software AG

Adabas Cluster Services

Installation

Version 7.4.2

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Adabas Cluster Services

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1 Installation

This documentation describes the installation process for Adabas Cluster Services.

It is important to review the entire installation procedure before starting the physical installation.

Depending on which components you actually install, it may be useful to group certain installation activities together, even though they may not be in the same installation section in this section. For example, if you are installing the Entire Net-Work XCF line driver, modifications to the CFRM policy for both the line driver and for sysplex cache and lock structures can be made in a single step rather than in two separate steps.

Refer to the *Release Notes* for specific information about late changes to this section.

Using System Maintenance Aid

If you use Software AG's System Maintenance Aid (SMA), refer to the *System Maintenance Aid* documentation for information about the installation process.

The installation procedures described in this section correspond to the jobs that SMA creates to install the product.

If you do not use SMA, you can modify and use the sample JCL provided to unload the Adabas Cluster Services and Entire Net-Work libraries from the installation tape.

The Adabas Cluster Services Installation documentation is organized in the following topics:

🔵	**Required Environment**
🔵	**Prerequisite Software Installations**
🔵	**What to Install**
🔵	**Overview of the Installation Procedure**

2   Required Environment

Adabas Cluster Services requires a parallel sysplex environment.

> **Note:** Siemens HIPLEX is not supported.

This chapter covers the following topics:

Parallel Sysplex System

One or more operating system images defined as a true parallel sysplex are required

- connected with an IBM Sysplex Timer ™ ; and

- connected to a coupling facility; and

- running OS/390, z/OS, or z/OS.e (see the *Release* Notes for information about supported versions and release levels).

Processors

Processors (CECs) with a level equal to or greater than G4 are required.

Coupling Facility

The environment required for the coupling facility includes the following IBM or equivalent components

- 9674 coupling facility under PR/SM

- 711 model ES9000 running in an LPAR under PR/SM

- 9672 E, P, or R models

The coupling facility configuration must have sufficient resources to support the cache and lock structures used by Adabas Cluster Services. Additional resources may be needed if XCF is configured to use the coupling facility. A coupling facility and links equal to or greater than G4 are highly recommended for performance reasons.

Adabas Cluster Services can coexist without restriction with other coupling facility users such as GRS Star.

Coupling Facility Channels

Each OS/390 or z/OS system that needs access to the sysplex coupling facility must be connected with at least one coupling facility channel, whether the system runs on the same processor as the coupling facility central processor (CFCP) or on a separate processor.

Channel Path Attachments

As part of the I/O configuration definitions for each coupling facility channel, you need to define the channel path attachments for all processors and coupling facility channels.

1. Connect the coupling facility to the processors in the sysplex.

2. When defining the coupling facility, you should dedicate one or more central processors (CPs) to the partition that runs the CFCP.

3. The CFCP does not support dynamic I/O reconfiguration or PR/SM LPAR reconfiguration. To activate configuration changes, you must power-on reset (POR) the processor that runs the CFCP.

4. Define channel paths for both the coupling facility channel attachment to the processor and the coupling facility channel attachment to the coupling facility. For each system in the sysplex, you can use the HCD panels to define the I/O configuration dataset (IOCDS) that must include definitions for the coupling facility channel paths.

XCF Communication

Adabas Cluster Services uses parallel sysplex XCF services for internucleus communication. Entire Net-Work may also use XCF services.

XCF services may be provided using

- dedicated channel-to-channel (CTC) links;
- coupling facility links; or
- both.

COUPLExx Parmlib Member

You must specify a COUPLExx parmlib member in SYS1.PARMLIB for each system in the sysplex. The COUPLExx member defines the following values:

- Sysplex name, sysplex COUPLExx dataset names, and other COUPLExx dataset names.
- Failure detection interval, operator notification interval, and cleanup interval.
- Default message buffer space, default message size for a signalling path, and local message buffer space.
- Transport classes.
- Outbound and inbound signalling paths.
- Default retry limit.

