BrightStor® Enterprise Backup

Agent for EMC TimeFinder Guide

Windows

10.5

Computer Associates®

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Chapter 1

Introduction

BrightStor® Enterprise Backup Agent for EMC TimeFinder combines the power of the BrightStor® Entrprise Backup high performance storage management tools with a custom option set to create a solution especially designed for environments that use EMC TimeFinder™ to backup frequently accessed, mission critical data.

In addition to its multiplatform backup and restore features, BrightStor Enterprise Backup seamlessly integrates with EMC TimeFinder giving you the power to backup critical data while your system remains online.

Businesses that require continuous access to information can back up and restore huge amounts of data with minimal impact on production time and maximum data integrity.

The EMC TimeFinder Options

BrightStor Enterprise Backup Agent for EMC TimeFinder provides backup and restore management for every machine in your environment and combines the following components to add zero-impact backup of Oracle databases using EMC TimeFinder with Symmetrix:

- Backup Agent for Oracle TimeFinder
- SAN option
- Tape Library option

The Backup Agent for Oracle TimeFinder

This agent provides an interface between BrightStor Enterprise Backup and Windows. In addition, the product provides integrated support for data protection on EMC Symmetrix storage using EMC TimeFinder.

Benefits of the Backup Agent for Oracle TimeFinder

The BrightStor Enterprise Backup Agent for EMC TimeFinder provides consistent backup and restore of active Oracle configurations and provides support for EMC TimeFinder.

EMC TimeFinder enables you to make a point-in-time copy of an actual production database available on another volume for backup by BrightStor Enterprise Backup. This provides the following benefits:

- Minimizes the time your Oracle database is in backup mode
- Data protection tasks use separate infrastructure and will not impact the production environment

The SAN Option

The Storage Area Network option (SAN) enables several BrightStor Enterprise Backup servers to share one or more tape libraries on a high-speed storage network.

Traditionally, one network server was connected to a device. The only server that had the benefits of high-speed backup was the one with a direct device connection. With the introduction of the Storage Area Network, several BrightStor Enterprise Backup servers can directly link to a device, thus eliminating the LAN bottleneck and slower transmission.

The BrightStor Enterprise Backup Agent for EMC TimeFinder solution allows you to add Oracle Servers with TimeFinder and Symmetrix devices to the SAN.

Benefits of the SAN Option

The benefits of using the BrightStor Enterprise Backup SAN option are as follows:

- Economizes by allowing servers to share one or more libraries.
- Improves backup and restore speed by eliminating the need for a remote backup. (Because you link directly to a tape library, you are essentially performing a local backup.)
- Centralizes backup hardware and media.
- Optimizes flexibility by allowing redirection or reconfiguring if a device fails.

The Tape Library Option

The BrightStor Enterprise Backup Tape Library option enables you to more efficiently manage your storage devices.

Benefits of the Tape Library Option

BrightStor Enterprise Backup with BrightStor Enterprise Backup Agent for EMC TimeFinder extends the following benefits to your Symmetrix devices:

- **Multiple drive support—**Support of libraries with multiple drives as well as those with single drives.
- **Multiple library support—**Support of multiple libraries. The number of libraries that can be installed at one computer is only limited by the computer's available resources and system performance.
- **Concurrent drive initialization—**The BrightStor Enterprise Backup Device Manager window allows you to track the initialization process. For multiple drive libraries, the Tape Engine uses all of the drives for the initialization process.
- **Multiple, concurrent, device management functions—**These functions include storage drive cleaning from any specified slot.
- **Support of the following library device management function—**Format Slot Range, Erase Slot Range (Both Quick and Long), Eject Tape, Inventory Slots, Mount Magazine, Dismount Magazine, Clean Library Drive. The Tape Library Option uses all available drives on a library. If multiple drives are available, device management functions are performed concurrently.

