



Zero Downtime Backup of MaxDB database with HP Data Protector

Technical whitepaper

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Executive summary

At the moment, there is no official DP-MaxDB interface to perform Zero Downtime Backup (ZDB) and Instant Recovery for Data Protector versions 5.5, 6.0, as well as 6.1. However, it is possible to perform ZDB using a scripted solution. This white paper provides the procedure on how to ZDB a MaxDB instance and potentially restore it to any point in time or to the latest point in time.

Supported systems

The MaxDB ZDB solution presented in this document has been tested on a combination of MaxDB 7.6 and Data Protector 6.1 on Windows 2003 32 bit OS in conjunction with EVA snapshot functionality. This combination is supported.

The MaxDB ZDB solution may also work on other operating systems, like HP-UX and Linux variants. However, these combinations have not been tested, and therefore, not supported.

Note

Do not modify the scripted MaxDB ZDB solution presented in this document. Modifications are not supported and you will end up operating in an unsupported configuration.

For latest support information on Data Protector 6.1 and MaxDB, see Data Protector's Platform and Integration Support matrix. You can navigate to it from www.hp.com/go/dataprotector, click Support Matrices, click HP Data Protector V6.1 Software, and click General Reference.

Introduction

Data Protector

HP Data Protector Software is backup and disaster-recovery software that provides reliable data protection and high accessibility for your fast-growing business data. Data Protector offers comprehensive backup and restore functionality specifically tailored for enterprise-wide and distributed environments. Data Protector can be used in environments ranging from a single system to thousands of systems on several sites. Due to the network component concept of Data Protector, elements of the backup infrastructure can be placed in the topology according to user requirements. The numerous backup options and alternatives to setting up a backup infrastructure allow the implementation of virtually any configuration you want.

HP Data Protector enables you to back up to a large number of backup devices simultaneously. It supports high-end devices in very large libraries. Various backup possibilities, such as local backup, network backup, online backup, disk image backup, synthetic backup, backup with object mirroring, and built-in support for parallel data streams allow you to tune your backups to best fit your requirements.

As Data Protector supports heterogeneous environments, most features are common to the UNIX and Windows platforms.

SAP MaxDB

SAP MaxDB is the database management system developed and supported by SAP AG. It has its focus on the requirements of SAP customers and SAP applications and can be used as a less expensive alternative to databases from other vendors for your own or third-party applications as well. It is a competitive database management system for medium to large server configurations, and a convincing offering for a desktop or laptop database management system since SAP MaxDB is very easy to install and operate.

The key benefits of SAP MaxDB are its many built-in self-administering features. SAP MaxDB is available for the most prominent operating system/hardware platforms, Microsoft Windows, Linux, and UNIX.

You can access the complete SAP MaxDB documentation at <http://maxdb.sap.com/documentation/>

Zero downtime backup

The general idea behind split mirror backups is to stream the backup off the mirror instead of the productive disk. The mirror is typically connected to a separate host with a tape device attached. Usually, hardware mirror technologies such as Continuous Access XP or Business Copy XP are used to create the mirror.

Before a backup off a mirror can be started, a valid point in time disk image needs to be created. It needs to be consistent so that it can be fully restored. The mirror is not created at backup time but needs to be established beforehand. To create the backup image, the mirror is simply split off the productive disk.

As the application host and backup host are different, it is very important that all cached information (database cache, filesystem cache) on the host is flushed to the disk before the mirror is split off. There are three ways of achieving this:

- The databases are put into backup mode
- The databases are taken offline
- The filesystem is unmounted

The backup image will then be consistent.

For a plain filesystem backup, it is not essential to unmount the filesystem first. The split-mirror backup can complete successfully with the filesystem mounted. However, a successful restore of all files and directories cannot be guaranteed since cached data will not be written to disk prior to the split. It is therefore recommended to unmount the filesystem before performing a split-mirror backup.

If a database is running on a filesystem, there is no need to unmount the filesystem as the database controls the write to the disk and ensures that data is really written to the disk and not to the filesystem cache.

For an online database backup, the backup image cannot be restored on its own. The archive log files from the application host are also needed. The archive log backup can be started when the database is taken out of backup mode. This will happen immediately after the mirrors are split off successfully their productive disks. The backup duration (from the perspective of the application) is only the time required to perform the split, during which the consistent backup copy is created. The backup and resynchronization of the mirrors do not affect the production database's I/O performance as they happen inside the XP Disk Array.

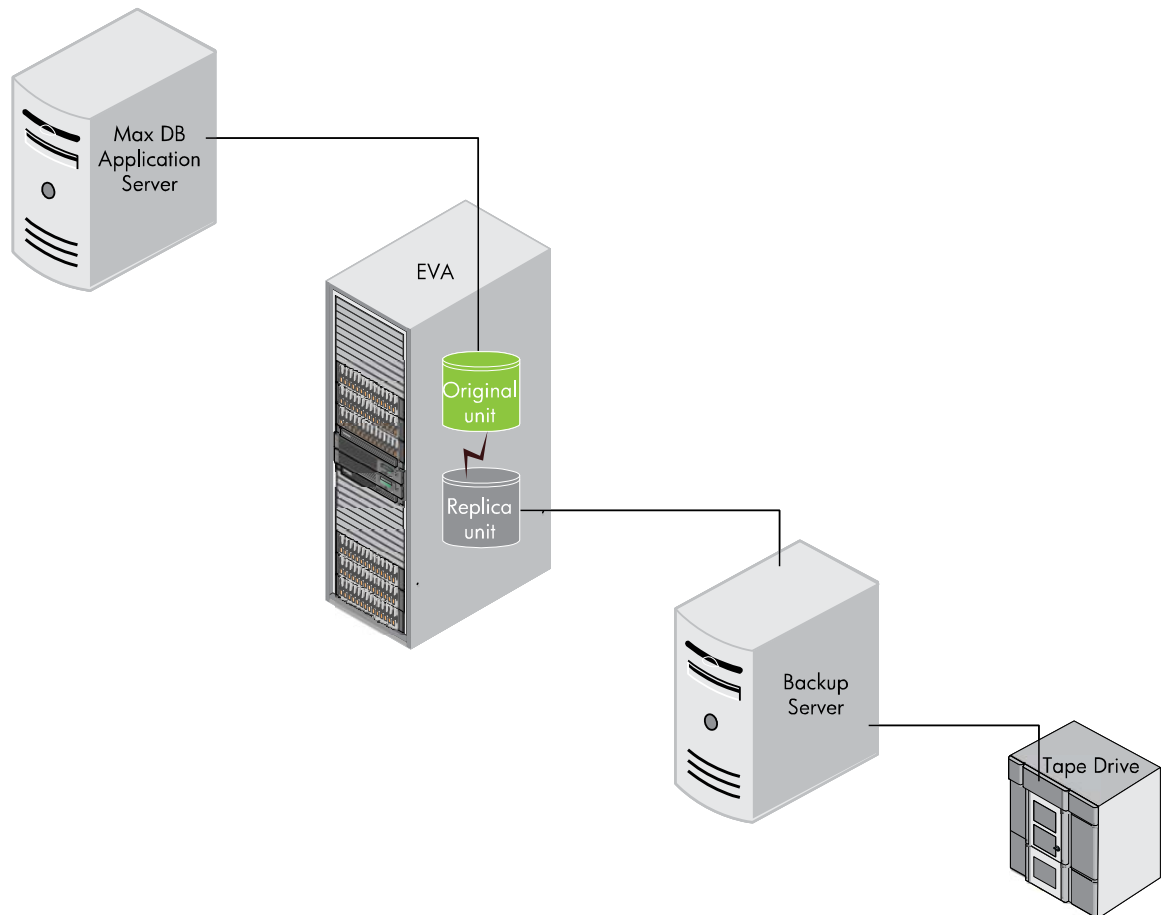
SMIS agent

The SMIS agent is Data Protector's ZDB-agent that controls the disk controller of the EVA through the SMI-S interface. SMIS is an attempt by vendors to describe hardware, functionality, and processes in a generic, common way. It is controlled by SNIA (Storage Network Industry Association), and major storage companies like HP, IBM, EMC, Hitachi, Oracle, StorageTek, Brocade (and smaller ones too) contribute to this standard.

See http://www.snia.org/tech_activities/standards/curr_standards/smi/ for more information.

A typical ZDB-MAXDB setup

Figure 1. A typical ZDB-MAXDB Setup



MaxDB binaries must be installed on the application server; however, they are optional on the backup server. As we are performing a plain Data Protector Filesystem-based ZDB as opposed to a Data Protector Application-based ZDB, it is not necessary to have MaxDB binaries on the backup server.

Concept

According to SAP Note 371247, ZDB can be performed on a MaxDB instance if all its data volumes are split consistently at the same time. It also adds that if this prerequisite cannot be met, there is a workaround, SAP Note 616814, in which MaxDB's logwriter must be suspended before the ZDB split process so that the data volume is made consistent and can then be zero downtime backed up.

In multi-disk environments, it cannot be guaranteed that all volumes are split at the same time. Because this does not meet the requirements laid down by SAP Note 371247, the only way to perform MaxDB-ZDB is to suspending the MaxDB's logwriter before the ZDB split process.

```
dbmcli -d <database_name> -u <dbm_user>,<password> #log on to MaxDB CLI
util_connect <dbm_user>,<password> #connect to MaxDB inst
util_execute suspend logwriter #suspend logwriter
```

→ split **mirror**/create **snapshot**

```
util_execute resume logwriter #connect to MaxDB inst
util_release #disconnect from MaxDB
exit
```

While MaxDB's logwriter process is suspended, write access to the database is effectively blocked. This achieves data consistency across the data volumes. However, on large production databases, you should not suspend the logwriter process for extended periods of time. To avoid this, you can reduce the log-suspension time significantly by achieving the process of resolution before suspending the logwriter.

Note:

For mirror-based ZDB, it is highly recommended to make the downtime as small as possible by making sure that the mirrors are in sync before ZDB commences.

After the split, you can perform any of the three ZDB variants: disk, tape, or disk+tape. The following apply:

- The ZDB backup will be a plain file-system backup and so MaxDB will not be aware of the backup. As a consequence, such backups will not show up in MaxDB's backup history.
- Being a file-level backup, this approach typically requires more tape space than database block-level backups.

The following outlines the process of MaxDB-DP Zero Downtime Backup. During the ZDB the following actions take place:

- The ZDB Agent is started
- Resolution of datafiles to be backed up
- **MaxDB's Logwriter is suspended**
- The array splits MaxDB's data volume, which is consistent
- **MaxDB's Logwriter is resumed**
- The Backup host and ZDB Media Agent are prepared for local backup
- The Disk agent backs up the snapshot

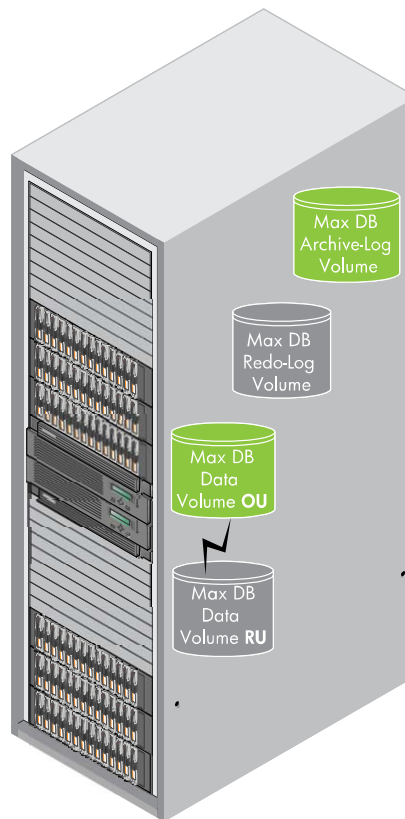
MaxDB Application Server configuration

When configuring a MaxDB instance, take care where the following MaxDB volumes will be configured on the array:

- **Data Volumes** containing data must reside on **splitable** disks. It is highly recommended that you locate data volumes on a dedicated LUN, and that archive redo log¹ files are **not** part of the same location.
 - See the screenshot illustrating various **data** and **log** volumes of a MaxDB instance in the [Archive log mode section](#) on [page 10](#).
 - To query all MaxDB volumes from MaxDB command line, use the `param_getvolsall` command. See the second example in the [Other useful `dmdba` commands](#) section on [page 29](#).
- **Log Volumes** that contain redo log files must not be included in ZDB, and therefore should not be located on the same disks as the data volumes.

Archive log files must be backed up separately using the regular MaxDB-DP integration. These series of backups will be tracked in Data Protector's IDB and are used to restore archive log files. For a particular MaxDB restore, you may have to restore a specific series of MaxDB archive log files, and for the last archive log restore session, select the appropriate RECOVERY options. See [Configuring the MaxDB-DP integration archive logfile backup specification](#) on [page 26](#) to configure MaxDB archive log backups.

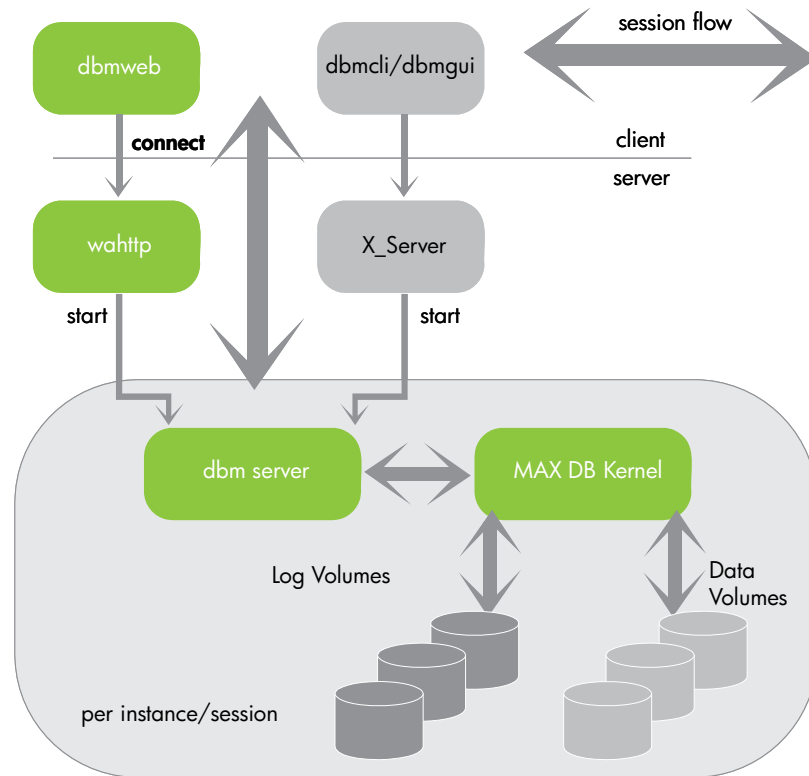
Figure 2. MaxDB Application Server configuration



¹ Archive RedoLog files are called **version files** in MaxDB terminology

MaxDB architecture

Figure 3. MaxDB architecture



Database Manager

The **Database Manager** has a client/server architecture. The **DBM Server** is responsible for the functions, and the user uses the client to access the tool.

Database Manager clients can be used for remote connections. This means that the client and the DBM Server can be installed on different hosts. However, the DBM Server must always be installed on the same host as the **database instance** that you want to access with the Database Manager.

The Database Manager is a database tool for managing MAX DB databases. You can use it to create, control, monitor, backup, and if necessary restore database instances on the local host or on remote hosts.

The Database Manager consists of a server part and a client part. The following clients are available. They provide similar functions, depending on your operating system and requirements:

- Database Manager GUI—Windows only
- Command-line oriented Database Manager CLI
- Web-based Web DBM

At the requests of the client (Database Manager GUI or Database Manager CLI), the **X server** starts the DBM server. After a connection has been successfully created, an additional thread or an additional child process is started in the X server process to transport the data packets over the network.

Database instance

Every database instance consists of threads (such as log writer, server task, timer tasks, and so on), main memory structures (caches) and volumes.

X Server

The X Server is the communication instance of MAX DB software. It is required if the individual software components are on different hosts. For example, database applications and MAX DB tools communicate with a database instance installed on a remote host using the X server that also runs on the remote host.

Database manager tools

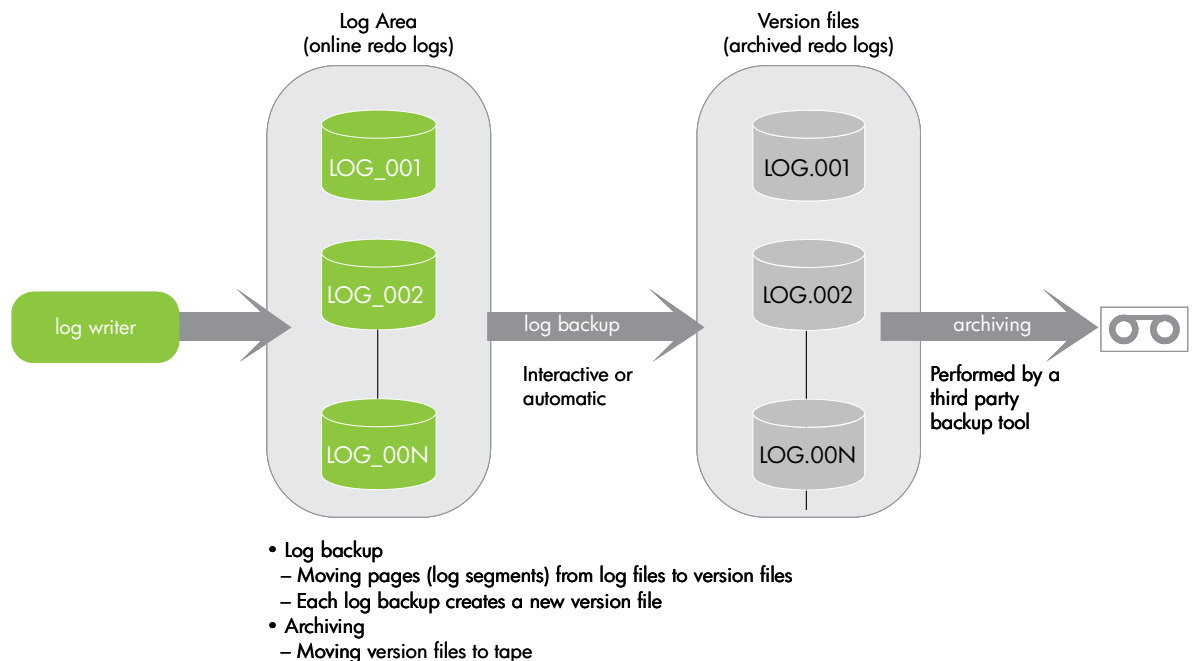
To create and manage database instances, three database tools are used:

- Database Manager GUI
- Web DBM
- Database Manager CLI

You can operate the Database Manager as a command line tool (Database Manager CLI), as a graphical user interface (Database Manager GUI), or as a Web-based tool (Web DBM). All three types of this program offer the same range of functions.

