



NATURAL

Natural

Installation Guide

Version 5.1.1 for UNIX and OpenVMS



This document applies to Natural Version 5.1.1 for UNIX and OpenVMS and to 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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Installing and Setting Up Software AG Products for UNIX

This section contains general information which applies when installing and setting up any Software AG product on a UNIX platform. The following topics are covered:

- Installation Package
- Writing Conventions
- General Installation and Setup Overview
- Performing General Installation and Setup
- SAG Environment

Note:

The information given here is independent of hardware type and platform.

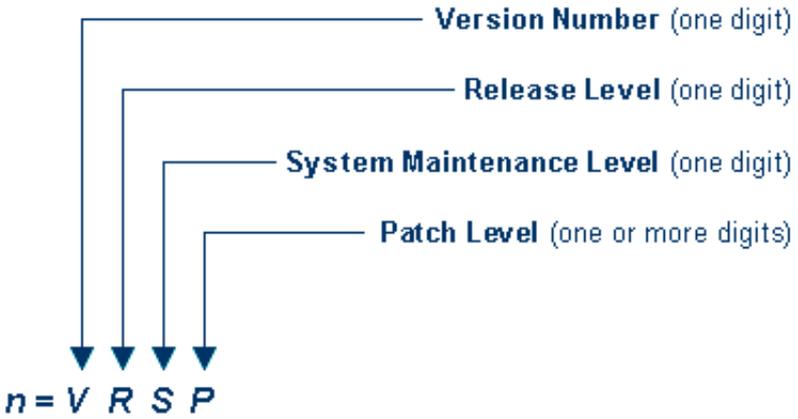
Installation Package

The installation package containing Software AG products is available on ISO 9660 CD-ROM. For some systems, the installation package is also available on cartridge, magnetic tape and other media.

For media other than CD-ROM, the installation medium is written in standard **cpio** format.

Writing Conventions

The following table describes the writing conventions used in this section.

Notation Example	Description
.profile	Letters in bold indicate set strings which you cannot change, for example commands or certain file names.
cpio	Letters in courier bold indicate that you must enter the information exactly as specified.
< <i>file-name</i> >	Lower-case letters in <i>italics</i> contained in angle brackets (< >) are used as placeholders to represent variable information which you must supply.
\$ <i>environment-variable-name</i>	An environment variable name preceded by a dollar sign (\$) stands for the string <i>contained</i> in the environment variable. For example, when the environment variable SAG is set to /usr /SAG , \$\$SAG stands for /usr/SAG .
vn	<p>vn represents a product version number. v can be v for released versions, b for beta test versions and r for run-time versions. n consists of the following components:</p>  <p style="text-align: center;">n = V R S P</p>

General Installation and Setup Overview

The following is a summary of the actions required to set up the Software AG environment and install Software AG products for UNIX:

- Creating the Administrator's Account and Group
- Backing Up Your Current Product Version
- Logging in as User sag
- Installing the Contents of the CD-ROM to Disk
- Checking Images
- The README Files
- Creating the Environment File sagenv.new
- Modifying User Profiles
- Setting up Product

Note:

For an overview of the directory structure created and the environment variables which are set at installation, see SAG Environment.

Performing General Installation and Setup

In this section the following is assumed:

- The account for the administrator of Software AG products is called **sag**.
- The group to which the administrator is assigned is called **sag**.
- The home directory for the user **sag** is **/usr/SAG**.
- The root directory for Software AG products is **/usr/SAG**.

Creating the Administrator's Account and Group

You must create one administrator's account and one group for all Software AG products when you install your first Software AG product.

1. Define an administrator account to which all of the Software AG products installed at your site belong. Since all environment definition files for the products are written in Bourne shell syntax, the Bourne (or Korn) shell is recommended as the login shell for the administrator account. This section assumes that the administrator account is called **sag**.
2. Define a group to which the administrator belongs. This section assumes that this group is also called **sag**.
3. Create a login directory for the user **sag**.

Note:

To perform these steps, use an appropriate system administration tool.

Examples:

The following is a possible entry in the system file **/etc/group**:

```
sag:*:21:sag
```

The following is a possible entry in the system file **/etc/passwd**:

```
sag::100:21:SAG - Product Administrator:/usr/SAG:/bin/sh
```

Backing Up Your Current Product Version

When upgrading a product, it is strongly recommended that you back up your current product version.

- Back up your current product version before upgrading to a newer version.

Logging in as User sag

This section assumes that the user **sag** is the administrator for Software AG products.

- Log in as the user **sag** (it is not recommended to log in as **root**).

Installing the Contents of the CD-ROM to Disk

Note:

Make sure that the administrator user and group have been created and defined.

1. Load the CD-ROM in the CD-ROM drive and mount it, if this is not done automatically.

Command	Description
<code>su - root</code>	To mount a CD-ROM you must be root.
<code>mkdir /<mount dir></code>	Create a mount directory for the CD-ROM.
<code>chmod a=rwx /<mount dir></code>	Change the access rights for the mount directory.
<code>mount <platform-specific mount options> <cdrom device name> /<mount dir></code>	Execute the mount command.
<code>exit</code>	Return to sag user.

Platform-specific mount command and options to mount the CD-ROM as ISO9660 or High-Sierra file system:

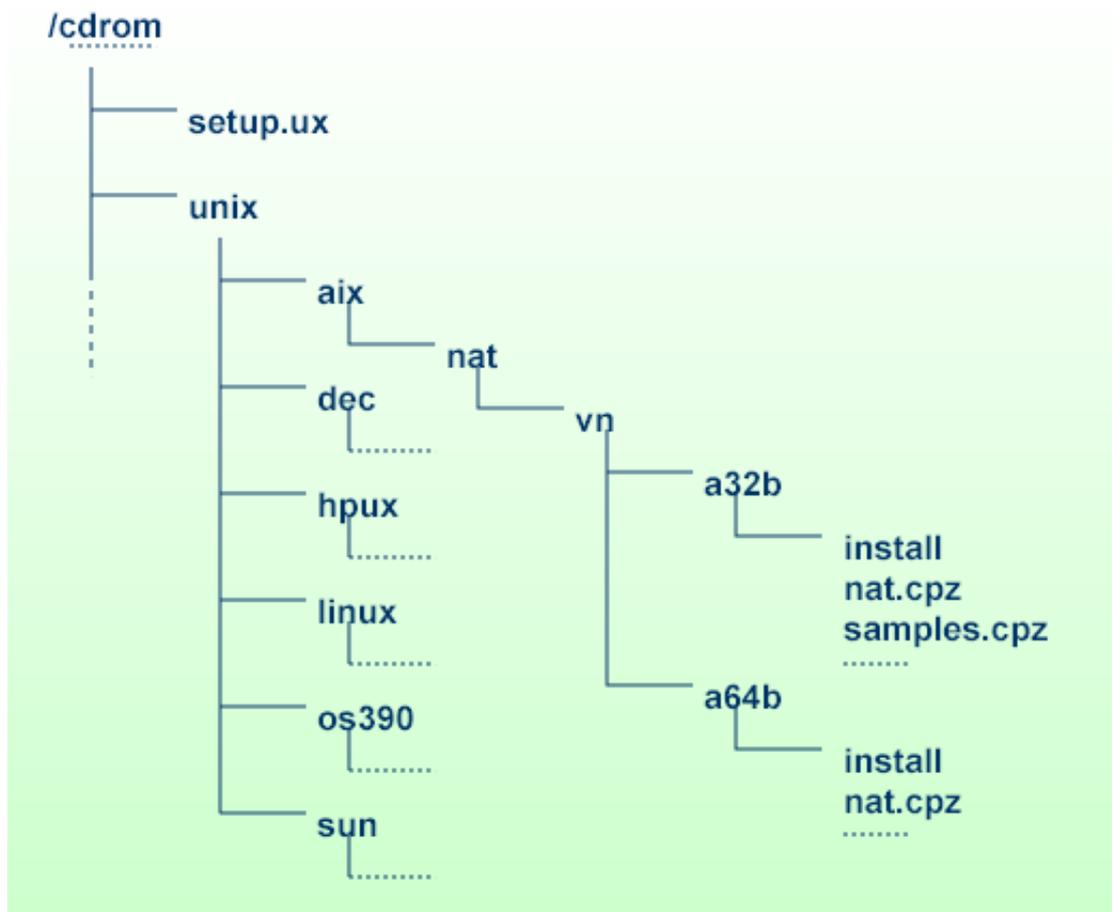
Platform	Mount Command
AIX	<code>/etc/mount -v cdrfs -o ro <device> <mount dir></code>
HP-UX	<code>/usr/sbin/mount -F cdfs -o cdcase <device> <mount dir></code>
Solaris	<code>/usr/sbin/mount -F hsfs -o ro <device> <mount dir></code>
Tru64	<code>/usr/sbin/mount -t cdfs -o noversion <device> <mount dir></code>

Notes:

On Solaris, the volume management daemon "vold" might be active. This daemon mounts the CD-ROM automatically.

Tru64 UNIX requires an ISO 9660 CD-ROM support configured within the kernel.

2. Check the directory structure of the UNIX part of the CD-ROM.
Running an `ls(1)` command on the CD-ROM you will see a structure like this.



Please note: Depending on the mount options used, the files will be **all upper case** or **all lower case**. If you mount the CD-ROM as a pure ISO 9660 Interchange Level I CD, you will also see a version number '1' appended to all files. Please note this for the following steps and use the correct name format.

3. Install the unix component to the SAG home directory.

Software AG products are in general installed by executing one of the following commands:

```
sh <mount dir>/setup.ux
```

depending on whether the files on the CD-ROM are shown in upper or lower case, upper case can also be used.

4. Dismount the CD-ROM and unload it.

Command	Description
su - root	To dismount a CD-ROM you must be root.
umount <mount dir>	Execute the umount command.
rmdir <mount dir>	Remove the mount directory.
exit	Return to SAG user.

Note:

On Solaris machines on which the volume management daemon "vold" is active, use the eject(1) command to dismount and to unload your CD-ROM.

Checking Images

- Ensure that all installed images are owned by the user **sag** and have the group ID **sag**.

The README Files

- If **README** files are included, read them before proceeding.

Creating the Environment File "sagenv"

The product installation generates an environment settings file **sagenv.new**.

1. Review the contents of **sagenv.new** and customize it as necessary.
2. Rename **sagenv.new** to another file name (optional). In the following examples, it is assumed that the environment file is called **sagenv**.

Note:

If you are performing an update installation and changes were made to your environment, replace only the modified product-specific part in your existing **sagenv** file.

