FUJITSU

PRIMECLUSTER Clustering Base 4.3A20

Installation Guide

Linux

Preface

Purpose

This manual explains how to install PRIMECLUSTER Clustering Base.

Target Readers

This manual is written for people who will install this product.
It is strongly recommended that you read the Software Release Guide from the product media before using this manual.
When setting up systems, it is assumed that readers have the basic knowledge required to configure the servers, storage and network devices to be installed.

Organization

This manual consists of four chapters, and appendices. The contents of these chapters, the appendices are listed below.

Title	Description
Chapter 1 Program components	Explains the packages of which this product is composed.
Chapter 2 Operation Environment	Explains the operational environment of this product.
Chapter 3 Installation	Explains how to install this product.
Chapter 4 Uninstallation	Explains how to uninstall this product.
Appendix A Troubleshooting	Explains how to address problems that occur.
Appendix B Upgrading from old versions	Explains how to upgrade from old versions.
Appendix C Necessary OS packages to be installed.	Explains about the necessary OS packages to be installed.

Notational Conventions

The notation in this manual conforms to the following conventions.

- References and character strings or values requiring emphasis are indicated using double quotes (").

- Text to be entered by the user is indicated using bold text.

- Variables are indicated using italic text.

The following abbreviations are used in this manual:

- Microsoft(R) Windows(R) XP operating system is abbreviated as Windows(R) XP.

- Microsoft(R) Windows(R) Vista operating system is abbreviated as Windows(R) Vista.

- Microsoft(R) Windows(R) 7 operating system is abbreviated as Windows(R) 7.

- Cluster Foundation is abbreviated as CF.

- Reliant Monitor Services is abbreviated as RMS.

- Global Disk Services is abbreviated as GDS.

- Global Link Services is abbreviated as GLS.

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Editing record

Changes	Section	Manual code
Basic software prerequisites have been added.	2.1.1, 2.2.1	J2UL-1441-02ENZ0(01) J2UL-1441-02ENZ2(01)
Required patches have been modified.	2.1.1	
The correction procedure for the /etc/kdump.conf file after uninstallation has been added.	4.1.2	
Upgrading from PRIMECLUSTER 4.3A10 has been modified.	B.1.2	
Appendix C Necessary OS packages to be installed has been added.	Appendix C	
Package version has been modified.	1.1 - 1.4	J2UL-1441-02ENZ0(02) J2UL-1441-02ENZ2(02)

Contents

Chapter 1 Program components

A system consists of programs, and each program is referred to as a package.
This chapter explains about the packages of which this software is composed.

PRIMERGY

- Red Hat Enterprise Linux 5 (for x86)

- Red Hat Enterprise Linux 5 (for Intel64)

- Red Hat Enterprise Linux 6 (for x86)

- Red Hat Enterprise Linux 6 (for Intel64)

1.1 Red Hat Enterprise Linux 5 (for x86) for PRIMERGY

No.	Component	Package	Version	Function
1	PCLsnap	FJSVpclsnap	4.3.0	Tool for collecting troubleshooting information
2	Web-Based Admin View	SMAWcj2re	1.7.0	GUI common framework, Cluster management GUI
		FJSVwvbs	4.3.2	
		FJSVwvmpc	4.3.2	
		SMAWrcadm	4.3A20	
3	Cluster Foundation(CF)	kmod-FJSVclotr-drv-PAE	4.3.0	Basic cluster Services
		SMAWskel	4.2A20	
		SMAWhvksh	4.3A00	
		SMAWcf	4.3A20	
		SMAWsf	4.3A20	
		FJSVclapi	4.3.2	
		FJSVcldbm	4.3.2	
		FJSVcldev	4.3.0	
		FJSVclotr	4.3.0	
4	Cluster Configuration Backup/ Restore(CCBR)	SMAWccbr	4.3A00	Configuration file backup and restoration
5	Reliant Monitor Services(RMS)	SMAWRrms	4.3A20	Application takeover for operational continuity
		SMAWRdfw	4.3A20	
6	Wizard Tools(WT)	SMAWRhv-to	4.3A20	Tool for defining RMS configuration
		SMAWRhv-ba	4.3A20	
		SMAWRhv-do	4.3A20	
		SMAWRhv-de	4.3A20	
		FJSVhvgl	2.13	
		FJSVhvgd	4.2.3	
7	CF Add-On(CAO)	FJSVclapm	4.3.0	CF add-on package

No.	Component	Package	Version	Function
8	RMS Add-On(RAO)	FJSVclrms	4.3.0	RMS add-on package
		FJSVclrwz	4.3.0	
		FJSVclsfw	4.3.0	
9	SA_LKCD	FJSVcllkcd	4.3.2	LKCD shutdown agent
10	GUIs	FJSVwvfrm	4.3.0	CRM view
11	Kdump Tool	kmod-kdump-poffinhibit-PAE	1.0.2	Kdump Cluster Tool (For physical environment)
		kdump-poffinhibit	1.0.2	

1.2 Red Hat Enterprise Linux 5 (for Intel64) for PRIMERGY

No.	Component	Package	Version	Function
1	PCLsnap	FJSVpclsnap	4.3.0	Tool for collecting troubleshooting information
2	Web-Based Admin View	SMAWcj2re	1.7.0	GUI common framework, Cluster management GUI
		FJSVwvbs	4.3.2	
		FJSVwvmpc	4.3.2	
		SMAWrcadm	4.3A20	
3	Cluster Foundation(CF)	kmod-FJSVclotr-drv	4.3.0	Basic cluster Services
		SMAWskel	4.2A20	
		SMAWhvksh	4.3A00	
		kmod-SMAWcf	4.3A20	
		SMAWcf	4.3A20	
		SMAWsf	4.3A20	
		FJSVclapi	4.3.2	
		FJSVcldbm	4.3.2	
		FJSVcldev	4.3.0	
		FJSVclotr	4.3.0	
4	Cluster Configuration Backup/ Restore(CCBR)	SMAWccbr	4.3A00	Configuration file backup and restoration
5	Reliant Monitor Services(RMS)	SMAWRrms	4.3A20	Application takeover for operational continuity
		SMAWRdfw	4.3A20	
6	Wizard Tools(WT)	SMAWRhv-to	4.3A20	Tool for defining RMS configuration
		SMAWRhv-ba	4.3A20	
		SMAWRhv-do	4.3A20	
		SMAWRhv-de	4.3A20	
		FJSVhvgl	2.13	
		FJSVhvgd	4.2.3	

No.	Component	Package	Version	Function
7	CF Add-On(CAO)	FJSVclapm	4.3.0	CF add-on package
8	RMS Add-On(RAO)	FJSVclrms	4.3.0	RMS add-on package
		FJSVclrwz	4.3.0	
		FJSVclsfw	4.3.0	
9	SA_LKCD	FJSVcllkcd	4.3.2	LKCD shutdown agent
10	GUIs	FJSVwvfrm	4.3.0	CRM view
11	Kdump Tool	kmod-kdump-poffinhibit	1.0.2	Kdump Cluster Tool (For physical environment)
		kdump-poffinhibit	1.0.2	

