RS/6000 SP Service Guide Updates
(February 2000)

Preface

This document contains the latest updates (February, 2000) to the November 1999 edition of the following RS/6000 SP hardware service publications:

- *RS/6000 SP: Installation and Relocation, GA22-7441-00*

- *RS/6000 SP: System Service Guide, GA22-7442-00*

- *RS/6000 SP: POWER3 SMP High Node Service Guide, GA22-7448-00*

RS/6000 SP: Installation and Relocation

The following updates are needed for *RS/6000 SP: Installation and Relocation*, GA22-7441-00.

Chapter 2. Installation Procedures

Performing RS/6000 SP System power-on and verification

Replace "Configuring the control workstation as CE installation aid" with the following:

Verifying SP frames using a preloaded control workstation

Use these instructions for new SP system installs where the control workstation is shipped with a preloaded image for testing.

Notes

1. A preloaded control workstation image can be used to test multiple frames, unlike the CE Installation Aid laptop.

2. You can connect the TTY cables from an appropriate CWS serial port to the frames at any point until you complete Step 1 of the menus. If the customer has defined TTY connections, you should attempt to match those connections.

3. You can connect the Ethernet LAN cables from an appropriate CWS Ethernet port to the frames at any point until you are ready to run the "Verify processor node" step. If the customer has defined LAN connections directly to the frame, you should attempt to match those connections. If the customer is using a LAN switch or router (anything more complex than a hub), you might have to connect the LAN directly from the CWS adapter to the nodes boot LAN.

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1. Perform the physical installation of the control workstation. Ensure that all asynchronous (serial port) and Ethernet LAN adapters are installed in the workstation and any externally attached breakout boxes before attempting to test the SP system.

2. Power on the control workstation and wait for the login prompt. At the prompt, enter **root**; no password is required.

3. At the AIX prompt, enter **xinit** to start X-windows. From an AIX window, enter **sptest** to display the **SP Installation Menu**.

4. Connect the TTY and Ethernet LAN cables between the CWS and the frames. Ensure that you have a record of the TTY and LAN connections for each frame so that you can configure the software properly to match the physical configuration.

   - LAN connections can be made through a hub but should not be made through a LAN switch or router. This is because the network boot operation is not sophisticated enough to set up or handle communication through a non-transparent device in the LAN.

- For more information on properly connecting these cables, refer to "Connecting RS-232 and Ethernet LAN cables to the customer hardware".

5. If the LAN is using a hub, ensure that the nodes are connected into it properly.

6. For each frame in the system, check the circuit breakers and power sequence the frame as follows:

    a. Ensure that the main power switch is in the Off ('0') position.

    b. Ensure that the circuit breaker on each processor node and switch assembly (if present) is in the Off ('0') position.

    c. Remove the lockout condition to restore the ac power connection for this frame.

    d. Switch on the ac power for this frame.

    e. Place the frame power switch in the On ('1') position.

    f. Place the circuit breaker for the switch assembly (if present) in the On ('1') position.

7. From the **SP System Installation Menu**, select **Frame Configuration** to view and enter the configuration for each frame. From **Frame Configuration**, complete the following:

    a. Use "**a**" to add any new frames to the current configuration. You are prompted for TTY port, LAN connection and type, and IP address information for the LAN and switch (if present).

    b. If you have frames defined which do not appear on the screen, use "**+**" to scroll forward or "**-**" to scroll backward through the list.

    c. Once a frame is defined, you modify its configuration information by typing the frame number. Once you select a frame, the **Current Frame information** menu displays. From this menu you can enter the following:

        - "**d**" to delete any frames that were not defined by these menus.

        - "**t**" to change TTY information. You are asked to select an asynchronous adapter. If the adapter supports multiple ports, you are asked to select a port. This must correspond to the physical connection.

        - "**l**" to change LAN information. You are asked to select a LAN adapter. You are prompted for a CWS IP address, a netmask, the type of connection at the CWS, an IP address for the first node in the frame, and the type of connection. You can use the default values if you are unable to determine the customer's configuration.

        - "**s**" to change switch information. You are prompted for a switch IP address for the first node in the frame and a netmask.

        - "**b**" to return without updating any modified frame information.

        - "**n**" to return with updated frame information for this frame.

    d. Use "**s**" to delete all frames that were defined by these menus.

    e. Use "**b**" to return without updating any modified system information.

    f. Use "**n**" to return with updated system information. This causes the configuration code to attempt to contact the defined frames to fill in more information about the system configuration, such as the number and types of nodes and switches.

8. Once the system has been defined and configured, from the **SP System Installation** menu, select the **Verify Frame Controls** step. This step powers off and on each frame, testing the frame power controls and sensors.

9. Ensure that the circuit breakers on every switch assembly and processor node under test are in the On ('1') position.

10. From the **SP System Installation** menu, select **Gather Ethernet Hardware Addresses** step. This step acquires the Ethernet hardware addresses specific to each node in each frame.

Note: If this step fails on any processor node, retry this step. Nodes often work on subsequent attempts.

11. From the **SP System Installation Menu**, select **Start System Monitor** to start the system monitor.

12. Verify processor nodes as follows:

    a. Check the frame to determine the number of processor nodes. Ensure that the values at the top of the **SP System Installation Menu** accurately reflect the current frame configuration.

       Note: If information is incorrect, use MAPs to isolate problem.

    b. Ensure that the circuit breakers of the processor nodes are in the On ('1') position.

    c. From the **SP System Installation Menu**, select **Verify Processor Nodes**. The software performs the following:

       1) Verifies communication to the frame, the processor nodes, and the switch assembly (if present).

