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# **ETERNUS Multipath Driver (Solaris OS Version) Installation Information**

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**November 2009**

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## Supported OS

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

OS Versions	MPD Version Levels/Patch
Solaris 10 OS	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

## Restrictions and Resolution schedule (the driver for Solaris10 OS and Solaris 9 OS)

### 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.	2.0.1
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
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

**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

## 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	2.0.1 or later 3.0.1 or later *2 914267-09 or later *2
Emulex LP10000DC *1*2	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
SE0X7F21F, SE0X7F22F	Not supported

\*1: lpfc 6.20 or later is not supported.

\*2: The driver for Solaris 10 OS and Solaris 9 OS are supported lpfc 6.30g.

- 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

### 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	2.0.1 or later
SafeCLUSTER 2.0	910910-30	2.0.1 or later
SafeCLUSTER 2.0.x	911820-20	2.0.1 or later
SafeCLUSTER 1.x	-	Not available
Softek Storage Cruiser 1.2.1 Softek Storage Cruiser V01L21	914057-02 (Agent) 913708-05 (Solaris Manager) TP38107 (Windows Manager) TP38104 (Windows Client)	2.0.1 or later

Softek Storage Cruiser 1.2 Softek Storage Cruiser V01L20	913305-04 (Agent) 913323-05 (Solaris Manager) TP28107 (Windows Manager) TP28104 (Windows Client)	2.0.1 or later
Softek Storage Cruiser 1.1.1 Softek Storage Cruiser V01L12	913304-04 (Agent) 913322-06 (Solaris Manager) TP18107 (Windows Manager) TP18104 (Windows Client)	2.0.1 or later
Softek Storage Cruiser 1.1 Softek Storage Cruiser V01L11	913078-05 (Agent) 913114-07 (Solaris Manager) TP08107 (Windows Manager) TP08104 (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 (Agent) 913708-05 (Solaris Manager) TP38104 (Windows Client)	2.0.1 or later
Systemwalker Resource Coordinator V11L01E	914057-02 (Agent) 913708-05 (Solaris Manager) TP38104 (Windows Client)	2.0.1 or later
Systemwalker Resource Coordinator V11L00	913305-04 (Agent) 913323-05 (Solaris Manager) TP28104 (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 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 newer.

### 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.

### 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. 8Gbps Fibre Channel Card

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

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

### 1. EFI partition tables

EFI partition tables are not supported.

### 2. SVM(Solaris Volume Manager)

SVM is not supported.

## 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 10 OS and Solaris 9 OS	914267-11
The legacy driver for Solaris 9 OS, Solaris 8 OS, Solaris 7 OS and Solaris 2.6 OS	912651-22

## Supported Disk Storage Systems

ETERNUS Multipath Driver supports the following disk storage systems:

- ETERNUS DX60/DX80
- ETERNUS DX400 series
- ETERNUS DX8000 series
- ETERNUS2000, ETERNUS3000, ETERNUS4000, ETERNUS6000, ETERNUS8000
- ETERNUS GR disk storage system

### ETERNUS DX60/DX80

FC interface

Supported Disk Storage Systems	Version Level
ETERNUS DX60, DX80	3.0.1 or later *1 914267-09 or later 912651-21 or later

SAS interface

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

### ETERNUS DX400 series, ETERNUS DX8000 series

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

### 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

## Product Names & IDs

Product names	Product IDs (with media)
ETERNUS Multipath Driver	B011103H0H

## 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, ETERNUS DX400 series, ETERNUS2000, ETERNUS3000, ETERNUS4000, GR710, GR720, GR730
Non-assigned-CM type	ETERNUS DX8000 series, ETERNUS6000, ETERNUS8000, GR740, GR820, GR840

### Change unit

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

	cu/controllerunit	g/groupmodule
ETERNUS DX60, ETERNUS DX80 ETERNUS2000, ETERNUS3000, ETERNUS4000 models 80 and 100	-	CM
ETERNUS6000	CA	ROUTER
ETERNUS DX400 series, ETERNUS DX8000 series 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, ETERNUS DX400 series, ETERNUS DX8000 series, ETERNUS2000, ETERNUS3000, ETERNUS4000, ETERNUS8000, GR710, GR720, GR730	CM

## Solaris Containers

- ETERNUS Multipath Driver only supports the installation on global-zone.
- “add fs” is only supported when the mplb compatible files is selected for I/O access. “add device” and “add fs ” are supported when the Solaris standard special file is selected.

