2005-11-01

Notes on Using Red Hat Enterprise Linux ES (v.4 for EM64T)

Preface

About This Manual

This manual provides notes on PRIMERGY operation with Linux installed. Be sure to read this manual before using Linux.

Intended Readers

This manual is intended for persons who operate PRIMERGY.

Organization of This Manual

This manual consists of the following chapters:

Chapter 1 Notes on Operation

This chapter provides notes on operation after installation. Be sure to read this chapter before operating PRIMERGY with Linux installed.

Chapter 2 Addition of Peripheral Devices and Option Cards

This chapter explains the procedures for adding peripheral devices and cards after installation and provides notes on adding these options. Read this chapter as required.

Chapter 3 Others

This chapter explains other functions and provides other notes such as notes on limits.

Attachment: Outline of Installation Procedure for Global Array Manager-Client

This attachment explains how to install Global Array Manager-Client. Read this attachment as necessary.

Operation Verification

The operations of the products described in this manual have been confirmed by Fujitsu. Please note, however, that these operations are subject to change without prior notice.

Support & Service

A support service (SupportDesk Product basic service), **available for a fee**, provides customers using Linux with an enhanced sense of security and confidence. Customers concluding a support and service agreement are entitled to receive support in such areas as assistance with queries regarding this manual and questions and problems that may come up during the installation and operation of this product. Please consider taking advantage of this service option by concluding a support and service agreement with us.

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1. Notes on Operation

1.1 Assignment of Device Names

Linux assigns device names to a variety of devices, such as the hard disk drive, in the order that it recognizes them during its startup sequence. If the system is restarted after a device such as a hard disk drive or controller fails, the assigned device names may be changed because the system cannot recognize a device that has failed.

Example: When hard disk drives are connected to SCSI ID 1, 2, and 3, device names /dev/sda, /dev/sdb, and /dev/sdc are assigned respectively to the disk drives. If /dev/sdb fails under this condition, the device previously assigned /dev/sdc/ is moved up by one and recognized as /dev/sdb after the system is restarted.

If an assigned device is unexpectedly changed, it may prevent the system from starting or, in the worst case, may damage your data. If a device fault is detected, therefore, Fujitsu recommends starting the system in rescue mode and checking for hardware faults before restarting the system (*1). Repair the hardware fault, restore the system by means such as the backup tape, and then restart the system.

*1 Using **installation CD 1/5**, start the system in rescue mode. For details on starting the system in rescue mode, see **Section 1.4**, "**Starting the System in Rescue Mode.**"

After starting the system, use the fdisk command to check whether the relevant hard disk drive can be recognized, and take necessary steps such as checking for hardware error messages in /var/log/messages.

1.2 Installation of Red Hat Enterprise Linux ES (v.4 for EM64T) Packages

Red Hat Enterprise Linux provides installation types so that the optimum system can be constructed according to the use purpose. For this reason, packages required for your purposes might not be installed. If a required package has not been installed, log in as the root and install it by executing the following procedure:

Install the necessary packages by using the **installation CDs** (**1/5 to 5/5**) that have been created according to the Installation Procedure included in the driver kit.

```
# mount -r /dev/cdrom /media/cdrom
* The CD is automatically mounted when the X-Window screen is displayed. Therefore, a
  "mounted" message is output after the above command is run.
# cd /media/cdrom/RedHat/RPMS
# rpm -ivh <package_file>
    Example: To install package "make"
# rpm -ivh make-3.79.1-17.i386.rpm
# cd /
# umount /media/cdrom
# eject
```

* Remove the CD.

1.3 Installing and Setting Up Global Array Manager (GAM)

Use Global Array Manager (GAM) as a RAID management tool in a system with a mounted onboard SCSI-RAID or SCSI-RAID card (PG-142E3).

For details on installing GAM-Client (Windows), see "**Outline of Installation Procedure for Global Array Manager-Client**", which is an attachment.

