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# **PRIMEQUEST 580A/540A**

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## **Dynamic Partitioning (DP) Manual**



## FOR SAFE OPERATION

This manual contains important information regarding the use and handling of this product. Read this manual thoroughly. Pay special attention to the section "NOTE ON SAFETY" Use the product according to the instructions and information available in this manual. Keep this manual handy for further reference.

Fujitsu makes every effort to prevent users and bystanders from being injured or from suffering damage to their property. Use the product according to this manual.

## ABOUT THIS PRODUCT

This product is designed and manufactured for use in standard applications such as office work, personal device, household appliance, and general industrial applications. This product is not intended for use in nuclear-reactor control systems, aeronautical and space systems, air traffic control systems, mass transportation control systems, medical devices for life support, missile launch control systems or other specialized uses in which extremely high levels of reliability are required, the required levels of safety cannot be guaranteed, or a failure or operational error could be life-threatening or could cause physical injury (referred to hereafter as "high-risk" use). You shall not use this product without securing the sufficient safety required for high-risk use. If you wish to use this product for high-risk use, please consult with sales representatives in charge before such use.

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Fujitsu Ltd, April 2006

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## Revision History

(1/1)

Edition	Date	Revised section (Added/ Deleted/ Altered) (Note)	Details
01	2008-04-01	-	-
02	2008-06-18	Chapter 2, Chapter 3 (Added)	<ul style="list-style-type: none"> <li>- Addition of a recovery function used for cases where the DP command is interrupted</li> <li>- Addition of the recovery procedure for the DP command</li> <li>- Addition of the SB state indication command</li> <li>- Addition of notes on dump collection</li> <li>- Addition of description for confirming operation after a panic</li> </ul>

Note: In this table, the revised section is indicated by its section number in the current edition.

An asterisk (\*) indicates a section in the previous edition.



# Preface

This manual explains the Dynamic Partitioning function of PRIMEQUEST.

Read the manual together with the reference manuals cited in it.

This section explains

- [Structure and Contents of This Manual](#)
- [Other Reference Manuals](#)
- [Abbreviations](#)
- [Text Conventions](#)
- [Syntax of the Command Line Interface \(CLI\)](#)
- [Notes Regarding Notations Used in This Manual](#)
- [Conventions for Alert Messages](#)
- [Environmental Requirements for Using This Product](#)

## Structure and Contents of This Manual

This manual is organized as described below.

### [Chapter 1 Dynamic Partitioning Overview](#)

Provides an overview of the DP function, describes the operating environment, and provides notes.

### [Chapter 2 Method of Using the DP Function in Linux](#)

Describes the installation procedure and usage of the DP function with Linux.

### [Chapter 3 Method of Using the DP Function in Windows](#)

Describes the installation procedure and usage of the DP function with Windows.

## Other Reference Manuals

The following manuals are provided for reference:

**a) PDF manuals included on the *PRIMEQUEST Manual* CD-ROM disk (C122-E013-C2)**

Title	Description	Manual code
<i>PRIMEQUEST 580A/540A/580/540/480/440 System Design Guide</i>	Explains requirements, considerations, and notes on the system operation design of the PRIMEQUEST 580A/540A/580/540/480/440.	C122-B001EN
<i>PRIMEQUEST 500A/500/400 Series Installation Manual</i>	Explains the setup of the PRIMEQUEST, including the preparation for the installation, initial settings, and software installation.	C122-E001EN
<i>PRIMEQUEST 580A/540A/520A/500/400 Series Reference Manual: Basic Operation/GUI/Commands</i>	Explains operations, setup methods, and the system management method that are required for the system operation of the PRIMEQUEST. The explanation covers basic operations and functions of the MMB, PSA, and EFI.	C122-E003EN
<i>PRIMEQUEST 500A/500/400 Series Reference Manual: Tools/Operation Information</i>	Explains system maintenance, Hot Plug, REMCS, and LEDs and other information required for system operation. Also, the manual provides supplementary information such as information on the physical locations of components.	C122-E074EN
<i>PRIMEQUEST 500A/500/400 Series Reference Manual: Messages/Logs</i>	Explains measures to be taken against problems that occur during operation and describes various types of messages.	C122-E004EN

**b) Printed manual**

For the printed manual (sold separately), contact your certified service engineer.

- *PRIMEQUEST 500A/500/400 Series Installation Manual* (C122-E001EN)



## Abbreviations

In this manual, the product names are abbreviated as follows:

Long title	Abbreviations
Red Hat® Enterprise Linux® 5.1 (for Intel Itanium)	Linux (*) Red Hat (*) RHEL 5.1 (IPF)
Microsoft® Windows Server® 2008 for Itanium-Based Systems	Windows (*)

\* Version-independent abbreviation

## Text Conventions

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

Fonts/symbols	Meaning	Example
<i>Italic</i>	Indicates names of manuals.	See the <i>PRIMEQUEST 580A/540A/580/540/480/440 System Design Guide</i> .
" "	Indicates names of chapters, sections, items, buttons, or menus.	See Chapter 1, "Dynamic Partitioning Overview."
[ ]	Indicates window names, window button names, tab names, and dropdown menu selections.	Click the [OK] button.

## Syntax of the Command Line Interface (CLI)

The command syntax is described below.

### Command syntax

The command syntax is as follows:

- A variable that requires input of a value must be enclosed in < >.
- An optional element must be enclosed in [ ].
- A group of options for an optional keyword must be enclosed in [ ] and delimited by |.
- A group of options for a mandatory keyword must be enclosed in { } and delimited by |.

The command syntax is shown in a frame such as this one.



## Notes Regarding Notations Used in This Manual

The notations used in this manual are as follows.

Notation in manual	Description
LSB	This indicates the partition granularity (*1) of a System Board (SB). For an SB not split by XPAR, the SB is referred to as an LSB. For an SB split by XPAR, each half of the SB is referred to as an LSB.  *1 Partition granularity refers to the minimum unit of each SB composing a partition.
Free SB	This represents an SB that does not belong to any partition.
Reserved SB	If a hardware error occurs in an SB that is incorporated into a partition, the SB may need to be isolated. A "Reserved SB" is an SB that would replace the isolated SB and be newly incorporated into the partition
Spare SB	Refers to an SB to be newly incorporated in a partition in place of a replaced SB during dynamic replacement (Hot-Replace) of an SB.

## Conventions for Alert Messages

This manual uses the following conventions to show alert messages. An alert message consists of an alert signal and alert statements.

 <b>WARNING</b>	This indicates a hazardous situation that <i>could result in serious personal injury</i> if the user does not perform the procedure correctly.
 <b>CAUTION</b>	This indicates a hazardous situation that <i>could result in minor or moderate personal injury</i> if the user does not perform the procedure correctly. This signal also indicates that damage to the product or other property may occur if the user does not perform the procedure correctly.
<b>IMPORTANT</b>	This indicates information that could help the user to use the product more effectively.

### Alert messages in the text

In the text, alert messages are indented to distinguish them from regular text. A wider space precedes and follows the message to show where the message begins and ends.



Certain tasks in this manual should only be performed by a certified service engineer. Users must not perform these tasks. Incorrect operation of these tasks may cause electric shock, injury, or fire.

- Installation and reinstallation of all components, and initial settings
- Removal of front, rear, or side covers
- Mounting/de-mounting of optional internal devices
- Plugging or unplugging of external interface cards
- Maintenance and inspections (repairing, and regular diagnosis and maintenance)

Important alert messages are summarized in "Alert Labels" in "NOTE ON SAFETY" following "Preface."

## Environmental Requirements for Using This Product

This product is a computer which is intended to be used in a computer room. For details on the operational environment, see the *PRIMEQUEST 580A/540A/580/540/480/440 Installation Planning Manual* (C122-H001EN).


## Reader Feedback

- The screen images in this manual may be different from the actual screen images.
- If you find any errors or unclear statements in this manual, please fill in the "Reader's Comment Form" sheet at the back of this manual and forward it to the address indicated at the bottom of the sheet.
- This manual is subject to revision without prior notice.
- The PDF version of this manual is best viewed in Adobe® Reader® with a magnification of 100% and Single Page for the page layout.

# NOTES ON SAFETY

## Alert Labels

The alert label provided in this manual is as follows:

	This indicates a hazardous situation that <i>could</i> result in <i>minor or moderate personal injury</i> if the user does not perform the procedure correctly. This signal also indicates that damage to the product or other property may occur if the user does not perform the procedure correctly.
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The current manual contains no notes on safety.



# Product Handling

## Maintenance

### **WARNING**

Certain tasks in this manual should only be performed by a certified service engineer. Users must not perform these tasks. Incorrect operation of these tasks may cause electric shock, injury, or fire.

- Installation and reinstallation of all components, and initial settings
- Removal of front, rear, or side covers
- Mounting/de-mounting of optional internal devices
- Plugging or unplugging of external interface cards
- Maintenance and inspections (repairing, and regular diagnosis and maintenance)

### **CAUTION**

The following tasks regarding this product and the optional products provided from Fujitsu should only be performed by a certified service engineer. Users must not perform these tasks. Incorrect operation of these tasks may cause malfunction.

- Unpacking optional adapters and such packages delivered to the users

## Remodeling/Rebuilding

### **CAUTION**

Do not make mechanical or electrical modifications to the equipment. Using this product after modifying or overhauling may cause unexpected injury or damage to the property, the user, or bystanders.





# Contents

Preface .....	i
NOTES ON SAFETY .....	vii
Product Handling .....	ix
Chapter 1 Dynamic Partitioning Overview .....	1-1
1.1 Functional Overview of Dynamic Partitioning.....	1-1
1.2 Operating Environment for Dynamic Partitioning .....	1-2
1.2.1 Hardware.....	1-2
1.2.2 Software .....	1-2
1.2.3 Prerequisites for dynamic partitioning operations .....	1-2
1.2.4 Notes on implementing dynamic partitioning.....	1-15
Chapter 2 Method of Using the DP Function in Linux.....	2-1
2.1 Installation.....	2-1
2.1.1 Flow of installation .....	2-2
2.1.2 Enabling dynamic partitioning of hardware.....	2-3
2.1.3 Note on installation.....	2-3
2.2 Operations .....	2-4
2.2.1 Flow of operations .....	2-4
2.2.1.1 Checking the slots to add an SB .....	2-5
2.2.1.2 Determining the quantities of resources (CPU's and DIMM's) to be added .....	2-7
2.2.1.3 Preparing the SB to be added.....	2-7
2.2.1.4 Updating the firmware on the SB .....	2-8
2.2.1.5 Checking the resource state before adding the SB.....	2-9
2.2.1.6 Confirming operation after a panic during DP operation ...	2-10
2.2.1.7 Dynamically adding the SB through the DP operation command (Hot-Add).....	2-11
2.2.1.8 Confirming the quantities of added resources .....	2-15
2.2.1.9 Confirming operation after a panic after DP operation.....	2-15
2.2.2 DP operation command (fjsvdr).....	2-16
2.2.3 SB state indication command (fjsvdr-stat) .....	2-17
2.2.4 Notes on performing a dynamic partitioning operation .....	2-19
2.2.5 Cooperation scripts .....	2-20
2.2.5.1 Cooperation script execution timing.....	2-20
2.2.5.2 Method of registering cooperation scripts .....	2-22
2.2.5.3 Information pass to cooperation scripts .....	2-24
2.2.5.4 End status of cooperation scripts .....	2-26
2.2.5.5 Notes.....	2-26
2.2.5.6 Cooperation script sample .....	2-27
2.3 Reference.....	2-28

2.3.1	Handling the DP operation command (fjsvdr) errors.....	2-28
2.3.1.1	Recovery procedure for the DP operation command .....	2-29
2.3.2	Handling other system log messages.....	2-31
2.3.3	Messages .....	2-31
2.3.3.1	DP operation command (fjsvdr) messages .....	2-31
2.3.3.2	System log messages.....	2-38
2.4	Notes and Restrictions on Software .....	2-41
2.4.1	Notes on software and commands recognizing the amounts of resources.....	2-41
2.4.2	Notes on software that binds processes to CPUs and SBs.....	2-41
2.4.3	Note on real-time processes.....	2-42
2.4.4	Functions not compatible with the DP function .....	2-42
2.4.4.1	Checking performance measurement tools .....	2-42
2.4.4.2	Checking the tools for analysis at the kernel level .....	2-43
2.4.5	Confirming the compatibility of software to the DP function .....	2-43
2.4.6	Notes on dump collection during DP operation.....	2-43
Chapter 3 Method of Using the DP Function in Windows.....		3-1
3.1	Installation .....	3-1
3.1.1	Notes on installation .....	3-1
3.1.2	Enabling dynamic partitioning of hardware .....	3-2
3.2	Operations.....	3-3
3.2.1	Flow of SB Hot-Add operations.....	3-3
3.2.1.1	Checking the slots to add an SB.....	3-4
3.2.1.2	Determining the quantities of resources (CPUs and DIMMs) required to add an SB.....	3-5
3.2.1.3	Preparing the SB to be added .....	3-6
3.2.1.4	Updating the firmware on the SB to be added .....	3-7
3.2.1.5	Checking the state before adding the SB.....	3-9
3.2.1.6	Dynamically adding the SB through the DP operation command (Hot-Add) .....	3-10
3.2.1.7	Confirming the quantities of added resources.....	3-13
3.2.2	Flow of SB Hot-Replace operations.....	3-15
3.2.2.1	Checking the empty slot for a spare SB .....	3-16
3.2.2.2	Preparing the spare SB .....	3-16
3.2.2.3	Updating the firmware on the spare SB .....	3-17
3.2.2.4	Checking the resource state before replacement .....	3-17
3.2.2.5	Dynamically replacing the SB through the DP operation command (Hot-Replace) .....	3-17
3.2.2.6	Confirming the quantities of resources after replacement .....	3-19
3.2.3	DP operation command (fjsvdr) .....	3-20
3.2.4	SB state indication command (fjsvdr-stat).....	3-21
3.3	Reference .....	3-23
3.3.1	Handling the DP operation command (fjsvdr) errors.....	3-23
3.3.1.1	Recovery procedure for the DP operation command .....	3-24
3.3.2	Messages .....	3-27
3.3.2.1	DP operation command (fjsvdr) messages .....	3-27
3.3.2.2	System log messages.....	3-34
3.4	Notes and Restrictions on Software .....	3-35

# Illustrations

## Figures

Figure 1.1	Example of a Linux partition configuration in which SBs can be dynamically added (SBs not split by XPAR) .....	1-5
Figure 1.2	Example of a Linux partition configuration in which SBs can be dynamically added (SBs split by XPAR) .....	1-6
Figure 1.3	Program and Function window .....	1-7
Figure 1.4	[Partition Information] window .....	1-7
Figure 1.5	Example of a Windows partition configuration in which an SB can be dynamically added .....	1-10
Figure 1.6	Example of a partition configuration in which SBs can be dynamically replaced (Mirror Mode Disabled or Standard Mirror Mode) .....	1-12
Figure 1.7	Example of a partition configuration in which SBs can be dynamically replaced (Extended Mirror Mode) .....	1-13
Figure 1.8	Partition configuration and mounting locations of SBs that can be dynamically added (Hot-Add) .....	1-16
Figure 1.9	Relationship between SB state indication command and mounting locations of SBs that can be dynamically replaced (Hot-Replace) .....	1-20
Figure 1.10	Status of DIMMs on the SB to be replaced and whether replacement is enabled/disabled (Mirror Mode Disabled or Standard Mirror Mode) .....	1-21
Figure 1.11	Status of DIMMs on the SB to be replaced and whether replacement is enabled/disabled (Extended Mirror Mode) .....	1-21
Figure 2.1	DP function installation flow .....	2-2
Figure 2.2	Settings in the [Mode] window .....	2-3
Figure 2.3	Popup message output when the mode is changed during system operation .....	2-3
Figure 2.4	Flow of dynamic partitioning (dynamic addition [Hot-Add] of an SB) in Linux .....	2-4
Figure 2.5	Output result of the SB state indication command (fjsvdr-stat) .....	2-5
Figure 2.6	[Partition Configuration] window .....	2-6
Figure 2.7	[SB] window .....	2-7
Figure 2.8	[Firmware Information] window .....	2-8
Figure 2.9	[PAL/SAL Firmware Update] window .....	2-9
Figure 2.10	Command operation in which output values are updated at the end of dynamic partitioning .....	2-19
Figure 2.11	Command operation in which output values are not updated after dynamic partitioning .....	2-19
Figure 2.12	Command operation in which the command is terminated before and restarted after dynamic partitioning .....	2-20
Figure 2.13	Flow of cooperation script execution .....	2-21
Figure 2.14	Format of the message output by the DP operation command (fjsvdr) .....	2-28

Figure 3.1	Settings in the [Mode] window .....	3-2
Figure 3.2	Popup message output when mode is changed during system operation.....	3-2
Figure 3.3	Flow of dynamic partitioning (dynamic addition (Hot-Add) of an SB) in Windows .....	3-3
Figure 3.4	Output result of the SB state indication command .....	3-4
Figure 3.5	[Partition Configuration] window .....	3-4
Figure 3.6	[SB] window .....	3-6
Figure 3.7	[SB Split] window .....	3-7
Figure 3.8	[Firmware Information] window .....	3-8
Figure 3.9	[PAL/SAL Firmware Update] window .....	3-8
Figure 3.10	[Performance] tab of Task Manager (before dynamic addition (Hot-Add)).....	3-9
Figure 3.11	Device Manager (before dynamic addition (Hot-Add)) .....	3-10
Figure 3.12	Performance tab of Task Manager (after dynamic addition (Hot-Add)).....	3-13
Figure 3.13	Device Manager (after dynamic addition (Hot-Add)).....	3-14
Figure 3.14	Flow of dynamic partitioning (dynamic replacement (Hot-Replace) of an SB) in Windows .....	3-15
Figure 3.15	Format of the message output by the DP operation command (fjsvdr) .....	3-23
Figure 3.16	[Services] window displayed by selecting [Administrative Tools] → [Services] .....	3-26

## Tables

Table 1.1	DP function .....	1-1
Table 1.2	Types of CPU that can be mounted in the PRIMEQUEST 580A/540A .....	1-23
Table 1.3	Types of DIMM that can be mounted in the PRIMEQUEST 580A/540A .....	1-23
Table 2.1	Storage directories of cooperation scripts .....	2-22
Table 2.2	Environment variables for cooperation scripts .....	2-25
Table 2.3	End status of cooperation scripts .....	2-26
Table 2.4	Overview of corrective actions for errors of the DP operation command (fjsvdr) (Linux) .....	2-28
Table 2.5	Command messages .....	2-31
Table 2.6	Error messages output to the system log .....	2-38
Table 2.7	Other messages output to the system log.....	2-40
Table 3.1	Overview of corrective actions for errors of the DP operation command (fjsvdr) (Windows) .....	3-23
Table 3.2	Command messages .....	3-27
Table 3.3	System log messages .....	3-34

# Chapter 1 Dynamic Partitioning Overview

## 1.1 Functional Overview of Dynamic Partitioning

The PRIMEQUEST 580A/540A newly supports a function that performs the addition, deletion, or replacement of a resource of CPU/DIMM or PCI-card on-board IO units during the operation of the operating system (OS). This function is supported by the dynamic partitioning (DP) function.

Users can add CPUs and DIMMs in the PRIMEQUEST 580A/540A by dynamic addition (Hot-Add) or dynamic replacement (Hot-Replace) of a system board (SB).

**Table 1.1 DP function**

Function name	Description
SB Hot-Add	This function adds an SB to a partition in which the OS is running. The function enables the user to compensate for a deficiency in resources (CPUs and DIMMs).
SB Hot-Replace (Windows only)	This function replaces an SB being used on a partition in which the OS is running. Integrate the replacement SB into the OS, copy the CPU and DIMM resources on the SB to be removed (source SB) to the replacement SB, and then remove the source SB from the OS. Thus, the SB can be replaced during system operation.

## 1.2 Operating Environment for Dynamic Partitioning

### 1.2.1 Hardware

The following cabinets support the DP function:

- PRIMEQUEST 580A/540A

### 1.2.2 Software

The following OS supports the DP function:

- Red Hat® Enterprise Linux® 5.1 (for Intel Itanium) or later (supports SB Hot-Add)

Note that the DP function is not supported in the virtual machine function of PRIMEQUEST.

- Microsoft® Windows Server® 2008 for Itanium-Based Systems or later (SB Hot-Add/Hot-Replace)

### 1.2.3 Prerequisites for dynamic partitioning operations

To implement dynamic partitioning, the PRIMEQUEST system must satisfy the following conditions:

#### ■ Linux

[System conditions]

- The system was built according to the *PRIMEQUEST 500A/500/400 Series Installation Manual* (C122-E001EN).
- The system was built according to the following manuals:
  - For APAC:  
*Red Hat Enterprise Linux 5 Software Guide for PRIMEQUEST - Professional Plus* -(J2UZ-9380-xxENZ0(A))
  - For FSC:  
*Red Hat Enterprise Linux 5 Software Guide for PRIMEQUEST - Basic* - (J2UZ-9310-xxENZ0(A))
- The following software programs included on the "PRIMEQUEST Drivers CD for Red Hat® Enterprise Linux® AS v.4/Red Hat® Enterprise Linux®5" are already installed:

FJSVpsa (1.15.x-x or later)

FJSVsbhp-RHEL5

To check the version of the installed package, execute the following command:

Input format

```
rpm -q <package-name>
```

## Execution example

```
Checking the version of FJSVpsa:
# rpm -q FJSVpsa
FJSVpsa-1.13.1-0RHEL5
```

- The hyper threading function is disabled in the partition in which dynamic addition (Hot-Add) of an SB will be implemented.

## [Conditions for added SBs]

## Hot-Add SB:

- A free SB that can be dynamically added (Hot-Add) or a reserved SB of a partition for which DP operation is performed.

The state of an SB can be checked with the SB state indication command (fjsvdrct-stat) (see [Section 2.2.3, "SB state indication command \(fjsvdrct-stat\)"](#)).

## SB status:

- The status of the SB to be added is "OK."

## SB mounting slot number:

- In the partition subject to dynamic partitioning, the number of the slot in which the added SB will be mounted is greater than the smallest SB mounting slot number.

However, if the SB mounted in the slot with the smallest slot number in the partition is split by XPAR and only the A side belongs to the partition, the B side in the same slot can be dynamically added.

## SB type:

- The SB to be added to a partition is the same type as the SBs used in the partition.
  - \* One type of SB does not support mounted 8-GB DIMMs, and one type accommodates only 8 GB DIMMs. Because different types of SBs cannot be mounted in the same partition, the SB to be added to a partition must be the same type as the SBs currently used in the partition.

## CPU type:

- The CPUs mounted on the SB to be added to a partition are the same type as the CPUs already running on the partition.

For a CPU of a different type, DP operation fails. Confirm the CPU type beforehand.

## Memory type:

- The DIMMs mounted on the SB to be added to a partition satisfy the DIMM mixture conditions of the partition (on the same SB or in the same partition that has 16 GB of memory (four 4-GB DIMMs) or 32 GB of memory (four 8-GB DIMMs), no other type of memory can be mounted together in combination).

When the DIMM mixture conditions are not satisfied, DP operation fails. Confirm the DIMM mixture conditions beforehand.

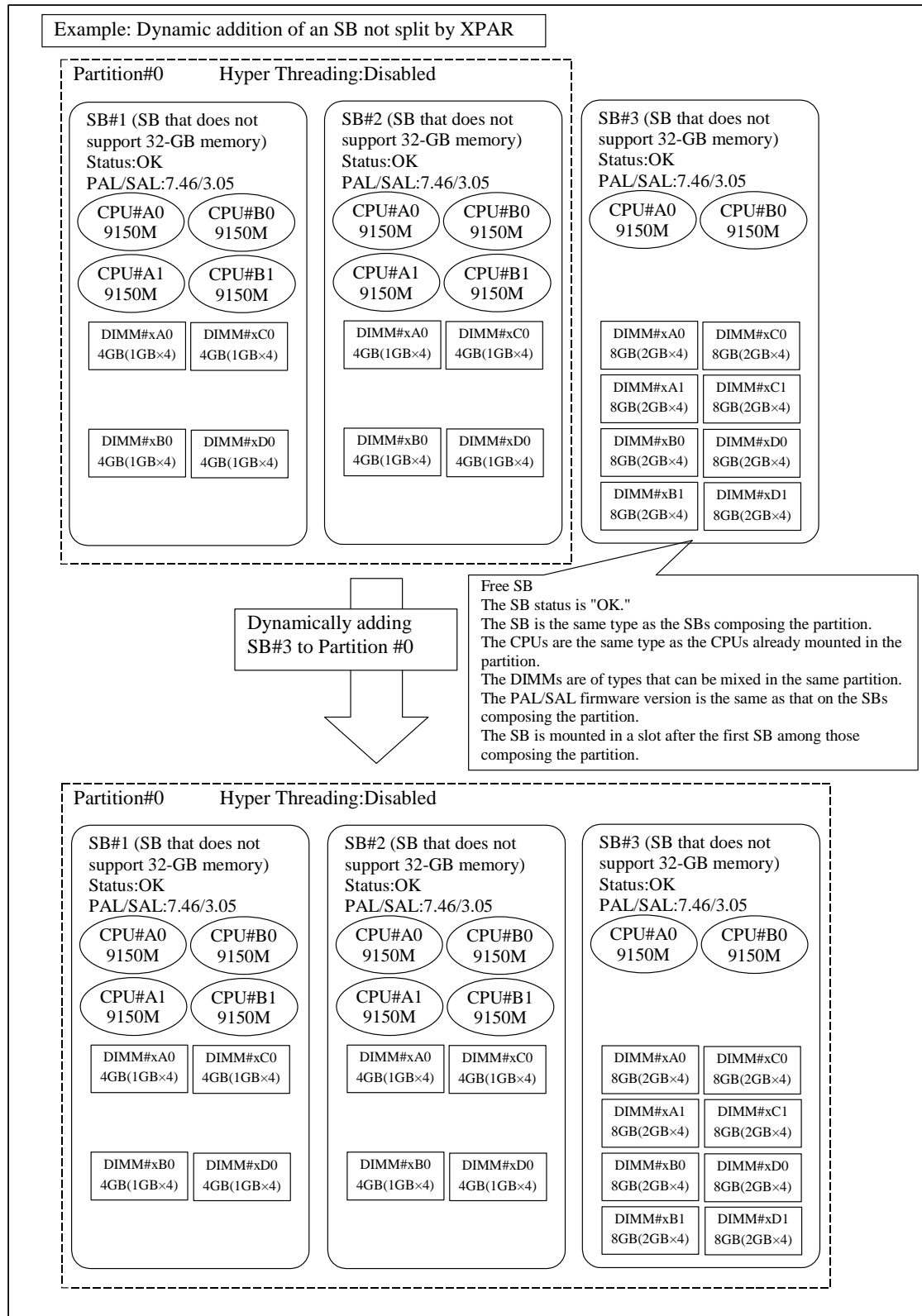
PAL/SAL firmware:

- The PAL or SAL firmware installed on the SB to be added to a partition is the same version as the PAL or SAL firmware already running on the partition.

When the PAL or SAL firmware version is different, DP operation fails. Confirm the firmware version beforehand. In addition, for an SB for which the firmware version of an SB to be added cannot be confirmed, DP operation cannot be performed in the [Firmware Information] window that is displayed by selecting [System] → [Firmware Information] from the MMB Web-UI.