## 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 the 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 the 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 by which the lpfc driver and the sd driver use devices other than the ETERNUS disk array, the device might be detached. Please attach by RescanLuns of the hbacmd command or reboot the server if the device is detached.

Please refer to HBAnyware User Manual for hbacmd.

## ZFS(Zettabyte File System)

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).
:
```

## 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
```

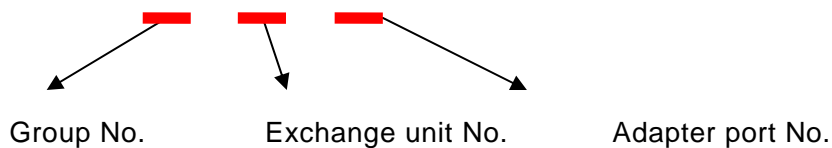
Element :

```
/dev/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 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, DX80

FC interface



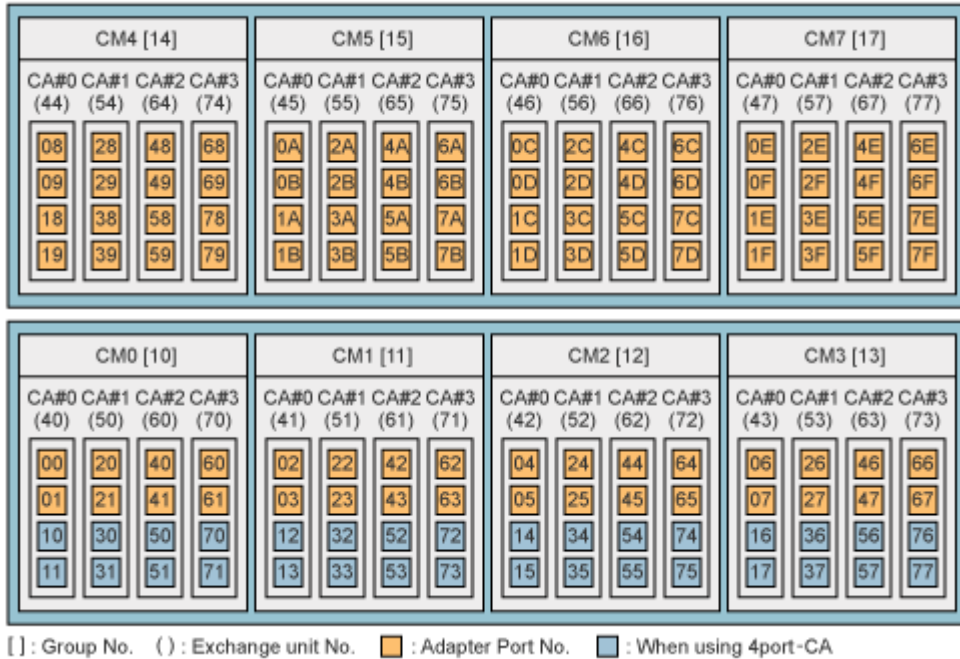
[ ]: Group No. () : Exchange unit No.   : adapter Port No.   : When using 2port-CM