1.3 Red Hat Enterprise Linux 6 (for x86) for PRIMERGY

No.	Component	Package	Version	Function
1	PCLsnap	FJSVpclsnap	4.3.0	Tool for collecting troubleshooting information
2	Web-Based Admin View	SMAWcj2re	1.7.0	GUI common framework, Cluster management GUI
		FJSVwvbs	4.3.2	
		FJSVwvmpc	4.3.2	
		SMAWrcadm	4.3A20	
3	Cluster Foundation(CF)	kmod-FJSVclotr-drv	4.3.0	Basic cluster Services
		SMAWskel	4.3A00	
		SMAWhvksh	4.3A00	
		kmod-SMAWcf	4.3A20	
		SMAWcf	4.3A20	
		SMAWsf	4.3A20	
		FJSVclapi	4.3.2	
		FJSVcldbm	4.3.2	
		FJSVcldev	4.3.0	
		FJSVclotr	4.3.0	
4	Cluster Configuration Backup/ Restore(CCBR)	SMAWccbr	4.3A00	Configuration file backup and restoration
5	Reliant Monitor Services(RMS)	SMAWRrms	4.3A20	Application takeover for operational continuity
		SMAWRdfw	4.3A20	
6	Wizard Tools(WT)	SMAWRhv-to	4.3A20	Tool for defining RMS configuration
		SMAWRhv-ba	4.3A20	
		SMAWRhv-do	4.3A20	
		SMAWRhv-de	4.3A20	
		FJSVhvgl	2.13	

No.	Component	Package	Version	Function
		FJSVhvgd	4.3.1	
7	CF Add-On(CAO)	FJSVclapm	4.3.0	CF add-on package
8	RMS Add-On(RAO)	FJSVclrms	4.3.0	RMS add-on package
		FJSVclrwz	4.3.0	
		FJSVclsfw	4.3.0	
9	SA_LKCD	FJSVcllkcd	4.3.2	LKCD shutdown agent
10	GUIs	FJSVwvfrm	4.3.0	CRM view
11	Kdump Tool	kmod-kdump-poffinhibit	2.0.0	Kdump Cluster Tool (For physical environment)
		kdump-poffinhibit	2.0.0	

1.4 Red Hat Enterprise Linux 6 (for Intel64) for PRIMERGY

No.	Component	Package	Version	Function
1	PCLsnap	FJSVpclsnap	4.3.0	Tool for collecting troubleshooting information
2	Web-Based Admin View	SMAWcj2re	1.7.0	GUI common framework, Cluster management GUI
		FJSVwvbs	4.3.2	
		FJSVwvmpc	4.3.2	
		SMAWrcadm	4.3A20	
3	Cluster Foundation(CF)	kmod-FJSVclotr-drv	4.3.0	Basic cluster Services
		SMAWskel	4.3A00	
		SMAWhvksh	4.3A00	
		kmod-SMAWcf	4.3A20	
		SMAWcf	4.3A20	
		SMAWsf	4.3A20	
		FJSVclapi	4.3.2	
		FJSVcldbm	4.3.2	
		FJSVcldev	4.3.0	
		FJSVclotr	4.3.0	
4	Cluster Configuration Backup/ Restore(CCBR)	SMAWccbr	4.3A00	Configuration file backup and restoration
5	Reliant Monitor Services(RMS)	SMAWRrms	4.3A20	Application takeover for operational continuity
		SMAWRdfw	4.3A20	
6	Wizard Tools(WT)	SMAWRhv-to	4.3A20	Tool for defining RMS configuration
		SMAWRhv-ba	4.3A20	
		SMAWRhv-do	4.3A20	
		SMAWRhv-de	4.3A20	

No.	Component	Package	Version	Function
		FJSVhvgl	2.13	
		FJSVhvgd	4.3.1 -	
7	CF Add-On(CAO)	FJSVclapm	4.3.0	CF add-on package
8	RMS Add-On(RAO)	FJSVclrms	4.3.0	RMS add-on package
		FJSVclrwz	4.3.0	
		FJSVclsfw	4.3.0	
9	SA_LKCD	FJSVcllkcd	4.3.2	LKCD shutdown agent
10	GUIs	FJSVwvfrm	4.3.0	CRM view
11	Kdump Tool	kmod-kdump-poffinhibit	2.0.0	Kdump Cluster Tool (For physical environment)
		kdump-poffinhibit	2.0.0	

Chapter 2 Operation Environment

This chapter explains the operation environment of this software.

Before you install this software on PRIMERGY, your system must meet the following prerequisites.

1. Cluster node

   This software must be installed and a cluster system is configured on a cluster node.

2. Cluster management server

   For information about the Web-Based Admin View topologies, see "2.4 Determining the Web-based Admin View Operation Mode" of the "PRIMECLUSTER Installation and Administration Guide".

2.1 Cluster node operating environment

This section explains operating environment of cluster node.

2.1.1 Software environment

1. Basic software prerequisites

   - Install the following software product on a cluster node on PRIMERGY:

No.	Basic Software	Remarks
1	Red Hat Enterprise Linux 5.3 (for x86)	Supports kernel-2.6.18-128.el5PAE
2	Red Hat Enterprise Linux 5.4 (for x86)	Supports kernel-2.6.18-164.el5PAE
3	Red Hat Enterprise Linux 5.5 (for x86)	Supports kernel-2.6.18-194.el5PAE
4	Red Hat Enterprise Linux 5.6 (for x86)	Supports kernel-2.6.18-238.el5PAE
5	Red Hat Enterprise Linux 5.7 (for x86)	Supports kernel-2.6.18-274.el5PAE
6	Red Hat Enterprise Linux 5.8 (for x86)	Supports kernel-2.6.18-308.el5PAE
7	Red Hat Enterprise Linux 5.9 (for x86)	Supports kernel-2.6.18-348.el5PAE
8	Red Hat Enterprise Linux 6 (for x86)	Supports kernel-2.6.32-71.el6
9	Red Hat Enterprise Linux 6.1 (for x86)	Supports kernel-2.6.32-131.0.15.el6
10	Red Hat Enterprise Linux 6.2 (for x86)	Supports kernel-2.6.32-220.4.2.el6 (*1)
11	Red Hat Enterprise Linux 6.3 (for x86)	Supports kernel-2.6.32-279.el6 (*1)
12	Red Hat Enterprise Linux 6.4 (for x86)	Supports kernel-2.6.32-358.el6
13	Red Hat Enterprise Linux 5.3 (for Intel64)	Supports kernel-2.6.18-128.el5

No.	Basic Software	Remarks
14	Red Hat Enterprise Linux 5.4 (for Intel64)	Supports kernel-2.6.18-164.el5
15	Red Hat Enterprise Linux 5.5 (for Intel64)	Supports kernel-2.6.18-194.el5
16	Red Hat Enterprise Linux 5.6 (for Intel64)	Supports kernel-2.6.18-238.el5
17	Red Hat Enterprise Linux 5.7 (for Intel64)	Supports kernel-2.6.18-274.el5
18	Red Hat Enterprise Linux 5.8 (for Intel64)	Supports kernel-2.6.18-308.el5
19	Red Hat Enterprise Linux 5.9 (for Intel64)	Supports kernel-2.6.18-348.el5
20	Red Hat Enterprise Linux 6 (for Intel64)	Supports kernel-2.6.32-71.el6
21	Red Hat Enterprise Linux 6.1 (for Intel64)	Supports kernel-2.6.32-131.0.15.el6
22	Red Hat Enterprise Linux 6.2 (for Intel64)	Supports kernel-2.6.32-220.4.2.el6 (*1)
23	Red Hat Enterprise Linux 6.3 (for Intel64)	Supports kernel-2.6.32-279.el6 (*1)
24	Red Hat Enterprise Linux 6.4 (for Intel64)	Supports kernel-2.6.32-358.el6

(*1) Please apply errata with reference to "4. Required patches".

For the supported versions of the kernel, please contact your local Fujitsu sales representative.

This software, when operating on the above software, requires additional packages to be added

besides the packages which are installed with a minimum OS option installation.

