software AG

Predict Application Control

Installation on Mainframes

Version 2.6.1

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PAC/PAA Installation

This documentation describes step-by-step how to install Predict Application Control (PAC) and Predict Application Audit (PAA) under the following operating systems:

- BS2000
- VM/CMS
- z/OS
- z/VSE

The steps to be taken depend on whether you are performing a first-time installation or an upgrade of a previous version.

This documentation is organized in a number of documents containing the following information:

Introduction	Gives a brief outline of the different types of installation possible with the current version of PAC/PAA.
General Information	Describes product prerequisites, use of System Maintenance Aid (SMA) and gives information about the installation jobs and procedures.
General Installation Steps	Lists the contents of the installation tape and describes how to copy its contents to disk (depending on your respective operating system).
First-Time Installation	Describes installation steps required to install PAC/PAA in an environment where they were not installed before.
Conversion Installation	Describes installation steps required to convert a previous version of PAC/PAA to the current version.
Customizing PAC and PAA	Describes the customization of PAC and PAA. Also described is how to install PAC utilities in an environment not under PAC or PAA control.
Establishing a Separate PAA Environment	Describes the actions necessary for the first-time installation of Predict Application Audit (PAA) and the steps required to establish a separate or additional PAA production environment to be served by a single PAC 2.6.1 system.
Sample Jobs	Lists sample jobs for customization purposes.

1 Introduction

This introduction gives a brief outline of the different types of installation possible with the current version of PAC/PAA, and provides information you should read before starting the actual installation.

Installing PAC/PAA for the First Time

If you are installing PAC for the first time or in an environment where PAC is not yet installed, read the **General Information**, and then proceed with the installation method described in **First-Time Installation**.

Converting from a Previous Version

If you have already used a previous version of PAC / PAA and a PAC / PAA system file containing data in the format of that version, the data must be converted to PAC 2.6.1 format. You should read the **General Information**, then proceed with the installation method described in **Conversion Installation**.

Establishing a Separate PAA Production Environment

It is possible to establish a PAA production environment or many PAA production environments separate from where the main Natural system file where PAC/PAA is installed. There can be several PAA system files running concurrently at your site. While a single PAC system can serve several environments, a single PAA system serves a single production environment. The details of establishing a separate PAA production environment are given in the section **Establishing a Separate PAA Environment**.

Using PAC Utilities without PAC/PAA

Using the utility MIGRATE you can load Natural objects, error messages, DDMs and foreign objects migrated to the following locations:

- Natural
- Predict
- Foreign

The compare utility is useful for comparing objects in Natural libraries. Refer to **Installing PAC Utilities Only** for details.

2   General Information

The information in this section applies to *all* installation methods. The following topics are covered:

- Prerequisites
- Installation Jobs and Procedures
- Using System Maintenance Aid

Prerequisites

Required Products

The following products must be installed before you install PAC / PAA 2.6.1.

Natural

- Natural Version 4.2.3 or above.

Adabas

- Adabas Version 7.

  The following Adabas parameter should be set during the installation of PAC/PAA 2.6.1:

  `NISNHQ=200` (or greater)

Predict

- Predict version 4.5 or above.

Predict Compatibility:

Since PAC and PAA provide change management for both Predict and Natural objects, they must be compatible with new versions of Predict. Thus, the structure of the PAC PCF system file must match the version of the Predict installed.

The PAC PCF system files provided on the PAC / PAA 2.6 installation tape is compatible with Predict 4.5. The PAC PCF system file must not be shared between different versions of Predict.

Other Related Software AG Products

These products are not in any particular order, but if used with PAC/PAA 2.6.1, the following prerequisites must be met:

Natural Security

■ Natural Security Version 4.2 with Service Pack NSC423I001 or above, if Natural Version 4.2 is used.

■ Natural Security is required to restrict users in the PAA system from performing administration functions and from initiating loads.

■ Natural Security is required to access User Exit subprograms from libraries other than SYSPAC and SYSPAA.

Natural for DB2

■ Natural for DB2 version 4.2.3 or above

Predict Case

■ Predict Case version 2.5.2.

Entire System Server

■ Entire System Server version 3.4.n is required to support foreign objects. Set the following ESY startup parameter:

   `IUBL=12000` (recommended)

You may wish to fine-tune this parameter with the parameters in module NATPNIPS, depending on the requirements of your installation.

Natural Construct (Co-requisite)

Natural Construct 5.2.1 and above.

Supported TP Monitors

- z/OS environment - Com-plete, CICS, TSO, and IMS DC TP-monitors.

- VSE environment - Com-plete and CICS TP-monitors.

- BS2000 environment - openUTM and TIAM TP-monitors.

- CMS environment - CMS TP-monitor.

Installation Jobs and Procedures

The method used for installing PAC/PAA depends on your operating system environment.

BS2000, z/OS, z/VSE

For these operating systems, the installation of Software AG products is performed by installation jobs. These jobs are either adapted "manually" or generated by System Maintenance Aid (SMA).

For each step of the installation procedure described below, the job number of a job performing the respective task is indicated. This job number refers to an installation job generated by SMA. If you are not using SMA, a sample installation job of the same number is provided in the job library on the PAC/PAA installation tape; you must adapt this example job to your requirements. Please note that the job numbers on the tape are preceded by a product code (for example, PACI061 or PAAI050).

VM/CMS

The installation of Software AG products is performed by installation procedures. Sample procedures are provided on the installation tape.

> **Note:** These procedures are only examples and must be adapted to your environment as required.