Logging mechanism

Figure 4. Logging Mechanism



MaxDB offers two kinds of archive log modes: archive and non-archive.

Non-archive log mode

By default, the log area can be overwritten only if the appropriate log entries have been backed up. You must therefore make regular log backups.

The log entries of the log area and the log backups are then available if you need to recover the database. If these entries and the data backups are complete and available without gaps, you can recover the database up to any point in time.

Archive log mode

The log area is overwritten cyclically, even if you do not perform any log backups.

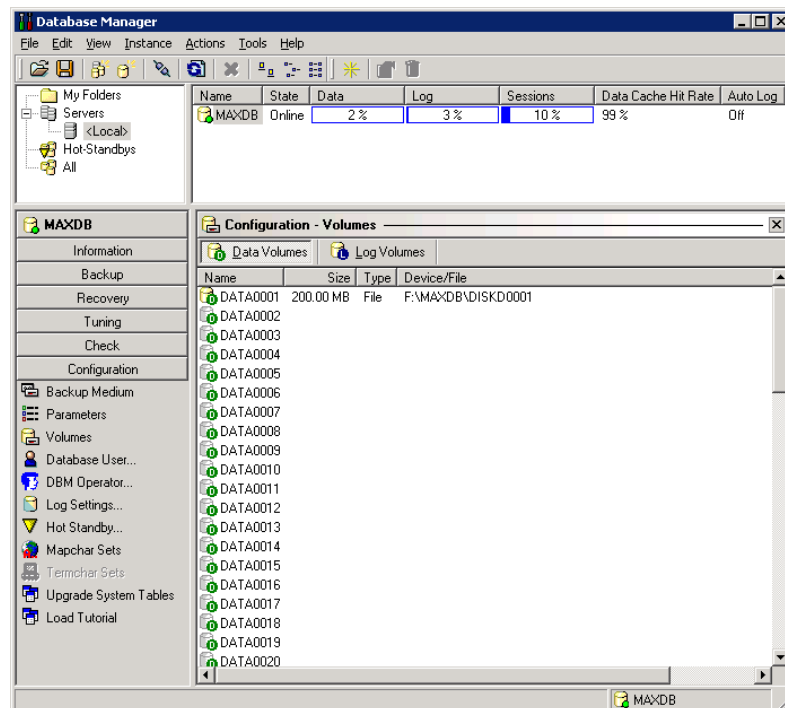
This interrupts the log backup history. Only the log entries in the log area are available if you need to recover the database. This usually means that you can recover your database instance only to the state it had at the time of the last data backup; you cannot restore it up to the last COMMIT before the crash, or to any other time.

You can only restore the database to a time of your choice if all the log entries written after the data backup exist in the log area (which means that the log area has not been overwritten since the data backup).

A transaction log backup consists of two distinct steps. Initially, the entries are exported from the log volumes to an archive log area in the filesystem. From there, they can be backed up by Data Protector.

The following screenshot shows properties of a MaxDB instance inside MaxDB's DBM GUI. The instance MaxDB is online and among others, the GUI shows data and log volumes configured to exist on different volumes. Note that although the instance is logging, because Auto Log mode is Off, automatic redo-archiving is not active.

Figure 5. Properties of a MaxDB instance inside MaxDB's DBM GUI



Compiling scripts

This section explains how to compile various scripts to regulate MaxDB's logwriter process. Six files are needed: three `cmd` and three `txt` files.

Place **all** script files on the application server in the `<Data_Protector_Home>/bin` directory, for example, `C:\Program Files\OmniBack\bin`.

The following information and credentials hold true for the test environment used:

MaxDB Instance Version	=	7.6.06.03
MaxDB DBM GUI Version	=	7.6.03.10
MaxDB dbmcli Version	=	7.6.6.0
MaxDB Backup Server Version	=	Win2003 SP2
MaxDB Appl. Server Version	=	Win2003 SP2
Data Protector Version	=	A0.06.10
qgrep Version	=	5.2.3790.0
MaxDB data path	=	C:\lab\sdb\data
MaxDB independent program path	=	C:\lab\sdb\programs
MaxDB dependent path	=	C:\lab\sdb\7600
MaxDB Run Directory	=	C:\Lab\sdb\data\wrk\MAXDB
EVA	=	5000
Firmware	=	4100
Command View	=	7.00.01
MaxDB Instance Name	=	MAXDB
DBM Administrator	=	DBADMIN
DBM Administrator Password	=	maxdb

Note:

You will need a grep-like utility called `qgrep` installed on the application server. The utility can help you find lines specific to an expression, allowing you to get information on the files you want.

The qgrep utility in the **Windows Server 2003 Resource Kit** is Windows equivalent of UNIX and Linux's grep utility. In UNIX, grep means **search globally for lines matching the expression and print the lines**.

You can download **Windows Server 2003 Resource Kit Tools** from

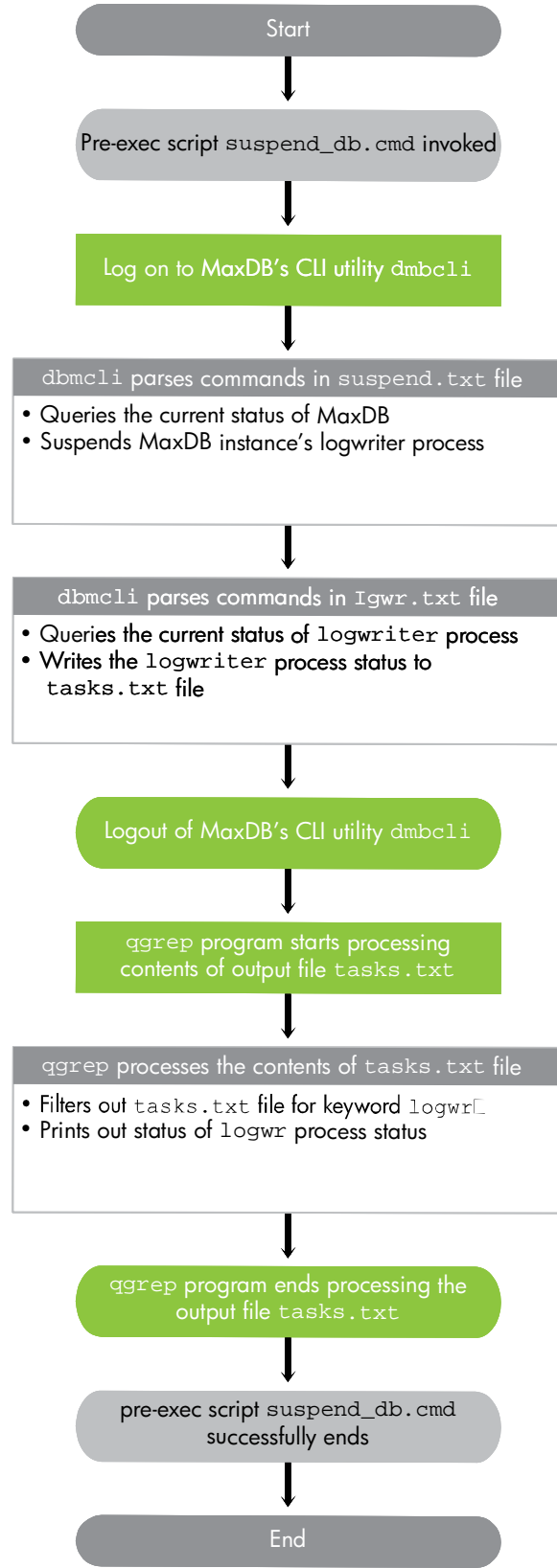
<http://www.microsoft.com/downloads/details.aspx?FamilyID=9D467A69-57FF-4AE7-96EE-B18C4790CFFD&displaylang=en>

suspend_db.cmd

1. On the MaxDB application server create a file called suspend_db.cmd, and copy and save the following into it. Make sure you adapt the file to suit MaxDB instance login requirements:

```
@ ECHO OFF
echo *-----MaxDb's dbmcli Output-----*
echo .
C:\Lab\sdb\programs\pgm\dbmcli.exe -uUTL -d MAXDB -u DBADMIN,maxy -uSQL DBADMIN,maxy -i
"C:\Program Files\OmniBack\bin\suspend.txt"
C:\Lab\sdb\programs\pgm\dbmcli.exe -uUTL -d MAXDB -u DBADMIN,maxy -uSQL DBADMIN,maxy -i
"C:\Program Files\OmniBack\bin\lgwr.txt" -o "C:\Program Files\OmniBack\bin\tasks.txt"
echo          Log Writer S t a t u s
echo .
echo =====*****=====*****=====
qgrep Logwr "C:\Program Files\OmniBack\bin\tasks.txt"
del "C:\Program Files\OmniBack\bin\tasks.txt"
echo =====*****=====*****=====
echo .
echo .
echo *-----MaxDb's dbmcli Output-----*
echo .
echo .
```

Figure 6. Flowchart of suspend_db.cmd script

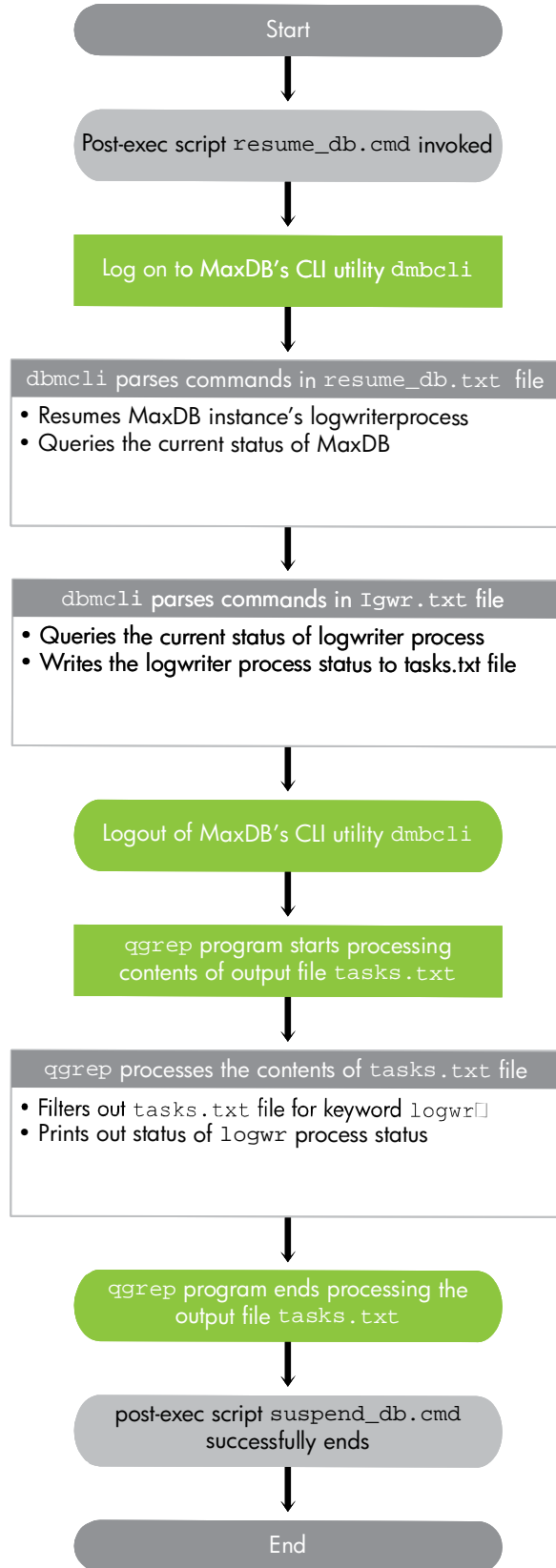


resume_db.cmd

2. On the MaxDB application server create a file called `resume_db.cmd` and copy and save the following into it. Make sure you adapt the file to suit MaxDB instance login requirements:

```
@ ECHO OFF
echo *-----MaxDb's dbmcli Output-----*
echo .
C:\Lab\sdb\programs\pgm\dbmcli.exe -uUTL -d MAXDB -u DBADMIN,maxy -uSQL DBADMIN,maxy -i
"C:\Program Files\OmniBack\bin\resume.txt"
C:\Lab\sdb\programs\pgm\dbmcli.exe -uUTL -d MAXDB -u DBADMIN,maxy -uSQL DBADMIN,maxy -i
"C:\Program Files\OmniBack\bin\lgwr.txt" -o "C:\Program Files\OmniBack\bin\tasks.txt"
echo          Log Writer Status
echo .
echo =====*****=====*****=====
qgrep Logwr "C:\Program Files\OmniBack\bin\tasks.txt"
del "C:\Program Files\OmniBack\bin\tasks.txt"
echo =====*****=====*****=====
echo .
echo .
echo *-----MaxDb's dbmcli Output-----*
echo .
echo .
```

Figure 7. Flowchart of resume_db.cmd script



lgwr.cmd

3. On the MaxDB application server create a file called `lgwr.cmd` and copy and save the following into it. Make sure you adapt the file to suit MaxDB instance login requirements:

```
@ ECHO OFF
C:\Lab\sdb\programs\pgm\dbmcli.exe -uUTL -d MAXDB -u DBADMIN,maxy -uSQL DBADMIN,maxy -i
"C:\Program Files\OmniBack\bin\lgwr.txt" > tasks.txt
qgrep Logwr tasks.txt
```

suspend.txt

4. On the MaxDB application server create a file called `suspend.txt` and copy and save the following into it:

```
show state
sql_execute suspend logwriter
```

resume.txt

5. On the MaxDB application server create a file called `resume.txt` and copy and save the following into it:

```
sql_execute resume logwriter
show state
```

lgwr.txt

6. On the MaxDB application server create a file called `lgwr.txt` and copy and save the following into it:

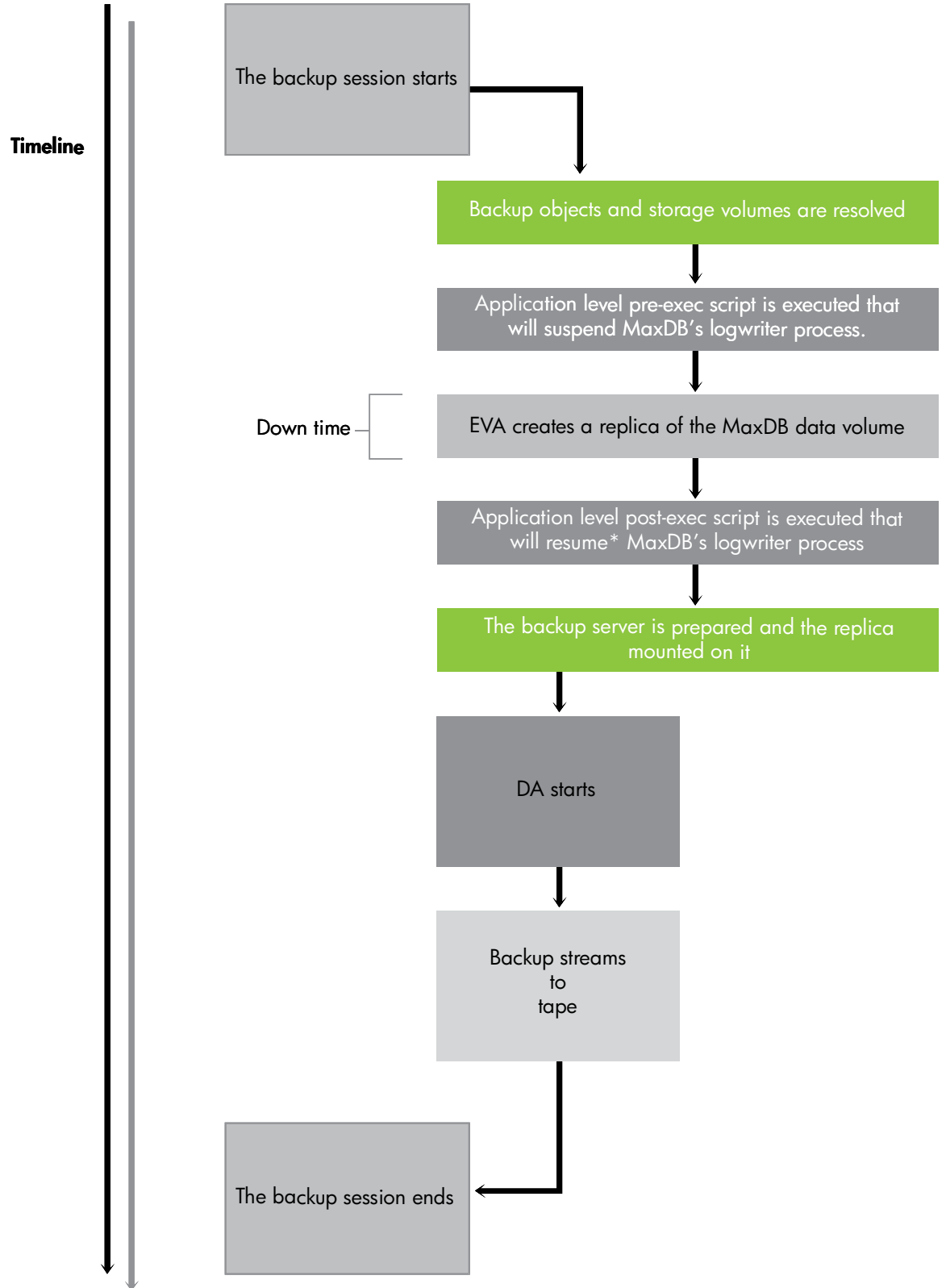
```
show tasks
```

How does the script-assisted backup work?

