

# **Adabas Transaction Manager**

## **Adabas Transaction Manager Installation**

Version 7.5.1

September 2009

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# Adabas Transaction Manager

This document applies to Adabas Transaction Manager Version 7.5.1 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.

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# 1 Adabas Transaction Manager Installation

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This document describes how to install Adabas Transaction Manager using installation jobs that are:

- generated by the Software AG System Maintenance Aid (SMA); or
- taken from the job library on the installation tape and manually customized.

For information about using SMA, refer to the *System Maintenance Aid* documentation.

Each step of the installation procedure is associated with the number of an installation job generated by SMA. If you are not using SMA, a sample job with the same number is provided in the JOBS library on the installation tape. You will need to adapt the sample job to your requirements. Installation job numbers are preceded by the product code ATM; for example, ATMI050.

- [Installation Prerequisites](#)
- [Before You Install](#)
- [Upgrading from Earlier Versions](#)
- [Installation Procedures](#)
- [Verifying the Installation](#)



# 2 Installation Prerequisites

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- Operating Systems ..... 4
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## Operating Systems

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Adabas Transaction Manager version 7.5 requires Adabas version 7.1, maintenance level .2 or above, or Adabas version 7.4.2 or above. The Adabas Transaction Manager daemon at version 7.5 requires Adabas version 7.4.2 and Adabas System Coordinator, both with load library updates applied. Refer to the Release Notes for details. Adabas Transaction Manager version 7.5 is compatible with the following operating systems:

- OS/390 version 2, release 10
- z/OS version 1, releases 1-4
- z/OS.e, releases 3-4 \*
- VSE/ESA version 2, releases 5, 6, and 7
- BS2000 OSD 2.0 and above

\* Support for z/OS.e is currently restricted to client programs executing in batch, or under TSO or Com-plete.

For more information about supported operating systems, refer to the *Adabas Installation* documentation.

## Software Prerequisites

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- Adabas
- Using Adabas Load Library Update LX06
- Required Datasets
- Entire Net-Work
- Natural
- Using Com-plete, RRMS and CICS Syncpoint Manager
- Mixing with Components of Earlier Versions

### Adabas

- Using ATM with Adabas Version 7.4



- [Using ATM with Adabas Version 7.1](#)

### Using ATM with Adabas Version 7.4

Adabas Transaction Manager version 7.5 can be used with databases running under Adabas version 7.4.2 or above. The ATM daemon requires load library update L005 or higher for the Adabas System Coordinator.



**Caution:** Adabas Transaction Manager version 7.5 should not be used with Adabas version 7.4.1.

### Using ATM with Adabas Version 7.1

Adabas Transaction Manager version 7.5 can be used with databases running under Adabas version 7.1.

### Using Adabas Load Library Update LX06

The installation package includes load library update LX06 for Adabas 7.4.3. This library must be used, together with the standard Adabas 7.4.3 library, by the ATM 7.5 daemon.

The LX06 library must also be used for any Adabas Cluster Services databases or Adabas Parallel Services databases that run with the parameter `DTP=RM`.

Do not use the LX06 library in any other circumstances.



**Note:** With Adabas load library update LX06, the usage of the ADARUN parameter `LDTP` has changed. The `LDTP` parameter is now used to indicate the size (in blocks) of the `WORK4` index which is used to administer the data on `DDWORKR4`. `DDWORKR4` is used for the same purpose as the `WK4` part of `DDWORKR1` was used previously, with the difference that `DDWORKR4` can be used in parallel by all members in a cluster. The `DDWORKR4` dataset should be allocated and formatted in the normal way, using the same block size as `DDWORKR1`. It should be at least as large as the cluster's `LP` parameter.

Before you use the LX06 library with a Cluster Services or Parallel Services database, you should run the ADACNV utility which is located in the LX06 library, specifying the following as DDKARTE input:

```
ADACNV  CONVERT  TOVERS=75
```

If you subsequently revert to using the standard Adabas 7.4.3 library, either because the cluster is now to be run with `DTP=NO`, or because the database is no longer to execute as part of a cluster, you should convert the database back to standard version 7.4 format by running `ADACNV`, as supplied in the `LX06` library, with the following `DDKARTE` input:

```
ADACNV  CONVERT  TOVERS=74
```



**Caution:** Failure to follow the above instructions can result in various problems relating to the PPT area of the Associator dataset.

### Required Datasets

For a complete overview of the datasets required by `ATM751`, see the section `Required Datasets`.

### Entire Net-Work

A currently supported version of Entire Net-Work is required for communication between Adabas Transaction Manager instances in different system images.

### Natural

The Adabas Transaction Manager Online Services component requires Natural version 3.1 or above for communication with other components.

### Using Com-plete, RRMS and CICS Syncpoint Manager

The Adabas Transaction Manager proxy currently supports only one Adabas SVC per session under Com-plete.

For cross-vendor coordination of distributed transactions, Adabas Transaction Manager supports the following IBM asynchronous exit drivers: RRMS and CICS Syncpoint Manager.



**Caution:** If you use the Adabas Transaction Manager implementation of the CICS Resource Manager Interface, please note that version 7.4 of the Adabas CICS interface is not compatible with Adabas Transaction Manager version 1.2. If these versions are used together, results could be unpredictable.

## Mixing with Components of Earlier Versions



**Caution:** It is *not* possible to mix components of Adabas Transaction Manager version 7.5 with components of version 1.2 within the same Entire Net-Work node. A node which runs ATM 1.2 must be upgraded to version 7.5 in its entirety; client jobs, RM databases and the ATM daemon must all be upgraded at the same time. However, a node which runs ATM 1.2 can operate with other nodes where ATM 7.5 executes, and vice versa, sharing in the coordination of distributed transactions.

ATM 7.4 daemons and ATM 7.5 daemons can inter-operate across different Entire Net-Work nodes. It is also possible to run versions 7.4 and 7.5 of ATM alongside each other in the same Entire Net-Work node. To do this, you will need to run a separate ATM daemon for each version. A DTP=RM database which runs with an ATM 7.5 library will be signed on to the 7.5 ATM daemon; an RM running with a version 7.4 ATM library will sign on to the version 7.4 daemon. Then, by choosing which version of ATM library will be used by an application environment, you determine which ATM daemon will take responsibility for coordinating transactions for that environment.



**Note:** A DTP=RM database cannot interact with both a version 7.4 ATM daemon and a 7.5 ATM daemon at the same time. However, the interoperability of the two versions of ATM daemon means that an RM can take part in distributed transactions, regardless of which version of daemon it signs on to.

For information about upgrading from an earlier version of Adabas Transaction Manager, see the section [Upgrading from Earlier Versions of ATM](#).



# 3 Before You Install

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- Actions Required Prior to Installation Verification ..... 10

This section describes actions which must be taken prior to performing Adabas Transaction Manager installation.



**Note:** If you are upgrading from Adabas Transaction Manager version 1.2 or version 7.4, refer to the section [Upgrading from Earlier Versions of ATM](#) before proceeding with the installation.

## Actions Required Prior to Installation

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The following actions need to be taken prior to installation:

- reserve a unique DBID for the transaction manager daemon in each operating system image.
- identify the TP system library names to be used.
- identify the Adabas library names to be used.
- install Adabas version 7.4.2 or above.
- download the Adabas version 7.4.3 load library and apply update LX06, ready for use by ATM daemons.
- install Adabas System Coordinator version 7.4.2 with load library update L005, or higher.

## Actions Required Prior to Installation Verification

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To verify the installation, two databases running with ADARUN DTP=RM are required:

- one database containing a standard Employees file, and
- one database containing a standard Vehicles file.

During the verification process, views of these files must be available in the Natural environment in which Adabas Transaction Manager Online Services is to be run.

# 4 Upgrading from Earlier Versions

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## Upgrading from Version 1.2

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This section describes actions which must be taken when upgrading from Adabas Transaction Manager version 1.2.

- [Recovery Database](#)
- [ET Data Management](#)
- [Parameter Override Routine \(PRMORID\)](#)
- [Upgrading Online Services](#)
- [Upgrading Daemons, Resource Managers and Client Jobs](#)

### Recovery Database

The FDTs of the PRR and STJ files in the Adabas Transaction Manager's recovery database changed with version 7.4. Moreover, these files must reside in the ATM daemon's own database at version 7.5. It is therefore necessary to load new files in the ATM daemon's database, as described in the installation instructions, once the version 1.2 daemon has been closed down for the last time.

When you upgrade a production Adabas Transaction Manager system, you should ensure that there are no global transactions in flight when the version 1.2 daemon is closed down for the last time; that is, the daemon must be closed down when there is no vital recovery information present in the recovery database. You should also check, using Online Services, that there is no useful information in the STJ file before you delete or discard it.

Next, load the daemon's database files, as described in the installation instructions. Remember to remove the ATM daemon's ADARUN `TMDBID` parameter.

When you first start the version 7.5 daemon using the new PRR and STJ files, the daemon's session number will revert to 1.

### ET Data Management

A new file, the ET data file, is required from version 7.4, if Adabas Transaction Manager is to manage the installation's ET data.

If you used the ADARUN parameter setting `TMETDATA=ATM` for your version 1.2 installation, the Adabas Transaction Manager daemon database or the recovery database will contain the ET data of your applications. Versions 7.4 and 7.5 no longer store ET data in the checkpoint file; therefore, before running your applications with version 7.5, you might need to move the existing ET data from the checkpoint file of the Adabas Transaction Manager daemon or recovery database to the new ET data file (file 8) in the version 7.5 daemon's database. See [Copy ET Data](#) for more information.



