Fujitsu SPARC M12

PCI Card Installation Guide

Manual Code: C120-0047-07EN
August 2018

Contents

Preface

This document describes the mounting rules for PCI cards mounted in the SPARC M12 from Oracle or Fujitsu.

Fujitsu SPARC M12 is sold as SPARC M12 by Fujitsu in Japan.
Fujitsu SPARC M12 and SPARC M12 are identical products.

In this document, Oracle Solaris is also referred to as Solaris.

Audience

This document is designed for system administrators with advanced knowledge of computer networks and Oracle Solaris, the service engineers who are in charge of system maintenance, and field engineers.

Related Documentation

All documents for your server are available online at the following locations.

- Sun Oracle software-related documents (Oracle Solaris, etc.)
  http://docs.oracle.com/en/
- Fujitsu documents
  Global site

  http://www.fujitsu.com/global/products/computing/servers/unix/sparc/downloads/manuals/

  Japanese site

  http://www.fujitsu.com/jp/products/computing/servers/unix/sparc/downloads/manual/

The following table lists documents related to SPARC M12 systems.

Documentation Related to the SPARC M12

Manual Names (*1)
Fujitsu SPARC M12 Product Notes
Fujitsu SPARC M12 Quick Guide
Fujitsu SPARC M12 Getting Started Guide (*2)
Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Important Legal and Safety Information (*2)
Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Safety and Compliance Guide
Software License Conditions for Fujitsu SPARC M12 and Fujitsu M10/SPARC M10
Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Security Guide
Fujitsu SPARC Servers/SPARC Enterprise/PRIMEQUEST Common Installation Planning Manual
Fujitsu SPARC M12-1 Installation Guide
Fujitsu SPARC M12-2 Installation Guide
Fujitsu SPARC M12-2S Installation Guide
Fujitsu SPARC M12 PCI Card Installation Guide
Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 System Operation and Administration Guide
Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide
Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 RCIL User Guide (*3)
Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 XSCF Reference Manual
Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 XSCF MIB and Trap Lists
Fujitsu SPARC M12-1 Service Manual
Fujitsu SPARC M12-2/M12-2S Service Manual
Crossbar Box for Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Service Manual
PCI Expansion Unit for Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Service Manual
Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Glossary
External USB-DVD Drive user guide

*1 The listed manuals are subject to change without notice.
*2 Printed manuals are provided with the product.
*3 This document applies specifically to the SPARC M12/M10 and FUJITSU ETERNUS disk storage system.

Notes on Safety

Read the following documents thoroughly before using or handling the SPARC M12.

- *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Important Legal and Safety Information*
- *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Safety and Compliance Guide*

Text Conventions

This manual uses the following fonts and symbols to express specific types of information.

Font/Symbol	Meaning	Example
AaBbCc123	What you type, when contrasted with on-screen computer output. This font is used to indicate an example of command input.	XSCF> **adduser jsmith**
AaBbCc123	The names of commands, files, and directories; on-screen computer output. This font is used to indicate an example of command output in the frame.	XSCF> **showuser -P** User Name: jsmith Privileges: useradm auditadm
Italic	Indicates the name of a reference manual.	See the *Fujitsu SPARC M12-2S Installation Guide*.
" "	Indicates the names of chapters, sections, items, buttons, or menus.	See "Chapter 2 Network Connection."

Command Syntax in the Text

While the XSCF commands have a section number of (8) or (1), it is omitted from the text.
For details on the commands, see the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 XSCF Reference Manual*.

Syntax of the Command-Line Interface (CLI)

The command syntax is as follows:

- A variable that requires the input of a value is in Italics.
- An optional element is enclosed in [].
- A group of options for an optional keyword is enclosed in [] and delimited by |.

Document Feedback

If you have any comments or requests regarding this document, please take a moment to share them with us. Along with the manual code, manual title, and page number, state your points specifically at one of the following websites:

- Global site
  http://www.fujitsu.com/global/contact/
- Japanese site
  http://www.fujitsu.com/jp/products/computing/servers/unix/sparc/contact/

Chapter 1

PCI Card Mounting Rules for the SPARC M12-1

This chapter describes the maximum number of each type of PCI card mounted in the SPARC M12-1 and the rules on mounting PCI cards in the PCI slots.
Be sure to observe these mounting rules when designing the system, adding a PCI card, or changing the mounting location of a PCI card.

1.1 Prerequisites

1.1.1 Domain OS

The maximum number of each type of mounted PCI card and the available PCI slots vary depending on the version of Oracle Solaris installed on the domain.

- Oracle Solaris 11:
  This is considered the version if the OS versions on the control domain, root domain, and I/O domain are all Oracle Solaris 11.
- Oracle Solaris 10:
  This is considered the version if the OS versions on the control domain, root domain, and I/O domain are all Oracle Solaris 10 or a mixture of Oracle Solaris 11 and Oracle Solaris 10.

  That is, if Oracle Solaris versions are mixed in your environment, apply the rules for Oracle Solaris 10.

When an Oracle Solaris 10 environment is used in the following configurations, however, apply the rules for Oracle Solaris 11.

- A guest domain of an Oracle Solaris 10 environment is configured using the virtual I/O services of a control domain or the root domain of Oracle Solaris 11.
- An Oracle Solaris 10 zone is configured on an Oracle Solaris 11 domain.

If there is any plan to add a root domain or I/O domain running Oracle Solaris 10 after system operation begins, apply the rules for Oracle Solaris 10.

Note - For details on the design of control domain, root domain, and I/O domain configurations, see the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*.

1.2 Maximum Number of Each Type of Mounted PCI Card and Available PCI Slots

For the maximum number of each type of mounted PCI card and the available PCI slots, see Table 1-1 to Table 1-4 according to the domain OS version.

- "Maximum Number Mounted" means the maximum number of PCI cards that can be mounted in the SPARC M12-1 and the PCI expansion unit. The numbers in ( ) indicate the PCI slot numbers where cards can be mounted in the slots of the SPARC M12-1. If there are no ( ), all of the slots are available for mounting. If the PCI expansion unit is available for mounting, all of the PCI slots in the PCI expansion unit are available for mounting.
- The SPARC M12 has an I/O bandwidth of 8 GB/s (simplex) per root complex. The bandwidth between the PCI expansion unit and the SPARC M12 is also 8 GB/s. Therefore, if multiple PCI cards that share root complexes operate at the same time, each PCI card may not demonstrate the maximum performance. If a high-speed communication card requires a certain level of performance, secure the bandwidth with either one of the following actions:
  - Instead of mounting PCI cards in the PCI expansion unit, mount them in the PCI slots of the SPARC M12-1.
  - Do not mount other PCI cards in the PCI slots of the same root complex.

Table 1-1 Maximum Number of Each Type of Mounted PCI Card: SPARC M12-1 Oracle Solaris 11 (Fujitsu Product ID)

Type	Product Name	Product ID	Maximum Number Mounted	
			Without PCI Expansion Unit	With PCI Expansion Unit
Link	PCI expansion unit connection card	-	-	3

Table 1-1 Maximum Number of Each Type of Mounted PCI Card: SPARC M12-1 Oracle Solaris 11 (Fujitsu Product ID) *(continued)*

Type	Product Name	Product ID	Maximum Number Mounted	
			Without PCI Expansion Unit	With PCI Expansion Unit
LAN	Dual Gigabit Ethernet card (MMF)	SP1X7GD2F	3	33
	Quad Gigabit Ethernet card (UTP)	SP1X7GQ2F	3	33
	Dual 10 Gigabit Ethernet card (10GBase-T)	SP1X7HF1F	3	33
	Dual 10 Gigabit Ethernet card	SE1X7HE3G	3	33
	Quad 10 Gigabit Ethernet card	SP1X7HH1F	3	15 (*1)
	40 Gb Ethernet card	SP1X7HG1F	3	33
FCoE	Dual-Channel 10 Gbps FCoE card (for optical cable) (Qlogic)	SP1X7FAR2F	3	33
	Dual-Channel 10 Gbps FCoE card (for Copper Twinax cable) (Qlogic)	SP1X7FAS2F	3	33
FC	Dual-Channel 32 Gbps Fibre Channel card	SP1X7FAC2F	3	33
	Dual-Channel 32 Gbps Fibre Channel card	SP1X7FBC2F	3	33
	Dual-Channel 16 Gbps Fibre Channel card (SR SFP+)	SP1X7FAA2F	3	33
	Dual-Channel 16 Gbps Fibre Channel card (LR SFP+)	SP1X7FAB2F	3	33
	Dual-Channel 16 Gbps Fibre Channel card (SR SFP+)	SP1X7FBA2F	3	33
	Quad-Channel 16 Gbps Fibre Channel card (SR)	SP0X7FAA4F	3	33
SAS	12 Gbps SAS card	SP1X7SA3F	3	33
FLASH	3.2 TB Flash Accelerator Card	SP0X7Y42F	3	33
	Flash Accelerator F320 card	SP1X7Y41F	3	33
IB	Dual Port InfiniBand 4x QDR card	SP1X7BA12F	3	2 Cannot be mounted in the PCI expansion unit

Table 1-1 Maximum Number of Each Type of Mounted PCI Card: SPARC M12-1 Oracle Solaris 11 (Fujitsu Product ID) *(continued)*

Type	Product Name	Product ID	Maximum Number Mounted	
			Without PCI Expansion Unit	With PCI Expansion Unit
Graphic	Graphics card	SP0X7GR1F	1(Slot#2,#0)(*2)	1(Slot#2,#0)(*2) Cannot be mounted in the PCI expansion unit

-: Not applicable
*1 Up to five Quad 10 Gigabit Ethernet cards can be mounted per PCI expansion unit.
*2 If the graphic card is mounted in Slot#0, the cable management arm cannot be used. Therefore, all the cables on the rear need to be removed at server maintenance.

Table 1-2 Maximum Number of Each Type of Mounted PCI Card: SPARC M12-1 Oracle Solaris 11 (Oracle Product ID)

Type	Product Name	Factory-Mounted Product ID When Shipped	Maximum Number Mounted	
		(Expanded-on-Site Product ID)	Without PCI Expansion Unit	With PCI Expansion Unit
Link	Link card kit	7105513 (7105576)	-	3
LAN	Sun Dual Port GbE PCIe 2.0 Low Profile Adapter, MMF	7100482 (7100481)	3	33
	Sun Quad Port GbE PCIe 2.0 Low Profile Adapter, UTP	7100479 (7100477)	3	33
	Sun Dual Port 10GBase-T Adapter	7100563 (7100488)	3	33
	Sun Dual 10 GbE SFP+ PCIe 2.0 Low Profile Adapter	1109A-Z (X1109A-Z)	3	33
	Oracle Quad Port 10GBase-T Adapter	7111182 (7111181)	3	15 (*1)
	Oracle Quad 10 Gb or Dual 40 Gb Ethernet Adapter	7114148 (7114134)	3	33
FC/FCoE	Oracle Storage Dual-Port 32 Gb Fibre Channel PCIe Low Profile HBA, QLogic	7115460 (7115462)	3	33
	Oracle Storage Dual-Port 32 Gb Fibre Channel PCIe Low Profile HBA, Emulex	7115459 (7115461)	3	33
	Sun Storage 16 Gb Fibre Channel PCIe Universal Host Bus Adapter, Qlogic (FC mode)	7101673 (7101674) with 7101675 (7101676)	3	33
	Sun Storage 16 Gb Fibre Channel PCIe Universal Host Bus Adapter, Qlogic (FC mode)	7101673 (7101674) with 7101679 (7101680)	3	33

Table 1-2 Maximum Number of Each Type of Mounted PCI Card: SPARC M12-1 Oracle Solaris 11 (Oracle Product ID) *(continued)*

Type	Product Name	Factory-Mounted Product ID When Shipped (Expanded-on-Site Product ID)	Maximum Number Mounted	
			Without PCI Expansion Unit	With PCI Expansion Unit
	Sun Storage 16 Gb Fibre Channel PCIe Universal Host Bus Adapter, Qlogic (CNA mode)	7101673 (7101674) with 7101677 (7101678) or TwinAx cables	3	33
	Sun Storage 16 Gb Fibre Channel PCIe Universal Host Bus Adapter, Emulex (FC mode)	7101683 (7101684) with 7101685 (7101686)	3	33
SAS	Oracle Storage 12 Gb SAS PCIe HBA	7110118 (7110119)	3	33
FLASH	Fujitsu 3.2 TB Flash Accelerator Card	7119601 (7119603)	3	33
	Oracle Flash Accelerator F320 PCIe Card	7113825 (7113826)	3	33
IB	Oracle Dual Port QDR InfiniBand Adapter M3	7104073 (7104074)	3	2 Cannot be mounted in the PCI expansion unit
Graphic	Raptor GFX 550e (*2)	-	1(Slot#2,#0)(*3)	1(Slot#2,#0)(*3) Cannot be mounted in the PCI expansion unit

-: Not applicable
*1 Up to five Oracle Quad Port 10GBase-T Adapters can be mounted per PCI expansion unit.
*2 Sales Contact
EIZO Rugged Solutions, Inc. (formerly Tech Source, Inc.): ers-info@eizo.com
Shoshin Corporation: is@shoshin.co.jp
The latest driver is available at the EIZO Rugged Solutions, Inc. web site below:
http://www.eizorugged.com/support/drivers/index.html
GFX550e_1.5.tar.Z includes the drivers for Oracle Solaris 11 and Oracle Solaris 10.
*3 If the graphic card is mounted in Slot#0, the cable management arm cannot be used. Therefore, all the cables on the rear need to be removed at server maintenance.

Table 1-3 Maximum Number of Each Type of Mounted PCI Card: SPARC M12-1 Oracle Solaris 10 or a Mixture of Oracle Solaris 10 and 11 (Fujitsu Product ID)

Type	Product Name	Product ID	Maximum Number Mounted	
			Without PCI Expansion Unit	With PCI Expansion Unit
Link	PCI expansion unit connection card	-	-	2 (Slot#0, #2)
LAN	Dual Gigabit Ethernet card (MMF)	SP1X7GD2F	3	23

Table 1-3 Maximum Number of Each Type of Mounted PCI Card: SPARC M12-1 Oracle Solaris 10 or a Mixture of Oracle Solaris 10 and 11 (Fujitsu Product ID) *(continued)*

Type	Product Name	Product ID	Maximum Number Mounted	
			Without PCI Expansion Unit	With PCI Expansion Unit
	Quad Gigabit Ethernet card (UTP)	SP1X7GQ2F	3	23
	Dual 10 Gigabit Ethernet card (10GBase-T)	SP1X7HF1F	3	23 (*1)
	Dual 10 Gigabit Ethernet card	SE1X7HE3G	3	23 (*1)
	Quad 10 Gigabit Ethernet card	SP1X7HH1F	3	11 (*2)
	40 Gb Ethernet card	SP1X7HG1F	3	23
FCoE	Dual-Channel 10 Gbps FCoE card (for optical cable) (Qlogic)	SP1X7FAR2F	3	2 Cannot be mounted in the PCI expansion unit
	Dual-Channel 10 Gbps FCoE card (for Copper Twinax cable) (Qlogic)	SP1X7FAS2F	3	2 Cannot be mounted in the PCI expansion unit
FC	Dual-Channel 32 Gbps Fibre Channel card	SP1X7FAC2F	3	23
	Dual-Channel 32 Gbps Fibre Channel card	SP1X7FBC2F	3	23
	Dual-Channel 16 Gbps Fibre Channel card (SR SFP+)	SP1X7FAA2F	3	23
	Dual-Channel 16 Gbps Fibre Channel card (LR SFP+)	SP1X7FAB2F	3	23
	Dual-Channel 16 Gbps Fibre Channel card (SR SFP+)	SP1X7FBA2F	3	23
	Quad-Channel 16 Gbps Fibre Channel card (SR)	SP0X7FAA4F	3	23
SAS	12 Gbps SAS card	SP1X7SA3F	3	23
FLASH	3.2 TB Flash Accelerator Card	SP0X7Y42F	3	23
	Flash Accelerator F320 card	SP1X7Y41F	3	23
IB	Dual Port InfiniBand 4x QDR card	SP1X7BA12F	3	2 Cannot be mounted in the PCI expansion unit

Table 1-3 Maximum Number of Each Type of Mounted PCI Card: SPARC M12-1 Oracle Solaris 10 or a Mixture of Oracle Solaris 10 and 11 (Fujitsu Product ID) *(continued)*

Type	Product Name	Product ID	Maximum Number Mounted	
			Without PCI Expansion Unit	With PCI Expansion Unit
Graphic	Graphics card	SP0X7GR1F	1(Slot#2,#0)(*3)	1(Slot#2,#0)(*3) Cannot be mounted in the PCI expansion unit

-: Not applicable
*1 If a jumbo frame is used, PCI cards cannot be mounted in the PCI expansion unit.
*2 Up to five Quad 10 Gigabit Ethernet cards can be mounted per PCI expansion unit.
*3 If the graphic card is mounted in Slot#0, the cable management arm cannot be used. Therefore, all the cables on the rear need to be removed at server maintenance.