Performance Recommendations

- The coupling facility processors (CFCPs) must be as fast or faster than the sysplex processors (CECs).
- The coupling facility link speed must match the coupling facility processor speed; for example, use ISC links for G4 speeds; ICB or IC links for G6 speeds.
- Buffer efficiency in a cluster nucleus when functioning as a non-cluster nucleus should be equal to or greater than 50.
- The rate of throwbacks due to ISN contention should be equal to or less than 2%.
- The LBP size used for a cluster nucleus when functioning as a noncluster nucleus should not be decreased when the nucleus in used in a cluster.
- The size of the cache and lock structures set in the coupling facility resource management (CFRM) policy must adhere to Software AG recommendations. See section *For List, Cache, and Lock Structures*.

3 Prerequisite Software Installations

The following Software AG products must be installed on the sysplex before proceeding with the installation of Adabas Cluster Services.

This chapter covers the following topics:

Adabas

The version of Adabas that underlies Adabas Cluster Services is a prerequisite for using the product.

The appropriate version of Adabas must be installed and operational on your systems before you install Adabas Cluster Services.

- Use ADADEF to define a new Adabas database.
- Use ADACNV to convert an existing database from an earlier version. Protection logs (PLOGs) and Work datasets must then be reformatted.

To install Adabas, see the appropriate version of the *Adabas Installation* documentation (OS/390, z/OS, OS IV/F4).

Entire Net-Work

Entire Net-Work for mainframes version 5.8 or above is required for communication between all operating system images participating in an Adabas nucleus cluster. The essential components including the XCF line driver are included as part of the Adabas Cluster Services package.

Entire Net-Work must be installed on each operating system image participating in the system of Adabas cluster nuclei and users. Each system with Entire Net-Work installed becomes a "node" in the network. Each node's adjacent links to other nodes are defined by name and driver type.

Adabas Cluster Services Router

The version 7.4 Adabas SVC (ADASVC), which is prelinked with the Adabas Cluster Services router component SVCCLU, must be installed on any node participating in the Adabas nucleus cluster where users of the cluster database are to be run, even if no Cluster Services nuclei will run on that node.

4 **What to Install**

Adabas Cluster Services requires Entire Net-Work to provide communication across operating system images between users (including utilities and AOS) and the nuclei in the Adabas cluster as well as among ADACOM jobs. Communication among the cluster nuclei is performed via XCF.

> **Note:** ADACOM and several Adabas cluster nuclei could run within a single operating system image without Entire Net-Work, but there could then be no application programs for that database in any other image.

This chapter covers the following topics:

Entire Net-Work Limited (WDXvrs) Library

If you are *not* currently running Entire Net-Work version 5.8 or above, you must install the Entire Net-Work limited (WDXvrs) library supplied on the Adabas Cluster Services installation tape. This library includes the XCF line driver.

Adabas Limited (WALvrs) Libraries

The Adabas limited (WALvrs) libraries provide the Adabas components necessary to support the Entire Net-Work connection on a node that participates in an Adabas sysplex cluster (that is, has cluster users) but does not have Adabas installed.

Using an Existing Entire Net-Work System

If you are currently running Entire Net-Work version 5.8 or above, you may be able to use your existing system as long as the following conditions are met:

- An Entire Net-Work node is running on each operating system image that will also be running a cluster nucleus and/or ADACOM.

- The Entire Net-Work nodes supporting the cluster nuclei are all interconnected using one of the currently supported Entire Net-Work line drivers: XCF, VTAM, CTC, or TCP/IP.

- The Entire Net-Work nodes use the same SVCCLU linked with the ADASVC that is used for the Adabas Cluster Services components they support.

If these conditions are not met, you cannot use your existing Entire Net-Work configuration. You must then use the Entire Net-Work limited library supplied on the Adabas Cluster Services installation tape.

Using the XCF Line Driver with an Existing Entire Net-Work

You may incorporate the XCF line driver into your existing Entire Net-Work configuration. The XCF line driver provides performance comparable to the CTC line driver.

When using the XCF line driver, the physical connection mechanism between Entire Net-Work nodes is transparent to Entire Net-Work. The connections may be over CTC links, ISC links, or both.

The connection mechanism/methods are defined by the system programmer using the COUPLExx SYS1.PARMLIB member and the coupling facility resource management (CFRM) policy.

Order the STEPLIB Concatenation

If you are installing the XCF line driver into an existing set of Entire Net-Work nodes, Software AG recommends that you concatenate the Entire Net-Work limited libraries from the Adabas Cluster Services tape in front of the existing Entire Net-Work library in the STEPLIB sequence.