       2) Powers off the processor nodes in this frame under program control.

       Note: You are prompted to boot the nodes automatically. If you answer "yes," go to Step 12f.

    d. From the **Global Commands** window:

       1) Click on buttons to select processor nodes (see note below).
       2) Click on the **Net Boot** button.
       3) Click on the **Do command** button. Click on the **OK** button of popup window.

          Note: The CE Installation Aid supports network boot of up to 6 processor nodes at the same time, so select up to 6 processor nodes, wait until they complete IPL, then repeat step with the next set of processor nodes.

    e. From the **3DigitDisplay** window, verify that for each processor node selected above, the 3DigitDisplay is cycling through the IPL sequence.

    f. Wait for the 3DigitDisplay to show one of the following conditions (for Thin or Wide nodes it should not take more than 10-15 minutes; for High nodes and 332 MHz nodes it might take up to 1.5 hours, depending on the configuration of the node):

       - **uuu**: PASS - indicates that diagnostics passed on a non-SMP node.

       - **0aaa**: PASS - indicates that diagnostics passed on an SMP node.

       - **000**: FAIL - indicates that diagnostics found a problem.

         Action: Wait until next step to get report on failures.

       - **Stuck on 231**: IPL PROBLEM - indicates problem with Ethernet IPL

         Action:

         – All nodes - Perform "Ethernet LAN Isolation Procedure" in *IBM RS/6000 SP: System Service Guide*
         – Single nodes - Check T-adapter coax connection at the rear of the processor node for a loose connection.

       - **Stuck on same value** more than 4 minutes or **Flashing 888**: HANG or CRASH - indicates a problem during IPL or diagnostics.

         Action: Perform the following steps until condition clears:

         1) Perform "Net Boot" on this processor node to see if problem clears.
         2) Use the MAPs in *IBM RS/6000 SP: System Service Guide* to determine the problem.

g. From the **SP System Installation Menu**, select **Check Node Diagnostics** to check results of processor node verification. This can be done at any time; however, you get an error if no nodes have completed diagnostics.

13. If a switch feature is installed, verify the switch feature in this frame:

    Attention: This step interferes with any customer use of the switch feature. If this frame is attached to other frames that are in use by the customer, first get concurrence from the customer before continuing.

    Note: If you find any problems here, refer to the "Switch Function" MAP in *IBM RS/6000 SP: SP Switch Service Guide* to correct.

    a. From the **SP System Installation Menu**, select **Verify Switch Feature** to verify the switch feature.

    b. From the **SP System Installation Menu**, select **Check Switch Diagnostics** to check the results of the switch feature verification.

    c. From the **SP System Installation Menu**, select **Verify Switch Clocks** to test the switch clock selection logic and any frame-to-frame switch clock cables. Follow directions given by the software.

       Note: This step requires that all switch cabling is installed.

14. Completing the frame:

    Attention: If this frame contains any switch adapters or switch assemblies, you must leave the frame, processor nodes, and switch assembly powered on until all frames have been verified. Successful verification of the switch network depends on correct settings left after frame verification by the CE Installation Aid.

    a. From the **SP System Installation Menu**, select **Finish Frame** to perform required procedures following verification of each frame.

    b. If you had to modify the Ethernet cabling from the customer's desired configuration to perform this testing, restore it now to match the customer's configuration.

15. Record the verification time for the system.

16. Record installation complete for the System Serial Number.

17. Verification of the system is now complete.

18. You can shut down the CWS by opening an AIX window and entering `shutdown -F`. The CWS eventually displays **Halt completed**, at which point it might automatically power off. If not, you can manually power off the CWS.

Selecting an international keyboard layout: This procedure allows you to select a non-en_US keyboard layout, in order to match the customer's keyboard hardware.

1. Log in with the user ID **root**.

2. Using the left mouse button, open an AIX window.

3. Type `smit` (or `smitty`) and press <Enter>.

4. From **smit**, set the keyboard for X-windows as follows:

   a. Select **System Environments**, then **Manage Language Environment**, then **Change/Show Primary Language Environment**, then **Change/Show Cultural Convention, Language, or Keyboard**.

   b. Next to **Primary KEYBOARD**, select **List** to display list of keyboard selections. From this list, select the appropriate keyboard choice. In many cases, this is the **ISO8859** Default selection for the language shown as lower-case/upper-case, such as **fr_FR**. Press <Enter> or click the appropriate button to complete the setting.

5. Exit back to main smit screen, then set the keyboard for the **lft** (login screen) as follows:

   a. Select **Devices**, then **Low Function Terminal (LFT)**, then **Software Keyboard**, then **Change the Keyboard Map for the Next System Restart**.

   b. Next to **PATHNAME of Keyboard Map**, select **List** to display list of keyboard selections. From this list, select the appropriate keyboard choice. In many cases, this is the selection that looks like **/usr/lib/nls/loc/it_IT.lftkeymap** (language in lower-case/upper-case). Press <Enter> or click the appropriate button to complete the setting.

6. Exit smit, then reboot the workstation by typing **reboot** and then press <Enter>.

7. Once the control workstation reboots, the new keyboard layout is active.

Verifying the RS/6000 SP system using customer configuration

Replace entire section with the following:

Verifying nodes and switches using the customer configuration

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Notes

- This procedure requires that all base PSSP software is properly installed on the control workstation, including all of the required configuration steps. To verify proper PSSP installation, refer to *IBM Parallel System Support Programs for AIX, Installation and Migration Guide*, GA22-7347. If the software is not fully configured, you might experience problems performing this verification procedure.

- You need access to the "root" password. The customer can enter it as required.