The following is an example of a configuration in which dynamic addition (Hot-Add) can be performed:



**Figure 1.1 Example of a Linux partition configuration in which SBs can be dynamically added (SBs not split by XPAR)**

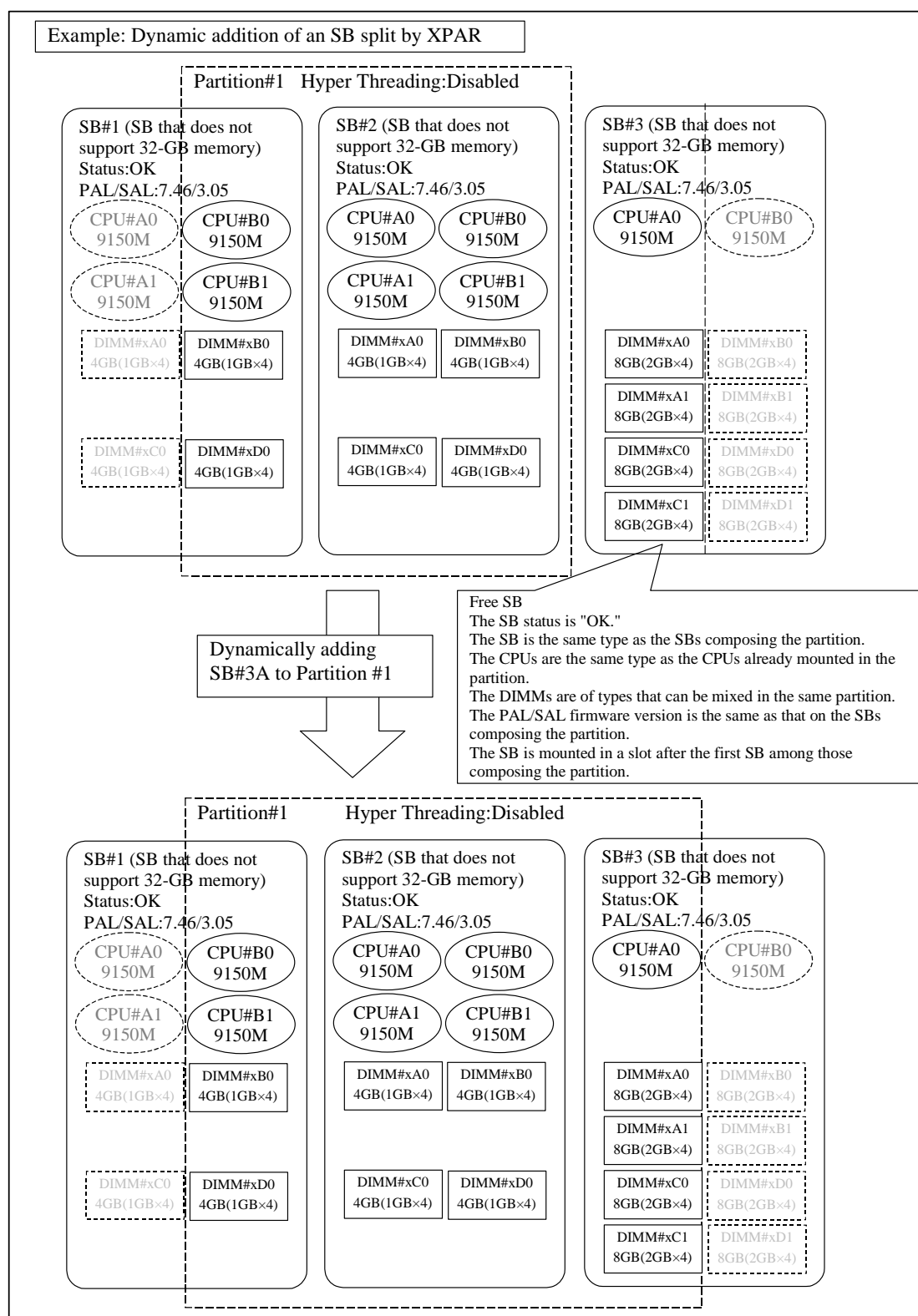


Figure 1.2 Example of a Linux partition configuration in which SBs can be dynamically added (SBs split by XPAR)

## ■ Windows

### [Common conditions for Hot-Add and Hot-Replace]

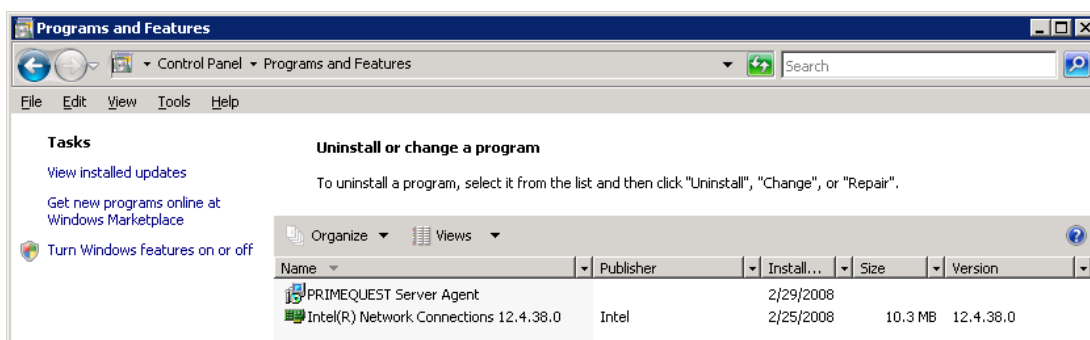
[System conditions]

- The system was built according to the *PRIMEQUEST 500A/500 Series Microsoft® Windows Server® 2008 User's Guide* (C122-E087EN).
- The following software included on the "PRIMEQUEST Drivers CD for Microsoft® Windows Server® 2008" (C122-E093) is already installed:

PSA (package name: fjpsa) (1.16.x.x or later)

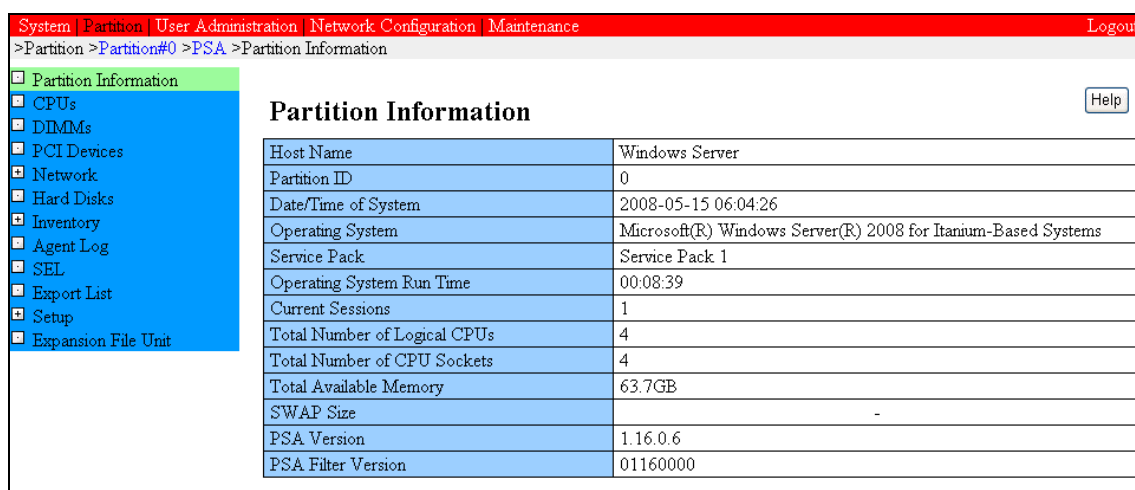
- The hyper threading function is disabled in the partition in which dynamic addition (Hot-Add) or dynamic replacement (Hot-Replace) of an SB will be implemented.

To confirm that PSA is installed, select [Control Panel] → [Program] → [Program and Function] ([Figure 1.3](#)), and then check whether "PRIMEQUEST Server Agent" is found.



**Figure 1.3 Program and Function window**

For the installed fjpsa version, see the PSA Version item in the [Partition Information] window ([Figure 1.4](#)) that can be displayed by selecting [Partition] → [Partition#n] → [PSA] → [Partition Information] from the Web-UI.



**Figure 1.4 [Partition Information] window**

[Conditions for added SBs or spare SBs for replacement]

- |                            |   |
|----------------------------|---|
| Hot-Add or Hot-Replace SB: | <ul style="list-style-type: none"><li>• A free SB for which dynamic addition (Hot-Add) or dynamic replacement (Hot-Replace) of an SB can be performed or a reserved SB of a partition for which DP operation is performed.</li></ul> <p>The state of an SB can be checked with the SB state indication command (fjsvdr-c-stat) (see <a href="#">Section 3.2.4, "SB state indication command (fjsvdr-c-stat)"</a>).</p>  |
| SB status:                 | <ul style="list-style-type: none"><li>• The status of the SB to be added or replacement (spare) SB is "OK."</li></ul>   |
| SB mounting slot number:   | <ul style="list-style-type: none"><li>• In the partition subject to dynamic partitioning, the number of the slot in which the added SB or the spare SB for replacement will be mounted is greater than the smallest SB mounting slot number.</li></ul> <p>However, if the SB mounted in the slot with the smallest slot number in the partition is split by XPAR and only the A side belongs to the partition, the B side in the same slot can be dynamically added.</p>  |
| SB type:                   | <ul style="list-style-type: none"><li>• The SB to be added to or the spare SB for replacement in a partition is the same type as the SBs used in the partition.</li></ul> <p>* One type of SB does not support mounted 8-GB DIMMs, and one type accommodates only 8-GB DIMMs. Because different types of SBs cannot be mounted in the same partition, the SB to be added to or the spare SB for replacement in a partition must be the same type as the SBs currently used in the partition.</p>  |
| Split by XPAR:             | <ul style="list-style-type: none"><li>• The SB to be added or the spare SB for replacement is not split by the XPAR function.</li></ul>   |
| PAL/SAL firmware:          | <ul style="list-style-type: none"><li>• The PAL or SAL firmware installed on the SB to be added or the spare SB for replacement is the same version as the PAL or SAL firmware already running on the partition.</li></ul> <p>When the PAL or SAL firmware version is different, DP operation fails. Confirm the firmware version beforehand. In addition, for an SB for which the firmware version of an SB to be added cannot be confirmed, DP operation cannot be performed in the [Firmware Information] window that is displayed by selecting [System] → [Firmware Information] from the MMB Web-UI.</p> |

**[Hot-Add conditions]**

[Conditions for added SBs]

CPU type:

- The CPUs mounted on the SB to be added to a partition are the same type as the CPUs already running on the partition.

For a CPU of a different type, DP operation fails. Confirm the CPU type beforehand.

Memory type:

- The DIMMs mounted on the SB to be added to a partition satisfy the DIMM mixture conditions of the partition (on the same SB or in the same partition that has 16 GB of memory (four 4-GB DIMMs ) or 32 GB of memory (four 8-GB DIMMs), no other type of memory can be mounted together in combination).

When the DIMM mixture conditions are not satisfied, DP operation fails. Confirm the DIMM mixture conditions beforehand.

The following is an example of a configuration in which dynamic addition (Hot-Add) can be performed:

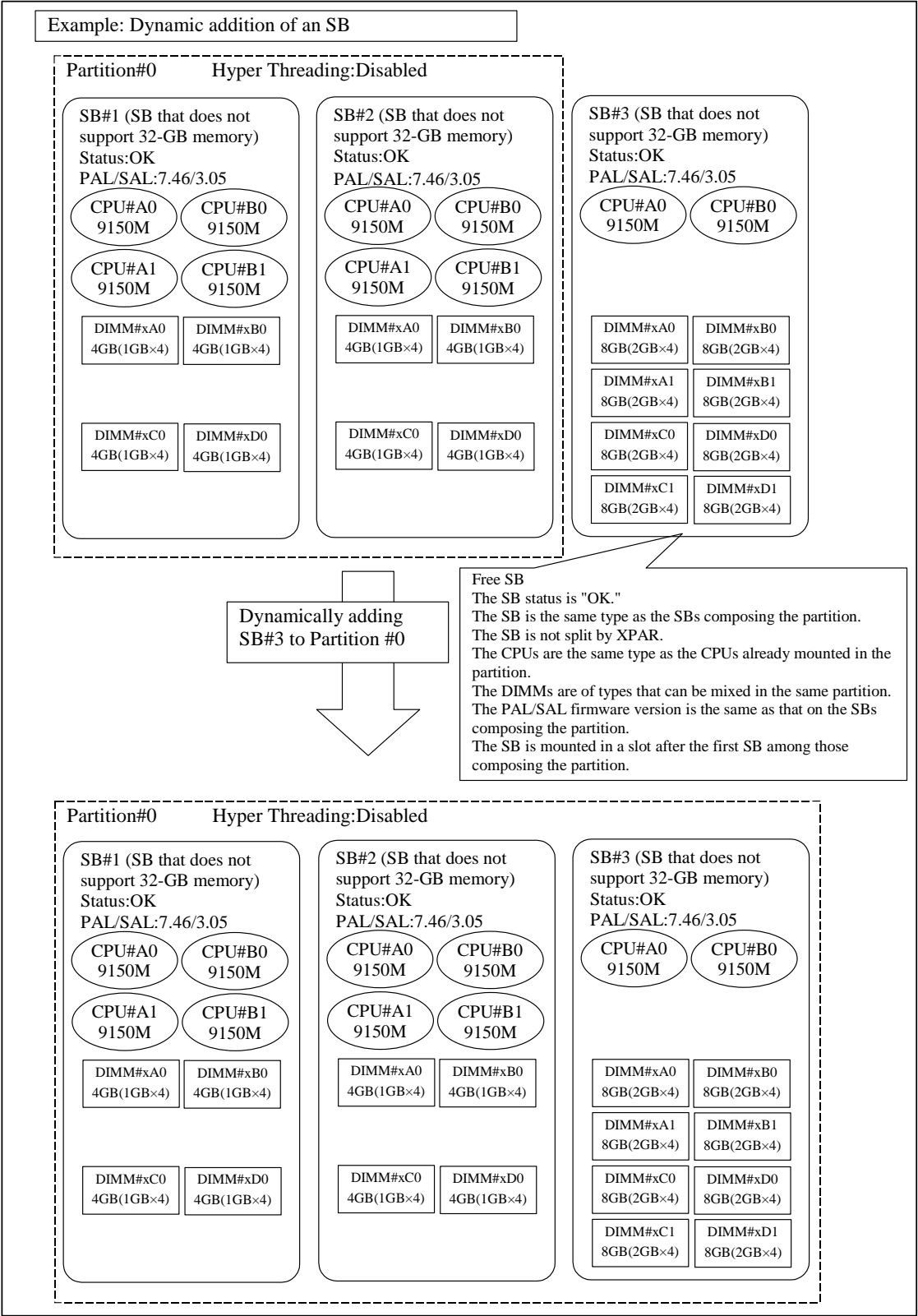


Figure 1.5 Example of a Windows partition configuration in which an SB can be dynamically added

**[Hot-Replace conditions]****[System conditions]**

- The partition in which dynamic replacement (Hot-Replace) of an SB will be implemented consists of two or more LSBs.

**[Conditions for SBs to be replaced]****SB that cannot be replaced**

- Use the SB state indication command (fjsvdr-stat) (see [Section 3.2.4, "SB state indication command \(fjsvdr-stat\)"](#)) to confirm that dynamic replacement (Hot-Replace) can be performed for the SB.
  - \* The display of "\*" in the Home column in the output result of the fjsvdr-stat command indicates that dynamic replacement (Hot-Replace) cannot be performed for the relevant SB.

**SB status:**

- The status of the SB to be replaced is "OK," "Warning," or "Degraded."

However, if the conditions for the CPU status and memory status described below are not satisfied, DP operation cannot be performed even in case of "Degraded."

**CPU status:**

- The status of the CPUs mounted on the SB to be replaced is "OK" or "Warning."
  - \* A CPU that enters the "Warning" state because of frequent correctable errors is isolated and placed in the "Disabled" state after the partition is rebooted. However, the CPU status on the MMB Web UI remains "Warning." In this case, the CPU is handled in the same way as in the "Disabled" state and thus cannot be dynamically replaced (Hot-Replace).

**Memory status:**

- In Mirror Mode Disabled or Standard Mirror Mode, the status of the DIMMs mounted on the SB to be replaced is "OK" or "Warning."
- In Extended Mirror Mode, the status of at least one of the DIMMs forming a mirror pair on the SB to be replaced is "OK" or "Warning."
  - \* DIMM#0Xy and DIMM#2Xy (X: A to D, y: 0 or 1) form a mirror pair, and DIMM#1Xy and DIMM#3Xy (X: A to D, y: 0 or 1) form another mirror pair.

**Split by XPAR:**

- The SB to be replaced is not split by the XPAR function.

**[Conditions for spare SBs]**

- The types, quantities, and mounting locations of CPUs and DIMMs on the spare SB are the same as on the SB to be replaced.

The following is an example of a configuration in which dynamic replacement (Hot-Replace) can be performed:

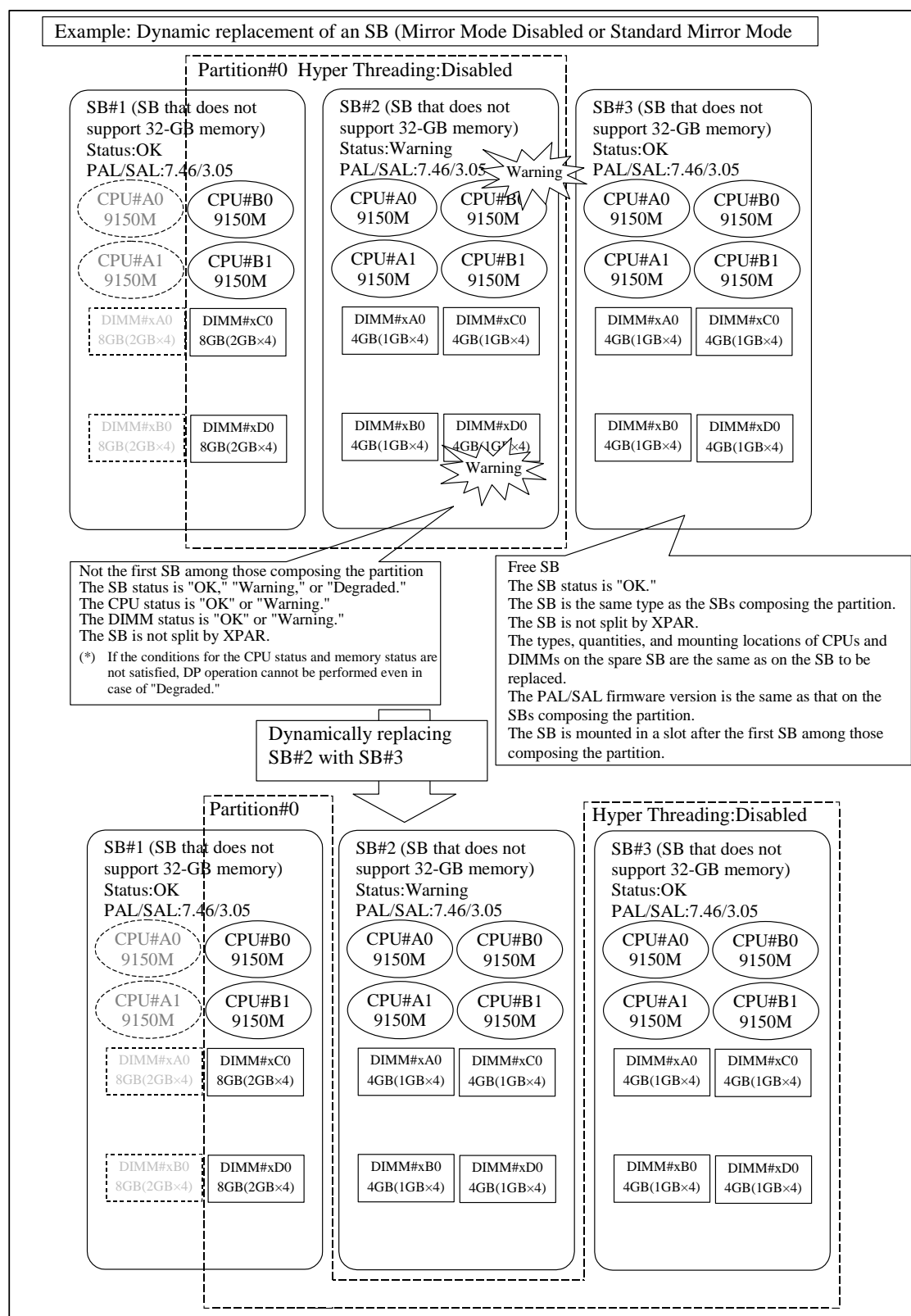


Figure 1.6 Example of a partition configuration in which SBs can be dynamically replaced (Mirror Mode Disabled or Standard Mirror Mode)



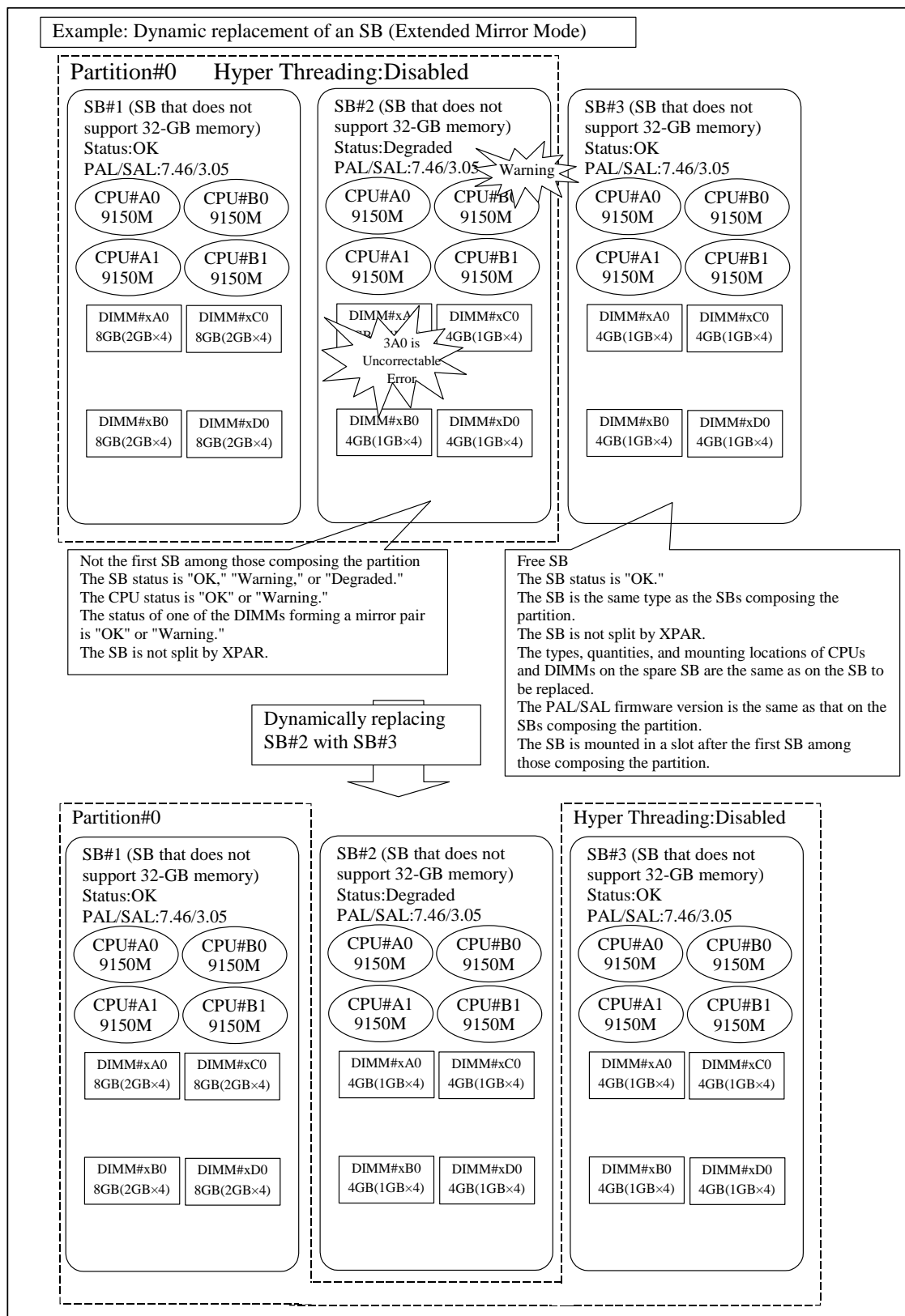


Figure 1.7 Example of a partition configuration in which SBs can be dynamically replaced (Extended Mirror Mode)

To implement dynamic partitioning, the following preparations must also be made:

### ■ **Dynamic addition of an SB (Hot-Add)**

- Specify the amounts of resources (number of CPUs and size of individual DIMMs) required to add an SB, and mount the required CPUs and DIMMs on the SB to be added.
- Using the MMB Web-UI, confirm that the status of an SB to be newly incorporated is "OK" and that the SB is either a free SB not belonging to any partition or a reserved SB of the partition for which DP operation is performed.

### ■ **Dynamic replacement of an SB (Hot-Replace)**

- The newly installed SB must have the same type and same number of CPUs or DIMMs at the same locations as those on the SB to be replaced.
- Using the MMB Web-UI, confirm that the status of an SB to be newly incorporated is "OK" and that the SB is either a free SB not belonging to any partition or a reserved SB of the partition for which DP operation is performed.

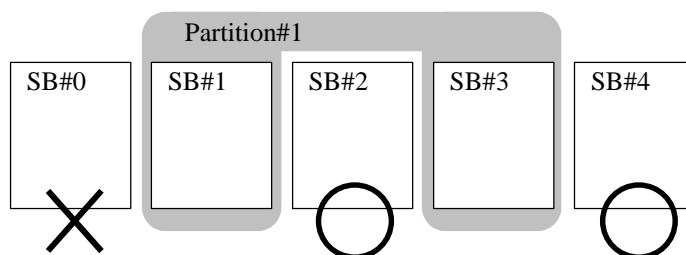
## 1.2.4 Notes on implementing dynamic partitioning

Note the following precautions for dynamic partitioning operations:

### ■ Dynamic addition of an SB (Hot-Add)

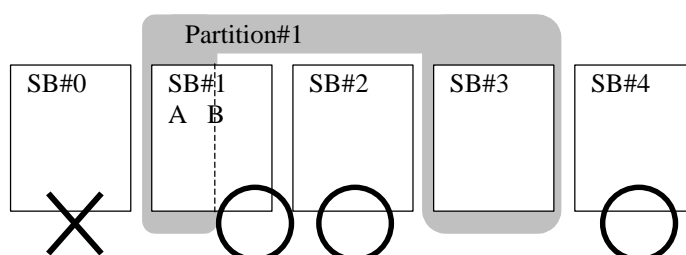
- |                                  |  |
|----------------------------------|--|
| SB type                          | <ul style="list-style-type: none"> <li>SBs are categorized into two types. On one type, 8-GB DIMMs cannot be mounted; and on the other type, only 8-GB DIMMs can be mounted. The SB added to a partition must be of the same type as those already mounted in the partition because different types of SB cannot be mounted together in the same partition.</li> </ul> |
| Mixture condition of CPUs        | <ul style="list-style-type: none"> <li>The CPUs mounted on the SB added to a partition must be of the same type as those already mounted in the partition because only the same type as that of CPU can be mounted together in the same partition. <a href="#">Table 1.3</a> lists the types of CPU that can be mounted in the PRIMEQUEST 580A/540A.</li> </ul>        |
| Mixture condition of memory      | <ul style="list-style-type: none"> <li>No other type of memory can be mounted together on the same SB or in the same partition with the 16 GB (four 4-GB DIMMs) or 32 GB of memory (four 8-GB DIMMs).</li> </ul>   |
| PAL/SAL firmware                 | <ul style="list-style-type: none"> <li>The PAL or SAL firmware installed on the SB added to a partition must be the same version as the PAL or SAL firmware already running in the partition. If the version does not match, dynamic addition (Hot-Add) fails and the original state of the SB that is supposed to be added is restored.</li> </ul>                    |
| Hot-Add SB                       | <ul style="list-style-type: none"> <li>An SB to be added must be either a free SB, which does not belong to any partition, or a reserved SB of the partition for which DP operation is performed.</li> </ul>   |
| Mounting location of an added SB | <ul style="list-style-type: none"> <li>The SB to be added to a partition must be mounted in a slot whose slot number is greater than the smallest mounting slot number among slots containing the SBs composing the partition (see <a href="#">Figure 1.8</a>).</li> </ul>   |

However, if the SB that is mounted in the slot having the smallest number in the partition has been split by XPAR and only the A side belongs to the partition, dynamic addition can be performed for the B side in the same slot.



If the SB that is mounted in the slot having the smallest number among those composing Partition#1 (SB#1) is not split:

An SB can be dynamically added (Hot-Add) to SB#2 or SB#4 after the SB mounted in the slot (SB#1) with the smallest mounting slot number among the slots containing the SBs composing Partition#1. No SB can be dynamically added (Hot-Add) to SB#0 and a slot preceding SB#0.

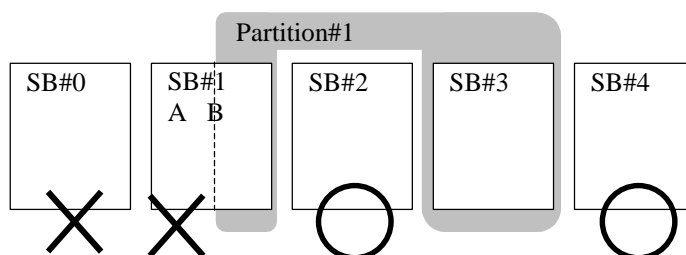


If the SB that is mounted in the slot having the smallest number among those composing Partition#1 (SB#1) is split and only the A side is incorporated:

An SB can be dynamically added (Hot-Add) to the B side (SB#1B) in the slot (SB#1) with the smallest mounting slot number, among the slots containing the SBs composing Partition#1.

An SB can be dynamically added (Hot-Add) to SB#2 or SB#4, after the SB mounted in the slot (SB#1) with the smallest mounting number among the slots containing the SBs composing Partition#1.

No SB can be dynamically added (Hot-Add) to SB#0 and a slot preceding SB#1.



If the SB that is mounted in the slot having the smallest number among those composing Partition#1 (SB#1) is split and only the B side is incorporated:

No SB can be dynamically added (Hot-Add) to the A side (SB#1A) in the slot (SB#1) with the smallest mounting slot number, among the slots containing the SBs composing Partition#1.

An SB can be dynamically added (Hot-Add) to SB#2 or SB#4, after the SB mounted in the slot (SB#1) with the smallest mounting number among the slots containing the SBs composing Partition#1.

No SB can be dynamically added (Hot-Add) to SB#0 and a slot preceding SB#1.

