

Disaster recovery with the HP StorageWorks Enterprise File Services Clustered Gateway Linux Version and HP StorageWorks XP Business Copy white paper



Executive summary.....	2
Clustered Gateway XP Business Copy configuration procedure	3
Preparing the cluster for use with XP Business Copy.....	3
Clustered Gateway XP Business Copy failover procedure	11
Clustered Gateway XP Business Copy File recovery procedure	12
The file recovery process on a simple filesystem	12
The file recovery process on a Dynamic Volume	12
Clustered Gateway XP Business Copy LUN backup.....	14
Preparing the cluster for a backup.....	14
Backing up from a simple filesystem	14
Backing up from a Dynamic Volume.....	15
For more information.....	17

Executive summary

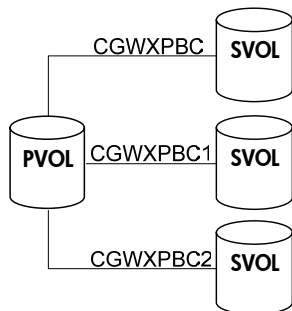
Developing a disaster tolerant file sharing infrastructure is an important goal in today's business environment. As file sharing has always been a business-critical activity, providing users with immediate and consistent access to shared files is a significant goal. To ensure that this shared data will be available, even in the case of a disaster, the HP StorageWorks XP Business Copy and HP StorageWorks XP Continuous Access families of high-availability data and disaster recovery tools enable real-time data mirroring between XP disk arrays or LUNs within a single array and protect you from catastrophic failures. To meet this objective, HP provides a proof point and best practice for file sharing disaster recovery solution.

This white paper describes the process to configure an HP StorageWorks Enterprise File Services Clustered Gateway when XP Business Copy is utilized in the solution. This white paper also describes the process to fail over all Primary BC LUNs to a set of Secondary BC LUNs, recovering lost files or directories from LUN copies, and utilizing a single node in the Clustered Gateway for performing a backup without affecting the Primary LUNs.

This white paper provides a:

- Clustered Gateway XP Business Copy solution overview
- Clustered Gateway XP Business Copy configuration procedure
- Clustered Gateway XP Business Copy failover procedure
- Clustered Gateway XP Business Copy file recovery procedure
- Clustered Gateway XP Business Copy LUN backup

Figure 1. XP Business Copy pairs



Clustered Gateway XP Business Copy configuration procedure

It is important to remember that XP LUN UIDs will vary between the LUNs in a pair. Therefore, it is extremely important to develop and save the corresponding relationships between the LUN UIDs for the Primary (P-VOL) and Secondary (S-VOL) LUNs in the XP Business Copy pairs.

Before you begin, be sure to consult the STREAMS documentation to verify that you have the latest supported drivers.

This white paper describes the method of disaster recovery using HP StorageWorks XP RAID Manager. It should be noted that the Web Console can also be used for this purpose, but is not described in this white paper.

Installation and configuration of XP RAID Manager is beyond the scope of this white paper.

Preparing the cluster for use with XP Business Copy

Figure 1 demonstrates how the pairs are configured for use in this white paper's examples and includes the XP Business Copy device group names used.

- Verify that XP RAID Manager is installed, configured, and started on the Clustered Gateway. For ease of use, install XP RAID Manager on all Clustered Gateway nodes. Installation on all nodes provides high availability for XP RAID Manager.

XP RAID Manager configuration files include:

```
/etc/horcm.conf  
/etc/services
```

To start XP RAID Manager:

```
horcmstart.sh 0  
horcmstart.sh 1
```

To set the environment variables:

```
export HORCMINST=0 (this specifies the local XP RAID Manager instance is 0)  
export HORCC_MRCF=1 (this specifies that commands will be directed to XP Business Copy)
```

- Create pairs with the `paircreate` command for each XP Business Copy device group defined in your `horcm.conf` files. To do this, execute the following command for each group:

```
paircreate -g <assigned BC group name> -vl
```

- For the example configuration in Figure 1, the corresponding `paircreate` commands are:

```
paircreate -g CGWXPBC -vl  
paircreate -g CGWXPBC1 -vl  
paircreate -g CGWXPBC2 -vl
```

- To split a pair such that a point-in-time copy is created, use the `pairsplit` command. By default, the `pairsplit` command will suspend the pairs so that copying is no longer done to the S-VOLs but the LUNs are still a pair. To suspend a pair in this way, execute the following command:

```
pairsplit -g <assigned BC group name>
```

- After the pairs are split, to resynchronize them later so that they continuously copy again, execute the following command:

```
pairresync -g <assigned BC group name>
```

