FUJITSU

FUJITSU Storage ETERNUS Multipath Driver (Oracle Solaris Version) Installation Information

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Preface

FUJITSU Storage ETERNUS Multipath Driver 3.1.0 is bundling two drivers.

·the driver for Solaris 11 OS and Solaris 10 OS

·the driver for Solaris 10 OS and Solaris 9 OS

HBA	OS	the driver for Solaris 11 OS and Solaris 10 OS	the driver for Solaris 10 OS and Solaris 9 OS
SE0X7F31F, SE0X7F32F, SP1X7FAB2F, SE0X7F21F, SE0X7F22F, SP1X7FBA2F, SP1X7FAA2F, SP1X7FAR2F, SP1X7FAS2F, SP1X7FBR2F, SP1X7FBS2F, SP1X5FAR2F, SP1X5FAS2F, SP1X5FBR2F, SP1X5FBS2F, SP1X5FAA2F, SP1X5FBA2F (SE0X7F11F, SE0X7F12F*1)	Solaris11 Solaris10	✔	
GP7B8FC1, PW008FC2, PW008FC3, SE0X7F11F, SE0X7F12F, SE0X7SA1F, Emulex LP10000	Solaris10 Solaris9		✔

*1 Please refer to notes (the driver for Solaris 11 OS and Solaris 10 OS).

Contents

Supported OS

FUJITSU Storage ETERNUS Multipath Driver (MPD) supports the following Solaris OS versions:

OS Versions	MPD Version Levels/Patch
Solaris 11 OS	3.1.0
Solaris 10 OS 8/11	3.0.4 or later
Solaris 10 OS 3/05 ~ 9/10	2.0.0 or later
Solaris 9 OS	2.0.1 or later
Solaris 8 OS, Solaris 7 OS, Solaris 2.6 OS	2.0.1, 2.0.2 or 2.0.3

Note1: MPD 2.0.1~2.0.3 consists of the following drivers. The driver to install varies with the type of Solaris(TM) Operating System.

- the driver for Solaris 10 OS and Solaris 9 OS
- the legacy driver for Solaris 9 OS, Solaris 8 OS, Solaris 7 OS and Solaris 2.6 OS

Note2: MPD 3.0.0 or later consists of the following one driver.

- the driver for Solaris 10 OS and Solaris 9 OS

Note3: MPD 3.1.0 or later consists of the following drivers. The driver to install varies with the type of Solaris OS/HBA.

- the driver for Solaris 11 OS and Solaris 10 OS
- the driver for Solaris 10 OS and Solaris 9 OS

Restrictions and Resolution schedule (the driver for Solaris 11 OS and Solaris 10 OS)

ETERNUS Multipath Driver Restrictions with Solaris 11 OS and Solaris 10 OS

Restrictions	Resolution schedule
This software cannot be used on the guest domain of Oracle VM.	3.1.1

Restrictions and Resolution schedule (the driver for Solaris 10 OS and Solaris 9)

ETERNUS Multipath Driver Restrictions with Solaris 10 OS

Restrictions	Resolution schedule
LUNs, paths and disk storage systems cannot be removed.	2.0.1
When setting a mplb-special file, a disk labeled as an EFI disk cannot be designated as a dump device. (Note: An EFI disk label can be written to a greater than 1 TB LUN, by using the format command, or by choosing the EFI label with the label subcommand of the format-e command.)	2.0.1
When setting mplb-special files, the devices controlled by Multipath Driver cannot be used as Boot devices or Swap devices.	2.0.1
The integration installer cooperation feature is not available. The cooperation feature with Resource Coordinator is not available.	2.0.1

A PRIMECLUSTER single node cluster is not supported.	2.0.3
SPARC Enterprise is not supported.	2.0.3 914267-04
11 ETERNUS or more cannot be connected.	3.0.0 914267-06
SAS interface is not supported.	3.0.0 914267-06
When setting mplb-special files, ZFS is not supported.	3.0.0 914267-06
When setting mplb-special files, EFI partition tables are not supported.	3.0.0 914267-06
lpfc 6.20 or later is not supported.	3.0.1 914267-09
Solaris 10 8/11 is not supported.	3.0.4 914267-14
Kernel patch 144500-19 is not supported.	3.0.4 914267-14

ETERNUS Multipath Driver Restrictions with Solaris 9 OS

Restrictions	Resolution Schedule
Solaris 9 OS	2.0.1
When setting a Solaris-standard-special file with Solaris 9 OS, the devices controlled by Multipath Driver cannot be used as Boot devices or Swap devices.	2.0.1
A PRIMECLUSTER single node cluster is not supported.	2.0.3
11 ETERNUS or more cannot be connected.	3.0.0 914267-06

Related Products Requirements

Supported Related Products are as follows:

Related Hardware Product Requirements

- FC Card

FC Card Types	MPD Version Levels/Patch
GP7B8FC1	2.0.0 or later
PW008FC2	2.0.0 or later
PW008FC3	2.0.0 or later
PW028FC4	2.0.0 or later
PW028FC5	2.0.0 or later

Emulex LP10000 *1	2.0.1 or later 3.0.1 or later *2 914267-09 or later *2
Emulex LP10000DC *1	2.0.1 or later 3.0.1 or later *2 914267-09 or later *2
SE0X7F11F, SE0X7F12F	2.0.3 or later 914267-04 or later
SE0X7F31F, SE0X7F32F, SP1X7FAB2F, SE0X7F21F, SE0X7F22F, SP1X7FBA2F, SP1X7FAA2F	3.1.0 or later

*1: LPFC 6.20j, LPFC 6.21f and LPFC 6.21g are not supported.
*2: LPFC 6.30g is supported by this MPD Version Levels/Patch.

- FCoE

FCoE Card Types	MPD Version Levels/Patch
SP1X7FAR2F, SP1X7FAS2F, SP1X7FBR2F, SP1X7FBS2F	3.1.0 or later

- iSCSI

iSCSI Card Types	MPD Version Levels/Patch
QLogic QLA4010C	To be determined

- SAS

SAS Card Types	MPD Version Levels/Patch
SE0X7SA1F	3.0.0 or later 914267-06 or later

- PCIe ExpressModule

PCIe ExpressModule Types	MPD Version Levels/Patch
SP1X5FAR2F, SP1X5FAS2F, SP1X5FBR2F, SP1X5FBS2F, SP1X5FAA2F, SP1X5FBA2F	3.1.0 or later

Related Software Product Requirements (the driver for Solaris 11 OS and Solaris 10 OS)

Related Software Product Names, Version Levels	Patch	MPD Version Levels / Patch
PRIMECLUSTER 4.2 or later	-	3.1.0 or later
ETERNUS SF Storage Cruiser V13 or later	-	3.1.0 or later

Related Software Product Requirements (the driver for Solaris 10 OS and Solaris 9 OS)

Related Software Product Names, Version Levels	Patch	MPD Version Levels / Patch
PRIMECLUSTER 4.1A40 or later	4.1A40 or later	2.0.1 or later
PRIMECLUSTER 4.1A30	914112-01 or later	2.0.1 or later
SafeCLUSTER 2.0	910910-30 or later	2.0.1 or later
SafeCLUSTER 2.0.x	911820-20 or later	2.0.1 or later
SafeCLUSTER 1.x	-	Not available
Softek Storage Cruiser 1.2.1 Softek Storage Cruiser V01L21	914057-02 or later (Agent) 913708-05 or later (Solaris Manager) TP38107 or later (Windows Manager) TP38104 or later (Windows Client)	2.0.1 or later
Softek Storage Cruiser 1.2 Softek Storage Cruiser V01L20	913305-04 or later (Agent) 913323-05 or later (Solaris Manager) TP28107 or later (Windows Manager) TP28104 or later (Windows Client)	2.0.1 or later
Softek Storage Cruiser 1.1.1 Softek Storage Cruiser V01L12	913304-04 or later (Agent) 913322-06 or later (Solaris Manager) TP18107 or later (Windows Manager) TP18104 or later (Windows Client)	2.0.1 or later
Softek Storage Cruiser 1.1 Softek Storage Cruiser V01L11	913078-05 or later (Agent) 913114-07 or later (Solaris Manager) TP08107 or later (Windows Manager) TP08104 or later (Windows Client)	2.0.1 or later
ETERNUS SF Storage Cruiser V13 or later	V13 or later	2.0.1 or later
Softek Storage Cruiser 1.2.2 or later Softek Storage Cruiser V01L22	1.2.2 or later V01L22 or later	2.0.1 or later
Systemwalker Resource Coordinator V12L20 or later	V12L20 or later	2.0.1 or later
Systemwalker Resource Coordinator V11L01	914057-02 or later (Agent) 913708-05 or later (Solaris Manager) TP38104 or later (Windows Client)	2.0.1 or later
Systemwalker Resource Coordinator V11L01E	914057-02 or later (Agent) 913708-05 or later (Solaris Manager) TP38104 or later (Windows Client)	2.0.1 or later
Systemwalker Resource Coordinator V11L00	913305-04 or later (Agent) 913323-05 or later (Solaris Manager) TP28104 or later (Windows Client)	2.0.1 or later

Softek Storage Cruiser and Systemwalker Resource Coordinator V11 agents can connect with the same or higher level manager and client. However, the manager and client must be at the same level.

