

# Installing Natural under BS2000/OSD

This document describes step by step how to install Natural under the operating system BS2000/OSD using Adabas system files.

The following topics are covered:

- Prerequisites
- Installation Tape for Natural under BS2000/OSD
- Transferring a License Key File from PC to Host with FTP
- Installation Procedure for Natural under BS2000/OSD
- Installation Verification for Natural under BS2000/OSD

For installation-related information on Unicode and code page support, refer to *Configuration and Administration of the Unicode/Code Page Environment* in the *Unicode and Code Page Support* documentation.

**Notation vrs or vr:** If used in the following document, the notation *vrs* or *vr* stands for the relevant version, release, system maintenance level numbers. For further information on product versions, see Version in the *Glossary*.

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## Prerequisites

- A supported version of the BS2000/OSD operating system must be installed. For the supported versions of the operating systems, refer to *Operating/Teleprocessing Systems Required* in the current *Natural Release Notes* for Mainframes.
- A supported version of Adabas must be installed. For the supported versions, refer to *Natural and Other Software AG Products* in the current *Natural Release Notes* for Mainframes.
- As a rule of thumb, each major Software AG product requires approximately 20 MB space in the Adabas database to store the Natural objects supplied by Software AG.

## Installation Tape for Natural under BS2000/OSD

The installation tape contains the datasets listed in the table below. The sequence of the datasets, the dataset type, the number of library blocks needed and the space each dataset requires on disk are shown in the *Report of Tape Creation* which accompanies the installation tape.

Dataset Name	Contents
NATvrs.LICS	Natural License Key File. For further information on license key file, license key file installation, product license check and product license check FAQs, see <i>Licensing Natural</i> .  If a license key file is supplied as an e-mail attachment, see <i>Transferring the License Key File from PC to Host with FTP</i> .
NATvrs.SYSF	Empty Natural system file
NATvrs.ERRN	Natural error messages
NATvrs.MOD	Natural module library
NATvrs.SRC	Natural source modules
NATvrs.MAC	Natural macros
NATvrs.JOBS	Example installation jobs
NATvrs.LDEL	Instructions to delete Natural system objects of Version 4.1
NATvrs.INPL	Natural system objects
NATvrs.EXPL	Natural example objects

**Note:**

The dataset NATvrs.JOBS will be converted automatically into an LMS-library when it is copied from tape to disk.

**Copying the Tape Contents to a BS2000/OSD Disk**

If you are not using System Maintenance Aid (SMA), use the procedure described below. In this procedure, the values specified below must be supplied.

To copy the datasets from tape to disk, perform the following steps:

- 1. Copy the Library SRVvrs.LIB from Tape to Disk
- 2. Copy the Procedure COPY.PROC from Tape to Disk
- 3. Copy all Product Files from Tape to Disk

**1. Copy the Library SRVvrs.LIB from Tape to Disk**

This step is not necessary if you have already copied the library SRVvrs.LIB from another Software AG installation tape. For further information, refer to the element #READ-ME in this library. The library SRVvrs.LIB is stored on the tape as a sequential file named SRVvrs.LIBS containing LMS commands. The current version vrs can be obtained from the *Report of Tape Creation*. To convert this sequential file into an LMS-library, execute the following commands:

```
/IMPORT-FILE  SUPPORT=*TAPE(FILE-NAME=SRVvrs.LIBS,      -
/  VOLUME=volser, DEV-TYPE=tape-device)
/ADD-FILE-LINK LINK-NAME=EDTSAM, FILE-NAME=SRVvrs.LIBS, -
/  SUPPORT=*TAPE(FILE-SEQ=3), ACC-METH=*BY-CAT,          -
/  BUF-LEN=*BY-CAT, REC-FORM=*BY-CAT, REC-SIZE=*BY-CAT
/START-EDT
@READ  '/'
```

```

@SYSTEM 'REMOVE-FILE-LINK  EDTSAM'
@SYSTEM 'EXPORT-FILE  FILE-NAME=SRVvrs.LIBS'
@WRITE  'SRVvrs.LIBS'
@HALT
/ASS-SYSDTA  SRVvrs.LIBS
/MOD-JOB-SW  ON=1
/START-PROG  $LMS
/MOD-JOB-SW  OFF=1
/ASS-SYSDTA  *PRIMARY

```

where:

*tape-device* is the device-type of the tape, for example: TAPE-C4  
*volser* is the VOLSER of the tape (see *Report of Tape Creation*)

## 2. Copy the Procedure COPY.PROC from Tape to Disk

To copy the procedure COPY . PROC to disk, call the procedure P . COPYTAPE in the library SRVvrs . LIB:

```

/CALL-PROCEDURE  (SRVvrs.LIB,P.COPYTAPE), -
/  (VSNT=volser, DEVT=tape-device)

```

If you use a TAPE-C4 device, you may omit the parameter DEVT.