Overview

MaxDB ZDB backup is based on scripts. This is realized by pre- and post-exec scripts executed at the application level facilitated by the ZDB Agent. All scripts must deploy and execute only on the application server.

Figure 8. Overview of script-assisted backup



* If pre-exec script execution or creation of the replica fails, you can **forcibly** resume the MaxDB logwriter process by setting the omnirc variable `ZDB_ALWAYS_POST_SCRIPT=1`. See [Set the ZDB_ALWAYS_POST_SCRIPT omnirc variable](#) on [page 26](#) for more details, and the complete DP Session report on the benefit of deploying the omnirc variable, `ZDB_ALWAYS_POST_SCRIPT`, on application server in [Appendix C](#) on [page 50](#).

The process in detail

- BSM starts on CM and parses the Backup Specification.
- SMISA is started and purges the ZDB database on the backup server.
- SMISA resolves backup objects on the application server.
- SMISA resolves the EVA units that control storage volumes on the backup server.
- SMISA verifies if the snapshot type and policy requirements are complied with.
- SMISA executes the `suspend_db.cmd` application level pre-exec script. The script authenticates and logs onto MaxDB's Database Manager via `dbmcli`.
- On the application server, MaxDB's `dbmcli` command suspends MaxDB's logwriter process.
 - This pre-exec script is executed at the application level.
 - By this time, resolution of volumes has taken place and so the MaxDB data volumes are consistent before the split occurs.
 - The logwriter process remains suspended just for the time needed to resolve and create a replica off the original. During this suspension, no end-user I/O takes place on the data volume, achieving data consistency.
 - The logwriter process remains suspended until the replica is split, and then resumes.
 - The time difference between the execution of the pre-exec and post-exec scripts, both at application-level, constitutes the effective downtime of the backup.
- A message is displayed in Data Protector Backup session that the logwriter process has successfully completed.
- The script exits successfully. If the MaxDB's logwriter process was already suspended then the pre-exec script will report with the following error message:

```
ERR
```

- 24988,ERR_SQL: SQL error
- 104,DBM command impossible at this time

The pre-exec script will not fail the Data Protector session, but will continue to complete from where BSM will take over. Since the prerequisites for splitting are correct, the BSM will continue to split, and then run the backup normally.

See the complete Data Protector session report of such a scenario in [Appendix B](#) on [page 44](#). Also, compare this against the impact of resuming the MaxDB logwriter process on an already working logwriter process (see [Appendix C](#) on [page 45](#)).

- SMISA **splits** the MaxDB data volume that has been made consistent through the logwriter process suspension, and from it creates a replica of the consistent MaxDB data volume.
- SMISA executes the `resume_db.cmd` application level post-exec script. The script authenticates and logs onto MaxDB's Database Manager via `dbmcli`.

- On the application server, MaxDB's `dbmccli` command resumes MaxDB's logwriter process
 - This post-exec script is executed at the application level.
 - The time difference between the execution of pre-exec and post-exec scripts, both at application-level, constitutes the effective downtime of the backup.
- SMISA prepares the backup server to mount the filesystem.
- SMISA presents the filesystem to the backup server.
- DA starts to stream data from the replica to the backup server.
- DA finishes streaming and MA unloads the medium.
- SMISA dismounts the filesystem mounted previously.
- SMIS removes presentations of the replica on the backup server.
- BSM completes.

Configuring backup specifications

It is important to bear in mind that the scripted MaxDB-ZDB solution integrates a regular Data Protector-ZDB file system backup with a MaxDB-DP integration backup in order to backup a MaxDB database instance with minimal downtime. These two separate sub-solutions collaborate to leverage the best of each: negligible downtime of MaxDB-ZDB backups combined with the convenience of a fully-fledged MaxDB-DP integration backing up archive logs, to secure and restore the database.

You need to create two separate backup specifications:

- Script-assisted MaxDB-ZDB, of type file-system ZDB.
Compiled scripts have to be incorporated into the script-assisted MaxDB-ZDB backup specification, which will back up MaxDB's data volumes.
- MaxDB-DP integration, which must be started **only** as **Trans** backup.
Deploy the already established MaxDB-DP integration to backup only archive log files. Note that it is possible to back up the entire MaxDB instance online using the MaxDB-DP integration, however, that would result in a plain online backup of the MaxDB instance instead of a Zero Downtime Backup.

You can schedule both these kinds of backup.

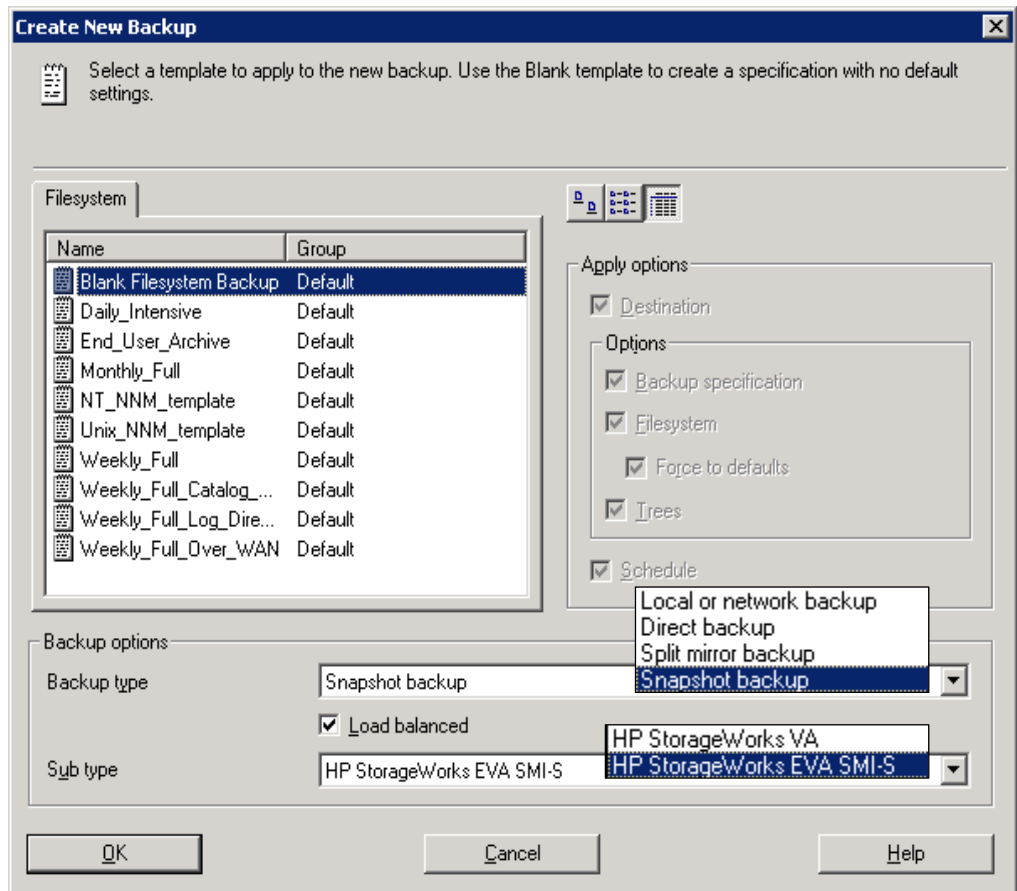
Using this joint approach, you can leverage the relatively minute downtime of ZDB and complement it with the MaxDB-DP integration's log backups to be able to restore and recover to any point in time or to the latest point in time.

MaxDB-ZDB data volume backup specification

This section explains how to configure a MaxDB-ZDB backup specification.

- In the HP Data Protector Manager, switch to the Backup context.
- On the Scoping pane, expand Backup and then Backup Specifications. Right-click Filesystem and then click Add Backup.
- In the Create New Backup dialog box, accept the default filesystem template Blank Filesystem Backup. For the Backup type, select Snapshot backup. For the Sub type, select HP StorageWorks EVA SMI-S, as shown below.

Figure 9. Create New Backup dialog box



- Click OK.
- Choose your MaxDB's Application system as well as Backup system from the drop-down menu. For Snapshot management options, select the desired Snapshot type (such as Standard snapshot) and Snapshot policy (such as Strict), as shown below.

Figure 10. Select MaxDB application and Backup systems and EVA related options

Select one or more available options to configure HP StorageWorks EVA integration for your backup.

Client systems

Application system: tpc003.dp2.com

Backup system: tpc007.dp2.com

Replica Options

Business Copy

Continuous Access + Business Copy

Replica handling during failover scenarios

Follow direction of replication

Maintain replica location

Instant recovery option

Track the replica for instant recovery

Replica management options

Keep the replica after the backup

Number of replicas rotated: 1

Snapshot management options

Snapshot type: Standard snapshot

Snapshot policy: Strict

Delay the tape backup by a maximum of 0 minutes if the snapclones are not fully created

Mount options

Dismount the filesystems on the application system

Enable the backup system in read/write mode

< Back Next > Finish Cancel

- Click **Next**.
- Select the MaxDB Data volumes on the application server to be backed up. These data volumes will be made consistent, then split, and subsequently mounted on the backup server for backup.
- Click **Next**.

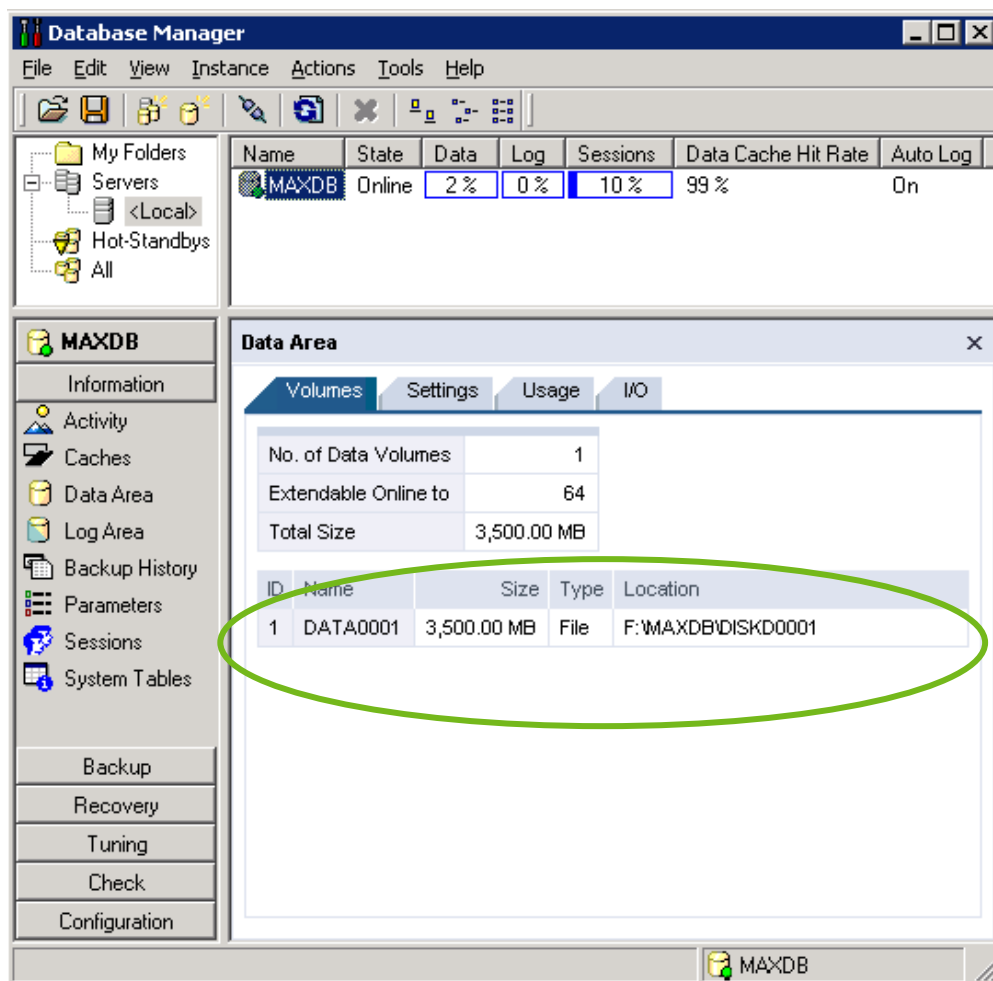
Determining MaxDB volumes for backup

Make sure you select the correct MaxDB data volumes. You can obtain the MaxDB volumes either via MaxDB's GUI or `dbmccli`.

MaxDB GUI

After logging in to the MaxDB Database Manager or MaxDB GUI, highlight your MaxDB database instance, click **Information** in the left hand pane, and finally click **Data Area** to list the MaxDB data volumes, as highlighted below:

Figure 11. MaxDB data volumes displayed in MaxDB Database Manager GUI



MaxDB dbmc1i

Query all MaxDB volumes by using the command `param_getvolsall`.

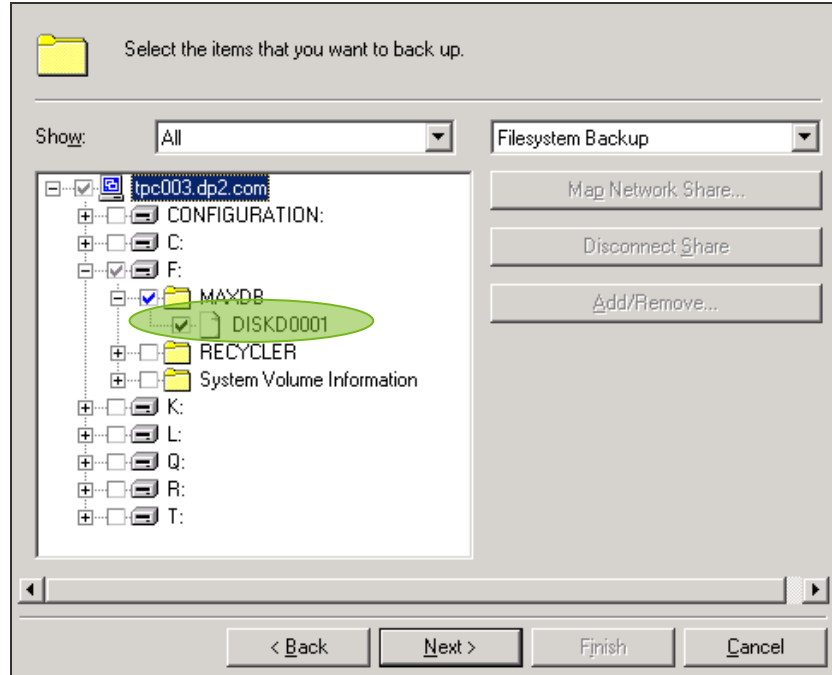
Example:

```
dbmc1i on MAXDB>param_getvolsall
OK
LOG_MIRRORED                NO
MAXLOGVOLUMES                2
MAXDATAVOLUMES              64
LOG_VOLUME_NAME_001         3200      F  R:\MAXDB\DISKL001
DATA_VOLUME_NAME_0001       19200     F  F:\MAXDB\DISKD0001
```

See [Using the MaxDB DBM CLI](#) section on [page 28](#) on how to logon to MaxDB CLI utility called `dbmc1i`.

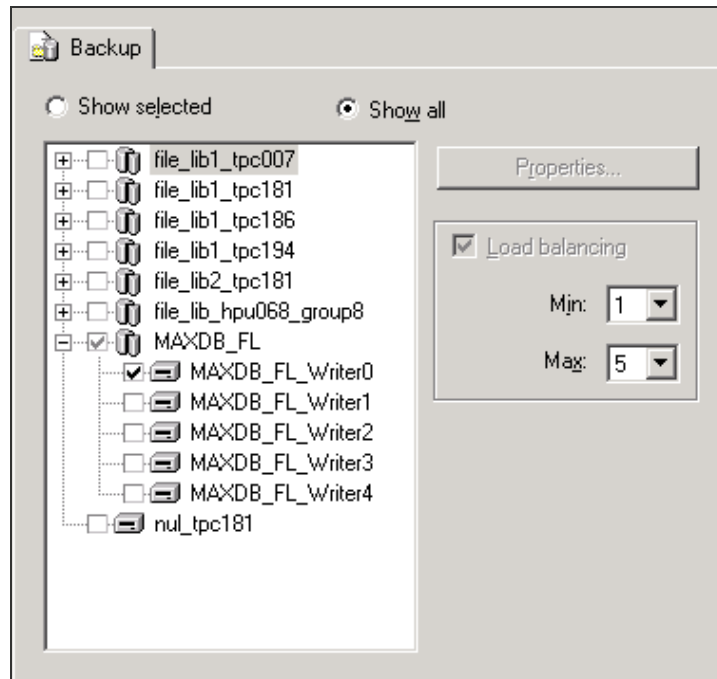
- Select the appropriate MaxDB data volumes.
- Click Next.

