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shaping tomorrow with you

Oracle Solaris 11 Implementation and Operations Guide

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Fujitsu Limited

Preface 1/2

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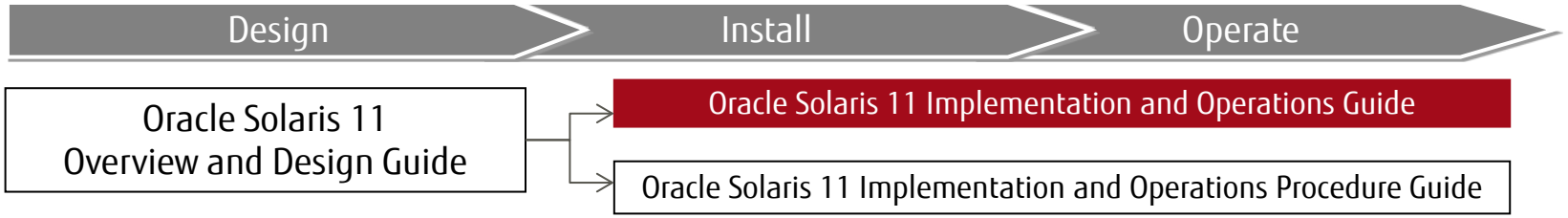
- Purpose
  - This document presents methods of building and operating Oracle Solaris 11.
- Audience
  - People who have a basic knowledge of Oracle Solaris
  - People who are referring to the *Oracle Solaris 11 Overview and Design Guide*
- Notes
  - The contents of this document are based on Oracle Solaris 11.3. For the latest information on Oracle Solaris 11, see the manuals from Oracle.
    - Oracle Solaris 11 Documentation
      http://www.oracle.com/technetwork/documentation/solaris-11-192991.html
  - Fujitsu M10 is sold as SPARC M10 Systems by Fujitsu in Japan. Fujitsu M10 and SPARC M10 Systems are identical products.
- Positioning of documents
  - *Oracle Solaris 11*
    http://www.fujitsu.com/global/products/computing/servers/unix/sparc/downloads/documents/



* Read this document together with the *Oracle Solaris 11 Implementation and Operations Procedure Guide*.

Preface 2/2

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- Descriptions in this document
  - The section numbers of commands are omitted.

    Example:
    - ls(1) => ls command
    - shutdown(1M) => shutdown command

  - The following table lists terms that may be abbreviated.

Abbreviation	Formal Name
Solaris	Oracle Solaris

Contents

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1. Installing Oracle Solaris 11

This chapter describes the procedure for installing Solaris 11 (solaris-large-server group package) by performing a text install (interactive).

Flow of Installing Oracle Solaris 11

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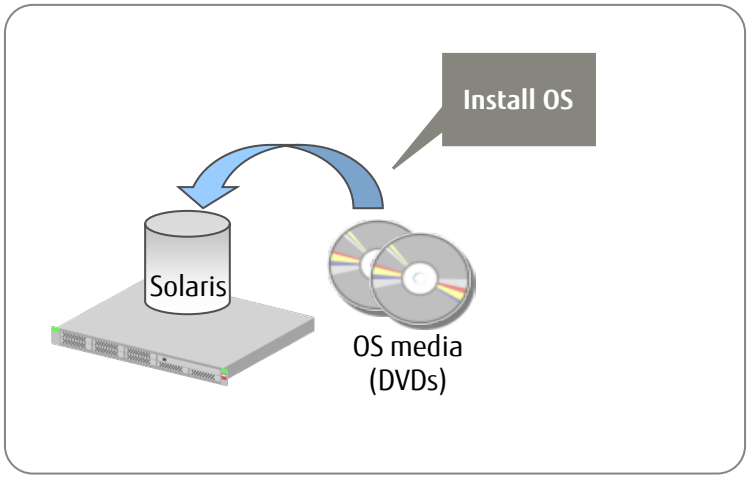
- Installation method and settings presented in this document
  - The installation method is text install from OS media (DVDs).
  - The disk label at installation is the SMI label.
- Text install
  (1) Configure the installation environment.
  (2) Select a disk detection method.
  (3) Select a disk for installation.
  (4) Select a slice for installation.
  (5) Enter a host name.
  (6) Set network information.
  (7) Select a name service.
  (8) Select a time zone.
  (9) Select a locale.
  (10) Set the root password and user account.
  (11) Set support information.
  (12) Start installation.



- The settings made in the text install are written and configured in various files after OS installation. If you want to change them after installation, execute the sysconfig configure command to configure the initial settings interactively.
  The sysconfig configure command is equivalent to the sys-unconfig command in Solaris 10.

Text Install 1/12 - Configure the Installation Environment -

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Set a keyboard layout.

```
 1. Arabic                          15. Korean
 2. Belgian                         16. Latin-American
 3. Brazilian                       17. Norwegian
 4. Canadian-Bilingual              18. Portuguese
 5. Canadian-French                 19. Russian
 6. Danish                          20. Spanish
 7. Dutch                           21. Swedish
 8. Dvorak                          22. Swiss-French
 9. Finnish                         23. Swiss-German
10. French                          24. Traditional-Chinese
11. German                          25. TurkishQ
12. Italian                         26. UK-English
13. Japanese-type6                  27. US-English
14. Japanese
To select the keyboard layout, enter a number [default 27]: 27
```

Select a keyboard layout.

Select a language.

```
 1. Chinese - Simplified
 2. Chinese - Traditional
 3. English
 4. French
 5. German
 6. Italian
 7. Japanese
 8. Korean
 9. Portuguese - Brazil
10. Spanish
To select the language you wish to use, enter a number
[default is 3]: 3
```

Select the language used during installation work.

* This is not the OS language setting (locale).

Text Install 2/12 - Select a Disk Detection Method -

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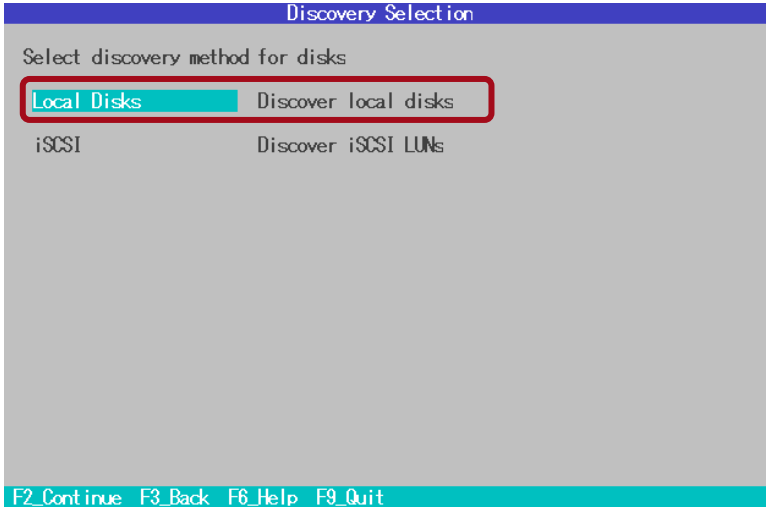
Select a detection method for disks for installing Solaris 11.

* This new item has been supported since Solaris 11.1.



Select a disk detection method.

- Local Disks
  The OS can be installed on a local disk.
- iSCSI (New item supported since Solaris 11.1)
  The OS can be installed on an iSCSI target.

Text Install 3/12 - Select a Disk for Installation -

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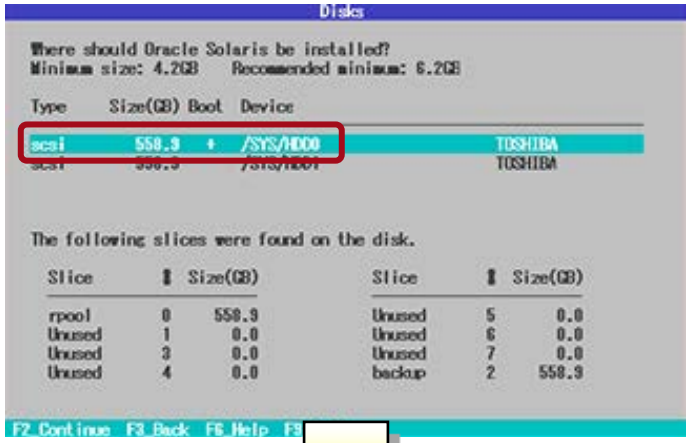
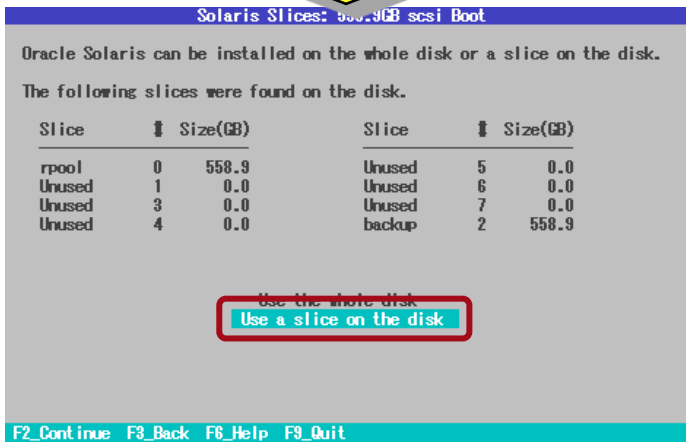
Select a disk for installing Solaris 11.





- Selecting the install disk
  Select a disk to display the disk partition setting information (capacity per slice).
  The two types of supported disk labels are the EFI label and SMI label.

* In a SAN boot environment, the SMI label must be used for OS installation.

- [Use the whole disk]
  The OS is installed using all the areas on the disk.
  An EFI label is set for the disk label.

- [Use a slice on the disk]
  The OS is installed on the specified slice area on the disk.
  The disk label is the format (EFI label/SMI label) that was set before installation.

- This document describes the procedure for installation using an SMI-labeled disk.
  -> For details on setting the label, see the *Oracle Solaris 11 Implementation and Operations Procedure Guide*.

Text Install 4/12 – Select a Slice for Installation -

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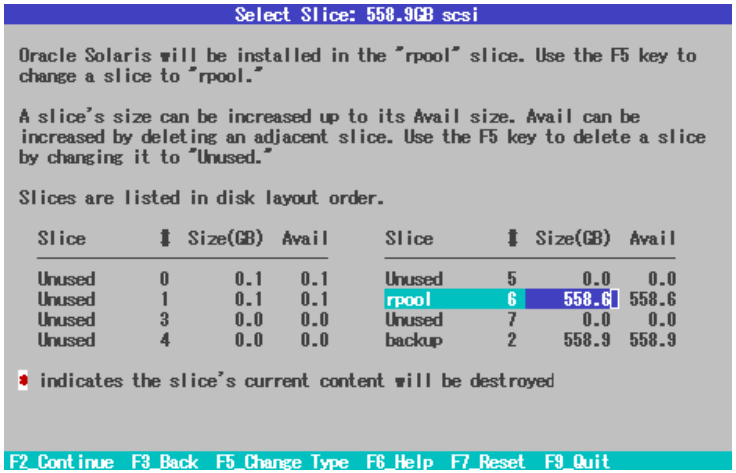
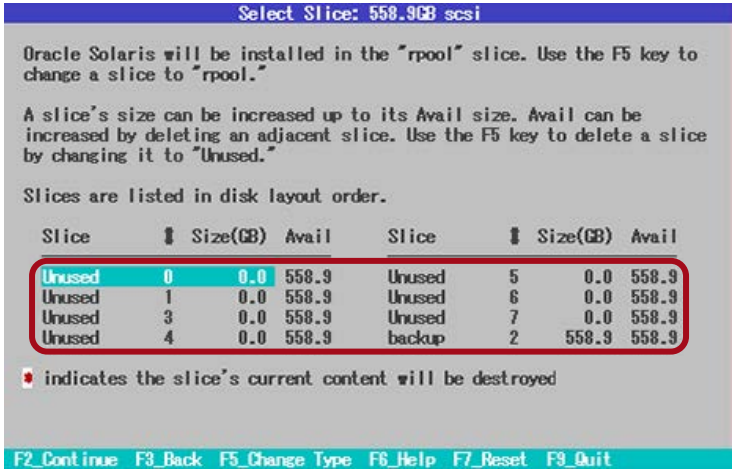
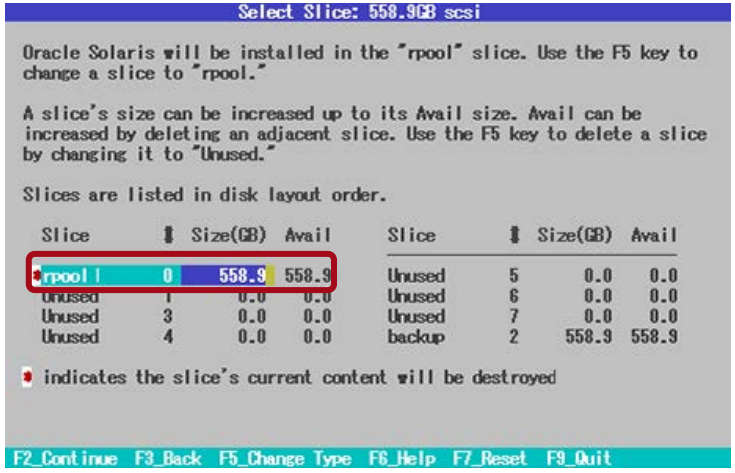
Select a slice for installing Solaris 11.



- Cancel all the sizes (GB) assigned by default to disk slices.
  In the left figure, sizes are assigned by default to slices 0, 1, and 6.
- To cancel an assignment, select the particular slice, and press the F5 key.
- Suppose that size assignments for all slices are canceled when you select the slice targeted for OS installation. Then, pressing the F5 key will assign all the disk areas to the slice.





- Here, "Slice 0" is selected.

Text Install 5/12 – Enter a Host Name -

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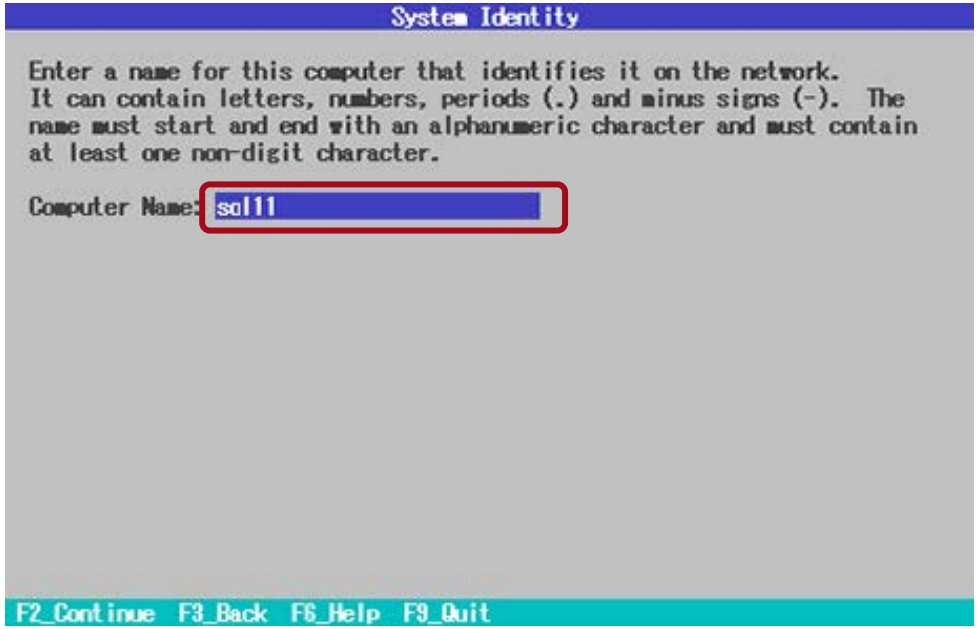
- Enter a host name to identify the host on the network.