## Parameter Override Routine (PRMORID)

If you have Natural applications that use ATM's parameter override subroutine (PRMORID), be sure to `STOW` them using the PRMORID subroutine that is supplied with version 7.5.

## Upgrading Online Services

The Online Services application (SYSATM) delivered with Adabas Transaction Manager version 7.5 can be installed alongside the version 1.2 equivalent. The installation process automatically loads the application into a library with a version-dependent name. The MENU program automatically invokes the most recent installed version, but a function key (PF12) can be used to switch to another installed version. If you plan to run versions 1.2 and 7.5 in parallel, use this feature to ensure that the correct version of SYSATM is used in conjunction with a particular ATM daemon or application environment.

## Upgrading Daemons, Resource Managers and Client Jobs

ATM 7.5 provides an interoperability feature which makes it possible for you to upgrade one node at a time. This feature can be used if your installation runs ATM 1.2, with ATM daemons communicating with each other across Entire Net-Work connections. To take advantage of this feature, follow the steps described below.

Before upgrading any version 1.2 node, it is strongly recommended that you carry out a test installation of ATM 7.5 in a clean test environment, and verify that it operates correctly. Then you can plan to upgrade existing ATM environments according to the following strategy.

- [Step 1: Implement an Adabas System Coordinator Daemon in Every Node](#)
- [Step 2: Prepare to Execute Version 7.5 on One Node](#)
- [Step 3: Upgrade the Node to Version 7.5](#)
- [Step 4: Upgrade Remaining Nodes to Version 7.5](#)

### Step 1: Implement an Adabas System Coordinator Daemon in Every Node

ATM 7.5 uses the services of the Adabas System Coordinator (SYSCO) daemon to learn about other ATM daemons in the network. By implementing a system coordinator group, consisting of a SYSCO daemon on each node where an ATM 1.2 or ATM 7.5 daemon runs, you make it possible for an ATM 7.5 daemon in any node to become aware of ATM 1.2 daemons and ATM 7.5 daemons in other nodes. This process takes place without any direct interaction between the ATM 1.2 daemon and its local SYSCO daemon.

For information about the Adabas System Coordinator, system coordinator groups and SYSCO daemons, please refer to the Adabas System Coordinator documentation, and also to the section Adabas Transaction Manager Daemons and Adabas System Coordinator Groups.

### Step 2: Prepare to Execute Version 7.5 on One Node

Follow the detailed instructions in the Release Notes and in the Adabas Transaction Manager documentation for installing ATM 7.5. Prepare, so that you are ready to run:

- the ATM daemon at version 7.5
- DTP=RM databases, either using Adabas version 7.4 or using Adabas version 7.1 in compatibility mode (see section Using ATM with Adabas Version 7.1), with ATM 7.5
- application jobs and TP systems using Adabas System Coordinator version 7.4 and using the ATM 7.5 proxy.



**Note:** You should not attempt to run an ATM 7.5 daemon and an ATM 1.2 daemon under the same Adabas ID table (SVC) at the same time.

### Step 3: Upgrade the Node to Version 7.5

A node must be upgraded to version 7.5 in its entirety; it is not possible to mix version 1.2 and version 7.5 within the local scope of a single Adabas router. Here is a summary of the steps you will need to take:

- close down application jobs and TP systems in the local system
- ensure that there are no incomplete transactions or branches in the local ATM daemon's domain
- close down the DTP=RM databases in the local system
- close down the version 1.2 daemon and its recovery database
- ensure that the local SYSCO daemon is executing, and that there is a SYSCO daemon executing on all other connected nodes in the network where ATM daemons execute
- start the version 7.5 daemon
- start the DTP=RM databases, running either Adabas version 7.4, or Adabas version 7.1 in compatibility mode, using the ATM 7.5 load library
- start application jobs and TP systems, using ATM 7.5.

### Step 4: Upgrade Remaining Nodes to Version 7.5

Repeat steps 2 and 3 for each of the remaining nodes in the network.

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## Upgrading from Version 7.4

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This section describes actions which must be taken when upgrading from Adabas Transaction Manager version 7.4.

- [Recovery Database](#)
- [Upgrading Online Services](#)
- [Parameter Override Routine \(PRMORID\)](#)
- [Upgrading Daemons, Resource Managers and Client Jobs](#)
- [Upgrading Job Parameters](#)

### Recovery Database

With version 7.5 of Adabas Transaction Manager, the PRR, STJ and ET data files must reside in the Adabas Transaction Manager daemon's own database, rather than in a separate recovery database. If you used a separate recovery database with ATM 7.4, you can simply unload these files from your recovery database, and load them into the daemon's database, using the same file numbers. Check that the ATM daemon's ADARUN TMD<sub>BID</sub> parameter specifies (or defaults to) the ATM daemon's database.

### Upgrading Online Services

The Online Services application (SYSATM) delivered with Adabas Transaction Manager version 7.5 can be installed alongside the version 7.4 equivalent. The installation process automatically loads the application into a library with a version-dependent name. The MENU program automatically invokes the most recent installed version, but a function key (PF12) can be used to switch to another installed version. If you plan to run versions 7.4 and 7.5 in parallel, use this feature to ensure that the correct version of SYSATM is used in conjunction with a particular ATM daemon or application environment.

### Parameter Override Routine (PRMORID)

If you have Natural applications that use ATM's parameter override subroutine (PRMORID), be sure to STOW them using the PRMORID subroutine that is supplied with version 7.5.

## Upgrading Daemons, Resource Managers and Client Jobs

Once the Online Services application has been upgraded to version 7.5, you can begin to upgrade other components. The following sequence is recommended:

- Upgrade ATM daemons from version 7.4 to version 7.5. It is not necessary to upgrade all daemons at the same time, since the two versions of daemon are capable of interacting fully.
- Upgrade Resource Managers. Replace the ATM 7.4 load library with the version 7.5 library. It is not necessary to upgrade all resource managers at the same time. Note that the parameter setting `DTP=ET` is not supported by ATM 7.5, so any databases that run with this setting should be changed to run either with `DTP=NO` or with `DTP=RM`. Before converting a cluster database to ATM 7.5, refer to the section Configuration.
- Upgrade client jobs and TP systems. Replace the version 7.4 ATM load library with the version 7.5 library.

## Upgrading Job Parameters

From version 7.5, every client job or TP system that uses Adabas Transaction Manager must be associated with an Adabas System Coordinator group. This association is made by means of a new job parameter. When you create new job parameters using version 7.5 Online Services, you will be forced to provide a value for this parameter. However, job parameters that were created using version 7.4 Online Services must be modified, using version 7.5 Online Services, so that a System Coordinator Group name can be provided. If a job's ATM job parameters specify that ATM processing is required, but no System Coordinator Group name is present, a warning message will be issued, the ATM proxy will fail to initialize, and ATM will take no part in processing the job.

# 5 Installation Procedure

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This section describes the procedure for Adabas Transaction Manager installation:

Installation for OS/390, z/OS, and z/OS.e

- **Installing Adabas Transaction Manager for OS/390, z/OS, and z/OS.e**
- **Installing CICS Resource Manager Interface for z/OS or OS/390**
- **Installing RRMS Interface Under z/OS or OS/390**

Installation for VSE/ESA

- **Installing Adabas Transaction Manager for VSE/ESA**
- **Installing CICS Resource Manager Interface for VSE/ESA**

Installation for BS2000

- **Installing Adabas Transaction Manager for BS2000**



# 6 Installing Adabas Transaction Manager for OS/390, z/OS, and z/OS.e

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## The Installation Tape

Review the *Report of Tape Creation* that accompanies the release package before restoring the release data to disk.

The installation tape contains the following datasets in the sequence indicated in the report:

Dataset	Contents
ATM $vrs$ .JOBS	Installation jobs, utility jobs
ATM $vrs$ .LOAD	Executable modules
ATM $vrs$ .SYS5	ADALOD input for the ATM PRR file
ATM $vrs$ .SYS6	ADALOD input for the ATM STJ file
ATM $vrs$ .SYS7	ADALOD input for the user proxy log (UPL) file
ATM $vrs$ .SYS8	ADALOD input for the ET data file
ATM $vrs$ .INPL	Online Services application
ATM $vrs$ .ERRN	Online Services messages
ATM $vrs$ .SYSC	ADALOD input for the Adabas System Coordinator file
ADA743.LX06	Adabas load library update

where  $vrs$  is the version, revision, and system maintenance level of the product. Use the comments in the jobs when modifying them to conform to site requirements.

## Installation Checklist

The steps needed for a successful installation are as follows:



**Note:** The checklist and Installation Procedure indicate how to install a new ATM environment. If you need to upgrade an environment from an earlier version of ATM, refer to [Upgrading from Earlier Versions of ATM](#) for important additional information..

Step	Description	Job Name
	Before proceeding with the installation, ensure that all necessary preparation has been completed as described in section <a href="#">Before You Install</a> .	
1	Restore the libraries from the installation tape.	
2	Create the transaction manager daemon database.	ATMI030
3	Load the transaction manager files to the ATM daemon's database.	ATM1050
4	INPL the Online Services application.	ATM1061



Step	Description	Job Name
5	Define the default job parameters for use by the transaction manager proxy.	
6	Prepare the Adabas Transaction Manager daemon job.	ATMI200
7	If required, define an Adabas System Coordinator file for migrated transaction records.	
8	Enable databases for two-phase commit.	
9	Prepare the Adabas System Coordinator daemons to support ATM.	
10	Make Adabas Transaction Manager components available as required.	