Figure 12. Select MaxDB data volumes for backup



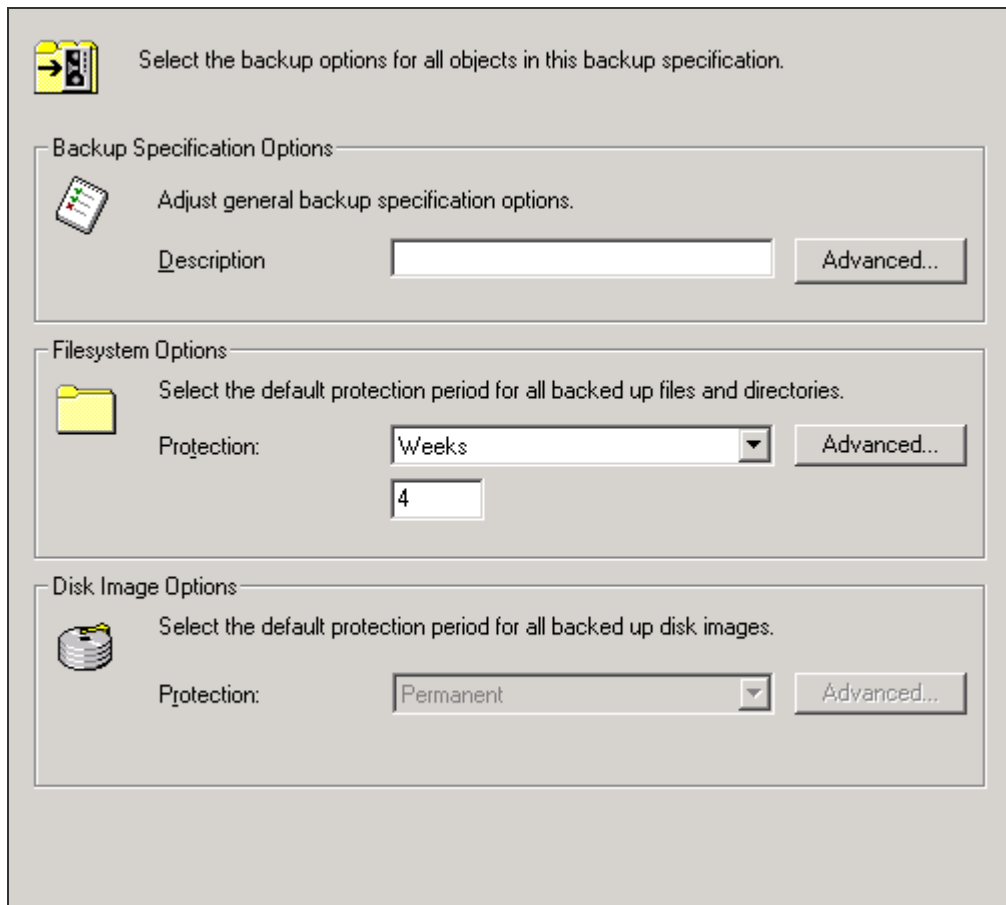
- Select appropriate drives.

Figure 13. Select backup drive/s



- Click **Advanced** under **Backup Specification Options** to bring up another page called **Backup Options**.

Figure 14. Advanced Backup specifications options

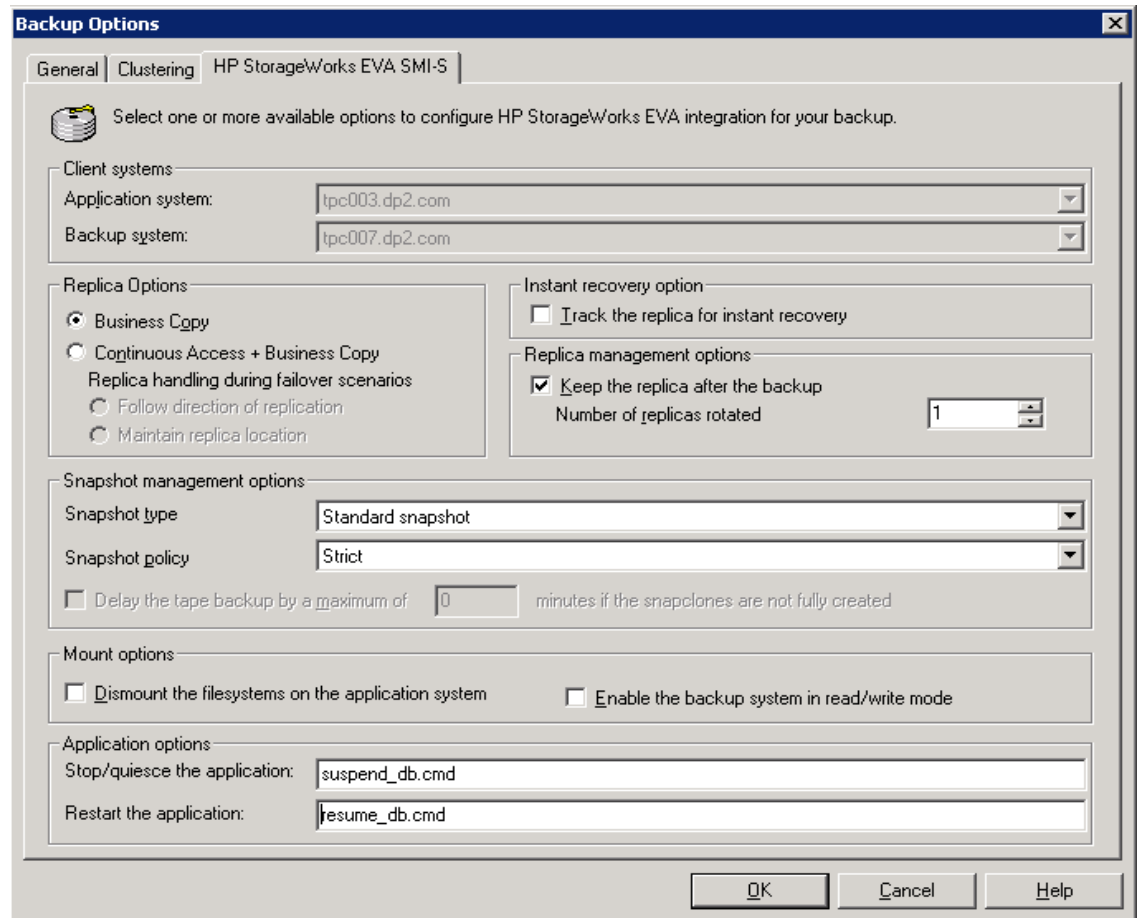


The screenshot shows a dialog box titled "Select the backup options for all objects in this backup specification." It contains three main sections:

- Backup Specification Options:** Includes a "Description" text box and an "Advanced..." button.
- Filesystem Options:** Includes a "Protection:" dropdown menu set to "Weeks" and a text box containing "4", with an "Advanced..." button.
- Disk Image Options:** Includes a "Protection:" dropdown menu set to "Permanent" and an "Advanced..." button.

- Select the HP StorageWorks EVA SMI-S tab. Deploy both pre- and post-exec scripts under Application options. Note that you can modify neither application nor backup system here.

Figure 15. HP StorageWorks EVA SMI-S backup options



- In the Stop/quiesce the application dialog box, enter the name of the script that will suspend the MaxDB logwriter process before the snapshot is created. The script will be executed on the application system.
- In the Restart the application dialog box, enter the name of the script that will resume the MaxDB logwriter process after the snapshot is created. The script will be executed on the application system.
If execution of the script suspend MaxDB logwriter process fails for any reason, the script resume MaxDB logwriter process command should be executed as soon as possible, so that the MaxDB instance resumes normal work after the brief interruption. To achieve this, set the ZDB_ALWAYS_POST_SCRIPT omnirc variable to 1. See [Set the ZDB_ALWAYS_POST_SCRIPT omnirc variable](#) section on [page 26](#) for more details.
- Click OK.
- Click Next twice until you reach the page where you assign a name to the backup specification. Give a name to the backup specification and save it.

For detailed analysis on how the various scripts function, see [How does the script-assisted backup work?](#) on [page 16](#).

Set the `ZDB_ALWAYS_POST_SCRIPT` omnirc variable

The omnirc variable file template is found on all data protector clients. This file is a template for Data Protector agent environment variables. To make a variable active, uncomment the line containing the variable, remove all leading spaces and set the desired value for the variable as follows:

```
# <VariableName>=<VariableValue>
```

By default, if the script corresponding to Stop/quiesce the application fails, then the script corresponding to Restart the application is not executed. However, if you set the omnirc variable `ZDB_ALWAYS_POST_SCRIPT` to 1, the script corresponding to Restart the application will always be executed.

To set an omnirc variable on the application system, go to `<Data_Protector_home>\` to find the `omnirc.TMPL` omnirc file template. Scroll down to search for the `ZDB_ALWAYS_POST_SCRIPT` parameter.

Its default value is 0; set it to 1:

```
ZDB_ALWAYS_POST_SCRIPT=1
```

then save the file.

Check the complete Data Protector Session report on the benefit of the omnirc variable, `ZDB_ALWAYS_POST_SCRIPT`, on the application server in [Appendix C](#) on [page 45](#).

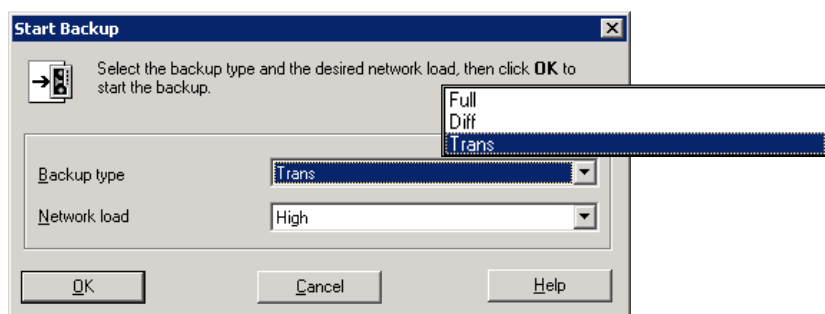
Configuring the MaxDB-DP integration archive logfile backup specification

This section explains how to configure a MaxDB-DP backup specification to back up archive logs.

- In the Backup context, expand Backup Specifications, right-click SAP DB Server, and click Add Backup. This opens the backup specification wizard Create New Backup.
- Accept all other defaults in the template Blank SAP DB Backup, then click OK.
- On the next page, input the application server under Client, and the name of the application database under Application database. Click Next.
- Select the entire database, which would include Config and Data objects. Click Next.
- On the next page, select a driver/writer. Click Next three times, then click Save as to save the backup specification.

There is no dedicated MaxDB-DP backup template to backup archive logs, so when you run a MaxDB backup specification, make sure you select Trans as the backup type, as shown in the following screen shot:

Figure 16. Types of DP-MaxDB integration backup available



Restore and recovery

To restore and recover a MaxDB database instance, you need a combination of a scripted MaxDB-ZDB solution and a MaxDB-DP integration backup solution. Scripted MaxDB-ZDB backs up data volumes using scripts, whereas the fully-fledged MaxDB-DP integration backup is used to back up MaxDB archive logs.

Using this combination, you benefit from the minimal downtime of ZDB and complement it with the convenience of a fully-fledged MaxDB-DP integration to be able to restore and recover to any point in time or to the latest point in time.

To perform a recovery, either to the latest point in time or to any point in time:

- Prepare the MaxDB instance to Offline or Admin mode.
- Perform a MaxDB datafiles restore, which restores file system ZDB backup to its original location.
- Perform a MaxDB archive logfiles restore, which restores the appropriate log files for recovery.

For the last archive log session restore, choose the appropriate Recovery options.

Preparing the MaxDB instance

This section explains how to change the status of a MaxDB instance among its three operational modes: Online, Admin, or Offline.

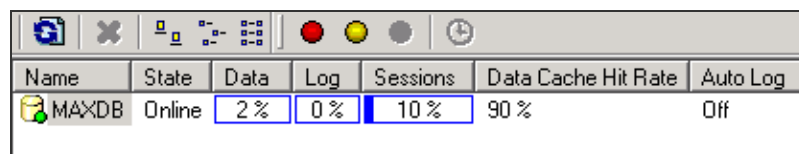
Before starting the restore process, set the MaxDB instance to Offline or Admin mode.

Using the MaxDB DBM GUI

In MaxDB DBM GUI, highlight the MaxDB instance. Directly above the instance you will see three buttons: red, yellow and green. These colors correspond to Offline, Admin, and Online status respectively. While the MaxDB instance is highlighted click the appropriate button to change between modes, as shown below:

Figure 17. Switching between the three MaxDB instance operational modes

For the Online mode, click green:



Name	State	Data	Log	Sessions	Data Cache Hit Rate	Auto Log
MAXDB	Online	2 %	0 %	10 %	90 %	Off

For the Admin mode, click yellow:



Name	State	Data	Log	Sessions	Data Cache Hit Rate	Auto Log
MAXDB	Admin					

For the Offline mode, click red:



Name	State	Data	Log	Sessions	Data Cache Hit Rate	Auto Log
MAXDB	Offline					

Using the MaxDB DBM CLI

Log into the MaxDB CLI at a command prompt on the application server with the syntax:

```
dbmcli -uUTL -d <MaxDB instance name> -u <username,password>
```

Note: To get a list of all dbmcli commands, type `help` at the prompt.

Example:

The following example logs into a MaxDB instance which is online. Then sequentially it is changed between modes: *offline* to *admin*, and finally back to *online* mode.

MaxDB instance name = MAXDB: User=DBADMIN: Password=maxdb

```
dbmcli -uUTL -d MAXDB -u DBADMIN,maxdb           #log in w credentials
dbmcli on MAXDB>db_state                          #query db status
OK
State
ONLINE
---
dbmcli on MAXDB>db_offline                        #set db offline
OK
---
dbmcli on MAXDB>db_admin                          #set db admin to status
OK
---
dbmcli on MAXDB>db_online                         #set db online
OK
---
dbmcli on MAXDB>exit                              #exit from dbmcli
OK
---
C:\>
```

Note: To obtain help about `dbmcli`, at the `dbmcli` prompt, type `explain` with the following syntax:

```
explain <command> [<option> [-nolinewrap|-longinfo]]
```

Example:

```
dbmcli on MAXDB>explain db_admin
OK
Put the database in operational state ADMIN. This command requires a
database name.
Preconditions:
    You have the server authorization DBStop.
Syntax:
    db_admin [-fast|-slow|-test]
Reply:
    OK
If DBM Server cannot explain, the following error message is displayed:
dbmcli on MAXDB>explain param_directgetallnext
ERR
-24872,ERR_NOEXPLAIN: The command param_directgetallnext cannot be explained by the DBM
Server
```

Other useful dbmcli commands

To list all MaxDB parameters, use `param_directgetall`. If you already know the parameter and want to query its value, use the command with the following syntax:

```
param_directget <keyname>
```

Example:

The following queries the MaxDB instance's log segment size:

```
dbmcli on MAXDB>param_directget LOG_SEGMENT_SIZE
OK
LOG_SEGMENT_SIZE          12
```

To list all MaxDB volumes use the `param_getvolsall` command.

Example:

```
dbmcli on MAXDB>param_getvolsall
OK
LOG_MIRRORED              NO
MAXLOGVOLUMES             2
MAXDATAVOLUMES           64
LOG_VOLUME_NAME_001      3200      F   R:\MAXDB\DISKL001
DATA_VOLUME_NAME_0001    19200     F   F:\MAXDB\DISKD0001
```

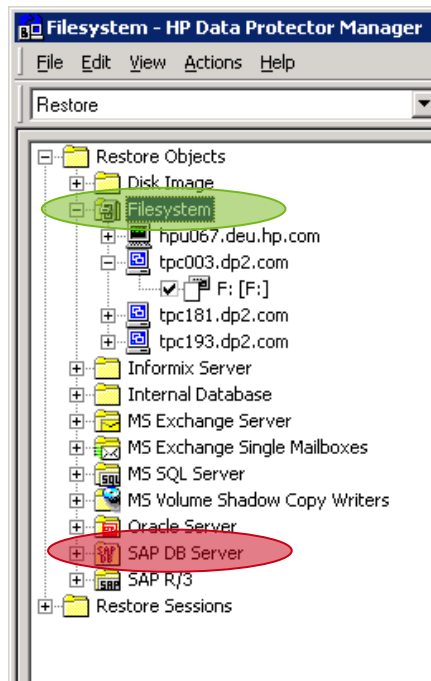
Performing a MaxDB datafiles restore

This section explains how to configure a restore of MaxDB ZDB file system backup so that MaxDB datafiles are restored back to their original location or a different location.

- In the Restore context, expand Restore Objects, Filesystem, and then your MaxDB server. Double-click the file system object under the MaxDB server.

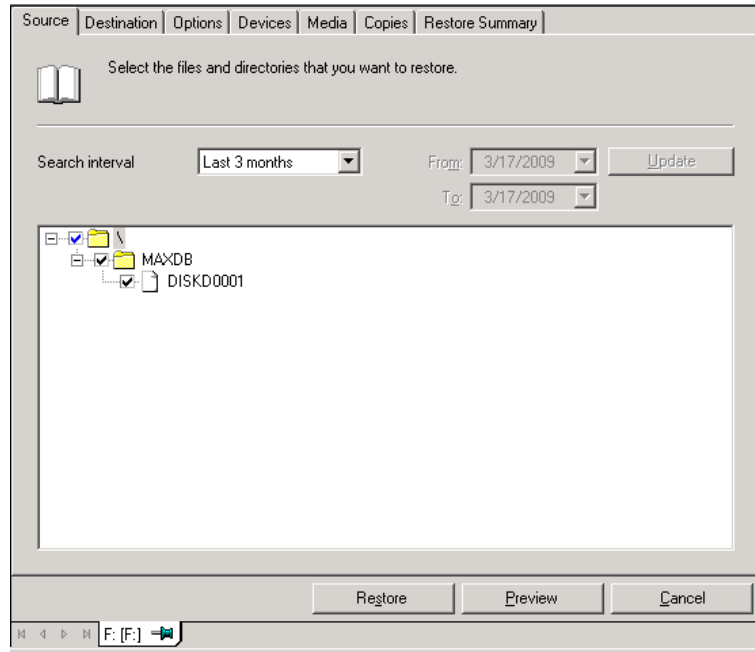
Note: Make sure you differentiate between the two kinds of restore objects available for restore—Filesystem and SAP DB Server. Select only Filesystem restore objects (highlighted in green below) and not the SAP DB Server restore object (highlighted in orange below). You will need to select the SAP DB Server object later to restore MaxDB log files as described in the next [Performing a MaxDB archive logfiles restore](#) section on [page 33](#).