Using System Maintenance Aid

> **Note:** System Maintenance Aid is not available for operating system VM/CMS.

If you are using Software AG's System Maintenance Aid (SMA) for the installation process, please note the following before generating jobs.

1. Load the SMA table data as described in the System Maintenance Aid documentation (if you have not already done so).

2. Set PAC 2.6.*n* in the list of available products for your environment to "TO BE INSTALLED".

Proceed with the steps described below, depending on the installation method you choose.

First-Time Installation

Make the following settings in parameter group OPTION depending on your operating system:

1. For operating systems z/OS, BS2000 and z/VSE: Set the parameter `PAC-FIRST-INSTALL` to Y.

2. After successful installation, you are strongly recommended to set the above parameters to N and to commit the environment.

Conversion / Upgrade Installation

If a PAC version 2.5 is marked as "INSTALLED" in your SMA environment, you can convert / upgrade to version 2.6.1 with the following parameter settings in parameter group OPTION.

For operating systems z/OS, BS2000 and z/VSE: Set the parameter `PAC-FIRST-INSTALL` to N.

See the System Maintenance Aid documentation for more information.

3   General Installation Steps

Dataset Name	Contents
PAC26*n*.TAPE (VM/CMS)	Sample installation jobs. `DCB=(RECFM=U,LRECL=0,BLKSIZE=5000)`
PAC26*n*.LIBJ (z/VSE)	Sample installation jobs. `DCB=(RECFM=U,LRECL=0,BLKSIZE=16632)`

Copying to a BS2000/OSD 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 SRV*nnn*.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.

Copying to a VM/CMS Disk

1. To position the tape for the TAPE LOAD command, calculate the number of tape marks as follows:

   If the sequence number of PAC26n.TAPE - as shown by the Report of Tape Creation - is n, you must position over $3n$-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 PAC/PAA installation files as minidisk.

3. Ask the system operator to attach a tape drive to your virtual machine at address X'181' and mount the PAC/PAA installation tape.

4. When the tape has been attached, enter the VM/CMS command: `TAPE REW`

5. Position the tape by entering the VM/CMS command: `TAPE FSF n`Where n is calculated as above (3*n-2).

6. Load the PAC/PAA VM/CMS installation material with the VM/CMS command: `TAPE LOAD * * minidisk`

You may wish to keep the tape drive attached to your virtual machine, because the tape is still required in the installation procedure.

Copying to a z/OS 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.

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.

2. Modify COPY.JOB to conform with your local naming conventions.

   There are three parameters you have to set before you can submit this job:

   ◼ Set HILEV to a valid high level qualifier.

   ◼ Set LOCATION to a storage location.

   ◼ Set EXPDT to a valid expiration date.

3. Submit COPY.JOB

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

Copying to a z/VSE 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.

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:
   <*hilev*> is a valid high level qualifier.

2. Modify COPYTAPE.JOB to conform with your local naming conventions and complete the disk space parameters before you can submit this job.

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

Which Installation Method?

The installation method you choose depends on whether PAC/PAA is already installed at your site. There are two methods of installing PAC/PAA: first-time installation and conversion installation. In addition, it is possible to install PAA in a separate environment or install PAC Utilities at a remote site.

- First-Time Installation

- Conversion Installation from Previous Installed Versions

First-Time Installation

If you have not previously installed PAC / PAA, or if you currently have an earlier version of PAC / PAA, and want to install PAC / PAA version 2.6.1 as a separate system and will not be migrating or converting the current existing PAC and PAA data, go straight to **First-Time Installation**.

Conversion Installation from Previous Installed Versions

- PAC from 2.5.*n*

PAC conversion processes described in section**Upgrading PAC** may cause.

- The overwriting and deletion of Natural objects in libraries SYSPAC, SYSPACA, SYSPACUS, SYSPAA, SYSPAAA, and SYSPAAUS in the FNAT.

- The overwriting of modules SYSPAC, SYSPACA, SYSPAA, and SYSPAAA in the SYSTEM libraries in the FNAT and the FUSER.

- The deletion of modules with names beginning in 'MIG', 'MG', 'PAC', and 'PAA' from the SYSTEM libraries in the FNAT and the FUSER.

- The overwriting and deletion of error messages for libraries SYSPAC and SYSPAA in the FNAT.

- The overwriting of JCL texts in the ACF.

To keep the old PAC/PAA Natural objects (user exit subprograms included) and error messages you should back them up or use another (FNAT, FUSER) pair.

To keep the JCL texts currently in the ACF you can rename them using the PAC maintenance function.

The contents of the ACF and the PCF have to be modified to accommodate PAC 2.6.1. Back up the current contents of the ACF and the PCF before starting the conversion.

Having upgraded PAC you may need to modify user profiles, JCL texts, or application - production status links; use PAC administration and maintenance functions described in the PAC Administration documentation and the PAC User's Guide to do it.

Pre-Installation Steps

⚠️ **Caution:** Before you begin to install PAC/PAA 2.6.1, ensure that all pending PAC migration events (Started or Authorized state) are completed or backed out. Ensure that all PAC entities are resolved and unlocked. Otherwise, inconsistencies may arise during conversion.

Before you begin installation of PAC/PAA version 2.6.1, do the following:

1. **Back up PAC/PAA System Files**
   Back up your existing PAC ACF and PCF system files, and the PAA system file that contains your PAA data. You must also backup the FNAT file(s) where PAC/PAA version 2.5 was installed and the FUSER and FDIC files where Natural objects were placed under PAC/PAA control.