- Problems found during software installation and configuration might be due to software, user configuration, or hardware problems. If you are unsure of the cause, contact the next level of support for assistance.
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1. Ensure that the RS/6000 SP system is ready for verification by checking with the customer or system administrator:

   a. Ensure that the AIX and PSSP software is installed and configured on the system, including the processor nodes.

   b. Ensure that all frames, switches, processor nodes, and SP-Attached Servers to be tested are not in use by the customer or software installation group.

   c. Ensure that all frames, processor nodes, and switches are powered on.

2. Ensure that the customer grants the proper permissions to allow "dsh" commands to work.

3. Verify processor nodes as follows:

   a. Change directory by entering **cd /usr/lpp/ssp/cediags/cws**.

   b. Start diagnostic tests on nodes using one of the following methods:

      1) Enter **diag.dsh -a** to test all nodes in the current system partition.

      2) Enter **diag.dsh -w**, *hostname1*, *hostname2*, **...** to test one or more nodes specified by the hostname list.

      3) Use "diag.dsh" with other valid "dsh" command flags if appropriate. Entering **diag.dsh** with no parameters returns information on command usage.

   c. Wait for the diagnostic results from the nodes. Output will appear on the screen as well as in a file on the workstation.

d. Check results of diagnostics by entering **pg /tmp/diag.client.out**.

e. For any problems shown in the file, use MAPs or run diagnostics on the processor nodes.

4. If installed, verify switch feature:

a. Refer to the "Selecting Appropriate Switch Clocks" procedure in the "Selecting Appropriate Switch Clocks" section of the *IBM RS/6000 SP: SP Switch Service Guide*, Chapter 2 to make sure clocks on all switch assemblies are set properly.

b. Have customer verify that the correct switch topology file has been selected.

c. From Perspectives window on the control workstation, enter

   Eunfence

   for the processor node(s) and/or SP-Attached Server(s) added to the switch.

   If this is unsuccessful, or the switch was not previously available, enter:

   Estart

   to restart the switch.

d. Determine the primary node number. From an AIX window on the control workstation, enter:

   Eprimary

e. Determine the hostname for this node by checking *reliable_hostname* for node# from command:

   splstdata -n | pg

f. Log onto the primary node with userID of "root":

   telnet hostname

g. Check the results in file "/var/adm/SPlogs/css/out.top":

   pg /var/adm/SPlogs/css/out.top

h. If there are any obvious problems (such as primary processor node is unavailable or switch assembly is powered off), address those problems first, then repeat "Eunfence"/"Estart" step.

i. If any hardware problems are found (such as processor node problems or problems in "/var/adm/SPlogs/css/out.top"), use the MAPs in *IBM RS/6000 SP: System Service Guide* to perform service on the system.

j. If this is a single-frame system, verification is now complete. A green "switch_responds" indicator will be lit for the processor node(s) or SP-Attached Server(s).

5. If switch feature is present and this is a multi-frame system, verify switch feature clocks (optional):

a. Refer to the "Determining Switch Clock Source" procedure in the "Selecting Appropriate Switch Clocks" section in *IBM RS/6000 SP: SP Switch Service Guide*, Chapter 2 for instructions on determining and selecting switch master clocks.

b. After determining the current master clock selection, use the procedure to select a new master clock for the system.

c. From an AIX window on the control workstation, reinitialize the switch adapter on all nodes by entering:

   dsh -a /usr/lpp/ssp/css/css_restart_node

d. From an AIX window on the control workstation, enter:

   Estart

e. Log onto the primary node as "root".

f. Check the results in file "/var/adm/SPlogs/css/out.top":

```
pg  /var/adm/SPlogs/css/out.top
```

g. If you see one or more switch assemblies where all ports show errors, there is most likely a clocking problem between the clock source of the switch(es) and that switch(es). Use the "Switch Function" MAP in *IBM RS/6000 SP: SP Switch Service Guide* to perform service.

h. Repeat this procedure with another master clock.

i. At the customer's discretion, leave the clock configuration at its current setting or set it back to the original configuration.

6. Verification is now complete.

RS/6000 SP: System Service Guide

The following updates are needed for the *RS/6000 SP: System Service Guide*, GA22-7442-00.

Chapter 1, Maintenance Analysis Procedures (MAPs)

Starting a service call (MAP 0100)

Step 0100-002

Add the following note to the list after Table 1-1:
Notes:
f. The most recent entry is found at the *top* of **errpt** on the control workstation.

Table 1-2, System conditions and suggested actions

Update priority 6 and 7 with:

Priority	Condition	Action

6	Problem with processor node:
	
	• TTY console and/or system monitor (errpt/not topology) reports a hardware problem for processor nodes (slots 1-16).
	• Problem with node power.
	
	  – **Uniprocessor (Thin/Wide Node)**
	
	    — Yellow LED on or flashing.
	
	    - OR -
	
	    — Green LED off or flashing.
	
	  – **SMP (Thin/Wide/High Node)**
	
	    — Supervisor LED #1 flashing (green)
	
	    - OR -
	
	    — Supervisor LED #5 flashing (yellow)
	
	  – **SP Expansion I/O Unit**
	
	    — Yellow supervisor LED on or flashing.
	
	    - OR -
	
	    — Green supervisor LED off or flashing.
		Go to "Processor node diagnostics and descriptions (MAP 0130)".

7	Problem with switch assembly or switch communication: • System monitor (errpt) reports a hardware problem for switch assembly (slot 17). • Yellow LED on or flashing. • Green LED off or flashing. • switchResponds is "**0**" for nodes. • switchResponds = YELLOW • Primary node **errpt -a -N Worm** lists problems. • Problem identified in **out.top** file. • Problem with dependent node connection to switch.	Go to the "Switch description and problem determination" MAP in the appropriate switch service guide..