Table 1-4 Maximum Number of Each Type of Mounted PCI Card: SPARC M12-1 Oracle Solaris 10 or a Mixture of Oracle Solaris 10 and 11 (Oracle Product ID)

Type	Product Name	Factory-Mounted Product ID When Shipped	Maximum Number Mounted	
		(Expanded-on-Site Product ID)	Without PCI Expansion Unit	With PCI Expansion Unit
Link	Link card kit	7105513 (7105576)	-	2 (Slot#0, #2)
LAN	Sun Dual Port GbE PCIe 2.0 Low Profile Adapter, MMF	7100482 (7100481)	3	23
	Sun Quad Port GbE PCIe 2.0 Low Profile Adapter, UTP	7100479 (7100477)	3	23
	Sun Dual Port 10GBase-T Adapter	7100563 (7100488)	3	23 (*1)
	Sun Dual 10 GbE SFP+ PCIe 2.0 Low Profile Adapter	1109A-Z (X1109A-Z)	3	23 (*1)
	Oracle Quad Port 10GBase-T Adapter	7111182 (7111181)	3	11 (*2)
	Oracle Quad 10 Gb or Dual 40 Gb Ethernet Adapter	7114148 (7114134)	3	23
FC/FCoE	Oracle Storage Dual-Port 32 Gb Fibre Channel PCIe Low Profile HBA, QLogic	7115460 (7115462)	3	23
	Oracle Storage Dual-Port 32 Gb Fibre Channel PCIe Low Profile HBA, Emulex	7115459 (7115461)	3	23

Table 1-4 Maximum Number of Each Type of Mounted PCI Card: SPARC M12-1 Oracle Solaris 10 or a Mixture of Oracle Solaris 10 and 11 (Oracle Product ID) *(continued)*

Type	Product Name	Factory-Mounted Product ID When Shipped (Expanded-on-Site Product ID)	Maximum Number Mounted	
			Without PCI Expansion Unit	With PCI Expansion Unit
	Sun Storage 16 Gb Fibre Channel PCIe Universal Host Bus Adapter, Qlogic (FC mode)	7101673 (7101674) with 7101675 (7101676)	3	23
	Sun Storage 16 Gb Fibre Channel PCIe Universal Host Bus Adapter, Qlogic (FC mode)	7101673 (7101674) with 7101679 (7101680)	3	23
	Sun Storage 16 Gb Fibre Channel PCIe Universal Host Bus Adapter, Qlogic (CNA mode)	7101673 (7101674) with 7101677 (7101678) or TwinAx cables	3	2 Cannot be mounted in the PCI expansion unit
	Sun Storage 16 Gb Fibre Channel PCIe Universal Host Bus Adapter, Emulex (FC mode)	7101683 (7101684) with 7101685 (7101686)	3	23
SAS	Oracle Storage 12 Gb SAS PCIe HBA	7110118 (7110119)	3	23
FLASH	Fujitsu 3.2 TB Flash Accelerator Card	7119601 (7119603)	3	23
	Oracle Flash Accelerator F320 PCIe Card	7113825 (7113826)	3	23
IB	Oracle Dual Port QDR InfiniBand Adapter M3	7104073 (7104074)	3	2 Cannot be mounted in the PCI expansion unit

Table 1-4 Maximum Number of Each Type of Mounted PCI Card: SPARC M12-1 Oracle Solaris 10 or a Mixture of Oracle Solaris 10 and 11 (Oracle Product ID) *(continued)*

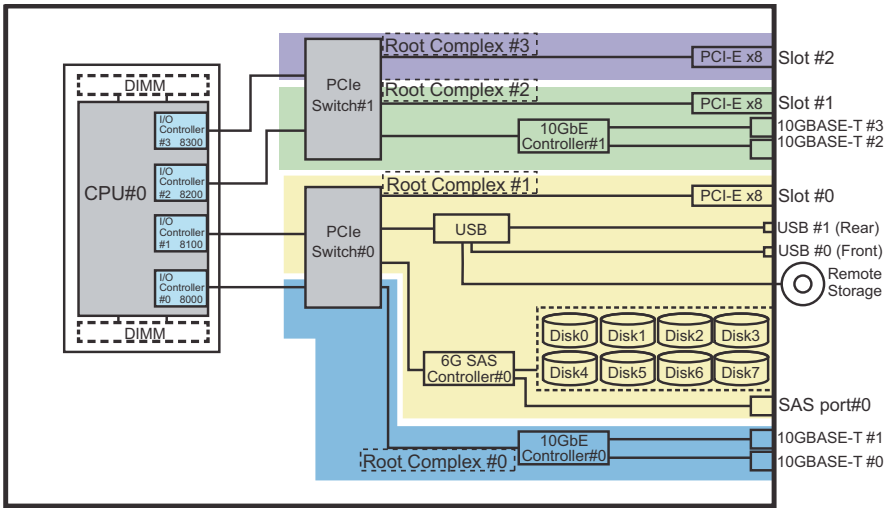
Type	Product Name	Factory-Mounted Product ID When Shipped (Expanded-on-Site Product ID)	Maximum Number Mounted	
			Without PCI Expansion Unit	With PCI Expansion Unit
Graphic	Raptor GFX 550e (*3)	-	1(Slot#2,#0)(*4)	1(Slot#2,#0)(*4) Cannot be mounted in the PCI expansion unit

-: Not applicable
*1 If a jumbo frame is used, PCI cards cannot be mounted in the PCI expansion unit.
*2 Up to five Oracle Quad Port 10GBase-T Adapters can be mounted per PCI expansion unit.
*3 Sales Contact
EIZO Rugged Solutions, Inc. (formerly Tech Source, Inc.): ers-info@eizo.com
Shoshin Corporation: is@shoshin.co.jp
The latest driver is available at the EIZO Rugged Solutions, Inc. web site below:
http://www.eizorugged.com/support/drivers/index.html
GFX550e_1.5.tar.Z includes the drivers for Oracle Solaris 11 and Oracle Solaris 10.
*4 If the graphic card is mounted in Slot#0, the cable management arm cannot be used. Therefore, all the cables on the rear need to be removed at server maintenance.

1.3 Hardware Configuration Diagram

Figure 1-1 is a hardware configuration diagram of the SPARC M12-1.

Figure 1-1 Hardware Configuration Diagram of the SPARC M12-1



Chapter 2

PCI Card Mounting Rules for the SPARC M12-2

This chapter describes the maximum number of each type of PCI card mounted in the SPARC M12-2 and the rules on mounting PCI cards in the PCI slots.
Be sure to observe these mounting rules when designing the system, adding a PCI card, or changing the mounting location of a PCI card.

2.1 Prerequisites

2.1.1 Domain OS

The maximum number of each type of mounted PCI card and the available PCI slots vary depending on the version of Oracle Solaris installed on the domain.

- Oracle Solaris 11:
  This is considered the version if the OS versions on the control domain, root domain, and I/O domain are all Oracle Solaris 11.
- Oracle Solaris 10:
  This is considered the version if the OS versions on the control domain, root domain, and I/O domain are all Oracle Solaris 10 or a mixture of Oracle Solaris 11 and Oracle Solaris 10.

  That is, if Oracle Solaris versions are mixed in your environment, apply the rules for Oracle Solaris 10.

When an Oracle Solaris 10 environment is used in the following configurations, however, apply the rules for Oracle Solaris 11.

- A guest domain of an Oracle Solaris 10 environment is configured using the virtual I/O services of a control domain or the root domain of Oracle Solaris 11.
- An Oracle Solaris 10 zone is configured on an Oracle Solaris 11 domain.

If there is any plan to add a root domain or I/O domain running Oracle Solaris 10 after system operation begins, apply the rules for Oracle Solaris 10.

Note - For details on the design of control domain, root domain, and I/O domain configurations, see the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*.

2.1.2 Number of CPUs and Number of Root Complexes

A root complex consists of an I/O controller mounted on a processor and the PCI switches, PCI devices, etc. under the I/O controller.
The number of root complexes varies depending on the CPU configuration. The maximum number of mounted PCI cards and the available PCI slots vary depending on the number of root complexes.
For cases of CPU module expansion after the installation of equipment to change to the 2-CPU configuration, if the I/O bus is not reconfigured, apply the rules for the 1-CPU configuration.
For details on root complexes, see "2.3 Relationship Between the CPU Configuration and Number of Root Complexes."

Note - For cases of CPU module expansion after the installation of equipment to change to the 2-CPU configuration, the recommended configuration is one with four root complexes. This configuration inherits the I/O bus configuration and mounting rules of the 1-CPU configuration. Changing the configuration into one with eight root complexes increases the maximum number of mounted PCI cards. However, system reconfiguration is required for reconfiguring the I/O bus.

2.2 Maximum Number of Each Type of Mounted PCI Card and Available PCI Slots

For the maximum number of each type of mounted PCI card and the available PCI slots, see Table 2-1 to Table 2-4 according to the domain OS version.

- "Maximum Number Mounted" means the maximum number of PCI cards that can be mounted in the SPARC M12-2 and the PCI expansion unit. The numbers in ( ) indicate the slot numbers where cards can be mounted, among the PCI slots of the

SPARC M12-2. If there are no ( ), all of the slots are available for mounting. If the PCI expansion unit is available for mounting, all of the PCI slots in the PCI expansion unit are available for mounting.

- The maximum number of connectable PCI expansion units is increased in XCP 3040 and later. If the maximum number of each type of mounted PCI card varies before and after XCP 3040, the maximum number of mounted PCI cards with XCP 3030 and earlier is shown in < >.
- The SPARC M12 has an I/O bandwidth of 8 GB/s (simplex) per root complex. The bandwidth between the PCI expansion unit and the SPARC M12 is also 8 GB/s. Therefore, if multiple PCI cards that share root complexes operate at the same time, each PCI card may not demonstrate the maximum performance. If a high-speed communication card requires a certain level of performance, secure the bandwidth with either one of the following actions:
  - Instead of mounting PCI cards in the PCI expansion unit, mount them in the PCI slots of the SPARC M12-2.
  - Do not mount other PCI cards in the PCI slots of the same root complex.

Table 2-1 Maximum Number of Each Type of Mounted PCI Card: SPARC M12-2 Oracle Solaris 11 (Fujitsu Product ID)

Type	Product Name	Product ID	Maximum Number Mounted	
			Without PCI Expansion Unit	With PCI Expansion Unit
Link	PCI expansion unit connection card	-	-	- XCP 3040 or later 1CPU: 4 (Slot#1, #3, #5, #7) 2CPU: 8 (Slot#0, #1, #2, #3, #4, #5, #6, #7) - XCP 3030 or earlier 1CPU: 3 (Slot#1, #3, #5) 2CPU: 6 (Slot#0, #1, #3, #4, #5, #7)
LAN	Dual Gigabit Ethernet card (MMF)	SP1X7GD2F	11	1CPU: 51<41> 2CPU: 91<71>
	Quad Gigabit Ethernet card (UTP)	SP1X7GQ2F	11	1CPU: 51<41> 2CPU: 91<71>
	Dual 10 Gigabit Ethernet card (10GBase-T)	SP1X7HF1F	11	1CPU: 51<41> 2CPU: 91<71>
	Dual 10 Gigabit Ethernet card	SE1X7HE3G	11	1CPU: 51<41> 2CPU: 91<71>
	Quad 10 Gigabit Ethernet card	SP1X7HH1F	11	1CPU: 27<23> (*1) 2CPU: 43<35> (*1)
	40 Gb Ethernet card	SP1X7HG1F	11	1CPU: 51<41> 2CPU: 91<71>

Table 2-1 Maximum Number of Each Type of Mounted PCI Card: SPARC M12-2 Oracle Solaris 11 (Fujitsu Product ID) *(continued)*

Type	Product Name	Product ID	Maximum Number Mounted	
			Without PCI Expansion Unit	With PCI Expansion Unit
FCoE	Dual-Channel 10 Gbps FCoE card (for optical cable) (Qlogic)	SP1X7FAR2F	11	1CPU: 51<41> 2CPU: 91<71>
	Dual-Channel 10 Gbps FCoE card (for Copper Twinax cable) (Qlogic)	SP1X7FAS2F	11	1CPU: 51<41> 2CPU: 91<71>
FC	Dual-Channel 32 Gbps Fibre Channel card	SP1X7FAC2F	11	1CPU: 51<41> 2CPU: 91<71>
	Dual-Channel 32 Gbps Fibre Channel card	SP1X7FBC2F	11	1CPU: 51<41> 2CPU: 91<71>
	Dual-Channel 16 Gbps Fibre Channel card (SR SFP+)	SP1X7FAA2F	11	1CPU: 51<41> 2CPU: 91<71>
	Dual-Channel 16 Gbps Fibre Channel card (LR SFP+)	SP1X7FAB2F	11	1CPU: 51<41> 2CPU: 91<71>
	Dual-Channel 16 Gbps Fibre Channel card (SR SFP+)	SP1X7FBA2F	11	1CPU: 51<41> 2CPU: 91<71>
	Quad-Channel 16 Gbps Fibre Channel card (SR)	SP0X7FAA4F	11	1CPU: 51<41> 2CPU: 91<71>
SAS	12 Gbps SAS card	SP1X7SA3F	11	1CPU: 51<41> 2CPU: 91<71>
FLASH	3.2 TB Flash Accelerator Card	SP0X7Y42F	11	1CPU: 51<41> 2CPU: 91<71>
	Flash Accelerator F320 card	SP1X7Y41F	11	1CPU: 51<41> 2CPU: 91<71>
IB	Dual Port InfiniBand 4x QDR card	SP1X7BA12F	11	10 Cannot be mounted in the PCI expansion unit
Graphic	Graphics card	SP0X7GR1F	1 (Slot#1, #2)	1 (Slot#1, #2) Cannot be mounted in the PCI expansion unit

-: Not applicable
*1 Up to five Quad 10 Gigabit Ethernet cards can be mounted per PCI expansion unit.

Table 2-2 Maximum Number of Each Type of Mounted PCI Card: SPARC M12-2 Oracle Solaris 11 (Oracle Product ID)

Type	Product Name	Factory-Mounted Product ID When Shipped (Expanded-on-Site Product ID)	Maximum Number Mounted Without PCI Expansion Unit	Maximum Number Mounted With PCI Expansion Unit
Link	Link card kit	7105513 (7105576)	-	- XCP 3040 or later 1CPU: 4 (Slot#1, #3, #5, #7) 2CPU: 8 (Slot#0, #1, #2, #3, #4, #5, #6, #7) - XCP 3030 or earlier 1CPU: 3 (Slot#1, #3, #5) 2CPU: 6 (Slot#0, #1, #3, #4, #5, #7)
LAN	Sun Dual Port GbE PCIe 2.0 Low Profile Adapter, MMF	7100482 (7100481)	11	1CPU: 51<41> 2CPU: 91<71>
	Sun Quad Port GbE PCIe 2.0 Low Profile Adapter, UTP	7100479 (7100477)	11	1CPU: 51<41> 2CPU: 91<71>
	Sun Dual Port 10GBase-T Adapter	7100563 (7100488)	11	1CPU: 51<41> 2CPU: 91<71>
	Sun Dual 10 GbE SFP+ PCIe 2.0 Low Profile Adapter	1109A-Z (X1109A-Z)	11	1CPU: 51<41> 2CPU: 91<71>
	Oracle Quad Port 10GBase-T Adapter	7111182 (7111181)	11	1CPU: 27<23> (*1) 2CPU: 43<35> (*1)
	Oracle Quad 10 Gb or Dual 40 Gb Ethernet Adapter	7114148 (7114134)	11	1CPU: 51<41> 2CPU: 91<71>
FC/FCoE	Oracle Storage Dual-Port 32 Gb Fibre Channel PCIe Low Profile HBA, QLogic	7115460 (7115462)	11	1CPU: 51<41> 2CPU: 91<71>
	Oracle Storage Dual-Port 32 Gb Fibre Channel PCIe Low Profile HBA, Emulex	7115459 (7115461)	11	1CPU: 51<41> 2CPU: 91<71>
	Sun Storage 16 Gb Fibre Channel PCIe Universal Host Bus Adapter, Qlogic (FC mode)	7101673 (7101674) with 7101675 (7101676)	11	1CPU: 51<41> 2CPU: 91<71>
	Sun Storage 16 Gb Fibre Channel PCIe Universal Host Bus Adapter, Qlogic (FC mode)	7101673 (7101674) with 7101679 (7101680)	11	1CPU: 51<41> 2CPU: 91<71>

Table 2-2 Maximum Number of Each Type of Mounted PCI Card: SPARC M12-2 Oracle Solaris 11 (Oracle Product ID) *(continued)*

Type	Product Name	Factory-Mounted Product ID When Shipped (Expanded-on-Site Product ID)	Maximum Number Mounted	
			Without PCI Expansion Unit	With PCI Expansion Unit
	Sun Storage 16 Gb Fibre Channel PCIe Universal Host Bus Adapter, Qlogic (CNA mode)	7101673 (7101674) with 7101677 (7101678) or TwinAx cables	11	1CPU: 51<41> 2CPU: 91<71>
	Sun Storage 16 Gb Fibre Channel PCIe Universal Host Bus Adapter, Emulex (FC mode)	7101683 (7101684) with 7101685 (7101686)	11	1CPU: 51<41> 2CPU: 91<71>
SAS	Oracle Storage 12 Gb SAS PCIe HBA	7110118 (7110119)	11	1CPU: 51<41> 2CPU: 91<71>
FLASH	Fujitsu 3.2 TB Flash Accelerator Card	7119601 (7119603)	11	1CPU: 51<41> 2CPU: 91<71>
	Oracle Flash Accelerator F320 PCIe Card	7113825 (7113826)	11	1CPU: 51<41> 2CPU: 91<71>
IB	Oracle Dual Port QDR InfiniBand Adapter M3	7104073 (7104074)	11	10 Cannot be mounted in the PCI expansion unit
Graphic	Raptor GFX 550e (*2)	-	1 (Slot#1, #2)	1 (Slot#1, #2) Cannot be mounted in the PCI expansion unit

-: Not applicable
*1 Up to five Oracle Quad Port 10GBase-T Adapters can be mounted per PCI expansion unit.
*2 Sales Contact
EIZO Rugged Solutions, Inc. (formerly Tech Source, Inc.): ers-info@eizo.com
Shoshin Corporation: is@shoshin.co.jp
The latest driver is available at the EIZO Rugged Solutions, Inc. web site below:
http://www.eizorugged.com/support/drivers/index.html
GFX550e_1.5.tar.Z includes the drivers for Oracle Solaris 11 and Oracle Solaris 10.

