# Adabas

## Adabas Installation for z/OS and OS IV/F4

Version 7.4.4

September 2009

This document applies to Adabas Version 7.4.4 and to all subsequent releases.

Specifications contained herein are subject to change and these changes will be reported in subsequent release notes or new editions.

## Table of Contents

# 1 Adabas Installation for z/OS and OS IV/F4

This document is intended for those who plan or perform Adabas installation on z/OS and OS IV/F4 systems, and for those who manage or maintain an Adabas database system (such as database administrators and systems programming personnel).

Notation `vrs` or `vr`: When used in this documentation, the notation `vrs` or `vr` stands for the relevant version, release, and system maintenance level numbers. For further information on product versions, see *Version* in the *Glossary*.

# 2 About This Document

This document provides information for installing and configuring Adabas Version 7.4 on the following systems:

- IBM OS/390, z/OS
- Fujitsu Ltd. OS IV/F4 MSP

Operating system requirements are provided, as well as procedures for installing Adabas, for connecting Adabas to TP monitor subsystems such as Software AG's Com-plete or IBM's CICS, and for adding new I/O devices.

**Note:** Data set names starting with DD are referred to in Adabas documentation with a slash separating the DD from the remainder of the data set name to accommodate VSE/ESA data set names that do not contain the DD prefix. The slash is not part of the data set name.

**Other Documentation You May Need**

The following Software AG documentation is referred to in this document and may be needed when installing Adabas:

- *Adabas Release Notes*
- *Adabas Operations*
- *Adabas DBA Tasks*
- *Adabas Triggers and Stored Procedures*
- *Adabas Command Reference*
- *Adabas Messages and Codes*
- *Adabas Utilities*
- *Adabas Security* (available only on written request from an authorized user site representative)

For Software AG's System Maintenance Aid (SMA) information, see the *System Maintenance Aid* documentation.

Depending on your system configuration, the following documentation is also referred to and may be required for installing or maintaining Adabas:

For IBM OS/390 and z/OS operating systems:

- *Extended Addressability Guide (GC28-1652)*

If installing Adabas on an OS/390 or z/OS system using VSAM files, the following IBM DFSMS/MVS documentation should also be available:

- *Access Method Services for VSAM*
- *Using Data Sets*

For IBM CICS/ESA environments:

- *System Definition Guide (for CICS version 3.2 on OS/390 systems)*

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

# 3 Supported Environments

Before attempting to install Adabas, ensure that the host operating system is at the minimum required level.

Adabas Version 7.4 is available for the following operating system environments:

- OS IV/MSP 20, EX, and AE (Address Extension 31-bit mode), and AF V10L10

  **Note:** Adabas 7.4.2 is the most current Adabas release to support MSP. Instructions for using Adabas under MSP are provided in this 7.4.4 documentation only as a convenience for MSP users of Adabas 7.4.2.

- z/OS Version 1 Releases 1, 2, and 3

Software AG provides Adabas support for the operating system versions supported by their respective manufacturers. Generally, when an operating system provider stops supporting a version of an operating system, Software AG will stop supporting that operating system version.

Although it may be technically possible to run a new version of Adabas on an old operating system, Software AG cannot continue to support operating system versions that are no longer supported by the system's provider.

If you have questions about support, or if you plan to install Adabas on a release, version, or type of operating system other than those included in the list above, consult Adabas technical support to determine whether support is possible, and under what circumstances.

# 4 Installation Procedure

This section describes the procedures for Adabas installation:

- *Installing Adabas for z/OS*
- *Installing Adabas for OS IV/F4*

**Note:** Adabas 7.4.2 is the most current Adabas release to support MSP. Instructions for using Adabas under MSP are provided in this 7.4.4 documentation only as a convenience for MSP users of Adabas 7.4.2.

# 5 Installing Adabas for z/OS

## Installation Checklist

The following is an overview of the steps for installing Adabas on an z/OS system.

| Step | Description | Additional Information |
|---|---|---|
| | **Basic Installation Steps** | |
| 1 | Allocate DASD space for the Adabas libraries. | The libraries are restored from the installation tape. Refer to the section *Disk Space Requirements for Libraries*. |
| 2 | Allocate DASD space for the Adabas database. | For better performance, distribute the database files over multiple devices and channels. Refer to the section *Disk Space Requirements for the Database*. |
| 3 | Specify the address space for running the Adabas nucleus. | Refer to the section *Adabas Nucleus Address Space Requirements*. |
| 4 | Restore the Adabas libraries from the installation tape. | Use the tape positioning information that accompanies the tape. Refer to the section *Installing the Release Tape*. |
| 5 | Install the Adabas SVC temporarily or permanently. | Refer to the section *Initializing the Adabas Communication Environment*. |
| | **Database Installation Steps** | Steps 6-15 require changes to the setup definitions as described in section *Installing an Adabas Database*. |
| 6 | Allocate and format the Adabas database with the ADAFRM utility job. | |
| 7 | Define the global database characteristics with the ADADEF utility job. | |
| 8 | Load the demonstration files with the ADALODE, ADALODV, and ADALODM jobs. | |
| 9 | Start the Adabas nucleus and test the Adabas communications with the ADANUC job. | |
| 10 | If appropriate, test Adabas address space communications by running ADAREP in MULTI mode with the `CPEXLIST` parameter. | |
| 11 | If appropriate, load the Adabas Online System (AOS) selectable unit into a Natural system file by running the AOSINPL job. Alternatively, install the AOS demo version. | See section *Installing the AOS Demo Version*. |
| 12 | Terminate the Adabas nucleus with an `ADAEND` operator command using the OS Modify command `F`. | |

| Step | Description | Additional Information |
|---|---|---|
| 13 | Back up the database by running the ADASAV utility job. | |
| 14 | Insert the ADARUN defaults by running the DEFAULTS job. | |
| | **TP Monitor Installation** | |
| 15 | Install the required TP link routines for Adabas. | See section ***Installing Adabas with TP Monitors***. |

## Preparing to Install Adabas

The major steps in preparing for Adabas installation are

- checking for the correct prerequisite system configuration; and
- allocating disk and storage space.

### Disk Space Requirements for Libraries

The minimum 3390 disk space requirements for the Adabas libraries are as follows:

| Library | 3390 Cylinders | 3390 Tracks | Directory Blocks |
|---|---|---|---|
| Load | 8 | 120 | 40 |
| Source | 3 | 45 | 20 |
| JCL | 1 | 15 | 20 |

**Note:** You can isolate user programs from the Adabas load library by creating a separate load library that contains only those modules needed to execute user programs in multiuser mode and linked with ADAUSER. For Version 7.4, the modules required by user programs are ADAIOR, ADAIOS, ADALNK, ADAMLF, ADAPRF, ADARUN.

### Data Sets Required for SMH Support

The Software AG WAL library is required if you intend to use Software AG's System Management Hub (SMH).

The following data set must be loaded and included in the STEPLIB concatenation: `WAL741.LOAD`

The following data sets are required when installing the System Management Hub:

```
WAL741.LOAD
WAL741.SRCE
WAL741.JOBS
WAL741.ALLAZIP
WAL741.SARG
```

### Data Sets Required for UES Support

The Software AG internal product libraries (BTE - basic technologies; and APS - porting platform) are required if you intend to enable a database for universal encoding service (UES) support. These libraries are now delivered separately from the product libraries.

For UES support, the following libraries must be loaded and included in the STEPLIB concatenation:

```
BTE312.LDnn
APS271.LDnn
```

—where *nn* is the load library level. If the library with a higher level number is not a full replacement for the lower level load library(s), the library with the higher level must precede those with lower numbers in the steplib concatenation.

**Note:** If you are using an Adabas load library prior to Version 7.2.2, it contains internal product libraries with an earlier version number and must be ordered below the current internal product libraries in the steplib concatenation.

Also for UES support, the following library must be loaded and included in the session execution JCL: `BTE312.ECS0`

For information about setting up connections to UES-enabled databases through Entire Net-Work and ADATCP, see section ***Connecting UES-Enabled Databases.***

### Disk Space Requirements for Internal Product Data Sets

The minimum disk space requirements on a 3390 disk for the internal product libraries delivered with Adabas Version 7.4 are as follows:

| Library | 3390 Cylinders | 3390 Tracks | Directory Blocks |
|---|---|---|---|
| BTE312.LD00 | 2 | 30 | 5 |
| BTE312.ECSO | 12 | 180 | 150 |
| APS271.LD00 | 5 | 75 | 55 |

### Disk Space Requirements for the Database

The actual database space needed by Adabas depends on user requirements. The minimum 3390 disk space requirements for the database are as follows:

| Database Component | 3390 Cylinders | 3390 Tracks |
|---|---|---|
| ASSOR1 (Associator) | 20 | 300 |
| DATAR1 (Data Storage) | 60 | 900 |
| WORKR1 (Work space) | 15 | 225 |
| TEMPR1 (temporary work space) | 15 | 225 |
| SORTR1 (sort work space) | 15 | 225 |

### Adabas Nucleus Address Space Requirements

The typical Adabas nucleus requires at least 800-1024 kilobytes to operate. The size of the nucleus address space may need to be larger, depending on the ADARUN parameter settings. Parameter settings are determined by the user.

## Installing the Release Tape

This section explains how to:

- copy data set COPY.JOB from tape to disk
- modify the data set according to your local naming conventions

You can use the modified data set to copy all data sets from tape to disk. You will then need to perform the individual install procedure for each component.

**Note:** If you are using SMA, please refer to the chapter Installing Software AG Products with SMA in the *System Maintenance Aid* documentation. If you are not using SMA, please follow the instructions below.

- Step 1a: Copy Data Set COPY.JOB from Tape to Disk (SMA Job Number Tnnn)
- Step 1b: Modify COPY.JOB to Local Naming Conventions
- Step 1c: Submit COPY.JOB

### Step 1a: Copy Data Set COPY.JOB from Tape to Disk (SMA Job Number Tnnn)

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, <T*nnnnn*> is the tape number, and <*vvvvvv*> is the desired volume serial number.

### Step 1b: Modify COPY.JOB to Local Naming Conventions

There are three parameters 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.

### Step 1c: Submit COPY.JOB

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

## Initializing the Adabas Communication Environment

This section describes the installation of the Adabas router (ADASVC). The router uses cross-memory services for communication between the Adabas nucleus and the Adabas users.

The Adabas z/OS cross-memory communications service comprises two modules:

- the Adabas router (ADASVC); and
- the Adabas subsystem initialization routine (ADASIR).

ADASIR, executed either during IPL or by the Adabas SVC installation program (ADASIP), initializes the router's operating environment, particularly the ID table.

ADASVC installation can be either temporary or permanent:

- The Adabas SVC can be installed temporarily by executing ADASIP. The SVC is then available only until the next IPL.

  **Note:** Once installed, the Adabas SVC can be re-installed temporarily using the ADASIP REPLACE option. However, no Adabas nucleus can be active during this procedure.

  **Note:** It is necessary to cycle CICS after executing ADASIP to initialize the SVC.

- The Adabas SVC is installed permanently using regular operating systems procedures. The SVC then requires an IPL to become active.

Typically, the Adabas SVC is first installed temporarily using ADASIP. This makes Adabas available immediately without the need to wait for an IPL. Meanwhile, preparations are usually made for permanent installation at the next IPL.

- Relinking the SVC for Permanent Installation

### Allocating an SVC Table Entry

Regardless of the installation procedure selected, an available SVC table entry must be allocated to the Adabas router (ADASVC). SVC table entries are defined in the member IEASVCxx of SYS1.PARMLIB.

The SVC table entry in the operating system for an ADASVC must contain the following information:

| Offset | Label | Description |
|---|---|---|
| 0 | SVCEP | SVC entry point address. |
| 4 | SVCATTR1 | Must indicate type 2 SVC (flag bit SVCTP2 set—X'80') or type 3 or 4 SVC (flag bits SVCTP34 set—X'C0'): ADASIR changes a type 1, 5, or 6 SVC to type 2.<br>May indicate that APF-authorization is needed for this SVC (flag bit SVCAPF set—X'08'): if set, all targets and users must be APF-authorized. |
| 6 | SVCLOCKS | Must contain all zeros. ADASIR sets SVCLOCKS to zeros. |

### Subsystem Name Requirements

The subsystem name contained in the four-character field SUBSYS at ADASVC offset X'28' (the default is "ADAB") must be the same as that specified in the IEFSSN*xx* member of SYS1.PARMLIB. If the name is not the same, ADASIR ends with an ADAS12 message and condition code 2, and Adabas is not usable.

### Page-Fixing the Adabas SVC

If the Adabas SVC is to reside in the fixed LPA, add an entry to an IEAFIX*xx* member of SYS1.PARMLIB.

### Initializing the Adabas SVC

The Adabas SVC should be initialized with ADASIP/ADASIR in order to guarantee full functioning of all Adabas nuclei.

## Router Installation Overview

### Temporary Router Installation (SMA Job Number I011)

Once you have restored the Adabas installation tape, use a local editor to customize the job JCLLINK (used to link ADASIR, ADASIP, and ADASVC) as follows:

**to perform temporary router installation:**

1 Link ADASIP into an APF-authorized library as an authorized module.

2 Link ADASIR and ADASVC into APF-authorized libraries:

- Place ADASVC in an APF-authorized library in order to run ADASIP.
- Place ADASIR in an APF-authorized library concatenated to SYS1.LINKLIB defined in source member LNKLST*xx* located in SYS1.PARMLIB.

3 Execute ADASIP to install the SVC.

Customize and run the job ADASIP to dynamically add the Adabas SVC without an IPL.

### Permanent Router Installation (SMA Job Number I010)

**to perform permanent router installation:**

1 Link the Adabas SVC (ADASVC) which has been renamed according to the SVC routine renaming rules (for example, type 3 SVCs must have names of IGC00*nnn*, where *nnn* is a signed decimal SVC number) into SYS1.LPALIB as a permanent step for ADASIR.

2 Link ADASIR into SYS1.LINKLIB or into an APF-authorized library concatenated to SYS1.LINKLIB with the LNKLST*xx* member of SYS1.PARMLIB.

**Note:** ADASIR is not reentrant, and therefore should not be linked into SYS1.LPALIB.

3 Customize and run the job JCLUPDT to add a new entry with the correct format.

4 IPL z/OS with the CLPA option to install and initialize the Adabas communication environment.

## Using ADASIP for Temporary Installations

### ADASIP Functions

ADASIP performs the following functions:

- acquires memory in the specified CSA subpool for the Adabas SVC and a subsystem communication vector table (SSCT)
- loads the Adabas SVC into the acquired CSA space
- modifies the SVC table entry as required by the Adabas SVC
- optionally deletes an SSCT for the same subsystem name from the SSCT chain
- adds the new SSCT to the SSCT chain
- invokes the ADASIR program

If any error is detected, ADASIP backs out all completed activities and terminates operation with a user abend specifying the error.

The following JCL links ADASIP, located in ADABAS.V*vrs*.LOAD, into an APF-authorized library as an authorized module:

```
//LNKSIP EXEC PGM=IEWL
//SYSPRINT DD SYSOUT=*
//SYSUT1 DD SPACE=(CYL,(1,1)),UNIT=SYSDA
//ADALIB DD DSN=ADABAS.Vvrs.LOAD,DISP=SHR
//SYSLMOD DD DSN=apflibname,DISP=SHR
//SYSLIN DD *
INCLUDE ADALIB(ADASIP)
SETCODE AC(1)
NAME ADASIP(R)
```

### ADASIP Parameters

ADASIP parameters have the following syntax:

```
CONSNAME=c,IDTSPL=i,LEAVE=l,NRIDTES=n,REPLACE=r,SUBSYS=su,
SVCNR=svcn,SVCSPL=svcs
```

—where

| | |
|---|---|
| *c* | is the console name to which operator messages are written. If omitted, messages are issued using ROUTCDE=2, master Console Information. |
| *i* | is the ID table subpool: see the ADASIR `IDTSPL` parameter for details. |
| *l* | indicates whether ADASIR should display message ADAS11 or ADAS12 on the operator console: see the ADASIR `LEAVE` parameter for details. |
| *n* | is the number of ID table entries: see the ADASIR `NRIDTES` parameter for details. |
| *r* | indicates whether or not an existing SSCT for the same subsystem name is to be replaced. Y for yes or N for no (N is the default). Use this option to replace any type of Adabas SVC (for example, when installing a new SVC version). |
| *su* | is the subsystem name. This parameter is required. Each instance of the Adabas SVC must have a unique subsystem name. |
| *svcn* | is the Adabas SVC number: see the ADASIR `SVCNR` parameter for details. |
| *svcs* | is the Adabas SVC and SSCT subpool: 228 for fixed CSA or 241 for pageable CSA (default: 241). |

The following are valid ADASIP parameter abbreviations:

| Parameter | Abbreviation |
|---|---|
| `CONSNAME=` | `C=` |
| `IDTSPL=` | `I=` |
| `LEAVE=` | `L=` |
| `NRIDTES=` | `N=` |
| `REPLACE=` | `R=` |
| `SUBSYS=` | `SU=` |
| `SVCNR=` | `SVCN=` |
| `SVCSPL=` | `SVCS=` |

All parameters are optional except `SUBSYS` and `SVCNR`. If specified, the parameters `IDTSPL`,`LEAVE`, `NRIDTES`, `SUBSYS`, and `SVCNR` are passed to ADASIR without being verified.

### Executing ADASIP

JCL similar to the following should be used to execute ADASIP:

```
// EXEC PGM=ADASIP,PARM=parameters
//STEPLIB DD ...
//SVCLIB DD ...
//SIRLIB DD ...
```

The data set defined by the STEPLIB DD statement must be an APF-authorized library containing the APF-authorized program ADASIP. Since ADASIP is neither reentrant nor refreshable, the data set cannot be SYS1.LPALIB.

The data set defined by the SVCLIB DD statement must be an APF-authorized library containing the Adabas SVC with either the name or alias ADASVC.

The data set defined by the SIRLIB DD statement must contain the ADASIR program. Since ADASIR is neither reentrant nor refreshable, the data set may not be SYS1.LPALIB.

ADASIP terminates with a U0481 abend if the parameter input is incorrectly specified.

The IBM job control convention for continuing the PARM parameter is:

```
// EXEC PGM=ADASIP,PARM=(’parameters ....’, X
// ’parameters’)
```

—where X in column 72 is a continuation character. The following restrictions also apply to JCL statements:

- a comma is required after the end-quote on a line that is to be continued
- a non-blank continuation character is required in column 72 of each line that is to be continued, and the continuation line must start within columns 4-16
- a comma is not permitted between the last parameter and the end-quote on the line to be continued because JCL automatically inserts a comma between parameters when concatenating continuation strings:

  -
    ```
    // ...PARM=(’CONSID=3’, X
    // ’SUBSYS=ADAB’, X
    // ’SVCNR=249’)
    ```

—results in an equivalent line of

```
CONSID=3,SUBSYS=ADAB,SVCNR=249
```

## Using ADASIR

### ADASIR Functions

The ADASIR program is invoked

- by the ADASIP program to install the Adabas SVC temporarily, or
- by z/OS to install the Adabas SVC permanently.

ADASIR receives control during either master scheduler initialization or ADASIP execution. The operator is prompted for any value that has been incorrectly zapped or assembled (refer to the *Adabas Messages and Codes* for specific message descriptions). If an error is found during the processing of parameters specified in the IEFSSN*xx* member or passed by ADASIP, the operator is prompted for all of the values.

If the SVC table entry is incorrect, ADASIR prompts the operator for permission to change the entry (if `SVCTAB=P`, the default, is specified). If any errors are detected, they must be corrected and either another IPL must be done or ADASIP must be rerun before the Adabas SVC can be used.

### Relinking ADASIR

The ADASIR module must be linked into an APF-authorized library.

The following JCL links ADASIR, located in ADABAS.V*vrs*.LOAD, into SYS1.LINKLIB:

```
//LNKSIR EXEC PGM=IEWL
//SYSPRINT DD SYSOUT=*
//SYSUT1 DD SPACE=(CYL,(1,1)),UNIT=3350
//ADALIB DD DSN=ADABAS.Vvrs.LOAD,DISP=SHR
//SYSLMOD DD DSN=SYS1.LINKLIB,DISP=SHR
//SYSLIN DD *
INCLUDE ADALIB(ADASIR)
NAME ADASIR(R)
```

### ADASIR Parameters

ADASIR parameters have the following syntax:

```
IDTSPL=i,LEAVE=l,NRIDTES=n,SVCNR=svcn,SVCTAB=svct
```

| Variable | Description |
|---|---|
| *i* | The ID table subpool: 228 for fixed CSA or 241 (the default) for pageable CSA. |
| *l* | Indicates whether message ADAS11 or ADAS12 is to be displayed on the operator console: Y for yes or N (the default) for no. |
| *n* | The ID table entry count, which can range from 1 to a maximum specified at offset X'146' in the CSECT IEAVESVT of the z/OS nucleus (see section ***Requirements for Cross-Memory Services***). |
| *svcn* | The Adabas SVC number (200-255). |
| *svct* | Indicates whether or not the operator should be prompted for permission to update the SVC table entry. Enter P (the default) to receive a prompt, or N for no prompt. P is recommended if a possibility exists that the SVC table entry will not be what ADASIR expects. |

The following are valid abbreviations for ADASIR parameters:

| Parameter | Abbreviation |
|---|---|
| IDTSPL= | I= |
| LEAVE= | L= |
| NRIDTES= | N= |
| SVCNR= | SVCN= |
| SVCSPL= | SVCS= |

### Executing ADASIR

**Note:** The ADASIR module must be linked into an APF-authorized library.

To prepare for permanent SVC installation, an entry must be made in either a new or existing member having the name IEFSSN*xx* in SYS1.PARMLIB. This entry is an 80-character record with the following format:

```
SUBSYS SUBNAME(cccc) CONSNAME(consname) INITRTN(ADASIR)
INITPARM('parameters') comments
```

—where

| | |
|---|---|
| *cccc* | is the 1- to 4-character subsystem name. This name and the name specified in the Adabas SVC at offset X'28' must be the same. The name provided in the SVC is ADAB; any other name must first be zapped into the SVC before being specified for *cccc*. |
| *consname* | The name of the console to which ADASIR will direct any messages. If omitted messages will be issued with ROUTCDE=2, Master Console Information. |
| *'parameters'* | ADASIR parameters. If there is more than one parameter, values must be enclosed in single quotation marks and a comma placed between the parameters. |
| *comments* | Comments are optional and must be preceded by at least one space. |

If the subsystem name does not match, ADASIR abends with an ADAS12 message and condition code 2; the Adabas OS/390 or z/OS communication environment is not initialized. Re-IPL OS/390 or z/OS, specifying SSN=*xx* if necessary. If this is the first IPL with a type 3 or 4 Adabas SVC, specify CLPA as one of the SET parameters.

If an error is encountered while processing any of the parameters obtained from the IEFSSN*xx* member or passed from ADASIP (message ADAS05), the operator is prompted to reenter all of the parameters. If the SVC table entry is not correct (message ADAS09) then, depending on the value of the SVCTAB parameter, either the operator is prompted (message ADAS10) for permission to change the SVCTAB parameter, or it is simply changed (message ADAS15).

A Version 6.2 ADASIP/ADASIR can be used to install a Version 7 Adabas SVC (and the reverse). However, Software AG recommends that you use the same release of ADASIP/ADASIR to install the SVC/router as the SVC/router itself.

The ADASIR messages and their meanings are described in the *Adabas Messages and Codes*.

### Relinking the SVC for Temporary Installation

Link the Adabas SVC with the name or alias ADASVC into an APF-authorized library. ADASVC must be linked with AMODE=31 and RMODE=24, the default.

The following example shows how to link the SVC:

```
// (job card)
//LKED EXEC PGM=IEWL,
// PARM='XREF,LIST,NCAL,LET,MAP,RENT,REFR,REUS'
//SYSPRINT DD SYSOUT=X
//SYSUT1 DD UNIT=SYSDA,SPACE=(CYL,(1,1))
//SYSLMOD DD DSN=SYS1.LINKLIB,DISP=SHR <--Target loadlib
//ADALIB DD DSN=user.loadlib,DISP=SHR <--ADASVC loadlib
//SYSLIN DD *
MODE AMODE(31),RMODE(24)
INCLUDE ADALIB(ADASVC)
```

```
NAME ADASVC(R)
/*
```

**Note:** If the SVC is linked with a name other than ADASVC when preparing to upgrade to a permanent installation, the SVC must have an alias of ADASVC. When dynamically loading the Adabas SVC, ADASIP searches for the module ADASVC in the library specified by the SVCLIB DD statement.

### Relinking the SVC for Permanent Installation

Software AG recommends using a type 3 or 4 SVC for the Adabas SVC.

SVC types 1 and 6 are not supported.

- Type 2 SVC
- Type 3 or 4 SVC

#### Type 2 SVC

If the Adabas SVC is to be type 2, link it into SYS1.NUCLEUS as the system nucleus IEANUC0*x*.

This nucleus must contain an SVC table entry for an enabled type 2 SVC, which must be defined during SYSGEN.

Then include linkage editor control statements similar to the following with those needed to link a nucleus:

```
CHANGE ADASVC(IGCnnn) ---> nnn is the SVC number in decimal
INCLUDE ADALIB(ADASVC) ---> ADALIB contains the Adabas SVC
```

#### Type 3 or 4 SVC

To install the Adabas SVC as type 3 or 4, link the Adabas SVC with the appropriate name into SYS1.LPALIB. ADASVC must be linked with `AMODE=31` and `RMODE=24` (the default).

The following example shows how to relink the SVC:

```
// (job card)
//LKED EXEC PGM=IEWL,
// PARM=’XREF,LIST,NCAL,LET,MAP,RENT,REFR,REUS’
//SYSPRINT DD SYSOUT=X
//SYSUT1 DD UNIT=SYSDA,SPACE=(CYL,(1,1))
//SYSLMOD DD DSN=SYS1.LPALIB,DISP=SHR <--Target Loadlib
//ADALIB DD DSN=ADABAS.Vvrs.LOAD,DISP=SHR <--ADASVC loadlib
//SYSLIN DD *
```

```
MODE AMODE(31),RMODE(24)
CHANGE ADASVC(IGC00nnp) <- where nn are the first two digits of the SVC in decimal and
INCLUDE ADALIB(ADASVC) p is the character corresponding to the x’Cn’
NAME IGC00nnp(R) ----> (n is the last digit of the SVC number in decimal)
*
/*
```

## Installing an Adabas Database

Once you have restored the Adabas installation tape and have installed the ADASVC, you can

- migrate an existing Adabas database to the new version; or
- install a new version of the Adabas database.

Messages or codes that occur during the installation are described in the *Adabas Messages and Codes*; utilities are described in the *Adabas Utilities*.

### Migrate an Existing Database

Use the ADACNV utility to migrate existing databases to new releases of Adabas (SMA job number I051). See *Adabas Utilities* for more information.

### Install a New Database

- Step 10: Install the Required TP Link Routines for Adabas

### Step 1: Allocate and Format the Adabas Database (SMA Job Number I030)

Customize and run the ADAFRM utility job to allocate and format the Adabas database. The following must be customized:

- data set names for the database and libraries;
- volumes for libraries and data sets for the database;
- space allocation for data sets for the database;
- the Adabas SVC number, the database ID, and database device type(s);
- sizes of the data sets for each ADAFRM statement.

### Step 2: Define the Global Database Characteristics (SMA Job Number I030)

Customize and run the ADADEF utility job to define the global definition of the database. The following must be customized:

- data set names of the database and libraries;
- the Adabas SVC number, the database ID, and database device type(s);
- ADADEF parameters.

### Step 3: Load the Demonstration Files (SMA Job Number I050)

Customize and run the job:

- ADALODE to load the sample demo file EMPL;
- ADALODV to load the sample demo file VEHI; and
- ADALODM to load the sample demo file MISC.

For each job, the following items must be customized:

- data set names for the database and libraries;
- the Adabas SVC number, the database ID, and database device type(s);
- ADALOD parameters.

### Step 4: Start Adabas Nucleus and Test Adabas Communications (SMA Job Number I040)

Customize and run the job ADANUC to start the Adabas nucleus. The following must be customized:

- data set names for the database and libraries;
- the Adabas SVC number, the database ID, and database device type(s);
- ADANUC parameters.

### Step 5: Test Adabas Address Space Communications, If Appropriate

Customize and run the job ADAREP in MULTI mode with the `CPEXLIST` parameter to test Adabas address space communications. The following must be customized:

- data set names for the database and libraries;
- the Adabas SVC number, the database ID, and database device type(s);
- ADAREP parameters.

### Step 6: Load Adabas Online System Selectable Unit, If Appropriate (SMA Job Number I061)

Customize and run the job AOSINPL to load the Adabas Online System (AOS) into a Natural system file using a batch version of Natural 3.1 or above. The following items must be customized:

- data set names of the database and libraries;
- the Adabas SVC number, the database ID, and device type(s);
- the Natural INPL parameters and system file number.

Alternatively, install the AOS demo version delivered with Adabas: see the section ***Installing the AOS Demo Version***.

### Step 7: Terminate the Adabas Nucleus

Communicate with the Adabas nucleus to terminate the session either with an `ADAEND` operator command using the OS `Modify` command

