Installing the Natural Optimizer Compiler

This section describes how to install the Natural Optimizer Compiler (also referred to as NOC) in the various environments supported.

- General Information
- Prerequisites
- Installation Tape - OS/390
- Installation Tape - VSE/ESA
- Installation Tape - BS2000/OSD
- Installation Tape - VM/CMS
- Installation Procedure
- Installation Verification

General Information

Below is information on:

- Installation Jobs
- Using System Maintenance Aid

Installation Jobs

The installation of Software AG products is performed by installation jobs. These jobs are either created manually or generated by Software AG's System Maintenance Aid (SMA).

For each step of the installation procedure described below, the job number of a job performing the corresponding task is indicated. This job number refers to an installation job generated by SMA.

Using System Maintenance Aid

For information on using SMA for the installation process, refer to the System Maintenance Aid documentation.

Prerequisites

Products and versions are specified in the sections Natural and Other Software AG Products and Operating/Teleprocessing Systems Required in the current Natural Release Notes for Mainframes.

Installation Tape - OS/390

The installation tape contains the dataset listed in the table below.

Dataset Name	Contents
NOC*nnn*.LOAD	This dataset contains the Natural Optimizer Compiler load modules.

The notation *nnn* in dataset names represents the version number of the product.

For a detailed description of the installation tape refer to the Report of Tape Creation which accompanies the tape.

Space Requirements

The space the dataset requires on disk is shown in the Report of Tape Creation.

Copying the Tape Contents to Disk

If you are using System Maintenance Aid (SMA), refer to the SMA documentation (included on the current edition of the Natural documentation CD).

If you are **not** using SMA, follow the instructions below.

This section explains how to:

- Copy data set COPY.JOB from tape to disk.
- Modify this data set to conform with your local naming conventions.

The JCL in this data set is then used to copy all data sets from tape to disk.

If the datasets for more than one product are delivered on the tape, the dataset COPY.JOB contains the JCL to unload the datasets for all delivered products from the tape to your disk.

After that, you will have to perform the individual install procedure for each component.

Step 1 - Copy data set COPY.JOB from tape to disk

The data set COPY.JOB (label 2) contains the JCL to unload all other existing data sets from tape to disk. To unload COPY.JOB, use the following sample JCL:

```
//SAGTAPE JOB SAG,CLASS=1,MSGCLASS=X
//* --------------------------------
//COPY EXEC PGM=IEBGENER
//SYSUT1 DD DSN=COPY.JOB,
// DISP=(OLD,PASS),
// UNIT=(CASS,,DEFER),
// VOL=(,RETAIN,SER=<Tnnnnn>),
// LABEL=(2,SL)
//SYSUT2 DD DSN=<hilev>.COPY.JOB,
// DISP=(NEW,CATLG,DELETE),
// UNIT=3390,VOL=SER=<vvvvvv>,
// SPACE=(TRK,(1,1),RLSE),
// DCB=*.SYSUT1
//SYSPRINT DD SYSOUT=*
//SYSIN DD DUMMY
//
```


Where:

<*hilev*>	is a valid high level qualifier
<*Tnnnnn*>	is the tape number
<*vvvvvv*>	is the desired volser

Step 2 - Modify COPYTAPE.JOB

Modify the COPYTAPE.JOB to conform with your local naming conventions and set the disk space parameters before submitting this job:

- Set HILEV to a valid high level qualifier.
- Set LOCATION to a storage location.
- Set EXPDT to a valid expiration date.

Step 3 - Submit COPY.JOB

Submit COPY.JOB to unload all other data sets from the tape to your disk.

Installation Tape - VSE/ESA

The installation tape contains the following dataset:

Dataset Name	Contents
NOC*nnn*.LIBR	LIBR backup file.

The notation *nnn* in dataset names represents the version number of the product.

Copying the Tape Contents to Disk

If you are using System Maintenance Aid (SMA), refer to the SMA documentation (included on the current edition of the Natural documentation CD).

If you are **not** using SMA, follow the instructions below.

This section explains how to:

- Copy data set COPYTAPE.JOB from tape to library.
- Modify this member to conform with your local naming conventions.

The JCL in this member is then used to copy all data sets from tape to disk.

If the datasets for more than one product are delivered on the tape, the member COPYTAPE.JOB contains the JCL to unload the datasets for all delivered products from the tape to your disk, except the datasets that you can directly install from tape, for example, Natural INPL objects.

After that, you will have to perform the individual install procedure for each component.

Step 1 - Copy data set COPYTAPE.JOB from tape to disk

The data set COPYTAPE.JOB (file 5) contains the JCL to unload all other existing data sets from tape to disk. To unload COPYTAPE.JOB, use the following sample JCL:

```
* $$ JOB JNM=LIBRCAT,CLASS=0,                                          +
* $$ DISP=D,LDEST=(*,UID),SYSID=1
* $$ LST CLASS=A,DISP=D
// JOB LIBRCAT
* ***************************************
*     CATALOG COPYTAPE.JOB TO LIBRARY
* ***************************************
// ASSGN SYS004,NNN                              <------  tape address
// MTC REW,SYS004
// MTC FSF,SYS004,4
ASSGN SYSIPT,SYS004
// TLBL IJSYSIN,'COPYTAPE.JOB'
// EXEC LIBR,PARM='MSHP; ACC S=lib.sublib'       <------- for catalog
/*
// MTC REW,SYS004
ASSGN SYSIPT,FEC
/*
/&
* $$ EOJ
```

Where:

NNN	is the tape address
lib.sublib	is the library and sublibrary of the catalog

Step 2 - Modify COPYTAPE.JOB

Modify COPYTAPE.JOB to conform with your local naming conventions and set the disk space parameters before submitting this job:

Step 3 - Submit COPYTAPE.JOB

Submit COPYTAPE.JOB to unload all other data sets from the tape to your disk.