## Installation Procedure

Following is the general Adabas Transaction Manager installation procedure. The actual installation depends on your particular requirements and the specific contents of the release package provided by Software AG for your site. Information in the release package is intended for your system. If that information differs from the information in this section, use the release package information or contact Software AG technical support for assistance.

### Step1: Copying the Tape Contents to Disk

If you are using System Maintenance Aid (SMA), refer to the SMA documentation (included on the current edition of the Natural documentation CD). If you are not using SMA, perform steps 1a, 1b and 1c as described in this section:

- [Step 1a: Copy Data Set COPY.JOB from Tape to Disk](#)
- [Step 1b: Modify COPY.JOB](#)
- [Step 1c: Submit COPY.JOB](#)



**Note:** If the datasets for more than one product are delivered on the tape, the dataset COPY.JOB contains the JCL to unload the datasets for all delivered products from the tape to your disk. After that, you will have to perform the individual install procedure for each component.

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

The data set COPY.JOB (label 2) contains the JCL to unload all other existing data sets from tape to disk. To unload COPY.JOB, use the following sample JCL:

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

where:

```
<hilev> is a valid high level qualifier
<Tnnnnn> is the tape number
<vvvvvv> is the desired volser
```

### Step 1b: Modify COPY.JOB

Modify the COPY.JOB to conform with your local naming conventions and set the disk space parameters before submitting this job:

- set HILEV to a valid high level qualifier
- set LOCATION to a storage location
- set EXPDT to a valid expiration date

**Step 1c: Submit COPY.JOB**

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

**Step 2: Create the Transaction Manager Daemon Database (Job ATMI030)(SMA Job I030, Steps 4190,4191)**

The transaction manager daemon database holds recovery information and, depending on the setting of the `TMETDATA` parameter, `ET` data, but no other operational data. The remaining files are for occasional use for special purposes – to store diagnostic log information obtained by the transaction manager proxy, and to hold details of transactions that were forcibly terminated. The size of this database depends mainly on the number of transactions that might be in progress at the same time, and the total amount of `ET` data, if any, that the ATM daemon will need to store.

**▶ to create the daemon database:**

- Use sample job ATMI030, modified to meet your requirements, to establish the database.

Initially, define a database with the following component sizes:

DATA: 250 cylinders  
 ASSO: 50 cylinders  
 WORK: 50 cylinders  
 TEMP: 20 cylinders  
 SORT: 20 cylinders

Enough Data Storage space in the recovery file must be allocated to accommodate the maximum number of concurrently active transactions. The following can be used as a guide for calculating the required Data Storage space:

$x$  times  $y$  is the required number of Data Storage blocks,

where  $x$  is the maximum number of concurrent transactions/branches at the local ATM daemon, and  $y$  is the average number of compressed recovery records (PRRs) per Data Storage block. Assume that a compressed PRR requires about 2300 bytes if the transaction has 2000 bytes (compressed) of `ET` data, and 300 bytes if there is no `ET` data. It is recommended to allow a safety margin of about 50 percent extra space.

Standard block sizes are adequate for most sites. However, if transactions which perform changes to many databases are to be used, it may be necessary to increase the Data Storage block size to accommodate large recovery records.

No `ET` data will be stored in this database's checkpoint file. The following parameters should be adequate for the daemon checkpoint file.

```
MAXISN=10,000
DSSIZE=100B
```

```
NISIZE=20B
UISIZE=8B
```

Use the normal reporting utilities to determine whether space shortages are likely to occur.

### **Step 3: Load the Transaction Manager Files into the ATM Daemon's Database (Job ATMI050)(SMA Job I050, Step 4190)**

The recovery record file, suspect transaction file, proxy log file and ET data file have numbers 5, 6, 7 and 8, respectively. These file numbers are fixed. Since no application files should be loaded into this database, there should be no conflict.

If ET data is to be stored in the ATM daemon's database (TMETDATA=ATM), define file 8 with MAXISN large enough to allow an ISN for each ETID that will ever be used in this Adabas Transaction Manager's local system. A decompressed ET data record occupies about 2 kilobytes. If you choose to store ET data in target databases (TMETDATA=TARGETS), file 8 will not be used. For more information, see TMETDATA parameter.

#### **▶ to load the Transaction Manager files into the ATM daemon's database:**

- Use job ATMI050 to define the recovery record, suspect transaction, proxy log and ET data files in the ATM daemon's database.

The suggested sizes are adequate for the purposes of testing. You can use the normal reporting utilities to check whether your system needs larger files.

### **Step 4: Install the Online Services Application SYSATM (Job ATMI061)(SMA Job I061, Steps 4190,4193)**

The Adabas Transaction Manager Online Services application is delivered on the installation tape as a NATUNLD dataset created under Natural 3.1. The application programs are stored in libraries SYSATM and SYSMT<sub>vrs</sub> where *vrs* is the version, revision, and system maintenance level of the product.

#### **▶ to install the Online Services application SYSATM:**

- 1 Use a Natural utility to install the Online Services application and ERRLODUS to install its messages.
- 2 If Natural Security is installed, define the libraries SYSATM and SYSMT<sub>vrs</sub>, where *vrs* is the version, revision, and system maintenance level of the product.

## Step 5: Define the Default Job Parameters for the Transaction Manager Proxy

The default job parameters for the Transaction Manager proxy must be defined. For further information, see Online Services, Job Parameters. See also the section Adabas Transaction Manager Components.



**Note:** If you are upgrading from ATM version 7.4, you must modify each set of job parameters by providing a value for the Adabas System Coordinator Group Name.

### ▶ to define the default job parameters for the Transaction Manager proxy:

- 1 Start a Natural session and log on to the newly installed SYSATM application. Invoke the Menu function. If you have not defined LFILE 152 for your Natural session, a message will prompt you to define it now. Select Systems Settings, then option LFILE 152 Maintenance. Enter the Database ID and file number of the system file that you created when you installed the Adabas System Coordinator. Enter values for the remaining input fields, and confirm your definition. Now return to the main menu and select the Job Parameters option. For a detailed description of the following step, refer to Online Services, Job Parameters.
- 2 On the Job Parameters screen, press PF10 to add a new default definition. Make sure that you set Adabas Transaction Manager to ON. Confirm your new definition, then select it for modification by marking it with an “m”. Set the SVC number that will be used by the Adabas Transaction Manager daemon that you are installing. You must also set the name of the Adabas System Coordinator group in which your client jobs and TP systems will execute. The provided default values for the remaining parameters should be satisfactory for the purpose of completing and verifying the installation. You can review and change them as required once you have completed and verified the installation.

## Step 6: Prepare the Adabas Transaction Manager Daemon Job (SMA Job I200, Step 4190)

Because the Adabas Transaction Manager daemon executes as a special kind of Adabas nucleus, its JCL is similar to that of a normal Adabas nucleus.

### ▶ to prepare the Adabas Transaction Manager daemon job:

- 1 Make any necessary site-specific changes to ATMI200 so that it can be used as a procedure for a started task.
- 2 Ensure that any ADALNK module that can be loaded by the ATM job does not have the Adabas System Coordinator stub linked into it.
- 3 Specify `ADARUN DTP=TM`.
- 4 Specify `ADARUN TMLLOG=NEVER` for the purpose of verifying the installation. Once the verification process has been completed, reconsider this parameter setting.
- 5 Specify `ADARUN NONDES=YES`. This is the default setting.

Set other ADARUN parameters as you would for a normal database. For initial testing, the default limits and pool and buffer sizes should be sufficient. You can use the sample parameters in the JOBS library, member TMPARMS, as a basis for the daemon's ADARUN parameters.

See the section Parameters for a description of the ADARUN parameters that affect Adabas Transaction Manager operation.



**Note:** An Adabas Transaction Manager daemon job must be run in each operating system image that will participate in distributed transaction processing (DTP). If more than one Adabas SVC is used in the same system image, an Adabas Transaction Manager daemon must be run under each Adabas SVC that will participate in DTP.

### Step 7: Define an Adabas System Coordinator File

If you plan to use ATM in a multi-system dynamic transaction routing (DTR) environment, you might first need to define an Adabas System Coordinator file (SYSCO file) to hold migrated transaction records (MTRs) for the ATM daemons that will execute alongside the Adabas System Coordinator daemons in the group. This file is needed if you plan to use a multi-system DTR environment in which a user who is not at global transaction status can be migrated from one system image to another (for example, a CICSplex cluster with the ATM job parameter `TRANMODE=DYNAMIC`).



**Note:** It is planned to provide a description of how to define and create a SYSCO file in the *Adabas System Coordinator* documentation. Until this description is available, please use the following instructions.

#### ▶ to define a SYSCO file to contain migrated transaction records:

- 1 Define a standard Adabas file to contain MTRs. For the Adabas Transaction Manager daemons in a COR group, a single MTR will be stored for each global transaction whose owner is migrated from one system image to another while the transaction is open; the record will be deleted when the transaction is finally committed or backed out. The following ADALOD parameters should be sufficient for 1000 MTRs at the same time, assuming block sizes of about 4 kilobytes for Data Storage and about 2 kilobytes for Associator:

```
DSSIZE=50B  
NISIZE=30B  
UISIZE=5B
```

During normal use, you can use the standard Adabas reporting utility to check that your file is of adequate size.