Please refer to "Appendix C. Necessary OS packages to be installed" for the necessary additional packages.

2. Required software

To operate this software, the following software products are required:

- PRIMERGY physical environment

None.

- KVM environment

None.

- VMware environment

No.	Software	Package	Version and/or level	Remarks
1	VMware vSphere		4 or later	

- Red Hat Enterprise Linux 6.2 or later environment

No.	Software	Package	Version and/or level	Remarks
1	System Data Output Tool (fjsnap)	FJSVsnap	5.02-05 or later	Please apply to all the OS's where this software is installed.

- PC

It is used as a client of Web-Based Admin View.
For details, see "3. Related hardware" of the "2.1.2 Hardware environment".

No.	Software	Package	Version and/or level	Remarks
1	Windows(R) XP, Windows(R) Vista, Windows(R) 7			One of them is required.
2	J2SE(TM) Runtime Environment		7	The use of the latest version is recommended. Version "7u9" is included in the CD.
3	Microsoft Internet Explorer		7 8 9	One of them is required. You can download from the site of the software company.

3. Exclusive software

None.

4. Required patches

No.	Software	ID/PTF	Remark
1	Red Hat Enterprise Linux 6.2	RHBA-2012:0124-1 or later	Please apply to all the OS's where this software is installed. In the KVM environment, whether this software is installed or not on the host OS, be sure to apply this patch to the host OS.
2	Red Hat Enterprise Linux 6.2	RHBA-2012:0419-1 or later	In the case of a KVM environment, please apply to the host OS.
3	Red Hat Enterprise Linux 6.3	RHSA-2012:1202-1 or later	In the case of a KVM environment, please apply to the host OS.

2.1.2 Hardware environment

The following hardware requirements must be satisfied to operate this software.

1. Memory

1024MB or more of memory is required.

2. Required hardware

None.

3. Related hardware

No.	Machine	Model	Remark
1	Personal Computer	FM-V, etc	Required to use as a client of Web-Based Admin View.

2.1.3 Static disk resources

The disk space requirements for this software are shown below.

2.1.3.1 Required disk space

The following table lists the disk space requirements for installing this software. If necessary, expand the size of the relevant file systems.

No.	Directory	Disk space (in MB)	Remarks
1	/	0.5	
2	/usr	17.8	
3	/var/opt	5.4	
4	/etc/opt	37.4	
5	/opt	232.9	

2.1.3.2 Required work area

None.

2.1.4 Dynamic disk resources

The dynamic disk space requirements for this software are shown below.

2.1.4.1 Required disk space

When this software is operated in the following environment, the additional disk space shown below is required for each directory as well as the disk space required for installing this software as described in "2.1.3 Static disk resources". If free space is insufficient, expand the size of the relevant file system.

No.	Directory	Disk space (in MB)	Operation
1	/var	44.7	A cluster system is operated under the following conditions: - One cluster application is registered in a cluster system. Note that 1.8 MB is required for each additional cluster application. - Web-Based Admin View is operated in two-tier model.

2.1.5 Required memory

The following table shows the memory required when this software is operated in the following environment:

No.	Memory (in MB)	Operation
1	364.1	A cluster system is operated under the following conditions: - One cluster application is registered in a cluster system. Note that 71.0 MB is required for each additional cluster application. - Web-Based Admin View is operated in two-tier model. In addition to the aforementioned user memory, 2.0 MB of kernel memory will be allocated per CPU by vmalloc.

2.2 Cluster management server operating environment

This section explains operating environment of cluster management server.

2.2.1 Software environment

1. Basic software prerequisites

   Install the following software product on a cluster management server on PRIMERGY:

No.	Basic Software	Remarks
1	Red Hat Enterprise Linux 5.3 (for x86)	Supports kernel-2.6.18-128.el5PAE
2	Red Hat Enterprise Linux 5.4 (for x86)	Supports kernel-2.6.18-164.el5PAE
3	Red Hat Enterprise Linux 5.5 (for x86)	Supports kernel-2.6.18-194.el5PAE
4	Red Hat Enterprise Linux 5.6 (for x86)	Supports kernel-2.6.18-238.el5PAE
5	Red Hat Enterprise Linux 5.7 (for x86)	Supports kernel-2.6.18-274.el5PAE
6	Red Hat Enterprise Linux 5.8 (for x86)	Supports kernel-2.6.18-308.el5PAE
7	Red Hat Enterprise Linux 5.9 (for x86)	Supports kernel-2.6.18-348.el5PAE
8	Red Hat Enterprise Linux 6 (for x86)	Supports kernel-2.6.32-71.el6
9	Red Hat Enterprise Linux 6.1 (for x86)	Supports kernel-2.6.32-131.0.15.el6
10	Red Hat Enterprise Linux 6.2 (for x86)	Supports kernel-2.6.32-220.el6
11	Red Hat Enterprise Linux 6.3 (for x86)	Supports kernel-2.6.32-279.el6
12	Red Hat Enterprise Linux 6.4 (for x86)	Supports kernel-2.6.32-358.el6
13	Red Hat Enterprise Linux 5.3 (for Intel64)	Supports kernel-2.6.18-128.el5
14	Red Hat Enterprise Linux 5.4 (for Intel64)	Supports kernel-2.6.18-164.el5
15	Red Hat Enterprise Linux 5.5 (for Intel64)	Supports kernel-2.6.18-194.el5

No.	Basic Software	Remarks
16	Red Hat Enterprise Linux 5.6 (for Intel64)	Supports kernel-2.6.18-238.el5
17	Red Hat Enterprise Linux 5.7 (for Intel64)	Supports kernel-2.6.18-274.el5
18	Red Hat Enterprise Linux 5.8 (for Intel64)	Supports kernel-2.6.18-308.el5
19	Red Hat Enterprise Linux 5.9 (for Intel64)	Supports kernel-2.6.18-348.el5
20	Red Hat Enterprise Linux 6 (for Intel64)	Supports kernel-2.6.32-71.el6
21	Red Hat Enterprise Linux 6.1 (for Intel64)	Supports kernel-2.6.32-131.0.15.el6
22	Red Hat Enterprise Linux 6.2 (for Intel64)	Supports kernel-2.6.32-220.el6
23	Red Hat Enterprise Linux 6.3 (for Intel64)	Supports kernel-2.6.32-279.el6
24	Red Hat Enterprise Linux 6.4 (for Intel64)	Supports kernel-2.6.32-358.el6

For the supported versions of the kernel, please contact your local Fujitsu sales representative.

This software, when operating on the above software, requires additional packages to be added besides the packages which are installed with a minimum OS option installation.

Please refer to "Appendix C. Necessary OS packages to be installed" for the necessary additional packages.

2. Required software

To operate this software, the following software products are required:

No.	Software	Package	Version and/or level	Remarks
1	Windows(R) XP, Windows(R) Vista, Windows(R) 7			Required to use as a client of Web-Based Admin View.
2	J2SE(TM) Runtime Environment		7	Required to use Web-Based Admin View. The use of the latest version is recommended. Version "7u9" is included in the CD.
3	Microsoft Internet Explorer		7 8 9	To use Web-Based Admin View, one of them is required. You can download from the site of the software company.

3. Exclusive software

None.

4. Required patches

   None.

2.2.2 Hardware environment

The following hardware requirements must be satisfied to operate this software.

1. Memory

   1024MB or more of memory is required.

2. Required hardware

   None.

3. Related hardware

No.	Machine	Model	Remark
1	Personal Computer	FM-V, etc	Required to use as a client of Web-Based Admin View.

2.2.3 Static disk resourcess

The disk space requirements for this software are shown below.