Notes (the driver for Solaris 11 OS and Solaris 10 OS)

1. Support HBA

HBA that had been supported before ETERNUS Multipath Driver 3.0.4 cannot be used.

SE0X7F11F and SE0X7F12F can be used with the following limitations in ETERNUS Multipath Driver 3.1.1 or later.

- "fjpfca.conf" must be set manually.
- A definition must be manually added to "sd.conf" for a LUN to be recognized.
- When an error occurs, it takes more time to switch a path than other HBAs.
- OVM guest domains are not supported.
- SAN Boot is not supported.
- For Oracle Solaris 11, SE0X7F11F and SE0X7F12F cannot be used.

2. Upgrade Install from ETERNUS Multipath Driver 2.0.x/3.0.x

The overwrite install cannot be done. Refer to Software Information.

3. ETERNUS Multipath Driver 2.0.x/3.0.x

This product cannot be used together with the following software. ETERNUS Multipath Driver 2.0.x/3.0.x

4. Migration from MPxIO

Refer to Software Information.

5. Oracle VM

This software cannot be used on the guest domain of Oracle VM.

The disk allocation to the guest domain of Oracle VM supports only block device and s2 (/dev/FJSVmplb/dsk/mplb*s2).

6. SVM (Solaris Volume Manager)

SVM is not supported.

7. Solaris Containers

ETERNUS Multipath Driver only supports the installation on global-zone.

8. EFI Disk Label

The entire disk is represented by mplb*s7 when the mplb compatible files is selected for a disk with an EFI label.

9. boot archive

When shutdown cannot be normally done with Panic, the change in the composition might not be reflected in 3.1.0 or 3.1.1. Please renew boot archive to prevent it after changing the composition.

(*1) Boot archive is renewed from 3.1.2 or T011535SP-01 with grmpdautoconf.

10. iompadm change

The iompadm change command might fail. In that case, please reexecute it.

11. About uninstall

The following errors might be output when uninstalling in 3.1.0 and 3.1.1. Please uninstall again in that case. Uninstallation is a success if displayed, "Successful".

pkgrm: ERROR: unable to remove existing directory at </dev/FJSVmplb/rdsk>

pkgrm: ERROR: unable to remove existing directory at </dev/FJSVmplb/dsk>

12. About offline when server starts

Please execute the following action when the following messages are output when the server boot and path becomes offline in 3.1.0 and 3.1.1.

Messages:

NOTICE: mplbxx: I/O Lun degraded.

Action:

Please add "forceload: drv/ssd" ahead of the line of "forceload: drv/mplb" of /etc/system.

Ex)# vi /etc/system

forceload: drv/ssd

forceload: drv/mplb

13. About I/O might not respond.

In ETERNUS Multipath Driver 3.1.1, I/O might not respond when 256 IO or more is issued at the same time. Please apply T011535SP-01 or execute the following evasion procedures.

1. Please add “mplb-max-recv-io=10000000;” to /kernel/drv/mplb.conf.

Ex) # vi /kernel/drv/mplb.conf

Global user option define

mplb-max-recv-io=10000000;

2. Please reboot the server.

14. About silent installation

In ETERNUS Multipath Driver 3.1.1, The error message is not notified of when silent installation. Moreover, the unwanted message might be output. In that case, please install ETERNUS Multipath Driver in the superscription by non-silent installation.

15. About SAN BOOT

When the system volume is made ZFS file system, you need to prepare two same size LUN

16. About installation

Please reboot the server after the installation.

Notes (the driver for Solaris 10 OS and Solaris 9 OS)

1. SPARC Enterprise

ETERNUS MPD 2.0.0, 2.0.1 or 2.0.2 can be used by applying patch 914267-04 or later.

2. DF series and GR700

ETERNUS MPD cannot control GP-DxxSx / GP-DxxFx / GP-DxCKxx / GP-DxRxxx / PW-D5xxx and the GR700 disk array device.

3. Routing through multiple FC switches

The grmpdautoconf command cannot choose a path routed through multiple FC switches. This is because path redundancy is not verified by the MPD driver or the grmpdautoconf command.

To use a path routed through multiple FC switches, verify the path redundancy, and then execute the grmpdautoconf command with the –X option.

4. Boot devices and Swap devices

When setting a Solaris-standard-special file with Solaris 10 OS, the devices controlled by Multipath Driver cannot be used as Boot devices or Swap devices. In addition, boot on disks greater than 1 Tbyte is not supported.

5. Migration from GR Multipath Driver

The driver for Solaris10 OS and Solaris 9 OS cannot be installed when the GR Multipath Driver is installed. Before installing this product, uninstall the GR Multipath Driver. It is possible that the special file names will be different. Contact your local Fujitsu support for directions on how to make the special file names the same.

6. Migration from Multipath Disk Control (MPHD)

Migration from Multipath Disk Control is not possible.

7. SVM(Solaris Volume Manager)

SVM is not supported.

8. DR (Dynamic Reconfiguration)

Dynamic Reconfiguration is not supported when setting a Solaris-standard-special file. For a server with Dynamic Reconfiguration function, an mplb special file is automatically selected if the "grmpdautoconf" command is not executed with the "-p" option.

9. SAS interface

MPD 2.0.0, 2.0.1, 2.0.2 or 2.0.3 can be used by applying patch 914267-06 or later.

10. EFI partition tables

When setting mplb-special files on the Solaris 9 OS, EFI partition tables are not supported.

11. 8Gbit/s Fibre Channel Card

8Gbit/s Fibre Channel Card, SE0X7F21F/SE0X7F22F, or later are not supported.

12. Solaris Containers

ETERNUS Multipath Driver only supports the installation on global-zone.

13. EFI Disk Label

The entire disk is represented by mplb*s7 when the mplb compatible files is selected for a disk with an EFI label.

14. grmpdautoconf command

In MPD 3.0.4 or patch 914267-15, ETERNUS DX60 S2 is displayed that DXL and ETERNUS DX8000 S2 series are DXM2. It is possible to use it though the device name is not displayed in the annotation.

switch	WWN	device	slot/port
1	500000e0d0xxxxxx	DXL	CM0P0
1	500000e0d4yyyyyy	DXM2	CM1CA0P0

*DXL :ETERNUS DX Entry Model(DX60, DX80, DX90)
*DXM2 :ETERNUS DX400 S2 series

15. boot archive

When shutdown cannot be normally done with Panic, the change in the composition might not be reflected in 3.1.0 or 3.1.1. Please renew boot archive to prevent it after changing the composition.

(*1)Boot archive is renewed from 914267-18 with grmpdautoconf.

Notes (the legacy driver for Solaris 9 OS, Solaris 8 OS, Solaris 7 OS and Solaris 2.6

1. EFI partition tables

EFI partition tables are not supported.

2. SVM(Solaris Volume Manager)

SVM is not supported.

3. grmpdautoconf command

In patch 912651-23, ETERNUS DX60 S2 is displayed that DXL and ETERNUS DX8000 S2 series are DXM2. It is possible to use it though the device name is not displayed in the annotation.

```
switch              WWN            device              slot/port
-------------------------------------------------------------------
     1      500000e0d0xxxxxx          DXL                 CM0P0
     1      500000e0d4yyyyyy          DXM2              CM1CA0P0
*DXL   :ETERNUS DX Entry Model(DX60, DX80, DX90)
*DXM2 :ETERNUS DX400 S2 series
```

Patch Information

The following are the most recent patches for the Multipath Driver. The patch to install depends on which driver is installed.

