



The AIX System Dump Facility



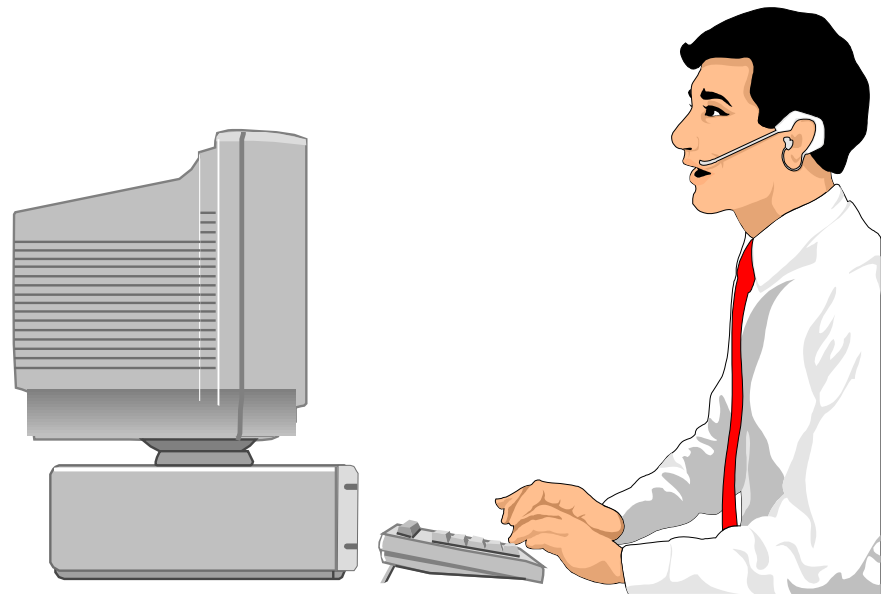
Unit Objectives

After completing this unit, you should be able to:

- Explain what is meant by a system dump
- Determine and change the primary and secondary dump devices
- Create a system dump
- Execute the `snap` command
- Use the `kdb` command to check a system dump