An ADALOD input file is supplied on the installation tape. Load the empty file into a database which runs with high availability and which is accessible to all SYSCO daemons in the group.

- 2 Log on to the online system, SYSCOR, of the Adabas System Coordinator. You will need a System Coordinator group definition for the group in which your ATM daemon will execute. Refer to the *Adabas System Coordinator* documentation for details of making group definitions. Having made your group definition, mark the group name with 'F', as shown below, and press Enter:

```
07:53:01 ***** A D A B A S   SYSTEM COORDINATOR 7.4.2 (I005) ***** 2005-01-19
                - System Coordinator Groups -                               C11200M1

Runmode: Local                                           Session: Local

C Group Name      Type      SVC ID      Cluster Facility      Name      Members
F  CORATMGP       Sysplex   254         CASPLI_CACHE1        1
  CORGROUP       Multi    244

Mark with D(isplay),M(odify),P(urge),R(ename),E(xpand),F(iles)

Command ==>
Enter-PF1---PF2---PF3---PF4---PF5---PF6---PF7---PF8---PF9---PF10--PF11--PF12
      Help      Exit  Refr          Add      Menu
```

At the next screen, press PF10 to add a new definition. Enter the MTR file definition in the pop-up window, as follows, specifying a DBID and file number that are suitable for your installation:

```
07:57:00                               Add File Definition                               2005-01-19
                                          C11270M2

Group Name: CORATMGP

File Name: ATMMTR      DB ID: 135      File Number: 175      SVC: 254

Description: ATM MIGRATED TRAN RECORDS

Press PF5 to confirm

Command ==>
                               PF1 Help      PF3 Exit      PF5 Add
```

ATM's MTR file must be defined with SYSCO file name ATMMTR.



**Note:** If you do not create a definition for the MTR file using SYSCOR, ATM will assume that you have determined that no MTR file is needed. Even so, an ATM daemon might issue a warning message if it finds no definition. If this happens, and you are sure that you do not need an MTR file, you can prevent the message from appearing simply by creating a dummy MTR file definition for the COR group, using SYSCOR.

## Step 8: Enable Databases for Two-Phase Commit Processing

### ▶ to enable databases for two-phase commit processing

- 1 Ensure that the parameter

```
ADARUN DTP=RM
```

is set in every database that participates in global transactions coordinated by Adabas Transaction Manager.

- 2 Add the Adabas System Coordinator load library and the Adabas Transaction Manager load library to the STEPLIB DD concatenation.
- 3 In the case of Adabas Cluster Services or Adabas Parallel Services databases, use the Adabas 7.4 update library LX06, concatenated before the standard Adabas 7.4.3 library in the STEPLIB concatenation.
- 4 In the case of Adabas 7.1 databases, you must apply fix A\$71306 to your Adabas 7.1 load library. The fix is contained in member ZAPOPT of the supplied JOBS library.



**Caution:** Applying this fix will make your Adabas 7.1 load library incompatible with Adabas Transaction Manager 1.2.

Refer to the *Adabas System Coordinator* documentation for more information on how to run Adabas Transaction Manager 7.4 with Adabas 7.1 databases. The same instructions can be used for running Adabas Transaction Manager 7.5 with Adabas 7.1 databases.

## Step 9: Prepare the Adabas System Coordinator Daemons

The ATM load library should be made available to all SYSCO daemons which will run under the same Adabas SVC as an ATM v7.5 daemon.

The SYSCO daemons must be started with the parameter setting `PRODUCT=ATM`.



## Step 10: Make Adabas Transaction Manager Components Available

The ATM load library should be made available:

- in the STEPLIB of batch jobs, TSO procedures, and JCL procedures for CICS and IMS/TM systems that will be used by users or applications that require Adabas Transaction Manager services;
- in the COMPLIB of the JCL procedures for Com-plete systems that will be used by users or applications that require Adabas Transaction Manager services.

Ensure that the Adabas System Coordinator stub has been linked into the Adabas link modules that will be executed in each of the above environments.

The ATM load library and the Adabas System Coordinator library should be made available:

- in the STEPLIB of Adabas Transaction Manager daemon jobs;
- in the STEPLIB of multiuser database nucleus jobs that will run with `DTP=RM`.



**Caution:** The Adabas Transaction Manager proxy must not be used by any job or started task that executes an Adabas Transaction Manager daemon, an Entire Net-Work node, or an Adabas nucleus running in multiuser mode. You should therefore make sure that the Adabas System Coordinator stub is not present in any ADALNK module that might be used by these jobs.



# 7 Installing CICS Resource Manager Interface for z/OS or OS/390

---

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- Installation Procedure ..... 45

If you intend to use Adabas Transaction Manager through the CICS Resource Manager Interface (RMI), use the following installation procedure in conjunction with the installation procedure for the Adabas task-related user exit (TRUE) described in the *Adabas Installation for OS/390 and z/OS* documentation.



**Note:** CICS/ESA version 4.1 or above or CICS/TS version 1.2 or above is required.

## Installation Overview

---

The steps needed for a successful installation are as follows:

Step	Description
	Before proceeding with the installation, ensure that all necessary preparation has been completed as described in section <b>Before You Install</b> .
1	Perform standard installation procedure for Adabas Transaction Manager, and verify the installation.
2	Follow the steps for the installation of the Adabas TRUE, with the changes described below.
3	Establish CICS definitions for Adabas Transaction Manager RMI programs.
4	Copy the Adabas Transaction Manager RMI modules into a CICS RPL library.
5	Enable the required CICS facilities.
6	Define job parameters for the CICS system.
7	Activate the Adabas Transaction Manager CICS Resource Manager Interface (RMI).

## Installation Procedure

---

The following is the general RMI installation procedure. All steps are required for a successful installation.

The actual installation depends on your particular requirements and the specific contents of the release package provided by Software AG for your site. Information in the release package is intended for your system. If that information differs from the information in this section, use the release package information or contact Software AG technical support for assistance.

## Step 1: Install Adabas Transaction Manager

It is strongly recommended that you first install and verify the execution of the Adabas Transaction Manager daemon and proxy without activating the RMI.

## Step 2: Install the Adabas TRUE (SMA Job I056, Step 0010)

This process is fully described in the *Adabas Installation for OS/390 and z/OS* documentation. However, the installation process for the RMI differs in a few points from that described. Follow the instructions below as you go through the installation process.

### ▶ to activate the RMI:

- 1 Set the following values in the ADAGSET macro:

RMI=YES	activate the CICS Resource Manager Interface (RMI)
TRUE=YES	run as a task-related user exit (TRUE)

- 2 When linking the Adabas command-level link component, you must link in the Adabas System Coordinator stub module.
- 3 When you assemble and link the Adabas task-related user exit, include the Adabas Transaction Manager RMI interface module in the link step. Sample job ATMIO80X can be adapted for this purpose.

## Step 3: Establish CICS Definitions for the RMI Programs (SMA Job I005, Steps 2211,2212,2230,2231)

### ▶ to establish CICS definitions for the RMI programs:

- Use DFHCSDUP or the CEDA RDO entry panels to add the definitions delivered in member DFHDUP in the ATM751.JOBS dataset.



**Note:** If storage protection is active in your CICS system, EXECKEY(CICS) should be specified for the PROGRAM definitions.

#### **Step 4: Copy RMI Modules into a CICS RPL library**

The following programs, supplied in the ATM load library, must be made available in the DFHRPL DD concatenation of your CICS JCL procedure:

ATMRMIR0  
ATMRMIRS  
ATMORID

#### **Step 5: Enable the Required CICS Facilities**

Adabas Transaction Manager uses the External CICS Interface (EXCI) to trigger the re-synchronization of incomplete transactions during restart. Therefore, the CICS system in which you are installing the RMI must have interregion communication enabled, and must be enabled for EXCI, the external EXEC CICS interface, which requires a generic connection. Refer to the relevant IBM documentation for details.

If your installation uses a security system, such as RACF, ensure that the User ID under which Adabas Transaction Manager executes has authorization to use EXCI.

#### **Step 6: Define Job Parameters for CICS**

Use Adabas Transaction Manager Online Services to define the required job parameters for the CICS job.

The required parameters are described in section Parameters. Some special considerations are necessary when running with the RMI active. Define a set of job parameters for the CICS job. Pay particular attention to the parameters LCLSYNC, TRANMODE and TRNCTL, as well as the SYNCONxx parameters.

#### **Step 7: Activate CICS Resource Manager Interface**

▶ to activate the CICS Resource Manager Interface:

- 1 Ensure that the CICS EXCI load library is available in the STEPLIB concatenation of your Adabas Transaction Manager job or JCL procedure.
- 2 Start CICS.
- 3 Ensure that the Adabas System Coordinator daemon is executing.
- 4 Start the Adabas Transaction Manager daemon.

# 8

## Installing RRMS Interface Under z/OS or OS/390

---

- Installation Checklist ..... 36
- Installation Procedure ..... 36

If you intend to use Adabas Transaction Manager in conjunction with the Recoverable Resource Management Services (RRMS), use the following installation procedure.