The GAM-Server (Linux) installation procedure is explained below.

[**Notes**]

1) The screen display may become unstable during GAM installation or GAM service startup. This is not an operational problem.
2) Specify the port numbers shown below for GAM service. Take care when configuring firewall settings.

   TCP Port numbers: 157,158

(1) To install GAM-Server (Linux), insert the driver CD into the CD-ROM drive, and enter commands as follows:

```
# mount -r /dev/cdrom /media/cdrom
```

* The CD is automatically mounted when the X-Window screen is displayed. Therefore, a "mounted" message is output after the above command is run.

```
# cd /media/cdrom/UTY/GAM/Linux
# rpm -ivh gam-server-6.02-21.i386.rpm
# rpm -ivh gam-agent-6.02-21.i386.rpm
```

- Enter the following only if onboard SCSI for RX200 S2

```
# rpm -ivh 1030SNMPAgent-2.4-3.i386.rpm
```

```
# sh ./insgam
```

* Confirm that “GAM is installed successfully.” is displayed.

```
# cd /
# umount /media/cdrom
# eject
```

* Remove the CD.

(2) For user accounts in Linux, create "gamroot" as a user account with GAM administrator authority and then create user accounts (e.g., "gamuser") with user authority.
(If a user account with user authority has already been created, another account need not be created.)

```
# adduser gamroot
# passwd gamroot

Changing password for user gamroot
New UNIX password              <--- Enter a password.
Retype new UNIX password       <--- Re-enter the same password for confirmation.
passwd: all authentication tokens updated successfully
```

* Create a user account with user authority in the same way as explained above.

(3) Edit three lines as shown below in the /etc/sysconfig/gam file.
Events can be posted to GAM-Client after this editing is completed.

vi /etc/sysconfig/gam

[Before editing]
START_GAMEVENT=n
GAMEVENT_OPTIONS=""
[After editing]
START_GAMEVENT=y <--- Change "n" to "y".
GAMEVENT_OPTIONS="-h ip-address" <--- Specify the IP address of the management Windows system on which GAM-Client is installed.

[Before editing]
START_GAMEVLOG=n
[After editing]
START_GAMEVLOG=y <--- Change "n" to "y".

(4) Restart the system.
shutdown -r now

* The following message may be displayed after the system starts. It does not indicate an operational problem.

[Message]
gamagent: gamagent: Connection refused
gamagent connect failure

1.4 Starting the System in Rescue Mode

Using only one of the installation CDs that have been created according to the Installation Procedure included in the driver kit, you can start the system in rescue mode. This may enable system recovery in the event of a problem that prevents the system from starting normally.
This section explains only how to start the system as one that has minimum functionality.
Start the system in rescue mode as follows:

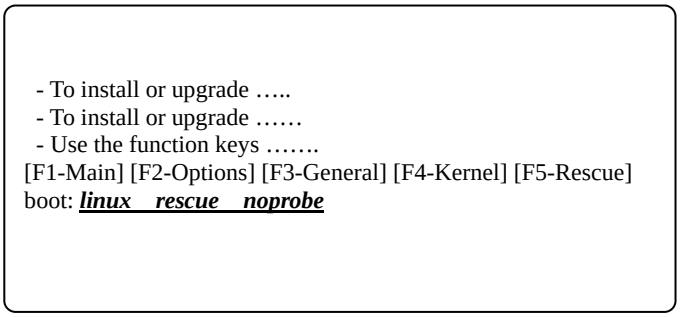
(1) Start the system from installation CD 1/4 that was created according to the Installation Procedure included in the driver kit. Enter the appropriate response in the following window, and press the [Enter] key.

