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:

- Data Sets Delivered

- Step 1: Unload the Installation Libraries to Disk

- Step 2: APF-Authorize All Load Libraries

- Step 3: Install the WALvrs Libraries, if Needed

- Step 4: Modify COUPLExx and the CFRM Policy

- Step 5: Customize the Entire Net-Work Startup

- Step 6: Apply Entire Net-Work Maintenance

- Step 7: Start Entire Net-Work

- Step 8: Create a Startup Procedure for ADACOM

- Step 9: Create a Startup Procedure for Each Cluster Nucleus

- Step 10: Starting Adabas Cluster Services

Data Sets Delivered

The following data sets are delivered with Adabas Cluster Services on z/OS platforms:

Data Set Name	Contains
ALS823.LOAD	Adabas Cluster Services load modules. Please be sure to check the Knowledge Center in Software AG's Empower (*https://empower.softwareag.com*) web site for additional cluster-related Adabas zaps when installing Adabas Cluster Services.

Step 1: 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 *Software AG Product Delivery Report* that accompanies the tape for the volume serial number, density, media type, data set names, and data set sequence numbers.

The tape contains the installation data sets, a data set required by SMA, and one or more data sets containing maintenance fixes. Refer to the *Adabas Cluster Services Release Notes* for information about recommended fixes.

- Allocate DASD

- Copy the Contents of the Tape to Disk

- Copy the Adabas Limited (WALvrs) Libraries, If Required

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

Copy the data sets from the supplied installation medium to your disk before you perform the individual installation procedure for each component to be installed.

The way you copy the data sets depends on the installation method and the medium used:

- If you use System Maintenance Aid (SMA), refer to the copy job instructions provided in the *System Maintenance Aid* documentation.

- If you are not using SMA and want to copy the data sets from CD-ROM, refer to the README.TXT file on the CD-ROM.

- If you are not using SMA and want to copy the data sets from tape, follow the instructions in this section.

This section explains how to copy all data sets from tape to disk.

- Step 1: Copy Data Set COPY.JOB from Tape to Disk
- Step 2: Modify hilev.COPY.JOB on Your Disk
- Step 3: Submit COPY.JOB

Step 1: Copy Data Set COPY.JOB from Tape to Disk

- Modify the following sample job according to your requirements:

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

where:

tape-volser is the VOLSER of the tape, for example: T12345,
hilev is a valid high-level qualifier, and
disk-volser is the VOLSER of the disk.

- Execute the job to copy the data set COPY.JOB to your disk.

Step 2: Modify *hilev*.COPY.JOB on Your Disk

- Modify *hilev*.COPY.JOB according to your requirements:

Set EXPDT to a valid expiration date, for example, 99365.

Set HILEV to a valid high-level qualifier, for example, USERLIB.

Set LOCATION to a storage location, for example, STORCLAS=ABC or UNIT=3390,VOL=SER=USR123.

Step 3: Submit COPY.JOB

- Execute *hilev*.COPY.JOB to copy single, multiple, or all data sets to your disk.

Copy the Adabas Limited (WAL*vrs*) 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 (WAL*vrs*). See the *Software AG Product Delivery Report* 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.

Step 2: 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 startup 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 or ABENDS306.

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.

Step 3: Install the WAL*vrs* Libraries, if Needed

The Adabas router (ADASVC), which contains the SVCCLU component used by Adabas Cluster Services, 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 WAL*vrs* 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.

Step 4: Modify COUPLE*xx* and the CFRM Policy

Make any needed additions and modifications to the COUPLE*xx* 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 COUPLE*xx* data sets are formatted with sufficient capacity for the necessary XCF groups.

No changes to the COUPLE*xx* 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 COUPLE*xx* 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 COUPLE*xx* 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 data set:

```
//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, read *Optimizing Lock and Cache Structures in the Coupling Facility*.

System-Managed Rebuild and Duplexing Rebuild

Adabas Cluster Services supports rebuild processes and duplexing rebuild processes for the cache and lock structures that it uses. These processes are managed by the operating system.

- *System-managed rebuild* dynamically rebuilds a coupling facility structure in the same or another coupling facility, while an active application (in this case, Adabas Cluster Services) may be using the structure. It can be used to reduce *planned* outage time for applications using the coupling facility.

  The option of the SETXCF operator command initiating this system-managed process is SETXCF START,REBUILD.

- *System-managed duplexing rebuild* dynamically duplicates a coupling facility structure into another coupling facility, while an application may be using the structure. It can be used to reduce *unplanned* outage time for applications using the coupling facility.

  The option of the SETXCF operator command initiating this system-managed processes is SETXCF START,REBUILD,DUPLEX.

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)

Step 5: Customize the Entire Net-Work Startup

Modify the Startup Procedure

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

The following example execution job can be used to start Entire Net-Work in a 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
*
```

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 (WAL*vrs*) 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 data set that can be copied when closed. The data set should be created with the DCB attributes RECFM=FBA and LRECL=121. To do this, allocate the file SHR. This causes the data set to be erased at the time the file is opened. Be aware that the diagnostic information is very large and will fill a data set 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. Read *Entire Net-Work (NETWRK) Initialization Parameters* 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. Read *Entire Net-Work Parameter Statements*.

Specify the Entire Net-Work Control Statements

As shown in the job example in section *Modify the Startup 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. Read *XCF NODE Statement*.

- 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, read *XCF DRIVER Statement*.

- 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, read *XCF LINK Statement*.

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 data set. Optionally, add one or more XCF LINK statements to describe Entire Net-Work partner nodes.

Step 6: Apply Entire Net-Work Maintenance

Apply corrective maintenance.

Refer to the *Software AG Product Delivery Report* to determine whether any files containing corrective maintenance (i.e., data sets named *pppvrs*.ZAPS) are supplied on the installation tape. If so, restore the data sets using IEBCOPY, and then follow the corrective maintenance instructions in the $READMVS member.

Step 7: 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 z/OS systems. As a result, the operating system may terminate the ASCB/initiator when Entire Net-Work terminates operation unless the system is configured with reusable address spaces. This is normal and is not an error.

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

Step 8: Create a Startup 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. Read *ADACOM Initialization Parameters* 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=nnnnn
//STEPLIB  DD DISP=SHR,DSN=ADAALS.Vvrs.LOAD
//         DD DISP=SHR,DSN=ADABAS.Vvrs.LOAD
//*
//COMPRINT DD SYSOUT=*
//DDPRINT  DD SYSOUT=X
//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 data set for all general messages printed by ADACOM. For each SVC/DBID set specified in the ADACOM task, two subtasks are attached and SYSOUT data sets are dynamically allocated to receive all messages specific to that combination. The DD-name of the SYSOUT data sets are "P*ssddddd*" and "D*ssddddd*", 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 COMMND*xx* of SYS1.PARMLIB; this enables the ADACOM task to begin automatically at IPL.

Step 9: Create a Startup Procedure for Each Cluster Nucleus

1. Customize a startup procedure to execute ADARUN.

   For each Adabas cluster nucleus, customize the appropriate startup 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 data set for each nucleus.

   All nuclei in an Adabas cluster share a common database resource; i.e., the same ASSO and DATA data sets. Each nucleus in the cluster must have its own Work data set; and all Work data sets 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 data set (DDWORKR1). During an offline or online restart/recovery, a nucleus may access the Work data sets 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               *
//*---------------------------------------------------------------*
//NUC240   EXEC PGM=ADARUN,REGION=8M,TIME=nnnnn
//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
        .
        .
        .
//*
```

Step 10: Starting 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 *Adabas Cluster Services Operations*.

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, read *DISPLAY - Display Information About a Network Component*.