- Again, due to the fact that the UIDs are different between the LUNs in the pair, it is necessary to create a LUN UID P-VOLs to S-VOLs relationship. Now, determine the LUN UIDs on the XP that have been imported into the Clustered Gateway. To obtain the imported P-VOL UIDs, use “sandiskinfo – ailq > your_filename_sandiskinfo_primary.” The following shows an example output from this command.

```

Disk: /dev/psd/psd1          (Membership Disk)
  Uid: 6-HP:OPEN-V:R500:00032334:01:BB SAN info: 192.168.1.252:27
  Vendor:          HP OPEN-V Capacity: 1024.68M
  Local Device Paths: /dev/sda
    partition 01: size 1023.80M type Linux (83) (PSMP/Active )
Disk: /dev/psd/psd2          (Membership Disk)
  Uid: 6-HP:OPEN-V:R500:00032334:01:BC SAN info: 192.168.1.252:27
  Vendor:          HP OPEN-V Capacity: 1024.68M
  Local Device Paths: /dev/sdb
    partition 01: size 1023.80M type Linux (83) (PSMP/Active )
Disk: /dev/psd/psd3          (Membership Disk)
  Uid: 6-HP:OPEN-V:R500:00032334:01:BD SAN info: 192.168.1.252:27
  Vendor:          HP OPEN-V Capacity: 1024.68M
  Local Device Paths: /dev/sdc
    partition 01: size 1023.80M type Linux (83) (PSMP/Active )
Disk: /dev/psd/psd4
  Uid: 6-HP:OPEN-V:R500:00032334:01:9C SAN info: 192.168.1.252:27
  Vendor:          HP OPEN-V Capacity: 136368.75M
  Local Device Paths: /dev/sde
Disk /dev/psd/psd4 doesn't contain a valid partition table
  unpartitioned: size 136368.75M type (none) (PSFS Filesystem)
Disk: /dev/psd/psd5
  Uid: 6-HP:OPEN-V:R500:00032334:01:8D SAN info: 192.168.1.252:27
  Vendor:          Capacity: 136368.75M
  Local Device Paths: /dev/sdd
    unpartitioned: size 136368.75M type (none) (SUBDEV/psv1)
Disk: /dev/psd/psd6
  Uid: 6-HP:OPEN-V:R500:00032334:01:AB SAN info: 192.168.1.252:27
  Vendor:          Capacity: 136368.75M
  Local Device Paths: /dev/sdf
    unpartitioned: size 136368.75M type (none) (SUBDEV/psv1)

```

- Having determined the P-VOL UIDs, now determine the S-VOL UIDs, which have not been imported into the Clustered Gateway. To obtain the unimported S-VOL UIDs, use “sandiskinfo –aulq > your_filename_sandiskinfo_secondary.” This information will be used later to determine and verify the corresponding LUN UID relationship. The following shows an example output from this command. Notice that the LUN UIDs are different than those in the preceding example.

Disk Uid: 6-HP:OPEN-V:R500:00032334:01:03

SAN info: 192.168.1.252:27

Vendor: HP OPEN-V Capacity: 136368.75M

Local Device Paths: /dev/sdg

Disk /dev/sdg doesn't contain a valid partition table

unpartitioned: size 136368.75M type (none)

Disk Uid: 6-HP:OPEN-V:R500:00032334:01:BE

SAN info: 192.168.1.252:26

Vendor: HP OPEN-V Capacity: 1024.68M

Local Device Paths: /dev/sdh

partition 01: size 1023.80M type Linux (83) (PSMP/Active)

Disk Uid: 6-HP:OPEN-V:R500:00032334:01:BF

SAN info: 192.168.1.252:26

Vendor: HP OPEN-V Capacity: 1024.68M

Local Device Paths: /dev/sdi

partition 01: size 1023.80M type Linux (83) (PSMP/Active)

Disk Uid: 6-HP:OPEN-V:R500:00032334:01:CO

SAN info: 192.168.1.252:26

Vendor: HP OPEN-V Capacity: 1024.68M

Local Device Paths: /dev/sdj

partition 01: size 1023.80M type Linux (83) (PSMP/Active)

Disk Uid: 6-HP:OPEN-V:R500:00032334:01:00

SAN info: 192.168.1.252:26

Vendor: HP OPEN-V Capacity: 136368.75M

Local Device Paths: /dev/sdk

Disk /dev/sdk doesn't contain a valid partition table

unpartitioned: size 136368.75M type (none)

Disk Uid: 6-HP:OPEN-V:R500:00032334:01:01

SAN info: 192.168.1.252:26

Vendor: HP OPEN-V Capacity: 136368.75M

Local Device Paths: /dev/sdl

Disk /dev/sdl doesn't contain a valid partition table

unpartitioned: size 136368.75M type (none) (PSFS Filesystem)

Disk Uid: 6-HP:OPEN-V:R500:00032334:01:02

SAN info: 192.168.1.252:26

Vendor: HP OPEN-V Capacity: 136368.75M

Local Device Paths: /dev/sdm

Disk /dev/sdm doesn't contain a valid partition table

unpartitioned: size 136368.75M type (none)

Disk Uid: 6-HP:OPEN-V:CM:R500:00032334:01:C2

SAN info: 192.168.1.252:26

Vendor: HP OPEN-V-CM Capacity: 100.31M

Local Device Paths: /dev/sdn

Disk /dev/sdn doesn't contain a valid partition table

unpartitioned: size 100.31M type (none)

Disk Uid: 6-HP:OPEN-V:R500:00032334:01:C1

SAN info: 192.168.1.252:26

Vendor: HP OPEN-V Capacity: 100.31M

Local Device Paths: /dev/sdo

Disk /dev/sdo doesn't contain a valid partition table

unpartitioned: size 100.31M type (none)

