HP OpenView Storage Data Protector
MPE/iX System
User Guide

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Release A.05.50

Legal Notices

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1 MPE/iX System User Guide

Overview

MPE/iX is an operating system for Hewlett-Packard's HP 3000 Computer Systems. The Data Protector MPE/iX integration uses TurboSTORE/iX backup utility to initiate backup and restore sessions on the MPE/iX platform. TurboSTORE/iX APIs are bundled with filesystem and use TurboSTORE/iX internally to backup or restore all MPE/iX files. Among the other MPE/iX files, these APIs provide access to specific MPE/iX database files, (ALLBASE/SQL database files and TurboIMAGE/XL database files) and POSIX filesystem files.

Features

Data Protector provides full backup and restore functionality for the following MPE/iX data:

- User files and directories
- System files
- Filesystem directories.

Supported Versions

For a list of MPE/iX operating systems supported by Data Protector, refer to the support matrices in the *HP OpenView Storage Data Protector Software Release Notes*.

Prerequisites and Limitations

This is a list of prerequisites and limitations for the Data Protector MPE/iX integration:

Prerequisites

- Before you begin, ensure that you have correctly installed and configured Data Protector. Refer to the:
  - ✓ *HP OpenView Storage Data Protector Installation and Licensing Guide* for instructions on how to install Data Protector on various architectures.
  - ✓ *HP OpenView Storage Data Protector Administrator's Guide* for instructions on how to configure and run backups.
- For an up-to-date list of supported versions, platforms, devices, required patches and other information, refer to the:
  - ✓ *HP OpenView Storage Data Protector Software Release Notes* or
  - ✓ http://www.openview.hp.com/products/datapro/spec_0001.html
- MPE/iX operating system is installed on your machine.
- TurboSTORE/iX or TurboSTORE/iX 7x24 True-Online is installed on your machine.
- Disk Agent on MPE/iX requires the `JINETD.NET.SYS` file to be configured and operational on all supported MPE/iX systems.

Limitations

See the *HP OpenView Storage Data Protector Software Release Notes* for a list of general Data Protector limitations.

There are some limitations according to the MPE/iX specific filesystem structure, and the POSIX filesystem:

- The backup of MPE/iX configuration files or operating system is not possible.
- Online and true-online backup (option ONLINE and ONLINE=START) are not supported without TurboSTORE/iX 7x24 True-Online product installed on your system.
- Cross-platform restore is not supported.
- Used with MPE/iX, the General Media Agent does not support some

device types and device policies.

Installing the MPE/iX Client System

Data Protector supports client systems running on the MPE/iX platform.

For the information about the components you need to install, refer to the *HP OpenView Storage Data Protector Installation and Licensing Guide*.

Refer to the *HP OpenView Storage Data Protector Software Release Notes* for the latest information about supported devices and MPE/iX platform versions.

Prerequisites

Before you install Data Protector on the MPE/iX platform, check the following:

- TurboSTORE/iX or TurboSTORE/iX 7x24 True-Online is installed on your machine.
- The TCP/IP protocol is installed and configured.
- The name resolving mechanism (DNS of host files) is enabled.
- At least 15 MB of disk space is available (at least 5 MB for installation package and at least 10 MB for installation itself).

Installation

To install Data Protector on the MPE/iX server, proceed as follows:

1. Transfer the `installDP5.50_MPE.sh` and the `DP55_MPE6.x.tar` package or `DP55_MPE7.x.tar` package (depending on the MPE/iX OS version - for example `DP55_MPE7.0.tar package for MPE/iX 7.0 systems`) to the `/tmp` directory using the `ftp` utility.

   It is important that you transfer the `installDP5.50_MPE.sh` file with the following characteristics:

   - Record size: `-150`
   - Block factor: `-empty`
   - Variable length of the records of the file: `V`
   - Type of coded records: `ASCII`

   You must also perform the binary transfer of the `DP55_MPE6.x.tar` or `DP55_MPE7.x.tar` package (depending on the MPE/iX OS version - for example `DP55_MPE7.0.tar package for MPE/iX 7.0 systems`).

Transfer of the InstallDP5.50_MPE.sh Script and DP55_MPE6.0.tar (DP55_MPE6.5.tar) Package:

```
W:\A.05.50\236\MPE>ftp hary

Connected to HARY.hermes.si.

220 HP ARPA FTP Server [A0010A02] (C) Hewlett-Packard
Co. 1990

User (HARY.hermes.si:(none)): manager.sys

230 User logged on

ftp> cd /tmp

250 CWD  file action successful.

ftp> put ./installDP5.50_MPE.sh
./installDP5.50_MPE.sh;rec=-150,,v,ascii

200 PORT command ok.

150 File: ./installDP5.50_MPE.sh;rec=-150,,v,ascii
opened; data connection will be opened

226 Transfer complete.

ftp: 10434 bytes sent in 0.00Seconds
10434000.00Kbytes/sec.

ftp> bi

200 Type set to I.

ftp> put ./DP55_MPE6.5.tar ./DP55_MPE6.5.tar

200 PORT command ok.

150 File: ./DP55_MPE6.5.tar opened; data connection will
be opened

226 Transfer complete.

ftp: 7207424 bytes sent in 8.74Seconds 824.46Kbytes/sec.

ftp> bye

221 Server is closing command connection

W:\A.05.50\236\MPE>
```

2. Login to target system and start unpacking process:.

```
shell/iX> . ./installDP5.50_MPE.sh

HP OpenView Storage Data Protector 5.50 installation

-> Checking MPE/iX OS version ...

-> Detecting old Data Protector installation ...

-> Unpacking ...

-> Retriving Data Protector version ...

-> Updating Data Protector info using Disk Agent version
A.05.50 ...

-> Updating Data Protector info using Media Agent
version A.05.50 ...

-> Setting file and directory permissions ...

HP OpenView Storage Data Protector 5.50 installed
successfully !

shell/iX>
```

After this operation the files are located in the `/usr/omni` directory.

