extensions* which is part of the Natural for Windows documentation.

External Sort Program

The external sort program SyncSort is no longer supported.

NATVERS Parameter

Natural now determines from which directory it has been started. Therefore, the Natural profile parameter `NATVERS` has been removed.

XADB Parameter

The Natural profile parameter `XADB` was not used and has therefore been removed.

Utilities NATUNLD, NATLOAD and SYSTRANS

The utilities NATUNLD, NATLOAD and SYSTRANS are no longer delivered with Natural. Thus, it is no longer possible to install these utilities by issuing the corresponding system commands for the first time. Use the Object Handler instead.

Entire Screen Builder

An interface to Entire Screen Builder is no longer provided. It is recommended to use ApplinX instead.

Notice of Future Changes

DEBUG System Command

Remote debugging is no longer supported. Therefore, the system command `DEBUG` is no longer required. It will be removed with a future version of Natural for UNIX.

Profile Parameters for Remote Debugging

Remote debugging is no longer supported. Therefore, the profile parameters `RDACTIVE`, `RDNODE` and `RDPORT` are no longer required. They will be removed with a future version of Natural.

3 Release Information for Natural Version 8.3.2

Installation of Natural Add-On Products

Many Software AG product installations are currently being changed in order to use the common Software AG Installer. Thus, all major products can be installed with the same look and feel. Natural for UNIX and Natural Security already use the Software AG Installer since version 8.3.1.

In the future, the Natural add-on products Predict Version 8.2.3 and Natural Construct Version 8.2.2 will also use the Software AG Installer. These releases are planned for October 2014. If you want to install Predict and/or Construct, it is therefore recommended that you wait for the October release where these products can be installed with the Software AG Installer.

New Features

Parameters

The following new Natural profile parameter is provided in this version:

Profile Parameter	Description
RENCONST	Can be used to renumber the line number references in alphanumeric constants within a Natural source. By default, line number references in alphanumeric constants are not renumbered.
	Note: For compatibility with the mainframe, this parameter has been renamed to RNCONST in version 8.3.4.

Changes and Enhancements

Installation

For the default buffer pool NATBP, the default size in the local configuration file has been changed from 100 MB (Natural Version 8.3.1 for UNIX) to 20 MB (Natural Version 8.3.2 for UNIX). If required, you can change this size using the Configuration Utility (**BP Size** option). See *Buffer Pool Assignments* in the *Configuration Utility* documentation.

SYSPCI Utility

The SYSPCI utility, which is used to configure the installed products, can now be called with direct command data (that is, with keywords and their corresponding values), both in batch mode and online. For example:

```
SYSPCI PRODUCT NDV FUNCTION ALL DBID 177 FNR 501
```

For more information, see *Calling the SYSPCI Utility with Direct Command Data* in the *Tools and Utilities* documentation.

Configuration Utility

Editor Options

The parameter group **Natural Development Environment** now contains the new category **Editor Options**. The new profile parameter RENCONST is available in this category. See *Editor Options* in the *Configuration Utility* documentation.

Read-Only Information in Buffer Pool Monitor

The buffer pool monitor now indicates whether a buffer pool is a special read-only buffer pool or not. See also the following in the *Operations* documentation: the description of the PARAM command (*Displaying the Buffer Pool Settings*) in *Using the Buffer Pool Monitor (NATBPMON)*.

Statistical Information in Buffer Pool Monitor

The precision of the information shown with the STATUS command has been increased. This leads to a different output of the statistics shown in the Natural Buffer Pool Monitor (NATBPMON utility). See *Statistical Information About the Buffer Pool* in the *Operations* documentation.

Startup Error for Incorrect Code Page

Natural now always displays the error "Invalid code page *name* specified" independently whether the code page is defined with the CP parameter or comes from the operating system. This is especially necessary on Linux machines where the default encoding is often UTF-8 which is not allowed as the default code page.

Dynamic Variables with ASCII Work Files

The work file types `ASCII` and `ASCII-COMPRESSED` can now handle dynamic variables with a maximum field/record length of 32766 bytes. Reading a dynamic variable from an `ASCII` or `ASCII-COMPRESSED` work file puts the rest of the work file record into the variable. Thus, for work files with these types, the dynamic variable is resized in each execution of the `READ WORK FILE` statement to match the exact length of the remaining part of the record. See also the sections *Handling of Large and Dynamic Variables* in the descriptions of the `READ WORK FILE` and `WRITE WORK FILE` statements.