Table 2-3 Maximum Number of Each Type of Mounted PCI Card: SPARC M12-2 Oracle Solaris 10 or a Mixture of Oracle Solaris 10 and 11 (Fujitsu Product ID)

Type	Product Name	Product ID	Maximum Number Mounted	
			Without PCI Expansion Unit	With PCI Expansion Unit
Link	PCI expansion unit connection card	-	-	1CPU: 2 (Slot#1, #5) 2CPU: 6 (Slot#0, #1, #3, #4, #5, #7)

Table 2-3 Maximum Number of Each Type of Mounted PCI Card: SPARC M12-2 Oracle Solaris 10 or a Mixture of Oracle Solaris 10 and 11 (Fujitsu Product ID) *(continued)*

Type	Product Name	Product ID	Maximum Number Mounted	
			Without PCI Expansion Unit	With PCI Expansion Unit
LAN	Dual Gigabit Ethernet card (MMF)	SP1X7GD2F	11	1CPU: 31 2CPU: 71
	Quad Gigabit Ethernet card (UTP)	SP1X7GQ2F	11	1CPU: 31 2CPU: 71
	Dual 10 Gigabit Ethernet card (10GBase-T)	SP1X7HF1F	11 (*1)	1CPU: 31 (*2) 2CPU: 71 (*2)
	Dual 10 Gigabit Ethernet card	SE1X7HE3G	11 (*1)	1CPU: 31 (*2) 2CPU: 71 (*2)
	Quad 10 Gigabit Ethernet card	SP1X7HH1F	11	1CPU: 19 (*3) 2CPU: 35 (*3)
	40 Gb Ethernet card	SP1X7HG1F	11	1CPU: 31 2CPU: 71
FCoE	Dual-Channel 10 Gbps FCoE card (for optical cable) (Qlogic)	SP1X7FAR2F	11 (*1)	1CPU: 5 (Slot#0, #1, #3, #4, #5, #7) 2CPU: 10 Cannot be mounted in the PCI expansion unit
	Dual-Channel 10 Gbps FCoE card (for Copper Twinax cable) (Qlogic)	SP1X7FAS2F	11 (*1)	1CPU: 5 (Slot#0, #1, #3, #4, #5, #7) 2CPU: 10 Cannot be mounted in the PCI expansion unit
FC	Dual-Channel 32 Gbps Fibre Channel card	SP1X7FAC2F	11	1CPU: 31 2CPU: 71
	Dual-Channel 32 Gbps Fibre Channel card	SP1X7FBC2F	11	1CPU: 31 2CPU: 71
	Dual-Channel 16 Gbps Fibre Channel card (SR SFP+)	SP1X7FAA2F	11	1CPU: 31 2CPU: 71
	Dual-Channel 16 Gbps Fibre Channel card (LR SFP+)	SP1X7FAB2F	11	1CPU: 31 2CPU: 71
	Dual-Channel 16 Gbps Fibre Channel card (SR SFP+)	SP1X7FBA2F	11	1CPU: 31 2CPU: 71
	Quad-Channel 16 Gbps Fibre Channel card (SR)	SP0X7FAA4F	11	1CPU: 31 2CPU: 71
SAS	12 Gbps SAS card	SP1X7SA3F	11	1CPU: 31 2CPU: 71

Table 2-3 Maximum Number of Each Type of Mounted PCI Card: SPARC M12-2 Oracle Solaris 10 or a Mixture of Oracle Solaris 10 and 11 (Fujitsu Product ID) *(continued)*

Type	Product Name	Product ID	Maximum Number Mounted	
			Without PCI Expansion Unit	With PCI Expansion Unit
FLASH	3.2 TB Flash Accelerator Card	SP0X7Y42F	11	1CPU: 31 2CPU: 71
	Flash Accelerator F320 card	SP1X7Y41F	11	1CPU: 31 2CPU: 71
IB	Dual Port InfiniBand 4x QDR card	SP1X7BA12F	11	10 Cannot be mounted in the PCI expansion unit
Graphic	Graphics card	SP0X7GR1F	1 (Slot#1, #2)	1 (Slot#1, #2) Cannot be mounted in the PCI expansion unit

-: Not applicable
*1 If a jumbo frame is used, the maximum number mounted for the 1-CPU configuration is seven, and the available PCI slots are Slot#0, #1, #3, #4, #5, #7, and #9.
*2 If a jumbo frame is used, the maximum number mounted for the 1-CPU configuration is three, and the available PCI slots are Slot#1, #3, #5, and #7. Both for the 1-CPU configuration and the 2-CPU configuration, PCI cards cannot be mounted in the PCI expansion unit.
*3 Up to five Quad 10 Gigabit Ethernet cards can be mounted per PCI expansion unit.

Table 2-4 Maximum Number of Each Type of Mounted PCI Card: SPARC M12-2 Oracle Solaris 10 or a Mixture of Oracle Solaris 10 and 11 (Oracle Product ID)

Type	Product Name	Factory-Mounted Product ID When Shipped	Maximum Number Mounted	
		(Expanded-on-Site Product ID)	Without PCI Expansion Unit	With PCI Expansion Unit
Link	Link card kit	7105513 (7105576)	-	1CPU: 2 (Slot#1, #5) 2CPU: 6 (Slot#0, #1, #3, #4, #5, #7)
LAN	Sun Dual Port GbE PCIe 2.0 Low Profile Adapter, MMF	7100482 (7100481)	11	1CPU: 31 2CPU: 71
	Sun Quad Port GbE PCIe 2.0 Low Profile Adapter, UTP	7100479 (7100477)	11	1CPU: 31 2CPU: 71
	Sun Dual Port 10GBase-T Adapter	7100563 (7100488)	11 (*1)	1CPU: 31 (*2) 2CPU: 71 (*2)
	Sun Dual 10 GbE SFP+ PCIe 2.0 Low Profile Adapter	1109A-Z (X1109A-Z)	11 (*1)	1CPU: 31 (*2) 2CPU: 71 (*2)
	Oracle Quad Port 10GBase-T Adapter	7111182 (7111181)	11	1CPU: 19 (*3) 2CPU: 35 (*3)

Table 2-4 Maximum Number of Each Type of Mounted PCI Card: SPARC M12-2 Oracle Solaris 10 or a Mixture of Oracle Solaris 10 and 11 (Oracle Product ID) *(continued)*

Type	Product Name	Factory-Mounted Product ID When Shipped (Expanded-on-Site Product ID)	Maximum Number Mounted	
			Without PCI Expansion Unit	With PCI Expansion Unit
	Oracle Quad 10 Gb or Dual 40 Gb Ethernet Adapter	7114148 (7114134)	11	1CPU: 31 2CPU: 71
FC/FCoE	Oracle Storage Dual-Port 32 Gb Fibre Channel PCIe Low Profile HBA, QLogic	7115460 (7115462)	11	1CPU: 31 2CPU: 71
	Oracle Storage Dual-Port 32 Gb Fibre Channel PCIe Low Profile HBA, Emulex	7115459 (7115461)	11	1CPU: 31 2CPU: 71
	Sun Storage 16 Gb Fibre Channel PCIe Universal Host Bus Adapter, Qlogic (FC mode)	7101673 (7101674) with 7101675 (7101676)	11	1CPU: 31 2CPU: 71
	Sun Storage 16 Gb Fibre Channel PCIe Universal Host Bus Adapter, Qlogic (FC mode)	7101673 (7101674) with 7101679 (7101680)	11	1CPU: 31 2CPU: 71
	Sun Storage 16 Gb Fibre Channel PCIe Universal Host Bus Adapter, Qlogic (CNA mode)	7101673 (7101674) with 7101677 (7101678) or TwinAx cables	11 (*1)	1CPU: 5 (Slot#0, #1, #3, #4, #5, #7) 2CPU: 10 Cannot be mounted in the PCI expansion unit
	Sun Storage 16 Gb Fibre Channel PCIe Universal Host Bus Adapter, Emulex (FC mode)	7101683 (7101684) with 7101685 (7101686)	11	1CPU: 31 2CPU: 71
SAS	Oracle Storage 12 Gb SAS PCIe HBA	7110118 (7110119)	11	1CPU: 31 2CPU: 71
FLASH	Fujitsu 3.2 TB Flash Accelerator Card	7119601 (7119603)	11	1CPU: 31 2CPU: 71
	Oracle Flash Accelerator F320 PCIe Card	7113825 (7113826)	11	1CPU: 31 2CPU: 71
IB	Oracle Dual Port QDR InfiniBand Adapter M3	7104073 (7104074)	11	10 Cannot be mounted in the PCI expansion unit

Table 2-4 Maximum Number of Each Type of Mounted PCI Card: SPARC M12-2 Oracle Solaris 10 or a Mixture of Oracle Solaris 10 and 11 (Oracle Product ID) *(continued)*

Type	Product Name	Factory-Mounted Product ID When Shipped (Expanded-on-Site Product ID)	Maximum Number Mounted Without PCI Expansion Unit	With PCI Expansion Unit
Graphic	Raptor GFX 550e (*4)	-	1 (Slot#1, #2)	1 (Slot#1, #2) Cannot be mounted in the PCI expansion unit

-: Not applicable
*1 If a jumbo frame is used, the maximum number mounted for the 1-CPU configuration is seven, and the available PCI slots are Slot#0, #1, #3, #4, #5, #7, and #9.
*2 If a jumbo frame is used, the maximum number mounted for the 1-CPU configuration is three, and the available PCI slots are Slot#1, #3, #5, and #7. Both for the 1-CPU configuration and the 2-CPU configuration, PCI cards cannot be mounted in the PCI expansion unit.
*3 Up to five Oracle Quad Port 10GBase-T Adapters can be mounted per PCI expansion unit.
*4 Sales Contact
EIZO Rugged Solutions, Inc. (formerly Tech Source, Inc.): ers-info@eizo.com
Shoshin Corporation: is@shoshin.co.jp
The latest driver is available at the EIZO Rugged Solutions, Inc. web site below:
http://www.eizorugged.com/support/drivers/index.html
GFX550e_1.5.tar.Z includes the drivers for Oracle Solaris 11 and Oracle Solaris 10.

2.3 Relationship Between the CPU Configuration and Number of Root Complexes

The 1-CPU configuration of the SPARC M12-2 consists of four root complexes, and the 2-CPU configuration consists of four or eight root complexes. A root complex consists of an I/O controller mounted on a processor and the PCI switches, PCI devices, etc. under the I/O controller.

The number of root complexes after on-site CPU module expansion has a default value of 4. It remains at this number by default. In this case, the system configuration can be kept as is since the I/O bus is not reconfigured. The PCI card mounting rules are also inherited, so the same 1-CPU configuration rules apply.

To change the number of root complexes to eight, the system administrator needs to change the XSCF settings to reconfigure the I/O bus. For details on how to set the number, see the man page for the setpparmode(8) command or the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 XSCF Reference Manual*. Changing the number of root complexes to eight increases the maximum number of mounted PCI cards. However, because device path names change with the reconfiguration of the I/O bus, system reconfiguration may be required for any device path name used by an application. An example of this reconfiguration is to set a device path name again.

Table 2-5 Relationship Between the CPU Configuration and Number of Root Complexes

	Ordered Only for Server	Ordered for CPU Module		
		Ordered Together With Server (Mounting at Factory)	Ordered Separately From Server (Expansion on Site)	
			Without I/O Bus Reconfiguration	With I/O Bus Reconfiguration
Number of CPUs	1	2	2	2
Number of root complexes	4	8	4	8

Figure 2-1 is a hardware configuration diagram of the SPARC M12-2 with 1 CPU.
Figure 2-2 is a hardware configuration diagram of the SPARC M12-2 with 2 CPUs.

Figure 2-1 Hardware Configuration Diagram of the SPARC M12-2 With 1 CPU

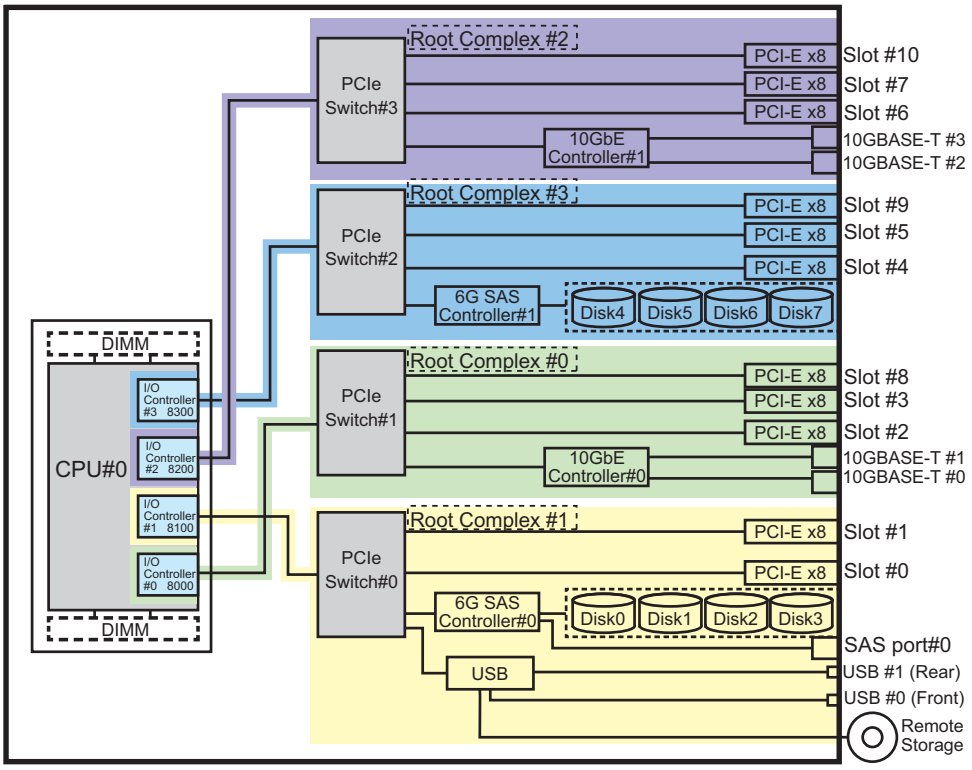
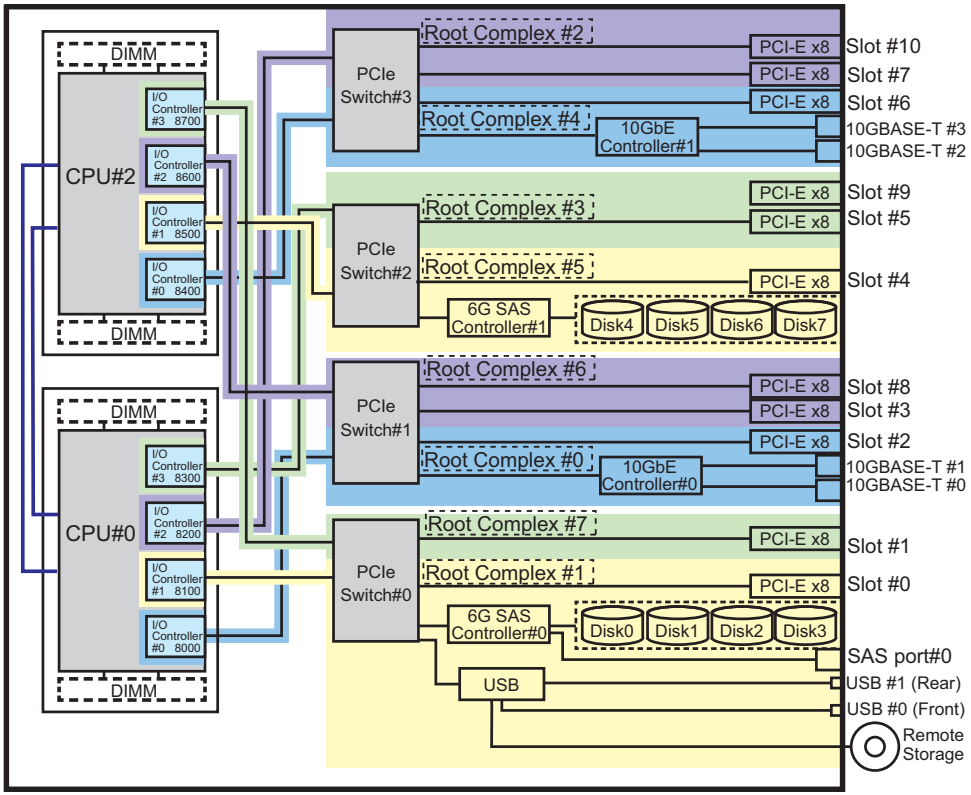


Figure 2-2 Hardware Configuration Diagram of the SPARC M12-2 With 2 CPUs



Chapter 3

PCI Card Mounting Rules for the SPARC M12-2S

This chapter describes the maximum number of each type of PCI card mounted in the SPARC M12-2S and the rules on mounting PCI cards in the PCI slots.
Be sure to observe these mounting rules when designing the system, adding a PCI card, or changing the mounting location of a PCI card.