SAS interface

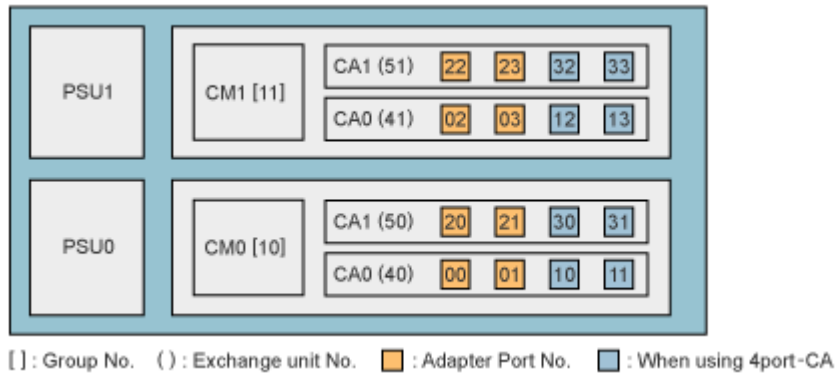


[ ]: Group No. () : Exchange unit No.   : adapter Port No.   : When using 2port-CM

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

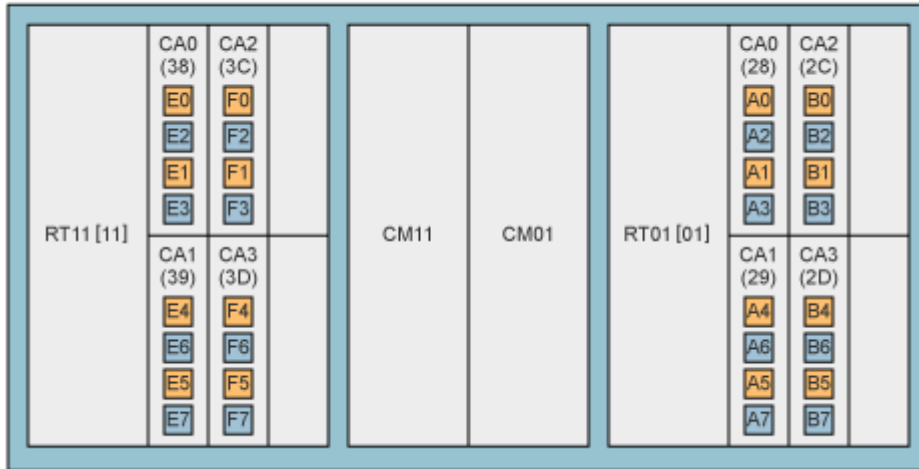


**ETERNUS DX400 series, ETERNUS4000 model 300, 400, 500, 600, ETERNUS8000 model 700, 800**

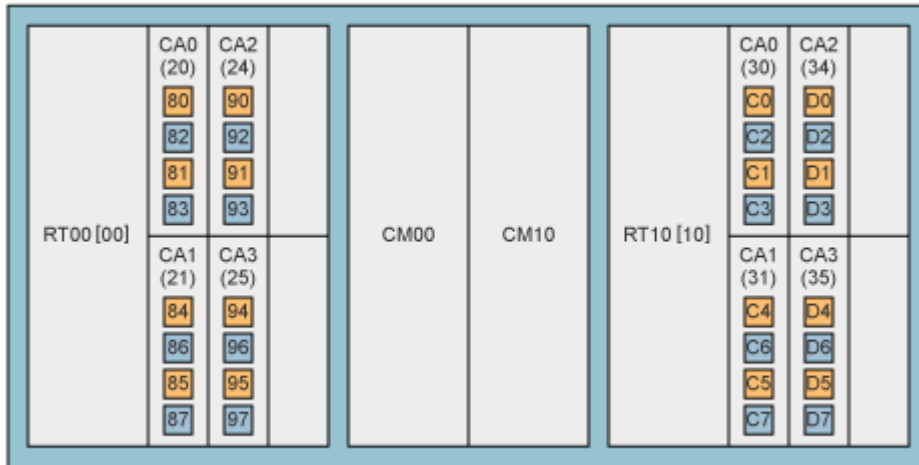


## ETERNUS6000

[ Device Front ]

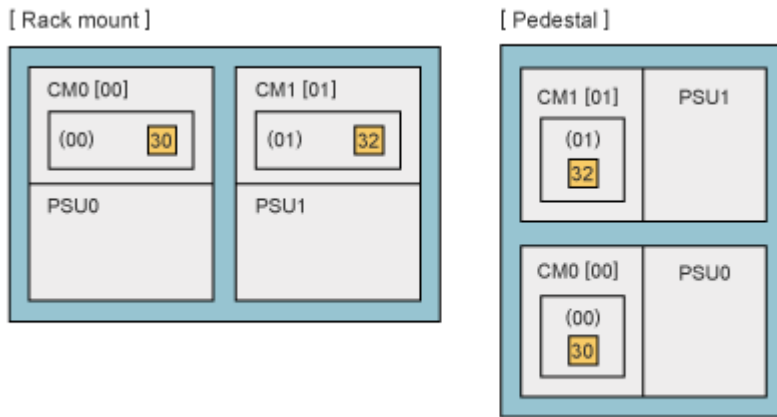


[ Device Rear ]



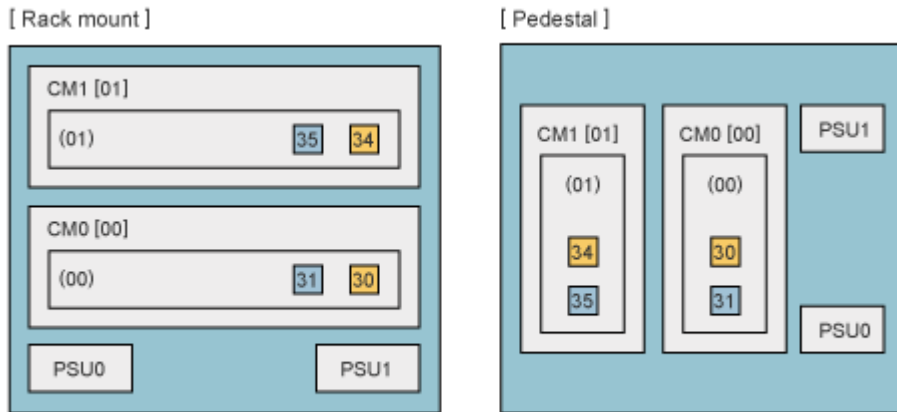
[ ] : Group No. ( ) : Exchange unit No.   : Adapter Port No.   : When using 4port-CA

**ETERNUS3000 model 50, GR710**



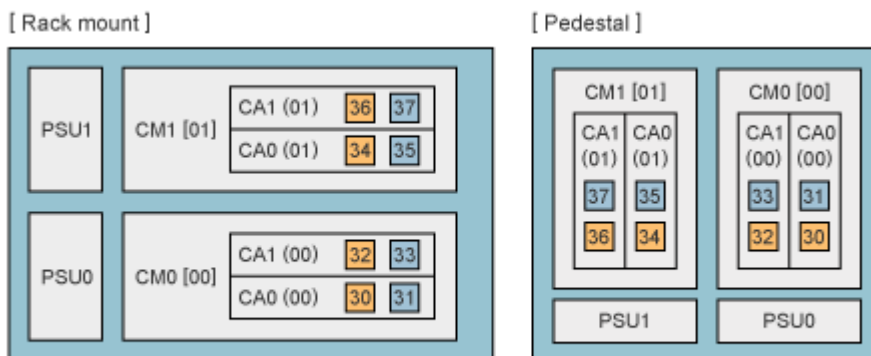
[ ] : Group No. ( ) : Exchange unit No. 30 : Adapter Port No.

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



[ ] : Group No. ( ) : Exchange unit No. 30 : Adapter Port No. 31 : When using 2port-CM