Concatenate the Adabas Cluster Services library ahead of the Adabas load library.

5 Overview of the Installation Procedure

This section provides information about installing Adabas Cluster Services in the operating system environment.

The installation procedure must be repeated for *each* operating system image (that is, LPAR) that will participate in the system.

Important: Before proceeding with the installation, ensure that the prerequisite environment has been established. Review the earlier sections of this documentation for detailed information.

The procedure corresponds to the jobs that SMA creates to install the product. If you do not use SMA, you can modify and use the sample JCL described in *Unload the Installation Libraries to Disk* to unload the libraries from the installation tape.

This chapter covers the following topics:

Unload the Installation Libraries to Disk

Sample JCL is provided in the base Adabas source library and in the Entire Net-Work source library. This JCL can be modified and used to unload the Adabas Cluster Services libraries and, optionally, the Entire Net-Work libraries from the installation tape.

The Adabas Cluster Services installation tape is a standard label tape. Refer to the *Report of Tape Creation* that accompanies the tape for the volume serial number, density, media type, dataset names, and dataset sequence numbers.

The tape contains the installation datasets, a dataset required by SMA, and one or more datasets containing maintenance fixes. Refer to the *Release Notes* for information about recommended fixes.

Allocate DASD

The ALS load library for Adabas Cluster Services requires one cylinder.

If you need to install them, the minimum 3390 disk space requirements for the Adabas limited (WAL) load library is one cylinder; the WAL source library requires two cylinders.

The WDX limited load library for Entire Net-Work requires four cylinders; the WCP source library for Entire Net-Work requires four cylinders.

Copy the Contents of the Tape to Disk

To copy the Adabas Cluster Services datasets and (optionally) the limited Entire Net-Work libraries from the installation tape, use JCL similar to the following:

```
//COPY     JOB . . . .
//*
//*     Adabas Cluster Services Load Library
//*
//CPY1    EXEC PGM=IEBCOPY
//SYSPRINT DD SYSOUT=*
//DDIN     DD DSN=ALSvrs.LOAD,DISP=OLD,UNIT=cart,
//           VOL=(,RETAIN,SER=volser),LABEL=n
//DDOUT    DD DSN=ADAALS.Vvrs.LOAD,DISP=(NEW,CATLG,DELETE),
//           UNIT=xxxxx,VOL=SER=vvvvvv,SPACE=(CYL,(cc,,bl))
//SYSIN    DD *
 COPY INDD=DDIN,OUTDD=DDOUT
/*
//*
//*     Entire Net-Work Limited Load Library
//*
//CPY2    EXEC PGM=IEBCOPY
//SYSPRINT DD SYSOUT=*
//DDIN     DD DSN=WDXvrs.LOAD,DISP=OLD,UNIT=cart,
//           VOL=(,RETAIN,SER=volser),LABEL=n
//DDOUT    DD DSN=WDXALS.Vvrs.LOAD,DISP=(NEW,CATLG,DELETE),
//           UNIT=xxxxx,VOL=SER=vvvvvv,SPACE=(CYL,(cc,,bl))
//SYSIN    DD *
 COPY INDD=DDIN,OUTDD=DDOUT
/*
//*
//*     Entire Net-Work Samples
//*
//CPY3    EXEC PGM=IEBCOPY
//SYSPRINT DD SYSOUT=*
//DDIN     DD DSN=WCPvrs.SRCE,DISP=OLD,UNIT=cart,
//           VOL=(,RETAIN,SER=volser),LABEL=n
//DDOUT    DD DSN=WCPALS.Vvrs.SRCE,DISP=(NEW,CATLG,DELETE),
//           UNIT=xxxxx,VOL=SER=vvvvvv,SPACE=(CYL,(cc,,bl))
//SYSIN    DD *
 COPY INDD=DDIN,OUTDD=DDOUT
/*
```

where

bl	number of directory blocks for this library
cart	tape device type
cc	number of cylinders for this library
vrs	product version, revision, and system maintenance (SM) level
volser	volume serial number for the installation tape
n	position of the dataset on the installation tape
ALS	product code for Adabas Cluster Services
WCP	product code for the Entire Net-Work source library
WDX	product code for Entire Net-Work limited load library
vvvvvv	volume serial number of the disk used for the specified library
xxxxx	DASD device type

Copy the Adabas Limited (WALvrs) Libraries, If Required

Entire Net-Work requires some Adabas modules. For systems where Adabas is not installed, these modules are supplied on the installation tape in the Adabas limited libraries (WALvrs). See the *Report of Tape Creation* for specific information regarding these limited libraries.