2. **Back up your user exits**
   Back up your user exits, otherwise, these routines will be overwritten when PAC/PAA is installed. User-modifiable routines have the following prefixes: PACEX* PAAEX*.

   📄 **Note:** Customized routines may need to be modified before using them in PAC/PAA version 2.6.1 For information on modifying these routines, refer to **Customizing PAC/PAA**.

3. **Rename JCL Texts**
   To preserve the JCL texts currently in the ACF, rename them using the PAC maintenance function.

4. **Backup and Delete System Libraries and Modules**
   SMA Reference: Job I051, Step 1700 / 1701 / 1702 / 1703 / 1704 / 1705

   Backup and delete the following:

   ▪ System libraries SYSPAC, SYSPACA, SYSPACUS, SYSPAA, SYSPAAA, and SYSPAAUS on the FNAT.

   ▪ Modules SYSPAC, SYSPACA, SYSPAA, SYSPAAA from library SYSTEM on the FNAT and FUSER.

   ▪ Module COMPARE and those modules whose names begin in MIG, MG, PAC and PAA from library SYSTEM on the FNAT and FUSER.

   This step is required because numerous PAC/PAA modules from previous versions have been discontinued.

4   First-time Installation

When installing PAC/PAA for the first time or in an environment where PAC/PAA was not installed before, perform the following steps after copying the tape contents to disk.

- Installation Procedure

Installation Procedure

≫ **Step 1: Establish PAC System Files**

Job I050, Steps 1700 and 1702

> **Note:** If you install PAC in more than one environment, load the ACF and the PCF into the additional environments directly from the installation tape. DO NOT use Adabas utilities to install the files from an existing system.

a   Load the PAC Application Control File (ACF) contained in dataset PAC26n.SYS1

b   Load the PAC Predict Control File (PCF) contained in dataset, PAC26n.SYS2.

c   PAC always has priority over Predict when using a shared Coordinator FDIC file. If a Predict load / import operation can run parallel to a PAC load operation at your site, you are strongly recommended to use different Coordinator FDIC files for Predict and PAC. Please see the Predict Installation Manual on how to load a Predict Coordinator file.

≫ **Step 2: Establish PAA System File**

Job I050, Step 1710

If installing PAA in a separate production environment from PAC, skip this step (see the section **Establishing a Separate PAA Environment** for more information).

■   Load the Predict Application Audit (PAA) file contained in dataset PAA26n.SYSF.

> **Note:** If you install PAA in more than one environment, load the PAA file into the additional environments directly from the installation tape. DO NOT use Adabas utilities to install the files from an existing system.

≫ **Step 3: Modify, Reassemble and Link the Natural Parameter Module/s**

Batch Job I060, Steps 0010, 0015 and 0020 (BS2000: Step 3801)

Com-plete Job I080, Steps 2300, 2310 and 2320

CICS Job I080, Steps 2210, 2220 and 2230

TSO Job I080, Steps 0010, 0015 and 0020

IMS DC Job I080, Steps 2500 and 2510

TIAM Job I080, Steps 0109 and 0110

openUTM Job I080, Steps 0200 and 0210

a   Modify all Natural parameter modules used for batch and online processing with PAC. Follow the procedure below for each module:

> **Note:** The size parameters are recommendations only. You may have to adapt these values to your particular environment.

The following Natural parameter settings are recommended during the installation of PAC/PAA 2.6.1:

```
CDYNAM=8 (or higher)
ESIZE=128
LC=ON (for use with the new COMPARE utility)
MADIO=0
MAXCL=0
MT=0
RJESIZE=8
```

> **Note:** The ESIZE required by PAC depends on the characteristics of your migration. It is used to store individual entries in the object list when you process PAC migration events or use the Expand function. The actual size needed may be larger or smaller than 128K. If error message NAT0886 occurs, the ESIZE has been set too low and has to be set higher.

> **Note:** If you want to transfer objects from status External, the following settings must be specified when starting Natural:
> `XML=(ON,RDOC=ON),CFICU=ON,CP='xxxxxx'.`

b   For online and batch processing, set:

PRINTER 1 in either the NTPRINT macro or dynamically using the printer parameter.

c   Set:

WORK 1,2,3 in either the NTWORK macro or dynamically using the work parameter.

OPEN=OBJ in the NTWORK macro.

d   Specify the following NTFILE parameters for the PAC ACF and PCF files and PAA file. For each file replace *m* with the appropriate database number and *n* with the appropriate file number.

NTFILE ID=210,DBID=m, FNR=n (ACF)

NTFILE ID=211,DBID=m, FNR=n (PCF)
NTFILE ID=178,DBID=m, FNR=n (PAA)

e   Setting up NATRJE for the various TP-Monitors:

For information about setting up and installing this functionality of Natural, please refer to the Natural Installation and Operations documentation. (Natural under CICS and Natural under IMS TM).

f   Assemble and link the Natural parameter modules.

> **Step 4: Link the Batch Natural Nucleus**

Job I060, Step 0020

a   Find the JCL used to link your current batch Natural nucleus.

This will ensure that all INCLUDE statements specified when you built your current batch Natural nucleus are included in this step.

b   In the INCLUDE statement for the Natural parameter module, specify the name of the batch Natural parameter module that you reassembled in **Step 3: Modify, Reassemble and Link the Natural Parameter Module(s)**.

c   Link the Natural nucleus.

