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**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,<br>SP1X7FAB2F, SE0X7F21F,<br>SE0X7F22F, SP1X7FBA2F,<br>SP1X7FAA2F, SP1X7FAR2F,<br>SP1X7FAS2F, SP1X7FBR2F,<br>SP1X7FBS2F, SP1X5FAR2F,<br>SP1X5FAS2F, SP1X5FBR2F,<br>SP1X5FBS2F, SP1X5FAA2F,<br>SP1X5FBA2F<br>(SE0X7F11F, SE0X7F12F*1) | Solaris11<br>Solaris10 | ✓  |   |
| GP7B8FC1, PW008FC2,<br>PW008FC3, SE0X7F11F,<br>SE0X7F12F, SE0X7SA1F,<br>Emulex LP10000   | Solaris10<br>Solaris9  |  | ✓   |

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

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## 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 ~ 1/13                  | 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               |
| TPG Referrals function is not support in Non-global-zone       | T011535SP-05        |

## 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 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.<br>(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.   | 2.0.1               |

|  |                    |
|--|--------------------|
| The cooperation feature with Resource Coordinator is not available.      |                    |
| A PRIMECLUSTER single node cluster is not supported.                     | 2.0.3              |
| SPARC Enterprise is not supported.                                       | 2.0.3<br>914267-04 |
| 11 ETERNUS or more cannot be connected.                                  | 3.0.0<br>914267-06 |
| SAS interface is not supported.  | 3.0.0<br>914267-06 |
| When setting mplb-special files, ZFS is not supported.                   | 3.0.0<br>914267-06 |
| When setting mplb-special files, EFI partition tables are not supported. | 3.0.0<br>914267-06 |
| lpfc 6.20 or later is not supported.                                     | 3.0.1<br>914267-09 |
| Solaris 10 8/11 or later is not supported.                               | 3.0.4<br>914267-14 |
| Kernel patch 144500-19 is not supported.                                 | 3.0.4<br>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<br>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<br>3.0.1 or later *2<br>914267-09 or later *2 |
| Emulex LP10000DC *1   | 2.0.1 or later<br>3.0.1 or later *2<br>914267-09 or later *2 |
| SE0X7F11F, SE0X7F12F  | 2.0.3 or later<br>914267-04 or later                         |
| SE0X7F31F, SE0X7F32F, SP1X7FAB2F, SE0X7F21F,<br>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<br>914267-06 or later |

- PCIe ExpressModule

| PCIe ExpressModule Types  | MPD Version Levels/Patch |
|---|--------------------------|
| SP1X5FAR2F, SP1X5FAS2F, SP1X5FBR2F, SP1X5FBS2F,<br>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<br>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<br>Softek Storage Cruiser V01L21          | 914057-02 or later (Agent)<br>913708-05 or later (Solaris Manager)<br>TP38107 or later (Windows Manager)<br>TP38104 or later (Windows Client) | 2.0.1 or later             |
| Softek Storage Cruiser 1.2<br>Softek Storage Cruiser V01L20            | 913305-04 or later (Agent)<br>913323-05 or later (Solaris Manager)<br>TP28107 or later (Windows Manager)<br>TP28104 or later (Windows Client) | 2.0.1 or later             |
| Softek Storage Cruiser 1.1.1<br>Softek Storage Cruiser V01L12          | 913304-04 or later (Agent)<br>913322-06 or later (Solaris Manager)<br>TP18107 or later (Windows Manager)<br>TP18104 or later (Windows Client) | 2.0.1 or later             |
| Softek Storage Cruiser 1.1<br>Softek Storage Cruiser V01L11            | 913078-05 or later (Agent)<br>913114-07 or later (Solaris Manager)<br>TP08107 or later (Windows Manager)<br>TP08104 or later (Windows Client) | 2.0.1 or later             |
| ETERNUS SF<br>Storage Cruiser V13 or later                             | V13 or later  | 2.0.1 or later             |
| Softek Storage Cruiser 1.2.2 or later<br>Softek Storage Cruiser V01L22 | 1.2.2 or later<br>V01L22 or later   | 2.0.1 or later             |
| Systemwalker<br>Resource Coordinator V12L20 or later                   | V12L20 or later   | 2.0.1 or later             |
| Systemwalker<br>Resource Coordinator V11L01                            | 914057-02 or later (Agent)<br>913708-05 or later (Solaris Manager)<br>TP38104 or later (Windows Client)                                       | 2.0.1 or later             |
| Systemwalker<br>Resource Coordinator V11L01E                           | 914057-02 or later (Agent)<br>913708-05 or later (Solaris Manager)<br>TP38104 or later (Windows Client)                                       | 2.0.1 or later             |
| Systemwalker<br>Resource Coordinator V11L00                            | 913305-04 or later (Agent)<br>913323-05 or later (Solaris Manager)<br>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/FJsvmp/b/dsk/mp/b\*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 mp/b\*s7 when the mp/b 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.

- Boot archive is renewed from 3.1.2 or T011535SP-01 with grmpdautoconf.  
When the load of I/O is high, update of boot-archive might take time. Please execute when the load of I/O is few.
- Boot archive is renewed from T011535SP-05 with PRIMECLUSTER automatic resource registration and mp/bconfig.

### 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/FJSMplb/rdisk>
```

```
pkgrm: ERROR: unable to remove existing directory at </dev/FJSMplb/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.
  - When the system volume is made UFS file system, the ssd path is displayed by the format command etc.
- 

## 16. About installation

Please reboot the server after the installation.

---

## 17. About mplbstrtrc that is the resting process

The mplbstrtrc process does not accept the signal with the system call issued to the mplb driver. Therefore, pfiles and prctl, etc. that keep waiting for the response of the system call become no responses. Do not execute those commands.

---

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## 18. About OracleASM

If the EFI label is used under the OracleASM to which T011535SP-03 is applied, path status might become warning. In that case, please set the slice (/dev/FJSVmplb/rdisk/ mplb\*s7) that shows the entire disk of EFI off the subject by the ASM\_DISKSTRING parameter of OracleASM. Please refer to the manual of OracleASM about the setting method.

---

## 19. About ZFS

- Please note the following when you make zpool with the entire disk of the EFI label(/dev/FJSVmplb/dsk/mplbXs7, X is an instance number) in Solaris11.
    - Please disregard it though an unnecessary slice might be made with zpool create.
    - In the environment before SRU16031 (SRU11.3.6.5.0) or after SRU17021 (SRU11.3.17.5.0), when zpool is exported, cannot do importing of zpool with mplbXs7. Do importing according to the following procedures.
      1. The symbolic link of /dev/FJSVmplb/[r]disk/mplbX is made.
 

Example)

```
# ln -s /dev/FJSVmplb/rdisk/mplb2s7 /dev/FJSVmplb/rdisk/mplb2
```

```
# ln -s /dev/FJSVmplb/dsk/mplb2s7 /dev/FJSVmplb/dsk/mplb2
```
      2. zpool import is done specifying the symbolic link.
 

Example)

```
# zpool import -d /dev/FJSVmplb/dsk/mplb2 zpoolname
```
    - In the environment SRU16042(SRU11.3.7.6.0) - SRU17011(SRU11.3.16.3.0), import is possible with mplbXs7.
  - In the environment since SRU16042(SRU11.3.7.6.0), all paths might become warning status at import. The path will return to online in 5 minutes for the diagnosis. Please execute the iompadm restart command when you want to return online the path at once.
- 

## 20. Uninstall

/dev/FJSVmplb/[r]disk/\* files and directories might not be deleted. Please delete them if necessary.

Example)

```
# rm -rf /dev/FJSVmplb
```

---

## 21. About Solaris 11.4

Refer to [About Solaris 11.4](#)

---

## 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.

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### 2. DF series and GR700

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

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### **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.

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### **6. Migration from Multipath Disk Control (MPHD)**

Migration from Multipath Disk Control is not possible.

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### **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.