3.1 Prerequisites

3.1.1 Domain OS

The maximum number of each type of mounted PCI card and the available PCI slots may vary depending on the version of Oracle Solaris installed on the domain.

- Oracle Solaris 11:
  This is considered the version if the OS versions on the control domain, root domain, and I/O domain are all Oracle Solaris 11.
- Oracle Solaris 10:
  This is considered the version if the OS versions on the control domain, root domain, and I/O domain are all Oracle Solaris 10 or a mixture of Oracle Solaris 11 and Oracle Solaris 10.

  That is, if Oracle Solaris versions are mixed in your environment, apply the rules for Oracle Solaris 10.

When an Oracle Solaris 10 environment is used in the following configurations, however, apply the rules for Oracle Solaris 11.

- A guest domain of an Oracle Solaris 10 environment is configured using the virtual I/O services of a control domain or the root domain of Oracle Solaris 11.
- An Oracle Solaris 10 zone is configured on an Oracle Solaris 11 domain.

If there is any plan to add a root domain or I/O domain running Oracle Solaris 10 after system operation begins, apply the rules for Oracle Solaris 10.

Note - For details on the design of control domain, root domain, and I/O domain configurations, see the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 Domain Configuration Guide*.

3.1.2 Number of CPUs and Number of Root Complexes

A root complex consists of an I/O controller mounted on a processor and the PCI switches, PCI devices, etc. under the I/O controller.
The number of root complexes varies depending on the CPU configuration. The maximum number of mounted PCI cards and the available PCI slots vary depending on the number of root complexes.
For cases of CPU module expansion after the installation of equipment to change to the 2-CPU configuration, if the I/O bus is not reconfigured, apply the rules for the 1-CPU configuration.
For details on root complexes, see "3.3 Relationship Between the CPU Configuration and Number of Root Complexes."

Note - For cases of CPU module expansion after the installation of equipment to change to the 2-CPU configuration, the recommended configuration is one with four root complexes. This configuration inherits the I/O bus configuration and mounting rules of the 1-CPU configuration. Changing the configuration into one with eight root complexes increases the maximum number of mounted PCI cards. However, system reconfiguration is required for reconfiguring the I/O bus.

3.2 Maximum Number of Each Type of Mounted PCI Card and Available PCI Slots

For the maximum number of each type of mounted PCI card and the available PCI slots, see Table 3-1 to Table 3-4 according to the domain OS version.

- "Maximum Number Mounted" means the maximum number of PCI cards that can be mounted in the SPARC M12-2S and the PCI expansion unit. The numbers in ( ) indicate the PCI slot numbers where cards can be mounted in the slots of the

SPARC M12-2S. If there are no ( ), all of the slots are available for mounting. If the PCI expansion unit is available for mounting, all of the PCI slots in the PCI expansion unit are available for mounting.

- The maximum number of connectable PCI expansion units is increased in XCP 3040 and later. If the maximum number of each type of mounted PCI card varies before and after XCP 3040, the maximum number of mounted PCI cards with XCP 3030 and earlier is shown in < >.
- The SPARC M12 has an I/O bandwidth of 8 GB/s (simplex) per root complex. The bandwidth between the PCI expansion unit and the SPARC M12 is also 8 GB/s. Therefore, if multiple PCI cards that share root complexes operate at the same time, each PCI card may not demonstrate the maximum performance. If a high-speed communication card requires a certain level of performance, secure the bandwidth with either one of the following actions:
  - Instead of mounting PCI cards in the PCI expansion unit, mount them in the PCI slots of the SPARC M12-2S.
  - Do not mount other PCI cards in the PCI slots of the same root complex.

Table 3-1 Maximum Number of Each Type of Mounted PCI Card: SPARC M12-2S Oracle Solaris 11 (Fujitsu Product ID)

Group	Product Name	Product ID	Maximum Number Mounted	
			Without PCI Expansion Unit	With PCI Expansion Unit
Link	PCI expansion unit connection card	-	-	- XCP 3040 or later 1CPU: 4 (Slot#1, #3, #5, #7) 2CPU: 8 - XCP 3030 or earlier 1CPU: 3 (Slot#1, #3, #5) 2CPU: 5 (Slot#1, #3, #4, #5, #7)
LAN	Dual Gigabit Ethernet card (MMF)	SP1X7GD2F	8	1CPU: 48<38> 2CPU: 88<58>
	Quad Gigabit Ethernet card (UTP)	SP1X7GQ2F	8	1CPU: 48<38> 2CPU: 88<58>
	Dual 10 Gigabit Ethernet card (10GBase-T)	SP1X7HF1F	8	1CPU: 48<38> 2CPU: 88<58>
	Dual 10 Gigabit Ethernet card	SE1X7HE3G	8	1CPU: 48<38> 2CPU: 88<58>
	Quad 10 Gigabit Ethernet card	SP1X7HH1F	4	1CPU: 24<19> (*1) 2CPU: 40<28> (*1)
	40 Gb Ethernet card	SP1X7HG1F	8	1CPU: 48<38> 2CPU: 88<58>
FCoE	Dual-Channel 10 Gbps FCoE card (for optical cable) (Qlogic)	SP1X7FAR2F	8	1CPU: 48<38> 2CPU: 88<58>
	Dual-Channel 10 Gbps FCoE card (for Copper Twinax cable) (Qlogic)	SP1X7FAS2F	8	1CPU: 48<38> 2CPU: 88<58>

Table 3-1 Maximum Number of Each Type of Mounted PCI Card: SPARC M12-2S Oracle Solaris 11 (Fujitsu Product ID) *(continued)*

Group	Product Name	Product ID	Maximum Number Mounted	
			Without PCI Expansion Unit	With PCI Expansion Unit
FC	Dual-Channel 32 Gbps Fibre Channel card	SP1X7FAC2F	8	1CPU: 48<38> 2CPU: 88<58>
	Dual-Channel 32 Gbps Fibre Channel card	SP1X7FBC2F	8	1CPU: 48<38> 2CPU: 88<58>
	Dual-Channel 16 Gbps Fibre Channel card (SR SFP+)	SP1X7FAA2F	8	1CPU: 48<38> 2CPU: 88<58>
	Dual-Channel 16 Gbps Fibre Channel card (LR SFP+)	SP1X7FAB2F	8	1CPU: 48<38> 2CPU: 88<58>
	Dual-Channel 16 Gbps Fibre Channel card (SR SFP+)	SP1X7FBA2F	8	1CPU: 48<38> 2CPU: 88<58>
	Quad-Channel 16 Gbps Fibre Channel card (SR)	SP0X7FAA4F	8	1CPU: 48<38> 2CPU: 88<58>
SAS	12 Gbps SAS card	SP1X7SA3F	8	1CPU: 48<38> 2CPU: 88<58>
FLASH	3.2 TB Flash Accelerator Card	SP0X7Y42F	8	1CPU: 48<38> 2CPU: 88<58>
	Flash Accelerator F320 card	SP1X7Y41F	8	1CPU: 48<38> 2CPU: 88<58>
IB	Dual Port InfiniBand 4x QDR card	SP1X7BA12F	8	7 Cannot be mounted in the PCI expansion unit
Graphic	Graphics card	SP0X7GR1F	1 (Slot#1, #2)	1 (Slot#1, #2) Cannot be mounted in the PCI expansion unit

-: Not applicable
*1 Up to five Quad 10 Gigabit Ethernet cards can be mounted per PCI expansion unit.

Table 3-2 Maximum Number of Each Type of Mounted PCI Card: SPARC M12-2S Oracle Solaris 11 (Oracle Product ID)

Group	Product Name	Factory-Mounted Product ID When Shipped (Expanded-on-Site Product ID)	Maximum Number Mounted: Without PCI Expansion Unit	Maximum Number Mounted: With PCI Expansion Unit
Link	Link card kit	7105513 (7105576)	-	- XCP 3040 or later 1CPU: 4 (Slot#1, #3, #5, #7) 2CPU: 8 - XCP 3030 or earlier 1CPU: 3 (Slot#1, #3, #5) 2CPU: 5 (Slot#1, #3, #4, #5, #7)
LAN	Sun Dual Port GbE PCIe 2.0 Low Profile Adapter, MMF	7100482 (7100481)	8	1CPU: 48<38> 2CPU: 88<58>
	Sun Quad Port GbE PCIe 2.0 Low Profile Adapter, UTP	7100479 (7100477)	8	1CPU: 48<38> 2CPU: 88<58>
	Sun Dual Port 10GBase-T Adapter	7100563 (7100488)	8	1CPU: 48<38> 2CPU: 88<58>
	Sun Dual 10 GbE SFP+ PCIe 2.0 Low Profile Adapter	1109A-Z (X1109A-Z)	8	1CPU: 48<38> 2CPU: 88<58>
	Oracle Quad Port 10GBase-T Adapter	7111182 (7111181)	4	1CPU: 24<19> (*1) 2CPU: 40<28> (*1)
	Oracle Quad 10 Gb or Dual 40 Gb Ethernet Adapter	7114148 (7114134)	8	1CPU: 48<38> 2CPU: 88<58>
FC/FCoE	Oracle Storage Dual-Port 32 Gb Fibre Channel PCIe Low Profile HBA, QLogic	7115460 (7115462)	8	1CPU: 48<38> 2CPU: 88<58>
	Oracle Storage Dual-Port 32 Gb Fibre Channel PCIe Low Profile HBA, Emulex	7115459 (7115461)	8	1CPU: 48<38> 2CPU: 88<58>
	Sun Storage 16 Gb Fibre Channel PCIe Universal Host Bus Adapter, Qlogic (FC mode)	7101673 (7101674) with 7101675 (7101676)	8	1CPU: 48<38> 2CPU: 88<58>
	Sun Storage 16 Gb Fibre Channel PCIe Universal Host Bus Adapter, Qlogic (FC mode)	7101673 (7101674) with 7101679 (7101680)	8	1CPU: 48<38> 2CPU: 88<58>
	Sun Storage 16 Gb Fibre Channel PCIe Universal Host Bus Adapter, Qlogic (CNA mode)	7101673 (7101674) with 7101677 (7101678) or TwinAx cables	8	1CPU: 48<38> 2CPU: 88<58>

Table 3-2 Maximum Number of Each Type of Mounted PCI Card: SPARC M12-2S Oracle Solaris 11 (Oracle Product ID) *(continued)*

Group	Product Name	Factory-Mounted Product ID When Shipped (Expanded-on-Site Product ID)	Maximum Number Mounted	
			Without PCI Expansion Unit	With PCI Expansion Unit
	Sun Storage 16 Gb Fibre Channel PCIe Universal Host Bus Adapter, Emulex (FC mode)	7101683 (7101684) with 7101685 (7101686)	8	1CPU: 48<38> 2CPU: 88<58>
SAS	Oracle Storage 12 Gb SAS PCIe HBA	7110118 (7110119)	8	1CPU: 48<38> 2CPU: 88<58>
FLASH	Fujitsu 3.2 TB Flash Accelerator Card	7119601 (7119603)	8	1CPU: 48<38> 2CPU: 88<58>
	Oracle Flash Accelerator F320 PCIe Card	7113825 (7113826)	8	1CPU: 48<38> 2CPU: 88<58>
IB	Oracle Dual Port QDR InfiniBand Adapter M3	7104073 (7104074)	8	7 Cannot be mounted in the PCI expansion unit
Graphic	Raptor GFX 550e (*2)	-	1 (Slot#1, #2)	1 (Slot#1, #2) Cannot be mounted in the PCI expansion unit

-: Not applicable
*1 Up to five Oracle Quad Port 10GBase-T Adapters can be mounted per PCI expansion unit.
*2 Sales Contact
EIZO Rugged Solutions, Inc. (formerly Tech Source, Inc.): ers-info@eizo.com
Shoshin Corporation: is@shoshin.co.jp
The latest driver is available at the EIZO Rugged Solutions, Inc. web site below:
http://www.eizorugged.com/support/drivers/index.html
GFX550e_1.5.tar.Z includes the drivers for Oracle Solaris 11 and Oracle Solaris 10.

Table 3-3 Maximum Number of Each Type of Mounted PCI Card: SPARC M12-2S Oracle Solaris 10 or a Mixture of Oracle Solaris 10 and 11 (Fujitsu Product ID)

Group	Product Name	Product ID	Maximum Number Mounted	
			Without PCI Expansion Unit	With PCI Expansion Unit
Link	PCI expansion unit connection card	-	-	1CPU: 2 (Slot#1, #5) 2CPU: 5 (Slot#1, #3, #4, #5, #7)
LAN	Dual Gigabit Ethernet card (MMF)	SP1X7GD2F	8	1CPU: 28 2CPU: 58
	Quad Gigabit Ethernet card (UTP)	SP1X7GQ2F	8	1CPU: 28 2CPU: 58

Table 3-3 Maximum Number of Each Type of Mounted PCI Card: SPARC M12-2S Oracle Solaris 10 or a Mixture of Oracle Solaris 10 and 11 (Fujitsu Product ID) *(continued)*

Group	Product Name	Product ID	Maximum Number Mounted	
			Without PCI Expansion Unit	With PCI Expansion Unit
	Dual 10 Gigabit Ethernet card (10GBase-T)	SP1X7HF1F	8 (*1)	1CPU: 28 (*2) 2CPU: 58 (*2)
	Dual 10 Gigabit Ethernet card	SE1X7HE3G	8 (*1)	1CPU: 28 (*2) 2CPU: 58 (*2)
	Quad 10 Gigabit Ethernet card	SP1X7HH1F	4	1CPU: 14 (*3) 2CPU: 28 (*3)
	40 Gb Ethernet card	SP1X7HG1F	8	1CPU: 28 2CPU: 58
FCoE	Dual-Channel 10 Gbps FCoE card (for optical cable) (Qlogic)	SP1X7FAR2F	8 (*1)	7 Cannot be mounted in the PCI expansion unit
	Dual-Channel 10 Gbps FCoE card (for Copper Twinax cable) (Qlogic)	SP1X7FAS2F	8 (*1)	7 Cannot be mounted in the PCI expansion unit
FC	Dual-Channel 32 Gbps Fibre Channel card	SP1X7FAC2F	8	1CPU: 28 2CPU: 58
	Dual-Channel 32 Gbps Fibre Channel card	SP1X7FBC2F	8	1CPU: 28 2CPU: 58
	Dual-Channel 16 Gbps Fibre Channel card (SR SFP+)	SP1X7FAA2F	8	1CPU: 28 2CPU: 58
	Dual-Channel 16 Gbps Fibre Channel card (LR SFP+)	SP1X7FAB2F	8	1CPU: 28 2CPU: 58
	Dual-Channel 16 Gbps Fibre Channel card (SR SFP+)	SP1X7FBA2F	8	1CPU: 28 2CPU: 58
	Quad-Channel 16 Gbps Fibre Channel card (SR)	SP0X7FAA4F	8	1CPU: 28 2CPU: 58
SAS	12 Gbps SAS card	SP1X7SA3F	8	1CPU: 28 2CPU: 58
FLASH	3.2 TB Flash Accelerator Card	SP0X7Y42F	8	1CPU: 28 2CPU: 58
	Flash Accelerator F320 card	SP1X7Y41F	8	1CPU: 28 2CPU: 58
IB	Dual Port InfiniBand 4x QDR card	SP1X7BA12F	8	7 Cannot be mounted in the PCI expansion unit

Table 3-3 Maximum Number of Each Type of Mounted PCI Card: SPARC M12-2S Oracle Solaris 10 or a Mixture of Oracle Solaris 10 and 11 (Fujitsu Product ID) *(continued)*

Group	Product Name	Product ID	Maximum Number Mounted	
			Without PCI Expansion Unit	With PCI Expansion Unit
Graphic	Graphics card	SP0X7GR1F	1 (Slot#1, #2)	1 (Slot#1, #2) Cannot be mounted in the PCI expansion unit

-: Not applicable
*1 If a jumbo frame is used, the maximum number mounted for the 1-CPU configuration is six, and the available PCI slots are Slot#0, #1, #3, #4, #5, and #7.
*2 If a jumbo frame is used, the maximum number mounted for the 1-CPU configuration is three, and the available PCI slots are Slot#1, #3, #5, and #7. Both for the 1-CPU configuration and the 2-CPU configuration, PCI cards cannot be mounted in the PCI expansion unit.
*3 Up to five Quad 10 Gigabit Ethernet cards can be mounted per PCI expansion unit.