> **Step 5: Load PAC/PAA System Programs**

Job I061, Step 1700

■   The PAC/PAA system programs are contained in the dataset PAC25n.INPL and are loaded to your Natural FNAT and FUSER system files using the Natural utility INPL.

This dataset also contains the PAC error messages.

> **Step 6: Define the PAC Libraries - Natural Security**

a   Define the libraries SYSPACUS, SYSPAC (make SYSDIC and SYSPACUS a steplib; SYSTEM must be specified last in the list), SYSPACA (people-protected=yes, make SYSPAC a steplib; SYSTEM must be specified last in the list) to Natural Security.

b   If you specify a start-up transaction MENU on the Natural Security Modify Library screen, then specify 'N' for batch execution.

c   Link all users requiring access to PAC Administrator Functions to the library SYSPACA.

d   Define online and batch user IDs to Natural Security as necessary.

e   Batch user IDs may be necessary to prevent NAT3048 and NAT8048 errors (duplicate user logon) when online users submit batch jobs under Natural Security.

f You are recommended to use the following naming convention when both online and batch user IDs are assigned in Natural Security:

Online user ID: USER

Batch user ID: USERBAT

≫ Step 7: Copy LOGON000 and PACSTEP - Non Natural Security

Job I082, Step 1710

> **Note:** LOGON000 is delivered in source format. The contents of this module shows as an example of how the various PAC required settings are to be used. It is recommended that you make the correct adaptations to fit into your own environment.

■ Copy modules LOGON000 and PACSTEP from SYSPACUS to SYSTEM on FNAT using the SYSMAIN Utility.

≫ Step 8: Initialize the PCF According to the Installed PRD Version

Job I200, Step 1703

To initialize the PCF according to the installed Predict version:

a Start a Natural session with your FDIC parameter pointing to your current PCF value.

b Logon to library SYSDIC and execute MENU.

A batch example is shown below.

Batch Example:

```
//CMSYNIN DD *
SYSDIC,DBA,DBA1
MENU
FIN
```

≫ Step 9: Initializing PAC

Job I200, Step 1705

a Execute module PACPIBEG from the library SYSPAC. This program expects a parameter (USER-ID). This will create a PAC User Profile for that (USER-ID).

Ensure that the NSC start-up transaction 'MENU' is not defined.

> **Note:** For Batch (without Natural Security): PAC expects as input a user ID. The default is DBA.

> **Note:** For Batch (with Natural Security): If user ID DBA is used for this function, ensure that it is linked to library SYSPAC, alternatively any user-ID known to Natural Security and linked to library SYSPAC can be used to perform this function.

Batch Example:

```
//CMSYNIN DD *
SYSPAC,DBA,DBA1
PACPIBEG
USER-ID
/*
```

b   Define a coordinator FDIC file for the PCF system file. To do this start a PAC session and enter into the PAC ADMIN section. Enter into the General defaults / System defaults / Modify system defaults option. This screen now has an option / parameter to enable the user to set / re-set the initial values of the coordinator FDIC file.

≫ **Step 10: Load the PAC Jobs**

Job I200, Step 1707

Sample JCL texts necessary for various PAC batch activities are supplied in data set PAC26*n*.DATA. The prefix of the name of a text indicates the operating system in whose JCL the text is written. A list of the supplied JCL texts is supplied in **Sample Jobs**.

To load the relevant JCL texts from data set PAC26*n*.DATA to the ACF do the following:

a   Assign data set PAC26*n*.DATA to file CMWKF01.

b   Execute module PACJOBLO from library SYSPAC; specify the value of its one parameter: a range of JCL text names indicating which of the texts in PAC26*n*.DATA should be loaded to the ACF.

Example:

```
PACJOBLO OS*
```

This will load all jobs for operating system (z/OS).

≫ **Step 11: Start PAC**

a   Log on to Natural.

b Ensure that Natural NTFILE definitions for the PAC ACF and PCF system files are correct. If the NTFILE definitions are incorrect, you will receive a PAC initialization error and will be unable to enter the PAC system.

> **Note:** The LFILE parameter may be used temporarily as a dynamic override until the Natural parameter modules are updated.

c If the PAC ACF or PCF system files have been renumbered, run the PACADJST utility to update the files. Refer to the PAC Administration documentation.

d Invoke the PAC administration system by entering `ADMIN` at the NEXT prompt from library SYSPAC.

≫ **Step 12: Initialize PAA**

Predict Application Audit (PAA) can be initialized only after ALL installation steps have been completed successfully. Perform the following sequence of activities.

a **Define the PAA Libraries (With Natural Security)**

Define the libraries SYSPAAUS, SYSPAA (make SYSPAC, SYSPAAUS and SYSPACUS a steplib; SYSTEM must be specified last in the list) and SYSPAAA (people-protected=yes, make SYSPAA and SYSPAC a steplib; SYSTEM must be specified last in the list) to Natural Security.

b **Define the PAA-AUTH group (With Natural Security)**

PAA-AUTH is a special group of PAA users who are authorized to add, modify, and delete applications, statuses, application status links, and migration paths.

1. Define the group PAA-AUTH to Natural Security.

2. Add to this group all users requiring the ability to run migration events (PAA jobs) that migrate objects into production statuses.

3. Link all users or groups requiring access to PAA Administrator Functions to the library SYSPAAA.

c **Customize Logon Exit (Without Natural Security)**

Job I082, Step 1710

1. If you have not already done so for PAC, customize the user exit LOGON000 in library SYSPACUS as required. Then catalog and copy it to library SYSTEM on the FNAT using the SYSMAIN utility.