Natural Web I/O Interface Client

The Natural Web I/O Interface client is now delivered in the Version 1.3.14.

This is the last version that supports JBoss Application Server 4.2 and Oracle Glassfish 3.1. Support of subsequent versions of JBoss Application Server and Oracle Glassfish is not planned.

⚠️ **Important:** Due to changes and corrections in the right-to-left (RTL) handling, the following prerequisites must be met to run RTL applications correctly: The Natural Web I/O Interface client Version 1.3.14 requires Natural Version 8.3.2 or above on Linux, UNIX or Windows, or Natural Version 8.2.4 or above on mainframes, and vice versa.

The Natural Web I/O Interface client now supports Internet Explorer 11. For a list of the currently supported web browsers, see *Browser Prerequisites* in the *Natural Web I/O Interface* documentation.

With the configuration tool, it is now possible to define the filler character that is to be removed from the input fields of an application. Trailing filler characters will be removed from the input fields, and leading filler characters will be replaced with blanks. See *Editing a Session* in the *Natural Web I/O Interface* 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 8.3.2, Natural RPC Version 6.3.4.9 is still delivered. This version only contains error corrections. New functionality is not provided.

Natural Security

The following enhancements are provided with Natural Security Version 8.3.2.

User Profiles

Time Differential

> With previous versions, **Time Differential** could only be set in user profiles of types Terminal and Group. As of this version, you can also set it in user profiles of types Administrator, Person and Member.

Utility Profiles

SYSPCI

> The use of the Natural product configuration and initialization utility SYSPCI can now be controlled by Natural Security. See *SYSPCI Utility Profiles* under *Protecting Utilities* in the *Natural Security* documentation for more information.

4 Release Information for Natural Version 8.3.3

Installation

Natural Add-On Products

The Natural add-on products now also use the Software AG Installer. These are:

- Predict Version 8.2.3
- Natural Business Services Version 8.2.2 (this also includes Natural Construct Version 8.2.2)
- Entire Operations Version 5.4.2
- Entire Output Management Version 3.4.3
- Entire System Server Version 2.1.5

For detailed information on how to install the above-mentioned Natural add-on products using the Software AG Installer, see the documentation for these add-on products. This documentation is available separately. It is not part of the Natural documentation.

EntireX Broker Access

As of Natural Version 8.3.3, the Natural-specific broker stub *natetb.so/natetb.sl* is delivered in the *Natural/extlib* directory. To access EntireX Broker, it is therefore no longer required to copy it from the directory `$EXXDIR/$EXXVERS/lib` to the directory which is specified as the binary load path (`NATEXTLIB`) in the installation assignments of the local configuration file.

The EntireX Broker stub is now made available automatically in the course of the EntireX installation. See also *Setting Up an EntireX Broker Access* in the *Natural RPC (Remote Procedure Call)* documentation.

New Features

Application Programming Interfaces

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

API	Description
USR8210N	This API enhances profiler monitoring with the Natural profiler that is provided with NaturalONE. You can start or pause profiler monitoring or view the current state of the profiler monitoring process.

Changes and Enhancements

PROCESS PAGE MODAL and ESCAPE Statements

The statements `ESCAPE TOP` and `ESCAPE BOTTOM` are no longer applied to the `PROCESS PAGE MODAL` processing block.

The statements `ESCAPE TOP` and `ESCAPE BOTTOM` are designed to interrupt the flow of a processing loop. Due to the fact that the statements `PROCESS PAGE MODAL` and `END-PROCESS` form a processing block (and not a processing loop), the `ESCAPE` statement is no longer applied to the `PROCESS PAGE MODAL` processing block.

If an `ESCAPE` statement is encountered during processing of a `PROCESS PAGE MODAL` block, the execution of the processing block will be terminated and the `ESCAPE` processing will continue as defined.

Comparison of Binary Operands During Runtime

The comparison of a binary operand with a length of less than or equal to 4 with an operand of format I (integer), P (packed numeric) or N (numeric unpacked) was adapted in order to be compatible with the mainframe.

■ For binary operands with a length less than 4, the comparison is now integer4-based.

> **Note:** This handling was already in place for binary operands with a length of 4.