Chapter 5, Parts catalog

Assembly 11

Addition:

- 31L7152, Cable, External Power

Assembly 23

Make the following changes:

1. 09L2090, Advanced Serial RAID (F/C 6225)

    - 09L2105, 32 MB Fast/Write Cache Option (F/C 6235)

    - 09L2104, 64 MB DRAM (Standard)

    - 09L5585, 128 MB DRAM Option (Replacement) (F/C 6231)

    - 09L5609, Battery Pack

2. 34L5388, Advanced Serial RAID Plus (F/C 6230)

    - 09L2105, Fast/Write Cache Option, 32 MB DIMM (F/C 6235)

    - 09L5585, 128 MB DRAM Option (Replacement) (F/C 6231)

    - 09L2104, 64 MB DRAM (Standard)

    - 09L5609, Battery Pack

Assembly 27

Addition:

- 11K0682, *Diagnostic Information for Multiple Bus Systems Supplement* (SN32-9071)

Title change:

- 05N6711, *RS/6000 SP: SMP Thin and Wide Node Service Guide* (GA22-7447)

Part number update:

- 05N6761, *RS/6000 SP: Planning, Volume 1, Hardware and Physical Environment* (GA22-7280)

RS/6000 SP: POWER3 SMP High Node Service Guide

The following updates are needed for the *RS/6000 SP: POWER3 SMP High Node Service Guide*, GA22-7448-00.

Chapter 1, Maintenance Analysis Procedures (MAPs)

POWER3 SMP High Node power (MAP0380)

Step 0380-037

The LED sequence on the node supervisor card indicated that you may have a power cable or planar problem. However, the problem still exists after you ran the diagnostics in POWER3 SMP High Node environment (MAP 0370). Replace the following parts in the order listed until the problem is fixed:

Note: After replacing a cable, power the node on and check the LED status before replacing the next part. If you are able to boot the node, go to the End of call procedures (MAP 0650) in *RS/6000 SP: System Service Guide*.

1. Cable running from P3J3 to P1J22 (16 position system planar power cable)

2. Cable running from P3J6 to P1J23 (26 position signal cable)

3. Cable running from P3J7 to P1J24 (34 position signal cable)

4. If you have replaced the three cables and the problem still exists, then this is not a power problem.

- Go to "POWER3 SMP High Node minimum configuration (MAP 0400)" and continue service.

POWER3 SMP High Node minimum configuration (MAP 0400)

Add this attention statement at the beginning of MAP 0400

Attention: The node must be placed into Service Position prior to handling logic or power parts. The node must be removed from Service position prior to attempting to answer "Does the node IPL?". For removal and replacement of logic or power parts, refer to "Chapter 4, FRU removals and replacements".

Update these procedure steps:

Step 0400-001

Before you place the POWER3 SMP High Node into its minimum configuration, you must determine if the problem is in the processor unit or in one of the SP Expansion I/O Units attached to the processor node. To make this determination:

1. Shutdown the node and power off from the control workstation.

2. Ensure all SP Expansion I/O Units attached to the processor node are shutdown and powered off from the control workstation.

   - **Note:** There may be more than one SP Expansion I/O Unit.

3. Set the POWER3 SMP High Node's circuit breaker to OFF ("0") position

4. Set the node's inline 48 V cable circuit breakers to OFF ("0") position

5. Record and remove all SP Expansion I/O Unit cables from the rear of the POWER3 SMP High Node at connectors Q1 through Q7

6. Set the node's inline 48 V cable circuit breakers to ON ("1") position

7. Set the POWER3 SMP High Node's circuit breaker to ON ("1") position

8. IPL the POWER3 SMP High Node

9. Does the node IPL properly?

   - If yes, the problem is in an SP Expansion I/O Unit, go to "Step 0400-012".

   - If no, the problem is in the processor node you need to test the minimum node configuration, go to "Step 0400-002".

Step 0400-002

You have determined that the POWER3 SMP High Node has a problem.

1. Check the POWER3 SMP High Node firmware levels of the I/O planar (IPLROS and SP code) to ensure they are at the correct levels, update if necessary. Refer to:

   - "Service processor flash EPROM updates (and system firmware)"

   - "Obtaining and installing updates on SP nodes"

2. Set the POWER3 SMP High Node's circuit breaker to OFF ("0") position.

3. Set the node's inline 48 V cable circuit breakers to OFF ("0") position.

4. Record the slot numbers of PCI adapters.

5. Label and record the location of any cable attached internally or externally to the adapters.

6. Remove all PCI adapters.

7. Remove all SP Expansion I/O Unit interposer cards from the I/O planar slots JR1 through JR7.

8. Remove the SPS MX2 adapter, if present, from POWER3 SMP High Node I/O planar slot J4.

9. Leave **one** CPU card installed in slot CPU1, remove all other CPU cards.

10. Leave **one** memory card installed in slot MEM1, remove all other memory cards.

11. The remaining memory card should **only** have 8 DIMMs located on connectors:

    * J11A

    * J21A

    * J31A

    * J41A

    * J51A

    * J61A

    * J71A

    * J81A

12. Remove all DASD except for the boot DASD (hdisk0).

    Check DASD signal cable and DASD power cable at this time

    Attention: When you disconnect a SCSI cable from the DASD, it is possible that some of the data required to IPL the node will be unavailable. This can happen if a required filesystem is fully or partially on the discon-nected DASD. In this case, the node will only boot to a code in the range **E1F7**, consider this a successful IPL for purposes of this MAP only.