- RX300 S2 / TX200 S2

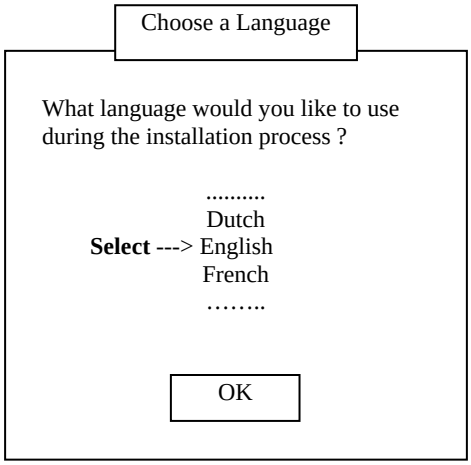
  boot: linux rescue noprobe

- RX200 S2

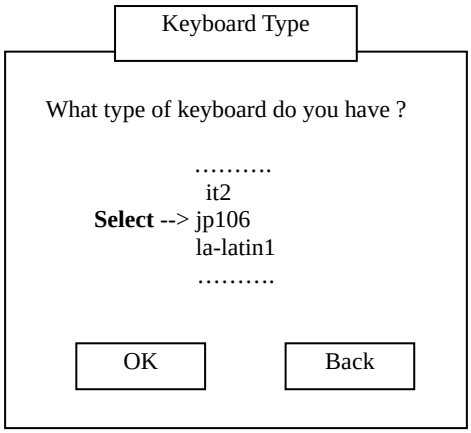
  boot: linux rescue noprobe acpi=ht



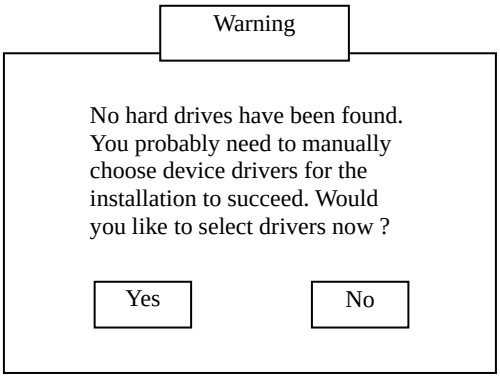
(2) In the Choose a Language window, select "English" and select "OK."



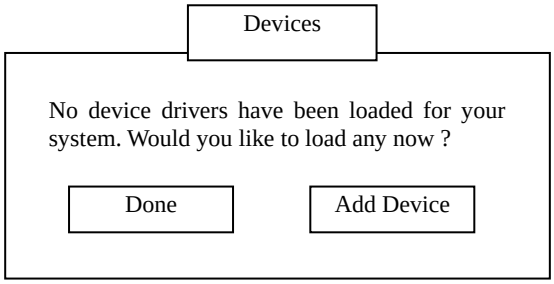
(3) In the Keyboard Type window, select "jp106" and select "OK."
If an accessory keyboard such as of a flat display (PG-R1DP3) is used, select "us" here.



(4) In the following window, select "Yes."



(5) In the following window, select "Add Device."



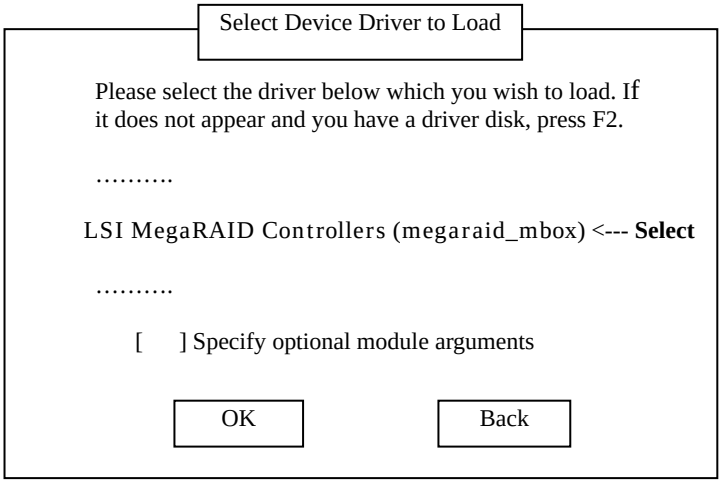
(6) In the Driver List window, select the drivers for the devices installed in the system, and select "OK." The following drivers must be selected:

[onboard SCSI type for TX200 S2]
[onboard SCSI type for RX200 S2 / onboard SCSI-RAID]
Two drivers must be selected. Select drivers as follows:

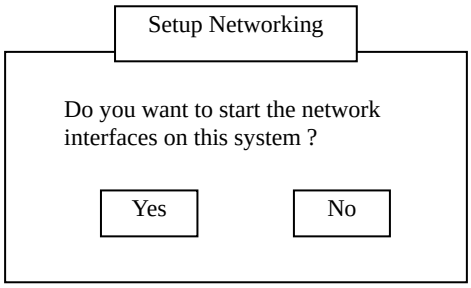
1. Select the driver shown below, and select "OK."
   "LSI Logic Fusion MPT Base Driver (mptbase)"
2. The Device Selection window is displayed. Select "AddDevice."
3. A list of drivers is displayed. Select the driver shown below, and select "OK."
   "LSI Logic Fusion MPT SCSI Driver (mptscsih)"

[SCSI-RAID card(PG-140D1/PG-142E3) for TX200 S2]
[onboard SCSI-RAID type for RX300 S2]
Select the driver shown below, and select "OK."

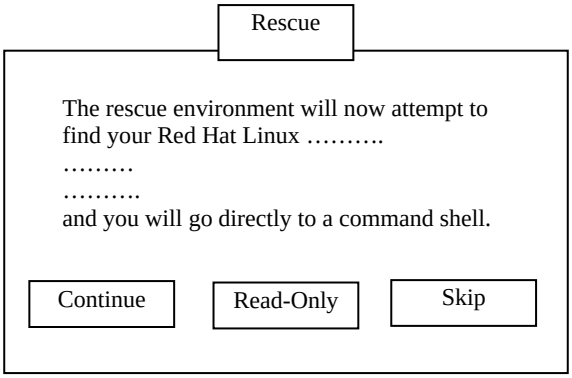
" LSI MegaRAID Controllers (megaraid_mbox)"



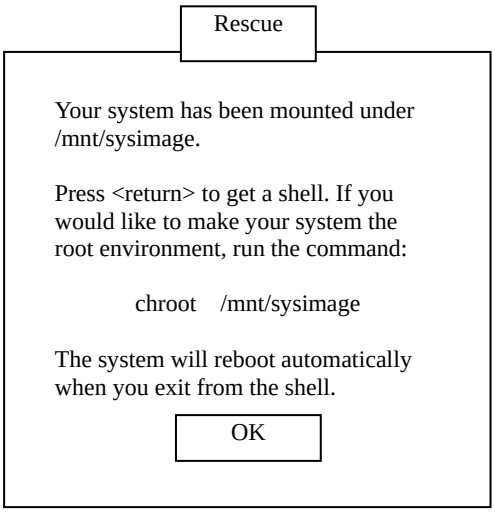
(7) The Setup Networking window is displayed. Select "No" because network settings need not be configured at this time.



(8) Select "Continue" in the Rescue window.



(9) If the root partition (/) in the existing Linux system has been mounted successfully under /mnt/sysimage, this is reported in the Rescue window. Select "OK."



(10) When the prompt is displayed, enter the chroot command to change the root path to the hard disk drive.

```
sh-3.00#  chroot  /mnt/sysimage
```

(11) This completes startup in rescue mode. To exit rescue mode, enter the exit command twice.

```
sh-3.00#  exit      <---  Exit from the chroot environment.
sh-3.00#  exit      <---  Exit from the rescue mode.
```

1.5 Power-off at Shutdown

Power may not be automatically turned off at shutdown.
When [Power down] is displayed on the console screen, press the power switch to turn off the power.