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### **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.

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### **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.

Boot archive is renewed from 914267-18 with grmpdautoconf.

When the load of I/O is high, update of boot-archive might take time. Please execute when the load of I/O is few.

## 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 11 OS and Solaris 10 OS | T011535SP-06 |

|   |           |
|---|-----------|
| 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 Storage Systems

ETERNUS Multipath Driver supports the following storage systems:

- ETERNUS DX60 S4
- ETERNUS DX100 S4/DX200 S4
- ETERNUS DX500 S4/DX600 S4
- ETERNUS AF250 S2/AF250
- ETERNUS AF650 S2/AF650
- ETERNUS DX60/DX80/DX90
- ETERNUS DX60 S2
- ETERNUS DX60 S3
- ETERNUS DX80 S2/DX90 S2
- ETERNUS DX100 S3/DX200 S3
- ETERNUS DX200F
- ETERNUS DX400 series
- ETERNUS DX400 S2 series
- ETERNUS DX500 S3/DX600 S3
- ETERNUS DX8000 series
- ETERNUS DX8000 S2 series
- ETERNUS DX8700 S3/ DX8900 S3
- ETERNUS DX8900 S4
- ETERNUS2000, ETERNUS3000, ETERNUS4000, ETERNUS6000,ETERNUS8000
- ETERNUS GR disk storage system(the driver for Solaris 11 OS and Solaris 10 OS is excluded)

### ETERNUS DX60 S4

| Supported Storage Systems | Version Level                           |
|---------------------------|---|
| ETERNUS DX60 S4           | 3.1.1 or later<br>914267-18 or later *1 |

\*1 Refer to "Preparation that uses ETERNUS DX60 S3/DX100 S3/DX200 S3, ETERNUS DX200F, ETERNUS AF250/AF250 S2 shipped after June, 2016 and ETERNUS DX60 S4, DX100 S4, DX200 S4 (the driver for Solaris 10 OS and Solaris 9 OS)".

**ETERNUS DX100 S4, DX200 S4, ETERNUS DX500 S4, DX600 S4**

| Supported Storage Systems | Version Level         |
|---------------------------|-----------------------|
| ETERNUS DX100 S4          | 3.1.1 or later        |
| ETERNUS DX200 S4          | 914267-18 or later *1 |
| ETERNUS DX500 S4          | 3.1.1 or later        |
| ETERNUS DX600 S4          | 914267-18 or later    |

\*1 Refer to "Preparation that uses ETERNUS DX60 S3/DX100 S3/DX200 S3, ETERNUS DX200F, ETERNUS AF250/AF250 S2 shipped after June, 2016 and ETERNUS DX60 S4, DX100 S4, DX200 S4 (the driver for Solaris 10 OS and Solaris 9 OS)".

**ETERNUS AF250 S2, AF250, AF650 S2, AF650**

| Supported Storage Systems | Version Level                           |
|---------------------------|---|
| ETERNUS AF250 S2, AF250   | 3.1.2 or later<br>914267-18 or later *1 |
| ETERNUS AF650 S2, AF650   | 3.1.2 or later<br>914267-18 or later    |

\*1 Refer to "Preparation that uses ETERNUS DX60 S3/DX100 S3/DX200 S3, ETERNUS DX200F, ETERNUS AF250/AF250 S2 shipped after June, 2016 and ETERNUS DX60 S4, DX100 S4, DX200 S4 (the driver for Solaris 10 OS and Solaris 9 OS)".

**ETERNUS DX60/DX80/DX90**

FC interface

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

SAS interface

| Supported Storage Systems | Version Level                        |
|---------------------------|--------------------------------------|
| ETERNUS DX60, DX80        | 3.0.1 or later<br>914267-09 or later |

## ETERNUS DX60 S2

### FC interface

| Supported Storage Systems | Version Level  |
|---------------------------|--|
| ETERNUS DX60 S2           | 3.0.4 or later<br>914267-14 or later<br>912651-23 or later |

### SAS interface

| Supported Storage Systems | Version Level                        |
|---------------------------|--------------------------------------|
| ETERNUS DX60 S2           | 3.0.4 or later<br>914267-14 or later |

## ETERNUS DX60 S3

| Supported Storage Systems | Version Level                           |
|---------------------------|---|
| ETERNUS DX60 S2           | 3.1.0 or later<br>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 Storage Systems  | Version Level                           |
|--|---|
| ETERNUS DX100 S3/DX200 S3<br>ETERNUS DX500 S3/DX600 S3<br>ETERNUS DX200F | 3.1.0 or later<br>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 Storage Systems | Version Level  |
|---------------------------|--|
| ETERNUS DX80 S2/DX90 S2   | 3.0.3 or later<br>914267-13 or later<br>912651-23 or later |

### SAS interface

| Supported Storage Systems | Version Level                        |
|---------------------------|--------------------------------------|
| ETERNUS DX80 S2/DX90 S2   | 3.0.3 or later<br>914267-13 or later |



**ETERNUS DX400 series, ETERNUS DX8000 series**

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

**ETERNUS DX400 S2 series**

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

**ETERNUS DX8000 S2 series**

| Supported Storage Systems | Version Level / Patch                    |
|---------------------------|--|
| ETERNUS DX8100 S2         | 3.0.4 or later                           |
| ETERNUS DX8700 S2         | 914267-15 or later<br>912651-23 or later |

**ETERNUS DX8700 S3/DX8900 S3**

| Supported Storage Systems | Version Level / Patch              |
|---------------------------|------------------------------------|
| ETERNUS DX8700 S3         | 3.1.2 or later                     |
| ETERNUS DX8900 S3         | T011535SP-01<br>914267-18 or later |

**ETERNUS DX8900 S4**

| Supported Storage Systems | Version Level / Patch                                |
|---------------------------|--|
| ETERNUS DX8900 S4         | 3.1.3 or later<br>T011535SP-05<br>914267-18 or later |

**ETERNUS8000**

| Supported Storage Systems | Version Level / Patch                                      |
|---------------------------|--|
| ETERNUS8000               | 2.0.2 or later<br>914267-03 or later<br>912651-14 or later |

## ETERNUS6000

| Supported Storage Systems | Version Level  |
|---------------------------|----------------|
| ETERNUS6000               | 2.0.0 or later |

## ETERNUS4000

| Supported Storage Systems | Version Level / Patch                                      |
|---------------------------|--|
| ETERNUS4000               | 2.0.2 or later<br>914267-03 or later<br>912651-14 or later |

## ETERNUS3000

| Supported Storage Systems | Version Level  |
|---------------------------|----------------|
| ETERNUS3000               | 2.0.0 or later |

## ETERNUS2000

### FC interface

| Supported Storage Systems | Version Level  |
|---------------------------|--|
| ETERNUS2000               | 2.0.3 or later<br>914267-05 or later<br>912651-17 or later |

### SAS interface

| Supported Storage Systems | Version Level                        |
|---------------------------|--------------------------------------|
| ETERNUS2000               | 3.0.0 or later<br>914267-06 or later |

## ETERNUS GR Storage

| Supported Storage Systems | Version Level  |
|---------------------------|----------------|
| GR710                     | 2.0.0 or later |
| GR720<br>GR730            | 2.0.0 or later |
| GR740<br>GR820<br>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 Storage Systems

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

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

The table below shows the “Assigned-CM” and “Non-assigned-CM” 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 S4, DX60 S3<br>ETERNUS DX100 S4, DX100 S3<br>ETERNUS DX200 S4, DX200 S3<br>ETERNUS DX500 S4, DX500 S3<br>ETERNUS DX600 S4, DX600 S3<br>ETERNUS DX60 S2, DX60<br>ETERNUS DX80 S2, DX80<br>ETERNUS DX90 S2, DX90<br>ETERNUS DX400 S2 series, DX400 series<br>ETERNUS2000, ETERNUS4000, ETERNUS3000<br>ETERNUS GR710, GR720, GR730<br>ETERNUS AF250 S2/AF650 S2, AF250/AF650<br>ETERNUS DX200F |
| Non-assigned-CM type | ETERNUS DX8900 S4<br>ETERNUS DX8000 S3 series<br>ETERNUS DX8000 S2 series, DX8000 series<br>ETERNUS8000<br>ETERNUS6000<br>ETERNUS GR740, GR820, GR840  |