Type of installed driver	Patch
The driver for Solaris 110 OS and Solaris 10 OS	T011535SP-02
The driver for Solaris 10 OS and Solaris 9 OS	914267-18
The legacy driver for Solaris 9 OS, Solaris 8 OS, Solaris 7 OS and Solaris 2.6 OS	912651-23

Product Names & IDs

Product names	Product IDs(with media)
FUJITSU Storage ETERNUS Multipath Driver3 (for Oracle Solaris)	B011103H0H

Supported Disk Storage Systems

ETERNUS Multipath Driver supports the following disk storage systems:

- ETERNUS DX60/DX80/DX90
- ETERNUS DX60 S2
- ETERNUS DX60 S3
- ETERNUS DX100 S3/DX200 S3/DX500 S3/DX600 S3
- ETERNUS DX200F
- ETERNUS DX80 S2/DX90 S2
- ETERNUS DX400 series
- ETERNUS DX400 S2 series
- ETERNUS DX8000 series
- ETERNUS DX8000 S2 series
- ETERNUS DX8700 S3/DX8900 S3
- ETERNUS2000, ETERNUS3000, ETERNUS4000, ETERNUS6000, ETERNUS8000
- ETERNUS GR disk storage system(the driver for Solaris 11 OS and Solaris 10 OS is excluded)

ETERNUS DX60/DX80/DX90

FC interface

Supported Disk Storage Systems	Version Level
ETERNUS DX60/DX80	3.0.1 or later 914267-09 or later 912651-21 or later
ETERNUS DX90	3.0.2 or later 914267-11 or later 912651-22 or later

SAS interface

Supported Disk Storage Systems	Version Level
ETERNUS DX60, DX80	3.0.1 or later 914267-09 or later

ETERNUS DX60 S2

FC interface

Supported Disk Storage Systems	Version Level
ETERNUS DX60 S2	3.0.4 or later 914267-14 or later 912651-23 or later

SAS interface

Supported Disk Storage Systems	Version Level
ETERNUS DX60 S2	3.0.4 or later 914267-14 or later

ETERNUS DX60 S3

Supported Disk Storage Systems	Version Level
ETERNUS DX60 S2	3.1.0 or later 914267-17 or later *1

*1 Refer to "Preparation that uses ETERNUS DX S3, ETERNUS DX200F with patch 914267-17".

ETERNUS DX100 S3/DX200 S3/DX500 S3/DX600 S3, ETERNUS DX200F

Supported Disk Storage Systems	Version Level
ETERNUS DX100 S3/DX200 S3 ETERNUS DX500 S3/DX600 S3 ETERNUS DX200F	3.1.0 or later 914267-17 or later *1

*1 Refer to "Preparation that uses ETERNUS DX S3, ETERNUS DX200F with patch 914267-17".

ETERNUS DX80 S2/DX90 S2

FC interface

Supported Disk Storage Systems	Version Level
ETERNUS DX80 S2/DX90 S2	3.0.3 or later 914267-13 or later 912651-23 or later

SAS interface

Supported Disk Storage Systems	Version Level
ETERNUS DX80 S2/DX90 S2	3.0.3 or later 914267-13 or later

ETERNUS DX400 series, ETERNUS DX8000 series

Supported Disk Storage Systems	Version Level / Patch
ETERNUS DX410 ETERNUS DX440 ETERNUS DX8100 ETERNUS DX8400 ETERNUS DX8700	3.0.2 or later 914267-11 or later 912651-22 or later

ETERNUS DX400 S2 series

Supported Disk Storage Systems	Version Level / Patch
ETERNUS DX400 S2 ETERNUS DX410 S2 ETERNUS DX440 S2	3.0.3 or later 914267-13 or later 912651-23 or later

ETERNUS DX8000 S2 series

Supported Disk Storage Systems	Version Level / Patch
ETERNUS DX8100 S2 ETERNUS DX8700 S2	3.0.4 or later 914267-15 or later 912651-23 or later

ETERNUS DX8700 S3/DX8900 S3

Supported Disk Storage Systems	Version Level / Patch
ETERNUS DX8700 S3 ETERNUS DX8900 S3	3.1.2 or later T011535SP-01 914267-18 or later

ETERNUS8000

Supported Disk Storage Systems	Version Level / Patch
ETERNUS8000	2.0.2 or later 914267-03 or later 912651-14 or later

ETERNUS6000

Supported Disk Storage Systems	Version Level
ETERNUS6000	2.0.0 or later

ETERNUS4000

Supported Disk Storage Systems	Version Level / Patch
ETERNUS4000	2.0.2 or later 914267-03 or later 912651-14 or later

ETERNUS3000

Supported Disk Storage Systems	Version Level
ETERNUS3000	2.0.0 or later

ETERNUS2000

FC interface

Supported Disk Storage Systems	Version Level
ETERNUS2000	2.0.3 or later 914267-05 or later 912651-17 or later

SAS interface

Supported Disk Storage Systems	Version Level
ETERNUS2000	3.0.0 or later 914267-06 or later

ETERNUS GR Storage

Supported Disk Storage Systems	Version Level
GR710	2.0.0 or later
GR720 GR730	2.0.0 or later
GR740 GR820 GR840	2.0.0 or later

Supplementary information

This section provides supplementary information not included in the manuals supplied with this product. Refer to this information in addition to the manuals supplied with this product.

Assigned-Non-assigned-CM Type Disk Storage Systems

There are two types of supported disk storage system: “Assigned-CM” and “Non-assigned-CM.” With Assigned-CM disk storage systems, the preferred paths for each LUN are assigned to a particular controller. With Non-assigned-CM disk storage systems, there are no assigned preferred LUN access paths.

With “Assigned-CM” type disk storage systems, the paths connected to the assigned controller are

active. Paths to other controllers are on standby. With “Non-assigned-CM” type disk storage systems, all paths are active and used for access.

The table below shows the “Assigned-CM” and “Non-assigned-CM” disk storage systems.

Load balancing/fail over performance can differ depending on “Assigned-CM” and “Non-assigned-CM” use and the number of paths. For details, refer to the supplied product manual.

Assigned-CM type	ETERNUS DX60/DX80/DX90, ETERNUS DX60 S2/DX80 S2/DX90 S2, ETERNUS DX400/DX400 S2 series, ETERNUS DX60 S3/DX100 S3/DX200 S3/DX500 S3/DX600 S3, ETERNUS DX200F, ETERNUS2000, ETERNUS3000, ETERNUS4000, GR710, GR720, GR730
Non-assigned-CM type	ETERNUS DX8000/DX8000 S2 series, ETERNUS DX8700 S3/DX8900 S3, ETERNUS6000, ETERNUS8000, GR740, GR820, GR840

Change unit

The table below shows the change unit and the corresponding replacement.

Disk Storage Systems	cu/controllerunit	g/groupmodule
ETERNUS DX60/DX80/DX90 ETERNUS DX60 S2/DX80 S2/DX90 S2 ETERNUS DX60 S3/DX100 S3/DX200 S3, ETERNUS DX200F, ETERNUS2000, ETERNUS3000, ETERNUS4000 models 80 and 100	-	CM
ETERNUS6000	CA	ROUTER
ETERNUS DX400 series, ETERNUS DX400 S2 series, ETERNUS DX500 S3/DX600 S3, ETERNUS DX8000 series, ETERNUS DX8000 S2 series, ETERNUS DX8700 S3/DX8900 S3, ETERNUS4000(except for models 80 and 100), ETERNUS8000	CA	CM
GR740,GR820,GR840	IOB	ROUTER
GR710,GR720,GR730	-	CM

Group Module

The table below shows the Group Module for each disk storage systems.

Disk Storage Systems	Group Module
ETERNUS6000, GR740, GR820, GR840	ROUTER
ETERNUS DX60/DX80/DX90, ETERNUS DX60 S2/DX80 S2/DX90 S2, ETERNUS DX60 S3/DX100 S3/DX200 S3/DX500 S3/DX600 S3, ETERNUS DX200F, ETERNUS DX400 series, ETERNUS DX400 S2 series, ETERNUS DX8000 series, ETERNUS DX8000 S2 series, ETERNUS DX8700 S3/DX8900 S3, ETERNUS2000, ETERNUS3000, ETERNUS4000, ETERNUS8000, GR710, GR720, GR730	CM

LPFC Driver 6.30g

When LPFC Driver 6.30g and ETERNUS Multipath driver (the driver for Solaris 10 OS and Solaris 9 OS) are used, the following procedures are executed.