    Although boot disk is typically set to *hdisk0* (which is typically the disk located in the lower CPU chassis DASD tray) it is possible that some other disk is defined as the boot disk. You can check the boot disk for this node using `splstdata -b` (then look at address jumpers on the disks). If possible, keep this boot disk in the configuration, even if it means physically moving the boot disk from the I/O expansion chassis to the CPU chassis.

    Note: DASD logical volume problems can be alleviated by performing a netboot.

13. Go to "Step 0400-003".

Step 0400-013

The POWER3 SMP High Node does not IPL with SP Expansion I/O Unit loops attached and you need to perform the loop isolation procedure.

1. Ensure that the SP Expansion I/O Unit is powered ON.

2. Ensure that the POWER3 SMP High Node is powered ON.

3. Are the power indicators on all SP Expansion I/O Units normal (green LED = on and yellow LED = off)?

    * If yes, go to "Step 0400-014".

    * If no, go to "SP Expansion I/O Unit power (MAP 0420)".

SP Expansion I/O Unit environment (MAP 0410)

Step 0410-006

Yellow LED 5 is On and it **is not** flashing.

1. Perform the "SP Expansion I/O Unit supervisor self-test."

2. Did the supervisor self test pass?

   - If yes, go to "Step 0410-007".

   - If no:

     – Replace the supervisor card on the SP Expansion I/O Unit.

     – Return to "Step 0410-005."

Step 0410-008

You have detected a cooling or fan problem with a SP Expansion I/O Unit.

1. Run the advanced diagnostics problem determination routine to obtain failure data.

2. Place the unit into the service position.

3. Use Table 1-11 to replace components.

Table 1-11, SP Expansion I/O Unit service actions

Priority	Component	Action
1	Fan 1, 2	1. Check specified fan for blockage or loose cable connection. Refer to the error log utility on the service processor menu. 2. Fix any obvious problems. If none are found, continue at Priority 2. 3. Continue at "Step 0410-009."
2	Fan 1, 2	1. Replace fan and/or cooling module as described in Chapter 4, FRU removals and replacements. Refer to: • "Removing a fan" • "Replacing a fan" • The error log utility on the service processor menu 2. Fix any obvious problems. 3. Continue at "Step 0410-009."
3	Supervisor Card	1. Replace card 2. Continue at "Step 0410-009."
4	DASD Controller Card	1. Replace card 2. Continue at "Step 0410-009."
5	DASD Docking Card	1. Replace card 2. Continue at "Step 0410-009."
6	DASD power cable assembly	1. Replace assembly 2. Continue at "Step 0410-009."
7	I/O Planar	1. Replace the I/O planar 2. Continue at "Step 0410-009."
8	All replaced	Call next level of support.

Step 0410-018

You found a flashing yellow LED on an SP Expansion I/O Unit.

1. Place the unit into the service position.

2. Use Table 1-12 to replace components.

Table 1-12, SP Expansion I/O Unit service actions

Priority	Component	Action
1	DASD Controller Card	1. Replace card 2. Continue at Step 0410-019.
2	DASD Docking Card	1. Replace card 2. Continue at Step 0410-019.
3	DASD power cable assembly	1. Replace assembly 2. Continue at Step 0410-019.
4	Supervisor Card	1. Replace card 2. Continue at Step 0410-019.

5	Power supply 1, 2	1. Replace power supply as described in Chapter 4, FRU removals and replacements. Refer to:
		  • "Removing a power supply"
		  • "Replacing a power supply"
		  • The error log utility on the service processor menu.
		2. Fix any obvious problems.
		3. Continue at Step 0410-019.

6	Fan 1, 2	1. Replace fan and/or cooling module as described in Chapter 4, FRU removals and replacements. Refer to:
		  • "Removing a fan"
		  • "Replacing a fan"
		  • The error log utility on the service processor menu.
		2. Fix any obvious problems.
		3. Continue at Step 0410-019.

7	I/O Planar	1. Replace the I/O planar 2. Continue at Step 0410-019.
8	All replaced	Call next level of support.

Step 0410-019

You have replaced a component.

1. Remove the unit from the service position.

   • See: "Removing a POWER3 High Node from the service position."

2. Check the yellow LED.

3. Is the yellow LED still flashing?

   • If yes, go to "Step 0410-020".

- If no:

    a. You have resolved the critical problem.

    b. Return to "Step 0410-001" to resolve any additional problems.

Bridge isolation (MAP 0430)

Step 0430-001

One of two conditions sent you to this location. Either:

1. You received error code 45800002 or 45800005. This indicates that you have a problems with Bridge 0 and Table 1-14 sent you to this step.

    - OR -

2. You were not able to IPL the node in Step 0430-008.

You must now determine whether the problem is in the processor node or in the expansion unit loop. To determine which device is at fault:

1. Remove the SP Expansion I/O Unit cables from connectors Q1 and Q2 at the rear of the POWER3 SMP High Node.

2. Switch On the 48-volt inline circuit breakers to the node.

3. Does the node IPL?

    - If yes, problem appears to be in the Q1-Q2 SP Expansion I/O Unit loop, go to "Step 0400-013".

    - If no, problem appears to be in the node. Go to "Step 0430-002".

Step 0430-008

You received error code 45800003. This indicates that you have a problems with Bridge 1 and Table 1-14 sent you to this step.

1. Remove the SP Expansion I/O Unit cables from connectors Q3, Q4, Q5, and Q6 at the rear of the POWER3 SMP High Node.

2. Switch the node circuit breaker and the node's 48-volt inline circuit breakers OFF and then back ON.

3. Does the node IPL?

    - If yes, the problem may be in one of the SP Expansion I/O Unit loops. Go to "Step 0400-012".