Modifying User Profiles

- Enter the following command line in the **.profile** file of each user who will use this environment permanently:

```
. <SAG-root-directory>/sagenv
```

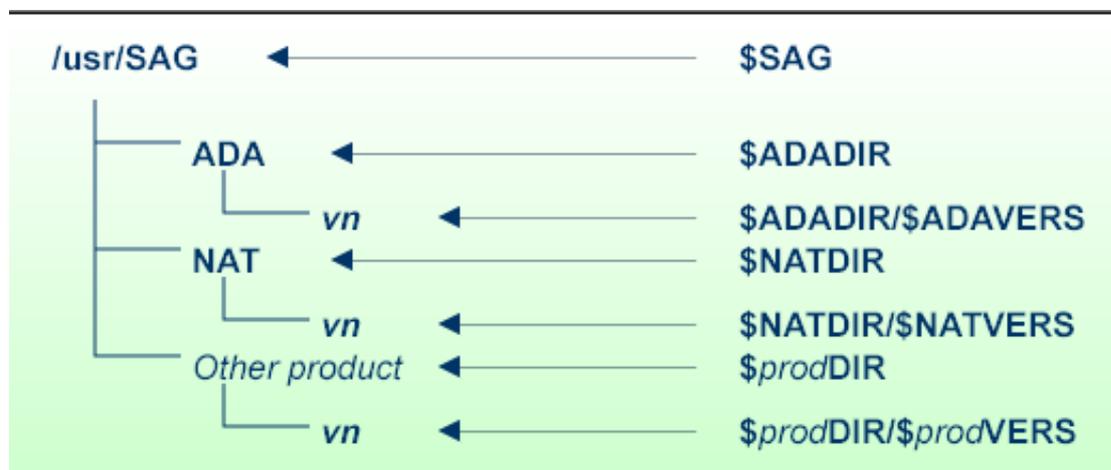
Setting up the Product

You have completed the installation steps common to all Software AG products for UNIX.

After reading the section SAG Environment, perform the steps required to use the product. These are described in the documentation that applies specifically to the product you have installed.

SAG Environment

The following figure shows the general directory structure generated during installation and the environment variables which reference the specified directories:



The environment variable **SAG** defines the root directory for all Software AG products and is usually the home directory of the administrator account.

For each product, the variable **\$prodDIR** is set to the path of the main directory of the product specified, where *prod* is a three-letter product code in uppercase letters. For example, all files for Natural, whose product code is NAT, are contained in the directory **\$NATDIR**.

The name of the main directory is usually the same as the product code in lowercase letters. For example, the main directory for Natural is named **nat**. However, there are exceptions to this convention. For example, the product code for Entire Net-Work is WCP but the environment variables use the prefix NET instead. Also, the product code for Predict is PRD but the environment variables use the prefix DIC.

Version-independent parts of the product, such as examples or data, are stored in a subdirectory of the product main directory. For example, all Adabas demo data is contained in the directory **\$ADADIR/adademo**.

Version-dependent components of the product are kept in the version directory **\$prodDIR/\$prodVERS**. For example, the current version of Natural is stored in the directory **\$NATDIR/\$NATVERS**.

The environment variables *prodDIR* and *prodVERS* for all products specified during installation are set in the file **sagenv**. The same applies to any other environment variables needed for the various products.

Setup and Installation of Natural under UNIX

This document describes how to setup and install Natural 5.1.1 on a UNIX platform. The following topics are covered:

- Product Requirements
 - The Natural Distribution Kit
 - Before You Start
 - Installing Natural under UNIX
 - Setting Up the Entire System Server Interface
-

Product Requirements

This section covers the following topics:

- Required Memory Space
- Disk Space
- Related Software AG Products

Required Memory Space

The memory space required by Natural largely depends on the number of users.

The memory space per user is determined by the settings in the NATPARM parameter module, especially by the values of profile parameters such as USIZE and SSIZE.

In addition to the user-specific memory, you require memory for the buffer pool, which is shared among all users.

Disk Space

Approximately 180 MB of hard-disk space is required for Natural.

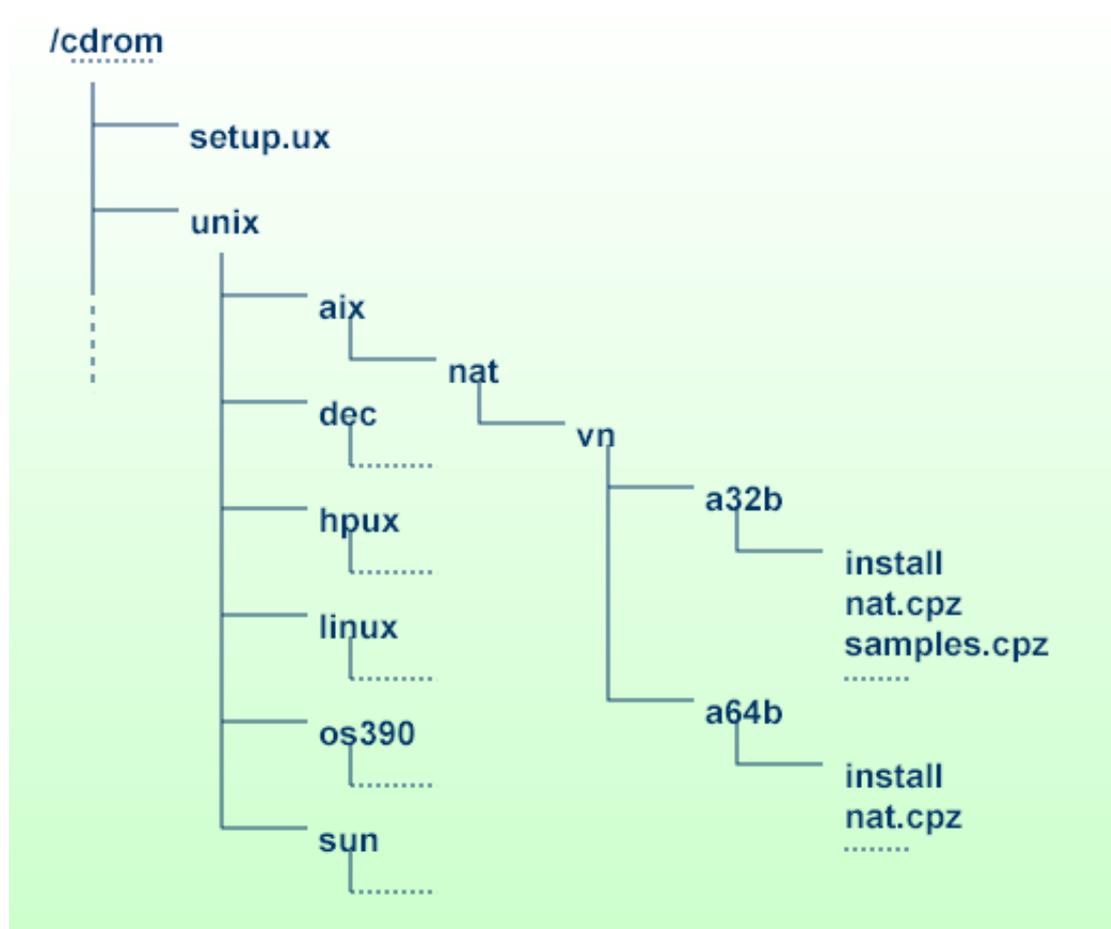
Related Software AG Products

Natural 5.1.1 requires:

- Adabas 3.1.1
- Entire Access 4.2.1 or 4.1.1 to access SQL databases.
- EntireX 5.3.1 or 6.1.1 when using the Natural RPC feature or the Natural Web Interface via RPC
- Entire Net-Work 2.1.1 UNIX to access remote Adabas database systems
- Tamino 2.2.1 or 2.3.1 and 3.1.1 when using the Natural Tamino examples.
- HTTP server, like Apache, IIS or Netscape when using the Natural Web Interface

The Natural Distribution Kit

The Natural distribution kit on CD-ROM contains the installation files for various UNIX platforms as well as for Windows and other platforms. An example of the directory hierarchy on the CD-ROM is shown below. Note: Directory level A32B/A64B applies only to AIX, HP-UX and Solaris.



Files for UNIX platforms are provided on CD. Please note that the License File is not contained on this CD. It must be obtained from Software AG.

Before You Start

This section contains important information on the necessary activities before installing and setting up Natural on a UNIX platform.

Please note the following before you start the Natural installation:

- Software AG recommends some common steps for the installation of Software AG products under UNIX. See Installing and Setting Up Software AG Products under UNIX for a detailed description.
- Some installation steps require super-user (root) permissions. The installation offers a choice between the **su** and **sudo** commands and asks for the corresponding password required to become super-user.
- Before you start the installation, backup your current product version.
- The directory on the disk into which the Natural distribution files are installed is identified by the environment variable **SAG** (which can be set to an appropriate value in advance).
- If a previous version of Natural is already installed, the configuration settings are evaluated and may be used in the update installation. Note that the Software AG cross-product component **bty** required by Natural is installed under **\$SAG/common** and may upgrade previous versions of this component.
- During the installation you need a valid Natural license file.
- Ensure that prerequisite software is installed.

Installing Natural under UNIX

This section describes step-by-step how to setup and install Natural under the UNIX operating system. The installation steps to be taken depend on whether you are installing Natural for the first time, or upgrading an existing Natural version. You will be guided accordingly during the installation process.

The installation can be performed in two installation modes, either in graphical mode or in character mode.

See the following list for an overview of the necessary steps:

- Step 1: Mount Your CD-ROM Drive
- Step 2: Choose the Installation Mode
- Step 3: Start the Installation Process
- Step 4: Enter A Valid CD-ROM Directory
- Step 5: Accept License Agreement
- Step 6: Enter \$SAG Environment Variable
- Step 7: Specify License File Location
- Step 8: Choose Natural Packages to Install
- Step 9: Confirm Your Installation Settings
- Step 10: Root Authentication
- Step 11: Select Installation Type
- Step 11a: NATDIR / NATVERS Settings (Update Installation Only)
- Step 12: Review Configuration Settings for NATURAL.INI
- Step 12a: Parameter Module Template (Update Installation Only)
- Step 13: Review Environment Settings for FNAT / FUSER
- Step 14: Set User Database Parameter
- Step 15: Loading Libraries
- Step 16: Relink Natural
- Step 17: Natural Buffer Pool
- Step 18: SAG Environment File
- Step 19: Finish Installation

Step 1: Mount Your CD-ROM Drive

If your CD-ROM drive has not yet been mounted, mount it now as described in section Installing the Contents of the CD-ROM to Disk of the steps common to all Software AG products.

When the installation is started, the setup procedure will check the hardware platform and operating system version and then start the appropriate installation program INSTALL.

Step 2: Choose Installation Mode

The installation procedure examines the environment variable DISPLAY to determine whether to run in graphical or character mode.

To use **graphical mode**, the environment variable DISPLAY must be set. If it is not yet set in your environment and you want to use graphical mode, set it using the following command:

```
DISPLAY="<your_machine_name>:0"  
export DISPLAY
```

Character mode will be used automatically if the environment variable DISPLAY is not set. If DISPLAY has been set in your environment but you want to use character mode, you can disable it using the -nw option when you start the installation.

At the end of an installation process, in either mode, a **batch script** is generated and written to the end of the installation log. It lists the parameters specified for that particular installation.

Example:

```
# ----- <Start of generated batch script> -----
# -- <Adapt the following lines until end of generated> --
# ----- < batch script to your needs > -----
#!/bin/sh
# You should replace SECRET by the actual password
# or (even better) call this script with superuser privileges.
#
SAG="/usr/SAG"; export SAG
/bin/sh /cdrom/setup.ux -batch \
  -sagenv /usr/SAG/sagenv.new \
  -installType customized \
  -user sag \
  -password SECRET \
  -authcmd sudo \
  -dbident 022 \
  -packages "
  Nucleus & utilities : off
  Adalnk : on
    Optimized Version of Adalnk : on
    Examples : on
    DBA Workbench : on"
# ----- <End of generated batch script> -----
```

You can use the **-help** option to display a list of all supported parameters.