```
F jobname,ADAEND
```

—or

```
P jobname
```

—where *`jobname`* is the job or task name of the started nucleus.

### Step 8. Back Up the Database

Customize and run the ADASAV utility job to back up the database. The following must be customized:

- data set names of the database and libraries;
- the Adabas SVC number, the database ID, and device type(s);
- ADASAV parameters.

### Step 9: Insert the ADARUN Defaults

The member DEFAULTS in the Adabas JCL library can be modified to set the ADARUN defaults. The following must be customized:

- data set names of the database and libraries;
- ADARUN user defaults:
  - device type(s) (default: 3380)
  - SVC number (default: 249)
  - database ID (default: 1)

Customize and run the DEFAULTS job to set the ADARUN defaults using the OS ZAP utility.

### Step 10: Install the Required TP Link Routines for Adabas

Refer to the section ***Installing Adabas with TP Monitors*** for a description of the TP link routine procedure.

## SVC Integrity Validation

In the past, the presence of multiple SVCs with the same subsystem ID has resulted in a single ID table being used by different SVCs. This has caused problems, some of them serious (abnormal nucleus termination or corruption of the database).

To eliminate this danger, the Version 7 SVC checks to ensure that the SVC accessing the ID table is the same as the one that was used by ADASIP/ADASIR to initialize the table. If the SVCs are not the same, an abend 650 occurs.

Abend 650 occurs when an incorrect SVC number is specified in the ADARUN parameters for a nucleus. It can occur during Adabas initialization, during the first Adabas call from a user program, or when the ID table is queried by another Software AG server such as Entire Net-Work.

## Requirements for Cross-Memory Services

Due to the implementation of cross-memory services in OS/390 and z/OS, the following points should be noted when running an Adabas nucleus in MULTI mode:

- a maximum of one step of a job can establish the cross-memory environment. This means that a job can include at most one step that is a target (for example, an Adabas nucleus).
- cross-memory accesses may not be made to a swapped-out address space. Therefore, the address space of an Adabas nucleus is set to “nonswappable” for the duration of the nucleus session. This can increase the installation’s real storage requirements. This behavior is documented in the IBM manual *Extended Addressability Guide*, chapter Synchronous Cross-Memory Communication.
- when a nucleus with an active cross-memory environment terminates either normally or abnormally, the entire address space including any initiator is also terminated.

The ASID representing this address space is not reassigned until the next IPL. Therefore, you should choose a sufficiently high value for the `MAXUSERS` parameter in the active IEASYS*xx* member of SYS1.PARMLIB or—if your system supports it—the `RSVNONR` parameter in the same member can be adjusted accordingly. Also, the Adabas nucleus should not be stopped and started without good reason.

This is described in the manuals referred to in the topics Recovery Considerations and Resource Management. Additional information can be found in IBM APARs OZ61154, OZ61741, and OZ67637.

To make its services available to all address spaces in the system, the Adabas nucleus must obtain a system linkage index (LX) from OS/390 or z/OS. The LX is a reserved slot in the linkage space of all address spaces, and permits system-wide linkage to all address spaces.

The number of LXs set aside by OS/390 or z/OS for system use is rather small (usually 165 out of a possible 2048).

Because of the way OS/390 and z/OS use cross-memory services, system LXs obtained by Adabas cannot be returned to OS/390 or z/OS until the next IPL. However, the system that owns the LXs can reuse them, even for a different address space. Adabas makes use of this feature by saving used LXs in the ID table, where they are available to future nuclei.

The number of system LXs can be specified in the member IEASYS*xx* contained in SYS1.PARMLIB, using the `NSYSLX` parameter. If you change this value, you must perform an IPL to make the change effective.

To determine an appropriate `NSYSLX` value, consider the following points:

- some LXs are probably already being used by other system functions. Therefore, the chances of creating an LX shortage for other users is small.
- Adabas requires one system LX for each Adabas nucleus (or any other target) that will be active concurrently. A value of decimal 64 would allow concurrent execution of up to 64 Adabas nuclei or other targets with little chance of restricting other components using LXs.
- Entire Net-Work Version 5 uses only one LX and one ID table entry, regardless of how many remote databases it must represent. This is unlike the pseudo-MPM concept of earlier Entire Net-Work versions.
- whenever ADASIP is executed with the REPLACE option, all LXs saved in the current ID table are lost until the next IPL.

Likewise, if a session ends either normally with the `FORCE` operator command or abnormally during ESTAE processing (for example, by an S222 operator cancel or by a S722 spool limit exceeded abend during a snap dump), the LX also cannot be recovered until the next IPL.

Any commands sent to these targets receive an S0D6 abend. Any attempt to restart the nucleus results in an ADAM98 message DUP ID (LOCAL), followed by an abend. To resolve both of these problems, restart the nucleus with the ADARUN `FORCE=YES` and `IGNDIB=YES` parameters.

The first target that tries to obtain a system LX when none is available ends with an S053 abend code and reason code 0112. No additional targets can be started until the next IPL.

The only CSA space used by Adabas Version 7 router is the following:

- 96+32*`NRIDTES` (where `NRIDTES` is the ADASIR or ADASIP parameter described above) every time either program is successfully executed.
- LEN(ADASVC)+SSCTSIZE (equal to 36 bytes) each time ADASIP executes successfully.

## Requirements for Global Resource Serialization

Adabas uses Global Resource Serialization (GRS) to synchronize the execution of Adabas nuclei and utilities at certain points in their processing. It is vital that GRS be set up correctly in the system so that GRS requests by Adabas will be effective.

When setting up GRS, consider the following:

- Adabas uses the GRS macros ENQ and DEQ with systems-wide scope (`SCOPE=SYSTEMS`) and major name ‘ADABAS’ (QNAME).
- if the database resides on disks that are shared between multiple images of the operating system (multiple LPARs or machines) and Adabas nuclei or utilities may be run against the database from several of these images, make sure that GRS is installed in a way that systems-wide ENQ requests are effective on all of these system images.

## Using EXCPVR

CPU usage is reduced considerably by using EXCPVR.

To use EXCPVR, you must

- APF-authorize ADARUN; and
- locate all Adabas modules in APF-authorized libraries.

When placed in an APF-authorized library, ADARUN allows the Adabas nucleus and utilities to use EXCPVR. All Adabas modules except the Adalink must run with `RMODE=24` (the default); the Adalink can run with any `RMODE`.

When the EXEC statement specifies `PGM=ADARUN`, `AMODE` is determined as follows:

- The default `AMODE=31` is used unless ADARUN was relinked using either the `AMODE=24` EXEC statement parameter or the `MODE AMODE(24)` linkage editor control statement.
- An `AMODE` of 31 is changed to 24 before affected macros (data management, for example) are run, and then changed back to 31 thereafter.

Adabas performance can be improved by using EXCPVR to improve channel program translation time. For Adabas to invoke EXCPVR automatically, the Adabas modules must be in an APF-authorized library and ADARUN must be linked with `SETCODE AC(1)`, the default, as shown in the following example:

```
//LINKRUN EXEC PGM=IEWL,PARM='REUS'
//SYSPRINT DD SYSOUT=*
//SYSUT1 DD UNIT=SYSDA,SPACE=(CYL,(1,1))
//ADALIB DD DSN=user.loadlib,DISP=SHR
//SYSLMOD DD DSN=user.loadlib,DISP=SHR <==APF-AUTHORIZED LIBRARY
//SYSLIN DD *
INCLUDE ADALIB(ADARUN)
SETCODE AC(1)
NAME ADARUN(R)
```

## Creating a Shareable ADARUN

The ADARUN module delivered in the Adabas load library is not reusable. If you need a shareable ADARUN, you will need to relink it with the `REUS=YES` link-edit attribute.

Linking ADARUN with the reusable option permits several programs running in the same address space to share the same ADARUN and ultimately, the same copy of ADALNK. This is important when it is necessary to have only one Adabas user ID for the different programs, and is also needed if single copies of ADALNK user exits are required.

To create a shareable ADARUN, use the sample job JCLLINRR in the MVSJOBS library to relink it with the `REUS` attribute.

If both nonreusable and reusable versions of ADARUN are required, they must be located in different load libraries since both must be loadable using the name ADARUN.

## Storage Above 16 MB

Adabas can acquire a number of its required areas, including buffer space, above the 16-MB addressing limit, allowing Adabas to increase the buffer pool size.

To reverse the space allocation to be below the 16-MB limit, set the `AMODE` value in the MODE statement in the example below to `AMODE(24)`:

```
//LINKRUN EXEC PGM=IEWL,PARM='REUS'
//SYSPRINT DD SYSOUT=*
//SYSUT1 DD UNIT=SYSDA,SPACE=(CYL,(1,1))
//ADALIB DD DSN=user.loadlib,DISP=SHR
//SYSLMOD DD DSN=user.loadlib,DISP=SHR <=APF-authorized library
//SYSLIN DD *
MODE AMODE(24),RMODE(24)
SETCODE AC(1)
INCLUDE ADALIB(ADARUN)
NAME ADARUN(R)
```

In addition, Adabas must be run with a sufficient REGION specification, either on the JOB or EXEC statement or as an installation default. For example:

```
//BIG JOB ...,REGION=30M,...
```

## Storage Above 2 GB (64-Bit)

### Real Storage

Adabas can exploit storage occupying real pages above the 2-gigabyte line. This capability allows Adabas I/Os to use 64-bit real addresses.

Support for 64-bit real storage is available whether you are running APF-authorized (using EXCPVR) or not (using EXCP). The run mode is indicated in the ADAI65 message:

```
ADAI65 EXCPVR IS {BEING | NOT BEING} USED FOR THIS RUN IN ESA64 MODE
```

Support for 64-bit real storage requires either

- OS/390 R10 in `ARCHLEVEL=2` (that is, z/architecture mode); or
- z/OS 1.2 or above

on a processor of the IBM 2064 family with an LPAR greater than 2 gigabytes for real storage allocation.

### Virtual Storage

IBM supports 64-bit virtual storage only for z/OS 1.2 or above.

Software AG provides support for IBM’s 64-bit virtual storage with the product Adabas Caching Facility (ACF). Contact your Software AG representative for more information.

A demo of Adabas Caching Facility is delivered in the ADA741.ALLINPL file.

## Applying Zaps

Use the OS/390 or z/OS AMASPZAP utility to apply zaps in the respective operating system; this method verifies (VER) and replaces (REP) data. The following sample JCL executes AMASPZAP:

```
//ADAZAP JOB
//STEP1 EXEC PGM=AMASPZAP
//SYSPRINT DD SYSOUT=X
//SYSLIB DD DSN=ADABAS.Vvrs.LOAD,DISP=SHR
//SYSIN DD *
(zap control statements)
/*
//
```

—where the following are examples of zap control statements:

```
NAME membername csectname
VER displacement data
REP displacement data
IDRDATA (up to eight bytes of user data)
* (comment)
```

**Note:** In VER and REP statements, spaces must be used to separate command, displacement, and data. Commas are acceptable data separators; however, commas with spaces or spaces alone are not, and may cause errors.

## Adalink Considerations

**Note:** For information about connecting a database that is enabled for data conversion using the universal encoding service (UES), see the section *Connecting UES-Enabled Databases*.

### User Exit B (Pre-Command) and User Exit A (Post-Command)

One or two user exits may be linked with an Adalink routine (SMA job number I088):

- UEXITB receives control before a command is passed to a target with the router 04 call.

  **Note:** Special commands emanating from utilities and from Adabas Online System are marked as physical calls. These calls must be bypassed in user exits. These calls have X'04' in the first byte (TYPE field) of the command's Adabas control block (ACB). UEXITB must check this byte and return if it is set to X'04'. Be sure to reset R15 to zero on return.

- UEXITA receives control after a command has been completely processed by a target, the router, or by the Adalink itself.

At entry to the exit(s), the registers contain the following:

| Register | Contents |
|---|---|
| 1 | Address of the UB.<br>If the flag bit UBFINUB is reset, the contents of the halfword at Adabas + X'86' have been moved to UBLUINFO. If those contents are greater than zero, the two bytes starting at UBINFO (UB+X'40') have been set to zero.<br>If UBFINUB is set, no changes can be made to the UB or ACB (except for ACBRSP). |
| 2 | Address of a 16-word save area (for ADALNC only) |
| 13 | Address of an 18-word save area (for non-CICS Adalink exits) |
| 14 | Return address |
| 15 | Entry point address: UEXITB or UEXITA |

Any registers except register 15 that are modified by the user exits must be saved and restored; the address of a save area for this purpose is in register 13 (or register 2 for ADALNC).

If at return from UEXITB register 15 contains a value other than zero, the command is not sent to the target but is returned to the caller. The user exit should have set ACBRSP to a non-zero value to indicate to the calling program that it has suppressed the command: response code 216 is reserved for this purpose.

The UEXITB exit may set the UB field UBLUINFO to any lesser value, including zero; an abend occurs if the user exit sets UBLUINFO to a greater value. The UBLUINFO length cannot be changed when any other exit is used; for example, Adabas Review or Adabas Fastpath.

The user information received by a UEXITA exit may have been modified; this modification may include decreasing its length, possibly to zero, by any of the Adalink user exits.

An Adalink routine can return the following non-zero response codes in ACBRSP:

| Response Code | Description |
|---|---|
| 213 | No ID table |
| 216 | UEXITB suppressed the command |
| 218 | No UB available |

At least the following three equates, described at the beginning of the source, can be modified before an Adalink routine is assembled. In some Adalink routines, however, the corresponding information can be zapped:

| Equate | Description |
|---|---|
| LOGID | The default logical ID, ranging in value from 1 to 65535. The default is 1. |
| LNUINFO | The length of the user information to be passed to Adalink user exits, ranging in value from 0 to 32767. The default is 0. |
| SVCNR | The Adabas SVC number; its range of values and the default depend on the operating system. This value can be provided as SYSPARM value for assembly of the following Adalink routine:<br>`//EXEC PGM=ass,PARM=‘......,SYSPARM(svcnr)’` |

The first 152 (X’98’) bytes of all Adabas Adalinks must maintain the following structure:

| Offset | Label | Contents | Meaning |
|---|---|---|---|
| 00 | ADABAS | | Entry code |
| 12 | | CL6’ADALN*x*’ | Program name |
| 18 | | XL4’*yyyymmdd*’ | Assembly date |
| 1C | | A(ZAPTAB) | Address of zap table |
| 20 | PATCH | XL96’00’ | Patch area |
| 80 | LNKLOGID | AL2(LOGID) | Default logical ID (default: 1) |
| 82 | | 82 XL2’00’ | Reserved |
| 84 | LNKSVC | SVC SVCNR | Executable SVC instruction for Adabas SVC (default: operating-system-dependent) |
| 86 | LUINFO | Y(LNUINFO) | Length of user information (default: 0) |
| 88 | VUEXITA | V(UEXITA) | Address of user exit after call (weak) |
| 8C | VUEXITB | V(UEXITB) | Address of user exit before call (weak) |
| 90 | ADABAS51 | CL8’ADABAS51’ | IDT ID |

### ADAUSER Considerations

ADAUSER is a program that links the user to Adabas. It is specific to an operating system and is independent of release level and mode. It can be used in batch and in some TP environments (such as TSO).

ADAUSER operates in the following way:

- ADAUSER contains the entry point ADABAS and should be linked with all user programs that call Adabas. No other programs containing the CSECT or entry point name ADABAS can be linked in these load modules/phases.
- on the first call to Adabas, ADAUSER loads the latest version of ADARUN. This makes the calling process release-independent. Subsequent Adabas calls bypass ADARUN.
- ADARUN processes its control statements. If the ADARUN `PROGRAM` parameter has the (default) value USER, ADARUN loads ADAIOR and, depending on whether the ADARUN `MODE` parameter specifies MULTI or SINGLE, loads the appropriate TP Adalink or ADANUC, respectively. This makes the calling process mode-independent.

# 6 Installing Adabas for OS IV/F4

This section describes how to prepare for and install Adabas on Fujitsu Ltd.'s OS IV/F4 (including MSP and MSP 20/AE/EX) operating systems.

For information about the prerequisite system levels supported by Adabas, refer to the section *Supported Environments*.

**Note:** Adabas 7.4.2 is the most current Adabas release to support MSP. Instructions for using Adabas under MSP are provided in this 7.4.4 documentation only as a convenience for MSP users of Adabas 7.4.2.

## Installation Checklist

**Note:** The MSP environment now has two tape versions. The newer tape contains MSP/EX support for cross-memory services.

The following is an overview of the steps for installing Adabas on an OS IV/F4 system.

| Step | Description | Additional Information |
|---|---|---|
| | **Basic Installation Steps** | |
| 1 | Allocate DASD space for the Adabas libraries. | The libraries are restored from the installation tape. Refer to the section *Disk Space Requirements for Libraries*. |
| 2 | Allocate DASD space for the Adabas database. | For better performance, distribute the database files over multiple devices and channels. Refer to the section *Disk Space Requirements for the Database*. |
| 3 | Specify the partition or OS IV/F4 address space for running the Adabas nucleus. | Refer to the section *Adabas Nucleus Address Space Requirements*. |
| 4 | Restore the Adabas libraries from the installation tape. | Use the tape positioning information that accompanies the tape. Refer to the section *Installing the Release Tape*. |
| 5 | Install the Adabas SVC. | Refer to the section *Initializing the Adabas Communication Environment*. |
| | **Database Installation Steps** | Steps 6-15 require changes to the setup definitions as described in the section *Installing an Adabas Database*. |
| 6 | Allocate and format the Adabas database with the ADAFRM utility job. | |
| 7 | Define the global database characteristics with the ADADEF utility job. | |
| 8 | Load the demonstration files with the ADALODE, ADALODV, and ADALODM jobs. | |

| Step | Description | Additional Information |
|---|---|---|
| 9 | Start the Adabas nucleus and test the Adabas communications with the ADANUC job. | |
| 10 | If appropriate, test Adabas address space communications by running ADAREP in MULTI mode with the `CPEXLIST` parameter. | |
| 11 | If appropriate, load the Adabas Online System (AOS) selectable unit into a Natural system file by running the AOSINPL job. Alternatively, install the AOS demo version. | See section ***Installing the AOS Demo Version***. |
| 12 | Terminate the Adabas nucleus with an `ADAEND` operator command using the OS Modify command `F`. | |
| 13 | Back up the database by running the ADASAV utility job. | |
| 14 | Insert the ADARUN defaults by running the DEFAULTS job. | |
| | **TP Monitor Installation** | |
| 15 | Install the required TP link routines for Adabas. | See section ***Installing Adabas with TP Monitors***. |

## Preparing to Install Adabas

The major steps in preparing for Adabas installation are

- check for the correct prerequisite system configuration; and
- allocate disk and storage space.

The following sections discuss the nominal disk and storage space requirements and how to allocate the space.

### Disk Space Requirements for Libraries

The minimum 3390 disk space requirements for the Adabas libraries are as follows:

| Library | 3390 Cylinders | 3390 Tracks | Directory Blocks |
|---|---|---|---|
| Load | 8 | 120 | 40 |
| Source | 3 | 45 | 20 |
| JCL | 1 | 15 | 20 |

**Note:** You can isolate user programs from the Adabas load library by creating a separate load library that contains only those modules needed to execute user programs in multiuser mode and linked with ADAUSER. For Version 7.4, the modules required by user programs are ADAIOR, ADAIOS, ADALNK, ADAMLF, ADAPRF, ADARUN.

### Disk Space Requirements for the Database

The actual database space needed by Adabas depends on user requirements. The minimum 3390 disk space requirements for the database are as follows:

| Database Component | 3390 Cylinders | 3390 Tracks |
|---|---|---|
| ASSOR1 (Associator) | 20 | 300 |
| DATAR1 (Data Storage) | 60 | 900 |
| WORKR1 (Work space) | 15 | 225 |
| TEMPR1 (temporary work space) | 15 | 225 |
| SORTR1 (sort work space) | 15 | 225 |

### Adabas Nucleus Address Space Requirements

The typical Adabas nucleus requires at least 800-1024 kilobytes to operate. The size of the nucleus address space may need to be larger, depending on the ADARUN parameter settings. Parameter settings are determined by the user.

## Installing the Release Tape

The following job control (JCL) restores the Adabas libraries:

```
//ADAREST JOB ...
//STEP1 EXEC PGM=IEBCOPY
//LOADT DD DSN=ADAvrs.LOAD,DISP=(OLD,PASS),
// UNIT=TAPE,VOL=SER=vvvvvv,
// LABEL=(n,SL)
//SOURCET DD DSN=ADAvrs.SRCE,DISP=(OLD,PASS),
// UNIT=TAPE,VOL=SER=vvvvvv,
// LABEL=(n,SL)
//JCLT DD DSN=ADAvrs.JOBS,DISP=(OLD,PASS),
// UNIT=TAPE,VOL=SER=vvvvvv,
// LABEL=(n,SL)
//*
//* ADABAS VERSION v LIBRARIES:
//*
//LOAD DD DSN=ADAvrs.LOAD,DISP=(NEW,CATLG),
// UNIT=dasdev,VOL=SER=volser,
// SPACE=(CYL,(cyl,,blk)),
// DCB=(RECFM=U,BLKSIZE=6447)
//SOURCE DD DSN=ADAvrs.SRCE,DISP=(NEW,CATLG),
// UNIT=dasdev,VOL=SER=volser,
// SPACE=(CYL,(cyl,,blk)),
// DCB=(RECFM=FB,BLKSIZE=6000,LRECL=80)
//JCL DD DSN=ADAvrs.JOBS,DISP=(NEW,CATLG),
// UNIT=dasdev,VOL=SER=volser,
// SPACE=(CYL,(cyl,,blk)),
// DCB=(RECFM=FB,BLKSIZE=6000,LRECL=80)
//SYSPRINT DD SYSOUT=X
//SYSIN DD *
COPY INDD=LOADT,OUTDD=LOAD
COPY INDD=SOURCET,OUTDD=SOURCE
COPY INDD=JCLT,OUTDD=JCL
/*
//
—where
blk is the number of directory blocks for this library
cyl is the number of cylinders for this library
vrs is the Adabas version level
vvvvvv is the volume serial number for the Adabas installation tape
n is the position of the data set on the Adabas installation tape
volser is the volume serial number of the disk used for the Adabas library
dasdev is the DASD device type
```

Refer to the *Report of Tape Creation* for the correct Adabas library sequence. The DCB statements in the above example are not required for the IEBCOPY step.

## Initializing the Adabas Communication Environment

This section describes the installation of the Adabas router (ADASVC). The router uses cross-memory services for communication between the Adabas nucleus and the Adabas users.

The Adabas cross-memory communications service comprises two modules:

- the Adabas router (ADASVC); and
- the Adabas subsystem initialization routine (ADASIR).

ADASIR, executed either during IPL or by the Adabas SVC installation program (ADASIP), initializes the router's operating environment, particularly the ID table.

ADASIR must be linked into either SYS1.LINKLIB or into a library concatenated to SYS1.LINKLIB by the LNKLST*xx* member of SYS1.PARMLIB. This requires re-IPLing the system to install the Adabas SVC.

**Note:** The CLPA option must first be specified as an IPL-selected option.

## Router Installation Overview

The following steps are required for installing the router:

- Step 1: Restore the Adabas Installation Tape
- Step 2: Apply the Zap To Define the Subsystem ADAB
- Step 3: Re-IPL the Operating System with CLPA To Load and Execute ADASIR

### Step 1: Restore the Adabas Installation Tape

Restore the Adabas Installation Tape as described in the section ***Installing the Release Tape***.

### Step 2: Apply the Zap To Define the Subsystem ADAB

Apply the zap to define the subsystem ADAB as described in the section ***Executing ADASIR***.

If necessary, also do the following operating-system-dependent steps:

| | |
|---|---|
| OS IV/F4 | Apply the zap to modify the SVC table entry for a type 3 SVC as described in the section ***Setting the SVC Table***. |
| MSP/EX | Modify the member KAASVC*nn* to define the Adabas router under MSP/EX as described in the section ***Setting the SVC Table.*** |
| MSP/EX | Modify the member SUBSYS*xx* to add the subsystem as described in the section ***Executing ADASIR***. |

Apply the zap as described in the section ***Setting the ID Table Count and SVC Number***.

If necessary, relink the SVC as described in the section ***Linking the Adabas SVC***.

### Step 3: Re-IPL the Operating System with CLPA To Load and Execute ADASIR

Re-IPL the operating system with CLPA to load and execute ADASIR.

## Setting the SVC Table

OS IV/F4 systems must define the SVC as a type 3 with no locks.

The VERIFY and REPLACE statement examples in the following sections show how to alter an available SVC entry to define it as type 3.

### For OS IV/F4 MSP E20

Use the following statements to alter an available SVC entry to define it as type 3:

```
NAMEX KAANUC01 SVCTABLE
VER offset xxxx
REP offset C000 (type 3, no locks)
—where
offset is the offset to byte 4 of the SVC entry for the specified SVC.
xx (or) xxxx is the existing contents of SVC bytes 4 and 5 at the specified offset.
```

**Note:** The SVC table entry is eight bytes long. The fourth byte of each entry specifies the type attribute, and the fifth byte specifies the lock attribute (see bytes 5 and 6 of the following E20 AE example).

### For OS IV/F4 MSP E20 AE

Use the following statements to alter an available SVC entry to define it as type 3:

```
NAMEX KAANUC01 SVCTABLE
VER offset xxxx xxxx
REP offset C000 00yy
—where
offset is the offset to byte 5 of the SVC entry for the specified SVC.
xxxx xxxx is the existing contents of SVC bytes 5-8 at the specified offset.
yy is the value of the selected AMODE option as described below in flag 4 (for
example, B’10nn nnnn’ for AMODE=31).
```

**Note:** The SVC table entry is eight bytes long, and has the following format:

| Bytes | Meaning |
|---|---|
| 1 - 4 | SVC entry address |
| 5 | Flag byte:<br>`Type 1 SVC: B’0000 nnnn’`<br>`Type 2 SVC: B’1000 nnnn’`<br>`Type 3 and 4 SVC: B’1100 nnnn’`<br>`Type 6 SVC: B’0010 nnnn’` |

| Bytes | Meaning |
|---|---|
| 6 | Flag 2:<br>`Local lock: B’10`*`nn nnnn`*`’`<br>`CMS lock: B’11`*`nn nnnn`*`’` |
| 7 | Flag 3 (reserved) |
| 8 | Flag 4:<br>`AMODE=24: B’00`*`nn nnnn`*`’`<br>`AMODE=31: B’10`*`nn nnnn`*`’`<br>`AMODE=ANY: B’01`*`nn nnnn`*`’` |

### For OS IV/F4 MSP 20AE/EX

Either create or modify member KAASVC*nn* in SYS1.PARMLIB. This member describes the attributes of the SVCs used in the MSP/EX system.

The following characteristics can be used for the Adabas SVC:

- Type 3
- No locks

The entry format is:

```
NUM=svc,TYPE=3,EPNAME=entryname,AM=31,APF=NO
—where
svc is the Adabas SVC number.
entryname is the Adabas SVC entry name.
```

## Setting the ID Table Count and SVC Number

ADASIR detects and supports either the MSP/20, or MSP/AE and MSP/EX without cross-memory services, based on PTF level 91212 or above running on a FACOM model M760 or higher.

ADASIR does not accept passed parameters. As a result, the ID table entry count, SVC number, and operating mode must be zapped as follows:

```
NAMEX ADASIR
* ADABAS 7 SVC number
VER 0034 0A00 (this default is invalid)
REP 0034 0Axx (where xx is the SVC number)
```

To enter the allowed maximum count of ID table entries, issue the following zap:

```
NAMEX ADASIR
* number of ID Table entries
VER 0020 0000,000A (default = 10)
REP 0020 0000,00xx (where xx is the maximum entry count)
```

To set the operating environment, make the following ZAP;

```
NAMEX ADASIR ADASIR
VER 0024 00 (this default is invalid)
REP 0024 xx
(where xx is the operating environment, as follows:
01: native mode
02: AVM/EF mode
03: AVM/EX mode)
```

**Note:** To get the VMID under AVM/EX, you must set the QAL for the AS option of AVM; otherwise, the VMID is NO.

### Using ADASIR

ADASIR receives control when the master scheduler is initialized. The operator is prompted for `NRIDTES` and `SVCNR` values that were not correctly zapped. Message ADAS03 indicates that ADASIR ended normally. Message ADAS04 indicates an error condition that prevents Adabas from being used until the problem is corrected and the system is re-IPLed. For specific message information, refer to the *Adabas Messages and Codes.*

- Linking the Adabas SVC

### Linking the Adabas SVC

Link the Adabas OS IV/F4 type 3 SVC into SYS1.LPALIB with the name JFF00*nnp*, where *nn* are the first two digits of the SVC number and *p* is the character equivalent of the last SVC digit (as an example, when the last SVC digit is 1, *p* must be set to A), which must be non-zero.

#### For MSP 20 AE Systems

For OS IV/F4 MSP 20 AE systems, the following example applies:

```
//A42L31 JOB CLASS=A,MSGCLASS=X
//IEWL2 EXEC PGM=IEWL,
// PARM='LET,LIST,NCAL,XREF,RENT,SECTION=(31)',REGION=1024K
//SYSPRINT DD SYSOUT=X
//SYSUT1 DD UNIT=SYSDA,SPACE=(CYL,(5,5))
//ADALIB DD DSN=user.loadlib,DISP=SHR <--ADASVC loadlib
//SYSLMOD DD DSN=SYS1.LPALIB,DISP=SHR
//SYSLIN DD *
CHANGE ADASVC(JFF00nnp)
INCLUDE ADALIB(ADASVC)
NAME JFF00nnp(R)
/*
```

#### For Non-MSP 20 AE Systems

The following example shows how to link the SVC for non-MSP 20 AE systems:

```
// (job card)
//LKED EXEC PGM=IEWL,
// PARM='XREF,LIST,LET,NCAL,RENT,REUS'
//SYSPRINT DD SYSOUT=X
//SYSUT1 DD UNIT=SYSDA,SPACE=(CYL,(1,1))
//SYSLMOD DD DSN=SYS1.LPALIB,DISP=SHR <- -Target loadlib
//ADALIB DD DSN=user.loadlib,DISP=SHR <--ADASVC loadlib
//SYSLIN DD *
CHANGE ADASVC(JFF00nnp)
INCLUDE ADALIB(ADASVC)
NAME JFF00nnp(R)
/*
```

### Executing ADASIR

#### For OS IV/F4 Environments

Zap the ADASIR entry into the subsystem table named KDJJSSNT in SYS1.LINKLIB.

Entries in the subsystem table are 80 bytes long. The table begins directly with the first entry.

To find an available entry for Adabas, dump the module KDJJSSNT in SYS1.LINKLIB and search for an empty 80-byte entry. Empty entries contain all blanks.

Use the following zap to add ADAB as a valid subsystem:

```
NAMEX KDJJSSNT KDJJSSNT
VER offset 40404040,4040404040404040
REP offset C1C4C1C2,C1C4C1E2C9D94040
```

—where *offset* is the offset to the beginning of the first available subsystem table entry specifying ADAB,ADASIR, as defined in the REP statement.

**Note:** The ADASIR program loads a channel appendage KHH019KU from SYS1.LINKLIB.

At this point, you are ready to IPL the ADASIR routine (with CLPA). Any messages or codes occurring while executing ADASIR are described in the *Adabas Messages and Codes*.

#### For OS IV/F4 MSP (E20, AE and EX) Environments

Define a SUBSYSTEM entry for Adabas by either creating or modifying the member SUBSYS*xx* in SYS1.PARMLIB. The format is as follows:

```
SNDSUB SUBNAME=name,PGM=ADASIR
```

—where *name* is the subsystem name (the default is ADAB). The value for *name* must be the same as the name in the Adabas router, offset X‘28’.

If you already have an “ADAB” subsystem in the system, apply the following zap:

```
NAMEX ADASVC
VER 0028 C1C4C1C2
REP 0028 subname
```

—where *subname* is a four-character name other than ADAB specified by SUBNAME.

# Installing an Adabas Database

Once you have restored the Adabas installation tape and have installed the ADASVC, you can

- migrate an existing Adabas database to the new version; or
- install a new version of the Adabas database.

Messages or codes that occur during the installation are described in the *Adabas Messages and Codes*; utilities are described in *Adabas Utilities*.

## Migrate an Existing Database

Use the ADACNV utility to migrate existing databases to new releases of Adabas (SMA job number I051). See *Adabas Utilities* for more information.

## Install a New Database

### Step 1: Allocate and Format the Adabas Database

Customize and run the ADAFRM utility job to allocate and format the Adabas database. The following must be customized (for references to Adabas utility parameters; see the specific utility descriptions in the *Adabas Utilities* documentation):

- data set names for the database and libraries;
- volumes for libraries and data sets for the database;
- space allocation for data sets for the database;
- the Adabas SVC number, the database ID, and database device type(s);
- sizes of the data sets for each ADAFRM statement.

### Step 2: Define the Global Database Characteristics

Customize and run the ADADEF utility job to define the global definition of the database. The following must be customized:

- data set names of the database and libraries;
- the Adabas SVC number, the database ID, and database device type(s);
- ADADEF parameters.

### Step 3: Load the Demonstration Files

Customize and run the job:

- ADALODE to load the sample demo file EMPL;
- ADALODV to load the sample demo file VEHI; and
- ADALODM to load the sample demo file MISC.

For each job, the following must be customized:

- data set names for the database and libraries;
- the Adabas SVC number, the database ID, and database device type(s);
- ADALOD parameters.

### Step 4: Start the Adabas Nucleus and Test the Adabas Communications

Customize and run the job ADANUC to start up the Adabas nucleus. The following must be customized:

- data set names for the database and libraries;
- the Adabas SVC number, the database ID, and database device type(s);
- ADANUC parameters.

### Step 5: Test Adabas Address Space Communications, If Appropriate

Customize and run the job ADAREP in MULTI mode with the `CPEXLIST` parameter to test Adabas address space communications. The following must be customized:

- data set names for the database and libraries;
- the Adabas SVC number, the database ID, and database device type(s);
- ADAREP parameters.

### Step 6: Load the Adabas Online System Selectable Unit, If Appropriate

Customize and run the job AOSINPL to load the Adabas Online System (AOS) into a Natural system file using a batch version of Natural 3.1 or above. The following must be customized:

- data set names of the database and libraries;
- the Adabas SVC number, the database ID, and device type(s);
- the Natural INPL parameters and system file number.

Alternatively, install the AOS demo version delivered with Adabas: see section ***Installing AOS Demo Version***.

### Step 7: Terminate the Adabas Nucleus

Communicate with the Adabas nucleus to terminate the session either with an `ADAEND` operator command using the OS `Modify` command