- Here, "sol11" is set as the host name.

Text Install 6/12 - Set Network Information -

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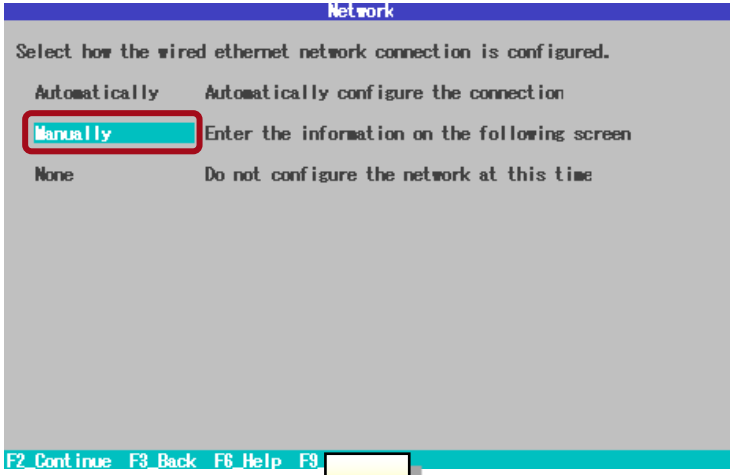
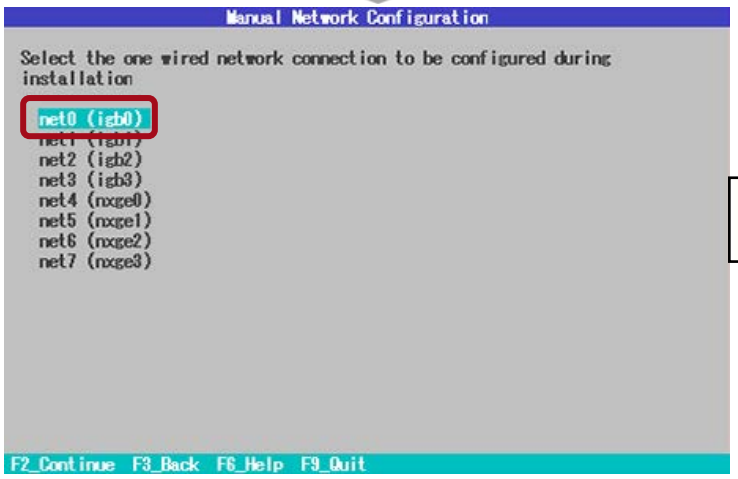
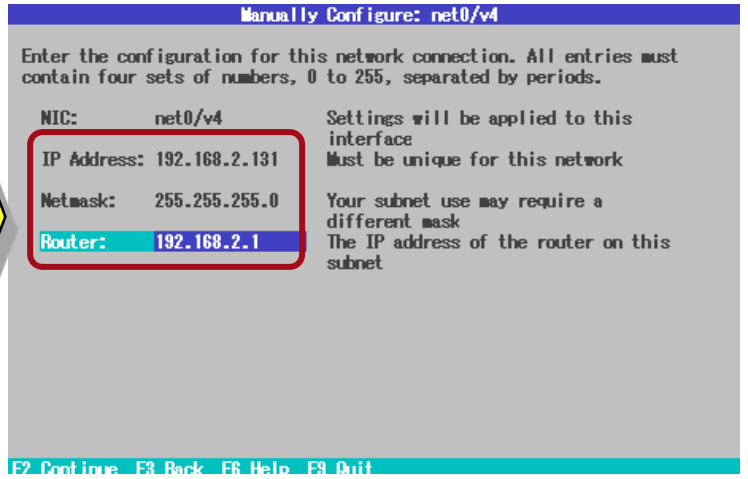
Select a method (Automatically, Manually, etc.) for configuring the network.

* When manually setting the information, enter an IP address, subnet mask, etc.







Methods of setting network information

- Automatically
  Network information is automatically configured using DHCP.
- Manually
  Network information is manually set.
- None
  Network information is manually set after OS installation.

Text Install 7/12 - Select a Name Service -

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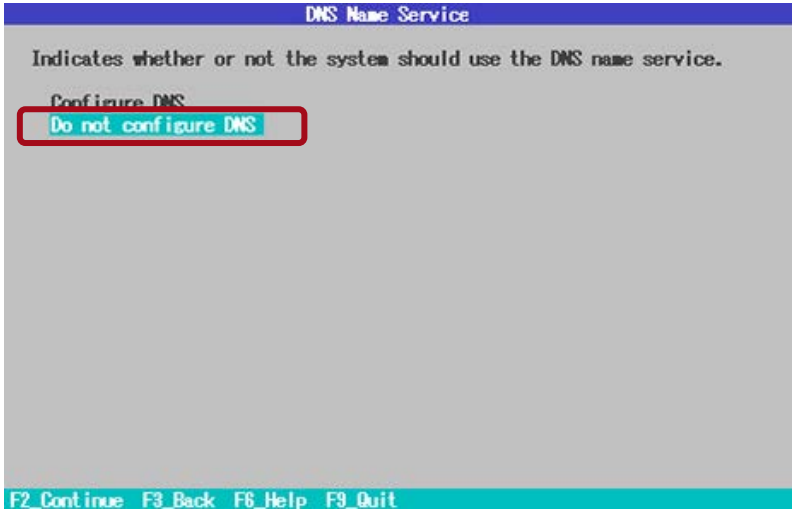
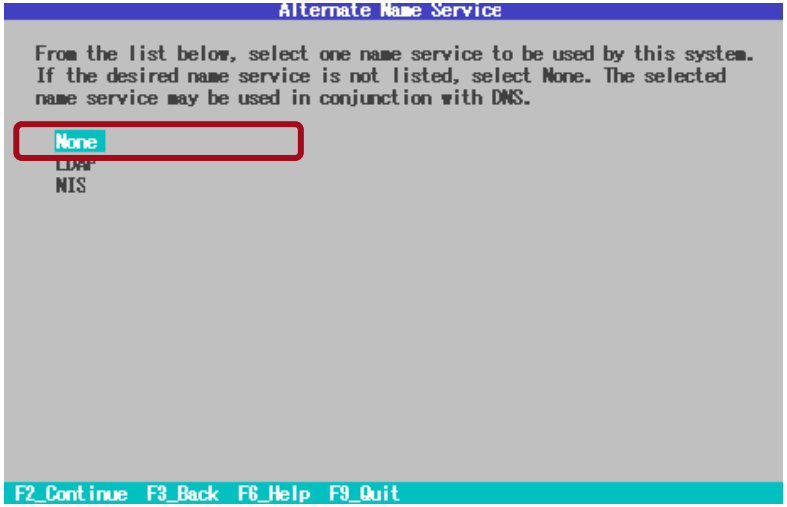
■ Select the name service to use.





Name services that can be selected

- DNS (Domain Name System)
  A DNS name resolution query (mapping a domain name to an IP address) is made to a DNS server.
- None
  Name resolution uses a local database (/etc/inet/hosts).
- LDAP (Lightweight Directory Access Protocol)
  LDAP is the protocol used by a client to communicate with a directory server to use the directory service.
- NIS (Network Information Service)
  NIS is the name service function used with a server to centrally manage the management information for systems connected to the network.

Text Install 8/12 – Select a Time Zone -

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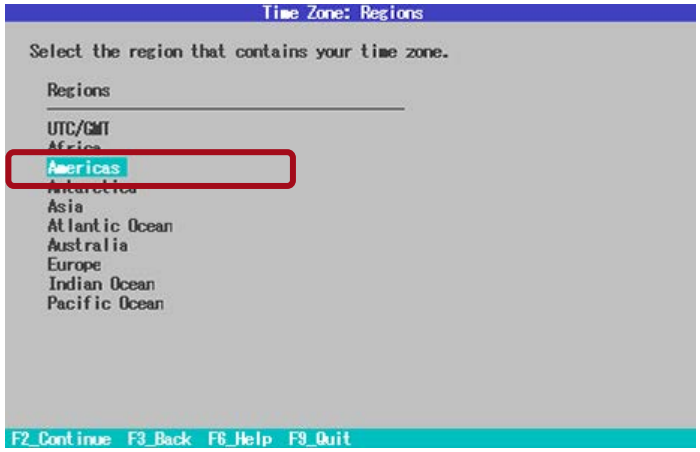
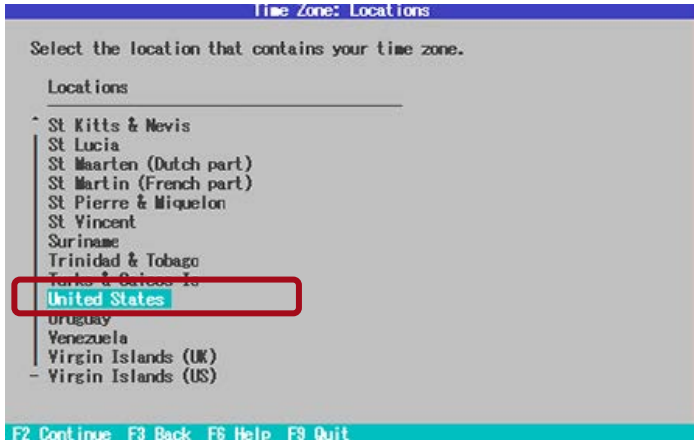
- Select a time zone (region/country).





Configuration file after OS installation

/etc/TIMEZONE file

```
root@sol1:~# cat /etc/TIMEZONE
#__GENERATED__V1__
#
# Copyright (c) 2005, 2011, Oracle and/or its affiliates. All rights reserved.
#
# This file is /etc/default/init.  /etc/TIMEZONE is a symlink to this
# file.
#
# READERS OF THIS FILE: This file is Obsolete.  Migrate to reading
# properties from svc:/system/environment:init.  This file may be
# removed in future releases.
#
# WRITERS OF THIS FILE: This file is no longer user editable.  To
# effect changes to the configuration contained in this file, an
# administrator with the "System Administrator" or "System
# Configuration" Rights Profile may set the corresponding
# properties of the svc:/system/environment:init service
# instance and refresh the instance.
# See init(1M) for further details.
#
# WARNING: CHANGES TO THIS FILE WILL BE OVERWRITTEN BY THE SYSTEM.
#
CMASK=022
TZ=localtime
LANG=en_US.UTF-8
```

CMASK=022: Mask value of process inherited from init, or mask value of init

TZ=localtime: Time zone

LANG=en_US.UTF-8: Locale (character code)

* The /etc/TIMEZONE file is a symbolic link to the /etc/default/init file.
* TZ=localtime is set as a symbolic file (/usr/share/lib/zoneinfo/Japan) reference of the /etc/localtime file.

- To change the time zone after installing the OS
  -> See "<<Reference>> How to Change the Time Zone and Locale."

Text Install 9/12 – Select a Locale -

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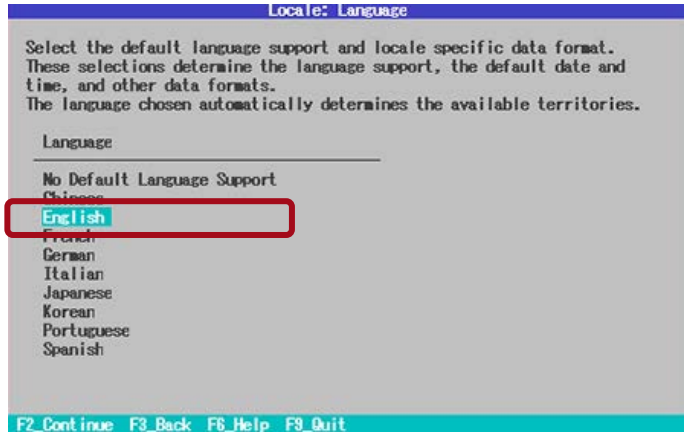
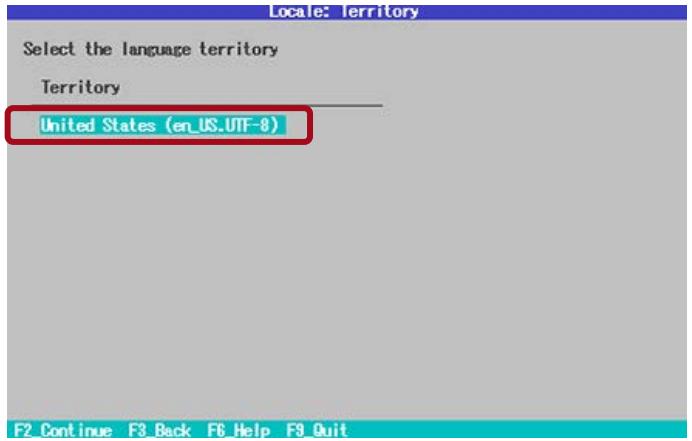
- Select a locale (character code).



Select the language of the locale used.
(Here, "English" is selected.)



The character codes for the selected language appear in a list.
Select the character code to use.
(Here, "en_US.UTF-8" is selected.)

- To change the locale after installing the OS
  -> See "<<Reference>> How to Change the Time Zone and Locale."

Text Install 10/12 – Set the root Password -

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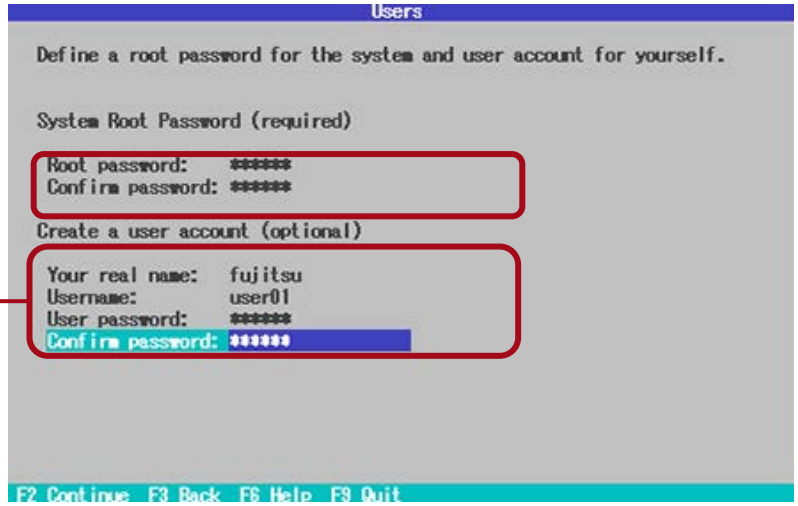
■ Set the root password (required) and a user account (optional).



- If a general user is created at OS installation, the root is created not as a user but as a **role**. **You will not be able to log in to the OS with the root account**.
- If a general user is not created at OS installation, the root is created as a **user**. **You will be able to log in directly to the OS with the root account.**

Configuration files after OS installation

(1) /etc/passwd file

This file is used to manage user information.

```
root:x:0:0:Super-User:/root:/usr/bin/bash
daemon:x:1:1::/:
bin:x:2:2::/usr/bin:
sys:x:3:3::/:
adm:x:4:4:Admin:/var/adm:
lp:x:71:8:Line Printer Admin:/usr/spool/lp:
uucp:x:5:5:uucp Admin:/usr/lib/uucp:
:
```

(2) /etc/shadow file

This file is used to manage passwords.