3. Add the following line to the `INETDCNF.NET.SYS` file:

   ```
   omni stream tcp nowait MANAGER.SYS /usr/omni/bin/inet
   inet -log /tmp/inet.log
   ```

4. Add the following line to the `SERVICES.NET.SYS` file:

   ```
   omni 5555/tcp #Data Protector inet
   ```

NOTE Use EDIT/3000 (invoked with `editor` command) to change these files. Refer to the *EDIT/3000:Reference Manual* for more information.

5. Restart `inetd` to update the configuration with new settings.

   Refer to the *Configuring and Managing MPE/iX Internet Services* manual for more information.

6. To check if `Data Protector inet` is running, telnet port 5555 from a different system:

   `telnet <hostname> 5555`

   You will get a message from Data Protector in 10 seconds. If there is no response, check the `INETDCNF.NET.SYS` and `SERVICES.NET.SYS` files.

7. Import the system to the Data Protector cell.

   For the procedure, refer to the *HP OpenView Storage Data Protector Installation and Licensing Guide*.

8. When the client system is successfully imported, it is important to add the MANAGER.SYS user to Admin Group provided by Data Protector as default user group.

   For information on how to add the user to Admin Group, see the *HP OpenView Storage Data Protector Administrator's Guide*.

Installation Related Tasks

After the installation is complete, the following tasks can be performed:

- Securing a client system

  To learn more about security issues in the cell, see topic in the *HP OpenView Storage Data Protector Installation and Licensing Guide*.

- Removing (exporting) a client system from the cell

  For information on how to remove (uninstall) a client from a cell, refer to the *HP OpenView Storage Data Protector Installation and Licensing Guide*.

- Verifying (checking) the installation

  This option is not supported for this version of Data Protector MPE/iX client system.

- Uninstalling

  For information on how to uninstall Data Protector software, refer to the *HP OpenView Storage Data Protector Installation and Licensing Guide*.

Backup of MPE/iX Client System

This section explains how to back up the MPE/iX operating system. The backup functionality is provided for the following MPE/iX data:

- User files and directories
- System files
- Filesystem directories

Prerequisites

To successfully back up data, the following prerequisites must be met:

- To back up data on MPE/iX system, MPE/iX Disk Agent must be installed.
- Disk Agent on MPE/iX requires the `JINETD.NET.SYS` file to be configured on all supported MPE/iX systems.
- For MPE/iX Disk Agent to operate properly, install one of the following products:
  - — TurboSTORE/iX
  - — TurboSTORE/iX 7x24 True-Online
- To use backup devices connected to MPE/iX system, the General Media Agent must be installed.

Limitations

The following limitations exist:

- The General Media Agent communication buffer is limited to 32 KB.
- The maximum number of MPE/iX Disk Agents that can be running at the same time is limited to 15.
- The backup of MPE/iX configuration files or operating system files is not possible.
- Online and true-online backup (option `ONLINE` and `ONLINE=START`) are not supported without TurboSTORE/iX 7x24 True-Online product installed on the system.
- True-online backup with the `ONLINE=END` option is not supported.
- When used with MPE/iX, the General Media Agent does not support some device types and device policies. Refer to the *HP OpenView*

Storage Data Protector Software Release Notes for the latest information about supported device types and device policies.

- The General Media Agent on MPE/iX handles more than one Disk Agent at the same time. The maximum number of concurrent Disk Agents per General Media Agents is set to 5.
- The display of statistical information is supported only during the backup preview. To enhance backup performance, Data Protector displays only the basic statistical info (backup profile) during the backup session. All the details are written to the Turbostore's log file in the `/system/tmp` directory.

Backup Types

TurboSTORE/iX supports two types of online backup:

- Online backup

  If you choose this backup type, you need to close for write access all the files you want to back up (option `ONLINE`).

- True-online backup

  This backup type does not require the files to be closed for write access at the time when backup starts (option `ONLINE=START`).

How to Back Up?

In general, you perform a backup of MPE/iX in the same way as the ordinary filesystem backup. For the procedure on creating a backup specification, refer to the online Help index keyword "creating backup specifications".

Backup Options

Additionally, you need to specify the supported MPE/iX used defined backup options in the form of extended variables. This is achieved by using the user defined backup options variable editor. For detailed procedure, refer to "Setting User Defined Backup Variables" on page 11.

User Defined Backup Variables

Set user defined backup variables (a variable name and its value) to enable flexible operation on MPE/iX system with Data Protector.

See Table 1-1 for a list of backup variables and their values configurable on MPE/iX platforms.

Table 1-1 List of Backup Variables on MPE/iX Platforms

Variable	Value	Description
ONLINE	none (default)	Force TurboSTORE/iX online backup option `ONLINE`
ONLINE	START	Force TurboSTORE/iX online backup option `ONLINE=START`
DIRECTORY	none (default)	Backup of volume set configuration information