  Note: When using the Virtual Library feature designed into the Tape Library Option, the cleaning slot must be configured as the last slot in the changer.
- **Bar code ID—**BrightStor Enterprise Backup quickly locates individual media by reading the bar code that can be affixed to the media.
- **Quick initialization—**After the installation is complete and the BrightStor Enterprise Backup Tape Engine is started for the first time, the entire library is inventoried and recorded. For all subsequent starts, enabling the Quick Initialization feature either during installation or through Library Setup can allow you to skip the normal inventory process.
- **Automated library cleaning—**Automatically schedule library cleaning procedures
- **Grouping by slots—**Library groups employ the same concept as device groups except that library groups are based upon slots. Any of the slots inside a library can be selected to form a library group. If the library runs out of tapes to span to, you can insert a new tape, and BrightStor Enterprise Backup will be able to identify the tape as part of the pre-defined group.
- **Single-step library group spanning—**Support of single-step group spanning, also known as the open door condition. This feature allows you to insert new media into a library and then continue the backup or restore operation without interruption because BrightStor Enterprise Backup inventories the new media for you.

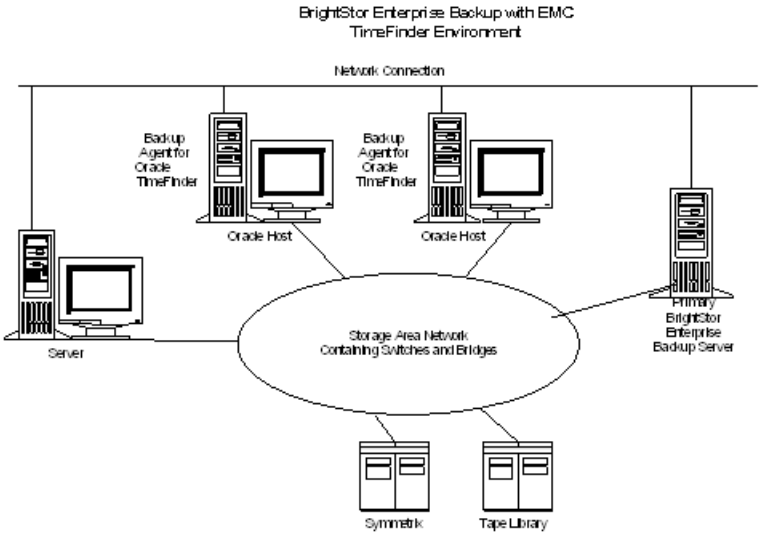
- **Fault tolerant operations—**continuous operation with a defective drive. If a drive in a multiple drive library becomes defective, it can be marked as offline. This enables the Tape Engine to continue to operate using the remaining non-defective drives in the library.
- **Multiple, concurrent, group access—**You can run as many jobs at the same time as you have tape drives available.
- **Find—**Allows you to search for a media name or a slot number.
- **Big Library Support—**Allows a changer with more than 1000 slots to be displayed in a list in the right panel instead of in the tree of devices. Slots can be displayed in four ways: large icons, small icons, details, and list.

How the Options Work Together

The Backup Agent for Oracle TimeFinder, Tape Library Option, and San Option work together with EMC TimeFinder to increase the speed and efficiency of your data backup operations.

The BrightStor Enterprise Backup Agent for EMC TimeFinder uses the Backup Agent for Oracle TimeFinder installed on your Oracle database hosts and Symmetrix systems to access the EMC TimeFinder application. TimeFinder creates independently addressable mirrors of the data that can be split from the source copy. BrightStor Enterprise Backup uses these mirrors, called Business Continuance Volumes (BCVs), to perform a backup allowing the database to stay online.

BrightStor Enterprise Backup uses its Storage Area Network (the SAN option) to link directly to the Tape Library where the data is automatically recorded and archived.