[HBA Configuration]
Edit /kernel/drv//lpfc.conf file to set target-disk.
lpfc#-target-disk="mplbt"
Example:
lpfc0-target-disk="mplbt";
lpfc1-target-disk="mplbt";

[Adding a LUN]
hbacmd or server reboot is necessary before the grmpdautoconf command is executed.
hbacmd RescanLuns HBA-WWN ETERNUS-WWN
Example:
/opt/HBAnyware/hbacmd RescanLuns 10:00:00:00:c9:5a:d7:0e 20:00:00:0B:5D:6A:02:99

[Adding a Path or Storage System Device]
hbacmd or server reboot is necessary before the grmpdautoconf command is executed.
hbacmd SetPersistentBinding HBA-WWN B P ETERNUS-WWN 0 targetID
Example:
/opt/HBAnyware/hbacmd SetPersistentBinding 10:00:00:00:c9:51:38:c3 B P 20:40:00:0B:5D:6A:02:99 0 16

[Note]
When grmpdautoconf is executed in the environment where the lpfc driver and the sd driver

connect devices other than the ETERNUS disk array, the devices might be detached. If any devices are detached, please reattach by executing the hbacmd command with RescanLuns option or reboot the server.
Please refer to HBAnyware User Manual for hbacmd.

Performing "add device" for mplb Special Files in Non-Global Zones

Perform the following procedure to "add device" for the mplb special files in a non-global zone.

1. Create a non-global zone (example: test-zone).

2. Create a directory for mplb under /dev/ in the non-global zone.

```
# mkdir /export/test-zone/dev/FJSVmplb
# mkdir /export/test-zone/dev/FJSVmplb/dsk
# mkdir /export/test-zone/dev/FJSVmplb/rdsk
```

3. Select the target multipath device from the test-zone, and check the device major and minor numbers.
The following example is for when "mplb0s0" is added:

```
# ls -l /dev/FJSVmplb/rdsk/mplb0s0
lrwxrwxrwx 1 root root 36 Aug 28 20:28 /dev/FJSVmplb/rdsk/mplb0s0
-> ../../../devices/pseudo/mplb@0:a,raw
# ls -l /devices/pseudo/mplb@0:a,raw
crw-r----- 1 root sys 253, 0 Aug 30 04:19 /devices/pseudo/mplb@0:a,raw
# ls -l /devices/pseudo/mplb@0:a
brw-r----- 1 root sys 253, 0 Aug 30 04:19 /devices/pseudo/mplb@0:a
```

The underlined parts are the major and minor numbers.

4. Create a special file under /export/test-zone/dev/FJSVmplb using the "mknod" command.

```
# mknod /export/test-zone/dev/FJSVmplb/rdsk/mplb0s0 c 253 0
# mknod /export/test-zone/dev/FJSVmplb/dsk/mplb0s0 b 253 0
```

5. Log in to the non-global zone and then access the mplb device.

Method of "add device" to Non-global zone of Solaris11 (the driver for Solaris 11 OS and Solaris 10 OS)

1. Create a non-global zone (example: sol11-zone).
2. Execute Add device.

```
# zonecfg -z sol11-zone
  zonecfg:sol11-zone> add device
  zonecfg:sol11-zone:device> set match=/dev/FJSVmplb/*dsk/mplb0s*
  zonecfg:sol11-zone:device> end
```

Note1: USCSI command is not support in Non-global-zone

Note2: TPG Referrals function is not support in Non-global-zone

ZFS (the driver for Solaris 10 OS and Solaris 9 OS)

If ETERNUS Multipath Driver devices are under the control of ZFS, the following message may be output when the server is rebooted.

```
SUNW-MSG-ID: ZFS-8000-CS, TYPE: Fault, VER: 1, SEVERITY: Major
EVENT-TIME: Mon Jun 25 14:43:42 JST 2007
PLATFORM: FJSV,GPUZC-M, CSN: -, HOSTNAME: raid-server2
SOURCE: zfs-diagnosis, REV: 1.0
EVENT-ID: ad895d1d-c04f-6686-88e8-bb23b276f467
DESC: A ZFS pool failed to open.  Refer to http://sun.com/msg/ZFS-8000-CS for more information.
AUTO-RESPONSE: No automated response will occur.
IMPACT: The pool data is unavailable
REC-ACTION: Run 'zpool status -x' and either attach the missing device or
                restore from backup.
```

This message is not displayed if the setting forceload of mplbt is defined in /etc/system file. Edit /etc/system file to set forceload.

Example.

```
                                                :
* forceload:
*
*       Cause these modules to be loaded at boot time, (just before mounting
*       the root filesystem) rather than at first reference. Note that
*       forceload expects a filename which includes the directory. Also
*       note that loading a module does not necessarily imply that it will
*       be installed.
*
*       Example:
*               forceload: drv/foo
forceload: drv/mplbt


* set:
*
*       Set an integer variable in the kernel or a module to a new value.
*       This facility should be used with caution.  See system(4).
                                                :
```

Upgrade Install from GR Multipath Driver

If PRIMECLUSTER is installed, execute the following command after uninstalling the GR Multipath Driver.

```
# rm /etc/opt/FJSVcluster/sys/cldiskadm
# ln –s /opt/FJSVclapi/sys/cldiskadm /etc/opt/FJSVcluster/sys/cldiskadm
```

Disk_device_controller_id and Connection Points

The iompadm command with “info” option shows information for the attached disks. The example below shows the Adapter port No. The Adapter port No is the connection path and is uniquely defined on each disk storage system.

Example :

```
# iompadm -c mplb info /dev/FJSVmplb/fiomp/adm0
IOMP : /dev/FJSVmplb/fiomp/adm0
Element :
/dev/rdsk/c5t0d0s2 online standby block "good status with standby
                    [E30004641- 130011-CM01-CA01-PORT34] (mplbt11)"
/dev/rdsk/c6t1d0s2 online active block "good status with active
                    [E30004641- 130011-CM00-CA00-PORT30] (mplbt10)"
```

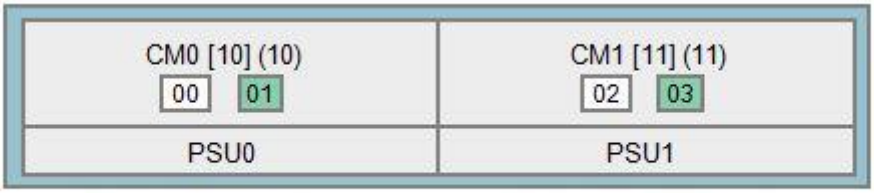
Group No. Exchange unit No. Adapter port No.

The figures below show the Adapter port No of supported disk storage systems.

The adapter port No is different from the physical port number. Refer to the manual of your storage system device for further information of the physical port number. Please note that the port position and the physical port number depend on the type of storage system.

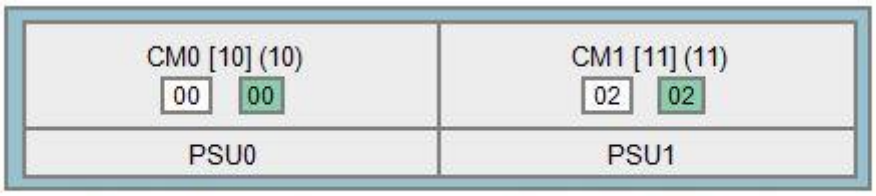
ETERNUS DX60, ETERNUS DX60 S2, ETERNUS DX80

FC interface



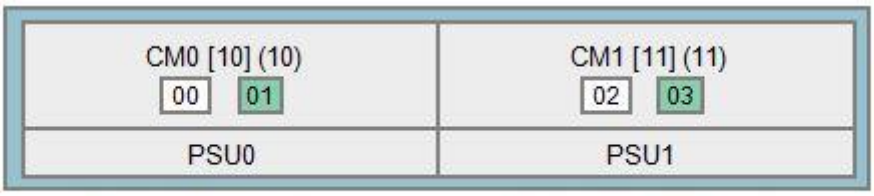
[ ]: Group No. ( ): Exchange unit No. : adapter Port No. : When using 2port-CM

SAS interface



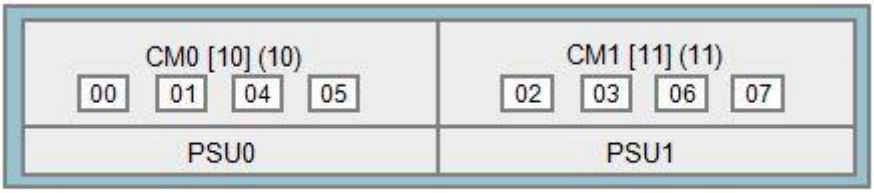
[ ]: Group No. ( ): Exchange unit No. : adapter Port No. : When using 2port-CM