Step 3: Start the Installation Process

To perform this step, you must either be the user `sag` or a member of the group `sag` to which the administrator and all users of Software AG products are assigned to. Do not perform this step as the user `root`.

Start the installation procedure from a **writable** working directory. We recommend `$SAG/INSTALL`. Enter the command:

```
sh <mount_dir>/setup.ux
```

where `<mount_dir>` is the starting directory on your product CD-ROM. Upper / lower case usage is possible.

The setup program is started and guides you through the installation. During installation you have to provide the license key.

Note:

The following descriptions of installation steps assume that the graphical installation mode is used. The step sequence is the same in character mode.

Step 4: Enter A Valid CD-ROM Directory

In this screen you have to confirm the path of your CD-ROM drive.

By default, the path of the mounted CD-ROM drive is displayed. You can enter a different path or use the Browse button to change the path.

Click Next to proceed.

Step 5: Accept License Agreement

In this screen, the license agreement is displayed. You must accept it to proceed with the installation.

Note:

If you run the installation procedure in character mode, at each command prompt, you must type in the exact wording (for example: "accept" for "accept", not just "y" or the ENTER key).

Step 6: Enter \$SAG Environment Variable

In this screen you can change the value of the \$SAG environment variable, which is the path name of the directory tree, where all Software AG products are installed.

By default, the current \$SAG variable is displayed. You can enter a different path or use the Browse button to change the path.

Click Next to proceed.

Step 7: Specify License File Location

In this screen you specify the directory and name of your license file. Enter the path where your license file is located or use the Browse button to change the path, and select the `<product_code>.xml` file. If no common Software AG environment exists yet, `<your current directory>/<product_code>.xml` is displayed.

If you click on the View button, the content of your license file will be displayed in a separate screen. Click OK or Quit to go back to the license file screen.

Click Next to proceed.

Step 8: Choose Natural Packages to Install

In this screen you can choose additional packages to be installed.

For Natural you can decide whether to install the Natural example files in addition to the Natural program files. Click on the Details button to do so. Choose the components you want to install and return to the original window using the Continue button.

Click Next to proceed.

Step 9: Confirm Your Installation Settings

In this screen the selected features are displayed. Use the scroll bars to display the entire list. If the common Software AG components are not installed in your environment, they will automatically be installed now.

To review or change your settings, click on the Back button.

Click Next to begin copying files. A screen will be displayed informing you about the extracted files. Click Next to continue.

Step 10: Root Authentication

Enter either the root password or your own password, if the sudo command is available and you are an authorized sudo user. Some of the installation steps must be performed as super-user, for example when copying the buffer pool start up script to the init.d system directory.

Click Next to proceed.

Step 11: Select Installation Type

In this screen you specify whether you are installing Natural for the first time, or updating an older Natural version already installed on your machine.

Click Next to proceed. If you are installing Natural for the first time, proceed with Step 12: Review the Configuration Settings for NATURAL.INI. If you are updating Natural, perform Step 11a: NATDIR / NATVERS Settings.

Step 11a: NATDIR / NATVERS Settings - Update Installation Only

If you are updating an existing Natural version, confirm or modify the settings displayed in this screen.

Step 12: Review the Configuration Settings for NATURAL.INI

In these screens review or change your configuration settings which will be stored in your NATURAL.INI file. The buttons displaying "..." can be used to browse to the relevant file location.

Click Next to start the initialization. If you are installing Natural for the first time, proceed with Step 13: Review the Environment Settings for FNAT / FUSER. If you are updating Natural, perform Step 12a: Parameter Module Template.

Step 13: Review the Environment Settings for FNAT / FUSER

Adapt the values displayed in this screen to your Natural environment. The buttons displaying "..." can be used to browse to the relevant file location.

Click Next to define the UDB parameter.

Step 14: Set User Database Parameter

Specify the UDB parameter you want to use for your current Natural environment.

If you are updating an existing Natural version, the current UDB parameter is displayed.

Click Next to start loading the Natural libraries into FNAT.

Step 15: Loading Libraries

In this screen the loading process is shown. The progress of the process is indicated by a bar with a percentage scale.

Wait for the process to finish, then click Next to proceed.

If you have chosen the default package in Step 8, proceed with Step 19: Finish Installation. If you have chosen additional packages, please perform the relevant steps.

Natural Command Processor

If you specified Natural Command Processor in Step 8, you will be asked if you want to create a database file for the Natural Command Processor. A dialog is displayed.

If you choose No, you will be passed to the screen relevant for the next package, if one was selected.

If you choose Yes, specify your Adabas environment settings, then click Next and specify the DBID and FNR for the Natural Command Processor FDT. Click Next again.

Entire Screen Builder

If you specified Entire Screen Builder in Step 8, continue with Step 16: Relink Natural.

Step 16: Relink Natural

If one of the packages you selected in Step 8 requires relinking a screen is displayed where you can specify the relevant parameters.

- For Adabas choose between dynamic and static binding.
- For SQL enter the SQL database you want to use.
- Select the check boxes if you want to use Entire DB or SYNCSORT.

Click Next to display the output of this relinking process. Please review the results and Click Next.

Step 18: SAG Environment File

Select the products and paths which will be written to the `sagenv.new` file and click Next.

Step 19: Finish Installation

This screen informs you that the installation has finished successfully. It is recommended to view the README file for further information. If you do not want to display the file, remove the selection.

Click Finish.

It is necessary to execute the `sagenv.new` file after exiting this installation program to set the environment variables NATDIR, NATVERS and PATH. Check these settings and insert them into your profile (for example, `.profile`).

Once the installation has been successfully completed, you can remove the working directory and all of its contents.

For further information on the packages you may have selected, see the documentation listed below.

- Natural Command Processor
- Natural Web Interface
- Natural Debugger

For Entire Screen Builder, please see the relevant documentation.

Setting Up the Entire System Server Interface

The Entire System Server Interface (ESX) is required if the product Entire System Server (ESY) is to be used. The Entire System Server Interface is part of Natural Version 5.1.1 and no extra installation is needed.

Additionally, Natural Version 5.1.1 provides the libraries SYSNPE and SYSNPR.

SYSNPE is the Entire System Server online tutorial as starting help for Entire System Server users. For more information about Entire System Server, see Entire System Server Overview.

The library SYSNPR contains the utility CHANGEDB which is used to change the database ID of the Entire System Server DDMs.

This section covers the following topics:

- Prerequisites
- Activation

Prerequisites

The Entire System Server Interface provides access to Entire System Server on OS/390, VSE/ESA and BS2000/OSD via Entire Net-Work. For full support of the Entire System Server Interface, WCP 581 or above is required on the mainframe platforms.

Activation

The Entire System Server Interface is not active if you use the standard Natural configuration settings. The value of the Entire System Server Interface database (Natural profile parameter ESXDB) is set to 0 by default. To use the Entire System Server Interface you need to run the Natural Configuration Utility and must set the value of the parameter ESXDB to 148. The parameter can be found in the Natural Configuration Utility > Natural Parameter Files > Product Configuration > Entire System Server.

ESXDB specifies the database ID used for the DDMs of Entire System Server. This DBID does not specify the target DBID of Entire System Server requests but tells Natural which DBID is used for the catalogued Entire System Server DDMs. The effective Entire System Server target DBID will be specified with the NODE field which is part of all Entire System Server DDMs.

Please change the value of ESXDB to 148 to run Natural with Entire System Server Interface support. All Entire System Server DDMs are catalogued with DBID 148.

After starting Natural again, you may access Entire System Server nodes running on the mainframes via Entire Net-Work.

Currently, the customization of Entire System Server Interface supports the modification of the Entire System Server DDMs only.

How to use a different DBID for the Entire System Server DDMs:

Library SYSNPR contains the CHANGEDB program which is used to modify the database ID of all Entire System Server DDMs. You will find all Entire System Server DDMs in the library SYSNPE.

The database ID entered as a new DBID value in the CHANGEDB program must also be specified as the value of the Entire System Server Interface database parameter (ESXDB) in the Natural Configuration Utility.

Activating the Natural Buffer Pool on UNIX

Because the Natural buffer pool requires resources that must be created every time your system is booted, a procedure to activate the buffer pool must be called during system startup. This procedure is different for each operating system.

Therefore, please proceed as described in the section appropriate to your operating system below:

- Preparing the System V Style Startup Procedure
- Preparing the Startup Procedure rc (AIX)
- Change Kernel Parameters

To verify the operation of the buffer pool, invoke the NATBPMON Utility, which is used to monitor the buffer pool's activity.

Preparing the System V Style Startup Procedure

The procedure **sagnatbp** which is used to invoke the Natural buffer pool during system startup is automatically copied to the **init.d** system directory during the Natural installation process.

The following table shows where the **init.d** and **rc3.d** directories are located on the various platforms. In the following description, **init.d** or **rc3.d** stand for the relevant path indicated below for the platform you are using.

Platform	System Directory for Initialization	Run Level Startup Directory
Solaris	/etc/init.d	/etc/rc3.d
HP-UX	/sbin/init.d	/sbin/rc3.d
DEC UNIX / True64	/sbin/init.d	/sbin/rc3.d
SCO UnixWare	/etc/init.d	/etc/rc3.d
Linux	/etc/rc.d/init.d	/etc/rc.d/rc3.d or /etc/rc.d/rc5.d

You must copy this buffer pool procedure to the run level 3 startup directory of your UNIX machine. The **rc3.d** directory contains several Bourne shell scripts that start with "S", followed by a number, for example 99. If you add a file to this directory, the code contained in it is executed when the system changes to "multi-user mode".

A sample copy of **sagnatbp** is shown below. It can be edited with a text editor.

1. Log in as user "root".
2. Create a backup copy of your current **S99natbp** file contained in the **rc3.d** directory (see table above).
3. Check the environment variable settings (NATDIR, NATVERS, NATADM) in the **sagnatbp** procedure.

NATDIR	Location where Natural was installed.
NATVERS	Natural version number.
NATADM	The login name of the Natural system administrator responsible for this buffer pool. It is assumed that this administrator account is called "sag", and that the user ID is already known to the system. It does not have to be a user with root privileges.

Note:

The Bourne shell does not allow blanks before and after the equal sign in the lines to be customized.

4. Copy the **sagnatbp** file to the **rc3.d** directory and rename it to **S99natbp**.
5. If an error occurs, you can start again with the backup copy after the deletion of the modified **S99natbp** file contained in the **rc3.d** directory.

Sample of "sagnatbp" File:

```

#!/bin/sh
#
# Copyright (c) 2002 Software AG, Germany.
#   All rights reserved.
#
# Start/stop script for Natural Bufferpool
#
#-----

NATDIR=/usr/SAG/nat
NATVERS=vn
NATADM=sag
export NATDIR NATVERS
#
#-----
#
natstart=${NATDIR}/${NATVERS}/bin/natstart.bsh
natbpmon=${NATDIR}/${NATVERS}/bin/natbpmon

if [ "${LOGNAME}" = "" ]; then

    LOGNAME=root
    HOME=/

    export LOGNAME HOME
    UNDO=1
else
    UNDO=0    fi
case "$1" in
    start)
    echo "Starting Natural Bufferpool ..."
    if [ -x "${natstart}" ]; then
        su $NATADM -c "${natstart}" > /dev/console 2> /dev/console
    else
        exit 1
    fi
    echo "done..."
    ;;
    stop)
    echo "Stopping Natural Bufferpool ..."
    if [ -x "${natbpmon}" ]; then
        su $NATADM -c "${natbpmon} shutdown" > /dev/console 2> /dev/console
    else
        exit 1
    fi
    echo "done..."
    ;;
    *)
    echo "Usage: $0 {start|stop}"
    exit 1
    ;;
esac
if [ ${UNDO} ]; then
    unset LOGNAME HOME
fi
unset UNDO
#
#-----

```

The procedure "natstart.bsh" is called automatically by the system startup procedure and is used to initialize the Natural environment. It needs no customization and is stored under: \$NATDIR/\$NATVERS/bin/natstart.bsh.