The following example will now result in `WRITE '#B2 GT -999'`:

```
DEFINE DATA LOCAL
  01 #B2 (B3)
END-DEFINE
#B2 := 12
IF #B2 < -999
 WRITE '#B2 LE -999'
ELSE
 WRITE '#B2 GT -999'
END-IF
END
```

The following example will now result in `WRITE 'TRUE....01'`:

```
MOVE -5 TO BIN11(B1)
MOVE -5 TO INT11(I1)
IF BIN11 > INT11 WRITE 'TRUE....01' ELSE WRITE 'FALSE...01'
```

■ For binary operands with a length less than or equal to 4 that are compared with packed or numeric operands, the comparison is now based on P (packed) format where the decimal precision is ignored.

In the previous implementation, the comparison was done according to the format of the second operand.

Natural Web I/O Interface Client

The Natural Web I/O Interface client is now delivered in the Version 1.3.15.

This is the last version that supports Internet Explorer 8.

A new option, **Double-click behavior**, is now available in the configuration tool. This option defines the key that is to be simulated when double-clicking an output field in a Natural map. By default, this is the ENTER key. You can also use this option to disable the double-click behavior. See *Overview of Session Options* in the *Natural Web I/O Interface* 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 8.3.3, Natural RPC Version 6.3.4.9 is still delivered. This version only contains error corrections. New functionality is not provided.

Natural Security

The following enhancements are provided with Natural Security Version 8.3.3.

Utility Profiles

PROFILER
> The use of the Natural PROFILER utility can now be controlled by Natural Security, as described under *Protecting Utilities* in the *Natural Security* documentation.

Documentation

SYSPCI Utility

The documentation for the SYSPCI utility has been moved from the *Installation* documentation to the *Tools and Utilities* documentation.

Removed Features

Natural Web I/O Interface Client

JBoss Application Server and Oracle Glassfish are no longer supported. As of this version, Apache Tomcat is the only supported application server.

If you are currently using JBoss Application Server or Oracle Glassfish, you have to move to Apache Tomcat. You can reuse your previous settings (that is, the URL for logon page and the configuration file *sessions.xml*).

Notice of Future Changes

Discontinued Support for EntireX Location Transparency

EntireX no longer supports Location Transparency. Effective with the next Natural version, Natural will no longer support Location Transparency as well.

5 Release Information for Natural Version 8.3.4

New Features

Parameters

The following new Natural profile parameter is provided in this version:

Profile Parameter	Description
ETIO	Determines whether or not implicit END TRANSACTION statements are to be issued upon terminal I/Os.

Changes and Enhancements

RNCONST Parameter

For compatibility with the mainframe, the RENCONST parameter has been renamed to RNCONST.

INPUT Statement and IM Parameter

Forms mode as specified by the parameter IM=F is now supported. See *Using the INPUT Statement in Batch Mode* in the *Statements* documentation.

For compatibility with existing applications, the default for the IM (input mode) parameter on UNIX has been to be changed to D (delimiter mode). Previously, the default was F (forms mode).

*TIMESTMP System Variable

To ensure that the *TIMESTMP value is unique on multiprocessor machines, the CPU ID is now written to an area of the *TIMESTMP system variable which was previously unused. Restriction for AIX platforms: For technical reasons, the CPU ID cannot be determined and can thus not be written to the *TIMESTMP system variable.

Configuration Utility

The new profile parameter ETIO (ET upon Terminal I/O) is now available in the **General Parameters** category of the **Database Management** parameter group. See *General Parameters* in the *Configuration Utility* documentation.

Natural Web I/O Interface Client

The Natural Web I/O Interface client is now delivered in the Version 1.3.16.

The environment variable NWO_PF_MSG_LINES_NATIVE_FORMAT can now be used to show the PF key prompting lines and the message line as normal output text, as in the native UNIX environment. See *Environment Variables* in the *Natural Web I/O Interface* 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 8.3.4, an enhanced Natural RPC Version 8.3.4 is delivered that replaces the existing Natural RPC Version 6.3.4.9.

Highest EntireX API Version Now Used

The highest API version of the EntireX ACI that Natural RPC, the EntireX Broker stub and the EntireX Broker support is now determined automatically. As a result, the ACIVERS profile parameter has become obsolete and is ignored. ACIVERS is described in the *Parameter Reference*.

Natural RPC-Specific Application Programming Interfaces

New API

The following Natural RPC-specific application programming interface (API) has been added in the SYSEXT system library:

API	Task
USR4371N	On the RPC client side, this API sets the user ID and ETID for Natural RPC servers which were configured with Impersonation = A (automatic logon).
USR8213N	Terminate a single Natural RPC server by using the sequence number returned for the required server.

Changed APIs

The following Natural RPC-specific application programming interfaces (APIs) have changed: they do no longer support EntireX Location Transparency.