    - If no, the problem may be in the node. Go to "Step 0430-001 ".

Chapter 3, Service procedures

Update the following service procedures:

Servicing SP Expansion I/O Unit hot-plug PCI adapters

The following procedure will help you service hot-pluggable PCI adapters.

Note: A PCI adapter is hot-pluggable **only if** all three of the following are true:

- The PCI adapter is supported for hot-plug applications.

- The PCI adapter is installed in the SP Expansion I/O Unit or other hot-plug capable unit.

- AIX 4.3.3 or later **and** specific filesets must be installed on the node. To check for the filesets and to make certain they are at the proper level:

  1. Enter the command "**lslpp -l bos.rte.methods devices.chrp.base.rte**"

  2. Make certain that the level for each fileset indicates "4.3.3.10" or later.

SP Expansion I/O Unit PCI slot LED definitions

Table 3-3 describes the possible states of the LED's associated with the SP Expansion I/O Unit PCI slots. These LEDs are located at the bottom rear of the unit. One LED is associated with each PCI slot.

Table 3-3, SP Expansion I/O Unit PCI slot status LEDs

PCI slot status	LED indication	Definition	Notes
Off	Off	Slot power is **Off**. It is safe to remove or replace adapters.	1
On	On (not flashing)	Slot power is **On**. Do not remove or replace adapters.	
Identify	Flashing slow (one flash per second)	Indicates slot has been identified by the software; **do not** remove or replace adapters at this time.	
Action	Flashing fast (6 to 8 flashes per second)	Indicates slot is ready for removal or replacement of adapters.	
Notes:			
1. If you suspect that the LED may be defective, refer to the PCI hot-plug tasks under "Service Aids" in the *Diagnostics Information Manual for Multiple Bus Systems*.			

Accessing hot-plug management functions from diagnostics

Note: The remove and replace options require the system administrator to take the PCI adapter offline prior to performing the operation. This is intended to prevent service personnel or user from causing an unexpected outage for users of the system. The system administrator should refer to the AIX documentation for more information on performing the necessary steps.

Access procedure

1. Enter "diag"

2. Select "Task Selection"

3. Select "Hot Plug Task"

4. Select "PCI Hot Plug Manager" and choose one of the following options:

List PCI Hot Plug Slots Provides a descriptive list of all slots which support PCI hot-plug capability, including occupied and empty slots.

- If the listing for a slot indicates it holds an "Unknown" device, select the "Install/Configure Devices Added After IPL" option to configure the adapter in that slot.

Add a PCI Hot Plug Adapter Allows the user to add a new PCI hot plug capable adapter to the slot while power is on. You will be given a chance to identify the PCI slot that you have selected prior to the actual operation. The selected PCI slot will go into the "On" state.

- The system will indicate the slot holds an "Unknown" device until you perform the "Install/Configure Devices Added After IPL" option to configure the adapter.

Replace/Remove a PCI Hot Plug Adapter Allows the user to remove an existing adapter, or replace an existing adapter with an identical one. For this option to work:

a. Adapter must be in the DEFINED state (see: "Unconfigure Devices" option below).

b. You will given a chance to identify the PCI slot prior to the actual operation.

c. The selected PCI slot will go into the "Action" state.

Identify a PCI Hot Plug Slot Allows the user to identify a PCI slot. The selected PCI slot will go into the "Identify" state.

Unconfigure a Device Allows user to put an existing PCI adapter into the DEFINED state **if** the device is no longer in use.

- This step **must** be completed successfully before starting any remove or replace operation.

- If this step fails, the customer must take action to free up the device.

Configure a Defined Device Allows a new device to be configured into the system **if** software support is already available for the PCI adapter.

Install/Configure Devices Added After IPL System attempts to configure any new devices and tries to find and install any required software from a user-selected source.

5. The add, remove, and replace functions return information to the user indicating whether the operation was successful.

- If instructions are provided, you or the system administrator (as appropriate) should complete the recommended actions. If the instructions do not resolve the problem, refer to the following bullets.

- If the adapter is listed as "Unknown," perform "Install/Configure Devices Added After IPL" option to configure the adapter.

- If you receive a warning indicating needed device packages are not installed, the system administrator must install the specified packages before you can configure or diagnose the adapter. When the software is installed, go to Step 6.

- If you receive a fail message indicating a hardware error, the problem may be either the adapter or the PCI slot. Isolate the problem by retrying the operation in a different PCI slot (if acceptable to the customer) or by replacing the adapter. If the PCI slot is the problem, perform maintenance now or mark the failing slot and schedule a service call.

6. If this procedure is run while the node is operational and you have added, removed, or replaced any devices, run "diag -a"

- If the system responds with a menu or prompt, follow the instructions to complete device configuration.

7. Verify the operation of all adapters that were just serviced by running "System Verification Tests" from the advanced diagnostics menu.

Information removals

Note: Remove the **entire** section listed under "Service processor menus." This is an extensive removal beginning at the end of the section titled "Open firmware command prompt" on page 3-34 and ending at the top of the section titled "Service processor operational phases" on page 3-55.

Remove the following main topics, sections (and all subsections not listed):

 1. Service processor menus (main topic)

 2. Service processor menus (section)

 3. General user menus (section)

 4. Privileged user menus (section)

 5. Service processor functions (section)

 6. Node power-on methods (section)

 7. Service processor reboot/restart recovery (section)

 8. Service processor system monitoring - surveillance (section)

 9. Service processor flash EPROM updates (and system firmware) (section)

10. Service processor error logs (section)

11. System POST errors (section)

12. Processor boot-time deconfiguration (main topic)

13. Memory boot-time deconfiguration (main topic)

Service processor menus

Replacement information

 Use the information listed in this section to replace the information removed in the section above.