## Installation Checklist

---

The steps needed for a successful installation are as follows:



**Note:** OS/390 version 2.6 or above, or z/OS is required.

Step	Description
1	Perform standard installation procedure for Adabas Transaction Manager, and verify the installation.
2	Copy the Adabas Transaction Manager RRMS exits into an LPA library.
3	APF-authorize the Adabas Transaction Manager daemon.
4	Link the RRMS interface modules to the Adabas Transaction Manager kernel (job ATMI070).
5	Define job parameters for the jobs and IMS systems whose transactions will be controlled by RRS.
6	Verify the system logger and RRS operation.
7	Activate the Adabas Transaction Manager RRMS interface.

## Installation Procedure

---

The following is the general procedure for installing the Adabas Transaction Manager RRMS interface. All steps are required for a successful installation.

The actual installation depends on your particular requirements and the specific contents of the release package provided by Software AG for your site. Information in the release package is intended for your system. If that information differs from the information in this section, use the release package information or contact Software AG technical support for assistance.

### Step 1: Install Adabas Transaction Manager

It is strongly recommended that you first install and verify the execution of the Adabas Transaction Manager daemon and proxy without activating the RRMS interface.



**Step 2: Copy RRMS Exits into an LPA Library**

The Adabas Transaction Manager RRMS exits are contained in the single module ATMRRSEX, which is supplied in the Adabas Transaction Manager load library.

This module must be made available in the LPA of your OS/390 or z/OS system. You can use various third-party tools to place ATMRRSEX in the LPA temporarily. For permanent installation, you should copy the module into a library that appears in the system LPALST concatenation, then IPL the system specifying the CLPA option.

If ATMRRSEX is not available in the LPA when Adabas Transaction Manager attempts to initialize its RRMS interface, system ABEND 052 occurs.

**Step 3: APF-Authorize the Adabas Transaction Manager Daemon**

RRMS requires that resource managers execute as APF-authorized programs. The Adabas Transaction Manager daemon must run authorized if its RRMS interface is to be used. However, databases that run with DTP=RM do not need to be authorized.

Ensure that every library in the STEPLIB concatenation of the Adabas Transaction Manager daemon JCL procedure is APF-authorized.

**Step 4: Link the RRMS Interface Modules to the ATM Kernel (Job ATMI070)(SMA Job I070, Step 4190)**

In order for an application's transactions to be coordinated by RRMS, some additional interface modules from IBM must be linked into the Adabas Transaction Manager kernel.

Job ATMI070 can be adapted for this purpose. Unresolved external references can be ignored, provided that the named RRMS modules are included successfully.

**Step 5: Create Job Parameters**

Use Adabas Transaction Manager Online Services to define the required job parameters.

The required parameters are described in section Parameters. Some special considerations are necessary when running with the RRMS interface active. Define a set of job parameters for those batch jobs and IMS/TM systems that require the transactional control of RRS, and pay particular attention to the TRNCTL parameter.

### **Step 6: Verify the System Logger and RRS Operation**

Ensure that the system logger is active in your OS/390 or z/OS system and that RRS has been started. Refer to the *IBM OS/390 or z/OS* documentation for details.

### **Step 7: Activate the Adabas Transaction Manager RRMS Interface**

▶ **to activate the RRMS Interface:**

- 1 Specify `TMSYNCMGR=RRMS` in the Adabas Transaction Manager ADARUN parameters.
- 2 Ensure that the Adabas System Coordinator daemon is running.
- 3 Start the Adabas Transaction Manager daemon.

# 9 Installing Adabas Transaction Manager for VSE/ESA

---

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## The Installation Tape

Review the *Report of Tape Creation* that accompanies the release package before restoring the release data to disk.

The installation tape contains the following datasets in the sequence indicated in the report:

Dataset	Contents
ATM $vrs$ .LIBR	Executable modules and sample jobs
ATM $vrs$ .SYS5	ADALOD input for the ATM PRR file
ATM $vrs$ .SYS6	ADALOD input for the ATM STJ file
ATM $vrs$ .SYS7	ADALOD input for the user proxy log (UPL) file
ATM $vrs$ .SYS8	ADALOD input for the ET data file
ATM $vrs$ .INPL	Online Services application
ATM $vrs$ .ERRN	Online Services messages
ADA743.LX06	Adabas load library update

where  $vrs$  is the version, revision, and system maintenance level of the product. Use the comments in the jobs when modifying them to conform to site requirements.

## Installation Checklist

The steps needed for a successful installation are as follows:

Step	Description	Job Name
	Before proceeding with the installation, ensure that all necessary preparation has been completed as described in section <b>Before You Install</b> .	
1	Restore the libraries from the installation tape.	
2	Create the transaction manager daemon database.	ATMI030
3	Load the transaction manager files to the ATM daemon's database.	ATM1050
4	INPL the Online Services application SYSATM.	ATM1061
5	Define the default job parameters for use by the transaction manager proxy.	
6	Prepare the Adabas Transaction Manager daemon job.	ATMI200
7	Enable databases for two-phase commit.	
8	Prepare the Adabas System Coordinator daemons to support ATM.	
9	Make Adabas Transaction Manager components available as required.	

Step	Description	Job Name
10	Define Adabas Transaction Manager to MSHP CORRECT facility.	

## Installation Procedure

Following is the general Adabas Transaction Manager installation procedure. The actual installation depends on your particular requirements and the specific contents of the release package provided by Software AG for your site. Information in the release package is intended for your system. If that information differs from the information in this section, use the release package information or contact Software AG technical support for assistance.

### Step 1: Restore Libraries from the Installation Tape

► to restore libraries from the installation tape:

- Use LIBR to unload the library:

Variable	Is the...
<i>cuu</i>	tape unit number
<i>vrs</i>	version, revision, and system maintenance level
<i>tttttt</i>	volume serial number of the installation tape
<i>xx</i>	file spacing information; see the Report of Tape Creation

```
* $$ JOB JNM=LIBREST,CLASS=0,DISP=D
* $$ LST CLASS=A,DISP=H
// JOB LIBREST
// ASSGN SYS006,cuu,VOL=tttttt
// ASSGN SYS005,IGN
// MTC REW,SYS006
// MTC FSF,SYS006,xx
// EXEC LIBR
RESTORE S=SAGLIB.AVIvrs:SAGLIB.AVIvrs
TAPE=SYS006 TL=tttttt LIST=Y
/*
// MTC REW,SYS006
/&
* $$ EOJ
```

## Step 2: Create the Transaction Manager Daemon Database (Job ATMI030)

The transaction manager daemon database holds recovery information and, depending on the setting of the `TMETDATA` parameter, `ET` data, but no other operational data. The remaining files are for occasional use for special purposes – to store diagnostic log information obtained by the transaction manager proxy, and to hold details of transactions that were forcibly terminated. The size of this database depends mainly on the number of transactions that might be in progress at the same time, and the total amount of `ET` data, if any, that the ATM daemon will need to store.

### ▶ to create the daemon database:

- Use sample job ATMI030, modified to meet your requirements, to establish the database.

Initially, define a database with the following component sizes:

DATA: 250 cylinders  
ASSO: 50 cylinders  
WORK: 50 cylinders  
TEMP: 20 cylinders  
SORT: 20 cylinders

Enough Data Storage space in the recovery file must be allocated to accommodate the maximum number of concurrently active transactions. The following can be used as a guide for calculating the required Data Storage space:

$x$  times  $y$  is the required number of Data Storage blocks,

where  $x$  is the maximum number of concurrent transactions/branches at the local ATM daemon, and  $y$  is the average number of compressed recovery records (PRRs) per Data Storage block. Assume that a compressed PRR requires about 2300 bytes if the transaction has 2000 bytes (compressed) of `ET` data, and 300 bytes if there is no `ET` data. It is recommended to allow a safety margin of about 50 percent extra space.

Standard block sizes are adequate for most sites. However, if transactions which perform changes to many databases are to be used, it may be necessary to increase the Data Storage block size to accommodate large recovery records.

No `ET` data will be stored in this database's checkpoint file. The following parameters should be adequate for the daemon checkpoint file.

```
MAXISN=10,000  
DSSIZE=100B  
NISIZE=20B  
UISIZE=8B
```

Use the normal reporting utilities to determine whether space shortages are likely to occur.

### Step 3: Load the Transaction Manager Files into the ATM Daemon's Database (Job ATMI050)

The recovery record file, suspect transaction file, proxy log file and ET data file have numbers 5, 6, 7 and 8, respectively. These file numbers are fixed. Since no application files should be loaded into this database, there should be no conflict.

If ET data is to be stored in the ATM daemon's database (TMETDATA=ATM), define file 8 with MAXISN large enough to allow an ISN for each ETID that will ever be used in this Adabas Transaction Manager's local system. A decompressed ET data record occupies about 2 kilobytes. If you choose to store ET data in target databases (TMETDATA=TARGETS), file 8 will not be used. For more information, see TMETDATA parameter.

▶ **to load the Transaction Manager files into the daemon's database:**

- Use job ATMI050 to define the recovery record, suspect transaction, proxy log and ET data files in the ATM daemon's database.

The suggested sizes are adequate for the purposes of testing. You can use the normal reporting utilities to check whether your system needs larger files.

### Step 4: Install the Online Services Application SYSATM (Job ATMI061)

The Adabas Transaction Manager Online Services application is delivered on the installation tape as a NATUNLD dataset created under Natural 3.1. The application programs are stored in libraries SYSATM and SYSMT<sub>vrs</sub> where *vrs* is the version, revision, and system maintenance level of the product.

▶ **to install the Online Services application SYSATM:**

- 1 Use a Natural utility to install the Online Services application and ERRLODUS to install its messages.
- 2 If Natural Security is installed, define the libraries SYSATM and SYSMT<sub>vrs</sub>, where *vrs* is the version, revision, and system maintenance level of the product.