Preparing the Startup Procedure rc (AIX)

The procedure to invoke the Natural buffer pool during system startup is contained in the directory "/etc/rc", which is a Bourne shell script. A sample copy of this procedure can be found on the installation tape under the name **rc.sag**.

1. Log in as user "root".
2. Create a backup copy of your current "/etc/rc" file.
3. Include the following lines into "/etc/rc":

```
#
# Load Software AG Processes semiautomatically
#
if [ -x /etc/rc.sag ]
then
echo " "
echo "Now I start all Software AG processes ..."
/etc/rc.sag
echo " "
fi
```

4. Verify your changes to make sure that the changes made to the procedure consist only of those changes desired. If an error occurs, you can start again with the backup copy. A sample of **rc.sag** is shown below.
5. Copy the file **rc.sag** to "/etc/rc.sag".

Note:

Site-specific changes to this procedure may exist on your computer; they might be lost by adding the Natural buffer pool startup code.

Sample of "rc.sag" File:

```

#-----
# announce start of local rc
#
echo "rc.sag started at 'date'" > /dev/console
#-----
#
# Start up the development version of natural. this section should be
# duplicated for each incarnation of the natural nucleus. due to
# security considerations, the procedure is called after changing the
# user and group id with the su command to the responsible natural
# system administrator.
#
NATDIR=/usr/SAG/nat      # customize
NATVERS=vn              # customize
NATADM=sag              # customize
#
#-----
natstart=$NATDIR/$NATVERS/bin/natstart.bsh
export NATDIR NATVERS NATADM
#
if [ -f ${natstart} ]
then
#
if [ "${LOGNAME}" = "" ]
then
LOGNAME=root
HOME=/
export LOGNAME HOME
UNDO=1
else
UNDO=0
fi
#
echo "calling ${natstart} for user ${NATADM}" > /dev/console
su ${NATADM} -c ${natstart} > /dev/console 2> /dev/console
#
if [ ${UNDO} ]
then
unset LOGNAME HOME
fi
unset UNDO
#
else
echo "${natstart} not found, natural not started" > /dev/console
fi
unset NATDIR NATVERS NATADM
#-----
# announce end of local rc
#
echo "rc.sag finished at 'date'" > /dev/console
#

```

Note:

Site-specific changes to this procedure may exist on your computer; they might be lost by adding the Natural buffer pool startup code.

Because environment variables are not known during system startup, they must be specified manually in **rc.sag**. Therefore, change the following variables:

NATDIR	Location where Natural was installed.
NATVERS	Natural version number.
NATADM	The login name of the Natural system administrator responsible for this buffer pool. It is assumed that this administrator account is called "sag", and that the user ID is already known to the system. It does not have to be a user with root privileges.

Note:

The Bourne shell does not allow blanks before and after the equal sign in the lines to be customized.

The procedure "natstart.bsh" is called automatically by the system startup procedure and is used to initialize the Natural environment. It needs no customization and is stored under: \$NATDIR/\$NATVERS/bin/natstart.bsh.

Change Kernel Parameters

- Solaris, HP-UX, DEC UNIX / Tru64, SCO UnixWare
- AIX

Solaris, HP-UX, DEC UNIX / Tru64, SCO UnixWare

The Natural buffer pool needs the following operating-system resources for its operation:

- A set of semaphores to enable synchronization between the users.
- Shared memory to store the buffer pools objects.

The amount of available shared memory and the semaphores are configured in the kernel. For information on how to change your current kernel, contact your system administrator or consult your respective operating system manuals.

Note:

Since semaphores are also needed to synchronize the access to Natural system files, additional operating-system resources should be considered here, too; see also System File Simulation.

The following abbreviations are used:

NBP	Number of buffer pools running on one computer.
SMU	Sum of all "Maxuser" parameters for all buffer pools.
MAXMEM	Largest "Memsize" value for all buffer pools.
NSF	Number of system files used.

If you have only one buffer pool on your computer, the following values are used:

NBP	= 1
SMU	= "Maxuser" (from NATPARM)
MAXMEM	= "Memsize"

As not all resources defined by the default parameter settings are used during normal system operation, the default values are sufficient to operate one buffer pool supporting up to 20 users using about 1 MB of memory.

Note:

You can find the default values specific to your environment in your kernel configuration file. Do not decrement any kernel parameters that are above their default values, as other software may need the larger value.

Change the following kernel parameters to the required values as follows:

Name	Required Value
SEMAEM	must be at least SMU
SEMMNI	increment by (NBP + NSF)
SEMMNS *)	increment by (SMU + 5 * NBP) + NSF
SEMMNU *)	increment by SMU
SEMMSL	must be at least SMU + 4
SEMUME	must be at least 5
SEMVMX	must be at least SMU
SHMMAX	must be at least MAXMEM
SHMMNI	increment by NBP
SHMSEG	must be at least 4

*) Not available under DEC UNIX.

Review the changes made to the file **S99natbp** in your **rc3.d** directory in case the startup message is not displayed during rebooting.

Note:

If the system should fail to boot after modification (that is, the new kernel cannot be booted), check if there is an error in the startup procedure. Detailed information about trouble-shooting the operating system can be found in your respective operating system manuals.

If you cannot solve the problem, contact Software AG support.

AIX Kernel Parameters

Since AIX dynamically adjusts the IPC configuration, kernel parameter changes are not required.

Before You Start Installing Natural 5.1.1 on OpenVMS

Before you start extracting the installation CD and installing Natural, read the following sections:

- Installation Prerequisites
- Required UAF and SYSGEN Parameters and Images
- Required Process Privileges
- Installing Natural in a Cluster Environment
- Multiple Versions of Natural
- Naming Conventions
- Recommended Directory Structure

After reading the information contained in this document, please continue with:

Installing Software AG Products from CD-ROM under OpenVMS | Installing and Setting Up Natural

Installation Prerequisites

Software

The following products are required for installing Natural for OpenVMS on Alpha/AXP:

- OpenVMS Version 7.2 or above,
- Adabas Version 4.1,
- Sagbase Version 1.2.3 (only if you install Sagbase with this version),
- Entire Net-Work 3.2.3 (necessary if RPC is used),

Disk Space

The space required on disk will be checked by the PCSI utility during the installation.

Required UAF and SYSGEN Parameters and Images

Parameters

The following UAF (User Authorization File) and SYSGEN parameters should have at least the following values for each Natural user:

Parameter	Function	Minimum Value	Utility
Fillm	File limit	100	UAF
TQElm	Timer queue elements	10	UAF
Enqlm	Lock queue entry limit	1000	UAF
Bytlm	Byte limit	30000	UAF
Maxbuf	Maximum size of buffered I/O transfer	4096	SYSGEN
JTquota	Job table quota	2048	UAF
Pgflquo	Page file quota	50000	UAF
Procsectnt	Process section count	70	SYSGEN

Images

If any of the above-mentioned SYSGEN parameter values are too small, the command procedure *NODENAME_*NATGEN.COM is generated during the installation, and it assigns the proper values to the parameters. If your system does not specify a nodename, *NODENAME* is set to "NONAME".

Note:

After *NODENAME_*NATGEN.COM is executed, the system must be rebooted to activate the new SYSGEN parameter values.

To install the recommended Natural images, the following system resources are required:

Images For	GBLPAGES	GBLSECTIONS
Natural Nucleus	10000	50
Natural Buffer Pool	8000	1

Required Process Privileges

To install the Natural images and to create the Natural buffer pool, the following system privileges are required: **CMKRNL, SYSNAM, SYSPRV, PRMGBL, SYSGBL, BYPASS.**

The process privilege **TMPMBX** is required before Natural can be used.

Installing Natural in a Cluster Environment

In a cluster environment, you must install Natural on each node on which it is to be used.

Initial Installation

Depending on the Sagbase installation, the initial Natural installation within a cluster will choose either the common or the specific root directory. Each node must first be prepared by installing Sagbase. The installation procedure checks for an existing Natural installation in the cluster.

Subsequent Installations

Subsequent installations consist of the following steps:

- Checking whether or not system parameters have correct values.
- Modifying NATBPENV_*nodename*.COM according to the parameters specified.
- Modifying the startup component database if STARTUP_NAT5.COM was found in SYS\$STARTUP.
- Executing the command procedure STARTUP_NAT5.COM.

Multiple Versions of Natural

You can use more than one Natural version on your system. Image names contain the current version number, and the command procedure LOGIN.COM is downward compatible.

For Natural 5.1.1 the version number should be used as parameter P1 when LOGIN.COM is called, for example @SAG\$ROOT:[NATURAL]LOGIN 5112.

Activating Another Natural Version

If a specific user wants to use another version in his/her job environment, the UAF parameter JTQUOTA must be set to 2048.

If you have already installed Natural system-wide by executing STARTUP_NAT5.COM, the value of the parameter P1 was set to the value of the installed Natural version.

You can now activate another version of Natural in a job environment by executing STARTUP_NAT5.COM with the parameter P1 set to a different value of an existing Natural version.

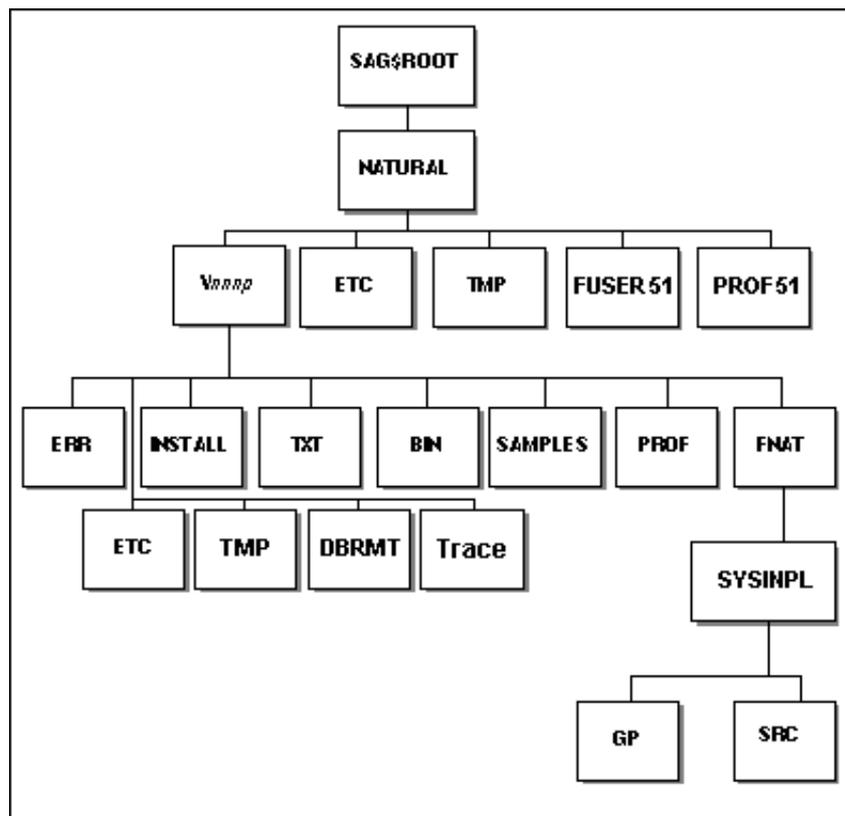
Naming Conventions

The following notations are used in the names of files and directories:

Notation	Description
product	product name or short product name (PPP)
v	version number
r	release number
s	system maintenance level
p	patch level
os	operating system short name

Recommended Directory Structure

The following graphic shows the directory structure for Natural version 5.1.1



The Natural logicals are to be found in a version-specific name table called Natural_C\$Vversionnumber_LOGICAL_NAMES.