## Change unit

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

| Storage Systems   | cu/controllerunit | g/groupmodule |
|---|-------------------|---------------|
| ETERNUS DX60 S4, DX60 S3<br>ETERNUS DX100 S4, DX100 S3<br>ETERNUS DX200 S4, DX200 S3<br>ETERNUS DX60 S2, DX60<br>ETERNUS DX80 S2, DX80<br>ETERNUS DX90 S2, DX90<br>ETERNUS AF250 S2, AF250,<br>ETERNUS2000, ETERNUS3000,<br>ETERNUS4000 models 80 and 100   | -                 | CM            |
| ETERNUS DX500 S4, DX500 S3,<br>ETERNUS DX600 S4, DX600 S3,<br>ETERNUS DX8900 S4<br>ETERNUS DX8700 S3/DX8900 S3,<br>ETERNUS DX400 S2 series, DX400 series,<br>ETERNUS DX8000 series,<br>ETERNUS DX8000 S2 series,<br>ETERNUS AF650 S2, AF650,<br>ETERNUS4000(except for models 80 and 100),<br>ETERNUS8000 | CA                | CM            |
| ETERNUS6000   | CA                | ROUTER        |
| GR740,GR820,GR840   | IOB               | ROUTER        |
| GR710,GR720,GR730   | -                 | CM            |

## Group Module

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

| Storage Systems  | Group Module |
|--|--------------|
| ETERNUS DX60 S4, DX60 S3<br>ETERNUS DX100 S4, DX100 S3<br>ETERNUS DX200 S4, DX200 S3<br>ETERNUS DX500 S4, DX500 S3<br>ETERNUS DX600 S4, DX600 S3<br>ETERNUS DX8900 S4<br>ETERNUS DX8000 S3 series<br>ETERNUS DX60 S2, DX60<br>ETERNUS DX80 S2, DX80<br>ETERNUS DX90 S2, DX90<br>ETERNUS DX400 S2 series, DX400 series<br>ETERNUS DX8000 S2 seies, DX8000 series<br>ETERNUS2000, ETERNUS4000 ,ETERNUS8000, ETERNUS3000<br>ETERNUS GR710, GR720, GR730 | CM           |

|  |        |
|--|--------|
| ETERNUS AF250 S2/AF650 S2, AF250/AF650<br>ETERNUS DX200F |        |
| ETERNUS6000, GR740, GR820, GR840                         | ROUTER |

### 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 grpmdautoconf 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 grpmdautoconf 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 grpmdautoconf is executed in the environment where the lpfc driver and the sd driver connect devices other than the storage systems, 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/rdisk
```

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/rdisk/mplb0s0
lrwxrwxrwx 1 root root 36 Aug 28 20:28 /dev/FJSVmplb/rdisk/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/rdisk/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

## 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.

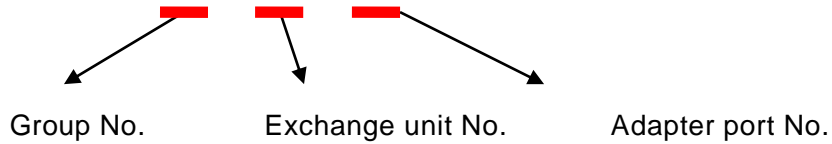
```
# rm /etc/opt/FJSVcluster/sys/cldiskadm
# ln -s /opt/FJSVclapi/sys/cldiskadm /etc/opt/FJSVcluster/sys/cldiskadm
```

## 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 storage system.

Example:

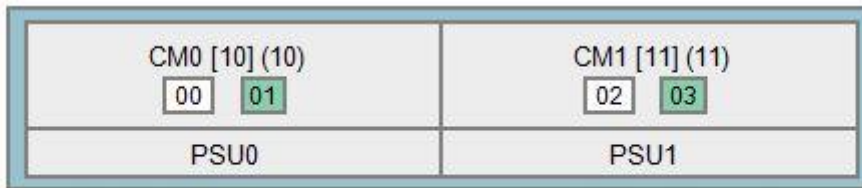
```
# iompadm -c mplb info /dev/FJSVmplb/fiomp/adm0
IOMP : /dev/FJSVmplb/fiomp/adm0
Element :
/dev/rdsd/c5t0d0s2 online standby block "good status with standby
[E30004641- 130011-CM01-CA01-PORT34] (mplbt11)"
/dev/rdsd/c6t1d0s2 online active block "good status with active
[E30004641- 130011-CM00-CA00-PORT30]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



The figures below show the Adapter port No of supported 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.

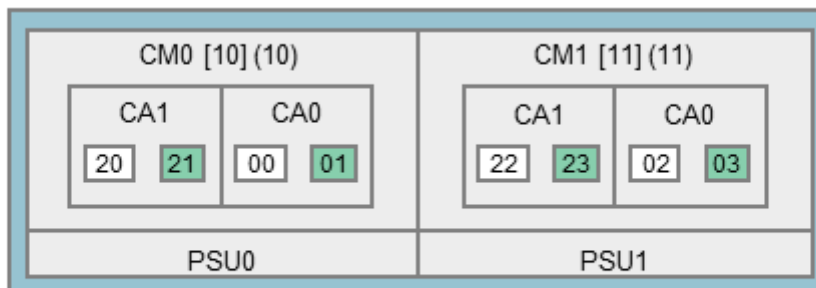
**ETERNUS DX60 S4, ETERNUS DX60 S3**



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

**ETERNUS DX100 S4, ETERNUS DX100 S3**

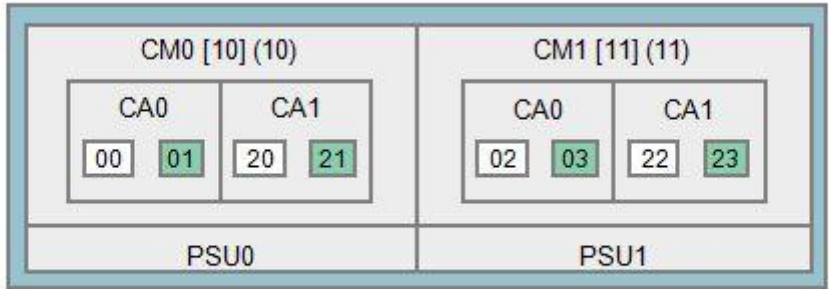
When CA of FC is installed in the basic host interface



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

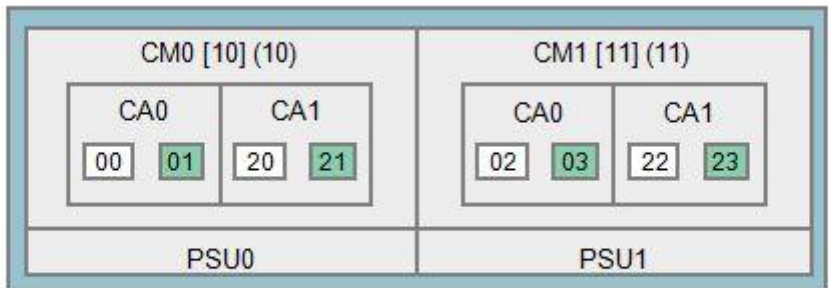
When CA other than FC are installed in the basic host interface