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



[ ] : Group No. ( ) : Exchange unit No. 30 : Adapter Port No. 31 : When using 2port-CA

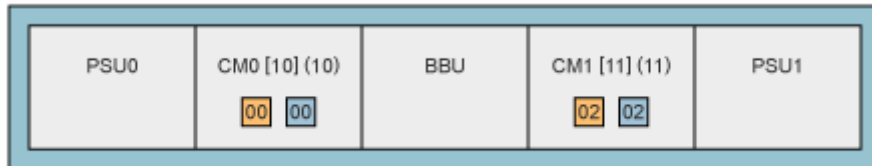
## ETERNUS2000

FC interface



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

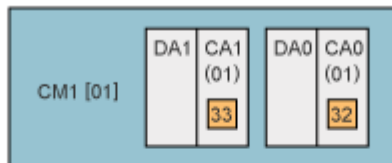
SAS interface



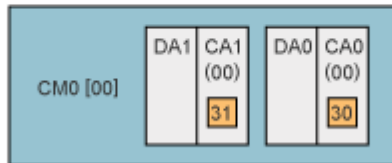
[ ] : Group No. ( ) : Exchange unit No. [ ] : Adapter Port No. [ ] : When using 2port-CA

## GR720 and GR730 Device Rear

[ Upper Compartment ]



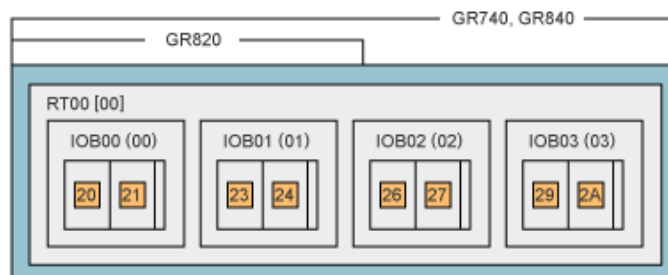
[ Lower Compartment ]



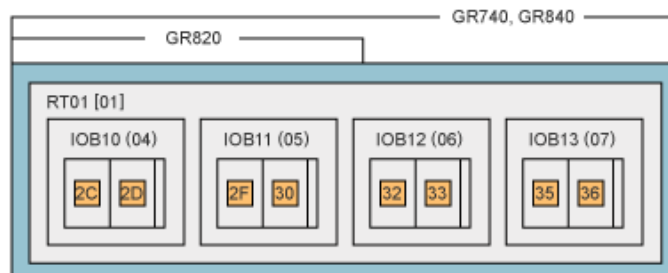
[ ] : Group No. ( ) : Exchange unit No. [ ] : Adapter Port No.

## GR740, GR820, GR840

[ Device Front ]



[ Device Rear ]



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

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