**Figure 1.8 Partition configuration and mounting locations of SBs that can be dynamically added (Hot-Add)**

Reserved SB setting	<ul style="list-style-type: none"><li>• Adding a reserved SB to a partition releases the SB from the reserved state.</li></ul>
SB status:	<ul style="list-style-type: none"><li>• A free SB or reserved SB in the "Failed," "Degraded," or "Warning" state cannot be dynamically added (Hot-Add).</li></ul>
Initial diagnosis of the SB to be added:	<ul style="list-style-type: none"><li>• When an error is detected in the SB to be added or in the mounted CPU/DIMM during the initial diagnosis performed by the firmware for the SB to be added, dynamic addition (Hot-Add) fails and the SB that is supposed to be added enters the free SB state. (If "Reserved" has been set, this setting is cleared.)</li></ul>
MMB switchover:	<ul style="list-style-type: none"><li>• Do not perform switching or reset of the MMB during DP operation. Otherwise, the DP operation command may terminate abnormally. When the command terminates abnormally due to MMB switching, follow the recovery procedure for the DP operation command.  Linux: <a href="#">Section 2.3.1.1, "Recovery procedure for the DP operation command"</a>  Windows: <a href="#">Section 3.3.1.1, "Recovery procedure for the DP operation command"</a></li></ul>
System operation:	<ul style="list-style-type: none"><li>• Do not perform restart, shutdown, or reset of the target partition of DP operation during DP operation. Even when restart, shutdown, or reset of the target partition of DP operation is performed during DP operation, at the next startup, the SB configuration of the partition will enter the state in which the DP operation will have succeeded.</li></ul>
Termination by Ctrl-C:	<ul style="list-style-type: none"><li>• The DP operation command cannot be forcibly terminated by Ctrl-C.</li></ul>
Closing of the terminal or prompt:	<ul style="list-style-type: none"><li>• [Linux] During DP operation, do not close the terminal from which the DP operation command is being executed. Even when the terminal is closed, the DP operation is continued in the background. In this case, the completion of the DP operation can be recognized from the message "FJSVpsa: I 08803 [Comment] 6/6 Adding of &lt;Unitttype&gt;#%d{A B} to this partition is completed (%s,%s)," which is output to the system log. For the system log, check the "/var/log/messages" file.</li></ul>

- [Windows] During DP operation, do not close the prompt from which the DP operation command is being executed. If the prompt is closed halfway, the DP operation is discontinued. When the prompt is closed during DP operation, follow the recovery procedure for the DP operation command (see [Section 3.3.1.1, "Recovery procedure for the DP operation command"](#)).
- Partition configuration operation
  - During DP operation, do not perform the Remove operation for an SB from the [Partition Configuration] window that is displayed by selecting [Partition] → [Partition Configuration] from the MMB Web-UI. Otherwise, the DP operation command terminates abnormally. When the command terminates abnormally, follow the recovery procedure for the DP operation command.
    - Linux: [Section 2.3.1.1, "Recovery procedure for the DP operation command"](#)
    - Windows: [Section 3.3.1.1, "Recovery procedure for the DP operation command"](#)
- Mirror mode:
  - A free SB or reserved SB split by XPAR cannot be dynamically added (Hot-Add) to a partition in Extended Mirror Mode.
- Split by XPAR:
  - [Linux] Before dynamically adding (Hot-Add) a split SB, split the SB by using the MMB Web-UI. Before dynamically adding (Hot-Add) an SB that is not split, integrate the SB into a single unit by using the MMB Web-UI.
  - [Windows] A free SB or a reserved SB that is split cannot be dynamically added (Hot-Add).

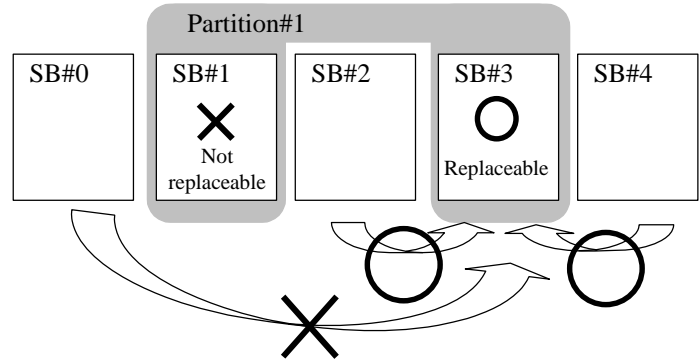
## ■ Dynamic replacement of an SB (Hot-Replace)

- SB type
  - SBs are categorized into two types. On one type, 8-GB DIMMs cannot be mounted; on the other type, only 8-GB DIMMs can be mounted. The SB added to a partition must be of the same type as those already mounted in the partition because different types of SB cannot be mounted together in the same partition.

Mounting condition of CPUs/memory	<ul style="list-style-type: none"><li>• The newly installed SB must have the same type and same number of CPUs or DIMMs at the same locations as those on the SB to be replaced. For the CPU types that can be mounted on the PRIMEQUEST 580A/540A, see <a href="#">Table 1.2</a>. For the DIMM types that can be mounted on the PRIMEQUEST 580A/540A, see <a href="#">Table 1.3</a>.</li></ul>
PAL/SAL firmware	<ul style="list-style-type: none"><li>• The PAL or SAL firmware installed on the SB to be added to a partition must be of the same version as the PAL or SAL firmware already running in the partition. If the version does not match, dynamic replacement (Hot-Replace) fails and the original state of the spare SB is restored.</li></ul>
Hot-Replace SB	<ul style="list-style-type: none"><li>• An SB to newly be added to a partition must be either a free SB, which is not belonging to any partition, or a reserved SB of the partition for which DP operation is performed.</li></ul>
Mounting location of an added SB:	<ul style="list-style-type: none"><li>• An SB to newly be added to a partition (spare SB) must be mounted in a slot whose slot number is greater than the smallest slot number among the slot numbers of the SBs that compose the partition for which DP operation is performed (see <a href="#">Figure 1.9</a>).</li></ul>
SB to be replaced:	<ul style="list-style-type: none"><li>• The display of "*" in the Home column in the output result of the SB state indication command (fjsvdr-stat) indicates that dynamic replacement (Hot-Replace) cannot be performed for the relevant SB (see <a href="#">Figure 1.9</a>).</li></ul>

Example) Output result of the SB state indication command (fjsvdrct-stat)

SB	Status	Power	PID	Home	Reserved
0	OK	StandBy	F	-	
1	OK	On	1	*	
2	OK	StandBy	F	-	
3	OK	On	1	-	
4	OK	StandBy	F	-	



SB#1 for which "\*" is displayed in the Home column in the output result of the fjsvdrct-stat command cannot be dynamically replaced (Hot-Replace).  
SB#3 can be dynamically replaced (Hot-Replace) with SB#2 and SB#4, which are mounted after SB#1, and cannot be dynamically replaced (Hot-Replace) with SB#0, which is mounted in a place before SB#1.

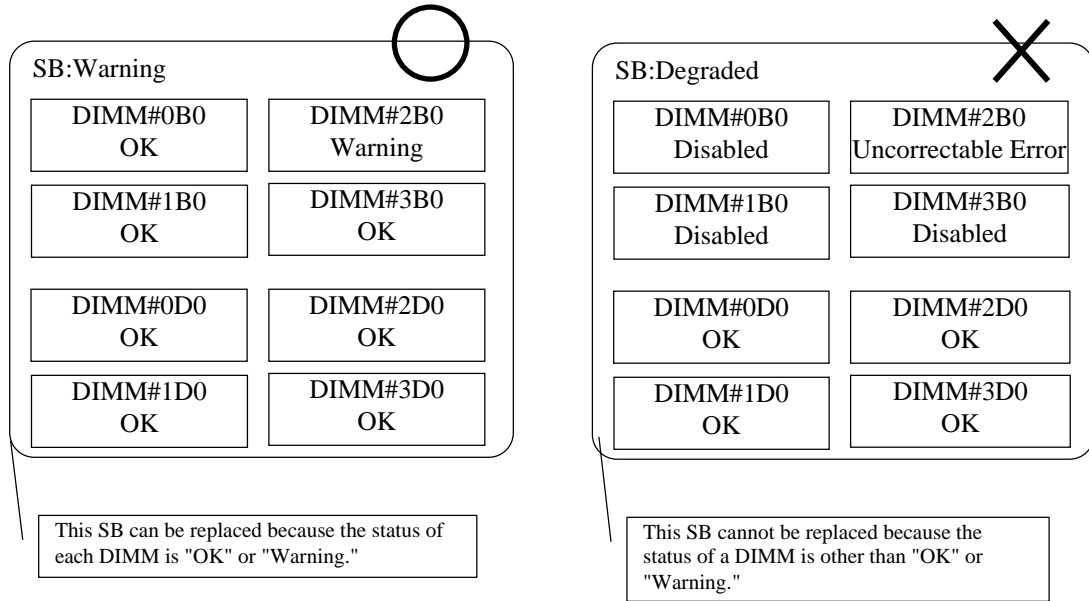
Figure 1.9 Relationship between SB state indication command and mounting locations of SBs that can be dynamically replaced (Hot-Replace)

- Reserved SB setting

Status of the SB to be replaced:
- Adding a reserved SB to a partition releases the SB from the reserved state.
  - If the status of a CPU or DIMM on an SB to be replaced is other than "OK" or "Warning," the SB cannot be replaced (\*1) (Figure 1.10). However, in a partition running in Extended Mirror Mode, the SB can be replaced only if the status of at least one of DIMMs forming a mirror pair is "OK" or "Warning" (\*2) (Figure 1.11).
    - \*1 A CPU that enters the "Warning" state because of frequent correctable errors is isolated and placed in the "Disabled" state after the partition is rebooted. However, the CPU status on the MMB Web UI remains "Warning." In this case, the CPU is handled in the same way as in the "Disabled" state and thus cannot be dynamically replaced (Hot-Replace).
    - \*2 DIMM#0Xy and DIMM#2Xy (X: A to D, y: 0 or 1) form a mirror pair, and DIMM#1Xy and DIMM#3Xy (X: A to D, y: 0 or 1) form another mirror pair.
  - If the status of the SB to be replaced changes to "Failed" during DP operation, the SB can no longer be isolated. In this event, the partition must be restarted for recovery.

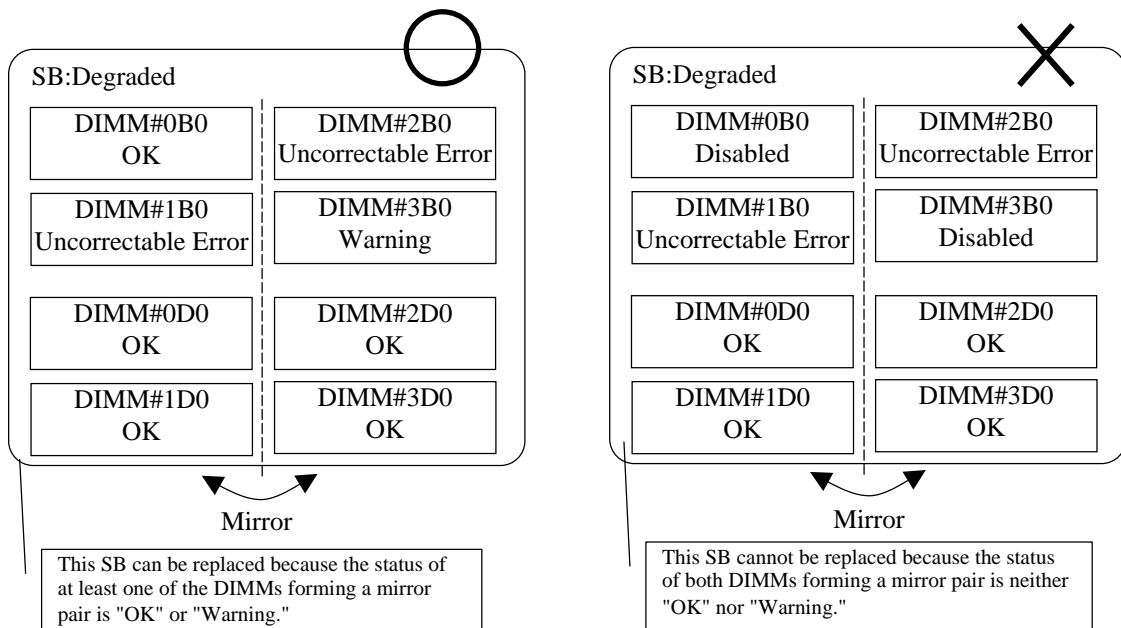


## Mirror Mode Disabled or Standard Mirror Mode



**Figure 1.10 Status of DIMMs on the SB to be replaced and whether replacement is enabled/disabled (Mirror Mode Disabled or Standard Mirror Mode)**

## Extended Mirror Mode



**Figure 1.11 Status of DIMMs on the SB to be replaced and whether replacement is enabled/disabled (Extended Mirror Mode)**

SB status:	<ul style="list-style-type: none"><li>• A free SB or reserved SB in the "Failed," "Degraded," or "Warning" state cannot be dynamically replaced (Hot-Replace).</li></ul>
Initial diagnosis of the spare SB:	<ul style="list-style-type: none"><li>• When an error is detected in a spare SB or in the mounted CPU/DIMM during the initial diagnosis performed by the firmware for the spare SB, dynamic replacement (Hot-Replace) fails and the spare SB enters the free SB state. (If "Reserved" has been set, this setting is cleared.)</li></ul>
MMB switchover:	<ul style="list-style-type: none"><li>• Do not perform switching or reset of the MMB during DP operation. Otherwise, the DP operation command may terminate abnormally. When the command terminates abnormally due to MMB switching, follow the recovery procedure for the DP operation command (see <a href="#">Section 3.3.1.1, "Recovery procedure for the DP operation command"</a>).</li></ul>
System operation:	<ul style="list-style-type: none"><li>• Do not perform restart, shutdown, or reset of the target partition of DP operation during DP operation. Otherwise, the SB configuration of the partition will be inconsistent with the state after the DP operation. Stop the partition once, and use the [Partition Configuration] window that is displayed by selecting [Partition] → [Partition Configuration] from the MMB Web-UI to change the SB configuration to the state after the DP operation.</li></ul>
Termination by Ctrl-C:	<ul style="list-style-type: none"><li>• The DP operation command cannot be forcibly terminated by Ctrl-C.</li></ul>
Closing of the terminal or prompt:	<ul style="list-style-type: none"><li>• During dynamic partitioning, do not close the prompt from which the DP operation command was executed. Otherwise, dynamic partitioning is terminated. When the prompt is closed during DP operation, follow the recovery procedure for the DP operation command (see <a href="#">Section 3.3.1.1, "Recovery procedure for the DP operation command"</a>).</li></ul>
Partition configuration operation	<ul style="list-style-type: none"><li>• During DP operation, do not perform the Remove operation for an SB from the [Partition Configuration] window that is displayed by selecting [Partition] → [Partition Configuration] from the MMB Web-UI. Otherwise, the DP operation command terminates abnormally. When the prompt is closed during DP operation, follow the recovery procedure for the DP operation command (see <a href="#">Section 3.3.1.1, "Recovery procedure for the DP operation command"</a>).</li></ul>

Split by XPAR:

- An SB to be replaced that is split by XPAR cannot be dynamically replaced (Hot-Replace).
- Before adding an SB that is split with the XPAR setting to a partition, integrate the SB into a single unit by using the MMB Web-UI.

Partition configuration:

- In a partition consisting of only one LSB, no SB can be replaced.

**Table 1.2 Types of CPU that can be mounted in the PRIMEQUEST 580A/540A**

Displayed by MMB Web-UI	Operating frequency	Front-side bus frequency	L3 cache size
Dual-Core Intel® Itanium® Processor 9150M	1.66 GHz	667 MHz	24 MB
Dual-Core Intel® Itanium® Processor 9130M	1.66 GHz	667 MHz	8 MB

**Table 1.3 Types of DIMM that can be mounted in the PRIMEQUEST 580A/540A**

Data rate	Size	Rank
DDR2-667	1 GB	1
DDR2-667	2 GB	1
DDR2-533	4 GB	2
DDR2-400	8 GB	4



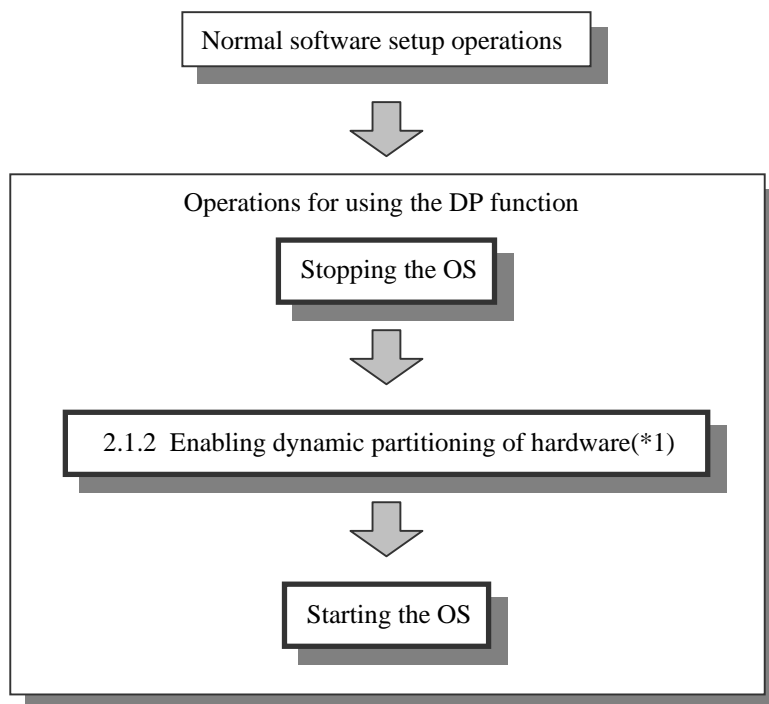
# **Chapter 2 Method of Using the DP Function in Linux**

## **2.1 Installation**

This section explains the DP function installation procedure as it relates to using the function.

## 2.1.1 Flow of installation

The figure below outlines the procedure for installing the DP function. The installation operations must be performed by the system administrator. All system installation steps until software setup must be completed before these operations. For details, see the *PRIMEQUEST 500A/500/400 Series Installation Manual (C122-E001EN)*. This manual explains only the procedures required for using the DP function and the procedures performed after software setup.



**Figure 2.1 DP function installation flow**

\*1 Do not enable dynamic partitioning of hardware before installing the DP function. For details of how to enable dynamic partitioning of hardware, see [Section 2.1.2, "Enabling dynamic partitioning of hardware."](#)

## 2.1.2 Enabling dynamic partitioning of hardware

Dynamic partitioning of hardware must be enabled. From the [Partition] menu in the MMB Web-UI window, select [Partition#n] → [Mode]. In the [Mode] window (Figure 2.2), select "Enable" for "Dynamic Partitioning." Since this setting requires that the target partition be inactive, stop the OS of the target partition before making this setting. If the setting is changed during system operation, a message pops up to report that the changes made to the setting will be validated the next time the system is rebooted (see Figure 2.3).

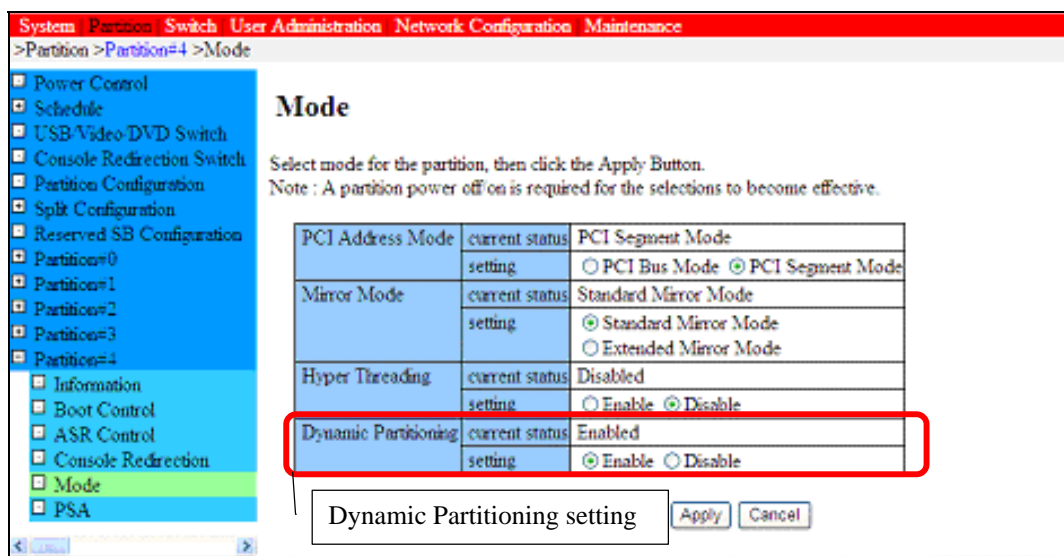


Figure 2.2 Settings in the [Mode] window

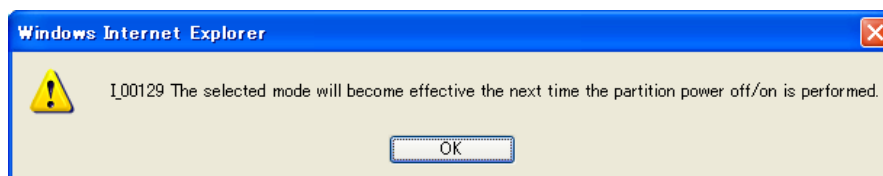


Figure 2.3 Popup message output when the mode is changed during system operation

Note:

If the system is earlier than RHEL5.1 (IPF) or the virtual machine function will be used, be sure to disable Dynamic Partitioning because it is not supported. If it is enabled, operation cannot be assured. Installation may not be performed normally depending on the distribution.

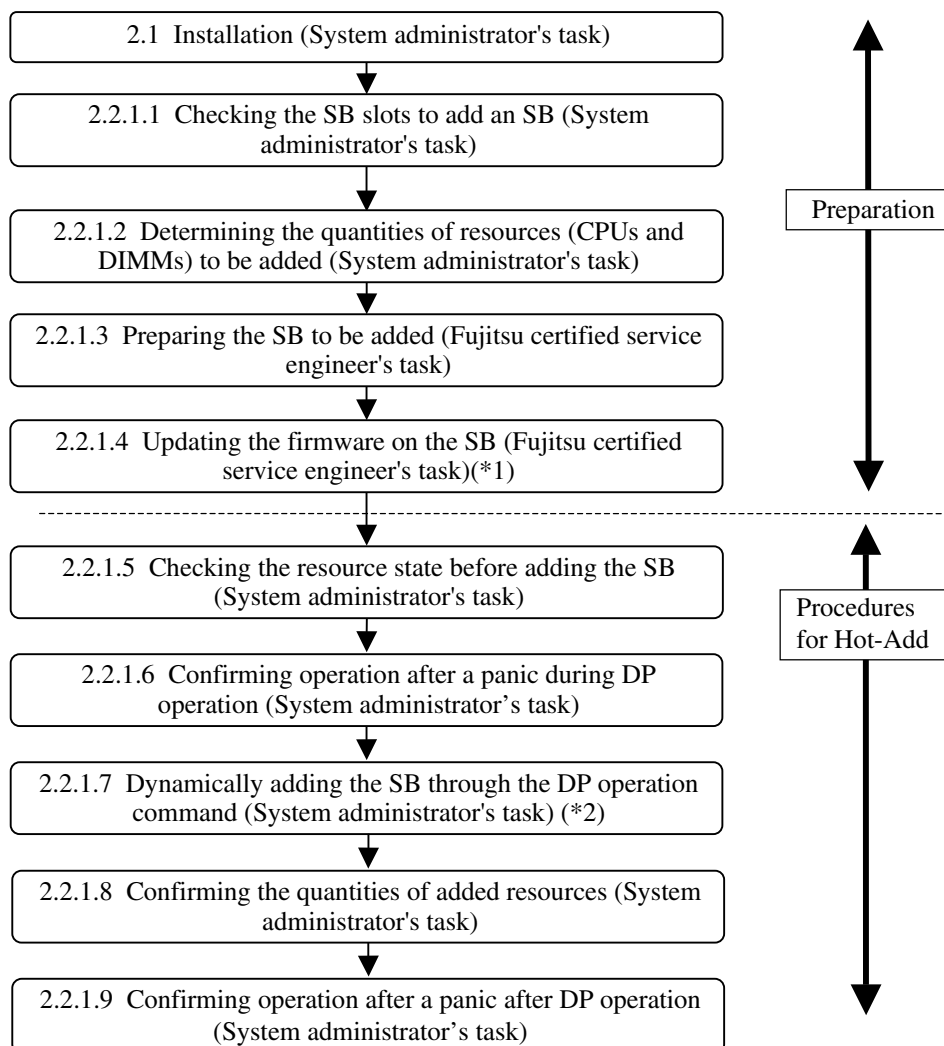
## 2.1.3 Note on installation

Based on the maximum memory size increased through dynamic partitioning, estimate the sizes of the dump device and dump saving areas to be allocated. If the sizes are estimated based on the original memory size, which excludes the increase in memory through dynamic partitioning, dump collection after a dynamic partitioning operation may fail. For details on this estimation, see Section 10.1, "Estimating Dump-use Area," in the *PRIMEQUEST 580A/540A/580/540/480/440 System Design Guide* (C122-B001EN).

## 2.2 Operations

### 2.2.1 Flow of operations

Dynamic partitioning is implemented with an assumption that the system has been built to enable dynamic partitioning as described in [Section 2.1, "Installation."](#) In a system whose environment satisfies the dynamic partitioning requirements, users can dynamically add (Hot-Add) SBs by following the flow of operations shown in [Figure 2.4](#).



\*1 The work time for the operations in [2.2.1.4](#) is about one hour per SB. Plan and perform this operation efficiently by considering the required operation time. Fujitsu recommends confirming the firmware version before starting dynamic partitioning, so that the work is performed efficiently.

\*2 The length of time taken for dynamic addition (Hot-Add) by the DP operation command depends on the CPU and DIMM capacities on the added SB and the system load. In an environment in which dynamic partitioning will be used, perform dynamic partitioning in advance to measure the length of time. In an environment with a low system load, the length of time can be roughly estimated as follows:

[Total capacity (GB) of DIMMs mounted on SB to be added] 2 + 250 (seconds)

**Figure 2.4 Flow of dynamic partitioning (dynamic addition [Hot-Add] of an SB) in Linux**



### 2.2.1.1 Checking the slots to add an SB

This operation is to be performed by the system administrator. To perform dynamic addition (Hot-Add) of an SB, the cabinet must contain a free SB or a reserved SB of a partition for which DP operation is performed. Whether an SB is a free SB or reserved SB can be checked by using the SB state indication command (fjsvdr-stat) (see [Figure 2.5](#)) or from the [Partition Configuration] window that is displayed by selecting [Partition] → [Partition Configuration] from the MMB Web-UI (see [Figure 2.6](#)).

Display example of the SB state indication command (fjsvdr-stat)

SB	Status	Power	PID	Home	Reserved
2	OK	On	1	*	
3	OK	On	1	-	
4	Warning	On	1	-	
5	OK	StandBy	1	-	
6	OK	StandBy	R	-	1+
7	OK	StandBy	F	-	

SB#5 is the SB that is incorporated in Partition#1 and recognized by the system at the time of restart.  
 SB#6 is the reserved SB for Partition#1.  
 SB#7 is a free SB.

**Figure 2.5 Output result of the SB state indication command (fjsvdr-stat)**

"F" in the PID column indicates that the relevant SB is a free SB, and "R," a reserved SB.

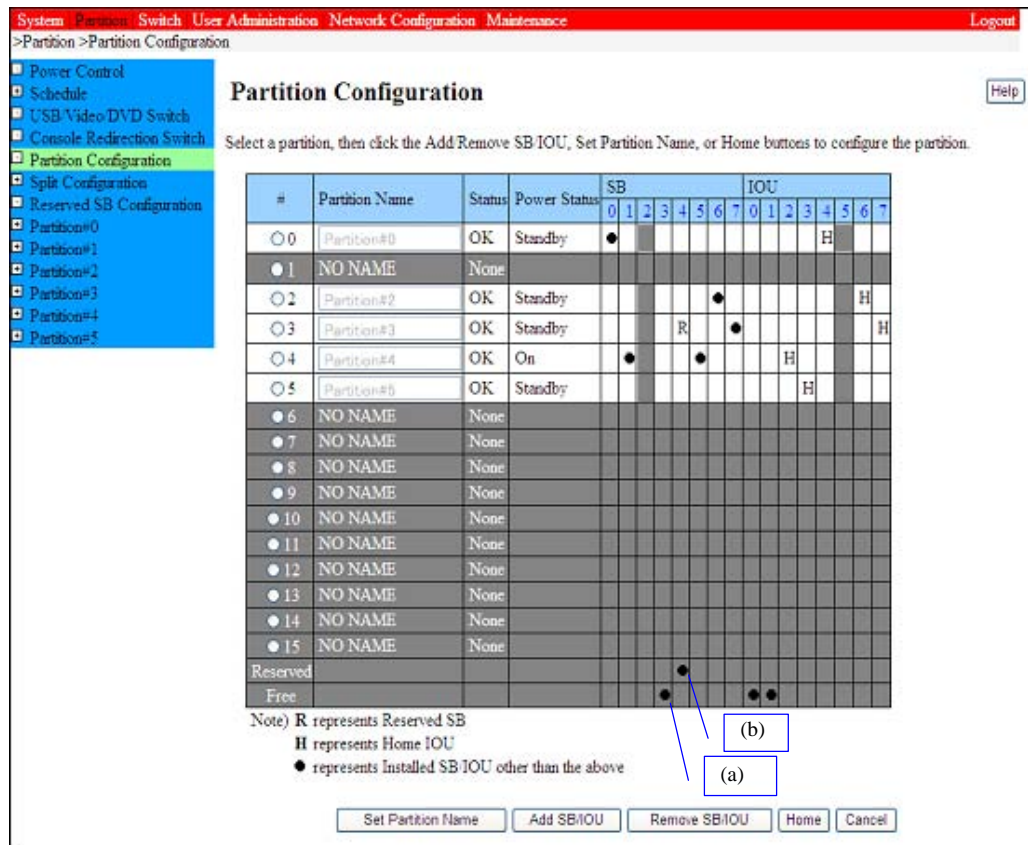


Figure 2.6 [Partition Configuration] window

An SB slot not marked with ● is an empty slot, an SB (a) marked with ● in the Free row is a free SB, and an SB (b) marked with ● in the Reserved row is a reserved SB.

DP operation cannot be performed in an environment containing neither a free SB nor a reserved SB of a partition for which DP operation is performed.

For SBs that are recognized by the system when the system is restarted next time, DP operation for these SBs is enabled by placing them in the "Free" state through the Remove operation from the Partition Configuration window (see Figure 2.6).

An SB that is recognized by the system when the system is restarted next time is the one for which "StandBy" is displayed in the Power column, "OK" is displayed in the Status column, and a number (other than "F" or "R") is displayed in the PID column when the SB state indication command (fjsvdrd-stat) (see Figure 2.5) is executed.

The added SB must conform to the conditions and requirements described in Section 1.2.3, "Prerequisites for dynamic partitioning operations," and Section 1.2.4, "Notes on implementing dynamic partitioning."

### 2.2.1.2 Determining the quantities of resources (CPUs and DIMMs) to be added

This operation must be performed by the system administrator. The SB added to a partition must have sufficient quantities of resources (CPUs and DIMMs) to compensate for a deficiency in resources in the partition. Estimate the quantities of resources that must be added, and prepare the required resources. Note that some conditions are set regarding possible combinations of the CPUs and DIMMs to be added to and the CPUs and DIMMs already operating in the target partition (see [Section 1.2.4, "Notes on implementing dynamic partitioning"](#)). If the conditions cannot be satisfied, do not execute dynamic partitioning.