### Step 5: Define the Default Job Parameters for the Transaction Manager Proxy

The default job parameters for the Transaction Manager proxy must be defined. For further information, see Online Services, Job Parameters. See also the section Adabas Transaction Manager Components.

▶ **to define the default job parameters for the Transaction Manager proxy:**

- 1 Start a Natural session and log on to the newly installed SYSATM application. Invoke the Menu function. If you have not defined LFILE 152 for your Natural session, a message will

prompt you to define it now. Select Systems Settings, then option LFILE 152 Maintenance. Enter the Database ID and file number of the system file that you created when you installed the Adabas System Coordinator. Enter values for the remaining input fields, and confirm your definition. Now return to the main menu and select the Job Parameters option. For a detailed description of the following step, refer to Online Services, Job Parameters

- 2 On the Job Parameters screen, press PF10 to add a new default definition. Make sure that you set Adabas Transaction Manager to ON. Confirm your new definition, then select it for modification by marking it with an "m". Set the SVC number that will be used by the Adabas Transaction Manager daemon that you are installing. You must also set the name of the Adabas System Coordinator group in which your client jobs and TP systems will execute. The provided default values for the remaining parameters should be satisfactory for the purpose of completing and verifying the installation. You can review and change them as required once you have completed and verified the installation.

### Step 6: Prepare the Adabas Transaction Manager Daemon Job

Because the Adabas Transaction Manager daemon executes as a special kind of Adabas nucleus, its JCL is similar to that of a normal Adabas nucleus.

#### to prepare the Adabas Transaction Manager daemon job:

- 1 Make any necessary site-specific changes to ATMI200 so that it can be used as a procedure for a started task.
- 2 Ensure that any ADALNK module that can be loaded by the ATM job does not have the Adabas System Coordinator stub linked into it.
- 3 Specify `ADARUN DTP=TM`.
- 4 Specify `ADARUN TMLLOG=NEVER` for the purpose of verifying the installation. Once the verification process has been completed, reconsider this parameter setting.
- 5 Specify `ADARUN NONDES=YES`. This is the default setting.

Set other ADARUN parameters as you would for a normal database. For initial testing, the default limits and pool and buffer sizes should be sufficient.

See the section Parameters for a description of the ADARUN parameters that affect Adabas Transaction Manager operation.



**Note:** An Adabas Transaction Manager daemon job must be run in each operating system image that will participate in distributed transaction processing (DTP). If more than one Adabas SVC is used in the same system image, an Adabas Transaction Manager daemon must be run under each Adabas SVC that will participate in DTP.



## Step 7: Enable Databases for Two-Phase Commit Processing

### ▶ to enable databases for two-phase commit processing

- 1 Ensure that the parameter

```
ADARUN DTP=RM
```

is set in every database that participates in global transactions coordinated by Adabas Transaction Manager.

- 2 Add the ATM load library to the LIBDEF SEARCH chain.
- 3 In the case of Adabas Parallel Services databases, use the Adabas 7.4 update library LX06, ahead of the standard Adabas 7.4.3 library in the LIBDEF SEARCH chain.
- 4 In the case of Adabas 7.1 databases, you must apply fix A\$71306 to your Adabas 7.1 load library. The fix is contained in member ZAPOPT of the supplied JOBS library.

Refer to the *Adabas System Coordinator* documentation for more information on how to run Adabas Transaction Manager 7.4 with Adabas 7.1 databases. The same instructions can be used for running Adabas Transaction Manager 7.5 with Adabas 7.1 databases.

## Step 8: Prepare the Adabas System Coordinator Daemons

The ATM load library should be made available to all SYSCO daemons which will run under the same Adabas SVC as an ATM v7.5 daemon.

The SYSCO daemons must be started with the parameter setting `PRODUCT=ATM`.

## Step 9: Make Adabas Transaction Manager Components Available

The ATM load library should be made available:

- in the LIBDEF SEARCH chain of batch jobs and JCL procedures for CICS and IMS/TM systems that will be used by users or applications that require Adabas Transaction Manager services;
- in the COMPLIB of the JCL procedures for Complete systems that will be used by users or applications that require Adabas Transaction Manager services.

Ensure that the Adabas System Coordinator stub has been linked into the Adabas link modules that will be executed in each of the above environments.

The ATM load library and the Adabas System Coordinator library should be made available:

- in the LIBDEF SEARCH chain of Adabas Transaction Manager daemon jobs;
- in the LIBDEF SEARCH chain of multiuser database nucleus jobs that will run with `DTP=RM`.



**Caution:** The Adabas Transaction Manager proxy must not be used by any job or started task that executes an Adabas Transaction Manager daemon, an Entire Net-Work node, or an Adabas nucleus running in multiuser mode. You should therefore make sure that the Adabas System Coordinator stub is not present in any ADALNK module that might be used by these jobs.

### Step 10: Define Adabas Transaction Manager to MSHP CORRECT Facility

Corrections for Adabas Transaction Manager will be distributed as zaps that are to be applied using the MSHP CORRECT facility. Before applying corrections you must define Adabas Transaction Manager to MSHP with the MSHP ARCHIVE command (see the following sample job):

```
// JOB ARCHIVE
// OPTION LOG
// EXEC MSHP
ARCHIVE ATMvrs
COMPRISES 9001-ATM-00
RESOLVES 'SOFTWARE AG - ADABAS TRANSACTION MANAGER Vv.r'
ARCHIVE 9001-ATM-00-vrs
RESIDENCE PRODUCT=ATMvrs -
PRODUCTION=saglib.ATMvrs -
GENERATION=saglib.ATMvrs
/*
/ &
```

# 10 Installing CICS Resource Manager Interface for VSE/ESA

---

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- Installation Procedure ..... 48

If you intend to use Adabas Transaction Manager through the CICS Resource Manager Interface (RMI), use the following installation procedure in conjunction with the installation procedure for the Adabas task-related user exit (TRUE) described in the *Adabas Installation for OS/390 and z/OS* documentation.



**Note:** CICS/ESA version 4.1 or above or CICS/TS version 1.2 or above is required.

## Installation Checklist

---

The steps needed for a successful installation are as follows:

Step	Description
	Before proceeding with the installation, ensure that all necessary preparation has been completed as described in section <b>Before You Install</b> .
1	Perform standard installation procedure for Adabas Transaction Manager, and verify the installation.
2	Follow the steps for the installation of the Adabas TRUE, with the changes described below.
3	Establish CICS definitions for Adabas Transaction Manager RMI programs.
4	Copy the Adabas Transaction Manager RMI modules into a CICS RPL library.
5	Enable the required CICS facilities.
6	Define job parameters for the CICS system.
7	Activate the Adabas Transaction Manager CICS Resource Manager Interface (RMI).

## Installation Procedure

---

The following is the general RMI installation procedure. All steps are required for a successful installation.

The actual installation depends on your particular requirements and the specific contents of the release package provided by Software AG for your site. Information in the release package is intended for your system. If that information differs from the information in this section, use the release package information or contact Software AG technical support for assistance.

## Step 1: Install Adabas Transaction Manager

It is strongly recommended that you first install and verify the execution of the Adabas Transaction Manager daemon and proxy without activating the RMI.

## Step 2: Install the Adabas TRUE

This process is fully described in the *Adabas Installation for VSE/ESA* documentation. However, the installation process for the RMI differs in a few points from that described. Follow the instructions below as you go through the installation process.

### ▶ to activate the RMI:

- 1 Set the following values in the ADAGSET macro:

RMI=YES	activate the CICS Resource Manager Interface (RMI)
TRUE=YES	run as a task-related user exit (TRUE)

- 2 When linking the Adabas command-level link component, you must link in the Adabas System Coordinator stub module.
- 3 When you assemble and link the Adabas task-related user exit, include the Adabas Transaction Manager RMI interface module in the link step. Sample job ATMI080X can be adapted for this purpose.

## Step 3: Establish CICS Definitions for the RMI Programs

### ▶ to establish CICS definitions for the RMI programs:

- Use DFHCSDUP or the CEDA RDO entry panels to add the following definitions to your CSD file:

```
DEFINE PROGRAM(ATMRMIRO) GROUP(ADABAS)
DESCRIPTION(ATM Vvrs RESYNC DRIVER INTERFACE)
LANGUAGE(ASSEMBLER) RELOAD(NO) RESIDENT(YES) USAGE(NORMAL)
USELPACOPY(NO) STATUS(ENABLED) CEDF(NO) DATALOCATION(ANY)
EXECKEY(USER) EXECUTIONSET(FULLAPI)

DEFINE PROGRAM(ATMRMIRS) GROUP(ADABAS)
DESCRIPTION(ATM Vvrs RESYNC DRIVER)
LANGUAGE(ASSEMBLER) RELOAD(NO) RESIDENT(YES) USAGE(NORMAL)
USELPACOPY(NO) STATUS(ENABLED) CEDF(YES) DATALOCATION(ANY)
EXECKEY(USER) EXECUTIONSET(FULLAPI)

DEFINE PROGRAM(ATMORID) GROUP(ADABAS)
```

```
DESCRIPTION(ATM Vvrs PARAMETER OVERRIDER)
LANGUAGE(ASSEMBLER) RELOAD(NO) RESIDENT(YES) USAGE(NORMAL)
USELPACOPY(NO) STATUS(ENABLED) CEDF(YES) DATALOCATION(ANY)
EXECKEY(USER) EXECUTIONSET(FULLAPI)

DEFINE TRANSACTION(TMRS) GROUP(ADABAS)
DESCRIPTION(ATM Vvrs RESYNC DRIVER)
PROGRAM(ATMRMIRS) TWASIZE(128) PROFILE(DFHCICST) STATUS(ENABLED)
TASKDATALOC(ANY) TASKDATAKEY(USER) STORAGECLEAR(NO)
RUNAWAY(SYSTEM) SHUTDOWN(DISABLED) ISOLATE(YES) DYNAMIC(NO)
PRIORITY(1) TRANCLASS(DFHTCLOO) DTIMOUT(NO) INDOUBT(BACKOUT)
RESTART(NO) SPURGE(NO) TPURGE(NO) DUMP(YES) TRACE(YES)
RESSEC(NO) CMDSEC(NO)
```

—where *vrs* is the version, revision, and SM level of Adabas Transaction Manager.