ETERNUS DX60 S3



[ ]: Group No. ( ): Exchange unit No. : adapter Port No. : When using 2port-CM

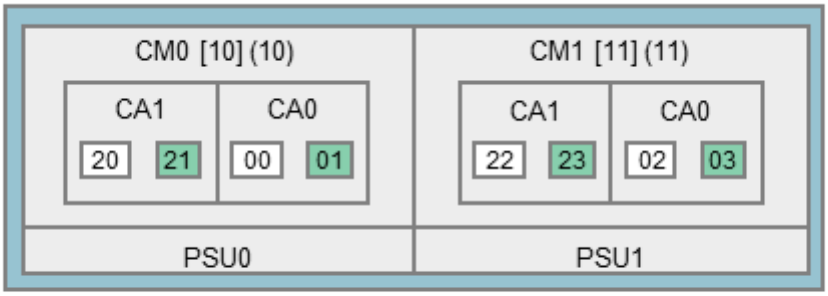
ETERNUS DX90



[ ]: Group No. ( ): Exchange unit No. : adapter Port No.

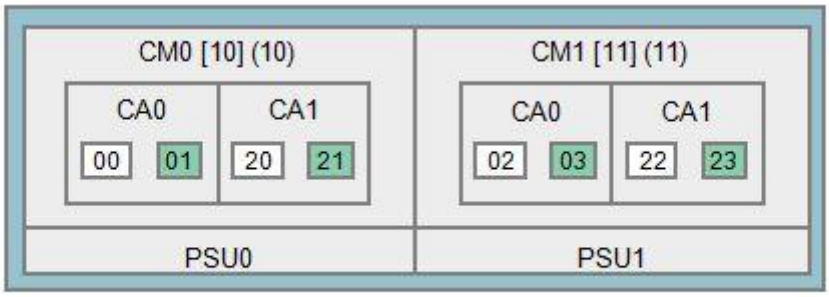
ETERNUS DX100 S3

When CA of FC is installed in the basic host interface



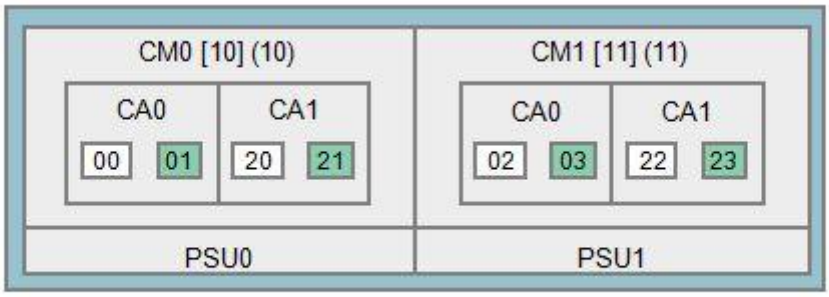
[ ]: Group No. ( ): Exchange unit No. : adapter Port No. : When using 2port-CA

When CA other than FC are installed in the basic host interface



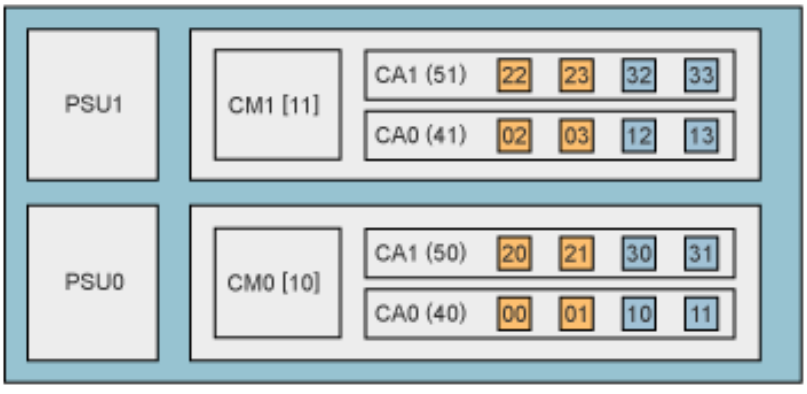
[ ]: Group No. (): Exchange unit No. : adapter Port No. : When using 2port-CA

ETERNUS DX80 S2, DX90 S2, ETERNUS DX200 S3, ETERNUS DX200F



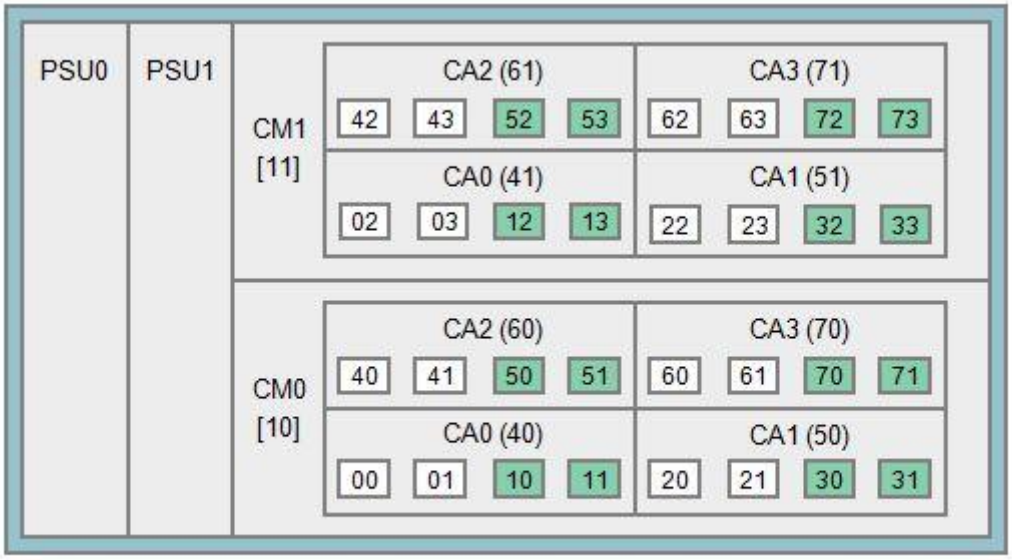
[ ]: Group No. (): Exchange unit No. : adapter Port No. : When using 2port-CA

ETERNUS DX400 series, ETERNUS4000 model 300, 400, 500, 600, ETERNUS8000 model 700, 800



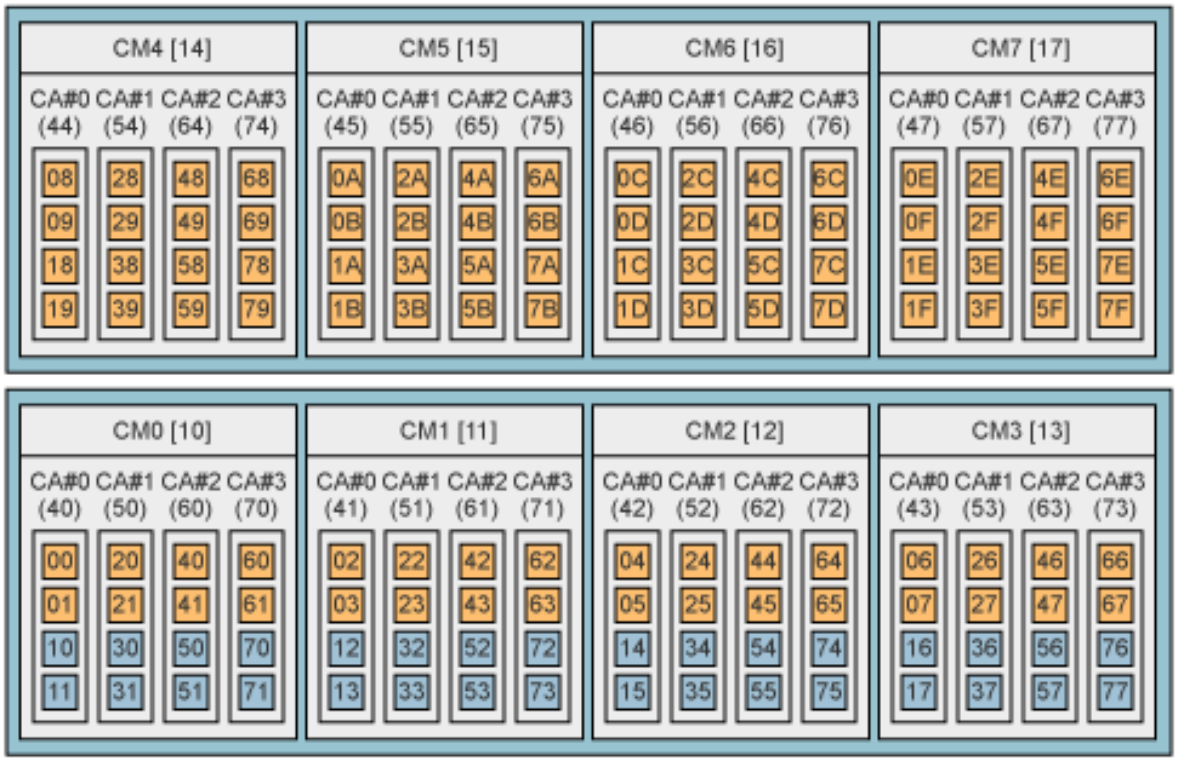
[ ] : Group No. ( ) : Exchange unit No. : Adapter Port No. : When using 4port-CA