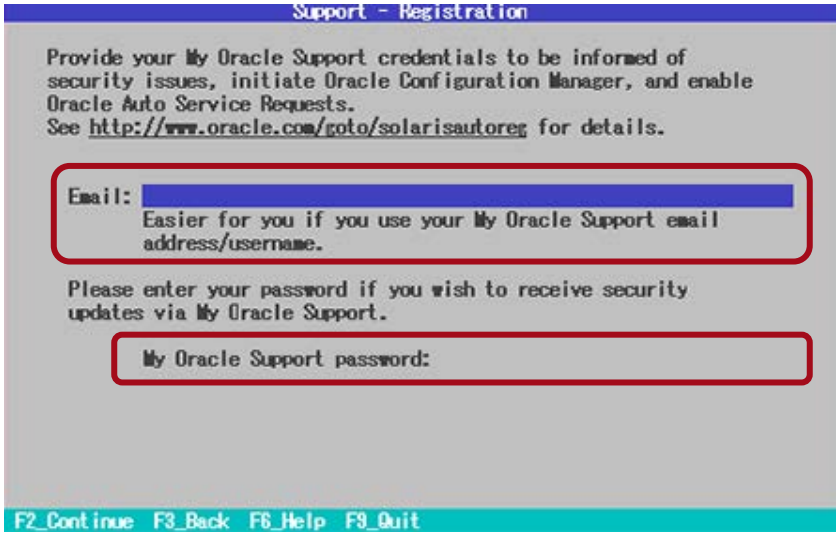
```
root:$5$rD$bsuQUVVx1qOcZUQb9m01/Z2klUZY5MeF
q2wpJju.IP.:6445::::::
daemon:NP:6445::::::
bin:NP:6445::::::
sys:NP:6445::::::
adm:NP:6445::::::
lp:NP:6445::::::
:
```

- Do not edit the above files directly in an editor or other tool. Use the passwd command to change the root password.
- To assign a role to a general user after OS installation
  -> See "<<Reference>> General User and root Role."

Text Install 11/12 - Set Support Information -

Set Email (optional) and My Oracle Support (optional).

* This new item has been supported since Solaris 11.1.



- Email
  You do not need to enter anything. If an e-mail address has already been entered, delete it to proceed. A warning message is output, but you can ignore it.
- My Oracle Support password
  You do not need to enter anything. Leave the password field blank and proceed.

* Here, you can enter your account information (e-mail address/password) for My Oracle Support (Oracle support service). Or you can proceed with OS installation without entering anything.

Text Install 12/12 – Install -

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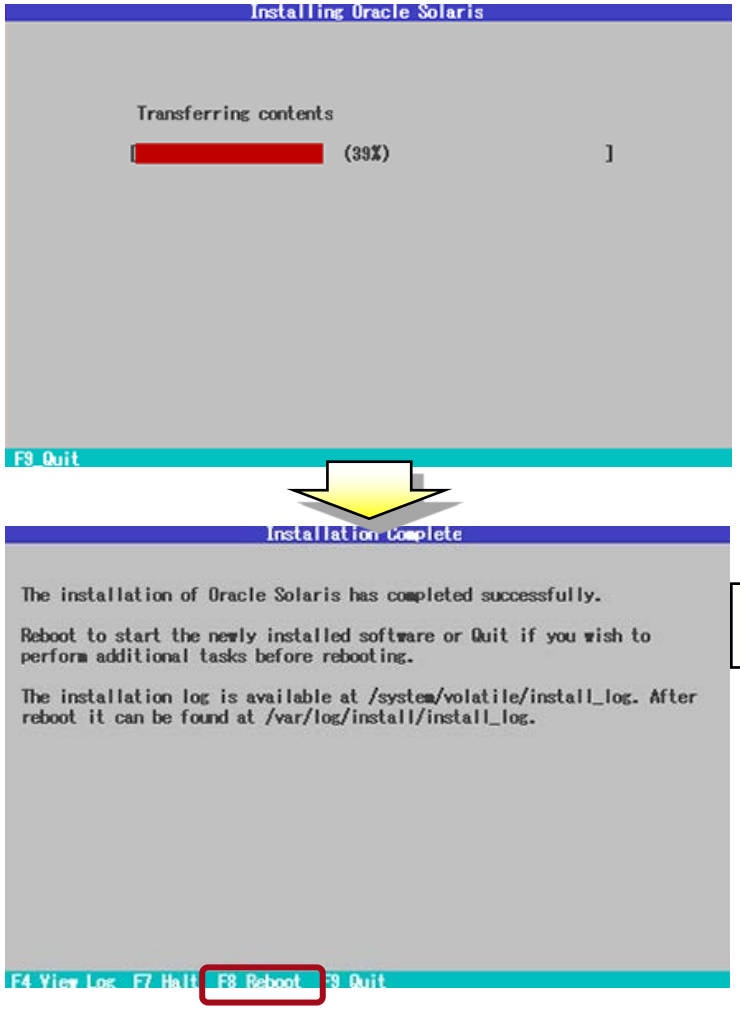
- Install Solaris 11.




```
sol11 console login:
```

- After OS installation completes, reboot by pressing F8.
- After the reboot, a login prompt appears. Log in as a general user or the root user.

<<Reference>> How to Change the Time Zone and Locale

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System default time zone and locale

- In Solaris 11, you can change the time zone and locale in the SMF service property settings. The /etc/default/init file will reflect the set values at the reload timing of the SMF service.
  * You cannot edit the conventional /etc/default/init file.

✓ /etc/default/init file in Solaris 10

```
sol10# ls -l /etc/default/init
-r--r--r--   1 root     sys          837 Nov 14 01:51 /etc/default/init
```

✓ /etc/default/init file in Solaris 11

```
sol11# ls -l /etc/default/init
-r--r--r--   1 root     sys          837 Nov 14 01:51 /etc/default/init
```

Read-only file in Solaris 11

✓ How to change the time zone (SMF service svc:/system/timezone:default)

```
# svccfg -s timezone:default setprop timezone/localtime = astring: GMT
# svcadm refresh timezone:default
# svcprop timezone:default | grep ^timezone/localtime
```

(1) Set time zone to GMT
(2) Reload SMF service
(3) Confirm that settings applied

* The /etc/default/init file contents do not change. However, the symbolic link destination of the /etc/localtime file as shown in the init file changes to the relevant file in the /usr/share/lib/zoneinfo directory.

✓ How to change the locale (SMF service svc:/system/environment:init)

```
# svccfg -s system/environment:init setprop environment/LANG = astring: C
# svcadm refresh system/environment:init
# svcprop system/environment:init | grep ^environment/LANG
```

(1) Set locale to C
(2) Reload SMF service
(3) Confirm that settings applied

* The /etc/default/init file contents will also reflect this change.

<<Reference>> General User and root Role

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Role assignment to a general user

- You will need to assign, in advance, the root role to the general users authorized to accept the role.

✓ How to confirm a role

```
# roles user01
root
```

"root" is displayed for the general user (user01) assigned the root role.
In this case, the general user (user01) can be the root.

```
# roles user02
No roles
```

"No roles" is displayed for the general user (user02) not assigned the root role.
In this case, the general user cannot be the root.

✓ How to set/change a role

* Set a role with the -R option in the useradd/usermod command.

```
# useradd -R root -d /export/home/user02 -m
user02
or
# usermod -R root user02
# roles user02
root
```

You can assign the root role to a general user by using the -R option.

```
user03$ su -
Password:
Roles can only be assumed by authorized
users
su: Sorry
```

If not assigned the root role, a general user cannot be the root even after entering the correct root password.

- The general users created at OS installation are automatically assigned the root role.

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2. Changing the Root Pool Configuration

This chapter describes the procedure for changing the root pool (system area in Solaris 11) to a mirror configuration.

Overview of Changing the Root Pool Configuration

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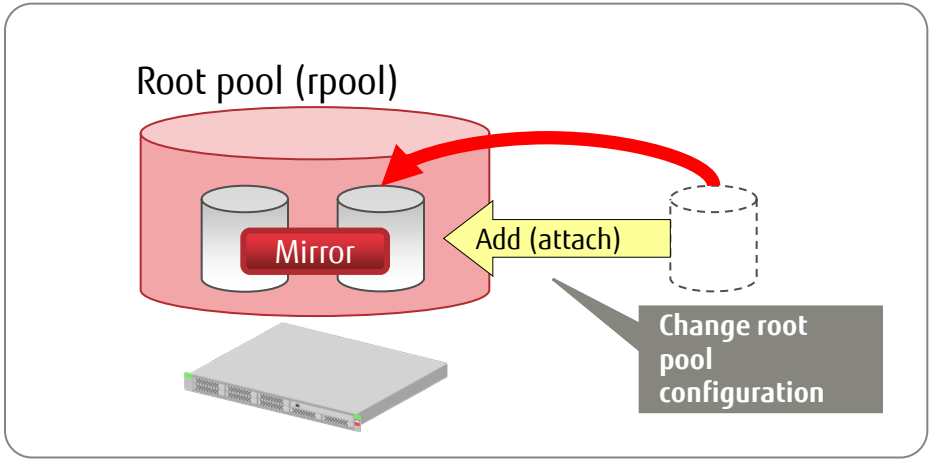
- What is a root pool?
  - The area where the Solaris 11 OS is installed is called the "root pool" (rpool).
  - Root pool mirroring (disk redundancy) must be configured manually.
- Adding a mirror disk
  - Root pool mirroring is accomplished using the ZFS function.
  - Add a disk to the root pool to change to a mirror configuration.



- For details on the root pool, see the following document:
  - *Oracle Solaris ZFS*
    http://www.fujitsu.com/global/products/computing/servers/unix/sparc/downloads/documents/

Adding a Mirror Disk

Add one physical disk to change the root pool to a dual-mirror configuration.

✓ Add a physical disk.

Format: zpool attach *pool_name mirror_source_disk mirror_disk*

```
# zpool attach rpool c1t1d0s0 c1t1d1s0
```

Add a physical disk to change to a dual-mirror configuration.

The disk name varies depending on what was selected for the disk at OS installation.
- If [Use the whole disk] is selected, the disk name is "cXtXdX" (X represents a device number).
- If [Use a slice on the disk] is selected, the disk name is "cXtXdXsX" (X represents a device or slice number).

-> For details on the disk selection at installation, see "Text Install 3/12 - Select a Disk for Installation -."

After the change to the mirror configuration, add the boot-device setting. By adding boot-device, you can start the OS from the added disk. In addition, even if one of the boot disks fails, it is automatically switched with the other disk to start the OS.

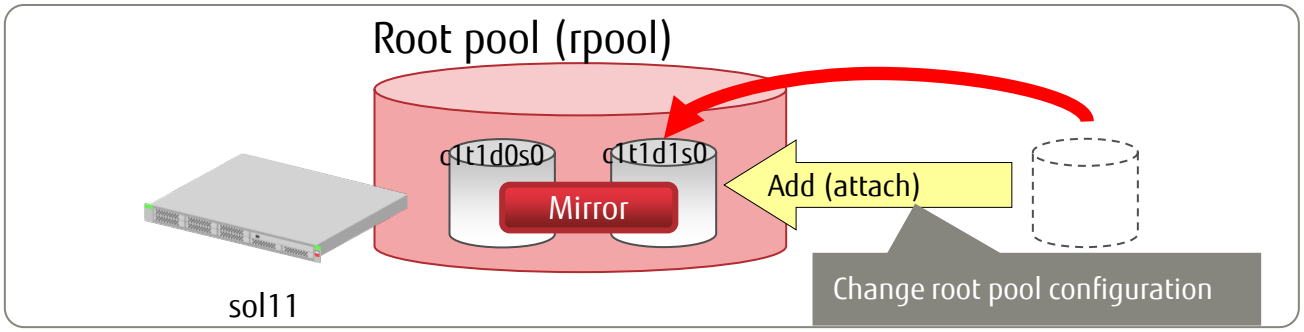
✓ Set boot-device (on OBP).

Format: setenv *disk_name [disk_name]*

```
{0}ok setenv boot-device disk0 disk1
```

Specify one or more disks to configure a mirror (specify the priority order of the disks at the same time).

For a disk name, specify the alias of a disk in the configuration of the root pool.
In the above case, normally the OS starts up from disk0. If disk0 fails, the OS starts up from disk1.



3. Configuring the Network

This chapter describes the procedure for checking network devices and setting IP addresses.

Flow of Configuring a Network

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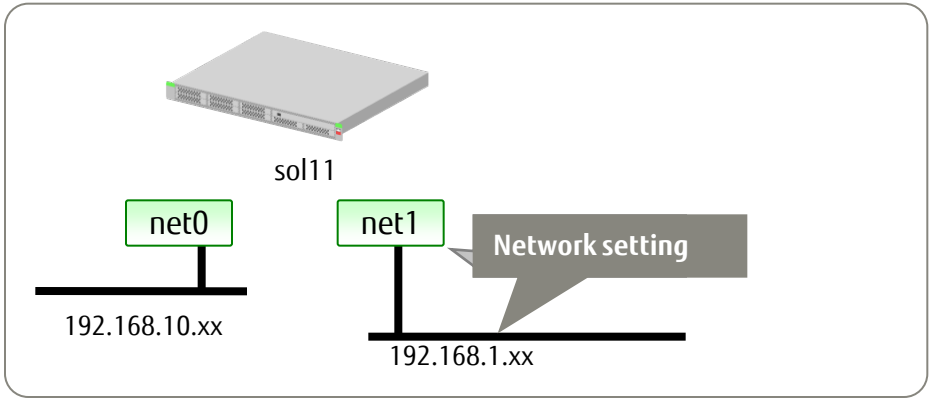
Solaris 11 implements a new method of configuring a network.
Instead of the conventional method of directly editing configuration files (/etc/hosts, etc.), the new method uses special commands to configure the network.

- Step 1: Check network devices.
  - Check the available network devices, and also check the status and setting values.
- Step 2: Configure the network.
  - Set the IP address and subnet mask for a network device.
- Step 3: Confirm network settings.
  - Confirm the set values.



- Here, the network is configured for a different device (net1) than the network device (net0) that was set at OS installation.

Commands Used to Configure a Network

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The dladm and ipadm commands in Solaris 11 are the main commands used to configure and manage a network.

- dladm command: Expanded function
  - Manages the data link layer.
  - Sets a VLAN, a VNIC, Link Aggregation, etc.
- ipadm command: New
  - Manages the IP layer.
  - Sets IP addresses, etc., in place of the ifconfig command or /etc/hostname.xxxx.
  - Permanently sets the IP addresses, etc. that were set by the ipadm command.
  - Compares with the ifconfig command in Solaris 10 as follows.

✓ Create an interface and set an address.

Solaris 10

```
# ifconfig NIC plumb
# ifconfig NIC addr/prefixlen up
```

Solaris 11

```
# ipadm create-ip NIC
# ipadm create-addr -T static -a local=addr/prefixlen NIC/xxx
```

* Specify an arbitrary character string in xxx.

✓ Check addresses and setting information.

Solaris 10

```
# ifconfig -a
```

Solaris 11

```
# ipadm show-addr
```

Step 1: Check Network Devices

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Check the post-installation network status.

- ✓ Check networks in advance, and check network interfaces.

```
# dladm show-link
LINK              CLASS      MTU    STATE      OVER
net1              phys       1500   unknown    --
net0              phys       1500   up         --


# ipadm show-addr
ADDROBJ           TYPE       STATE     ADDR
lo0/v4            static     ok        127.0.0.1/8
net0/v4           static     ok        192.168.10.xx/24
lo0/v6            static     ok        ::1/128
net0/v6           addrconf   ok        fe80::214:4fff:fefa:6118/10
```

Check the network status.
net0 => up
net1 => unknown

"v4" (IPv4) and "v6" (IPv6) are used by default for the network interfaces that are set at OS installation.