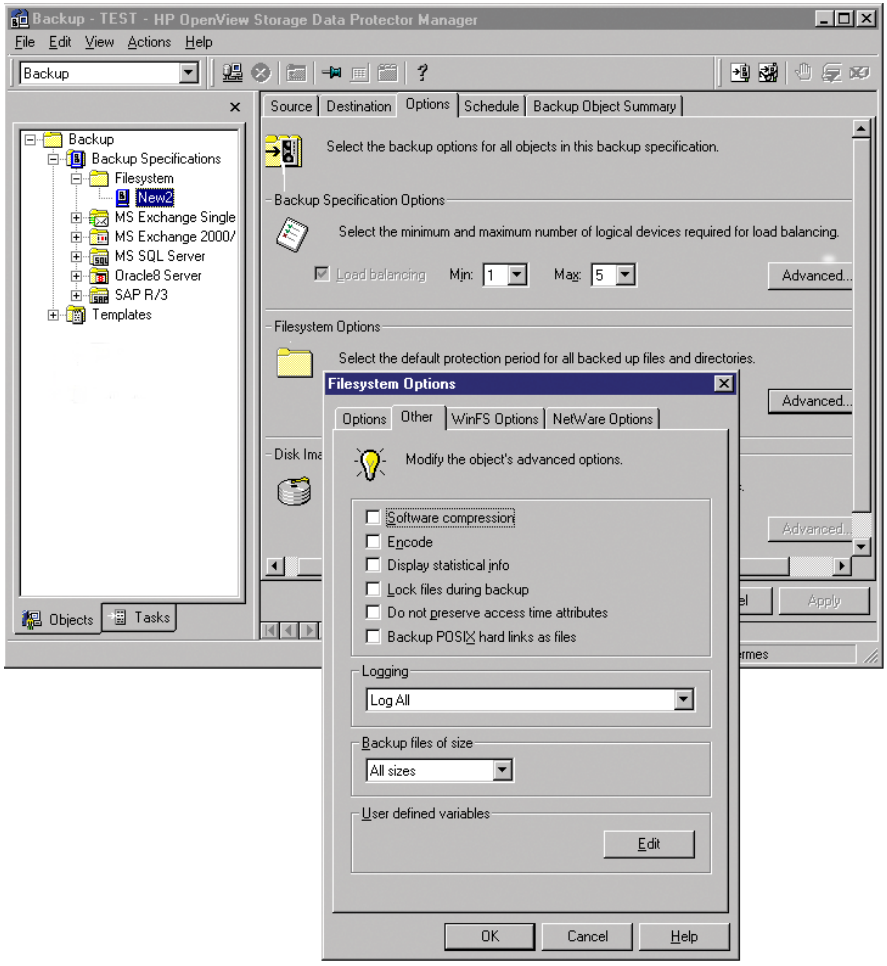
User definable options that are depending on TurboSTORE/iX options are: `DIRECTORY`, `ONLINE`, `ONLINE=START`. These options are mapped to the same TurboSTORE/iX options.

Setting User Defined Backup Variables

To specify the MPE/iX backup variables, follow the procedure described below:

1. In the `HP OpenView Storage Data Protector Manager`, switch to the `Backup` context.
2. In the `Scoping Pane`, expand the `Backup` item, and double-click `Backup Specifications`.
3. Right-click the created backup specification and select `Properties` from the pop-up menu.
4. Click the `Options` tab, and then click the `Advanced` button under Filesystem Options.
5. Select the `Other` tab from the `Filesystem Options` window, and then click the `Edit` button under `User defined variables`. Refer to Figure 1-1 on page 12.

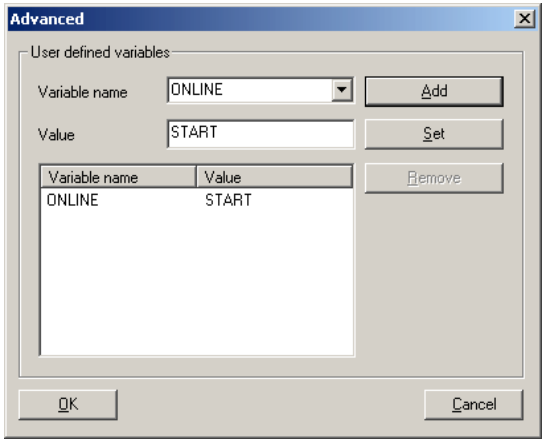
Figure 1-1 Specifying the Backup Options



The `Advanced` window appears.

6. In the `Advanced` window, enter one of the supported user defined variable for MPE/iX, for example `ONLINE` variable with value `START`. Refer to Figure 1-2 on page 13.

Figure 1-2 Entering the ONLINE=START Backup Variable



7. Click the Add button to add the new variable to the list.

Description of TurboSTORE/iX Supported Backup Options

If the backup variable ONLINE is used, files have to be "closed for write access" in order to get backed up. This provides compatibility to pre - MPE/iX-5.5 TurboStore backup behavior. TurboSTORE/iX log logs the information about the files that are not backed up. This log is always created during the backup and restore processes with TurboSTORE/iX. You can find it as /tmp/store<*processid*>.log on the MPE system.

Setting the backup variable ONLINE=START, does not require that files on the MPE system have to be closed at any time during the backup.

If ONLINE=START is not set during backup and database files on the MPE system are active, "open file" errors are likely to occur and the database files will not be backed up. For more information consult the TurboSTORE/iX documentation.

The DIRECTORY variable is used to backup and restore MPE system directory information. The system directory keeps track of the accounts, groups, users, and files in your system but not of the private volume sets. Private volume set directories keep track of the contents of private volume sets. Storing directory information helps you to rebuild your MPE system. All hierarchical filesystem directories on the system are also stored when the DIRECTORY variable is specified. Setting the

DIRECTORY variable during backup, will backup the directory structure. Setting the DIRECTORY variable during restore, will restore the directory information assuming it is in the backup.

The following TurboSTORE/iX backup options are always used and cannot be disabled: ONVS, TREE and DIRECTORY (if the whole volume set is checked for backup).

The following TurboSTORE/iX backup options cannot be used as they are replaced by standard Data Protector functionality: DATE, PROGRESS and STATISTICS.

Unsupported TurboSTORE/iX Options

The following TurboSTORE/iX options are not supported and must not be used: COMPRESS, FCRANGE, FILES, FULLDB, INTER, LOGVOLSET, MAXTAPEBUF, NOTIFY, ONERROR, PARALLEL, PARTIALDB, PURGE, RENAME, SPLITVS, STOREDIRECTORY, STORESET and TRANSPORT.

Pre- and Post-Exec Commands

Before a backup or restore session begins, additional action is sometimes necessary. For example, you may want to check the number of files to back up, stop some transaction processing, or shut down a database. Such actions are performed using Pre- and Post- exec commands. Pre- and Post- exec commands are not supplied by Data Protector. Depending on what you need, you have to write your own executable files that perform the required actions.

Prerequisites

To execute Pre- and Post- Exec commands you must enter /bin/sh and the full script pathname in the pre-exec and post-exec fields. Refer to the example below for more information.