```
F jobname,ADAEND
```

—or

```
P jobname
```

—where `jobname` is the job or task name of the started nucleus.

### Step 8. Back Up the Database

Customize and run the ADASAV utility job to back up the database. The following must be customized:

- data set names of the database and libraries;
- the Adabas SVC number, the database ID, and device type(s);
- ADASAV parameters.

### Step 9: Insert the ADARUN Defaults

The member DEFAULTS in the Adabas JCL library can be modified to set the ADARUN defaults. The following must be customized:

- data set names of the database and libraries;
- ADARUN user defaults:
  - device type(s) (default: 3380)
  - SVC number (default: 249)

- database ID (default: 1)

Customize and run the DEFAULTS job to set the ADARUN defaults using the OS ZAP utility.

### Step 10: Install the Required TP Link Routines for Adabas

Refer to the section *Installing Adabas with TP Monitors* for a description of the TP link routine procedure.

## SVC Integrity Validation

In the past, the presence of multiple SVCs with the same subsystem ID has resulted in a single ID table being used by different SVCs. This has caused problems, some of them serious (abnormal nucleus termination or corruption of the database).

To eliminate this danger, the Version 7 SVC checks to ensure that the SVC accessing the ID table is the same as the one that was used by ADASIP/ADASIR to initialize the table. If the SVCs are not the same, an abend 650 occurs.

Abend 650 occurs when an incorrect SVC number is specified in the ADARUN parameters for a nucleus. It can occur during Adabas initialization, during the first Adabas call from a user program, or when the ID table is queried by another Software AG server such as Entire Net-Work.

## Requirements for Cross-Memory Services

The following hardware/software is required to use cross-memory services with MSP EX:

- FACOM M760, or above;
- MSP EX level PTF91121 operating system, or above.

With cross-memory services, the Adabas command queue and attached buffers are located in the address space instead of the common storage area (CSA), where all components except the ID table are usually located.

When cross-memory services is used, the number of system linkage indexes can be increased from the default of 55 (X’37’) by using the following zap:

```
NAMEX KAANUC01 KAACMTBL
VER 004E 0037 (default = 55)
REP 004E 0xxx (maximum: 1024)
```

To get the VMID under AVM/EX, you must set the ASP option of AVM to ON; otherwise, the VMID will be null.

## Using EXCPVR

CPU usage is reduced considerably by using EXCPVR. This requires that ADARUN be APF-authorized and that all Adabas modules be contained in APF-authorized libraries. When placed in an APF-authorized library, ADARUN allows the Adabas nucleus and utilities to use EXCPVR.

All Adabas modules except the Adalink must run with `RMODE=24` (the default); the Adalink can run with any `RMODE`.

When the EXEC statement specifies `PGM=ADARUN`, the `AMODE` is determined as follows:

- The default `AMODE=31` is used unless ADARUN was relinked using either the `AMODE=24` EXEC statement parameter or the `MODE AMODE(24)` linkage editor control statement.
- An `AMODE` of 31 is changed to 24 before affected macros (data management, for example) are run, and then changed back to 31 thereafter.

Adabas performance can be improved by using EXCPVR to improve channel program translation time. For Adabas to invoke EXCPVR automatically, the Adabas modules must be in an APF-authorized library and ADARUN must be linked with `SETCODE AC(1)`, the default, as shown in the following example:

```
//LINKRUN EXEC PGM=IEWL,PARM=’REUS’
//SYSPRINT DD SYSOUT=*
//SYSUT1 DD UNIT=SYSDA,SPACE=(CYL,(1,1))
//ADALIB DD DSN=user.loadlib,DISP=SHR
//SYSLMOD DD DSN=user.loadlib,DISP=SHR <==APF-authorized library
//SYSLIN DD *
INCLUDE ADALIB(ADARUN)
SETCODE AC(1)
NAME ADARUN(R)
```

## Creating a Shareable ADARUN

The ADARUN module delivered in the Adabas load library is neither reentrant nor reusable.

A reusable ADARUN permits several programs running in the same address space to share the same ADARUN and ultimately, the same copy of ADALNK. This is important when it is necessary to have only one Adabas user ID for the different programs, and is also needed if single copies of ADALNK user exits are required.

To create a shareable ADARUN, re-link it with the REUS attribute using the sample job JCLLINRR in the MVSJOBS library.

If both nonreusable and reusable versions of ADARUN are required, they must be located in different load libraries since both must be loadable using the name ADARUN.

## Storage Above 16 MB

Adabas can acquire a number of its required areas, including buffer space, above the 16-MB addressing limit, allowing Adabas to increase the buffer pool size. Storage above 16 MB is available on OS IV/F4 MSP 20 AE and MSP/EX operating systems.

To reverse the space allocation to be below the 16-MB limit, set the SECTION value in the PARM statement in the example below to "(24)":

```
//LINKRUN EXEC PGM=IEWL,
PARM='LET,LIST,NCAL,XREF,RENT,SECTION=(24)'
//SYSPRINT DD SYSOUT=*
//SYSUT1 DD UNIT=SYSDA,SPACE=(CYL,(1,1))
//ADALIB DD DSN=user.loadlib,DISP=SHR
//SYSLMOD DD DSN=user.loadlib,DISP=SHR <==APF-authorized library
//SYSLIN DD *
INCLUDE ADALIB(ADARUN)
SETCODE AC(1)
NAME ADARUN(R)
```

In addition, Adabas must be run with a sufficient REGION specification, either on the JOB or EXEC statement or as an installation default. For example:

```
//BIG JOB ...,REGION=30M,...
```

The attached buffers and the Adabas command queue can also be allocated in storage above the 16-MB line. These components are allocated in ECSA if the SVC table entry FLAG 4 specifies `AMODE=31`.

## Adalink Considerations

**Note:** For information about connecting a database that is enabled for data conversion using the universal encoding service (UES), see the section ***Connecting UES-Enabled Databases***.

### User Exit B (Pre-Command) and User Exit A (Post-Command)

One or two user exits may be linked with an Adalink routine (SMA job number I088):

- UEXITB receives control before a command is passed to a target with the router 04 call.

  **Note:** Special commands emanating from utilities and from Adabas Online System are marked as physical calls. These calls must be bypassed in user exits. These calls have X‘04’ in the first byte (TYPE field) of the command’s Adabas control block (ACB). UEXITB must check this byte and return if it is set to X‘04’. Be sure to reset R15 to zero on return.

- UEXITA receives control after a command has been completely processed by a target, the router, or by the Adalink itself.

At entry to the exit(s), the registers contain the following:

| Register | Contents |
|---|---|
| 1 | Address of the UB.<br>If the flag bit UBFINUB is reset, the contents of the halfword at Adabas + X’86’ have been moved to UBLUINFO. If those contents are greater than zero, the two bytes starting at UBINFO (UB+X’40’) have been set to zero.<br>If UBFINUB is set, no changes can be made to the UB or ACB (except for ACBRSP). |
| 2 | Address of a 16-word save area (for ADALNC only) |
| 13 | Address of an 18-word save area (for non-CICS Adalink exits) |
| 14 | Return address |
| 15 | Entry point address: UEXITB or UEXITA |

Any registers except register 15 that are modified by the user exits must be saved and restored; the address of a save area for this purpose is in register 13 (or register 2 for ADALNC).

If at return from UEXITB register 15 contains a value other than zero, the command is not sent to the target but is returned to the caller. The user exit should have set ACBRSP to a non-zero value to indicate to the calling program that it has suppressed the command: response code 216 is reserved for this purpose.

The UEXITB exit may set the UB field UBLUINFO to any lesser value, including zero; an abend occurs if the user exit sets UBLUINFO to a greater value. The UBLUINFO length cannot be changed when any other exit is used; for example, Adabas Review or Adabas Fastpath.

The user information received by a UEXITA exit may have been modified; this modification may include decreasing its length, possibly to zero, by any of the Adalink user exits.

An Adalink routine can return the following non-zero response codes in ACBRSP:

| Response Code | Description |
|---|---|
| 213 | No ID table |
| 216 | UEXITB suppressed the command |
| 218 | No UB available |

At least the following three equates, described at the beginning of the source, can be modified before an Adalink routine is assembled. In some Adalink routines, however, the corresponding information can be zapped:

| Equate | Description |
|---|---|
| LOGID | The default logical ID, ranging in value from 1 to 65535. The default is 1. |
| LNUINFO | The length of the user information to be passed to Adalink user exits, ranging in value from 0 to 32767. The default is 0. |
| SVCNR | The Adabas SVC number; its range of values and the default depend on the operating system. This value can be provided as SYSPARM value for assembly of the following Adalink routine:<br>`//EXEC PGM=ass,PARM=‘......,SYSPARM(svcnr)’` |

The first 152 (X’98’) bytes of all Adabas Adalinks must maintain the following structure:

| Offset | Label | Contents | Meaning |
|---|---|---|---|
| 00 | ADABAS | | Entry code |
| 12 | | CL6’ADALN*x*’ | Program name |
| 18 | | XL4’*yyyymmdd*’ | Assembly date |
| 1C | | A(ZAPTAB) | Address of zap table |
| 20 | PATCH | XL96’00’ | Patch area |
| 80 | LNKLOGID | AL2(LOGID) | Default logical ID (default: 1) |
| 82 | | 82 XL2’00’ | Reserved |
| 84 | LNKSVC | SVC SVCNR | Executable SVC instruction for Adabas SVC (default: operating-system-dependent) |
| 86 | LUINFO | Y(LNUINFO) | Length of user information (default: 0) |
| 88 | VUEXITA | V(UEXITA) | Address of user exit after call (weak) |
| 8C | VUEXITB | V(UEXITB) | Address of user exit before call (weak) |
| 90 | ADABAS51 | CL8’ADABAS51’ | IDT ID |

### ADAUSER Considerations

ADAUSER is a program that links the user to Adabas. It is specific to an operating system and is independent of release level and mode. It can be used in batch and in some TP environments (such as TSO).

ADAUSER operates in the following way:

- ADAUSER contains the entry point ADABAS and should be linked with all user programs that call Adabas. No other programs containing the CSECT or entry point name ADABAS can be linked in these load modules/phases.
- On the first call to Adabas, ADAUSER loads the latest version of ADARUN. This makes the calling process release-independent. Subsequent Adabas calls bypass ADARUN.
- ADARUN processes its control statements. If the ADARUN `PROGRAM` parameter has the (default) value USER, ADARUN loads ADAIOR and, depending on whether the ADARUN `MODE` parameter specifies MULTI or SINGLE, loads the appropriate TP Adalink or ADANUC, respectively. This makes the calling process mode-independent.

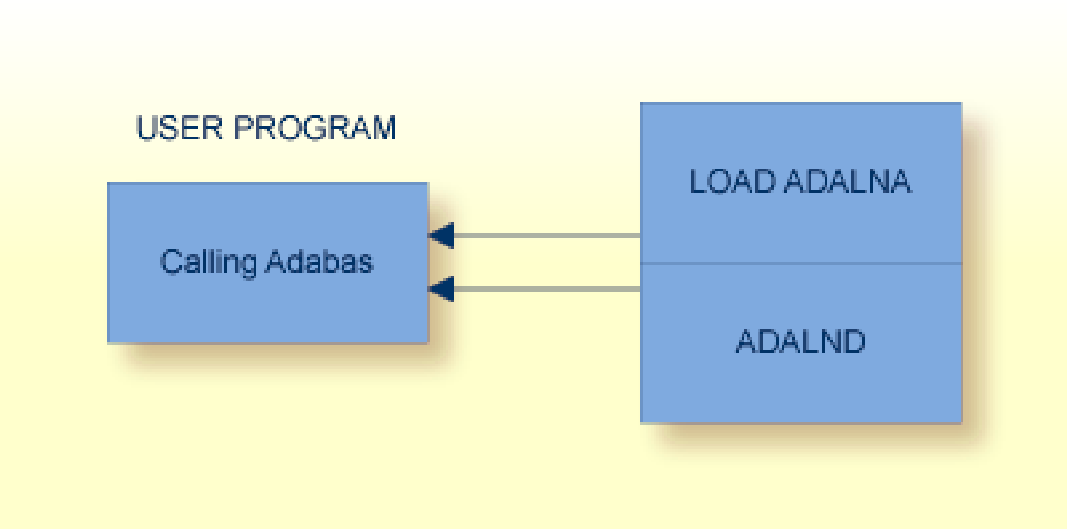
# 7 Installing Adabas With TP Monitors

This section provides information needed to install Adabas for the teleprocessing (TP) monitors shown in the table below. Information about using Adabas with TP monitors is contained in other sections as well, particularly in the sections describing Adabas installation by operating system.

| Platform | TP Monitor | TP Monitor / Adalink |
|---|---|---|
| Fujitsu, Ltd. (FACOM) | AIM/DC | ADALNA / ADALND |
| IBM z/OS | CICS command-level | LNKOLSC / LNKOLM |
| IBM z/OS | CICS high-performance stub | LNCSTUB |
| IBM z/OS | Com-plete | ADALCO |
| IBM IMS | IMS/DC | ADALNI / ADALNK |
| IBM z/OS | Shadow | ADALNS |
| IBM z/OS | Batch / TSO | ADALNK / ADALNKR |

## Installing Adabas with AIM/DC

This section describes installation of the Fujitsu (FACOM) AIM/DC TP monitor with Adabas.



The job AIMASM is provided for assembling the source members ADALNA and ADALND, the AIM/DC-dependent link routines. You must first customize the JCL for AIMASM to select the MVS operating system MACLIB (SYS1.MACLIB) containing the LOAD macro.

Before AIMASM can be run, ADALNA must be customized to select the following options:

| Option | Value | Specify ... |
|---|---|---|
| SVCNR | 249 \| *nn* | the value of the MSP SVC number. The default value is 249. |
| LOGID | 1 \| *nn* | the value of the default logical database ID in the range 1-255. The default value is 1. |
| NUBS | 50 \| *nn* | the value for the number of UBs (user blocks) to be created by ADALNA. This value must be high enough to handle the maximum possible number of concurrent Adabas requests. The default value is 50. |

**Note:** The modules ADALNA and ADALND are linked together to form ADALNA.

## Preparing Adabas Link Routines for IBM Platforms

This section describes the preparation of Adabas link routines for TP monitors for IBM platforms.

- High-Level Assembler
- Addressing Mode Assembly Directives
- UES-Enabled Link Routines

### High-Level Assembler

The IBM high-level Assembler is required when assembling the Adabas link routines for TP monitors. The high-level Assembler generates 4-digit year assembly dates into the load modules using the &SYSDATC assembly variable. The older Assemblers H and F do not support 4-digit year assembly dates.

It is possible to assemble the Adabas link routines without the high-level Assembler, either as is (ignore the assembly error), or with the &SYSDATC variable changed to *yyyymmdd*, any valid 4-byte unsigned decimal assembly date where *yyyy* is a 4-digit year, *mm* is a 2-digit month, and *dd* is a 2-digit day. The assembly date field is restricted to 4 bytes in the load module.

### Addressing Mode Assembly Directives

The Adabas link routines now have `AMODE` and `RMODE` assembly directives in the source. These allow the linkage editor to produce warning messages when conflicting `AMODE` or `RMODE` linkage-editor control statements are encountered in the link JCL, JCS, or EXECs.

These assembly directives also serve to document the preferred `AMODE` and `RMODE` for each link routine. It is important to note that in and of themselves, these directives do not alter the actual addressing mode of the link routine during execution.

The batch/TSO link routine ADALNK has the following AMODE and RMODE assembly directives:

```
ADABAS AMODE 31
ADABAS RMODE 24
```

For the CICS and IMS link routines (modules LNKOLM, LNKOLSC, and ADALNI) the directives are

```
ADABAS AMODE 31
ADABAS RMODE ANY
```

### Modifying the Assembly Directives

These directives may be changed by modifying the source members before assembling them, or they may be overridden by linkage editor control statements. For example, to link the batch/TSO ADALNK module with AMODE 31 and an RMODE of ANY, the following control statements may be provided as input to the linkage editor:

```
MODE AMODE(31),RMODE(ANY)
ENTRY ADABAS
NAME ADALNK(R)
```

The linkage editor control statements override the Assembler directives in the source module.

> **Note:** Future releases of the Adabas link routines may require an AMODE of 31 and an RMODE of ANY to function properly in the z/OS environment. Software AG strongly recommends that you evaluate application programs and update them to conform to this standard.

For more information about the AMODE and RMODE directives and their effects on the assembler, linkage editor, and execution, consult the *IBM MVS/ESA Extended Addressability* Guide.

## UES-Enabled Link Routines

For Adabas Version 7.4, UES is enabled by default for the batch/TSO, Com-plete, and IMS link routines. It is not necessary to disable UES support. Applications that do not require UES translation continue to work properly even when the UES components are linked with the Adabas link routines. See the section ***Connecting UES-Enabled Databases*** for more information.

### Disabling UES Support

However, if for some reason you feel it necessary to disable UES support in the Adabas link routines, use the following procedure to do so:

1. Edit the source member ADALCO, ADALNI, ADALNK, or ADALNKR. Set the &UES Boolean assembler variable to 0 by commenting out the source line where it is set to 1 and removing the comment from the line where it is set to 0.
2. Assemble the link routine after making any other necessary modifications to the equates and other directives in the source module as required by your installation.
3. Link the Adabas link routine and do not include any of the UES components (that is, LNKUES, ASC2EBC, or EBC2ASC).

## Installing Adabas with CICS

CICS/ESA 3.2 and above for z/OS environments must run a current version of Adabas and use the command-level link component. The macro-level link routine ADALNC is no longer supported in this environment.

The Adabas command-level link routine supports the CICS transaction server (CTS) environment.

**Notes:**

1. The OPID option for the USERID field is not supported under CICS/ESA 3.2 and above; therefore, it is not provided with the command-level link routine.
2. When running under CICS 4.1, the CICS components from Adabas 5.3.3 or above are required.

The following sections describe specific points of Adabas/CICS installation and operation from the CICS perspective:

- Adabas Bridge for VSAM Considerations
- CICS MRO Environment Requirements
- Using CICS Storage Protection
- Standard Versus Enhanced Installation
- LNKENAB and LNKTRUE Modules
- JCL and Source Members
- Sample Resource Definitions
- Modifying Source Member Defaults (ADAGSET Macro)

- Installation Procedure

### Adabas Bridge for VSAM Considerations

If you are running Adabas Bridge for VSAM 4.2 or 5.1 under CICS, you must run CICS 3.3 or above and the Adabas Version 7.1 or above command-level link routine.

**Note:** Adabas Bridge for VSAM Version 4.1.1 must use the Adabas command-level link routine included in the AVB 4.1.1 source library.

### CICS MRO Environment Requirements

If you run the Adabas CICS command-level link routine with the CICS multiple region option (MRO), you must set the ADAGSET option `MRO=YES` and use the default value for the ADAGSET `NETOPT` option.

You can use the ADAGSET `NTGPID` option to provide a 4-byte literal for the Adabas communication ID to be used by the Adabas SVC when applications that call Adabas span multiple application regions.

Alternatively, you can create a user exit B (UEXITB) for the link routine that

- sets UBFLAG1 (byte X'29' in the UB DSECT) to a value of X'08' (UBF1IMSR); and
- places a 4-byte alphanumeric value in the UB field UBIMSID.

The exit then allows the Adabas SVC to provide a proper Adabas communication ID in the Adabas command queue element (CQE) even when transactions originate in multiple regions.

### Using CICS Storage Protection

The storage protection mechanism (STGPROT) was introduced under CICS/ESA 3.3. Storage protection permits resources to access either CICS or user storage by using the storage protection keys. Resources defined to operate in

- user key may not overwrite CICS storage, thus affording a degree of protection to CICS.
- CICS key may read or write either CICS or user key storage, affording the highest degree of access to CICS resources.

To use storage protection with Adabas, you must either

- use the task-related user exit (ADAGSET `TRUE=YES`); or
- define the Adabas link routine with EXECKEY(CICS) in RDO.

Software AG recommends using the task-related user exit.

## Standard Versus Enhanced Installation

All supported versions of the command-level link routine can be installed using the standard installation, which comprises steps 1 through 3 of the **installation procedure**.

Steps 4 and 5 are required in order to use the enhanced features of the command-level link routine:

- CICS transaction isolation;
- ADASAF under CICS 4.1 or above; and
- an operationally reentrant command-level link after initialization.

Step 6 is used to install the optional DISPGWA program. The DISPGWA program is only available with the enhanced installation.

The enhanced installation is required if

- Adabas SAF Security (ADASAF) is being used under CICS 4.1 or above;
- CICS transaction isolation is used;
- Adabas Bridge for VSAM is used (Version 4.1 uses a separate command-level link routine included in the AVB Version 4.1 source library; Versions 4.2 and 5.1 use the same routine as Adabas); or
- the DISPGWA storage display program is used.

### CICS Transaction Isolation

The enhanced Adabas CICS command-level link components take advantage of the transaction isolation facility provided by CICS/ESA 4.1 when running with specific hardware under z/OS.

Transaction isolation is an extension of the storage protection mechanism. It further protects CICS resources by isolating them in subspaces. This protects user key resources from one another, and protects CICS key resources from the CICS kernel.

Transaction isolation can be enabled globally through the TRANISO system initialization (`SIT`) parameter, and for each CICS transaction with the new resource definition `ISOLATE` keyword.

Transaction isolation places some restrictions on CICS resources that must be available both during the life of the CICS system and to all transactions running in the CICS system.

The Adabas CICS command-level link components must be defined to CICS with the proper storage access to ensure proper operation when transaction isolation is active:

- The Adabas CICS command-level link routine, comprising the LNKOLSC, LNKOLM, and CICS entry and exit code, must be defined to CICS as a “user key” program.
- The LNKTRUE and LNKENAB (ADATRUE and ADAENAB) programs must both be defined as “CICS key” programs.

This permits the correct degree of isolation between applications invoking the link routine and the Adabas CICS task-related user exit (TRUE), which interacts directly with CICS resources.

When CICS transaction isolation is active, user SVCs cannot execute from the CICS region. SVCs can be executed in CICS key, however, during the PLT phase of the CICS startup and termination. For this reason, the module LNKENAB is provided to execute during the PLTPI phase of CICS initialization.

### ADASAF and CICS 4.1

The Adabas SAF Security (ADASAF) module resides in the Adabas nucleus region to handle the authorization of Adabas resources.

Under CICS 4.1, this module depends on the external security identifier (user sign-on) being extracted from the access control environment element (ACEE) in the caller's address space, and being passed on to Adabas by the SVC.

Under CICS 4.1, the command-level link routine must utilize a CICS task-related user exit to extract the external security identifier from the ACEE. The Adabas task-related user exit in the module LNKTRUE has been included in Adabas for this purpose.

**Note:** The Adabas task-related user exit LNKTRUE is not required for ADASAF under CICS versions prior to 4.1.

### Operationally Reentrant Link Routine after Initialization

The Adabas command-level link routine is operationally reentrant and not self-modifying after initialization. During execution, a CICS global work area (GWA) is obtained and passed to the command-level link, which uses the GWA to store addresses. This feature is available for CICS Version 3.2 and above.

**Note:** Do not use the JCL parameter `RENT` when assembling/linking the command-level link routine.

### DISPGWA Module : Displaying the CICS Global Work Areas

The DISPGWA module is a program provided by Software AG as an optional feature for CICS Version 3.3 and above.

The DISPGWA program displays the global work area (GWA) used by the various command-level link components. It can be used to display other areas of CICS that are important to the Adabas command-level link routine when it is executing as a task-related user exit (TRUE). With the help of Software AG personnel, you can use this program to interrogate important data areas during problem determination.

The DISPGWA module is used only if the LNKTRUE module is used, since it is the LNKTRUE module that actually EXTRACTs the global work area.

## LNKENAB and LNKTRUE Modules

This section describes the usage of the LNKENAB and LNKTRUE modules.

### LNKENAB Module

The LNKENAB module

- starts and enables the task-related user exit LNKTRUE (see the next section) during PLTPI processing.
- defines the length of storage that CICS gives to LNKTRUE as each task is invoked for the first time. The storage remains in CICS until the task terminates and is used by LNKTRUE as a task work area.
- issues an Adabas command to the default target and Adabas SVC defined in the ADAGSET macro in LNKOLSC. The target need not be active.

The purpose of the command is to derive the address of the IDTH from the first SVC call. All other SVC calls from the command-level link routine are then made using a branch entry into the Adabas SVC.

### LNKTRUE Module

When started and enabled by LNKENAB during PLTPI processing, the task-related user exit LNKTRUE module

- permits the command-level link routine to obtain the pointer to the access control environment element (ACEE) in a CICS/ESA 4.1 environment;
- facilitates processing when CICS transaction isolation is installed and enabled; and
- coordinates Adabas transactions through the CICS Resource Manager Interface (RMI) when the Adabas Transaction Manager (ATM) is installed and enabled.

Most of the command-level link components execute under the umbrella of LNKTRUE. This means that any abend condition during the execution of LNKTRUE is serious; CICS may even respond by terminating the entire CICS region.

Items that may cause this condition include, but are not limited to

- invalid application parameter lists for Adabas calls;
- inconsistent or incorrect keyword values coded in the ADAGSET macro for the various command-level components;
- user modification to the command-level link components or the task-related user exit; or
- incorrect coding in UEXITA and/or UEXITB components.

Software AG strongly recommends that you test application programs in a CICS region that supports the non-task-related user exit version (standard installation) of the command-level link before migrating to a task-related user exit version (enhanced installation) of the command-level link routine.

### JCL and Source Members

The JCL members use the sources indicated in the following table:

| JCL | Source | Source Description |
|---|---|---|
| CICCASM | LNKOLSC/LNKOLM | LNKOLSC is the dependent part of the Adabas command-level link routine. LNKOLM is the independent part of the Adabas command-level link routine. |
| CICTASM | LNKTRUE | Adabas task-related user exit. |
| CICEASM | LNKENAB | Adabas PLT-enabled program. |
| CICDASM | DISPGWA | Display program for Adabas global work area (GWA). |

### Sample Resource Definitions

Under CICS/TS 1.1 and above for z/OS and VSE, the preferred method for defining and installing CICS programs and transactions is RDO (resource definition online). The CICS documentation no longer recommends the assembly of PPT and PCT entries to define resources.

The following table provides sample RDO definitions for the Adabas CICS command-level link components (SMA job number I005). The data has been extracted directly from the CICS CSD file and should be used as a guide for providing comparable information on the CEDA panels.