Software AG recommends that you concatenate the Adabas limited (WAL) libraries with the Entire Net-Work (WDX) load library first in the sequence.

APF-Authorize All Load Libraries

Ensure that Adabas Cluster Services runs authorized.

To run authorized, the Adabas Cluster Services, Adabas, and limited Entire Net-Work load libraries and all other load libraries in the STEPLIB concatenation must be APF-authorized.

Ensure that all load libraries referenced in the STEPLIB concatenation for your Entire Net-Work, ADACOM, and Adabas cluster nuclei start-up procedures are defined to the operating system as authorized libraries. If this is not done, the Entire Net-Work, ADACOM, or the Adabas cluster nuclei will not initialize and may abnormally terminate, usually with an ABENDS047, ABENDS306, or ABENDS0C1.

Either copy the base Adabas modules and the Adabas Cluster Services modules to an existing APF-authorized library or APF-authorize the Adabas Cluster Services library that was unloaded from the installation tape and the Adabas load library unloaded from the base Adabas installation tape.

Install the WALvrs Libraries, if Needed

The version 7.4 ADASVC, which is prelinked with the cluster SVCCLU component, can and should also be used for Entire Net-Work. It must be installed on any node where Entire Net-Work is to be run, even if no servers are running on that node. Use the WALvrs libraries for such nodes.

Link Routines

Adabas client application programs need an Adabas link routine module suitable for the environment in which they run. For example, batch programs should be linked with ADAUSER, which loads current versions of ADALNK and supporting modules from the Adabas load library. TP environments usually require specialized link routine modules that may require an additional license.

Software AG recommends that link routines have the same version level as Adabas in a sysplex cluster environment.

Modify COUPLExx and the CFRM Policy

Make any needed additions and modifications to the COUPLExx SYS1.PARMLIB member and the sysplex CFRM policy. See the *Performance and Tuning* documentation for sizing recommendations.

For XCF Groups

A separate XCF group is activated for each

- Adabas sysplex cluster;
- Entire Net-Work instance using an XCF line driver; and
- active lock structure; each Adabas cluster uses one lock structure.

Ensure that the COUPLExx datasets are formatted with sufficient capacity for the necessary XCF groups.

No changes to the COUPLExx member are required. If values are not specified, the system defaults are used. However, rather than use the default values for CLASS, GROUP, and STRUCTURE, Software AG recommends that you add specific values to the COUPLExx member in SYS1.PARMLIB for use by the Entire Net-Work XCF line driver, as follows:

1. Add a CLASSDEF statement with CLASS(ENTIRE) and GROUP(NETWORK) specified.
2. Add a PATHIN statement with STRNAME(IXC_NETWORK) specified.

3. Add a PATHOUT statement with STRNAME(IXC_NETWORK) and CLASS(ENTIRE) specified.

A sample section from the COUPLExx member in SYS1.PARMLIB is as follows:

```
COUPLE SYSPLEX(USRSPLX1)
    PCOUPLE(SYS1.SYSPLEX.USRSPLX1.CDS01)
    ACOUPLE(SYS1.SYSPLEX.USRSPLX1.CDS02)
    INTERVAL(120)
CLASSDEF
    CLASS(ENTIRE)
    CLASSLEN(8192)
        GROUP(NETWORK)
    MAXMSG(4096)
LOCALMSG
    MAXMSG(4096)
    CLASS(ENTIRE)
PATHIN STRNAME(IXC_DEFAULT ,IXC_NETWORK)
PATHOUT STRNAME(IXC_DEFAULT)
PATHOUT STRNAME(IXC_NETWORK) CLASS(ENTIRE)
```