2.2.3.1 Required disk space

The following table lists the disk space requirements for installing this software. If necessary, expand the size of the relevant file systems.

No.	Directory	Disk space (in MB)	Remarks
1	/	0.1	
2	/usr	13.1	
3	/var/opt	0.8	
4	/etc/opt	2.4	
5	/opt	143.7	

2.2.3.2 Required work area

None.

2.2.4 Dynamic disk resources

The dynamic disk space requirements for this software are shown below.

2.2.4.1 Required disk space

When this software is operated in the following environment, the additional disk space shown below is required for each directory as well as the disk space required for installing this software as described in "2.2.3 Static disk resourcess". If free space is insufficient, expand the size of the relevant file system.

No.	Directory	Disk space (in MB)	Operation
1	/var	14	Required to operate Web-Based Admin View.

2.2.5 Required memory

The following table shows the memory required when this software is operated in the following environment:

No.	Memory (in MB)	Operation
1	145	When the management server is operated.
2	167.2	When the management server is operated, and a single instance of Internet Explorer is started on the server.

Chapter 3 Installation

This chapter explains the installation of this software.

You can install this software on each node where basic and required software is installed. For details about error messages during installation, see "Appendix A Troubleshooting".

This software can be also upgraded on a system where the old version is already installed. For details, see "Appendix B Upgrading from old versions".

3.1 Installation on cluster nodes

This section explains installation on cluster nodes with CLI installer.

3.1.1 Preparations

1. Time required

   It takes approximately 15 minutes to install this software.

2. Kernel header

   Before installing this software, it is necessary to install the kernel header that supports OS of the system. Check if the kernel header is installed on the system by executing the following command:

   ```
   Red Hat Enterprise Linux 5 (for x86)
   ```

   ```
   # rpm -qi kernel-PAE-devel <Return>
   ```

   ```
   Red Hat Enterprise Linux 5 (for Intel64)
   Red Hat Enterprise Linux 6 (for x86)
   Red Hat Enterprise Linux 6 (for Intel64)
   ```

   ```
   # rpm -qi kernel-devel <Return>
   ```

   If the command encounters an error, or the kernel source version different than the system OS, install the kernel source according to the OS document.

3. System environment check

   To install Web-Based Admin View, it is necessary to modify the IP address of the admin LAN for Web-Based Admin View and its corresponding host name, and the host name corresponding to "127.0.0.1".

   1. Login to the system and become a root user.

      ```
      # su <Return>
      Password:password <Return>
      ```

   2. Delete the host name allocated to "127.0.0.1" using vi(1) and allocate it to the IP address of the admin LAN.

      ```
      Before change)
      ```

      ```
      # cat /etc/hosts <Return>
      # Do not remove the following line, or various programs
      # that require network functionality will fail.
      127.0.0.1       host-name localhost.localdomain localhost
      ```

      ```
      After change)
      ```

```
# cat /etc/hosts <Return>
# Do not remove the following line, or various programs
# that require network functionality will fail.
127.0.0.1        localhost.localdomain localhost
IP-Address       host-name
```

4. Package check

    1. Check if the package is installed on the system by executing the following command:

    ```
    # rpm -qi compat-libstdc++-33 <Return>
    ```

    If the command encounters an error, install the package from CD-ROM of the OS.

    2. Compiler(gcc) installation

    Before installing this software, check that the gcc package is installed and that the version of the package is the same as the version of gcc that compiles the kernel.
    Check the version of the gcc package by executing the following command:

    ```
    # gcc --version <Return>
    gcc (GCC) 4.4.4 20100726 (Red Hat 4.4.4-13)
    ```

    Check the version of gcc that compiles the running kernel by executing the following command:

    ```
    # cat /proc/version <Return>
    Linux version 2.6.32-71.el6.x86_64 (mockbuild@x86-007.build.bos.
    redhat.com) (gcc version 4.4.4 20100726 (Red Hat 4.4.4-13) (GCC) )
    #1 SMP Wed Sep 1 01:33:01 EDT 2010
    ```

    The first and second numbers of the version (e.g. "4.4" for "4.4.4") must be the same between both gcc.

5. Patch download

    Before installing this software, download the latest PRIMECLUSTER patch by UpdateSite format and update information file from Updatesite.

3.1.2 Installation

1. Login to the system and become a root user.

```
# su <Return>
Password:password <Return>
```

2. The system is changed to the single user mode.

```
# shutdown now <Return>
```

3. Insert CD in the CD-ROM drive.

```
# mount /media/cdrom <Return>
```

    <CDROM_DIR> will be used as the mount point.

4. Execute the CLI installer.

```
# cd <CDROM_DIR>/Tool <Return>
# ./cluster_install -e CB-PG <Return>


Installation of PRIMECLUSTER started.


PRODUCT : PCLsnap


Installing package <FJSVpclsnap> ... finished.

        .
```

```
         .
The installation finished successfully.
```

5. Eject CD.

```
# cd / <Return>
# umount /media/cdrom <Return>
# eject <Return>
```

6. Please apply the patch for PRIMECLUSTER.

   Please refer to the update information file of each patch for installation instructions and points of concern, etc.

7. Reboot the system by executing the shutdown(8) command.

```
# shutdown -r now <Return>
```

3.1.3 Environment configuration

Configure the system environment according to "4.3 Preparations for Starting the Web-Based Admin View Screen" and "Chapter 5 Building a cluster", and "Chapter 6 Building cluster application" of the "PRIMECLUSTER Installation and Administration Guide".

3.2 Installation on cluster management server

This section explains installation on cluster management server with CLI installer.

If you want to operate Web-Based Admin View in the three tier model, install a cluster management server using the procedure described below. For information on how to operate Web-Based Admin View, see "2.4 Determining the Web-Based Admin View Operation Mode" of the "PRIMECLUSTER Installation and Administration Guide".

3.2.1 Preparations

1. Time required

   It takes approximately 10 minutes to install this software.

2. System environment check

   To install Web-Based Admin View, it is necessary to modify the IP address of the admin LAN for Web-Based Admin View and its corresponding host name, and the host name corresponding to "127.0.0.1".

   1. Login to the system and become a root user.

   ```
   # su <Return>
   Password:password <Return>
   ```

   2. Delete the host name allocated to "127.0.0.1" using vi(1) and allocate it to the IP address of the admin LAN.

   ```
   Before change)
   ```

   ```
   # cat /etc/hosts <Return>
   # Do not remove the following line, or various programs
   # that require network functionality will fail.
   127.0.0.1        host-name localhost.localdomain localhost
   ```

   ```
   After change)
   ```

   ```
   # cat /etc/hosts <Return>
   # Do not remove the following line, or various programs
   # that require network functionality will fail.
   ```

```
127.0.0.1          localhost.localdomain localhost
IP-Address         host-name
```

3. Patch download

    Before installing this software, download the latest PRIMECLUSTER patch by UpdateSite format and update information file from Updatesite.

3.2.2 Installation

1. Login to the system and become a root user.

   ```
   # su <Return>
   Password:password <Return>
   ```

2. Insert CD in the CD-ROM drive.

   ```
   # mount /media/cdrom <Return>
   ```

   `<CDROM_DIR>` will be used as the mount point.

3. Execute the CLI installer.

   ```
   # cd <CDROM_DIR>/Tool <Return>
   # ./cluster_install -e CB-M <Return>

   Installation of PRIMECLUSTER started.

   PRODUCT : PCLsnap

   Installing package <FJSVpclsnap> ... finished.
           .
           .

   The installation finished successfully.
   ```

4. Eject CD.

   ```
   # cd / <Return>
   # umount /media/cdrom <Return>
   # eject <Return>
   ```

5. Please apply the patch for PRIMECLUSTER.

    Please refer to the update information file of each patch for installation instructions and points of concern, etc.