API	Task
RPC-CNTX	Maintain RPC context for Natural clients.
USR2071N	Support EntireX Security on client side.
USR2073N	Ping or terminate an RPC server.
USR2074N	Set new password for Natural Security user in RPC context.
USR2075N	Terminate EntireX Broker service.

All USR* APIs are contained in the SYSEXT system library, RPC-CNTX is contained in the SYSRPC system library.

SYSRPC Utility

Discontinued Support for Logical Names

The **Service Directory Maintenance** and the **Server Command Execution** functions of the SYSRPC utility no longer support logical node and server names previously supplied by EntireX.

See also *Discontinued Support for EntireX Location Transparency*.

Replace Option for Service Directory Items

The Service Directory Maintenance function now provides the option to search for and replace single or multiple nodes, servers, libraries and/or programs. For more information, see the new REPLACE direct command and corresponding PF key described in *Direct Commands and PF Keys* in the section *Service Directory Maintenance* in the *SYSRPC Utility* documentation.

The replace function can also be executed with the SYSRPC system command. .

SYSRPC System Command

The SYSRPC system command now provides the SM REPLACE option to replace single or multiple items maintained in the service directory of the SYSRPC utility.

Natural Security

The following enhancements are provided with Natural Security Version 8.3.4.

- Utility Profiles -SYSPCI
- Application Programming Interfaces
- Read-Only FSEC System File

> **Note:** The sections indicated for more information are contained in the *Natural Security* documentation, unless otherwise noted.

Utility Profiles -SYSPCI

The SYSPCI utility functions related to the products System Automation Tools, Entire Output Management, Entire Operations and Natural Engineer can now also be controlled via SYPCI utility profiles

Application Programming Interfaces

The application programming interfaces NSCADM, example program PGMADM02, and NSCXR, example program PGMXR006, provide a new subcode "D": This can be used for the maintenance/retrieval of logon records sorted by date.

Read-Only FSEC System File

If the FSEC system file is read-only (profile parameter `FSEC=(dbid,fnr,,,RO)` or `ROSY=ON`), any attempt to invoke a Natural Security maintenance function which would cause an update to the system file will be rejected with error NAT1012.

Removed Features

Discontinued Support for EntireX Location Transparency

EntireX no longer supports Location Transparency. Effective with this Natural version, Natural no longer supports Location Transparency as well. For this reason, SYSRPC utility functions and Natural RPC-specific application programming interfaces have changed as described above.

Notice of Future Changes

Version Number

With the upcoming release in October 2015, Natural for UNIX will have the same version number as NaturalONE. This means, Natural Version 8.3.5 will be skipped and the next version will be 8.3.6.

6 Release Information for Natural Version 8.3.6

New Features

Parameters

The following new Natural profile parameter is provided in this version:

Profile Parameter	Description
PROFILER	Can be used to profile a Natural session. The profiling data is written to a resource file you can analyze with the Natural Profiler in NaturalONE.

Application Programming Interfaces

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

API	Description
USR8217	Can be used to search in the Natural search path the execution library for a given object. If the object name is not filled, the name of the calling program is used.

Support of External Sort

This version of Natural supports the usage of the DMExpress Syncsort library. To use this library, you have to link it to your Natural nucleus as described in *Re-Linking a Natural Nucleus* in the *Installation* documentation.

Once linked to your Natural nucleus, you can use Syncsort options when issuing a SORT statement. Refer to *Using External Sort Programs* in the section *SORT* in the *Statements* documentation for further details.

Changes and Enhancements

REQUEST DOCUMENT Statement

The HEADER/VALUE option of the RETURN clause now also supports arrays in addition to scalar values. Arrays are required if more than one occurrence of the same header is returned by the HTTP server.

For more information, see the *header-value-in* operand of the *return-clause* described in the *Statements* documentation.

Poodle Safe SSL Connections

The SSL connection between the Natural Web I/O server and the Natural Web I/O client(s) or Natural for Ajax is now Poodle-safe. The Poodle ("Padding Oracle On Downgraded Legacy Encryption") vulnerability can be exploited by possible attackers to break the cryptographic security of SSL Version 3.

To counter this, the clients and server no longer allow to be forced back to SSL Version 3. Only TLS Version 1.0 and upwards is possible.

Further information can be found in the **Software AG Security Advisory on Poodle** in Empower.