- In Solaris 11, when the text installer sets an IPv4 address after manual configuration of the network is selected, it automatically sets an IPv6 network interface and address too.
  After installation, you can delete the automatically configured IPv6 settings.
  -> See "<<Reference>> Setting an IPv6 Address 1/2" (Automatic setting of an IPv6 address).

Step 2: Configure the Network

FUJITSU

- Create an interface, and set an IP address and subnet mask.
  - Set an address object in the "interface name/arbitrary character string" format.
  - An arbitrary character string can be defined, so use the address object to manage the use of physical interfaces or for other purposes.(For example, use it to differentiate multiple logical interfaces.) You need to set the address object even if there is only one logical interface.

✓ Create an interface (ipadm create-ip), and set an IP address (ipadm create-addr).

Format: ipadm create-ip *interface_name*
Format: ipadm create-addr -T static -a local=*IP_address/netmask_length* *interface_name/arbitrary_character_string*
-T: Sets an address object type.
-A: Sets an IP address and netmask length.

```
# ipadm create-ip net1
# ipadm create-addr -T static -a local=192.168.1.xx/24 net1/v4
```

Set an IP address to activate the interface.

The arbitrary character string can use up to 31 alphanumeric characters (the character string must begin with an alphabetic character).

Solaris 11 has changed the method of managing network interface names.
-> See "<<Reference>> Network Interface Name."

Step 3: Confirm Network Settings

FUJITSU

- Check the network status and configuration files.
  - The network settings by the ipadm command are applied to the /etc/ipadm/ipadm-DefaultFixed.conf file.
    * This specification applies to Solaris 11.1 and later.

✓ Confirm network settings.

```
# ipadm show-addr
ADDROBJ    TYPE      STATE      ADDR
lo0/v4     static    ok                 127.0.0.1/8
net0/v4    static    ok                 192.168.10.xx/24
net1/v4    static    ok                 192.168.1.xx/24
lo0/v6     static    ok                 ::1/128
--<Omitted>--
```

Confirm the configured network (STATE of net1/v4 displays "ok").

✓ Check the /etc/ipadm/ipadm-DefaultFixed.conf file.

* Do not edit this file directly.

```
# cat /etc/ipadm/ipadm-DefaultFixed.conf
_ifname=lo0;_aobjname=lo0/v4;
_ipv4saddr=string,127.0.0.1;prefixlen=string,8;up=string,yes;
_ifname=lo0;     _family=string,2,26;_class=uint64,2;
_ifname=lo0;_aobjname=lo0/v6;
_ipv6saddr=string,::1;prefixlen=string,128;up=string,yes;
_ifname=net0;    _family=string,2,26;_class=uint64,0;
_ifname=net0;_aobjname=net0/v4;
_ipv4saddr=string,192.168.10.xx;prefixlen=string,24;up=string,yes;
_ifname=net0;_aobjname=net0/v6;
_intfid=string,::;prefixlen=string,0;_stateless=string,yes;_stateful=string,yes;
_ifname=net1;    _family=string,2,26;_class=uint64,0;
_ifname=net1;_aobjname=net1/v4;
_ipv4saddr=string,192.168.1.xx;prefixlen=string,24;up=string,yes;
```

Confirm the configured network (net1 information was added).

<<Reference>> Setting an IPv6 Address 1/2

FUJITSU

Automatic setting of an IPv6 address

- When the text installer sets an IPv4 address after manual configuration of the network is selected, it automatically sets not only IPv4 but also IPv6 network interfaces and addresses.
- With the IPv4 settings by the ipadm command, not only IPv4 but also IPv6 network interfaces are set. However, an IPv6 address is not set.

✓ When set by the text installer

```
# ipadm show-addr
ADDROBJ   TYPE      STATE     ADDR
lo0/v4    static    ok        127.0.0.1/8
net0/v4   static    ok        10.20.8.100/16
lo0/v6    static    ok        ::1/128
net0/v6   addrconf  ok        fe80::214:4fff:fefa:bad/10
```

TYPE of the IPv6 address type is shown as addrconf (automatically set address).

If an IPv6 address is not set, select "None" in the network settings of the installer, and manually set the IP address after OS installation.

```
# ipadm create-ip net0
# ipadm create-addr -T static -a local=10.20.8.100/16
net0/v4
# ipadm show-addr
ADDROBJ   TYPE      STATE      ADDR
lo0/v4    static    ok         127.0.0.1/8
net0/v4   static    ok         10.20.8.100/16
lo0/v6    static    ok         ::1/128
```

An IPv6 address was not created.

<<Reference>> Setting an IPv6 Address 2/2

FUJITSU

How to delete an IPv6 address

- After OS installation, you can delete an IPv6 address that was automatically set during the OS installation.

✓ How to delete an IPv6 address and interface

Format: ipadm delete-addr [ADDROBJ]

```
# ipadm show-addr
ADDROBJ   TYPE      STATE     ADDR
lo0/v4    static    ok        127.0.0.1/8
net0/v4   static    ok        10.20.8.100/16
lo0/v6    static    ok        ::1/128
net0/v6   addrconf  ok        fe80::214:4fff:fefa:bad/10
#
# ipadm delete-addr net0/v6
#
# ipadm show-addr
ADDROBJ   TYPE      STATE     ADDR
lo0/v4    static    ok        127.0.0.1/8
net0/v4   static    ok        10.20.8.100/16
lo0/v6    static    ok        ::1/128
#
```

TYPE displays "addrconf" for this interface, whose address was automatically set.

Confirm that the IPv6 address has been deleted.

✓ Display format when the ifconfig or netstat command is executed

If you create a new /etc/default/inet_type file and set the default IP protocol, only the set protocol information appears.

```
# vi /etc/default/inet_type
DEFAULT_IP=IP_VERSION4
```

There are three configuration parameters:
- **DEFAULT_IP=IP_VERSION4**
- **DEFAULT_IP=IP_VERSION6**
- **DEFAULT_IP=BOTH**

<<Reference>> Network Interface Name

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Notational change of network interface names

- Network interfaces are managed with names like "netX" that are unrelated to the physical devices, instead of conventional names like "e100gX" and "fjgiX" that are dependent on the physical device.

✓ How to check interface names and physical device names (dladm)

Format: dladm show-phys

```
# dladm show-phys
LINK              MEDIA             STATE      SPEED      DUPLEX   DEVICE
net3              Ethernet          up         100        full     nxge3
net2              Ethernet          up         100        full     nxge2
net1              Ethernet          up         100        full     nxge1
net0              Ethernet          up         100        full     nxge0
```

The instance numbers "net0,1,..." are added according to the priority order of the physical device instance numbers. If the system is restarted while a physical device is removed, the correspondence relationship between "netX" and the physical device instance numbers is reset. Therefore, caution needs to be exercised at times of card expansion or configuration change.

✓ How to change an interface

You can change "netX" to an arbitrary name.

"net3" changes to "hogehoge3".

```
# dladm rename-link net3 hogehoge3
# dladm show-phys
LINK              MEDIA             STATE      SPEED      DUPLEX   DEVICE
hogehoge3         Ethernet          up         100        full     nxge3
net2              Ethernet          up         100        full     nxge2
net1              Ethernet          up         100        full     nxge1
net0              Ethernet          up         100        full     nxge0
```

FUJITSU

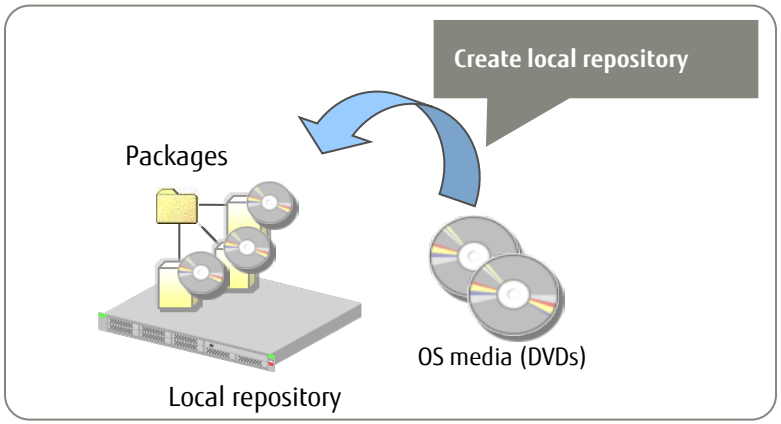
4. Creating and Registering a Local Repository

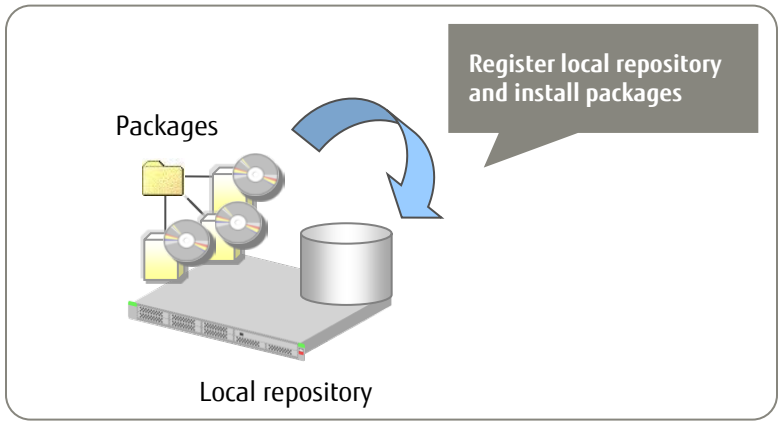
This chapter describes the procedure for building a repository to install additional packages (IPS packages) for Solaris in the local environment (local repository).
The chapter also describes the procedure for installing IPS packages from the local repository.

Flow of Creating and Registering a Local Repository

Build a repository server in the local environment.

- Preparation: Create a local repository area.
  - Create a disk area (file system) for the repository.
- Step 1: Create a local repository.
  - Create the local repository by using a repository image.
- Step 2: Register the local repository.
  - Register the created local repository as a publisher (package issuer) to prepare for IPS package installation.
- Step 3: Install IPS packages.
  - Install IPS packages from the local repository.





Preparation: Create a Local Repository Area

FUJITSU

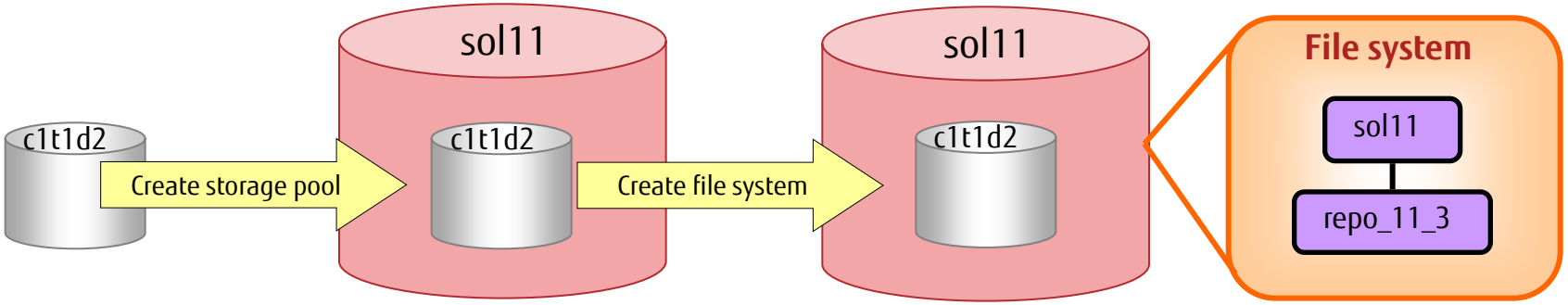
- Create a disk area (file system) for the repository.
  - Create a dedicated file system for deployment of the local repository data.

✓ Create a new file system.

[Format] zpool create *pool_name disk*
[Format] zfs create *option file_system_name*
[Option] –o compression: Sets a compression method. (* Not necessary)

```
# zpool create sol11 c1t1d2
# zfs create -o compression=on sol11/repo_11_3
```

Create an area (file system) for deploying a repository image.



* The mountpoint is the same as the file system name. It is created immediately under / (root).
The file system is automatically mounted there.

- You can reduce usage of the storage pool by enabling the compression option.
  * Amount used when creating a local repository in Solaris 11.3
  Option enabled: About 10.8 GB, Option disabled: About 11.8 GB

Step 1: Create a Local Repository 1/2

FUJITSU

- Create a local repository by using a repository image.

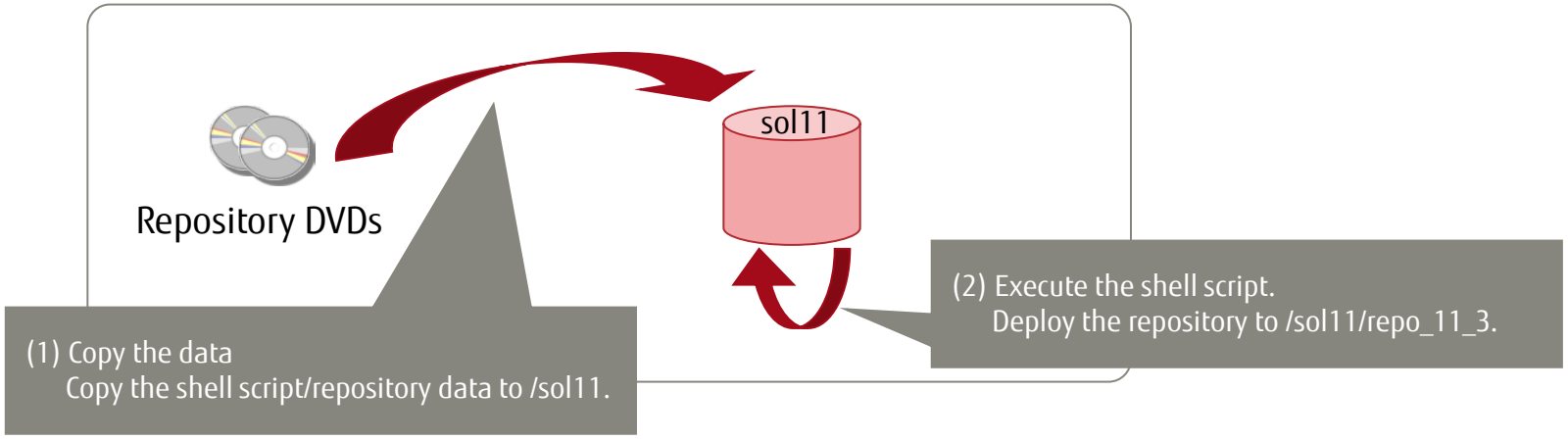
  Repository image used

  - Use the following repository DVDs contained in the Solaris 11.3 media pack:
    - IPS Repository Installation Guide (SPARC, x86) / IPS Repository (1/2) ... (1)
      - The contents include a shell script (install-repo.ksh) to create a repository, and compressed repository files.
    - IPS Repository (2/2) (SPARC, x86) ... (2)
      - The contents include compressed repository files.

  Flow of creating a local repository

  (1) Copy the data.

  (2) Execute the shell script.



Step 1: Create a Local Repository 2/2

FUJITSU

Creation procedure

(1) Copy the repository DVD data.

```
* Insert media (1) into DVD drive
# cp -p /media/V78247-01/* /sol11/          ... Copy of 1st DVD
# eject cdrom
* Insert media (2) into DVD drive
# cp -p /media/V78246-01/* /sol11/          ... Copy of 2nd DVD
```

→ For details on media (1) and (2), see "Step 1: Create a Local Repository 1/2."

(2) Unzip the archive files, and execute the shell script to create the repository.