## 3. Copy all Product Files from Tape to Disk

To copy all Software AG product files from tape to disk, enter the procedure COPY . PROC:

```

/ENTER-PROCEDURE  COPY.PROC, DEVT=tape-device

```

If you use a TAPE-C4 device, you may omit the parameter DEVT. The result of this procedure is written to the file L . REPORT . SRV.

# Transferring a License Key File from PC to Host with FTP

If a license key file is supplied as an e-mail attachment, you must transfer the attached license key file `natvr.xml` from the PC to the mainframe, using native FTP commands.



### Warning:

**Using utilities instead of native FTP commands for the license key file transfer may corrupt the license key and thus prevent Natural from execution later on. This applies for example to file transfer based on 3270 terminal emulations that do not provide a true binary file transfer, but convert specific characters.**

To transfer a license key file from the PC to the mainframe, perform the following steps:

1. Save the product license key file e-mail attachment on your PC hard disk.
2. Open a command prompt window. In the command prompt window, change to the directory where you saved the product license key file.

3. Start an FTP session for communication with the BS2000/OSD host:

```
ftp host-name
```

Where *host-name* is the name of the BS2000/OSD host.

4. Enter your BS2000/OSD host login *User* and *Password*.
5. Enter your BS2000/OSD host *Account*.
6. Specify that the file for the license key file must be written with `FCBTYPE=SAM` and `RECFORM=V`.

```
ftp>Literal file NATvrs.LICS,FCBTYPE=SAM,RECFORM=V
```

7. Switch to binary data mode (the license key file must retain its ASCII format during the transfer):

```
ftp>bin
```

8. Write the license as a file on the mainframe system.

```
ftp>put natvr.xml NATvrs.LICS
```

This command will create a file called `NATvrs.LICS`.

The file set will have `RECFORM=V`, and the license key information stored in the file set will be in ASCII format.

9. Stop your FTP session by entering:

```
ftp>quit
```

## Installation Procedure for Natural under BS2000/OSD

### Naming Conventions

In the following text, the library name *JOBLIB* stands for

- the example job library (`NATvrs.JOBS`) if you are *not* using SMA or
- the SMA job library (see SMA parameter *JOBLIB* in SMA Parameter Group *BASIC*) if you are using SMA.

#### Note:

Software AG uses the following naming conventions for source elements in the library *JOBLIB*:

**A**<product-code><function> = Assembler sources

**L**<product-code><function> = Instruction for TSOSLNK/BINDER

**Example:** ANATFRNT, ANATRENT, ANATSTUB or LNATFRNT

### Step 1: Convert the License Key File

1. Convert Dataset `NATvrs.LICS` with PROGRAM `NATLICAB` in an Assembler input file.

(Job I010, Step 0100)

Convert license key file (`NATvrs.LICS`).

2. Assemble license key module. This module is linked (Job I060) to the Natural nucleus.

(Job I010, Step 0101)

`ANATLIC` (Natural BS2000/OSD module `NATLIC`)

### Step 2: Load the FNAT System File

- (Job I050, Step 0100)

If you are installing into an existing Natural 4.1 FNAT file, skip this step.

Load the empty Natural system file (dataset `NATvrs.SYSF`) using the `ADALOD` utility.

This file will contain all Natural objects supplied by Software AG. Its size depends on the number of products to be installed later. As a rule of thumb, 20 MB can be assumed for each major Software AG product.

The following `ADALOD` parameters must not be altered:

```
ISNREUSE=YES
```

To avoid Natural errors `NAT9988` and `NAT7397` after reorganization of the FNAT system file using `ADAULD/ADALOD`, the parameter `USERISN` should be set to `YES`.

The file number `fnat` of the FNAT system file can be chosen as described under Natural profile parameter `FNAT` in the Natural *Parameter Reference* documentation.

### Step 3: Load the FUSER System File

- (Job I050, Step 0101)

You have the following options:

1. You can use an existing Version 4.1 FUSER file, then you can skip this step.
2. You can use a new FUSER file for Version 4.2.
3. You can use an existing Version 4.1 FUSER file to be shared by Versions 4.1 and 4.2.
4. You can use an existing Version 4.1 FUSER file to be used by Version 4.2 only.

## Use a New Version 4.2 FUSER System File - First-Time Installation

For the use of a new and empty FUSER system file for Natural Version 4.2, no additional system-file-related actions are necessary.

If you do *not* want to share the FUSER system file, proceed as follows:

Load the empty Natural user file contained in dataset NATVRS.SYSF using the ADALOD utility.

In this file, all user-written Natural programs are stored.

The following ADALOD parameters *must not* be altered:

```
ISNREUSE=YES
```

The file number *fuser* of the FUSER system file can be chosen as described under Natural profile parameter FUSER in the Natural *Parameter Reference* documentation.