Figure 18. MaxDB datafiles restore



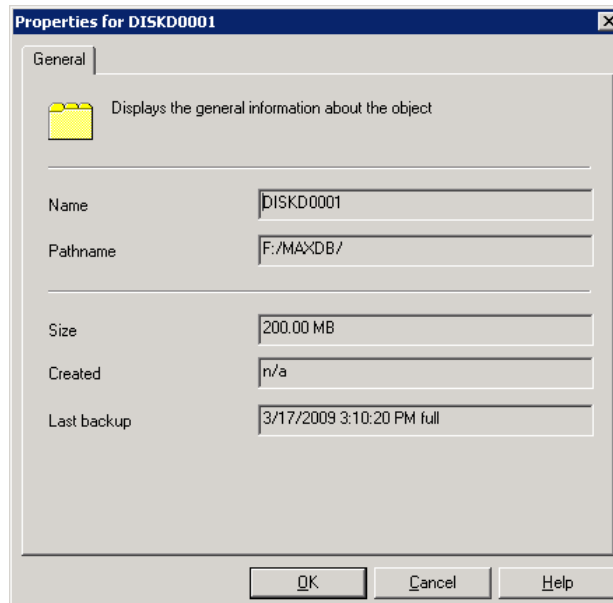
- In the Source pane, select the MaxDB data volume to be restored:

Figure 19. MaxDB data volume restore selection dialog box



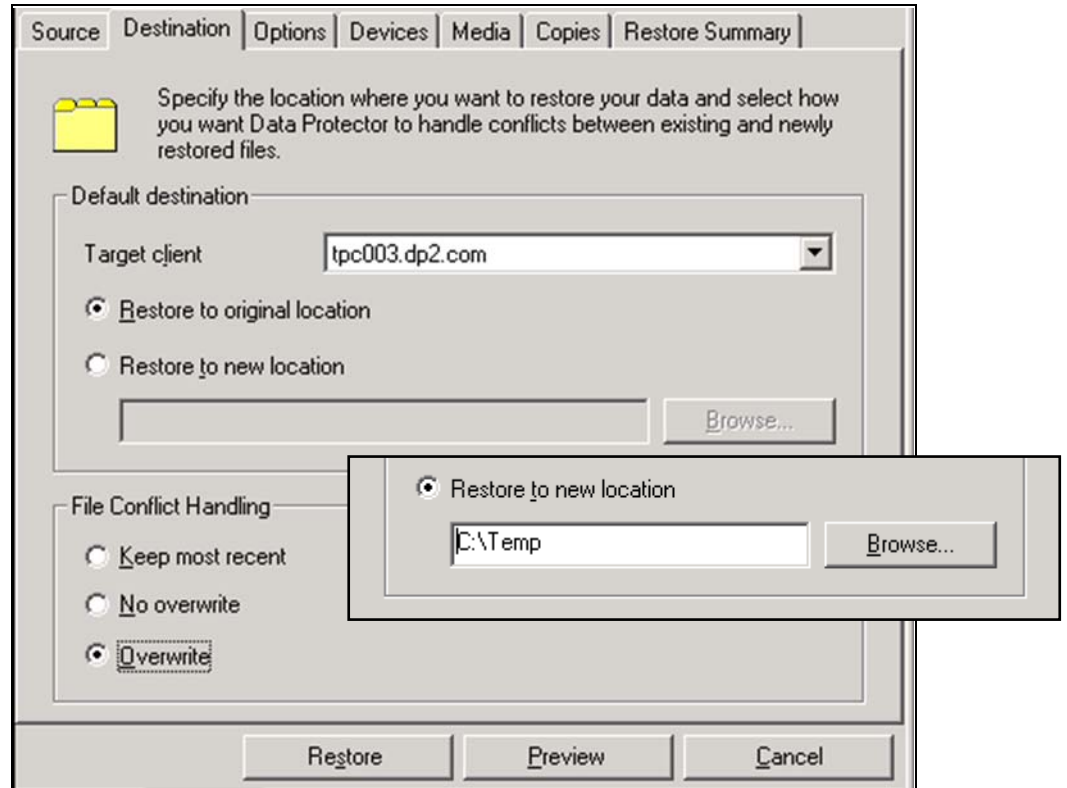
- Right-click the MaxDB data volume object and select the correct version of the MaxDB ZDB filesystem object. Click OK.

Figure 20. Backup Properties of MaxDB data volume object



- Select the `Destination` tab, and select the `Overwrite` option under `File Conflict Handling`. This will effectively overwrite the contents of MaxDB data volume. Optionally, you can choose to restore the object to a different location. To do this, select the option `Restore to new location`, and input the alternate location:

Figure 21. Restore destination options dialog box



Note: If you select `Restore to new location`, there is no need to select the `Overwrite` option.

- Click `Restore`.

See [Appendix D](#) on [page 49](#) showing a complete Data Protector ZDB tape restore session report restoring MaxDB's data volume.

After restoring a ZDB file system object, verify the contents and time stamps files inside the MaxDB data volume directory.

The next step is to restore the appropriate log files, for which all corresponding archive log backup sessions must be restored. With the last archive log session, in addition, select and specify the appropriate `Recovery` options.

Performing a MaxDB archive logfiles restore

This section explains how to configure a restore of MaxDB ZDB archive logfiles, which will be used during recovery process.

Note: You should have already performed a MaxDB datafiles restore, as described in the previous [Performing a MaxDB datafiles restore](#) section on [page 30](#).

MaxDB archive logfiles are backed up by running a MaxDB-DP integration backup specification in Trans mode, so to restore the logfiles, you need to restore MaxDB-DP integration objects containing archive logfiles.

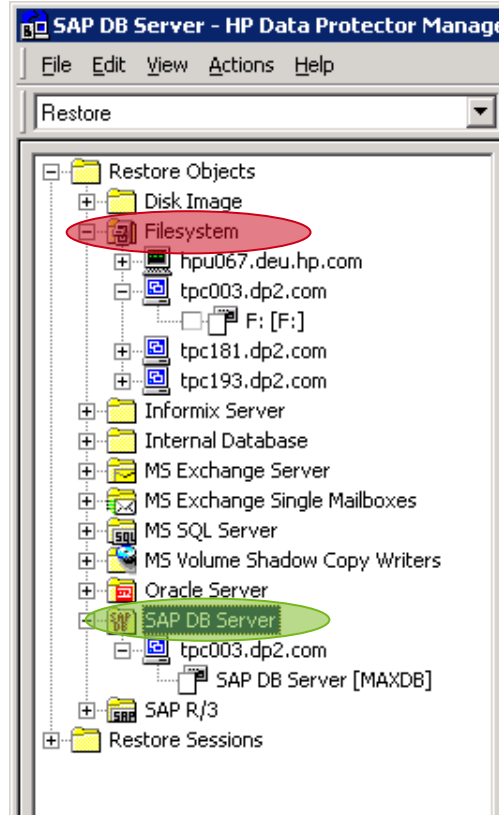
MaxDB archive logfiles can be restored using either Data Protector's GUI or CLI. For brevity, the following section only describes how to restore logfiles using the GUI.

If the logfiles required for restore were backed up in several sessions, restore each of those archive logfile sessions one after the other. Before restoring the last archive log session, choose the appropriate Recovery options. You may elect only to complete the restore and not follow it with a recovery process in the Data Protector GUI, in which case you must finish the recovery with MaxDB `dbmccli` commands. Therefore to finish the recovery process after restoring the appropriate MaxDB archive logfiles, you have the option of choosing between the Data Protector GUI or MaxDB `dbmccli` commands.

The following two sub-sections describe the procedure of restoring MaxDB archive logfiles using Data Protector GUI and MaxDB `dbmccli` commands.

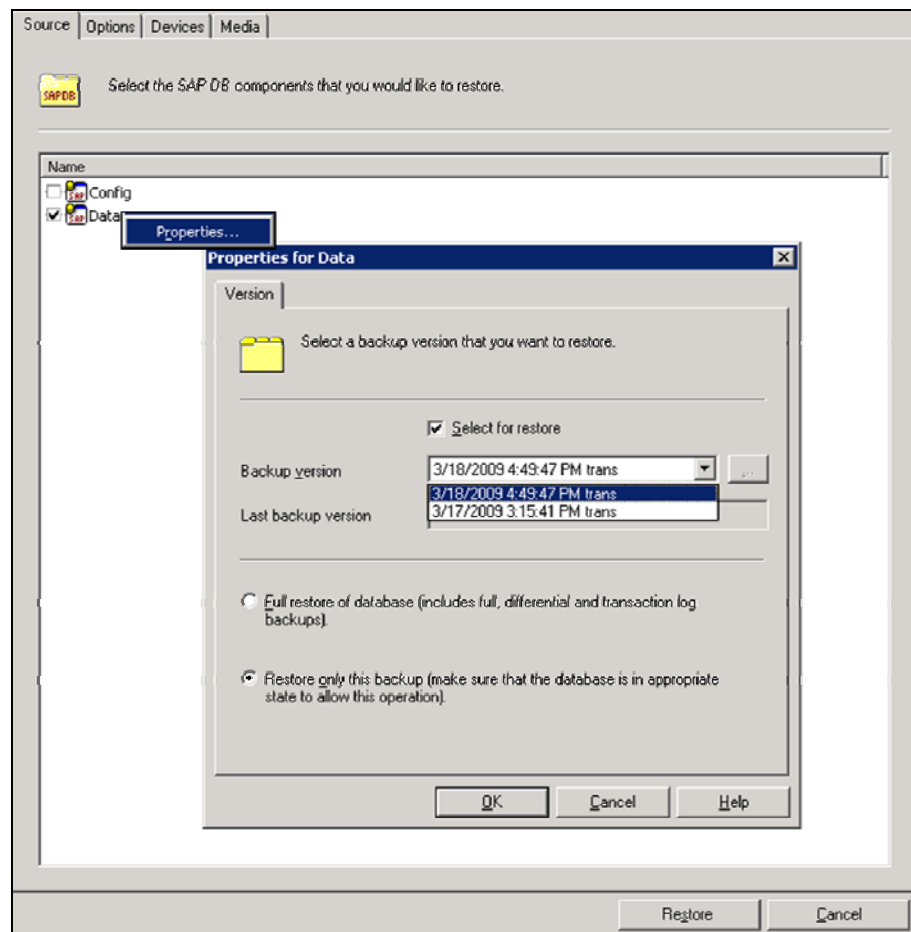
Restoring and recovering with the Data Protector GUI

Figure 22. MaxDB archive logfiles restore selection dialog box



- In the Restore context, expand Restore Objects, then SAP DB Server, and finally your MaxDB server.
- Double-click the MaxDB server object.
Note: In the Data Protector GUI, the MaxDB Server is denoted as SAP DB Server for legacy reasons. MaxDB's historical name was SAPDB.
- In the Source pane, select only the Data object for restore. Right-click it to access Properties for Data object.
Note: Do not select the CONFIG object. If you select it, Data Protector will abort the session. See error messages in [Appendix E](#) on [page 50](#).
- Select the appropriate trans backup sessions and finally select the option: Restore only this backup (make sure that the database is in an appropriate state to allow this operation).
Note: Do not select the option Full restore of database (includes full, differential and transaction log backups). If you select it, Data Protector will abort the session. See error messages in [Appendix E](#) on [page 50](#).
- Click OK.
Note: Make sure you differentiate between the two kinds of restore objects available for restore—Filesystem and SAP DB Server. Select only the SAP DB Server restore object highlighted in green above and not the Filesystem object highlighted in orange.

Figure 23. Backup properties of MaxDB archive log file object



- Go to the Options tab and deselect the Recovery option.

Figure 24. Select Recovery options

The screenshot shows a dialog box titled "SAPDB" with the instruction "Select options for how you want your SAP DB instance restored." The dialog has four tabs: "Source", "Options", "Devices", and "Media", with "Options" currently selected. The "Options" tab contains the following fields and controls:

- Restore to client:** A dropdown menu showing "tpc003.dp2.com".
- Restore to instance:** A dropdown menu showing "MAXDB" and a "Settings..." button to its right.
- User name:** A text input field containing "ADMINISTRATOR".
- User group:** A text input field containing "DP2".

Below these fields is a section for the "Recovery" option, which is currently unchecked:

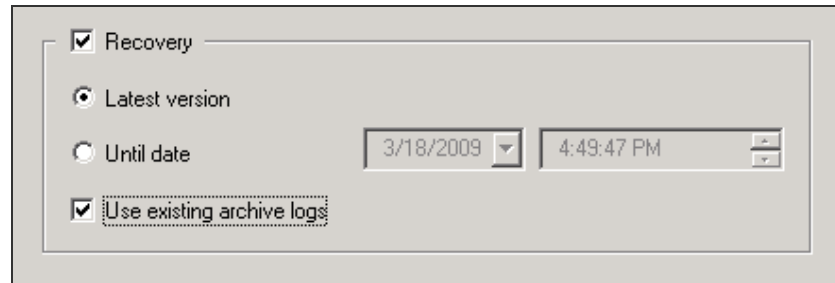
- Recovery
- Latest version
- Until date: A date dropdown showing "3/18/2009" and a time dropdown showing "4:49:47 PM".
- Use existing archive logs

At the bottom of the dialog are two buttons: "Restore" and "Cancel".

- Repeat the above steps as many times as needed until you are certain that appropriate archive logs have been restored to start recovery. However, with the last archive log restore session, you can input the MaxDB recovery time, either to:

The latest version

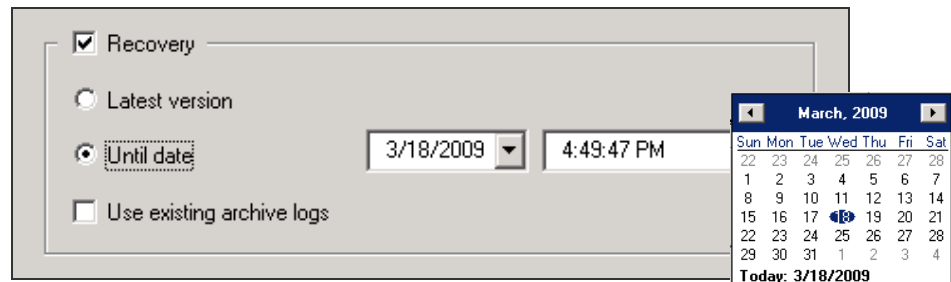
Figure 25. Recovery option to the latest version



Use the option **Use existing archive logs** if when recovering to the latest version

Any particular point in time in the past

Figure 26. Recovery option to a particular time



Note: The backup admin must determine which archive log sessions hold the archive logs necessary to achieve the recovery goal.

- Click `Restore`.

Recovering with MaxDB `dbmcli`

After restoring the MaxDB archive logfiles, if you have stopped short of performing a full recovery via the Data Protector GUI, you can conclude the pending recovery job by using MaxDB `dbmcli` commands.

See [Using the MaxDB DBM CLI](#) section on [page 28](#) to learn how to log into MaxDB's CLI utility. When you are logged in, issue the following commands to recover the database:

- To recover until the latest point in time:

```
dbmcli on MAXDB>db_warm -f
OK
```
- To recover until a specific point in time:

```
dbmcli on MAXDB>db_warm -f -u 20090320 160441
OK
```

Appendix A

The following is a complete MaxDB DP ZDB session report using scripts deployed on the application server. A dedicated backup server was also used to secure the backup:

```
[Normal] From: BSM@hpu069.deu.hp.com "Delete_zdb_tpc003_maxdb_bkp_serv" Time: 4/2/2009
5:28:50 PM
    Backup session 2009/04/02-6 started.

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/2/2009 5:31:00 PM
    Starting agent on tpc007.dp2.com.

[Normal] From: SMISA@tpc003.dp2.com "SMISA" Time: 4/2/2009 5:31:00 PM
    Starting agent on tpc003.dp2.com.

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/2/2009 5:31:00 PM
    Starting purge of ZDB database.

[Normal] From: SMISA@tpc003.dp2.com "SMISA" Time: 4/2/2009 5:31:00 PM
    Resolving backup objects on the application system.

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/2/2009 5:31:00 PM
    Purge of ZDB database completed.

[Normal] From: SMISA@tpc003.dp2.com "SMISA" Time: 4/2/2009 5:31:01 PM
    Resolving of backup objects on the application system completed.

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/2/2009 5:31:00 PM
    Beginning the resolve of the StorageWorks EVA units that
    control the storage volumes.

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/2/2009 5:31:00 PM
    Checking StorageWorks EVA SMI-S provider using this
    connection data:
        Host: tpc181.deu.hp.com
        User: administrator
        Namespace: root/eva
        Port: 5988
        SSL: FALSE

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/2/2009 5:31:01 PM
    This StorageWorks EVA SMI-S provider has access to the following StorageWorks EVA
    unit:
        Array Name: TM_CPE
        Array WWN: 50001FE150004460
        Array Status: OK
        Status Description: initialized_ok
        Firmware Version: 4100
        Comment Field:

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/2/2009 5:31:01 PM
    This StorageWorks EVA SMI-S provider has access to the following StorageWorks EVA
    unit:
        Array Name: TM_CPE_2
        Array WWN: 50001FE15000C7C0
        Array Status: OK
        Status Description: initialized_ok
        Firmware Version: 4100
        Comment Field:

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/2/2009 5:31:01 PM
    Checking StorageWorks EVA SMI-S provider using this
    connection data:
        Host: tpc194.deu.hp.com
        User: administrator@dp2
        Namespace: root/eva
        Port: 5988
        SSL: FALSE

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/2/2009 5:31:01 PM
    This StorageWorks EVA SMI-S provider has access to the following StorageWorks EVA
    unit:
        Array Name: TM_CPE_3
        Array WWN: 50014380013BE8C0
        Array Status: OK
        Status Description: initialized_ok
        Firmware Version: 09003000
        Comment Field:

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/2/2009 5:31:01 PM
    The resolve of StorageWorks EVA units has completed.
```

```

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/2/2009 5:31:01 PM
A StorageWorks EVA unit has been successfully located
for the storage volume:
Storage volume name : 6005-08B4-0001-478C-0001-E000-0E75-0000
StorageWorks EVA name : TM_CPE_2

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/2/2009 5:31:02 PM
Beginning the resolve of storage volumes.

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/2/2009 5:31:02 PM
Beginning the resolve of the storage volume with the characteristics:
Storage volume WWN : 6005-08B4-0001-478C-0001-E000-0E75-0000
StorageWorks EVA WWN : 5000-1FE1-5000-C7C0

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/2/2009 5:31:21 PM
The resolve of this storage volume has succeeded. The information
returned is:
Storage volume name : 50001FE15000C7C0\\Virtual
Disks\MaxDB\tpc003_maxdb\maxdb_data\ACTIVE
Storage volume WWN : 6005-08B4-0001-478C-0001-E000-0E75-0000
Storage volume UUID : 6005-08B4-0001-478C-0001-E000-1AF3-0000

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/2/2009 5:31:21 PM
The resolve of storage volumes has completed.

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/2/2009 5:31:21 PM
Beginning the check for snapshot type and snapshot policy requirements.

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/2/2009 5:31:22 PM
The snapshot type and policy requirements have been fulfilled.

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/2/2009 5:31:22 PM
The check for snapshot type and snapshot policy requirements
has completed.

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/2/2009 5:31:23 PM
Creation of replica started on host tpc007.dp2.com.

[Normal] From: SMISA@tpc003.dp2.com "SMISA" Time: 4/2/2009 5:31:23 PM
Executing the split pre-exec script.
(tpc003.dp2.com:suspend_db.cmd)

*-----MaxDb's dbmcli Output-----*
.
>show state
OK

SERVERDB: MAXDB

The SERVERDB state is ONLINE

Console command finished (2009-04-02 17:31:24).

---
>sql_execute suspend logwriter
OK
IO SEQUENCE = 1864

---
Log Writer S t a t u s
.
=====*****=====
T2 2 0x13E8 Logwr USR HOLD (248) 0 0 1407(s)
=====*****=====
.
.
*-----MaxDb's dbmcli Output-----*
.
[Normal] From: SMISA@tpc003.dp2.com "SMISA" Time: 4/2/2009 5:31:25 PM
Split pre-exec script completed successfully.

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/2/2009 5:31:28 PM
A fully-allocated snapshot was successfully created:
Source storage volume : 50001FE15000C7C0\\Virtual
Disks\MaxDB\tpc003_maxdb\maxdb_data\ACTIVE
StorageWorks EVA name : 5000-1FE1-5000-C7C0
Target storage volume : 50001FE15000C7C0\\Virtual
Disks\MaxDB\tpc003_maxdb\maxdb_data\DP-2009.04.02-6-049D4DA4D

[Normal] From: SMISA@tpc003.dp2.com "SMISA" Time: 4/2/2009 5:31:28 PM
Executing the split post-exec script.
(tpc003.dp2.com:resume_db.cmd)

*-----MaxDb's dbmcli Output-----*
.