[Format] install-repo.ksh -d *deployment_destination* *option*
[Option] -v: Diagnoses the repository directory.
-c: Compares the checksums of archive files.

```
# unzip /sol11/V78247-01.zip
# ls -l /sol11
total 16478153
-rw-r--r--   1 root     root        3922 10月  7日  05:12 README-zipped-repo.
-r-xr-xr-x   1 root     sys   1540097274 10月 27日  10:13 V78246-01_1of5.zip
-r-xr-xr-x   1 root     sys   1730669364 10月 27日  10:15 V78246-01_2of5.zip
-r-xr-xr-x   1 root     sys   1717187368 10月 27日  10:19 V78246-01_3of5.zip
-r-xr-xr-x   1 root     sys   1871913207 10月 27日  10:25 V78246-01_4of5.zip
-r-xr-xr-x   1 root     sys   1570373423 10月 27日  10:10 V78246-01_5of5.zip
-r-xr-xr-x   1 root     sys         6470 10月 27日  08:59 V78247-01.zip
-rwxr-xr-x   1 root     root       11612 10月  7日  05:12 install-repo.ksh
drwxr-xr-x   2 root     root           2  2月 24日  17:40 repo_11_3
-rw-r--r--   1 root     root         285 10月  8日  06:52 sol-11_3-repo_md5sums.txt
# ./install-repo.ksh -d /sol11/repo_11_3 -v -c
```

Repository data (5 files)

Shell script to create repository

Checksum file

* The -v and -c options are not necessary, but we recommend specifying them.

Step 2: Register the Local Repository 1/2

FUJITSU

- Configure the repository, and start the service.
  - ✓ Set the directory with the copied repository image.

```
# svccfg -s pkg/server setprop pkg/inst_root=/sol11/repo_11_3
```

Change the manifest/content storage directory.

  - ✓ Set whether to add packages to the repository.

```
# svccfg -s application/pkg/server setprop pkg/readonly=true
```

  - ✓ Start the service.

```
# svcadm enable application/pkg/server
# svcs -p application/pkg/server
```

Start the service, and apply the settings.

Step 2: Register the Local Repository 2/2

FUJITSU

- Register the local repository as a publisher (package issuer) to prepare for package installation.
  - ✓ Register a publisher (package issuer).

    [Format] pkg set-publisher *option*
    [Option] -G: Deletes a publisher (package issuer).
    -g: Registers a publisher (package issuer).

```
# pkg set-publisher -G http://pkg.oracle.com/solaris/release/ -g http://localhost/ solaris
```

Delete the default publisher (Oracle release repository), and register your own server as a publisher.

  - ✓ Confirm the registration of the publisher (package issuer).

```
# pkg publisher
PUBLISHER                       TYPE     STATUS   P   LOCATION
solaris                         origin   online   F   http://localhost/
```

Confirm that the local repository has been added.

  - ✓ <<Reference>> Delete a publisher (package issuer).

```
# pkg set-publisher -G http://localhost/ solaris
```

You can cancel the registration of the repository by using the -G option.

Step 3: Install IPS Packages

FUJITSU

- Install IPS packages from the local repository.
  - We recommend installing the following packages:
    - pkg://solaris/system/locale/extra
      This package is required for using a locale that cannot be selected at OS installation.
    - pkg://solaris/text/locale
      This package uses a product (MW) to support the gettxt command.

✓ Install the packages

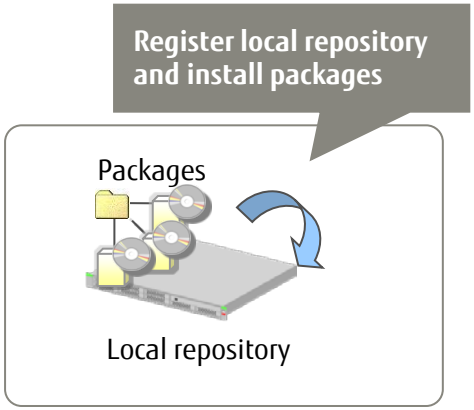
Install the packages with the pkg install command.

```
# pkg install pkg://solaris/system/locale/extra
# pkg install pkg://solaris/text/locale
```

✓ Confirm the installation and the number of packages.

```
# pkg list pkg://solaris/system/locale/extra
NAME (PUBLISHER)          VERSION                    IFO
system/locale/extra       0.5.11-0.175.2.0.0.42.2    i--
```

* IFO displays "i" for a successful installation.



- To uninstall packages
  -> See "<<Reference>> Uninstalling IPS Packages."

<<Reference>> Uninstalling IPS Packages

FUJITSU

IPS package uninstallation and confirmation

- Uninstall the packages by using the pkg uninstall command.

✓ Uninstall pkg://solaris/text/locale.

```
# pkg uninstall pkg://solaris/text/locale
            Packages to remove:  1
       Create boot environment: No
Create backup boot environment: No

PHASE                                          ITEMS
Removing old actions                           67/67
Updating package state database                 Done
Updating package cache                           1/1
Updating image state                            Done
Creating fast lookup database                   Done
Updating package cache                           1/1
```

The number of packages to be uninstalled is displayed.

✓ Confirm after uninstallation.

```
# pkg list pkg://solaris/text/locale
pkg list: No packages matching 'pkg://solaris/text/locale'
installed
```

Confirm that uninstallation is successful.

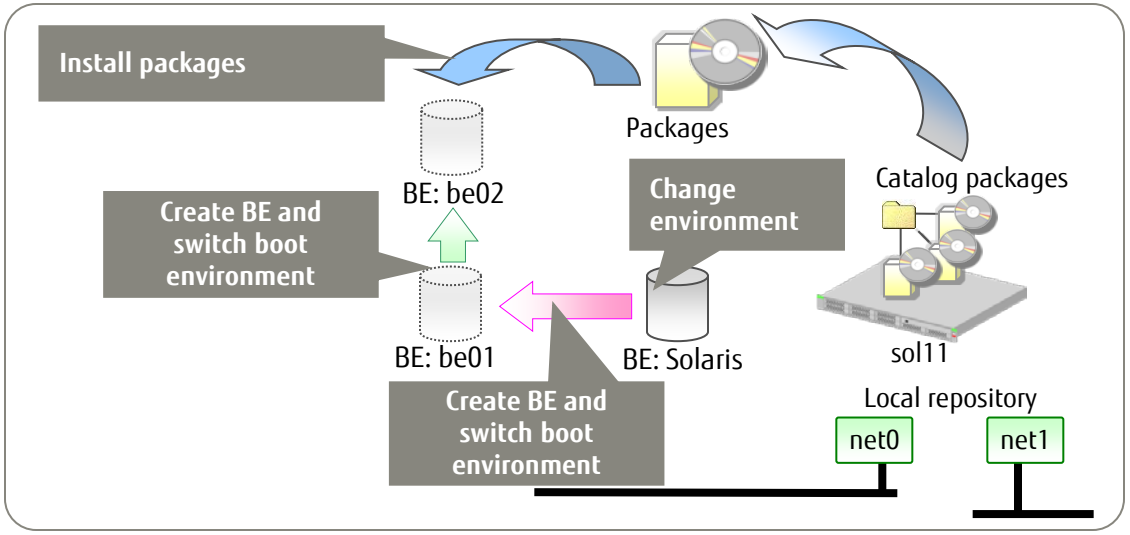
FUJITSU

5. Operating and Utilizing a Boot Environment(BE)

This chapter describes basic methods of BE operation and the procedure for creating and utilizing a BE.

Overview of Operating and Utilizing a Boot Environment (BE)

- Basic methods of BE operation
  - The next page presents the main commands used.
- Restoring an environment using a BE
  - Create a BE (be01) for restoring the environment. After changing the OS (Solaris) environment, restore the environment with the BE.
- Package application using a BE
  - Create a test BE (be02), and install the IPS packages on be02.



- You can check the bootable BEs on OBP, and then select and boot the BE to be used.
  -> See "<<Reference>> Selecting and Booting a BE."
- A BE may be automatically created when a package is installed/uninstalled.
  -> See "<<Reference>> Automatically Creating a BE at Package Installation."

Basic Methods of BE Operation

FUJITSU

This section presents commands used for BE operation.

- ✓ Create (create) and check (list) a boot environment.

```
# beadm create be00
# beadm list
BE      Flags Mountpoint Space  Policy Created
--      ----- ---------- -----  ------ -------
be00    -     -          96.33M static 2016-02-26 14:09
solaris NR    /          3.40G  static 2016-02-25 11:57
```

Create the BE (be00) replicating the current environment.

- ✓ Select a boot environment for the next start time (activate).

```
# beadm activate be00
# beadm list
BE      Flags Mountpoint Space Policy Created
--      ----- ---------- ----- ------ -------
be00    R     -          3.58G static 2016-02-26 14:09
solaris N     /          51.0K static 2016-02-25 11:57
```

"R" appears as the Active value.

The system boots with the be00 environment at the next start time.

- ✓ Mount a boot environment (mount).

```
# beadm mount be00 /mnt
# beadm list
BE      Flags Mountpoint Space Policy Created
--      ----- ---------- ----- ------ -------
be00    R     /mnt       3.58G static 2016-02-26 14:09
solaris N     /          51.0K static 2016-02-25 11:57
```

"/mnt" appears as the Mountpoint value.

You can check the details of the boot environment at /mnt.

- ✓ Remove a boot environment (destroy).

```
# beadm destroy be00
```

Restoring an Environment Using a BE

FUJITSU

- In advance, create a BE (be01) for restoring the environment.
- After changing the OS (Solaris) environment (creating a test file, in this example), restore the environment by using be01.

(1) Create be01.

```
# beadm create be01
```

(2) Create a test file.

```
# touch /root/testfile1
# ls -l /root
total 1
-rw-r--r--   1 root   root   0 Feb 26 16:26 testfile1
```

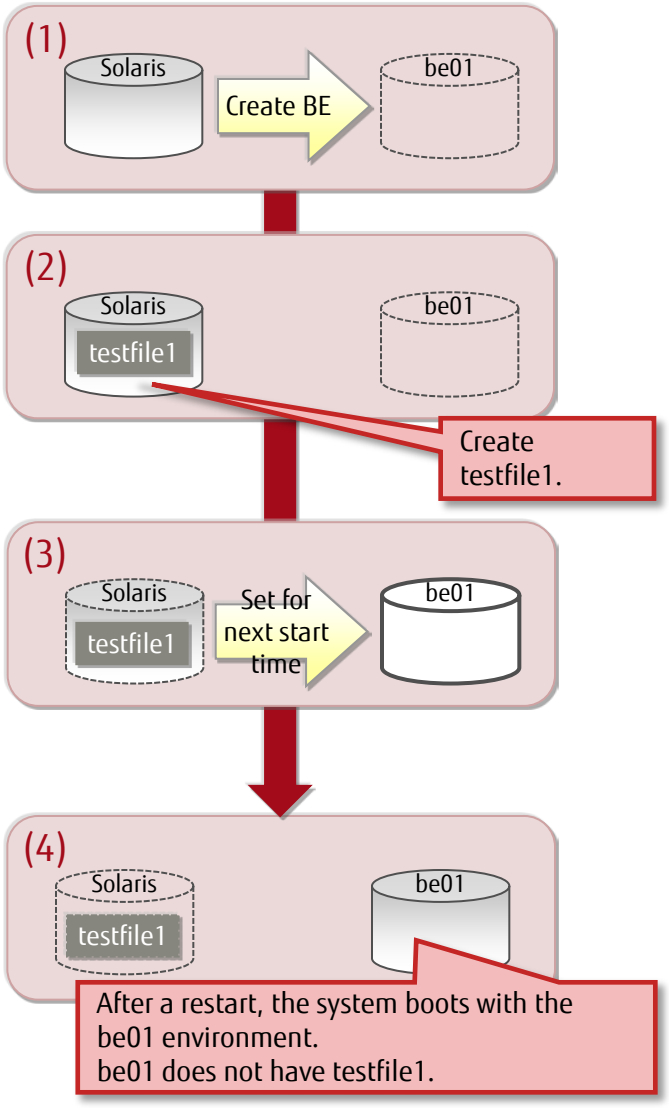
(3) Activate be01.

(Set it as the boot environment for the next start time.)

```
# beadm activate be01
# beadm list
BE      Flags Mountpoint Space   Policy Created
--      ----- ---------- -----   ------ -------
be01    R     -          3.63G   static 2016-02-26 16:08
solaris N     /          36.96M static 2016-02-25 11:57
```

(4) Restart the server, and check the test file

```
# shutdown -y -g0 -i6
--<Omitted>--
# beadm list
BE      Flags Mountpoint Space   Policy Created
--      ----- ---------- -----   ------ -------
be01    NR    /          3.64G   static 2016-02-26 16:08
solaris -     -          37.06M static 2016-02-25 11:57
# ls -l /root
total 0
```



Package Application Using a BE 1/3

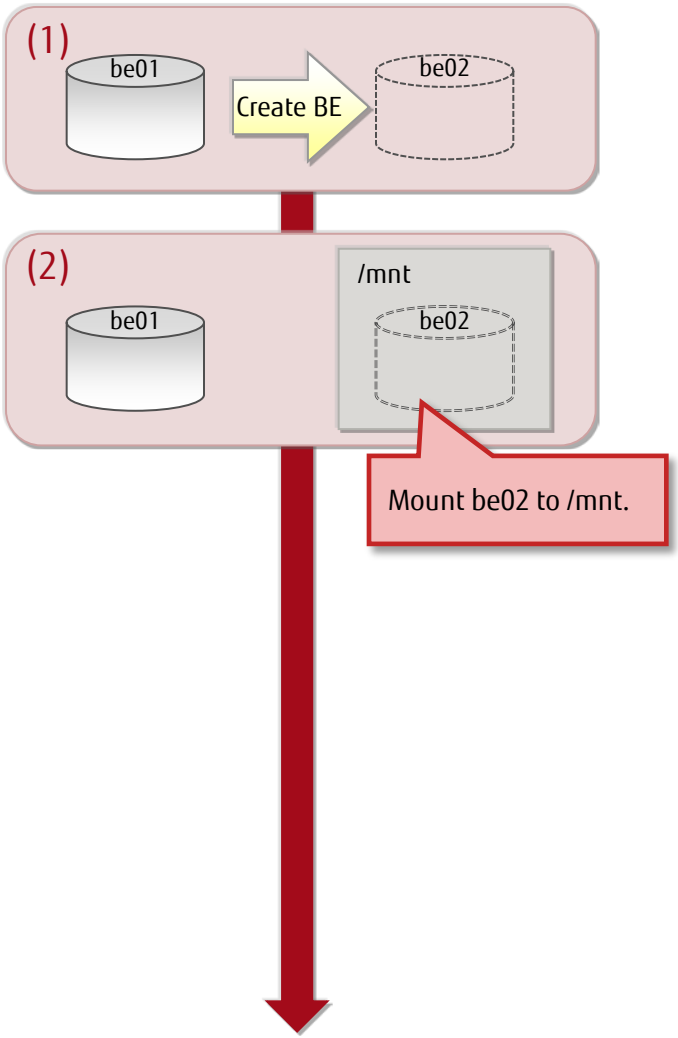
- Create a test BE (be02).
- Install IPS packages on be02, and confirm package application.