Support of Adabas Short Names

This version of Natural supports lowercase characters in database short names for DDM fields generated from an Adabas file. For detailed information, see *Using the DDM Editor* in the *Editors* documentation and the ADAFDU utility in the *Adabas Utilities* documentation.

Natural Web I/O Interface Client

The Natural Web I/O Interface client is now delivered in the Version 1.3.17.

Natural Security

The following enhancements are provided with Natural Security Version 8.3.6.

- Administrator Services
- Application Programming Interfaces

> **Note:** The sections indicated for more information are contained in the *Natural Security* documentation, unless otherwise noted.

Administrator Services

- Logging of Maintenance Functions
- Store Logon and Error Data on Separate System Files

- Definition of System Libraries

Logging of Maintenance Functions

Whenever you modify a security profile, 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 profile to remove that group from the list of the user's Privileged Groups, if necessary.

As of this version, the general option **Logging of Maintenance Functions** will not only log the profile modifications themselves but also the automatic adjustments of related profiles.

Store Logon and Error Data on Separate System Files

With previous versions, all Natural Security data were stored on a single FSEC system file.

As of this version, you can store the following data on separate system files:

- logon records,
- logon/countersign error records,
- maintenance log records.

These system files can be specified with the new general option **Store Logon and Error Data on Separate System Files**.

All other definitions of Natural Security settings, object definitions and object relations will still be stored on the main FSEC system file.

Definition of System Libraries

The function **Definition of System Libraries** now also supports Entire Operations and Entire Output Management; that is, you can use this function to create library security profiles for the system libraries of these products.

Application Programming Interfaces

- NSCADM
- NSCSSX

- NSCXR

NSCADM

The application programing interface NSCADM has been enhanced and now allows you to list unlocked user IDs and unlock individual user IDs.

For details, see the example program `PGMADM06` and text member `TXTADM06` in the library `SYSSEC`.

NSCSSX

The new application programming interface NSCSSX is available to check the validity of a password in an LDAP user authentication context.

NSCXR

The application programing interface NSCXR has been enhanced:

- It allows you to obtain a list of all users with all libraries to which they are linked directly.
- It allows you to obtain the **Time Differential** and **Time Zone** values of a specific user security profile.

For details, see the example programs `PGMXR019` and `PGMXR020` and text members `TXTXR019` and `TXTXR020` in the library `SYSSEC`.

Notice of Future Changes

Encryption

EntireX Encryption will be deprecated with the next version of EntireX.

For encrypted transport, Software AG strongly recommends that you use the Secure Sockets Layer/Transport Layer Security protocol. The relevant sections in the Natural RPC documentation have been updated accordingly.

Applications that execute with EntireX Encryption are still supported for compatibility reasons.

For more information, see *SSL/TLS and Certificates with EntireX* in the *EntireX* documentation.

7 Release Information for Natural Version 8.3.7

Installation

Copy Configuration Data

The installation option **Copy configuration data from another installation directory** has been enhanced.

This option (available during the first-time installation of Natural) now also copies the Natural text member INST-`<productcode>` within the library SYSPCI.

Execute SYSPCI via Shell Script

It is now possible to execute the SYSPCI utility via shell script.

The following modifications have been made to support this feature:

- It is now possible to execute the SYSPCI functions ADU and ALU without a Database ID (DBID) and File number (FNR). SYSPCI will use the values for DBID and FNR that are supplied in the existing text member INST-`<productcode>`.

- It is now possible to execute the SYSPCI functions ADA and ALL with File number (FNR) -1 specified. SYSPCI will use the next free File number in that case.

- Two scripts *syspci_reuse.sh* and *syspci_create.sh* are available in the folder `<install-dir>`/Natural/INSTALL. These scripts can be used to automatically call SYSPCI for each installed product to intialize the product.

New Features

Application Programming Interfaces

The utility SYSEXT provides the following new application programming interfaces (APIs):

API	Description
USR8215N	This new API returns the Natural and Natural Security versions installed at your site.
USR8216N	This new API retrieves a Natural RPC service directory and creates, changes and deletes the node and server definitions in the directory.
USR8219N	This new API enables you to issue Adabas direct calls by using the extended Adabas control block (ACBX) interface. All Adabas buffers you can specify with this API are defined as dynamic variables of the format A.
USR8220N	This new API causes an active RPC server to terminate if it is called by a Natural RPC server subprogram. Explicit server termination through this API is useful when severe errors occur.

API	Description
USR8301N	With this new API, information about installed Natural hot fixes is returned to the calling program. The information is contained in arrays. USR8301N in conjunction with USR2031N returns all information which SYSPROD returns.
USR8302N	This new API enables you to specify a "wait interval" for the session that can be less than one second.