For List, Cache, and Lock Structures

To define the optional list structure for Entire Net-Work and the required cache and lock structures for each ADABAS nucleus cluster, you will need to run a job similar to the following to update the CFRM administrative policy data in the COUPLE dataset:

```
//STEP20   EXEC PGM=IXCMIAPU
//SYSPRINT DD   SYSOUT=*
//SYSABEND DD   SYSOUT=*
//SYSIN    DD   *
    DATA TYPE(CFRM) REPORT(YES)
    DEFINE POLICY NAME(POLICY1) REPLACE(YES)
    CF NAME(CF)
        TYPE(009674)
            MFG(IBM)
            PLANT(02)
            SEQUENCE (000000040101)
            PARTITION(1)
            CPCID(00)
            DUMPSPACE(2000)

            .
            .
        STRUCTURE NAME(IXC_DEFAULT)
            SIZE(1000)
            PREFLIST(CF)
        STRUCTURE NAME(ADA_CACHE1)
            SIZE(48000)
            PREFLIST(CF)
            .
```

```
             .
     STRUCTURE NAME(ADA_LOCK1)
         SIZE(16000)
         PREFLIST(CF)
         .
         .
     STRUCTURE NAME(IXC_NETWORK)
         SIZE(10000)
         PREFLIST(CF)
         .
         .
```

The CACHE structure must be large enough to retain

◼ all changed blocks between buffer flushes; and

◼ directory elements for all blocks in all buffer pools.

For information on cache structure sizes, see the section *Optimizing Lock and Cache Structures in the Coupling Facility* in the *Performance and Tuning* documentation.

Adabas Cluster Services 7.4 supports rebuild processes and duplexing rebuild processes for the cache and lock structures that it uses. These processes are managed by the operating system. See the following IBM documentation for additional information:

◼ MVS Setting Up a Sysplex

◼ MVS Programming: Sysplex Services Guide

◼ MVS System Commands (the `SETXCF` operator command)

Customize the Entire Net-Work Startup

Modify the Start-up Procedure

Customize the Entire Net-Work start-up procedure and copy it to a valid system procedure library.

The following example execution job can be used to start Entire Net-Work in an OS/390 or z/OS environment. More JCL may be needed, depending on the node configuration (types of line drivers, number of links, and so on). All load libraries in the STEPLIB concatenation must be APF-authorized.

```
//NETWORK  JOB . . . .
//*-----------------------------------------------------------*
//*               ENTIRE NET-WORK Vv.r.s STARTUP              *
//*-----------------------------------------------------------*
//XCFNET01 EXEC PGM=ADARUN,REGION=4M,TIME=1440  <--- see Note 1
//STEPLIB  DD DISP=SHR,DSN=NETWRK.Vvrs.LOAD
//         DD DISP=SHR,DSN=ADAALS.Vvrs.LOAD
//         DD DISP=SHR,DSN=ADABAS.Vvrs.LOAD     <--- see Note 2
//DDPRINT  DD SYSOUT=*                          <--- see Note 3
//NETPRNT  DD DISP=SHR,DSN=WDXvrs.NETPRNT       <--- see Note 4
//MPMDUMP  DD SYSOUT=*                          <--- see Note 5
//SYSUDUMP DD SYSOUT=*
//DDCARD   DD *                                 <--- see Note 6
*-----------------------------------------------------------*
*            SAMPLE ADARUN CARDS FOR ENTIRE NET-WORK
     *
*-----------------------------------------------------------*
ADARUN PROG=NETWRK
ADARUN TARGETID=65490      /* MUST BE UNIQUE WITHIN SYSTEM  */
ADARUN SVC=209             /* SUPPLY ADABAS SVC NUMBER      */
ADARUN NAB=16,LU=65535,NC=20
ADARUN FORCE=N
*
//DDKARTE  DD *                                 <--- see Note 7
*-----------------------------------------------------------*
*               SAMPLE ENTIRE NET-WORK NODE STATEMENT       *
*-----------------------------------------------------------*
NODE XCFNET01 BUFFERS=(32K,16K,512K,0),  -
              CQTIMER=60,                -
              LOG=NO,                    -
              MAXPATH=10,                -
              NTRACE=1000,               -
              REPLYTIM=60,               -
              TIMER=20
*-----------------------------------------------------------*
*        SAMPLE ENTIRE NET-WORK LINE DRIVER DEFINITION      *
*-----------------------------------------------------------*
DRIVER  XCFD  GROUP=NETWORK,             -
              ACCEPTUI=Y,                -
              TRACESIZ=256K
*-----------------------------------------------------------*
*        SAMPLE ENTIRE NET-WORK LINK TO NODE XCFNET02       *
*                FROM THIS NODE (XCFNET01)                  *
*-----------------------------------------------------------*
LINK  XCFLNK02  XCFD   MEMBER=XCFNET02
*
```