(1) Create be02.

```
# beadm create be02
```

(2) Mount be02.

```
# beadm mount be02 /mnt
# beadm list
BE      Flags Mountpoint Space   Policy Created
--      ----- ---------- -----   ------ -------
be01    NR    /          3.64G   static 2016-02-26 16:08
be02    -     /mnt       96.21M  static 2016-02-27 14:15
solaris -     -          37.06M  static 2016-02-25 11:57
```



Package Application Using a BE 2/3

FUJITSU

(3) Apply packages to be02.

```
# pkg -R /mnt install gcc-3
Packages to install: 2
 Services to change: 1

DOWNLOAD                                PKGS         FILES
XFER (MB)   SPEED
Completed                               2/2      2010/2010
35.0/35.0  4.3M/s

PHASE                                          ITEMS
Installing new actions                     2216/2216
Updating package state database                 Done
Updating package cache                           0/0
Updating image state                            Done
Creating fast lookup database                   Done
Updating package cache                           1/1
```

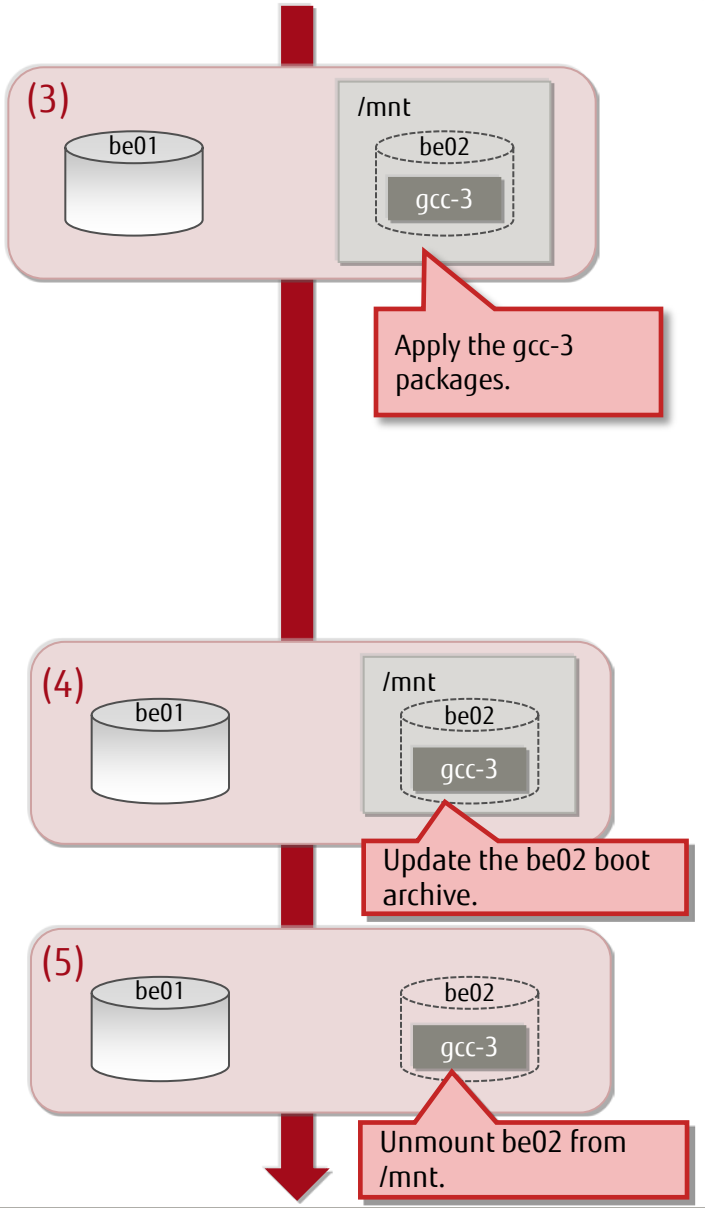
(4) Update the be02 boot archive.

```
# bootadm update-archive -R /mnt
```

* The boot archive needs to be reconfigured when the files in the archive are updated.

(5) Unmount be02.

```
# beadm unmount be02
```



Package Application Using a BE 3/3

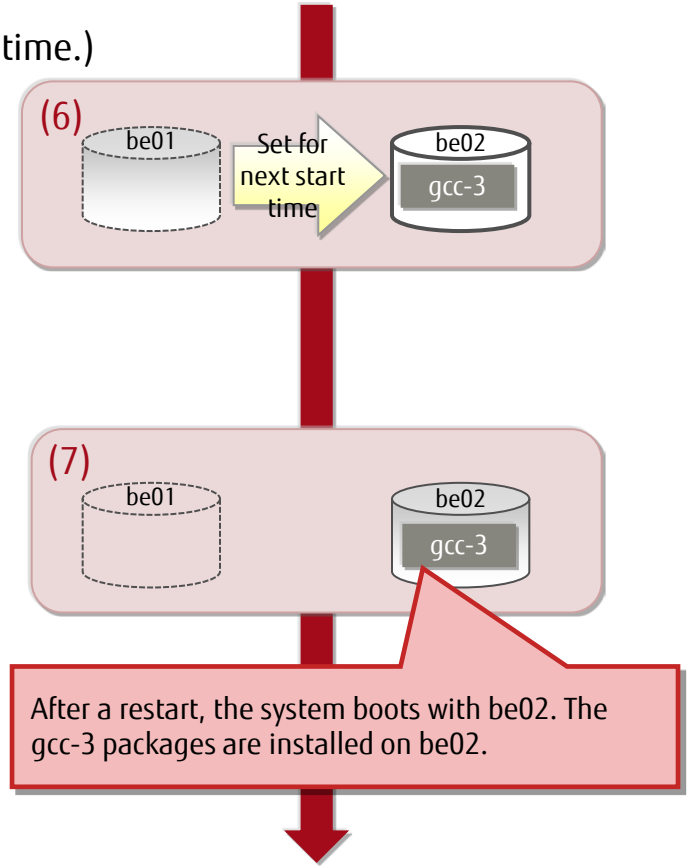
FUJITSU

(6) Activate be02. (Set it as the boot environment for the next start time.)

```
# beadm activate be02
# beadm list
BE      Flags Mountpoint Space  Policy Created
--      ----- ---------- -----  ------ -------
be01    N     /          522.0K static 2016-02-26 16:08
be02    R     -          4.03G  static 2016-02-27 14:15
solaris -     -          37.06M static 2016-02-25 11:57
```

(7) Restart the OS, and check the packages.

```
# shutdown -y -g0 -i6
--<Omitted>--
# beadm list
BE      Flags Mountpoint Space  Policy Created
--      ----- ---------- -----  ------ -------
be01    -     -          6.26M  static 2016-02-26 16:08
be02    NR    /          4.11G  static 2016-02-27 14:15
solaris -     -          37.06M static 2016-02-25 11:57
# pkg list gcc-3
NAME (PUBLISHER)       VERSION                    IFO
developer/gcc-3        3.4.3-0.175.3.0.0.30.0     i--
```



- By reactivating the BE (be01) used before the switching of the boot environment, you can restore the environment to the state before the packages were installed.

<<Reference>> Selecting and Booting a BE

FUJITSU

- Check the bootable BEs on OBP, and then select and boot the BE to be used.
  - This example selects a BE (be02) and then boots from be02.

✓ Check the bootable BEs.

```
{0} ok boot -L
-<Omitted>-
1 Oracle Solaris 11.3 SPARC
2 be01
3 be02
Select environment to boot: [ 1 - 3 ]: 3

To boot the selected entry, invoke:
boot [<root-device>] -Z rpool/ROOT/be02

{0} ok boot -Z rpool/ROOT/be02
```

Bootable BEs displayed

(1) The displayed format shows booting from the selected BE.

(2) The system boots from the BE (be02).

✓ Confirm the BE (be02).

```
# beadm list
BE      Flags Mountpoint Space   Policy Created
--      ----- ---------- -----   ------ -------
be01    R     -          3.94G   static 2016-03-02 16:19
be02    N     /          391.87M static 2016-03-02 17:13
solaris -     -          6.95M   static 2016-03-01 18:20
```

Confirm that the current BE (Active column: N) is be02.

- The BE started by boot -Z is temporarily the active one. To start from the selected BE after a restart, you need to activate the selected BE with the beadm activate command.

<<Reference>> Automatically Creating a BE at Package Installation

FUJITSU

- A BE or backup BE may be automatically created when a package is installed/uninstalled.
  - Normally, a BE is created when a module, such as a kernel module or driver, that requires a reboot is included.

```
# pkg install pkg:/group/system/solaris-desktop
           Packages to install: 339
            Services to change:  13
       Create boot environment:  No
Create backup boot environment: Yes
-<Omitted>-
# beadm list
BE             Flags Mountpoint Space   Policy Created
--             ----- ---------- -----   ------ -------
be01           NR    /          7.37G   static 2016-12-02 16:51
be01-backup-1  -     -          97.14M  static 2016-12-02 17:01
```

A backup BE is automatically created, and the packages are installed on the current BE.

Automatically created backup BE

```
# pkg uninstall pkg://solaris/system/locale/extra
            Packages to remove:  1
            Services to change:  1
      Create boot environment: Yes
Create backup boot environment: No
-<Omitted>-
# beadm list
BE               Flags Mountpoint Space   P
--               ----- ---------- -----   ------ -------
be01             N     /          39.0K   static 2016-11-15 05:08
be01-1           R     -          10.32G  static 2016-11-15 05:34
```

A BE is automatically created, and the package is uninstalled from the BE.

A restart is required for activating the automatically created BE.

FUJITSU

6. Applying an Update Package (SRU)

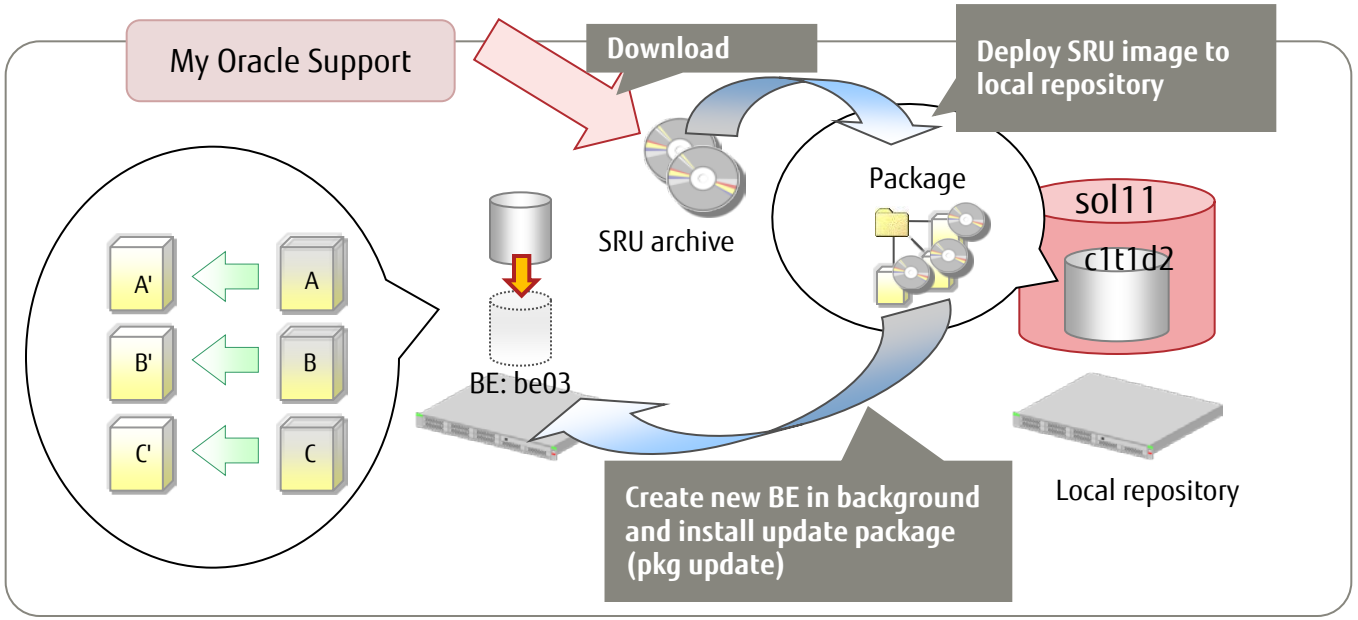
This chapter describes the procedure for updating the local repository package with an update package (SRU).
Based on the updated package, modifications are applied to the OS package.

Flow of Applying an Update Package (SRU)

FUJITSU

Update the local repository package with an SRU, and apply modifications based on the updated package to the OS package.

- Step 1: Update the local repository package.
  - Update the local repository package based on the SRU archive downloaded from My Oracle Support.
- Step 2: Apply the update package (SRU).
  - Use the pkg update command to apply the modifications of the installed package to the OS .

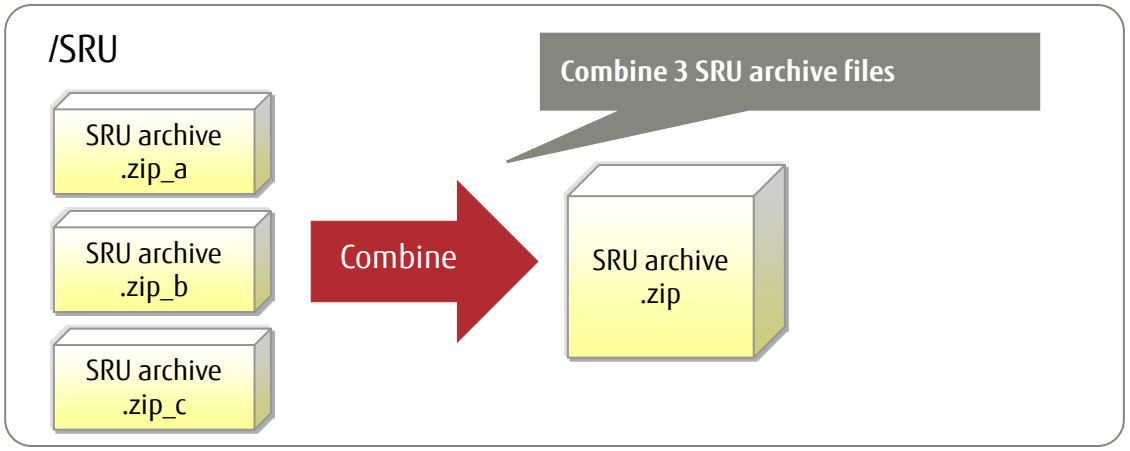


- To upgrade the OS version (such as from 11.2 to 11.3), use the IPS repository (full repository) of an update release not included in an SRU but in a Solaris 11 media pack.

Step 1: Update the Local Repository Package 1/2

FUJITSU

- Download and combine the archive files from My Oracle Support.



✓ Combine archive files.

```
# ls -l /SRU
total 4755909
-rw-r--r--   1 5001     5000     1073741824 Apr  1  2015 SRU15121.zip_a
-rw-r--r--   1 5001     5000     1073741824 Apr  1  2015 SRU15121.zip_b
-rw-r--r--   1 5001     5000     285668346  Apr  1  2015 SRU15121.zip_c
# cat SRU15121.zip_a SRU15121.zip_b SRU15121.zip_c > SRU15121.zip
```

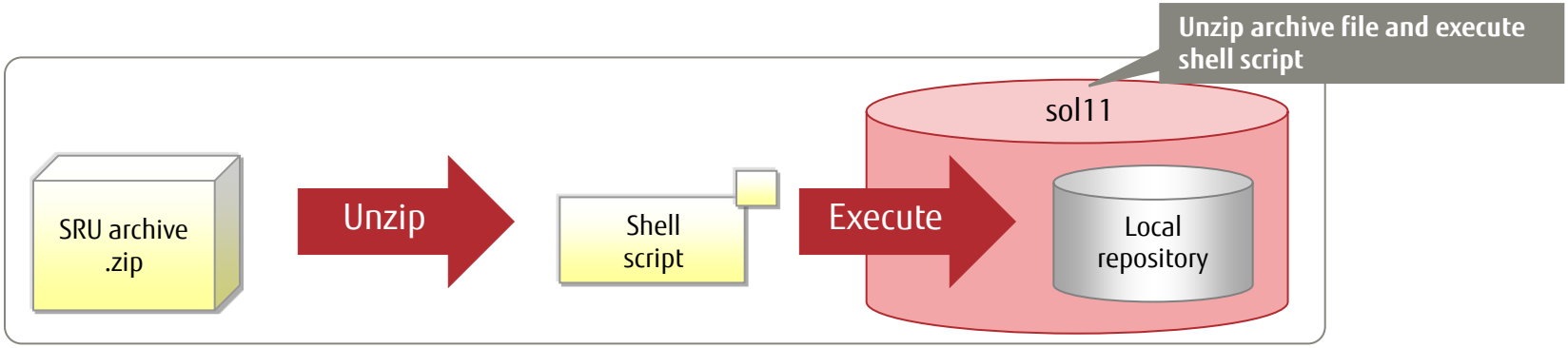
Combined SRU archive file

- The number of split archive files varies depending on the SRU version. In this example, the archive is split into three files.