Installation Tape - BS2000/OSD

The installation tape contains the following dataset:

Dataset Name	Contents
NOC*nnn*.PAMS	Optimizer Compiler module library.

The notation *nnn* in dataset names represents the version number of the product. For a detailed description of the installation tape refer to the Report of Tape Creation which accompanies the tape.

Space Requirements

The space the dataset requires on disk is shown in the Report of Tape Creation.

Copying the Tape Contents to Disk

If you are not using 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 SRVnnn.LIB from Tape to Disk

This step is not necessary if you have already copied the library SRV*nnn*.LIB from another Software AG tape. For more information, refer to the element #READ-ME in this library.

The library SRV*nnn*.LIB is stored on the tape as the sequential file SRV*nnn*.LIBS containing LMS commands. The current version *nnn* 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=SRVnnn.LIBS, -
/   VOLUME=<volser>, DEV-TYPE=<tape-device>)
/ADD-FILE-LINK  LINK-NAME=EDTSAM, FILE-NAME=SRVnnn.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=SRVnnn.LIBS'
@WRITE  'SRVnnn.LIBS'
@HALT
/ASS-SYSDTA  SRVnnn.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, e.g. 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 SRV*nnn*.LIB:

```
/CALL-PROCEDURE  (SRVnnn.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’.

Installation Tape - VM/CMS

The installation tape contains the dataset listed in the table below.

Dataset Name	Contents
NOC*nnn*.TAPE	This dataset contains the Natural Optimizer Compiler load module.

The notation *nnn* in dataset names represents the version number of the product.

For a detailed description of the installation tape refer to the Report of Tape Creation which accompanies the tape.

Space Requirements

The space the dataset requires on disk is shown in the Report of Tape Creation.

Copying the Tape Contents to Disk

To copy the tape contents to disk

1. Position the tape for the TAPE LOAD command by calculating the number of tape marks as follows:
   If the sequence number of NOC*nnn*.TAPE, as shown by the Report of Tape Creation, is *n*, you must position over 3*n* - 2 tape marks (that is, FSF 1 for the first dataset, FSF 4 for the second, etc.)
2. Access the disk that is to contain the Natural installation files as disk **A**.
3. Ask the system operator to attach a tape drive to your virtual machine at the address X’181’ and mount the Natural Optimizer Compiler installation tape.
4. When the tape has been attached, enter the following CMS command:
   `TAPE REW`
   Position the tape by entering the CMS command:
   `TAPE FSF` *n*
   where *n* is the number of tape marks and is calculated as described above (3*n* - 2) .
5. Load the Natural Optimizer Compiler/CMS installation material by entering the CMS command:
   `TAPE LOAD * * A`
   Keep the tape drive attached to your virtual machine, because the tape is needed later in the installation procedure.

Installation Procedure

Step 1 - Modify the Natural Parameter Module - Jobs I060, I080

Activate the Natural Optimizer Compiler by adding the following macro to your Natural parameter module (NATPARM):

```
NTOPT ON
```

Assemble and link the parameter module.

Step 2 - Relink all Natural Nuclei - Jobs I060, I080

Adapt the link steps for Natural.

- **OS/390**

  Add the following INCLUDE instruction to all links of the Natural nuclei (if you are using a shared nucleus, then include this statement in the link of the shared part):

  ```
  INCLUDE NOCLIB(NOCNUC)
  ```

  Add the corresponding DD statement:

  ```
  //NOCLIB DD DSN=NOCnnn.LOAD,DISP=SHR
  ```
- **VSE/ESA**

  Add the following INCLUDE instruction and the corresponding sublibrary for the Natural Optimizer Compiler in the search chain for the linkage editor:

  ```
  INCLUDE NOCNUC
  ```
- **BS2000/OSD**

  Add the following INCLUDE instruction to the element LNATSHAR in NAT*nnn*.JOBS:

  ```
  INCLUDE NOCNUC,NOCnnn.MOD
  ```

  Relink your Natural nucleus as described in Step 5: Link the Natural Nucleus in Installing Natural under BS2000/OSD in the Natural Installation Guide for Mainframes.

- **VM/CMS**

  The list of text files to be included in the Natural module or DCSS is contained in REXX program NAT$LOAD EXEC (variable LOADLIST). To customize your Natural system, modify this EXEC with XEDIT by changing the LOADLIST as required.

  Add the following INCLUDE instruction to the program NAT$LOAD EXEC

  ```
  LOADLIST = LOADLIST 'NOCNUC'
  ```

  Relink your Natural nucleus with the procedure NATBLDM.

Installation Verification

1. Recatalog an existing program or write a new program and then catalog it.
2. Check the directory information for the program you have just cataloged, by using the LIST system command:
   `LIST DIR` *`object-name`*

The directory information for the specified object will be displayed, showing the size of the machine code at the bottom of the screen.