Table 3-4 Maximum Number of Each Type of Mounted PCI Card: SPARC M12-2S Oracle Solaris 10 or a Mixture of Oracle Solaris 10 and 11 (Oracle Product ID)

Group	Product Name	Factory-Mounted Product ID When Shipped	Maximum Number Mounted	
		(Expanded-on-Site Product ID)	Without PCI Expansion Unit	With PCI Expansion Unit
Link	Link card kit	7105513 (7105576)	-	1CPU: 2 (Slot#1, #5) 2CPU: 5 (Slot#1, #3, #4, #5, #7)
LAN	Sun Dual Port GbE PCIe 2.0 Low Profile Adapter, MMF	7100482 (7100481)	8	1CPU: 28 2CPU: 58
	Sun Quad Port GbE PCIe 2.0 Low Profile Adapter, UTP	7100479 (7100477)	8	1CPU: 28 2CPU: 58
	Sun Dual Port 10GBase-T Adapter	7100563 (7100488)	8 (*1)	1CPU: 28 (*2) 2CPU: 58 (*2)
	Sun Dual 10 GbE SFP+ PCIe 2.0 Low Profile Adapter	1109A-Z (X1109A-Z)	8 (*1)	1CPU: 28 (*2) 2CPU: 58 (*2)
	Oracle Quad Port 10GBase-T Adapter	7111182 (7111181)	4	1CPU: 14 (*3) 2CPU: 28 (*3)
	Oracle Quad 10 Gb or Dual 40 Gb Ethernet Adapter	7114148 (7114134)	8	1CPU: 28 2CPU: 58
FC/FCoE	Oracle Storage Dual-Port 32 Gb Fibre Channel PCIe Low Profile HBA, QLogic	7115460 (7115462)	8	1CPU: 28 2CPU: 58
	Oracle Storage Dual-Port 32 Gb Fibre Channel PCIe Low Profile HBA, Emulex	7115459 (7115461)	8	1CPU: 28 2CPU: 58

Table 3-4 Maximum Number of Each Type of Mounted PCI Card: SPARC M12-2S Oracle Solaris 10 or a Mixture of Oracle Solaris 10 and 11 (Oracle Product ID) *(continued)*

Group	Product Name	Factory-Mounted Product ID When Shipped (Expanded-on-Site Product ID)	Maximum Number Mounted Without PCI Expansion Unit	Maximum Number Mounted With PCI Expansion Unit
	Sun Storage 16 Gb Fibre Channel PCIe Universal Host Bus Adapter, Qlogic (FC mode)	7101673 (7101674) with 7101675 (7101676)	8	1CPU: 28 2CPU: 58
	Sun Storage 16 Gb Fibre Channel PCIe Universal Host Bus Adapter, Qlogic (FC mode)	7101673 (7101674) with 7101679 (7101680)	8	1CPU: 28 2CPU: 58
	Sun Storage 16 Gb Fibre Channel PCIe Universal Host Bus Adapter, Qlogic (CNA mode)	7101673 (7101674) with 7101677 (7101678) or TwinAx cables	8 (*1)	7 Cannot be mounted in the PCI expansion unit
	Sun Storage 16 Gb Fibre Channel PCIe Universal Host Bus Adapter, Emulex (FC mode)	7101683 (7101684) with 7101685 (7101686)	8	1CPU: 28 2CPU: 58
SAS	Oracle Storage 12 Gb SAS PCIe HBA	7110118 (7110119)	8	1CPU: 28 2CPU: 58
FLASH	Fujitsu 3.2 TB Flash Accelerator Card	7119601 (7119603)	8	1CPU: 28 2CPU: 58
	Oracle Flash Accelerator F320 PCIe Card	7113825 (7113826)	8	1CPU: 28 2CPU: 58
IB	Oracle Dual Port QDR InfiniBand Adapter M3	7104073 (7104074)	8	7 Cannot be mounted in the PCI expansion unit
Graphic	Raptor GFX 550e (*4)	-	1 (Slot#1, #2)	1 (Slot#1, #2) Cannot be mounted in the PCI expansion unit

-: Not applicable

*1 If a jumbo frame is used, the maximum number mounted for the 1-CPU configuration is six, and the available PCI slots are Slot#0, #1, #3, #4, #5, and #7.

*2 If a jumbo frame is used, the maximum number mounted for the 1-CPU configuration is three, and the available PCI slots are Slot#1, #3, #5, and #7. Both for the 1-CPU configuration and the 2-CPU configuration, PCI cards cannot be mounted in the PCI expansion unit.

*3 Up to five Oracle Quad Port 10GBase-T Adapters can be mounted per PCI expansion unit.

*4 Sales Contact

EIZO Rugged Solutions, Inc. (formerly Tech Source, Inc.): ers-info@eizo.com

Shoshin Corporation: is@shoshin.co.jp

The latest driver is available at the EIZO Rugged Solutions, Inc. web site below:

http://www.eizorugged.com/support/drivers/index.html

GFX550e_1.5.tar.Z includes the drivers for Oracle Solaris 11 and Oracle Solaris 10.

3.3 Relationship Between the CPU Configuration and Number of Root Complexes

The 1-CPU configuration of the SPARC M12-2S consists of four root complexes, and the 2-CPU configuration consists of four or eight root complexes. A root complex consists of an I/O controller mounted on a processor and the PCI switches, PCI devices, etc. under the I/O controller.

The number of root complexes after on-site CPU module expansion has a default value of 4. It remains at this number by default. In this case, the system configuration can be kept as is since the I/O bus is not reconfigured. The PCI card mounting rules are also kept, so the same 1-CPU configuration rules apply.

To change the number of root complexes to eight, the system administrator needs to change the XSCF settings to reconfigure the I/O bus. For details on how to set the number, see the man page for the setpparmode(8) command or the *Fujitsu SPARC M12 and Fujitsu M10/SPARC M10 XSCF Reference Manual*. Changing the number of root complexes to eight increases the maximum number of mounted PCI cards. However, because device path names change with the reconfiguration of the I/O bus, system reconfiguration may be required for any device path name used by an application. An example of this reconfiguration is to set a device path name again.

Table 3-5 Relationship Between the CPU Configuration and Number of Root Complexes

	Ordered Only for Server	Ordered for CPU Module		
		Ordered Together With Server (Mounting at Factory)	Ordered Separately From Server (Expansion on Site)	
			Without I/O Bus Reconfiguration	With I/O Bus Reconfiguration
Number of CPUs	1	2	2	2
Number of root complexes	4	8	4	8

Figure 3-1 is a hardware configuration diagram of the SPARC M12-2S with 1 CPU.
Figure 3-2 is a hardware configuration diagram of the SPARC M12-2S with 2 CPUs.

Figure 3-1 Hardware Configuration Diagram of the SPARC M12-2S With 1 CPU

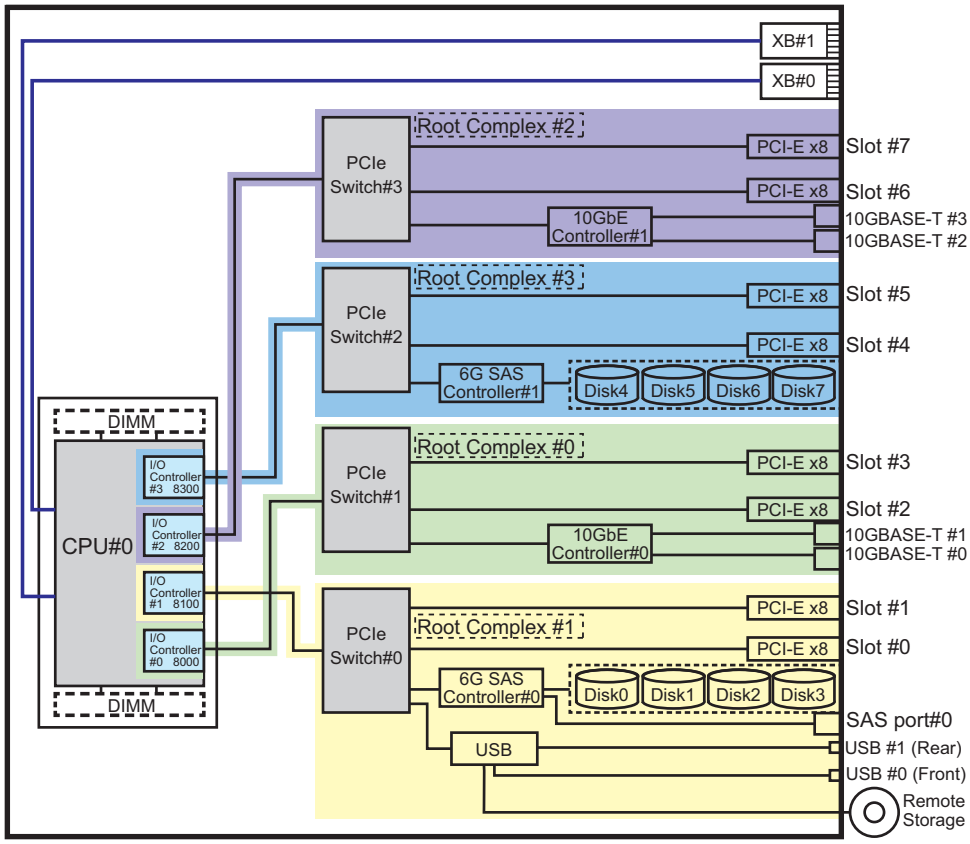
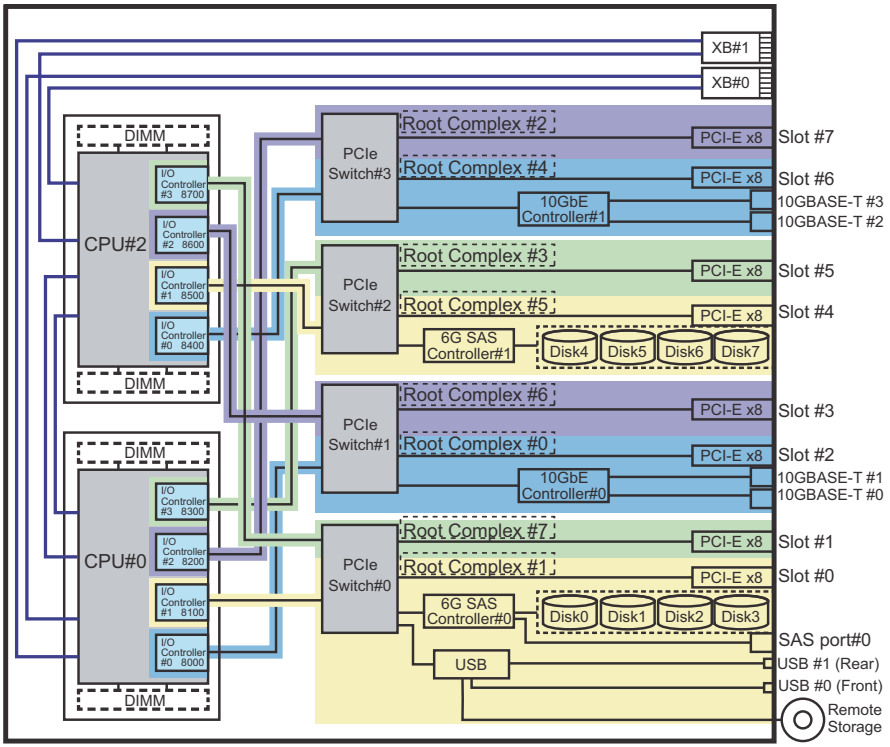


Figure 3-2 Hardware Configuration Diagram of the SPARC M12-2S With 2 CPUs



Chapter 4

Factory-Default Mounting Order of PCI Cards

This chapter describes the factory-default mounting order of PCI cards.

PCI cards ordered together with the SPARC M12 or PCI expansion unit are mounted in each chassis and shipped from the factory according to the rules described in this chapter.
PCI cards are classified into groups A, B, and C, and mounted in the order of mounting priority (from highest to lowest) shown in Table 4-1 or Table 4-2.
In the SPARC M12-1, the PCI cards of each group are mounted in PCI slots in the order shown for PCI slots in Table 4-3.
In the SPARC M12-2, the PCI cards of each group are mounted in PCI slots in the order shown for PCI slots in Table 4-4.
In the SPARC M12-2S, the PCI cards of each group are mounted in PCI slots in the order shown for PCI slots in Table 4-5.
In the PCI expansion unit, PCI cards are mounted in PCI slots according to Table 4-6.
Note that PCI card mounting locations do not necessarily comply with the mounting rules described in this chapter.
Observe the PCI card mounting rules in Chapter 1, Chapter 2, and Chapter 3, and determine the mounting locations.

Note - In Table 4-3, Table 4-4, and Table 4-5, PCI cards in each group cannot be mounted in certain PCI slots, and these PCI slots have mounting order numbers that depend on the Oracle Solaris version, number of CPUs, and availability of a PCI expansion unit connection. In that case, mount in the PCI slots of the following numbers.
Note that the Oracle Solaris versions vary depending on the preinstalled OS versions, and the PCI expansion unit connection availability varies depending on whether or not the PCI expansion unit connection card is ordered together with the server.

Note - The following PCI cards may be shipped mounted in slots not applicable for mounting into a jumbo frame. In that case, move the cards to available slots.
[LAN] SP1X7HF1F, SE1X7HE3G, 7100563, 1109A-Z
[FCoE] SP1X7FAR2F, SP1X7FAS2F, 7101673 (CNA mode)

Table 4-1 Mounting Priority Order of PCI Cards (Fujitsu Product ID)

Group	Product Name	Product ID	Mounting Priority Order
A	PCI expansion unit connection card	SPME8LK1F	High
A	Graphics card	SP0X7GR1F	|
C	Dual Port InfiniBand 4x QDR card	SP1X7BA12F	|
B	Dual-Channel 10 Gbps FCoE card (for optical cable) (Qlogic)	SP1X7FAR2F	|
B	Dual-Channel 10 Gbps FCoE card (for Copper Twinax cable) (Qlogic)	SP1X7FAS2F	|
C	Dual 10 Gigabit Ethernet card	SE1X7HE3G	|
C	Dual 10 Gigabit Ethernet card (10GBase-T)	SP1X7HF1F	|
C	Quad 10 Gigabit Ethernet card	SP1X7HH1F	|
C	40 Gb Ethernet card	SP1X7HG1F	|
C	Dual-Channel 32 Gbps Fibre Channel card	SP1X7FAC2F	|
C	Dual-Channel 32 Gbps Fibre Channel card	SP1X7FBC2F	|
C	Quad-Channel 16 Gbps Fibre Channel card (SR)	SP0X7FAA4F	|
C	Dual-Channel 16 Gbps Fibre Channel card (SR SFP+)	SP1X7FBA2F	|
C	3.2 TB Flash Accelerator Card	SP0X7Y42F	|
C	Flash Accelerator F320 card	SP1X7Y41F	|
C	Dual-Channel 16 Gbps Fibre Channel card (SR SFP+)	SP1X7FAA2F	|
C	Dual-Channel 16 Gbps Fibre Channel card (LR SFP+)	SP1X7FAB2F	|
C	12 Gbps SAS card	SP1X7SA3F	|
C	Quad Gigabit Ethernet card (UTP)	SP1X7GQ2F	|
C	Dual Gigabit Ethernet card (MMF)	SP1X7GD2F	Low

Table 4-2 Mounting Priority Order of PCI Cards (Oracle Product ID)

Group	Product Name	Product ID	Mounting Priority Order
A	Link card kit	7105513	High
C	Oracle Dual Port QDR InfiniBand Adapter M3	7104073	|
B	Sun Storage 16 Gb Fibre Channel PCIe Universal Host Bus Adapter, Qlogic	7101673 (CNA mode)	|
C	Sun Dual 10 GbE SFP+ PCIe 2.0 Low Profile Adapter	1109A-Z	|
C	Sun Dual Port 10GBase-T Adapter	7100563	|
C	Oracle Quad Port 10GBase-T Adapter	7111182	|
C	Oracle Quad 10 Gb or Dual 40 Gb Ethernet Adapter	7114148	|