Step 1: Update the Local Repository Package 2/2

FUJITSU

Update the local repository package based on the SRU archive.



✓ Unzip the SRU archive file, and execute the shell script.

[Format] install-repo.ksh –d *deployment_destination option*
[Option] -v: Diagnoses the repository directory.
-c: Compares the checksums of archive files.

```
# unzip /SRU/SRU15121.zip
# ls -l
--<Omitted>--
-rwxr-xr-x 1 root root      11612 Dec 15 05:21 install-repo.ksh
-rw-r--r-- 1 root root 1272657355 Dec 16 09:05 p22288085_1100_SOLARIS64_1of2.zip
-rw-r--r-- 1 root root 1160457100 Dec 16 9:14 AM p22288085_1100_SOLARIS64_2of2.zip
-rw-r--r-- 1 root root      55896 Dec 16 06:15 readme-11_3_3_6_0.html
-rw-r--r-- 1 root root      39214 Dec 16 06:15 readme-11_3_3_6_0.txt
-rw-r--r-- 1 root root        136 Dec 15 05:25 sol-11_3_3_6_0-incr-repo_md5sums.txt
# chmod +x install-repo.ksh
# env LANG=C ./install-repo.ksh -d /sol11/repo_11_3 -v -c
```

Shell script for installation

Repository data

Checksum file

* The -v and -c options are not necessary, but we recommend specifying them.

Step 2: Apply the Update Package (SRU)

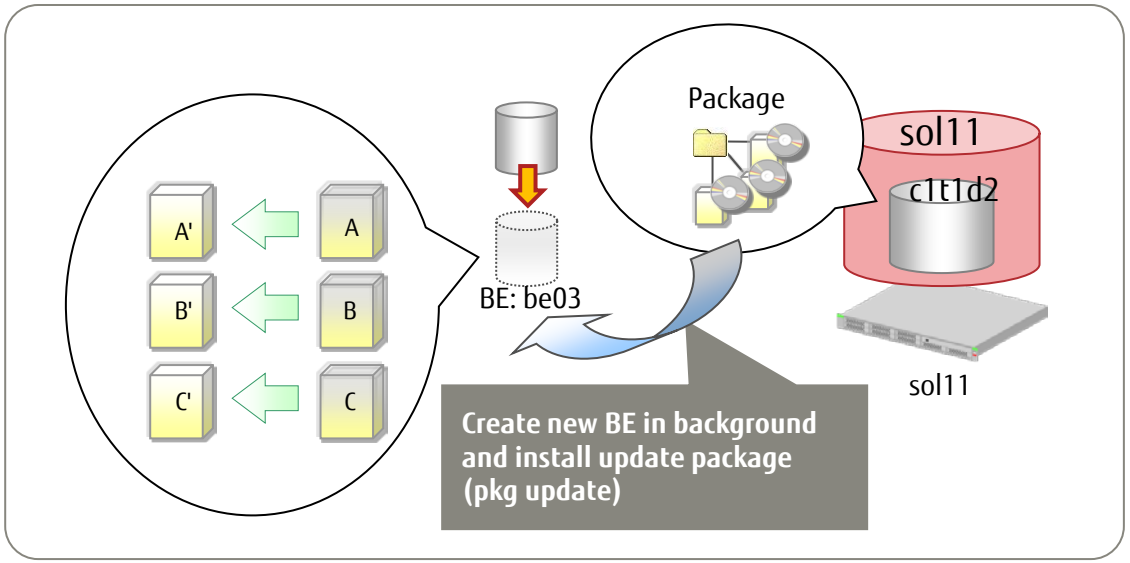
FUJITSU

- Use the pkg update command to apply the modifications of the installed package to the OS.
  - The update package contained in the SRU replaces the current package.
  - The update package is applied to the new automatically created BE.

✓ Install the update package (pkg update).

```
# pkg update --be-name be03
# shutdown -y -g0 -i6
```

Create a new be03, and install the update package on be03.



* If the command is executed without a BE name specified in an option (--be-name), a BE name is automatically assigned.

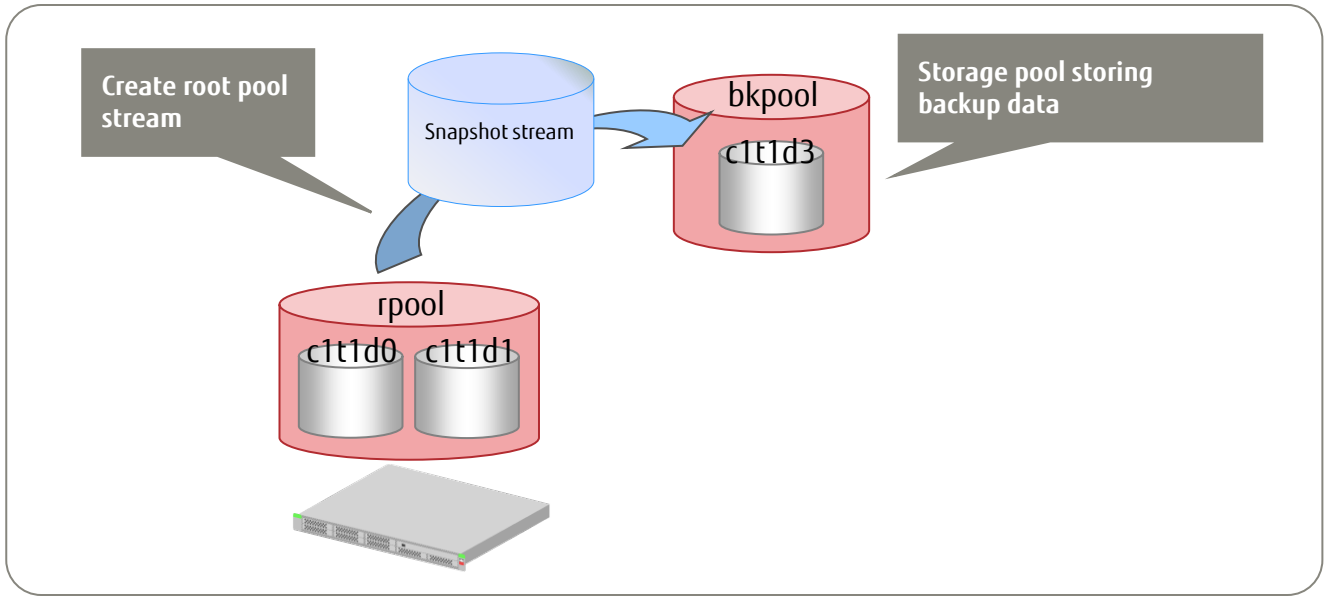
- A confirmation message asking whether you agree to the update package may appear when you execute the pkg update command. If so, execute the pkg update command with the -accept option.

7. Backing Up/Restoring the System Volume

This chapter describes the procedure for backing up/restoring the system environment. You can also use the ZFS standard functions to back up/restore the system environment.

Flow of Backing Up the System Volume

- Step 1: Obtain system information. (Preparation)
  - Record environment setting information, including the OS and SRU versions and file system properties.
- Step 2: Create a ZFS snapshot.
  - Create a ZFS snapshot of the root pool (rpool).
- Step 3: Create a root pool stream.
  - Create a root pool stream (backup data) based on the ZFS snapshot created in step 2. At the same time, store the archive files in a backup area.



Step 1: Obtain System Information (Preparation) 1/2

FUJITSU

- Obtain system information before creating backup data, for confirmation after restore.
  - ✓ Check system information.

```
# uname -a
SunOS sol11 5.11 11.3 sun4v sparc SUNW,T5240
```

  - ✓ Confirm the SRU version.

```
# pkg info entire
Name: entire
       Summary: entire incorporation including Support Repository
Update (Oracle Solaris 11.3.3.6.0).

--<Omitted>--
```

  - ✓ Check BEs.

```
# beadm list
BE                Active Mountpoint Space    Policy Created
--                ------ ---------- -----    ------ -------
be01              -      -          7.44M    static 2014-09-26 23:04
be02              -      -          269.11M  static 2014-09-26 23:56
be03              NR     /          6.31G    static 2014-09-27 00:56
solaris           -      -          6.58M    static 2014-09-26 01:25
solaris-backup-1  -      -          178.0K   static 2014-09-26 20:23
```

Check the BE (be03) currently used.

Step 1: Obtain System Information (Preparation) 2/2

FUJITSU

- ✓ Check the storage pool status.

```
# zpool status
--<Omitted>--

        NAME                    STATE     READ WRITE CKSUM
        rpool                   ONLINE       0     0     0
          mirror-0              ONLINE       0
            c1t1d0s0            ONLINE       0
            c1t1d1s0            ONLINE       0

errors: No known data errors
```

Check each storage pool disk (cXtXdXsX) and the RAID configuration (mirror configuration in this example).

- ✓ Check property information.

```
# zpool get all rpool
# zfs get all rpool/ROOT
# zfs get all rpool/ROOT/be01
--<Omitted>--
# zfs get all rpool/dump
# zfs get all rpool/swap
```

Obtain property information in advance because it will be needed after restore.
* The property information for the dump and swap areas must be confirmed because they are re-created after restore.

Step 2: Create a Snapshot

FUJITSU

- Create a snapshot of the system volume (rpool: root pool) for making a backup.

  ✓ Create a snapshot.

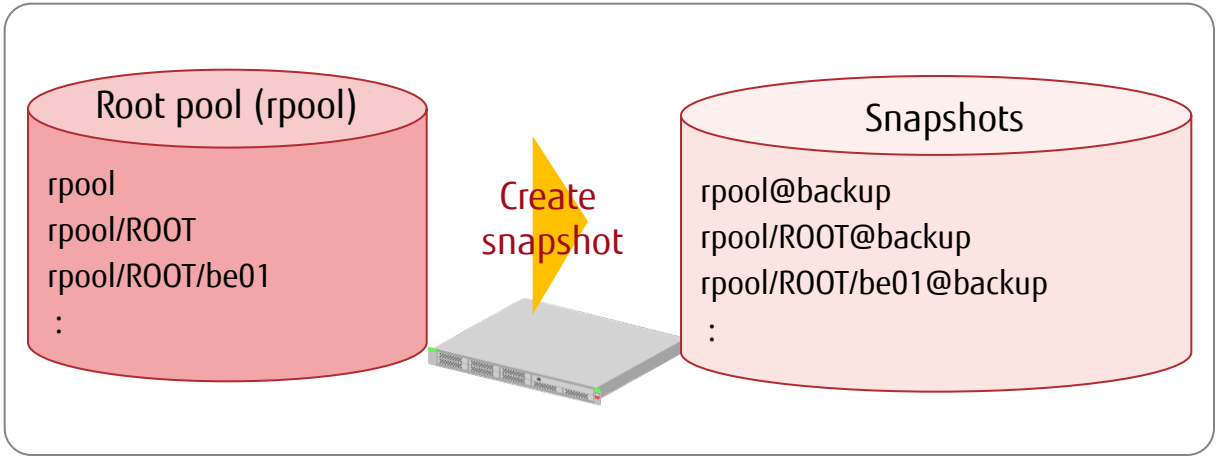
  [Format] zfs snapshot *option* <*file_system@snap_name*|*volume@snap_name*>
  [Option] -r: Creates a ZFS snapshot of everything under the volume.

```
# zfs snapshot -r rpool@backup
```

  ✓ Delete the snapshots of the dump and swap areas.

```
# zfs destroy rpool/dump@backup
# zfs destroy rpool/swap@backup
```

The dump and swap areas are used temporarily, so they do not need to be saved.



Step 3: Create a Root Pool Stream 1/2

FUJITSU

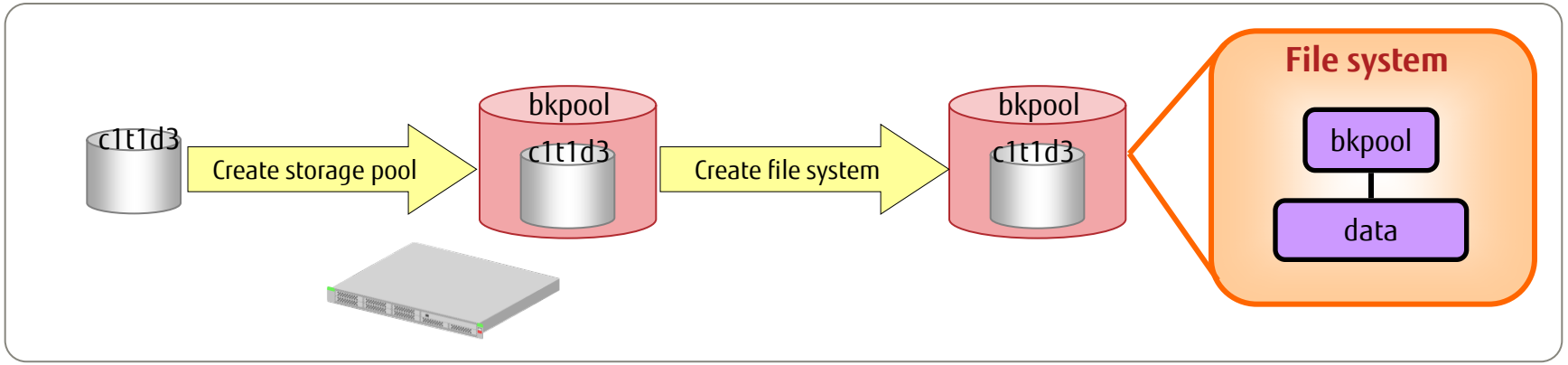
- Prepare the area (file system) for storing backup data (snapshot streams).

✓ Create a storage pool.

```
# zpool create bkpool c1t1d3
```

✓ Create a file system.

```
# zfs create bkpool/data
```



* The mountpoint is the same as the file system name. It is created immediately under / (root).
The file system is automatically mounted there.

- Here, a disk in the same server is used as the backup area. Normally, however, we recommend storing the backup data in a separate chassis (backup server, external storage device, etc.).

Step 3: Create a Root Pool Stream 2/2

FUJITSU

- Send the system environment (rpool: root pool) snapshot created in step 2 to the storage pool for storing backup data, and store snapshot streams.

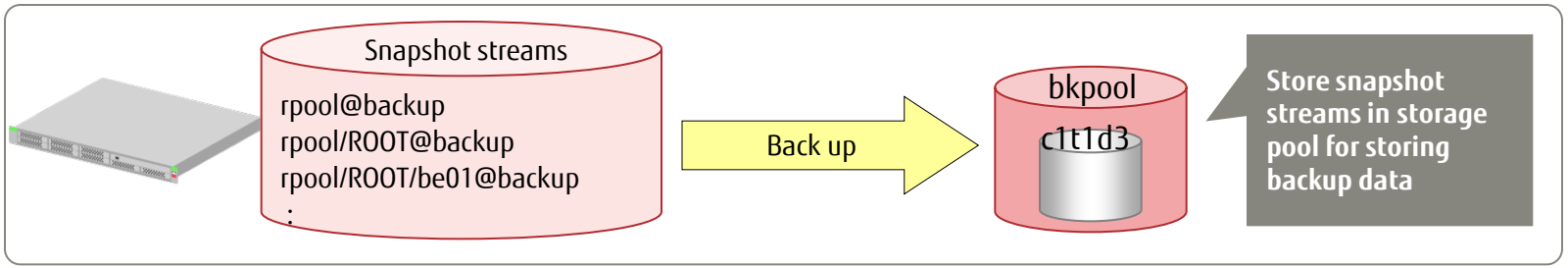
  ✓ Send snapshot streams.