Example of Pre- and Post- exec command

```
/bin/sh   /usr/omni/bin/<script_name>
```

Shell script can contain commands for job streaming:

```
callci stream <job_file_name>
```

Example

```
callci stream MYJOB.SYS.PUB
```

NOTE Make sure that the permissions for Pre- and Post- Exec commands are set appropriately before starting backup or restore session.

For more information on how to use pre- and post-exec commands, refer to the online Help index keyword “pre- and post-exec commands”.

Full System Backup on MPE/iX

For full system backup on MPE/iX, it is necessary to create two sets of tapes:

- SLT (system load tape) tape that contains system parameters and I/O configuration, and
- Store tape that contains user files and directories and system directory information.

`SYSGEN` utility (on MPE/iX) creates a system load tape without additional files.

For more information on `SYSGEN`, refer to the *System Startup, Configuration, and Shutdown Reference Manual*.

To create SLT enter the following command:

`sysgen>TAPE` (or `sysgen>TA`).

At the end of the tape creation, you receive the message that boot backup was generated successfully. If an error occurs during the tape creation, a flashing TAPE ERROR message is issued to the console, describing the error. The SLT tape should be created after any configuration changes have been made.

In general, to create store tape you perform a backup of MPE/iX in the same way as the any other ordinary backup, and additionally, you need to specify user defined `DIRECTORY` option (the supported MPE/iX backup options in the form of extended variables). This option is used to store system directory information. Storing directory information helps you to rebuild your system from backups if you unexpectedly lose information. System directory information will be stored in file on the medium named volset_name _DAF. This file is not real permanent file. This file does not physically exist on the system, it exist only on the medium.

For full system backup on MPE/iX performed using Data Protector it is important that all users and jobs should be logged off the system during the backup time. If you need to continue to access files during the backup time, true-online backup (by using user defined `ONLINE = START` option) has to be performed.

Additionally, you need to specify the supported MPE/iX backup options in the form of extended variables. This is achieved by using the user defined backup options variable editor.

To specify the MPE/iX full backup options, make sure that the user defined variable `DIRECTORY` is specified in the backup options window. For detailed procedure on how to set user defined backup variables, refer to “Setting User Defined Backup Variables” on page 11.

Restore of MPE/iX Client System

This section describes how to restore files to the MPE/iX operating system.

Limitations

The following limitations exist:

- Cross-platform restore is not supported.
- No restore to non MPE/iX system is possible.

For the complete list of limitations, refer to the *HP OpenView Storage Data Protector Software Release Notes*.

How to Restore?

To perform the restore, you need to select the backed up objects and start the restore session. For information on restore procedure, refer to the *HP OpenView Storage Data Protector Administrator's Guide*.

Restore Options

Besides standard restore options, Data Protector offers you to use some special restore options for MPE/iX, as user definable restore variables. For detailed steps, refer to "Setting User Defined Restore Variables" on page 18.

User Defined Restore Variables

Set user defined variables (a variable name and its value) to enable flexible operation on MPE/iX system with Data Protector.

See Table 1-2 for a list of restore variables and their values configurable on MPE/iX platforms.

Table 1-2 List of Restore Variables on MPE/iX Platforms

Variable	Value	Description
DIRECTORY	none (default)	Restore of volume set configuration information

Table 1-2 List of Restore Variables on MPE/iX Platforms

Variable	Value	Description
VOLSET	/<*volume_set_name*>	Enables restore to target volume set, if backed up volume set is different (cross-volume set restore using options -as or -into)
CREATE	NOHFS	Force restoring of MPE account or MPE group instead of hfs directory

User definable options that are depending on TurboSTORE/iX options are: `DIRECTORY` and `VOLSET`. These options are mapped to the same TurboSTORE/iX options.

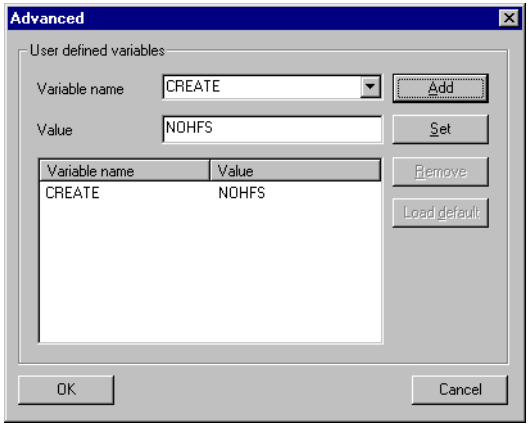
The user definable option `CREATE=NOHFS` is not a TurboSTORE/iX option.

Setting User Defined Restore Variables

To specify the MPE/iX restore variables, follow the procedure described below:

1. In the `HP OpenView Storage Data Protector Manager`, switch to the `Restore` context.
2. In the `Scoping Pane`, under `Restore Objects`, expand the appropriate data type.
3. Expand the client system with the data you want to restore and then click the object that has the data.
4. In the `Source property` page, select the object to restore.
5. Click the `Options` tab to open the `Options property` page.
6. Click the `Advanced` button.
7. In the `Advanced` dialog box, specify the appropriate variable and its value and then click `Add`.

Figure 1-3 Entering the CREATE=NOHFS Restore Variable



8. Click OK to apply the settings.

Description of TurboSTORE/iX Supported Restore Options

The restore variable VOLSET=/*<VOLUMESETNAME>* directs the restore behavior to write the data to the */<VOLUMESETNAME>*. In case the variable is not used, the files are restored to the original volume set. This option is helpful for a cross-volume set restore.

In order to restore MPE accounts/groups as native MPE accounts/groups (and not HFS directories) you have to use the CREATE variable as well.

The restore variable CREATE=NOHFS directs the behavior to create an MPE account/group.

TurboSTORE/iX can only restore data into MPE accounts/groups that already exist. If a restore is performed into or as a new MPE account/group TurboSTORE/iX would create a hierarchical filesystem directory instead of an MPE account/group. To avoid this behavior, the variable CREATE=NOHFS can be set during restore. In this case a MPE account/group will be created.

It is possible to use restore definable options together. For example, you can use VOLSET and CREATE=NOHFS options to restore backed up account/group from one volume set to a new account/group on the other volume set.