Table 4-2 Mounting Priority Order of PCI Cards (Oracle Product ID) *(continued)*

Group	Product Name	Product ID	Mounting Priority Order
C	Oracle Storage Dual-Port 32 Gb Fibre Channel PCIe Low Profile HBA, QLogic	7115460	I
C	Oracle Storage Dual-Port 32 Gb Fibre Channel PCIe Low Profile HBA, Emulex	7115459	I
C	Sun Storage 16 Gb Fibre Channel PCIe Universal Host Bus Adapter, Emulex	7101683 with 7101685	I
C	Fujitsu 3.2 TB Flash Accelerator Card	7119601	I
C	Oracle Flash Accelerator F320 PCIe Card	7113825	I
C	Sun Storage 16 Gb Fibre Channel PCIe Universal Host Bus Adapter, Qlogic	7101673 (FC mode)	I
C	Oracle Storage 12 Gb SAS PCIe HBA	7110118	I
C	Sun Quad Port GbE PCIe 2.0 Low Profile Adapter, UTP	7100479	I
C	Sun Dual Port GbE PCIe 2.0 Low Profile Adapter, MMF	7100482	Low

Table 4-3 Mounting Order of PCI Slots in the SPARC M12-1

	Group A		Group B	Group C
	Link Card	Graphics		
Slot#0	1	2	2	2
Slot#1	3	-	1	3
Slot#2	2	1	3	1

-: Cannot be mounted

Table 4-4 Mounting Order of PCI Slots in the SPARC M12-2

	Group A		Group B	Group C
	Link Card	Graphics		
Slot#0	6	-	5	3
Slot#1	1	2	2	10
Slot#2	8	1	10	7
Slot#3	3	-	4	2
Slot#4	5	-	1	4
Slot#5	2	-	11	9
Slot#6	7	-	9	8
Slot#7	4	-	7	1
Slot#8	-	-	6	6

Table 4-4 Mounting Order of PCI Slots in the SPARC M12-2 *(continued)*

	Group A		Group B	Group C
	Link Card	Graphics		
Slot#9	-	-	3	11
Slot#10	-	-	8	5

-: Cannot be mounted

Table 4-5 Mounting Order of PCI Slots in the SPARC M12-2S

	Group A		Group B	Group C
	Link Card	Graphics		
Slot#0	6	-	5	3
Slot#1	1	2	2	8
Slot#2	7	1	7	5
Slot#3	3	-	4	2
Slot#4	5	-	6	4
Slot#5	2	-	1	7
Slot#6	8	-	8	6
Slot#7	4	-	3	1

-: Cannot be mounted

Table 4-6 Mounting Order of PCI Slots in the PCI Expansion Unit

	Common to Group B/C
Slot#1	1
Slot#2	6
Slot#3	7
Slot#4	2
Slot#5	5
Slot#6	8
Slot#7	11
Slot#8	3
Slot#9	4
Slot#10	9
Slot#11	10

Appendix A

List of the Operating Environment of the PCI Cards

This appendix provides lists of the operating environment (minimum supported versions) when PCI cards are used in the SPARC M12.
To use each PCI card in the SPARC M12, use it in an environment that meets the Oracle Solaris version, XCP version, and other listed requirements.
In the Oracle Solaris Zone environment, check the Oracle Solaris version in the global zone. You can use PCI cards there if the global zone meets the requirement, regardless of the Oracle Solaris version in non-global zones.
Table A-1 lists the operating environment of the PCI cards that have Fujitsu product IDs. Table A-2 lists the operating environment of the PCI cards that have Oracle product IDs.

Table A-1 List of the Operating Environment of the PCI Cards (Fujitsu Product ID)

Type	Product Name	Product ID	Oracle Solaris		XCP	Others
			Solaris 11	Solaris 10		
Link	PCI expansion unit connection card	SPME8LK1F	OS-independent	OS-independent	XCP 3021	Supported by PCI expansion unit firmware version 1310 and later
LAN	Dual Gigabit Ethernet card (MMF)	SP1X7GD2F	Solaris 11.1 SRU 1.4	Solaris 10 1/13	XCP 3021	
	Quad Gigabit Ethernet card (UTP)	SP1X7GQ2F	Solaris 11.1 SRU 1.4	Solaris 10 1/13	XCP 3021	
	Dual 10 Gigabit Ethernet card (10GBase-T)	SP1X7HF1F	Solaris 11.1 SRU 1.4	Solaris 10 1/13	XCP 3021	
	Dual 10 Gigabit Ethernet card	SE1X7HE3G	Solaris 11.1 SRU 1.4	Solaris 10 1/13	XCP 3021	

Table A-1 List of the Operating Environment of the PCI Cards (Fujitsu Product ID) *(continued)*

Type	Product Name	Product ID	Oracle Solaris		XCP	Others
			Solaris 11	Solaris 10		
	Quad 10 Gigabit Ethernet card	SP1X7HH1F	Solaris 11.3 SRU 22.3	Not supported	XCP 3021	
	40 Gb Ethernet card	SP1X7HG1F	Solaris 11.3 SRU 8.7	Not supported	XCP 3021	
FCoE	Dual-Channel 10 Gbps FCoE card (for optical cable) (Qlogic)	SP1X7FAR2F	Solaris 11.1 SRU 7.5	Solaris 10 1/13 patch 149167-01, 149175-03	XCP 3021	
	Dual-Channel 10 Gbps FCoE card (for Copper Twinax cable) (Qlogic)	SP1X7FAS2F	Solaris 11.1 SRU 7.5	Solaris 10 1/13 patch 149167-01, 149175-03	XCP 3021	
FC	Dual-Channel 32 Gbps Fibre Channel card	SP1X7FAC2F	Solaris 11.3 SRU 29.5	Not supported	XCP 3021	
	Dual-Channel 32 Gbps Fibre Channel card	SP1X7FBC2F	Solaris 11.3 SRU 23.5	Not supported	XCP 3021	
	Dual-Channel 16 Gbps Fibre Channel card (SR SFP+)	SP1X7FAA2F	Solaris 11.1 SRU 7.5	Solaris 10 1/13 patch 149167-01, 149175-03	XCP 3021	
	Dual-Channel 16 Gbps Fibre Channel card (LR SFP+)	SP1X7FAB2F	Solaris 11.1 SRU 7.5	Solaris 10 1/13 patch 149167-01, 149175-03	XCP 3021	
	Dual-Channel 16 Gbps Fibre Channel card (SR SFP+)	SP1X7FBA2F	Solaris 11.1 SRU 6.4	Solaris 10 1/13 patch 149622-02	XCP 3021	
	Quad-Channel 16 Gbps Fibre Channel card (SR)	SP0X7FAA4F	Solaris 11.3 SRU 29.5	Not supported	XCP 3021	
SAS	12 Gbps SAS card	SP1X7SA3F	Solaris 11.2 SRU 15.5	Not supported	XCP 3021	
FLASH	3.2 TB Flash Accelerator Card	SP0X7Y42F	Solaris 11.3 SRU 28.4	Not supported	XCP 3021	
	Flash Accelerator F320 card	SP1X7Y41F	Solaris 11.3 SRU 10.7	Not supported	XCP 3021	
IB	Dual Port InfiniBand 4x QDR card	SP1X7BA12F	Solaris 11.1 SRU 14.5	Solaris 10 8/11 patch 150400-13	XCP 3021	

Table A-1 List of the Operating Environment of the PCI Cards (Fujitsu Product ID) *(continued)*

Type	Product Name	Product ID	Oracle Solaris		XCP	Others
			Solaris 11	Solaris 10		
Graphic	Graphics card	SP0X7GR1F	Solaris 11.2 SRU 15.5 (*1)	Solaris 10 1/13	XCP 3021	

*1 Oracle Solaris 11.4 and later are not supported. Use the product in an environment with Oracle Solaris 11.3 or earlier.

Table A-2 List of the Operating Environment of the PCI Cards (Oracle Product ID)

Type	Product Name	Factory-Mounted Product ID When Shipped	Oracle Solaris		XCP	Others
		(Expanded-on-Site Product ID)	Solaris 11	Solaris 10		
Link	Link card kit	7105513 (7105576)	OS-independent	OS-independent	XCP 3021	Supported by PCI expansion unit firmware version 1310 and later
LAN	Sun Dual Port GbE PCIe 2.0 Low Profile Adapter, MMF	7100482 (7100481)	Solaris 11.1 SRU 1.4	Solaris 10 1/13	XCP 3021	
	Sun Quad Port GbE PCIe 2.0 Low Profile Adapter, UTP	7100479 (7100477)	Solaris 11.1 SRU 1.4	Solaris 10 1/13	XCP 3021	
	Sun Dual Port 10GBase-T Adapter	7100563 (7100488)	Solaris 11.1 SRU 1.4	Solaris 10 1/13	XCP 3021	
	Sun Dual 10 GbE SFP+ PCIe 2.0 Low Profile Adapter	1109A-Z (X1109A-Z)	Solaris 11.1 SRU 1.4	Solaris 10 1/13	XCP 3021	
	Oracle Quad Port 10GBase-T Adapter	7111182 (7111181)	Solaris 11.3 SRU 22.3	Not supported	XCP 3021	
	Oracle Quad 10 Gb or Dual 40 Gb Ethernet Adapter	7114148 (7114134)	Solaris 11.3 SRU 8.7	Not supported	XCP 3021	

Table A-2 List of the Operating Environment of the PCI Cards (Oracle Product ID) *(continued)*

Type	Product Name	Factory-Mounted Product ID When Shipped (Expanded-on-Site Product ID)	Oracle Solaris		XCP	Others
			Solaris 11	Solaris 10		
FC/FCoE	Oracle Storage Dual-Port 32 Gb Fibre Channel PCIe Low Profile HBA, QLogic	7115460 (7115462)	Solaris 11.3 SRU 29.5	Not supported	XCP 3021	
	Oracle Storage Dual-Port 32 Gb Fibre Channel PCIe Low Profile HBA, Emulex	7115459 (7115461)	Solaris 11.3 SRU 23.5	Not supported	XCP 3021	
	Sun Storage 16 Gb Fibre Channel PCIe Universal Host Bus Adapter, Qlogic	7101673 (7101674) with 7101675 (7101676)	Solaris 11.1 SRU 7.5	Solaris 10 1/13 patch 149167-01, 149175-03	XCP 3021	
	Sun Storage 16 Gb Fibre Channel PCIe Universal Host Bus Adapter, Qlogic	7101673 (7101674) with 7101679 (7101680)	Solaris 11.1 SRU 7.5	Solaris 10 1/13 patch 149167-01, 149175-03	XCP 3021	
	Sun Storage 16 Gb Fibre Channel PCIe Universal Host Bus Adapter, Qlogic	7101673 (7101674) with 7101677 (7101678) or TwinAx cables	Solaris 11.1 SRU 7.5	Solaris 10 1/13 patch 149167-01, 149175-03	XCP 3021	
	Sun Storage 16 Gb Fibre Channel PCIe Universal Host Bus Adapter, Emulex	7101683 (7101684) with 7101685 (7101686)	Solaris 11.1 SRU 6.4	Solaris 10 1/13 patch 149622-02	XCP 3021	
SAS	Oracle Storage 12 Gb SAS PCIe HBA	7110118 (7110119)	Solaris 11.2 SRU 15.5	Not supported	XCP 3021	Card firmware: 06.00.00.00
FLASH	Fujitsu 3.2 TB Flash Accelerator Card	7119601 (7119603)	Solaris 11.3 SRU 28.4	Not supported	XCP 3021	
	Oracle Flash Accelerator F320 PCIe Card	7113825 (7113826)	Solaris 11.3 SRU 10.7	Not supported	XCP 3021	

Table A-2 List of the Operating Environment of the PCI Cards (Oracle Product ID) *(continued)*

Type	Product Name	Factory-Mounted Product ID When Shipped (Expanded-on-Site Product ID)	Oracle Solaris		XCP	Others
			Solaris 11	Solaris 10		
IB	Oracle Dual Port QDR InfiniBand Adapter M3	7104073 (7104074)	Solaris 11.1 SRU 14.5	Solaris 10 8/11 patch 150400-13	XCP 3021	
Graphic	Raptor GFX 550e	-	Solaris 11.2 SRU 15.5 (*1)	Solaris 10 1/13	XCP 3021	

-: Not applicable
*1 Oracle Solaris 11.4 and later are not supported. Use the product in an environment with Oracle Solaris 11.3 or earlier.

Appendix B

Cards That Support PCI Hot Plug and Dynamic Reconfiguration

This appendix describes cards that support PCI Hot Plug and dynamic reconfiguration. The SPARC M12 on-board PCI slots and the PCI expansion unit support active replacement and active addition of PCI cards using PCI Hot Plug (PHP).
The SPARC M12 supports the physical partition dynamic reconfiguration (DR) function. If a card that does not support the dynamic reconfiguration (DR) function is mounted in a physical partition, the physical partition cannot be dynamically reconfigured. In that case, perform replacement or maintenance in the inactive state.
Table B-1 lists the PHP/DR supporting cards that have Fujitsu product IDs. Table B-2 lists the PHP/DR supporting cards that have Oracle product IDs.

Table B-1 Cards That Support PHP/DR (Fujitsu Product ID)

Category	Name	Product ID	Driver Name Software Product Name	PHP: PCI Hot Plug		DR: Dynamic Reconfiguration			Path Redundancy Software
				Active Replacement	Active Addition	Active Replacement	Active Addition	Suspend/ Resume Processing Time (*1)	
Link	PCI expansion unit connection card	SPME8LK1F	None	Supported	Supported (*2)	Supported	Supported	0.1 sec. (*3)	None
LAN	Dual Gigabit Ethernet card (MMF)	SP1X7GD2F	igb	Supported	Supported	To be supported			Oracle Solaris standard multi-path function (IPMP), or PRIMECLUSTER GLS 4.3A20 or later
	Quad Gigabit Ethernet card (UTP)	SP1X7GQ2F	igb	Supported	Supported	Supported	Supported	0.8 sec.	
	Dual 10 Gigabit Ethernet card	SE1X7HE3G	ixgbe	Supported	Supported	Supported (*4)	Supported (*4)	0.4 sec.	
	Dual 10 Gigabit Ethernet card (10GBase-T)	SP1X7HF1F	ixgbe	Supported	Supported	Supported (*4)	Supported (*4)	0.4 sec.	

Table B-1 Cards That Support PHP/DR (Fujitsu Product ID) *(continued)*

Category	Name	Product ID	Driver Name Software Product Name	PHP: PCI Hot Plug		DR: Dynamic Reconfiguration			Path Redundancy Software
				Active Replacement	Active Addition	Active Replacement	Active Addition	Suspend/ Resume Processing Time (*1)	
	Quad 10 Gigabit Ethernet card	SP1X7HH1F	i40e	Supported	Not supported	Supported (*4)	Supported (*4)	1.0 sec.	
	Dual 40 Gigabit Ethernet card	SP1X7HG1F	i40e	Supported (*5)	Not supported	Supported (*5)	Supported (*5)	1.5 sec.	
FCoE	Dual-Channel 10 Gbps FCoE card (for optical cable)	SP1X7FAR2F	qlc, qlcnic	Not supported	Not supported	Supported (*6)	Supported (*6)	20 sec. (*7)	Network redundancy: Oracle Solaris standard multi-path function (IPMP) FC redundancy: Oracle Solaris standard multi-path function (mpxio) or ETERNUS multi-path driver 3.1.0 or later
	Dual-Channel 10 Gbps FCoE card (for Copper Twinax cable)	SP1X7FAS2F	qlc, qlcnic	Not supported	Not supported	Supported (*6)	Supported (*6)	20 sec. (*7)	
FC	Dual-Channel 32 Gbps Fibre Channel card	SP1X7FAC2F	qlc	Supported	Supported	Not supported	Not supported	-	
	Dual-Channel 32 Gbps Fibre Channel card	SP1X7FBC2F	emlxs	Supported	Supported	Supported	Supported	37 sec. (*9)	

Table B-1 Cards That Support PHP/DR (Fujitsu Product ID) *(continued)*

Category	Name	Product ID	Driver Name Software Product Name	PHP: PCI Hot Plug		DR: Dynamic Reconfiguration			Path Redundancy Software
				Active Replacement	Active Addition	Active Replacement	Active Addition	Suspend/ Resume Processing Time (*1)	
	Dual-Channel 16 Gbps Fibre Channel card (SR SFP+)	SP1X7FAA2F	qlc	Supported	Supported (*8)	Supported	Supported	20 sec. (*7)	Oracle Solaris standard multi-path function (mpxio) or ETERNUS multi-path driver 3.1.0 or later
	Dual-Channel 16 Gbps Fibre Channel card (LR SFP+)	SP1X7FAB2F	qlc	Supported	Supported (*8)	Supported	Supported	20 sec. (*7)	
	Dual-Channel 16 Gbps Fibre Channel card (SR SFP+)	SP1X7FBA2F	emlxs	Supported	Supported	Supported	Supported	37 sec. (*9)	
	Quad-Channel 16 Gbps Fibre Channel card (SR)	SP0X7FAA4F	qlc	Supported	Supported	Not supported	Not supported	-	
SAS	12 Gbps SAS card	SP1X7SA3F	lsc	Supported (*10)	Supported (*10)	Supported (*11)	Supported (*11)	2 sec.	Oracle Solaris standard multi-path function (mpxio)
FLASH	3.2 TB Flash Accelerator Card	SP0X7Y42F	nvme	Not supported	Not supported	Not supported	Not supported	-	
	Flash Accelerator F320 card	SP1X7Y41F	nvme	Not supported	Not supported	Not supported	Not supported	-	
Infini Band	Dual Port InfiniBand 4x QDR card	SP1X7BA12F	hermon	Not supported	Not supported	Not supported	Not supported	-	Oracle Solaris standard multi-path function (IPMP)

Table B-1 Cards That Support PHP/DR (Fujitsu Product ID) *(continued)*

Category	Name	Product ID	Driver Name Software Product Name	PHP: PCI Hot Plug		DR: Dynamic Reconfiguration			Path Redundancy Software
				Active Replacement	Active Addition	Active Replacement	Active Addition	Suspend/ Resume Processing Time (*1)	
Graphic	Graphics card	SP0X7GR1F	mko (TSI)	Not supported	Not supported	Not supported	Not supported	-	None

-: Not applicable
*1 The suspend/resume processing time means the time required for the suspend/resume processing per PCI card. Calculate the total suspend/resume processing time for the PCI cards to be used.
*2 Supported by Oracle Solaris 11.2 SRU 11.2.2.8.0 and later and Oracle Solaris 10 1/13 150400-18 and later.
*3 Add up the suspend/resume processing time for all the PCI cards mounted in the PCI expansion unit.
*4 In a configuration that uses this card to assign SR-IOV (VF), DR is restricted.
*5 In 2x40 mode or 2x2x10 mode, the root domain must be restarted because the QCU tool is used to switch modes.
*6 To use the Ethernet function (qlcnic driver) in Oracle Solaris 10, apply patch 149167-07 or later.
*7 When the suspend/resume processing occurs as the port is being linked up, it takes about 3 seconds with a 1-port card and about 5 seconds with a 2-port card.
*8 Immediately after active addition of the PCI expansion unit, active addition of this card using PHP to the PCI expansion unit is not possible.
*9 The processing time for each card is 10 seconds in Oracle Solaris 11.3 or later and Oracle Solaris 10 1/13 149173-06 or later.
*10 Active addition and active replacement of the PCI expansion unit are not possible.
*11 Supported by Oracle Solaris 11.3 and later.