### 2.2.1.3 Preparing the SB to be added

This operation must be performed by a Fujitsu certified service engineer.

Confirm that the determined quantities of resources (CPUs and DIMMs) are mounted on the SB to be added in the cabinet. From the [System] menu in the MMB Web-UI window, select [SB] → [SB#n] to display the [SB#n] window ([Figure 2.7](#)). Also confirm that the SB to be added is normal.

The screenshot shows the MMB Web-UI interface for the [SB#4] window. The left sidebar contains a tree view with categories like System Status, System Event Log, System Information, Firmware Information, System Setup, System Power Control, LEDs, Power Supply, Fans, Temperature, SB, IOU, System Interconnect, Other Boards, MMB, and GSWB. The main content area is titled 'SB#4' and includes a 'Refresh' button and a 'Help' button. Below the title, there is a note: 'Click the Status Clear button to clear the status.'

**Board Information**

Status	OK	A	OK	B	OK
Power Status	On				
Split Mode	Enabled				
Part Number	CA06501-D402 F2				
Serial Number	PP0623X522				
Location LED	Off <input type="button" value="On"/> <input type="button" value="Off"/> <input type="button" value="Blink"/>				

**CPUs**

Split	CPU#	Status	Model	Stepping	Serial Number	PPOD
A	A0	OK	Dual-Core Intel® Itanium® 2 Processor 9150M	A1	EDDE8F14C2E90100	OK
	A1	Not-present				
B	B0	OK	Dual-Core Intel® Itanium® 2 Processor 9150M	A1	F5B17E474B860100	OK
	B1	Not-present				

**DIMMs**

Split	DIMM#	Status	Size	Rank	Data Rate	Part Number	Serial Number
	0A0	OK	1GB	1	DDR2-667	EBE10RD4ABFA-4A-E+	2215FB70
	0A1	Not-present					
	0B0	Not-present					
	0B1	Not-present					
	1A0	OK	1GB	1	DDR2-667	EBE10RD4ABFA-4A-E+	2215F6AD
	1A1	Not-present					
	1B0	Not-present					

At the bottom of the window, there is a 'Status Clear' button.

Figure 2.7 [SB] window

### 2.2.1.4 Updating the firmware on the SB

This operation must be performed by a Fujitsu certified service engineer. The PAL or SAL firmware on all SBs in the same cabinet must be the same version. From the [System] menu in the MMB Web-UI window, select [Firmware Information] to display the [Firmware Information] window (Figure 2.8) to confirm the PAL or SAL firmware version.

To update the PAL or SAL firmware of the SB to be added, select [Firmware Update] → [PAL/SAL Firmware Update] from the [Maintenance] menu in the MMB Web-UI window, and perform the updating operation in the [PAL/SAL Firmware Update] window (Figure 2.9). In this window, select the SB to be added, specify the PAL/SAL firmware file, and click the Update button to start updating the firmware.

This operation requires about one hour per SB. Plan and perform this operation efficiently by considering the required operation time.

Unit	Firmware	Version
SB#0	PAL_A/PAL_B	1.08 / 1.08
	SAL_A/SAL_B	3.02 / 3.02
SB#1	PAL_A/PAL_B	1.08 / 1.08
	SAL_A/SAL_B	3.02 / 3.02
SB#2	Not-present	
SB#3	Not-present	
SB#4	A	PAL_A/PAL_B 1.08 / 1.08
		SAL_A/SAL_B 3.02 / 3.02
	B	PAL_A/PAL_B 1.08 / 1.08
		SAL_A/SAL_B 3.02 / 3.02
SB#5	PAL_A/PAL_B	1.08 / 1.08
	SAL_A/SAL_B	3.02 / 3.02
SB#6	PAL_A/PAL_B	-
	SAL_A/SAL_B	-
SB#7	Not-present	
IOU#0	BMM#0	BMC 1.29
		EFI 1.10.1.14
	BMM#1	BMC 1.29
		EFI 1.10.1.14
IOU#1	BMM#0	BMC 1.29
		EFI 1.10.1.14
	BMM#1	BMC 1.29
		EFI 1.10.1.14
IOU#2	BMM#0	BMC 1.29
		EFI 1.10.1.14
	BMM#1	BMC 1.29
		EFI 1.10.1.14
	BMM#0	BMC 1.29
		EFI 1.10.1.14

Figure 2.8 [Firmware Information] window

System Partition Switch User Administration Network Configuration Maintenance Logout

>Maintenance >Firmware Update >PAL/SAL Firmware Update

**PAL/SAL Firmware Update** Help

1. Select SB(s) to update.

☐ all

☐ specified unit(s)

SB#	0	1	2	3	4	5	6	7
	<input type="checkbox"/> A	<input type="checkbox"/> A	<input type="checkbox"/> A	<input type="checkbox"/> A	<input type="checkbox"/> A	<input type="checkbox"/> A	<input type="checkbox"/> A	<input type="checkbox"/> A
	<input type="checkbox"/> B	<input type="checkbox"/> B	<input type="checkbox"/> B	<input type="checkbox"/> B	<input type="checkbox"/> B	<input type="checkbox"/> B	<input type="checkbox"/> B	<input type="checkbox"/> B

☐ specified partition(s)

Partition#	0	1	2	3	4	5	6	7
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/> 8	<input type="checkbox"/> 9	<input type="checkbox"/> 10	<input type="checkbox"/> 11	<input type="checkbox"/> 12	<input type="checkbox"/> 13	<input type="checkbox"/> 14	<input type="checkbox"/> 15

2. Select a PAL/SAL firmware file.

参照...

Update Cancel

Figure 2.9 [PAL/SAL Firmware Update] window

### 2.2.1.5 Checking the resource state before adding the SB

This operation must be performed by the system administrator. Check the resource state prior to SB addition by dynamic partitioning in order to compare it with the state following the SB addition by dynamic partitioning. Refer to the following files as described below to check the quantities of resources prior to the SB addition:

CPU: /proc/cpuinfo

Enter the command shown below to output information on the CPUs recognized by the OS when this file is referenced.

This command outputs the number of CPUs as follows.

```
# grep -c processor /proc/cpuinfo
8
```

Memory: /proc/meminfo

Enter the command shown below to output the memory state when this file is referenced.

```
# cat /proc/meminfo
MemTotal:      66271968 kB
MemFree:       65637712 kB
Buffers:       30992 kB
:
:
```

The MemTotal line shows the total size of physical memory in the system.

Note that some resource state display commands output different values before and after dynamic partitioning.

Example: Output by the free command

Executed before dynamic partitioning:		
#free		
	total	used
Mem:	66272512	.....
Executed after dynamic partitioning:		
#free		
	total	used
Mem:	99761408	.....

### 2.2.1.6 Confirming operation after a panic during DP operation

This operation must be performed by the system administrator. If a panic occurs during DP operation, operation after the panic is undefined. Therefore, make a change prior to DP operation so that the OS setting matches the dump setting. The state after any panic that occurs during DP operation may be either of the following:

- Abnormal dump collected

If a panic occurs during DP operation, an abnormal dump may be collected. In this case, the operation after the collection of the dump is a system halt or system reboot, depending on the dump setting (default line in /etc/kdump.conf).

- No dump can be collected

If a panic occurs during DP operation, the system may fail to collect a dump. In this case, the operation after the panic is a system halt or system reboot, depending on the dump setting (kernel.panic line in /etc/sysctl.conf).

Ordinarily, the OS setting is set to halt. Before implementing DP operation, change the /etc/sysctl.conf file settings so that the OS setting matches the dump setting.

In the following example of the OS setting, reboot (system reboot after dump collection) has been set for dump in the setting file:

To change the setting, modify kernel.panic line in the /etc/sysctl.conf file and enable the changed setting.

# vi /etc/sysctl.conf
Modified/added line:
kernel.panic = x
x = 0 or no kernel.panic line: The system is halted.
x = 1 or greater (maximum of 2147483647): The system is rebooted after x seconds.
Example) If the default line in /etc/kdump.conf is reboot
kernel.panic = 5
# sysctl -p

When changing the line to the halt setting, set kernel.panic = 0 and reflect the setting. If the kernel.panic line is simply deleted, this setting will not be reflected.

### 2.2.1.7 Dynamically adding the SB through the DP operation command (Hot-Add)

This operation must be performed by the system administrator. Log in as the root user to the target partition of dynamic partitioning, and execute the DP operation command to dynamically add the SB (Hot-Add). For details of the SB to be added, see [Section 2.2.1.3, "Preparing the SB to be added."](#)

When DP operation is started, firmware performs an initial diagnosis of the SB to be added. The detection of any error in the SB during the initial diagnosis by the firmware interrupts the DP operation and places the SB to be added in the Free SB state (If "Reserved" has been set, this setting is cleared). If the version of SAL/PAL is different from the version of the one operating in the partition, the DP operation is interrupted and the SB to be added is placed in its original state.

The time required for the DP operation varies depending on the system configuration and states (e.g., load).

In an environment with a low load, the length of time taken for dynamic partitioning can be estimated as follows according to the total capacity of the DIMMs mounted on the SB to be added:

(Reference) Length of time taken for dynamic partitioning

$[\text{Total capacity of DIMMs (GB) mounted on SB to be added}] \times 2 + 250 \text{ (seconds)}$

Example: The total capacity of DIMMs mounted on the SB to be added is 16 GB.

$16 \times 2 + 250 = 282 \text{ (seconds)}$

[Notes on command execution]

- |                                   |   |
|-----------------------------------|---|
| Termination by Ctrl-C:            | <ul style="list-style-type: none"> <li>The DP operation command cannot be forcibly terminated by Ctrl-C.</li> </ul>   |
| Closing of the terminal:          | <ul style="list-style-type: none"> <li>During dynamic partitioning, do not close the terminal on which the DP operation command was executed. Even if the terminal is closed, dynamic partitioning continues in the background. In this case, completion of dynamic partitioning can be known from the following message output to the system log:<br/><br/>"FJSVpsa: I 08803 [Comment] 6/6 Adding of &lt;Unitttype&gt;#%d {A B} to this partition is completed (%s, %s)"<br/><br/>For the system log, check the "/var/log/messages" file.</li> </ul> |
| MMB switchover:                   | <ul style="list-style-type: none"> <li>Do not switch or reset the MMB during dynamic partitioning. Otherwise, the DP operation command may terminate abnormally. When the command terminates abnormally due to MMB switching, follow the recovery procedure for the DP operation command (see <a href="#">Section 2.3.1.1, "Recovery procedure for the DP operation command"</a>).</li> </ul>   |
| System operation                  | <ul style="list-style-type: none"> <li>Do not perform restart, shutdown, or reset of the target partition of DP operation during DP operation. Even when restart, shutdown, or reset of the target partition of DP operation is performed during DP operation, at the next startup, the SB configuration of the partition will enter the state in which the DP operation will have succeeded.</li> </ul>  |
| Partition configuration operation | <ul style="list-style-type: none"> <li>During DP operation, do not perform the Remove operation for an SB from the [Partition Configuration] window that is displayed by selecting [Partition] → [Partition Configuration] from the MMB Web-UI. Otherwise, the DP operation command terminates abnormally. When the command terminates abnormally, follow the recovery procedure for the DP operation command (see <a href="#">Section 2.3.1.1, "Recovery procedure for the DP operation command"</a>).</li> </ul>                                    |

For details of the DP operation command, see [Section 2.2.2, "DP operation command \(fjsvdrc\)"](#). Also, before executing the DP operation command, confirm the conditions and states as described in [Section 2.4, "Notes and Restrictions on Software."](#)



## Example of execution

```
Dynamically adding (Hot-Add) SB#3B:
# /opt/FJSPsa/bin/fjsvdr -add SB 3B
FJSPsa : I 08809 [Comment] 0/6 DP operation start (xx, xx)
.....
FJSPsa : I 08800 [Comment] 1/6 Adding SB#3B to this partition (xx, xx)
....
FJSPsa : I 08805 [Comment] 2/6 Diagnosing SB#3B (xx, xx)
.....
FJSPsa : I 08806 [Comment] 3/6 Realizing SB#3B (xx, xx)
..
FJSPsa : I 08807 [Comment] 4/6 Adding the new resources to the OS (xx, xx)
.....
FJSPsa : I 08808 [Comment] 5/6 Restarting PSA (xx,xx)
...
FJSPsa : I 08803 [Comment] 6/6 Adding of SB#3B to this partition is completed (xx, xx)
```

## Note:

"." is displayed about every 10 seconds during dynamic partitioning.

Example of system log output (see the "/var/log/messages" file.)

```

When SB#5 is dynamically added (Hod-Add)
FJSVpsa: I 08809 [Comment] 0/6 DP operation start (xx, xx)
FJSVpsa: I 08800 [Comment] 1/6 Adding SB#5 to this partition (xx, xx)
FJSVpsa: I 08805 [Comment] 2/6 Diagnosing SB#5 (xx, xx)
FJSVpsa: I 08806 [Comment] 3/6 Realizing SB#5 (xx, xx)
kernel: Container driver received ACPI_NOTIFY_DEVICE_CHECK event
container_hotplug[6832]: container_hotplug start.
container_hotplug[6832]: exec preadd scripts.
container_hotplug[6832]: /lib/udev/container/preadd/00-FJSVpsa.container success.
container_hotplug[6832]: MEMORY hotplug start.
kernel: Built 15 zonelists. Total pages: xxxxxx
container_hotplug[6832]: MEMORY hotplug finish.
container_hotplug[6832]: MEMORY hotplug success.
container_hotplug[6832]: CPU hotplug start.
kernel: CPU 4: synchronized ITC with CPU 0 (last diff x cycles, maxerr xxx cycles)
kernel: CPU 5: synchronized ITC with CPU 0 (last diff x cycles, maxerr xxx cycles)
kernel: CPU 6: synchronized ITC with CPU 0 (last diff x cycles, maxerr xxx cycles)
kernel: CPU 7: synchronized ITC with CPU 0 (last diff x cycles, maxerr xxx cycles)
container_hotplug[6832]: CPU hotplug finish.
container_hotplug[6832]: CPU hotplug success.
container_hotplug[6832]: exec postadd scripts.
drdump: drdump start.
drdump: sadump is operated.
sadump: Rebuilding /boot/efi/efi/redhat/initrd-2.6.18-53.el5kdump.img
FJSVpsa: I 08807 [Comment] 4/6 Adding the new resources to the OS (xx, xx)
kernel: kjournald starting. Commit interval 5 seconds
kernel: EXT3-fs warning: maximal mount count reached, running e2fsck is recommended
kernel: EXT3 FS on sda4, internal journal
kernel: EXT3-fs: mounted filesystem with ordered data mode.
kdump: kexec: unloaded kdump kernel
kdump: stopped
kdump: kexec: loaded kdump kernel
kdump: started up
kernel: sadump-init: shut down.
sadump: Rebuilding /boot/efi/efi/redhat/initrd-2.6.18-53.el5kdump.img
kernel: kjournald starting. Commit interval 5 seconds
kernel: EXT3-fs warning: maximal mount count reached, running e2fsck is recommended
kernel: EXT3 FS on sda4, internal journal
kernel: EXT3-fs: mounted filesystem with ordered data mode.
kdump: kexec: unloaded kdump kernel
kdump: stopped
kdump: kexec: loaded kdump kernel
kdump: started up
kernel: sadump-init: start sadump initialize.
drdump: sadump restarted.
drdump: drdump compleated.
container_hotplug[6832]: /lib/udev/container/postadd/40-FJSVsbhp-drdump-restart.container success.
container_hotplug[6832]: /lib/udev/container/postadd/99-FJSVpsa.container success.
container_hotplug[6832]: container_hotplug finish.
FJSVpsa: I 08808 [Comment] 5/6 Restarting PSA (xx, xx)
kernel: IPMI Watchdog: driver initialized
snmpd[5210]: Received TERM or STOP signal... shutting down...
snmpd[11107]: Duplicate IPv6 address detected, some interfaces may not be visible in IP-MIB
FJSVpsa: I 00061 PM daemon normal end(/etc/opt/FJSVpsa/global/pmpsa.conf)
snmpd[11107]: Turning on AgentX master support.
snmpd[11107]: NET-SNMP version 5.3.1
FJSVpsa: I 00129 PMS stop succeeded (/etc/opt/FJSVpsa/global/pmpsa.conf)
kernel: IPMI Watchdog: driver initialized
FJSVpsa: I 00069 PM startup succeeded (/etc/opt/FJSVpsa/global/pmpsa.conf)
FJSVpsa: I 08803 [Comment] 6/6 Adding of SB#5 to this partition is completed (xx, xx)

```

### 2.2.1.8 Confirming the quantities of added resources

This operation must be performed by the system administrator. After executing the DP operation command as described in [Section 2.2.1.7, "Dynamically adding the SB through the DP operation command \(Hot-Add\),"](#) check the resource state following SB addition by dynamic partitioning. For this purpose, refer to the following files in the same way as in checking the resource state prior to dynamic partitioning:

CPU: `/proc/cpuinfo`  
(The number of CPUs has been increased by the number of added CPUs.)

```
# grep -c processor /proc/cpuinfo
12
```

Memory: `/proc/meminfo`  
(The size of added memory is reflected in the MemTotal value.)

```
# cat /proc/meminfo
MemTotal:      99760864 kB
MemFree:       98984464 kB
Buffers:       31904 kB
:
:
```

Note that some resource state display commands output different values before and after dynamic partitioning, as described in [Section 2.2.1.5, "Checking the resource state before adding the SB."](#)

### 2.2.1.9 Confirming operation after a panic after DP operation

This operation must be performed by the system administrator. After the completion of the DP operation command, restore the setting made as described in [Section 2.2.1.6, "Confirming operation after a panic during DP operation."](#)

In the following example, the OS setting is restored to the halt setting.

To change the setting, modify kernel.panic line in the `/etc/sysctl.conf` file and enable the changed setting.

```
# vi /etc/sysctl.conf
```

Modified/added line:

```
kernel.panic = x
```

x = 0 or no kernel.panic line: The system is halted.

x = 1 or greater (maximum of 2147483647): The system is rebooted after x seconds.

Example) To make the halt setting

```
kernel.panic = 0
```

```
# sysctl -p
```

If there was no kernel.panic line (i.e., the halt setting) prior to the change, set kernel.panic = 0 and reflect the original setting. for restoring the setting. If the kernel.panic line is simply deleted, this setting will not be reflected.

## 2.2.2 DP operation command (fjsvdrc)

### (1) Input format

```
/opt/FJSVpsa/bin/fjsvdrc -add Nodetype addNode  
/opt/FJSVpsa/bin/fjsvdrc -recover
```

### (2) Function description

The DP operation command adds an SB in a partition while the OS is running. This command can be executed only for an SB for which no partition is defined (free SB or reserved SB of the partition for which DP operation is performed). The command also outputs the progress of dynamic partitioning to the standard output. Only the root user is permitted to execute the command.

Also, when the DP operation command terminates due to an error in communication with the MMB, use the `-recover` option to resume the interrupted operation.

Messages indicating the progress of dynamic partitioning and error messages are output to the console from which the command is executed. For details, see [Section 2.3.3.1, "DP operation command \(fjsvdrc\) messages."](#)

### (3) Options

- |                        |  |
|------------------------|--|
| <code>-add:</code>     | With this option specified, the DP operation command adds the specified SB to the local partition.   |
| <code>Nodetype:</code> | Always specify "SB" in this parameter.   |
| <code>addNode:</code>  | Specify the SB number of the SB to be added.<br>A number ranging from 0 to 7 can be specified.<br>When specifying a split SB, specify a side (A or B) after the SB number.<br>Example: For SB#3 on the A side, specify "3A". |
| <code>-recover:</code> | This option resumes the interrupted operation when the DP operation command terminates.  |

### 2.2.3 SB state indication command (fjsvdrc-stat)

#### (1) Input format

```
/opt/FJSVpsa/bin/fjsvdrc-stat Nodetype
```

#### (2) Function description

Of the SBs mounted in a cabinet, the state of SBs belonging to the local partition, free SBs, and SBs set as reserved SBs of the local partition is displayed. The state of SBs belonging to other partitions and SBs set as reserved SBs of only other partitions is not displayed.

This command can be executed only by a root user.

#### (3) Options

*Nodetype*: Always specify "SB".

#### (4) Representation format

Information of one LSB is displayed in one line. The information to be displayed is as follows:

Item name	Meaning	Display example
SB	SB number A number between 0 and 7, or such a number followed by "A" or "B" for an SB split by XPAR	1 , 5 , 6A , 7B
Status	SB error status	OK , Warning , Degraded , Failed
Power	SB power state	On , StandBy
PID	Partition ID to which an SB belongs A number between 0 and 15, "F" (for a free SB), or "R" (for a reserved SB) An SB for which a number (other than "F" or "R") is displayed in the PID column, "StandBy" is displayed in the Power column, and "OK" is displayed in the Status column is recognized by the system when the system is restarted next time.	1 , 12 , F , R
Home	Indicates an SB that cannot be dynamically replaced (Hot-Replace). "*" is displayed for SBs that cannot be dynamically replaced, and "-" is displayed for other SBs. Note) Even if "-" is displayed, it may not be possible to dynamically replace the SB.	* , -
Reserved	Indicates the partition ID for an SB for which the reserved setting has been set. The partition ID is displayed for an SB for which the reserved setting has been set, or the column is left blank for an SB for which the reserved setting has not been set (SB for which "R" is not displayed in the PID column). However, if an SB has also been set as a reserved SB for another partition, the local partition ID is followed by "+".	5 , 5+

Display example)

```
# /opt/FJSVpsa/bin/fjsvdr-stat SB
SB  Status    Power    PID  Home  Reserved
---+-----+-----+---+----+-----
2   OK        On       1    *
3   OK        On       1    -
4   Warning   On       1    -
5A  OK        StandBy  1    -
5B  OK        StandBy  F    -
6   OK        StandBy  R    -    1+
7   OK        StandBy  F    -
---+-----+-----+---+----+-----
```

For SB#5A in the example above, because the PID column contains a number, the Power column contains "StandBy," and the Status column contains "OK," this SB is recognized by the system when the system is restarted next time.

### (5) Error messages

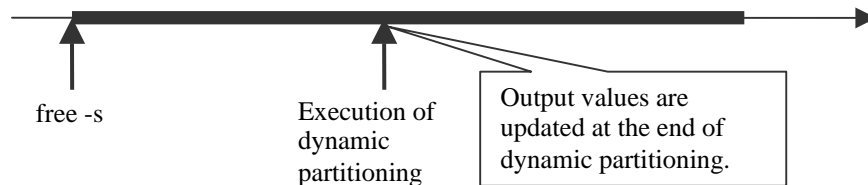
Message	Meaning	Corrective action
FJSVpsa: E 08600 [Command] Internal error(%s,%s,%s,%s,%s,%s)	Internal inconsistency occurred.	Use fjsnap to collect information for investigation on the partition side, and contact your Fujitsu certified service engineer.
FJSVpsa: E 08601 [Option] Too few or excessive option count(%s,%s,%s)	The number of command options is incorrect.	Check the specified option, specify the correct option, and reexecute the command.
FJSVpsa: E 08602 [Option] Invalid or unsupported option(%s,%s,%s)	An invalid or unsupported option was specified.	Check the specified option, specify the correct option, and reexecute the command.
FJSVpsa: E 08603 [Environment] Partition environment requirements are not met(%s,%s,%s,%s)	This command cannot be used for a server other than the PRIMEQUEST 580A/540A.	Check whether the cabinet is the PRIMEQUEST 580A/540A. The model name can be checked from the Model field displayed in the Information area in the upper part of the MMB Web-UI.
FJSVpsa: E 08604 [MMB] IPMI retry failure(%s,%s,%s,%s,%s,%s)	A retryable error was returned for the IPMI command and retry was performed, but the error was not corrected.	The SB state could not be obtained due to a temporary error of the MMB. Confirm that the MMB Web-UI can be referenced, and then reexecute the command. If the error message is output even after the command is reexecuted, collect SEL by using the MMB Web-UI, use fjsnap to collect information for investigation on the partition side, and contact your Fujitsu certified service engineer.
FJSVpsa: E 08605 [MMB] IPMI response error(%s,%s,%s,%s,%s,%s)	A response error was detected for the IPMI command.	Collect SEL by using the MMB Web-UI, use fjsnap to collect information for investigation on the partition side, and then contact your Fujitsu certified service engineer.

## 2.2.4 Notes on performing a dynamic partitioning operation

Note that dynamic partitioning changes the capacities of OS resources such as CPUs and memory; accordingly, it changes the output values of commands that display resource states.

Most of the resource state display commands that can be executed continuously over a dynamic partitioning operation will automatically change their output values to reflect the new resource information at the end of dynamic partitioning.

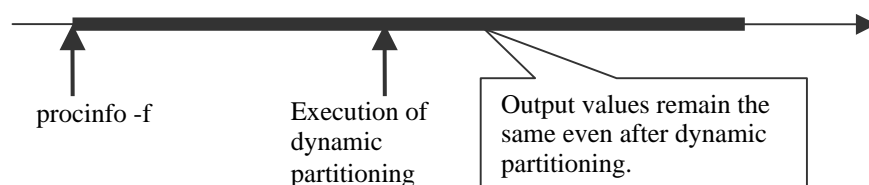
Example: `free -s` command (with the `-s` option)



**Figure 2.10 Command operation in which output values are updated at the end of dynamic partitioning**

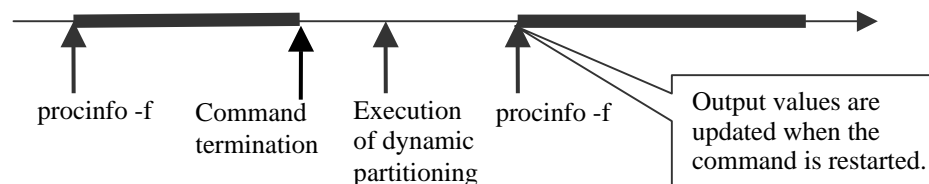
In contrast, the resource state prior to dynamic partitioning is still displayed by the following commands even after dynamic partitioning is executed:

<code>procinfo</code>	(with the <code>-f</code> option specified) (This command collects and displays the system state from the <code>/proc</code> file.)
<code>iostat</code>	(with the interval parameter specified) (This command outputs statistical information on CPUs and IO units.)
<code>mpstat</code>	(with the interval parameter specified) (This command outputs statistical information on CPUs.)
<code>sar</code>	(with the interval and count parameters specified) (This command outputs various statistical information on the system.)
<code>gnome-system-monitor</code>	(This command outputs system information via a GUI.)



**Figure 2.11 Command operation in which output values are not updated after dynamic partitioning**

To update the output values of these commands, terminate them with the kill command before dynamic partitioning, and restart them after dynamic partitioning.



**Figure 2.12 Command operation in which the command is terminated before and restarted after dynamic partitioning**

## 2.2.5 Cooperation scripts

Specific commands sometimes need to be automatically executed in connection with dynamic partitioning. For example, the user should change the preset maximum number of threads on the server because dynamic partitioning changes the number of CPUs.

For this purpose, if the desired command scripts (called "cooperation scripts", in this document) are registered in specific directories, the desired commands can be automatically executed in connection with resource addition by dynamic partitioning. Such cooperation scripts are called by the SB hotplug cooperation function.

### 2.2.5.1 Cooperation script execution timing

When the DP operation command is entered, the system will execute cooperation scripts at the following points in time:

- Before dynamic addition (Hot-Add) of an SB (simply called "before dynamic addition")
- After successful dynamic addition (Hot-Add) of an SB (simply called "after dynamic addition")
- At the time that dynamic addition (Hot-Add) of an SB fails (simply called "at the dynamic addition failure time")

At each execution time, the SB hotplug cooperation function sequentially executes the cooperation scripts stored in the corresponding directory. The cooperation scripts that are executed before dynamic addition and after dynamic addition are executed in ascending order of script file names. The cooperation scripts that are executed at the dynamic addition failure time are executed in descending order of script file names. Even if execution of any of the cooperation scripts (executed before dynamic addition, after dynamic addition, or at the dynamic addition failure time) fails, the SB hotplug cooperation function executes all the registered cooperation scripts. After executing a cooperation script, the SB hotplug cooperation function outputs a message corresponding to a return value to the system log.

For details of how to register cooperation scripts, see [Section 2.2.5.2, "Method of registering cooperation scripts."](#)

The figure below shows the flow of cooperation script execution according to the execution timing in connection with dynamic addition (Hot-Add) of an SB.