Disk Uid: 6-HP:OPEN-V:R500:00032334:01:C3

SAN info: 192.168.1.252:26

Vendor: HP OPEN-V Capacity: 1024.68M

Local Device Paths: /dev/sdp

partition 01: size 1023.80M type Linux (83) (PSMP/Active)

Disk Uid: 6-HP:OPEN-V:R500:00032334:01:C4

SAN info: 192.168.1.252:26

Vendor: HP OPEN-V Capacity: 1024.68M

Local Device Paths: /dev/sdq

partition 01: size 1023.80M type Linux (83) (PSMP/Active)

Disk Uid: 6-HP:OPEN-V:R500:00032334:01:C5

SAN info: 192.168.1.252:26

Vendor: HP OPEN-V Capacity: 1024.68M

Local Device Paths: /dev/sdr

partition 01: size 1023.80M type Linux (83) (PSMP/Active)

Disk Uid: 6-HP:OPEN-V:R500:00032334:01:06

SAN info: 192.168.1.252:26

Vendor: HP OPEN-V Capacity: 136368.75M

Local Device Paths: /dev/sds

Disk /dev/sds doesn't contain a valid partition table

unpartitioned: size 136368.75M type (none)

Disk Uid: 6-HP:OPEN-V:R500:00032334:01:07

SAN info: 192.168.1.252:26

Vendor: HP OPEN-V Capacity: 136368.75M

Local Device Paths: /dev/sdt

Disk /dev/sdt doesn't contain a valid partition table

unpartitioned: size 136368.75M type (none) (PSFS Filesystem)

Disk Uid: 6-HP:OPEN-V:R500:00032334:01:08

SAN info: 192.168.1.252:26

Vendor: HP OPEN-V Capacity: 136368.75M

Local Device Paths: /dev/sdu

Disk /dev/sdu doesn't contain a valid partition table

unpartitioned: size 136368.75M type (none)

Disk Uid: 6-HP:OPEN-V:R500:00032334:01:C6

SAN info: 192.168.1.252:26

Vendor: HP OPEN-V Capacity: 1024.68M

Local Device Paths: /dev/sdv

partition 01: size 1023.80M type Linux (83) (PSMP/Active)

Disk Uid: 6-HP:OPEN-V:R500:00032334:01:C7

SAN info: 192.168.1.252:26

Vendor: HP OPEN-V Capacity: 1024.68M

Local Device Paths: /dev/sdw

partition 01: size 1023.80M type Linux (83) (PSMP/Active)

Disk Uid: 6-HP:OPEN-V:R500:00032334:01:C8

SAN info: 192.168.1.252:26

Vendor: HP OPEN-V Capacity: 1024.68M

Local Device Paths: /dev/sdx

partition 01: size 1023.80M type Linux (83) (PSMP/Active)

Disk Uid: 6-HP:OPEN-V:R500:00032334:01:13

SAN info: 192.168.1.252:26

Vendor: HP OPEN-V Capacity: 136368.75M

Local Device Paths: /dev/sdy

Disk /dev/sdy doesn't contain a valid partition table

unpartitioned: size 136368.75M type (none)

Disk Uid: 6-HP:OPEN-V:R500:00032334:01:14

SAN info: 192.168.1.252:26

Vendor: HP OPEN-V Capacity: 136368.75M

Local Device Paths: /dev/sdz

Disk /dev/sdz doesn't contain a valid partition table

unpartitioned: size 136368.75M type (none) (PSFS Filesystem)

Disk Uid: 6-HP:OPEN-V:R500:00032334:01:15

SAN info: 192.168.1.252:26

Vendor: HP OPEN-V Capacity: 136368.75M

Local Device Paths: /dev/sdaa

Disk /dev/sdaa doesn't contain a valid partition table

unpartitioned: size 136368.75M type (none)

- Now that the P-VOL LUN UUIDs have been imported and the S-VOL LUN UUIDs are unimported, determine the P-VOL to S-VOL relationship between the corresponding UUIDs. The tool used to determine this P-VOL to S-VOL relationship is the XP RAID Manager `pairdisplay` command. Using XP RAID Manager “`pairdisplay -g <assigned BC group name> -IBC0 -fx > your_filename_pairdisplay_groupname,`” view the XP Business Copy configuration and determine the P-VOL to S-VOL relationship assigned for the XP Business Copy LUNs.

Note

Use BCO, like in the preceding example, if the local XP RAID Manager is currently 0. Otherwise, use the instance number that you are currently running. The following shows the corresponding output for the LUN groups in Figure 1.