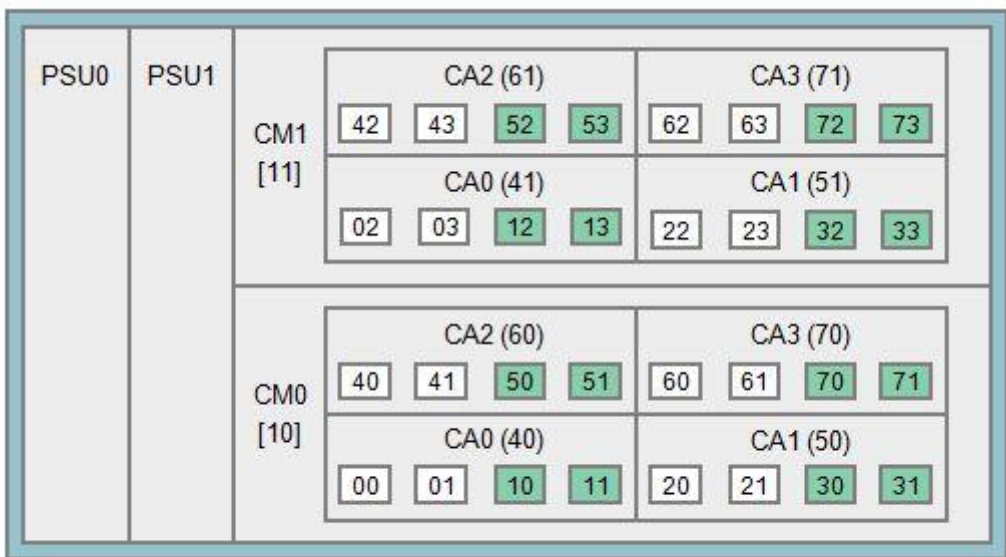
[ ]: Group No. () : Exchange unit No.  : adapter Port No.  : When using 2port-CA

**ETERNUS DX200 S4, ETERNUS DX200 S3, ETERNUS AF250 S2, ETERNUS AF250, ETERNUS DX200F, ETERNUS DX80 S2, ETERNUS DX90 S2,**



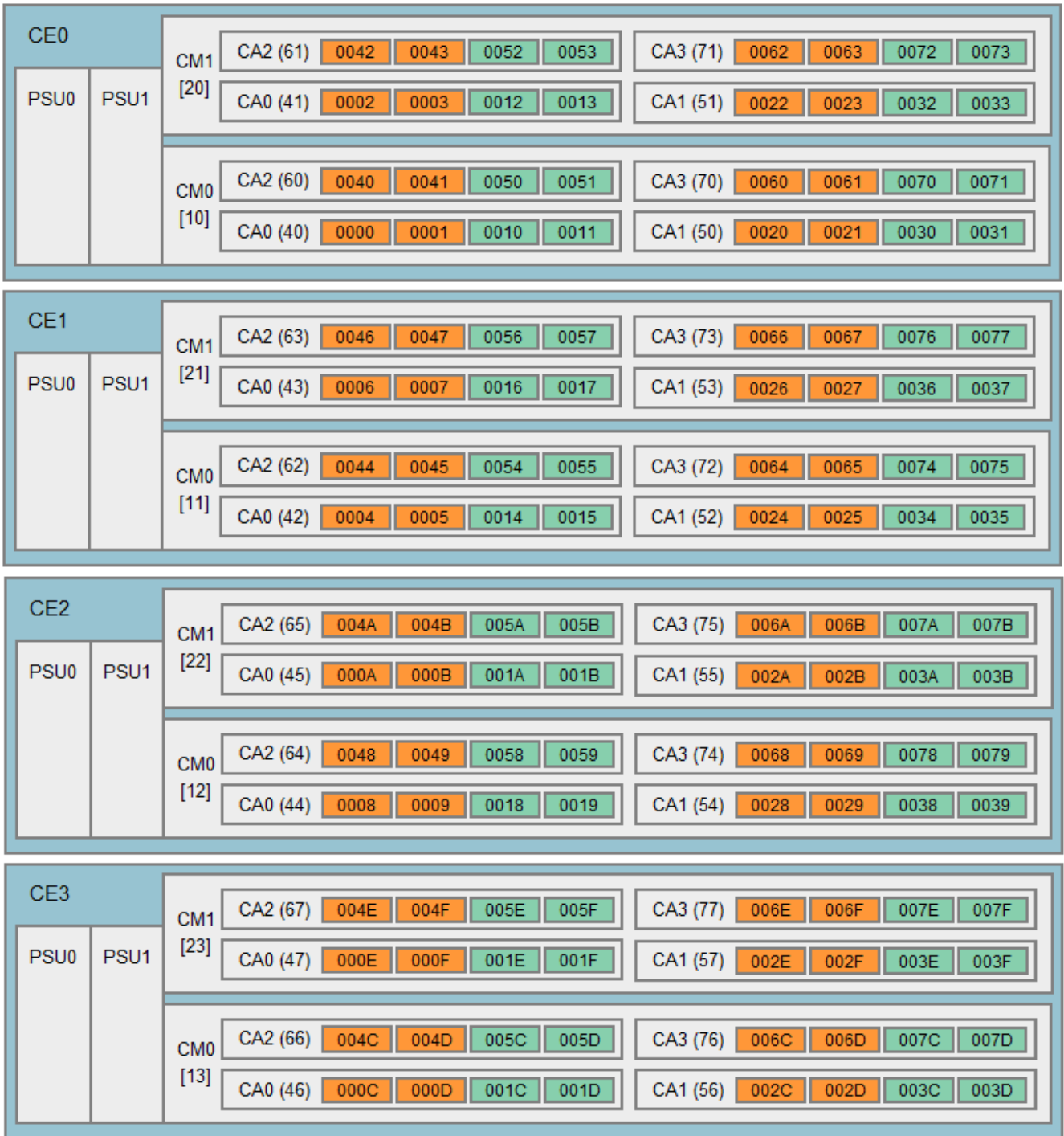
[ ]: Group No. () : Exchange unit No.  : adapter Port No.  : When using 2port-CA

**ETERNUS DX500 S4, ETERNUS DX 600 S4, ETERNUS AF650 S2, ETERNUS DX500 S3, DX600 S3, ETERNUS AF650, ETERNUS DX400 S2 series**



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

**ETERNUS DX8900 S4, ETERNUS DX8700 S3/DX8900 S3**



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

|     |                              |      |      |                              |                              |                              |
|-----|------------------------------|------|------|------------------------------|------------------------------|------------------------------|
| CE4 |                              | PSU0 | PSU1 | CM1<br>[24]                  | CA2 (A1) 00C2 00C3 00D2 00D3 | CA3 (B1) 00E2 00E3 00F2 00F3 |
|     | CA0 (81) 0082 0083 0092 0093 |      |      |                              | CA1 (91) 00A2 00A3 00B2 00B3 |                              |
|     | CM0<br>[14]                  |      |      | CA2 (A0) 00C0 00C1 00D0 00D1 | CA3 (B0) 00E0 00E1 00F0 00F1 |                              |
|     |                              |      |      | CA0 (80) 0080 0081 0090 0091 | CA1 (90) 00A0 00A1 00B0 00B1 |                              |
| CE5 |                              | PSU0 | PSU1 | CM1<br>[25]                  | CA2 (A3) 00C6 00C7 00D6 00D7 | CA3 (B3) 00E6 00E7 00F6 00F7 |
|     | CA0 (83) 0086 0087 0096 0097 |      |      |                              | CA1 (93) 00A6 00A7 00B6 00B7 |                              |
|     | CM0<br>[15]                  |      |      | CA2 (A2) 00C4 00C5 00D4 00D5 | CA3 (B2) 00E4 00E5 00F4 00F5 |                              |
|     |                              |      |      | CA0 (82) 0084 0085 0094 0095 | CA1 (92) 00A4 00A5 00B4 00B5 |                              |
| CE6 |                              | PSU0 | PSU1 | CM1<br>[26]                  | CA2 (A5) 00CA 00CB 00DA 00DB | CA3 (B5) 00EA 00EB 00FA 00FB |
|     | CA0 (85) 008A 008B 009A 009B |      |      |                              | CA1 (95) 00AA 00AB 00BA 00BB |                              |
|     | CM0<br>[16]                  |      |      | CA2 (A4) 00C8 00C9 00D8 00D9 | CA3 (B4) 00E8 00E9 00F8 00F9 |                              |
|     |                              |      |      | CA0 (84) 0088 0089 0098 0099 | CA1 (94) 00A8 00A9 00B8 00B9 |                              |
| CE7 |                              | PSU0 | PSU1 | CM1<br>[27]                  | CA2 (A7) 00CE 00CF 00DE 00DF | CA3 (B7) 00EE 00EF 00FE 00FF |
|     | CA0 (87) 008E 008F 009E 009F |      |      |                              | CA1 (97) 00AE 00AF 00BE 00BF |                              |
|     | CM0<br>[17]                  |      |      | CA2 (A6) 00CC 00CD 00DC 00DD | CA3 (B6) 00EC 00ED 00FC 00FD |                              |
|     |                              |      |      | CA0 (86) 008C 008D 009C 009D | CA1 (96) 00AC 00AD 00BC 00BD |                              |