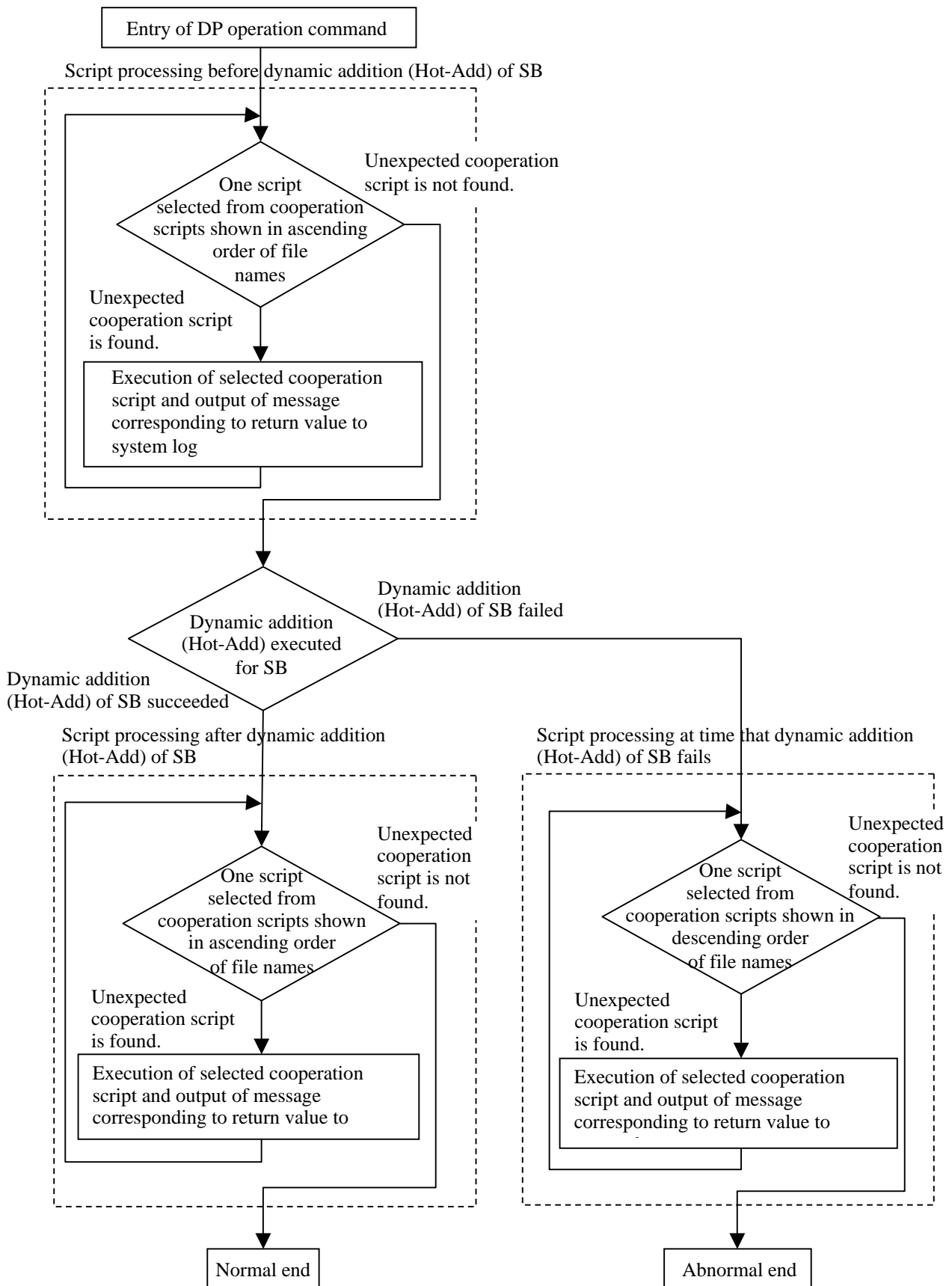


Figure 2.13 Flow of cooperation script execution

### 2.2.5.2 Method of registering cooperation scripts

To register a cooperation script, first save the cooperation script to the specified directory described below. Next, in accordance with the given naming rule, create a symbolic link to the cooperation script in the directory corresponding to the cooperation script execution timing.

Note:

Script files that are not stored in the specified directory or whose file names violate the naming rule are not executed.

#### 2.2.5.2.1 Storage directories

The table below lists the storage directories of cooperation scripts. Do not create other directories in any of these directories.

**Table 2.1 Storage directories of cooperation scripts**

Execution timing	Execution timing name	Directory
		Description
-	-	/lib/udev/container/script
		Stores cooperation scripts.
Before dynamic addition	preadd	/lib/udev/container/preadd
		Stores symbolic links to cooperation scripts executed before dynamic addition (Hot-Add) of an SB.
After dynamic addition	postadd	/lib/udev/container/postadd
		Stores symbolic links to cooperation scripts executed after successful dynamic addition (Hot-Add) of an SB.
At the dynamic addition failure time	canceladd	/lib/udev/container/canceladd
		Stores symbolic links to cooperation scripts executed at the time that dynamic addition (Hot-Add) of an SB fails.

#### 2.2.5.2.2 Naming rule

Assign a symbolic link name to each cooperation script in accordance with the following naming rule:

`nn-XXX.container`

**nn:**

"nn" must be a two-digit number (one-byte characters) ranging from 10 to 90. Do not use other numbers, which are reserved by the system.

Before dynamic addition and after dynamic addition of SBs, the SB hotplug cooperation function executes the corresponding cooperation scripts in ascending order of their symbolic cooperation names. To execute these cooperation scripts earlier than the cooperation scripts installed by other packages, assign these cooperation scripts with lower numbers than those assigned to the cooperation scripts installed by the other packages. To execute these cooperation scripts later than the cooperation scripts installed by other packages, assign these cooperation scripts with higher numbers than those assigned to the cooperation scripts installed by the other packages.

At the time that dynamic addition of an SB fails, the SB hotplug cooperation function executes the corresponding cooperation scripts in descending order of their symbolic link names. This specification is intended to roll back the processes executed before the attempted dynamic addition of the SB. To execute these cooperation scripts earlier than the cooperation scripts installed by other packages, assign these cooperation scripts with higher numbers than those assigned to the cooperation scripts installed by the other packages. To execute these cooperation scripts later than the cooperation scripts installed by other packages, assign these cooperation scripts with lower numbers than those assigned to the cooperation scripts installed by the other packages.

**XXX:**

"XXX" is a script identifier.

The recommended identifier for a cooperation script is a name from which the contents of the script can easily be inferred. For the identifier, use the en-size characters available for file names.

An example of a symbolic name is shown below.

`10-get-cpu-info.container`

Here, the symbolic link name is "10-get-cpu-info.container", and "get-cpu-info" in it is the script identifier.

#### 2.2.5.2.3 Privilege required for executing cooperation scripts

The SB hotplug cooperation function executes cooperation scripts with the root privilege. Therefore, assign the execution attribute of the root user to each cooperation script. Cooperation scripts without the execution attribute of the root user are not executed. To register cooperation scripts, the root privilege is required. To register a cooperation script, log in as the root user to the partition.

### 2.2.5.3 Information pass to cooperation scripts

When executing a cooperation script, the SB hotplug cooperation function passes information to the cooperation script through arguments and environment variables.

#### 2.2.5.3.1 Arguments

The cooperation script is executed with the following format:

```
/lib/udev/container/<execution-timing-name>/<script-name>
<execution-timing-name>
```

execution-timing-name:

This argument specifies the execution timing name corresponding to the execution timing for the specified script. The string "preadd", "postadd", or "canceladd" is set in this argument.

### 2.2.5.3.2 Environment variables

The table below lists the environment variables set by the system when cooperation scripts are executed.

**Table 2.2 Environment variables for cooperation scripts**

Environment variable name	Execution timing (execution timing name)	Description
SBHP_CPU	Before dynamic addition (preadd)	Specifies the number of CPUs to be added. Example: 4
	After dynamic addition (postadd)	Specifies the number of CPUs actually added. Example: 4
	At the dynamic addition failure time (canceladd)	Specifies the number of CPUs added before the failure. Example: 3
SBHP_CPULIST	Before dynamic addition (preadd)	Specifies the logical numbers of CPUs to be added. Logical numbers are delimited by an en-size space character. Example: 4, 5, 6, 7
	After dynamic addition (postadd)	Specifies the logical numbers of CPUs actually added. Logical numbers are delimited by an en-size space character. Example: 4, 5, 6, 7
	At the dynamic addition failure time (canceladd)	Specifies the logical numbers of CPUs added before the failure. Logical numbers are delimited by an en-size space character. Example: 4, 5, 6
SBHP_MEM	Before dynamic addition (preadd)	Specifies the (estimated) size of memory to be added. The value is in units of megabytes.(*1) Example: 16384
	After dynamic addition (postadd)	Specifies the (estimated) size of memory actually added. The value is in units of megabytes.(*1) Example: 16384
	At the dynamic addition failure time (canceladd)	Specifies the (estimated) size of memory added before the failure. The value is in units of megabytes.(*1) Example: 12288
SBHP_NODE	Before dynamic addition (preadd)	Specifies the LSB logical number managed by the OS corresponding to the added SB regardless of timing (before dynamic addition, after dynamic addition, or at the dynamic addition failure time). Example: 2
	After dynamic addition (postadd)	
	At the dynamic addition failure time (canceladd)	

- \*1 Even after memory is added, the total size of memory available for use may be less than the size of added memory because the system uses part of the added memory. The user can find out the size of this reduction from the size of added memory only after the memory is actually added to the system. To find out the size of memory actually added, check the difference in the memory sizes output to the `/proc/meminfo` file, between before and after dynamic addition, or between before dynamic addition and at the dynamic addition failure time.

Do not change the values of the environment variables listed below, which are used by the system for debugging purposes. The values of these variables are undefined.

ACTION, DEVPATH, SUBSYSTEM, SEQNUM, PHYSDEVDRIVER, UDEV\_LOG, UDEVD\_EVENT

#### 2.2.5.4 End status of cooperation scripts

The cooperation script function outputs the execution result of each cooperation script to the system log. The function also refers to the end status of each cooperation script to determine whether the script ended normally or abnormally.

The codes indicating the end status of cooperation scripts must be as follows.

**Table 2.3 End status of cooperation scripts**

Cooperation script execution result	End status
Normal end of a cooperation script	0
Abnormal end of a cooperation script	Integer other than 0

Examples of the execution result data output by the SB hotplug cooperation function to the system log are shown below. The examples show the execution results of the `10-get-cpu-info.container` cooperation script executed before dynamic partitioning. Actually, only one line of data is output.

The cooperation script ended normally:

```
Jul 18 18:37:51 hostname container_hotplug[PID]:  
/lib/udev/container/preadd/10-get-cpu-info.container success.
```

The cooperation script ended abnormally:

```
Jul 18 18:37:51 hostname container_hotplug[PID]:  
/lib/udev/container/preadd/10-get-cpu-info.container failure. ERROR=end-status
```

#### 2.2.5.5 Notes

The SB hotplug cooperation function calls cooperation scripts in synchronous mode.

- Code every cooperation script such that it always returns control to the caller.
- Do not forcibly terminate any cooperation script.

If a cooperation script becomes unresponsive or is forcibly terminated, the SB hotplug cooperation function cannot execute the subsequent processing.

Note that cooperation scripts cannot use the standard input and standard output (stdin and stdout) and the standard error output (stderr). If messages from cooperation scripts must be output for debugging purposes, use files.

Do not delete or modify the cooperation scripts supplied with the Fujitsu product. If any of them is deleted or modified, the system operates unpredictably.

### 2.2.5.6 Cooperation script sample

This section shows a cooperation script sample.

```
#!/bin/sh
#
# DP Sample script
#
# Argument $1
#      preadd, postadd, or canceladd
#
# Copyright(C) 2007 FUJITSU LIMITED
#

SCRIPT_NAME="sample"

MEMINFO=/proc/meminfo          # File for acquiring the memory size
CPUINFO=/proc/cpuinfo          # File for acquiring the number of CPUs
LOGTAG="logger -t $SCRIPT_NAME[$$]" # System log output format definition

# Determining the execution timing based on arguments
case $1 in
    preadd)
        #
        ;;
    postadd)
        # Acquires the memory size
        totalmem=`awk '/MemTotal/{print $2;}' $MEMINFO`
        # Outputs the acquired memory size to the system log
        $LOGTAG "Total memory is $totalmem"

        # Acquires the number of CPUs
        cpunum=`grep -c processor $CPUINFO`
        # Outputs the acquired number of CPUs to the system log
        $LOGTAG "Total cpu is $cpunum"

        # Command restart sample based on the acquired number of CPUs and memory size
        sample-command --restart --mem=$totalmem --cpu=$cpunum
        #
        ;;
    canceladd)
        #
        ;;
esac

exit 0;
```

## 2.3 Reference

### 2.3.1 Handling the DP operation command (fjsvdr) errors

The action to be taken when the DP operation command (fjsvdr) ends abnormally varies greatly depending on the category information in the message output by the command.

Table 2.4 lists the actions to be taken according to the category.

Check the displayed error message.

Format: FJSVpsa: *Severity Message\_ID* [*Category*] *Message*

*Severity*: Message level E=Error, W=Warning, I=Information

*Message\_ID*: Message identification number

*Category*: Message category

Example: FJSVpsa: E 08810 [Option]Invalid or unsupported option

**Figure 2.14 Format of the message output by the DP operation command (fjsvdr)**

**Table 2.4 Overview of corrective actions for errors of the DP operation command (fjsvdr) (Linux)**

Category	Corrective action
Comment	The message indicates the progress of processing. The progress rate of the DP operation is displayed after the category. No action is required.
Option	The specification of a command option has a problem. According to the error message contents, confirm the options, and execute the command again.
Condition	The command temporarily cannot be started. According to the error message contents, execute the command again.
Node	The SB to be added has a problem. Take action according to the output message contents.
OS	A problem occurred in OS processing. Check the system log and take action according to the output message contents.
Environment	Dynamic partitioning is disabled in this environment.
MMB	The DP operation is interrupted due to an MMB error. Take the corrective action indicated by the message output.
Other	Collect diagnostic data on the partition with fjsnap and SEL data on the MMB, and contact a Fujitsu certified service engineer.

For fjsnap, see Section 1.4.1, "System data output tool (fjsnap) (Linux)" in the *PRIMEQUEST 500A/500/400 Series Reference Manual: Messages/Logs* (C122-E004EN).



### 2.3.1.1 Recovery procedure for the DP operation command

The DP operation command (fjsvdr) may be terminated due to a temporary error condition of the MMB. In relevant events, the following error messages are output to the command execution console:

- 08829 [MMB] IPMI retry failure(%s,%s,%s,%s,%s,%s)
- 08864 [Node] <Unitttype>#%d{A|B} state transition failure(%s,%s,%s)

When these messages are output, the DP operation has been discontinued. The [Partition Configuration] window that is displayed by selecting [Partition] → [Partition Configuration] from the MMB Web-UI (see [Figure 2.6](#)) indicates that the SB to be added has already been incorporated in the partition. However, the quantities of resources checked from the operating system ([Section 2.2.1.8, "Confirming the quantities of added resources"](#)) are the same as the quantities before the addition.

When these messages are output, the procedures below can be used to complete the DP operation normally. The procedure to be used varies depending on the output timing of the messages.

- 1) When the DP operation command terminates with the 08829 message output
  - 1-1) When the 08809 or 08800 message is output immediately before the 08829 message

Output example)

```
# /opt/FJSVpsa/bin/fjsvdr -add SB 3B
FJSVpsa : I 08809 [Comment] 0/6 DP operation start (xx, xx)
.....
FJSVpsa : I 08800 [Comment] 1/6 Adding SB#3B to this partition (xx, xx)
....
FJSVpsa : E 08829 [MMB] IPMI retry failure (xx, xx, xx, xx, xx, xx)
```

Recovery procedure)

- (1) Check the [Partition Configuration] window that is displayed by selecting [Partition] → [Partition Configuration] from the MMB Web-UI (see [Figure 2.6](#)). If the SB to be added has already been contained in the partition, remove the SB from the partition. If the SB to be added is not contained in the partition, perform (2).
- (2) Reexecute the DP operation command.

- 1-2) When the 08805 or 08806 message is output immediately before the 08829 message

Output example)

```
# /opt/FJSVpsa/bin/fjsvdc -add SB 3B
FJSVpsa : I 08809 [Comment] 0/6 DP operation start (xx, xx)
.....
FJSVpsa : I 08800 [Comment] 1/6 Adding SB#3B to this partition (xx, xx)
....
FJSVpsa : I 08805 [Comment] 2/6 Diagnosing SB#3B (xx, xx)
.....
FJSVpsa : I 08806 [Comment] 3/6 Realizing SB#3B (xx, xx)
..
FJSVpsa : E 08829 [MMB] IPMI retry failure (xx, xx, xx, xx, xx, xx)
```

Recovery procedure)

Execute the DP operation command with the -recover option specified.

- 2) When the DP operation command terminates with the 08864 message output

Output example)

```
# /opt/FJSVpsa/bin/fjsvdc -add SB 3B
FJSVpsa : I 08809 [Comment] 0/6 DP operation start (xx, xx)
.....
FJSVpsa : I 08800 [Comment] 1/6 Adding SB#3B to this partition (xx, xx)
....
FJSVpsa : I 08805 [Comment] 2/6 Diagnosing SB#3B (xx, xx)
.....
FJSVpsa : I 08806 [Comment] 3/6 Realizing SB#3B (xx, xx)
..
FJSVpsa : E 08864 [Node] SB#3B state transition failure (xx, xx, xx)
```

Recovery procedure)

Execute the DP operation command with the -recover option specified.

## 2.3.2 Handling other system log messages

If a system panic message is output, collect diagnostic data with fjsnap, and contact a Fujitsu certified service engineer.

If a message is output to indicate an error in cooperation script execution or if no message has been output to indicate the completion of cooperation script execution, check the scripts to determine which script output the error message, became unresponsive, or ended abnormally. If a script registered by the user caused the problem, correct it to eliminate the problem. If a script supplied with the Fujitsu product caused the problem, collect diagnostic data with fjsnap, and contact a Fujitsu certified service engineer. For fjsnap, see Section 1.4.1, "System data output tool (fjsnap) (Linux)" in the *PRIMEQUEST 500A/500/400 Series Reference Manual: Messages/Logs* (C122-E004EN). Even though the OS can continue operating when a cooperation script ends abnormally, the system must be restarted if dynamic partitioning is to be retried.

## 2.3.3 Messages

### 2.3.3.1 DP operation command (fjsvdr) messages

This section lists the messages output by the DP operation command (fjsvdr). For the message format, see [Figure 2.14](#). All the messages listed below are output to the console where the command was executed. Messages whose severity is "I" are also output to the system log.

**Table 2.5 Command messages (1/7)**

Message	Explanation	Response
FJSVpsa: I 08800 [Comment] %d1/%d2 Adding <Unitttype>#%d3{A B} to this partition(%s,%s)	%d1/%d2: DP operation progress rate  Unitttype: SB  %d3: Additional/spare unit number  The specified unit is being added to the partition.	No action is required.
FJSVpsa: I 08803 [Comment] %d1/%d2 Adding of <Unitttype>#%d3{A B} to this partition is completed(%s,%s)	%d1/%d2: DP operation progress rate  Unitttype: SB  %d3: Additional unit number  Unit Hot-Add was completed.	No action is required.
FJSVpsa: I 08805 [Comment] %d1/%d2 Diagnosing <Unitttype>#%d3{A B}(%s,%s)	%d1/%d2: DP operation progress rate  Unitttype: SB  %d3: Additional unit number  Firmware is performing initial diagnosis.	No action is required.

Table 2.5 Command messages (2/7)

Message	Explanation	Response
FJSVpsa: I 08806 [Comment] %d1/%d2 Realizing <Unittype>#%d3{A B}(%s,%s)	%d1/%d2: DP operation progress rate  Unittype: SB  %d3: Additional unit number  An additional unit is being recognized.	No action is required.
FJSVpsa: I 08807 [Comment] %d1/%d2 Adding the new resources to the OS(%s,%s)	%d1/%d2: DP operation progress rate  Additional resources are being incorporated.	No action is required.
FJSVpsa: I 08808 [Comment] %d1/%d2 Restarting PSA(%s,%s)	%d1/%d2: DP operation progress rate  The PSA is being restarted.	No action is required.
FJSVpsa: I 08809 [Comment] %d1/%d2 DP operation start(%s,%s)	%d1/%d2: DP operation progress rate  DP operation is started.	No action is required.
FJSVpsa: E 08810 [Option] Invalid or unsupported option(%s,%s,%s)	An invalid or unsupported option is specified.	Confirm the specified options, and execute the command again with valid options specified.
FJSVpsa: E 08811 [Option] Too few or excessive option count(%s,%s,%s)	The number of specified options is incorrect.	Confirm the specified options, and execute the command again with valid options specified.
FJSVpsa: E 08812 [Condition] Already executing(%s,%s,%s,%s, %s)	An attempt was made to execute multiple commands concurrently.	Wait until the command being executed is completed before executing another command.
FJSVpsa: E 08814 [Command] Internal error(%s,%s,%s,%s,%s,%s)	An internal conflict occurred.	Collect diagnostic data on the partition with fjsnap, and contact a Fujitsu certified service engineer.
FJSVpsa: E 08816 [Environment] Partition environment requirements are not met(%s,%s,%s,%s)	The partition does not satisfy the environmental requirements for dynamic partitioning.	Confirm the cabinet type, OS type, and OS version. If this message is output even though the requirements are satisfied, collect diagnostic data on the partition with fjsnap, and contact a Fujitsu certified service engineer.
FJSVpsa: E 08817 [Node] Specified <Unittype>#%d{A B} is not free(%s,%s,%s,%s,%s,%s)	Unittype: SB  %d: Unit number  The specified unit is not a free unit.	Confirm that the specified unit is a free unit, which does not belong to any partition. If it is not a free unit, reexecute the command with the specification of a free SB or a reserved SB of the partition for which DP operation is performed.

Table 2.5 Command messages (3/7)

Message	Explanation	Response
FJSVpsa: E 08818 [Option] Specified <Unittype> number is invalid(%s,%s,%s,%s)	Unittype: SB  The specified unit number is outside the valid range.	Specify a valid unit number, and execute the command again.
FJSVpsa: E 08819 [Node] Specified <Unittype>#%d{A B} is not present(%s,%s,%s)	Unittype: SB  %d: Additional unit number  The specified unit has not been mounted.	Confirm that the specified unit has been mounted in the cabinet. If it has not been mounted, reexecute the command with the specification of a free SB mounted in the cabinet or reserved SB of the partition for which DP operation is performed.
FJSVpsa: E 08820 [Node] CPU mismatched(%s,%s,%s)	The type of a CPU mounted on the specified SB does not match the type of CPUs in the partition.	Because the type of the mounted CPU is different from that of the CPUs in the partition, the specified SB cannot be dynamically added. Check the requirements of an SB to be added by referencing <a href="#">Section 1.2.3, "Prerequisites for dynamic partitioning operations,"</a> and use an SB that satisfies the requirements to reexecute the command.
FJSVpsa: E 08821 [Node] Cannot add the split <Unittype> because of extended mirror mode(%s,%s,%s)	Unittype: SB  A unit split by XPAR cannot be added by Hot-Add, because the partition is in extended mirror mode.	Request a Fujitsu certified service engineer to prepare a non-split unit, before executing the command again.
FJSVpsa: E 08822 [Node] <Unittype> mismatched(%s,%s,%s)	Unittype: SB  The specified unit does not match the units in the partition.	Prepare a unit matching those in the partition, before executing the command again.
FJSVpsa: E 08823 [Node] Specified <Unittype>#%d{A B} is not split(%s,%s)	Unittype: SB  %d: Target unit number  The specified unit has not been split.	Confirm that the specified unit has been split by XPAR. If it has not been split, request a Fujitsu certified service engineer to prepare a unit split by XPAR, before executing the command again.
FJSVpsa: E 08824 [Node] Specified <Unittype>#%d is split(%s,%s)	Unittype: SB  %d: Target unit number  The specified unit has been split.	Confirm that the specified unit has not been split by XPAR. If it has been split, request a Fujitsu certified service engineer to prepare a unit not split by XPAR, before executing the command again.

Table 2.5 Command messages (4/7)

Message	Explanation	Response
FJSVpsa: E 08827 [Node] Cannot add the <Unittype>#d{A B} with alarm(%s,%s,%s,%s,%s)	Unittype: SB %d: Target unit number  A unit in the failed/degraded/warning state cannot be added.	Specify a unit whose status is OK to reexecute the command.
FJSVpsa: E 08828 [MMB] IPMI response error(%s,%s,%s,%s,%s)	An IPMI command response error was detected.	Collect SEL data via the MMB Web-UI, collect diagnostic data on the partition with fjsnap, and contact a Fujitsu certified service engineer.
FJSVpsa: E 08829 [MMB] IPMI retry failure(%s,%s,%s,%s,%s,%s)	Although the IPMI command responded with an error message indicating that retry is possible, a retry of command execution resulted in an error.	The DP operation may be interrupted due to a temporary MMB error. Confirm that the MMB Web-UI can be referenced, and then follow the instructions in <a href="#">Section 2.3.1.1, "Recovery procedure for the DP operation command."</a> If this error message is output even after the command recovery procedure is performed, collect SEL by using the MMB Web-UI, use fjsnap to collect information for investigation on the partition side, and then contact your Fujitsu certified service engineer.
FJSVpsa: W 08832 [PSA] PSA data restructuring failed(%s,%s,%s,%s,%s)	Although dynamic partitioning completed normally, restructuring of PSA configuration data failed.	Unless a message whose severity is "W" or "E" is output in addition to this message, dynamic partitioning has completed normally. Check the system log. If message FJSVpsa:00070 is output, reconfiguration of PSA configuration data failed because Ctrl-C was executed during dynamic partitioning. Start PSA. In other cases, collect SEL data through the Web-UI, collect diagnostic data on the partition by using fjsnap, and contact a Fujitsu certified service engineer.
FJSVpsa: E 08833 [OS] Receive the failure notification(%s,%s,%s)	Notification of a failure was received from the OS.	Check the system log of the partition. If a message is found, take action according to the message. If no message is found, collect diagnostic data with fjsnap, and contact a Fujitsu certified service engineer.

Table 2.5 Command messages (5/7)

Message	Explanation	Response
FJSVpsa: E 08836 [Environment] Dynamic Partitioning function is disabled(%s,%s,%s)	The DP function is disabled.	Dynamic partitioning cannot be executed because the DP function has been disabled for the partition via the MMB Web-UI.
FJSVpsa:E 08839 [Environment] Hyper Threading is enabled(%s,%s,%s)	The hyper threading function is enabled.	Dynamic partitioning cannot be performed because the hyper threading function has not been disabled in the partition from the MMB Web-UI.
FJSVpsa:E 08843 [Node] SAL version mismatch(%s,%s,%s,%s)	The PAL or SAL firmware version on the SB to be added does not match that of the firmware running on the partition.	Using the MMB Web-UI, confirm that the versions of the PAL or SAL firmware running on the SB to be added and the target partition are the same. If the versions are not the same, ask a Fujitsu certified service engineer to match the versions of the PAL or SAL firmware on the SB to be added and that running on the target partition, and then reexecute the command.
FJSVpsa:E 08844[Condition] There are some obstructive tools for the DP operation(%s,%s,%s,%s)	A tool that cannot run in parallel to dynamic partitioning is running.	Terminate the tool that cannot run in parallel to dynamic partitioning, and reexecute the command. For details of the tools that cannot run in parallel to dynamic partitioning, see <a href="#">Section 2.4.4, "Functions not compatible with the DP function."</a>
FJSVpsa:E 08845[Environment] The necessary package for the DP operation does not exist(%s,%s,%s,%s)	A package required for dynamic partitioning is not installed.	Dynamic partitioning is disabled because the package FJSVsbhp-RHEL5 is not installed.
FJSVpsa:E 08846 [Environment] Specified %s#%d%s is mounted in the slot that cannot be added(%s,%s,%s,%s)	The slot number of the slot containing the SB to be added is not greater than the smallest mounting slot number among the slots containing the SBs composing the partition.	Dynamic partitioning cannot be performed because the slot number of the slot containing the SB to be added precedes the slot with the smallest mounting slot number among the SBs composing the partition. If the SB to be added can be moved after the slot with the smallest mounting slot number among the SBs composing the partition, move it and then reexecute the command.

Table 2.5 Command messages (6/7)

Message	Explanation	Response
FJSVpsa:E 08847 [Condition] Command is not interrupting(%s,%s)	In the state in which the DP operation command was not terminated, the -recover option was specified.	DP operation is not being performed or the -recover option cannot be specified in the current state. Check the recovery procedure and perform the correct procedure.
FJSVpsa:E 08848 [Condition] Command has been interrupting(%s,%s)	In the state in which the DP operation command was terminated, a new attempt was made to execute DP operation.	Perform the recovery procedure and then newly perform DP operation.
FJSVpsa:E 08849 [Node] DIMM mismatched(%s,%s,%s,%s)	The type of DIMM in the partition does not match the type of DIMM on the specified SB.	Mount a DIMM that satisfies the DIMM mixture conditions on the SB, and then reexecute the command.
FJSVpsa:E 08860 [Node] <Unittyp>#%d{A B} was removed by the operation from MMB(%s,%s,%s)	Unittyp:SB %d: Target unit number During DP operation, the SB to be added was removed by operation from the MMB.	Check the reason for the Remove operation, and then reexecute the command if dynamic addition is to be performed using DP operation.
FJSVpsa:E 08862 [Node] <Unittyp>#%d{A B} is not the reserved <Unittyp> of this partition(%s,%s)	Unittyp:SB %d: Target unit number The SB to be added is not a reserved SB of the partition for which DP operation is performed.	Reexecute the command with the specification of a free SB or a reserved SB of the partition for which DP operation was performed.
FJSVpsa:E 08863 [Node] Cannot read out the type data of DIMMs installed on <Unittyp>#%d{A B}(%s,%s)	Unittyp:SB %d: Target unit number DIMM information cannot be obtained.	For an SB that has never been powered on since it was mounted in the cabinet, since its DIMM mounting status has not been fixed, dynamic addition (Hot-Add) cannot be performed. Check the [SB#n] window that is displayed by selecting [System] → [SB] → [SB#n] from the MMB Web-UI (see <a href="#">Figure 2.7</a> ), and then use an SB for which the DIMM status has been fixed to reexecute the command.



Table 2.5 Command messages (7/7)

Message	Explanation	Response
FJSVpsa:E 08864 [Node] <Unittype>#%d{A B} state transition failure(%s,%s,%s)	Unittype:SB %d: Target unit number  During SB incorporation operation, a normal state was not entered.	The DP operation may be interrupted due to a temporary MMB error. Confirm that the MMB Web-UI can be referenced, and then follow the instructions in <a href="#">Section 2.3.1.1, "Recovery procedure for the DP operation command."</a> If this error message is output even after the command recovery procedure is performed, collect SEL by using the MMB Web-UI, use fjsnap to collect information for investigation on the partition side, and then contact your Fujitsu certified service engineer.
FJSVpsa:E 08865 [Node] <Unittype>#%d{A B} is not turned off(%s,%s,%s,%s,%s)	The power to the SB to be added is not off.	The DP operation and SB maintenance operation from the MMB Web-UI may have entered into contention with each other. After the maintenance work, reexecute the command.