Note that the power is automatically turned off when the system is shut down in an environment in which ServerView is installed.

2. Addition of Peripheral Devices and Option Cards

2.1 Adding a SCSI Disk

The number of LUNs is set to 1 by default. To add a SCSI disk, shared disk, or tape library, log in as the root and define the number of LUNs as shown below. Multiple LUN referencing is enabled after the system is started next.

(1) Add the following lines to /etc//modprobe.conf:

options scsi_mod max_luns=***N***
* *N* is the number of LUNs. Define the appropriate number.

(2) Enter the mkinitrd command to create initrd.
To create initrd, enter the mkinitrd command appropriate for the type of kernel used.
* Enter the following command to check the type of kernel used:

```
# uname -r
```

[2.6.9-11.EL (kernel for single CPU)]

```
# cp /boot/initrd-2.6.9-11.img /boot/initrd-2.6.9-11.EL.img.bak
# mkinitrd -f /boot/initrd-2.6.9-11.EL.img 2.6.9-11.EL
```

[2.6.9-11.ELsmp (kernel for multi-CPU)]

```
#cp /boot/initrd-2.6.9-11.ELsmp.img /boot/initrd-2.6.9-11.ELsmp.img.bak
# mkinitrd -f /boot/initrd-2.6.9-11.ELsmp.img 2.6.9-11.ELsmp
```

(3) Restart the system.
Enter the following command to restart the system.

```
# shutdown -r now
```

2.2 Adding Option Cards

The table lists models and the option cards supported by them.

			TX200 S2	RX200 S2	RX300 S2
onboard	**SCSI card**	PG-128	V	--	--
		PG-130L	--	V	V
	SCSI-RAID card	PG-140D1	V	--	--
		PG-142E3	V	V	--
	LAN card	PG-1852	V	V	--
		PG-1853	V	--	--
		PG-1853L	--	V	--
		PG-1862	V	V	--
		PG-1882	V	--	--
		PG-1882L	--	V	V
		PG-1892	V	--	--
		PG-1892L	--	V	V
	Fibre-Channel card	PG-FC106	V	V	V
		PG-FC107	V	V	V
Raiser Card	**SCSI card**	PG-128	--	--	V
	SCSI-RAID card	PG-142E3	--	--	V
	LAN card	PG-1852	--	--	V
		PG-1853	--	--	V
		PG-1862	--	--	V
		PG-1882	--	--	V
		PG-1892	--	--	V
	Fibre-Channel card	PG-FC106	--	--	V
		PG-FC107	--	--	V

V: Supported
--: Not supported

- **For the RX300 S2, any card other than the PG-1862 in the TX200 S2 or any card other than the LAN card in the RX200 S2:**

  If one of the optional cards listed in the above table has been added after system installation, the "Welcome to Kudzu" window is displayed at system startup. Do not perform any operation from the window. After a while, system startup automatically continues.
  When system startup is completed, log in as the root user, and perform the operation described below.
  After completing the operation, follow the instructions in **Section 2.3**, "**Executing mkinitrd.**"
  The added card is automatically recognized at the next system startup.

  (1) Display the command input screen, and enter the following command:
  # kudzu

  (2) When "Welcome to Kudzu" is displayed, press any key.

  (3) When "Added hardware" is displayed, select <**Set**>.

- **For the PG-1862 in the TX200 S2**

If one of the optional cards listed in the above table has been added after system installation, the "Welcome to Kudzu" window is displayed at system startup. Do not perform any operation from the window. After a while, system startup automatically continues.
When system startup is completed, log in as the root user, and perform the operation described below.
After completing the operation, follow the instructions in **Section 2.4**, "**Executing mkinitrd.**"
The added card is automatically recognized at the next system startup.

(1) Display the command input screen, and enter the following command:
```
# kudzu
```

(2) When "Welcome to Kudzu" is displayed, press any key.

(3) When "Added hardware" is displayed, select <**Configure**>.