2. Copy module PACSTEP from library SYSPACUS to library SYSTEM on the FNAT using the SYSMAIN utility.

    d   **Initialization**

        Job I200, Step 1710

        Ensure that the NSC start-up transaction 'MENU' is not defined.

        1. Execute module PAAPIBEG from the library SYSPAA.

        2. With Natural Security, define online start-up transaction MENU for libraries SYSPAA and SYSPAAA.

≫ **Step 13: Starting PAA**

    a   Log on to Natural.

    b   Ensure that the Natural NTFILE definitions for the PAA system file is correct. If the NTFILE definitions are incorrect, you will receive a PAA initialization error and will be unable to enter the PAA system.

        Note: The LFILE parameter may be used temporarily as a dynamic override until the Natural parameter modules are updated.

    c   Invoke the PAA administration system by entering ADMIN at the NEXT prompt from library SYSPAA.

5   Establishing a Separate PAA Environment

This section describes the actions necessary for the first time installation of Predict Application Audit (PAA) and the steps required to establish a separate or additional PAA production environment to be served by a single PAC 2.6.1 system.

- Installation Procedure

Installation Procedure

≫ **Step 1: Load PAA System File**

Job I050, Step 1710

■ Load the Predict Application Audit (PAA) file contained in dataset PAA26*n*.SYSF.

> **Note:** If you install PAA in more than one environment, load the PAA into the additional environments directly from the installation tape. DO NOT use Adabas utilities to install the files from an existing system.

≫ **Step 2: Modify, Reassemble, and Link the Natural Parameter Module/s**

Batch Job I060, Steps 0010 and 0015

Com-plete Job I080, Steps 2300 and 2310

CICS Job I080, Steps 2210 and 2220

TSO Job I080, Steps 0010 and 0015

IMS DC Job I080, Steps 2500 and 2510

TIAM Job I080, Steps 0100 and 0120

openUTM Job I080, Steps 0200 and 0210

a Modify all Natural parameter modules used for batch and online processing with PAC. Follow the procedure below for each module:

> **Note:** The size parameters are recommendations only. You may have to adapt these values to your particular environment.

The following Natural parameter settings are recommended during the installation of PAC/PAA 2.6.1:

CDYNAM=8 (or higher)
ESIZE=128
LC=ON (for use with the new COMPARE utility)

```
MADIO=0
MAXCL=0
MT=0
RJESIZE=8
```

> **Note:** The ESIZE required by PAC depends on the characteristics of your migration. It is used to store individual entries in the object list when you process PAC migration events or use the Expand function. The actual size needed may be larger or smaller than 128K. If error message NAT0886 occurs, the ESIZE has been set too low and has to be set higher.

b   For online and batch processing, set: PRINTER 1 in either the NTPRINT macro or dynamically using the printer parameter.

c   Set: WORK 1,2,3 in either the NTWORK macro or dynamically using the work parameter.

OPEN=OBJ in the NTWORK macro.

d   Specify the following NTFILE parameters for the PAC ACF and PCF files and PAA file. For each file replace *m* with the appropriate database number and *n* with the appropriate file number.

NTFILE ID=178,DBID=m, FNR=n (PAA)

e   Setting up NATRJE for the various TP-Monitors:

For information about setting up and installing this functionality of Natural, please refer to the Natural Installation and Operations documentation. (Natural under CICS and Natural under IMS TM).

f   Assemble and link the Natural parameter modules.

≫ Step 3: Link the Batch / Online Natural Nucleus

Job I060, Step 0020 - batch and online

a   Find the JCL used to link your current batch / online Natural nucleus. This will ensure that all INCLUDE statements specified when you built your current batch Natural nucleus are included in this step.

b   In the INCLUDE statement for the Natural parameter module, specify the name of the batch Natural parameter module that you reassembled in **Step 2: Modify, Reassemble and Link the Natural Parameter Module(s)**

c   Link the Natural nucleus.

≫ Step 4: Load PAC/PAA System Programs

Job I061, Step 1700

■   The PAC/PAA system programs are contained in the dataset PAC26*n*.INPL and are loaded to your Natural FNAT and FUSER system files using the Natural utility INPL.

≫   **Step 5: Initialize PAA**

Predict Application Audit (PAA) can be initialized only after ALL installation steps have been completed successfully. Perform the following sequence of activities.

a   **Define the PAA Libraries (With Natural Security)**

Define the libraries SYSPAAUS, SYSPAA (make SYSPAC, SYSPAAUS and SYSPACUS a steplib; SYSTEM must be specified last in the list) and SYSPAAA (people-protected=yes, make SYSPAA and SYSPAC a steplib; SYSTEM must be specified last in the list) to Natural Security.

b   **Define the PAA-AUTH group (With Natural Security)**

PAA-AUTH is a special group of PAA users who are authorized to add, modify, and delete applications, statuses, application status links, and migration paths.

1. Define the group PAA-AUTH to Natural Security.

2. Add to this group all users requiring the ability to run migration events (PAA jobs) that migrate objects into production statuses.

3. Link all users or groups requiring access to PAA Administrator Functions to the library SYSPAAA.

c   **Customize Logon Exit (Without Natural Security)**

Job I082, Step 1710

1. If you have not already done so for PAC, customize the user exit LOGON000 in library SYSPACUS as required. Then catalog and copy it to library SYSTEM on the FNAT using the SYSMAIN utility.

2. Copy module PACSTEP from library SYSPACUS to library SYSTEM on the FNAT using the SYSMAIN utility.

d   **Initialization**

Job I200, Step 1710

Ensure that the NSC start-up transaction 'MENU' is not defined.