```

```
>sql_execute resume logwriter
OK
```

```
---
>show state
OK
```

SERVERDB: MAXDB

The SERVERDB state is ONLINE

Console command finished (2009-04-02 17:31:29).

Log Writer Status

```
.
=====*****=====*****=====
T2      2 0x13E8 Logwr      No-Work (255)      0 0      1409(s)
=====*****=====*****=====
```

.

-----MaxDb's dbmcli Output-----

.

[Normal] From: SMISA@tpc003.dp2.com "SMISA" Time: 4/2/2009 5:31:30 PM
Split post-exec script completed successfully.

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/2/2009 5:31:30 PM
Creation of replica on host tpc007.dp2.com completed.

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/2/2009 5:31:30 PM
Preparing the backup system:
1) Mounting of filesystems

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/2/2009 5:31:30 PM
Beginning the creation of presentations.

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/2/2009 5:31:30 PM
A presentation is being created for:
Storage volume name : 50001FE15000C7C0\\Virtual
Disks\MaxDB\tpc003_maxdb\maxdb_data\DP-2009.04.02-6-049D4DA4D

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/2/2009 5:31:36 PM
The presentation has been successfully created.

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/2/2009 5:31:37 PM
The creation of presentations has completed.

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/2/2009 5:31:37 PM
Starting drive scan.

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/2/2009 5:31:46 PM
Drive scan has completed.

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/2/2009 5:31:47 PM
A filesystem has been successfully mounted.
Filesystem name : \\?\Volume{10ece3bf-035a-11de-925a-000802dfd8a1}
Mount point : C:\Program Files\OmniBack\tmp\tpc003.dp2.com\F_2009-04-02-6

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/2/2009 5:31:47 PM
Preparation of the backup system completed.

[Normal] From: BMA@tpc007.dp2.com "MAXDB_FL_Writer1" Time: 4/2/2009 5:31:52 PM
STARTING Media Agent "MAXDB_FL_Writer1"

[Normal] From: BMA@tpc007.dp2.com "MAXDB_FL_Writer1" Time: 4/2/2009 5:31:53 PM
Loading medium from slot D:\Backup\10394b45549d4da34504cd501b5.fd to device
MAXDB_FL_Writer1

[Normal] From: BMA@tpc007.dp2.com "MAXDB_FL_Writer1" Time: 4/2/2009 5:31:53 PM
D:\Backup\10394b45549d4da34504cd501b5.fd
Initializing new medium: "MAXDB_FL_MediaPool_110"

[Normal] From: VBDA@tpc007.dp2.com "F:" Time: 4/2/2009 5:31:58 PM
STARTING Disk Agent for tpc007.dp2.com:C:\Program
Files\OmniBack\tmp\tpc003.dp2.com\F_2009-04-02-6 "F:".

[Normal] From: VBDA@tpc007.dp2.com "F:" Time: 4/2/2009 5:32:03 PM
COMPLETED Disk Agent for tpc007.dp2.com:C:\Program
Files\OmniBack\tmp\tpc003.dp2.com\F_2009-04-02-6 "F:".

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/2/2009 5:32:03 PM
Resuming the backup system.

```

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/2/2009 5:32:03 PM
A filesystem has been successfully dismounted.
Filesystem name : \\?\Volume{10ece3bf-035a-11de-925a-000802dfd8a1}
Mount point : C:\Program Files\OmniBack\tmp\tpc003.dp2.com\F_2009-04-02-6

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/2/2009 5:32:03 PM
Removing any presentations of:
Storage volume name : 50001FE15000C7C0\\Virtual
Disks\MaxDB\tpc003_maxdb_maxdb_data\DP-2009.04.02-6-049D4DA4D

[Normal] From: BMA@tpc007.dp2.com "MAXDB_FL_Writer1" Time: 4/2/2009 5:32:03 PM
Unloading medium to slot D:\Backup\10394b45549d4da34504cd501b5.fd from device
MAXDB_FL_Writer1

[Normal] From: BMA@tpc007.dp2.com "MAXDB_FL_Writer1" Time: 4/2/2009 5:32:03 PM
COMPLETED Media Agent "MAXDB_FL_Writer1"

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/2/2009 5:32:04 PM
The presentations have been successfully removed.

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/2/2009 5:32:04 PM
Starting drive scan.

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/2/2009 5:32:08 PM
Drive scan has completed.

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/2/2009 5:32:08 PM
The backup system was successfully resumed.

[Normal] From: SMISA@tpc003.dp2.com "SMISA" Time: 4/2/2009 5:32:08 PM
COMPLETED SMIS-Application agent on tpc003.dp2.com.

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/2/2009 5:32:08 PM
COMPLETED SMIS-Backup agent on tpc007.dp2.com.

[Normal] From: BSM@hpu069.deu.hp.com "Delete_zdb_tpc003_maxdb_bkp_serv" Time: 4/2/2009
5:31:16 PM

```

Backup Statistics:

```

Session Queuing Time (hours)           0.03
-----
Completed Disk Agents .....           1
Failed Disk Agents .....              0
Aborted Disk Agents .....             0
-----
Disk Agents Total .....               1
=====
Completed Media Agents .....           1
Failed Media Agents .....              0
Aborted Media Agents .....             0
-----
Media Agents Total .....              1
=====
Mbytes Total .....                   150 MB
Used Media Total .....                 1
Disk Agent Errors Total .....          0

```

```

=====
                        Session completed successfully!
=====

```


Appendix B

The following is a complete Data Protector session report which shows what happens if you start MaxDB data volume ZDB backup session when the MaxDB logwriter process has already been suspended. The backup successfully completes, and the script reports an error, displayed in the Data Protector session report, stating that the MaxDB log suspend command cannot be executed again on a MaxDB instance where the process is already in suspension.

However, since the prerequisite for splitting is satisfied in that the MaxDB logwriter process is indeed suspended, Data Protector continues to split the replica, after which it resumes the MaxDB logwriter process. Subsequently the backup is streamed to tape. Compare this against the impact of resuming the MaxDB logwriter process on an already working logwriter process (see [Appendix C](#) on [page 45](#)).

```
[Normal] From: BSM@hpu069.deu.hp.com "zdb_tpc003_maxdb_bkp_serv" Time: 4/7/2009 2:05:51 PM
Backup session 2009/04/07-7 started.

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/7/2009 2:08:01 PM
Starting agent on tpc007.dp2.com.

[Normal] From: SMISA@tpc003.dp2.com "SMISA" Time: 4/7/2009 2:08:02 PM
Starting agent on tpc003.dp2.com.

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/7/2009 2:08:01 PM
Starting purge of ZDB database.

[Normal] From: SMISA@tpc003.dp2.com "SMISA" Time: 4/7/2009 2:08:02 PM
Resolving backup objects on the application system.

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/7/2009 2:08:01 PM
Purge of ZDB database completed.

[Normal] From: SMISA@tpc003.dp2.com "SMISA" Time: 4/7/2009 2:08:02 PM
Resolving of backup objects on the application system completed.

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/7/2009 2:08:02 PM
Beginning the resolve of the StorageWorks EVA units that
control the storage volumes.

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/7/2009 2:08:02 PM
Checking StorageWorks EVA SMI-S provider using this
connection data:
Host: 16.112.14.188
User: administrator
Namespace: root/eva
Port: 5988
SSL: FALSE

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/7/2009 2:09:37 PM
Checking StorageWorks EVA SMI-S provider using this
connection data:
Host: tpc181.deu.hp.com
User: administrator
Namespace: root/eva
Port: 5988
SSL: FALSE

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/7/2009 2:09:38 PM
This StorageWorks EVA SMI-S provider has access to the following StorageWorks EVA
unit:
Array Name: TM_CPE
Array WWN: 50001FE150004460
Array Status: OK
Status Description: initialized_ok
Firmware Version: 4100
Comment Field:

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/7/2009 2:09:38 PM
This StorageWorks EVA SMI-S provider has access to the following StorageWorks EVA
unit:
Array Name: TM_CPE_2
Array WWN: 50001FE15000C7C0
Array Status: OK
Status Description: initialized_ok
Firmware Version: 4100
Comment Field:
```

```

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/7/2009 2:09:38 PM
Checking StorageWorks EVA SMI-S provider using this
connection data:
    Host: tpc194.deu.hp.com
    User: administrator@dp2
    Namespace: root/eva
    Port: 5988
    SSL: FALSE

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/7/2009 2:09:38 PM
This StorageWorks EVA SMI-S provider has access to the following StorageWorks EVA
unit:
    Array Name: TM_CPE_3
    Array WWN: 50014380013BE8C0
    Array Status: OK
    Status Description: initialized_ok
    Firmware Version: 09003000
    Comment Field:

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/7/2009 2:09:38 PM
The resolve of StorageWorks EVA units has completed.

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/7/2009 2:09:38 PM
A StorageWorks EVA unit has been successfully located
for the storage volume:
Storage volume name : 6005-08B4-0001-478C-0001-E000-0E75-0000
StorageWorks EVA name : TM_CPE_2

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/7/2009 2:09:39 PM
Beginning the resolve of storage volumes.

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/7/2009 2:09:39 PM
Beginning the resolve of the storage volume with the characteristics:
Storage volume WWN : 6005-08B4-0001-478C-0001-E000-0E75-0000
StorageWorks EVA WWN : 5000-1FE1-5000-C7C0

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/7/2009 2:09:45 PM
The resolve of this storage volume has succeeded. The information
returned is:
Storage volume name : 50001FE15000C7C0\\Virtual
Disks\MaxDB\tpc003_maxdb\maxdb_data\ACTIVE
Storage volume WWN : 6005-08B4-0001-478C-0001-E000-0E75-0000
Storage volume UUID : 6005-08B4-0001-478C-0001-E000-1AF3-0000

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/7/2009 2:09:45 PM
The resolve of storage volumes has completed.

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/7/2009 2:09:45 PM
Beginning the check for snapshot type and snapshot policy requirements.

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/7/2009 2:09:46 PM
The snapshot type and policy requirements have been fulfilled.

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/7/2009 2:09:46 PM
The check for snapshot type and snapshot policy requirements
has completed.

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/7/2009 2:09:47 PM
Creation of replica started on host tpc007.dp2.com.

[Normal] From: SMISA@tpc003.dp2.com "SMISA" Time: 4/7/2009 2:09:47 PM
Executing the split pre-exec script.
(tpc003.dp2.com:suspend_db.cmd)

```

```
*-----MaxDb's dbmcli Output-----*
```

```
.
>show state
OK
```

```
SERVERDB: MAXDB
```

```
The SERVERDB state is ONLINE
```

```
Console command finished (2009-04-07 14:09:48).
```

```
---
>sql_execute suspend logwriter
ERR
-24988,ERR_SQL: SQL error
-104,DBM command impossible at this time
---
```

Log Writer S t a t u s

```
.
=====*****=====*****=====
T2      2 0x13E8 Logwr          USR HOLD (248)          0 0          3776(s)
=====*****=====*****=====
.
.
*-----MaxDb's dbmcli Output-----*
.
[Normal] From: SMISA@tpc003.dp2.com "SMISA" Time: 4/7/2009 2:09:49 PM
Split pre-exec script completed successfully.

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/7/2009 2:09:52 PM
A fully-allocated snapshot was successfully created:
Source storage volume : 50001FE15000C7C0\\Virtual
Disks\MaxDB\tpc003_maxdb\maxdb_data\ACTIVE
StorageWorks EVA name : 5000-1FE1-5000-C7C0
Target storage volume : 50001FE15000C7C0\\Virtual
Disks\MaxDB\tpc003_maxdb\maxdb_data\DP-2009.04.07-7-049DB428D

[Normal] From: SMISA@tpc003.dp2.com "SMISA" Time: 4/7/2009 2:09:52 PM
Executing the split post-exec script.
(tpc003.dp2.com:resume_db.cmd)

*-----MaxDb's dbmcli Output-----*
.
>sql_execute resume logwriter
OK

---
>show state
OK

SERVERDB: MAXDB

The SERVERDB state is ONLINE

Console command finished (2009-04-07 14:09:53).

---
                                Log Writer Status

.
=====*****=====*****=====
T2      2 0x13E8 Logwr          No-Work (255)          0 0          3778(s)
=====*****=====*****=====
.
.
*-----MaxDb's dbmcli Output-----*
.
[Normal] From: SMISA@tpc003.dp2.com "SMISA" Time: 4/7/2009 2:09:54 PM
Split post-exec script completed successfully.

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/7/2009 2:09:54 PM
Creation of replica on host tpc007.dp2.com completed.

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/7/2009 2:09:54 PM
Preparing the backup system:
1) Mounting of filesystems

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/7/2009 2:09:54 PM
Beginning the creation of presentations.

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/7/2009 2:09:54 PM
A presentation is being created for:
Storage volume name : 50001FE15000C7C0\\Virtual
Disks\MaxDB\tpc003_maxdb\maxdb_data\DP-2009.04.07-7-049DB428D

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/7/2009 2:10:01 PM
The presentation has been successfully created.

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/7/2009 2:10:01 PM
The creation of presentations has completed.

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/7/2009 2:10:01 PM
Starting drive scan.

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/7/2009 2:10:10 PM
Drive scan has completed.

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/7/2009 2:10:10 PM
A filesystem has been successfully mounted.
Filesystem name : \\?\Volume{10ece3cb-035a-11de-925a-000802dfd8a1}
Mount point : C:\Program Files\OmniBack\tmp\tpc003.dp2.com\F_2009-04-07-7
```

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/7/2009 2:10:10 PM
Preparation of the backup system completed.

[Normal] From: BMA@tpc007.dp2.com "MAXDB_FL_Writer0" Time: 4/7/2009 2:10:15 PM
STARTING Media Agent "MAXDB_FL_Writer0"

[Normal] From: BMA@tpc007.dp2.com "MAXDB_FL_Writer0" Time: 4/7/2009 2:10:16 PM
Loading medium from slot D:\Backup\10394b45549db4272504cd501dd.fd to device
MAXDB_FL_Writer0

[Normal] From: BMA@tpc007.dp2.com "MAXDB_FL_Writer0" Time: 4/7/2009 2:10:16 PM
D:\Backup\10394b45549db4272504cd501dd.fd
Initializing new medium: "MAXDB_FL_MediaPool_114"

[Normal] From: VBDA@tpc007.dp2.com "F:" Time: 4/7/2009 2:10:21 PM
STARTING Disk Agent for tpc007.dp2.com:C:\Program
Files\OmniBack\tmp\tpc003.dp2.com\F_2009-04-07-7 "F:".

[Normal] From: VBDA@tpc007.dp2.com "F:" Time: 4/7/2009 2:10:26 PM
COMPLETED Disk Agent for tpc007.dp2.com:C:\Program
Files\OmniBack\tmp\tpc003.dp2.com\F_2009-04-07-7 "F:".

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/7/2009 2:10:26 PM
Resuming the backup system.

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/7/2009 2:10:26 PM
A filesystem has been successfully dismounted.
Filesystem name : \\?\Volume{10ece3cb-035a-11de-925a-000802dfd8a1}
Mount point : C:\Program Files\OmniBack\tmp\tpc003.dp2.com\F_2009-04-07-7

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/7/2009 2:10:26 PM
Removing any presentations of:
Storage volume name : 50001FE15000C7C0\\Virtual
Disks\MaxDB\tpc003_maxdb\maxdb_data\DP-2009.04.07-7-049DB428D

[Normal] From: BMA@tpc007.dp2.com "MAXDB_FL_Writer0" Time: 4/7/2009 2:10:26 PM
Unloading medium to slot D:\Backup\10394b45549db4272504cd501dd.fd from device
MAXDB_FL_Writer0

[Normal] From: BMA@tpc007.dp2.com "MAXDB_FL_Writer0" Time: 4/7/2009 2:10:26 PM
COMPLETED Media Agent "MAXDB_FL_Writer0"

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/7/2009 2:10:27 PM
The presentations have been successfully removed.