Installing Software AG Products under OpenVMS

This section describes how to install Software AG products under OpenVMS from CD-ROM.

- General Installation and Setup Overview
 - Installation Package
 - Mounting the CD-ROM
 - CD-ROM Directory Structure
 - Installing the Product from CD-ROM
-

General Installation and Setup Overview

This section describes how to install Software AG products for OpenVMS (AXP).

The general procedure is:

1. Use Software AG's product Sagbase to prepare the OpenVMS environment for installation of Software AG's OpenVMS products. Sagbase creates an account and a top-level directory, in which all Software AG OpenVMS products are placed in subdirectories. For further information on Sagbase, please refer to the Sagbase documentation.
2. Use the command procedure SETUP.COM located on CD to install the product in the OpenVMS environment.
SETUP.COM copies the Natural PCS file from the CD to the SAG\$ROOT:[CDINST] directory, changes the default location to this directory and starts the Polycenter Software Installation utility (PCSI).
3. The PCSI utility guides you through the installation and verifies whether the installation was successful.
4. After completion of the PCSI installation procedure, some product-specific post-installation steps must be performed as described in each product's installation documentation.

Installation Package

The installation package containing Software AG products is available on CD-ROM.

Mounting the CD-ROM

Log in to the privileged account

Log in to the OpenVMS system manager's account or DBA account.

Mount the CD-ROM

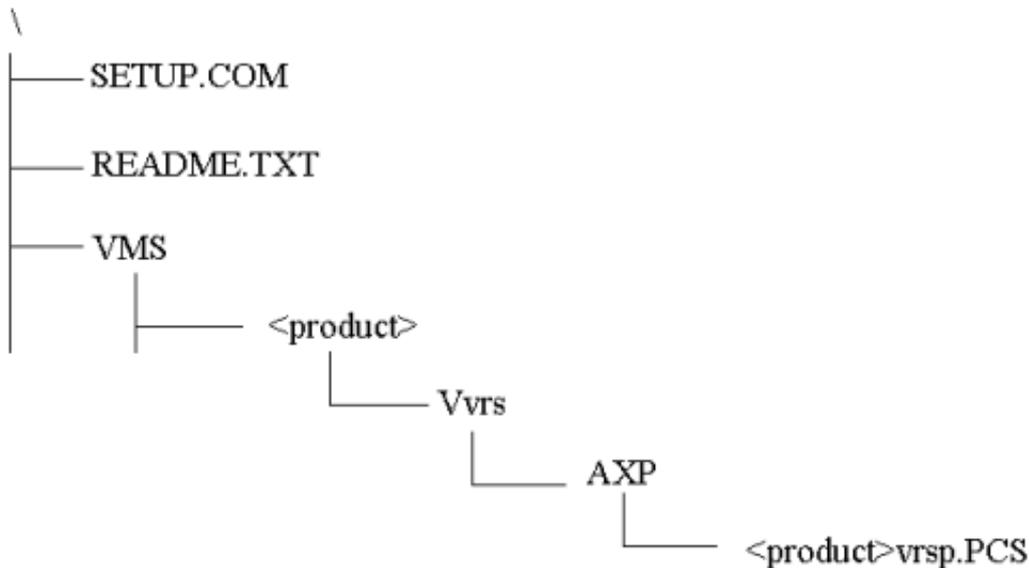
Use the following command:

```
$ MOUNT/OVERRIDE=ID/MEDIA=CD/UNDEF=VAR:CR <device-name>
```

The /OVERRIDE=ID qualifier is necessary because the volume label may differ from CD-ROM to CD-ROM. This qualifier implies that only the user who mounted the CD-ROM can access it and, therefore, should perform the installation.

CD-ROM Directory Structure

The following graphic shows the general directory structure for Software AG products on OpenVMS.



In the README.TXT file you will find important information about the product installation.

The product is saved in the product PCSI file <product>vrsp.PCS for example NAT5110.PCS for a Natural installation.

The SETUP.COM procedure invokes the installation.

Installing the Software AG Product from CD-ROM

Use the SETUP.COM procedure to copy the product file to the SAG root directory and to start the PCSI installation procedure.

Change your current directory

```
$ SET DEFAULT <CD-ROM-device-name>:[000000]
```

Enter the following command to start the SETUP.COM extraction procedure

```
$ @SETUP
```

The SETUP.COM procedure will prompt you for all information it needs for the installation.

The product <product>vrsp from the CD-ROM will be copied to
SAG\$ROOT:[CDINST.<os>_<product>_V<vrmp>].

Copy the product PCSI file

Enter

Y - to copy the product PCSI file to
SAG\$ROOT:[CDINST.<os>_<product>_V<vrmp>]
N - to copy the product PCSI file to another directory
RETURN - to exit this procedure

Enter Y or N:

Enter "Y" to copy the product to SAG\$ROOT:[CDINST.<os>_<product>_V<vrmp>] directory or "N" to copy it to another location.

Print the README.TXT file

Print README.TXT(queue SYS\$PRINT)? [Y]:

Enter "Y" if you want to print the README.TXT file from the CD.

Setup completed

The SETUP.COM command procedure displays the following message, if the product PCSI file was successfully copied to the directory SAG\$ROOT:[CDINST.<os>_<product>_V<vrmp>].

SETUP successfully done

Invoke the PCSI installation procedure or interrupt the process

You have the choice to proceed with the PCSI installation or to interrupt the installation.

The installation procedure displays the location where you copied the PCSI file.

You may execute the PCSI installation utility now or later.

Enter

I - to install the product on SAG\$ROOT
RETURN - to exit this procedure

Say "I" to install the product with the PCSI utility. This procedure is described in detail in the product-specific installation documentation.

If you press "RETURN", you will leave the SETUP.COM procedure.

You can continue the installation, if you start the SETUP.COM procedure once more.

Installing and Setting Up Natural 5.1.1 under OpenVMS

This document describes the Natural installation under OpenVMS and the steps you need to take before and after the installation.

- Overview of the Installation Procedure
- PCSI Installation Procedure
- After the Installation Procedure
- Setting Up the Entire System Server Interface

If you have not yet done so, please see also:

[Before You Start Installing Natural 5.1.1 Under OpenVMS | Installing Software AG Products under OpenVMS](#)

Overview of the Installation Procedure

The installation procedure PCSI automatically performs the following steps when used to install Natural:

- Checks which OpenVMS version is running.
- Temporarily sets the privileges (BYPASS, CMKRNL, SYSNAM).
- Checks whether Sagbase is installed.
- Modifies DBA account if required.
- Checks whether system parameters have correct values, and if they do not, a procedure is generated that assigns the correct values.
- Registers product SAGBASE to PCSI if required.
- Calculates and verifies the disk space needed for installation on both the work-directory device and the installation device.
- Creates Natural directories if necessary.
- Moves all files and images to the appropriate directories.
- Sets protections for files and directories.
- Asks whether you want to copy STARTUP_NAT5.COM into the SAG\$ROOT:[NATURAL] directory or the SYS\$STARTUP directory.

Note: If you want Natural to be loaded and activated automatically at every booting, specify the option that the STARTUP_NAT5.COM shall be moved to SYS\$STARTUP during the PCSI installation. An entry in the system startup database will then automatically be generated. When rebooting, STARTUP_NAT5.COM will then be invoked with the most current Natural version number as parameters P1 and parameter P2 will be set to BP. For more information, see Changing a Process Environment with STARTUP_NAT5.COM.

- Asks whether you want to modify the system startup database (only if the directory SYS\$STARTUP was selected to contain STARTUP_NAT5.COM).
- Creates the patch level file in the version subdirectory of Natural directory (in this version, "V511p").

Note: Patch level files are for internal use and should not be modified or deleted. They are used for other installations.

- Inserts the node specific buffer pool section into the NATURAL.INI file.
- Asks for the location of the buffer pool section file.
- Creates the buffer pool start procedure NATBPENV_<nodename>.COM

Note: For more information, see Activating the Natural Buffer Pool.

- Executes STARTUP_NAT5.COM for the new Natural version.
- Verifies the installation.

PCSI Installation Procedure

Before you start installing Natural using the PCSI procedure, perform the steps necessary for Installing and Setting up Software AG products for OpenVMS and see the information described in Before You Start Installing Natural 5.1.1 Under OpenVMS.

You started the installation using the command procedure SETUP.COM located on CD to install Natural in the OpenVMS environment.

SETUP.COM copies the Natural PSC file from the CD to the SAG\$ROOT:[CDINST] directory and starts the Polycenter Software Installation utility (PCSI). During the installation procedure, a number of general information messages are displayed. Read all messages carefully and follow any advice they may provide.

Continue the PCSI installation

The following messages are displayed during the installation process:

```
The following product has been selected:
SAG AXPVMS NAT_vrsp Vv.rs-PLp Layered Product [Installed]
```

```
Do you want to continue? [YES]
Answer: yes
```

The installation procedure checks if the product SAGBASE (GBA) has already been installed and registered with the PCSI utility. If GBA has been installed but not yet registered, you will be asked to do so. Register by following the instructions on the screen.

If the SAGBASE software has not been found on your system the installation aborts.

Modify the PCSI options

```
Do you want the defaults for all options? [YES]
Answer "no" to modify the options.
```

```
Do you want to copy the examples?
Answer: yes
```

```
Print READ_ME_FIRST.TXT (SYS$PRINT)?
Answer is optional (yes or no)
```

```
Move STARTUP_NATv.COM to SYS$STARTUP?
```

Press RETURN to accept the default: the startup file is moved to the SYS\$STARTUP directory and an entry is made in the startup database. Software AG recommends running the STARTUP_NATv.COM procedure during system startup.

If you enter NO, the startup file will be moved to the directory SAG\$ROOT:[NATURAL].

```
If you used the default value, the following prompt is displayed:
Enable STARTUP_NATv.COM using SYSMAN? [YES]:
```

Press RETURN to generate entries in the system startup database in order to execute the procedure automatically during system startup.

An entry of the following form will be generated:

Phase	Mode	File
LPBETA	DIRECT	STARTUP_NATv.COM

Run STARTUP_NAT5.COM after successful installation?

Answer is optional (yes or no).

Are you satisfied with these options ?

Answer is optional (yes or no).

The procedure now installs Natural to the destination directory.

Setup the Natural buffer pool section file

The procedure inserts the node-specific buffer pool section into the NATURAL.INI file.

The information about the global section file for the Natural buffer pool file is displayed. You have the choice to place the section file into the NATETC directory or to another location.

Place global section file into NATETC ?