System Dumps

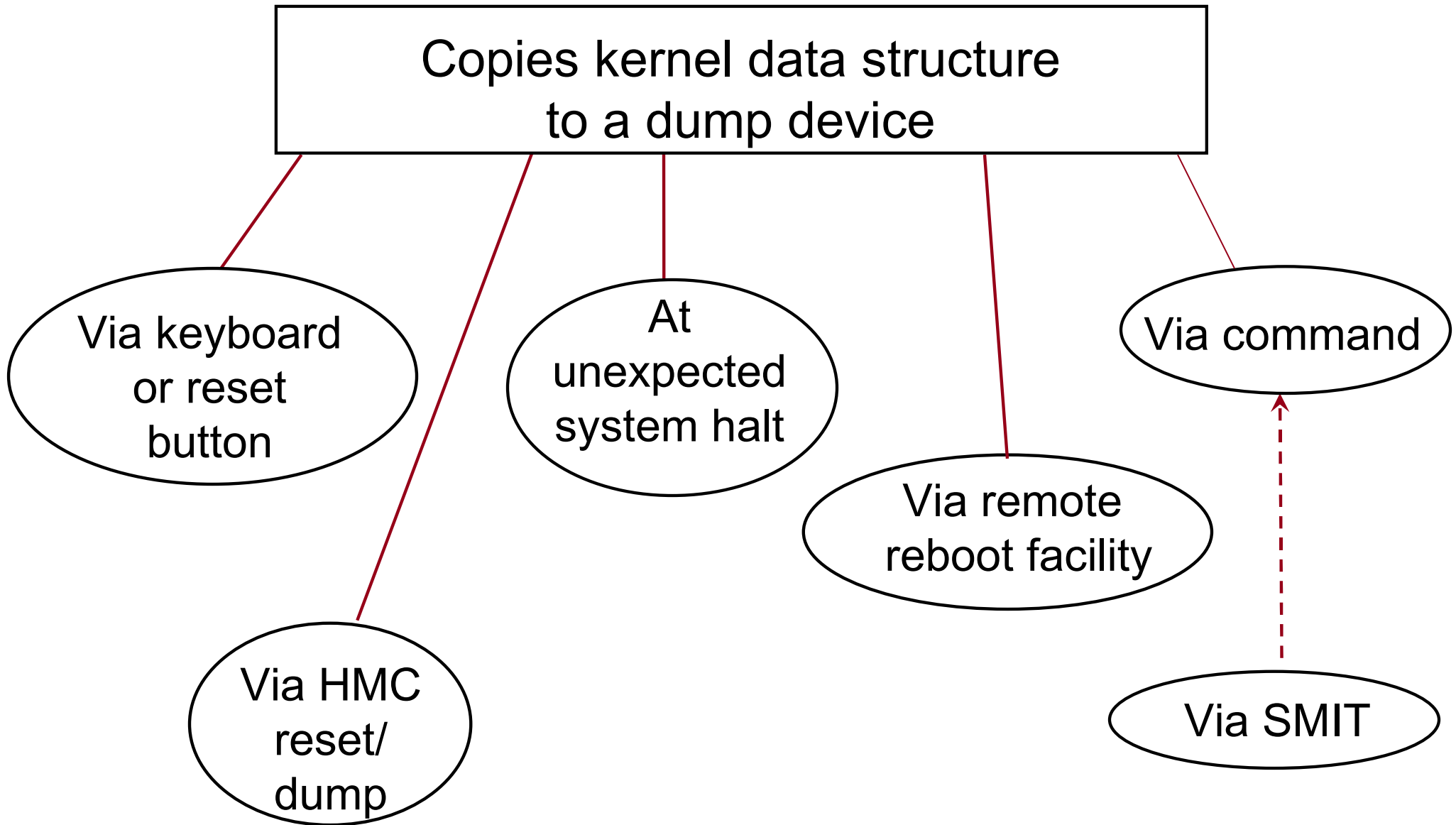
- What is a system dump?
- What is a system dump used for?