Table B-2 Cards That Support PHP/DR (Oracle Product ID)

Category	Name	Factory-Mounted Product ID When Shipped (Expanded-on-Site Product ID)	Driver Name Software Product Name	PHP: PCI Hot Plug		DR: Dynamic Reconfiguration			Path Redundancy Software
				Active Replacement	Active Addition	Active Replacement	Active Addition	Suspend/ Resume Processing Time (*1)	
Link	Link card kit	7105513 (7105576)	None	Supported	Supported (*2)	Supported	Supported	0.1 sec. (*3)	None
LAN	Sun Dual Port GbE PCIe 2.0 Low Profile Adapter, MMF	7100482 (7100481)	igb	Supported	Supported	To be supported			Oracle Solaris standard multi-path function (IPMP)
	Sun Quad Port GbE PCIe 2.0 Low Profile Adapter, UTP	7100479 (7100477)	igb	Supported	Supported	Supported	Supported	0.8 sec.	
	Sun Dual Port 10GBase-T Adapter	7100563 (7100488)	ixgbe	Supported	Supported	Supported (*4)	Supported (*4)	0.4 sec.	

Table B-2 Cards That Support PHP/DR (Oracle Product ID) *(continued)*

Category	Name	Factory-Mounted Product ID When Shipped (Expanded-on-Site Product ID)	Driver Name Software Product Name	PHP: PCI Hot Plug		DR: Dynamic Reconfiguration			Path Redundancy Software
				Active Replacement	Active Addition	Active Replacement	Active Addition	Suspend/Resume Processing Time (*1)	
	Sun Dual 10 GbE SFP+ PCIe 2.0 Low Profile Adapter	1109A-Z (X1109A-Z)	ixgbe	Supported	Supported	Supported (*4)	Supported (*4)	0.4 sec.	
	Oracle Quad Port 10GBase-T Adapter	7111182 (7111181)	i40e	Supported	Not supported	Supported (*4)	Supported (*4)	1.0 sec.	
	Oracle Quad 10 Gb or Dual 40 Gb Ethernet Adapter	7114148 (7114134)	i40e	Supported (*5)	Not supported	Supported (*5)	Supported (*5)	1.5 sec.	
FCoE/FC	Oracle Storage Dual-Port 32 Gb Fibre Channel PCIe Low Profile HBA, QLogic	7115460 (7115462)	qlc	Supported	Supported	Not supported	Not supported	-	
	Oracle Storage Dual-Port 32 Gb Fibre Channel PCIe Low Profile HBA, Emulex	7115459 (7115461)	emlxs	Supported	Supported	Supported	Supported	37 sec. (*9)	
	Sun Storage 16 Gb Fibre Channel PCIe Universal Host Bus Adapter, Qlogic	7101673 (7101674)	-	-	-	-	-	-	Oracle Solaris standard multi-path function (IPMP), and Oracle Solaris standard multi-path function (mpxio)
	with the 16 Gb FC short wave optics	with 7101675 (7101676)	qlc	Supported	Supported (*6)	Supported	Supported	20 sec. (*7)	
	with the 16 Gb FC long wave optics	with 7101679 (7101680)	qlc	Supported	Supported (*6)	Supported	Supported	20 sec. (*7)	
	with the 10 Gb FCoE short reach optics or TwinAx cables	with 7101677 (7101678) or TwinAx cables	qlc, qlcnic	Supported	Supported (*6)	Supported (*8)	Supported (*8)	20 sec. (*7)	

Table B-2 Cards That Support PHP/DR (Oracle Product ID) *(continued)*

Category	Name	Factory-Mounted Product ID When Shipped (Expanded-on-Site Product ID)	Driver Name Software Product Name	PHP: PCI Hot Plug		DR: Dynamic Reconfiguration			Path Redundancy Software
				Active Replacement	Active Addition	Active Replacement	Active Addition	Suspend/Resume Processing Time (*1)	
	Sun Storage 16 Gb Fibre Channel PCIe Universal Host Bus Adapter, Emulex	7101683 (7101684)	-	-	-	-	-	-	
	with the 16 Gb FC short wave optics	with 7101685 (7101686)	emlxs	Supported	Supported	Supported	Supported	37 sec. (*9)	
SAS	Oracle Storage 12 Gb SAS PCIe HBA, external: 8 port	7110118 (7110119)	lsc	Supported (*10)	Supported (*10)	Supported (*11)	Supported (*11)	2 sec.	Oracle Solaris standard multi-path function (mpxio)
FLASH	Fujitsu 3.2 TB Flash Accelerator Card	7119601 (7119603)	nvme	Not supported	Not supported	Not supported	Not supported	-	
	Oracle Flash Accelerator F320 PCIe Card	7113825 (7113826)	nvme	Not supported	Not supported	Not supported	Not supported	-	

Table B-2 Cards That Support PHP/DR (Oracle Product ID) *(continued)*

Category	Name	Factory-Mounted Product ID When Shipped (Expanded-on-Site Product ID)	Driver Name Software Product Name	PHP: PCI Hot Plug		DR: Dynamic Reconfiguration			Path Redundancy Software
				Active Replacement	Active Addition	Active Replacement	Active Addition	Suspend/Resume Processing Time (*1)	
IB	Oracle Dual Port QDR InfiniBand Adapter M3	7104073 (7104074)	hermon	Not supported	Not supported	Not supported	Not supported	-	Oracle Solaris standard multi-path function (IPMP), and Oracle Solaris standard multi-path function (mpxio)

-: Not applicable
*1 Apply the total suspend/resume processing time for the PCI cards to be used.
*2 Supported by Oracle Solaris 11.2 SRU 11.2.2.8.0 and later and Oracle Solaris 10 1/13 150400-18 and later.
*3 Add the suspend/resume processing time for all the PCI cards mounted in the PCI expansion unit to the suspend/resume processing time for the link card.
*4 In a configuration that uses this card to assign SR-IOV (VF), DR is restricted.
*5 In 2x40 mode or 2x2x10 mode, the root domain must be restarted because the QCU tool is used to switch modes.
*6 Immediately after active addition of the PCI expansion unit, active addition of this card using PHP to the PCI expansion unit is not possible.
*7 When the suspend/resume processing occurs as the port is being linked up, it takes about 3 seconds with a 1-port card and about 5 seconds with a 2-port card.
*8 To use the Ethernet function (qlcnic driver) in Oracle Solaris 10, apply patch 149167-07 or later.
*9 The processing time for each card is 10 seconds in Oracle Solaris 11.3 or later and Oracle Solaris 10 1/13 149173-06 or later.
*10 Active addition and active replacement of the PCI expansion unit are not possible.
*11 Supported by Oracle Solaris 11.3 and later.

Appendix C

Cards/On-Board Devices That Support SR-IOV

This appendix describes cards and on-board devices that support SR-IOV.
Use Oracle Solaris 11.1 or later on all logical domains to use the SR-IOV function. The logical domains of Oracle Solaris 10 have the following restrictions.

- The root domain does not support the SR-IOV function (Oracle VM Server for SPARC 3.2).
- The I/O domain does not support the SR-IOV function (Oracle VM Server for SPARC 3.3).

Therefore, use Oracle Solaris 11.1 or later with all logical domains to use the SR-IOV function. For details, see the *Oracle VM Server for SPARC 3.3 Administration Guide*.

Table C-1 lists the SR-IOV supporting cards that have Fujitsu product IDs. Table C-2 lists the SR-IOV supporting cards that have Oracle product IDs.

Table C-1 Cards That Support SR-IOV (Fujitsu Product ID)

Category	Name	Product ID	Driver Name Software Product Name	I/O Domain Resiliency
LAN	Dual Gigabit Ethernet card (MMF)	SP1X7GD2F	Oracle Solaris (igb)	Supported (*3)
	Quad Gigabit Ethernet card (UTP)	SP1X7GQ2F	Oracle Solaris (igb)	Supported (*3)
	Dual 10 Gigabit Ethernet card	SE1X7HE3G	Oracle Solaris (ixgbe)	Supported (*3)
	Dual 10 Gigabit Ethernet card (10GBase-T)	SP1X7HF1F	Oracle Solaris (ixgbe)	Supported (*3)
	Quad 10 Gigabit Ethernet card	SP1X7HH1F	Oracle Solaris (i40e)	Supported (*4)
	Dual 40 Gigabit Ethernet card	SP1X7HG1F	Oracle Solaris (i40e)	Supported
InfiniBand (*1)	Dual Port InfiniBand 4x QDR card	SP1X7BA12F	Oracle Solaris (hermon)	Not supported
FC (*2)	Dual-Channel 32 Gbps Fibre Channel card	SP1X7FBC2F	Oracle Solaris (emlxs)	Not supported (*5)

Table C-1 Cards That Support SR-IOV (Fujitsu Product ID) *(continued)*

Category	Name	Product ID	Driver Name Software Product Name	I/O Domain Resiliency
	Dual-Channel 16 Gbps Fibre Channel card (SR SFP+)	SP1X7FAA2F	Oracle Solaris (qlc)	Supported (*6)
	Dual-Channel 16 Gbps Fibre Channel card (LR SFP+)	SP1X7FAB2F	Oracle Solaris (qlc)	Supported (*6)
	Dual-Channel 16 Gbps Fibre Channel card (SR SFP+)	SP1X7FBA2F	Oracle Solaris (emlxs)	Supported (*7)

*1 An InfiniBand switch that supports SR-IOV is required. For details, see the *Oracle VM Server for SPARC 3.3 Administration Guide*.
*2 For details on the Fibre Channel SR-IOV, see the *Oracle VM Server for SPARC 3.3 Administration Guide*.
*3 Oracle Solaris 11.2 SRU 11.2.8.4.0 or later supports the card.
*4 The following conditions must be met in order to use the Quad 10Gigabit Ethernet card in an SR-IOV environment.
- The ID of the applied PCIe card firmware patch is 27397966.
- The OS version on the root domain that has the Physical Function (PF) is Solaris 11.3.22.3.0 or later.
- The OS version on the I/O domain that has the Virtual Function (VF) is Solaris 11.3.27.4.0 or later.
*5 A configuration with I/O root domain redundancy cannot be built using the multi-path function for I/O domains.
*6 Oracle Solaris 11.2 SRU 11.2.8.4.0 or later supports the card.
*7 Oracle Solaris 11.2 SRU 11.2.11.5.0 or later supports the card.

Table C-2 Cards That Support SR-IOV (Oracle Product ID)

Category	Name	Factory-Mounted Product ID When Shipped (Expanded-on-Site Product ID)	Driver Name Software Product Name	I/O Domain Resiliency
LAN	Sun Dual Port GbE PCIe 2.0 Low Profile Adapter, MMF	7100482 (7100481)	Oracle Solaris (igb)	Supported (*3)
	Sun Quad Port GbE PCIe 2.0 Low Profile Adapter, UTP	7100479 (7100477)	Oracle Solaris (igb)	Supported (*3)
	Sun Dual Port 10GBase-T Adapter	7100563 (7100488)	Oracle Solaris (ixgbe)	Supported (*3)
	Sun Dual 10 GbE SFP+ PCIe 2.0 Low Profile Adapter	1109A-Z (X1109A-Z)	Oracle Solaris (ixgbe)	Supported (*3)
	Oracle Quad Port 10GBase-T Adapter	7111182 (7111181)	Oracle Solaris (i40e)	Supported (*4)
	Oracle Quad 10 Gb or Dual 40 Gb Ethernet Adapter	7114148 (7114134)	Oracle Solaris (i40e)	Supported
InfiniBand (*1)	Oracle Dual Port QDR InfiniBand Adapter M3	7104073 (7104074)	Oracle Solaris (hermon)	Not supported
FC (*2)	Oracle Storage Dual-Port 32 Gb Fibre Channel PCIe Low Profile HBA, Emulex	7115459 (7115461)	Oracle Solaris (emlxs)	Not supported (*5)

Table C-2 Cards That Support SR-IOV (Oracle Product ID) *(continued)*

Category	Name	Factory-Mounted Product ID When Shipped (Expanded-on-Site Product ID)	Driver Name Software Product Name	I/O Domain Resiliency
	Sun Storage 16 Gb Fibre Channel PCIe Universal Host Bus Adapter, Emulex with the 16 Gb FC short wave optics with emlxs	7101683 (7101684) +7101685 (7101686)	Oracle Solaris (emlxs)	Supported (*6)
	Sun Storage 16 Gb Fibre Channel PCIe Universal Host Bus Adapter, Qlogic with the 16 Gb FC short wave optics	7101673 (7101674) + 7101675 (7101676)	Oracle Solaris (qlc)	Supported (*7)
	Sun Storage 16 Gb Fibre Channel PCIe Universal Host Bus Adapter, Qlogic with the 16 Gb FC longwave optics	7101673 (7101674) + +7101679 (7101680)	Oracle Solaris (qlc)	Supported (*7)

*1 An InfiniBand switch that supports SR-IOV is required. For details, see the *Oracle VM Server for SPARC 3.3 Administration Guide*.
*2 For details on the Fibre Channel SR-IOV, see the *Oracle VM Server for SPARC 3.3 Administration Guide*.
*3 Oracle Solaris 11.2 SRU 11.2.8.4.0 or later supports the card.
*4 The following conditions must be met in order to use the Oracle Quad Port 10GBase-T Adapter in an SR-IOV environment.
- The ID of the applied PCIe card firmware patch is 27397966.
- The OS version on the root domain that has the Physical Function (PF) is Solaris 11.3.22.3.0 or later.
- The OS version on the I/O domain that has the Virtual Function (VF) is Solaris 11.3.27.4.0 or later.
*5 A configuration with I/O root domain redundancy cannot be built using the multi-path function for I/O domains.
*6 Oracle Solaris 11.2 SRU 11.2.11.5.0 or later supports the card.
*7 Oracle Solaris 11.2 SRU 11.2.8.4.0 or later supports the card.

Table C-3 shows the on-board device that supports SR-IOV.

Table C-3 On-board Device That Supports SR-IOV

Category	Name	Driver Name Software Product Name	I/O Domain Resiliency
On-board	On-board LAN (10 GbE)	Oracle Solaris (ixgbe)	Supported

Table C-4 lists the numbers of PFs (Physical Functions)/VFs (Virtual Functions) on the SR-IOV supporting cards that have Fujitsu product IDs. Table C-5 lists the numbers of PFs/VFs on the SR-IOV supporting cards that have Oracle product IDs.