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/7/2009 2:10:27 PM
Starting drive scan.

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/7/2009 2:10:31 PM
Drive scan has completed.

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/7/2009 2:10:31 PM
The backup system was successfully resumed.

[Normal] From: SMISA@tpc003.dp2.com "SMISA" Time: 4/7/2009 2:10:32 PM
COMPLETED SMIS-Application agent on tpc003.dp2.com.

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/7/2009 2:10:31 PM
COMPLETED SMIS-Backup agent on tpc007.dp2.com.

[Normal] From: BSM@hpu069.deu.hp.com "zdb_tpc003_maxdb_bkp_serv" Time: 4/7/2009 2:09:38 PM

Backup Statistics:

Session Queuing Time (hours)	0.06

Completed Disk Agents	1
Failed Disk Agents	0
Aborted Disk Agents	0

Disk Agents Total	1
=====	
Completed Media Agents	1
Failed Media Agents	0
Aborted Media Agents	0

Media Agents Total	1
=====	
Mbytes Total	150 MB
Used Media Total	1
Disk Agent Errors Total	0

=====
Session completed successfully!
=====

Appendix C

The following is a complete Data Protector session report which shows the benefit of deploying the ZDB_ALWAYS_POST_SCRIPT omnirc variable on the application server. There was a problem with the resolution of the storage volume and so the storage volume was not resolved. As a consequence Data Protector cleans up the procedure, bypasses the application level pre-exec script, and jumps directly to executing the application level post-exec script.

This behavior is a direct consequence of setting the ZDB_ALWAYS_POST_SCRIPT omnirc variable to 1, which means the application level post-exec script is always executed whenever the backup specification is run. By default, the variable is set to 0.

Note that the MaxDB instance continues to work normally even though there is an array volume resolution problem. Invoking the application level post-exec script which resumes MaxDB's logwriter process has no detrimental effect on the running MaxDB instance. In fact, resuming MaxDB's logwriter process has no impact on a logwriter process that is already running. Compare this with the impact of suspending the MaxDB logwriter process on an already suspended logwriter process (see [Appendix B](#) on [page 41](#)).

```
[Normal] From: BSM@hpu069.deu.hp.com "zdb_tpc003_maxdb_bkp_serv" Time: 4/8/2009 4:05:25 PM
Backup session 2009/04/08-4 started.

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/8/2009 4:07:38 PM
Starting agent on tpc007.dp2.com.

[Normal] From: SMISA@tpc003.dp2.com "SMISA" Time: 4/8/2009 4:07:39 PM
Starting agent on tpc003.dp2.com.

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/8/2009 4:07:38 PM
Starting purge of ZDB database.

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/8/2009 4:07:38 PM
The target volumes that will be purged:
50001FE15000C7C0\\Virtual Disks\MaxDB\tpc003_maxdb\maxdb_data\DP-2009.04.07-7-
049DB428D

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/8/2009 4:07:38 PM
Beginning the resolve of the StorageWorks EVA units that
control the storage volumes.

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/8/2009 4:07:38 PM
Checking StorageWorks EVA SMI-S provider using this
connection data:
Host: 16.112.14.188
User: administrator
Namespace: root/eva
Port: 5988
SSL: FALSE

[Warning] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/8/2009 4:07:39 PM
The StorageWorks EVA SMI-S agent received this exception
message from the StorageWorks EVA SMI-S provider:
HTTP Error (401 Unauthorized).

[Warning] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/8/2009 4:09:14 PM
[236:7468] This StorageWorks EVA SMI-S provider is not currently
responding correctly.

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/8/2009 4:09:14 PM
Checking StorageWorks EVA SMI-S provider using this
connection data:
Host: tpc181.deu.hp.com
User: administrator
Namespace: root/eva
Port: 5988
SSL: FALSE
```

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/8/2009 4:09:16 PM
This StorageWorks EVA SMI-S provider has access to the following StorageWorks EVA unit:

```

Array Name:          TM_CPE
Array WWN:           50001FE150004460
Array Status:        OK
Status Description:  initialized_ok
Firmware Version:   4100
Comment Field:

```

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/8/2009 4:09:16 PM
This StorageWorks EVA SMI-S provider has access to the following StorageWorks EVA unit:

```

Array Name:          TM_CPE_2
Array WWN:           50001FE15000C7C0
Array Status:        OK
Status Description:  initialized_ok
Firmware Version:   4100
Comment Field:

```

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/8/2009 4:09:16 PM
Checking StorageWorks EVA SMI-S provider using this connection data:

```

Host:    tpc194.deu.hp.com
User:    administrator@dp2
Namespace:  root/eva
Port:    5988
SSL:     FALSE

```

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/8/2009 4:09:16 PM
This StorageWorks EVA SMI-S provider has access to the following StorageWorks EVA unit:

```

Array Name:          TM_CPE_3
Array WWN:           50014380013BE8C0
Array Status:        OK
Status Description:  initialized_ok
Firmware Version:   09003000
Comment Field:

```

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/8/2009 4:09:16 PM
The resolve of StorageWorks EVA units has completed.

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/8/2009 4:09:16 PM
A StorageWorks EVA unit has been successfully located for the storage volume:
Storage volume name : 50001FE15000C7C0\\Virtual
Disks\MaxDB\tpc003_maxdb\maxdb_data\DP-2009.04.07-7-049DB428D
StorageWorks EVA name : TM_CPE_2

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/8/2009 4:09:17 PM
Beginning the resolve of storage volumes.

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/8/2009 4:09:17 PM
Beginning the resolve of the storage volume with the characteristics:
Storage volume UUID : 6005-08B4-0001-478C-0001-E000-1C66-0000

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/8/2009 4:09:17 PM
The resolve of this storage volume has succeeded. The information returned is:
Storage volume name : 50001FE15000C7C0\\Virtual
Disks\MaxDB\tpc003_maxdb\maxdb_data\DP-2009.04.07-7-049DB428D
Storage volume WWN : 6005-08B4-0001-478C-0001-E000-1C66-0000
Storage volume UUID : 6005-08B4-0001-478C-0001-E000-1C66-0000

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/8/2009 4:09:17 PM
The resolve of storage volumes has completed.

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/8/2009 4:09:18 PM
StorageWorks EVA SMI-S agent is attempting to delete this storage volume:
Storage volume name : 50001FE15000C7C0\\Virtual
Disks\MaxDB\tpc003_maxdb\maxdb_data\DP-2009.04.07-7-049DB428D
StorageWorks EVA name : 5000-1FE1-5000-C7C0

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/8/2009 4:09:18 PM
The storage volume has been successfully deleted.

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/8/2009 4:09:18 PM
Purge of ZDB database completed.

[Normal] From: SMISA@tpc003.dp2.com "SMISA" Time: 4/8/2009 4:09:18 PM
Resolving backup objects on the application system.

[Normal] From: SMISA@tpc003.dp2.com "SMISA" Time: 4/8/2009 4:09:19 PM
Resolving of backup objects on the application system completed.

```

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/8/2009 4:09:19 PM
A StorageWorks EVA unit has been successfully located
for the storage volume:
Storage volume name : 6005-08B4-0001-478C-0001-E000-0E75-0000
StorageWorks EVA name : TM_CPE_2

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/8/2009 4:09:20 PM
Beginning the resolve of storage volumes.

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/8/2009 4:09:20 PM
Beginning the resolve of the storage volume with the characteristics:
Storage volume WWN : 6005-08B4-0001-478C-0001-E000-0E75-0000
StorageWorks EVA WWN : 5000-1FE1-5000-C7C0

[Minor] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/8/2009 4:09:32 PM
[236:7103] The resolve of this storage volume has failed.

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/8/2009 4:09:32 PM
The resolve of storage volumes has completed.

[Critical] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/8/2009 4:09:32 PM
There are no valid objects left.

[Normal] From: SMISA@tpc003.dp2.com "SMISA" Time: 4/8/2009 4:09:33 PM
SMIS-Application agent will start with clean up.

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/8/2009 4:09:33 PM
SMIS-Backup agent will start with clean up.

[Normal] From: SMISA@tpc003.dp2.com "SMISA" Time: 4/8/2009 4:09:33 PM
Executing the split post-exec script.
(tpc003.dp2.com:resume_db.cmd)

[Normal] From: SMISA@tpc007.dp2.com "SMISA" Time: 4/8/2009 4:09:33 PM
ABORTED SMIS-Backup agent on tpc007.dp2.com.

*-----MaxDb's dbmcli Output-----*
.
>sql_execute resume logwriter
OK

---
>show state
OK

SERVERDB: MAXDB

The SERVERDB state is ONLINE

Console command finished (2009-04-08 16:09:34).

---
Log Writer Status
.
=====
T2      2 0x6DC Logwr      No-Work (255)      0 0      398(s)
=====
.
.
*-----MaxDb's dbmcli Output-----*
.
.
[Normal] From: SMISA@tpc003.dp2.com "SMISA" Time: 4/8/2009 4:09:36 PM
Split post-exec script completed successfully.

[Normal] From: SMISA@tpc003.dp2.com "SMISA" Time: 4/8/2009 4:09:36 PM
ABORTED SMIS-Application agent on tpc003.dp2.com.

[Critical] From: BSM@hpu069.deu.hp.com "zdb_tpc003_maxdb_bkp_serv" Time: 4/8/2009 4:08:42
PM
None of the Disk Agents completed successfully.
Session has failed.

```

Backup Statistics:

Session Queuing Time (hours)	0.05
-----	-----
Completed Disk Agents	0
Failed Disk Agents	1
Aborted Disk Agents	0
-----	-----
Disk Agents Total	1
=====	=====
Completed Media Agents	0
Failed Media Agents	0
Aborted Media Agents	0
-----	-----
Media Agents Total	0
=====	=====
Mbytes Total	0 MB
Used Media Total	0
Disk Agent Errors Total	0

=====
Session failed!
=====

Appendix D

The following is a complete DP ZDB tape restore session report which restores MaxDB's data volume.

```
[Normal] From: RSM@hpu069.deu.hp.com " " Time: 3/17/2009 6:05:33 PM
Restore session 2009/03/17-12 started.

[Normal] From: RMA@tpc007.dp2.com "MAXDB_FL_Writer0" Time: 3/17/2009 6:06:21 PM
STARTING Media Agent "MAXDB_FL_Writer0"

[Normal] From: RMA@tpc007.dp2.com "MAXDB_FL_Writer0" Time: 3/17/2009 6:06:22 PM
Loading medium from slot D:\Backup\10394b45549bfaf4c504cd500ff.fd to device
MAXDB_FL_Writer0

[Normal] From: VRDA@tpc003.dp2.com "F:" Time: 3/17/2009 6:06:28 PM
STARTING Disk Agent for tpc003.dp2.com:F:

[Warning] From: VRDA@tpc003.dp2.com "F:" Time: 3/17/2009 6:06:30 PM
F:\MAXDB\DISKD0001

Option OVERWRITE => Old file will be replaced !

[Normal] From: VRDA@tpc003.dp2.com "F:" Time: 3/17/2009 6:07:11 PM
COMPLETED Disk Agent for tpc003.dp2.com:F:

[Normal] From: RMA@tpc007.dp2.com "MAXDB_FL_Writer0" Time: 3/17/2009 6:07:17 PM
Unloading medium to slot D:\Backup\10394b45549bfaf4c504cd500ff.fd from device
MAXDB_FL_Writer0

[Normal] From: RMA@tpc007.dp2.com "MAXDB_FL_Writer0" Time: 3/17/2009 6:07:17 PM
COMPLETED Media Agent "MAXDB_FL_Writer0"
```

```
=====
                        Session completed successfully!
=====
```

Appendix E

What happens if you select the CONFIG object in addition to the DATA object in the Restore Source pane?

Data Protector aborts the restore session and displays the following message:

```
[Normal] From: RSM@hpu069.deu.hp.com " " Time: 3/19/2009 5:06:45 PM
Restore session 2009/03/19-14 started.

[Normal] From: OB2BAR_SAPDBBAR@tpc003.dp2.com "MAXDB" Time: 3/19/2009 5:07:34 PM
Executing the dbmcli command: `user_logon`.

[Normal] From: OB2BAR_SAPDBBAR@tpc003.dp2.com "MAXDB" Time: 3/19/2009 5:07:34 PM
Executing the dbmcli command: `dbm_configset -raw BSI_ENV
C:\PROGRA~1\OmniBack\tmp\MAXDB.bsi_env`.

[Normal] From: OB2BAR_SAPDBBAR@tpc003.dp2.com "MAXDB" Time: 3/19/2009 5:07:35 PM
Executing the dbmcli command: `exit`.

[Normal] From: RSM@hpu069.deu.hp.com " " Time: 3/19/2009 5:06:46 PM
OB2BAR application on "tpc003.dp2.com" disconnected.
```

```
=====
                        Session aborted!
=====
```

What happens if you select the restore option Full restore of database (includes full, differential and transaction log backups)?

Because a combination of file system ZDB and MaxDB-DP is used in the integration, the restore process requires admin intervention. In using the script-assisted MaxDB ZDB and MaxDB-DP integration solutions together, there is no need to perform MaxDB-DP integration full or differential backups. Therefore, if you select this option the restore session will abort with the following error:

```
[Normal] From: RSM@hpu069.deu.hp.com " " Time: 3/19/2009 4:51:22 PM
Restore session 2009/03/19-13 started.

[Normal] From: OB2BAR_SAPDBBAR@tpc003.dp2.com "MAXDB" Time: 3/19/2009 4:52:11 PM
Executing the dbmcli command: `user_logon`.

[Normal] From: OB2BAR_SAPDBBAR@tpc003.dp2.com "MAXDB" Time: 3/19/2009 4:52:12 PM
Executing the dbmcli command: `dbm_configset -raw BSI_ENV
C:\PROGRA~1\OmniBack\tmp\MAXDB.bsi_env`.

[Normal] From: OB2BAR_SAPDBBAR@tpc003.dp2.com "MAXDB" Time: 3/19/2009 4:52:12 PM
Executing the dbmcli command: `exit`.

[Normal] From: RSM@hpu069.deu.hp.com " " Time: 3/19/2009 4:51:24 PM
OB2BAR application on "tpc003.dp2.com" disconnected.
```

```
=====
                        Session aborted!
=====
```

Appendix F

The following is a complete Data Protector session report in which Latest Point In Time Recovery was selected. After restoring the appropriate archive log backup sessions, with the final archive log session yet to be restored, the Recovery option was selected with latest point in time.

Data Protector restores the last archive log session and then instructs MaxDB to recover the instance to the latest point in time:

```
[Normal] From: RSM@hpu069.deu.hp.com " " Time: 3/19/2009 2:28:11 PM
Restore session 2009/03/19-6 started.

[Normal] From: OB2BAR_SAPDBBAR@tpc003.dp2.com "MAXDB" Time: 3/19/2009 2:29:00 PM
Executing the dbmcli command: `user_logon'.

[Normal] From: OB2BAR_SAPDBBAR@tpc003.dp2.com "MAXDB" Time: 3/19/2009 2:29:00 PM
Executing the dbmcli command: `dbm_configset -raw BSI_ENV
C:\PROGRA~1\OmniBack\tmp\MAXDB.bsi_env'.

[Normal] From: OB2BAR_SAPDBBAR@tpc003.dp2.com "MAXDB" Time: 3/19/2009 2:29:01 PM
Executing the dbmcli command: `db_admin'.

[Normal] From: OB2BAR_SAPDBBAR@tpc003.dp2.com "MAXDB" Time: 3/19/2009 2:29:10 PM
Executing the dbmcli command: `dbm_configset -raw set_variable_10
OB2BACKUPAPPNAME=MAXDB'.

[Normal] From: OB2BAR_SAPDBBAR@tpc003.dp2.com "MAXDB" Time: 3/19/2009 2:29:10 PM
Executing the dbmcli command: `dbm_configset -raw set_variable_11
OB2BACKUPHOSTNAME=tpc003.dp2.com'.

[Normal] From: OB2BAR_SAPDBBAR@tpc003.dp2.com "MAXDB" Time: 3/19/2009 2:29:10 PM
Executing the dbmcli command: `util_connect'.

[Normal] From: OB2BAR_SAPDBBAR@tpc003.dp2.com "MAXDB" Time: 3/19/2009 2:29:10 PM
Restoring backup 2009/03/19 0002.

[Normal] From: OB2BAR_SAPDBBAR@tpc003.dp2.com "MAXDB" Time: 3/19/2009 2:29:10 PM
Executing the dbmcli command: `medium_put BACKDP-Archive/1 \\.Pipe\MAXDB.BACKDP-
Archive.1 PIPE LOG 0 8 NO NO \\" BACK'.

[Normal] From: OB2BAR_SAPDBBAR@tpc003.dp2.com "MAXDB" Time: 3/19/2009 2:29:10 PM
Executing the dbmcli command: `db_state'.

[Normal] From: OB2BAR_SAPDBBAR@tpc003.dp2.com "MAXDB" Time: 3/19/2009 2:29:10 PM
Executing the dbmcli command: `recover_start BACKDP-Archive LOG ExternalBackupID
"MAXDB 0903192:1 Stream"'.

[Normal] From: RMA@tpc007.dp2.com "MAXDB_FL_Writer0" Time: 3/19/2009 2:31:02 PM
STARTING Media Agent "MAXDB_FL_Writer0"

[Normal] From: RMA@tpc007.dp2.com "MAXDB_FL_Writer0" Time: 3/19/2009 2:31:03 PM
Loading medium from slot D:\Backup\10394b45549c22fb0504cd5013e.fd to device
MAXDB_FL_Writer0

[Normal] From: OB2BAR_DMA@tpc003.dp2.com "MAXDB" Time: 3/19/2009 2:31:10 PM
Starting OB2BAR Restore: tpc003.dp2.com:/MAXDB/Data/1 "SAPDB"

[Normal] From: OB2BAR_DMA@tpc003.dp2.com "MAXDB" Time: 3/19/2009 2:31:13 PM
Completed OB2BAR Restore: tpc003.dp2.com:/MAXDB/Data/1 "SAPDB"

[Normal] From: OB2BAR_SAPDBBAR@tpc003.dp2.com "MAXDB" Time: 3/19/2009 2:31:14 PM
Executing the dbmcli command: `db_state'.

[Normal] From: OB2BAR_SAPDBBAR@tpc003.dp2.com "MAXDB" Time: 3/19/2009 2:31:14 PM
Executing the dbmcli command: `recover_start BACKDP-Archive LOG ExternalBackupID
"MAXDB 0903192:2 Stream"'.

[Normal] From: OB2BAR_DMA@tpc003.dp2.com "MAXDB" Time: 3/19/2009 2:31:56 PM
Starting OB2BAR Restore: tpc003.dp2.com:/MAXDB/Data/2 "SAPDB"

[Normal] From: OB2BAR_DMA@tpc003.dp2.com "MAXDB" Time: 3/19/2009 2:31:58 PM
Completed OB2BAR Restore: tpc003.dp2.com:/MAXDB/Data/2 "SAPDB"

[Normal] From: OB2BAR_SAPDBBAR@tpc003.dp2.com "MAXDB" Time: 3/19/2009 2:31:59 PM
Executing the dbmcli command: `db_state'.

[Normal] From: OB2BAR_SAPDBBAR@tpc003.dp2.com "MAXDB" Time: 3/19/2009 2:31:59 PM
Executing the dbmcli command: `recover_start BACKDP-Archive LOG ExternalBackupID
"MAXDB 0903192:3 Stream"'.