6. Reboot the system by executing the shutdown(8) command.

   ```
   # shutdown -r now <Return>
   ```

3.2.3 Environment configuration

Configure the system environment according to "4.3 Preparations for Starting the Web-Based Admin View Screen" of the "PRIMECLUSTER Installation and Administration Guide".

Chapter 4 Uninstallation

This chapter explains the uninstallation of this software.

4.1 Uninstallation on cluster nodes

This section explains uninstallation on cluster nodes with CLI uninstaller.

![Note icon] Note

. . . .

If the following products are installed, when this software is uninstalled, they are also uninstalled at the same time.

- PRIMECLUSTER GDS

- PRIMECLUSTER GLS

. . . .

4.1.1 Preparations

1. Before uninstalling, if you are applying patch for PRIMECLUSTER by UpdateSite format, remove them by UpdateAdvisor (middleware).
   For details, see help information on UpdateAdvisor(middleware) and the update information file of the patch.

2. Before uninstalling this software, check the following:

   1. Check if the server function of Symfoware Server (*) is installed using the following command:

      ```
      # rpm -qi FJSVrdbdb <Return>
      ```

      (*) Symfoware Server is divided into the following three products:

      - Symfoware Server Enterprise Edition

      - Symfoware Server Enterprise Extended Edition

      - Symfoware Server Standard Edition

   2. Take corrective action as instructed below if the Server function of Symfoware Server is installed.

      When Symfoware Server is installed:

      1. Uninstall the middleware products that use the Server function of Symfoware Server. See the manual of each middleware product.

      2. Uninstall Symfoware Server. See the installation guide of Symfoware Server.

      When Symfoware Server is not installed:

      1. Uninstall the middleware products that use the Server function of Symfoware Server.

      2. Uninstall the Server function of Symfoware Server. See the manual of each middleware product.

4.1.2 Uninstallation

1. Login to the system as a root user.

   ```
   # su <Return>
   Password:password <Return>
   ```

2. If you are using RMS, stop RMS.

   ```
   # hvshut -a <Return>
   ```

3. If you are using GDS, cancel the GDS settings. For details see the "PRIMECLUSTER Global Disk Services Configuration and Administration Guide".

4. Boot the system in single user mode.

```
# shutdown now <Return>
```

5. If you are using GDS, check the file in the /dev/sfdsk directory. If there are other files than _adm, _diag, _sysadm, and _sysdiag, delete them.

6. Insert CD and mount the CD-ROM device.

```
# mount /media/cdrom <Return>
```

<CDROM_DIR> will be used as the mount point.

7. Execute the CLI uninstaller.

```
# cd <CDROM_DIR>/Tool <Return>
# ./cluster_uninstall <Return>
Are you sure to remove PRIMECLUSTER from your system (y or n) ? y <Return>


   .
   .

The uninstallation finished successfully.
```

8. All of the four lines are deleted by vi(1) etc. when there are the following four lines in/etc/kdump.conf file by using Red Hat Enterprise Linux 6 (for x86) and Red Hat Enterprise Linux 6 (for Intel64) on PRIMERGY (*).

```
### poffinhibit configuration(automatically inserted) ###
kdump_post /etc/poffinhibit/unlock.sh
extra_modules poffinhibit_ipdv poffinhibit
### poffinhibit configuration end ###
```

*For guest OS of the virtualization environment, this work becomes unnecessary.

9. If you want to remove the configuration files, use the following steps. If you don't remove them, part of the configuration will be taken over to the system where this software is reinstalled.

```
# cd /opt <Return>
# rm -r SMAW <Return>

# cd /etc/opt <Return>
# rm -r SMAW <Return>

# cd /etc <Return>
# rm cip.cf <Return>

# cd /etc/default <Return>
# rm cluster <Return>
# rm cluster.config <Return>

# cd /var/adm <Return>
# rm cfreg.data <Return>
```

10. Eject CD, then reboot the system by executing the "shutdown(8)" command.

```
# cd / <Return>
# umount /media/cdrom <Return>
# eject <Return>
# shutdown -r now <Return>
```

 Note

. . . .

- If you were using GDS, after the uninstallation of this software, the /etc/opt/FJSVsdx/sysdb.d.tmp directory may remain undeleted. Even if this directory remains, there will be no effect on the system operation. If you want to delete it, use the following command.

```
# cd /etc/opt <Return>
# rm -rf FJSVsdx <Return>
```

- If you were using the GLS's user command execution function and script files remains, the directory under /etc/opt/FJSVhanet/script is not deleted after the uninstallation of this software. Delete this directory after saving or deleting script files.

```
# rm -r /etc/opt/FJSVhanet <Return>
```

. . . .

4.2 Uninstallation on cluster management server

This section explains uninstallation on cluster management server with CLI uninstaller.

4.2.1 Preparation

Before uninstalling, if you are applying patch for PRIMECLUSTER by UpdateSite format, remove them by UpdateAdvisor (middleware). For details, see help information on UpdateAdvisor(middleware) and the update information file of the patch.

4.2.2 Uninstallation

1. Login to the system and become a root user.

```
# su <Return>
Password:password <Return>
```

2. Start the system in single user mode.

```
# shutdown now <Return>
```

3. Insert CD in the CD-ROM drive.

```
# mount /media/cdrom <Return>
```

   <CDROM_DIR> will be used as the mount point.

4. Execute the CLI uninstaller.

```
# cd <CDROM_DIR>/Tool <Return>
# ./cluster_uninstall <Return>
Are you sure to remove PRIMECLUSTER from your system (y or n) ? y <Return>


        .
        .


The uninstallation finished successfully.
```

5. If you want to remove the configuration files, use the following steps. If you don't remove them, part of the configuration will be taken over to the system where this software is reinstalled.

```
# cd /opt <Return>
# rm -r SMAW <Return>
```

6. Eject CD, then reboot the system by executing the shutdown(8) command.

```
# cd /  <Return>
# umount /media/cdrom <Return>
# eject <Return>
# shutdown -r now <Return>
```

Appendix A Troubleshooting

This chapter explains how to address problems that occur.

A.1 CLI installer

This section explains CLI installer.

A.1.1 Log file

The CLI installer log including the rpm(8) command output will be saved in the following log file:

- /var/log/install/cluster_install

A.1.2 Information messages

INFO: The installation process stopped by user request

Description

Installation process was stopped according at user's request.

Workaround

Execute the command again.

INFO: no package to update

Description

Since the package same as that in CD or newer than that in CD is installed, the package in CD cannot be installed.

Workaround

According to the procedure of "4.1.2 Uninstallation", execute the command again after removing PRIMECLUSTER from the system.

A.1.3 Error messages

Installation failed

Description

Installation failed.

Workaround

Remove the cause of the problem referring to the error message and log file then execute the command again.

ERROR: syntax error

Description

An incorrect option was specified.

Workaround

Correct the option then execute the command again.

ERROR: syntax error (<PSET> <PLAT>)

Description

An incorrect option was specified.
Installation of the product set <PSET> is not supported for this software.

Workaround

Check if the command option is correct. If it is, check whether the environment meets operating conditions as prescribed in "Chapter 2 Operation Environment".

ERROR: </usr/sbin/dmidecode> command not found

Description

The command </usr/sbin/dmidecode> not installed on the system.

Workaround

Check if the OS is installed with a right procedure.

ERROR: to use this installer you will need to be the root user.