```
**********************************************************************
* Sample DEFINE control statements for the DFHCSDUP utility.
* For Adabas V7.4 CICS command-level link routine components.
*
* These control statements can be used as input to the DFHCSDUP
* CICS CSD update utility to define the Adabas CICS command-level
* link routine components on a CICS/TS system.
**********************************************************************
DEFINE PROGRAM(ADABAS) GROUP(ADABAS)
DESCRIPTION(ADABAS V74s COMMAND LEVEL LINK ROUTINE)
LANGUAGE(ASSEMBLER) RELOAD(NO) RESIDENT(YES) USAGE(NORMAL)
USELPACOPY(NO) STATUS(ENABLED) CEDF(YES) DATALOCATION(ANY)
EXECKEY(CICS) EXECUTIONSET(FULLAPI)
DEFINE PROGRAM(ADAENAB) GROUP(ADABAS)
DESCRIPTION(ADABAS V74s PLTPI ENABLE ADATRUE PROGRAM)
LANGUAGE(ASSEMBLER) RELOAD(NO) RESIDENT(NO) USAGE(NORMAL)
USELPACOPY(NO) STATUS(ENABLED) CEDF(YES) DATALOCATION(ANY)
EXECKEY(CICS) EXECUTIONSET(FULLAPI)
```

```
DEFINE PROGRAM(ADATEST) GROUP(ADABAS)
DESCRIPTION(ADABAS V74s DISPLAY GWA PROGRAM - DISPGWA)
LANGUAGE(ASSEMBLER) RELOAD(NO) RESIDENT(NO) USAGE(NORMAL)
USELPACOPY(NO) STATUS(ENABLED) CEDF(YES) DATALOCATION(ANY)
EXECKEY(CICS) EXECUTIONSET(FULLAPI)
DEFINE PROGRAM(ADATRUE) GROUP(ADABAS)
DESCRIPTION(ADABAS V74s TASK RELATED USER EXIT)
LANGUAGE(ASSEMBLER) RELOAD(NO) RESIDENT(YES) USAGE(NORMAL)
USELPACOPY(NO) STATUS(ENABLED) CEDF(YES) DATALOCATION(ANY)
EXECKEY(CICS) EXECUTIONSET(FULLAPI)
DEFINE TRANSACTION(DGWA) GROUP(ADABAS)
DESCRIPTION(TRANSACTION TO DISPLAY ADABAS GWA)
PROGRAM(ADATEST) TWASIZE(128) PROFILE(DFHCICST) STATUS(ENABLED)
TASKDATALOC(ANY) TASKDATAKEY(CICS) STORAGECLEAR(NO)
RUNAWAY(SYSTEM) SHUTDOWN(DISABLED) ISOLATE(YES) DYNAMIC(NO)
PRIORITY(1) TRANCLASS(DFHTCL00) DTIMOUT(NO) INDOUBT(BACKOUT)
RESTART(NO) SPURGE(NO) TPURGE(NO) DUMP(YES) TRACE(YES)
RESSEC(NO) CMDSEC(NO)
```

—where *s* is the system maintenance level of Adabas.

These sample DEFINE statements are located in member DEFADAC in the Adabas Version 7.4 CICS command-level source library. They can be modified and used as input to the IBM DFHCSDUP utility to define the Adabas CICS command-level components. Consult the appropriate IBM CICS documentation for information on the DFHCSDUP utility.

### Modifying Source Member Defaults (ADAGSET Macro)

The ADAGSET macro is used to create default settings for the command-level link components. This macro exists in each of the installation source members. The macro settings must be identical in every installation source member used.

To facilitate the assembly of the Adabas command-level link routine components, Software AG recommends that you program the ADAGSET macro with site-specific default values and put it in a source library that is available in the SYSLIB concatenation during assembly.

It is critical that the values for the following keywords agree for all components of the Adabas CICS command-level link routine: LOGID, SVCNO, LUINFO, LRINFO, LUSAVE, NUBS, ENTPT, TRUENAM, and ENABNAM.

Step 1 of the installation procedure identifies the source members that must be edited for standard and enhanced installation.

The ADAGSET parameter options with their default values (underlined) are described below:

### AVB: Adabas VSAM Bridge Support

| Parameter | Description | Syntax |
|---|---|---|
| AVB | Indicates whether or not Software AG's Adabas Bridge for VSAM is to be supported by this command-level link routine.<br>■ AVB=YES: Adabas VSAM Bridge is to be supported.<br>■ AVB=NO: Adabas VSAM Bridge is not to be supported. | AVB={ NO \| YES } |

### ENABNM: Entry Point Name for Program to Enable Adabas TRUE

| Parameter | Description | Syntax |
|---|---|---|
| ENABNM | The entry point name for the program that is run to enable the Adabas TRUE during CICS PLTPI processing. The value must be a valid program name that matches the module name specified in the DFHPLT table at your site. The default value is ADAENAB.<br>This parameter is ignored if TRUE=NO is specified. | ENABNM={ 'ADAENAB' \| 'name' } |

### ENTPT: Name of the Adabas CICS Command-Level Link Routine

| Parameter | Description | Syntax |
|---|---|---|
| ENTPT | The name given to the Adabas CICS command-level link routine, which is the combination of LNKOLSC, LNKOLM, and the CICS entry and exit code. This name is used in EXEC CICS LINK commands to invoke Adabas services from CICS application programs.<br>See also notes 1 and 2 in the installation procedure. | ENTPT={ 'ADABAS' \| 'name' } |

### LADAFP: Length of Work Area for Adabas Fastpath Exit

| Parameter | Description | Syntax |
|---|---|---|
| LADAFP | The length of the work area provided to the Adabas Fastpath exit.<br>Values from 0 (the default) to 32767 may be specified. 0 indicates that Adabas Fastpath is not linked with the Adabas command-level link routine. A non-zero value requires that the parameter TRUE=YES is also set and the Adabas task-related user exit (TRUE) is used. Consult the Adabas Fastpath documentation for recommended values.<br>**Note:** This parameter is not yet fully implemented. It is provided for future use by Adabas Fastpath. | LADAFP={ 0 \| nn} |

### LOGID: Default Logical Database ID

| Parameter | Description | Syntax |
|---|---|---|
| `LOGID` | The value of the default logical database ID. Valid ID numbers are 1-65535. | `LOGID= nnn` |

### LRINFO: Length of Adabas Review Data Area

| Parameter | Description | Syntax |
|---|---|---|
| `LRINFO` | The length (in bytes) of the Adabas Review data area to be used by the REVEXITB program. The default is zero (Adabas Review is not being used). The minimum (and recommended) value is 256, the size Adabas Review expects when the REVEXITB program is invoked. See the Adabas Review documentation for more information. | `LRINFO={ 0 \| 256}` |

### LUINFO: Length of User Data passed to Adabas UEXITA and UEXITB

| Parameter | Description | Syntax |
|---|---|---|
| `LUINFO` | Length of the user data to be passed from the CICS link routine to Adabas UEXITA and UEXITB.<br>If `LUINFO` is not specified, the default is zero (no user save area is passed). | `LUINFO={ 0 \| length}` |

### LUSAVE: Size of User Save Area for Adabas UEXITA and UEXITB

| Parameter | Description | Syntax |
|---|---|---|
| `LUSAVE` | Size of the user save area to be used by Adabas user exits UEXITA and UEXITB. If `LUSAVE` is specified, a value of 72 or higher must be specified.<br>If `LUSAVE` is not specified, the default is zero (no user data is passed). | `LUSAVE={ 0 \| size}` |

### LXITAA: Length of Work Area provided to UEXITA

| Parameter | Description | Syntax |
|---|---|---|
| `LXITAA` | Length of the work area provided to the UEXITA user exit program.<br>Values from 0 (the default) to 32767 may be specified. 0 indicates that no UEXITA program is linked with the Adabas command-level link routine and no data is passed to UEXITA.<br>**Note:** This parameter is not yet fully implemented. It is provided for future use by the CICS user exit A program linked with LNKOLM. | `LXITAA={ 0 \| nn}` |

### LXITBA: Length of Work Area for UEXITB

| Parameter | Description | Syntax |
|---|---|---|
| LXITBA | Length of the work area provided to the UEXITB user exit program.<br>Values from 0 (the default) to 32767 may be specified. 0 indicates that no UEXITB program is linked with the Adabas command-level link routine and no data is passed to UEXITB.<br>**Note:** This parameter is not yet fully implemented. It is provided for future use by the CICS user exit A program linked with LNKOLM. | LXITBA={ 0 \| nn} |

### MRO: Multiple Region Option

| Parameter | Description | Syntax |
|---|---|---|
| MRO | The MRO parameter is used to indicate whether or not the CICS multiple region option is to be used.<br>If you run the CICS command-level link with the CICS multiple region option (MRO), set MRO=YES; otherwise, use the default value MRO=NO.<br>If MRO=YES, NETOPT must be set to NETOPT=NO (the default) to prevent non-unique LU names from multiple application regions.<br>If NETOPT=YES and MRO=YES are specified, an assembler MNOTE and a return code of 16 are produced from the assembly step. | MRO={ NO<br>\| YES } |

### NETOPT: Method Used to Create User ID

| Parameter | Description | Syntax |
|---|---|---|
| NETOPT | If NETOPT=YES is specified, an 8-byte user ID will be constructed from the VTAM LU name. If NETOPT=NO is specified, the user ID is created from the constant CICS plus the four-byte CICS terminal ID (TCTTETI) for terminal tasks. For non-terminal tasks, the user ID comprises the constant CIC plus the CICS task number.<br>If you run with the CICS multiple region option (MRO), you must use the default value for this option. If NETOPT=YES and MRO=YES are specified, an assembler MNOTE and a return code of 16 are produced from the assembly step. | NETOPT={ NO<br>\| YES } |

### NTGPID: Natural Group ID

| Parameter | Description | Syntax |
|---|---|---|
| NTGPID | This parameter is used to specify a 4-byte Natural group ID as required for unique Adabas user ID generation in the CICSplex environment with Natural Version 2.2.8 and above. The value is associated with all users who call the Adabas command-level link routine assembled with the specified value.<br>There is no default value. If no value is specified, the Adabas internal user ID is built in the conventional manner.<br>Any 4-byte alphanumeric value may be specified, but it must be unique for each Adabas command-level link routine running in a CICSplex, or z/OS image. If more than one NTGPID is required (for example, both test and production Natural 2.2.8), more than one Adabas command-level link routine with associated TRUE must be generated.<br>If you run with the CICS multiple region option (MRO), you may use NTGPID to provide a 4-byte literal for the Adabas communication ID to be used by the Adabas SVC when multiple application regions call Adabas. | `NTGPID=4-byte-value` |

### NUBS: Number of User Blocks Created By CICS Link Routine

| Parameter | Description | Syntax |
|---|---|---|
| NUBS | The number of user blocks (UBs) to be created by the CICS link routine. The number of blocks must be large enough to handle the maximum possible number of concurrent Adabas requests.<br>**Note:** The Adabas 6.2 and above command-level link routine obtains storage for the user blocks (the UB pool) above the 16-megabyte line. | `NUBS={ 50 \| blocks }` |

### PARMTYP: Area for Adabas Parameter List

| Parameter | Description | Syntax |
|---|---|---|
| PARMTYP | The area which is to contain the Adabas parameter list. TWA picks up the parameter list in the first six fullwords of the transaction work area (TWA). COM picks up the list in the COMMAREA, followed by the normal Adabas parameter list. The COMMAREA list must be at least 32 bytes long and begin with the label “ADABAS52”. PARMTYP=ALL (the default) uses both the COMMAREA and TWA to pass the Adabas parameters; in this case, the COMMAREA is checked first.<br>PARMTYP=ALL or PARMTYP=COM must be used if the TRUE=YES option is specified. | `PARMTYP={ ALL \| COM \| TWA }` |

### PURGE: Purge Transaction

| Parameter | Description | Syntax |
|---|---|---|
| PURGE | The PURGE parameter is used when assembling with CICS 3.2 or above. If PURGE=YES is specified, the CICS WAIT EXTERNAL will contain PURGEABLE as one of its parameters, allowing the transaction to be purged by CICS if the DTIMOUT value is exceeded and PURGE is specified.<br>If PURGE=NO (the default) is specified, the NONPURGEABLE option is generated. | PURGE={ NO<br>\| YES } |

### RMI: Resource Manager Interface

| Parameter | Description | Syntax |
|---|---|---|
| RMI | The RMI parameter is used to indicate whether or not the CICS Resource Manager Interface is to be used.<br>If RMI=YES is specified, the Adabas task-related user exit (TRUE) will be executed as a resource manager (RM) using the CICS Resource Manager Interface (RMI).<br>RMI=YES is valid only when the Adabas Transaction Manager is installed, enabled, and available to users executing in the CICS environment. Consult the Adabas Transaction Manager documentation for additional instructions related to the installation of the Adabas TRUE. | RMI={ NO<br>\| YES } |

### SAF: Adabas SAF Security

| Parameter | Description | Syntax |
|---|---|---|
| SAF | Indicates whether or not the Adabas SAF Security (ADASAF) is to be used. If you are using ADASAF, you must set SAF=YES.<br>■ YES: Adabas SAF Security is to be used.<br>■ NO: Adabas SAF Security is not to be used.<br>ADASAF requires the Adabas task-related user exit (TRUE) when running under CICS/ESA 4.1 or above. When SAF=YES and TRUE=YES, the task-related user exit passes the user's external security ID (sign-on) to Adabas.<br>If TRUE=YES is not specified in this case, the ADAGSET macro terminates the LNKOLSC, LNKTRUE, or LNKENAB assembly process with an MNOTE and a return code of 16.<br>TRUE=YES is not required when running ADASAF under CICS/ESA 3.3 or below. The combination SAF=YES and TRUE=NO is valid in such cases. | SAF={ NO<br>\| YES } |

### SAP: SAP Application Support

| Parameter | Description | Syntax |
|---|---|---|
| SAP | The SAP parameter is used to indicate whether or not Adabas support for the SAP application system is required.<br>If SAP=YES is specified, the LNKOLSC program will detect a SAP initialization call and set the user ID for SAP applications from the constant provided on the initialization call, plus the field ACBADD2.<br>For more information, refer to the supplementary information provided to customers using the SAP application system. | SAP={ NO \| YES } |

### SVCNO: Adabas SVC number

| Parameter | Description | Syntax |
|---|---|---|
| SVCNO | The SVCNO parameter is used to specify the value of the Adabas SVC number. | SVCNO={ 0 \| nnn} |

### TRUE: Adabas Task-Related User Exit

| Parameter | Description | Syntax |
|---|---|---|
| TRUE | The TRUE parameter is used to indicate whether or not the Adabas task-related user exit is to be used.<br>If TRUE=YES is specified, LNKOLSC will use the Adabas task-related user exit LNKTRUE.<br>If TRUE=YES is specified, the parameter settings PARMTYP={ALL \| COM} and TRUENM='*name*' must also be specified. | TRUE={ NO \| YES } |

### TRUENM: Name of Adabas Task-Related User Exit

| Parameter | Description | Syntax |
|---|---|---|
| TRUENM | The TRUENM parameter is used to specify the name of the Adabas task-related user exit.<br>This parameter is required if TRUE=YES is specified.<br>See also notes 1 and 2 in the installation procedure. | TRUENM= {'*name*' \| ADATRUE} |

### UBPLOC: User Block Pool Allocation

| Parameter | Description | Syntax |
|---|---|---|
| `UBPLOC` | The `UBPLOC` parameter is used to specify whether the user block (UB) pool is to be obtained above (the default) or below the 16-megabyte line in CICS.<br>The ECB used by the EXEC CICS WAIT WAITCICS or the EXEC CICS WAIT EXTERNAL is included in the UB pool.<br>The `UBPLOC=BELOW` setting supports versions of CICS that do not allow ECBs above the 16-megabyte line; that is, CICS/ESA 3.2 or below.<br>Refer to the IBM manual *CICS/ESA Application Programming Reference* for more information. | `UBPLOC= {ABOVE \| BELOW}` |

### XWAIT: XWAIT Setting for CICS

| Parameter | Description | Syntax |
|---|---|---|
| `XWAIT` | The XWAIT parameter is used to specify whether a standard EXEC CICS WAITCICS (`XWAIT=NO`) or a WAIT EVENTS EXTERNAL (`XWAIT=YES`) will be generated into the command-level link component by the assembler process in the LNKOLSC module. `XWAIT=YES` is the default.<br>The CICS WAIT EVENTS EXTERNAL (`XWAIT=YES`) is the recommended interface for CICS/ESA 3.3 and above.<br>The CICS WAITCICS statement (`XWAIT=NO`) is provided for use with CICS/MVS 2.1.2 and for CICS/VSE 2.1 through 2.3. It may also be used for CICS/ESA 3.3 and above, but may result in poor CICS transaction performance or unpredictable transaction results in busy CICS/ESA environments.<br>**Note:** If `XWAIT=NO` is specified for use under CICS/ESA 3.3, IBM APAR PN39579 must be applied to the CICS/ESA 3.3 system. For CICS/ESA 4.1 and above, this APAR is not required. | `XWAIT={ NO \| YES }` |

**Notes:**

1. With Adabas Version 6, the default for the `XWAIT` parameter changed from `XWAIT=NO` to `XWAIT=YES` to conform with IBM usage.
2. If `XWAIT=NO` is specified, the Adabas 6.2 and above LNKOLSC module issues an EXEC CICS WAITCICS command instead of the EXEC CICS WAIT EVENT command used in previous versions. This conforms with recommended IBM usage of the WAIT and ECB lists in a high-transaction volume CICS system with CICS/ESA Version 4.1 and above.
3. All EXEC CICS commands are processed by the CICS preprocessor; the ADAGSET parameters cause the subsequent assembly step to skip some of the statements.

### XWAIT Posting Mechanisms

CICS WAITCICS (`XWAIT=NO`) can support a "soft post" of the specified ECB. This has the disadvantage of becoming a low priority dispatchable unit of work in a CICS/ESA environment, since the "hand postable" work is not processed by CICS on every work cycle.

EXEC CICS WAIT EXTERNAL (`XWAIT=YES`), on the other hand, allows CICS to make use of its special post exit code, and will always be checked and processed (if posted) on every CICS work cycle.

For more details on the differences between the various CICS WAIT commands and their relationship to hard and soft posting mechanisms, consult the IBM *CICS/ESA Application Programming Reference Guide* and the texts accompanying IBM APAR PN39579 or "Item RTA000043874" on the IBM InfoLink service.

### XWAIT and the Adabas SVC / Router

The Adabas 6.2 and above SVC is fully compatible with the `XWAIT=YES` setting. The SVC performs the necessary "hard post" for Adabas callers under CICS/ESA using the Adabas 6 command-level link routine. The same SVC performs a "soft post" for batch callers where the hard post is not required.

If `XWAIT=YES` is specified and the Adabas SVC is below the 6.2 level, a zap is required to provide the "hard post" code preferred for CICS/ESA users:

```
ZAP AO33024 for an Adabas 5.3.3 SVC
ZAP AO13016 for an Adabas 6.1.2 or 6.1.3 SVC
```

This zap is available from your Software AG technical support representative.

Software AG strongly recommends that you use the Adabas 6.2 or above SVC/router with `XWAIT=YES`. The zaps to earlier SVC/routers may degrade performance for non-CICS Adabas transactions that use the modified SVC/router.

## Installation Procedure

- Step 1: Modify the ADAGSET Macro for the Source Member(s)
- Step 2: Modify the JCL Members
- Step 3: Install the Adabas Command-Level Link Component (SMA Job Number I070)
- Step 4: Install the Adabas Task-Related User Exit (SMA Job Number I070)
- Step 5: Install the Adabas PLT-Enable Program (SMA Job Number I070)

- Step 6: Install the DISPGWA Program (Optional)

### Step 1: Modify the ADAGSET Macro for the Source Member(s)

Modify the ADAGSET macro for the source members to be used.

See the section *Modifying Source Member Defaults (ADAGSET)* for details. Software AG recommends that you modify a common version of ADAGSET and place it in a library available in the SYSLIB concatenation when the Adabas command-level link components are assembled.

**Note:** It is no longer necessary to modify the equates inside the LNKOLSC code. Instead, use the ADAGSET macro to set default values before assembly, thus making the process easier and more self-documenting.

#### For the Standard Installation (Without Enhanced Functions)

Modify the source member ADAGSET to set the following options:

- database ID (LOGID);
- Adabas SVC number (SVCNO);
- any additional options necessary for your site.

#### For the Enhanced Installation

Modify the source member ADAGSET to set the following options:

- database ID (LOGID);
- Adabas SVC number (SVCNO);
- the command-level link routine name (ENTPT);
- the task-related user exit name (TRUENM);
- any additional options necessary for your site.

**Notes:**

1. It is critically important that the `ENTPT` and `TRUENM` parameters coded in the LNKENAB, LNKTRUE, and LNKOLSC modules are identical. These module names are used to identify the global work area and task-related user exit (TRUE) storage provided for the CICS transaction using the link-specific link component.
2. If you are installing multiple instances of the command-level link routine, the `ENTPT` and `TRUENM` names must be unique, as there is a one-for-one relationship between a command-level link routine, its associated task-related user exit (TRUE), and the enabling program LNKENAB run at CICS startup.

### Step 2: Modify the JCL Members

Use your editor to modify the JCL members necessary for your installation, and set the library names according to your installation's specifications. The Adabas job library contains the following JCL members:

| JCL Member | Installation Type | Required/Optional | Description |
|---|---|---|---|
| CICCASM | standard and enhanced | required | Adabas command-level link routine modules. |
| CICTASM | enhanced | required | Adabas task-related user exit |
|  | enhanced | required | Adabas PLT-enabled program |
|  | enhanced | optional | Adabas global work area (GWA) display program. |

Make mass changes to the JCL members in the following order:

| Order | change ... | to ... |
|---|---|---|
| 1 | ADABAS.V7*nn*.COML | Adabas CICS ... source library. |
| 2 | ADABAS.V7*nn* | Adabas V7 prefix. |
| 3 | MAC5='CICS' | CICS system prefix. |
| 4 | CLIB='CICS' | CICS system prefix for CICS LOAD. |
| 5 | RPLLIB='ADABAS' | COMLEV CICS RPL lib. |

### Step 3: Install the Adabas Command-Level Link Component (SMA Job Number I070)

▶ **to install the Adabas command-level link component:**

1 For CICCASM, concatenate the Adabas CICS 7.4 source library on the assembler SYSLIB statement in front of the Adabas source library for the version of Adabas you are running.

2 Execute CICCASM.

This job preprocesses, assembles, and links the Adabas CICS command-level link routine modules LNKOLSC and LNKOLM into a staging load library.

The final step of the CICCASM job links the LNKOLSC and LNKOLM modules together with CICS entry and exit code to form the Adabas command-level link routine, which is placed in a CICS RPL library.

3 Use DFHCSDUP or the CEDA RDO entry panels to add the following definition to your CICS CSD file:

```
DEFINE PROGRAM(ADABAS) GROUP(ADABAS)
DESCRIPTION(ADABAS V74s COMMAND LEVEL LINK ROUTINE)
LANGUAGE(ASSEMBLER) RELOAD(NO) RESIDENT(YES) USAGE(NORMAL)
USELPACOPY(NO) STATUS(ENABLED) CEDF(YES) DATALOCATION(ANY)
EXECKEY(CICS) EXECUTIONSET(FULLAPI)
```

—where *s* is the system maintenance level of Adabas.

The Adabas command-level link routine is now installed. This completes the standard installation. To install the enhanced functions, continue with step 4.

### Step 4: Install the Adabas Task-Related User Exit (SMA Job Number I070)

The Adabas CICS components reside in the Adabas CICS source library (ACI74*s*.SRCE).

**to install the Adabas Task-Related User Exit:**

1 Execute CICTASM.

This module preprocesses, assembles, and links the Adabas task-related user exit into a staging load library, and then links it with CICS entry and exit code into a CICS RPL library.

Unless you are following the installation procedure required for running with the Adabas Transaction Manager, expect the unresolved external references TCISYNC and TCIRESYN.

2 Use DFHCSDUP or the CEDA RDO entry panels to add the following definition to your CICS CSD file:

```
DEFINE PROGRAM(ADATRUE) GROUP(ADABAS)
DESCRIPTION(ADABAS V74s TASK RELATED USER EXIT)
LANGUAGE(ASSEMBLER) RELOAD(NO) RESIDENT(YES) USAGE(NORMAL)
USELPACOPY(NO) STATUS(ENABLED) CEDF(YES) DATALOCATION(ANY)
EXECKEY(CICS) EXECUTIONSET(FULLAPI)
```

—where *s* is the system maintenance level of Adabas.

### Step 5: Install the Adabas PLT-Enable Program (SMA Job Number I070)

The Adabas CICS components reside in the Adabas base source library ADA74*s*.SRCE.

**to install the Adabas PLT-enable program:**

1 Execute CICEASM.

This job preprocesses, assembles, and links this module into a staging library, and then links it with CICS entry and exit code into a CICS RPL library.

2 Use DFHCSDUP or the CEDA RDO entry panels to add the following definition to your CICS CSD file:

```
DEFINE PROGRAM(ADAENAB) GROUP(ADABAS)
DESCRIPTION(ADABAS V74s PLTPI ENABLE ADATRUE PROGRAM)
LANGUAGE(ASSEMBLER) RELOAD(NO) RESIDENT(NO) USAGE(NORMAL)
USELPACOPY(NO) STATUS(ENABLED) CEDF(YES) DATALOCATION(ANY)
EXECKEY(CICS) EXECUTIONSET(FULLAPI)
```

—where *s* is the system maintenance level of Adabas.

3 After defining LNKENAB to CICS, add the following entry to your PLTPI table, DFHPLT:

```
DFHPLT TYPE=ENTRY,PROGRAM=ADAENAB
```

This entry should follow the first DFHPLT `TYPE=DELIM` statement to ensure that LNKENAB will be executed in either stage II or stage III of the CICS PLTPI process. This is necessary because the CICS EXEC interface environment must be present to support the writing of console messages using the EXEC CICS `WRITE OPERATOR` command employed by the LNKENAB module.

4 Code an appropriate `PLTPI=`*xx* parameter in the CICS start-up data. *xx* should match the suffix value given in the DFHPLT table.

### Step 6: Install the DISPGWA Program (Optional)

**to install the DISPGWA program:**

1 Execute CICDASM.

This job preprocesses, assembles, and links this module into a staging library, then links it with CICS entry and exit code into a CICS RPL library. The final link step creates the load module ADATEST.

2. Add a CICS transaction to execute the ADATEST program. RDO may be used to do this. Sample DEFINE statements for the ADATEST (DISPGWA) program and the transaction to execute it are:

   ```
   DEFINE PROGRAM(ADATEST) GROUP(ADABAS)
   DESCRIPTION(ADABAS V74s DISPLAY GWA PROGRAM - DISPGWA)
   LANGUAGE(ASSEMBLER) RELOAD(NO) RESIDENT(NO) USAGE(NORMAL)
   USELPACOPY(NO) STATUS(ENABLED) CEDF(YES) DATALOCATION(ANY)
   EXECKEY(CICS) EXECUTIONSET(FULLAPI)

   DEFINE TRANSACTION(DGWA) GROUP(ADABAS)
   DESCRIPTION(TRANSACTION TO DISPLAY ADABAS GWA)
   PROGRAM(ADATEST) TWASIZE(128) PROFILE(DFHCICST) STATUS(ENABLED)
   TASKDATALOC(ANY) TASKDATAKEY(CICS) STORAGECLEAR(NO)
   RUNAWAY(SYSTEM) SHUTDOWN(DISABLED) ISOLATE(YES) DYNAMIC(NO)
   PRIORITY(1) TRANCLASS(DFHTCL00) DTIMOUT(NO) INDOUBT(BACKOUT)
   RESTART(NO) SPURGE(NO) TPURGE(NO) DUMP(YES) TRACE(YES)
   RESSEC(NO) CMDSEC(NO)
   ```

   —where *s* is the system maintenance level of Adabas.

   The Adabas command-level link routine, enhanced functions, and DISPGWA program are now installed.

## Installing the CICS High-Performance Stub Routine

The Adabas high-performance stub routine extends the direct call interface (DCI) facility that is available with the Adabas CICS command-level link component to applications written in languages other than Software AG's Natural (for example, Assembler, COBOL, PL/I).

**Note:** The stub routine must be used with the Adabas CICS command-level link component. The stub routine will not function properly with the Adabas CICS macro-level link component.

The DCI enables a CICS/ESA 3.2 application or above to call Adabas through the Adabas command-level link routine. The overhead incurred when the EXEC CICS LINK and EXEC CICS RETURN command set is used to transfer program control is thus avoided. Once the proper environment has been established with the initial call (IC) command from the high-performance stub or Natural 3.1 or above, the DCI permits a BALR interface to be used.

The high-performance stub routine is written in Assembler language. When linked with the application program, it serves as an interface between the application and the Adabas CICS command-level link component. The application program can then issue CALL statements to access the stub routine when executing an Adabas command.

An application at CICS/ESA 3.2 level or above derives the following advantages from the high-performance stub:

- improved performance and throughput when issuing Adabas commands under CICS/ESA 3.2 or above due to the reduced use of CICS services related to the CICS LINK and RETURN program control mechanism.
- a call mechanism for Adabas requests under CICS/ESA 3.2 or above which is simpler than the methods normally employed to pass control with information from one program to another in the CICS environment.

### Restrictions and Requirements

The following restrictions and requirements apply to the high-performance stub routine:

- CICS/ESA 3.2 or above Required

  The Adabas high-performance stub routine is supported under CICS/ESA 3.2 or above. Earlier versions of CICS are not supported.

  A CICS transaction work area (TWA) of at least 24 bytes must be provided to the application for the proper execution of the high-performance stub routine.
- CICS Command-Level Link Required

  The application program must be written using the CICS command-level interface and instructions, and may not issue any CICS macro level commands.
- Supported Programming Languages

  The application program may be written in ALC (Assembler language), COBOL, COBOL II, PL/I, or C. Installation verification programs (IVPs) are provided in ALC and COBOL on the distribution tape.

Additional requirements for specific programming languages are discussed later in the sections relating to each language.

### Stub Components

| Type | Member | Description |
|---|---|---|
| Source | ALCSIVP<br>COBSIVP<br>LNCSTUB | source for the ALC install verification<br>source for the COBOL install verification<br>source for the high-performance stub |
| Job control | JCLALCI<br>JCLCOBI<br>JCLLNCS | sample JCL for ALC install verification<br>sample JCL for COBOL install verification<br>sample JCL for LNCSTUB (high-performance stub) |

## Installation Overview

Use the following procedure to install the Adabas CICS high-performance stub routine:

- Edit, preprocess, assemble and link the LNCSTUB module.
- (Optional) Modify, preprocess, compile or assemble, link, and execute the desired installation verification program (IVP).
- Modify, preprocess, compile or assemble, link, and execute the application programs.

### Step 1: Install the LNCSTUB Module

The Adabas CICS high-performance stub routine is an Assembler language module provided in source form on the distribution tape in member LNCSTUB.

Step 1 has the following substeps:

- Edit the ADAGSET macro.
- Change the LNCNAME field value, if necessary.
- Modify member JCLLNCS.
- Preprocess, assemble, and link the LNCSTUB module.
- Place the LNCSTUB load module in a library that is available to your application programs when they are linked.

#### Edit the ADAGSET Macro

**Note:** For information about editing the ADAGSET macro, refer to the section ***Modifying Source Member Defaults (ADAGSET Macro)***.

Edit the ADAGSET macro in a library that will be available in the SYSLIB concatenation when LNCSTUB is assembled.

The values given for the ADAGSET parameters are primarily for documentation purposes within the LNCSTUB module, but may be used at a later time in the stub routine at the discretion of Software AG.

#### Change the LNCNAME Field Value

If your Adabas CICS command-level link component program has been linked with a name other than ADABAS, change the constant value in the field LNCNAME to match the name used (see the **ADAGSET option ENTPT**). The value in this field is used in the priming EXEC CICS LINK command issued by LNCSTUB.

### Modify Member JCLLNCS

Member JCLLNCS is used to preprocess, assemble, and link the LNCSTUB module. To modify this JCL to meet your site requirements, change the JOB card in the member and the symbolic values as indicated in the following table:

| Value | Description |
|---|---|
| &SUFFIX | Suffix value used for the CICS translator. The default value is “1$”. |
| &ASMBLR | Assembler program used to assemble the LNCSTUB source. |
| &M | Member name to be processed; code LNCSTUB or ALCSIVP. |
| &STUBLIB | A load library to contain the LNCSTUB load module. This library should be available to application programs when they are linked. |
| &INDEX | High-level qualifier for the CICS macro library used in the SYSLIB DD statement for the assembler. |
| &INDEX2 | High-level qualifier for the CICS load library to use for the translator STEPLIB DD statement, and for the SYSLIB in the link step. |
| &ADACOML | Adabas command-level source library containing the ADACB, ADAGDEF, ADAGSET, and LNCDS copy code and macros. |
| &ADASRCE | Adabas source library used for additional copy code or macro expansion. |
| &STBSRCE | Source library containing the distributed Adabas CICS high-performance stub LNCSTUB. |
| &MAC1 | Primary system macro library, usually SYS1.MACLIB. |
| &OUTC | Output class for messages, SYSPRINT, SYSOUT. |
| &REG | Step region size. |
| &NCAL | Value for the linkage editor `NCAL` parameter. The recommended value is NCAL. |
| &LSIZE | Primary and secondary table sizes used by the linkage editor. |
| &WORK | DASD device type to use for temporary and utility data sets. |

### Preprocess, Assemble, and Link the LNCSTUB Module

Because of the possible use of the 31-bit instructions, Assembler H (IEV90) or the High-Level Assembler (ASMA90) should be used to assemble the LNCSTUB module after CICS preprocessing.

**Note:** The LNCSTUB module can be linked reentrant or reusable. If it is linked reentrant, it is automatically reusable; if it is linked reusable, it is not automatically reentrant.

In addition to the CICS macro library, the Adabas CICS command-level source library and standard Adabas source library must be provided to the SYSLIB DD statement in the assembly step:

- do not concatenate any CICS load libraries in the SYSLIB DD statement when linking the LNCSTUB load module.

- in the SYSLIN data stream after the LNCSTUB object deck, use just the control statement

```
NAME LNCSTUB(R)
```

- do not include the CICS stub modules DFHEAI0 & DFHEAI1 with the LNCSTUB load module. As a result, however, the following occurs:
    - the linkage editor issues IEW462 or similar messages indicating that DFHEAI1 is an unresolved external reference;
    - the LNCSTUB module may be marked NOT EXECUTABLE by the linkage editor;
    - a condition code of 8 may be set in the link step.

  When the application program is linked with LNCSTUB, all the external references are resolved.

**Make the LNCSTUB Available to Application Programs**

The LNCSTUB module has an entry name of ADABAS, which can be used by the application program as the object of a CALL statement to pass control to LNCSTUB with a list of parameters. The language-specific calling conventions for LNCSTUB are discussed later in this section.

The LNCSTUB load module must be available to the link step of the application program that is to use the DCI facility.

**Note:** In the same step, the CICS load library should be available; otherwise, the external references to the CICS stub modules will not be resolved.

Place the LNCSTUB load module in a library available to your application language assembler or compiler so that it will be included when the application programs are linked.

### Step 2: (Optional) Install and Execute an IVP

Two installation verification programs (IVPs) are provided in source form: one for Assembler language, and one for COBOL/VS. These programs are samples for implementing the Adabas high-performance stub routine in your applications. They also provide a way of verifying the proper installation of the LNCSTUB module.

Step 2 has the following substeps:

- Modify the Assembler (ALCSIVP) or COBOL (COBSIVP) source decks to provide the proper Adabas database ID and file number on your site’s database for the Software AG-provided PERSONNEL file.
- Modify the JCL provided to preprocess and compile (assemble) the desired IVP.
- Preprocess, compile or assemble, and link the IVP using the sample JCL provided as a guide.
- Add RDO entries to your CICS system to execute the IVPs.
- Execute the IVPs to verify the LNCSTUB module (ALCSIVP and COBSIVP).

### Install and Execute the Assembler IVP: ALCSIVP

The source member ALCSIVP is provided to demonstrate and verify the use of the Adabas DCI using the LNCSTUB module. This program issues a series of Adabas commands using the conventional CICS LINK/RETURN mechanism, produces a partial screen of output data, then reexecutes the same call sequence using the Adabas DCI and the LNCSTUB subprogram.

**▶ to modify source member ALCSIVP:**

1. Edit the database ID and file number fields DBID (line 321) and DBFNR (line 322) to be sure they match the values needed to access the PERSONNEL file on the database you intend to use.
2. Check the fields FBUFF, SBUFF and VBUFF for values consistent with your PERSONNEL file's FDT and data content.
3. Check the name used in the EXEC CICS LINK statement (line 242) to be sure it matches the name of your Adabas CICS command-level link component program.

**▶ to modify the JCLALCI sample job stream:**

1. Member JCLALCI is used to preprocess, assemble, and link the installation verification program ALCSIVP. Place the load module in your CICS RPLLIB.
2. To modify this JCL to meet your site requirements, change the JOB card in the member and the symbolic values as indicated in the table used in step 1 (see ***Step 1, Modify Member JCLLNCS***).

   The JCLALCI member uses one additional symbolic parameter: &CICSLIB. This is the name of your CICS RPL library.

**▶ to preprocess, assemble, and link ALCSIVP:**

- Using the modified sample JCLALCI member, preprocess, assemble, and link ALCSIVP.

**to add RDO entries:**

- Add the following RDO entries to your CICS system, or use the RDO facility to add the STB1 transaction to run the ALCSIVP program:

```
DEFINE PROGRAM(ALCSIVP) GROUP(ADABAS)
DESCRIPTION(ADABAS V74s ASSEMBLER IVP FOR HIGH-PERFORMANCE STUB)
LANGUAGE(ASSEMBLER) RELOAD(NO) RESIDENT(NO) USAGE(NORMAL)
USELPACOPY(NO) STATUS(ENABLED) CEDF(YES) DATALOCATION(ANY)
EXECKEY(USER) EXECUTIONSET(FULLAPI)

DEFINE TRANSACTION(STB1) GROUP(ADABAS)
DESCRIPTION(TRANSACTION TO EXECUTE THE ASSEMBLER IVP FOR HIGH-PERFORMANCE STUB)
PROGRAM(ALCSIVP) TWASIZE(32) PROFILE(DFHCICST) STATUS(ENABLED)
TASKDATALOC(ANY) TASKDATAKEY(USER) STORAGECLEAR(NO)
RUNAWAY(SYSTEM) SHUTDOWN(DISABLED) ISOLATE(YES) DYNAMIC(NO)
PRIORITY(1) TRANCLASS(DFHTCL00) DTIMOUT(NO) INDOUBT(BACKOUT)
RESTART(NO) SPURGE(NO) TPURGE(NO) DUMP(YES) TRACE(YES)
RESSEC(NO) CMDSEC(NO)
```

**to execute ALCSIVP:**

- Run the STB1 transaction to execute ALCSIVP. Executing ALCSIVP verifies the LNCSTUB module.

### Install and Execute the COBOL IVP: COBSIVP

Member COBSIVP illustrates the use of the Adabas DCI with a COBOL program. COBIVP produces a screen showing output lines produced by a series of Adabas calls executed by the CICS LINK/RETURN facility, followed by the reexecution of these Adabas commands using the DCI.

**to modify source member COBSIVP:**

1. Edit the fields WORK-DBID and WORK-FNR to place the desired database ID and file number in the VALUE clauses to access the PERSONNEL file on your site's database.
2. Ensure that the value in the field LINK-NAME matches the name used in your Adabas CICS command-level link component program.

3 Ensure that the values (literals in the PROCEDURE DIVISION) in the following fields are consistent with the requirements of the PERSONNEL file FDT and data content you are using:

```
ADABAS-FORMAT-BUFFER,
ADABAS-SEARCH-BUFFER, and
ADABAS-VALUE-BUFFER
```

**to modify the JCLCOBI sample job stream:**

- Member JCLCOBI is used to preprocess, compile, and link the COBSIVP installation verification program. To modify the JCLCOBI example to meet site requirements, change the JOB card in the member and provide values for the symbolic procedure variables as described in the following table:

| Value | Description |
|---|---|
| &ADALIB | Adabas load library used to provide the ADASTWA load module for the linkage editor. |
| &MEM | Member name to be processed; in this case, COBSIVP. |
| &CICSLIB | CICS RPL library where the COBSIVP load module is placed for execution under CICS. |
| &COBLIB | COBOL compiler STEPLIB. |
| &INDEX | High-level qualifier for the CICS macro library used in the SYSLIB DD statement for the compiler. |
| &INDEX2 | High-level qualifier for the CICS load library to use for the translator STEPLIB DD statement, and for the SYSLIB in the link step. |
| &LINKLIB | COBOL LINKLIB. |
| &STBSRCE | Source library containing the distributed Adabas CICS high-performance stub LNCSTUB. |
| &STUBLIB | A load library to contain the LNCSTUB load module. This library should be available to your application programs when they are linked. |
| &SYSMSG | Output class for translator messages. |
| &SYSOUT | Output class for SYSOUT and SYSPRINT messages. |
| &WORK | DASD device type to use for temporary and utility data sets. |

**to preprocess, compile, and link COBSIVP:**

1 Use the modified JCLCOBI job to preprocess, compile, and link the COBSIVP program. Assemble ADASTWA into a library available to COBOL programs when they are linked. Include the ADASTWA load module in the link of COBSIVP.

COBSIVP uses the ADASTWA subroutine when it issues Adabas calls through the standard CICS LINK/RETURN mechanism. ADASTWA is supplied in source form in the Adabas source library.

The LNCSTUB subroutine does not use ADASTWA because it places the passed Adabas parameters in the TWA. Thus, the ADASTWA routine is not required when linking COBOL applications that utilize the Adabas DCI through the LNCSTUB module.

Even though the LNCSTUB routine does not require the ADASTWA subroutine, it is included in the COBSIVP program to illustrate the usual way in which a COBOL application places the Adabas call parameters into the CICS TWA.

2. Link the COBSIVP program with the LNCSTUB load module and the ADASTWA load module. Make the LNCSTUB load module available to the linkage editor to be included with the COBSIVP load module.

   **Note:** The CICS stub modules are also resolved in the link step.

**to add RDO entries:**

- Add the following RDO entries to your CICS system, or use the RDO facility to add the STB2 transaction to run the COBSIVP program:

```
DEFINE PROGRAM(COBSIVP) GROUP(ADABAS)
DESCRIPTION(ADABAS V74s COBOL IVP FOR HIGH-PERFORMANCE STUB)
LANGUAGE(COBOL) RELOAD(NO) RESIDENT(NO) USAGE(NORMAL)
USELPACOPY(NO) STATUS(ENABLED) CEDF(YES) DATALOCATION(ANY)
EXECKEY(USER) EXECUTIONSET(FULLAPI)

DEFINE TRANSACTION(STB2) GROUP(ADABAS)
DESCRIPTION(TRANSACTION TO EXECUTE THE COBOL IVP FOR HIGH-PERFORMANCE STUB)
PROGRAM(COBSIVP) TWASIZE(32) PROFILE(DFHCICST) STATUS(ENABLED)
TASKDATALOC(ANY) TASKDATAKEY(USER) STORAGECLEAR(NO)
RUNAWAY(SYSTEM) SHUTDOWN(DISABLED) ISOLATE(YES) DYNAMIC(NO)
PRIORITY(1) TRANCLASS(DFHTCL00) DTIMOUT(NO) INDOUBT(BACKOUT)
RESTART(NO) SPURGE(NO) TPURGE(NO) DUMP(YES) TRACE(YES)
RESSEC(NO) CMDSEC(NO)
```

**to execute COBSIVP:**

- Run the STB2 transaction to execute COBSIVP. Executing COBSIVP verifies the LNCSTUB module.

### Step 3: Link and Execute the Application Program

Once the IVP programs have been successfully executed, the Adabas DCI is ready to be used with real application programs. In step 3, the application program interface (API) is coded to utilize the LNCSTUB subprogram.

Step 3 has the following substeps:

- Modify the application programs that will utilize the Adabas CICS high-performance stub routine in accordance with the guidelines described in the following section.
- Preprocess, compile or assemble, and link the application programs to include the LNCSTUB module.
- Execute the application programs using the Adabas CICS high-performance stub.

#### Guidelines for Modifying the Application Program

The LNCSTUB load module must be linked with your application program. The application program invokes the DCI interface using a standard batch-like call mechanism. The LNCSTUB module makes any additional CICS requests required to pass data to the Adabas CICS command-level link component.

- Programming Languages Supported by LNCSTUB

  The LNCSTUB program functions with application programs written in Assembler language, VS/COBOL, COBOL II, PL/I, and C.
- Transaction Work Area Required

  A transaction that uses the Adabas DCI or the Adabas CICS command-level link component must provide a transaction work area (TWA) at least 28 bytes long. Failure to provide an adequate TWA will result in an abend U636 (abnormal termination of the task).
- Reentrant Requirement

  The application program may or may not be reentrant. The LNCSTUB module has been written to be reentrant, but using linkage editor parameters to mark the LNCSTUB load module as reentrant is not recommended.
- CICS Requests Issued by LNCSTUB

The LNCSTUB module issues the following command-level CICS requests whenever it is invoked:

```
EXEC CICS ADDRESS TWA
EXEC CICS ASSIGN TWALENG
EXEC CICS ADDRESS EIB
```

- DCI Entry Point Address

  An EXEC CICS LINK command is issued by LNCSTUB at least once to acquire the DCI entry point from the Adabas CICS command-level link component program. This address is then used for BALR access on all subsequent Adabas calls for a transaction. Thus, the calling application program must provide a fullword (4-byte) field to hold the DCI entry point address obtained by LNCSTUB. This 4-byte field is the first parameter passed to the LNCSTUB module by the call mechanism. The remaining parameters comprise the standard Adabas parameter list needed to execute an Adabas request.

- DCI Parameter List

  The Adabas DCI parameter list expected by the LNCSTUB program is composed of a pointer to the DCI entry point in the Adabas CICS command-level link component followed by the six pointers to the Adabas control block and buffers: format, record, search, value, and ISN.

  For information on coding the standard Adabas control block and buffers, refer to the *Adabas Command Reference*.

  The parameter list offsets are summarized in the table below:

| Offset | Pointer to the ... |
|---|---|
| 0 | DCI entry point in the Adabas command-level link component |
| 4 | Adabas control block |
| 8 | Adabas format buffer |
| 12 | Adabas record buffer |
| 16 | Adabas search buffer |
| 20 | Adabas value buffer |
| 24 | Adabas ISN buffer |

  All of the parameters except the first (the DCI entry point) are built and maintained by the application program in accordance with the requirements of an Adabas call.

  The DCI entry point parameter should be set to binary zeros at the beginning of a task, and should not be modified by the application program thereafter. Software AG strongly recommends that the fields comprising the parameter list be placed in CICS storage (WORKING-STORAGE for COBOL and the DFHEISTG user storage area for Assembler) to maintain pseudo-reentrability.

The following is a sample parameter list for an assembler language program:

```
DFHEISTG DSECT
.
PARMLIST DS 0F
DS A(DCIPTR)
DS A(ADACB)
DS A(ADAFB)
DS A(ADARB)
DS A(ADASB)
DS A(ADAVB)
DS A(ADAIB)
.
DCIPTR DS F
ADACB DS CL80
ADAFB DS CL50
ADARB DS CL250
ADASB DS CL50
ADAVB DS CL50
ADAIB DS CL200
.
DFHEIENT CODEREG=(R12),EIBREG=(R10),DATAREG=(R13)
.
LA R1,PARMLIST
L R15,=V(ADABAS)
BALR R14,R15
.
END
```

**Note:** The DFHEIENT macro in the Assembler example uses a DATAREG parameter of register 13. This is a strict requirement of the LNCSTUB program. When the LNCSTUB program is invoked, register 13 should point to the standard CICS save area (DFHEISA) and register 1 should point to the parameter list. The best way to ensure this standard is to code the Assembler application with a DFHEIENT macro like the one in the example.

The following is a sample parameter list for a COBOL language program:

```
WORKING-STORAGE SECTION.
.
01 STUB-DCI-PTR PIC S9(8) COMP VALUE ZERO.
01 ADACB PIC X(80).
01 ADAFB PIC X(50).
01 ADARB PIC X(250).
01 ADASB PIC X(50).
01 ADAVB PIC X(50).
01 ADAIB PIC X(200).
.
PROCEDURE DIVISION.
```

```
.
CALL 'ADABAS' USING STUB-DCI-PTR,
ADACB,
ADAFB,
ADARB,
ADASB,
ADAVB,
ADAIB.
.
EXEC CICS RETURN END-EXEC.
.
GOBACK.
```

- Restrictions on Application Program Coding

  In all other respects, the application program should be coded like a standard CICS command-level routine. As long as the DCI parameter list is correct when LNCSTUB is called, there are no restrictions on the CICS commands that an application can issue.

- Standard Batch Call Mechanism Used

  As shown in the Assembler and COBOL language program parameter list examples above, the call to ADABAS (the LNCSTUB entry point) is accomplished like a batch application. Likewise, calls for the other supported languages should be coded with their standard batch call mechanisms.

**Link the Application Programs to Include the LNCSTUB Module**

To properly link the LNCSTUB module with application programs, link the application program to include the LNCSTUB module and the CICS stub modules. The method for doing this varies with the programming language used for the application:

- Assembler language programs should include the DFHEAI and DFHEAI0 CICS modules;
- COBOL applications should include DFHECI and DFHEAI0.

To avoid a double reference to the DFHEAI0 module, code the linkage editor REPLACE DFHEAI0 control statement at the beginning of the SYSLIN data deck.

### for linking Assembler language programs:

- For an Assembler program, the SYSLIN input is similar to:

```
INCLUDE DFHEAI
```

The Assembler object input is similar to:

```
REPLACE DFHEAI0
INCLUDE SYSLIB(LNCSTUB)
INCLUDE SYSLIB(DFHEAI0)
NAME ALCSIVP(R)
```

When examining the cross-reference from the linkage editor, the symbol “ADABAS” must have the same starting location as the LNCSTUB module in the link map.

### for linking COBOL language programs:

- For an COBOL program, the SYSLIN input is similar to:

```
REPLACE DFHEAI0
INCLUDE SYSLIB(DFHECI)
```

The COBOL object input is similar to:

```
INCLUDE SYSLIB(LNCSTUB)
INCLUDE SYSLIB(DFHEAI0)
NAME COBSIVP(R)
```

When examining the cross-reference from the linkage editor, the symbol “ADABAS” must have the same starting location as the LNCSTUB module in the link map.

### for linking PL/I and C language programs:

- Refer to the IBM manual *CICS/ESA System Definition Guide* for information about linking PL/I and C applications under CICS.

### Performance Using LNCSTUB

To obtain the best performance from applications using the Adabas direct call interface (DCI), examine how the DCI interface functions at the logical level.

A CICS application using the standard LINK/RETURN mechanism to access the Adabas link routines invokes the CICS program control service for every Adabas request made to the link routine. The LNCSTUB module permits a BALR interface to be used. A BALR interface can substantially reduce the CICS overhead required to pass control from the application program to the Adabas CICS command-level link component.

The LNCSTUB module accomplishes this by using the standard EXEC CICS LINK/RETURN mechanism to make an Initial Call (IC) to the Adabas CICS command-level link routine. The link routine recognizes this call, and returns the entry point address of the DCI subroutine to LNCSTUB. LNCSTUB must then save this address in a location that can be assured of existence throughout the duration of the invoking task. This is why the calling program must provide the 4-byte field to hold the DCI entry point address. After the DCI address has been obtained, and for as long as LNCSTUB receives this address as the first parameter passed to it on subsequent Adabas calls, LNCSTUB utilizes the BALR interface to pass control to the Adabas CICS command-level link component program.

As a consequence of this logic, the more Adabas requests made between ICs, the more efficient the application in terms of passing data to and from Adabas under CICS. In fact, pseudo-conversational applications that issue one Adabas call each time a task is invoked should not be coded to use the DCI because there will be an IC request for each Adabas command issued by the calling program.

An additional performance improvement can be realized by taking advantage of the fact that the Adabas CICS command-level link component program must be defined as resident in CICS. This fact should allow the DCI entry point to be stored across CICS tasks, making it possible for different programs to call the LNCSTUB module with a valid DCI entry point. The IC at each program startup is thus avoided. When this procedure is used, however, any change to the CICS environment that invalidates the entry point address (such as a NEWCOPY) will lead to unpredictable and possibly disastrous results.

It is imperative that at least one IC be made to the Adabas CICS command-level link component program using CICS services. This call is used to trigger the acquisition of shared storage for the Adabas user block (UB) and (in the case of migration aids) an array of register save areas. If no IC request is made, Adabas calls will not execute due to a lack of working storage, and to the fact that critical control blocks used by the link routines and the Adabas SVC are not built.

## Installing Adabas with Com-plete

Certain Adabas parameters are required by Com-plete, Software AG's TP monitor, when installing Adabas. For more information, see the *Com-plete System Programmer's* manual.

The link routine for Com-plete initialization (module/phase ADALCO) is provided in the Adabas distribution library for the z/OS environments. ADALCO is loaded during Com-plete initialization to service Adabas calls. The Adabas library containing ADALCO should be placed in either the z/OS COMPINIT library concatenation or in the VSE/ESA LIBDEF search chain (SMA job number I070).

The Adabas Version 7.4 ADALCO is UES-enabled as distributed. See the section ***Connecting UES-Enabled Databases*** for more information.

## Installing Adabas with IMS

This section describes installation of the Adabas link routine for the IMS TP monitor with Adabas.

### IMS Link Routines

The Adabas link routines for IMS are:

- ADALNI for message processing programs (MPPs), and
- ADALNK the batch Adabas link routine, for batch message processing (BMP) programs, batch-oriented BMP programs, and batch processing programs (DLIBATCH).

ADALNI and ADALNK use the CSECT name and ENTRY directive ADABAS by default.

The Adabas Version 7.4 ADALNI and ADALNK are UES-enabled as distributed. See the section ***Connecting UES-Enabled Databases*** for more information.

This section describes using ADALNI only. For information on using ADALNK, read ***Installing Adabas with Batch / TSO***, elsewhere in this guide.

### Obtaining the Adabas User ID

The Adabas user ID is obtained at execution time by the ADALNI load module from the LTERM field (first first eight bytes) of the IOPCB. The user ID is stored in the Adabas user block field UBUID and will be used for the last eight bytes of the Adabas communication ID.

### Obtaining the SAF ID

The SAF ID is supported for use by Adabas SAF Security (ADASAF) if an external security package such as IBM's RACF or CA's ACF2 is present. The SAF ID is obtained at execution time by the ADALNI load module from the user ID field (bytes 33-40) in the IOPCB. To get a valid user ID, signon must be active in your IMS installation and the user has performed an IMS /SIGN command to log on to an IMS terminal.

### Generating a Reentrant Version

It is not recommended that a reentrant ADALNI version be generated. Please contact Software AG support if you plan to do this.

**Note:** The reentrant version of ADALNI must *not* be used with Software AG's Natural

### Installation Procedure

The following steps are required to install the Adabas IMS link routine ADALNI (SMA job number I055):

- Edit the ADALNI source member to set the assembly variables and equate values
- Assemble the ADALNI module
- Link the ADALNI module into an appropriate execution library

#### Step 1: Edit the ADALNI Source Member

The ADALNI source module must be edited before it can be assembled to provide the following information:

- Assembly language variables for the IMS level to be supported, and whether Adabas SAF Security (ADASAF) will be supported;
- Values for the assembler equates (EQU symbols) must be provided for the database ID (logical ID), Adabas SVC number, length of Adabas Review, and user information areas.

After modifying the assembler variables and the equate values, save your changes.

### &ADAESI

A global Boolean assembly language variable, &ADAESI, is provided. Use an editor to find the SETB assembler directives in the ADALNI module and modify it to set &ADAESI as required.

If you plan to use Adabas SAF Security (ADASAF) under IMS, you must

- Set the variable &ADAESI to a 1 prior to assembling the ADALNI routine.
- Link the ADASAF exit with the Adabas router (SVC).
- Enforce all external security procedures for IMS transactions at user sign-on time.

The variable &ADAESI must be turned *on* (set to a "1") if ADASAF is linked with the Adabas SVC that the ADALNI module will invoke during execution.

### &IMSLVL

When assembling the Adabas IMS link routine that is distributed with the Adabas source library, find the assembler local variable &IMSLVL and modify the character value in the assembler SETC directive to match the level of your IMS system: V8 or V9.

### Modify Assembler Language Equates

Locate and modify the following assembly language EQU statement parameter values:

| Parameter | Description | Syntax |
|---|---|---|
| `LNUINFO` | Length of the user information area passed to the Adabas user exit B (UEXITB) and user exit A (UEXITA).<br>Values from 0 to 32767 may be coded. The default value is 0. | `LNUINFO={user-area | 0 }` |

| Parameter | Description | Syntax |
|---|---|---|
| `LRVINFO` | Length of the Adabas Review work area provided to the Adabas Review exit (REVEXITB).<br>The default value is 0, indicating that no Adabas Review support is required.<br>See the Adabas Review documentation for a recommended `LRVINFO` value. | `LRVINFO={work-size | 0 }` |

| Parameter | Description | Syntax |
|---|---|---|
| `LOGID` | The default database ID. Values from 1 to 65535 may be provided. The default value is 1, which will be used if no value is provided in<br>- the Adabas control block on each call, or<br>- the ADARUN DDCARD input data. | `LOGID={dbid \| 1 }` |

| Parameter | Description | Syntax |
|---|---|---|
| `SVCNR` | The Adabas SVC number. A value from 200 to 255 may be provided. The default value is 249.<br>The value must match the number of the Adabas SVC installed in your z/OS image. | `SVCNR={svc-number \| 249 }` |

### Step 2: Assemble the Edited ADALNI Module

Use the IBM high-level Assembler to assemble the ADALNI routine.

The order of data set concatenation on the assembly JCL SYSLIB DD statement is critically important:

| | Data Set | Description |
|---|---|---|
| 1 | AII*vrs*.SRCE | Adabas for IMS source library |
| 2 | ADA*vrs*.SRCE | Standard or base Adabas source library |
| 4 | SYS1.MACLIB | |
| 5 | SYS1.AMODGEN | or SYS1.MODGEN in z/OS systems. |

### Step 3: Link ADALNI for IMS

Link the ADALNI module into a library that is available in your runtime concatenation.

#### Specifying AMODE and RMODE

Software AG also recommends that you link the Adabas IMS link routine with `AMODE` of `31` and a `RMODE` of `ANY` under IMS.

The addressing mode and run mode of the Adabas link routine for IMS must be chosen to match the mode of the application programs that invoke the link routine. Since the ADALNI module will not validate the parameter addresses passed to it, it is the responsibility of the user to ensure the proper addressing (`AMODE`) mode.

**Note:** All IMS programs that are to access Adabas should be relinked to include the Version 7.4 ADALNI module if IMS Version 3.1 or above is used at your site.

## Installing Adabas with Shadow

Shadow can be used in OS/390 or z/OS and in VSE/ESA environments. The Adabas link routine specific to Shadow, ADALNS, is provided in source form along with the job SHADASM to assemble it. SHADASM must be customized to select the Shadow macro (source) library containing the macros SAVED, $WAIT, RELOCD, RETURND, TCBD.

### Selecting Options for ADALNS

Customizing the source member ADALNS means selecting the following options:

| Option | Default | Specify . . . |
|---|---|---|
| SVCNR | 0 | Adabas SVC number |
| LOGID | 1 | Default logical database ID (range 1-255). |
| NUBS | 50 | Number of UBs (user blocks) to be created by ADALNS. This must be high enough to handle the maximum possible number of concurrent Adabas requests. |
| PLINTWA | Y (yes) | N if the Adabas parameter list is passed in register 1 instead of at offset 0 in the Shadow TWA. |
| LNUINFO | 0 | Length for the user data to be passed from the ADALNS link routine to the Adabas user exit 4. |

### Shadow Table Entry for ADALNS

The user must specify the following entry in the Shadow PCT table:

```
PCT PROG=ADABAS,DISP=INITL,LANG=BAL,SAVE=YES,PURGE=YES
```

It is important that Adabas be made resident. Under Shadow, the ADABAS parameter is normally passed in the first 24 bytes of the TWA.

The user exit called from ADALNS gains control before the Adabas call (UEXITB), and can be used to modify the eight-byte UBUID field. This allows users who process the command log to have a unique terminal, since the command log presently contains only a four-byte field. This field does not contain a unique ID. The user exit could then be used to make the first four bytes unique. The user exit must create a unique user exit for each user. For Shadow, the UBUID field normally contains the constant “SHAD” in the high-order four bytes, followed by the value from ITRMTYPE.

## Installing Adabas with Batch / TSO

When installing Adabas on TSO systems, the standard Adabas batch link routine (ADALNK) provides Adabas/TSO communication (SMA job number I088).

The Adabas Version 7.4 ADALNK is UES-enabled as distributed. See the section *Connecting UES-Enabled Databases* for more information.

However, it is important to note that user programs linked with ADAUSER also load ADARUN. ADARUN, in turn, loads other modules.

To start a user program linked with ADAUSER, the following modules must all be available from the defined load libraries for that specific TSO user at execution time:

```
ADAIOR ADAMLF
ADAIOS ADAPRF
ADALNK ADARUN
```

### ADALNKR : Reentrant Batch Link Routine

The ADALNKR source modules are provided in the Adabas source library to support applications where a reentrant batch link routine is desired. Several Software AG products require the use of the reentrant batch link routine and the ADALNKR load module is provided in the Adabas load library to support them.

**Notes:**

1. For Adabas 7.2.2 and above, the ADALNKR source module should be assembled separately to obtain the reentrant version of the batch/TSO link routine.
2. The ADALNKR routine differs somewhat from the nonreentrant ADALNK routine provided in the Adabas source library. It is no longer sufficient to set the &RENT Boolean variable to 1 in the ADALNK module to obtain a reentrant version which is compatible with Adabas 7.2.2 and above.
3. Software AG still recommends that batch application programs be linked with the ADAUSER module, not ADALNK or ADALNKR. The ADAUSER load module is not reentrant, but the ADALNKR module may be linked with it as long as the application program conforms to the calling requirements described below.

# 8 Connecting UES-Enabled Databases

## Overview

Prior to Adabas Version 7, Entire Net-Work converted all data for mainframe Adabas when necessary from ASCII to EBCDIC. Starting with Version 7, Adabas is delivered with its own data conversion capability called universal encoding support (UES). Entire Net-Work detects when it is connected to a target database that converts data and passes the data through to Adabas without converting it.

For Adabas Version 7.4, UES is enabled by default for the link routines ADALNK, ADALNKR, ADALCO, and ADALNI.

**Note:** The use of UES-enabled link routines is transparent to applications, including applications that do not require UES translation support: it is not necessary to disable UES support.

### Load Modules

The load modules for ADALNK, ADALNKR, and ADALCO have been linked with LNKUES and the default translation tables.

LNKUES converts data in the Adabas buffers and byte-swaps, if necessary, depending on the data architecture of the caller.

The two standard translation tables are

- ASC2EBC: ASCII to EBCDIC translation; and
- EBC2ASC: EBCDIC to ASCII translation.

The Adabas translation table pair is provided in the section ***Translation Tables***.

### Default or Customized Translation Tables

You may use the load modules with the default translation tables linked in, or you may prepare your own customized translation tables, re-assemble the tables, and link them with the LNKUES module that is delivered.

**Notes:**

1. It should only be necessary to modify these translation tables in the rare case that some country-specific character other than "A-Z a-z 0-9" must be used in the Additions 1 (user ID) or Additions 3 field of the control block.
2. The load module LNKUESL delivered with earlier levels of Adabas Version 7 is no longer supplied since the link jobs now specify the LNKUES module and the translation tables separately.
3. The LNKUES module is functionally reentrant; however, it is not linked that way in the Adabas load library.
4. When linking the LNKUES load module and the translation tables, the linkage editor may produce warning messages concerning the reentrant or reusability status of the linked module. These warning messages can be ignored.

### Source Modules

The ADALNK, ADALNKR, ADALCO, and ADALNI source modules have been coded to enable UES support by default when assembled:

- The &UES Boolean assembly variable is set to 1 by default; the statement to set it to 0 has been commented out.
- The setting of the other Boolean variables and equates such as the SVC number and the database ID remain unchanged from earlier deliveries of the source modules.

### Required Environment

The Adabas database must be UES-enabled. See *DBA Tasks* and the ADACMP and ADADEF utility sections in the *Adabas Utilities* documentation for more information.

### Connection Possibilities

UES-enabled databases are connected to machines with different architectures through Smarts, through Entire Net-Work, and optionally in a z/OS environment, through a direct TCP/IP link to the Adabas nucleus from web-based applications or from PC-based applications such as Software AG's Jadabas.

## Connection Through Com-plete or Smarts

Adabas SQL Gateway (ACE) clients may not be strictly EBCDIC in an environment where databases are connected through Software AG's internal product Smarts (APS).

The relevant Adabas link routine ADALCO is UES-enabled by default. The sample jobstream to assemble and link the ADALCO module is ALNKLCO.

The assembled and linked ADALCO (as delivered or with customized and reassembled translation tables) is placed in the Smarts steplib or a user library concatenated with it.

### Step 1: Assemble ADALCO Module into the Adabas Load Library (SMA Job Number I070)

Modify the MVSJOBS member ALNKLCO to assemble and link ADALCO as follows:

- provide all necessary jobcard information
- check the symbolic parameter value for version, revision level, and SM level (*vrs*). It must reflect the level of your Adabas source and load libraries.
- check the data set names for SYSLIB, SYSIN, SYSLMOD & SYSLIN in the SAGASM and LINKALL inline procedures.

```
// JOB
//SAGASM PROC MEM=,
// VRS=
//ASM EXEC PGM=ASMA90,
// PARM='ASA,NODECK,OBJECT,USING(MAP),XREF(SHORT),TERM'
//SYSUT1 DD SPACE=(4096,(120,120),,,ROUND),UNIT=VIO,DCB=BUFNO=1
//SYSTERM DD SYSOUT=*
//SYSPRINT DD SYSOUT=*
//SYSLIB DD DISP=SHR,DSN=ADABAS.&VRS..SRCE
// DD DISP=SHR,DSN=SYS1.MACLIB
// DD DISP=SHR,DSN=SYS1.MODGEN
```

```
//SYSIN DD DISP=SHR,DSN=ADABAS.&VRS..SRCE(&MEM)
//SYSLIN DD DSN=&&OBJ,SPACE=(3040,(40,40),,,ROUND),UNIT=VIO,
// DISP=(MOD,PASS),
// DCB=(BLKSIZE=3040,LRECL=80,RECFM=FBS,BUFNO=1)
//LINK EXEC PGM=HEWL,REGION=2M,COND=(5,LT,ASM),
// PARM='XREF,LIST(ALL),LET,MAP'
//SYSPRINT DD SYSOUT=*
//SYSLIN DD DSN=&&OBJ,DISP=(OLD,DELETE)
//SYSLMOD DD DISP=SHR,DSN=ADABAS.&VRS..LOAD(&MEM)
// PEND
//*
//ADALCO EXEC SAGASM,VRS=Vvrs,MEM=ADALCO
//LINK.SYSIN DD *
MODE AMODE(31) RMODE(ANY)
ENTRY ADABAS
NAME ADALCO(R)
```

### Step 2: Assemble Translation Tables into the Adabas Load Library (SMA Job Number I056)

Assemble the ASCII to EBCDIC and EBCDIC to ASCII translation tables, either default or customized.