Notes:

1. The region size required varies with the number and type of links, as well as other operating parameters.

2. The STEPLIB should always designate the most current Adabas load library unless you have been specifically instructed otherwise by Software AG. Adabas Cluster Services requires the version of Adabas that underlies it or the corresponding Adabas limited library (WALvrs) provided on the Adabas Cluster Services installation tape.

3. All Entire Net-Work print output is written to DDPRINT.

4. All diagnostic information from tracing, logging, and ABENDs is written to the NETPRNT file if it is open (otherwise it is written to the DDPRINT file). NETPRNT can be allocated to a large dataset that can be copied when closed. The dataset should be created with the DCB attributes RECFM=FBA and LRECL=121. To do this, allocate the file SHR. This causes the dataset to be erased at the time the file is opened. Be aware that the diagnostic information is very large and will fill a dataset quickly. When this happens, the file is closed and all additional output is sent to DDPRINT. This diagnostic information is created by Entire Net-Work and does not include the operating system dump information written to SYSUDUMP.

5. If MPMDUMP is defined, a snap dump is produced during any abnormal termination. In most error situations, the MPMDUMP dump may contain more pertinent information than the SYSUDUMP dump.

6. DDCARD contains the ADARUN control statements defining the interregion communication parameters for Entire Net-Work. Some ADARUN parameters are the same as for Adabas; others are similar, but are designed specifically for Entire Net-Work. See the section ADARUN Session Parameters on page for information about coding ADARUN statements for Entire Net-Work.

7. DDKARTE contains Entire Net-Work parameter statements describing the local environment and the network connections for this node. See the section *Entire Net-Work Parameter Statements* in the *Parameters and Parameter Statements* documentation.

Specify the Entire Net-Work Control Statements

As shown in the job example in section *Modify the Start-up Procedure*, there are four types of Entire Net-Work control statements:

- ADARUN control statements define the interregion communication environment.

- NODE statements define the node's name and operating characteristics. See the section *XCF NODE Statement* in the *Parameters and Parameter Statements* documentation..

- DRIVER statements define the line driver type(s) to be loaded. Add one or more DRIVER statements that specify your requirements for this Entire Net-Work node. At least one DRIVER statement is required. For the XCF line driver, see the section *XCF DRIVER Statement* in the *Parameters and Parameter Statements* documentation.

- LINK statements define the links to other nodes and are currently not required. Optionally, add one or more LINK statements. For the XCF line driver, see the section *XCF LINK Statement* in the *Parameters and Parameter Statements* documentation..

Customize the Entire Net-Work ADARUN and NODE statement parameters.

Add the XCF DRIVER statement that specifies your requirements to the Entire Net-Work parameter dataset. Optionally, add one or more XCF LINK statements to describe Entire Net-Work partner nodes.

Apply Entire Net-Work Maintenance

Apply corrective maintenance.

Refer to the *Report of Tape Creation* to determine whether any files containing corrective maintenance (i.e., datasets named pppvrs.ZAPS) are supplied on the installation tape. If so, restore the datasets using IEBCOPY, and then follow the corrective maintenance instructions in the $READMVS member.

Start Entire Net-Work

When execution JCL, including the ADARUN and Entire Net-Work parameter statements, is created for each node and all access method-specific definitions and installation steps are completed, Entire Net-Work can be started.

Start Entire Net-Work on multiple nodes and establish connectivity with the partner nodes.

The execution job or procedure for Entire Net-Work must be started on each of the participating nodes. Once started, Entire Net-Work determines the interregion communications environment on its node, connects to neighboring nodes through the defined links, and exchanges all relevant information with the other nodes during the "handshaking" process following link connection.