Description

The command was executed by a non-root user.

Workaround

Execute the command using root user access privileges.

ERROR: /tmp needs *TMP_LEAST* KB at least

Description

There is not enough free space on the /tmp file system.

Workaround

Reserve at least *TMP_LEAST*KB on the /tmp file system then execute the command again.

ERROR: /var needs *VAR_LEAST* KB at least

Description

There is not enough free space on the /var file system.

Workaround

Reserve at least V*AR_LEAST*KB on the /var file system then execute the command again.

ERROR: /tmp not writable

Description

Creation of a temporary file in /temp failed.

Workaround

After /temp is made writable, execute the command again.
Example: If the file system including /temp is mounted as a read-only file system, make /temp writable by executing "mount -o remount <mount point of the file system including /tmp>".

ERROR: CF driver is loaded

Description

The CF driver is loaded.

Workaround

Unload the CF driver then execute the command again. For details, see "PRIMECLUSTER Cluster Foundation Configuration and Administration Guide".

ERROR: the installation process is running now

Description

The other installation process is running.

Workaround

Wait until the other installation process is completed then execute the command again.

Note

If this message appears although the other installation process is not being executed, delete the "/tmp/cluster_install" and "/tmp/cluster_uninstall" flag files then execute the command again.

ERROR: platform *<PLAT>* not supported

Description

This software is not supported.

Workaround

Check if the environment meets operating conditions as prescribed in "Chapter 2 Operation Environment". If there is nothing wrong with the environment, put down the message then contact your Fujitsu system engineers.

ERROR: product *<PROD>* on platform *<PLAT>* not supported

Description

Installation of the product set *<PROD>* is not supported for this software.

Workaround

Check if the command option is correct. If it is, then check if the environment meets operating conditions as prescribed in "Chapter 2 Operation Environment". If there is nothing wrong with the environment, put down the message then contact your Fujitsu system engineers.

ERROR: product *<PROD1>* and *<PROD2>* contains the same package *<PKG>*

Description

The products *<PROD1>* and *<PROD2>* are included in the same package *<PKG>*, so they cannot be installed at the same time.

Workaround

An option cannot be specified for the products *<PROD1>* and *<PROD2>*.

ERROR: failed: rpm *

Description

The rpm command failed.

Workaround

Remove the cause of the error referring to the log file then execute the command again.

ERROR: internal error: *

Description

An internal error occurred.

Workaround

Put down the message then contact your Fujitsu system engineers.

Please see the following log file.
/var/log/install/cluster_install

Description

See the /var/log/install/cluster_install log file.

Workaround

Remove the cause of the error referring to the log file then execute the command again.

A.1.4   When segmentation violation causes an installation failure

If segmentation violation is due to the rpm(8) command, take the following corrective steps. If the problem still remains unresolved, contact Fujitsu customer support engineers.

1. Reboot the system by executing the shutdown(8) command.

```
# shutdown -r now <Return>
```

2. Delete PRIMECLUSTER from the system according to "4.1.2 Uninstallation" or "4.2.2 Uninstallation".

3. Execute the following command.

```
# rpm --rebuilddb <Return>
```

4. Install PRIMECLUSTER again.

A.2   CLI uninstaller

This section explains CLI uninstaller.

A.2.1   Log file

Logs of the CLI uninstaller including the output of the rpm(8) command will be saved into the log file below:

- /var/log/install/cluster_uninstall

A.2.2   Information messages

INFO: no package to uninstall

Description

Currently, no packages that need to be uninstalled are installed on the system.

Workaround

None.

INFO: The uninstallation process stopped by user request

Description

The uninstallation process has been stopped at user's request.

Workaround

If you want to continue the uninstallation process, execute the command again.

A.2.3   Error messages

Uninstallation failed.

Description

Uninstallation failed.

Workaround

Remove the cause of the error referring to the log file or error message then execute the command again.

ERROR: syntax error

Description

The incorrect option was specified.

Workaround

Correct the option and execute the command again.

ERROR: syntax error (*<PSET> <PLAT>*)

Description

An incorrect option was specified.
The product set *<PSET>* package is invalid.

Workaround

Run the command with the right option.

ERROR: to use this uninstaller you will need to be the root user

Description

The command was executed by a non-root user.

Workaround

Execute the command with root user access privileges.

ERROR: /tmp needs *TMP_LEAST* KB at least

Description

There is not enough free space on the /tmp file system.

Workaround

Reserve at least *TMP_LEAST*KB on the /tmp file system then execute the command again.

ERROR: /tmp not writable

Description

Creation of a temporary file in /temp failed.

Workaround

After /temp is made writable, execute the command again.
Example: If the file system including /temp is mounted as a read-only file system, make /temp writable by executing "mount -o remount <mount point of the file system including /tmp>".

ERROR: /var needs *VAR_LEAST* KB at least

Description

There is not enough free space on the /var file system.

Workaround

Reserve at least *VAR_LEAST*KB on the /var file system then execute the command again.

ERROR: CF driver is loaded

Description

The CF driver is loaded.

Workaround

Unload the CF driver then execute the command again. For details see the "PRIMECLUSTER Cluster Foundation Configuration and Administration Guide".

ERROR: there exists GDS object(s)

Description

Some GDS objects are not deleted.

Workaround

Delete all the GDS objects then execute the command again.

ERROR: the installation process is running now

Description

The other installation process is being executed.

Workaround

Wait until the other installation process is completed then execute the command again.

Note

If this message appears although the other installation process is not being executed, delete the "/tmp/cluster_install" and "/tmp/cluster_uninstall" flag files then execute the command again.

ERROR: product *<PROD>* on platform *<PLAT>* not supported

Description

The product set *<PROD>* package is invalid.

Workaround

Specify a correct command option then execute the command again.

ERROR: failed: rpm *

Description

The rpm command failed.

Workaround

Remove the cause of the error referring to the log file then execute the command again.

ERROR: internal error: *

Description

An internal error occurred.

Workaround

Put down the message then contact your Fujitsu system engineers.

Please see the following log file.
/var/log/install/cluster_uninstall

Description

See the /var/log/install/cluster_uninstall log file.

Workaround

Remove the cause of the error referring to the log file then execute the command again.

Appendix B Upgrading from old versions

Before upgrading, back up the entire system using the dd(1) command on all the nodes. Proceed this steps on the console of each system.

B.1 Upgrading cluster nodes

This section explains upgrading cluster nodes.

B.1.1 Upgrading from PRIMECLUSTER Clustering Base 4.3A10

1. Check the configuration name of RMS by executing the following command on any one of the cluster nodes.
   Put down the name as you can use it later.

   ```
   # hvdisp -a | grep Configuration <Return>
   Configuration: /opt/SMAW/SMAWRrms/build/<configuration_name>.us
   ```

2. Stop RMS if you are using it.

   ```
   # hvshut -a <Return>
   ```

3. Boot the system. Start each cluster node in single user mode.

   ```
   # shutdown now <Return>
   ```

4. When update the basic software from existing environment, updating basic software, see the following document Operating Update manual.

5. Proceed the following steps on each cluster node.

   1. Create a backup directory.

      ```
      # mkdir /<mydir> <Return>
      ```

   2. Back up the PRIMECLUSTER operating environment.

      ```
      # cp -p /usr/opt/reliant/etc/hvipalias /<mydir> <Return>
      # cp -p /var/opt/FJSVclapm/etc/Tuning_Param /<mydir> <Return>
      # cp -p /opt/FJSVwvbs/etc/Plugin.html /<mydir> <Return>
      ```

   3. If you are using GLS, Back up the GLS operating environment.

      ```
      # /opt/FJSVhanet/usr/sbin/hanetbackup -d /<mydir> <Return>
      ```

      The backup file name is "hanet*YYYYMMDD*.bk". *YYYYMMDD* shows information of the command execution date. (*YYYY*: year, *MM*: month, *DD*: day)

   4. Insert CD and mount the CD-ROM device.

      ```
      # mount /media/cdrom <Return>
      ```

      <CDROM_DIR> will be used as the mount point.