### 2.3.3.2 System log messages

#### 2.3.3.2.1 Error messages

**Table 2.6 Error messages output to the system log (1/2)**

Message	Explanation	Response
_cpu_up: attempt to ring up CPU [CPU-number] failed	Addition of the CPU indicated by "CPU-number" failed because of an internal system conflict.	Collect diagnostic data with fjsnap, and contact a Fujitsu certified service engineer.
ACPI: add_memory failed	The ACPI memory hot-plug driver detected a memory addition failure.	If this message is output together with the error message "add_memory(): Problem Encountered in __add_pages as ret=[error number]," take action according to the latter error message. Otherwise, collect diagnostic data with fjsnap, and contact a Fujitsu certified service engineer.
ACPI: device is NULL	The DP function failed to be called for dynamic addition (Hot-Add) of an SB because of a logical conflict in the system.	Collect diagnostic data with fjsnap, and contact a Fujitsu certified service engineer.
add_memory() : Problem Encountered in __add_pages as ret=[error-number]	Memory addition processing in the kernel failed. "error-number" is as follows in most cases:  12 (ENOMEM): The kernel could not allocate an area for managing the added physical memory.	Error number is 12: The DP function cannot handle the error. Stop the system, and incorporate the SB in the system.  Error number is other than 12: Collect diagnostic data with fjsnap, and contact a Fujitsu certified service engineer.
BIOS reported wrong ACPI id for the processor	An error due to an internal system conflict was detected during CPU addition processing.	Collect diagnostic data with fjsnap, and contact a Fujitsu certified service engineer.
container_hotplug[PID]: /lib/udev/container/<execution-timing-name>/<cooperation-script-name> failure. ERROR=<error-number>'	The SB hotplug cooperation function executed the processing corresponding to "execution-timing-name" and "cooperation-script-name," but the processing failed because of an error. "error-number" indicates the error.	If the script was registered by the user, correct it to eliminate the problem. If the script was supplied with the Fujitsu product, collect diagnostic data with fjsnap, and contact a Fujitsu certified service engineer.

**Table 2.6 Error messages output to the system log (2/2)**

Message	Explanation	Response
container_hotplug[PID]: Cannot access to file /proc/acpi/processor/PR<n>/info	A file required by the SB hotplug cooperation function to enable a CPU could not be found.	Collect diagnostic data with fjsnap, and contact a Fujitsu certified service engineer.
container_hotplug[PID]: Cannot access to file /sys/devices/system/cpu/cpu<CPU-number>/online.	A file required by the SB hotplug cooperation function to enable a CPU could not be found.	Collect diagnostic data with fjsnap, and contact a Fujitsu certified service engineer.
container_hotplug[PID]: Cannot access to file /sys/devices/system/memory/sys/devices/system/memory/memory<n>/state	A file required by the SB hotplug cooperation function to enable memory could not be found.	Collect diagnostic data with fjsnap, and contact a Fujitsu certified service engineer.
container_hotplug[PID]: CPU hotplug failure.	The SB hotplug cooperation function failed to enable a CPU.	Collect diagnostic data with fjsnap, and contact a Fujitsu certified service engineer.
container_hotplug[PID]: MEMORY hotplug failure.	The SB hotplug cooperation function failed to enable memory.	Collect diagnostic data with fjsnap, and contact a Fujitsu certified service engineer.
failed to get attention of CPU [CPU-number]!	A logical conflict in the system caused a failure in synchronizing the clock of the added CPU with that of the CPU indicated by "CPU-number."	Collect diagnostic data with fjsnap, and contact a Fujitsu certified service engineer.
ksoftirqd for [CPU-number] failed	The softirq daemon failed to start for the added CPU indicated by "CPU-number."	Collect diagnostic data with fjsnap, and contact a Fujitsu certified service engineer.
Processor [CPU-number]/[interrupt-controller-number] is stuck.	An internal system conflict caused a failure in adding the CPU indicated by "CPU-number" or "interrupt-controller-number."	Collect diagnostic data with fjsnap, and contact a Fujitsu certified service engineer.
System RAM resource xxx - yyy cannot be added	An internal system conflict disabled addition of memory.	Collect diagnostic data with fjsnap, and contact a Fujitsu certified service engineer.
workqueue for [CPU-number] failed	The workqueue daemon failed to start for the added CPU indicated by "CPU-number".	Collect diagnostic data with fjsnap, and contact a Fujitsu certified service engineer.

## 2.3.3.2.2 Other messages (such as progress messages)

Table 2.7 Other messages output to the system log

Message	Explanation	Response
Build xx zonelists, Totalpages: yyy	The indicated number (xx) of zonelist structures was built for the kernel. (The number of built structures depends on the system.) The total number of pages recognized by the kernel is "yyy" at this message output time.  Note: For the final total number of added pages, refer to the information in the /proc/meminfo file after dynamic partitioning.  This message is output not only at the dynamic partitioning execution time but also at the system start time.	No action is required.
container_hotplug[PID]: /lib/udev/container/<execution-timing-name>/<cooperation-script-name> success.	The processing corresponding to "execution-timing-name" and "cooperation-script-name" and executed by the SB hotplug cooperation function ended normally.	No action is required.
container_hotplug[PID]: container_hotplug finish.	The SB hotplug cooperation function completed its processing.	No action is required.
container_hotplug[PID]: container_hotplug start.	The SB hotplug cooperation function started.	No action is required.
container_hotplug[PID]: CPU hotplug finish.	Enabling of a CPU by the SB hotplug cooperation function has been completed.	No action is required.
container_hotplug[PID]: CPU hotplug start.	The SB hotplug cooperation function started to enable a CPU.	No action is required.
container_hotplug[PID]: CPU hotplug success.	The SB hotplug cooperation function succeeded in enabling a CPU.	No action is required.
container_hotplug[PID]: exec <execution-timing-name> scripts.	The SB hotplug cooperation function started executing the cooperation script corresponding to "execution-timing-name."	No action is required.
container_hotplug[PID]: MEMORY hotplug finish.	Enabling of memory by the SB hotplug cooperation function has been completed.	No action is required.
container_hotplug[PID]: MEMORY hotplug start.	The SB hotplug cooperation function started to enable memory.	No action is required.
container_hotplug[PID]: MEMORY hotplug success.	The SB hotplug cooperation function succeeded in enabling memory.	No action is required.
Container driver received ACPI_NOTIFY_BUS_CHECK event or Container driver received ACPI_NOTIFY_DEVICE_CHECK event	The OS received notification of SB addition by dynamic partitioning from hardware.	No action is required.
CPU [CPU-number-1]: synchronized ITC with CPU [CPU-number-2] (last diff -1 cycles, maxerr 2865 cycles)	The clock of the added CPU indicated by "CPU-number-1" was synchronized with that of the CPU indicated by "CPU-number-2."	No action is required.

## 2.4 Notes and Restrictions on Software

This section provides notes on the software and commands that are run in the system to use the DP function in Linux, and it also describes related restrictions.

### 2.4.1 Notes on software and commands recognizing the amounts of resources

Some software programs operate with recognition of the amounts of resources, that is, the number of CPUs and the size of mounted memory. Such software programs perform, for example, the following operations:

- Starting the same number of processes as the number of CPUs
- Controlling the size of memory used according to the size of mounted memory

To use one of these software programs, it must be able to accommodate the increased amounts of resources resulting from dynamic partitioning. Check the following points for each software program to be used:

- Whether the software program recognizes the amounts of resources during operation as described above
- Whether the software program is compatible with the DP function in recognizing the amounts of resources

A software program that is operating with recognition of the amounts of resources but is not compatible with the DP function may cause a problem; for example, it is unable to recognize changes in amounts of resource resulting from dynamic partitioning.

In such a software program created by the user, the user can use cooperation scripts to notify the software program of the changes in amounts of resource resulting from dynamic partitioning in order to reconfigure the software settings.

For details of cooperation scripts, see [Section 2.2.5, "Cooperation scripts."](#)

### 2.4.2 Notes on software that binds processes to CPUs and SBs

Some software programs bind processes to CPUs and SBs. Binding processes means specifying the CPUs and memory locations used by the processes. The following functions can be used to bind:

- taskset and numactl commands
- sched\_setaffinity() system call
- libnuma library (group)(\*1)
- mbind() or set\_mempolicy() system call
- cpuset function

Any software program that uses these functions but is not compatible with the DP function may cause a problem; for example, it will not use added resources. Confirm that the software programs to be used are compatible with the DP function.

\*1 For details of the libnuma library functions, see numa (3) in the online manual.

### 2.4.3 Note on real-time processes

If a real-time process (\*1) that is given the highest priority continues running for a long time because it has entered an infinite loop, and if it does not voluntarily hand over control of the CPU to another process, the system assumes an error and outputs the following message to the system log:

```
Nov 14 14:25:58 rhel51GA kernel: BUG: soft lockup detected
on CPU#<n>! ... <n> is a numeric value.
```

If dynamic partitioning is executed in the above state, the system may become unresponsive. To prevent this problem, do not execute dynamic partitioning when the system outputs the above message to the system log.

\*1 The process that is executed in the real-time class (SCHED\_FIFO or SCHED\_RR). They can be bound by using the sched\_setscheduler() system call or other such methods.

### 2.4.4 Functions not compatible with the DP function

This section describes functions that cannot be used together with the DP function because they are not compatible with it. Do not use them together with the DP function. Executing dynamic partitioning while one of the following processes is being executed may cause a serious problem; for example, the system may become unresponsive.

- Performance measurement tools

The perfmon and oprofile functions are used.

For details of how to check for usage of these performance measurement tools, see [Section 2.4.4.1, "Checking performance measurement tools."](#)

- Tools for analysis at the kernel level

The systemtap function is used.

For details of how to check for usage of this function, see [Section 2.4.4.2, "Checking the tools for analysis at the kernel level."](#)

#### 2.4.4.1 Checking performance measurement tools

To check for usage of the perfmon and oprofile functions, refer to the /proc/perfmon file. If any of the values output to the proc\_sessions line (seventh line) and the sys\_sessions line (eighth line) is 1 or higher, the corresponding functions is used. If one of the values is 1 or higher, such as shown in the following example, do not execute dynamic partitioning.

```
      :
proc_sessions      : 0
sys_sessions       : 1   --- The oprofile or perfmon function is used.
      :
```

### 2.4.4.2 Checking the tools for analysis at the kernel level

To check for usage of the systemtap function, determine whether the kernel modules include a systemtap module. As shown in the following command execution example, a systemtap module name is a combination of the string "stap\_" and a random displayed string. If a module having such a name is found among the kernel modules, do not execute dynamic partitioning.

```
% /sbin/lsmmod |grep stap_                                -(1)
stap_95c2513f8484424c5f5bf7f276df4861_22777 3476652 1 -(2)
```

- (1) Kernel modules are searched to find a module name that includes the string "stap\_".  
 (2) This is a systemtap module in the kernel.

### 2.4.5 Confirming the compatibility of software to the DP function

To use the DP function, all software programs to be used must be confirmed as compatible with the DP function. Ask a qualified engineer for each software program whether the software program is compatible with the DP function or can be made compatible with the DP function (\*1).

- \*1 Some software products that can be made compatible with the DP function require special operations for use with dynamic partitioning.

### 2.4.6 Notes on dump collection during DP operation

If a panic occurs (such as because of a system abnormality, the INIT instruction from the MMB Web-UI, or a PRIMECLUSTER-issued panic) during DP operation in a period between the output of the following message (1) and the output of the following message (2), which indicates the completion of the DP operation command, normal dump collection may not be possible.

```
Build xx zonelists, Totalpages: yyy                                -(1)
```

Message (1) indicates that the added SB is recognized.

```
FJSVpsa: I 08803 [Comment] Adding of <Unittype>#%d to this
partition is completed(%s,%s)                                    -(2)
```

Message (2) indicates the completion of the DP operation command.

The state after any panic that occurs under circumstances where a normal dump cannot be collected may be either of those listed below. An abnormal dump is a dump that cannot be normally referenced with the crash command.

- Abnormal dump collected
- No dump can be collected

If a panic occurs before the completion of the DP operation command, dynamic addition (Hot-Add) of the SB is completed at the output time of message (1), and the SB is available after a reboot. Normal dump collection is possible after the reboot.





# Chapter 3 Method of Using the DP Function in Windows

## 3.1 Installation

This section explains the DP function installation procedure as it relates to using the function.

### 3.1.1 Notes on installation

If the installed memory is expanded by Hot-Add, the size of the paging file stored on the system drive must also be increased. For details of the paging file setting, see the *PRIMEQUEST 500A/500 Series Microsoft® Windows Server® 2008 User's Guide* (C122-E087EN).

Similarly, in the setting for collecting a complete memory dump, the file size of the collected dump will also be increased by Hot-Add. When constructing a system, examine the size of the system drive.

### 3.1.2 Enabling dynamic partitioning of hardware

Dynamic partitioning of partition must be enabled. From the [Partition] menu in the MMB Web-UI window, select [Partition#n] → [Mode]. In the [Mode] window (Figure 3.1), select "Enable" for "Dynamic Partitioning." Because the target partition must be inactive to make this setting, stop the system before making this setting. If the setting is changed during system operation, a message pops up to report that the changes made to the setting will be validated the next time the system is rebooted (see Figure 3.2).

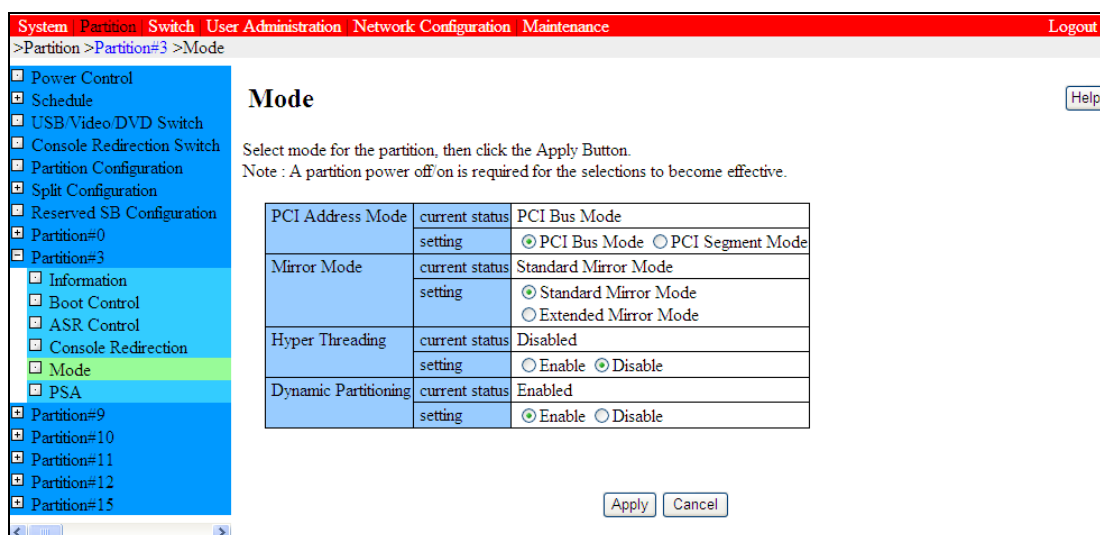


Figure 3.1 Settings in the [Mode] window

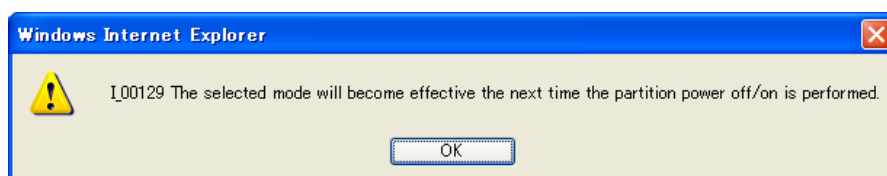


Figure 3.2 Popup message output when mode is changed during system operation

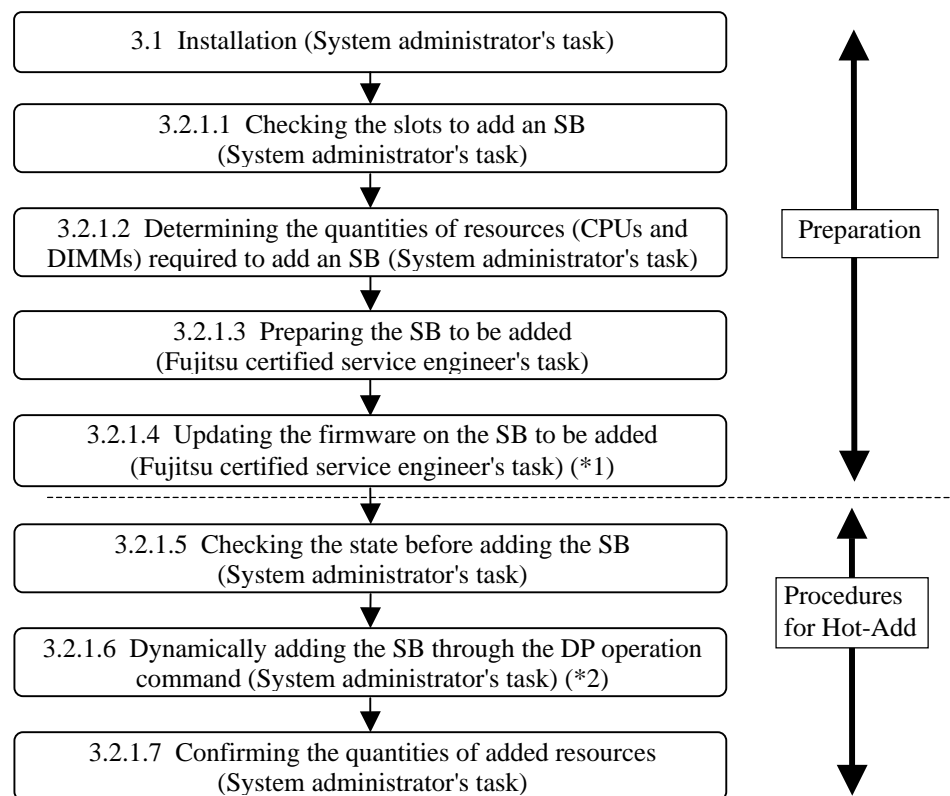
Note:

When using earlier version of the Windows than Microsoft® Windows Server ® 2008 for Itanium-Based Systems, be sure to select "Disable" for "Dynamic Partitioning." If "Enable" is selected, system operation is not assured.

## 3.2 Operations

### 3.2.1 Flow of SB Hot-Add operations

Dynamic partitioning is implemented on the assumption that the system has been built to enable dynamic partitioning as described in [Section 3.1, "Installation."](#) In a system whose environment satisfies the dynamic partitioning requirements, users can dynamically add (Hot-Add) SBs by following the flow of operations shown in [Figure 3.3](#).



\*1 The work time for the operations in [3.2.1.4](#) is about one hour per SB. Plan and perform this operation efficiently by considering the required operation time.

Fujitsu recommends confirming the firmware version before starting dynamic partitioning, so that the work is performed efficiently.

\*2 The length of time taken for dynamic addition (Hot-Add) by the DP operation command depends on the CPU and DIMM capacities on the added SB and the system load. In an environment with a low system load, the length of time can be roughly estimated as follows:

[Total capacity (GB) of DIMMs mounted on SB to be added] × 2 + 250 (seconds)

**Figure 3.3 Flow of dynamic partitioning  
(dynamic addition (Hot-Add) of an SB) in Windows**

### 3.2.1.1 Checking the slots to add an SB

This operation must be performed by the system administrator. To perform dynamic addition (Hot-Add) of an SB, the cabinet must contain a free SB or a reserved SB of a partition for which DP operation is performed. Whether an SB is a free SB or a reserved SB can be checked by using the SB state indication command (fjsvdrcl-stat) (see [Figure 3.4](#)) or from the [Partition Configuration] window that is displayed by selecting [Partition] → [Partition Configuration] from the MMB Web-UI (see [Figure 3.5](#)).

Display example of the SB state indication command (fjsvdrcl-stat)

SB	Status	Power	PID	Home	Reserved
2	OK	On	1	*	
3	OK	On	1	-	
4	Warning	On	1	-	
5	OK	StandBy	1	-	
6	OK	StandBy	R	-	1+
7	OK	StandBy	F	-	

SB#5 is the SB that is incorporated in Partition#1 and recognized by the system at the time of restart.  
 SB#6 is the reserved SB for Partition#1.  
 SB#7 is a free SB.

Figure 3.4 Output result of the SB state indication command

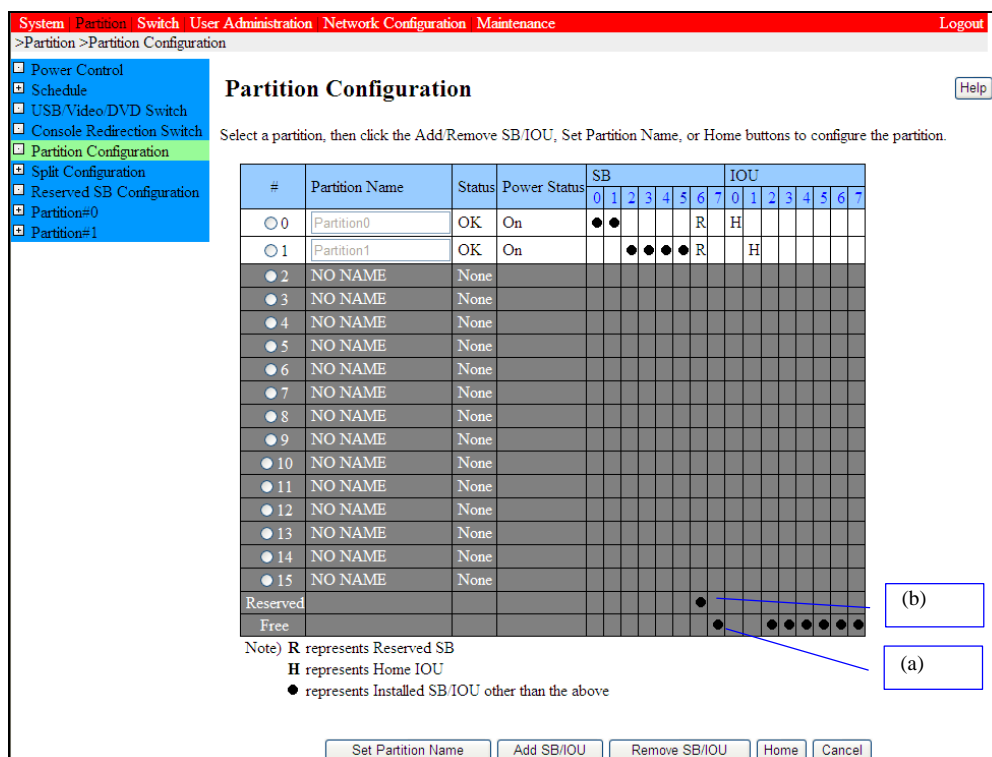


Figure 3.5 [Partition Configuration] window

An SB slot not marked with ● is an empty slot, an SB (a) marked with ● in the Free row is a free SB, and an SB (b) marked with ● in the Reserved row is a reserved SB.

DP operation cannot be performed in an environment containing neither a free SB nor a reserved SB of a partition for which DP operation is performed.

For SBs that are recognized by the system when the system is restarted next time, DP operation for these SBs is enabled by placing them in the "Free" state through the Remove operation from the Partition Configuration window (see [Figure 3.5](#)).

An SB that is recognized by the system when the system is restarted next time is the one for which "StandBy" is displayed in the Power column, "OK" is displayed in the Status column, and a number (other than "F" or "R") is displayed in the PID column when the SB state indication command (fjsvdr-stat) (see [Figure 3.4](#)) is executed.

The added SB must conform to the conditions and requirements described in [Section 1.2.3, "Prerequisites for dynamic partitioning operations,"](#) and [Section 1.2.4, "Notes on implementing dynamic partitioning."](#)

### **3.2.1.2 Determining the quantities of resources (CPUs and DIMMs) required to add an SB**

This operation must be performed by the system administrator. The SB added to a partition must have sufficient quantities of resources (CPUs and DIMMs) to compensate for a deficiency in resources in the partition. Determine and prepare the quantities of resources that will be required to add the SB. Note that some conditions are set regarding possible combinations of the CPUs and DIMMs to be added to and the CPUs and DIMMs already operating in the target partition (see [Section 1.2.4, "Notes on implementing dynamic partitioning"](#)). If these conditions cannot be satisfied, do not execute dynamic partitioning.

### 3.2.1.3 Preparing the SB to be added

This operation must be performed by a Fujitsu certified service engineer.

Confirm that the determined quantities of resources (CPUs and DIMMs) are mounted on the SB to be added in the cabinet. From the [System] menu in the MMB Web-UI window, select [SB] → [SB#n] to display the [SB#n] window (Figure 3.6). Also confirm that the SB to be added is normal.

**SB#4** Refresh Help

Click the Status Clear button to clear the status.

**Board Information**

Status	OK	A	OK	B	OK
Power Status	On				
Split Mode	Enabled				
Part Number	CA06501-D402 F2				
Serial Number	PP0623X522				
Location LED	Off <input type="button" value="On"/> <input type="button" value="Off"/> <input type="button" value="Blink"/>				

**CPUs**

Split	CPU#	Status	Model	Stepping	Serial Number	PPOD
A	A0	OK	Dual-Core Intel® Itanium® 2 Processor 9150M	A1	EDDE8F14C2E90100	OK
	A1	Not-present				
B	B0	OK	Dual-Core Intel® Itanium® 2 Processor 9150M	A1	F5B17E474B860100	OK
	B1	Not-present				

**DIMMs**

Split	DIMM#	Status	Size	Rank	Data Rate	Part Number	Serial Number
	0A0	OK	1GB	1	DDR2-667	EBE10RD4ABFA-4A-E+	2215FB70
	0A1	Not-present					
	0B0	Not-present					
	0B1	Not-present					
	1A0	OK	1GB	1	DDR2-667	EBE10RD4ABFA-4A-E+	2215F6AD
	1B0	Not-present					

Status Clear

**Figure 3.6 [SB] window**

Note that an SB split by XPAR cannot be dynamically added (Hot-Add). To check whether the SB is split by XPAR, select [Split Configuration] → [SB Split] (Figure 3.7) from the [Partition] menu in the MMB Web-UI window.

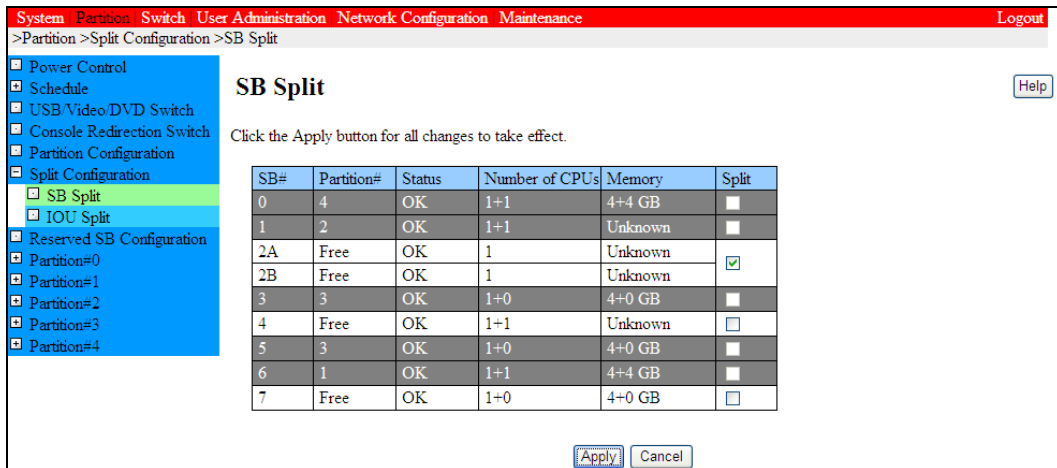


Figure 3.7 [SB Split] window

#### 3.2.1.4 Updating the firmware on the SB to be added

This operation must be performed by a Fujitsu certified service engineer. The PAL or SAL firmware on all SBs in the same cabinet must be the same version. From the [System] menu in the MMB Web-UI window, select [Firmware Information] to display the [Firmware Information] window (Figure 3.8) to confirm the PAL or SAL firmware version.

To update the PAL or SAL firmware of the SB to be added, select [Firmware Update] → [PAL/SAL Firmware Update] from the [Maintenance] menu in the MMB Web-UI window, and then perform the updating operation in the [PAL/SAL Firmware Update] window (Figure 3.9). In this window, select the SB to be added, specify the PAL/SAL firmware file, and then click the Update button to start updating the firmware.

This operation requires about one hour per SB. Plan and perform this operation efficiently by considering the required operation time.

Unit	Firmware	Version
SB#0	PAL_A/PAL_B	1.08 / 1.08
	SAL_A/SAL_B	3.02 / 3.02
SB#1	PAL_A/PAL_B	1.08 / 1.08
	SAL_A/SAL_B	3.02 / 3.02
SB#2	Not-present	
SB#3	Not-present	
SB#4	A PAL_A/PAL_B	1.08 / 1.08
	A SAL_A/SAL_B	3.02 / 3.02
	B PAL_A/PAL_B	1.08 / 1.08
	B SAL_A/SAL_B	3.02 / 3.02
SB#5	PAL_A/PAL_B	1.08 / 1.08
	SAL_A/SAL_B	3.02 / 3.02
SB#6	PAL_A/PAL_B	-
	SAL_A/SAL_B	-
SB#7	Not-present	
IOU#0	BMM#0 BMC	1.29
	BMM#0 EFI	1.10.1.14
	BMM#1 BMC	1.29
	BMM#1 EFI	1.10.1.14
IOU#1	BMM#0 BMC	1.29
	BMM#0 EFI	1.10.1.14
	BMM#1 BMC	1.29
	BMM#1 EFI	1.10.1.14
IOU#2	BMM#0 BMC	1.29
	BMM#0 EFI	1.10.1.14
	BMM#1 BMC	1.29
	BMM#1 EFI	1.10.1.14
	BMM#0 BMC	1.29
	BMM#0 EFI	1.10.1.14

Figure 3.8 [Firmware Information] window

**PAL/SAL Firmware Update**

1. Select SB(s) to update.

☐ all

☐ specified unit(s)

SB#	0	1	2	3	4	5	6	7
A	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

☐ specified partition(s)

Partition#	0	1	2	3	4	5	6	7
8	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2. Select a PAL/SAL firmware file.