```

```

[Normal] From: OB2BAR_DMA@tpc003.dp2.com "MAXDB" Time: 3/19/2009 2:32:41 PM
Starting OB2BAR Restore: tpc003.dp2.com:/MAXDB/Data/3 "SAPDB"

[Normal] From: OB2BAR_DMA@tpc003.dp2.com "MAXDB" Time: 3/19/2009 2:32:43 PM
Completed OB2BAR Restore: tpc003.dp2.com:/MAXDB/Data/3 "SAPDB"

[Normal] From: OB2BAR_SAPDBBAR@tpc003.dp2.com "MAXDB" Time: 3/19/2009 2:32:44 PM
Executing the dbmcli command: `db_state`.

[Normal] From: OB2BAR_SAPDBBAR@tpc003.dp2.com "MAXDB" Time: 3/19/2009 2:32:44 PM
Executing the dbmcli command: `recover_start BACKDP-Archive LOG ExternalBackupID
"MAXDB 0903192:4 Stream"`.

[Normal] From: OB2BAR_DMA@tpc003.dp2.com "MAXDB" Time: 3/19/2009 2:33:25 PM
Starting OB2BAR Restore: tpc003.dp2.com:/MAXDB/Data/4 "SAPDB"

[Normal] From: OB2BAR_DMA@tpc003.dp2.com "MAXDB" Time: 3/19/2009 2:33:28 PM
Completed OB2BAR Restore: tpc003.dp2.com:/MAXDB/Data/4 "SAPDB"

[Normal] From: OB2BAR_SAPDBBAR@tpc003.dp2.com "MAXDB" Time: 3/19/2009 2:33:28 PM
Executing the dbmcli command: `db_state`.

[Normal] From: OB2BAR_SAPDBBAR@tpc003.dp2.com "MAXDB" Time: 3/19/2009 2:33:28 PM
Executing the dbmcli command: `recover_start BACKDP-Archive LOG ExternalBackupID
"MAXDB 0903192:5 Stream"`.

[Normal] From: OB2BAR_DMA@tpc003.dp2.com "MAXDB" Time: 3/19/2009 2:34:10 PM
Starting OB2BAR Restore: tpc003.dp2.com:/MAXDB/Data/5 "SAPDB"

[Normal] From: OB2BAR_DMA@tpc003.dp2.com "MAXDB" Time: 3/19/2009 2:34:12 PM
Completed OB2BAR Restore: tpc003.dp2.com:/MAXDB/Data/5 "SAPDB"

[Normal] From: OB2BAR_SAPDBBAR@tpc003.dp2.com "MAXDB" Time: 3/19/2009 2:34:13 PM
Executing the dbmcli command: `db_state`.

[Normal] From: OB2BAR_SAPDBBAR@tpc003.dp2.com "MAXDB" Time: 3/19/2009 2:34:13 PM
Executing the dbmcli command: `recover_start BACKDP-Archive LOG ExternalBackupID
"MAXDB 0903192:6 Stream"`.

[Normal] From: OB2BAR_DMA@tpc003.dp2.com "MAXDB" Time: 3/19/2009 2:34:55 PM
Starting OB2BAR Restore: tpc003.dp2.com:/MAXDB/Data/6 "SAPDB"

[Normal] From: OB2BAR_DMA@tpc003.dp2.com "MAXDB" Time: 3/19/2009 2:34:57 PM
Completed OB2BAR Restore: tpc003.dp2.com:/MAXDB/Data/6 "SAPDB"

[Normal] From: OB2BAR_SAPDBBAR@tpc003.dp2.com "MAXDB" Time: 3/19/2009 2:34:58 PM
Executing the dbmcli command: `db_state`.

[Normal] From: OB2BAR_SAPDBBAR@tpc003.dp2.com "MAXDB" Time: 3/19/2009 2:34:58 PM
Executing the dbmcli command: `recover_start BACKDP-Archive LOG ExternalBackupID
"MAXDB 0903192:7 Stream"`.

[Normal] From: OB2BAR_DMA@tpc003.dp2.com "MAXDB" Time: 3/19/2009 2:35:40 PM
Starting OB2BAR Restore: tpc003.dp2.com:/MAXDB/Data/7 "SAPDB"

[Normal] From: OB2BAR_DMA@tpc003.dp2.com "MAXDB" Time: 3/19/2009 2:35:42 PM
Completed OB2BAR Restore: tpc003.dp2.com:/MAXDB/Data/7 "SAPDB"

[Normal] From: OB2BAR_SAPDBBAR@tpc003.dp2.com "MAXDB" Time: 3/19/2009 2:35:43 PM
Executing the dbmcli command: `db_warm -f`.

[Normal] From: OB2BAR_SAPDBBAR@tpc003.dp2.com "MAXDB" Time: 3/19/2009 2:35:45 PM
Executing the dbmcli command: `exit`.

[Normal] From: RSM@hpu069.deu.hp.com "" Time: 3/19/2009 2:34:57 PM
OB2BAR application on "tpc003.dp2.com" disconnected.

[Normal] From: RMA@tpc007.dp2.com "MAXDB_FL_Writer0" Time: 3/19/2009 2:36:12 PM
Unloading medium to slot D:\Backup\10394b45549c22fb0504cd5013e.fd from device
MAXDB_FL_Writer0

[Normal] From: RMA@tpc007.dp2.com "MAXDB_FL_Writer0" Time: 3/19/2009 2:36:12 PM
COMPLETED Media Agent "MAXDB_FL_Writer0"

```

```

=====
Session completed successfully!
=====

```

Appendix G

The following is a complete Data Protector session report in which a particular Point In Time Recovery was selected. After restoring appropriate archive log backup sessions, with the final archive log session yet to be restored, the Recovery option was selected with a specific point in time in the past. Data Protector restores the last archive log session and subsequently instructs MaxDB to recover the instance to a specific point in time:

```
[Normal] From: RSM@hpu069.deu.hp.com "" Time: 3/20/2009 2:41:45 PM
Restore session 2009/03/20-6 started.

[Normal] From: OB2BAR_SAPDBBAR@tpc003.dp2.com "MAXDB" Time: 3/20/2009 2:42:34 PM
Executing the dbmcli command: `user_logon'.

[Normal] From: OB2BAR_SAPDBBAR@tpc003.dp2.com "MAXDB" Time: 3/20/2009 2:42:34 PM
Executing the dbmcli command: `dbm_configset -raw BSI_ENV
C:\PROGRA~1\OmniBack\tmp\MAXDB.bsi_env'.

[Normal] From: OB2BAR_SAPDBBAR@tpc003.dp2.com "MAXDB" Time: 3/20/2009 2:42:35 PM
Executing the dbmcli command: `db_admin'.

[Normal] From: OB2BAR_SAPDBBAR@tpc003.dp2.com "MAXDB" Time: 3/20/2009 2:42:35 PM
Executing the dbmcli command: `dbm_configset -raw set_variable_10
OB2BACKUPAPPNAME=MAXDB'.

[Normal] From: OB2BAR_SAPDBBAR@tpc003.dp2.com "MAXDB" Time: 3/20/2009 2:42:35 PM
Executing the dbmcli command: `dbm_configset -raw set_variable_11
OB2BACKUPHOSTNAME=tpc003.dp2.com'.

[Normal] From: OB2BAR_SAPDBBAR@tpc003.dp2.com "MAXDB" Time: 3/20/2009 2:42:35 PM
Executing the dbmcli command: `util_connect'.

[Normal] From: OB2BAR_SAPDBBAR@tpc003.dp2.com "MAXDB" Time: 3/20/2009 2:42:35 PM
Restoring backup 2009/03/20 0003.

[Normal] From: OB2BAR_SAPDBBAR@tpc003.dp2.com "MAXDB" Time: 3/20/2009 2:42:35 PM
Executing the dbmcli command: `medium_put BACKDP-Archive/1 \\.\Pipe\MAXDB.BACKDP-
Archive.1 PIPE LOG 0 8 NO NO \\\" BACK'.

[Normal] From: OB2BAR_SAPDBBAR@tpc003.dp2.com "MAXDB" Time: 3/20/2009 2:42:36 PM
Executing the dbmcli command: `db_state'.

[Normal] From: OB2BAR_SAPDBBAR@tpc003.dp2.com "MAXDB" Time: 3/20/2009 2:42:36 PM
Executing the dbmcli command: `recover_start BACKDP-Archive LOG ExternalBackupID
"MAXDB 0903203:1 Stream"'.

[Normal] From: RMA@tpc007.dp2.com "MAXDB_FL_Writer0" Time: 3/20/2009 2:43:10 PM
STARTING Media Agent "MAXDB_FL_Writer0"

[Normal] From: RMA@tpc007.dp2.com "MAXDB_FL_Writer0" Time: 3/20/2009 2:43:11 PM
Loading medium from slot D:\Backup\10394b45549c3994d504cd5015c.fd to device
MAXDB_FL_Writer0

[Normal] From: OB2BAR_DMA@tpc003.dp2.com "MAXDB" Time: 3/20/2009 2:43:19 PM
Starting OB2BAR Restore: tpc003.dp2.com:/MAXDB/Data/1 "SAPDB"

[Normal] From: OB2BAR_DMA@tpc003.dp2.com "MAXDB" Time: 3/20/2009 2:43:21 PM
Completed OB2BAR Restore: tpc003.dp2.com:/MAXDB/Data/1 "SAPDB"

[Normal] From: OB2BAR_SAPDBBAR@tpc003.dp2.com "MAXDB" Time: 3/20/2009 2:43:24 PM
Executing the dbmcli command: `db_warm -f -u 20090320 142205'.

[Normal] From: OB2BAR_SAPDBBAR@tpc003.dp2.com "MAXDB" Time: 3/20/2009 2:43:24 PM
Executing the dbmcli command: `exit'.

[Normal] From: RSM@hpu069.deu.hp.com "" Time: 3/20/2009 2:42:36 PM
OB2BAR application on "tpc003.dp2.com" disconnected.

[Normal] From: RMA@tpc007.dp2.com "MAXDB_FL_Writer0" Time: 3/20/2009 2:43:52 PM
Unloading medium to slot D:\Backup\10394b45549c3994d504cd5015c.fd from device
MAXDB_FL_Writer0

[Normal] From: RMA@tpc007.dp2.com "MAXDB_FL_Writer0" Time: 3/20/2009 2:43:52 PM
COMPLETED Media Agent "MAXDB_FL_Writer0"
```

```
=====
Session completed successfully!
=====
```

Appendix H

This is a reproduction of SAP Note 616814 downloaded on 28 July, 2008.

Note 616814 - Suspend log writer for split mirror or snapshot

Note Language: English Version: 13 Validity: Valid from 08.11.2006

Summary

Symptom

You want use a split mirror or snapshot of the storage system for data backups with MaxDB or liveCache. The storage system cannot ensure the consistency of the I/O for all data volumes, in other words the storage system cannot create a point-in-time image.

More Terms

EMC, Symmetrix, ESS, XP512, Network Appliance, Filer, StorageWorks, StorEdge, backup, consistent, instance, split BCV, flashcopy, DPM

Cause and Prerequisites

SAP DB, MaxDB or liveCache version

7.3.0 Build 44 or higher (SAP DB only)

7.4.2 Build 18 or higher

7.4.2 Build 21 or higher

7.5.0

All higher versions

Additional information:

As of SAP DB Version 7.3.0 Build 35, you can stop the log writer, however, this results in incorrect displays. Therefore, we recommend that you only use these functions as of 7.3.0 Build 44 or higher.

Solution

SAP DB provides the option of using split mirrors or snapshots for data backups even if the disk system used cannot guarantee the I/O consistency of all data volumes of a database instance.

The log writer can be suspended for this purpose in SAP DB. In this way, you ensure that no more Savepoints (or Checkpoints in 7.3) can be written. The relevant last created savepoint serves as an entry point for a restart or a recovery. Changes to data between two Savepoints are not written back to the old block position.

If the log writer is suspended, the last Savepoint is already stored on the data disks. A new Savepoint can only be created when the log writer is activated again.

If a split or snapshot is created in the time of the suspended log writer, the corresponding disk image contains a complete savepoint on which the database can be based during a restart or restore.

To create the split mirror or snapshot, proceed as follows:

```
dbmcli -d <database_name> -u <dbm_user>,<password>
util_connect <dbm_user>,<password>
util_execute suspend logwriter

==> Create the split mirror or snapshot

util_execute resume logwriter
util_release
exit
```

To create the snapshot, you can call a command for the operating system or a script with the exclamation mark:

```
dbmcli -d <database_name> -u <dbm_user>,<password>
...
!/.../.../create_snapshot.sh
...
```

Important: With Version 7.3, you must not exit the utility session between suspend logwriter and resume logwriter. With version 7.4, this is permitted.

The database manager CLI command "util_execute suspend logwriter" returns the following:

```
OK
```

```
LOGPOS = <number>
```

<number> corresponds to the log page of the current character position.

You can compare this log page with the page numbers of the log backups in the log history.

While the log writer is suspended, transactions that change data and therefore want to write data log entries are suspended. Therefore, the period of time between suspend logwriter and resume logwriter should be as short as possible in a production system. The procedure is not suitable for creating data backups in such a way that the data volumes are physically copied while the log is suspended (copy, cp, dd, ...).

You can use a select to check the status of the suspension at a specific time.

Versions as of 7.3.00.36, 7.4.02.21, 7.4.03.23, 7.5.00.39:

```
select * from show_stat_state
where description = 'Logwriter suspended'
```

As of Version 7.6:

```
select LOGWRITERSUSPENDED from loginformation
```

Header Data

Release Status: Released for Customer

Released on: 08.11.2006 15:22:54

Priority: Recommendations/additional info

28.07.2008 Page 3 of 3

Category: FAQ

Main Component BC-DB-SDB MaxDB

Additional Components:

BC-DB-LVC liveCache

The note is not release-dependent.

Related Notes

Number	Short Text
669963	Log mirroring: DUAL/Mirrored vs. Hard/software raid
371247	MaxDB and "Split Mirror" techniques

Appendix I

This is a reproduction of SAP Note 1351632 version 1, dated 13 July, 2009, downloaded on 25 July, 2009.

Number	1351632
Version	1 from 10.06.2009
Status	In Process
Set on	10.06.2009
Language	EN
Master language	EN
Short text	MaxDB Zero Downtime Backup with HP Data Protector
Component	BC-DB-SDB-DBA Database Administration MaxDB

Long text

Symptom

You would like to use HP Data Protector to create split-mirror or snapshot backups of MaxDB or liveCache databases.

Other terms

Hewlett Packard, hp, data protector, backup, consistent, instance, split mirror, clone, snapshot, disk array, zero downtime backup, zdb

Reason and Prerequisites

The MaxDB "Zero-Downtime Backup" (ZDB) solution presented in the white paper has been tested on a combination of MaxDB 7.6.03.10 and Data Protector V6.1 software on Windows 2003 32 bit OS in conjunction with EVA snapshot functionality. This combination is supported by HP.

The MaxDB ZDB solution may also work on other operating systems, like HP-UX and Linux variants. However, these combinations have not been tested and thus are not supported by HP.

Solution

HP published a technical whitepaper which describes the necessary steps to create split-mirror or snapshot backups of a MaxDB database. It utilizes the "Zero Downtime Backup" (ZDB) technique of Data Protector.

The direct URL to the Whitepaper is:

<http://bizsupport2.austin.hp.com/bc/docs/support/SupportManual/c01785574/c01785574.pdf>

Alternatively, it can be accessed from HP website as follows:

Browse to <http://www.hp.com/support/manuals>, click "Storage Software", click "HP Data Protector V6.1 Software", and click White Papers to see the white paper listed.

Note is release

Reference to related Notes

Number	Short text
616814	Suspend log writer for split mirror or snapshot
371247	MaxDB and "Split Mirror" techniques

For more information

Visit the following Data Protector online resources to get more information:

www.hp.com/go/dataprotector

www.hp.com/go/imhub/dataprotector

HP Data Protector guides

To get more information on this topic consider the following Data Protector guides, available in the /docs directory on the HP Data Protector DVD, on your Installation Server or online.

HP Data Protector A.06.10 IntegrationORASAP

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