**Note:** If storage protection is active in your CICS system, EXECKEY(CICS) should be specified for the PROGRAM definitions.

### Step 4: Copy RMI Modules into a CICS RPL library

The following programs, supplied in the ATM load library, must be made available in the DFHRPL DD concatenation of your CICS JCL procedure:

```
ATMRMIR0
ATMRMIRS
ATMORID
```

### Step 5: Enable the Required CICS Facilities

Adabas Transaction Manager uses the External CICS Interface (EXCI) to trigger the re-synchronization of incomplete transactions during restart. Therefore, the CICS system in which you are installing the RMI must have interregion communication enabled, and must be enabled for EXCI, the external EXEC CICS interface, which requires a generic connection. Refer to the relevant IBM documentation for details.

If your installation uses a security system, such as RACF, ensure that the User ID under which Adabas Transaction Manager executes has authorization to use EXCI.

**Step 6: Define Job Parameters for CICS**

Use Adabas Transaction Manager Online Services to define the required job parameters for the CICS job.

The required parameters are described in section Parameters. Some special considerations are necessary when running with the RMI active. Define a set of job parameters for the CICS job. Pay particular attention to the parameters `LCLSYNC`, `TRANMODE` and `TRNCTL`, as well as the `SYNCONxx` parameters.

**Step 7: Activate CICS Resource Manager Interface**

▶ to activate the CICS Resource Manager Interface:

- 1 Ensure that the CICS EXCI load library is available in the LIBDEF SEARCH concatenation of your Adabas Transaction Manager job or JCL procedure.
- 2 Start CICS.
- 3 Ensure that the Adabas System Coordinator daemon is running.
- 4 Start the Adabas Transaction Manager daemon.





# 11 Installing Adabas Transaction Manager for BS2000

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## The Installation Tape

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Review the *Report of Tape Creation* that accompanies the release package before restoring the release data to disk.

The installation tape contains the following datasets in the sequence indicated in the report:

Dataset	Contents
ATM $vrs$ .JOBS	Installation jobs, utility jobs
ATM $vrs$ .PAMS	Executable modules
ATM $vrs$ .SYS5	ADALOD input for the ATM PRR file
ATM $vrs$ .SYS6	ADALOD input for the ATM STJ file
ATM $vrs$ .SYS7	ADALOD input for the user proxy log (UPL) file
ATM $vrs$ .SYS8	ADALOD input for the ET data file
ATM $vrs$ .INPL	Online Services application
ATM $vrs$ .ERRN	Online Services messages
ADA743.LX06	Adabas load library update

where  $vrs$  is the version, revision, and system maintenance level of the product. Use the comments in the jobs when modifying them to conform to site requirements.

## Installation Checklist

---

The steps needed for a successful installation are as follows:

Step	Description	Job Name
	Before proceeding with the installation, ensure that all necessary preparation has been completed as described in section <b>Before You Install</b>	
1	Restore libraries from installation tape.	
2	Create the transaction manager daemon database.	ATMI030
3	Load the transaction manager files to the ATM daemon's database.	ATM1050
4	INPL the Online Services application.	ATM1061
5	Define the default job parameters for use by the transaction manager proxy.	
6	Prepare the Adabas Transaction Manager daemon job.	ATMI200
7	Enable databases for two-phase commit.	
8	Prepare the Adabas System Coordinator daemons to support ATM.	

Step	Description	Job Name
9	Make Adabas Transaction Manager components available as required.	

## Installation Procedure

Following is the general Adabas Transaction Manager installation procedure. The actual installation depends on your particular requirements and the specific contents of the release package provided by Software AG for your site. Information in the release package is intended for your system. If that information differs from the information in this section, use the release package information or contact Software AG technical support for assistance.

### Step 1: Restore Libraries from the Installation Tape

► to restore libraries from the installation tape:

- 1 Copy the library `SRVnnn.LIB` from tape to disk.



**Note:** This step is not necessary if you have already copied the library `SRVnnn.LIB` from another Software AG tape. For more information, refer to the element `#READ-ME` in this library.

The library `SRVnnn.LIB` is stored on the tape as the sequential file `SRVnnn.LIBS` containing LMS commands. The current version `nnn` can be obtained of the Report of Tape Creation. To convert this sequential file into an LMS-library, execute the following commands:

```
/IMPORT-FILE SUPPORT=*TAPE(FILE-NAME=SRVnnn.LIBS, -
/ VOLUME=<volser>, DEV-TYPE=<tape-device>)
/ADD-FILE-LINK LINK-NAME=EDTSAM, FILE-NAME=SRVnnn.LIBS, -
/ SUPPORT=*TAPE(FILE-SEQ=9), ACC-METH=*BY-CAT, -
/ BUF-LEN=*BY-CAT, REC-FORM=*BY-CAT, REC-SIZE=*BY-CAT
/START-EDT
@READ '/'
@SYSTEM 'REMOVE-FILE-LINK EDTSAM'
@SYSTEM 'EXPORT-FILE FILE-NAME=SRVnnn.LIBS'
@WRITE 'SRVnnn.LIBS'
@HALT
/ASS-SYSDTA SRVnnn.LIBS
/MOD-JOB-SW ON=1
/START-PROG $LMS
/MOD-JOB-SW OFF=1
/ASS-SYSDTA *PRIMARY
```

```
<tape-device> = device-type of the tape, e.g. TAPE-C4  
<volser> = VOLSER of tape (see Report of Tape Creation)
```

2 Copy the procedure COPY.PROC from tape to disk

Call the procedure P.COPYTAPE in the library SRV $nnn$ .LIB to copy the procedure COPY.PROC to disk:

```
/CALL-PROCEDURE (SRV $nnn$ .LIB,P.COPYTAPE), -  
/ (VSNT=<volser>, DEVT=<tape-device>)
```

If you use a TAPE-C4 device, you can omit the parameter DEVT.

3 Copy all product files from tape to disk

Enter the procedure COPY.PROC to copy all Software AG product files from tape to disk:

```
/ENTER-PROCEDURE COPY.PROC, DEVT=<tape-device>
```

If you use a TAPE-C4 device, you can omit the parameter DEVT. The result of this procedure is written to the file L.REPORT.SRV.

## Step 2: Create the Transaction Manager Daemon Database (Job ATMI030)

The transaction manager daemon database holds recovery information and, depending on the setting of the TMETDATA parameter, ET data, but no other operational data. The remaining files are for occasional use for special purposes – to store diagnostic log information obtained by the transaction manager proxy, and to hold details of transactions that were forcibly terminated. The size of this database depends mainly on the number of transactions that might be in progress at the same time, and the total amount of ET data, if any, that the ATM daemon will need to store.

▶ **to create the daemon database:**

- Use sample job ATMI030, modified to meet your requirements, to establish the database.

Initially, define a database with the following component sizes:

DATA: 250 cylinders  
ASSO: 50 cylinders  
WORK: 50 cylinders  
TEMP: 20 cylinders  
SORT: 20 cylinders

Enough Data Storage space in the recovery file must be allocated to accommodate the maximum number of concurrently active transactions. The following can be used as a guide for calculating the required Data Storage space:

$x$  times  $y$  is the required number of Data Storage blocks,

where  $x$  is the maximum number of concurrent transactions/branches at the local ATM daemon, and  $y$  is the average number of compressed recovery records (PRRs) per Data Storage block. Assume that a compressed PRR requires about 2300 bytes if the transaction has 2000 bytes (compressed) of ET data, and 300 bytes if there is no ET data. It is recommended to allow a safety margin of about 50 percent extra space.

Standard block sizes are adequate for most sites. However, if transactions which perform changes to many databases are to be used, it may be necessary to increase the Data Storage block size to accommodate large recovery records.

No ET data will be stored in this database's checkpoint file. The following parameters should be adequate for the daemon checkpoint file.

```
MAXISN=10,000
DSSIZE=100B
NISIZE=20B
UISIZE=8B
```

Use the normal reporting utilities to determine whether space shortages are likely to occur.

### Step 3: Load the Transaction Manager Files into the ATM Daemon's Database (Job ATMI050)

The recovery record file, suspect transaction file, proxy log file and ET data file have numbers 5, 6, 7 and 8, respectively. These file numbers are fixed. Since no application files should be loaded into this database, there should be no conflict.

If ET data is to be stored in the ATM daemon's database (TMETDATA=ATM), define file 8 with MAXISN large enough to allow an ISN for each ETID that will ever be used in this Adabas Transaction Manager's local system. A decompressed ET data record occupies about 2 kilobytes. If you choose to store ET data in target databases (TMETDATA=TARGETS), file 8 will not be used. For more information, see TMETDATA parameter.