The following TurboSTORE/iX restore options are always used and cannot be disabled: VOLSET.

The following TurboSTORE/iX restore options cannot be used as they are replaced by standard Data Protector functionality: COPYACD, KEEP,NEWDATE, NOACD, OLDDATE and SHOW.

Disaster Recovery on MPE/iX

Disaster recovery procedure on MPE/iX system is manually performed and involves recovering the system by reinstalling using the SLT tape. In addition Data Protector is used to restore all files, including the system directory information.

Refer to the *STORE and TurboSTORE/iX Products Manual* for more information about disaster recovery on MPE/iX.

Prerequisites

You will need the following successfully perform a Disaster Recovery on MPE/iX systems:

- SLT (system load tape) tape that contains system parameters and I/O configuration, and
- Store tape that contains user files and directories and system directory information.

The following steps need to be performed to recover an MPE/iX client:

1. Boot your system from the latest SLT tape. Use the INSTALL utility to make your hard disk bootable.
2. Run VOLUTIL to initialize the system volume set members.

Example

volutil: SCRATCHVOL LDEV=2

volutil: NEWVOL MPEXL_SYSTEM_VOLUME_SET:MEMBER 2 LDEV=2 PERM=80 TRANS=100

volutil: EXIT

Verify that the master volume (LDEV1) for the MPEXL_SYSTEM_VOLUME_SET is in the MASTER state. Other volumes may be in the SCRATCH or UNKNOWN state. These are the volumes that must be re-initializing.

VOLUTIL may not be necessary if the members of the system set are defined in SYSGEN utility using AVOL command. If this has been done, the members of the system volume set is initializing when INSTALL is performed.

3. Reinstall the Data Protector software on the system.
4. Restore the latest backup of your system directory information. To perform the restore, select backed *volset_name_DAF* object and specify the supported user definable restore option DIRECTORY. All system information will be restored.
5. Restore the latest backup of your filesystem.
6. Reboot the system.

Device Configuration

The following section describes how you can configure standalone device and SCSI tape library to be used with MPE/iX systems.

Limitations

The following limitations exist:

- Autoconfiguration of devices is not possible on MPE/iX systems.
- When used with MPE/ix, the General Media Agent communication buffer is limited to 32 KB.

Configuration of Standalone Device on MPE/iX

To configure a standalone device on the MPE/iX systems follow the steps below:

1. Connect backup device to a computer system.
2. Write down tape I/O Configuration from `ISL` utility `MAPPER`.
   a. Press `CTRL - B` to put the system in control mode
   b. Enter `TC` and press `RETURN` to soft reset the system
   c. Press any key to override the autoboot
   d. Enter `Y` for “Boot from the primary boot path (Y or N)?” or if prompt “>” show enter `BO PRI` and press `RETURN`
   e. Enter `Y` for “Interact with IPL (Y/N)?”
   f. At the `ISL` prompt “ISL>” enter:

```
ISL>ODE
ODE>MAPPER
MAPPER>RUN
```

   g. After `MAPPER` scans system I/O configuration you should get something like this in console:

Figure 1-4 I/O Configuration of Standalone Device

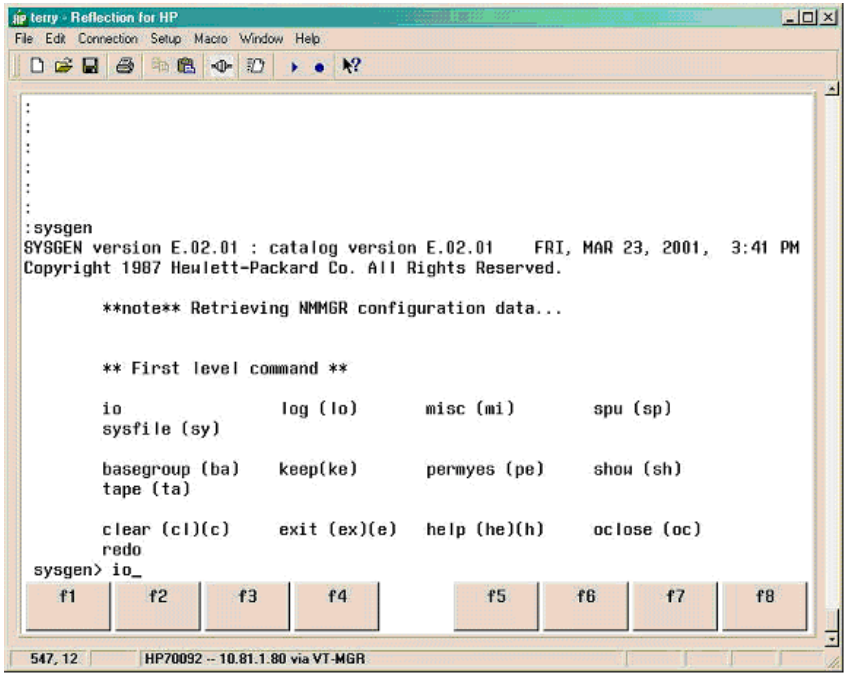
```
*******************************************************************************
I/O Configuration:

                                                        HW  SW   Revisions
Path     Component Name                  Type ID        Mod Mod  Hdwr Firm
-------- ------------------------------- ---------- ------ ------ -------- ------
.
.
52.3.0   HPC1533A                        -              -    -      -    L100
.
.
*******************************************************************************
```

- Find Tape Device and write down the I/O path (for example, 52.3.0) and Component Name (for example, HPC1533A).