Profiler Utility

The new Profiler utility provides functions to pause and to restart the Profiler data collection and to process the Profiler event data. Additionally, it offers an interface to MashZone (Software AG's tool for creating interactive business dashboards).

The Profiler utility runs in batch mode only.

- Event Data Processing
- Presentation of Profiler Data on an Interactive Dashboard

Event Data Processing

When you profile a Natural application with the Natural Profiler for UNIX and Windows, the resulting event data is written to a Natural resource file. The use of the Natural Profiler for UNIX and Windows is described with the PROFILER profile parameter in the *Parameter Reference* documentation.

The new Profiler utility reads and analyzes the event data from the Profiler resource files. It provides functions for data consolidation (aggregation), event tracing and program tracing. It also provides a program summary and displays the Profiler properties and statistics. The resulting data can be exported in text or CSV (comma-separated values) format, or in the format expected by the Natural Profiler MashApp (see the following section).

For detailed information, see *Using the Profiler Utility* in the section *Natural Profiler* of the *Tools and Utilities* documentation.

Presentation of Profiler Data on an Interactive Dashboard

The new Natural Profiler MashApp is used to evaluate Profiler event data with MashZone.

MashZone is a browser-based application from Software AG which is used to visualize data on a graphical, interactive dashboard.

For detailed information, see *Natural Profiler MashApp* in the section *Natural Profiler* of the *Tools and Utilities* documentation.

Changes and Enhancements

Application Programming Interfaces

The utility SYSEXT provides the following enhanced application programming interfaces (APIs):

API	Description
USR1009N	Convert store clock into microseconds. The performance of the API has been improved. See *Improved Time Conversion APIs*.
USR1023N	Convert date and time format. The performance of the API has been improved. See *Improved Time Conversion APIs*.
USR2036N	Convert variable of format (B8) into (P20). Can be used to convert the system variable *TIMESTMP into a numeric variable. The performance of the API has been improved. See *Improved Time Conversion APIs*.

Improved Time Conversion APIs

The time conversion APIs USR1009N, USR1023N, and USR2036N have been redesigned and now provide a significantly better performance. If your application is using these APIs, replace each copy of the API with the corresponding subprogram delivered in library SYSEXT.

In addition to the subprograms, the utility SYSEXT provides the following new copycodes for the conversion of time related values:

Copycode	Description
USR1023W	Convert microseconds into a store clock value.
USR1023X	Convert microseconds into Natural time.
USR1023Y	Convert a store clock value (such as *TIMESTMP) into microseconds.
USR1023Z	Convert Natural time into microseconds.
USR2036Z	Convert variable of format (B8) into (P20). Can be used to convert the system variable *TIMESTMP into a numeric variable.

Performance of the Time Conversion APIs

The following graphic illustrates the result of a performance test of the time conversion APIs. For the test, a Natural program converts the following formats 1 million times:

■ Store clock value into microseconds using the subprogram USR1009N (previous version) compared with the new version of the subprogram and with the new copycode USR1023Y.

■ Store clock value into microseconds and Natural time using the subprogram USR1023N with function S (previous version) compared with the new version of the subprogram and with the new copycodes USR1023Y (store clock into microseconds) and USR1023X (microseconds into Natural time)

■ Store clock value into numeric variable (P20) using the subprogram USR2036N (previous version) compared with the new version of the subprogram and with the new copycode USR2036Z
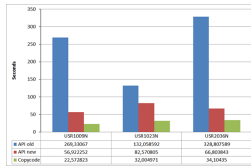
The new version of the APIs is up to five times faster than the old version; the corresponding copycodes are up to twelve times faster.

Internal Buffer Pool Structures

Because of a required correction in the Natural Buffer Pool, it was necessary to change internal buffer pool structures. This change makes the buffer pool incompatible to previous buffer pool versions. As a consequence the internal buffer pool version was incremented, which identifies this change.

This implies that Natural Version 8.3.7 does not work with a buffer pool started with an older version of Natural. Instead, an error message is displayed.

Support of Apache 2.4

With Natural Version 8.3.7 and SYSWEB3, Apache 2.4 in 64-Bit is supported.

The 32-Bit applications on Apache 2.4 are not supported.

Natural RPC (Remote Procedure Call)

With Natural Version 8.3.7, an enhanced Natural RPC Version is delivered which introduces the following changes and enhancements:

- Encryption
- SYSRPC Utility

Encryption

The encryption/decryption mechanism provided by EntireX Security is deprecated.