ETERNUS DX400 S2 series, ETERNUS DX500 S3, DX600 S3



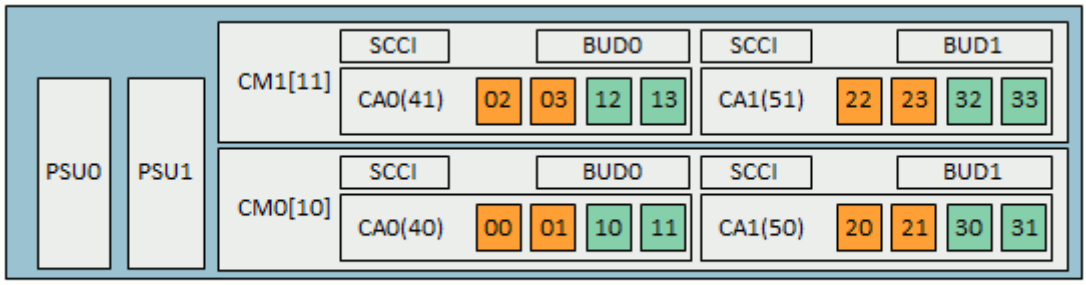
[ ]: Group No. (): Exchange unit No. : adapter Port No. : When using 4port-CA

ETERNUS DX8000 series, ETERNUS8000 model 900, 1100, 1200, 2100, 2200



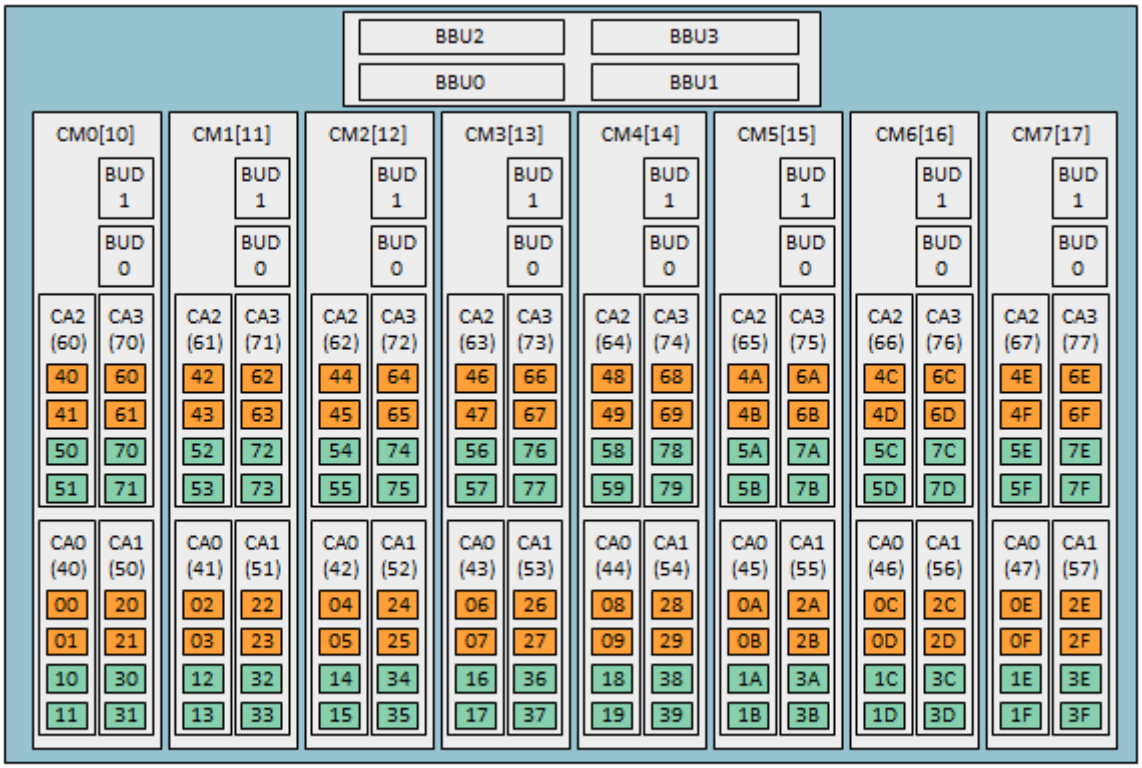
[ ] : Group No. ( ) : Exchange unit No. : Adapter Port No. : When using 4port-CA

ETERNUS DX8100 S2



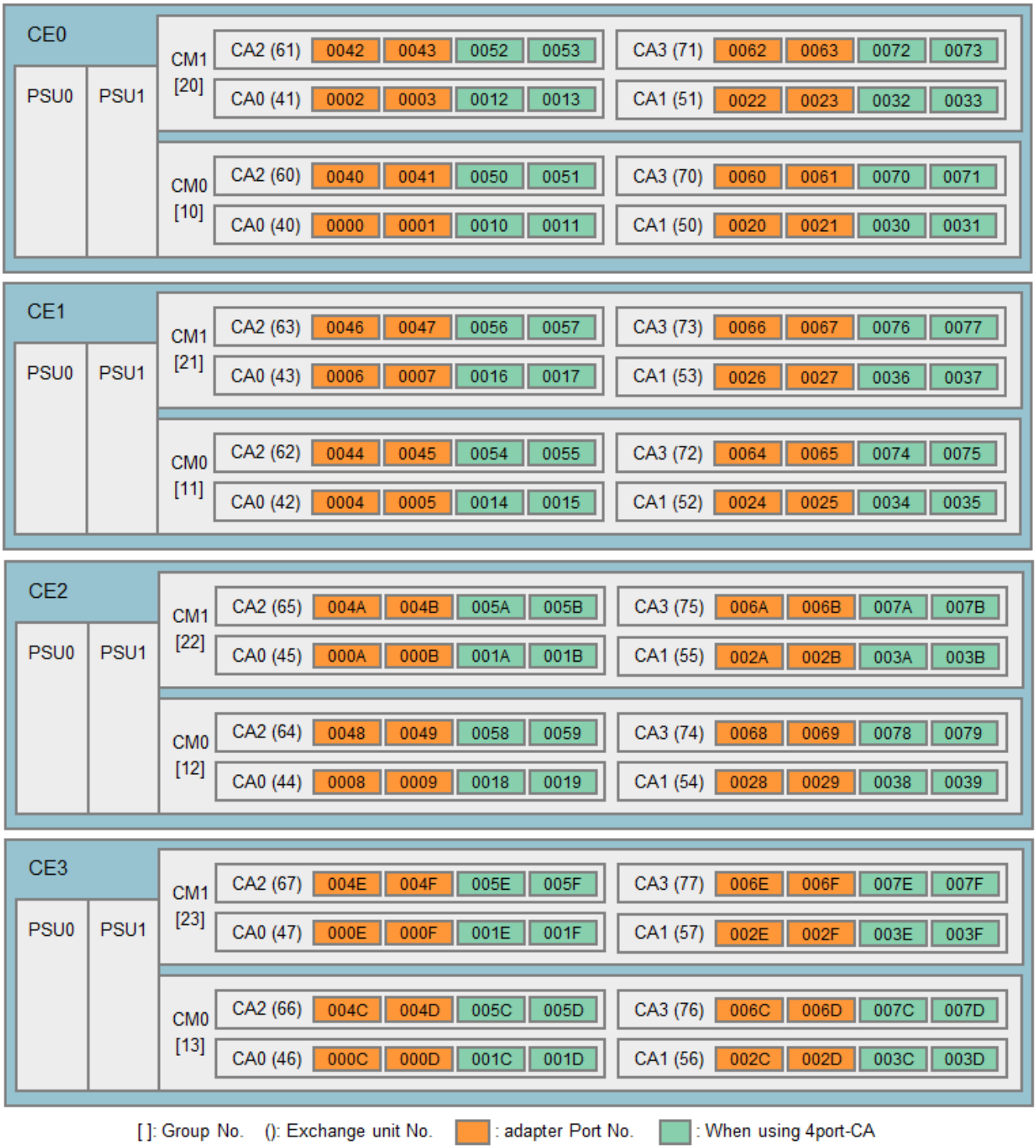
[ ]: Group No. (): Exchange unit No. : adapter Port No. : When using 4port-CA