#### ▶ to load the Transaction Manager files into the daemon's database:

- Use job ATMI050 to define the recovery record, suspect transaction, proxy log and ET data files in the daemon's database.

The suggested sizes are adequate for the purposes of testing. You can use the normal reporting utilities to check whether your system needs larger files.

#### **Step 4: Install the Online Services Application SYSATM (Job ATMI061)**

The Adabas Transaction Manager Online Services application is delivered on the installation tape as a NATUNLD dataset created under Natural 3.1. The application programs are stored in libraries SYSATM and SYSMT*vrs* where *vrs* is the version, revision, and system maintenance level of the product.

▶ **to install the Online Services application SYSATM:**

- 1 Use a Natural utility to install the Online Services application and ERRLODUS to install its messages.
- 2 If Natural Security is installed, define the libraries SYSATM and SYSMT*vrs*, where *vrs* is the version, revision, and system maintenance level of the product.

#### **Step 5: Define the Default Job Parameters for the Transaction Manager Proxy**

The default job parameters for the Transaction Manager proxy must be defined. For further information, see Online Services, Job Parameters. See also the section Adabas Transaction Manager Components.

▶ **to define the default job parameters for the Transaction Manager proxy:**

- 1 Start a Natural session and log on to the newly installed SYSATM application. Invoke the Menu function. If you have not defined LFILE 152 for your Natural session, a message will prompt you to define it now. Select the function Systems Settings, then option LFILE 152 Maintenance. Enter the Database ID and file number of the system file that you created when you installed the Adabas System Coordinator. Enter values for the remaining input fields, and confirm your definition. Now return to the main menu and select the Job Parameters option. For a detailed description of the following step, refer to Online Services, Job Parameters
- 2 On the Job Parameters screen, press PF10 to add a new default definition. Make sure that you set Adabas Transaction Manager to ON. Confirm your new definition, then select it for modification by marking it with an "m". You must also set the name of the Adabas System Coordinator group in which your client jobs and TP systems will execute. The provided default values for the remaining parameters should be satisfactory for the purpose of completing and verifying the installation. You can review and change them as required once you have completed and verified the installation.

## Step 6: Prepare the Adabas Transaction Manager Daemon Job

Because the Adabas Transaction Manager daemon executes as a special kind of Adabas nucleus, its JCL is similar to that of a normal Adabas nucleus.

### ▶ to prepare the Adabas Transaction Manager daemon job:

- 1 Make any necessary site-specific changes to ATMI200 so that it can be used as a procedure for a started task.
- 2 Ensure that any ADALNK module that can be loaded by the ATM job does not have the Adabas System Coordinator stub linked into it.
- 3 Specify `ADARUN DTP=TM`.
- 4 Specify `ADARUN TMLLOG=NEVER` for the purpose of verifying the installation. Once the verification process has been completed, reconsider this parameter setting.
- 5 Specify `ADARUN NONDES=YES`. This is the default setting.

Set other ADARUN parameters as you would for a normal database. For initial testing, the default limits and pool and buffer sizes should be sufficient.

See the section Parameters for a description of the ADARUN parameters that affect Adabas Transaction Manager operation.



**Note:** An Adabas Transaction Manager daemon job must be run in each operating system image that will participate in distributed transaction processing (DTP). If more than one Adabas ID table is used in the same system image, an Adabas System Coordinator daemon and an Adabas Transaction Manager daemon must be run under each Adabas ID table that will participate in DTP. For further information, see ATM Daemons and Adabas System Coordinator Groups.

## Step 7: Enable Databases for Two-Phase Commit Processing

### ▶ to enable databases for two-phase commit processing

- 1 Ensure that the parameter

```
ADARUN DTP=RM
```

is set in every database that participates in global transactions coordinated by Adabas Transaction Manager.

- 2 Add ADD-FILE-LINK statements for the Adabas Transaction Manager product library and the Adabas System Coordinator product library to each database job that will run with `DTP=RM`.
- 3 In the case of Adabas Parallel Services databases, use the Adabas 7.4 update library LX06 together with the standard Adabas 7.4.3 library.

- 4 In the case of Adabas 7.1 databases, you must apply fix A\$71306 to your Adabas 7.1 load library. The fix is contained in member ZAPOPT of the supplied JOBS library.

Refer to the *Adabas System Coordinator* documentation for more information on how to run Adabas Transaction Manager 7.4 with Adabas 7.1 databases. The same instructions can be used for running Adabas Transaction Manager 7.5 with Adabas 7.1 databases.

### Step 8: Prepare the Adabas System Coordinator Daemons

The ATM load library should be made available to all SYSCO daemons which will run under the same Adabas ID table as an ATM v7.5 daemon.

The SYSCO daemons must be started with the parameter setting `PRODUCT=ATM`.

### Step 9: Make Adabas Transaction Manager Components Available

Add an ADD-FILE-LINK for the Adabas Transaction Manager product library to all batch, TIAM and UTM tasks that will use Adabas Transaction Manager services. The Adabas Transaction Manager library and the Adabas System Coordinator library must be available to Adabas Transaction Manager daemon tasks.



**Caution:** The Adabas Transaction Manager proxy must not be used by any job or started task that executes an Adabas Transaction Manager daemon, an Entire Net-Work node, or an Adabas nucleus running in multiuser mode. You should therefore make sure that the Adabas System Coordinator stub is not present in any ADALNK module that might be used by these jobs.



# 12 Verifying the Installation

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- Verify Two-Phase Commit Operation ..... 63

At the end of the installation process, you should verify that the installation was successful by performing the steps described in this section.

## Verify Basic Operation of the Adabas Transaction Manager Proxy

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▶ to verify basic operation of the Adabas Transaction Manager proxy:

- 1 If it is currently executing, stop the TP system where you will use Adabas Transaction Manager Online Services.

This must be a TP system in which the Adabas Transaction Manager proxy has been installed, with job parameter setting `ATM=ON`.

- 2 Start (or restart) the TP system so that the Adabas Transaction Manager proxy is loaded and initialized.
- 3 Log on to the Adabas Online System (AOS). Select Adabas Transaction Manager to invoke the Online Services application SYSATM.

SYSATM automatically searches for an active transaction manager daemon in the local system. If the Adabas Transaction Manager daemon is not active in the local system, a message is displayed indicating that status. You can ignore the message at this time.

- 4 Press `Enter`, then make a note of the Terminal ID that is displayed on the main menu.
- 5 Select Local User Information, then Local Users.

One of the listed items should be recognizable either as the Terminal ID you noted in step 4 or the User ID of your current session, depending on your TP environment. This verifies the basic operation of the Adabas Transaction Manager proxy.

## Verify Communication with the Transaction Manager Daemon

---

▶ to verify communication with the Transaction Manager daemon:

- 1 Start the transaction manager daemon and re-enter the SYSATM application.

The Adabas Transaction Manager daemon is identified automatically by the Adabas Transaction Manager proxy when you enter SYSATM.

- 2 Select Transaction Manager Daemon Information, then Display Zap Information.

Displaying the list of applied fixes provided by this function verifies that communication with the Adabas Transaction Manager daemon is functioning correctly, even if the list of fixes is empty.

- 3 Terminate your SYSATM session.

## Verify Two-Phase Commit Operation

### ▶ to verify two-phase commit operation:

- 1 Start two databases with the parameter setting `ADARUN DTP=RM`: one database containing a standard Employees file and the other database containing a standard Vehicles file.
- 2 In library `SYSMTvrs` (where *vrs* is the version, revision, and system maintenance level of Adabas Transaction Manager), modify the test program `DEMOTDP` so that it correctly refers to the Employees and Vehicles files.
- 3 Execute the `DEMOTDP` program, supplying a non-zero value when prompted for a new personnel number.
- 4 When the message “About to commit” is displayed
  - start a new session in your TP system
  - log on to the Adabas Online System (AOS)
  - select Adabas Transaction Manager, then Transaction Manager Daemon Information, and then Active Global Transactions specifying List Sequence E.

The display of your pending transaction should indicate that two databases are involved in it.



**Note:** This test is not valid in a CICS/RMI environment in which Natural executes in pseudo-conversational mode. In this mode, the `INPUT` statement that displays the message “About to commit” causes CICS to take a syncpoint at end-of-task and commit the pending Adabas updates. To verify correct operation in a CICS/RMI environment, this test should be done in a Natural session that was started with `PSEUDO=OFF`.



**Note:** This test is not valid in an IMS/TM environment in which RRMS acts as the superior transaction coordinator. In such an environment, the `ADARUN TMSYNCMGR` parameter should take the value `NONE` for the purposes of this test.

- 5 Display additional details of the transaction by marking it on the screen and pressing `Enter`.
- 6 Verify that the Adabas Transaction Manager proxy’s view of the transaction is correct by returning to the main menu and selecting Local User Information, then Local Users.
- 7 Return to the session where your transaction is waiting to be completed and press `Enter`.

- 8 Use SYSATM to check that the transaction is no longer open.

The user session itself should still be listed under both the Local Users option of Local User Information and the Global User Queue option of Transaction Manager Daemon Information.

- 9 Execute the program DEMODTP again to ensure that the personnel number was changed consistently in the Employees and Vehicles files.

You can now be assured of global transaction integrity in client environments and databases where the software is installed.

## Index

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