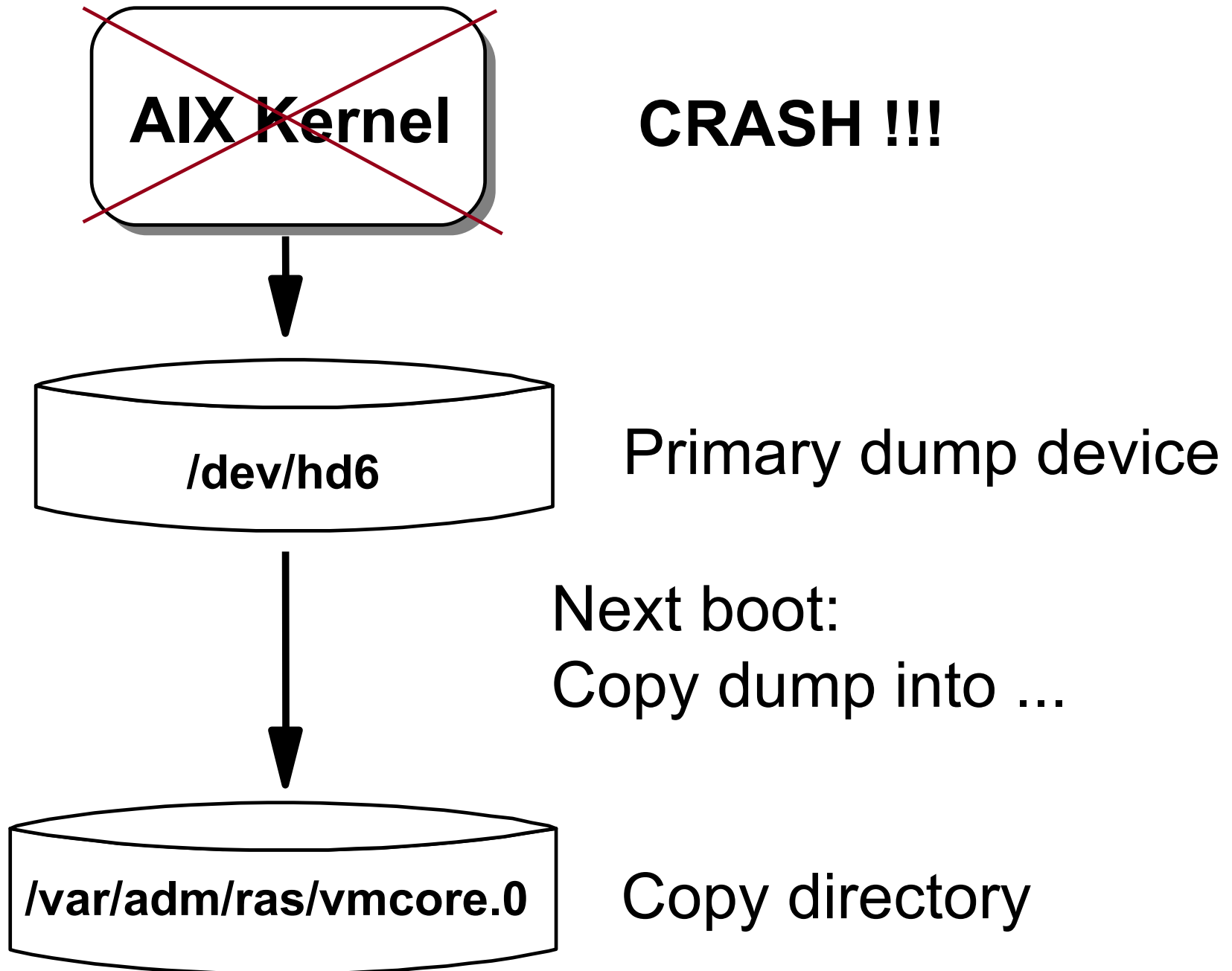
Types of Dumps

- Traditional:
 - AIX generates dump prior to halt
- Firmware assisted (fw-assist):
 - POWER6 firmware generates dump in parallel with AIX V6 halt process
 - Defaults to same scope of memory as traditional
 - Can request a full system dump
- Live Dump Facility:
 - Selective dump of registered components without need for a system restart
 - Can be initiated by software or by operator
 - Controlled by `livedumpstart` and `dumpctrl`
 - Written to a file system rather than a dump device

How a System Dump Is Invoked



When a Dump Occurs



The sysdumpdev Command

sysdumpdev -l ← List dump values

```
primary          /dev/hd6
secondary       /dev/sysdumpnull
copy directory  /var/adm/ras
forced copy flag TRUE
always allow dump FALSE
dump compression ON
type of dump    traditional
```

sysdumpdev -p /dev/sysdumpnull ← Deactivate primary dump device (temporary)

sysdumpdev -P -s /dev/rmt0 ← Change secondary dump device (Permanent)

sysdumpdev -L ← Display information about last dump

```
Device name:          /dev/hd6
Major device number:  10
Minor device number:  2
Size:                 9507840 bytes
Date/Time:            Tue Oct 5 20:41:56 PDT 2007
Dump status:          0
```

Dedicated Dump Device (1 of 2)

Servers with real memory > 4 GB will have a dedicated dump device created at installation time

System Memory Size	Dump Device Size
4 GB to, but not including, 12 GB	1 GB
12, but not including, 24 GB	2 GB
24, but not including, 48 GB	3 GB
48 GB and up	4 GB

Dedicated Dump Device (2 of 2)

/bosinst.data

```
...
control_flow:
    CONSOLE = /dev/vty0
...
large_dumplv:
    DUMPDEVICE = /dev/lg_dumplv
    SIZEGB = 1
```