3. Restart the system and login.

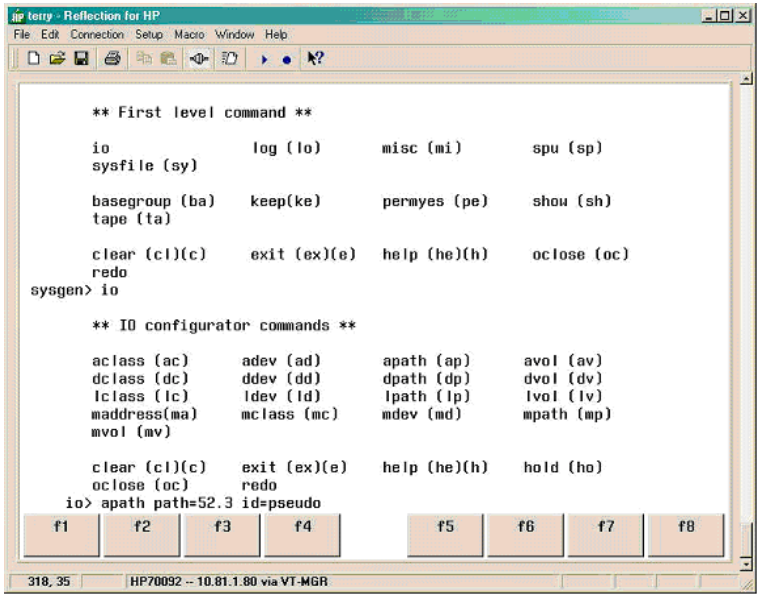
   Do not stream jobs and do not start network interface and network services.

4. Run SYSGEN utility, IO subsystem, as follows:



For a standalone (DDS) device, there are three things that have to be added:

- Add path for device and identify it as the PSEUDO, as follows:



- Add tape drive device (always on path address that end with 0), set ID and mode as AUTOREPLY, as follows:

  ```
  IO>ADEV LDEV=30 PATH=52.3.0 ID=HPC1533A MODE=AUTOREPLY
  ```

- Add autochanger (robotics) device and identify it as PICKER, as follows:

  ```
  IO>ADEV LDEV=31 PATH=52.3.1 ID=PICKER
  ```

From the MAPPER utility you get the path number (for example, PATH=52.3) and ID for the device (use the first word from Component Name, for example ID=HPC1533A).

LDEV number (for example, LDEV=31) is any free number from 1-255. You can check already used numbers by listing all devices with SYSGEN utility, IO subsystem, or with showdev command, as follows:

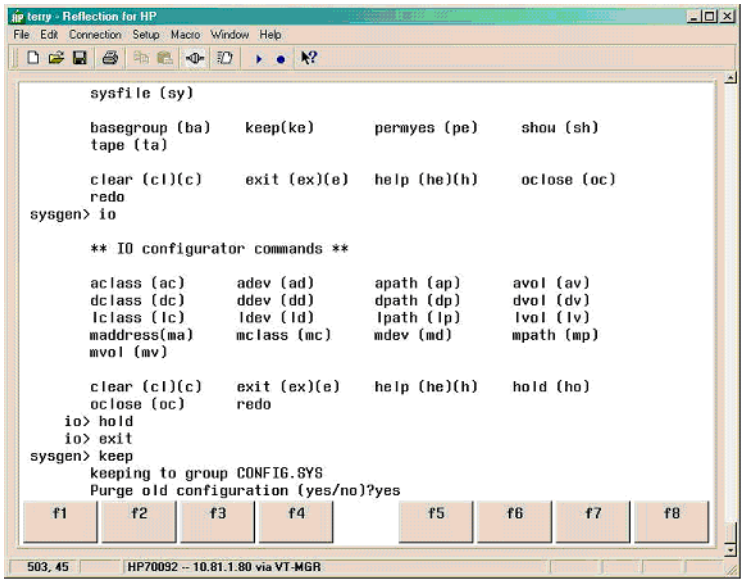
```
:SYSGEN

SYSGEN>IO

IO>LDEV
```

```
:SHOWDEV
```

Path address for autochanger (robotics) is usually path address for tape +1.

NOTE For a SCSI device you have to use the word `PSEUDO` as the device identifier.

5. Then keep new configuration and exit `SYSGEN` utility, as follows:



Enter Y for “Purge old configuration (yes/no)?”.

6. Create device link file with `mknod` command:

   :mknod “/dev/picker c 0 31”

   :mknod “/dev/drive c 0 30”

7. To verify the changes, restart the system.

After you have connected and configured the standalone device on MPE/iX system, you can configure it for use with Data Protector. For detailed steps on how to configure a standalone device with Data Protector, refer to the online Help index keyword “configuring standalone devices”.

Configuration of SCSI Tape Library on MPE/iX

To configure a SCSI Tape Library on the MPE/iX systems follow the steps below:

1. Connect backup device to a computer system.
2. Write down tape I/O Configuration from `ISL` utility `MAPPER`.
   a. Press `CTRL - B` to put the system in control mode
   b. Enter `TC` and press `RETURN` to soft reset the system
   c. Press any key to override the autoboot
   d. Enter `Y` for “Boot from the primary boot path (Y or N)?” or if prompt “>” show enter `BO PRI` and press `RETURN`
   e. Enter `Y` for “Interact with IPL (Y/N)?”
   f. At the `ISL` prompt “ISL>” enter:

      ISL>ODE

      ODE>MAPPER

      MAPPER>RUN

   g. After `MAPPER` scans system I/O configuration you should get something like this in console:

Figure 1-5 I/O Configuration of SCSI Tape Library

```
I/O Configuration:

                                  Type  SW  Revisions  Test
Path     Component Name                ID  Mod Hdwr  Firm Avail
-------  ----------------------------- --- --- ---- ---- ----
.
.
56/52.0.0  C7200-8000 AUTOCHANGER        -   -    -    -    -
.
56/52.2.0  DLT8000 TAPEDRIVE             -   -    -    -    -
.
56/52.3.0  DLT8000 TAPEDRIVE             -   -    -    -    -
.
.
********************************************************************************
```

- Find Tape Device and write down the I/O path (for example `56/52.0.0`) and Component Name (DLT8000)

3. Restart the system and login.

   Do not stream jobs and do not start network interface and network services.