`pairdisplay -g CGWXPBC -IBC0 -fx > CGWXPBCpairs.txt`

```

Group   PairVol (L/R) (Port#,TID, LU-M) ,Seq#,LDEV#.P/S,Status, Seq#,P-LDEV# M
CGWXPBC disk1 (L)   (CL7-R , 0, 0-0 ) 32334 1bb.P-VOL PAIR,32334 1be -
CGWXPBC disk1 (R)   (CL8-R , 0, 3-0 ) 32334 1be.S-VOL PAIR,----- 1bb -
CGWXPBC disk2 (L)   (CL7-R , 0, 1-0 ) 32334 1bc.P-VOL PAIR,32334 1bf -
CGWXPBC disk2 (R)   (CL8-R , 0, 4-0 ) 32334 1bf.S-VOL PAIR,----- 1bc -
CGWXPBC disk3 (L)   (CL7-R , 0, 2-0 ) 32334 1bd.P-VOL PAIR,32334 1c0 -
CGWXPBC disk3 (R)   (CL8-R , 0, 5-0 ) 32334 1c0.S-VOL PAIR,----- 1bd -
CGWXPBC disk4 (L)   (CL7-R , 0, 3-0 ) 32334 18d.P-VOL PAIR,32334 100 -
CGWXPBC disk4 (R)   (CL8-R , 0, 0-0 ) 32334 100.S-VOL PAIR,----- 18d -
CGWXPBC disk5 (L)   (CL7-R , 0, 4-0 ) 32334 19c.P-VOL PAIR,32334 101 -
CGWXPBC disk5 (R)   (CL8-R , 0, 1-0 ) 32334 101.S-VOL PAIR,----- 19c -
CGWXPBC disk6 (L)   (CL7-R , 0, 5-0 ) 32334 1ab.P-VOL PAIR,32334 102 -
CGWXPBC disk6 (R)   (CL8-R , 0, 2-0 ) 32334 102.S-VOL PAIR,----- 1ab -

```

`pairdisplay -g CGWXPBC1 -IBC0 -fx > CGWXPBC1pairs.txt`

```

Group   PairVol (L/R) (Port#,TID, LU-M) ,Seq#,LDEV#.P/S,Status, Seq#,P-LDEV# M
CGWXPBC1 disk11 (L)   (CL7-R , 0, 0-1 ) 32334 1bb.P-VOL PSUS,32334 1c3 W
CGWXPBC1 disk11 (R)   (CL8-R , 0, 8-0 ) 32334 1c3.S-VOL SSUS,----- 1bb -
CGWXPBC1 disk12 (L)   (CL7-R , 0, 1-1 ) 32334 1bc.P-VOL PSUS,32334 1c4 W
CGWXPBC1 disk12 (R)   (CL8-R , 0, 9-0 ) 32334 1c4.S-VOL SSUS,----- 1bc -
CGWXPBC1 disk13 (L)   (CL7-R , 0, 2-1 ) 32334 1bd.P-VOL PSUS,32334 1c5 W
CGWXPBC1 disk13 (R)   (CL8-R , 0, 10-0 ) 32334 1c5.S-VOL SSUS,----- 1bd -
CGWXPBC1 disk14 (L)   (CL7-R , 0, 3-1 ) 32334 18d.P-VOL PSUS,32334 106 W
CGWXPBC1 disk14 (R)   (CL8-R , 0, 11-0 ) 32334 106.S-VOL SSUS,----- 18d -
CGWXPBC1 disk15 (L)   (CL7-R , 0, 4-1 ) 32334 19c.P-VOL PSUS,32334 107 W
CGWXPBC1 disk15 (R)   (CL8-R , 0, 12-0 ) 32334 107.S-VOL SSUS,----- 19c -
CGWXPBC1 disk16 (L)   (CL7-R , 0, 5-1 ) 32334 1ab.P-VOL PSUS,32334 108 W

```

```
CGWXPBC1      disk16(R)    (CL8-R , 0, 13-0 )32334 108.S-VOL SSUS,-----
1ab -
```

```
pairdisplay -g CGWXPBC2 -IBC0 -fx > CGWXPBC2pairs.txt.
```

```
Group   PairVol(L/R) (Port#,TID, LU-M) ,Seq#,LDEV#.P/S,Status, Seq#,P-LDEV# M
CGWXPBC2   disk21(L)    (CL7-R , 0, 0-2 )32334 1bb.P-VOL PSUS,32334
1c6 W
CGWXPBC2   disk21(R)    (CL8-R , 0, 14-0 )32334 1c6.S-VOL SSUS,-----
1bb -
CGWXPBC2   disk22(L)    (CL7-R , 0, 1-2 )32334 1bc.P-VOL PSUS,32334
1c7 W
CGWXPBC2   disk22(R)    (CL8-R , 0, 15-0 )32334 1c7.S-VOL SSUS,-----
1bc -
CGWXPBC2   disk23(L)    (CL7-R , 0, 2-2 )32334 1bd.P-VOL PSUS,32334
1c8 W
CGWXPBC2   disk23(R)    (CL8-R , 0, 16-0 )32334 1c8.S-VOL SSUS,-----
1bd -
CGWXPBC2   disk24(L)    (CL7-R , 0, 3-2 )32334 18d.P-VOL PSUS,32334
113 W
CGWXPBC2   disk24(R)    (CL8-R , 0, 17-0 )32334 113.S-VOL SSUS,-----
18d -
CGWXPBC2   disk25(L)    (CL7-R , 0, 4-2 )32334 19c.P-VOL PSUS,32334
114 W
CGWXPBC2   disk25(R)    (CL8-R , 0, 18-0 )32334 114.S-VOL SSUS,-----
19c -
CGWXPBC2   disk26(L)    (CL7-R , 0, 5-2 )32334 1ab.P-VOL PSUS,32334
115 W
CGWXPBC2   disk26(R)    (CL8-R , 0, 19-0 )32334 115.S-VOL SSUS,-----
1ab -
```