Estimating Dump Size

sysdumpdev -e ← Estimate dump size
0453-041 estimated dump size in bytes: 52428800

sysdumpdev -C ← Turn on dump compression
(In AIX 6.1 dumps are
always compressed)

sysdumpdev -e
0453-041 estimated dump size in bytes: 10485760

Use this information to size the **/var** file system

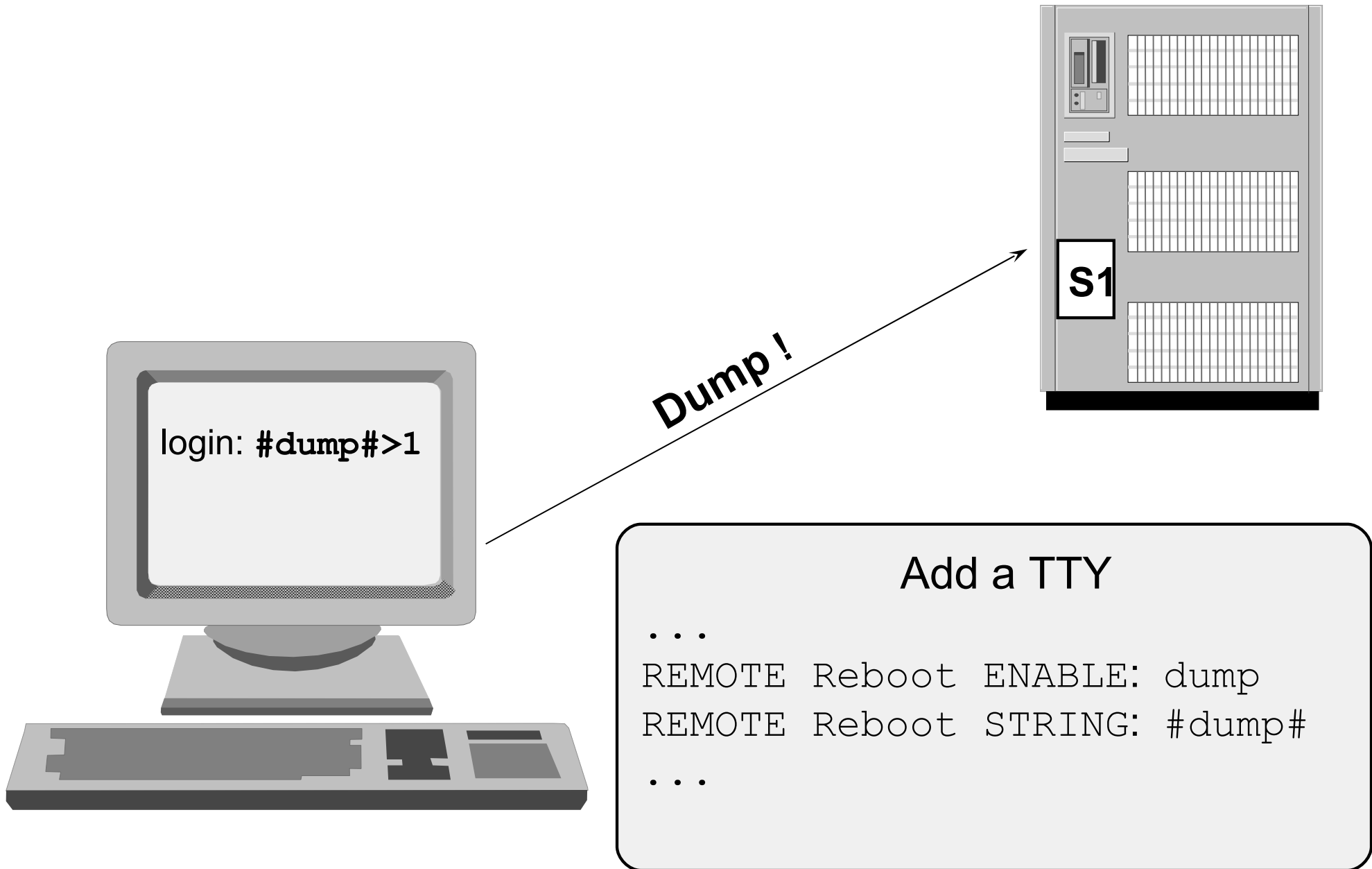
dumpcheck Utility

- The **dumpcheck** utility will do the following when enabled:
 - Estimate the dump or compressed dump size using **sysdumpdev -e**
 - Find the dump logical volumes and copy directory using **sysdumpdev -1**
 - Estimate the primary and secondary dump device sizes
 - Estimate the copy directory free space
 - Report any problems in the error log file

Methods of Starting a Dump

- Automatic invocation of dump routines by system
- Using the **sysdumpstart** command or SMIT
 - Option: **-p** (send to primary dump device)
 - Option: **-s** (send to secondary dump device)
 - Option: **-t** (use traditional dump)
 - Option: **-f** (select scope of dump)
- Using a special key sequence on the LFT
 - <Ctrl-Alt-NUMPAD1>** (to primary dump device)
 - <Ctrl-Alt-NUMPAD2>** (to secondary dump device)
- Using the **Reset** button
- Using the Hardware Management Console (HMC)
- Using the remote reboot facility