For encrypted transport, Software AG strongly recommends that you use the Secure Sockets Layer/Transport Layer Security protocol. All references regarding encryption have been removed from the *Natural RPC* documentation accordingly.

Applications that execute with EntireX Encryption are still supported for compatibility reasons.

For more information, see *SSL/TLS and Certificates with EntireX* in the *EntireX* documentation.

SYSRPC Utility

Support for Long Natural RPC Node Names

The Service Directory Maintenance function of the SYSRPC utility now supports node names of up 192 characters, which is particularly useful when referencing Internet Protocol Version 6 (IPv6) names. If you press PF2 on the Service Directory screen, a window opens where you can enter a long node name. See also Service Directory Maintenance in *SYSRPC Utility* in the *Tools and Utilities* documentation.

API for Natural RPC Service Directory Maintenance

The new API USR8216N provides the option to retrieve a Natural RPC service directory and create, change and delete the node and server definitions in the directory.

Natural Security

The following enhancements are provided with Natural Security Version 8.3.7.

- Administrator Services
- Library Profiles
- Utility Profiles
- Application Programming Interfaces

Administrator Services

Library FDIC Assignment Enabled

A new option **Library FDIC Assignment Enabled** is available under **Library and User Preset Values** to enable the new settings described under *Assigning FDIC and FUSER* below.

Library Profiles

Assigning FDIC and FUSER

With previous versions, the following applied:

- You could not make FDIC specifications in library or special-link profiles. The Natural profile parameter FDIC set at the start of the Natural session determined which FDIC system file was used for all libraries.

- You could make FUSER specifications in library profiles, but not in special-link profiles.

- You could set the **Cross-reference** option in library profiles, but not in special-link profiles.

As of this version, the following applies:

- You can make FDIC specifications in both library profiles and special-link profiles.

- You can make FUSER specifications in both library profiles and special-link profiles.

- You can set the **Cross-reference** option in both library profiles and special-link profiles.

This feature is activated by the new Administrator Services option **Library FDIC Assignment Enabled** (see above).

The usual logic applies, that is: The settings at library level take precedence of those which apply at session start; and the settings at special-link level take precedence of those at library level.

Utility Profiles

SYSMAIN

A new option **Enable Unrestricted Use of Libraries** is available in the SYSMAIN default utility profile (under **Additional Options > Session Options**). It can be used to allow users of type Administrator unrestricted use of libraries with SYSMAIN. They may then 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. For an Administrator to be able to do so, another new option **Process All Libraries** has to be set in his/her user-specific SYSMAIN utility profile.

Application Programming Interfaces

NSCXR

The application programming interface NSCXR has been enhanced: It allows you to list all library profiles in which an FDIC and/or FUSER specification is made. For details, see the example program `PGMXR021` and the text member `TXTXR021` in the library `SYSSEC`.

8 Release Information for Natural Version 8.3.8

Installation

System Requirements

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

Compilers Used to Build Natural

New Features

Application Programming Interfaces

The utility `SYSEXT` provides the following new application programming interfaces (APIs):

API	Description
USR8221N	This new API generates a translation table which maps all codepoints of the source codepage to the corresponding value of the target codepage. The delivered sample program USR8221P generates the translation tables used by the API USR0620N for ASCII/EBCIDC translation.

Parameters

The following new Natural profile parameter is provided in this version:

Profile Parameter	Description
ITERM	Specifies whether or not the Natural session is to continue in the case of a session initialization error.

Configuration Utility

Program Loading and Deletion
  The category **Program Loading and Deletion** in the parameter group **Natural Execution Configuration** now contains the new profile parameter ITERM. See *Program Loading and Deletion* in the *Configuration Utility* documentation.

System Variables

*LINEX

`*LINEX` is a new system variable which returns the source line number of the statement currently executing plus the line numbers of the copycode references (`INCLUDE` statements) in which the statement is embedded.

The line numbers are presented as a path where a slash (/) separates superior from subordinate statement levels (from left to right), for example: `3210/0200/0050`.

*LOAD-LIBRARY-ID

`*LOAD-LIBRARY-ID` is a new system variable which returns the name of the library from where the current executed object was loaded.

System Commands

PROFILER System Command

The `PROFILER` system command is now also available on UNIX and Windows. This command executes the Profiler utility in batch mode. The `PROFILER` system command is described in the *System Commands* documentation.