- Now determine how each of the imported XP LUN UUIDs is being used. To determine their use, ask questions like: Are they being used for membership partitions? Which psd devices are they assigned to? Are they being used for psv devices? To determine this utilization on one of the Clustered Gateway nodes, save the contents of the membership partitions by executing `"/opt/hpccfs/lib/mpdump > your_file_name_mpdump_primary."` The following shows an example output.

```
Current Product MP Version: 2
```

```
Membership Partition Version: 2
```

```
Membership Partitions:
```

```
6-HP:OPEN-V:R500:00032334:01:BB/1 (ONLINE)
```

```
6-HP:OPEN-V:R500:00032334:01:BC/1 (ONLINE)
```

```
6-HP:OPEN-V:R500:00032334:01:BD/1 (ONLINE)
```

```
Membership Partition Device Database (Version 1):
```

```
UID:6-HP:OPEN-V:R500:00032334:01:BB Label:psd1 (state=0x1/mask=00000000)
```

```
UID:6-HP:OPEN-V:R500:00032334:01:BC Label:psd2 (state=0x1/mask=00000000)
```

```
UID:6-HP:OPEN-V:R500:00032334:01:BD Label:psd3 (state=0x1/mask=00000000)
```

```
UID:6-HP:OPEN-V:R500:00032334:01:9C Label:psd4 (state=0x1/mask=00000000)
```

```
UID:6-HP:OPEN-V:R500:00032334:01:8D Label:psd5 (state=0x1/mask=00000000)
```

```
UID:6-HP:OPEN-V:R500:00032334:01:AB Label:psd6 (state=0x1/mask=00000000)
```

```
Membership Partition Volume Database (Version 2):
```

```
VOL:psv1 (stripesize=1024K)
```

```
Set 0: SUBDEV: 6-HP:OPEN-V:R500:00032334:01:8D/0 size=139640832K
```

```
SUBDEV: 6-HP:OPEN-V:R500:00032334:01:AB/0 size=139640832K
```

Membership Partition Host Registry (Version 3):

Host ID: 10.1.1.90 state=unfenced fencetype=0

Fence ID:21:00:00:e0:8b:08:0f:ea::192.168.1.252 state=0

Fence ID:21:01:00:e0:8b:28:0f:ea::192.168.1.252 state=0

Host ID: 10.1.1.91 state=fenced fencetype=0

Fence ID:21:00:00:e0:8b:1e:61:02::192.168.1.252 state=0

Fence ID:21:01:00:e0:8b:3e:61:02::192.168.1.252 state=0

- Using information gathered before this step, determine the actual LUN UID P-VOL to S-VOL relationships. For example:
 - Using the `your_filename_pairdisplay_groupname` files, note that there is a Primary to Secondary relationship between 1bb and 1be, where 1bb is the Primary and 1be is the Secondary. Note the last two characters of the UIDs. In this case, note that the P-VOL to S-VOL relationship between bb and be is:
CGWXPBC disk1(L) (CL7-R , 0, 0-0)32334 1bb.P-VOL PAIR,32334 1be -
CGWXPBC disk1(R) (CL8-R , 0, 3-0)32334 1be.S-VOL PAIR,---- 1bb -
 - Using the `your_filename_sandiskinfo_primary`, you have a LUN UID:
6-HP:OPEN-V:R500:00032334:01:BB
 - Using the `your_filename_sandiskinfo_secondary`, you have a LUN UID:
6-HP:OPEN-V:R500:00032334:01:BE
 - Now note that:
6-HP:OPEN-V:R500:00032334:01:BB relates to 6-HP:OPEN-V:R500:00032334:01:BE
 - Also, note that this pair is in the CGWXPBC device group.
 - Do this for each pair of XP Business Copy LUNs.
- Now build an mpdump file for each set of S-VOLs. To do this on the same node, copy the Primary mpdump file so that you can edit this with the Secondary information. It is recommended to give each mpdump file a descriptive name to make it easier to determine what these copies may contain.
`cp your_file_name_mpdump_primary your_file_name_mpdump_copy`
- Now create an mpdump file for the Secondary LUNs of each of the device groups using the P-VOL to S-VOL relationships, as described in the preceding step. Edit each `your_file_name_mpdump_copy` file and modify each LUN UID so that it is equivalent to the LUN UID Secondary, which in turn corresponds to the Primary LUN UID. Save each file after all LUN UIDs have been modified. In this failover example, the XP Business Copy copy file for the Secondary pairs in the CGWXPBC1 device group will be as follows.