4. Run `SYSGEN` utility, `IO` subsystem, as follows:

   ```
   :SYSGEN
   SYSGEN>IO
   ```

   For a SCSI Tape Library (DLT) device, there are two things that have to be added:

   - Add path and device for autochanger, as follows:

     ```
     IO>APATH PATH=56/52.0 ID=PSEUDO
     IO>ADEV LDEV=30 PATH=56/52.0.0 ID=PICKER
     ```

   - Add paths and devices for tapes, as follows:

```
IO>APATH PATH=56/52.2 ID=PSEUDO
IO>ADEV LDEV=31 PATH=56/52.2.0 ID=DLT8000
MODE=AUTOREPLY

IO>APATH PATH=56/52.3 ID=PSEUDO
IO>ADEV LDEV=32 PATH=56/52.3.0 ID=DLT8000
MODE=AUTOREPLY
```

From the MAPPER utility you get the path number (for example, PATH=56/52.0) and ID for the device (use the first word from Component Name, for example ID=DLT8000).

LDEV number (for example, LDEV=31) is any free number from 1-255. You can check already used numbers by listing all devices with SYSGEN utility, IO subsystem, or with showdev command, as follows:

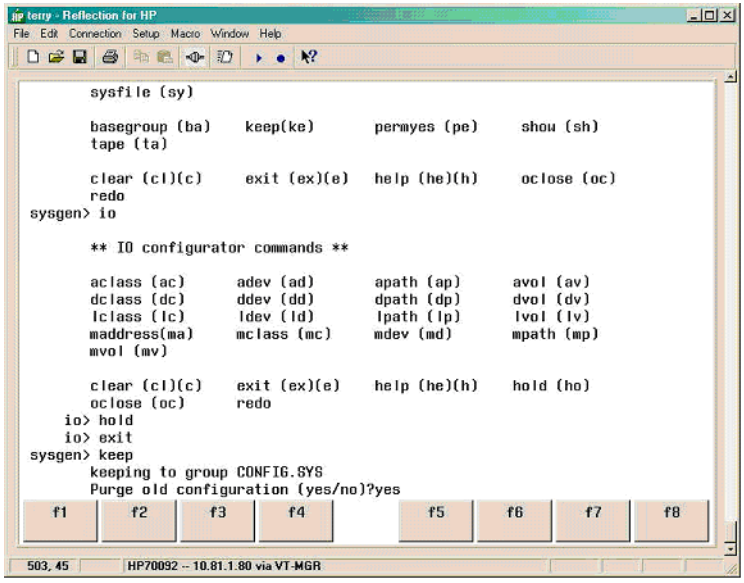
```
:SYSGEN
SYSGEN>IO
IO>LDEV

:SHOWDEV
```

Path address for autochanger (robotics) is usually path address for tape +1.

5. For path number (PATH=56/52.0 - PATH=56/52.0.0) from MAPPER utility, for ID use the first word from Component Name (ID=DLT8000), for autochanger use PICKER (ID=PICKER) and for LDEV numbers (LDEV=31, ...) use any free numbers from 1-255 (you can check already used numbers by entering LDEV in "IO>" prompt).

NOTE For a SCSI device you must use the word PSEUDO as the device identifier.

6. Then keep the new configuration and exit SYSGEN utility, as follows:



Enter Y for “Purge old configuration (yes/no)?”.

7. Create device link file with mknod command:

   :mknod “/dev/dlt_picker c 0 30”

   :mknod “/dev/dlt_tape01 c 0 31”

   :mknod “/dev/dlt_tape02 c 0 32”

8. Restart the system to verify the changes.

   After you have connected and configured the SCSI library on MPE/iX system, you can configure it for use with Data Protector. For detailed steps on how to configure a SCSI library with Data Protector, refer to the online Help index keyword “configuring SCSI libraries”.

Supported CLI commands

The following section describes supported CLI commands on MPE/iX systems.

This version of Data Protector supports the following command:

- `omnib`

Prerequisites

MANAGER.SYS user must be added to the Admin Group provided by Data Protector in order for this CLI commands to work properly. If this user is not added, commands cannot be executed.

Limitations

Due to the limitations of the MPE/iX Posix shell (utility `nroff` is not implemented), it is not possible to implement help for this command as man page.

omnib CLI Command

The `omnib` CLI command is now also available for MPE/iX systems. The `omnib` CLI command uses a backup specification to back up data objects.

The following Data Protector functionality are supported:

- Session management

  This option controls the backup sessions. The Session Manager reads the backup specification or uses the command options to determine what to back up. It then initiates the Disk and General Media Agents for disks and backup devices that will be used in the session. Once the session has been completed, the Session Manager updates the media management database with the session information.

- Media management

  Provides easy and efficient management of large sets of media by grouping media, tracking their status, implementing a media rotation policy, supporting the barcode recognition, vaulting the media, automating the library device operations, storing the media related information in a central place and sharing this information among several Data Protector cells.

- Data compression

  Writes data to media in a compressed format.

- Data encoding

  Writes data to media in an encoded mode.

- Backup monitoring

  When the backup command is executed, it sends a request (specifying the backup objects) to the Session Manager. When the Session Manager accepts the request, it assigns a unique SessionID to the session. You can use this SessionID to monitor the progress of the session using the xomnimonitor or omnistat commands. You can also use the omniabort command to terminate a session.

NOTE The `omniintro` man page is also available on the `/usr/omni/docs` directory on MPE/iX systems.

MPE/iX Database Backup and Restore

MPE/iX platforms support ALLBASE/SQL database and the TurboIMAGE/XL Database Management System.

ALLBASE/SQL Database

ALLBASE/SQL is a relational database management system that gives you flexibility in designing and using SQL database applications on a small or large scale.

TurboIMAGE/XL Database Management System

TurboIMAGE/XL is a database management system that includes a set of programs and procedures which you can use to define, create, access, and maintain a database.

To backup MPE/iX database with Data Protector you can perform a backup in the same way as the ordinary file backup. It is important that:

- If you want to backup a complete database (all database files), you have to perform true-online backup.
- Select the (account/) group in which database files reside to backup them.

Follow the standard procedure for backup as described in the “Backup of MPE/iX Client System” on page 9. Additionally, you can specify user defined backup variables that are supported by Data Protector. Refer to “User Defined Backup Variables” on page 11.