Answer is optional (yes or no)

If you specified "Run STARTUP_NAT5.COM after successful installation", the procedure continues by executing STARTUP_NATv.COM with parameters P1: <vrsp> and P2:BP to define the logical names required by Natural. The Natural images will not be installed. See the section Changing a Process Environment with STARTUP NAT4.COM below.

After a successful installation, the PCSI utility displays the message:

The following product has been installed:

SAG AXPVMS NAT_vrsp Vv.rs-PLp Layered Product

After the Installation Procedure

- Completing the Installation
- Verifying the Installation
- Changing a Process Environment with STARTUP NAT4.COM
- Activating the Natural Buffer Pool
- Remote Debugger

Completing the Installation

To complete your Natural installation, go to the following directory:

```
$ set def sag$root:[Natural.v511p.install]
```

In this directory, execute the following procedure:

```
$ @SAGINST_NAT.COM
```

The "Installation Procedure" screen appears. It offers two functions:

- 1 - Load Natural modules
- 2 - Check logfile of inpl procedure

To complete the installation, first execute Function 1, then execute Function 2. If you want to use the Natural command processor, execute Functions 3 and 4.

- 3 - Specify Adabas DBID for SYSNCP
- 4 - Create SYSNCP file

Your installation is now complete. To invoke Natural, enter "NAT51".

Verifying the Installation Procedure

To verify the product entry in the PCSI database enter:

```
$ PRODUCT SHOW PRODUCT NAT_<vrsp>
```

Changing a Process Environment with STARTUP_NAT5.COM

During the Natural installation with PCSI as described above, the command procedure STARTUP_NAT5.COM was executed for the environment, if you answered "Run STARTUP_NAT5.COM after successful installation?" with yes. However, if you want to change a user-specific environment, you can use STARTUP_NAT5.COM again, but you specify different parameters. These parameters are:

- P1 - Natural version, for example 5112 (Natural version 5.1.1. does not use a version file anymore)
- P2 - BP or NOBP, that is, whether you want to activate the Natural buffer pool or not.
- P3 - INST or nothing, that is, whether you want to install the Natural Images or not.

Note:

If you wish to install the Natural images, you must have the privileges SETPRV, CMKRNL, SYSNAM or SYSPRV.

Enter the following command to start STARTUP_NAT5.COM:

```
$ @STARTUP_NAT5 P1 P2 P3
```

for example @STARTUP_NAT5 5112 BP INST.

Activating the Natural Buffer Pool

To activate the Natural buffer pool, you execute the command procedure STARTUP_NAT5.COM with parameter P2 = "BP" as in the following example:

```
$ @STARTUP_NAT5.COM <vrsp> BP
```

Remote Debugger

If you want to use the remote debugger, copy `sag$root:[Natural.v511p.dbrmt.i386]nrd.exe` to your Windows computer.

Transferring the Remote Debugger

To transfer the Natural Remote Debugger from your OpenVMS environment to a Windows PC, perform the following steps:

1. Open the command prompt on your Windows PC.
2. Run Windows ftp service:

```
ftp <NODE>
```

where <NODE> is the Open VMS machine where your Natural installation is located on.

3. After you have logged on successfully, apply the ftp 'binary' command to switch to binary transfer mode.
4. Use the ftp 'SET DEFAULT' command to go to the OpenVMS directory where the Remote Debugger installation is available.

```
set default SAG$ROOT:[NATURAL.V<vrsp>.DBRMT]
```

5. Apply the ftp 'get NRD_I386.EXE' command to have the Remote Debugger installation transferred to your PC. NRD_I386.EXE is a self-extracting ZIP file.
6. In Windows, run NRD_I386.EXE to unzip all files. The files will be put into the I386 directory.
7. Go to directory I386 and install the Remote Debugger by running "setup.exe" from the command prompt of your Windows machine.

Setting Up the Entire System Server Interface

The Entire System Server Interface (ESX) is required, if the product Entire System Server (ESY) is to be used. The Entire System Server Interface is part of Natural Version 5.1.1 and no extra installation is needed.

Additionally, Natural Version 5.1.1 provides the libraries SYSNPE and SYSNPR.

SYSNPE is the Entire System Server online tutorial as starting help for Entire System Server users. For more information about Entire System Server, see Entire System Server Overview.

The library SYSNPR contains the utility CHANGEDB which is used to change the database ID of the Entire System Server DDMs.

This section covers the following topics:

- Prerequisites
- Activation

Prerequisites

The Entire System Server Interface provides access to Entire System Server on OS/390, VSE/ESA and BS2000/OSD via Entire Net-Work. For full support of the Entire System Server Interface, WCP 581 or above is required on the mainframe platforms.

Activation

The Entire System Server Interface is not active if you use the standard Natural configuration settings. The value of the Entire System Server Interface database (Natural profile parameter ESXDB) is set to 0 by default. To use the Entire System Server Interface you need to run the Natural Configuration Utility and must set the value of the parameter ESXDB to 148. The parameter can be found in the Natural Configuration Utility > Natural Parameter Files > Product Configuration > Entire System Server.

ESXDB specifies the database ID used for the DDMs of Entire System Server. This DBID does not specify the target DBID of Entire System Server requests but tells Natural which DBID is used for the catalogued Entire System Server DDMs. The effective Entire System Server target DBID will be specified with the NODE field which is part of all Entire System Server DDMs.

Please change the value of ESXDB to 148 to run Natural with Entire System Server Interface support. All Entire System Server DDMs are catalogued with DBID 148.

After starting Natural again, you may access Entire System Server nodes running on the mainframes via Entire Net-Work.

Currently, the customization of Entire System Server Interface supports the modification of the Entire System Server DDMs only.

How to use a different DBID for the Entire System Server DDMs:

Library SYSNPR contains the CHANGEDB program which is used to modify the database ID of all Entire System Server DDMs. You will find all Entire System Server DDMs in the library SYSNPE.

The database ID entered as a new DBID value in the CHANGEDB program must also be specified as the value of the Entire System Server Interface database parameter (ESXDB) in the Natural Configuration Utility.

General Information for Natural Security

This section covers the following topics:

- General Installation Information
- Natural Security in a Heterogeneous Environment

Platform-specific installation procedures:

- Installing Natural Security under OpenVMS
 - Installing Natural Security under UNIX
-

General Installation Information

It is recommended that you install Natural Security *after* having installed all other subproducts of Natural, as this makes defining the subproducts' system libraries to Natural Security easier.

Once Natural Security is installed, Natural on the assigned system file (FNAT) can only be accessed under the control of Natural Security. Natural Security cannot be removed again once it has been installed. It is therefore recommended that you make a backup copy of your FNAT system file before you install Natural Security.

Shared Natural Security System File FSEC

As of Natural Security Version 2.2, it is no longer necessary to create a new Natural Security system file (FSEC) for a new Natural Security version. This means that you do not need separate FSEC files for different Natural Security versions.

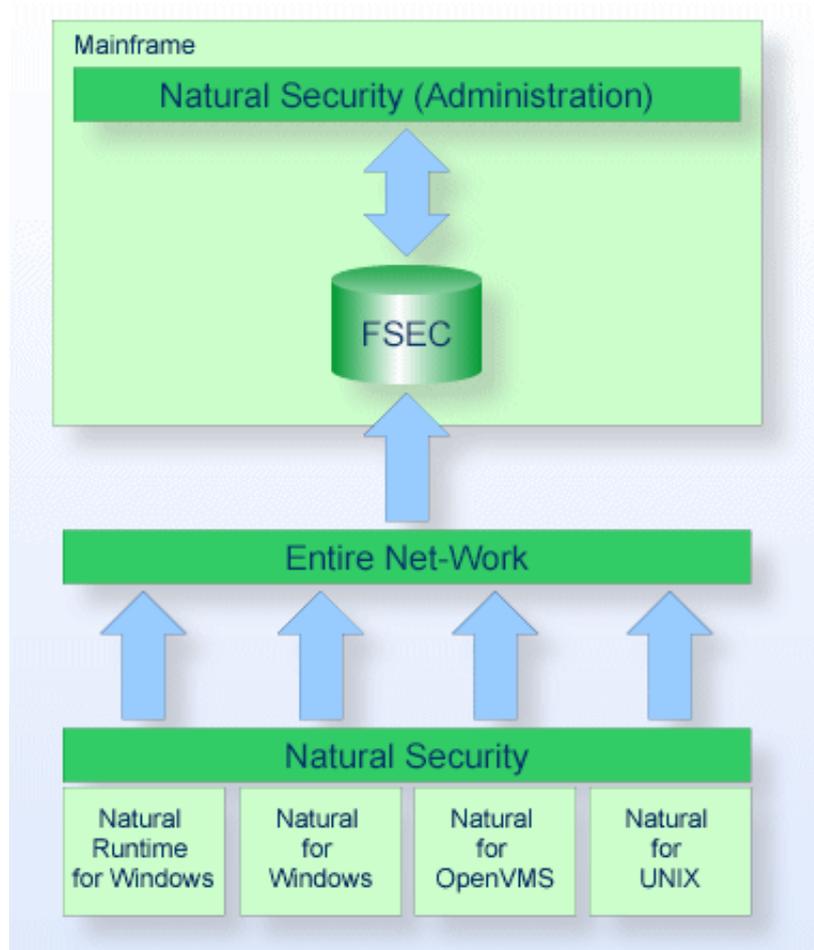
Instead you can keep an existing (Version 2.2 or above) FSEC file and share it between different Natural Security versions. This also means that you do not have to transfer your existing Natural Security data to another FSEC file or convert them.

If you use an FSEC file shared by different Natural Security versions, always use the highest of these versions for the maintenance of your Natural Security data in order to ensure the consistency of your data.

Natural Security in a Heterogeneous Environment

With Natural Security for mainframes, all enterprise security profile data can be stored and administered centrally in a mainframe system file, which is accessible to a heterogeneous environment, thus simplifying and standardizing security maintenance on a company-wide basis. The security data in the mainframe Natural Security system file (FSEC) can be retrieved via remote database calls, managed by Entire Net-Work, from the following Natural Security installations:

- Natural Runtime for Windows
- Natural for OpenVMS
- Natural for UNIX
- Natural for Windows



From the non-mainframe Natural Security installations, you can log on to the Natural Security mainframe environment and retrieve security data.

However, in the non-mainframe Natural Security installations, the security data maintenance application SYSSEC is disabled, as are the following Natural Security interface subprograms for modifying security profiles:

- NSCLI
- NSCOB
- NSCMA
- NSCUS

If these interface subprograms are invoked, error NAT0828 is returned.

For further information on setting up Natural Security in a heterogeneous environment, see below.

Setting Up Natural Security in a Heterogeneous Environment

Configuring Entire Net-Work

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

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

- LW
- LC
- LQ
- LV
- LS

This prevents values being either translated or swapped.

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

Customizing the Natural I/O Conversion Table on Non-Mainframe Platforms

If you want to use special characters not contained in the default Natural character set (ISO08859), for example in passwords, you must customize the Natural I/O conversion table in the following sections of the file NATCONV.INI:

ISO8859_1->EBCDIC

EBCDIC->ISO8859_1

You can use the call CMCNV provided in the module SULCONV in the library SYSTRANS to check the settings.

For further information on the file NATCONV.INI, see your Natural Operations documentation.

Setting Up Module Access

When you are using Natural Security across platforms, security profiles held in the mainframe FSEC system file will usually apply to data held in libraries on another platform.