Current Product MP Version: 2

Membership Partition Version: 2

Membership Partitions:

6-HP:OPEN-V:R500:00032334:01:C3/1 (ONLINE)

6-HP:OPEN-V:R500:00032334:01:C4/1 (ONLINE)

6-HP:OPEN-V:R500:00032334:01:C5/1 (ONLINE)

Membership Partition Device Database (Version 1):

UID:6-HP:OPEN-V:R500:00032334:01:C3 Label:psd1 (state=0x1/mask=00000000)

```

UID:6-HP:OPEN-V:R500:00032334:01:C4 Label:psd2 (state=0x1/mask=00000000)
UID:6-HP:OPEN-V:R500:00032334:01:C5 Label:psd3 (state=0x1/mask=00000000)
UID:6-HP:OPEN-V:R500:00032334:01:07 Label:psd4 (state=0x1/mask=00000000)
UID:6-HP:OPEN-V:R500:00032334:01:06 Label:psd5 (state=0x1/mask=00000000)
UID:6-HP:OPEN-V:R500:00032334:01:08 Label:psd6 (state=0x1/mask=00000000)

```

Membership Partition Volume Database (Version 2):

```

VOL:psv1 (stripesize=1024K)
Set 0: SUBDEV: 6-HP:OPEN-V:R500:00032334:01:06/0 size=139640832K
      SUBDEV: 6-HP:OPEN-V:R500:00032334:01:08/0 size=139640832K

```

Membership Partition Host Registry (Version 3):

```

Host ID: 10.1.1.90 state=unfenced fencetype=0
      Fence ID:21:00:00:e0:8b:08:0f:ea::192.168.1.252 state=0
      Fence ID:21:01:00:e0:8b:28:0f:ea::192.168.1.252 state=0
Host ID: 10.1.1.91 state=fenced fencetype=0
      Fence ID:21:00:00:e0:8b:1e:61:02::192.168.1.252 state=0
      Fence ID:21:01:00:e0:8b:3e:61:02::192.168.1.252 state=0

```

Clustered Gateway XP Business Copy failover procedure

Understandably, the Clustered Gateway service will fail if the nodes lose the Primary LUNs for any reason because storage is no longer available. With XP Business Copy, you can recover the cluster in the event that the Primary LUNs are lost or corrupted. It is recommended that Secondary LUN copies, intended for recovery, are updated periodically to limit the loss of data.

The following operations demonstrate the procedure to follow in the event that all Primary LUNs must be replaced with a set of Secondary LUNs, including membership partitions.

- To import new LUNs to replace the current imported LUNs, you must stop cluster services. To do this, execute the following command on each node:

```
/etc/init.d/pmxs stop
```

- After the node has rebooted, log on as root since you must reconfigure the Clustered Gateway to read the new LUNs. This is necessary because XP Business Copy recovery utilizes different LUN UIDs on the Primary and Secondary LUNs. Then, execute the `mpimport` command on all nodes so that the device numbering remains static, the membership information will be rebuilt, and the configuration file, as defined in the configuration step, will be read. To do this, execute the following commands:

```
/opt/hpcfs/lib/mpimport -s -M -f your_file_name_mpdump_copy
```

- After the `mpimport` command has been executed, the Clustered Gateway service can be started. To do this, execute the following command on each node:

```
/etc/init.d/pmxs start
```

- When the Primary LUNs are ready to be imported back into the cluster, first shut down the services on all nodes again:

```
/etc/init.d/pmxs stop
```

- A reverse resynchronization must be done to update the PVOLs with any new changes that occurred on the S-VOLs. To do this, execute the following XP RAID Manager command:

```
pairresync -g <assigned BC group name> -restore
```

- To import the Primary LUNs into the cluster, replacing the Secondary LUNs, execute the following command:

```
/opt/hpcfs/lib/mpimport -s -M -f your_file_name_mpdump_primary
```

- After the `mpimport` command has been executed, the Clustered Gateway service can be started. To do this, execute the following command on each node:

```
/etc/init.d/pmxc start
```

Clustered Gateway XP Business Copy File recovery procedure

It is useful to maintain suspended copies of the Primary LUNs imported into the cluster. With XP Business Copy, pairs can be suspended with the `pairsplit` option at any point in time so that they later can be used to recover data that existed at that point.

The file recovery process on a simple filesystem

In the event that a file/directory is lost or corrupted and is located on a simple filesystem, execute the following procedures.

- Determine which P-VOL the file/directory was located in and the corresponding S-VOL to be recopied from.

For example, `psd4` is mounted on a directory and a file is created under it. Using the relationships developed during configuration, note that S-VOL `6-HP:OPEN-V:R500:00032334:01:07` is related to P-VOL `6-HP:OPEN-V:R500:00032334:01:9C`, which is `psd4`, as seen in the Primary `mpdump` file. To import the file in the state it was in when the S-VOL was updated last, import the S-VOL into the cluster, mount it, and retrieve the file.

- In this example, import the S-VOL using the `mpimport` command as follows:

```
mx disk import <LUN UID>
```

- Mount the LUN on a new directory:

```
mx fs mount --persist --activate --options CREATEDIR -path <directory to mount on> <psd name> <server names separated by whitespace>
```

- The mount should now be seen on all applicable servers when you run the `mount` command.
- Retrieve the desired file/directory from the newly mounted directory.
- When you finish, the LUN may be unmounted and exported. To do this, execute the following commands:

```
mx fs unmount --persistent --active <psd names> ALL_SERVERS
mx disk deport <LUN uid>
```

The file recovery process on a Dynamic Volume

In the event that a file/directory is lost or corrupted and is located on a Dynamic Volume, execute the following procedures.

