Using Natural with VSAM System Files

The Natural system files FNAT, FUSER, FDIC, FSEC and FSPOOL can also be located on VSAM files.

To support the locking of source objects a separate FLOCK file and related paths are necessary.

This section covers the following topics:

- Prerequisites

- Installing Natural on VSAM System Files - z/OS

- Installing Natural on VSAM System Files - z/VSE

- Installation Verification with VSAM System Files

- Restrictions

Prerequisites

See the Prerequisites under Installing Natural for VSAM in the Installation section.

For the installation of Natural ISPF on VSAM system files, refer to the Natural ISPF Installation documentation. Be sure that you use the relevant module (NVSISPV) provided on the NVS installation tape.

Installing Natural on VSAM System Files - z/OS

This section describes step by step how to install Natural under the operating system z/OS using VSAM system files. The information given is basically a combination of the installation descriptions for both base Natural and Natural for VSAM (NVS), plus some points specific to VSAM system files.

Installation Tape

To install Natural with VSAM system files, you need the datasets for both base Natural and NVS. The required datasets are listed in the table below:

Dataset Name	Contents
NAT*nnn*.ERRN	Natural error messages.
NAT*nnn*.LOAD	Natural load modules.
NAT*nnn*.SRCE	Natural source modules and macros.
NAT*nnn*.JOBS	Example installation jobs.
NAT*nnn*.INPL	Natural system programs.
NAT*nnn*.EXPL	Natural example programs.
NVS*nnn*.LOAD	NVS load modules.
NVS*nnn*.SRCE	NVS source modules.
NVS*nnn*.EMPL	NVS example file.
NVS*nnn*.EXPL	NVS example programs.
NVS*nnn*.LINI	NVS Locking Source Objects.
NVS*nnn*.VINI	NVS FDIC initialization file.

The notation *nnn* in dataset names represents the version number of the product. The sequence of the datasets is shown in the Report of Tape Creation which accompanies the installation tape.

Copying the Tape Contents to a z/OS Disk

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

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

This section explains how to:

- Copy dataset `COPY.JOB` from tape to disk.

- Modify this dataset to conform to your local naming conventions.

The JCL in this dataset is then used to copy all datasets 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 Dataset COPY.JOB from Tape to Disk
- Step 2 - Modify COPY.JOB on Your Disk
- Step 3 - Submit COPY.JOB

Step 1 - Copy Dataset COPY.JOB from Tape to Disk

The dataset COPY.JOB (Label 2) contains the JCL to unload all other existing datasets 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=tape-volume),
// LABEL=(2,SL)
//SYSUT2 DD DSN=hilev.COPY.JOB,
// DISP=(NEW,CATLG,DELETE),
// UNIT=3390,VOL=SER=volume,
// SPACE=(TRK,(1,1),RLSE),
// DCB=*.SYSUT1
//SYSPRINT DD SYSOUT=*
//SYSIN DD DUMMY
//
```

where:

hilev is a valid high level qualifier
tape-volume is the tape volume name, for example: T12345
volume is the disk volume name

Step 2 - Modify COPY.JOB on Your Disk

Modify the COPY.JOB on your disk to conform to 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 datasets from the tape to your disk.

Installation Procedure

Under z/OS, the installation procedure for Natural with VSAM system files consists of the following steps:

- Step 1: Prepare NVS Demo File - Job NVSI008, Steps 1403 to 1407
- Step 2: Prepare VSAM Clusters System Files - Job VSAMI008, Steps 1420 to 1446
- Step 3: Prepare VSAM Cluster for the Spool File - Job VSAMI008, Steps 0300 to 0309
- Step 4: Prepare VSAM Cluster for the Security File - Job VSAMI008, Steps 9900 to 9907
- Step 5: Prepare VSAM Cluster for Scratch-Pad File - (Dataset NVSnnn.VINI)
- Step 6: Prepare VSAM Cluster for Source locking File FLOCK - Job VSAMI008, Step 1460 and 1461

- Step 7: Assemble Natural z/OS Interface Module - Job NATI055, Steps 0100 and 0102
- Step 8: Create NVS Parameter Module - Job NVSI055, Steps 1400 and 1401
- Step 9: Create NVS I/O Module - Job NVSI055, Steps 1410 and 1411
- Step 10: Create Natural Batch Parameter Module - Job VSAMI060, Steps 0010
- Step 11: Link Natural Batch Nucleus - Job VSAMI060, Step 0020
- Step 12: Load System Programs - Job VSAMI061, Step 0100
- Step 13: Load Error Messages - Job VSAMI061, Steps 0102
- Step 14: Load Examples - Job VSAMI061, Steps 0103 and 1400
- Step 15: Reorganize FNAT System File
- Step 16: Create NVS I/O Module for CICS - Job NVSI070, Step 1400
- Step 17: Install Online Natural
- Step 18: Customize your TP Monitor

Step 1: Prepare NVS Demo File - Job NVSI008, Steps 1403 to 1407

Load the VSAM demo file EMPL and define the alternate index path EMPLX for the file EMPL.

Step 2: Prepare VSAM Clusters System Files - Job VSAMI008, Steps 1420 to 1446

Define three VSAM clusters to be used as system files for Natural (FNAT, FUSER and FDIC), an alternate index and a path for the alternate index for FDIC.

It is strongly recommended that you keep these three system files on separate VSAM clusters.

Step 3: Prepare VSAM Cluster for the Spool File - Job VSAMI008, Steps 0300 to 0309

This step must only be performed if you have Natural Advanced Facilities installed and want your spool file to be a VSAM file, too.

Define an additional VSAM cluster to be used as spool file (FSPOOL) and five alternate indices.

Note:
Path processing is **not** supported for FSPOOL.

Step 4: Prepare VSAM Cluster for the Security File - Job VSAMI008, Steps 9900 to 9907

This step must only be performed if you have Natural Security installed and want your security file to be a VSAM file, too.

Define an additional VSAM cluster to be used as security file (FSEC) and three alternate indices.

Note:
Path processing is **not** supported for FSEC.

Step 5: Prepare VSAM Cluster for Scratch-Pad File - (Dataset NVSnnn.VINI)

- Allocate VSAM SCRATCH PAD File - Job VSAMI008, Step 1450

- Initialization VSAM SCRATCH PAD File - Job VSAMI008, Step 1451

This step must only be performed if you want to use a scratch-pad file; that is, if you want to use read-only system files (ROSY=ON); see also the parameter ROSY and the macro NTLFILE (described in the Natural Parameter Reference documentation).

Define an additional VSAM cluster to be used as scratch-pad file.

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