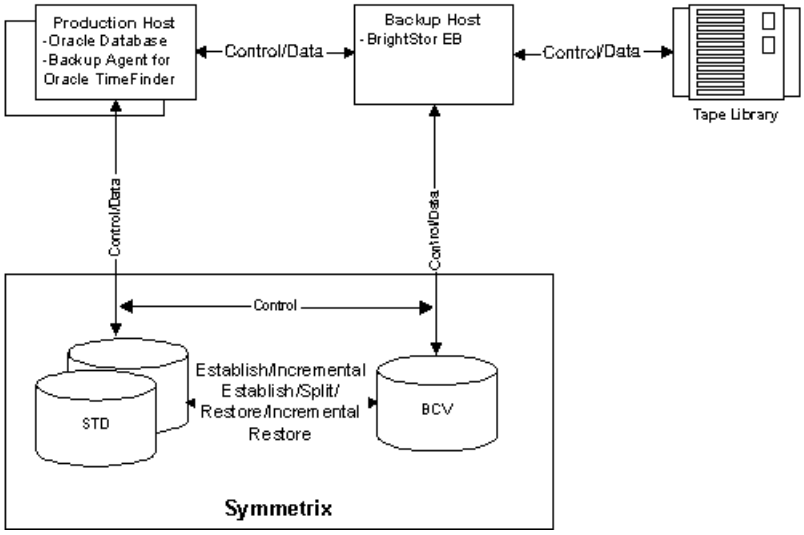


Configuring Symmetrix for Online Backups

You must use the following Symmetrix configuration to perform online backups:

- Each Standard Symmetrix Device (STD) that you want to backup must be paired with one Business Continuance Volume (BCV) of the same size .
- The Production host must connect to the STDs on Windows.
- The Backup host must connect to the BCVs on Windows only.

Symmetrix Configuration on Window



System Requirements

The BrightStor Enterprise Backup Agent for Oracle Server for EMC TimeFinder requires the following:

- One of the following versions of Oracle Server:
- 7.3, 8.0 or 8.1, 9.0 or 9.2
- Windows NT 4.0 with Service Packs 4, 5, or 6, or Windows 2000 with Service Packs 1 or 2 is required
- BrightStor Enterprise Backup
- BrightStor Enterprise Backup Agent for Oracle Server
- EMC TimeFinder Software
- EMC Symmetrix systems hardware

Configuring Oracle for Online Backups

To configure Oracle and take advantage of available high performance of Oracle TimeFinder, assure that the following items are in order:

- The entire Oracle database must be located on Standard Symmetrix Devices.
- Oracle must be running on the Production host.
- The Standard Symmetrix Devices on which the Oracle database resides must be paired with BCVs.
- The Oracle database must be on standard file systems on the Standard Symmetrix Devices.
- Set the database to ARCHIVELOG mode.
- For more information, consult your Oracle documentation and the chapter, "Using the Backup Agent on the Windows Platform" in the Backup Agent for Oracle Option Guide.

Chapter 2

Understanding the Backup Agent for Oracle TimeFinder

The Backup Agent for Oracle TimeFinder integrates with EMC TimeFinder to support the protection of Oracle databases on Windows.

How the Backup Agent for Oracle TimeFinder Works

The Backup Agent for Oracle TimeFinder provides consistent backups and restores of active Oracle databases through integration and support of EMC TimeFinder.