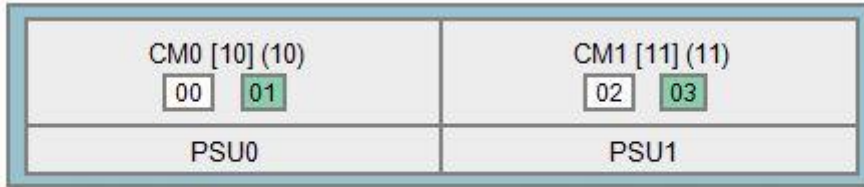
[ ]: Group No. ( ): Exchange unit No.  : adapter Port No.  : When using 4port-CA

|             |          |      |      |             |          |      |      |          |      |          |      |      |      |      |
|-------------|----------|------|------|-------------|----------|------|------|----------|------|----------|------|------|------|------|
| CE8         |          | PSU0 | PSU1 | CM1<br>[28] | CA2 (E1) | 0142 | 0143 | 0152     | 0153 | CA3 (F1) | 0162 | 0163 | 0172 | 0173 |
| CA0 (C1)    | 0102     |      |      |             | 0103     | 0112 | 0113 | CA1 (D1) | 0122 | 0123     | 0132 | 0133 |      |      |
| CM0<br>[18] | CA2 (E0) |      |      | 0140        | 0141     | 0150 | 0151 | CA3 (F0) | 0160 | 0161     | 0170 | 0171 |      |      |
|             | CA0 (C0) |      |      | 0100        | 0101     | 0110 | 0111 | CA1 (D0) | 0120 | 0121     | 0130 | 0131 |      |      |
| CE9         |          | PSU0 | PSU1 | CM1<br>[29] | CA2 (E3) | 0146 | 0147 | 0156     | 0157 | CA3 (F3) | 0166 | 0167 | 0176 | 0177 |
| CA0 (C3)    | 0106     |      |      |             | 0107     | 0116 | 0117 | CA1 (D3) | 0126 | 0127     | 0136 | 0137 |      |      |
| CM0<br>[19] | CA2 (E2) |      |      | 0144        | 0145     | 0154 | 0155 | CA3 (F2) | 0164 | 0165     | 0174 | 0175 |      |      |
|             | CA0 (C2) |      |      | 0104        | 0105     | 0114 | 0115 | CA1 (D2) | 0124 | 0125     | 0134 | 0135 |      |      |
| CE10        |          | PSU0 | PSU1 | CM1<br>[2A] | CA2 (E5) | 014A | 014B | 015A     | 015B | CA3 (F5) | 016A | 016B | 017A | 017B |
| CA0 (C5)    | 010A     |      |      |             | 010B     | 011A | 011B | CA1 (D5) | 012A | 012B     | 013A | 013B |      |      |
| CM0<br>[1A] | CA2 (E4) |      |      | 0148        | 0149     | 0158 | 0159 | CA3 (F4) | 0168 | 0169     | 0178 | 0179 |      |      |
|             | CA0 (C4) |      |      | 0108        | 0109     | 0118 | 0119 | CA1 (D4) | 0128 | 0129     | 0138 | 0139 |      |      |
| CE11        |          | PSU0 | PSU1 | CM1<br>[2B] | CA2 (E7) | 014E | 014F | 015E     | 015F | CA3 (F7) | 016E | 016F | 017E | 017F |
| CA0 (C7)    | 010E     |      |      |             | 010F     | 011E | 011F | CA1 (D7) | 012E | 012F     | 013E | 013F |      |      |
| CM0<br>[1B] | CA2 (E6) |      |      | 014C        | 014D     | 015C | 015D | CA3 (F6) | 016C | 016D     | 017C | 017D |      |      |
|             | CA0 (C6) |      |      | 010C        | 010D     | 011C | 011D | CA1 (D6) | 012C | 012D     | 013C | 013D |      |      |

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

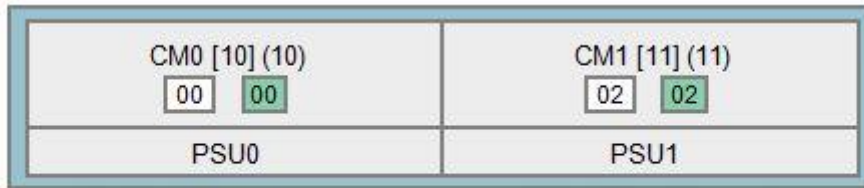
**ETERNUS DX60 S2, ETERNUS DX60, ETERNUS DX80**

FC interface



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

SAS interface



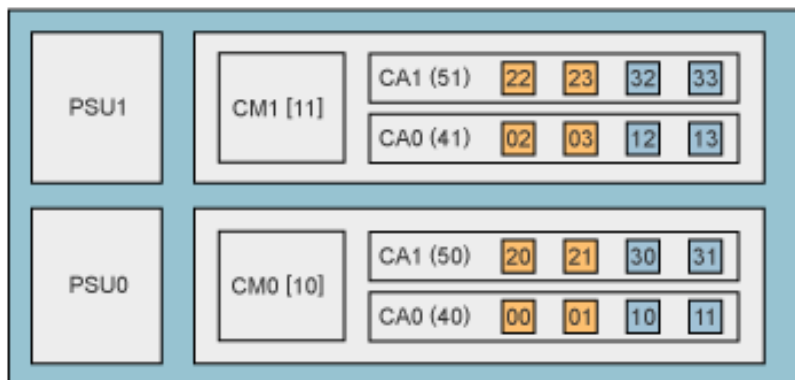
[ ]: Group No. (): Exchange unit No. □: adapter Port No. ■: When using 2port-CM