   5. Execute the following script then delete a part of the PRIMECLUSTER package.

      ```
      # cd <CDROM_DIR>/Tool <Return>
      # ./upgrade_uninstall <Return>
      Are you sure to remove a part of PRIMECLUSTER from your system (y or n) ? y <Return>
      :
      :
      The uninstallation finished successfully.
      ```

6. Execute the following cluster_install script, and install the package or overwrite it.

```
# cd <CDROM_DIR>/Tool <Return>
# ./cluster_install -e CB-PG <Return>
:
:
The installation finished successfully.
```

📝 Note

. . . .

- The following message might be output:

```
# ./cluster_install -x xx <Return>
INFO: no package to update
```

This message indicates that the newer version of all the packages is installed, so it is not necessary to upgrade.

- While executing the cluster_install script, the following message might be output

```
# ./cluster_install -x xx <Return>
Installing package <XXXXXXXXXXX> ... skipped.
```

This message indicates that the same version of all the packages is installed, so it is not necessary to upgrade.

. . . .

7. If you are using GLS, Execute the following cluster_install script, and install the package or overwrite it.

```
# cd <CDROM_DIR>/Tool <Return>
# ./cluster_install -e PCL-GLS <Return>
:
:
The installation finished successfully.
```

8. Eject CD.

```
# cd / <Return>
# eject cdrom <Return>
```

9. Restore the PRIMECLUSTER operating environment that was saved at step 2.

```
# cp -p /<mydir>/Plugin.html /opt/FJSVwvbs/etc <Return>
# cp -p /<mydir>/Tuning_Param /var/opt/FJSVclapm/etc <Return>
# cp -p /<mydir>/hvipalias /usr/opt/reliant/etc <Return>
```

10. If you are using GLS, Restore the GLS operating environment that was backed up at step 3.

```
# /opt/FJSVhanet/usr/sbin/hanetrestore -f /<mydir>/hanetYYYYMMDD.bk <Return>
```

11. Edit the /opt/SMAW/SMAWRrms/bin/hvenv.local file, and set "0" to the HV_RCSTART variable. If the /opt/SMAW/SMAWRrms/bin/hvenv.local file does not exist, create a file as follows. This setting will prevent automatic RMS startup during node startup.

```
export HV_RCSTART=0
```

6. After completing step 5 on all the cluster nodes, reboot all the cluster nodes. Check if they are all active then go to the next step.

```
# shutdown -r now <Return>
```

7. Enable the RMS setting on any one of the cluster nodes.

1. Start RMS Wizard using the following command. The configuration name is the same as that of step 1.

```
# hvw -n <configuration name> <Return>
```

2. Select "Configuration-Activate" from "Main configuration menu" then execute Activate of the RMS setting.

3. Exit RMS Wizard.

8. Change HV_RCSTART variable from "0" to "1" on all the nodes as follows:

1. Edit the /opt/SMAW/SMAWRrms/bin/hvenv.local file, and change the HV_RCSTART variable to "1". The value was set to "0" at step 10 of the procedure 5. This change will enable automatic RMS startup during node startup.

```
export HV_RCSTART=1
```

2. Start RMS.

```
# hvcm <Return>
```

B.2 Cluster management server upgrading

This section explains upgrading cluster management server.

B.2.1 Upgrading from PRIMECLUSTER Clustering Base 4.3A10

1. Boot all the cluster management servers in single user mode.

```
# shutdown now <Return>
```

2. Updating basic software, install the kernel source.

3. Proceed the following steps on each cluster management server.

1. Create a backup directory.

```
# mkdir /<mydir> <Return>
```

2. Back up the PRIMECLUSTER operating environment.

```
# cp -p /opt/FJSVwvbs/etc/Plugin.html /<mydir> <Return>
```

3. Insert CD and mount the CD-ROM device.

```
# mount /media/cdrom <Return>
```

   <CDROM_DIR> will be used as the mount point.

4. Execute the following script then delete part of the PRIMECLUSTER package.

```
# cd <CDROM_DIR>/Tool <Return>
# ./upgrade_uninstall <Return>
Are you sure to remove a part of PRIMECLUSTER from your system (y or n) ? y <Return>
:
:
The uninstallation finished successfully.
```

5. Execute the following cluster_install script, and install the package or override it.

```
# cd <CDROM_DIR>/Tool <Return>
# ./cluster_install -e CB-M <Return>
:
:
The installation finished successfully.
```

6. Eject CD.

```
# cd / <Return>
# eject cdrom <Return>
```

7. Restore the PRIMECLUSTER operating environment that was saved at step 2.

```
# cp -p /<mydir>/Plugin.html /opt/FJSVwvbs/etc <Return>
```

4. After completing step 3 on all the cluster management servers, reboot all the cluster management servers.

```
# shutdown -r now <Return>
```

Appendix C Necessary OS packages to be installed

When operating this software on Red Hat Enterprise Linux, in addition to the packages that are installed with a minimum OS option installation, the following packages are used.

C.1 For Red Hat Enterprise Linux 5 (for x86)

Package	Architecture
OpenIPMI	i386
OpenIPMI-libs	i386
OpenIPMI-tools	i386
alsa-lib	i386
at	i386
attr	i386
autoconf	noarch
bc	i386
bind	i386
bind-utils	i386
compat-gcc-34-g77	i386
compat-libstdc++-33	i386
cpp	i386
crash	i386
cups	i386
cvs	i386
dhcp	i386
docbook-utils	noarch
dump	i386
eject	i386
gcc	i386
gcc-c++	i386
gdb	i386
ghostscript	i386
groff	i386
httpd	i386
indent	i386
kernel-PAE	i686
kernel-PAE-devel	i686
kernel-devel	i686
kernel-headers	i386
kernel-xen-devel	i686
kexec-tools	i386

Package	Architecture
krb5-workstation	i386
libICE	i386
libSM	i386
libX11	i386
libXau	i386
libXdmcp	i386
libXext	i386
libXi	i386
libXrender	i386
libXt	i386
libXtst	i386
lsof	i386
lv	i386
m4	i386
mailx	i386
make	i386
man	i386
mgetty	i386
mlocate	i386
mt-st	i386
mtools	i386
mtr	i386
nc	i386
net-snmp	i386
net-snmp-utils	i386
nfs-utils	i386
ntp	i386
opensp	i386
openssh	i386
openssh-clients	i386
parted	i386
patch	i386
perl	i386
perl-libwww-perl	noarch
pinfo	i386
postfix	i386
procmail	i386
psacct	i386
pstack	i386

Package	Architecture
quota	i386
rcs	i386
rdist	i386
rsh	i386
samba-common	i386
screen	i386
setarch	i386
setuptool	i386
sox	i386
strace	i386
subversion	i386
symlinks	i386
time	i386
tree	i386
tux	i386
vconfig	i386
xinetd	i386
xorg-x11-apps	i386
xorg-x11-server-utils	i386
xterm	i386

C.2 For Red Hat Enterprise Linux 5 (for Intel64)