The service processor menus enable you to configure service processor options and to enable and disable functions.

Service processor menus are available using an open TTY window from the control workstation when the node is logically powered off and the service processor is operating with standby power. Service processor menus are also available when node power is on and the service processor has detected a node problem (such as loss of surveillance).

During the first power up (i.e. node circuit breaker is powered on), service processor menus are not available for 45 seconds while the service processor is running self-tests and initializing the node. If the node logically powers down, service processor menus become available after 15 seconds.

Menu inactivity

To prevent loss of control in unstable power environments, the service processor leaves the menu mode after 5 minutes of inactivity. Menus may be resumed by pressing any key on the terminal, local or remote.

How to access service processor menus locally

Service processor menus may be accessed locally on the control workstation by pressing a key from an open TTY window from Perspectives on the control workstation.

Note: The node power cable must be attached with inline circuit breakers On and the node power must be logically Off.

How to access service processor menus remotely.

Remote service processor access **is not** supported on this node.

Service processor menu options

Main menu

At the top of the Main Menu is a listing containing:

- Your Service Processor's current firmware version
- The firmware copyright notice
- The System Name given to your node during setup (if set).

The following screens show example node information as it appears for the specific node.

POWER3 SMP High Nodes:

```
        Service Processor Firmware
         Firmware level: NH991029)
        Copyright 1998, IBM Corporation
                 SVLAB1N05
```

You need the firmware version for reference when you either update or repair the functions of your service processor.

The System Name, an optional field, is the name your node reports in problem messages. This name helps your support team, (for example, your system administrator, network administrator, or service representative) to more quickly identify the location, configuration, and history of your node. The System Name is set from the Main Menu using option 6.

Service processor setup menu

> **Note**
>
> Unless otherwise stated in menu responses settings become effective when a menu is exited using option 98 or 99.

Passwords: Passwords can be any combination of up to 8 alphanumeric characters. You can enter longer passwords, but the entries are truncated to include only the first 8 characters. Passwords can be set from the service processor menu or from the SMS menus.

The following illustrates what you can access with the Privileged Access Password and the General Access Password.

Privileged Access Password	General Access Password	Resulting Menu
None	None	Main Menu displayed
None	Set	Main Menu displayed
Set	None	User's with password see the Main Menu Other users see the General User Menu
Set	Set	Users see menus associated with the entered password

Change privileged access password: Set or change the Privileged Access Password. It provides the user with the capability to access all service processor functions. This password is usually used by the system administrator or **root** user.

Change general access password: Set or change the General Access Password. It provides limited access to service processor menus, and is usually available to all users who are allowed to power-on the node.

Enable/disable console mirroring: This option **is not** supported on this node.

Start talk mode: This option **is not** supported on this node.

OS Surveillance setup menu: This option may be used to setup operating system surveillance.

Surveillance May be set to Enable or Disable.

Surveillance time interval May be set to any number from 2 to 255.

Surveillance delay May be set to any number from 0 to 255.

Refer to "Service processor system monitoring - surveillance" for more information about surveillance.

Reset service processor: Allows the user to reinitialize the service processor.

Reprogram service processor flash EPROM: This option **is not** supported on this node.

This menu option will not operate on this node because no diskette drive is available. If you need to update system firmware, use the procedure in "Service processor flash EPROM updates (and system firmware)".

System power control menu

Enable/disable unattended start mode: This option may be used to instruct the service processor to immediately power-on the node after a power failure, bypassing power-on password verification.

Ring indicate power-on menu: This option **is not** supported on this node.

Reboot/restart policy setup menu:

Number of reboot attempts If the node fails to successfully complete the boot process, it attempts to reboot the number of times specified. Entry values equal to or greater than 0 are valid. Only successive failed reboots attempts count, not reboots that occur after a restart attempt. At restart, the counter is set to 0.

Use OS-defined restart policy Lets the service processor react or not react the same as the operating system to major system faults, by reading the setting of the operating system parameter **Automatically Restart/Reboot After a System Crash**. This parameter may, or may not be defined depending on the

operating system or its version/level. If the operating system automatic restart setting is defined, then it may be set to respond to a major fault by restarting or by not restarting. See your operating system documentation for details on setting up operating systems automatic restarts. Option values are Yes or No, the default value is Yes.

Enable supplemental restart policy The default setting is No. If set to Yes, the service processor restarts the system when the system loses control as detected by service processor surveillance, and either:

1. The **Use OS-Defined restart policy** is set to No *or*

2. The **Use OS-Defined restart policy** is set to Yes and the operating system has No automatic restart policy.

    Refer to "Service processor reboot/restart recovery".

Call-Out before restart (enabled/disabled) This option **is not** supported on this node.

Power-on system: Lets you power-on the system immediately. For other power-on methods see "Node power-on methods".

Power-off system: Allows the user to power-off the node following a surveillance failure.

Enable/disable fast system boot: Allows the user to power-off the node following a surveillance failure.

Available values for this option are Enabled or Disabled.

In fast boot mode, there are two actions that will explicitly change the mode back to slow boot: 1) All checkstop conditions and 2) The user manually changing mode using the menu.

Clearing NVRAM also returns the mode to slow boot mode, slow boot remains in effect until the system boots AIX successfully one time, then automatically changes to fast boot.