## Reuse an Existing Version 4.1 FUSER System File - Migration from Natural Version 4.1

If you want to use the existing Natural Version 4.1 FUSER system file and you do not want to share the FUSER system file, skip this step.

## Using a Version 4.1 FUSER File to be Shared by Natural Versions 4.1 and 4.2

If you use an existing Natural Version 4.1 FUSER system file to be shared by Natural Versions 4.1 and 4.2, you must upgrade your Natural Version 4.1 installation to Version 4.1.4.

Natural Version 4.1.4 Service Pack I003 or a subsequent Service Pack is required. Service Pack I003 and all subsequent Service Packs contain all the necessary Version 4.1 based solutions for Natural Version 4.2.

## User Application Programming Interfaces USR\* in Library SYSEXT

The USR\* programs from the delivered library SYSEXT run in a special mode. As a result, the USR\* programs do not need to set further steplib to execute related objects for processing. This reduces the impact on the Natural buffer pool search logic and improves the performance significantly if user exits are used extensively within user written applications.

It is necessary that the user exits are cataloged with Natural Version 4.2. This implies that the user exits cannot be executed with Natural Version 4.1.

## Use of USR\* Programs

Usually, the access of USR\* programs by an application requires that the user application programming interfaces be copied from library SYSEXT to either the application libraries on the FUSER system file or to library SYSTEM on the FUSER system file or to library SYSTEM on the FNAT system file, respectively, or any other library which is defined as steplib for the application. Library SYSEXT can also be used as steplib. Due to the fact that the delivered user application programming interfaces will always be cataloged with the latest Natural version, we recommend that the user application programming interfaces should reside on the FNAT system file. This will ensure that the right version is executed and will separate user written applications from Software AG

modules.

If applications which call user application programming interfaces should run with both Natural Version 4.1 and Natural Version 4.2, it must be made sure that the user application programming interfaces delivered with the corresponding Natural version are used.

The following scenarios may be considered:

### **Using a Version 4.1 FUSER File for Natural Version 4.1 and 4.2**

If the same FUSER system file shall be used in a Natural Version 4.1 and Version 4.2 environment in parallel the following steps are recommended:

- Remove all `USR*` modules you have copied from library `SYSEXT` into application libraries on your FUSER system file.
- In both environments, copy the used `USR*` modules from library `SYSEXT` to library `SYSTEM` on the corresponding FNAT system file.
- Alternatively, the `USR*` modules can be moved to another system library on FNAT which then must be defined as `steplib`, or library `SYSEXT` can be used as `steplib` for the applications. Then automatically in both environments the right versions of the user application programming interfaces are executed.

### **Using a Version 4.1 FUSER File for Natural Version 4.2 only**

If you want to use the existing Natural Version 4.1 FUSER system file and you do not want to share the FUSER system file, then it is still possible to replace all `USR*` modules you have copied from library `SYSEXT` into application libraries with the new `USR*` objects from the Version 4.2 library `SYSEXT`.

But the preferred way is to remove all user application programming interfaces on the FUSER system file and copy the used user application programming interfaces from library `SYSEXT` to library system of the FNAT system file or use a `SYS` library on FNAT as `steplib`.

### **Using a New FUSER File for Natural Version 4.2**

If you want to port existing applications to a new FUSER system file, copy all application objects but no Software AG `USR*` objects to the new FUSER system file. Then proceed as described in the scenario above.

## **Migration**

The `FIND` function of the Natural utility `SYSMAIN` can be used to search for all `USR*` modules stored in a specific library on the FUSER system file or across the whole system file. In addition, Predict cross reference data can be used to determine all referenced user application programming interfaces.

The file number `fuser` of the FUSER system file can be chosen as described under Natural profile parameter FNAT in the *Parameter Reference* documentation.

#### Step 4: Load the Scratch-Pad File

- This step is not supported by SMA.

The scratch-pad file (which is a Natural-internal system file) can be used exclusively by the new Natural version or it can be shared by different versions of Natural.

If you do *not* want to use a scratch-pad file, skip this step.

If you do want to use a scratch-pad file; that is, if you want to use read-only system files (profile parameter ROSY=ON), see also *Natural Scratch-Pad File* in the *Natural Operations* documentation, proceed as follows:

Load the empty scratch-pad file contained in dataset NATvrs . SYSF, using the ADALOD utility as described below.

The following ADALOD parameter *must not* be altered:

```
ISNREUSE=YES
```

For the optional scratch-pad file inclusion, the following NATPARM parameters must be added or, if already present, updated with:

```
LFILE=(212,dbid,fnr)
ROSY=ON
```

#### Step 5: Load the FDIC System File

- (Job I050, Step 0103)

Skip this step:

- if you want to install Predict (in this case, use the corresponding installation step in the *Predict Installation* documentation), or
- if you want to use an existing FDIC system file (an existing FDIC system file can be shared by Natural Versions 4.1 and 4.2), or
- if you do not use your own FDIC system file.