  [Format] zfs send *option <snap shot>*

  [Option] -R: Outputs streams of everything under the volume.
  -v: Displays detailed information about the generated stream package.

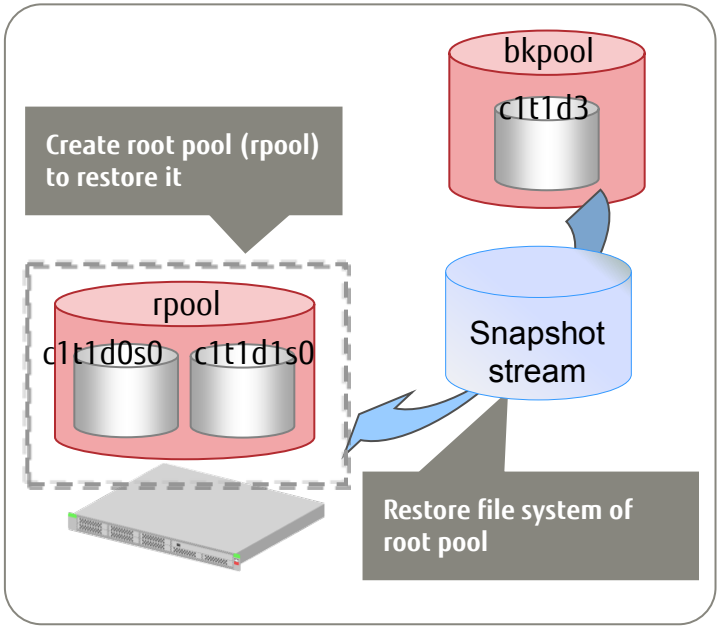
```
# zfs send -Rv rpool@backup |gzip > /bkpool/data/archive.zfs.gz
WARNING: could not send rpool/swap@backup: does not exist
WARNING: could not send rpool/dump@backup: does not exist
sending full stream to rpool@backup
sending full stream to rpool/VARSHARE@backup
sending full stream to rpool/VARSHARE/pkg@backup
sending full stream to rpool/VARSHARE/pkg/repositories@ba
sending full stream to rpool/VARSHARE/zones@backup
sending full stream to rpool/export@backup
sending full stream to rpool/export/home@backup
sending full stream to rpool/export/home/user01@backup
-<Omitted>-
```

"WARNING" may be output when the dump and swap areas have been deleted beforehand. If so, ignore it.



Flow of Restoring the System Volume

- Prepare as follows before beginning the restore.
  - Confirm the OS backup data by any appropriate means.
- Step 1: Create a root pool.
  - Specify the disk for restoring the OS, and create a root pool (rpool).
- Step 2: Restore the file system of the root pool.
  - Restore the file system in the root pool by using the ZFS stream reception function.
- Step 3: Set the boot block.
  - Set the boot block for the root pool.
- Step 4: Start the OS in the restored environment
  - Start the OS in the restored root pool.
- Step 5: Confirm the system information after restore
  - Confirm that the OS environment setting values match those of the backup.



Step 1: Create a Root Pool

FUJITSU

- Create a root pool (rpool) for the restored system on the same disk used for the backup.

  Creation procedure

  (1) Start the OS with a DVD boot from OS media (DVDs) or with a network boot.

  (2) Import an rpool from backup data.

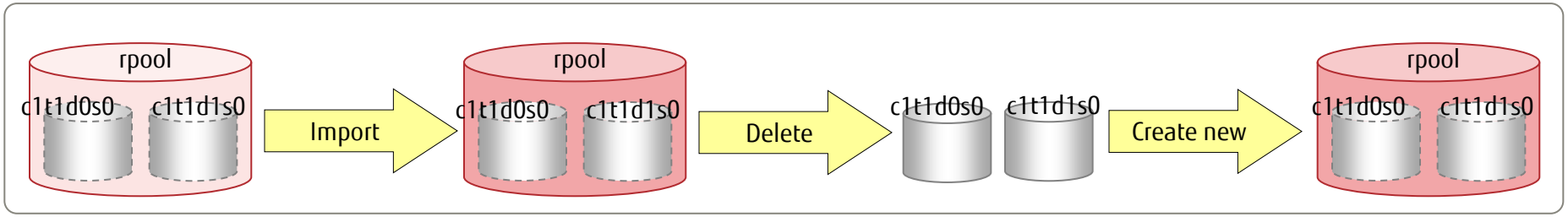
  (3) Delete the imported rpool once.

  (4) Create an rpool with the same disk configuration again.

  - If an rpool already exists, import one for the time being. After deleting the existing rpool, create one again.
  - If an rpool does not already exist, such as because a disk was replaced due to a physical failure, set disk partitioning and then create an rpool.

✓ Create a new rpool.

```
# zpool create rpool mirror c1t1d0s0 c1t1d1s0
```



Step 2: Restore the File System of the Root Pool

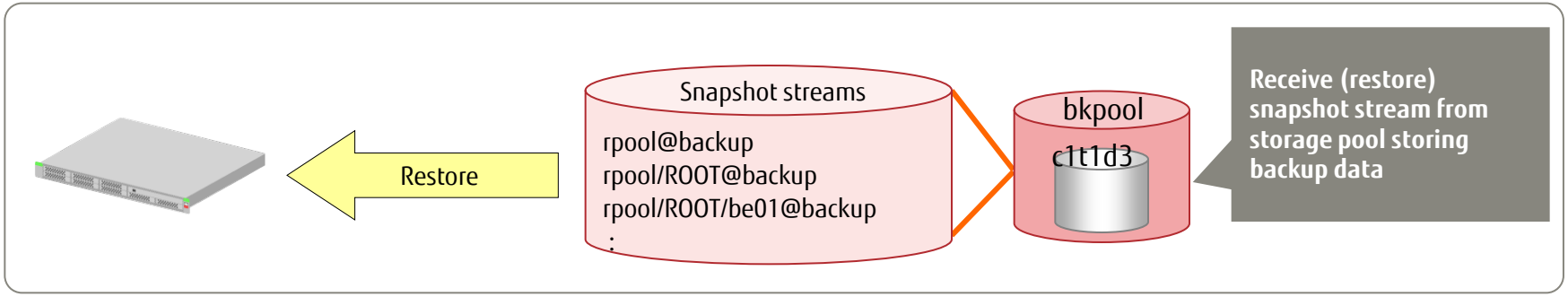
FUJITSU

- Receive (restore) a snapshot stream from the storage pool storing backup data.
  - After the restore, re-create the dump and swap areas by referencing the information obtained in the preparation for backup.
    -> For details on the preparation for backup, see "Step 1: Obtain System Information (Preparation) 2/2."

✓ Receive the ZFS snapshot stream.

[Format] zfs receive *option <file_system>*
[Option] -v: Outputs detailed information about the stream and the time taken for the receive operation.
-F: Forcibly rolls back the file system from the latest snapshot.

```
# gzcat /mnt/archive.zfs.gz | zfs receive -vF rpool
receiving full stream of rpool@backup into rpool@backup
received 91.8KB stream in 4 seconds (22.9KB/sec)
receiving full stream of rpool/ROOT@backup into rpool/ROOT@backup
-<Omitted>-
found clone origin rpool/ROOT/be03/var@backup
receiving incremental stream of rpool/ROOT/solaris/var@backup into
rpool/ROOT/solaris/var@backup
received 4.17MB stream in 7 seconds (610KB/sec)
```



Step 3: Set the Boot Block

FUJITSU

Set the boot block (program used at OS boot).

- After mounting the BE confirmed in the preparation for backup, set the boot block.
  → For details on the preparation for backup, see "Step 1: Obtain System Information (Preparation) 1/2."

✓ Mount the BE.

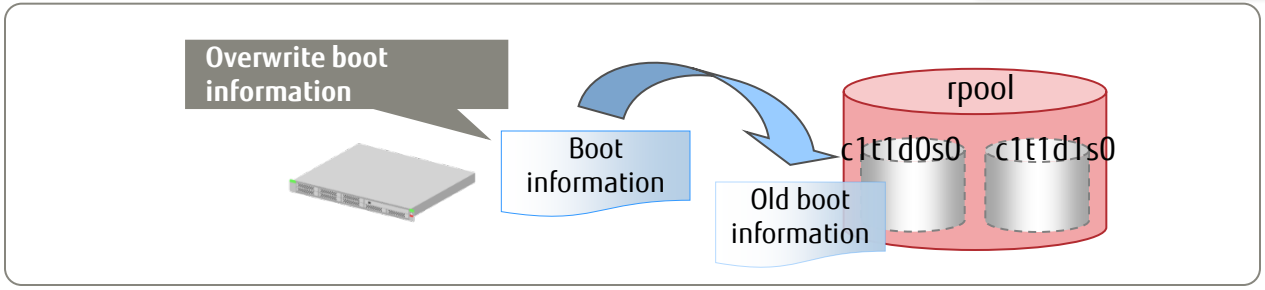
```
# beadm mount be03 /tmp/mnt
# beadm list
be_find_current_be: failed to find current BE name
BE                 Active Mountpoint    Space      Policy Created
--                 ------ ----------    -----      ------ -------
be01               -      -             6.15M      stati
be02               -      -             220.87M    stat
be03               -      /tmp/mnt      4.23G      static 2012-11-28 07:13
solaris        -       -             8.89M      static 2012-11-28 07:27
solaris-backup-1   -      -             153.0K     static 2012-11-28 07:27
```

Mount the BE (be03) confirmed during backup.

✓ Set the boot block.

```
# bootadm install-bootloader -P rpool
# devfsadm -Cn -r /tmp/mnt
# touch /tmp/mnt/reconfigure
```

Write boot information to the rpool.
If boot information from the backup source remains, overwrite the boot information by specifying the -f option.



Step 4: Start the OS in the Restored Environment

FUJITSU

- Activate the restored BE (be03) to restart the OS.
  - Activate the BE, and set the OS to start in the be03 environment at the next start time.
  - Export the root pool (rpool), and confirm the OBP start disk.

✓ Activate be03.

```
# beadm activate be03
be_find_current_be: failed to find current BE name
be_find_current_be: failed to find current BE name
# beadm list
be_find_current_be: failed to find current BE name
BE                Active Mountpoint Space   Policy Created
--                ------ ---------- -----   ------ -------
be01              -      -          7.26M   static 2014-09-29 15:58
be02              -      -          268.75M static 2014-09
be03              R      -          6.31G   static 2014-0
solaris           -      -          6.41M   static 2014-09-29 15:58
solaris-backup-1  -      -          176.0K  static 2014-09-29 15:58
```

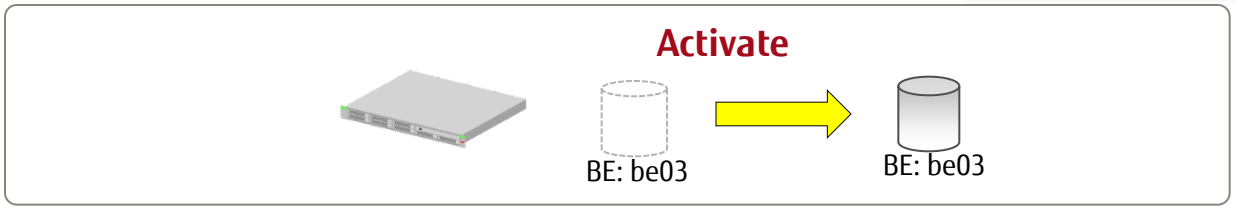
Confirm that be03 is activated.

✓ Check OBP.

```
# eeprom boot-device
boot-device=disk0 disk1
# eeprom auto-boot?
auto-boot?=false
```

disk0 and disk1 are the alias names of the system volume.

Confirm that the set value is "false" so that the OS does not automatically start up at power-on.



Step 5: Confirm the System Information After Restore 1/2

FUJITSU

- In a comparison with the information obtained in the preparation for backup, confirm that the restored environment has the same information as the backup.

  → For details on the preparation for backup, see "Step 1: Obtain System Information (Preparation) 1/2" and "Step 1: Obtain System Information (Preparation) 2/2."

✓ Display system information.

```
# uname -a
SunOS sol11 5.11 11.3 sun4v sparc SUNW,T5240
```

Confirm that "11.3" is the same as the version in the system information from the preparation.

✓ Confirm the SRU version.

```
# pkg info entire
Name: entire
       Summary: entire incorporation including Support Repository Update
(Oracle Solaris 11.3.3.6.0).

--<Omitted>--
```

Confirm that "3.6" is the same as the SRU version from the preparation.

✓ Check BEs.

```
# beadm list
BE                Active Mountpoint Space    Policy Created
--                ------ ---------- -----    ------ -------
be01              -      -          7.26M    static 9/30/2014 12:58 AM
be02              -      -          268.75M  static 9/30/2014 12:57 AM
be03              NR     /          6.37G    static 20
solaris           -      -          6.41M    static 9/
solaris-backup-1  -      -          176.0K   static 9/
```

Confirm that be03 is the same BE that was active during the preparation.

Step 5: Confirm the System Information After Restore 2/2

FUJITSU

- ✓ Check the storage pool status.

```
# zpool status
-<Omitted>-

        NAME          STATE     READ WRITE CKSUM
        rpool         ONLINE    0    0     0
          mirror-0    ONLINE    0    0     0
            c1t1d0s0  ONLINE    0    0     0
            c1t1d1s0  ONLINE    0    0     0

errors: No known data errors
```

Confirm that the mirror disk configuration is the same as during the preparation.

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Appendix

Related Documents

Installation of Oracle Solaris 11.3 Systems (Oracle)
http://docs.oracle.com/cd/E53394_01/html/E54756/index.html

Copying and Creating Package Repositories in Oracle Solaris 11.3 (Oracle)
http://docs.oracle.com/cd/E53394_01/html/E54747/index.html

Creating and Administering Oracle Solaris 11.3 Boot Environments (Oracle)
http://docs.oracle.com/cd/E53394_01/html/E54749/index.html

Revision History

Edition	Date	Description
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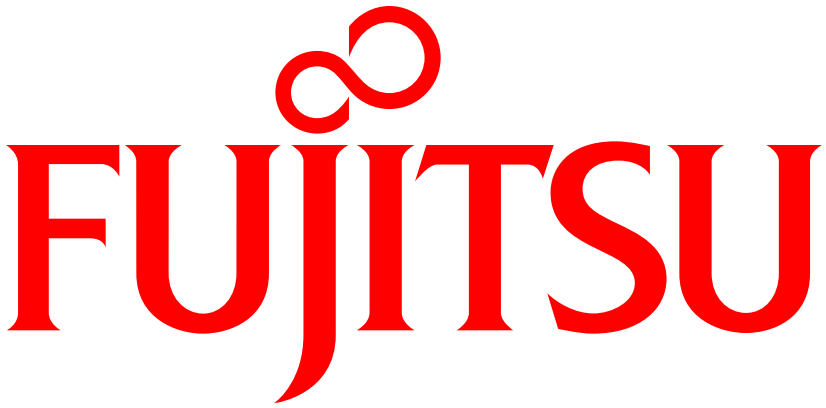

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