(4) Add the following to /etc/modprobe.conf:

```
alias eth0 tg3
alias eth1 e1000 <--- Add
alias eth2 e1000 <--- Add
```

(5) Configure network settings

```
# netconfig   -d   eth1
# netconfig   -d   eth2
```

- **For the LAN card in the RX200 S2**

If one of the optional cards listed in the above table has been added after system installation, the "Welcome to Kudzu" window is displayed at system startup. Do not perform any operation from the window. After a while, system startup automatically continues.
When system startup is completed, log in as the root user, and perform the operation described below.
After completing the operation, follow the instructions in **Section 2.3**, "**Executing mkinitrd.**"
The added card is automatically recognized at the next system startup.

(1) Display the command input screen, and enter the following command:
```
# kudzu
```

(2) When "Welcome to Kudzu" is displayed, press any key.

(3) When "Added hardware" is displayed, select <**Set**>.

(4) Add the following to /etc/modprobe.conf:

[PG-1852, PG-1853L, PG-1892L or PG-1882L]

```
alias eth0 e1000
alias eth1 e1000
alias eth2 e1000 <--- Add
```

[PG-1862]

```
alias   eth0   e1000
alias   eth1   e1000
alias   eth2   e1000   <--- Add
alias   eth3   e1000   <--- Add
```

(5) Configure network settings:

[PG-1852, PG-1853L, PG-1892L or PG-1882L]

```
# netconfig   -d   eth0
# netconfig   -d   eth1
# netconfig   -d   eth2
```

[PG-1862]

```
# netconfig   -d   eth0
# netconfig   -d   eth1
# netconfig   -d   eth2
# netconfig   -d   eth3
```

2.3 Configuring the Fibre Channel driver environment

When using the system with a Fibre Channel card (PG-FC106 or PG-FC107) installed, follow the procedure below:

(1) Add the following to /etc/modprobe.conf:

```
options scsi_mod max_luns=128    <--- Add
```

(2) Enter the mkinitrd command to create initrd.

To create initrd, enter the mkinitrd command appropriate for the type of kernel used.

* Enter the following command to check the type of kernel used:

```
# uname -r
```

Command execution examples are shown below

[2.6.9-11.EL (kernel for single CPU)]

```
# cp /boot/initrd-2.6.9-11.EL.img /boot/initrd-2.6.9-11.EL.img.bak
# mkinitrd -f /boot/initrd-2.6.9-11.EL.img 2.6.9-11.EL
```

[2.6.9-11.ELsmp (kernel for multi-CPU)]

```
# cp /boot/initrd-2.6.9-11.ELsmp.img /boot/initrd-2.6.9-11.ELsmp.img.bak
# mkinitrd -f /boot/initrd-2.6.9-11.ELsmp.img 2.6.9-11.ELsmp
```

2.4 Executing mkinitrd

(1) Create initrd by executing the mkinitrd command.

Create initrd by executing the mkinitrd command according to the kernel used.

* Enter the following command to check the kernel used:

```
# uname    -r
```

Command execution examples are shown below.

[2.6.9-11.EL (kernel for a single CPU)]

```
# cp    /boot/initrd-2.6.9-11.EL.img    /boot/initrd-2.6.9-11.EL L.img.bak
# mkinitrd    -f    /boot/initrd-2.6.9-11.EL.img    2.6.9-11.EL
```

[2.6.9-11.ELsmp (kernel for multi-CPUs)]

```
# cp    /boot/initrd-2.6.9-11.ELsmp.img    /boot/initrd-2.6.9-11.ELsmp.img.bak
# mkinitrd    -f    /boot/initrd-2.6.9-11.ELsmp.img    2.6.9-11.ELsmp
```

(2) Restart the system.

Restart the system as follows:

```
# shutdown    -r    now
```

3. Others

3.1 Sound Function

No sound function is supported.