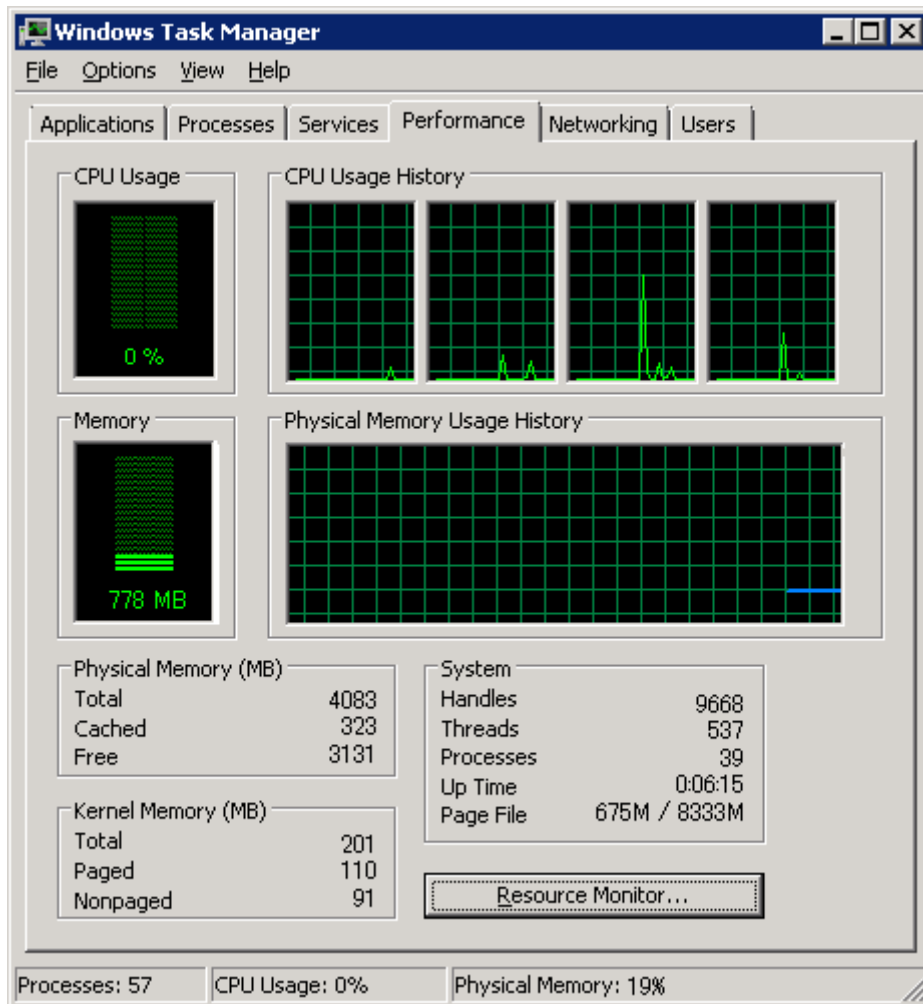
参照...

Figure 3.9 [PAL/SAL Firmware Update] window



### 3.2.1.5 Checking the state before adding the SB

This operation must be performed by the system administrator. Check the resource state prior to SB addition by dynamic partitioning in order to compare it with the state following the SB addition by dynamic partitioning. The quantities of resources prior to the SB addition can be checked on the [Performance] tab of Task Manager ([Figure 3.10](#)) or Device Manager ([Figure 3.11](#)).



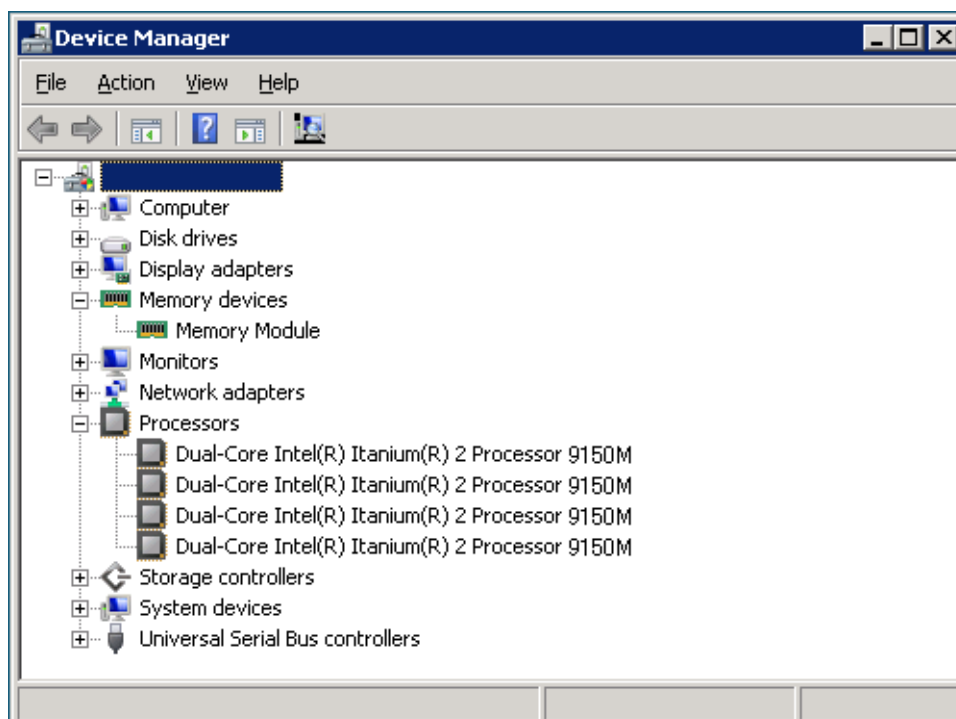
**Figure 3.10 [Performance] tab of Task Manager (before dynamic addition (Hot-Add))**

**Number of CPUs:** The number of windows in the history of CPU utilization is the number of CPUs currently running in the system.

The above figure shows that four CPUs are currently running.

**Memory size:** The value in the Total field of Physical Memory is the size of memory that can be used in the current system.

The above figure shows 4 gigabytes of memory can be used.



**Figure 3.11 Device Manager (before dynamic addition (Hot-Add))**

Number of CPUs: The number of CPUs displayed in the processor tree

Memory size: The memory mounted on the SB is displayed as one memory module under Memory Device.

### 3.2.1.6 Dynamically adding the SB through the DP operation command (Hot-Add)

This operation must be performed by the system administrator. Log in as the user with Administrator privilege to the target partition of dynamic partitioning, and activate the command prompt by selecting "Execute as Administrator." At the activated command prompt, specify the SB (that is, the one to be added and that has been prepared as described in [Section 3.2.1.3, "Preparing the SB to be added"](#)), and execute the DP operation command to dynamically add (Hot-Add) the SB.

When DP operation is started, the firmware performs an initial diagnosis of the SB to be added. The detection of any error during the initial diagnosis by the firmware interrupts the DP operation and places the SB to be added in the Free SB state (If "Reserved" has been set, this setting is cleared). If the version of SAL/PAL is different from the version of the one operating in the partition, the DP operation is interrupted and the SB to be added is placed in its original state.

The time required for the DP operation varies depending on the system configuration and states (e.g., load).

In an environment with a low load, the length of time taken for dynamic partitioning can be estimated as follows according to the total capacity of the DIMMs mounted on the SB to be added:

(Reference) Length of time taken for dynamic partitioning

$[\text{Total capacity of DIMMs (GB) mounted on SB to be added}] \times 2 + 250 \text{ (seconds)}$

Example: The total capacity of DIMMs mounted on the SB to be added is 16 GB.

$16 \times 2 + 250 = 282 \text{ (seconds)}$

[Notes on command execution]

- |                                   |  |
|-----------------------------------|--|
| Termination by Ctrl-C:            | <ul style="list-style-type: none"> <li>The DP operation command cannot be forcibly terminated by Ctrl-C.</li> </ul>  |
| Closing of the prompt:            | <ul style="list-style-type: none"> <li>During dynamic partitioning, do not close the prompt from which the DP operation command was executed. Otherwise, dynamic partitioning is terminated. If the prompt is closed and the DP operation is discontinued, perform the recovery procedure for the DP operation command.</li> </ul>   |
| MMB switchover:                   | <ul style="list-style-type: none"> <li>Do not switch or reset the MMB during dynamic partitioning. Otherwise, the DP operation command may terminate abnormally. When the command terminates abnormally due to MMB switching, follow the recovery procedure for the DP operation command (see <a href="#">Section 3.3.1.1, "Recovery procedure for the DP operation command"</a>).</li> </ul>  |
| System operation                  | <ul style="list-style-type: none"> <li>Do not perform restart, shutdown, or reset of the target partition of DP operation during DP operation. Even when restart, shutdown, or reset of the target partition of DP operation is performed during DP operation, at the next startup, the SB configuration of the partition will enter the state in which the DP operation will have succeeded.</li> </ul>   |
| Partition configuration operation | <ul style="list-style-type: none"> <li>During DP operation, do not perform the Remove operation for an SB from the [Partition Configuration] window that is displayed by selecting [Partition] → [Partition Configuration] from the MMB Web-UI. Otherwise, the DP operation command terminates abnormally. When the command terminates abnormally, follow the recovery procedure for the DP operation command (see <a href="#">Section 3.3.1.1, "Recovery procedure for the DP operation command"</a>).</li> </ul> |

For details of the DP operation command, see [Section 3.3, "Reference."](#)

Example of execution

```
Dynamically adding (Hot-Add) SB#3B:  
> fjsvdr -add SB 3  
FJSVpsa : I 08809 [Comment] 0/6 DP operation start (xx, xx)  
.....  
FJSVpsa : I 08800 [Comment] 1/6 Adding SB#3 to this partition (xx, xx)  
....  
FJSVpsa : I 08805 [Comment] 2/6 Diagnosing SB#3 (xx, xx)  
.....  
FJSVpsa : I 08806 [Comment] 3/6 Realizing SB#3 (xx, xx)  
..  
FJSVpsa : I 08807 [Comment] 4/6 Adding the new resources to the OS (xx, xx)  
.....  
FJSVpsa : I 08808 [Comment] 5/6 Restarting PSA (xx, xx)  
...  
FJSVpsa : I 08803 [Comment] 6/6 Adding of SB#3 to this partition is completed (xx, xx)
```

Note:

"." is displayed about every 10 seconds during dynamic partitioning.

### 3.2.1.7 Confirming the quantities of added resources

After completion of dynamic addition (Hot-Add) of an SB with the DP operation command, restart Task Manager to confirm the added resources on the Performance tab (Figure 3.12). Device Manager (Figure 3.13) automatically adds and displays the added hardware.

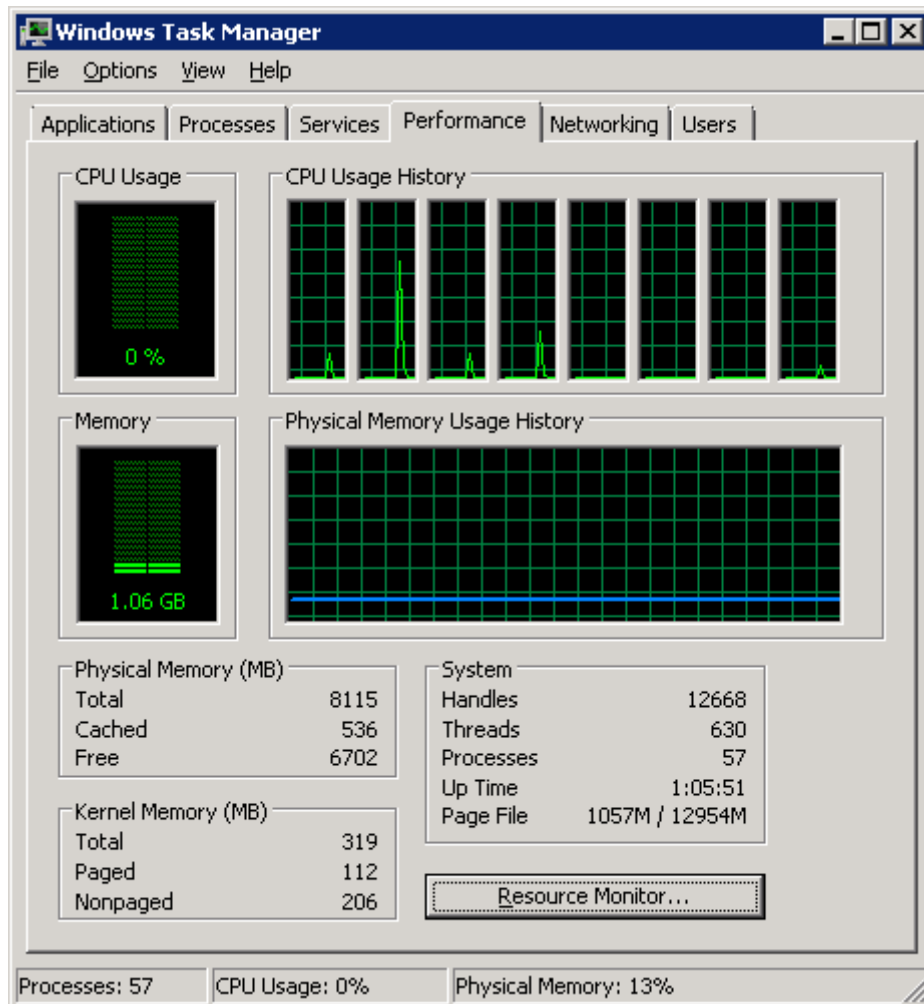
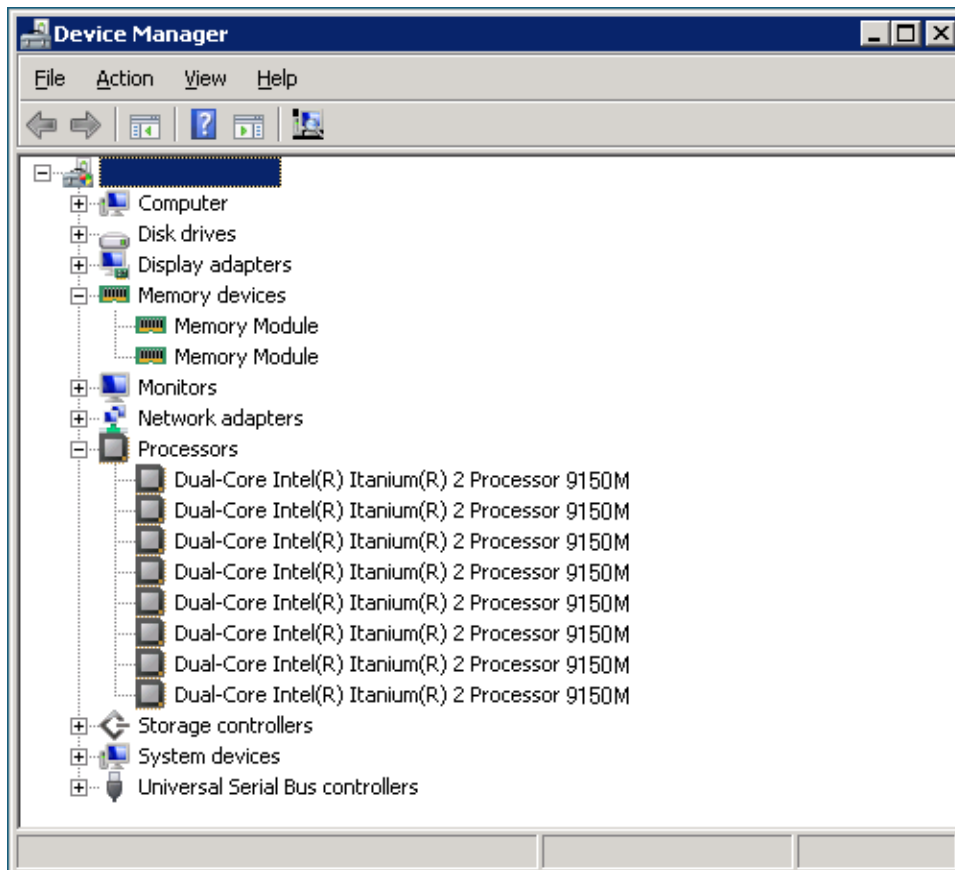


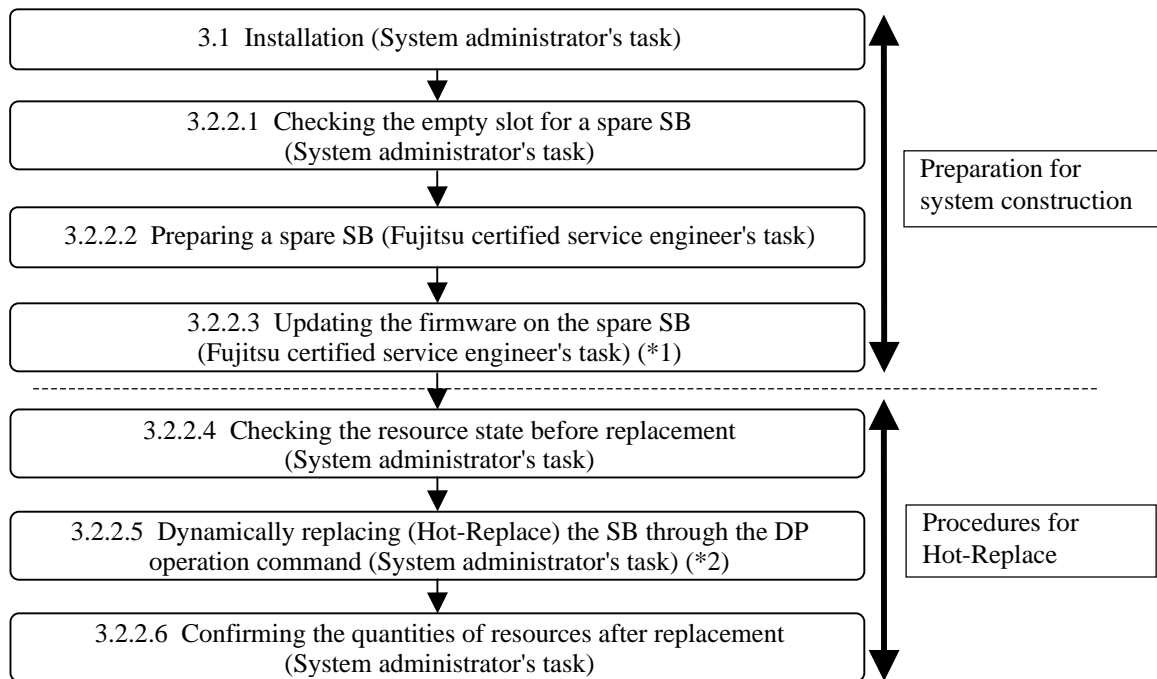
Figure 3.12 Performance tab of Task Manager (after dynamic addition (Hot-Add))



**Figure 3.13 Device Manager (after dynamic addition (Hot-Add))**

### 3.2.2 Flow of SB Hot-Replace operations

Dynamic partitioning is implemented on the assumption that the system has been built to enable dynamic partitioning as described in [Section 3.1, "Installation."](#) In a system whose environment satisfies the dynamic partitioning requirements, users can dynamically replace (Hot-Replace) SBs by following the flow of operations shown in [Figure 3.14](#).



\*1 The work time for the operations in [3.2.2.3](#) is about one hour per SB. Plan and perform this operation efficiently by considering the required operation time.

Fujitsu recommends confirming the firmware version before starting dynamic partitioning, so that the work is performed efficiently.

\*2 The length of time taken for dynamic replacement (Hot-Replace) by the DP operation command depends on the CPU and DIMM capacities on the replacement (spare) SB and the system load. In an environment in which dynamic partitioning will be used, perform dynamic partitioning in advance to measure the length of time. In an environment with a low system load, the length of time can be roughly estimated as follows:

$$[\text{Total capacity (GB) of DIMMs mounted on spare SB for replacement}] \times 2 + 250$$
  
(seconds)

**Figure 3.14 Flow of dynamic partitioning  
(dynamic replacement (Hot-Replace) of an SB) in Windows**

### 3.2.2.1 Checking the empty slot for a spare SB

This operation must be performed by the system administrator. To perform dynamic replacement (Hot-Replace) of an SB, the cabinet must contain a free SB or a reserved SB of a partition for which DP operation is performed. Whether an SB is a free SB or a reserved SB can be checked by using the SB state indication command (fjsvdr-stat) (see [Figure 3.4](#)) or from the [Partition Configuration] window that is displayed by selecting [Partition] → [Partition Configuration] from the MMB Web-UI (see [Figure 3.5](#)).

The spare SB must carry the same resources as those on the replaced SB. If a free SB or reserved SB already mounted in the cabinet is used, the resources mounted on it may need to be changed.

DP operation cannot be performed in an environment containing neither a free SB nor a reserved SB of a partition for which DP operation is performed.

For SBs that are recognized by the system when the system is restarted next time, DP operation for these SBs is enabled by placing them in the "Free" state through the Remove operation from the Partition Configuration window (see [Figure 3.5](#)).

An SB that is recognized by the system when the system is restarted next time is the one for which "StandBy" is displayed in the Power column, "OK" is displayed in the Status column, and a number (other than "F" or "R") is displayed in the PID column when the SB state indication command (fjsvdr-stat) (see [Figure 3.4](#)) is executed.

The spare SB must conform to the conditions and requirements describes in [Section 1.2.3, "Prerequisites for dynamic partitioning operations,"](#) and [Section 1.2.4, "Notes on implementing dynamic partitioning."](#)

### 3.2.2.2 Preparing the spare SB

This operation must be performed by a Fujitsu certified service engineer. The spare SB in the cabinet must be of the same type as that of the replaced SB (see [Section 1.2.4, "Notes on implementing dynamic partitioning"](#)). If the relevant SBs are not of the same type, do not execute dynamic partitioning.

The mounting conditions of the resources (CPU and DIMM) mounted on the spare SB in the cabinet (quantity, location, and type) must be the same as those of the resources mounted on the replaced SB. For details of the resource mounting conditions of the spare SB or replaced SB, select [SB] from the [System] menu in the MMB Web-UI window to display the [SB#n] window ([Figure 3.6](#)), and check them. Based on this information, confirm that the mounting conditions (quantity, location, and type) of mounted resources are the same as on the replaced SB.

Also confirm that the spare SB for replacement is normal.



### 3.2.2.3 Updating the firmware on the spare SB

This operation must be performed by a Fujitsu certified service engineer. The PAL or SAL firmware on all SBs in the same cabinet must be the same version. From the [System] menu in the MMB Web-UI window, select [Firmware Information] to display the [Firmware Information] window ([Figure 3.8](#)) to confirm the PAL or SAL firmware version.

From the [System] menu in the MMB Web-UI window, select [Firmware Information], and see the Version column for the SBs belonging to the target partition in the [Firmware Information] window ([Figure 3.8](#)) to check the version of the PAL or SAL firmware already running in the target partition.

To update the PAL or SAL firmware of the spare SB, select [Firmware Update] → [PAL/SAL Firmware Update] from the [Maintenance] menu in the MMB Web-UI window, and then perform the updating operation in the [PAL/SAL Firmware Update] window ([Figure 3.9](#)). In this window, select the spare SB, specify the PAL/SAL firmware file, and then click the Update button to start updating the firmware.

This operation requires about one hour per SB. Plan and perform this operation efficiently by considering the required operation time.

### 3.2.2.4 Checking the resource state before replacement

This operation must be performed by the system administrator. Check the system state prior to SB replacement by dynamic partitioning in order to compare it with the state following the SB replacement by dynamic partitioning. The quantities of resources prior to the SB replacement can be checked on the [Performance] tab of Task Manager ([Figure 3.10](#)).

### 3.2.2.5 Dynamically replacing the SB through the DP operation command (Hot-Replace)

This operation must be performed by the system administrator. Log in as the user with Administrator privilege to Windows for the target partition of dynamic partitioning, and activate the command prompt by selecting "Execute as Administrator." At the activated command prompt, specify the replaced SB and the spare SB prepared as described in [Section 3.2.2.2, "Preparing the spare SB,"](#) and execute the DP operation command to dynamically replace (Hot-Replace) the SB.

The detection of any error during the initial diagnosis by the firmware interrupts the DP operation and places the spare SB in the Free SB state (If "Reserved" has been set, this setting is cleared). If the version of SAL/PAL is different from the version of the one operating in the partition, the DP operation is interrupted and the SB to be added is placed in its original state.

The time required for the DP operation varies depending on the system configuration and states (e.g., load).

In an environment with a low load, the length of time taken for dynamic partitioning can be estimated as follows according to the total capacity of the DIMMs mounted on the spare SB:

(Reference) Length of time taken for dynamic partitioning

$[\text{Total capacity of DIMMs (GB) mounted on SB to be replaced}] \times 2 + 250 \text{ (seconds)}$

Example: The total capacity of DIMMs mounted on the SB to be replaced is 16 GB.

$16 \times 2 + 250 = 282 \text{ (seconds)}$

[Notes on command execution]

- |                                   |   |
|-----------------------------------|---|
| Termination by Ctrl-C:            | <ul style="list-style-type: none"> <li>• The DP operation command cannot be forcibly terminated by Ctrl-C.</li> </ul>   |
| Closing of the prompt:            | <ul style="list-style-type: none"> <li>• During dynamic partitioning, do not close the prompt from which the DP operation command was executed. Otherwise, dynamic partitioning is terminated. If the prompt is closed and the DP operation is discontinued, perform the recovery procedure for the DP operation command (see <a href="#">Section 3.3.1.1, "Recovery procedure for the DP operation command"</a>).</li> </ul>   |
| MMB switchover:                   | <ul style="list-style-type: none"> <li>• Do not switch or reset the MMB during dynamic partitioning. The DP operation command may terminate abnormally.</li> </ul>  |
| System operation                  | <ul style="list-style-type: none"> <li>• Do not perform restart, shutdown, or reset of the target partition system of DP operation during DP operation. Otherwise, when the system is restarted next time, the SB configuration of the partition will be inconsistent with the state after the DP operation. Stop the partition once, and then use the [Partition Configuration] window that is displayed by selecting [Partition] → [Partition Configuration] from the MMB Web-UI to change the SB configuration to the state after the DP operation.</li> </ul> |
| Partition configuration operation | <ul style="list-style-type: none"> <li>• During DP operation, do not perform the Remove operation for an SB from the [Partition Configuration] window that is displayed by selecting [Partition] → [Partition Configuration] from the MMB Web-UI. Otherwise, the DP operation command terminates abnormally. When the command terminates abnormally, follow the recovery procedure for the DP operation command (see <a href="#">Section 3.3.1.1, "Recovery procedure for the DP operation command"</a>).</li> </ul>  |

For details of the DP operation command, see [Section 3.2.3, "DP operation command \(fjsvdr\)"](#).

## Example of execution

```

Dynamically replacing (Hot-Replace) SB#3 with SB#5:
> fjsvdr -replace SB 3 5
FJSVpsa : I 08809 [Comment] 0/8 DP operation start (1,245)
.....
FJSVpsa : I 08800 [Comment] 1/8 Adding SB#5 to this partition (1,529)
....
FJSVpsa : I 08805 [Comment] 2/8 Diagnosing SB#5 (30,140)
.....
FJSVpsa : I 08806 [Comment] 3/8 Realizing SB#5 (30,200)
..
FJSVpsa : I 08807 [Comment] 4/8 Adding the new resources to the OS (1,542)
....
FJSVpsa : I 08801 [Comment] 5/8 Copying and moving the resource from SB#3 to SB#5 (60,160)
.
FJSVpsa : I 08802 [Comment] 6/8 Removing SB#3 from this partition (1,568)
....
FJSVpsa : I 08808 [Comment] 7/8 Restarting PSA (1,584)
....
FJSVpsa : I 08804 [Comment] 8/8 Replacing of SB#3 by SB#5 is completed (1,602)

```

Note:

"," is displayed about every 10 seconds during dynamic partitioning.

### 3.2.2.6 Confirming the quantities of resources after replacement

After completion of dynamic replacement (Hot-Replace) of an SB with the DP operation command, start Task Manager to verify that the resource quantities after replacement are correct. If necessary, remove the replaced SB, which is no longer required for the partition, from the cabinet. Before removal, confirm in the Web-UI window that the replaced SB is a free SB and is powered off.

### 3.2.3 DP operation command (fjsvdr)

#### (1) Input format

```
fjsvdr -add Nodetype addNode  
fjsvdr -replace Nodetype orgNode dstNode  
fjsvdr -recover
```

#### (2) Function description

The DP operation command adds or replaces an SB in a partition while the OS is running. This command can be executed only for an SB belonging to the local partition or an SB for which no partition is defined (free or reserved SB). The command also outputs the progress of dynamic partitioning to the standard output. Only users with administrator privilege can execute the command. When executing the command at the command prompt, select "Execute as Administrator" when activating the command prompt.

Also, when the DP operation command terminates due to an error in communication with the MMB, use the -recover option to resume the interrupted operation.

Messages indicating the progress of dynamic partitioning and error messages are output to the console from which the command is executed. For details, see [Section 3.3.2.1, "DP operation command \(fjsvdr\) messages."](#)

#### (3) Options

- add: With this option specified, the command adds the specified SB to the local partition.
- replace: With this option specified, the command replaces the *orgNode* of the specified SB belonging to the local partition with *dstNode* for which no partition is defined.
- Nodetype*: Always specify "SB" for this parameter.
- addNode*: Specify the SB number of the SB to be added.  
  