Start a Dump from a TTY



Generating Dumps with SMIT

```
# smit dump
```

System Dump

Move cursor to desired item and press Enter

Show Current Dump Devices

Show Information About the Previous System Dump

Show Estimated Dump Size

Change the Type of Dump

Change the Full Memory Dump Mode

Change the Primary Dump Device

Change the Secondary Dump Device

Change the Directory to which Dump is Copied on Boot

Start a Dump to the Primary Dump Device

Start a Traditional System Dump to the Secondary Dump Device

Copy a System Dump from a Dump Device to a File

Always ALLOW System Dump

Check Dump Resources Utility

Change/Show Global System Dump Properties

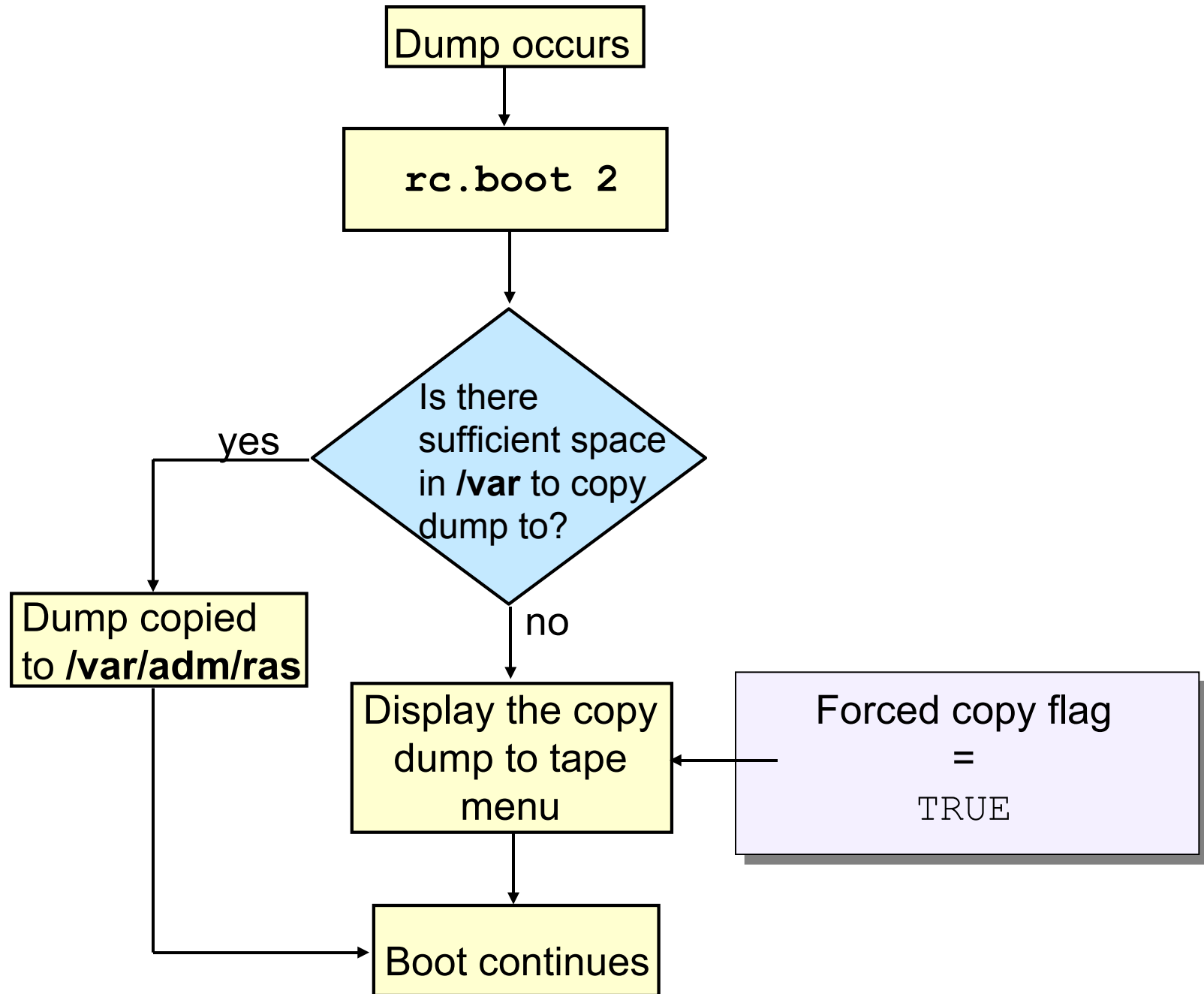
Change/Show Dump Attributes for a Component

Change Dump Attributes for multiple Components

Dump-related LED Codes

0c0	Dump completed successfully
0c1	An I/O error occurred during the dump.
0c2	Dump started by user.
0c4	Dump completed unsuccessfully. Not enough space on dump device. Partial dump available.
0c5	Dump failed to start. Unexpected error occurred when attempting to write to dump device; for example, tape not loaded.
0c6	Secondary dump started by user.
0c8	Dump disabled. No dump device configured.
0c9	System-initiated panic dump started.
0cc	Failure writing to primary dump device. Switched over to secondary.

Copying System Dump



Automatically Reboot After a Crash

```
# smit chgsys
```

Change/Show Characteristics of Operating System

Type or select values in entry fields.
Press Enter AFTER making all desired changes.

Maximum number of PROCESSES allowed per user	[128]
Maximum number of pages in block I/O BUFFER CACHE	[20]
Automatically REBOOT system after a crash	false

...

Enable full CORE dump	false
Use pre-430 style CORE dump	false

F1=Help	F2=Refresh	F3=Cancel	F4=List
F5=Reset	F6=Command	F7=Edit	F8=Image
F9=Shell	F10=Exit	Enter=Do	