**ETERNUS DX90**



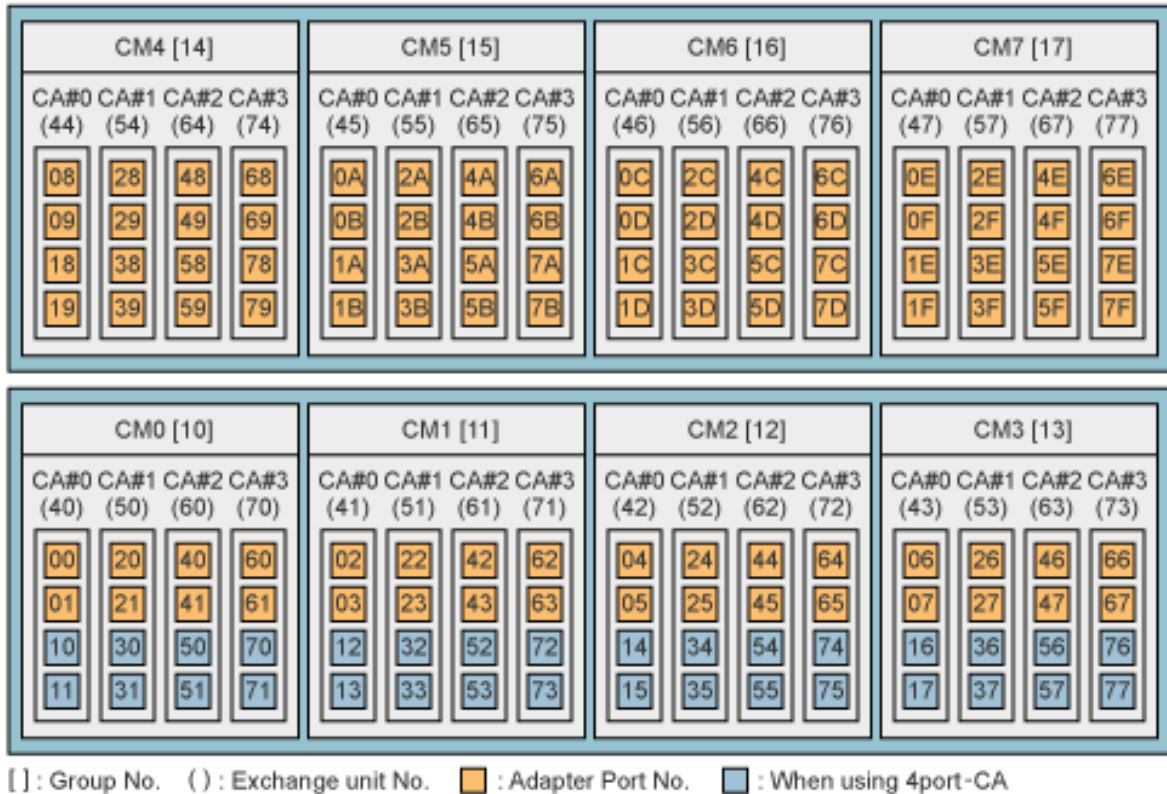
[ ]: Group No. (): Exchange unit No. □: adapter Port No.

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

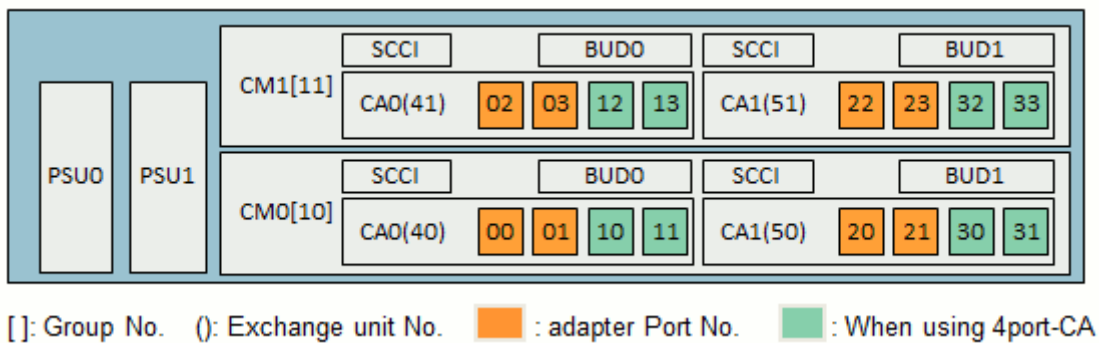


[ ]: Group No. (): Exchange unit No. ■: Adapter Port No. ■: When using 4port-CA

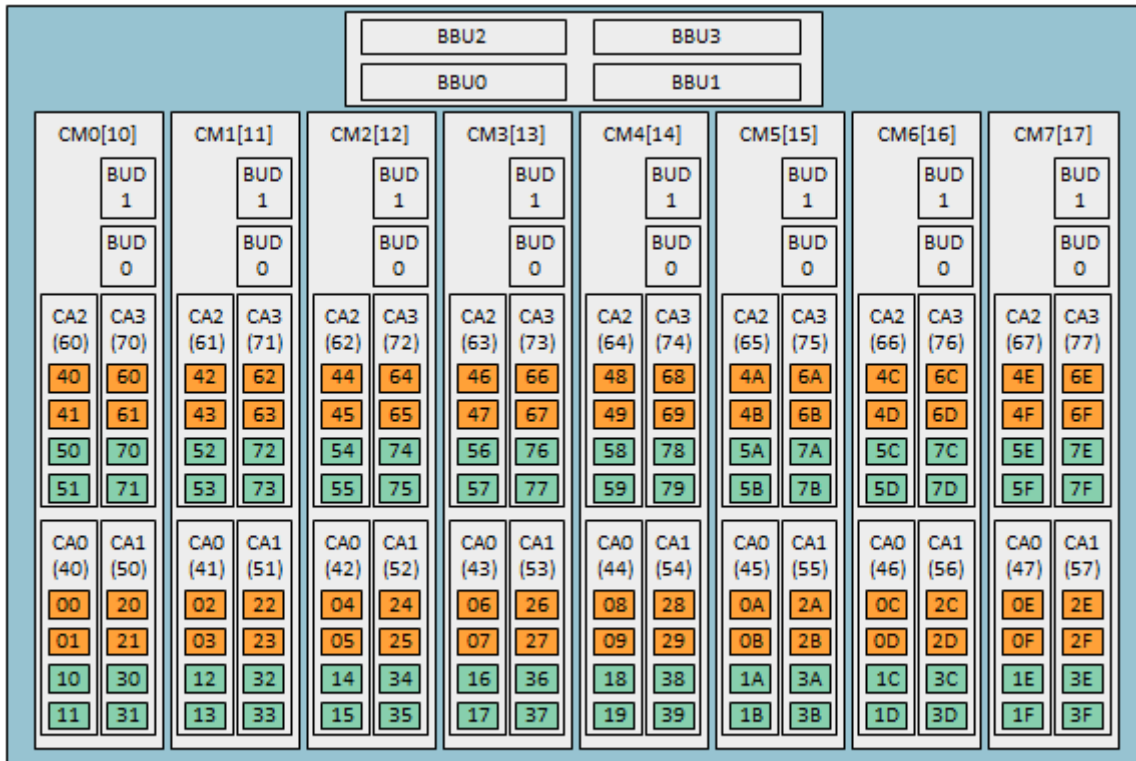
**ETERNUS DX8000 series, ETERNUS8000 model 900, 1100, 1200, 2100, 2200**