3.2 PCI Hot Plug Function

The PCI hot plug function is not supported.

3.3 Usable Kernels

The kernels that can be used vary depending on the hardware conditions.
See the table below for the kernels that can be used.
Note that middleware specifications might limit the kernel to be selected. In this case, select the kernel in accordance with the middleware specifications.

Hardware conditions		Kernel to be selected
Memory	Number of logical CPUs (*1)	
Up to 4 GB	1CPU	Kernel for single CPU
	2 or more CPUs	Kernel for multi-CPU
More than 4 GB and up to 12 GB	No conditions	Kernel for multi-CPU

(*1) Even when only one CPU is installed, the number of logical CPUs is 2 if Hyper Threading = Enabled.

3.4 Distribution Limitations

Operation is not guaranteed if one of the following CPU, memory, and file system limitations is exceeded:

Maximum number of logical CPUs: 4
Maximum memory size: 16GB(*)
File system: Less than 8 TB

(*)The maximum number of CPUs and the maximum memory size for each model are displayed.

	RX200 S2/RX300 S2/ TX200 S2
Maximum memory size	12 GB

3.5 Installation Procedure

For information on the procedure for installing Red Hat Enterprise Linux ES (v.4 for EM64T), see the Installation Procedure included in the "Installation Kit" downloaded from Download Search.

-- END --

Attachment　Outline of Global Array Manager Client Installation

* Perform this operation only when an onboard SCSI-RAID or a SCSI-RAID card (PG-140D1 or PG-142E3) are mounted.
* GAM-Client runs on Windows2000 and Windows2003.　Prepare a management Windows system.

1. Insert the driver CD into the CD-ROM drive in the management Windows system.

2. Execute setup.exe in RHEL4EM64T¥UTY¥GAM¥Windows on the driver CD.

3. When the "Welcome" window is displayed, click "Next."

4. The "Software License Agreement" window is displayed.　Read the statements and click "Yes" if you accept the terms of this agreement.

5. The "Select Components" window (Figure 1) is displayed.　Confirm that the check box before "Global Array Manager Client" is selected.　Clear the "Global Array Manager Server" and "SAN Array Manager Client" check boxes, and click "Next."

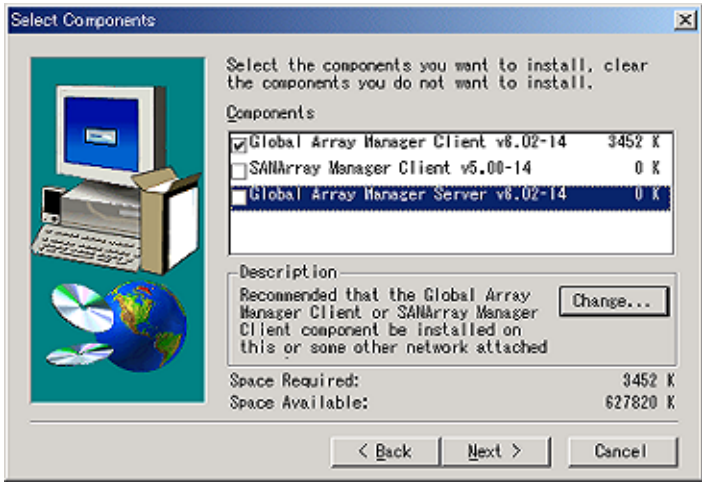


Figure 1

*** "SAN Array Manager Client" is not supported.　Do not install it.**

6. The "Choose Destination Location" window is displayed.
Click "Browse," specify the location that you want as the installation destination, and click "Next."

*** If GAM-Client is already installed, a message confirming whether to overwrite is displayed.　Click "OK" to continue.**

7. A dialog box for specifying the GAM-Client installation destination is displayed. Click "Next." and the setup program starts copying files.

8. The "Setup Complete" window is displayed.
Click "Finish" to exit the GAM-Client installation wizard.

-- END --