If you use the Allow/Disallow Modules definition, it is recommended that you use the "Module names held in the user buffer" fields of the library maintenance function Disallow/Allow Modules screen. For modules which are not on the mainframe FUSER, use the Free List.

For further information, see the section on disallowing/allowing modules in the Natural Security for Mainframes documentation.

Setting Up Natural DDM Security

If you want to use a non-mainframe platform as your Natural development environment, you must move any DDMs required by Natural modules to the library SYSTEM (FUSER). This is necessary because Natural Security runtime only checks DDMs located in the library SYSTEM.

Installing Natural Security under UNIX

This section describes step-by-step how to install Natural Security.

- Prerequisites
- Installation Process
- After the Installation

Before you start the installation process, please perform the steps described in the section Installing and Setting Up Software AG Products under UNIX and refer to the section General Information for Natural Security.

Prerequisites

To install Natural Security under UNIX, ensure that your computer meets the following prerequisites:

- Natural Version 5.1.1.
- Adabas Version 3.1.1.
- Entire Net-Work Version 2.1.1 (only required if FSEC is located remotely).

Installation Process

See the following list for an overview of the necessary steps:

- Step 1: Mount Your CD-ROM Drive
- Step 2: Choose the Installation Mode
- Step 3: Start the Installation Process
- Step 4: Enter A Valid CD-ROM Directory
- Step 5: Accept License Agreement
- Step 6: Enter \$SAG Environment Variable
- Step 7: Specify License File Location
- Step 8: Confirm your Installation Settings
- Step 9: Environment Settings
- Step 10: Parameter Module Template
- Step 11: Review Environment Settings for FNAT / FUSER
- Step 12: FSEC System File
- Step 13: Log System File
- Step 14: Relink Natural
- Step 15: INPL Process
- Step 16: Finish Installation

Step 1: Mount Your CD-ROM Drive

If your CD-ROM drive has not yet been mounted, mount it now as described in section Step 4: Install the Contents of the CD-ROM to Disk of the steps common to all Software AG products.

When the installation is started, the setup procedure will check the hardware platform and operating system version and then start the appropriate installation program INSTALL.

Step 2: Choose Installation Mode

The installation procedure examines the environment variable DISPLAY to determine whether to run in graphical or character mode.

To use **graphical mode**, the environment variable DISPLAY must be set. If it is not yet set in your environment and you want to use graphical mode, set it using the following command:

```
DISPLAY="<your_machine_name>:0"  
export DISPLAY
```

Character mode will be used automatically if the environment variable DISPLAY is not set. If DISPLAY has been set in your environment but you want to use character mode, you can disable it using the -nw option when you start the installation.

At the end of an installation process, in either mode, a **batch script** is generated and written to the end of the installation log. It lists the parameters specified for that particular installation.

Example:

```
# ----- <Start of generated batch script> -----
# -- <Adapt the following lines until end of generated> --
# ----- < batch script to your needs > -----
#!/bin/sh
# You should replace SECRET by the actual password
# or (even better) call this script with superuser privileges.
#
SAG="/usr/SAG"; export SAG
/bin/sh /cdrom/setup.ux -batch \
  -sagenv /usr/SAG/sagenv.new \
  -installType customized \
  -user sag \
  -password SECRET \
  -authcmd sudo \
  -dbident 022 \
  -packages "
  Nucleus & utilities : off
  Adalnk : on
    Optimized Version of Adalnk : on
    Examples : on
    DBA Workbench : on"
# ----- <End of generated batch script> -----
```

You can use the **-help** option to display a list of all supported parameters.

Step 3: Start the Installation Process

To perform this step, you must either be the user `sag` or a member of the group `sag` to which the administrator and all users of Software AG products are assigned to. Do not perform this step as the user `root`.

Start the installation procedure from a **writable** working directory. We recommend `$SAG/INSTALL`. Enter the command:

```
sh <mount_dir>/setup.ux
```

where `<mount_dir>` is the starting directory on your product CD-ROM. Upper and lower case letters are possible.

The setup program is started and guides you through the installation. During installation you have to provide the license key.

Note:

The following descriptions of installation steps assume that the graphical installation mode is used. The step sequence is the same in character mode.

Step 4: Enter A Valid CD-ROM Directory

In this screen you have to confirm the path of your CD-ROM drive.

By default, the path of the mounted CD-ROM drive is displayed. You can enter a different path or use the Browse button to change the path.

Click Next to proceed.

Step 5: Accept License Agreement

In this screen, the license agreement is displayed. You must accept it to proceed with the installation.

Note:

If you run the installation procedure in character mode, at each command prompt, you must type in the exact wording (for example: "accept" for "accept", not just "y" or the ENTER key).

Step 6: Enter \$SAG Environment Variable

In this screen you can change the value of the \$SAG environment variable, which is the path name of the directory tree, where all Software AG products are installed.

By default, the current \$SAG variable is displayed. You can enter a different path or use the Browse button to change the path.

Click Next to proceed.

Step 7: Specify License File Location

In this screen you specify the directory of your license file.

If no common SAG environment exists yet, your current directory is displayed. Enter the path where your license file is located or the Browse button to change the path.

If you click on the View button, the content of your license file will be displayed in a separate screen. Click OK or Quit to go back to the license file screen.

Click Next to proceed.

Step 8: Confirm Your Installation Settings

In this screen the paths of your source directory and the \$SAG variable are displayed.

To review or change your settings, click on the Back button.

Click Next to begin copying files. A screen will be displayed informing you about the extracted files. Click Next to continue.

Step 9: Environment Settings

In this screen the paths where Natural (\$NATDIR / \$NATVERS) and Adabas (\$ADADIR / \$ADAVERS) are installed are displayed. Confirm these settings or modify them using the Browse buttons.

To use a remote FSEC, select "Use remote database".

Click Next to proceed.

Step 10: Parameter Module Template

Select the Natural parameter module you want to use as a template. The settings in this Natural parameter module will be used to create a new parameter module for Natural Security called NSCPARM.

Note:

If NSCPARM already exists, a copy of it will be saved.

Click Next to proceed.

Step 11: Review the Environment Settings for FNAT / FUSER

Adapt the values displayed in this screen to your Natural environment.

Step 12: FSEC System File

In the following screens select the database ID and file number for the FSEC system file.

If no local FSEC exists yet, the system file will be created and initialized. If you choose an existing FSEC, its contents will not be modified.

If you are using a local FSEC system file, all available databases are displayed. If you specified "Use remote database" in Step 9: Environment Settings, enter the DBID and FNR of an *existing* FSEC on your remote database you want to use.

Step 13: Natural Security Log File - optional

If you want to use the Natural Security feature "Logging of Maintenance Functions" described in the section Processing of Maintenance Log Records, enter or select the database ID and file number for the Natural Security log file in the following screens. If you do not want to use this feature, enter "0" as DBID.

If you are using a local database, all available database IDs and file numbers are displayed. If you want to use an existing log file, select the DBID and FNR. If no log file exists yet, the Natural Security installation creates a new log file. Enter a DBID and FNR.

If you specified "Use remote database" in Step 9: Environment Settings, enter the DBID and FNR of an *existing* log file on the remote database you want to use.

Note:

Please note that the option Logging of Maintenance Functions must additionally be enabled in Natural Security after the installation.

Step 14: Relink Natural

In this screen the parameters for relinking are displayed where you can specify the relevant parameters.

- For Adabas choose between dynamic and static binding.
- For SQL enter the SQL database you want to use.
- Select the check boxes if you want to use SYNC SORT.

Click Next to display the output of this relinking process. Please review the results and Click Next.

Step 16: Finish Installation

This screen informs you that the installation has finished successfully. It is recommended to view the README file for further information. If you do not want to display the file, remove the selection.

Click Finish.

After the Installation

Step 1: Change the Password of the User DBA

1. Invoke Natural.
2. On the Natural Security logon screen, type the library ID "SYSSEC", the user ID "DBA", the password "DBA", and a new password, and press ENTER.
3. Type the new password again and press ENTER to confirm the password change.

The following steps are only relevant if your FSEC system file was initialized for the first time. Perform these steps immediately after a successful installation of Natural Security.

Step 2: Define Administrators

1. Create a user security profile for each person who is to be a Natural Security administrator.
2. Link each Natural Security administrator to the library SYSSEC.

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

- On the logon screen, type the library ID "SYSSEC", the user ID "DBA" and the password as established in Step 2.
The Natural Security Main Menu is displayed.
- Enter the code "M".
A window is displayed.
- Mark the object type "User" with a character or with the cursor.
The User Maintenance selection list is displayed.
- In the command line of the User Maintenance selection list, enter the command "ADD".
A window is displayed.
- Choose a user ID for your Natural Security administrator.
For example, if the administrator's name were Arthur Dent, you could choose "AD" as his user ID; the following steps will take this as an example.
- Enter the user ID "AD" and the user type "A".
The Add User screen is displayed.
- Enter the user name "Arthur Dent" and set Private Library to "N".
- Press PF3.
The user Arthur Dent is now defined to Natural Security under the user ID "AD".
The User Maintenance selection list is displayed again.
- In the "Co" column of the selection list, mark the user "AD" with the function code "LL".
A window is displayed.
- Enter the library ID "SYSSEC".
The Link User To Libraries selection list is displayed
- In the "Co" column of the selection list, mark the library SYSSEC with the function code "LK".
The user Arthur Dent is now linked to the library SYSSEC.
- In the command line, enter the direct command "LOGOFF".
The Natural Security logon screen is displayed.

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

Note:

Once you have successfully defined administrators, it may be advisable to delete the user DBA to make sure that the user ID "DBA" cannot be used by unauthorized users to gain access to SYSSEC. To delete the user DBA, log on to SYSSEC with the user ID "AD". Go to the User Maintenance selection list as described above; on the list, mark the user "DBA" with the function code "DE". A window is displayed, in which you enter the user ID

"DBA". The user DBA is now deleted.

Step 3: Define System Libraries

This step must only be performed if Version 5.1.1 is your first version of Natural Security; that is, if you have not used any previous version of Natural Security. Otherwise, omit this step.

Create security profiles for all system libraries of Natural and Natural subproducts installed at your site. It is recommended that you create the security profiles automatically using the function "Definition of System Libraries" as described below.

System library IDs begin with "SYS".

Note:

You can also create security profiles individually using the "Add a New Library" function.

1. Log on to the library "SYSSEC".
2. On the Natural Security Main Menu, select "Administrator Services".
3. On the Administrator Services Menu, select the function "Definition of System Libraries".
A list of the system libraries of Natural and all Natural subproducts installed at your site is displayed. For each system library, a library-specific security profile is provided in which all the necessary components are already defined appropriately.
4. Either mark on the list individual libraries to which their predefined profiles should be applied or choose to have the predefined profiles applied to all system libraries simultaneously.

Notes:

This step should **not** be performed for SYS libraries containing Natural utilities, as it is recommended that these utilities be protected as described in the section "Protecting Natural Utilities".

If you use the function "Definition of System Libraries" in an initial installation, you have to set the Natural profile parameter MADIO to a value of at least "2000".

Other Software AG products such as Predict and Connect have their own security functions in addition to Natural Security.

Installation Verification

After performing Step 1: Change the Password of the User DBA, Natural Security is operational. No further verification is required.