While the Entire Net-Work tasks are active and connected, user programs on any node can access all active targets on any other node, regardless of the targets' locations.

Run verification tests. For example:

- Test your applications running across Entire Net-Work. Run one application at a time and verify the results.
- Run a load test through the network (that is, multiple users on each node accessing data on the partner node).

If a link fails or cannot be connected properly, Entire Net-Work searches for possible alternate routes to complete the call. Once a disconnected link becomes available again, it is automatically considered for traffic.

Entire Net-Work can also be installed as a started task; no special considerations apply.

Entire Net-Work uses cross-memory services similar to Adabas in OS/390 and z/OS systems. As a result, the operating system terminates the ASCB/initiator when Entire Net-Work terminates operation. This is normal and is not be regarded as an error.

During execution, a number of operator commands may be issued to Entire Net-Work to display or modify the system status. See the section *Entire Net-Work Operator Commands* in the *Operator Commands* documentation.

Create a Start-up Procedure for ADACOM

An ADACOM initialization task is provided. This task must execute on each operating system image that has users who access the cluster database but no cluster nuclei; Software AG recommends that you also execute it on each operating system image that has a nucleus that participates in the cluster so that it is available as a command manager. All load libraries in the STEPLIB concatenation of ADACOM must be APF-authorized.

Either a cluster nucleus or the ADACOM program can allocate the nucleus table for monitoring the active nuclei and the user table for monitoring users in the extended CSA (ECSA) above the 16MB line.

The ADACOM task can be set up to manage any number of SVC/DBID sets in a sysplex. Refer to the section *ADACOM Initialization Parameters* in the *Parameters and Parameter Statements* document- ation for more information about specifying values for ADACOM parameters.

The following is a sample job for running ADACOM:

```
//ADACOM JOB . . . .
//*------------------------------------------------------------*
//*         Adabas Cluster Services ADACOM Vv.r.s STARTUP      *
//*------------------------------------------------------------*
//ALSvrs EXEC PGM=ADARUN,REGION=4M,TIME=1440
//STEPLIB  DD DISP=SHR,DSN=ADAALS.Vvrs.LOAD
//         DD DISP=SHR,DSN=ADABAS.Vvrs.LOAD
//*
//COMPRINT DD SYSOUT=*
//DDCARD DD *
ADARUN PROGRAM=ADACOM
/*
//DDKARTE DD *
ADACOM SVC=sv1,DBID=dbid1,NU=150
ADACOM SVC=sv1,DBID=dbid2,NU=150,C=N,F=Y
ADACOM SVC=sv2,DBID=dbid1,NU=500
ADACOM SVC=sv2,DBID=dbid3,NU=500
/*
```

The COMPRINT DD statement must be specified when running ADACOM. It defines an output dataset for all general messages printed by ADACOM. For each SVC/DBID set specified in the ADACOM task, a subtask is attached and a SYSOUT dataset is dynamically allocated to receive all messages specific to that combination. The DD-name of the SYSOUT dataset is 'Pssddddd', where 'ss' represents the last two digits of the SVC number and 'ddddd' are the five digits of the DBID.

ADACOM can also be installed as a started task; no special considerations apply.

You may also want to add the ADACOM task's start command to member COMMNDxx of SYS1.PARMLIB; this enables the ADACOM task to begin automatically at IPL.

Create a Start-up Procedure for Each Cluster Nucleus

1. Customize a start-up procedure to execute ADARUN.

   For each Adabas cluster nucleus, customize the appropriate start-up parameters and execute ADARUN from the Adabas load library.

2. Concatenate the Adabas Cluster Services load library ahead of the Adabas load library in the STEPLIB. All load libraries in the STEPLIB concatenation of the cluster nucleus must be APF-authorized.

3. Allocate and format a Work dataset for each nucleus.

   All nuclei in an Adabas cluster share a common database resource; i.e., the same ASSO and DATA datasets. Each nucleus in the cluster must have its own Work dataset; and all Work datasets within a cluster must have the same size and device type as defined in the general control block (GCB).

   Use DISP=SHR on the DD card for the Work dataset (DDWORKR1). During an offline or online restart/recovery, a nucleus may access the Work datasets belonging to other nuclei in the cluster.