How EMC TimeFinder Works

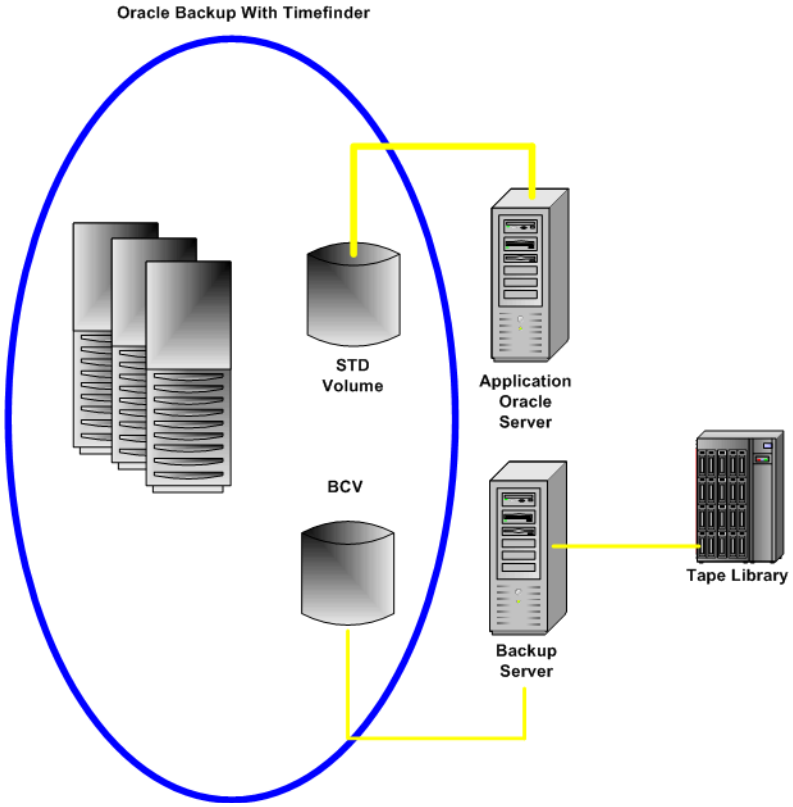
EMC TimeFinder runs on EMC's Symmetrix systems. Symmetrix systems provide centralized and shareable enterprise data storage, allowing storage of heterogeneous hosts on a single system. Symmetrix systems manage huge amounts of data. In addition, they are easily scalable and inter-connectable.

EMC TimeFinder allows the creation and manipulation of independently addressable Business Continuance Volumes (BCVs) that the Backup Agent for Oracle TimeFinder uses to backup Oracle data while the database stays on-line. A BCV is a Symmetrix device that provides a manageable mirror-image copy of a Symmetrix standard disk. One Symmetrix standard disk is matched to one BCV. EMC's documentation on TimeFinder refers to these matches as BCV pairs.

Backing Up Data

To back up data you must have both the Backup Agent for Oracle TimeFinder and the Oracle server running on the host machine. The agent uses SymAPI to create a complete and synchronized copy of the Oracle database on an addressable BCV. To do so, the agent has to first establish a BCV pair with each disk containing the Oracle database.

The following illustration shows how the Backup Agent for Oracle TimeFinder establishes a BCV pair in a Windows environment:

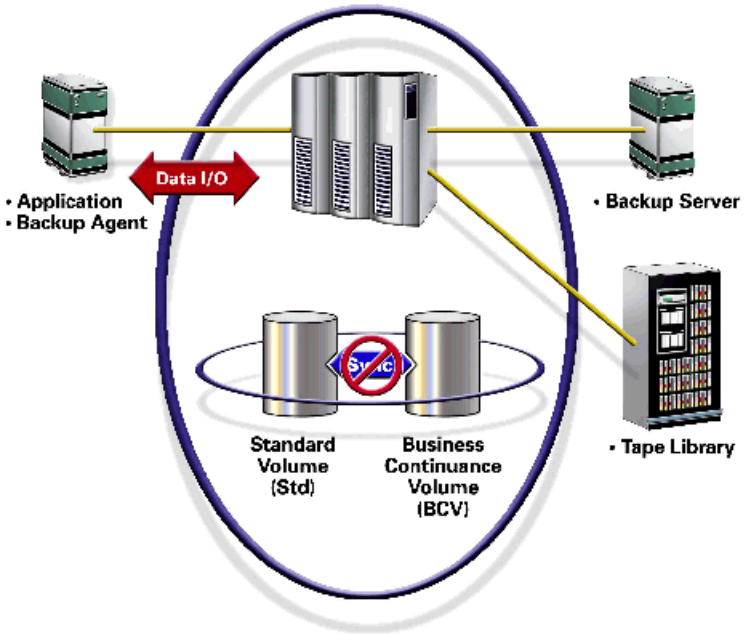


The first call to establish a BCV pair is very slow and time-consuming since we have to create a complete copy of the disk in an empty BCV. Later calls to establish are much faster since they are incremental. When the initial establish is complete and the BCV contains all the information from the original disk, the Oracle agent issues an "alter tablespace begin backup" command for each tablespace forming the database. This marks the beginning of a backup of the Oracle database while it is on-line and available for normal operations on the Symmetrix device.