ETERNUS DX8700 S2



[ ]: Group No. (): Exchange unit No. : adapter Port No. : When using 4port-CA

ETERNUS DX8700 S3/DX8900 S3

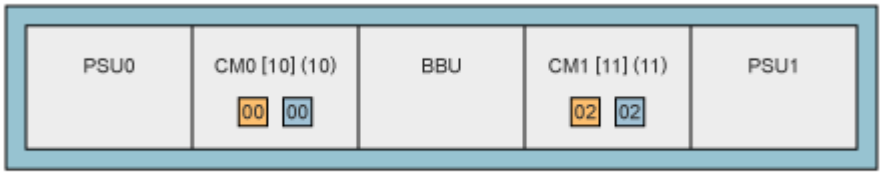


ETERNUS2000

FC interface

[ ] : Group No. ( ) : Exchange unit No. : Adapter Port No. : When using 2port-CA

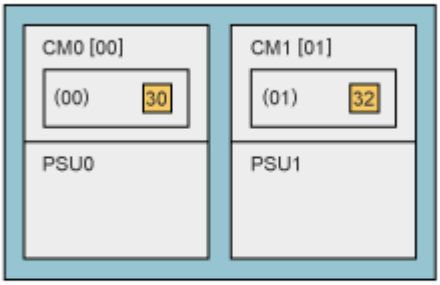
SAS interface



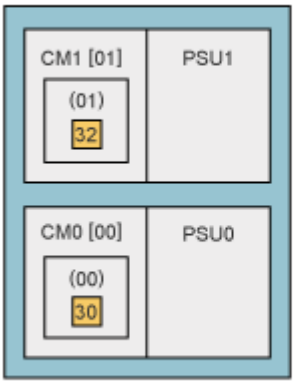
[ ] : Group No. ( ) : Exchange unit No. : Adapter Port No. : When using 2port-CA

ETERNUS3000 model 50, GR710

[Rack mount]



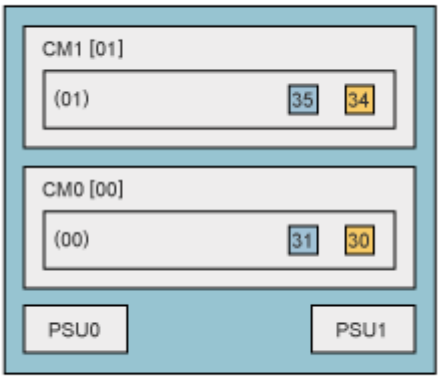
[Pedestal]



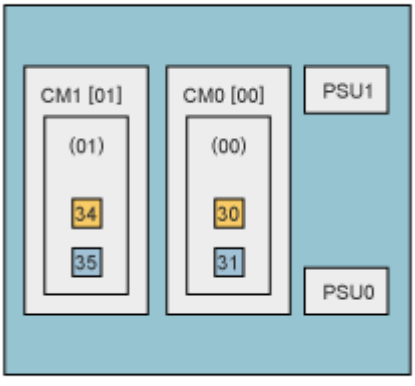
[ ] : Group No. ( ) : Exchange unit No. : Adapter Port No.

ETERNUS3000 model 80, 100, ETERNUS4000 model 80, 100

[Rack mount]

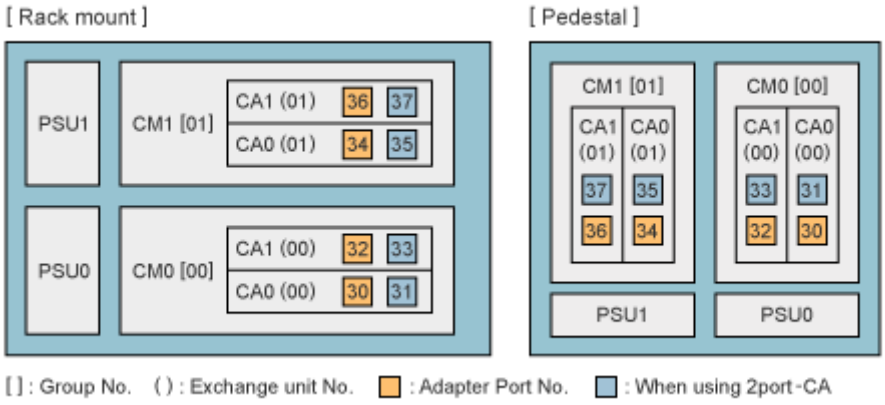


[Pedestal]