1. Execute module PAAPIBEG from the library SYSPAA.

2. With Natural Security, define online start-up transaction MENU for libraries SYSPAA and SYSPAAA.

> ⟫ **Step 6: Starting PAA**

    a   Log on to Natural

    b   Ensure that the Natural NTFILE definitions for the PAA system file is correct. If the NT-FILE definitions are incorrect, you will receive a PAA initialization error and will be unable to enter the PAA system.

> 📄 **Note:** The LFILE parameter may be used temporarily as a dynamic override until the Natural parameter modules are updated.

    c   Invoke the PAA administration system by entering ADMIN at the NEXT prompt from library SYSPAA.

6   Conversion Installation

The following outlines the conversion installation from a previously installed PAC installation. When converting from a previous version of PAC to version 2.6.1, perform the following steps after copying the tape contents to disk.

- Upgrading PAC
- Converting the ACF and the PCF Data
- Upgrading PAA
- Converting the FPAA Data

Upgrading PAC

≫ **Step 1: Deleting old PAC/PAA System Programs**

Job I051, Steps 1700, 1701, 1702, 1703, 1704 and 1705

■ Backup all of the following system libraries and modules mentioned then perform the following tasks:

▪ Copy the modules PQPNPUR and PRDPACVW from library SYSPAC into a different library.

▪ Delete the system libraries SYSPAC, SYSPACA, SYSPACUS, SYSPAA, SYSPAAA, and SYSPAAUS on the FNAT.

▪ Delete the modules SYSPAC, SYSPACA, SYSPAA, SYSPAAA from library SYSTEM on the FNAT and FUSER.

▪ Delete the module COMPARE and all modules where the name starts with either MIG, MG, PAC or PAA from library SYSTEM on the FNAT and FUSER.

▪ Restore the modules PQPNPUR and PRDPACVW into library SYSPAC.

This step is required because numerous PAC/PAA modules from previous versions have been discontinued.

≫ **Step 2: Modify, Reassemble and Link the Natural Parameter Module/s**

Batch Job I060, Steps 0010, 0015 and 0020 (BS2000: Step 3801)

Com-plete Job I080, Steps 2300, 2310 and 2320

CICS Job I080, Steps 2210, 2220 and 2230

TSO Job I080, Steps 0010, 0015 and 0020

IMS DC Job I080, Steps 2500 and 2510

TIAM Job I080, Steps 0109 and 0110

openUTM Job I080, Steps 0200 and 0210

> **Note:** The size parameters are recommendations only. You may have to adapt these values to your particular environment.

a   The following Natural parameter settings are recommended during the installation of PAC/PAA 2.5.1:

CDYNAM=8 (or higher)
ESIZE=128
LC=ON (for use with the new COMPARE utility)
MADIO=0

MAXCL=0
MT=0
RJESIZE=8

> **Note:** The ESIZE required by PAC depends on the characteristics of your migration. It is used to store individual entries in the object list when you process PAC migration events or use the Expand function. The actual size needed may be larger or smaller than 128K. If error message NAT0886 occurs, the ESIZE has been set too low and has to be set higher.

> **Note:** If you want to transfer objects from status External, the following settings must be specified when starting Natural:
> `XML=(ON,RDOC=ON),CFICU=ON,CP='xxxxxx'.`

b   For online and batch processing, set: PRINTER 1 in either the NTPRINT macro or dynamically using the printer parameter.

c   Set:

WORK 1,2,3 in either the NTWORK macro or dynamically using the work parameter.

OPEN=OBJ in the NTWORK macro.

d   Specify the following NTFILE parameters for the PAC ACF and PCF files and PAA file. For each file replace m with the appropriate database number and n with the appropriate file number.

NTFILE ID=210,DBID=m, FNR=n (ACF)
NTFILE ID=211,DBID=m, FNR=n (PCF)
NTFILE ID=178,DBID=m, FNR=n (PAA)

e   Setting up NATRJE for the various TP-Monitors:

For information about setting up and installing this functionality of Natural, please refer to the Natural Installation and Operations documentation. (Natural under CICS and Natural under IMS TM).

f   Assemble and link the Natural parameter modules.

Step 3: Link the Batch Natural Nucleus

Job I060, Step 0020

a   Find the JCL used to link your current batch Natural nucleus.

This will ensure that all INCLUDE statements specified when you built your current batch Natural nucleus are included in this step.

b   In the INCLUDE statement for the Natural parameter module, specify the name of the batch Natural parameter module that you reassembled in **Step 1: Modify, Reassemble and Link the Natural Parameter Module(s)**.

c   Link the Natural nucleus.

Step 4: Load PAC/PAA System Programs

Job I061, Step 1700

a   Before loading the INPL dataset, make a note of the PAC administrator user ID of the existing PAC system, or ask the PAC administrator to define a temporary administrator user for installation purposes. You will need this user-ID later.

b   The PAC/PAA system programs are contained in the dataset PAC25n.INPL. Load these to your Natural FNAT and FUSER system files using the Natural utility INPL.

Step 5: Copy LOGON000 and PACSTEP - Non Natural Security

Job I082, Step 1710

> **Note:** LOGON000 is delivered in source format. The contents of this module shows as an example of how the various PAC required settings are to be used. It is recommended that you make the correct adaptations to fit into your own environment.

■   Copy modules LOGON000 and PACSTEP from SYSPACUS to SYSTEM on FNAT using the SYSMAIN Utility.