- Determine the Dynamic Volume P-VOLs and the corresponding S-VOLs.

For example, in our Primary `mpdump` file, note that LUN UIDs `6-HP:OPEN-V:R500:00032334:01:8D` and `6-HP:OPEN-V:R500:00032334:01:AB` are subdevices of `psv1`. Using the relationships developed in the configuration step, note that one set of S-VOLs corresponding to these P-VOLs are `6-HP:OPEN-V:R500:00032334:01:06` and `6-HP:OPEN-V:R500:00032334:01:08`.

- After you determine which S-VOLs to import, stop the cluster services by executing the following command on each node:

```
/etc/init.d/pmxc stop
```
- Import the S-VOLs by executing the following `mpimport` command with the corresponding LUN UID:

```
/opt/hpcfs/lib/mpimport <LUN uid>
```
- Edit the `your_file_name_mpdump_copy` file, created in the configuration step, containing the Dynamic Volume (psv) that needs to be imported. Change `psvX` in the file to `psvY`, where `Y` is the next available `psv`. For example, the Secondary LUN file shown in the configuration step would now contain `psv2` rather than `psv1`, as follows:

```
Current Product MP Version: 2
Membership Partition Version: 2
Membership Partitions:
6-HP:OPEN-V:R500:00032334:01:C3/1 (ONLINE)
6-HP:OPEN-V:R500:00032334:01:C4/1 (ONLINE)
6-HP:OPEN-V:R500:00032334:01:C5/1 (ONLINE)
Membership Partition Device Database (Version 1):
UID:6-HP:OPEN-V:R500:00032334:01:C3 Label:psd1 (state=0x1/mask=00000000)
UID:6-HP:OPEN-V:R500:00032334:01:C4 Label:psd2 (state=0x1/mask=00000000)
UID:6-HP:OPEN-V:R500:00032334:01:C5 Label:psd3 (state=0x1/mask=00000000)
UID:6-HP:OPEN-V:R500:00032334:01:07 Label:psd4 (state=0x1/mask=00000000)
UID:6-HP:OPEN-V:R500:00032334:01:06 Label:psd5 (state=0x1/mask=00000000)
UID:6-HP:OPEN-V:R500:00032334:01:08 Label:psd6 (state=0x1/mask=00000000)
Membership Partition Volume Database (Version 2):
VOL:psv2 (stripesize=1024K)
Set 0: SUBDEV: 6-HP:OPEN-V:R500:00032334:01:06/0 size=139640832K
SUBDEV: 6-HP:OPEN-V:R500:00032334:01:08/0 size=139640832K
Membership Partition Host Registry (Version 3):
Host ID: 10.1.1.90 state=unfenced fencetype=0
Fence ID:21:00:00:e0:8b:08:0f:ea::192.168.1.252 state=0
Fence ID:21:01:00:e0:8b:28:0f:ea::192.168.1.252 state=0
Host ID: 10.1.1.91 state=fenced fencetype=0
Fence ID:21:00:00:e0:8b:1e:61:02::192.168.1.252 state=0
Fence ID:21:01:00:e0:8b:3e:61:02::192.168.1.252 state=0
```

- After the file is altered, import the volume, as shown in the preceding example, by executing the following command:

```
/opt/hpcfs/lib/mpimport -s -f <your altered mpdump file> <psv name>
```
- Restart the cluster services on all nodes, by executing the following command on each node:

```
/etc/init.d/pmxc start
```
- Mount the device into a directory, by executing the following command:

```
mx fs mount --persist --activate --options CREATEDIR --path <directory to mount on> <psv name> <server names separated by spaces>
```

- Retrieve the desired file/directory from the newly mounted directory.
- When finished, to safely remove the devices so that the filesystem and contents are preserved, first unmount the volume from the directory:

```
mx fs unmount --persistent --active <psv name> ALL_SERVERS
```
- Stop the cluster services on all nodes again:

```
/etc/init.d/pmxc stop
```
- For each device to be removed, including any volumes and LUNs in the volume, execute the following command:

```
/opt/hpcfs/lib/mpimport -r <psd/psv name>
```
- If the deport is successful, a message should return similar to the following:

```
Dynamic Volume psv2 DEPORTED
```

Clustered Gateway XP Business Copy LUN backup

This section describes the recommended procedure to follow to back up LUNs on the Clustered Gateway with XP Business Copy LUNs. Note that this white paper does not describe the procedure to do the backup, and this can be done by the preferred method.

It is recommended that you designate one node in the Clustered Gateway to be used for running backups, but that all nodes are capable of performing the backup in the event that the designated node becomes unavailable.

Preparing the cluster for a backup

- Split the device group containing the Secondary LUNs to be used for backup. By using the Secondary LUNs, the cluster will not see an impact on performance, as seen if backing up from the Primary LUNs. To suspend all LUNs in a group, execute the following command:

```
pairsplit -g <assigned BC group name>
```
- Import and mount the Secondary LUNs into the cluster, using the processes in the following sections. If the LUNs are part of a Dynamic Volume, use Backing up from a Dynamic Volume. Otherwise, use Backing up from a simple filesystem.