To begin the backup, the Backup Agent for Oracle TimeFinder calls a split so the host can resume or continue its activities with Symmetrix and start using the BCV device address to backup datafiles on that BCV. The agent calls an "alter tablespace end backup" command for all the tablespaces composing the database. At this point, the Backup Agent or Oracle transfers data from the BCV to BrightStor Enterprise Backup.

BrightStor Enterprise Backup backs the data up to tape. The control file and archive logs are backed up at the end of the operation (after the datafiles) from the original disk (not from the BCV) for consistency reasons.

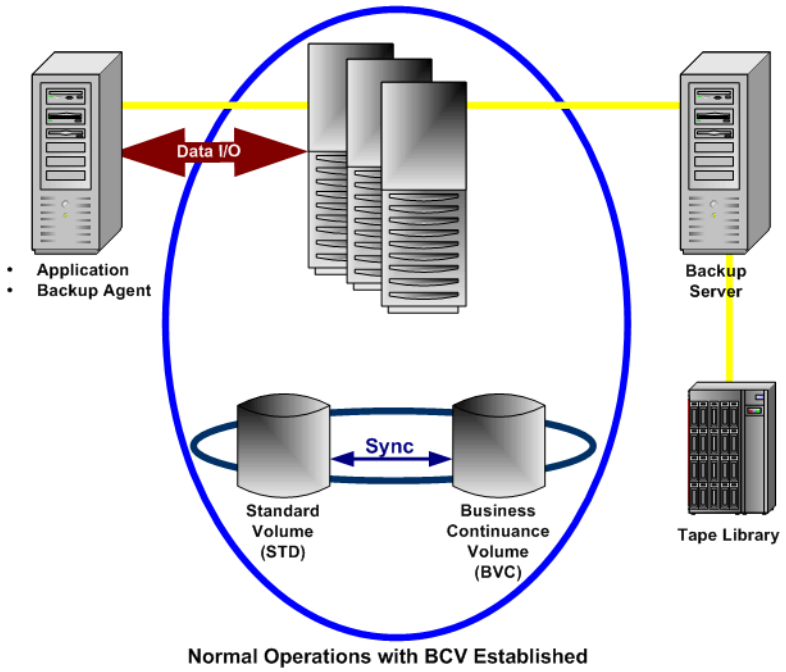
The following illustration shows how the Backup Agent for Oracle TimeFinder splits the BCV from the Standard Volume in a Windows environment:



Backup Operations – BCV Split For Backup on Windows

The agent finally calls the re-establish command to re-synchronize the Symmetrix disk(s) and BCV pair(s). The content of the BCV is updated with the contents of the corresponding original Symmetrix disk.

The following illustration shows how the Backup Agent for Oracle TimeFinder re-establishes the BCV pair in a Windows environment:



Restoring Data

When you restore data, you need to shut down the database or take the tablespace offline and restore the selected data directly on the Symmetrix device. You must then recover the database using the Oracle Server Manager Console.

Configuration Requirements

TimeFinder support is based on device groups that allow the identification of a subset of available Symmetrix devices. On Windows you must create a new configuration file in which you define the name of the device group associated with the Symmetrix disks that contain the Oracle database. Any system using the agent on Windows must be running Oracle.

Chapter 3

Implementing an Online Backup Strategy

To fully protect your databases, you should:

- Back up all files including archive logs and control files
- Verify your data
- Back up your databases on a regular schedule
- Use a rotation scheme
- Keep a backup log
- Label your media

Dependency on the 24 x 7 availability of Oracle applications makes it impossible to take databases offline to perform these data protection tasks. The following sections discuss how you can use BrightStor Enterprise Backup Agent for EMC TimeFinder to fully protect your valuable data, without impacting user and customer operations.

Configuring for Online Backups

Before performing an online backup you must properly configure your system.