Step 6: Load the PAC Jobs

Job I200, Step 1707

To load the relevant JCL texts from data set PAC26*n*.DATA to the ACF do the following:

a   Assign data set PAC26*n*.DATA to file CMWKF01

b   Execute module PACJOBLO from library SYSPAC; specify the value of its one parameter: a range of JCL text names indicating which of the texts in PAC26*n*.DATA should be loaded to the ACF.

Example:

```
PACJOBLO OS*
```

This will load all jobs for operating system z/OS.

Converting the ACF and the PCF Data

≫   **Step 1: Converting the ACF Data**

Job I200, Step 1720

This step converts your PAC ACF data from version 2.5.*n* format.

a   Make sure that the logical file 210 points at your ACF and logical file 211 to your PCF. If not, restart Natural, specifying 'LFILE=(210,DBID,FNR)', 'LFILE=(211,DBID,FNR)'.

b   Execute module CONVERT from library SYSPACA, ensure that MENU is not defined as startup transaction for library SYSPACA.

Please now continue with **Customizing PAC and PAA**.

≫   **Step 2: Converting the PCF Data**

Job I200, Step 1701

When upgrading from Predict Version 4.4 to Predict Version 4.5, the PAC PCF system file must conform to Predict Version 4.5 respectively. This step is carried out by Predict. As PAC PCF data needs to conform to Predict FDIC data, it is necessary to convert the data that exists on your PCF file.

📄   **Note:** It is advised that when converting the PCF data using the Predict conversion mechanism, that the INPLACE conversion method be used and not the UNLOAD/LOAD method.

In order to do this:

a   Start a Natural session with your FDIC parameter pointing to your current PCF value.

b   Logon to library SYSDICCO and execute the CONVERT routine.

A batch example is shown below.

Batch Example:

```
//CMSYNIN       DD      *
SYSDICCO,DBA,DBA1
MENU
CONVERT VERSION45
FIN
```

Upgrading PAA

The two steps described in this section need be taken only if the PAA being upgraded is to run in an environment without an already upgraded PAC.

≫ **Step 1: Load PAA System Programs**

Job I061, Step 1700

■ The PAA system programs are contained in the dataset PAC26*n*.INPL. Load these to your Natural FNAT and FUSER system files using the Natural utility INPL

Converting the FPAA Data

≫ **Step 1: Execute the CONVERT module**

Job I200, Step 1715

This step converts your PAA data from version 2.5.*n* to 2.6.1 format.

a   Make sure that logical file 178 points at your FPAA. If not, restart Natural, specifying 'LFILE=(178,DBID,FNR)'.

b   Execute module CONVERT from library SYSPAAA, specifying no parameters.

This module does access your production FUSER / FUSERS in order to verify and or update PAA control records.

Please now continue with **Customizing PAC and PAA**.

7   Customizing PAC and PAA

This section describes the customization of PAC and PAA. Also described is how to install PAC utilities separately. This information is organized in the following sections:

- Customizing PAC
- Customizing PAA
- Installing PAC Utilities Only

Customizing PAC

The sample jobs are prefixed with an operating system identifier and are located in dataset PAC26*n*.DATA. For a list of sample jobs, see **Sample Jobs**.

1. Log on to library SYSPAC and enter MENU at the NEXT prompt.

2. Select Jobs from the PAC Maintenance Menu to access the Jobs Maintenance Menu.

3. Modify all jobs that begin with your operating environment prefix (for example, "OS_" for z/OS) to comply with your site's requirements and job standards.

⛔ **Caution:** Do not modify the parameters assigned to @ variables.

These jobs use the PACBATCH procedure installed from the dataset PAC26*n*.SRCE.

For more information about modifying, copying, and renaming the sample jobs, refer to the section describing editing jobs in the PAC User's Guide.

- Converting from PAC 2.5
- Copying and Customizing Applymods and User Exits

Converting from PAC 2.5

PAC 2.5 jobs have been superseded by PAC 2.6.1 jobs. Jobs created using PAC 2.5 sample jobs may not run correctly under PAC 2.6.1. To convert to PAC 2.6.1 as quickly as possible, there are two options:

- Using old job names and jobs, or
- Using the new PAC 2.6.1 jobs

≫ **To use old job names and jobs**

1 Ensure that your existing PAC 2.5 jobs conform to the job steps, work-file assignments, and CMSYNIN control statements in the PAC 2.6.1 jobs.

2 Review all PAC 2.6.1 jobs to see what you have to change in your existing jobs.

≫ **To use the new PAC 2.6.1 jobs**

1 Rename your existing jobs.

2 Rename the PAC 2.6.1 jobs and tailor them to your site.

3 Use the SCANPATH utility to change the names of jobs referenced in your migration paths to the names of the customized PAC 2.6.1 jobs that supersede them.

For information about the SCANPATH utility, refer to Scan Utilities, in the PAC User's Guide.

Copying and Customizing Applymods and User Exits

≫ **To review Applymods:**

1 Review the PAC Applymods settings and change them as necessary.

2 Refer to the description of the Applymods in the PAC Administration documentation and the current Release Notes.

≫ **To modify the user exits you intend to use**

■ Back up and modify user exits to meet your site's requirements before you copy them to the libraries listed below. Otherwise, unpredictable results may occur. User exits have may have changed with PAC 2.6.1.

   Note: If you do not use the PAC 2.6.1 user exits or if you modify your existing user exits to conform to the PAC 2.6.1 user exits, expect to receive NAT0935 errors. Before PAC 2.6.1 will call a cataloged user exit, a PAC administrator must use the User Exit Maintenance facility in PAC Administration to activate the user exit.