**ETERNUS DX8100 S2**



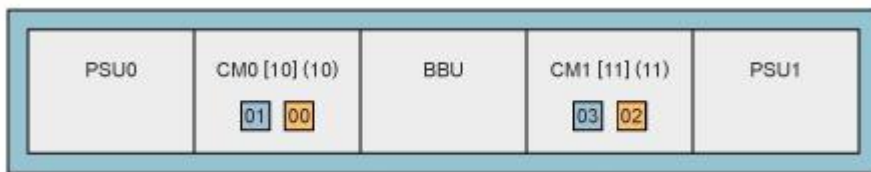
**ETERNUS DX8700 S2**



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

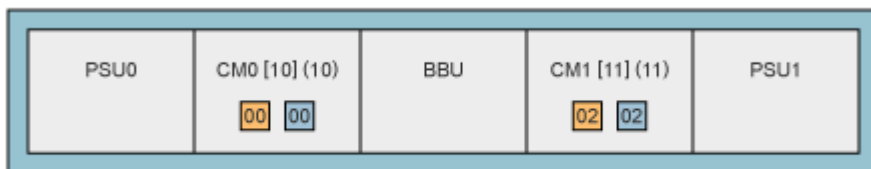
**ETERNUS2000**

FC interface



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

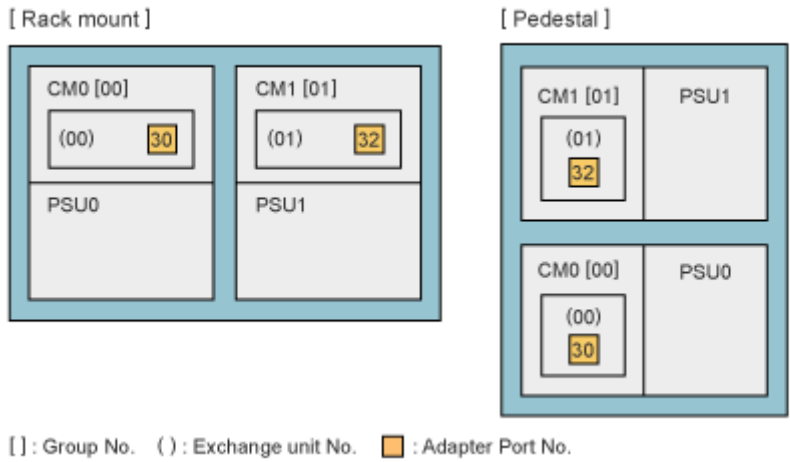
SAS interface



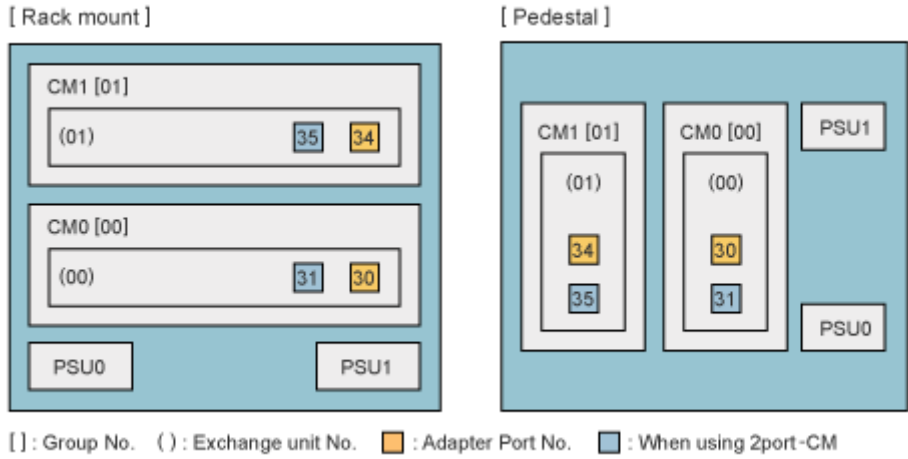
[ ]: Group No. ( ): Exchange unit No. ■ : Adapter Port No. ■ : When using 2port-CA



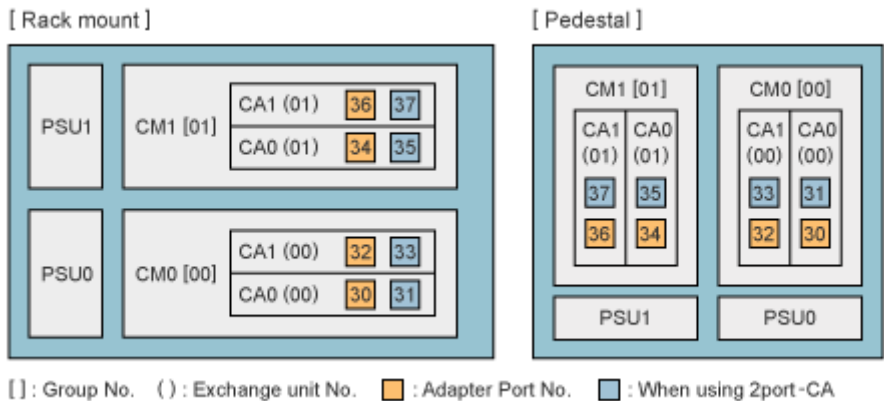
**ETERNUS3000 model 50, GR710**



**ETERNUS3000 model 80, 100, ETERNUS4000 model 80, 100**



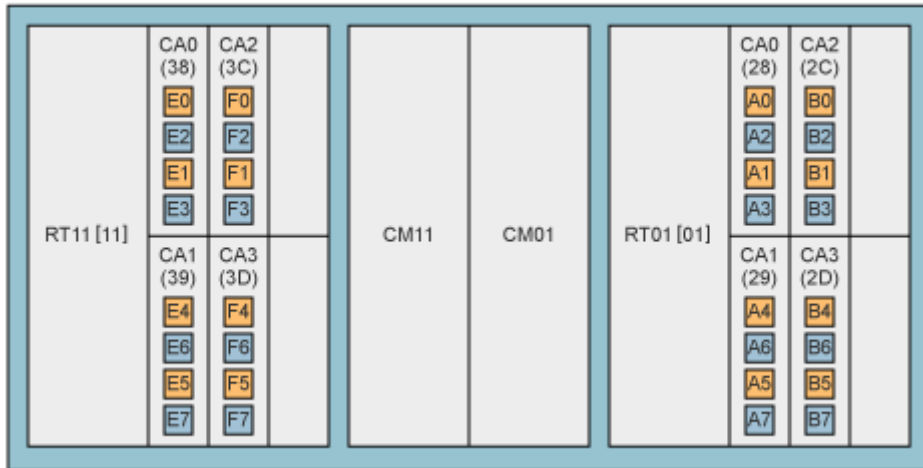
**ETERNUS3000 model 200, 300, 400, 500, 600, 700**



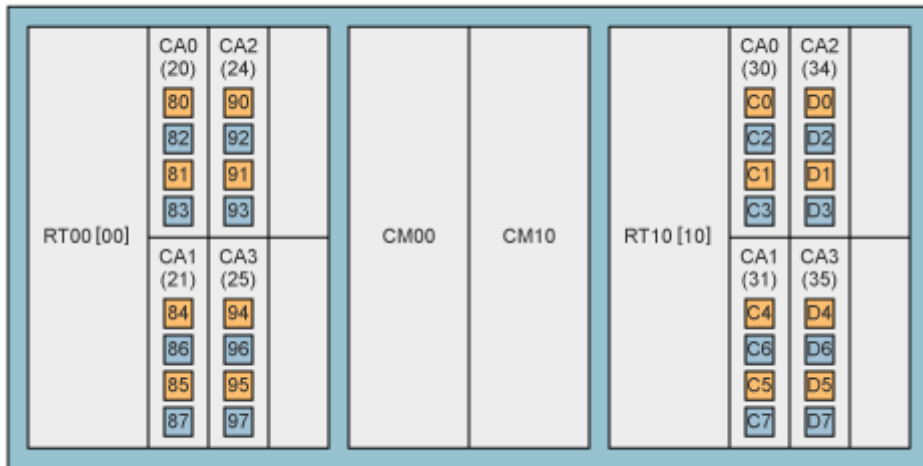


## ETERNUS6000

[ Device Front ]



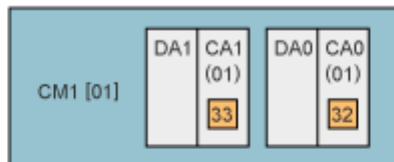
[ Device Rear ]



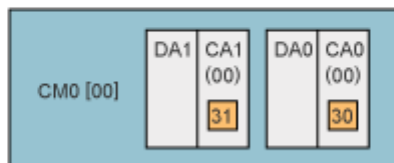
[ ] : Group No. ( ) : Exchange unit No.   : Adapter Port No.   : When using 4port-CA

## GR720 and GR730 Device Rear

[ Upper Compartment ]