Configuration on Windows Systems

To backup objects from your online Oracle databases on Windows you must do the following:

- Set the Oracle databases to ARCHIVELOG mode
- Enable the Oracle database for automatic archiving
- Create the Symmetrix Device group
- Configure the BrightStor Enterprise Backup Server to work with EMC TimeFinder

The first three topics are described in previous sections. Perform the following to view and log in to the Oracle databases you specified at install:

1. Start BrightStor Enterprise Backup, open the Backup Manager, and start the Backup Agent.
2. In the browser, expand the server on which the Oracle Server is installed. All the databases you configured during setup on the Oracle Server display.
3. Right-click on the database you want to log in to. A popup menu opens.
4. Select the Security option.
5. Enter the user name and password you specified during installation. This user name should be INTERNAL or have INTERNAL equivalent privileges.
6. Click OK. Expand the selected database to select the objects for back up.

BrightStor Enterprise Backup and the Backup Agent for Oracle can back up a complete database or individual objects within the database. If you wish to back up a complete database, you must configure the backup to include all of the objects that are contained within the database.

Configuring the BrightStor Enterprise Backup Server

The file symconfig_servername.utl in the BrightStor Enterprise Backup home directory contains all the information that BrightStor Enterprise Backup needs to configure the EMC TimeFinder:

```
###############################################################################

# This Symmetrix device configuration file is used by Backup agent for
# Oracle TimeFinder, it contains the Symmetrix device group information and
# drive letter information of both production and backup servers.

###############################################################################

[SYMAPI info]
SYMAPI_DLL_PATH=c:\program files\emc\symcli\dll
# SYMAPI_DLL_PATH is where the symapi.dll file is installed on the local machine
SYMAPI_DB_NAME=c:\program files\emc\symapi\db\symapi_db.bin
#SYMAPI_DB_NAME is the SYMAPI database file name
SYMNTCTL_EXE_PATH=c:\nt_util
# SYMNTCTL_EXE_PATH is where the symntctl.exe is located.

[Device Group Info]
DEVICEGROUP=CA1
                # symdg show CA1 gives you the PdevName of the BCV

NUM_OF_BCVPAIRS=2
STD_NAME1=005
STD_DRIVE_LETTER1=G:

BCV_NAME1=02B
BCV_DRIVE_LETTER1=G:
BCV_SIG1=BB791BF7
                # symntctl list -physical gives you the signature of the disk
                # For Windows 2000 machine, user should use HarddiskVolume
                # instead of signature. For example: BCV_SIG1=HarddiskVolume1

STD_NAME2=006
STD_DRIVE_LETTER2=H:


BCV_NAME2=02A
BCV_DRIVE_LETTER2=H:
BCV_SIG2=BB791BF8

###############################################################################
```

To configure the BrightStor Enterprise Backup Agent for EMC TimeFinder server, you need to issue 2 sym commands:

- symdg show CA1- which gives you the PdevName of the BCV.
- symntctl list -physical- which gets the signature of the disk.

Note: You need to issue these commands for every BCV you have in your device group.

Backing Up Oracle Databases Online

The Backup Agent for Oracle enables you to back up individual Oracle database objects, such as tablespaces, archived redo log files, and control files (each tablespace in a database will be backed up as a separate session) and automatically verify data. BrightStor Enterprise Backup Agent for EMC TimeFinder also provides options that make it easy to setup a backup schedule and implement a GFS Rotation scheme.

For more information, see the *BrightStor Enterprise Backup Agent for Oracle Option Guide*.

Managing Media with the Tape Library Option

The Tape Library Option uses barcode recognition and serial number labeling to quickly recognize media. BrightStor Enterprise Backup Agent for EMC TimeFinder can read the barcode label affixed by the manufacturer to the media to locate specific backups. For more information, see the *BrightStor Enterprise BackupTape Library Option Guide*.

Creating Backup Logs

BrightStor Enterprise Backup Agent for EMC TimeFinder automatically creates reports of all BrightStor Enterprise Backup activity. The Report Manager option enables you to view activity logs including Job Record, Media Sessions, and GFS Rotation Job reports. For more information, see the section The Report Manager in the chapter "Managing the Database and Reporting" in the BrightStor Enterprise Backup Administrator Guide.