Package	Architecture
OpenIPMI	x86_64
OpenIPMI-libs	x86_64
OpenIPMI-tools	x86_64
alsa-lib	i386
alsa-lib	x86_64
at	x86_64
attr	x86_64
audit-libs	i386
autoconf	noarch
bc	x86_64
bind	x86_64
bind-utils	x86_64
compat-gcc-34-g77	x86_64
compat-libstdc++-33	i386
compat-libstdc++-33	noarch
cpp	x86_64

Package	Architecture
crash	x86_64
cups	x86_64
cvs	x86_64
dhcp	x86_64
docbook-utils	noarch
dump	x86_64
eject	x86_64
gcc	x86_64
gcc-c++	x86_64
gdb	x86_64
ghostscript	x86_64
groff	x86_64
httpd	x86_64
indent	x86_64
iptables	x86_64
kernel-devel	x86_64
kernel-headers	x86_64
kernel-xen	x86_64
kernel-xen-devel	x86_64
kexec-tools	x86_64
krb5-workstation	x86_64
libICE	x86_64
libSM	x86_64
libX11	i386
libX11	x86_64
libXau	i386
libXau	x86_64
libXdmcp	i386
libXdmcp	x86_64
libXext	i386
libXext	x86_64
libXi	i386
libXi	x86_64
libXrender	i386
libXrender	x86_64
libXt	x86_64
libXtst	i386
libXtst	x86_64
libstdc++	i386

Package	Architecture
lsof	x86_64
lv	x86_64
m4	x86_64
mailx	x86_64
make	x86_64
man	x86_64
mgetty	x86_64
mlocate	x86_64
mt-st	x86_64
mtools	x86_64
mtr	x86_64
nc	x86_64
net-snmp	x86_64
net-snmp-utils	x86_64
nfs-utils	x86_64
ntp	x86_64
opensp	x86_64
openssh	x86_64
openssh-clients	x86_64
pam	i386
parted	x86_64
patch	x86_64
perl	x86_64
perl-libwww-perl	noarch
pinfo	x86_64
postfix	x86_64
procmail	x86_64
psacct	x86_64
pstack	x86_64
quota	x86_64
rcs	x86_64
rdist	x86_64
rsh	x86_64
samba-common	x86_64
screen	x86_64
setarch	x86_64
setuptool	x86_64
sox	x86_64
strace	x86_64

Package	Architecture
subversion	x86_64
symlinks	x86_64
time	x86_64
tree	x86_64
tux	x86_64
vconfig	x86_64
xinetd	x86_64
xorg-x11-apps	x86_64
xorg-x11-server-utils	x86_64
xterm	x86_64

C.3 For Red Hat Enterprise Linux 6 (for x86)

Package	Architecture
OpenIPMI	i686
OpenIPMI-libs	i686
alsa-lib	i686
at	i686
autoconf	noarch
bc	i686
bind	i686
bind-utils	i686
compat-libstdc++-33	i686
cpp	i686
crash	i686
cvs	i686
dhcp	i686
docbook-utils	noarch
dump	i686
ebtables	i686
ed	i686
eject	i686
fontconfig	i686
freetype	i686
ftp	i686
gcc	i686
gdb	i686
ghostscript	i686
graphviz	i686
hdparm	i686

Package	Architecture
httpd	i686
httpd-tools	i686
indent	i686
ipmitool	i686
iw	i686
kernel-devel	i686
kernel-headers	i686
kexec-tools	i686
libICE	i686
libSM	i686
libX11	i686
libXau	i686
libXext	i686
libXft	i686
libXi	i686
libXmu	i686
libXp	i686
libXrender	i686
libXt	i686
libXtst	i686
libjpeg/libjpeg-turbo(*1)	i686
libpng	i686
libproxy-bin	i686
libreport	i686
libvirt-client	i686
libxcb	i686
lsof	i686
lvm2	i686
make	i686
man	i686
mlocate	i686
mod_wsgi	i686
mt-st	i686
mtools	i686
mtr	i686
mysql-server	i686
nc	i686
net-snmp	i686
net-snmp-utils	i686

Package	Architecture
nfs-utils	i686
ntp	i686
openmotif	i686
openmotif22	i686
opensp	i686
openssh-clients	i686
parted	i686
patch	i686
pciutils	i686
perl	i686
perl-libwww-perl	noarch
pinfo	i686
prelink	i686
procmail	i686
psacct	i686
quota	i686
rpcbind	i686
rsh	i686
samba-common	i686
setuptool	i686
strace	i686
subversion	i686
sysstat	i686
tcpdump	i686
telnet	i686
time	i686
tree	i686
vconfig	i686
vim-common	i686
xinetd	i686
xorg-x11-apps	i686
xorg-x11-server-Xorg	i686
xorg-x11-server-utils	i686
xterm	i686
xz	i686

(*1) For Red Hat Enterprise Linux 6.3 or earlier, use the libjpeg package.
For Red Hat Enterprise Linux 6.4 or later, use the libjpeg-turbo package.

C.4 For Red Hat Enterprise Linux 6 (for Intel64)

Package	Architecture
OpenIPMI	x86_64
OpenIPMI-libs	x86_64
PyQt4	x86_64
PyQt4-devel	i686
PyQt4-devel	x86_64
alsa-lib	i686
alsa-lib	x86_64
at	x86_64
audit-libs	i686
autoconf	noarch
bc	x86_64
bind	x86_64
bind-utils	x86_64
compat-libstdc++-33	i686
compat-libstdc++-33	x86_64
cpp	x86_64
crash	x86_64
cvs	x86_64
device-mapper	x86_64
dhcp	x86_64
docbook-utils	noarch
dump	x86_64
ebtables	x86_64
ed	x86_64
eject	x86_64
fontconfig	i686
freetype	x86_64
gcc	x86_64
gdb	x86_64
ghostscript	x86_64
glibc	i686
hdparm	x86_64
httpd	x86_64
indent	x86_64
ipmitool	x86_64
kernel-devel	x86_64
kernel-headers	x86_64
kexec-tools	x86_64
libICE	x86_64

Package	Architecture
libSM	x86_64
libX11	i686
libX11	x86_64
libXau	i686
libXau	x86_64
libXext	i686
libXext	x86_64
libXft	x86_64
libXi	i686
libXi	x86_64
libXmu	x86_64
libXp	x86_64
libXrender	x86_64
libXt	x86_64
libXtst	i686
libXtst	x86_64
libgcc	i686
libjpeg/libjpeg-turbo(*1)	x86_64
libpng	x86_64
libstdc++	i686
libxcb	x86_64
lsof	x86_64
lvm2	x86_64
make	x86_64
man	x86_64
mlocate	x86_64
mt-st	x86_64
mtools	x86_64
mtr	x86_64
nc	x86_64
net-snmp	x86_64
net-snmp-utils	x86_64
nfs-utils	x86_64
ntp	x86_64
openmotif	x86_64
openmotif22	x86_64
opensp	i686
openssh-clients	x86_64
pam	i686

Package	Architecture
parted	x86_64
patch	x86_64
pciutils	x86_64
perl	x86_64
perl-libwww-perl	noarch
pinfo	x86_64
prelink	x86_64
psacct	x86_64
quota	x86_64
rsh	x86_64
ruby	x86_64
samba-common	x86_64
setuptool	x86_64
strace	x86_64
subversion	x86_64
sysstat	x86_64
tcpdump	x86_64
time	x86_64
tree	x86_64
vconfig	x86_64
xinetd	x86_64
xorg-x11-apps	x86_64
xorg-x11-server-utils	x86_64
xterm	x86_64

(*1) For Red Hat Enterprise Linux 6.3 or earlier, use the libjpeg package.
For Red Hat Enterprise Linux 6.4 or later, use the libjpeg-turbo package.