A number ranging from 0 to 7 can be specified. Note that an SB split by XPAR cannot be specified.  
  
Example: To specify SB#3 → 3
- orgNode*: Specify the number of the SB to be replaced.  
  
The specification method is the same as that for *addNode*.  
  
After completion of Hot-Replace, the specified SB is isolated from the partition.
- dstNode*: Specify the number of a spare SB.  
  
The specification method is the same as that for *addNode*.  
  
After completion of Hot-Replace, the specified SB, instead of *orgNode*, belongs to the partition.
- recover: This option resumes the interrupted operation when the DP operation command terminates.

### 3.2.4 SB state indication command (fjsvdrc-stat)

#### (1) Input format

```
fjsvdrc-stat Nodetype
```

#### (2) Function description

Of the SBs mounted in a cabinet, the state of SBs belonging to the local partition, free SBs, and SBs set as reserved SBs of the local partition is displayed. The state of SBs belonging to other partitions and SBs set as reserved SBs of only other partitions is not displayed.

This command can be executed only by a user with the Administrator privilege. To execute this command from the command prompt, select "Execute as the administrator" when starting the command prompt.

#### (3) Options

*Nodetype:* Always specify "SB".

#### (4) Representation format

Information of one LSB is displayed in one line. The information to be displayed is as follows:

Item name	Meaning	Display example
SB	SB number A number between 0 and 7, or such a number followed by "A" or "B" for an SB split by XPAR	1 , 5 , 6A , 7B
Status	SB error status	OK , Warning , Degraded , Failed
Power	SB power state	On , StandBy
PID	ID of partition to which an SB belongs A number between 0 and 15, "F" (for a free SB), or "R" (for a reserved SB)	1 , 12 , F , R
Home	Indicates an SB that cannot be dynamically replaced (Hot-Replace). "*" is displayed for SBs that cannot be dynamically replaced, and "-" is displayed for other SBs. Note) Even if "-" is displayed, it may not be possible to dynamically replace the SB.	* , -
Reserved	Indicates the partition ID for an SB for which the reserved setting has been set. The partition ID is displayed for an SB for which the reserved setting has been set, or the column is left blank for an SB for which the reserved setting has not been set (SB for which "R" is not displayed in the PID column). However, if an SB has also been set as a reserved SB for another partition, the local partition ID is followed by "+".	5 , 5+

Display example)

```

> fjsvdc-stat SB
SB  Status   Power   PID  Home Reserved
-----+-----+-----+-----+-----+
2   OK       On      1    *
3   OK       On      1    -
4   Warning  On      1    -
5A  OK       StandBy 1    -
5B  OK       StandBy F    -
6   OK       StandBy R    -    1+
7   OK       StandBy F    -
-----+-----+-----+-----+

```

**(5) Error messages**

Message	Meaning	Corrective action
FJSVpsa: E 08600 [Command] Internal error(%s,%s,%s,%s,%s,%s)	Internal inconsistency occurred.	Use QSS to collect information for investigation on the partition side, and contact your Fujitsu certified service engineer.
FJSVpsa: E 08601 [Option] Too few or excessive option count(%s,%s,%s)	The number of command options is incorrect.	Check the specified option, specify the correct option, and reexecute the command.
FJSVpsa: E 08602 [Option] Invalid or unsupported option(%s,%s,%s)	An invalid or unsupported option was specified.	Check the specified option, specify the correct option, and reexecute the command.
FJSVpsa: E 08603 [Environment] Partition environment requirements are not met(%s,%s,%s,%s)	This command cannot be used for a server other than the PRIMEQUEST 580A/540A.	Check whether the cabinet is the PRIMEQUEST 580A/540A. The model name can be checked from the Model field displayed in the Information area in the upper part of the MMB Web-UI.
FJSVpsa: E 08604 [MMB] IPMI retry failure(%s,%s,%s,%s,%s,%s,%s)	A retryable error was returned for the IPMI command and retry was performed, but the error was not corrected.	The SB state could not be obtained due to a temporary error of the MMB. Confirm that the MMB Web-UI can be referenced, and then reexecute the command. If this error message is output even after the command is reexecuted, collect SEL by using the MMB Web-UI, use QSS to collect information for investigation on the partition side, and then contact your Fujitsu certified service engineer.
FJSVpsa: E 08605 [MMB] IPMI response error(%s,%s,%s,%s,%s,%s,%s)	A response error was detected for the IPMI command.	Collect SEL by using the MMB Web-UI, use QSS to collect information for investigation on the partition side, and then contact your Fujitsu certified service engineer.
FJSVpsa: E 08606 [Condition] DP operation not permitted(%s,%s,%s,%s)	The command was not executed with the Administrator privilege.	Reexecute the command with the Administrator privilege.

## 3.3 Reference

### 3.3.1 Handling the DP operation command (fjsvdr) errors

The action to be taken when the DP operation command (fjsvdr) ends abnormally varies greatly depending on the category information in the message output by the command. [Table 3.1](#) lists the actions to be taken according to the category.

<p>Check the displayed error message.</p> <p><i>Format:</i> FJSVpsa: Severity Message_ID [Category] Message</p> <p><i>Severity:</i> Message level E=Error, W=Warning, I=Information</p> <p><i>Message_ID:</i> Message identification number</p> <p><i>Category:</i> Message category</p> <p>Example: FJSVpsa: E 08810 [Option] Invalid or unsupported option</p>
--

**Figure 3.15 Format of the message output by the DP operation command (fjsvdr)**

**Table 3.1 Overview of corrective actions for errors of the DP operation command (fjsvdr) (Windows)**

Category	Corrective action
Comment	The message indicates the progress of processing. No action is required.
Option	The specification of a command option has a problem. According to the error message contents, confirm the options, and execute the command again.
Condition	The command temporarily cannot be started. According to the error message contents, execute the command again.
Node	The SB to be added or replacement SB has a problem. Take action according to the output message contents.
OS	A problem occurred in OS processing. Check the system log and take action according to the output message contents.
Environment	Dynamic partitioning is disabled in this environment.
MMB	The DP operation is interrupted due to an MMB error. Take the corrective action indicated by the message output.
Other	Collect QSS data on the partition and SEL data on the MMB, and contact a Fujitsu certified service engineer.

### 3.3.1.1 Recovery procedure for the DP operation command

The DP operation command (fjsvdr) may be terminated due to a temporary error condition of the MMB. In relevant events, the following error messages are output to the command execution console:

- 08829 [MMB] IPMI retry failure(%s,%s,%s,%s,%s,%s)
- 08864 [Node] <Unittyp>#%d{A|B} state transition failure(%s,%s,%s)

When the prompt from which the DP operation command is being executed is closed by mistake during DP operation, the operation is interrupted at this point of time.

When these messages are output or the prompt is closed during DP operation, the following states may result because the DP operation is interrupted:

#### Dynamic addition (Hot-Add)

The [Partition Configuration] window that is displayed by selecting [Partition] → [Partition Configuration] from the MMB Web-UI (see [Figure 2.6](#)) indicates that the SB to be added has already been incorporated in the partition. However, the quantities of resources checked from the operating system ([Section 2.2.1.8, "Confirming the quantities of added resources"](#)) appear the same as the quantities before the addition.

#### Dynamic replacement (Hot-Replace)

In the [Partition Configuration] window that is displayed by selecting [Partition] → [Partition Configuration] from the MMB Web-UI (see [Figure 2.6](#)), the spare SB and SB to be replaced have already been incorporated in the partition.

When these messages are output or the prompt is closed during DP operation, the procedures below can be used to complete the DP operation normally. The procedure to be used varies depending on the output timing of the messages (procedures are common to dynamic addition and dynamic replacement).

#### 1) When the DP operation terminates with the 08829 message output

##### 1-1) When the 08809 or 08800 message is output immediately before the 08829 message

Output example)s

```
> fjsvdr -add SB 3
FJSVpsa : I 08809 [Comment] 0/6 DP operation start (xx, xx)
.....
FJSVpsa : I 08800 [Comment] 1/6 Adding SB#3 to this partition (xx, xx)
....
FJSVpsa : E 08829 [MMB] IPMI retry failure (xx, xx, xx, xx, xx, xx)
```

#### Recovery procedure)

- (1) Check the [Partition Configuration] window that is displayed by selecting [Partition] → [Partition Configuration] from the MMB Web-UI (see [Figure 2.6](#)). If the SB to be added is already contained in the partition, remove the SB from the partition. If the SB to be added is not contained in the partition, perform (2).
- (2) Reexecute the DP operation command.



- 1-2) When any of the 08805, 08806, 08801 (only for dynamic replacement), and 08802 (only for dynamic replacement) messages is output immediately before the 08829 message

Output example)

```
> fjsvdr -add SB 3
FJSVpsa : I 08809 [Comment] 0/6 DP operation start (xx, xx)
.....
FJSVpsa : I 08800 [Comment] 1/6 Adding SB#3 to this partition (xx, xx)
....
FJSVpsa : I 08805 [Comment] 2/6 Diagnosing SB#3 (xx, xx)
.....
FJSVpsa : I 08806 [Comment] 3/6 Realizing SB#3 (xx, xx)
..
FJSVpsa : E 08829 [MMB] IPMI retry failure (xx, xx, xx, xx, xx, xx)
```

Recovery procedure)

Execute the DP operation command with the -recover option specified.

- 2) When the DP operation terminates with the 08864 message output

Output example)

```
# /opt/FJSVpsa/bin/fjsvdr -add SB 3B
FJSVpsa : I 08809 [Comment] 0/6 DP operation start (xx, xx)
.....
FJSVpsa : I 08800 [Comment] 1/6 Adding SB#3B to this partition (xx, xx)
....
FJSVpsa : I 08805 [Comment] 2/6 Diagnosing SB#3B (xx, xx)
.....
FJSVpsa : I 08806 [Comment] 3/6 Realizing SB#3B (xx, xx)
..
FJSVpsa : E 08864 [Node] SB#3B state transition failure (xx, xx, xx)
```

Recovery procedure)

Execute the DP operation command with the -recover option specified.

- 3) When the prompt was closed by mistake during DP operation

- 3-1) If messages only up to the 8809 or 8800 message have been recorded in the event log (application)

Event log output example)

```
Information FJSVpsa 8809 None [Comment] 0/8 DP operation start (xx, xx)
Information FJSVpsa 8800 None [Comment] 1/8 Adding SB#2 to this partition (1,529)
```

## Recovery procedure)

- (1) Check the [Partition Configuration] window that is displayed by selecting [Partition] → [Partition Configuration] from the MMB Web-UI (see [Figure 2.6](#)). If the SB to be added is already contained in the partition, remove the SB from the partition. If the SB to be added is not contained in the partition, perform (2).
- (2) Reexecute the DP operation command.

3-2) When any of the 8805, 8806, 8807, 8801 (only for dynamic replacement), 8802 (only for dynamic replacement), and 8808 messages is recorded in the event log (application)

## Event log output example)

```
Information FJSVpsa 8809 None [Comment] 0/8 DP operation start (xx, xx)
Information FJSVpsa 8800 None [Comment] 1/8 Adding SB#1 to this partition (xx, xx)
Information FJSVpsa 8805 None [Comment] 2/8 Diagnosing SB#1 (xx, xx)
Information FJSVpsa 8806 None [Comment] 3/8 Realizing SB#1 (xx, xx)
Information FJSVpsa 8807 None [Comment] 4/8 Adding the new resources
to the OS (xx, xx)
Information FJSVpsa 8801 None [Comment] 5/8 Copying and moving the resource
from SB#2 to SB#1 (xx, xx)
Information FJSVpsa 8802 None [Comment] 6/8 Removing SB#2 from this partition
(xx, xx)
```

## Recovery procedure)

- (1) Execute the DP operation command with the -recover option specified.
- (2) Check whether PSA has been started. If it has not been started, start it manually.

The PSA start state can be checked from PRIMEQUEST PSA Environment Control Service in the [Service] window that is displayed by selecting [Administrative Tools] → [Services] (see [Figure 3.16](#)). To start PSA, select PRIMEQUEST PSA Environment Control Service and execute "Start service."



Figure 3.16 [Services] window displayed by selecting [Administrative Tools] → [Services]

## 3.3.2 Messages

### 3.3.2.1 DP operation command (fjsvdrc) messages

This section lists the messages output with the DP operation command (fjsvdrc). For the message format, see [Figure 3.15](#). All the messages listed below are output to the console where the command was executed. Messages whose severity is "I" are also output to the system log.

**Table 3.2 Command messages (1/7)**

Message	Explanation	Response
FJSVpsa: I 08800 [Comment] Adding <Unittype>#%d to this partition(%s,%s)	Unittype: SB %d: Additional/spare unit number The specified unit is being added to the partition.	No action is required.
FJSVpsa: I 08801 [Comment] Copying and moving the resource from <Unittype>#%d1 to <Unittype>#%d2(%s,%s)	Unittype: SB %d1: Replaced unit number %d2: Spare unit number Resource copy is in progress between units subject to replacement.	No action is required.
FJSVpsa: I 08802 [Comment] Removing <Unittype>#%d1 from this partition(%s,%s)	Unittype: SB %d: Replaced unit number The unit to be replaced is being deleted from the partition.	No action is required.
FJSVpsa: I 08803 [Comment] Adding of <Unittype>#%d to this partition is completed(%s,%s)	Unittype: SB %d: Additional unit number Unit Hot-Add was completed.	No action is required.
FJSVpsa: I 08804 [Comment] Replacing of <Unittype>#%d1 by <Unittype>#%d2 is completed(%s1,%s2)	Unittype: SB %d1: Replaced unit number %d2: Spare unit number Unit Hot-Replace was completed.	No action is required.
FJSVpsa: I 08805 [Comment] %d1/%d2 Diagnosing <Unittype>#%d3{A B}(%s,%s)	%d1/%d2: DP operation progress rate Unittype:SB %d3: Additional unit number Firmware is performing initial diagnosis.	No action is required.

Table 3.2 Command messages (2/7)

Message	Explanation	Response
FJSVpsa: I 08806 [Comment] %d1/%d2 Realizing <Unittype>#%d3{A B}(%s,%s)	%d1/%d2: DP operation progress rate  Unittype:SB  %d3: Additional unit number  An additional unit is being recognized.	No action is required.
FJSVpsa: I 08807 [Comment] %d1/%d2 Adding the new resources to the OS(%s,%s)	%d1/%d2: DP operation progress rate  Additional resources are being incorporated.	No action is required.
FJSVpsa: I 08808 [Comment] %d1/%d2 Restarting PSA(%s,%s)	%d1/%d2: DP operation progress rate  The PSA is being restarted.	No action is required.
FJSVpsa: I 08809 [Comment] %d1/%d2 DP operation start(%s,%s)	%d1/%d2: DP operation progress rate  DP operation is started.	No action is required.
FJSVpsa: E 08810 [Option] Invalid or unsupported option(%s,%s,%s)	An invalid or unsupported option is specified.	Confirm the specified options, and execute the command again with valid options specified.
FJSVpsa: E 08811 [Option] Too few or excessive option count(%s,%s,%s)	The number of specified options is incorrect.	Confirm the specified options, and execute the command again with valid options specified.
FJSVpsa: E 08812 [Condition] Already executing(%s,%s,%s,%s,%s)	An attempt was made to execute multiple commands concurrently.	Wait until the command being executed is completed before executing another command.
FJSVpsa: E 08814 [Command] Internal error(%s,%s,%s,%s,%s,%s)	An internal conflict occurred.	Collect diagnostic data on the partition with QSS, and contact a Fujitsu certified service engineer.
FJSVpsa: E 08816 [Environment] Partition environment requirements are not met(%s,%s,%s,%s)	The partition does not satisfy the environmental requirements for dynamic partitioning.	Confirm the cabinet type, OS type, and OS version. If this message is output even though the requirements are satisfied, collect diagnostic data on the partition with QSS, and contact a Fujitsu certified service engineer.
FJSVpsa: E 08817 [Node] Specified <Unittype>#%d is not free(%s,%s,%s,%s,%s)	Unittype: SB  %d: Unit number  The specified unit is not a free unit.	Confirm that the specified unit is a free unit, which does not belong to any partition. If it is not a free unit, reexecute the command with the specification of a free SB or a reserved SB of the partition for which DP operation is performed.

Table 3.2 Command messages (3/7)

Message	Explanation	Response
FJSVpsa: E 08818 [Option] Specified <Unitttype> number is invalid(%s,%s,%s,%s)	Unitttype: SB The specified unit number is outside the valid range.	Specify a valid unit number, and execute the command again.
FJSVpsa: E 08819 [Node] Specified <Unitttype>#%d is not present(%s,%s,%s)	Unitttype: SB %d: Additional unit number The specified unit has not been mounted.	Confirm that the specified unit has been mounted in the cabinet. If it has not been mounted, reexecute the command with the specification of a free SB mounted in the cabinet or reserved SB of the partition for which DP operation is performed.
FJSVpsa: E 08820 [Node] CPU mismatched(%s,%s,%s)	The type of a CPU mounted on the specified SB does not match the type of CPUs in the partition.	Because the type of the mounted CPU is different from that of the CPUs in the partition, the specified SB cannot be dynamically added. Check the requirements of an SB to be added by referencing <a href="#">Section 1.2.3, "Prerequisites for dynamic partitioning operations,"</a> and use an SB that satisfies the requirements to reexecute the command.
FJSVpsa: E 08821 [Node] Cannot add the split <Unitttype> because of extended mirror mode(%s,%s,%s)	Unitttype: SB A unit split by XPAR cannot be added by Hot-Add, because the partition is in extended mirror mode.	Request a Fujitsu certified service engineer to prepare a non-split unit, before executing the command again.
FJSVpsa: E 08822 [Node] <Unitttype> mismatched(%s,%s,%s)	Unitttype: SB The specified unit does not match the units in the partition.	Prepare a unit matching those in the partition, before executing the command again.
FJSVpsa: E 08824 [Node] Specified <Unitttype>#%d is split(%s,%s)	Unitttype: SB %d: Target unit number The specified unit has been split.	Confirm that the specified unit has not been split by XPAR. If it has been split, request a Fujitsu certified service engineer to prepare a unit not split by XPAR, before executing the command again.
FJSVpsa: E 08825 [Node] <Unitttype> mode mismatched(%s %s,%s,%s)	Unitttype: SB The modes of the specified units are inconsistent.	Confirm that the specified unit has not been split by XPAR. If it has been split, request a Fujitsu certified service engineer to prepare a unit not split by XPAR, before executing the command again.
FJSVpsa: E 08826 [Environment] SB Replace Operation requires more then 2 LSBs(%s,%s,%s)	The partition in which Hot-Replace was attempted contains only 1 LSB.	The partition in which Hot-Replace can be executed must have 2 or more LSBs. Hot-Replace by DP operation cannot be performed with 1 LSB.

Table 3.2 Command messages (4/7)

Message	Explanation	Response
FJSVpsa: E 08827 [Node] Cannot add the <Unittype>#d with alarm(%s,%s,%s,%s,%s)	Unittype: SB %d: Target unit number  A unit in the failed state cannot be added.	Specify a unit whose status is OK to reexecute the command.
FJSVpsa: E 08828 [MMB] IPMI response error(%s,%s,%s,%s,%s)	An IPMI command response error was detected.	Collect SEL data via the MMB Web-UI, collect diagnostic data on the partition with QSS, and contact a Fujitsu certified service engineer.
FJSVpsa: E 08829 [MMB] IPMI retry failure(%s,%s,%s,%s,%s,%s)	Although the IPMI command responded with an error message indicating that retry is possible, a retry of command execution resulted in an error.	The DP operation may be interrupted due to a temporary MMB error. Confirm that the MMB Web-UI can be referenced, and then follow the instructions in <a href="#">Section 3.3.1.1, "Recovery procedure for the DP operation command."</a> If this error message is output even after the command recovery procedure is performed, collect SEL by using the MMB Web-UI, use QSS to collect information for investigation on the partition side, and then contact your Fujitsu certified service engineer.
FJSVpsa: E 08831 [Condition] Specified <Unittype>#%d does not belong to this partition(%s,%s,%s,%s)	The replaced SB does not belong to the local partition.  Unittype: SB %d: Target unit number	The replaced SB does not belong to the local partition. Reenter the command with an SB belonging to the local partition specified.
FJSVpsa: W 08832 [PSA] PSA data restructuring failed(%s,%s,%s,%s,%s)	Although dynamic partitioning completed normally, restructuring of PSA configuration data failed.	Unless a message whose severity is "W" or "E" is output in addition to this message, dynamic partitioning has completed normally. Check the system log. If message FJSVpsa:00070 is output, reconfiguration of PSA configuration data failed because Ctrl-C was executed during dynamic partitioning. Start PSA. In other cases, collect SEL data through the Web-UI, collect diagnostic data on the partition by using QSS, and contact a Fujitsu certified service engineer.
FJSVpsa: E 08833 [OS] Receive the failure notification(%s,%s,%s)	Notification of a failure was received from the OS.	Check the system log on the partition. If a message is found, take action according to the message. If no message is found, collect diagnostic data with QSS, and contact a Fujitsu certified service engineer.

Table 3.2 Command messages (5/7)

Message	Explanation	Response
FJSVpsa: E 08834 [Node] Cannot add the split <Unittype> into Windows partition(%2,%3,%4)	Windows does not support the addition and replacement of split SBs. Unittype: SB	Reenter the command with a non- split SB specified.
FJSVpsa: E 08835 [OS] Failed to copy and move the resource from <Unittype>#d1 to <Unittype>#d2(%s,%s,%s,%s)	An error occurred during copying of resources on the SB. Unittype: SB %d1: Replaced unit number %d2: Spare unit number	Check the system log on the partition, and follow the corrective action provided in the messages if output. If no message is found, collect SEL data via the MMB Web- UI, collect diagnostic data on the partition with QSS, and contact a Fujitsu certified service engineer.
FJSVpsa: E 08836 [Environment] Dynamic Partitioning function is disabled(%s1,%s2,%s3)	The DP function is disabled.	Data partitioning cannot be executed because the DP function has not been enabled for the partition via the MMB Web-UI.
FJSVpsa: E 08837 [Environment] SB#%d is the HOME SB(%3,%4,%5,%6)	A Home SB cannot be replaced. %d: Target unit number	No Home SB can be replaced.
FJSVpsa: E 08838 [Node] CPU mount point mismatched(%s,%s,%s,%s)	The mounting location of CPU differs between the replaced SB and spare SB.	Match the CPU mounting location on the spare SB with that on the replaced SB and then reenter the command.
FJSVpsa: E 08839 [Environment] Hyper Threading is enabled(%s,%s,%s)	The hyper threading function is enabled.	Dynamic partitioning cannot be performed because the hyper threading function has not been disabled in the partition from the MMB Web-UI.
FJSVpsa: E 08840 [Environment] There are some Failed/Disabled CPUs on SB#%d(%s,%s,%s,%s)	A CPU in the Failed or Disabled state exists on the replaced SB. %d: Target unit number	Hot-Replace operations cannot be performed if a CPU in the Failed or Disabled state exists on the replaced SB.  * A CPU that enters the "Warning" state because of frequent correctable errors is isolated and placed in the "Disabled" state after the partition is rebooted. However, the CPU status on the MMB Web UI remains "Warning." In this case, the CPU is handled in the same way as in the "Disabled" state and thus cannot be dynamically replaced (Hot- Replace).
FJSVpsa: E 08841 [Condition] DP operation not permitted(%s,%s,%s,%s)	Operation is executed without Administrator privilege.	Execute the operation again with Administrator privilege.

Table 3.2 Command messages (6/7)

Message	Explanation	Response
FJSVpsa:E 08842 [Environment] SB#%d is in the alarm status(%s,%s,%s,%s)	%d: Target unit number  An SB whose status is Failed cannot be replaced.	If the status of the SB to be replaced is "Failed," the SB cannot be dynamically replaced (Hot-Replace).
FJSVpsa:E 08843 [Node] SAL version mismatch(%s,%s,%s,%s)	The PAL or SAL firmware version on the SB to be added does not match that of the firmware running on the partition.	Using the MMB Web-UI, confirm that the versions of the PAL or SAL firmware running on the SB to be added and the target partition are the same. If the versions are not the same, ask a Fujitsu certified service engineer to match the versions of the PAL or SAL firmware on the SB to be added and that running on the target partition, and then reexecute the command.
FJSVpsa:E 08846 [Environment] Specified %s#%d%s is mounted in the slot that cannot be added(%s,%s,%s,%s)	The slot number of the slot containing the SB to be added or the spare SB is not greater than the smallest mounting slot number among the slots containing the SBs composing the partition.	Dynamic partitioning cannot be performed because the slot number of the slot containing the SB to be added or the spare SB precedes the slot with the smallest mounting slot number among the SBs composing the partition. If the SB to be added or spare SB can be moved after the slot with the smallest mounting slot number among the SBs composing the partition, move it and then reexecute the command.
FJSVpsa:E 08847 [Condition] Command is not interrupting(%s,%s)	In the state in which the DP operation command was not terminated, the -recover option was specified.	DP operation is not being performed or the -recover option cannot be specified in the current state. Check the recovery procedure and perform the correct procedure.
FJSVpsa:E 08848 [Condition] Command has been interrupting(%s,%s)	In the state in which the DP operation command was terminated, a new attempt was made to execute DP operation.	Check the recovery procedure and perform the correct procedure.
FJSVpsa:E 08849 [Node] DIMM mismatched(%s,%s,%s,%s)	The type of DIMM in the partition does not match the type of DIMM on the specified SB.	Mount a DIMM that satisfies the DIMM mixture conditions on the SB, and then reexecute the command.
FJSVpsa:E 08860 [Node] <Unittyp>#%d{A B} was removed by the operation from MMB(%s,%s,%s)	Unittyp:SB  %d: Target unit number  During DP operation, the SB to be added or spare SB was removed by operation from the MMB.	Check the reason for the Remove operation, and then reexecute the command if dynamic addition or replacement is to be performed using DP operation.



Table 3.2 Command messages (7/7)

Message	Explanation	Response
FJSVpsa:E 08861 [Node] Cannot turn off the power of <Unitttype>#%d{A B} with alarm(%s,%s,%s)	Unitttype:SB  %d: Target unit number  Since the status of the SB to be replaced has changed to the Failed status, the power cannot be turned off.	Because the status of the SB to be replaced has changed to the Failed status during the DP operation, the power cannot be turned off. The SB replacement work has been completed and there is no problem in system operation. The power to the SB to be replaced is turned off when the partition is stopped next time.
FJSVpsa:E 08862 [Node] <Unitttype>#%d{A B} is not the reserved <Unitttype> of this partition(%s,%s)	Unitttype:SB  %d: Target unit number  The SB to be added or spare SB is not a reserved SB of the partition for which DP operation is performed.	Reexecute the command with the specification of a free SB or reserved SB of the partition for which DP operation was performed.
FJSVpsa:E 08863 [Node] Cannot read out the type data of DIMMs installed on <Unitttype>#%d{A B}(%s,%s)	Unitttype:SB  %d: Target unit number  DIMM information cannot be obtained.	For an SB that has never been powered on since it was mounted in the cabinet, since its DIMM mounting status has not been fixed, neither dynamic addition (Hot-Add) nor dynamic replacement (Hot-Replace) can be performed. Check the [SB#n] window that is displayed by selecting [System] → [SB] → [SB#n] from the MMB Web-UI (see <a href="#">Figure 3.6</a> ), and then use an SB for which the DIMM status has been fixed to reexecute the command.
FJSVpsa:E 08864 [Node] <Unitttype>#%d{A B} state transition failure(%s,%s,%s)	Unitttype:SB  %d: Target unit number  During SB incorporation operation, a normal state was not entered.	The DP operation may be interrupted due to a temporary MMB error. Confirm that the MMB Web-UI can be referenced, and then follow the instructions in <a href="#">Section 3.3.1.1</a> , " <a href="#">Recovery procedure for the DP operation command</a> ." If this error message is output even after the command recovery procedure is performed, collect SEL by using the MMB Web-UI, use QSS to collect information for investigation on the partition side, and then contact your Fujitsu certified service engineer.
FJSVpsa:E 08865 [Node] <Unitttype>#%d{A B} is not turned off(%s,%s,%s,%s)	The power to the SB to be added is not off.	The DP operation and SB maintenance operation from the MMB Web-UI may have entered into contention with each other. After the maintenance work, reexecute the command.

### 3.3.2.2 System log messages

Table 3.3 lists the system log data output when the DP operation command is executed. The table also lists the responses to be made for the log items. The system log data is recorded in the system log of the system.

**Table 3.3 System log messages**

Event ID	Source	Level	Message	Explanation	Response
240	Kernel-PnP	Information	Replacement operation for specific partition started	In Windows, dynamic replacement (Hot-Replace) has started.	No action is required.
241	Kernel-PnP	Error	Replacement operation for specific partition failed.	In Windows, dynamic replacement (Hot-Replace) failed.	Check the command messages of the DP operation command, resource quantities, and resource mounting locations. If no problem is found, collect a diagnostic data with QSS and contact a Fujitsu certified service engineer.
242	Kernel-PnP	Information	Replacement for specific partition successful	In Windows, dynamic replacement (Hot-Replace) was completed successfully.	No action is required.
10001	Replace Driver	Error	Error detected while replace initiated.	Dynamic replacement of the driver (Hot-Replace) failed.	Check the command messages of the DP operation command, resource quantities, and resource mounting locations. If no problem is found, collect a diagnostic data with QSS and contact a Fujitsu certified service engineer.

## 3.4 Notes and Restrictions on Software

To use the DP function of Windows, all software programs to be used must be confirmed as compatible with the DP function. Contact a Fujitsu certified service engineer to check whether using the DP function with each software program will cause any problems or whether each software program can be made compatible with the DP function (\*1).

Because the system temporarily stops responding during dynamic partitioning, be careful with regard to the settings of software programs that need to confirm responses from the system, such as in a cluster system. Because the duration of the stoppage depends on the system configuration and states (e.g., load), it must be tested in advance.

\*1 Some software products that can be made compatible with the DP function require special operations for use with dynamic partitioning.