```

/*
//ASC2EBC EXEC SAGASM,VRS=Vvrs,MEM=ASC2EBC
//LINK.SYSIN DD *
MODE AMODE(31) RMODE(ANY)
ENTRY ASC2EBC
NAME ASC2EBC(R)
/*
//EBC2ASC EXEC SAGASM,VRS=Vvrs,MEM=EBC2ASC
//LINK.SYSIN DD *
MODE AMODE(31) RMODE(ANY)
ENTRY EBC2ASC
NAME EBC2ASC(R)
```

### Step 3: Link the Translation Tables and LNKUES into ADALCO (SMA Job Number I088)

Link the ADALCO, ASC2EBC, EBC2ASC and LNKUES modules into a final ADALCO module that is UES-enabled. Place this load module into a "USER.LOAD" library. Be sure to modify the &USERLIB symbol in the SYSLMOD statement to match your user load library.

```
/*
//LINKALL PROC VRS=,USERLIB=
//LKED EXEC PGM=HEWL,REGION=2M,COND=(5,LT),
// PARM='XREF,LIST(ALL),LET,MAP,NCAL'
//SYSPRINT DD SYSOUT=*
//ADALIB DD DISP=SHR,DSN=ADABAS.&VRS..LOAD
//SYSLMOD DD DISP=SHR,DSN=&USERLIB
//SYSLIN DD DDNAME=SYSIN
// PEND
//LINKUES EXEC LINKALL,VRS=Vvrs,
// USERLIB='YOUR.USER.LOADLIB'

//LKED.SYSIN DD *
MODE AMODE(31) RMODE(ANY)
INCLUDE ADALIB(ADALCO)
INCLUDE ADALIB(LNKUES)
INCLUDE ADALIB(ASC2EBC)
INCLUDE ADALIB(EBC2ASC)
ENTRY ADABAS
NAME ADALCO(R)
/*
```

### Step 4: Make ADALCO Available to Smarts

The (re)linked ADALCO must be made available to Smarts. If you are calling Adabas Version 7 and you do not have the correct LNKUES/ADALCO module, Adabas produces unexpected results: response code 022, 253, etc.

## Connection Through Entire Net-Work

UES-enabled databases are connected through Software AG's Entire Net-Work (WCP) using the Adabas non-reentrant batch or TSO link routine ADALNK. The sample jobstream to assemble and link the non-reentrant ADALNK module is ALNKLNK.

The assembled and linked non-reentrant, batch ADALNK (as delivered or with customized and reassembled translation tables) is placed in the Entire Net-Work steplib.

- Step 1: Assemble ADALNK Module into Adabas Load Library (SMA Job Number I055)
- Step 2: Assemble Translation Tables into Adabas Load Library (SMA Job Number I056)

- Step 3: Link the Translation Tables and LNKUES into ADALNK (SMA Job Number I088)
- Step 4: Make ADALNK Available to Entire Net-Work

### Step 1: Assemble ADALNK Module into Adabas Load Library (SMA Job Number I055)

Modify the MVSJOBS member ALNKLNK to assemble and link ADALNK as follows:

- provide all necessary jobcard information
- check the symbolic parameter value for version, revision level, and SM level (*vrs*). It must reflect the level of your Adabas source and load libraries.
- check the data set names for SYSLIB, SYSIN, SYSLMOD, and SYSLIN in the SAGASM and LINKALL inline procedures.

```
// JOB
//SAGASM PROC MEM=,
// VRS=
//ASM EXEC PGM=ASMA90,
// PARM='ASA,NODECK,OBJECT,USING(MAP),XREF(SHORT),TERM'
//SYSUT1 DD SPACE=(4096,(120,120),,,ROUND),UNIT=VIO,DCB=BUFNO=1
//SYSTERM DD SYSOUT=*
//SYSPRINT DD SYSOUT=*
//SYSLIB DD DISP=SHR,DSN=ADABAS.&VRS..SRCE
// DD DISP=SHR,DSN=SYS1.MACLIB
// DD DISP=SHR,DSN=SYS1.MODGEN
//SYSIN DD DISP=SHR,DSN=ADABAS.&VRS..SRCE(&MEM)
//SYSLIN DD DSN=&&OBJ,SPACE=(3040,(40,40),,,ROUND),UNIT=VIO,
// DISP=(MOD,PASS),
// DCB=(BLKSIZE=3040,LRECL=80,RECFM=FBS,BUFNO=1)
//LINK EXEC PGM=HEWL,REGION=2M,COND=(5,LT,ASM),
// PARM='XREF,LIST(ALL),LET,MAP'
//SYSPRINT DD SYSOUT=*
//SYSLIN DD DSN=&&OBJ,DISP=(OLD,DELETE)
//SYSLMOD DD DISP=SHR,DSN=ADABAS.&VRS..LOAD(&MEM)
// PEND
//*
//ADALNK EXEC SAGASM,VRS=Vvrs,MEM=ADALNK
//LINK.SYSIN DD *
MODE AMODE(31) RMODE(24)
ENTRY ADABAS
NAME ADALNK(R)
```

### Step 2: Assemble Translation Tables into Adabas Load Library (SMA Job Number I056)

If you prefer to use the same translation tables that are used in Entire Net-work, change the COPY statements in ASC2EBC and EBC2ASC from UES2ASC and UES2EBC to NW2ASC and NW2EBC, respectively. After modifying the translation tables, be sure to (re)assemble them and link them with the delivered LNKUES module.

The Entire Net-Work translation table pair is also provided in the section *Translation Tables*.

Assemble the ASCII to EBCDIC and EBCDIC to ASCII translation tables, either default or customized.

```
/*
//ASC2EBC EXEC SAGASM,VRS=Vvrs,MEM=ASC2EBC
//LINK.SYSIN DD *
MODE AMODE(31) RMODE(ANY)
ENTRY ASC2EBC
NAME ASC2EBC(R)
/*
//EBC2ASC EXEC SAGASM,VRS=Vvrs,MEM=EBC2ASC
//LINK.SYSIN DD *
MODE AMODE(31) RMODE(ANY)
ENTRY EBC2ASC
```

### Step 3: Link the Translation Tables and LNKUES into ADALNK (SMA Job Number I088)

Link the ADALNK, ASC2EBC, EBC2ASC, LNKUES, and other user exit modules into a final ADALNK module that is UES-enabled. Place this load module into a “USER.LOAD” library. Be sure to modify the &USERLIB symbol in the SYSLMOD statement to match your user load library.

```
/*
//LINKALL PROC VRS=,USERLIB=
//LKED EXEC PGM=HEWL,REGION=2M,COND=(5,LT),
// PARM='XREF,LIST(ALL),LET,MAP,NCAL'
//SYSPRINT DD SYSOUT=*
//ADALIB DD DISP=SHR,DSN=ADABAS.&VRS..LOAD
//SYSLMOD DD DISP=SHR,DSN=&USERLIB
//SYSLIN DD DDNAME=SYSIN
// PEND
//LINKUES EXEC LINKALL,VRS=Vvrs,
// USERLIB='YOUR.USER.LOADLIB'
//LKED.SYSIN DD *
MODE AMODE(31) RMODE(24)
INCLUDE ADALIB(ADALNK)
INCLUDE ADALIB(LNKUES)
INCLUDE ADALIB(ASC2EBC)
INCLUDE ADALIB(EBC2ASC)
```

```
ENTRY ADABAS
NAME ADALNK(R)
/*
```

### Step 4: Make ADALNK Available to Entire Net-Work

The (re)linked ADALNK must be made available to Entire Net-Work. If you are calling Adabas Version 7 and you do not have the correct LNKUES/ADALNK module, Adabas produces unexpected results: response code 022, 253, etc.

## Connection Through a Direct TCP/IP Link

A TCP/IP link requires in addition that you link a reentrant ADALNKR module with LNKUES and your customized and reassembled translation tables and that you make the result available in the Adabas steplib.

UES-enabled databases are connected directly through TCP/IP using the Adabas reentrant batch or TSO link routine ADALNKR. The sample jobstream to assemble and link the ADALNK module is ALNKLNKR.

- Step 1: Assemble the ADALNKR Module into the Adabas Load Library
- Step 2: Assemble the Two Translation Tables into the Adabas Load Library (SMA Job Number I056)
- Step 3: Link the Translation Tables and LNKUES into ADALNKR
- Step 4: Make ADALNKR Available to the Adabas Nucleus

### Step 1: Assemble the ADALNKR Module into the Adabas Load Library

In order to enable UES support for a database through TCP/IP, you must prepare a modified batch ADALNKR.

**to prepare a modified batch ADALNKR:**

1 Update the source ADALNKR:

```
&RENT SETB 1
SVCNR EQU nnn (hard-coded SVC number)
```

2 Assemble and link the modified batch ADALNKR.

Modify the MVSJOBS member ALNKLNKR to assemble and link ADALNKR as follows:

- provide all necessary jobcard information

- check the symbolic parameter value for version, revision level, and SM level (vrs). It must reflect the level of your Adabas source and load libraries.
- check the data set names for SYSLIB, SYSIN, SYSLMOD, and SYSLIN in the SAGASM and LINKALL inline procedures.

```
// JOB
//SAGASM PROC MEM=,
// VRS=
//ASM EXEC PGM=ASMA90,
// PARM='ASA,NODECK,OBJECT,USING(MAP),XREF(SHORT),TERM'
//SYSUT1 DD SPACE=(4096,(120,120),,,ROUND),UNIT=VIO,DCB=BUFNO=1
//SYSTERM DD SYSOUT=*
//SYSPRINT DD SYSOUT=*
//SYSLIB DD DISP=SHR,DSN=ADABAS.&VRS..SRCE
// DD DISP=SHR,DSN=SYS1.MACLIB
// DD DISP=SHR,DSN=SYS1.MODGEN
//S//SYSLIN DD DSN=&&OBJ,SPACE=(3040,(40,40),,,ROUND),UNIT=VIO,
// DISP=(MOD,PASS),
// DCB=(BLKSIZE=3040,LRECL=80,RECFM=FBS,BUFNO=1)
//LINK EXEC PGM=HEWL,REGION=2M,COND=(5,LT,ASM),
// PARM='XREF,LIST(ALL),LET,MAP'
//SYSPRINT DD SYSOUT=*
//SYSLIN DD DSN=&&OBJ,DISP=(OLD,DELETE)
//SYSLMOD DD DISP=SHR,DSN=ADABAS.&VRS..LOAD(&MEM)
// PEND
//*
//ADALNKR EXEC SAGASM,VRS=Vvrs,MEM=ADALNKR
//LINK.SYSIN DD *
MODE AMODE(31) RMODE(24)
ENTRY ADABAS
NAME ADALNKR(R)YSIN DD DISP=SHR,DSN=ADABAS.&VRS..SRCE(&MEM)
```

### Step 2: Assemble the Two Translation Tables into the Adabas Load Library (SMA Job Number I056)

Assemble the ASCII to EBCDIC and EBCDIC to ASCII translation tables, either default or customized.

```
/*
//ASC2EBC EXEC SAGASM,VRS=Vvrs,MEM=ASC2EBC
//LINK.SYSIN DD *
MODE AMODE(31) RMODE(ANY)
ENTRY ASC2EBC
NAME ASC2EBC(R)
/*
```

```
//EBC2ASC EXEC SAGASM,VRS=Vvrs,MEM=EBC2ASC
//LINK.SYSIN DD *
MODE AMODE(31) RMODE(ANY)
ENTRY EBC2ASC
NAME EBC2ASC(R)
```

### Step 3: Link the Translation Tables and LNKUES into ADALNKR

It is now necessary to (re)link ADALNKR with LNKUES and your customized and reassembled translation tables.

Link the ADALNKR, ASC2EBC, EBC2ASC, LNKUES, and other user exit modules into a final ADALNKR module that is UES-enabled. Place this load module into a “USER.LOAD” library. Be sure to modify the &USERLIB symbol in the SYSLMOD statement to match your user load library.

```
/*
//LINKALL PROC VRS=,USERLIB=
//LKED EXEC PGM=HEWL,REGION=2M,COND=(5,LT),
// PARM='XREF,LIST(ALL),LET,MAP,NCAL'
//SYSPRINT DD SYSOUT=*
//ADALIB DD DISP=SHR,DSN=ADABAS.&VRS..LOAD
//SYSLMOD DD DISP=SHR,DSN=&USERLIB
//SYSLIN DD DDNAME=SYSIN
// PEND
//LINKUES EXEC LINKALL,VRS=Vvrs,
// USERLIB='YOUR.USER.LOADLIB'
//LKED.SYSIN DD *
MODE AMODE(31) RMODE(24)
INCLUDE ADALIB(ADALNKR)
INCLUDE ADALIB(LNKUES)
INCLUDE ADALIB(ASC2EBC)
INCLUDE ADALIB(EBC2ASC)
ENTRY ADABAS
NAME ADALNKR(R)
/*
```

### Step 4: Make ADALNKR Available to the Adabas Nucleus

The (re)linked ADALNK must be made available to the Adabas nucleus.

If you are calling Adabas Version 7 directly through a TCP/IP link and the correct ADALNKR is not available to the Adabas nucleus, Adabas produces unexpected results: response code 148, empty buffers, etc.

## Activating the TCP/IP Link

**To activate a direct TCP/IP link to the Adabas nucleus:**

1 Set the ADARUN parameter `TCPIP=YES`.

2 Specify a universal resource locator (URL).

### Specifying a URL

The URL is a 20-byte address that conforms to the RFC specification for URLs.

You can specify the URL required to activate the direct TCP/IP link in the ADARUN parameter `TCPURL` as follows:

```
ADARUN PROG=ADANUC,TCPIP=YES,TCPURL=api-name://stackid:port-number

—where

api-name is a 1-3 character value identifying the application programming interface
(API) to use.
The APIs for the IBM TCP/IP stack (HPS, OES) are currently supported.
stackid is a 1-8 character value identifying the stack to use:
- for the HPS API, this is the name of the TCP/IP started task.
- for the OES API, no value is needed.
- for the ILK API, this is the subsystem identifier.
port-number is a 1-5 character number in decimal notation.
```

**Examples**

```
ADARUN PROG=ADANUC,TCPIP=YES,TCPURL=HPS://STACKNAME:1234
ADARUN PROG=ADANUC,TCPIP=YES,TCPURL=OES://:1234
ADARUN PROG=ADANUC,TCPIP=YES,TCPURL=ILK://ILZ5:1234
```

## Managing URLs

Optionally, you can specify the first and additional URLs using the operator command `TCPIP`:

```
TCPIP={ OPEN=url|CLOSE=url | CLOSE }
```

—where *`url`* is the URL for the TCP/IP link you want to open or close and has the same format as the ADARUN `TCPURL` parameter:

```
api-name://stackid:port-number
```

The command allows you to open or close a TCP/IP link to the Adabas nucleus or to close all links. It can only be used when ADARUN `TCPIP=YES` and all conditions for that setting have been met. This command can be used to close the URL set in the ADARUN `TCPURL` parameter, or to open/close additional TCP/IP links.

**Examples**

```
TCPIP=OPEN=ILK://ILZ5:1234
TCPIP=CLOSE=ILK://ILZ5:1234

To close all open URLs:
TCPIP=CLOSE
```

# 9 Device And File Considerations

This section provides information for the following device and system file topics:

## Supported Device Types

The standard characteristics of the device types supported by Adabas on z/OS are summarized in the following table. Adabas block sizes and RABNs per track are provided for each Adabas component for each device type.

| Device | Trks/Cyl | ASSO | DATA | WORK | PLOG/RLOG | CLOG | TEMP/SORT/DSIM | Notes |
|---|---|---|---|---|---|---|---|---|
| 0512 | 16 | 2044:8 | 4092:4 | 8192:2 | 8192:2 | 8192:2 | 8192:2 | |
| 3310 | 11 | 2044:8 | 4092:4 | 4096:4 | 4096:4 | 4096:4 | 8192:2 | |
| 3330 | 19 | 1510:8 | 3140:4 | 4252:3 | 4252:3 | 3156:4 | 3140:4 | |
| 3340 | 12 | 1255:6 | 2678:3 | 3516:2 | 3516:2 | 3516:2 | 3500:2 | |
| 3350 | 30 | 1564:11 | 3008:6 | 4628:4 | 4628:4 | 3024:6 | 3008:6 | |
| 3370 | 12 | 2044:15 | 3068:10 | 5120:6 | 5120:6 | 3072:10 | 7680:4 | |
| 3375 | 12 | 2016:15 | 4092:8 | 4096:8 | 4096:8 | 4096:8 | 8608:4 | |
| 3380 | 15 | 2004:19 | 4820:9 | 5492:8 | 5492:8 | 4820:9 | 7476:6 | 3 |
| 3390 | 15 | 2544:18 | 5064:10 | 5724:9 | 5724:9 | 5064:10 | 8904:6 | 3 |
| 8345 | 15 | 4092:10 | 22780:2 | 22920:2 | 22920:2 | 22920:2 | 22920:2 | |
| 8350 | 30 | 3008:6 | 6232:3 | 9442:2 | 9442:2 | 9442:2 | 9442:2 | 1 |
| 8380 | 15 | 3476:12 | 6356:7 | 9076:5 | 9076:5 | 9076:5 | 9076:5 | 1 |
| 8381 | 15 | 3476:12 | 9076:5 | 11476:4 | 11476:4 | 9076:5 | 9076:5 | 1 |
| 8385 | 15 | 4092:10 | 23292:2 | 23468:2 | 23468:2 | 23468:2 | 23468:2 | 1 |
| 8390 | 15 | 3440:14 | 6518:8 | 10706:5 | 10706:5 | 8904:6 | 8904:6 | 1 |
| 8391 | 15 | 4136:12 | 10796:5 | 13682:4 | 13682:4 | 8904:6 | 18452:3 | 1 |
| 8392 | 15 | 4092:12 | 12796:4 | 18452:3 | 18452:3 | 18452:3 | 18452:3 | 1 |
| 8393 | 15 | 4092:12 | 27644:2 | 27990:2 | 27990:2 | 27990:2 | 27990:2 | 1 |
| 9332 | 6 | 2044:10 | 4092:5 | 5120:4 | 5120:4 | 10240:2 | 10240:2 | 2 |
| 9335 | 6 | 2556:14 | 3580:10 | 5120:7 | 5120:7 | 7168:5 | 7168:5 | |
| 9345 | 15 | 4092:10 | 7164:6 | 11148:4 | 11148:4 | 22920:2 | 22920:2 | 3 |

**Notes:**

1. The 8350, 838*n*, and 839*n* are pseudodevice types physically contained on a 3350, 3380, and 3390 device, respectively, but for which some or all of the standard block sizes are larger.
2. The number of tracks per cylinder listed here is artificial.
3. The IBM RAMAC 9394 emulates devices 3390 Model 3, 3380 Model K, or 9345 Model 2.

**Support for VSAM Data Sets**

VSAM support is available only on z/OS.

To support VSAM data sets, the following table shows the CISZ values for the Adabas components on the 3380/90 devices:

| Device | ASSO | DATA | WORK | PLOG/RLOG | CLOG | TEMP/SORT/DSIM |
|---|---|---|---|---|---|---|
| 3380 | 2048 | 5120 | 5632 | 5632 | 5120 | 7680 |
| 3390 | 2560 | 5120 | 6144 | 6144 | 5120 | 9216 |

The VSAM device types 5555, 6666, 7777, 8888, and 9999 are dynamic device types that depend on the user definition.

A VSAM user can determine the RABN size currently in use from message ADAI64.

## ECKD Devices

Adabas supports ECKD DASD devices such as the IBM 3390 with the 3990 controller and ESCON channels.

During an open operation, ADAIOR determines which DASD device types are being used for the ASSO, DATA, WORK, SORT, and TEMP data sets. At that time, Adabas issues an informational message for each Adabas database component, where *type* is the component:

```
ADA164 ... FILE DDtype HAS BEEN OPENED IN ckd/eckd MODE - RABN SIZE rabn-size
```

**Note:** Software AG strongly recommends that you avoid mixing ECKD and CKD extents within a file, because the file will be opened only in CKD mode. Mixing extents could degrade performance when file I/O operations are performed.

## Adding New Devices

Support for new device types that include user-defined block sizes can be implemented in ADAIOR by modifying one of the table of device-constant entries (TDCEs) reserved for this purpose.

A TDCE is X’40’ bytes long and the first free TDCE can be identified by X’0000’ in its first two bytes (TDCDT).

For all versions of Adabas prior to version 6.2, the address of the first TDCE is at offset ADAIOR+ X‘34’.

For Adabas Version 6.2, TDCE entries are in the ADAIOR CSECT TDCON: the first TDCE entry is at offset 0; the first free TDCE entry is at offset X‘400’.

For Adabas Version 7.1, TDCE entries are in the ADAIOS CSECT TDCON: the first TDCE entry is at offset 0; the first free TDCE entry is at offset X‘580’.

This information is valuable when adding an additional TDCE entry.

### Information to be Zapped into the First Free ADAIOR TDCE

The information in the following tables must be zapped into the first free TDCE. The rules described in the section ***General Rules for Defining Device Block Sizes*** must be followed when changing the TDCE.

| Label | Offset | Contents |
|---|---|---|
| TDCDT | 00 | Device type in unsigned decimal (X’3385’), must be numeric, and unique among all TDCEs. |
| TDCKSN | 02 | Constant set number: must be uniquely chosen from the values X’2B’ or X’2E’. |
| TDCF | 03 | The flag bit must be set—TDCFCKD (X’40’) for CKD devices, TDCFECKD (X’60’) for ECKD devices or TDCFECKD (X’61’) for ECKD, not user defined devices. |
| TDCDT1 | 04 | (see note 1) |
| TDCDT2 | 05 | (see note 1) |
| TDCDT3 | 06 | (see note 1) |
| TDCDT4 | 07 | (see note 1) |
| TDCMSBS | 08 | Refer to the section ***Maximum Sequential Block Size***. |
| TDCTPC | 0A | Number of tracks per cylinder. |
| TDCCIPT | 0C | (see note 2) |
| TDCBPCI | 0E | (see note 2) |
| TDCABPT | 10 | Number of Associator blocks per track. |
| TDCABS | 12 | Associator block size. |
| TDCACPB | 14 | (see note 2) |
| TDCDBPT | 16 | Number of Data Storage blocks per track. |
| TDCDBS | 18 | Data Storage block size. |

| Label | Offset | Contents |
|---|---|---|
| TDCDCPB | 1A | (see note 2) |
| TDCWBPT | 1C | Number of Work blocks per track. |
| TDCWBS | 1E | Work block size. |
| TDCWCPB | 20 | (see note 2) |
| TDCTSBPT | 22 | Number of TEMP or SORT blocks per track |
| TDCTSBS | 24 | TEMP or SORT block size. |
| TDCTSCPB | 26 | (see note 2) |
| TDCPBPT | 28 | Number of PLOG blocks per track. |
| TDCPBS | 2A | PLOG block size. |
| TDCPCPB | 2C | (see note 2) |
| TDCCBPT | 2E | Number of CLOG blocks per track. |
| TDCCBS | 30 | CLOG block size. |
| TDCCCPB | 32 | (see note 2) |

**Notes:**

1. One or more operating-system-dependent codes for identifying the device type: z/OS, the UCB unit type from UCBTBYT4.
2. Not used for z/OS operating systems.

### General Rules for Defining Device Block Sizes

The following general rules must be followed when defining Adabas device block sizes:

- All block sizes must be multiples of 4.
- A single block cannot be split between tracks (that is, the block size must be less than or equal to the track size).

### Maximum Sequential Block Size

When adding new devices, the maximum sequential block size must also be specified. The value to be set to the maximum sequential block size is TDCMSBS, located at offset X’08’ from the beginning of the ADAIOR TDCE table.

Depending on the device type, the TDCMSBS value should be as follows:

| Device Type | Maximum Block Size |
|---|---|
| 0512 | 32760 |
| 3310 | 32760 |
| 3330 | 13030 |
| 3340 | 8368 |
| 3350 (8350) | 19069 |
| 3370 | 32760 |
| 3375 | 17600 |
| 3380 (8380/81) | 23476 |
| 339*n* | 27998 |
| 8380/1/5 | 23476 |
| 839*n* | 27998 |
| 9332 | 32760 |
| 9335 | 32760 |

**Note:** On some devices, it may be most efficient to use smaller block sizes (for example, to specify 23476 for the 3380, but with two blocks per track).

### Rules for Associator and Data Storage Block Sizes

The following rules apply for Associator and Data Storage block sizes:

- Associator block size must be greater than one-fourth the size of the largest FDT, and should be large enough to accept definitions in the various administrative blocks (RABN 1 - 30) and in the FCB;
- The block sizes for Associator and Data Storage should be a multiple of 256, less four bytes (for example, 1020) to save Adabas buffer pool space.
- The Associator and Data Storage block sizes must be at least 32 less than the sequential block size.
- Data Storage block size must be greater than: (maximum compressed record length + 10 + padding bytes).

### Rule for Work Data Set Block Size

The Work block size must be greater than either (maximum compressed record length + 110) or (Associator block size + 110), whichever is greater.

### Rules for TEMP/SORT Data Set Block Sizes

If ADAM direct addressing is used:

```
size > (maximum compressed record length + ADAM record length + 24);
size > 277 (maximum descriptor length + 24)
```

However, TEMP and SORT are generally read and written sequentially; therefore, the larger the TEMP/SORT block size, the better.

Block sizes for TEMP and SORT must be greater than the block sizes for Data Storage.

### Rules for PLOG or SIBA Block Sizes

**Note:** The use of 3480/3490 tape cartridge compression (IDRC) is not recommended for protection log files. The ADARES BACKOUT function will run at least twice as long under z/OS when processing compressed data.

The following rules apply for PLOG or SIBA block sizes:

- The PLOG or SIBA block size must be greater than either (maximum compressed record length + 110) or (Associator block size + 110), whichever is greater.
- It is also recommended that PLOG/SIBA be defined larger than the largest Data Storage block size. This avoids increased I/O caused by splitting Data Storage blocks during online ADASAV operations.

The block size (BLKSIZE) of a sequential file is determined as follows:

```
if PTTF(JCL) then BLKSIZE is taken from file assignment statement or label;
if PTTMBS > 0 then BLKSIZE = PTTMBS;
if PTTMBS = 0 then
if tape then BLKSIZE = 32760;
else BLKSIZE = TDCMSBS;
else if BLKSIZE in file assignment statement or label then use it;
if PTTF(OUT) then
if QBLKSIZE > 0 then BLKSIZE = QBLKSIZE;
if tape then BLKSIZE = 32760;
else BLKSIZE = TDCMSBS;
else error.
```

**Note:** `QBLKSIZE` is an ADARUN parameter.

### Sequential Protection Log Block Size in I_PPT

In addition, the sequential protection log block size may have to be increased in the corresponding PTT entry in CSECT I_PTT of the load module ADAIOR.

The address of the first PTT entry is contained in the fullword at ADAIOR+X‘4C8’.

PTT entries begin at offset 0 into CSECT I_PTT.

Each PTT entry is X’10’ bytes long and has the structure given below:

| Label | Offset | Contents |
|---|---|---|
| PTTPN | 00 | Program number |
| PTTFT | 01 | File type |
| PTTN | 02 | DD name characters 2 - 8 |
| PTTF | 08 | Flags:<br>OUT (X’80’) output<br>BSAM (X’40’) BSAM<br>BACK (X’20’) read backwards<br>JCL (X’10’) BLKSIZE/LRECL/RECFM taken from DATADEF statement or label<br>UNDEF (X’04’) undefined record format<br>VAR (X’02’) variable record format |
| - | 09 | Reserved |
| PTTMBSZ | 0C | Maximum block size |

The PTT entry for the sequential protection log can be identified by X‘12F1’ in its first two bytes.

## Installing Adabas Using VSAM Data Sets

This section presents information needed to install Adabas on z/OS systems using VSAM as the access method for containing Adabas data. Software AG provides a VSAM interface as an alternative to using EXCP with BDAM container files.

## Suggested Additional VSAM Information Sources

Software AG recommends that you have the following reference manuals when dealing with VSAM files. References are made in this section to these manuals:

- *IBM Access Method Services*
- *IBM VSAM Administration Guide, Macro References*

  See the list of manuals in the introduction for more specific information.

## Defining VSAM Data Sets

The following topics describe the VSAM file types used for Adabas files, and how to define and delete those files with the IDCAMS utility.

### VSAM File Types

There are four types of VSAM container files:

```
KSDS key sequential data sets
ESDS entry sequence data sets
RRDS relative record data sets
LDS linear data sets
```

Adabas uses RRDS or the optional LDS as the VSAM container file type that must be defined.

Normally, files are seen as containing records that can be read and written by the application program. Adabas uses the VSAM record to hold a block of compressed Adabas data. This means that the VSAM file contents is identical with that of its BDAM equivalent; only the access method is different. The RRDS and LDS VSAM file types were chosen because of their similarity to the current BDAM file structure.

### Defining a VSAM Data Set with the IDCAMS Utility

To define a VSAM data set, the IBM-supplied utility IDCAMS is used. This utility and its parameters are discussed in the manual *IBM Access Method Services*. It is not the intention here to describe IDCAMS in detail, but only those aspects that relate to Adabas requirements.

The following is an example job set-up for defining a VSAM data set for Adabas:

```
//IDC01 EXEC PGM=IDCAMS
//SYSPRINT DD SYSOUT=*
//SYSOUT DD SYSOUT=*
//SYSIN DD *
DEFINE CLUSTER ( NAME (EXAMPLE.ASSOR1) VOL (VOLXXX) -
CYLINDER(100) NUMBERED) -
DATA (NAME (EXAMPLE.ASSOR1.DATA) -
SHAREOPTIONS ( 3 3 ) -
CISZ (2048) -
RECORDSIZE (2004 2004) )
/*
//
```

The first SYSIN statement defines the VSAM cluster. The information that follows the SYSIN statement (within the outer parentheses) describe the VSAM file. The following is a short description of the parameters:

| Parameter | Description |
|---|---|
| NAME | Name assigned to the data set and used to refer to the data set in later jobs; for example, the following data definition refers to the name defined in the above example:<br>`//DDASSOR1 DD DSN=EXAMPLE.ASSOR1,DISP=SHR` |
| VOL | Volume or volumes on which this file is contained. |
| CYLINDER | DASD space required for this component. This may also be specified as RECORDS, TRACKS, etc. |
| NUMBERED | Identifies the file type as RRDS. |
| DATA (NAME) | Internal name describing the Data component of the VSAM file. |
| SHAREOPTIONS (3 3) | Defines how this data set is to be shared among other users. See the *IBM Access Method Services* manual for more information. |
| CISZ | Internal VSAM control interval size for this data set. |
| RECORDSIZE | VSAM record size; for Adabas use, this is the Adabas block size. |

The “-” character indicates continuation on the next job statement line.

### Deleting a VSAM Data Set

The IDCAMS utility is also used to delete a VSAM data set. The following is an example of a job for deleting a VSAM file:

```
//IDC01 EXEC PGM=IDCAMS
//SYSPRINT DD SYSOUT=*
//SYSOUT DD SYSOUT=*
//SYSIN DD *
DELETE (EXAMPLE.ASSOR1)
/*
//
```

### Multiple IDCAMS Operations

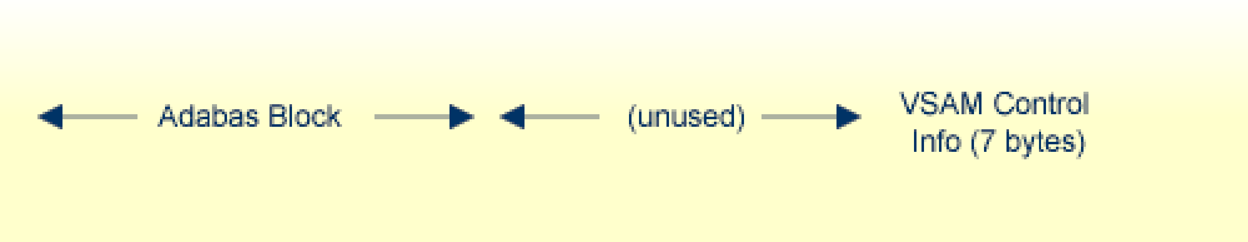
You can combine more than one IDCAMS utility operation. For example, you can delete and define a cluster or multiple clusters in one execution step. The following is an example:

```
//IDC01 EXEC PGM=IDCAMS
//SYSPRINT DD SYSOUT=*
//SYSOUT DD SYSOUT=*
//SYSIN DD *
DEFINE CLUSTER ( NAME (EXAMPLE.ASSOR1) VOL (VOLXXX) -
CYLINDER(100) NUMBERED) -
DATA (NAME (EXAMPLE.ASSOR1.DATA) -
SHAREOPTIONS ( 3 3 ) -
CISZ (2048) -
RECORDSIZE (2004 2004) )
DELETE (EXAMPLE.DATAR1)
DEFINE CLUSTER ( NAME (EXAMPLE.DATAR1) VOL (VOLXXX) -
CYLINDER(100) NUMBERED) -
DATA (NAME (EXAMPLE.DATAR1.DATA) -
SHAREOPTIONS ( 3 3 ) -
CISZ (5120) -
RECORDSIZE (4820 4820) )
/*
//
```

## Defining Control Interval Sizes

A control interval is an area in which VSAM manages a record or group of records. VSAM maintains locks at the control-interval level; if an update is in progress for a record within a control interval, all records in that control interval are also locked, and cannot be accessed or changed. For this reason, only one record per control interval should be defined for Adabas VSAM files, since Adabas must be allowed to update or access any block on the database at any given time.

The following diagram shows a control interval containing an Adabas block:



How large the control interval is, depends on the record size. For records less than 8 KB, the control interval is defined in multiples of 512 bytes; for records equal to or larger than 8 KB, the control interval is defined in multiples of 2048 bytes.

To ensure that the correct `CISZ` is coded in your IDCAMS DEFINE request, use the following formula:

For records less than 8 KB:

```
resulta =  (recordsize + (7-byte CI overhead))  /  512
```

Round *resulta* up to the next higher number, then calculate CISZ:

```
CISZ = resulta (rounded)  *  512
```

For records equal or larger than 8 KB:

```
resulta =  (recordsize + (7-byte CI overhead))  /  2048
```

Round *resulta* up to the next higher number, then calculate CISZ:

```
CISZ = resulta (rounded)  *  2048
```

The following table shows the record sizes and CISZ values for the Adabas components on the 3380/90 devices:

| Device | ASSO | DATA | WORK | PLOG/RLOG | CLOG | TEMP/SORT |
|---|---|---|---|---|---|---|
| 3380 | 2004:2048 | 4820:5120 | 5492:5632 | 5492:5632 | 4820:5120 | 7476:7680 |
| 3390 | 2544:2560 | 5064:5120 | 5724:6144 | 5724:6144 | 5064:5120 | 8904:9216 |

### Using Existing Adabas Device Definitions

It is possible to use existing devices and device characteristics within the Adabas VSAM interface. No DEVICE-related changes are required in the ADARUN control parameters. The only requirement is that the IDCAMS RECORDSIZE parameter be identical to the block size of your existing BDAM component. However, it should be taken into account that this may lead to wasted disk space.

For example, a 3380 definition for the Associator requires a block size of 2004 bytes, plus seven bytes overhead per control interval and only one record per control interval. The actual use of the control interval is 2011 bytes, resulting in an unused area of 37 bytes (2048 - 2011 = 37). This unused space generally requires that the VSAM physical space allocation for the data set be larger than its BDAM equivalent.

It is not necessary that the VSAM data sets be on the same device type as that defined on the present ADARUN statements. For example, you may define the RECORDSIZE parameter for IDCAMS as a 3390 Adabas block size, while the VOL parameter points to a 3350 physical device type. In addition, VSAM allows the cluster to span different physical device types, while appearing to Adabas as a single device type.

### Defining Your Own Device Characteristics

When you define your own block sizes, the Adabas VSAM interface detects this and dynamically creates a device type of 9999 for the DD/*xxxx*R1 Adabas component. Or, if the VSAM interface detects an ADARUN DEVICE=9999 parameter, the VSAM file information is obtained from the VSAM catalog entry.

By defining your Adabas data sets with your own RECORDSIZE definition, you can ensure the best use of VSAM's control intervals. However, you must adhere to the guidelines for Adabas block sizes as defined in the section ***General Rules for Defining Device Block Sizes***, except for the restriction that prohibits splitting a block between tracks. This can be done with the VSAM interface.

DD/*xxxx*R2 Adabas components (DD/PLOGR2, DD/ASSOR2, etc.) are defined using a dynamic device type of 8888, DD/*xxxx*R3 uses 7777, DD/*xxxx*R4 uses 6666, and DD/*xxxx*R5 uses 5555. For utilities that require DATADEV or ASSODEV, it is important to provide the appropriate dynamic device types according to this system.

The DD/*xxxx*R2-R5 data sets are only required for different Adabas block size definitions; they are no longer needed for defining VSAM files on different physical device types alone. A single component may span physically different devices in the VSAM interface, while still appearing to Adabas as being on the same device type.

### Mixing VSAM and BDAM Components

VSAM and BDAM components can be mixed. For example, you can have an Associator in a VSAM file with the rest of the Adabas components in BDAM files. But you cannot mix VSAM and BDAM within the same component. If, for example, you have DD/ASSOR1 and R2 defined, they must both be either VSAM or BDAM files. Any Adabas component that currently resides on a BDAM file may be redefined on a VSAM data set. This includes Associator, Data, Work, PLOG, CLOG and the RLOG.

### Converting Adabas BDAM Components to VSAM

There are two ways to convert Adabas Associator (ASSO) and Data Storage (DATA) components to VSAM. The simplest method, described next, may require more DASD space for the VSAM components. The second method takes more time, but may save on DASD space.

**Method 1**

▶ **to convert ASSO and DATA components to VSAM (method 1):**

1 Run the ADAREP (database report) utility on the existing database with its BDAM components.

2 Run ADASAV SAVE on the database.

3 Run the IDCAMS utility to DEFINE the cluster or clusters for the Associator and/or Data Storage components being converted. Specify a `RECORDSIZE` that is consistent with these components, and a `RECORDS` value using the number of blocks indicated in the ADAREP output's “database physical layout” section for those components being converted. Remember to add one track's worth of blocks to the size reported there.

4 Following successful IDCAMS operation, run the ADAFRM utility on the VSAM files to format them. Remember to use the same device types as were defined on the BDAM database.

5 Run the ADASAV RESTORE function on the new VSAM data sets.

6 Convert all other nucleus and utility job control statements to apply to the VSAM data sets.

### Method 2

**to convert ASSO and DATA components to VSAM (method 2):**

1 Run the ADAORD RESTRUCTUREDB function on the BDAM-based database. Do not specify an Associator device type with ASSODEV different from the existing Adabas block size and device type definitions.

2 Run IDCAMS to allocate the VSAM files, using your own `RECORDSIZE` and size definitions. Define all Adabas Data Storage and/or Associator components.

3 Run the ADAFRM utility to format the VSAM files created in step 2. When using existing Adabas block sizes, use the existing device definition; otherwise, specify `DEVICE=9999` to indicate dynamic device usage (see the section *Defining Your Own Device Characteristics* for more information).

4 Run the ADADEF DEFINE function on the VSAM files, and specify `ASSOSIZE/DATASIZE` according to the result of step 2, above, minus one track's worth of blocks.

5 Run the ADAORD STORE function on the VSAM files, and specify the correct device types. Use device type "9999" for dynamic device usage (see the section *Defining Your Own Device Characteristics* for more information).

Specify `ADARUN TMLOG=NEVER` for the purpose of verifying the installation. Once the verification process has been completed, reconsider this parameter setting.

6 Change all other nucleus and utility job control to specify the VSAM data sets defined and formatted in steps 2 through 5. Remember to change any device specifications to "9999" if you are using dynamic device definition (see the section *Defining Your Own Device Characteristics* for more information).

## Converting WORK, PLOG, CLOG and RLOG Components

**To convert WORK, PLOG, CLOG and RLOG components:**

1 Execute IDCAMS to define the cluster, using either the existing Adabas block sizes or your own `RECORDSIZE` definitions.

2 Execute ADAFRM to format the VSAM data sets.

3 Use the VSAM file or files in place of their BDAM counterparts in all Adabas nucleus and utility job control statements.

### VSAM File Storage Requirements

The Adabas VSAM interface makes use of BDAM user buffering and VSAM control interval processing to minimize VSAM overhead. However, this requires that the Adabas VSAM interface acquire storage to manage the contents of VSAM control intervals.

The Adabas VSAM interface uses up to 255 areas per Adabas file to manage VSAM control intervals. Each area is equivalent to the `CISIZE` specified in the IDCAMS definition for the file. These control interval areas are acquired dynamically while the nucleus or utility is executing; this minimizes the amount of storage required, based on the I/O response times of your environment. For example, in an environment where I/O performance is optimized, it is possible that only seven to ten of these CIAREAs would be needed to handle concurrent asynchronous VSAM requests.

In 31-bit addressing mode, these buffers are allocated above 16 MB. Software AG therefore recommends that you run with `AMODE=31` when using the VSAM interface.

### Allocating VSAM Data Sets on Multiple Volumes

Allocating VSAM data sets across multiple volumes is done by specifying secondary space allocations as well as the volume serial numbers that will contain the VSAM data set. The following is a sample IDCAMS execution for defining EXAMPLE.ASSOR1 on volumes VOLXXX and VOLYYY with a primary space allocation of 100 cylinders and a secondary space allocation of 50 cylinders:

```
//IDC01 EXEC PGM=IDCAMS
//SYSPRINT DD SYSOUT=*
//SYSOUT DD SYSOUT=*
//SYSIN DD *
DEFINE CLUSTER ( NAME (EXAMPLE.ASSOR1) VOL (VOLXXX VOLYYY) -
CYLINDER(100 50) NUMBERED) -
DATA (NAME (EXAMPLE.ASSOR1.DATA) -
SHAREOPTIONS ( 3 3 ) -
CISZ (2048) -
RECORDSIZE (2004 2004) )
```

If the secondary allocation of 50 cylinders can be obtained on VOLXXX, it will be taken from that volume. Allocation of 50 cylinders will continue until VOLXXX can no longer satisfy an allocation. Then, space is acquired from VOLYYY.

The primary allocation must be acquired from VOLXXX; otherwise, IDCAMS will fail. The maximum number of VSAM extents is 123. On large databases, you must be careful to avoid fragmented VSAM file allocations that could cause the limit of 123 extents to be exceeded. For extremely large databases or for those requiring more than 123 extents, consider allocating additional database components (DD/*xxxx*R2-R5).

### VSAM Limitations

VSAM files can be defined to include up to 123 extents, or a maximum size of 4,294,967,296 bytes (4 gigabytes). Therefore, Adabas is permitted a maximum of 20 gigabytes of Associator (ASSO) and 20 gigabytes of Data Storage (DATA) components through the use of DD/xxxxR1 - DD/xxxxR5 data sets, and up to 4 gigabytes for all other Adabas components.

### Comparison of EXCP and VSAM on High-Capacity Disk Drives

Newly developed DASD (disk) devices have capacities considerably larger than any previous devices. The IBM 3390 Model 9 is one example. Such devices contain more than 65,535 tracks per volume, which makes it impossible to allocate a complete volume as a single data set, regardless of the number of extents. The 65,535 track limit is imposed by the operating system for most access methods.

To make use of a whole volume for ASSO or DATA files, it becomes necessary to allocate more than one container data set per volume, each data set not exceeding 65,535 tracks. These data sets would then be assigned to separate DATAR*n* or ASSOR*n* DD statements in Adabas JCL procedures. Since DATA and ASSO can each have up to five containers, this technique allows up to 327,675 tracks total for each. On a 3390-type device, this can be more than 18 GB.

If larger DATA or ASSO files are required, it is necessary to allocate one or more container files on multiple volumes. The operating system permits a single data set to span up to 59 volumes, as long as the total number of tracks allocated on each volume does not exceed 65,535. This allows DATA and ASSO each to be as large as 19,332,825 tracks, which can be more than 1 TB on 3390-type devices.

When deciding between EXCP and VSAM for such a device, the factors that should be considered are

- performance;
- maximum capacity; and
- ease of maintenance.

VSAM permits easier handling and improved SMS integration, but at the cost of somewhat lower performance. Also, since there can only be one VSAM cluster per operating system file (i.e., ASSOR1, etc.), this limits the total Associator or Data Storage size to 20 gigabytes. The maximum size for the Work data set is four gigabytes.

The capacity of high-capacity devices themselves may also restrict the choice. Unlike a BDAM file, a single VSAM cluster cannot exceed four gigabytes. This means that a single VSAM cluster cannot reference the complete volume on such a device (for example, the 3390 Model 9 has a maximum capacity of 8.5 gigabytes).

**Notes:**

1. EXCP offers high volume and performance, but with the disadvantage of requiring more maintenance.
2. Certain high-capacity drives have a slower data transfer rate. The performance impact of the data transfer rate must be taken into consideration when choosing the access method to be used on such devices.

# 10 Installing The AOS Demo Version

This section describes how to install the Adabas Online System (AOS) demo version on a z/OS or FACOM MSP system. To install AOS on systems that use Software AG's System Maintenance Aid (SMA), refer to the section of this document describing installation of Adabas in your operating environment. For information about SMA, see the *System Maintenance Aid* documentation.

**Notes:**

1. To install the full version selectable unit AOS, see the *Adabas Online System* documentation.
2. Demo versions of Adabas Vista (AVI), Adabas Fastpath (AFP), Adabas SAF Security (AAF), and Adabas Transaction Manager (ATM) are automatically installed when you install either the demo or full version of AOS.

The AOS demo version requires Natural version 3.1 or above.

## AOS Demo Installation Procedure

**To install the AOS demo version without the System Maintenance Aid**

1 For a Com-plete or CICS environment, link the correct object module with the Natural TP nucleus.

If a split Natural nucleus is to be installed, the AOSASM module must be linked to the shared portion of the nucleus and not to the thread portion.

2 Perform a Natural INPL.

The tape containing the AOS demo version contains an INPL-formatted data set in Natural 3.1. The programs for the AOS demo version are stored in library SYSAOS.

3 Load the ADA error messages using the Natural utility ERRLODUS.

The error messages are stored in an ERRN-formatted data set included on the tape.

See the *Natural Utilities* documentation for information about the ERRLODUS utility.

4 Execute the AOS demo version by logging on to the application library SYSAOS and entering the command `DBMENU`.

## Installing AOS with Natural Security

If Natural Security is installed, define at least the library SYSAOS to it.

Define the following libraries as needed:

- For Adabas Vista: SYSAVI and SYSMV*vrs*
- For Adabas Fastpath: SYSAFP and SYSMW*vrs*
- For Adabas SAF Security: SYSAAF and SYSMX*vrs*
- For Adabas Transaction Manager: SYSATM and SYSMT*vrs*

Software AG recommends you define SYSAOS and any other libraries you may define as protected.

Specify the start-up program for SYSAOS as DBMENU. Do not specify a start-up program name for the other libraries.

Natural Security must be installed before implementing Adabas Online System Security. See the *Adabas Security* documentation for more information. For information about installing Natural Security for use with AOS Security, see the *Natural Security* documentation.

Natural Security includes the ability to automatically close all open databases when the Natural command mode's LOGON function of the AOS demo version is invoked.

## Setting the AOS Demo Version Defaults

Parameters that control the operation of the AOS demo version can be set at installation time by changing the defaults in the Natural program AOSEX1. The table below lists the parameters and possible values. Default values are underlined:

| Parameter | Valid Values / Default | Function |
|---|---|---|
| AOS-END-MSG | `Yes (Y) / No (N)` | Display the AOS demo version end-of-session message? |
| AOS-LOGO | `Yes (Y) / No (N)` | Display the AOS demo version logo? |
| CPEXLIST | `No (N): normal list`<br>`Yes (Y): extended` | Display extended checkpoint list? |
| MAX-AC-IOS | `0-999999 (150)` | AC read converter block threshold value |
| NR-EXT | `1, 2, 3, 4, 5` | Critical extent threshold for listing file |

| Parameter | Valid Values / Default | Function |
|---|---|---|
| STATINTV | 1-9999 seconds (60) | Statistics gathering interval |

To change the defaults, you must edit the Natural AOSEX1 program and make the changes directly within the program listing in the defaults area, as shown by the following example:

```
DEFINE DATA PARAMETER USING P-AOSEX1
END-DEFINE
*
* SET THE DEFAULTS
*
AOS-END-MSG = 'Y' (Display end-of-session message)
AOS-LOGO = 'Y' (Online System logo display—set to 'N' for no logo display)
CPEXLIST = 'N' (Checkpoint list control: set to 'Y' for extended checkpoint list)
NR-EXT = 4 (Critical extent threshold: 1, 2, 3, 4 or 5)
MAX-AC-IOS = 150 (AC read converter block threshold)
STATINTV = 60 (Statistic gathering time interval:  range: 1 - 9999)
*
END
```

# 11 Installing The Recovery Aid (ADARAI)

This section describes how to install the Adabas Recovery Aid (ADARAI).

## ADARAI Installation Overview

To install the Adabas Recovery Aid, it is necessary to:

- allocate the recovery log;
- customize the skeleton job streams for your installation (see the *Adabas Operations* documentation for more detailed information);
- update the necessary nucleus run/utility job control to include the Recovery Aid data definition statements;
- install the Adabas/ADARAI utility configuration; and
- run ADARAI PREPARE and a save operation to begin a logging generation.

## ADARAI Installation Procedure

Except for customizing the skeleton job stream, the specific installation steps are as follows:

**To install the Adabas Recovery Aid:**

1. Define and format the DDRLOGR1 file.

   Use the ADAFRM RLOGFRM function to format the RLOG.

2. Add DDRLOGR1 DD or DLBL statements to the nucleus job stream and to any utilities that update or save the database and thus write to the RLOG file.

   Whenever these utilities are executed while ADARAI is active in the database (that is, after the PREPARE function has been executed), the DDRLOGR1 or DDDLBL statements must be included.

The following utilities update the database and therefore write to the RLOG:

```
ADAORD (all STORE and REORDER functions)
ADALOD (all functions)
ADAINV (all functions)
ADARES REGENERATE/BACKOUT database
ADASAV RESTORE (all functions) and RESTPLOG
ADADEF NEWWORK
```

The following utilities save the database and therefore write to the RLOG:

```
ADASAV SAVE (all functions)
ADAORD RESTRUCTURE
ADAULD
```

The following utility functions have an impact on recovery and therefore write to the RLOG:

```
ADARES PLCOPY/COPY
ADASAV MERGE
```

Additionally, the Adabas nucleus writes to the RLOG during startup and termination. The nucleus also writes checkpoint information to the RLOG when ADADBS or Adabas Online System functions are processed, ensuring these events are known to ADARAI for recovery processing.

3. Install ADARAI on the database.

   Execute the ADARAI PREPARE function. ADARAI PREPARE updates the ASSO GCB to indicate that ADARAI is installed. It also creates a control record on the RLOG file with necessary ADARAI information (number of generations, RLOG size, etc.).

4. Create the first ADARAI generation.

   Execute ADASAV SAVE (database) to start the logging of RLOG information. See the *Adabas Utilities* documentation for more information.

Once ADARAI is active in the database, protection logging must always be used.

# 12 Installing The Error Handling And Message Buffering Feature

This section describes how to install the error handling and message buffering feature.

**to install the error handling and message buffering feature:**

1. Specify ADARUN `SMGT=YES`. If message buffering is to be used, also specify ADARUN `MSGBUF` with a value greater than zero.

   When ADARUN `SMGT=YES` is specified to activate the error handling tool, the initialization module ADAMXI is loaded by ADARUN and is then called during session open:

   - the error handling header/environment is initialized;
   - the message buffer is initialized if ADARUN `MSGBUF` is specified with a value greater than zero;
   - the error handling modules are loaded into memory by ADAIOR;
   - the Adabas module table is built;
   - any provided error handling user exit is initialized;
   - the default recovery plug-in (PIN) module ADAMXY is installed;
   - the program check and abnormal termination handlers are activated;
   - the error handling flag in the header is raised indicating a successful start;
   - the ADANI2 message is generated to indicate that error handling is active in the nucleus.

2. Decide which exits are critical (the default) and issue `SMGT,XNOTCRITICAL=`*`exit-code`* operator commands for those that are not critical.

3 Customize ADASMXIT if necessary, particularily if PINRSP or PINAUTOR are to be activated. Re-assemble the exit and ensure that it resides in the Adabas load library or is available in a load library that is available at start-up time.

4 Decide which PINs to activate.

The following table lists the available PINs and how to activate them:

| PIN Routine | To install ... |
|---|---|
| PINAUTOR | rename NOAUTOR in the Adabas load library to PINAUTOR |
| PINOPRSP | rename NOOPRSP in the Adabas load library to PINOPRSP |
| PINRSP | issue operator command `SMGT,ADDPIN=PINRSP` when the nucleus is active (see note below) |
| PINUES | issue operator command `SMGT,ADDPIN=PINUES` when the nucleus is active (see note below) |

**Note:** Since PINRSP and PINUES handle some of the same response codes, perform the ADDPIN function last on the module that is to acquire control. For example, PINRSP and PINUES both handle a response code 55. If PINUES is to acquire control, the ADDPIN must be done on PINUES after PINRSP.

At this point error handling is fully operational and `SMGT` operator commands may be issued.

# 13 Installing And Using The Adabas Migration Tool

This section describes how to install and use the Adabas migration tool.

## Migration Tool Installation

- Installation Data Sets
- Create Migration Table

### Installation Data Sets

This section describes the data sets used for the migration tool.

#### Load Library

Migration tool members in the Adabas load library are listed in the following table:

| Member | Description |
|---|---|
| MIGS01 | Batch migration tool.<br>Rename to ADALNK and make available to any batch job that needs to use the migration tool. |
| MIGS02 | Com-plete migration tool.<br>Rename to ADALCO and place in a COMPLIB library for any Com-plete job that needs to use the migration tool. |
| MIGS03 | CICS command-level migration tool.<br>Link this with the CICS command-level stubs, name it Adabas (or whatever your CICS link module is called), and place it in the DFHRPL concatenation of any CICS job that needs to use the migration tool. |
| MIGS09 | Batch migration tool for use with reentrant ADALNK.<br>Rename to ADALNK and make available to any batch job that uses a reentrant ADALNK and needs to use the migration tool. |

**Note:** There is no requirement to relink any of these modules. However, if you do, you must be sure to leave their attributes unchanged (`REUS, AMODE31`).

### Source Library

Migration tool members in the Adabas source library are listed in the following table:

| Member | Description |
|---|---|
| MIGCICIN | Sample CICS program to initialize the migration tool. |
| MIGLINK | Macro used to generate the migration table. |
| MIGT01 | Sample migration table. |

The source library may also contain other members such as README files or ZAPs.

### Jobs Library

Migration tool members in the Adabas jobs library are listed in the following table:

| Member | Description |
|---|---|
| MIGAFP32 | Example zap to change the names of the modules loaded by Adabas Fastpath 3.2 (FASTENV, FASTNUC, FASTPRM) |
| MIGAVI63 | Example zap to change the names of the modules loaded by Adabas Vista 6.3 |
| MIGCIASM | Sample job to assemble and link MIGCICIN |
| MIGCICLK | Sample job to link MIGS03 with the CICS command-level stubs. This example creates a CICS load module called CICMIG. |
| MIGTASM | Sample assembly and link job for creating the migration table |
| MIGZAPCI | Zap to change defaults for the CICS migration tool (see the section ***Migration Tool Defaults***). |
| MIGZAPDE | Zap to change default database ID and buffer sizes (see the section ***Migration Tool Defaults***). |
| MIGZAPRS | Zap to change the handling of initialization contention under Com-plete and CICS (initialization must be single-threaded in those environments).<br>By default, the migration tool delays contending users for a second at a time until initialization has completed. You can use this zap to give contending users a bad response code instead. |
| MIGZAPSV | Zap to change the SVC number in standard batch link modules, depending on the SVC number specified in the ADARUN parameters |

## Create Migration Table

A migration table defines

- all available link modules and the versions (if any) of Adabas Fastpath, Adabas Transaction Manager, and/or Adabas Vista linked with them (see the section ***Adabas Options*** for more information).
- the databases that are to be accessed using which link module. Any call to a database not defined in the table is issued using the default link module. You *must* nominate a default link module.

  You can use the supplied sample migration table as a base. Ensure that the assembly terminates with condition code 0. Any error in parameter specification is reported in an MNOTE and generates condition code 16.

The linked migration table must be called:

- MIGT01 for batch;
- MIGT02 for Com-plete;
- MIGT03 for CICS; or
- MIGT09 for batch using a reentrant link module.

The migration table must not be linked reentrant.

### Define the Link Modules

Each link module named in the migration table

- must be available to the migration tool at runtime; and
- must have the correct SVC number specified in it.

### Example

You access your databases through an ADALNK Version 7.4.1 using SVC 249, but database 1 is still running at Version 6.2.3 accessed through an ADALNK Version 6.2.3 using SVC 248.

**To allow batch jobs to access all databases including database 1**

1. Rename your Version 7.4.1 ADALNK to

   ```
   A741LNK
   ```

2. Rename your Version 6.2.3 ADALNK to

   ```
   A623LNK
   ```

3. Define both link modules in the migration table, defining A741LNK as the default and specifying that database 1 is to be accessed through A623LNK:

   ```
   MIGLINK TYPE=LINK,LINK=A623LNK
   MIGLINK TYPE=LINK,LINK=A741LNK,DEFAULT=YES
   MIGLINK DBID=1,LINK=A623LNK
   MIGLINK TYPE=END
   END
   ```

## Migration Tool Operation

The loading environment is

- STEPLIB for batch;
- COMPLIB for Com-plete; and
- DFHRPL for CICS.

To use the migration tool, you need to have available in your loading environment:

- the appropriate migration tool:
  - MIGS01 renamed ADALNK for batch;
  - MIGS02 renamed ADALCO for Com-plete;
  - MIGS03 linked as Adabas (or the name of your choice) for CICS; or
  - MIGS09 renamed ADALNK for batch using a reentrant link module.

**Caution:** Some products such as the Adabas nucleus and Com-plete (when running in ACCESS mode) require an unmodified ADALNK. Do not put the batch migration tool on the loading environment of any Software AG product that signs on to the Adabas SVC.

- the correct migration table:
  - MIGT01 for batch;
  - MIGT02 for Com-plete;
  - MIGT03 for CICS; or
  - MIGT09 for batch using a reentrant link module.
- all link modules named in the migration table.

When the first Adabas call is issued, the migration tool loads the migration table and all link modules named in it. If any load fails, the migration tool abends with a system 0C3 and the PSW pointing to one of the following error strings:

| Error Message | Explanation |
|---|---|
| MIGT0*x* NOT AVAILABLE | The LOAD for MIGT0*x* failed |
| NO LINK MODULES DEFINED | No link modules are defined in the migration table |
| LINK MODULE NOT FOUND | The LOAD failed for one of the link modules defined in the migration table |

When initialized, the migration tool examines every Adabas call to determine the target. If the target is defined in the migration table, the call is routed to the appropriate link module. Otherwise, the call is passed to the default link module.

Under CICS, the migration tool can also be initialized using the supplied MIGCICIN program. This may in fact be necessary if you want to force initialization during PLT processing without specifying `PARMTYP=ALL` in ADAGSET. MIGCICIN sends a special Adabas command `IM` to instruct the migration tool to initialize.

## Changing Link Module SVCs Dynamically

**Note:** This section applies to the standard batch migration tool (MIGS01) only.

When using the batch migration tool MIGS01, the SVC number assembled into ADALNK is not overwritten at execution time by the SVC number specified in the ADARUN parameters. Instead, you must assemble the correct SVC number into each copy of ADALNK.

This means, for example, that you cannot easily switch a batch job from a production to a test SVC. You would need to maintain two ADALNKs; one with the production SVC and another with the test SVC.

Depending on the SVC number specified in the ADARUN parameters, you may be able to avoid this situation by zapping translation rules into MIGS01 so that it will overwrite the SVC numbers in the link modules. The supplied job MIGZAPSV provides an example of how to do this.

An SVC translation rule is 16 bytes long. You may zap as many as 10 of these into MIGS01.

The format of each rule is:

| Format | Description |
|---|---|
| 00*xx* | ADARUN SVC to which this rule applies (2-bytes where the first byte must be X'00' and the second byte X'*xx*' is the relevant ADARUN SVC number in hexadecimal) |
| *yyxx* | 2-byte pairs of SVC numbers in hexadecimal (up to 7 allowed per rule where the first byte X'*yy*' specifies the old and the second byte X '*xx*' specifies the new SVC number) |

If the link module contains the first number, it is overwritten with the second number which is usually the same as the SVC to which the rule applies; that is, X'*xx*'.

The final pair must have X'00' as the first number. If the second number in the final pair is not X'00', this is treated as a default value which is applied to any link module that did not match one of the preceding pairs.

If there is no rule for the ADARUN SVC, no translation is done.

**Examples**

```
Example 1:

You have 2 SVCs: 249 (Production) and 248 (Test), but all your batch ADALNKs contain
SVC
249. To zap an SVC translation rule into MIGS01:

00F8 This rule will be in effect if ADARUN SVC=248
F9F8 Any ADALNK assembled with SVC 249 will be changed at execution time to
        use SVC 248 instead
0000 Any other ADALNK remains unchanged
```

```
Example 2:

You have 4 SVCs: 249 (old Production), 248 (old Test), 239 (new Production), 238
(new Test)
and you want to ensure that all ADALNKs use the new versions of the SVCs. In
addition, you
want to use the test version if ADARUN SVC=248 or 238 and the production version if
ADARUN SVC=249 or 239. To zap SVC translation rules into MIGS01:

00F9 rule for ADARUN SVC=249
00EF make all ADALNKs use SVC 239
00000000 pad to next rule
00000000
00000000
```

```
00F8 rule for ADARUN SVC=248
00EE make all ADALNKs use SVC 238
00000000 pad to next rule
00000000
00000000
00EF rule for ADARUN SVC=239
00EF make all ADALNKs use SVC 239
00000000 pad to next rule
00000000
00000000
00EE rule for ADARUN SVC=238
00EE make all ADALNKs use SVC 238
00000000 pad to next rule
00000000
00000000
```

## CICS Considerations

This section provides information related to the use of the migration tool with CICS.

### PPT Entries

You must define a PPT entry for the migration tool itself, the migration table, and all link modules named in the migration table.

The entries for the migration tool and table should have the same options as for the link modules. The migration tool and table must both be defined as resident.

### LNKENAB and LNKTRUE

If you use the task-related user exit, you must have a LNKENAB and a LNKTRUE for each Adabas link module that operates in TRUE mode.

**Note:** You may not define both TRUE and non-TRUE link modules in the same migration table.

In ADAGSET, specify the name of the actual link module and not the name of the migration tool.

### Example

In order to communicate through two SVCs, 248 and 249, you might define:

```
ADAEN48
ADATR48
ADABAS48

—with ADAGSET parameters

ENTPT=ADABAS48,PARMTYP=ALL,SVCNO=248,TRUENM=ADATR48…

—and

ADAEN49
ADATR49
ADABAS49

—with ADAGSET parameters

ENTPT=ADABAS49,PARMTYP=ALL,SVCNO=249,TRUENM=ADATR49…
```

## Direct Call Interface

MIGS03 supports callers using both the DCI and the EXEC CICS LINK interface to Adabas. MIGS03, however, always uses the DCI interface to call the various link modules.

## Passing Parameters

When MIGS03 is called using

- EXEC CICS LINK, it first looks for the Adabas parameter address list in COMMAREA and then in the transaction work area (TWA).

  If neither storage area contains a parameter list, MIGS03 will abend with S0C3 and with the PSW pointing to the string

  NO ADABAS PARAMETER LIST
- the DCI, R1 must contain the address of the Adabas parameter list.

### Supported Versions

The migration tool only works with command-level link modules from Adabas Version 6.2 and above.

### Newcopy

The migration tool records the entry-point addresses of all link modules named in the migration table.

This means that if you want to activate a new copy of an Adabas link module, you must also activate a new copy of the migration tool MIGS03 and the migration table MIGT03.

Similarly, if you wish to activate a new copy of MIGT03, you must also activate a new copy of the migration tool MIGS03.

For most sites, it is probably safer to recycle CICS.

## Migration Tool Defaults

The migration tool modules contain certain default values at fixed offsets, the same as an ordinary link module.

### Changing Non-CICS Module Defaults

For the non-CICS migration tools (MIGS01, MIGS02 and MIGS09), these defaults are shown in the following table:

| Offset (Hex) | ADALNK Name | Default Value | Purpose |
|---|---|---|---|
| 80 | LNKLOGID | 0 | Default DBID |
| 86 | LUINFO | 0 | Length of user information |
| 9C | RVINFO | 0 | Length of Adabas Review buffer |
| A0 | XITBLEN | 0 | Length of buffer for user exit B |
| A2 | XITALEN | 0 | Length of buffer for user exit A |
| A4 | XITAFPLN | 0 | Length of Adabas Fastpath buffer |

The migration tool uses LNKLOGID (if not 0) to select the link module for calls that have no database ID specified. If LNKLOGID is 0, these calls are given to the default link module.

The various length fields are not used by the migration tool itself. However, it is important to set them to the same values used in your current link modules because they are used by prefetch/multifetch to calculate buffer sizes and by Com-plete to suballocate its Adabas buffers. If you have different values in different link modules, use the highest value.

### Changing CICS Module Defaults

The offsets are different for CICS (MIGS03), as shown in the table below. The recommendations above also apply for CICS.

| Offset (Hex) | ADAGSET Name | Default Value | Purpose |
|---|---|---|---|
| 9DC | LOGID | 0 | Default DBID |
| 9E2 | LUINFO | 0 | Length of user information |
| A38 | None | 0070 | Total length of a UB = (UBPFXL+UBLEN+LUINFO+LRINFO +LUSAVE+7) / 8 * 8 |
| A42 | LUSAVE | 0 | Length of user exit save area |
| A44 | LRINFO | 0 | Length of Adabas Review buffer |
| A46 | LXITBA | 0 | Length of buffer for user exit B |
| A48 | LXITAA | 0 | Length of buffer for user exit A |
| A4A | LADAFP | 0 | Length of Adabas Fastpath buffer |

## Adabas Options

The Adabas options Adabas Fastpath, Adabas Transaction Manager, Adabas Vista, and Adabas System Coordinator have components operating in the link module and are thus affected by the migration tool.

- Common Considerations
- Option-Specific Considerations

### Common Considerations

For these options:

- each version must have its own system file; and
- when the option’s link module component loads other modules (for example, FASTENV, FASTNUC and FASTPRM in the case of Adabas Fastpath), it is necessary to zap older versions to change the names of the modules they load. Similarly, the older versions of the loaded modules must be renamed.

### Option-Specific Considerations

Individual options impose additional restrictions.

#### Adabas Fastpath

Each version of Adabas Fastpath must have a separate Asynchronous Buffer Manager.

#### Adabas Transaction Manager

All databases participating in a transaction must be accessible through the same link module.

#### Adabas Vista

All partitions of a partitioned file must be accessible through the same link module.

#### Adabas Online Services

Adabas Fastpath, Adabas Transaction Manager, Adabas Vista, and Adabas System Coordinator each have an online services system that are written in Natural.

Certain online functions communicate with the option's link module component by issuing Adabas calls that do not contain a meaningful DBID. The link module component recognizes such calls and satisfies them.

Because the DBID is not significant, the migration tool cannot route these commands to the appropriate link module. However, it can recognize that the commands are internal to an option and it can identify the relevant option and its version.

Having identified the option and its version, the migration tool searches the migration table for a link module that has been defined as containing the matching option version and forwards the call to that link module. If no match is found, the call is passed to the default link module.

**Note:** A link module may contain only one version of an option and an option version may reside in only one link module.

## Generating a Link Module Migration Table

A sample link module migration table is provided in the source library for use in generating a link module migration table.

**to generate a link module migration table:**

1 Specify the Link Modules

You may specify up to 10 different link modules to be used in this environment.

For each link module, you must provide the following:

```
MIGLINK TYPE=LINK,LINK=link-module-name
```

One of the link modules must be designated as the default link module by providing the `DEFAULT=YES` parameter:

```
MIGLINK TYPE=LINK,LINK=link-module-name,DEFAULT=YES
```

Additionally, when a link module has an Adabas option linked with it, you must indicate the option version. For example:

```
MIGLINK TYPE=LINK,LINK=link-module-name,AFP=vrs,AVI=vrs,ATM=vrs,COR=vrs
```

—for a link module containing Adabas Fastpath, Adabas Vista, Adabas Transaction Manager, and Adabas System Coordinator at the version, revision, and system maintenance (SM) levels specified by `vrs`. The same version of an option may not be specified for more than one link module.

**Example:**

There are four link modules: one per Adabas SVC 236, 237, 249, and 254.

The link module for databases on SVC 237 is the default and includes version 712 of Adabas Fastpath and Adabas Vista.

The link module for databases on SVC 254 includes old versions of Adabas Fastpath and Adabas Vista. Note that special zaps are required in order to run more than one version of Adabas Fastpath or Adabas Vista in a single job.

Databases on SVCs 236 and 249 use neither Adabas Fastpath nor Adabas Vista.

```
MIGLINK TYPE=LINK,LINK=ADALNK36
MIGLINK TYPE=LINK,LINK=ADALNK37,DEFAULT=YES,AFP=712,AVI=712
MIGLINK TYPE=LINK,LINK=ADALNK54,AFP=321,AVI=631
MIGLINK TYPE=LINK,LINK=ADALNK49
```

2 Specify the Databases and Other Targets

For each database that will use a link module other than the default, you must provide:

```
MIGLINK DBID=dbid[,LINK=link-module-name]
```

You must specify at least one DBID entry. If you omit the `LINK` parameter, the database uses the default link module. Otherwise, it should match a previously defined link module.

You may specify up to 1000 DBIDs.

**Example:**

Define databases and other SVC-based targets, for example:

- Database 131 is accessed through ADALNK54, Adabas SVC 254;
- Database 122 is accessed through ADALNK49, Adabas SVC 249;
- Database 153 is accessed through ADALNK36, Adabas SVC 236;
- Calls to any other target are directed to the default link module.
-
  ```
  MIGLINK DBID=131,LINK=ADALNK54
  MIGLINK DBID=122,LINK=ADALNK49
  MIGLINK DBID=153,LINK=ADALNK36
  ```

3 Generate the Migration Table

To generate a migration table with optionally up to *nnn* spare DBID entries, specify

```
MIGLINK TYPE=END[,SPAREDB=nnn][,WTO={YES|NO}]
```

Specify `WTO=NO` if the contents of the migration table are not to be written to the operator console at execution time. The default is `WTO=YES`.

**Example:**

Generate the table with 10 spare entries for zapping in emergency targets that should not use the default link module. Do not write the migration table contents to the operator console:

```
MIGLINK TYPE=END,SPAREDB=10,WTO=NO
END
```

## Migration Table DSECT

The DSECT for the migration table is shown below:

| Field | Description |
|---|---|
| MLTMLT DSECT | |
| MLTEYE DS CL8 | |
| MLTALNK DS F | A(TABLE OF LINK MODULES) |
| MLTNLNK DS F | NUMBER OF LINK MODULES |
| MLTADBS DS F | A(TABLE OF DBIDS) |
| MLTNDBS DS F | NUMBER OF DATABASES |
| MLTAUSR DS F | A(TABLE OF USERIDS) (FUTURE) |
| MLTNUSR DS F | NUMBER OF USERIDS (FUTURE) |
| MLTRSVD DS XL2 | RESERVED |
| MLTVRL DS XL2 | VERSION |
| MLTWTO DS CL1 | ISSUE WTOS OR NOT |
| DS XL27 | RESERVED FOR FUTURE USE |
| MLTLNK DSECT | LINK MODULE TABLE |
| MLTLKNM DS CL8 | NAME |
| MLTLKAD DS F | ADDRESS |
| MLTAFPV DS XL2 | VERSION OF ADABAS FASTPATH |
| MLTAVIV DS XL2 | VERSION OF ADABAS VISTA |
| MLTATMV DS XL2 | VERSION OF ADABAS TRANS. MGR. |
| MLTAAFV DS XL2 | VERSION OF ADASAF |
| MLTREVV DS XL2 | VERSION OF REVIEW |
| MLTCORV DS XL2 | VERSION OF SYSTEM COORDINATOR |
| MLTLKST DS XL1 | LINK MODULE STATUS |
| MLTLKOK EQU 0 | LINK MODULE CAN BE USED |
| MLTLXX1 DS XL5 | SPARE |
| MLTLKX DS XL2 | ENTRY NUMBER |
| MLTLLEN EQU *- MLTLKNM | LENGTH OF AN ENTRY |
| MLTDBS DSECT | DBID TABLE |
| MLTDBID DS XL2 | DBID |
| MLTDLKX DS XL2 | INDEX INTO LINK TABLE |
| MLTDLNK DS CL8 | LINK MODULE FOR THIS DBID |
| MLTDXX1 DS XL20 | SPARE |

| Field | Description |
|---|---|
| MLTDLEN EQU *- MLTDBID | LENGTH OF AN ENTRY |
| MLTUIDS DSECT | USERID TABLE (FOR FUTURE USE) |
| MLTUSER DS CL8 | USERID |
| MLTULKX DS XL2 | INDEX INTO LINK TABLE |
| MLTULNK DS CL8 | LINK MODULE FOR THIS USER |
| MLTUXX1 DS XL14 | SPARE |
| MLTULEN EQU *- MLTUIDS | LENGTH OF AN ENTRY |

# 14 Adabas Dump Formatting Tool (ADAFDP)

This section describes the use of the Adabas dump formatting tool ADAFDP.

## ADAFDP Function

ADAFDP is the address space dump formatting module. During abnormal shutdown of the Adabas nucleus, this module receives control to format and display information that should help you analyze the reason for the error.

During a nucleus shutdown, ADAMPM determines the shutdown reason. If the reason is abnormal termination, ADAMPM loads the ADAFDP module into the address space prior to the 20 call to the Adabas SVC. ADAFDP subsequently receives control to format nucleus information.

If ADAFDP cannot be loaded, message ADAF03 is written to the console and abnormal shutdown continues.

## ADAFDP Output

Much of the information formatted by ADAFDP is self-explanatory. However, because the type and amount of information depends on the shutdown situation, a summary of ADAFDP output is provided in this section.

- ADAFDP Messages
- Pool Abbreviations
- User Threads
- Command Information
- RABN Information

### ADAFDP Messages

| Message | Description |
|---|---|
| ADAH51 / ADAH52 | The message is displayed on the console and written to DDPRINT at the point where the format begins and terminates. |
| ADAMPM ABEND CODE and PSW | If an Abend code and program status word (PSW) were saved in ADAMPM by the Adabas ESTAE, ADAFDP displays these. In addition, ADAFDP determines the module whose entry point best fits the PSW and calculates the offset within that module. If the ADAMPM abend code and PSW are zero, ADAFDP does not format this information. |
| ADABAS MODULE LOCATIONS | ADAFDP formats and displays the location of each of the Adabas nucleus modules resident in the address space. |
| ADDRESS LOCATIONS FOR USER EXITS | ADAFDP formats and displays the location of any user exit loaded with the Adabas nucleus. |

| Message | Description |
|---|---|
| ADDRESS LOCATIONS FOR HYPEREXITS | ADAFDP formats and displays the location of any hyperexit loaded with the Adabas nucleus. Hyperexits 10-31 are displayed as A-U, respectively. |
| ADANC0 STANDARD REGISTER SAVE AREA | Registers 0-7/8-F, which are saved in ADANC0. ADAFDP determines if any of these registers contains an address that points at a nucleus pool in storage. If yes, ADAFDP indicates which pool and snaps storage at that address. If the register is 12 and it points to a user thread, ADAFDP snaps the entire thread. |
| ADANC0 ABEND SAVE REGISTERS | Registers 0-7/8-F, which are saved in ADANC0 as a result of a user abend. ADAFDP determines if any of these saved registers contains an address that points at a nucleus pool in storage. If yes, ADAFDP indicates which pool and snaps storage at that location. If the saved register is 12 and it points to a user thread, ADAFDP snaps the entire thread. |
| ADAMPM SAVE REGISTERS | Registers 0-7/8-F, which were saved in ADAMPM by the Adabas ESTAE. These are the same registers displayed with the ADAM99 message. ADAFDP determines if any of these saved registers contains an address that points within a nucleus pool in storage. If yes, ADAFDP indicates which pool and snaps storage at that location. |
| BEGIN / ENDING ADDRESSES OF POOLS / TABLES | ADAFDP determines begin/ending address locations for pools and tables for the Adabas nucleus. These addresses are presented for easy location in the actual dump. See *Pool Abbreviations* for more information. |
| ADABAS THREADS | ADAFDP formats the physical threads including threads 0, -1, and -2. The number of lines depends on the value of `NT`. The thread that was active at the time of the abnormal termination (if any) is marked by a pointer "-->". |
| USER THREADS | For any of the threads -2 to `NT` that had assigned work to perform, ADAFDP formats and displays information about the status of that thread. See *User Threads* for more information: |
| FOLLOWING COMMANDS WERE FOUND IN THE CMD QUEUE | ADAFDP scans the command queue and formats information for any command found in the queue. See *Command Information* for more information. |
| POOL INTEGRITY CHECK | ADAFDP check the integrity of several pools within the Adabas nucleus address space. If an error is detected within that pool, ADAFDP indicates which pool and what type of error was encountered. In addition, ADAFDP snaps storage at the location where the error was detected. |
| FOLLOWING RABNS / FILES ACTIVE IN BUFFER POOL | ADAFDP scans the buffer pool header for RABNs that were active or being updated. See *RABN Information* for more information. |
| ADAIOR REGS FOUND AT OFFSET X'080' | Registers 0-7/8-F found saved in ADAIOR at this offset. If ADAFDP determines that any of these register values is pointing within an Adabas pool, it snaps storage at that location. |
| ADAIOR REGS FOUND AT OFFSET X'0C0' | Registers 0-7/8-F found saved in ADAIOR at this offset. If ADAFDP determines that any of these register values is pointing within an Adabas pool, it snaps storage at that location. |
| ICCB POINTED FROM X'A0' IN IOR | The ICCB address to which this offset in ADAIOR points. |

| Message | Description |
|---|---|
| ADAI22 ADAIOR TRACE TABLE | Format of ADAIOR trace table; same as that found with the ADAM99 message. |

## Pool Abbreviations

| Pool Abbreviation | Description |
|---|---|
| LOG | Log area |
| OPR | Adabas nucleus operator command processing area |
| CQ | Address of the command queue, which is formatted later by ADAFDP |
| ICQ | Internal command queue |
| TT | Thread table |
| IA1 | Software AG internal area 1 |
| SFT | Session file table |
| FU | File usage table |
| FUP | File update table |
| IOT | I/O table for asynchronous buffer flushing |
| PL2 | PLOG area for asynchronous buffer flushing |
| PET | Table of posted ETs |
| TPT | Tpost |
| TPL | Tplatz |
| UQP | Unique descriptor pool |
| UHQ | Upper hold queue |
| HQ | Hold queue |
| UUQ | Upper user queue |
| UQ | User queue |
| FP | Format pool |
| FHF | File HILF element |
| PA | Protection area |
| TBI | Table of ISNs |
| TBQ | Table of sequential searches |
| WK3 | Work part 3 space allocation table |
| IA2 | Software AG internal area 2 |
| WK2 | Work part 2 space allocation table |
| VOL | VOLSER table |
| WIO | Work block I/O area |
| FST | Free space table work area |

| Pool Abbreviation | Description |
|---|---|
| UT | User threads |
| WP | Work pool |
| AW2 | Work block asynchronous I/O area |
| IOP | I/O pool related to asynchronous buffer flush |
| IU2 | Buffer pool importance header upper 2 |
| IU1 | Buffer pool importance header upper 1 |
| BU2 | Buffer pool upper header 2 |
| BU1 | Buffer pool upper header 1 |
| BH | Address location of the buffer pool header, information from the buffer pool header is formatted later by ADAFDP |
| BP | Address location of the physical start of the buffer pool |

## User Threads

| Information | Description |
|---|---|
| Thread Number | -2 to `NT` |
| Status | Indicates the current status of the thread:<br>■ *Active*: the currently active thread<br>■ In Use: thread has been assigned work<br>■ Waiting For I/O: waiting for a block not in buffer pool<br>■ Waiting For RABN: waiting for a RABN already in use<br>■ Waiting For Work-2 Area Block: similar to waiting for I/O<br>■ Waiting Workpool Space: provides number of bytes in decimal<br>■ Ready To Run: waiting to be selected for execution |
| CMD | The Adabas command being executed |
| Response Code | Response code (if any) |
| File Number | File number for this command |
| ISN | Internal sequence number for this command |
| Sub. Rsp | Subroutine response code (if any) |
| Last RABN for I/O | Last RABN required by command processing, in decimal |
| Type | Last RABN type (A - ASSO, D - DATA) |
| CQE Addr | Command queue element address for this command |
| User Jobname | Job name for user who executed this command |
| ITID | Internal Adabas ID for user who executed this command |
| User | User ID for user who executed this command |

| Information | Description |
|---|---|
| Unique global ID | 28-byte ID for user who owns this command |
| Buffer Addresses | buffer addresses for: control block, format buffer, search buffer, value buffer, ISN buffer |
| Buffer Lengths | FL: format buffer length<br>RL: record buffer length<br>SL: search buffer length<br>VL: value buffer length<br>IL: ISN buffer length |
| Snap Thread | The first 144 bytes of the user thread are snapped |

## Command Information

| Information | Description |
|---|---|
| CQE Address | The address location of this CQE |
| F | Command queue flag bytes:<br>■ First Byte: General Purpose Flag<br>■ X'80': User buffers in service partition, region, address space<br>■ X'40': ET command waiting for 12 call<br>■ X'20': Waiting for 16 call<br>■ X'10': 16 call required<br>■ X'08': Attached buffer<br>■ X'04': Attached buffer required<br>■ X'02': X-memory lock held (MVS only)<br>■ Second Byte: Selection Flag<br>■ X'80': In process<br>■ X'40': Ready to be selected<br>■ X'20': Search for UQE done<br>■ X'10': UQE found<br>■ X'08': Not selectable during BSS=x'80' status<br>■ X'04': Not selectable during ET-SYNC<br>■ X'02': Waiting for space<br>■ X'01': Waiting for ISN in HQ |
| CMD | The command type |
| File Number | The file number for this command |
| Job Name | Job name for the user |
| Addr User | UQE Address of users UQE, if searched for and found |
| Addr User ASCB | Address location of user's ASCB |

| Information | Description |
|---|---|
| Addr ECB | Address location of user's ECB (in user's address space) |
| Addr User UB | Address of users UB (in user's address space) |
| Addr User PAL | Address location of user's parameter address list |
| CQE ACA | ACA field of CQE. |
| CQE RQST | RQST field of CQE |
| Abuf/Pal | Address of the attached buffer/parameter address list (PAL) for CMD |
| Comm Id | 28-byte unique user ID for this command |

### RABN Information

| Information | Description |
|---|---|
| RABN Number | The RABN number in decimal |
| Type | Type of block (A - ASSO, D - DATA) |
| Flag | BP header element flag byte:<br>■ AKZ X'40': Active indicator<br>■ UKZ X'20': Update indicator<br>■ RKZ X'10': Read indicator<br>■ XKZ X'04': Access is waiting for block<br>■ YKZ X'02': Update is waiting for block<br>■ SKZ X'01': Write indicator |
| File | File number that owns this block |
| Address | Address location of block in storage. |

# 15 Translation Tables

This section describes the translation tables which are supplied by Adabas.

## Adabas EBCDIC to ASCII and ASCII to EBCDIC

```
cUES2ASC DS OF
c* .0.1.2.3.4.5.6.7.8.9.A.B.C.D.E.F
c DC x’000102033F093F7F3F3F3F0B0C0D0E0F’ 0.
c DC x’101112133F3F083F18193F3F3F1D3F1F’ 1.
c DC x’3F3F1C3F3F0A171B3F3F3F3F3F050607’ 2.
c DC x’3F3F163F3F1E3F043F3F3F3F14153F1A’ 3.
c DC x’203F3F3F3F3F3F3F3F3F3F2E3C282B3F’ 4.
c DC x’263F3F3F3F3F3F3F3F3F21242A293B5E’ 5.
c DC x’2D2F3F3F3F3F3F3F3F3F7C2C255F3E3F’ 6.
c DC x’3F3F3F3F3F3F3F3F3F603A2340273D22’ 7.
c DC x’3F616263646566676869 3F3F3F3F3F3F’ 8.
c DC x’3F6A6B6C6D6E6F7071723F3F3F3F3F3F’ 9.
c DC x’3F7E737475767778797A3F3F3F5B3F3F’ A.
c DC x’3F3F3F3F3F3F3F3F3F3F3F3F3F5D3F3F’ B.
c DC x’7B414243444546474849 3F3F3F3F3F3F’ C.
c DC x’7D4A4B4C4D4E4F5051523F3F3F3F3F3F’ D.
c DC x’5C3F535455565758595A3F3F3F3F3F3F’ E.
c DC x’303132333435363738393F3F3F3F3F3F’ F.
c* .0.1.2.3.4.5.6.7.8.9.A.B.C.D.E.F
END
cUES2EBC DS OF
c* .0.1.2.3.4.5.6.7.8.9.A.B.C.D.E.F
c DC x’00010203372D2E2F1605250B0C0D0E0F’ 0.
c DC x’101112133C3D322618193F27221D351F’ 1.
c DC x’405A7F7B5B6C507D4D5D5C4E6B604B61’ 2.
c DC x’F0F1F2F3F4F5F6F7F8F97A5E4C7E6E6F’ 3.
c DC x’7CC1C2C3C4C5C6C7C8C9D1D2D3D4D5D6’ 4.
c DC x’D7D8D9E2E3E4E5E6E7E8E9ADE0BD5F6D’ 5.
c DC x’79818283848586878889919293949596’ 6.
c DC x’979899A2A3A4A5A6A7A8A9C06AD0A107’ 7.
c DC x’6F6F6F6F6F6F6F6F6F6F6F6F6F6F6F6F’ 8.
c DC x’6F6F6F6F6F6F6F6F6F6F6F6F6F6F6F6F’ 9.
c DC x’6F6F6F6F6F6F6F6F6F6F6F6F6F6F6F6F’ A.
c DC x’6F6F6F6F6F6F6F6F6F6F6F6F6F6F6F6F’ B.
c DC x’6F6F6F6F6F6F6F6F6F6F6F6F6F6F6F6F’ C.
c DC x’6F6F6F6F6F6F6F6F6F6F6F6F6F6F6F6F’ D.
c DC x’6F6F6F6F6F6F6F6F6F6F6F6F6F6F6F6F’ E.
c DC x’6F6F6F6F6F6F6F6F6F6F6F6F6F6F6F6F’ F.
c* .0.1.2.3.4.5.6.7.8.9.A.B.C.D.E.F
END
```

## Entire Net-Work EBCDIC to ASCII and ASCII to EBCDIC

```
NW2ASC DS OF
* .0.1.2.3.4.5.6.7.8.9.A.B.C.D.E.F
DC X’000102030405060708090A0B0C0D0E0F’ 0.
DC X’101112131415161718191A1B1C1D1E1F’ 1.
DC X’00000000000000000000000000000000’ 2.
DC X’200000000000000000005B2E3C282B5D’ 3.
DC X’2600000000000000000021242A293B5E’ 5.
DC X’2D2F00000000000000007C2C255F3E3F’ 6.
DC X’000000000000000000603A2340273D22’ 7.
DC X’00616263646566676869000000000000’ 8.
DC X’006A6B6C6D6E6F707172000000000000’ 9.
DC X’007E737475767778797A00005B000000’ A.
DC X’000000000000000000000000005D0000’ B.
DC X’7B414243444546474849000000000000’ C.
DC X’7D4A4B4C4D4E4F505152000000000000’ D.
DC X’5C7E535455565758595A000000000000’ E.
DC X’303132333435363738397C00000000FF’ F.
* .0.1.2.3.4.5.6.7.8.9.A.B.C.D.E.F
NW2EBC DS OF
* .0.1.2.3.4.5.6.7.8.9.A.B.C.D.E.F
DC X’000102030405060708090A0B0C0D0E0F’ 0.
DC X’101112131415161718191A1B1C1D1E1F’ 1.
DC X’405A7F7B5B6C507D4D5D5C4E6B604B61’ 2.
DC X’F0F1F2F3F4F5F6F7F8F97A5E4C7E6E6F’ 3.
DC X’7CC1C2C3C4C5C6C7C8C9D1D2D3D4D5D6’ 4.
DC X’D7D8D9E2E3E4E5E6E7E8E9ADE0BD5F6D’ 5.
DC X’79818283848586878889919293949596’ 6.
DC X’979899A2A3A4A5A6A7A8A9C06AD0A100’ 7.
DC X’00000000000000000000000000000000’ 8.
DC X’00000000000000000000000000000000’ 9.
DC X’00000000000000000000000000000000’ A.
DC X’00000000000000000000000000000000’ B.
DC X’00000000000000000000000000000000’ C.
DC X’00000000000000000000000000000000’ D.
DC X’00000000000000000000000000000000’ E.
DC X’000000000000000000000000000000FF’ F.
* .0.1.2.3.4.5.6.7.8.9.A.B.C.D.E.F
END
```

# 16 Relative Adabas Block Number (RABN) Calculation

Adabas identifies individual physical blocks within a given database component (Associator, Data Storage, Work) by using a relative Adabas block number (RABN).

The physical blocks within each database component are numbered in consecutive sequence beginning with 1. If the component consists of more than one physical extent (as defined by the operating system), the block numbering is continued across physical extents.

The first track of the first physical extent of the Associator, Data Storage and Work components is not used. The first track of the second and each subsequent physical extent as well as all extents of TEMP, SORT, CLOG, and PLOG is used.

The number of Adabas blocks that can be stored on a given physical unit (track/cylinder/volume) of external storage is different for each database component and for each device type.

Using the information provided in section ***Supported Device Types***, the number of blocks that can be stored on a given volume may be calculated as shown below:

**Example 1**

Associator database component, model 3380 (880 cylinders are assumed to be available on the volume).

```
number of ASSO blocks = blocks/track · tracks/cylinder · number of cylinders
= 19 · 15 · 880
= 250,800 Associator blocks
```

19 blocks must be subtracted for the first track of the first Associator physical extent; therefore, the first Associator volume can contain a maximum of 250,781 blocks.

### Example 2

Data Storage database component, model 3370 (748 cylinders are assumed to be available on the volume).

```
number of DATA blocks = blocks/track · tracks/cylinder · number of cylinders
= 10 · 12 · 748
= 89,760 Data Storage blocks
```

10 blocks must be subtracted for the first track of the first Data Storage physical extent; therefore, the first Data Storage volume can contain a maximum of 89,750 blocks.

The RABN ranges stored on each VOLSER can easily be determined using the Adabas Online System report function.

# 17 Glossary of Installation-Related Terms

**Adalink**

The teleprocessing-monitor-dependent interface module that connects the application/user to Adabas. The actual module name depends on the environment being used; for example, the module name for linking to a batch or TSO program is ADALNK, and for CICS, the module name is ADALNC. The term “Adalink” refers to the module appropriate for the given environment.

**address converter**

Adabas stores each database record in a Data Storage block having a relative Adabas block number (RABN). This RABN location is kept in a table called the address converter. The address converters, one for each database file, are stored in the Associator. Address converter entries are in ISN order (that is, the first entry tells the RABN location of data for ISN 1, the 15th entry holds the RABN location of data for ISN 15, and so on).

**address space**

The storage area assigned to a program task/work unit. In MVS, an address space is a region; in VSE, a partition; and in BS2000, a task. In this documentation, the term region is used as a synonym for partition and task.

**communicator**

A routine for communicating between operating systems, making remote targets accessible. Entire Net-work is a communicator.

**database administrator**

Controls and manages the database resources. Tasks include defining database distribution structure and resources, creating and maintaining programming and operation standards, ensuring high performance, resolving user problems, user training, controlling database access and security, and planning for growth and the integration of new database resource applications and system upgrades. Also known as the database analyst.

**ID**

An abbreviation of “target ID”, a unique identifier used for directing Adabas calls to their targets.

**ID table**

A reference data list maintained for all active targets within the boundaries of one operating system. The ID table is located in commonly addressable storage.

**IIBS**

The “isolated ID bit string”, a 256-bit (32-byte) string contained in the ID table header. Each bit corresponds in ascending order to a logical ID. If the bit has the value 1, the corresponding ID is isolated.

**isolated ID**

The ID of an isolated target, which can be specified by the user as a logical ID. An isolated ID must be greater than zero and less than 256. The isolated ID is interpreted as a physical ID for addressing the target.

**isolated target**

A target called directly by a user.

**logical ID**

A user’s identifier of target(s) to which a message is directed. It must be greater than 0 and less than 256 (either explicitly or implicitly, the content of the first byte of ACBFNR is a logical ID).

**non-DB target**

A target that is not an Adabas nucleus. Access and X-COM are non-DB targets.

**physical ID**

The identifier of a target. It must be greater than 0 and less than 65,536. A database ID (DBID) is a physical ID.

**pseudo-cylinder**

The logical cylinder on an fixed-block-addressed (FBA) device that has no actual DASD cylinder.

**reset**

A flag bit is said to be reset when it contains 0.

**router**

A central routine for communication within the boundaries of one operating system. The routine is called by users with Adalink routines, and by targets with ADAMPM. The router's main purpose is to transfer information between the Adalink and Adabas. The router also maintains the ID table. VM/ESA, z/VM, and BS2000 environments divide router functions among Adalink or other Adabas functions. The Adabas SVCs in OS/390, z/OS, and VSE/ESA are examples of routers.

**service**

A processor of Adabas calls and issuer of replies. An Adabas nucleus is an example of a service (see also target).

**set**

A flag bit is said to be set when it contains 1.

**target**

A receiver of Adabas calls. A target maintains a command queue, and communicates with routers using ADAMPM. A target is also classified as a service (see definition). The Adabas nucleus is a target.

**user**

A batch or online application program that generates Adabas calls and uses an Adalink for communication.

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