The best way to understand using option `ONLINE` and `ONLINE = START` and differences between them is probably performing online database backup on MPE/iX systems.

If the `ONLINE` option is used, then all files that are closed for writing access are not backed up and TurboSTORE/iX log (this log file is always created during backup and restore processes with TurboSTORE/iX) will contain the information about the files that are not backed up.

Else, if the `ONLINE = START` option is used all files are stored, including files that are closed for write access. This is called true-online backup.

Refer to “TurboSTORE/iX Log Files on MPE/iX Systems” on page 34 for examples of TurboSTORE/iX log files with option ONLINE and with option ONLINE=START.

TurboSTORE/iX Log Files on MPE/iX Systems

During the backup or restore procedure on MPE/iX, the TurboSTORE/iX utility creates a log file. The log file is saved in system `/tmp` directory. Its name consists of store or restore process and the process identification number (pid), for example `store74711122.log`.

IMPORTANT TurboSTORE/iX log file for backup can sometimes show more objects than there are actually backed up. That is because of some Data Protector options (`-skip`, `-only`, `-since` options) where the data is read but not written to the medium. The last line Total media written is related to TurboSTORE/iX media, not to Data Protector media.

The following are examples of TurboSTORE/iX log files during the backup database files with option ONLINE and option ONLINE=START.

Example 1-1 **Example of TurboSTORE/iX log files with option ONLINE**

```
>> TURBO-STORE/RESTORE  VERSION  C.60.17  B5152AA  <<

(C) 1986 Hewlett-Packard CO.


STORE /SYS/SAMPLEDB/;
;TREE;ONVS=MPEXL_SYSTEM_VOLUME_SET;ONLINE=START;NW3K^M

THU, JAN 25, 2001,  3:59 PM

/SYS/SAMPLEDB/MUSIC NOT STORED: FILE OPEN FOR WRITE ST
ATTACH

/SYS/SAMPLEDB/MUSICDBE NOT STORED: FILE OPEN FOR WRITE ST
ATTACH

/SYS/SAMPLEDB/MUSICDCR NOT STORED: FILE OPEN FOR WRITE ST
ATTACH

/SYS/SAMPLEDB/MUSICDFL NOT STORED: FILE OPEN FOR WRITE ST
ATTACH

/SYS/SAMPLEDB/MUSICDLG NOT STORED: FILE OPEN FOR WRITE ST
ATTACH
```

```
ONLINE BACKUP UTILIZED DISC SPACE FOR LOG ON THE FOLLOWING
VOLSETS:

MPEXL_SYSTEM_VOLUME_SET :
0 KB

DATABASE INFORMATION:

ALL/SQL DATABASE: /SYS/SAMPLEDB/PARTSDBE

FILES STORED:
12

HFS DIRECTORIES STORED:
1

FILES STORED:
104

FILES NOT STORED:
5

TOTAL MEDIA WRITTEN:
0
```

Example 1-2 Example of TurboSTORE/iX log files with option ONLINE=START

```
>> TURBO-STORE/RESTORE  VERSION  C.60.17  B5152AA  <<

(C) 1986 Hewlett-Packard CO.


STORE /SYS/SAMPLEDB/;
;TREE;ONVS=MPEXL_SYSTEM_VOLUME_SET;ONLINE=START;NW3K^M

THU, JAN 25, 2001,  3:59 PM

ONLINE BACKUP UTILIZED DISC SPACE FOR LOG ON THE FOLLOWING
VOLSETS:

MPEXL_SYSTEM_VOLUME_SET:
832 KB

TURBOIMAGE DATABASE: /SYS/SAMPLEDB/MUSIC
FILES STORED:
7
```

```
ALLBASE/SQL DATABASE: /SYS/SAMPLEDB/MUSICDBE
FILES STORED:
3

ALLBASE/SQL DATABASE: /SYS/SAMPLEDB/PARTSDBE
FILES STORED:
12

HFS DIRECTORIES STORED:
1

FILES STORED:
109

TOTAL MEDIA WRITTEN:
0
```

UDC Files and Environment Variables

The following section describes how to create UDC files and how to use MA environment variables.

UDC Files

To create a UDC file enter the following in command prompt:

```
:editor

HP32201A.09.00 EDIT/3000 MON, JAN 15, 2001,  2:37 PM
(C) Hewlett-Packard CO. 1993

/add
   1    OB2UDC            <- UDC NAME
   2    OPTION LOGON      <- START ON LOGIN
   3
   4    OB2SET            <- SET OB2VARIABLES SCRIPT
   5    *              <- END OF UDC COMMAND
   6    //
...
/keep OB2UDCF.PUB.SYS
/exit

END OF SUBSYSTEM
:
```

To activate the UDC file enter:

```
:SETCATALOG OB2UDC.PUB.SYS; APPEND
```

OB2SET File

OB2SET file can be created with any editor.

The following is an example of the Data Protector environment variables:

Example

```
SETVAR OB2DEVRETRY                  5
SETVAR OB2DEVSLEEP                  5
COMMENT SETVAR OB2BLKSIZE           -1
COMMENT SETVAR OB2SEGSIZE           -1
SETVAR OB2OMNIMAXCATALOG            -1

SETVAR OB2OMNIMAXCATALOG            -1

SETVAR OB2SHORTSEEKFM               -1
SETVAR OB2EODMETHOD                 -1
SETVAR OB2DASDRIVESTATUS2           -1
SETVAR OB2SPTRETRY                  5
SETVAR OB2SPTSLEEP                  5
SETVAR OB2SPTRETRYCOMMAND           5
SETVAR OB2SPTSLEEPCOMMAND           5
SETVAR OB2SKIPWRITE                 -1
SETVAR OB2SCSITIMEOUT               -1
SETVAR OB2DBD                       -1
SETVAR OB2SKIPEJECT                 -1
SETVAR OB2IMMEDFM                   -1
```

After adding new environment variables to `OB2SET` file, restart `inetd` to update the configuration with the new settings. Refer to the *Configuring and Managing MPE/iX Internet Services* manual for more information.