```
NTLFILE 212,dbid,nt-file-number,dd-name-scratch-pad-file
ROSY=ON
```

If you want your system file(s) to be opened for input, adapt your Natural parameter module as follows:

```
FNAT=(dbid,fnr,filename,,RO),
FUSER=(dbid,fnr,filename,,RO),
FSEC=(dbid,fnr,filename,,RO),
```

Step 6: Prepare VSAM Cluster for Source locking File FLOCK - Job VSAMI008, Step 1460 and 1461

This step must only be performed if you want to use a locking of source objects on VSAM system file (SLOCK=PRE); see also the parameter SLOCK and the macro NTLFILE (described in the Natural Parameter Reference documentation).

Define an additional VSAM cluster to be used as source locking file.

For the optional source locking file inclusion, the following NATPARM parameters must be added or, if already present, updated with:

```
NTLFILE 002,dbid,nt-file-number,dd-name-source-locking-file,,PATH
SLOCK=PRE
```

The default dd-name is FLOCK, the related default pathes are FLOCKA, FLOCKB and FLOCKC.

- Allocate and Define VSAM Source Locking File - Job VSAMI008, Step 1460

- Printing Data Records VSAM Source Locking File - Job VSAMI008, Step 1461

This step must only be performed if you want to use a VSAM Source Locking File; that is, if you want to use VSAM Source Locking parameter SLOCK - Source Locking (described in the Natural Parameter Reference documentation).

Step 7: Assemble Natural z/OS Interface Module - Job NATI055, Steps 0100 and 0102

Assemble and link the Natural z/OS interface module NATOS contained in dataset NAT *nnn*.SRCE.

Step 8: Create NVS Parameter Module - Job NVSI055, Steps 1400 and 1401

Edit, assemble and link the NVS parameter module NVSPARM. For a description of the parameters which can be specified, see Assembling the NVSPARM Parameter Module in the section Parameters.

Step 9: Create NVS I/O Module - Job NVSI055, Steps 1410 and 1411

Assemble and link the NVS I/O module NVSMISC with the LSR options:

```
DEFER=YES
COMMIT=NO
READINT=NO
```

See a description of the parameters which can be specified in NVSMISC (see the section Parameters).

Step 10: Create Natural Batch Parameter Module - Job VSAMI060, Steps 0010

Create the Natural batch parameter module.

To install Natural with VSAM system files, in addition to the VSIZE and NTDB specification, you must modify the parameters FNAT, FUSER and FDIC as follows:

```
VSIZE=126,
FNAT=(vsam-dbid,fnr-fnat,dd-name-fnat),
FUSER=(vsam-dbid,fnr-fuser,dd-name-fuser),
FDIC=(vsam-dbid,fnr-fdic,dd-name-fdic),
NTDB VSAM,vsam-dbid
```

vsam-dbid must have the same value in all four entries.

It is recommended to use different files and different file numbers for FNAT and FUSER. The FDIC file *must* be a file different from FNAT and FUSER. Therefore, the FDIC parameter must not be omitted.

The DD names are the logical names of the system files; each DD name can be up to seven characters long. The DD name for the FDIC path is created by appending an **X** to the DD name of the FDIC file.

If you have Natural Advanced Facilities installed and want your spool file to be a VSAM file, modify the FSPOOL parameter accordingly:

```
FSPOOL=(vsam-dbid,fnr-fspool,dd-name-fspool)
```

If you have Natural Security installed and want your security file to be a VSAM file, modify the FSEC parameter accordingly:

```
FSEC=(vsam-dbid,fnr-fsec,dd-name-fsec)
```

The FSEC file must be a file different from FNAT.

Step 11: Link Natural Batch Nucleus - Job VSAMI060, Step 0020

For information on the components and structure of the Natural interface to VSAM, see also Components of Natural for VSAM and Structure of the Natural Interface to VSAM in the section General Information.

With the INCLUDE instruction for the parameter module, specify the name of the Natural parameter module created in Step 8.

Add the following INCLUDE instructions to the link of the Natural batch nucleus:

```
INCLUDE NVSLIB(NVSNUC)
INCLUDE NVSLIB(NVSFNAT)
INCLUDE NVSLIB(NVSFSPO)
INCLUDE NVSLIB(NVSFSEC)
INCLUDE SMALIB(NVSFLOCK)
INCLUDE SMALIB(NVSPARM)
INCLUDE SMALIB(NVSMISC)
```

The module NVSFSPO is only required if you have Natural Advanced Facilities installed and want your spool file to be a VSAM file, too.

The module NVSFSEC is only required if you have Natural Security installed and want your security file to be a VSAM file, too.

The module NVSFLOCK is only required if you want locking for source objects on VSAM system files FUSER/FNAT.

If your front-end is *not* linked to your Natural nucleus, NVSPARM and NVSMISC must be linked to NATPARM instead.

Add the corresponding DD statements to the link step for Natural and link-edit the executable module.

Link the executable batch Natural nucleus.

Step 12: Load System Programs - Job VSAMI061, Step 0100

Use the Natural system command INPL (see the *Natural System Command Reference* documentation) to load the Natural system programs (dataset NAT*nnn*.INPL) into the Natural system files.

Ensure that the DD names specified in NATPARM are specified in the INPL job, too. In addition, an alternate index DD name (*dd-name-fdic*X) must be specified for FDIC.

Note:
If you want to install any other Software AG products that require INPL steps, ensure that these INPL steps are adapted according to the VSAMI061 job.

Step 13: Load Error Messages - Job VSAMI061, Steps 0102

Load the Natural error messages file (dataset NAT*nnn*.ERRN) using the program ERRLODUS as described in the Natural SYSERR Utility documentation.

Ensure that the DD names specified in NATPARM are specified in the ERRLODUS job, too.

Step 14: Load Examples - Job VSAMI061, Steps 0103 and 1400

Use the system command INPL to load the Natural example programs (dataset NAT*nnn*.EXPL) and the NVS example programs (dataset NVS*nnn*.EXPL) into the Natural system file.

Ensure that the DD names specified in NATPARM are specified in the INPL job, too. In addition, a path DD name (*dd-name-fdic*X) must be specified for FDIC.

Step 15: Reorganize FNAT System File

Reorganize the FNAT system file using the VSAM facility AMS REPRO to unload and reload the file.

Step 16: Create NVS I/O Module for CICS - Job NVSI070, Step 1400

This step must only be performed if you wish to install NVS under CICS.

If NVS is to be installed under CICS, assemble and link the module NVSCICS.

Step 17: Install Online Natural

Proceed with the specific installation steps for Natural required under your TP monitor (see the relevant sections in the Natural Installation), taking into account the following additions:

- Modify your Natural online parameter modules according to Step 8.

- Add the following INCLUDE instructions to all links of the online Natural nucleus:

```
INCLUDE NVSLIB(NVSNUC)
INCLUDE NVSLIB(NVSFNAT)
INCLUDE NVSLIB(NVSFSPO)
INCLUDE NVSLIB(NVSFSEC)
INCLUDE NVSLIB(NVSFLOCK)
```

   The module NVSFSPO is only required if you have Natural Advanced Facilities installed and want your spool file to be a VSAM file, too. The online environment for Natural Advanced Facilities must be a CICS environment, and the VSAM spool files must be defined in the CICS FCT. The module NVSFSEC is only required if you have Natural Security installed and want your security file to be a VSAM file, too. The VSAM security files must be defined in the CICS FCT. The module NVSFLOCK is only required if you want locking for source objects on VSAM system files FUSER/FNAT. The VSAM locking files must be defined in the CICS FCT.

- Add the following INCLUDE instructions to the link of the front-end in a CICS environment:

```
INCLUDE SMALIB(NVSPARM)
INCLUDE SMALIB(NVSCICS)
```

- Add the following INCLUDE instructions to the link of the front-end in any other supported environment:

```
INCLUDE SMALIB(NVSPARM)
INCLUDE SMALIB(NVSMISC)
```

Before starting Natural, ensure that the DD and DSN names of the VSAM system files are known in your respective batch and online environments.

Step 18: Customize your TP Monitor

TP Monitor	Instruction
Com-plete	Catalog the VSAM system files FNAT, FUSER, FDIC and FDICX to Com-plete using the CA function of the Com-plete utility UFILE. If Natural Security is installed, catalog the VSAM security files FSEC, FSECA, FSECB and FSECC to Com-plete using the CA function of the Com-plete utility UFILE. If locking of source objects for VSAM system files FUSER/FNAT is desired, catalog the VSAM locking files FLOCK, FLOCKA, FLOCKB and FLOCKC to Com-plete using the CA function of the Com-plete utility UFILE. If you have specified PATH=CHECK in NVSPARM, catalog your front program to Com-plete using the CA function of the Com-plete utility ULIB with a region size of 36 KB, if you have not changed the first default value for the WPSIZE parameter in the Natural parameter module.
CICS	Add the following entries to your FCT: ● the NVS system files FNAT, FUSER, FDIC and FDICX; ● the NVS test files EMPLVS and EMPLVX; ● the Natural Security files FSEC, FSECA, FSECB and FSECC (if you have Natural Security installed). ● the locking files FLOCK, FLOCKA, FLOCKB and FLOCKC (if you want locking of source objects for VSAM system files FUSER/FNAT). Refer to the job VSAMI005 for examples. You can add DD statements for these datasets to your CICS startup job, too.

TP Monitor	Instruction

TSO	Add the following statements to your Natural CLIST:
	
	`ALLOC F(FNAT)   DA('SAGLIB.VSAM.FNAT')        SHR`
	`ALLOC F(FUSER)  DA('SAGLIB.VSAM.FUSER')       SHR`
	`ALLOC F(FDIC)   DA('SAGLIB.VSAM.FDIC')        SHR`
	`ALLOC F(FDICX)  DA('SAGLIB.VSAM.FDIC.PATH')   SHR`
	`ALLOC F(FSEC)   DA('SAGLIB.VSAM.FSEC')        SHR`
	`ALLOC F(FSECA)  DA('SAGLIB.VSAM.FSEC.AIXA')   SHR`
	`ALLOC F(FSECB)  DA('SAGLIB.VSAM.FSEC.AIXB')   SHR`
	`ALLOC F(FSECC)  DA('SAGLIB.VSAM.FSEC.AIXC')   SHR`
	`ALLOC F(FLOCK)  DA('SAGLIB.VSAM.FLOCK')       SHR`
	`ALLOC F(FLOCKA) DA('SAGLIB.VSAM.FLOCK.PATHA') SHR`
	`ALLOC F(FLOCKB) DA('SAGLIB.VSAM.FLOCK.PATHB') SHR`
	`ALLOC F(FLOCKC) DA('SAGLIB.VSAM.FLOCK.PATHC') SHR`
	`ALLOC F(EMPLVS) DA('SAGLIB.VSAM.EMPLVS')      SHR`
	`ALLOC F(EMPLVX) DA('SAGLIB.VSAM.EMPLVX.PATH') SHR`

Installing Natural on VSAM System Files - z/VSE

This section describes step by step how to install Natural under the operating system z/VSE using VSAM system files. The information given is basically a combination of the installation descriptions for both base Natural and Natural for VSAM (NVS), plus some points specific to VSAM system files.

- Installation Tape

- Installation Procedure

Installation Tape

To install Natural with VSAM system files, you need the datasets for both base Natural and NVS. The required datasets are listed in the table below:

Dataset Name	Contents
NAT*nnn*.LIBR	Natural source modules, macros, relocatable modules and sample installation jobs.
NAT*nnn*.INPL	Natural system programs.
NAT*nnn*.EXPL	Natural example programs.
NAT*nnn*.ERRN	Natural error messages.
NVS*nnn*.LIBR	NVS source modules, macros and relocatable modules.
NVS*nnn*.EMPL	NVS example file.
NVS*nnn*.EXPL	NVS example programs.
NVS*nnn*.LINI	NVS Locking Source Objects.
NVS*nnn*.VINI	NVS FDIC initialization file.

The notation *nnn* in dataset names represents the version number of the product. The sequence of the datasets, their type and the space each dataset requires on disk are shown in the Report of Tape Creation which accompanies the installation tape.

Copying the Tape Contents to Disk

The sample JCS supplied on tape for the installation of Natural assumes one library, which has installation sublibraries per Software AG product library. In addition to these sublibraries, you need a work sublibrary and a sublibrary for sample installation jobs for Natural. It is recommended that you create this library and the work sublibrary now.

Then copy the sublibrary containing the sample installation jobs from tape using the following JCS:

```
* $$ JOB JNM=NATJOBS,CLASS=0,DISP=D,LDEST=*,SYSID=1
* $$ LST CLASS=A,DISP=D
// JOB NATJOBS
// ASSGN SYS005,IGN
// ASSGN SYS006,cuu,VOL=NVSnnn
// MTC REW,SYS006
// MTC FSF,SYS006,nn
*  Tape positioned at file ?, tape mark nn
*  *** Now process NVSnnn.LIBR - JOBS ***
// EXEC LIBR,PARM='MSHP'
 RESTORE SUBLIB=SAGLIB.NVSnnnJ:SAGLIB.NVSnnnJ -
               TAPE=SYS006 -
               LIST=YES -
               REPLACE=NO
/*
// MTC REW,SYS006
/*
/&
* $$ EOJ
```

The notation *cuu* represents the physical unit address of the tape drive.

The notation *nn* represents the file sequence number given by "(3 * *file-no*) - 2", as shown on the Report of Tape Creation. Leave out the "// MTC FSF ..." instructions if your library is the first dataset on the tape.

The notation *nnn* represents the version number of the product.

Now use jobs NATTAPE and NVSTAPE from this job library to restore the Natural sublibrary from tape and make Natural known to MSHP.

All further datasets will be directly used from tape by the installation jobs.

Installation Procedure

Under z/VSE, the installation procedure for Natural with VSAM system files consists of the following steps:

- Step 1: Prepare NVS Demo File - Job NVSI008, Steps 1403 to 1407
- Step 2: Prepare VSAM Clusters for System Files - Job VSAMI008, Steps 1420 to 1446
- Step 3: Prepare VSAM Cluster for Spool File - Job VSAMI008, Steps 0300 to 0309
- Step 4: Prepare VSAM Cluster for Security File - VSAMI008, Steps 9900 to 9907
- Step 5: Prepare VSAM Cluster for Scratch-Pad File (Dataset NVSnnn.VINI)
- Step 6: Prepare VSAM Cluster for Source locking File FLOCK - Job VSAMI008, Step 1460 and 1461
- Step 7: Assemble Natural z/VSE Interface Module - Job NATI055, Step 0100
- Step 8: Create NVS Parameter Module - Job NVSI055, Step 1400
- Step 9: Create NVS I/O Module - Job NVSI055, Step 1410
- Step 10: Create Natural Batch Parameter Module - Job VSAMI060, Steps 0010, 0015
- Step 11: Link Natural Batch Nucleus - Job VSAMI060, Step 0020
- Step 12: Load System Programs - Job VSAMI061, Step 0100
- Step 13: Load Error Messages - Job VSAMI061, Steps 0102
- Step 14: Load Examples - Job VSAMI061, Step 0103
- Step 15: Reorganize the FNAT System File
- Step 16: Create NVS I/O Module for CICS - Job NVSI070, Step 1400
- Step 17: Install Online Natural
- Step 18: Customize your TP Monitor

Step 1: Prepare NVS Demo File - Job NVSI008, Steps 1403 to 1407

Load the VSAM demo file EMPL and define the alternate index path EMPLX for the file EMPL.

Step 2: Prepare VSAM Clusters for System Files - Job VSAMI008, Steps 1420 to 1446

Define three VSAM clusters to be used as system files for Natural (FNAT, FUSER and FDIC) and a path for FDIC.

It is strongly recommended that you keep these three system files on separate VSAM clusters.

Step 3: Prepare VSAM Cluster for Spool File - Job VSAMI008, Steps 0300 to 0309

This step must only be performed if you have Natural Advanced Facilities installed and want your spool file to be a VSAM file, too.

Define an additional VSAM cluster to be used as spool file (FSPOOL) and five alternate indices.

Note:
Path processing is *not* supported for FSPOOL.

Step 4: Prepare VSAM Cluster for Security File - VSAMI008, Steps 9900 to 9907

This step must only be performed if you have Natural Security installed and want your security file to be a VSAM file, too.

Define an additional VSAM cluster to be used as security file (FSEC) and three alternate indices.

Note:
Path processing is *not* supported for FSEC.

Step 5: Prepare VSAM Cluster for Scratch-Pad File (Dataset NVSnnn.VINI)

- Allocate VSAM SCRATCH PAD File - Job VSAMI008, Step 1450

- Initialization VSAM SCRATCH PAD File - Job VSAMI008, Step 1451

This step must only be performed if you want to use a scratch-pad file; that is, if you want to use read-only system files (ROSY=ON); see also the parameter ROSY and the macro NTFILE in the section Profile Parameters in the Natural Parameters Reference documentation.

Define an additional VSAM cluster to be used as scratch-pad file.

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