Backing up from a simple filesystem

- Import the S-VOLs executing the `mx disk import` command, as shown in the following example:

```
mx disk import <LUN UID>
```
- Mount the LUN onto a new directory on the designated server only:

```
mx fs mount --persist --activate --options CREATEDIR -path <directory to mount on> <psd name> <server name>
```
- Perform the backup using the preferred method.
- When the backup is finished, unmount and export the LUN. To do this, execute the following commands:

```
mx fs unmount --persistent --active <psd names> <server name>
mx disk deport <LUN uid>
```

Backing up from a Dynamic Volume

- Stop the Clustered Gateway services, by executing the following command on all nodes:

```
/etc/init.d/pmxc stop
```

- Import the S-VOLs that are subdevices of the Dynamic Volume, by executing the `mpimport` command with the corresponding LUN UID for each S-VOL:

```
/opt/hpcfs/lib/mpimport <LUN uid>
```

- Edit the `your_file_name_mpdump_copy` file, created in the configuration step, containing the Dynamic Volume (psv) that needs to be imported. Change `psvX` in the file to `psvY`, where `Y` is the next available psv. For example, the Secondary LUN file shown in the configuration step would now contain `psv2` rather than `psv1`, as follows:

```
Current Product MP Version: 2
```

```
Membership Partition Version: 2
```

```
Membership Partitions:
```

```
6-HP:OPEN-V:R500:00032334:01:C3/1 (ONLINE)
```

```
6-HP:OPEN-V:R500:00032334:01:C4/1 (ONLINE)
```

```
6-HP:OPEN-V:R500:00032334:01:C5/1 (ONLINE)
```

```
Membership Partition Device Database (Version 1):
```

```
UID:6-HP:OPEN-V:R500:00032334:01:C3 Label:psd1 (state=0x1/mask=00000000)
```

```
UID:6-HP:OPEN-V:R500:00032334:01:C4 Label:psd2 (state=0x1/mask=00000000)
```

```
UID:6-HP:OPEN-V:R500:00032334:01:C5 Label:psd3 (state=0x1/mask=00000000)
```

```
UID:6-HP:OPEN-V:R500:00032334:01:07 Label:psd4 (state=0x1/mask=00000000)
```

```
UID:6-HP:OPEN-V:R500:00032334:01:06 Label:psd5 (state=0x1/mask=00000000)
```

```
UID:6-HP:OPEN-V:R500:00032334:01:08 Label:psd6 (state=0x1/mask=00000000)
```

```
Membership Partition Volume Database (Version 2):
```

```
VOL:psv2 (stripesize=1024K)
```

```
Set 0: SUBDEV: 6-HP:OPEN-V:R500:00032334:01:06/0 size=139640832K
```

```
SUBDEV: 6-HP:OPEN-V:R500:00032334:01:08/0 size=139640832K
```

```
Membership Partition Host Registry (Version 3):
```

```
Host ID: 10.1.1.90 state=unfenced fencetype=0
```

```
Fence ID:21:00:00:e0:8b:08:0f:ea::192.168.1.252 state=0
```

```
Fence ID:21:01:00:e0:8b:28:0f:ea::192.168.1.252 state=0
```

```
Host ID: 10.1.1.91 state=fenced fencetype=0
```

```
Fence ID:21:00:00:e0:8b:1e:61:02::192.168.1.252 state=0
```

```
Fence ID:21:01:00:e0:8b:3e:61:02::192.168.1.252 state=0
```

- After the file is altered, import the volume, as shown in the preceding example, by executing the following command:

```
/opt/hpcfs/lib/mpimport -s -f <your altered mpdump file> <psv name>
```

- Restart the cluster services on all nodes, by executing the following command on each node:

```
/etc/init.d/pmxc start
```

- Mount the device into a new directory on the designated server, by executing the following command:

```
mx fs mount --persist --activate --options CREATEDIR --path <directory to mount on> <psv name> <server name >
```
- Perform the backup using the preferred method.
- When the backup is finished, to safely remove the devices so that the filesystem on the Dynamic Volume is preserved, first unmount the volume from the directory:

```
mx fs unmount --persistent --active <psv name> <server name>
```
- Next, stop the cluster services on all nodes again:

```
/etc/init.d/pmxs stop
```
- For each device to be removed, including any volumes and LUNs in the volume, execute the following command:

```
/opt/hpcfcs/lib/mpimport -r <psd/psv name>
```
- If the deport is successful, a message should return similar to the following:

```
Dynamic Volume psv2 DEPORTED
```
- Afterward, the cluster services can be started on each node, by executing the following command:

```
/etc/init.d/pmxs start
```

For more information

www.hp.com/go/storage

© 2007 Hewlett-Packard Development Company, L.P. The information contained herein is subject to change without notice. The only warranties for HP products and services are set forth in the express warranty statements accompanying such products and services. Nothing herein should be construed as constituting an additional warranty. HP shall not be liable for technical or editorial errors or omissions contained herein.

4AA1-0011ENW, August 2007