4. Specify the ADARUN `CLUSTER`, `NUCID`, `CLUGROUPNAME`, `CLUCACHENAME`, and `CLULOCKNAME` parameters for each nucleus.

   Although each nucleus of an Adabas cluster shares the same database resource (DBID), each nucleus must have a unique `NUCID` value:

   - a single (noncluster) nucleus: NUCID=0 (default)
   - a cluster nucleus: NUCID=1-65000

   Each cluster has cache and lock structure names that are unique in the sysplex system. ADARUN parameters are used to identify these names to each cluster nucleus.

Use current values for all other ADARUN parameters, then reevaluate the values after monitoring the result. Ensure that each nucleus in the cluster is prepared to handle the entire workload for the common database, if necessary.

5. If protection logs are used, they must be dual or multiple logs and each nucleus must have its own. If one nucleus in the cluster runs with PLOGs, all nuclei in the cluster must run with PLOGs. The ADARUN PLOGRQ parameter must be the same for all nuclei (global parameter).

   If user exit 2 or user exit 12 is supplied for one nucleus, the same user exit must be supplied for all nuclei in the cluster. User exit 12 must be used instead of user exit 2 if NCLOG/NPLOG is specified.

6. If command logs are used, each nucleus must have its own. If command logs are to be merged, they must be dual or multiple command logs and each nucleus in the cluster must have the same CLOG definition. CLOGMRG=YES must be specified in the ADARUN parameters to invoke automatic CLOG merging.

The following sample nucleus JCL executes the Adabas ADARUN program to implement session parameters for an Adabas cluster nucleus.

Note that the Adabas Cluster Services library is concatenated ahead of the Adabas library in the STEPLIB.

```
//PLX240N1 JOB . . . .
//*----------------------------------------------------------------*
//*                STARTUP FOR ADABAS CLUSTER NUC #1               *
//*----------------------------------------------------------------*
//V7NUC240 EXEC
PGM=ADARUN

,REGION=8M,TIME=1440
//STEPLIB  DD DSN=ADAALS.Vvrs.LOAD,DISP=SHR
//         DD DSN=ADABAS.Vvrs.LOAD,DISP=SHR
//*
//DDASSOR1 DD DSN=MPM240.ASSOR1,DISP=SHR
//DDDATAR1 DD DSN=MPM240.DATAR1,DISP=SHR
//DDWORKR1 DD DSN=MPM240.WORKR1.CLU01,DISP=SHR
//*
//DDPRINT  DD SYSOUT=*
//DDDRUCK  DD SYSOUT=*
//SYSUDUMP DD SYSOUT=*
//SYSABEND DD SYSOUT=*
//*
//DDCARD   DD *
ADARUN PROG=ADANUC
ADARUN CLUSTER=SYSPLEX              ADABAS CLUSTER SERVICES
ADARUN NUCID=1

                 ADABAS CLUSTER NUCLEUS ID
ADARUN CLUGROUPNAME=ADA240          XCF GROUP NAME
```

```
ADARUN CLUCACHENAME=ADA240_CACHE    CACHE STRUCTURE NAME
ADARUN CLULOCKNAME=ADA240_LOCK      LOCK STRUCTURE NAME
ADARUN SVC=209                      SVC NUMBER
ADARUN DBID=240                     DATABASE ID
ADARUN PLOGRQ=NO                    PLOG REQUIRED
ADARUN MODE=MULTI                   MULTIUSER MODE
ADARUN LOCAL=NO
      .
      .
      .
//*
```

Start Adabas Cluster Services

Software AG recommends the following first start sequence:

1. Start Entire Net-Work on each operating system image that is participating in the Adabas nucleus cluster. Ensure that all nodes required for the cluster are connected.

2. Start the ADACOM initialization task on each operating system image that is participating in the Adabas cluster.

3. Start the Adabas cluster nuclei in any order.

The Adabas cluster is now ready to process user requests.

Rules for subsequent starts of Adabas Cluster Services are described in the *Operations* documentation.

When the Adabas cluster nuclei are active, issue the Entire Net-Work operator command DISPLAY TARGETS to ensure that the required targets have been established. For more information, see section *DISPLAY - Display Information About a Network Component* in the *Operator Commands* documentation.

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