Installing Natural Security 5.1.1 under OpenVMS

This section describes how to install Natural Security under OpenVMS on an AXP computer. It covers the following topics:

- Before You Start
- Installing Software AG Products from CD-ROM under OpenVMS
- Installing and Setting up Natural Security
- After the Installation Procedure

See also:

- General Installation Information about Natural Security
 - Natural Security in a Heterogeneous Environment
-

Before You Start

Before you begin to install Natural Security, ensure that your computer meets the installation prerequisites described below. This section covers the following topics:

- Installation Prerequisites
- Installing Natural Security in a Cluster Environment
- Naming Conventions
- Logical Name Assignments
- Recommended Directory Structure

Installation Prerequisites

Software

Before you begin to install Natural Security under OpenVMS, the following software must be installed and running:

- Natural Version 5.1.1
- OpenVMS Version 7.2 or above,
- Adabas Version 4.1,
- Sagbase Version 1.2.3 (only if you install Sagbase with this version),
- Entire Net-Work 3.2.3 (only required if FSEC is located remotely),

Disk Space

The space required on disk will be checked by the PCSI utility during the installation.

Installing Natural Security in a Cluster Environment

If you install Natural Security in a cluster environment, you have to install it on each node in the cluster environment.

Note:

Sagbase must be installed on each node on which Natural Security is to be installed.

Initial Installation in a Cluster Environment

Depending on how Sagbase has been installed, the initial Natural Security installation within a cluster will choose either the common or the specific root directory. The installation procedure checks if there is already an existing Natural Security installation in the cluster.

Update Installations in a Cluster Environment

During an update installation the values of the system parameters are automatically checked.

Naming Conventions

The following notations are used in the names of files and directories:

Notation	Description
product	product name or short product name (PPP)
v	version number
r	release number
s	system maintenance level
p	patch level
os	operating system short name

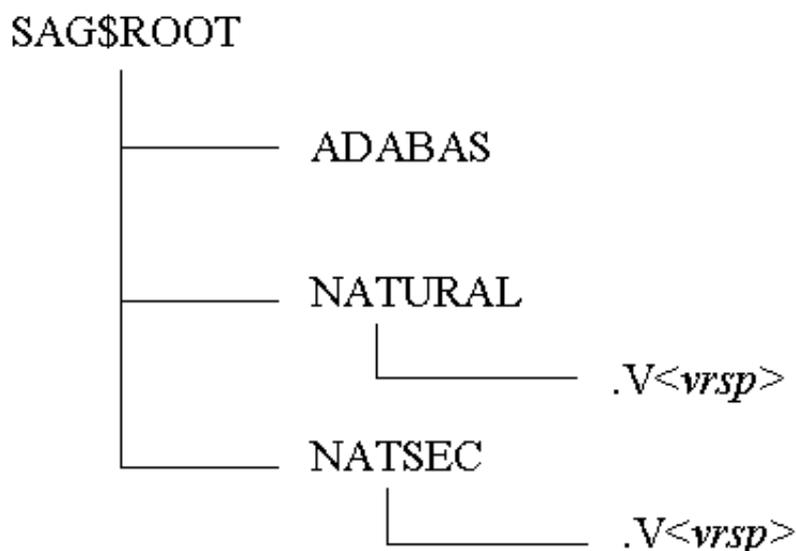
Logical Name Assignments

Natural Security uses the following logical name assignment:

Logical Name	Directory
NATSEC	NATBIN:NATSEC <i>vrsp</i> .EXE

Recommended Directory Structure

Software AG recommends the following directory structure for its products under OpenVMS:



Installing and Setting Up Natural Security

This section covers the following topics:

- Overview of the Installation Procedure
- PCSI Installation Procedure

Overview of the Installation Procedure

The Natural Security installation procedure performs the following steps:

- Checks which OpenVMS version is running.
- Temporarily sets the privileges (BYPASS, CMKRNL, SYSNAM).
- Checks whether Sagbase is installed.
- Modifies DBA account, if required.
- Registers product Sagbase to PCSI, if required.
- Calculates and verifies the disk space needed for the installation on both the work-directory device and the installation device.
- Checks whether Natural is installed.
- Checks whether Adabas is installed.
- Creates the directories SAG\$ROOT:[NATSEC] and SAG\$ROOT:[NATSEC.Vnnnp].
- Moves all files and images to the appropriate directories.
- Sets protections for files and directories.
- Creates the patch level file in the version subdirectory of the Natural Security directory (in this version, "V511p")

Note: Patch level files are for internal use and should not be modified or deleted. They are used for other installations.

PCSI Installation Procedure

Before you start installing Natural Security using the PCSI procedure, read *Installing and Setting up Software AG products for OpenVMS* and see the information described in the section *Before You Start*.

You started the installation using the command procedure `SETUP.COM` located on CD to install Natural in the OpenVMS environment.

`SETUP.COM` copies the Natural PSC file from the CD to the `SAG$ROOT:[CDINST]` directory and starts the Polycenter Software Installation utility (PCSI). During the installation procedure, a number of general information messages are displayed. Read all messages carefully and follow any advice they may provide.

Continue the PCSI installation

The following messages are displayed during the installation process:

```
The following product has been selected:
SAG AXPVMS NSC_vrsp Vv.rs-PLp Layered Product [Installed]
```

```
Do you want to continue? [YES]
Answer: yes
```

The installation procedure checks if the product SAGBASE (GBA) has already been installed and registered with the PCSI utility. If GBA has been installed but not yet registered, you will be asked to do so. Register by following the instructions on the screen.

If the SAGBASE software has not been found on your system the installation aborts.

The installation procedure checks if the product prerequisites Natural and Adabas has already been installed and registered with the PCSI utility.

Modify the PCSI options

Do you want the defaults for all options? [YES]
 Answer "no" to modify the options.

Print READ_ME_FIRST.TXT (SYS\$PRINT)?
 Answer is optional (yes or no)

Are you satisfied with these options ?
 Answer is optional (yes or no).

The procedure now installs Natural Security to the destination directory.

After a successful installation, the PCSI utility displays the message:

The following product has been installed:
 SAG AXPVMS NSC_vrsp Vv.rs-PLp Layered Product

After the Installation Procedure

This section covers the following topics:

- Verifying the Installation Procedure
- Initial Installation
- Update Installation

Verifying the Installation Procedure

To verify the product entry in the PCSI database enter:

```
$ PRODUCT SHOW PRODUCT NSC_<vrsp>
```

Initial Installation

The following sections are only relevant if this is your first version of Natural Security.

1. Make sure that Natural Version *nnn* (where *nnn* must be the same version as the Natural Security Version *nnn* you are installing) is installed on your OpenVMS system.
2. Make sure that the Adabas database is running.
3. Enter the following command to start the installation procedure:

```
$ @SAGINST_NSC.COM
```

A menu is displayed providing several functions.

4. Perform each of the functions.

Note for the "Specify the FSEC profile parameter in the parameter file" function:

When you choose this function, the Natural Parameter Setting screen for the current parameter file appears. Using the Edit option, enter the same DBID and FNR for FSEC that you specified in functions 1 and 2 respectively. For further information, refer to the section NATPARAM Utility.

Note for the "Add FSEC definition to NATCONF.CFG" function:

For Natural Security to run, the section [NAT-DB-TABLE] in the Natural global configuration file NATCONF.CFG must contain the following sub-section:

```

###Natural FSEC Definition
  [ DBID_xxx]
  GEN = ADA
  EXE = ADA
  [ DBID_xxx-END ]

```

where *xxx* is the number of the database which contains FSEC.

If this sub section is missing (because NATCONF.CFG was modified using the NATPARM Utility), add it, and if it is present, edit it accordingly.

Natural Security is now installed and operational.

Change the Password of the User "DBA"

1. Invoke Natural.
2. On the Natural Security logon screen, type in the library ID "SYSSEC", the user ID "DBA", the password "DBA", and a new password, and press ENTER.
3. Type the new password again and press ENTER to confirm the password change.

Define Administrators

Define the administrators immediately after successfully installing Natural Security.

1. Create a user security profile for each person who is to be a Natural Security administrator.
2. Link each Natural Security administrator to the library SYSSEC.

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

- On the logon screen, type the library ID "SYSSEC", the user ID "DBA" and the password as established before.
- The Natural Security Main Menu is displayed. On this menu, enter the code "M".
- A window is displayed. In this window, mark the object type "User" with a character or with the cursor.
- The User Maintenance selection list is displayed. In the command line of the User Maintenance selection list, enter the command "ADD".
- A window is displayed. Choose a user ID for your Natural Security administrator (for example, if the administrators name were Arthur Dent, you could choose "AD" as his user ID; the following steps will take this as an example). In the window, enter the user ID "AD" and the user type "A".
- The Add User screen is displayed. Enter the user name "Arthur Dent" and set Private Library to "N" (and press ENTER).
- Press PF3. The user Arthur Dent is now defined to Natural Security under the user ID "AD".
- The User Maintenance selection list is displayed again. In the "Co" column of the selection list, mark the user "AD" with the function code "LL".
- A window is displayed. In the window, enter the library ID "SYSSEC".
- The Link User To Libraries selection list is displayed. In the "Co" column of the selection list, mark the library "SYSSEC" with the function code "LK". The user Arthur Dent is now linked to library SYSSEC.
- In the command line, enter the direct command "LOGOFF". The Natural Security logon screen is displayed.

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

Note:

Once you have successfully defined administrators, it may be advisable to delete the user DBA to make sure that the user ID "DBA" cannot be used by unauthorized users to gain access to SYSSEC. To delete the user DBA, log on to SYSSEC with the user ID "AD". Go to the User Maintenance selection list as described above; on the list, mark the user "DBA" with the function code "DE". A window is displayed, in which you enter the user ID

"DBA". The user DBA is now deleted.

Define System Libraries

You must now create security profiles for all system libraries of Natural and Natural subproducts installed at your site. It is recommended that you create the security profiles automatically, using the function "Definition of System Libraries" as described below.

System library IDs begin with "SYS".

1. Log on to the library "SYSSEC".
2. On the Natural Security Main Menu, select "Administrator Services".
3. On the Administrator Services Menu, select the function "Definition of System Libraries".
4. A list of the system libraries of Natural and all Natural subproducts installed at your site is displayed. For each system library, a library-specific security profile is provided in which all the necessary components are already defined appropriately.
5. Either mark on the list individual libraries to which their predefined profiles should be applied or choose to have the predefined profiles applied to all system libraries simultaneously.

Notes:

This should **not** be performed for SYS libraries containing Natural utilities, as it is recommended that these utilities be protected as described in the section "Protecting Natural Utilities".

If you use the function "Definition of System Libraries" in an initial installation, you have to set the Natural profile parameter MADIO to the value "0". The default value is "2000".

Other Software AG products such as Predict and Connect have their own security functions in addition to Natural Security.

Update Installation

The following sections are only relevant if this is **not** your first version of Natural Security.

1. Before you proceed, make sure that Natural Version *nnn* (where *nnn* must be the same version as the Natural Security Version *nnn* you are installing) is installed on your OpenVMS system.
2. Make sure Adabas is running.
3. Enter the following command to start the installation procedure:

```
$ @SAGINST_NSC.COM
```

A menu is displayed providing several functions.

4. Perform each of the functions *except* Function 2, as described for initial installation. In Functions 3 and 4, enter the DBID and FNR of your existing FSEC system file, as a new FSEC system file is not loaded.

Natural Security is now installed and operational.