```
NTFILE ID=212,DBID=dbid,FNR=nt-file-number,PASSWD=dd-name-scratch-pad-file
ROSY=ON
```

If you want your system file(s) to be opened for input, adapt your Natural parameter module as follows:

```
FNAT=(dbid,fnr,filename,,RO),
FUSER=(dbid,fnr, filename,,RO),
FSEC=(dbid,fnr,filename,, RO),
```

Step 6: Prepare VSAM Cluster for Source locking File FLOCK - Job VSAMI008, Step 1460 and 1461

This step must only be performed if you want to use a locking of source objects on VSAM system file (SLOCK=PRE); see also the parameter SLOCKand the macro NTFILE (described in the Natural Parameter Reference documentation).

Define an additional VSAM cluster to be used as source locking file.

- Allocate and Define VSAM Source Locking File - Job VSAMI008, Step 1460

- Printing Data Records VSAM Source Locking File - Job VSAMI008, Step 1461

For the optional source locking file inclusion, the following NATPARM parameters must be added or, if already present, updated with:

```
NTLFILE 002,dbid,nt-file-number,dd-name-source-locking-file,,PATH
SLOCK=PRE
```

The default dd-name is FLOCK, the related default pathes are FLOCKA, FLOCKB and FLOCKC.

Step 7: Assemble Natural z/VSE Interface Module - Job NATI055, Step 0100

Set the parameters in the source of the module NATVSE to suit your requirements. The NATVSE generation parameters are described in the section Running Natural in Batch under z/VSE (Natural in Batch Mode) in the Natural Operations documentation.

Assemble and link the Natural z/VSE interface module NATVSE contained in dataset NAT*nnn*.LIBR.

Step 8: Create NVS Parameter Module - Job NVSI055, Step 1400

Edit, assemble and link the NVS parameter module NVSPARM. For a description of the parameters which can be specified, see the section Assembling the NVSPARM Parameter Module.

For a quick installation, use the Natural for VSAM LSR feature and specify the following NVMLSR definitions in NVSPARM (see also NVMLSR Macro in the section Parameters):

```
NVMLSR DDNAME=fnat-dd-name,SHRPOOL=1
NVMLSR DDNAME=fuser-dd-name,SHRPOOL=2
NVMLSR DDNAME=fdic-dd-name,SHRPOOL=3
NVMLSR DDNAME=fdicx-dd-name,SHRPOOL=3
```

If you want to use FSEC system files:

```
NVMLSR DDNAME=fsec-dd-name,SHRPOOL=4
NVMLSR DDNAME=fseca-dd-name,SHRPOOL=4
NVMLSR DDNAME=fsecb-dd-name,SHRPOOL=4
NVMLSR DDNAME=fsecc-dd-name,SHRPOOL=4
```

Step 9: Create NVS I/O Module - Job NVSI055, Step 1410

Assemble and link the NVS I/O module NVSMISC with the LSR options:

```
DEFER=YES
COMMIT=NO
READINT=NO
```

See the description of the parameters which can be specified in NVSMISC (see the section Parameters).

Step 10: Create Natural Batch Parameter Module - Job VSAMI060, Steps 0010, 0015

Create the Natural batch parameter module.

To be able to install Natural with VSAM system files, in addition to the VSIZE and NTDB specification, modify the parameters FNAT, FUSER and FDIC as follows:

```
VSIZE=126,
FNAT=(vsam-dbid,fnr-fnat,dlbl-name-fnat),
FUSER=(vsam-dbid,fnr-fuser,dlbl-name-fuser),
FDIC=(vsam-dbid,fnr-fdic,dlbl-name-fdic),
NTDB VSAM,vsam-dbid
```

vsam-dbid must have the same value in all four entries.

It is recommended to use different files and different file numbers for FNAT and FUSER. The FDIC file *must* be a file different from FNAT and FUSER. Therefore, the FDIC parameter must not be omitted.

The DD names are the logical names of the system files; each DD name can be up to seven characters long. The DLBL name for FDIC is created by appending an **X** to the DLBL name for the FDIC file.

If you have Natural Advanced Facilities installed and want your spool file to be a VSAM file, modify the FSPOOL parameter accordingly:

```
FSPOOL=(vsam-dbid,fnr-fspool,dd-name-fspool)
```

Assemble and link the parameter module.

If you have Natural Security installed and want your security file to be a VSAM file, modify the FSEC parameter accordingly:

```
FSEC=(vsam-dbid,fnr-fsec,dd-name-fsec)
```

The FSEC file must be a file different from FNAT.

Step 11: Link Natural Batch Nucleus - Job VSAMI060, Step 0020

For information on the components and structure of the Natural interface to VSAM, see also Components of Natural for VSAM and Structure of the Natural Interface to VSAM in the section General Information.

With the INCLUDE instruction for the parameter module, specify the name of the Natural parameter module created in Step 8.

Add the following INCLUDE instructions to the link of the Natural batch nucleus:

```
INCLUDE NVSNUC
INCLUDE NVSFNAT
INCLUDE NVSFSPO
INCLUDE NVSFSEC
INCLUDE NVSFLOCK
INCLUDE NVSPARM
INCLUDE NVSMISCD
```

The module NVSFSPO is only required if you have Natural Advanced Facilities installed and want your spool file to be a VSAM file, too.

The module NVSFSEC is only required if you have Natural Security installed and want your security file to be a VSAM file, too.

The module NVSFLOCK is only required if you want locking for source objects on VSAM system files FUSER/FNAT.

If your front-end is *not* linked to your Natural nucleus, NVSPARM and NVSMISCD must be linked to NATPARM instead.

Add the corresponding sublibrary for NVS to the search chain for the linkage editor and link-edit the executable module.

Link the executable batch Natural nucleus.

Step 12: Load System Programs - Job VSAMI061, Step 0100

Use the Natural system command INPL (see the Natural System Command Reference documentation) to load the Natural system programs (dataset NAT*nnn*.INPL) into the Natural system files.

Ensure that the DLBL names specified in NATPARM (Step 8) are specified in the INPL job, too. In addition, a path DLBL name (*dlbl-name-fdic*X) must be specified for FDIC.

Note:
If you want to install any other Software AG products that require INPL steps, ensure that these INPL steps are adapted according to the VSAMI061 job.

Step 13: Load Error Messages - Job VSAMI061, Steps 0102

Load the Natural error messages file (dataset NAT*nnn*.ERRN) using the ERRLODUS utility (which is described in the Natural SYSERR Utility documentation).

Ensure that the DLBL names specified in NATPARM (Step 8) are specified in the ERRLODUS job, too.

Step 14: Load Examples - Job VSAMI061, Step 0103

Use the system command INPL to load the Natural example programs (dataset NAT*nnn*.EXPL) and the NVS example programs (dataset NVS*nnn*.EXPL) into the Natural system file.

Ensure that the DLBL names specified in NATPARM (Step 8) are specified in the INPL job, too. In addition, a path DLBL name (*dlbl-name-fdic*X) must be specified for FDIC.

Step 15: Reorganize the FNAT System File

Reorganize the FNAT system file using the VSAM facility AMS REPRO to unload and reload the file.

Step 16: Create NVS I/O Module for CICS - Job NVSI070, Step 1400

This step must only be performed if you wish to install NVS under CICS.

If NVS is to be installed under CICS, assemble and link the module NVSCICS.

Step 17: Install Online Natural

Proceed with the specific installation steps for Natural required under your TP monitor (see the relevant sections in the Natural Installation), taking into account the following additions:

- Modify your Natural online parameter modules according to Step 8.

- Add the following INCLUDE instructions to all links of the online Natural nucleus:

```
INCLUDE NVSNUC
INCLUDE NVSFNAT
INCLUDE NVSFSPO
INCLUDE NVSFSEC
INCLUDE NVSFLOCK
```

The module NVSFSPO is only required if you have Natural Advanced Facilities installed and want your spool file to be a VSAM file, too. The online environment for Natural Advanced Facilities must be a CICS environment, and the VSAM spool files must be defined in the CICS FCT. The module NVSFSEC is only required if you have Natural Security installed and want your security file to be a VSAM file, too. The VSAM security files must be defined in the CICS FCT. The module NVSFLOCK is only required if you want locking for source objects on VSAM system files FUSER/FNAT. The VSAM locking files must be defined in the CICS FCT.

- Add the following INCLUDE instructions to the link of the front-end in a CICS environment:

```
INCLUDE NVSPARM
INCLUDE NVSCICS
```

- Add the following INCLUDE instructions to the link of the front-end in a Com-plete environment:

```
INCLUDE NVSPARM
INCLUDE NVSMISCD
```

- Add the corresponding sublibrary for NVS to the search chain for the linkage editor and link-edit the executable module. Before starting Natural, ensure that the DLBL names of the VSAM system files are known in your batch and online environments.

Step 18: Customize your TP Monitor

TP Monitor	Instruction

Com-plete	Add the following DLBL statements to your Com-plete startup job:
	
	``
	// DLBL FNAT, 'DSN=SAGLIB.VSAM.FNAT',,VSAM,CAT=xxxx
	// DLBL FUSER, 'DSN=SAGLIB.VSAM.FUSER',,VSAM,CAT=xxxx
	// DLBL FDIC, 'DSN=SAGLIB.VSAM.FDIC',,VSAM,CAT=xxxx
	// DLBL FDICX, 'DSN=SAGLIB.VSAM.FDIC.PATH',,VSAM,CAT=xxxx
	// DLBL EMPLVS, 'DSN=SAGLIB.VSAM.EMPLVS',,VSAM,CAT=xxxx
	// DLBL EMPLVX, 'DSN=SAGLIB.VSAM.EMPLVX.PATH',,VSAM,CAT=xxxx
	``
	
	If Natural Security is installed, add the following DLBL statements to your Com-plete startup job:
	
	``
	// DLBL FSEC, 'DSN=SAGLIB.VSAM.FSEC',,VSAM,CAT=xxxx
	// DLBL FSECA, 'DSN=SAGLIB.VSAM.FSEC.AIXA',,VSAM,CAT=xxxx
	// DLBL FSECB, 'DSN=SAGLIB.VSAM.FSEC.AIXB',,VSAM,CAT=xxxx
	// DLBL FSECC, 'DSN=SAGLIB.VSAM.FSEC.AIXC',,VSAM,CAT=xxxx
	``
	
	If you want locking of source objects for VSAM system files FUSER/FNAT, add the following DLBL statements to your Com-plete startup job:
	
	``
	// DLBL FLOCK, 'DSN=SAGLIB.VSAM.FLOCK',,VSAM,CAT=xxxx
	// DLBL FLOCKA, 'DSN=SAGLIB.VSAM.FLOCK.PATHA',,VSAM,CAT=xxxx
	// DLBL FLOCKB, 'DSN=SAGLIB.VSAM.FLOCK.PATHB',,VSAM,CAT=xxxx
	// DLBL FLOCKC, 'DSN=SAGLIB.VSAM.FLOCK.PATHC',,VSAM,CAT=xxxx
	``
	
	If you have specified PATH=CHECK in NVSPARM, catalog your front program to Com-plete using the CA function of the Com-plete utility ULIB with a region size of 36 KB, if you have not changed the first default value for the WPSIZE parameter in the Natural parameter module.

CICS	Add the following entries to your FCT: ● the NVS system files FNAT, FUSER, FDIC and FDICX; ● the NVS test files EMPLVS and EMPLVX; ● the Natural Security files FSEC, FSECA, FSECB and FSECC (if you have Natural Security installed). ● the locking files FLOCK, FLOCKA, FLOCKB and FLOCKC (if you want locking of source objects for VSAM system files FUSER/FNAT). Refer to the job VSAMI005 for examples. You can add DLBL statements for these datasets to your CICS startup job, too.

Installation Verification with VSAM System Files

Under z/OS and z/VSE

To verify whether the installation has been successfully performed, log on to the library SYSEXNVS and run the following programs:

- NVSINST1

- NVSINST2

- NVSINST3

- NVSINST4

- NVSINST5

- NVSINST6

If all these programs can be executed successfully, the installation of Natural on VSAM system files is completed and verified.

Note for z/OS batch mode:
For verification in batch mode under z/OS, you can run the job VSAMI200 which executes the above programs.

Restrictions

The Natural VSAM system files FSEC and FSPOOL cannot be used for record-level sharing (RLS), as the related AIX files cannot be accessed using a path definition. The reason is that null values are not suppressed during VSAM upgrade handling for AIX keys. The record length of AIX files related to FSEC and FSPOOL would be exceeded for AIX keys filled with blanks or binary zeros. This would cause problems under CICS, as the record length supported is limited to 32 K only. Natural for VSAM supports null-value suppression for AIX keys and the upgrade handling for AIX files.