Sending a Dump to IBM

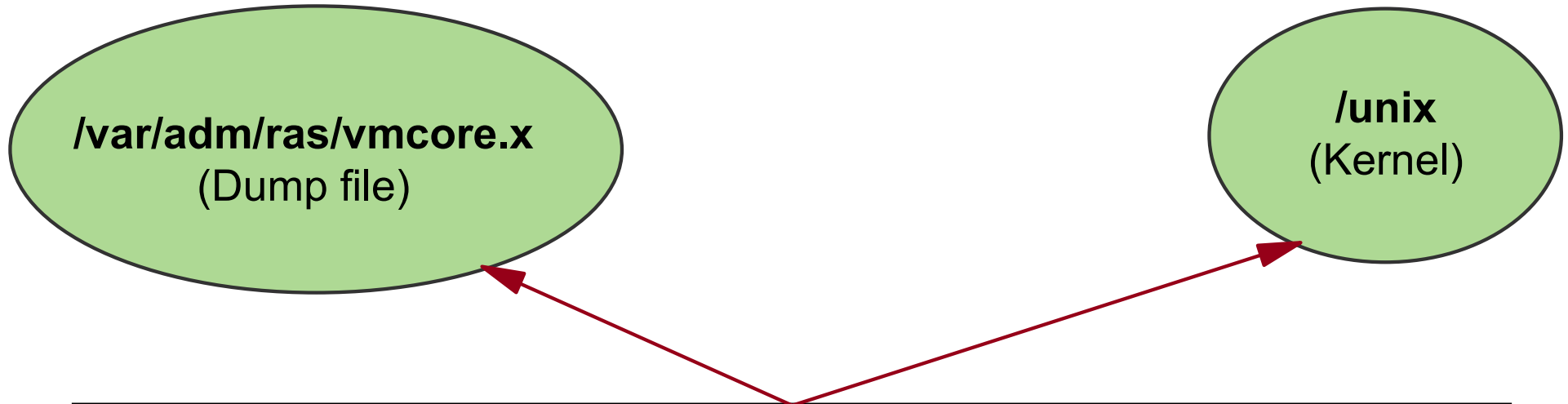
- Copy all system configuration data including a dump onto tape:

```
# snap -a -o /dev/rmt0
```

Note: There are some AIX 5L V5.3 enhancements to **snap**

- Label tape with:
 - Problem Management Record (PMR) number
 - Command used to create tape
 - Block size of tape
- Support Center uses **kdb** to examine the dump

Use kdb to Analyze a Dump



```
# uncompress /var/adm/ras/vmcore.x.Z  
or  
# dmpuncompress /var/adm/ras/vmcore.x.BZ  
# kdb /var/adm/ras/vmcore.x /unix  
> status  
> stat  
(further sub-commands for analyzing)  
> quit
```

/unix kernel must be the same as on the failing machine

Checkpoint

1. If your system has less than 4 GB of main memory, what is the default primary dump device? Where do you find the dump file after reboot?

5. How do you turn on dump compression?

8. What command can be used to initiate a system dump?

11. If the copy directory is too small, will the dump, which is copied during the reboot of the system, be lost?

15. Which command should you execute to collect system data before sending a dump to IBM?

Checkpoint Solutions

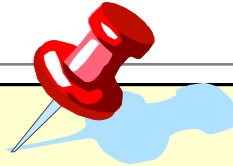
1. If your system has less than 4 GB of main memory, what is the default primary dump device? Where do you find the dump file after reboot?
The default primary dump device is /dev/hd6. The default dump file is /var/adm/ras/vmcore.x, where x indicates the number of the dump.
4. How do you turn on dump compression?
sysdumpdev -C (Dump compression is on by default in AIX 5L V5.3 and cannot be turned off in AIX 6.1)
7. What command can be used to initiate a system dump?
sysdumpstart
10. If the copy directory is too small, will the dump, which is copied during the reboot of the system, be lost?
If the force copy flag is set to TRUE, a special menu is shown during reboot. From this menu, you can copy the system dump to portable media.
13. Which command should you execute to collect system data before sending a dump to IBM?
snap

Exercise 11: System Dump



- Working with the AIX dump facility

Unit Summary



- When a dump occurs, kernel and system data are copied to the primary dump device.
- The system by default has a primary dump device (**/dev/hd6**) and a secondary device (**/dev/sysdumpnull**).
- During reboot, the dump is copied to the copy directory (**/var/adm/ras**).
- A system dump should be retrieved from the system using the **snap** command.
- The Support Center uses the **kdb** debugger to examine the dump.