Load the empty FDIC system file contained in dataset NATvrs . SYSF using the ADALOD utility, as described below.

The following ADALOD parameters *must not* be altered:

```
ISNREUSE=YES
```

The file number *fdic* of the FDIC system file can be chosen as described under Natural profile parameter FDIC in the *Parameter Reference* documentation.



## Step 6: Load the FSEC System File

- If you use Natural Security, refer to *Installing Natural Security*.

Skip this step,

- if you do not use Natural Security, or
- if you want to use an existing FSEC system file, or
- if you do not want to use an own FSEC system file.

## Step 7: Assemble the Natural BS2000/OSD Stub Module and Batch Driver

- (Job I055, Steps 0216 to 0218)

Assemble the following source modules:

- ANATSTUB (Natural BS2000/OSD stub module),
- ANATFRNT (Natural BS2000/OSD front-end batch driver)
- ANATRENT (Natural BS2000/OSD reentrant batch driver).

These source modules are contained in the library JOBLIB.

## Step 8: Create the Parameter Module

- (Job I060, Step 0010)

Create the Natural batch parameter module.

The following parameters in the source parameter module ANATPARM, which is contained in library JOBLIB, must be modified for the installation:

```
FNAT=(dbid,fnat)  
FUSER=(dbid,fuser)
```

For *dbid*, *fnat* and *fuser*, use the values you specified when loading the system files (see the corresponding installation steps).

For all other parameters, you can generally use the default values.

Modify only the values of those parameters whose default values do not suit your requirements.

For the individual parameters contained in the parameter module, refer to the Natural *Parameter Reference* documentation.

Assemble the parameter module.

## Step 9: Link the Natural Nucleus

- (Job I060, Steps 3801, 3802)

Link the source modules LNATFRNT (front-end part of batch nucleus) and LNATSHAR (shared part of batch nucleus).

These source modules are contained in the library JOBLIB .

With the INCLUDE instruction for the parameter module, specify the name of the Natural parameter module created in the corresponding step.

### Using a Sort Program

If you wish to use a sort program (either Natural's internal one or an external one), include the module NAT2SORT.

It is also possible to place NAT2SORT in a load library from where it can be loaded dynamically at runtime; this requires that NAT2SORT is specified with the profile parameter RCA.

## Step 10: Start All Pools

- (Job I061, Step 001)

Start the job E . START . ALL which is contained in the library JOBLIB.

To end all pools, start job E . END . ALL which is contained in the library JOBLIB.

## Step 11: Delete Natural System Objects

- This step is optional but recommended to avoid data inconsistencies.

If you are using a Version 4.1 Natural FNAT system file, you can delete obsolete Version 4.1 Natural objects.

**If you are using SMA:** Set the SMA parameter NAT-OPT-FNAT41 to 'Y' (yes).

### If only base Natural Version 4.1 is installed

Delete the Version 4.1 Natural objects by loading the NATvrs . LDEL data set with the Natural INPL utility.

(Job I061, Step 0010)

### If Natural Security Version 4.1 is installed

Delete the Version 4.1 Natural Security objects by loading the NSCvrs . LDEL data set with the Natural INPL utility.

(Job I061, Step 0099)

See also *Delete Natural Security Objects* in *Installing Natural Security*.

## Step 12: Load the System Programs

- (Job I061, Step 0100)

Use the Natural INPL utility to load the Natural system objects (the dataset NATVRS . INPL) into the Natural system files.

## Step 13: Load the Error Messages

- (Job I061, Step 0102)

Load the English Natural error messages file (dataset NATVRS . ERRN) using the program ERRLODUS. In addition to the English error message short and long texts, error message short texts in German language (ULANG=2) are loaded. Use the program ERRUPPER to convert the error message texts to upper case. Both programs are described in the Natural *SYSERR Utility* documentation.

## Step 14: Load the Examples

- (Job I061, Step 0103)

Use the INPL utility to load the Natural example objects (dataset NATVRS . EXPL) into the Natural system file.

## Step 15: Allocate and Format the Editor Work File

- (Job I081, Step 1900)

Allocate the editor work file (see also *Editor Work File* in the *Natural Operations* documentation) by issuing the command:

```
/FILE dataset-name, LINK=CMEDIT, SPACE=...
```

Then execute the formatting program (NATEDFM2, NATVRS . MOD) by entering FORMAT to format and load the control record in the editor work file.

# Installation Verification for Natural under BS2000/OSD

For base Natural, there are no specific installation verification procedures. After the last step of the installation procedure has been successfully performed, check that the following results are available:

- Communication between Adabas and Natural is working.
- The Natural system files have been loaded.
- Batch Natural is operational.