Table C-4 Numbers of PFs/VFs on the SR-IOV Supporting Cards (Fujitsu Product ID)

Category	Name	Product ID	Number of PFs/Card (*1)	Number of VFs/PF (*2)	Number of VFs/Domain (*3)
LAN	Dual Gigabit Ethernet card (MMF)	SP1X7GD2F	2	7	7 (Solaris 11) 6 (Solaris 10)
	Quad Gigabit Ethernet card (UTP)	SP1X7GQ2F	4	7	7 (Solaris 11) 3 (Solaris 10)

Table C-4 Numbers of PFs/VFs on the SR-IOV Supporting Cards (Fujitsu Product ID) *(continued)*

Category	Name	Product ID	Number of PFs/Card (*1)	Number of VFs/PF (*2)	Number of VFs/Domain (*3)
	Dual 10 Gigabit Ethernet card	SE1X7HE3G	2	63	63 (Solaris 11) 1 (Solaris 10)
	Dual 10 Gigabit Ethernet card (10GBase-T)	SP1X7HF1F	2	63	63 (Solaris 11) 1 (Solaris 10)
	Quad 10 Gigabit Ethernet card	SP1X7HH1F	2	63	63 (Solaris 11)
	Dual 40 Gigabit Ethernet card	SP1X7HG1F	2 (2 x 40 Gbps) 4 (4 x 10 Gbps, 2 x 2 x 10 Gbps)	63 (2 x 40G) 31 (4 x 10G, 2 x 2 x 10G)	63 (Solaris 11)
InfiniBand	Dual Port InfiniBand 4x QDR card	SP1X7BA12F	1	63	63 (Solaris 11) 12 (Solaris 10)
FC	Dual-Channel 32 Gbps Fibre Channel card	SP1X7FBC2F	2	16	16 (Solaris 11)
	Dual-Channel 16 Gbps Fibre Channel card (SR SFP+)	SP1X7FAA2F	2	16	16 (Solaris 11) 8 (Solaris 10)
	Dual-Channel 16 Gbps Fibre Channel card (LR SFP+)	SP1X7FAB2F	2	16	16 (Solaris 11) 8 (Solaris 10)
	Dual-Channel 16 Gbps Fibre Channel card (SR SFP+)	SP1X7FBA2F	2	8	8 (Solaris 11) 4 (Solaris 10)

*1 The number of PFs created for each card
*2 The number of VFs created for each PF
*3 The number of VFs assigned from each PF/card for a domain of Oracle Solaris 10 or Oracle Solaris 11 Note that support for the SR-IOV I/O domain in Oracle Solaris 10 has been eliminated in Oracle VM Server for SPARC 3.3. Therefore, use Oracle Solaris 11.1 or later with all logical domains to use the SR-IOV function.

Table C-5 Numbers of PFs/VFs on the SR-IOV Supporting Cards (Oracle Product ID)

Category	Name	Factory-Mounted Product ID When Shipped (Expanded-on-Site Product ID)	Number of PFs/Card (*1)	Number of VFs/PF (*2)	Number of VFs/Domain (*3)
LAN	Sun Dual Port GbE PCIe 2.0 Low Profile Adapter, MMF	7100482 (7100481)	2	7	7 (Solaris 11) 6 (Solaris 10)
	Sun Quad Port GbE PCIe 2.0 Low Profile Adapter, UTP	7100479 (7100477)	4	7	7 (Solaris 11) 3 (Solaris 10)
	Sun Dual Port 10GBase-T Adapter	7100563 (7100488)	2	63	63 (Solaris 11) 1 (Solaris 10)
	Sun Dual 10 GbE SFP+ PCIe 2.0 Low Profile Adapter	1109A-Z (X1109A-Z)	2	63	63 (Solaris 11) 1 (Solaris 10)

Table C-5 Numbers of PFs/VFs on the SR-IOV Supporting Cards (Oracle Product ID) *(continued)*

Category	Name	Factory-Mounted Product ID When Shipped (Expanded-on-Site Product ID)	Number of PFs/Card (*1)	Number of VFs/PF (*2)	Number of VFs/Domain (*3)
	Oracle Quad Port 10GBase-T Adapter	7111182 (7111181)	2	63	63 (Solaris 11)
	Oracle Quad 10 Gb or Dual 40 Gb Ethernet Adapter	7114148 (7114134)	2 (2 x 40 Gbps) 4 (4 x 10 Gbps, 2 x 2 x 10 Gbps)	63 (2 x 40G) 31 (4 x 10G, 2 x 2 x 10G)	63 (Solaris 11)
InfiniBand	Oracle Dual Port QDR InfiniBand Adapter M3	7104073 (7104074)	1	63	63 (Solaris 11) 12 (Solaris 10)
FC	Oracle Storage Dual-Port 32 Gb Fibre Channel PCIe Low Profile HBA, Emulex	7115459 (7115461)	2	16	16 (Solaris 11)
	Sun Storage 16 Gb Fibre Channel PCIe Universal Host Bus Adapter, Qlogic with the 16 Gb FC short wave optics	7101673 (7101674) + 7101675 (7101676)	2	16	16 (Solaris 11) 8 (Solaris 10)
	Sun Storage 16 Gb Fibre Channel PCIe Universal Host Bus Adapter, Qlogic with the 16 Gb FC long wave optics	7101673 (7101674) + 7101679 (7101680)	2	16	16 (Solaris 11) 8 (Solaris 10)
	Sun Storage 16 Gb Fibre Channel PCIe Universal Host Bus Adapter, Emulex with the 16 Gb FC short wave optics with emlxs	7101683 (7101684) + 7101685 (7101686)	2	8	8 (Solaris 11) 4 (Solaris 10)

*1 The number of PFs created for each card
*2 The number of VFs created for each PF
*3 The number of VFs assigned from each PF/card for a domain of Oracle Solaris 10 or Oracle Solaris 11 Note that support for the SR-IOV I/O domain in Oracle Solaris 10 has been eliminated in Oracle VM Server for SPARC 3.3. Therefore, use Oracle Solaris 11.1 or later with all logical domains to use the SR-IOV function.

Table C-6 lists the numbers of PFs/VFs on the SR-IOV supporting on-board device.

Table C-6 Numbers of PFs/VFs on the SR-IOV Supporting On-board Device

Category	Name	Number of PFs	Number of VFs/PF (*1)	Number of VFs/Domain (*2)
LAN	On-board LAN (10 GbE)	4	63	63 (Solaris 11) 1 (Solaris 10)

*1 The number of VFs created for each PF

*2 The number of VFs assigned from each PF/card for a domain of Oracle Solaris 10 or Oracle Solaris 11 Note that support for the SR-IOV I/O domain in Oracle Solaris 10 has been eliminated in Oracle VM Server for SPARC 3.3. Therefore, use Oracle Solaris 11.1 or later with all logical domains to use the SR-IOV function.

Appendix D

Cards/On-Board Devices That Support Assignment of PCIe End Point Devices (PCIe Cards)

This appendix describes the cards and on-board devices that support assignment of PCIe end point devices (in units of PCIe cards and I/O controllers) by using the direct I/O function on the SPARC M12.
Dynamic reassignment of the PCIe end point devices is possible with OVM 3.1.1 or later.
For details on this function, see the *Oracle VM Server for SPARC 3.1 Release Notes*.
Table D-1 lists the supporting cards that have Fujitsu product IDs. Table D-2 lists the supporting cards that have Oracle product IDs.

Table D-1 Cards That Support Assignment of PCIe End Point Devices (PCIe Cards) (Fujitsu Product ID)

Category	Name	Product ID	Dynamic Assignment OVM 3.1.1 or Later	Static Assignment OVM 3.1 or Later	Static Assignment OVM 3.0
Link	PCI expansion unit connection card	SPME8LK1F	Not supported	Not supported	Not supported
LAN	Dual Gigabit Ethernet card (MMF)	SP1X7GD2F	Supported	Supported	Supported
	Quad Gigabit Ethernet card (UTP)	SP1X7GQ2F	Supported	Supported	Supported
	Dual 10 Gigabit Ethernet card	SE1X7HE3G	Supported	Supported	Supported
	Dual 10 Gigabit Ethernet card (10GBase-T)	SP1X7HF1F	Supported	Supported	Supported
	Quad 10 Gigabit Ethernet card	SP1X7HH1F	Not supported	Not supported	Not supported
	Dual 40 Gigabit Ethernet card	SP1X7HG1F	Not supported	Not supported	Not supported
FCoE	Dual-Channel 10 Gbps FCoE card (for optical cable)	SP1X7FAR2F	Not supported	Supported	Not supported
	Dual-Channel 10 Gbps FCoE card (for Copper Twinax cable)	SP1X7FAS2F	Not supported	Supported	Not supported

Table D-1 Cards That Support Assignment of PCIe End Point Devices (PCIe Cards) (Fujitsu Product ID) *(continued)*

Category	Name	Product ID	Dynamic Assignment OVM 3.1.1 or Later	Static Assignment OVM 3.1 or Later	Static Assignment OVM 3.0
FC	Dual-Channel 32 Gbps Fibre Channel card	SP1X7FAC2F	Not supported	Not supported	Not supported
	Dual-Channel 32 Gbps Fibre Channel card	SP1X7FBC2F	Not supported	Not supported	Not supported
	Dual-Channel 16 Gbps Fibre Channel card (SR SFP+)	SP1X7FAA2F	Supported	Supported	Not supported
	Dual-Channel 16 Gbps Fibre Channel card (LR SFP+)	SP1X7FAB2F	Supported	Supported	Not supported
	Dual-Channel 16 Gbps Fibre Channel card (SR SFP+)	SP1X7FBA2F	Supported	Supported	Not supported
	Quad-Channel 16 Gbps Fibre Channel card (SR)	SP0X7FAA4F	Not supported	Not supported	Not supported
SAS	12 Gbps SAS card	SP1X7SA3F	Not supported	Not supported	Not supported
FLASH	3.2 TB Flash Accelerator Card	SP0X7Y42F	Not supported	Not supported	Not supported
	Flash Accelerator F320 card	SP1X7Y41F	Not supported	Not supported	Not supported
	Dual Port InfiniBand 4x QDR card	SP1X7BA12F	Not supported	Not supported	Not supported

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Table D-2 Cards That Support Assignment of PCIe End Point Devices (PCIe Cards) (Oracle Product ID)

Category	Name	Factory-Mounted Product ID When Shipped (Expanded-on-Site Product ID)	Dynamic Assignment OVM 3.1.1 or Later	Static Assignment OVM 3.1 or Later	Static Assignment OVM 3.0
Link	Link card kit	7105513 (7105576)	Not supported	Not supported	Not supported
LAN	Sun Dual Port GbE PCIe 2.0 Low Profile Adapter, MMF	7100482 (7100481)	Supported	Supported	Supported
	Sun Quad Port GbE PCIe 2.0 Low Profile Adapter, UTP	7100479 (7100477)	Supported	Supported	Supported
	Sun Dual Port 10GBase-T Adapter	7100563 (7100488)	Supported	Supported	Supported
	Sun Dual 10 GbE SFP+ PCIe 2.0 Low Profile Adapter	1109A-Z (X1109A-Z)	Supported	Supported	Supported

Table D-2 Cards That Support Assignment of PCIe End Point Devices (PCIe Cards) (Oracle Product ID) *(continued)*

Category	Name	Factory-Mounted Product ID When Shipped (Expanded-on-Site Product ID)	Dynamic Assignment OVM 3.1.1 or Later	Static Assignment OVM 3.1 or Later	Static Assignment OVM 3.0
	Oracle Quad Port 10GBase-T Adapter	7111182 (7111181)	Not supported	Not supported	Not supported
	Oracle Quad 10 Gb or Dual 40 Gb Ethernet Adapter	7114148 (7114134)	Not supported	Not supported	Not supported
FCoE/FC	Oracle Storage Dual-Port 32 Gb Fibre Channel PCIe Low Profile HBA, QLogic	7115460 (7115462)	Not supported	Not supported	Not supported
	Oracle Storage Dual-Port 32 Gb Fibre Channel PCIe Low Profile HBA, Emulex	7115459 (7115461)	Not supported	Not supported	Not supported
	Sun Storage 16 Gb Fibre Channel PCIe Universal Host Bus Adapter Qlogic	7101673 (7101674)	-	-	-
	with the 16 Gb FC short wave optics	with 7101675 (7101676)	Supported	Supported	Not supported
	with the 16 Gb FC long wave optics	with 7101679 (7101680)	Supported	Supported	Not supported
	with the 10 Gb FCoE short reach optics or TwinAx cables	with 7101677 (7101678) or TwinAx cables	Not supported	Supported	Not supported
	Sun Storage 16 Gb Fibre Channel PCIe Universal Host Bus Adapter, Emulex	7101683 (7101684)	-	-	-
	with the 16 Gb FC short wave optics	with 7101685 (7101686)	Supported	Supported	Not supported
SAS	Oracle Storage 12 Gb SAS PCIe HBA, external: 8 port	7110118 (7110119)	Not supported	Not supported	Not supported
FLASH	Fujitsu 3.2 TB Flash Accelerator Card	7119601 (7119603)	Not supported	Not supported	Not supported
	Oracle Flash Accelerator F320 PCIe Card	7113825 (7113826)	Not supported	Not supported	Not supported
InfiniBand	Oracle Dual Port QDR InfiniBand Adapter M3	7104073 (7104074)	Not supported	Not supported	Not supported

-: Not applicable OVM: Oracle VM Server for SPARC

Table D-3 lists the on-board devices that support assignment of PCIe end points.

Table D-3 On-Board Devices That Support Assignment of PCIe End Points

Category	Name	Dynamic Assignment OVM 3.1.1 or Later	Static Assignment OVM 3.1 or Later	Static Assignment OVM 3.0
On-board	On-board LAN (10 GbE)	Supported	Supported	Supported
	On-board SAS (6 Gbps SAS)	Not supported	Not supported	Not supported
	On-board USB	Not supported	Not supported	Not supported

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Appendix E

Cards That Support EFI (GPT) Labeled Disks

This appendix describes the cards that support EFI (GPT) labeled disks.
The following tables show the PCIe cards that support the activation of Oracle Solaris from an EFI (GPT) labeled disk, as well as the size of the disk.
Table E-1 lists the cards that support EFI (GPT) labeled disks and have Fujitsu product IDs. Table E-2 lists the cards that support EFI (GPT) labeled disks and have Oracle product IDs.

Table E-1 Cards That Support EFI (GPT) Labeled Disks (Fujitsu Product ID)

Category	Name	Product ID	Disk Size	
			Under 2 TiB	2 TiB or More
FCoE	Dual-Channel 10 Gbps FCoE card (for optical cable)	SP1X7FAR2F	Supported	Not supported
	Dual-Channel 10 Gbps FCoE card (for Copper Twinax cable)	SP1X7FAS2F	Supported	Not supported
FC	Dual-Channel 32 Gbps Fibre Channel card	SP1X7FAC2F	Supported	Not supported
	Dual-Channel 32 Gbps Fibre Channel card	SP1X7FBC2F	Supported	Not supported
	Dual-Channel 16 Gbps Fibre Channel card (SR SFP+)	SP1X7FAA2F	Supported	Not supported
	Dual-Channel 16 Gbps Fibre Channel card (LR SFP+)	SP1X7FAB2F	Supported	Not supported
	Dual-Channel 16 Gbps Fibre Channel card (SR SFP+)	SP1X7FBA2F	Supported	Not supported
	Quad-Channel 16 Gbps Fibre Channel card (SR)	SP0X7FAA4F	Supported	Not supported
SAS	12 Gbps SAS card	SP1X7SA3F	Supported	Supported
FLASH	3.2 TB Flash Accelerator Card	SP0X7Y42F	Supported	Supported
	Flash Accelerator F320 card	SP1X7Y41F	Supported	Supported

Table E-2 Cards That Support EFI (GPT) Labeled Disks (Oracle Product ID)

Category	Name	Factory-Mounted Product ID When Shipped (Expanded-on-Site Product ID)	Disk Size	
			Under 2 TiB	2 TiB or More
FCoE/FC	Oracle Storage Dual-Port 32 Gb Fibre Channel PCIe Low Profile HBA, QLogic	7115460 (7115462)	Supported	Not supported
	Oracle Storage Dual-Port 32 Gb Fibre Channel PCIe Low Profile HBA, Emulex	7115459 (7115461)	Supported	Not supported
	Sun Storage 16 Gb Fibre Channel PCIe Universal Host Bus Adapter Qlogic	7101673 (7101674)	Supported	Not supported
	with the 16 Gb FC short wave optics	with 7101675 (7101676)	Supported	Not supported
	with the 16 Gb FC long wave optics	with 7101679 (7101680)	Supported	Not supported
	with the 10 Gb FCoE short reach optics or TwinAx cables	with 7101677 (7101678) or TwinAx cables	Supported	Not supported
	Sun Storage 16 Gb Fibre Channel PCIe Universal Host Bus Adapter, Emulex	7101683 (7101684)	Supported	Not supported
	with the 16 Gb FC short wave optics	with 7101685 (7101686)	Supported	Not supported
SAS	Oracle Storage 12 Gb SAS PCIe HBA, external: 8 port	7110118 (7110119)	Supported	Supported
FLASH	Fujitsu 3.2 TB Flash Accelerator Card	7119601 (7119603)	Supported	Supported
	Oracle Flash Accelerator F320 PCIe Card	7113825 (7113826)	Supported	Supported