≫ **To copy the user exits:**

■ Use the Natural SYSMAIN utility to copy the user exits (if necessary) to the libraries listed in the table below.

Prefix	Contents	From Library	To Library
MIGEX*	User Exits, MIGRATE	SYSPACUS	SYSTEM (FNAT)
PACEX*	PAC User Exits	SYSPACUS	SYSPAC

Customizing PAA

You can customize PAA user exits.

Modify user exits to meet your site's requirements before you copy them to the destination libraries.

Use the Natural SYSMAIN utility to copy the user exits to the libraries listed in the following table.

⚠ **Important:** Do not copy the user exits you do not intend to use.

Prefix	Contents	From Library	To Library
MIGEX*	User Exits, MIGRATE	SYSPACUS	SYSTEM (FNAT)
PAAEX*	PAA User Exits	SYSPAAUS	SYSPAA

Installing PAC Utilities Only

The PAC utility MIGRATE is provided for loading objects to and retiring objects from locations on remote sites where neither PAC / PAA is installed.

The PAC utility COMPARE will compare both Natural and Foreign objects.

The INPL dataset PAC26n.UTIL contains the Natural modules required to run the utilities MIGRATE and COMPARE. To install and initialize these utilities, perform the following steps:

≫ **Step 1: To load the PAC Utilities**

1   Point to the correct FNAT and FUSER files for the Natural environment in which PAA will run.

2   The PAC utilities are contained in the dataset PAC26n.UTIL.

3   Assign dataset PAC26n.UTIL to work file CMWKF01.

4   Load PAC utilities from dataset PAC26n.UTIL to your Natural system file (FNAT) using the Natural INPL utility.

≫ **Step 2: To ensure PAC/PAA System Programs are on all FNATs**

■   If multiple FUSER files or separate FNAT and FUSER files will be used, ensure that Step 5: Load PAC/PAA System Programs of a first-time installation is performed on every Natural system file (FNAT) used.

> **Step 3: To verify Consistent Prefixes**

■   Verify that the modules with the following prefixes are consistent between the Natural system files (FNATs):

PACN*, MIG*, MG*, CF*,COMPARE

You can use the PAC COMPARE utility to verify the modules.

> **Step 4: To correct Inconsistencies**

■   If inconsistencies are detected in a Natural system file (FNAT), INPL the PAC26n.UTIL dataset into that Natural system file (FNAT) to correct the inconsistencies (See To Load the PAC Utilities).

A Sample Jobs

The following is a list of sample jobs provided for customization purposes in dataset PAC26*n*.DATA on the installation tape. Each job is prefixed with the operating system for which it is intended.

Prefixes are:

BS3	for BS2000 (for use with Natural 4.2)
CMS	for VM/CMS
OS	for z/OS
VSE	for z/VSE

The following is a list of the sample JCL texts supplied in data set PAC26*n*.DATA; a brief description of each text is given.

Sample Job	Description
<prefix>_ARCHIVE-RELOAD	For restoration events, restores archived Natural objects from a work file to CONTROL.
<prefix>_ARCHIVE-UNLOAD	For archiving events, copies Natural objects from CONTROL to a work file when the event is run.
<prefix>_BATCH-JCL	For execution of PAC requests, e.g., finalizes a completed archiving event.
<prefix>_COMPARE	For comparing Natural objects.
<prefix>_EXPORT-JCL	Copies a JCL text from the ACF to a work file.
<prefix>_IMPORT_JCL	Copies a JCL text from a work file to the ACF (and makes it into a PAC entity).
<prefix>_INCORPORATE	For migration events which use work files at the migration in stage, but do not use work files at the migration out stage (if they have one); can be used for handling Natural objects, error messages, and DDMs (for DDMs only immigration). The data set assigned

Sample Job	Description
	to the work file would normally be produced by the NATUNLD utility.
<prefix>_INCORPORATE_WORKFILE	For migration events which use work files at both the migration in and at the migration out stages; can be used for handling Natural objects and error messages. The data set assigned to the migration work file would normally be produced by the NATUNLD utility.
<prefix>_MIGRATE	For migration events and retirements which do not use work files; can be used for handling Natural objects, error messages, DDMs, rules, and foreign objects; cannot be used for handling Predict objects.
<prefix>_MIGRATE_WORKFILE	For migration events and retirements which use work files; can be used for handling Natural objects, error messages, DDMs, rules, and foreign objects; cannot be used for handling Predict objects.
<prefix>_PREDICT_MIGRATE_IN	For Predict migration in events other than those of DDM or rule incorporation; DDMs may be generated in the course of such events. **Note:** The Predict commands generated with this job use the value '=' as input assign character (IA). If you are using Natural Security (NSC), you are strongly recommended to specify the same value in your NSC profile for the libraries SYSDICBE and SYSDIC. Otherwise the migration will fail.
<prefix>_PREDICT_MIGRATE_OUT	For Predict migration out events; cannot be used for DDM handling.
<prefix>_SYSTRANS_MIGRATE_IN	For migrating Natural Open System objects into PAC.
<prefix>_SYSTRANS_MIGRATE_OUT	For migrating Natural Open System objects out of PAC.
<prefix>_UNLOCK	For unlocking PAC Application locks.

If after an upgrade you have to change the JCL text names in many migration path records, you may find the SCANPATH utility helpful; it is described in the *PAC Reference* documentation.