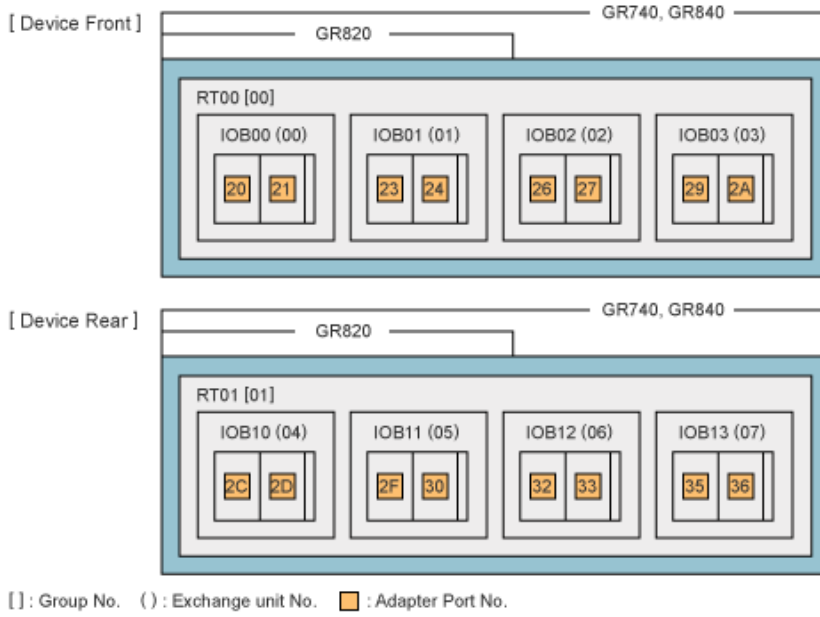


[ Lower Compartment ]



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

**GR740, GR820, GR840**



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

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 later or kernel patch 144500-19 or later.

**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 | 10 500000e0da817c90 | DXM3         | - | New    |
| [ ] 2    | fjpfca1 | 10 500000e0da817c80 | DXM3         | - | New    |

**Preparation that uses ETERNUS DX60 S3/DX100 S3/DX200 S3, ETERNUS DX200F, ETERNUS AF250/AF250 S2 shipped after June, 2016 and ETERNUS DX60 S4, DX100 S4, DX200 S4 (the driver for Solaris 10 OS and Solaris 9 OS)**

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

| definition                |
|---------------------------|
| ^500000e0da[4-7]:DXL3:255 |
| ^500000e0db[0-3]:DXL3:255 |

ETERNUS DX S4 series is displayed that DXL3. It is possible to use it though the device name is not displayed in the annotation.

**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/FJSMplb/fiomp/admXX /dev/rdisk/cXdXs2
```

- The grpdautoconf 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 grpdautoconf command.

```
Ex.) # grpdautoconf
```

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.
  - # Idm rm-vdisk <vdisk> <guest domain>
  - # Idm 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.
- About the Idmp2v command
  - The Idmp2v command cannot use the ETERNUS multipath driver.

**Note of Oracle VM SR-IOV environments**

The support condition is as follows.

|                          |  |
|--------------------------|--|
| OS version               | Solaris 11.3 SRU18031(SRU11.3.30.4.0) or later |
| MPD Version Levels/Patch | 3.1.3 or later<br>or<br>T011535SP-06 or later  |
| HBA                      | Emulex FC cards                                |

**About ssd path name (the driver for Solaris 11 OS and Solaris 10 OS)**

Since T011535SP-04

The ssd path name (/dev/[r]dsk/cXt0dXsX) can be used. The following commands are used and set.

Ssd path name:

- cX : Unused c number
- t0 : 0 fixation
- dX : Instance number of mplb
- sX : Slice number

Command:

mplbconfig -S on  
The ssd path name is made effective.

mplbconfig -S off  
The ssd path name is invalidated.

mplbconfig -S up  
When EFI and the SMI label are changed, the ssd path is updated.

---

```
/opt/FJsvmplb/bin/mpdinfo (*1)
```

The instance number of mplb and the correspondence of the ssd path name are displayed.

(\*1)"/opt" is a directory specified when installing.

**Note:**

- In the PRIMECLUSTER environment, put the ssd path name in the exclusion list of PRIMECLUSTER.
- The ssd path name is unsupported in the environment in which PRIMECLUSTER GDS/PRIMECLUSTER GD is installed.
- The ssd path name cannot be used for the system volume of SAN Boot.

## About Solaris 11.4

Solaris 11.4 is supported with ETERNUS multipath driver 3.1.3/patch T011535SP-05.

The procedure and the limitation when Solaris 11.4 is used are described

## INSTALLATION

- Procedure of new installation

1. The driver is changed to ssd.  
/etc/devices/inception\_points is edited.

```
scsa-no-binding-set-fcp
scsa-no-binding-set-vhci
swapgeneric-ssd-loads-sd
```



```
# scsa-no-binding-set-fcp
# scsa-no-binding-set-vhci
# swapgeneric-ssd-loads-sd
```

2. MPxIO is invalidated.  
The following command is executed, and the server is reboot.

```
# /usr/sbin/stmsboot -D fp -d
WARNING: This operation will require a reboot.
Do you want to continue ? [y/n] (default: y) y
The changes will come into effect after rebooting the system.
Reboot the system now ? [y/n] (default: y) y
```

3. Please set the label and the partition before installing the multipath driver.
4. Please install by the mpdpkgadd command. Please refer to the "Software Information" for details.  
\*Do not reboot after the installation.\*

5. Please confirm service by the svcs command after completing the mpdpkgadd command, and start if necessary.

```
# svcs -a | grep fjsvmp1b
Service is started when displayed as follows.
online          xx:xx:xx  svc:/system/fjsvmp1b:default
```

Please start service by the svcadm command when it is displayed as follows.

```
disabled        xx:xx:xx  svc:/system/fjsvmp1b:default
```

---

```
# svcadm enable svc:/system/fjssvmlb:default
```

6. Please execute the remaining work of the installation procedure of the “Software Information”.
- Procedure of installation in environment updated from Solaris11.3 to 11.4
    1. Please set the label and the partition before installing the multipath driver.
    2. Please install by the mpdpkgadd command. Please refer to the “Software Information” for details.  
\*Do not reboot after the installation.\*
    3. Please confirm service by the svcs command after completing the mpdpkgadd command, and start if necessary.
    4. Refer to Procedure of new installation 5.
    5. Please execute the remaining work of the installation procedure of the “Software Information”.

## RESTRICTIONS

- The format command cannot be used.  
Please set the label and the partition before make multipath.  
When the format command is needed after the multipath, it is necessary to destroy the multipath.
- It is not possible to use it though the ssd path of multipath are displayed in the list of format.
- Ssd paths are displayed in the list of format. However, they cannot be used.
- The IOR composition supported by ETERNUS multipath driver 3.1.3 needs SRU19011(SRU11.4.5.3.0) or later. Refer to FNS-28221 when the IO root domain is shutdown, reboot or panic.
- The server might not be able to be boot when the service start is not confirmed after the installation and it reactivates.  
Please login from the console in that case, and execute 5 of the "Procedure of a new installation".

## 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".<br>(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<br>(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<br>10.3 Silent Installation                                    | Please reboot the server after the installation.   |
| 3.1.2           | Software Information | 10.1 New Installation<br>10.3 Silent Installation                                    | Please reboot the server after the installation.   |
| 3.1.0-<br>3.1.2 | User's Guide         | B.7 Performing "add device" for mplb Special Files in Non-Global Zones               | Please refer to "Method of "add device" to Non-global zone of Solaris11 (the driver for Solaris 11 OS and Solaris 10 OS)" in this book when the Non-global zone is Solaris11.  |
| 3.1.0-<br>3.1.2 | User's Guide         | 4.2 Adding a Path or Storage System<br>•When used as a shared disk for PRIMECLUSTER: | (Not Correct) The cluster will implement the automatic resource registration. Refer to the cluster manual for more details.<br>(Correct) For Adding a Path, the grmpdautoconf command is executed.<br>For Adding Storage System, the cluster will implement the automatic resource registration. Refer to the cluster manual for more details. |
| 3.1.2           | User's Guide         | B.5 Cluster System<br>4th Caution  | (Not Correct) and then execute the "grmpdautoconf" command again to redo the multipath settings.<br>(Correct) and then perform the automatic configuration of the cluster system.  |



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