Changes and Enhancements

Application Programming Interfaces

The utility `SYSEXT` provides the following new application programming interfaces (APIs):

API	Description
USR0620N	Convert string into ASCII or EBCDIC code. The API offers the new function codes "1" and "2". The functions use ASCII/EBCIDC translation tables from *natconv.ini* which can be edited by the user.
USR1059N - USR1060N	Natural Reporter interface. The APIs return a code "-99" if an unsupported machine class is encountered. The sample programs USR1059P – USR1060P print a corresponding message in this case.

Profiler Utility

Data Input for Profiler from Natural text objects
>The Profiler utility now provides the option to retrieve data from Natural text objects and include them in the input data for the Profiler.

>For more information, see *Including Profiler Input from Natural Text Objects* in the section *Using the Profiler Utility in Batch Mode* in the *Tools and Utilities* documentation.

Natural RPC (Remote Procedure Call)

With Natural Version 8.3.8, an enhanced Natural RPC Version is delivered which introduces the following changes and enhancements:

- SYSRPC Utility
- SYSRPC System Command

SYSRPC Utility

The new features provided with the SYSRPC utility are announced in this section.

For detailed information on these features, refer to the indicated chapters in the *Tools and Utilities* documentation.

Direct Command for Pinging a Server
>The new direct command `SYSRPC PING` provides the option to ping a Natural RPC server in online or batch mode.

>For more information, see *Using the SYSRPC PING Direct Command*.

Direct Command for Server Information from EntireX Broker
>The new direct command `SYSRPC SRVLIST` provides the option to obtain information on all Natural RPC servers registered on the EntireX Broker in online or batch mode. For the kind of information provided and further instructions, see *Viewing a Server List*.

>In addition, you can obtain further information on a single Natural RPC server as shown and explained in *Viewing Additional Server Information*.

>For all information on `SYSRPC SRVLIST`, see *Listing Servers Registered on EntireXBroker*.

New Line Commands for Server Command Execution
>New line commands are provided on the **Server Command Execution** screen to ping or terminate an EntireX Broker service or a server and view information on Natural RPC servers registered on EntireX Broker (alternatively, you can use the new `SRVLIST` direct command).

>For more information, see *Line Commands: Server Command Execution*.

Service Directory now always Shows Nodes and Servers
When scrolling down in a **Service Directory** screen, the **Node** and **Server** names are now displayed on all pages of the service directory.

SYSRPC System Command

The following options are new in the SYSRPC system command:

SYSRPC PING - Ping Server
Pings an RPC server in online or batch mode. For more information, see *Pinging an RPC Server* and *Using the SYSRPC PING Direct Command* in *SYSRPC Utility* in the *Tools and Utilities* documentation.

SYSRPC SRVLIST - Show Server Information
Provides information on Natural RPC servers registered on EntireX Broker. For more information, see *Listing Servers Registered on EntireX Broker* in *SYSRPC Utility* in the *Tools and Utilities* documentation.

Natural Security

The following enhancements are provided with Natural Security Version 8.3.8.

- Group Within Group
- SECULD2 Workplan for Unloading Security Data
- NaturalONE LSO Container Libraries

Group Within Group

With previous versions, it was not possible for a user of type "Group" to contain another group. As of this version, a group can also contain another group. However, a group within a group within a group is not possible.

SECULD2 Workplan for Unloading Security Data

If you need to perform the same unload operation at regular intervals, you can make the desired SECULD2 specifications in a so-called "workplan". Instead of having to make all the specifications every time on the SECULD2 menu, you make them in the workplan, and then only have specify the ID of the workplan on the SECULD2 menu. See *Using SECULD2* in the *Natural Security* documentation.

NaturalONE LSO Container Libraries

Natural Security supports LSO container libraries (LSO = library search order) generated in NaturalONE and automatically creates security profiles for them. See *LSO Container Libraries* under *Protection With Development Mode Options* in the *Natural Security* documentation.

Notice of Future Changes

Entire Transaction Propagator

Entire Transaction Propagator will no longer be supported with the next version of Natural. As a consequence, the parameters `ETPDB` and `ETPSIZE` will be removed as well.

Additional Parameter for Profiling Natural Applications

It is planned to add a new parameter to further support the profiling of Natural applications. This parameter will be used to generate specific profiling information which is currently only generated if the corresponding Natural object was compiled with `SYMGEN=ON`. With the introduction of the new parameter, it will no longer be required to use the `SYMGEN` profile parameter.