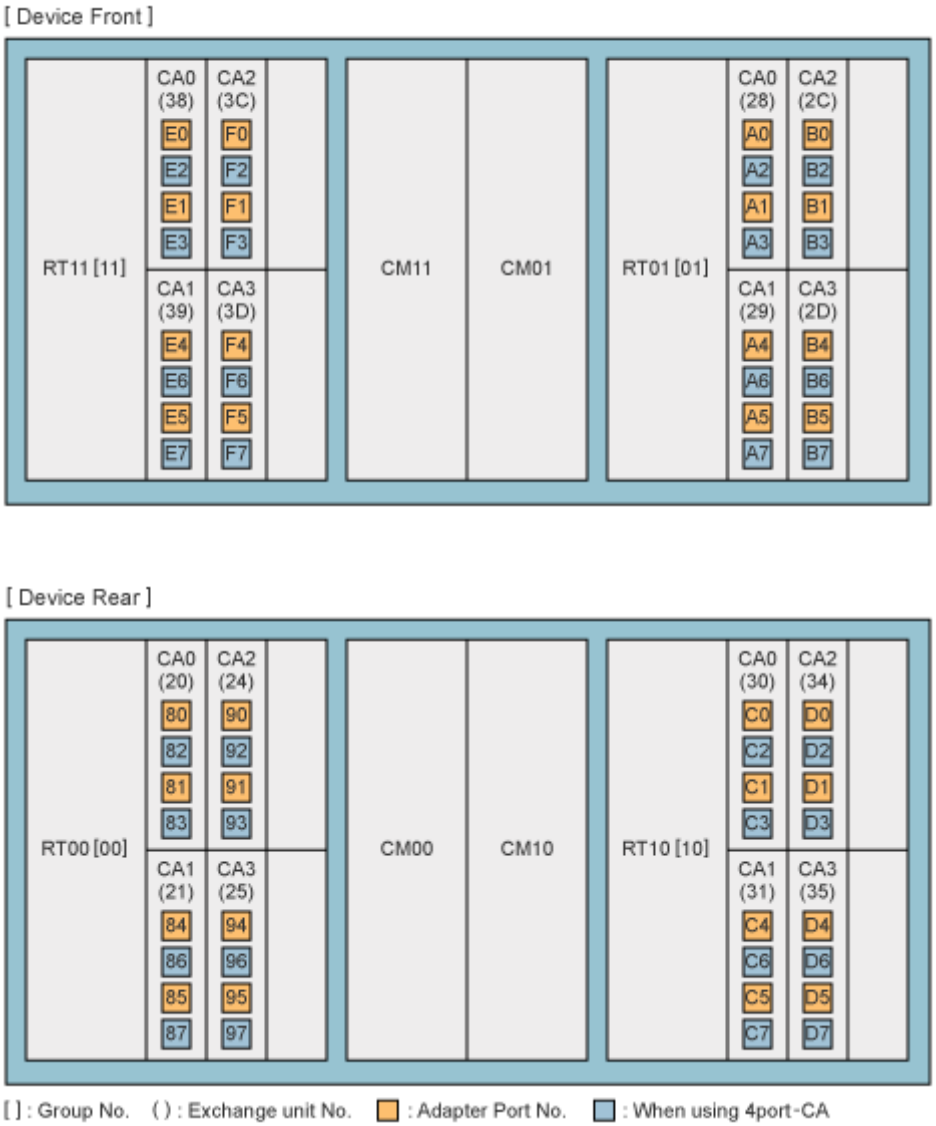


[ ] : Group No. ( ) : Exchange unit No. : Adapter Port No. : When using 2port-CM

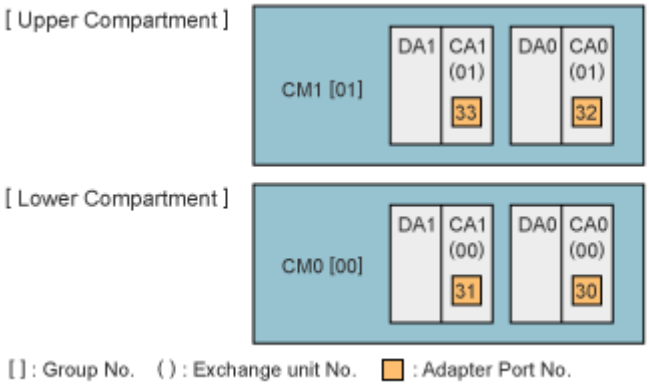
ETERNUS3000 model 200, 300, 400, 500, 600, 700



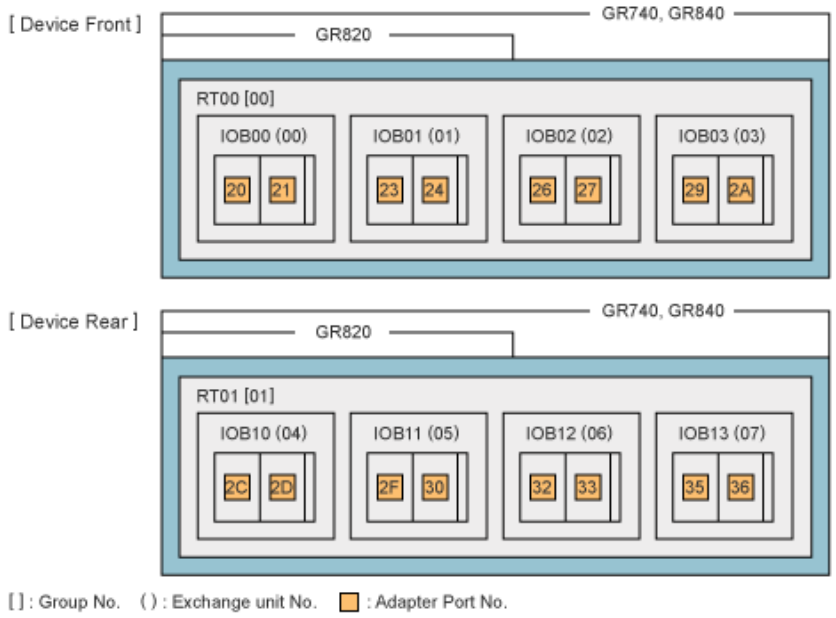
ETERNUS6000



GR720 and GR730 Device Rear



GR740, GR820, GR840



OS update to Solaris 10 8/11 and kernel patch 144500-19

If ETERNUS Multipath driver 3.0.3 or earlier is installed, please apply patch 914267-14 before applying OS update of Solaris10 8/11 or kernel patch 144500-19.

Preparation that uses ETERNUS DX S3, ETERNUS DX200F with patch 914267-17

The procedure is unnecessary in multipath driver 3.1.0 or later or applying 914267-18 environment.

Please add the following a definition to/var/opt/FJSVmplb/catalog.

Storage Systems	definition
ETERNUS DX60 S3/DX100 S3/DX200 S3, ETERNUS DX200F	^500000e0da[0-3]:DXL3:40
ETERNUS DX500 S3/DX600 S3	^500000e0da[8-f]:DXM3:255

It comes to be able to select ETERNUS DX S3 with grmpdautoconf.

Example

```
Search devices ....display device and access paths list after searching.
switch                WWN         device                  slot/port
-------------------------------------------------------------------
    10    100000000e24418f        fjpfca0                        -
    10    100000000e2441a9        fjpfca1                        -
    10    500000e0da817c80           DXM3                        -
    10    500000e0da817c90           DXM3                        -
            Adapter           Switch           ETERNUS(GR)            Status
      instance       WWN                    WWN        product
-----+------------------------+-----+---------------------------------+-----
[ ] 1  fjpfca0 100000000e24418f    10 500000e0da817c90  DXM3          -   New
[ ] 2  fjpfca1 100000000e2441a9    10 500000e0da817c80  DXM3          -   New
```

Note of Oracle VM

- About the problem that the I/O domain cannot be reboot.
  The I/O domain cannot be started when the guest domain is binding.

  [Environment]
  I/O domain's OS version is:
  - Solaris11.1 + SRU14051 (SRU11.1.19.6.0) or later
  - Solaris11.2 ~ Solaris11.2 SRU14111
  - Solaris10 + 150840-04 or later

  [Recommended Action]
  In the IO domain, add the following definitions to /etc/system.
  forceload: drv/px

  * "forceload: drv/vp" written in the Software Information fro 3.1.1 is a mistake. Please specify "forceload: drv/px".

- About the problem that path cannot be restored by the guest domain after reboot of the I/O domain.
  When the I/O domain is reactivated, the USCSI command is not issuable from the guest domain. Path of the guest domain becomes offline, and can't restore to online, because the multipath driver is using the USCSI command.

  [Environment]

  I/O domain's OS version is:
  - Solaris11.1 + SRU14051 (SRU11.1.19.6.0) or later
  - Solaris11.2 ~ Solaris11.2 SRU14111
  - Solaris10 + 150840-04 or later

  [Recommended Action]

  Deal with either as follows when the phenomenon is generated.

  Corrective action 1:
  1. Delete path of the rebooted I/O domain from the guest domain.
     Ex.) # /usr/opt/FJSViomp/bin/iompadm del /dev/FJSVmplb/fiomp/admXX /dev/rdsk/cXdXs2
     - The grmpdautoconf command cannot be used.
     - Execute it with the I/O domain is active.
  2. The allocated vdisk is released.

Ex.) # ldm rm-vdisk vdisk2-0 gdom2
3. The released vdisk is allocated again.
Ex.) # ldm add-vdisk vdisk2-0 vol2-2@iodom1-vds0 gdom2
4. Add path by the grmpdautoconf command.
Ex.) # grmpdautoconf

Corrective action 2:
1. Shutdown the guest domain.
2. Do unbind the guest domain.
Ex.) # ldm unbind-domain gdom2
3. Do bind the guest domain.
Ex.) # ldm bind-domain gdom2
4. Start the guest domain.
Ex.) # ldm start-domain gdom2

- In the Oracle VM environment, when the I/O domain is rebooted, the virtual disk allocated in the guest domain might not be correctly allocated.

[Environment]

I/O domain's OS version is:
- Solaris11.1 + SRU14051 (SRU11.1.19.6.0) or later
- Solaris11.2 ~ Solaris11.2 SRU14111
- Solaris10 + 150840-04 or later

[Recommended Action]
1. Please start I/O domain
2. The state of the guest domain is made bound or inactive.
3. Please execute the following to each virtual disk.
ldm rm-vdisk <vdisk> <guest domain>
ldm add-vdisk <vdisk> <vol>@<vds> <guest domain name>
4. Please start guest domain.

- Don't send the break request to OS at I/O domain while I/O is issued. Select sync or reset or halt when you do "break" by mistake.

- About the hang-up of the I/O domain
When the I/O domain does hang-up, the guest domain becomes no I/O response. Please do panic the I/O domain in that case.

Errata of User's Guide and Software Information

Version	Document	Part	Correction
3.1.1	User's Guide	Table of page 121	(Not Correct) An I/O error message is sent to the guest domain. The path status changes to "fail". (Correct) An I/O error message is sent to the guest domain. The path status changes to "warning".
3.1.1	Software Information	Page 6	(Not Correct) forceload: drv/vp (Correct) forceload: drv/px
3.1.0	Software Information	10.1 Installation	Please reboot the server after the installation.

3.1.1	Software Information	10.1 New Installation 10.3 Silent Installation	Please reboot the server after the installation.
3.1.2	Software Information	10.1 New Installation 10.3 Silent Installation	Please reboot the server after the installation.

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