Boot mode menu: The Boot Mode Menu allows users to configure the system to automatically start a specific function on the next boot-up. This configuration applies to the next boot only and are reset to the default state of being disabled following a successful boot attempt.

Boot to SMS menu Selecting this option causes the system to automatically enter the System Management Services menu during the boot process. Enabling this option is equivalent to pressing "1" on the open TTY window while the system initialization indicators are appearing on screen (see "Text-based System Management Services").

Service mode boot from saved list This option causes system to boot from disk using the Maintenance Image (see "SERVICE mode (from disk)"). Enabling this option is equivalent to pressing "5" on the open TTY window while the system initialization indicators are appearing on screen.

Note: The device to boot from can be changed using SMS menu (see "MultiBoot").

Service mode boot from default list This option causes a Service Mode boot using the default boot list hard-coded into system firmware. The default list is set as follows:

1. Disk Drive

2. Network Adapter

    - Token-Ring

    - Ethernet

Enabling this option is equivalent to pressing "6" on the open TTY window while the system initialization indicators are appearing on screen.

Note: This option should only be used if booting using Saved List fails.

Boot to open firmware prompt When selected, the system will automatically enter Open Firmware prompt (also called he OK prompt). Enabling this option is equivalent to pressing "8" on the open TTY window while the system initialization indicators are appearing on screen (see "OK prompt").

If more than one option is enabled, the system will only act on the option corresponding to the smallest menu number. For example, if option 4 and 2 were enabled, the system would only look at option 2: Service Mode Boot from Saved List. After a boot attempt, all enabled options are disabled. In effect, the system throws away any menu options that are enabled after the option with the highest priority (the option with the smallest menu number) is executed.

The user can also override the choices in the boot mode menu while the system initialization indicators are appearing on screen. For example, if the user had enabled the system to enter the SMS menus (option 1) but hit the 8 key while the system initialization indicators are appearing on screen, the system would enter the Open Firmware prompt and disregard the settings in the Boot Mode Menu.

Note: The system initialization indicators are shown after the first time "RS/6000" is displayed on the TTY screen during system boot. You may select a boot mode from the TTY keyboard quickly after the words "MEMORY" and then "KEYBOARD" appear. You will also know when the initialization indicators are displayed by watching the operator panel or LCD display for the code E1F1.

System information menu

Read VPD image from last system boot: Displays the VPD information that was in effect after the last system boot. This information will usually be identical with the results from the menu selection "Read VPD," but in the case of configuration updates or certain faults, this historical comparison can be useful to System Administrators and service personnel.

Read progress indicator from last system boot: Displays the boot progress indicators (check points), up to a maximum of 80, from the last system boot. This historical information may be useful to help diagnose system faults.

Read service processor error logs: Displays error conditions detected by the Service Processor.

The time stamp in this error log is Coordinated Universal Time, also known as Greenwich Mean Time (GMT). AIX error logs have more information available and are able to time stamp with local time.

Read system POST errors: Selecting this item lets you review the results of the POST (Power-On Self Test). The node may be able to start in the presence of POST errors if there is sufficient working system resources. If POST errors occur during startup, this error log when used with the diagnostics helps to isolate faults.

Read NVRAM: Displays Non-Volatile Random Access Memory (NVRAM) content.

Read service processor configuration: Displays the processor configurations.

View system environmental conditions: The service processor reads all environmental sensors and reports the results to the user. This option is most useful when surveillance fails, as it allows the user to determine the environmental conditions that may be related to the failure.

The content of the system environmental conditions menu varies depending on the node examined and the level of service processor firmware installed.

Processor configuration/deconfiguration menu: Use this option to view and modify processor configuration.

Figure 3-3 shows an example of the Processor Configuration/Deconfiguration Menu:

```
        Processor Configuration/Deconfiguration Menu

ID NUM   CARD SLOT   MODULE   ERROR         STATUS
   0.        2          1     (0x 0) : Configured by system
   1.        2          2     (0x 0) : Configured by system
   2.        2          3     (0x 0) : Configured by system
   3.        2          4     (0x 0) : Configured by system
   4.        1          1     (0x 0) : Configured by system
   5.        1          2     (0x 0) : Configured by system
   6.        1          2     (0x 0) : Configured by system
   7.        1          4     (0x 0) : Configured by system
   8.        3          1     (0x 0) : Configured by system
   9.        3          2     (0x 0) : Configured by system
  10.        3          3     (0x 0) : Configured by system
  11.        3          4     (0x 0) : Configured by system
  12.        4          1     (0x 0) : Configured by system
  13.        4          2     (0x 0) : Configured by system
  14.        4          3     (0x 0) : Configured by system
  15.        4          4     (0x 0) : Configured by system
98. Return to Previous Menu
```

The user can manually configure or deconfigure any processor, regardless of failure status, through this Service Processor menu. The configuration process takes place during the system power-up. Therefore, the configuration displayed in STANDBY mode reflects the configuration during the last boot.

To view the current configuration, access the Service Processor menu after the system starts. When the user selects a processor, its state toggles between configured and deconfigured. Processors that are not present are not listed. A processor can be in any of the following four states:

Configured by System: The processor is present, and has not exceeded the number of failure threshold. It is configured by the system and is available.

Deconfigured by System: The processor is present, but has exceeded the number of failure threshold. It is deconfigured by the system and is currently unavailable.

Manually configured: The processor is present and available. It is configured by the user through the Service Processor menus.

Manually deconfigured: The processor is present, but unavailable. It has been deconfigured by the user through the Service Processor menus.

Note: The processor configuration/deconfiguration menu is not valid unless the system has been booted to progress code 'E0A1' once.

The processor numbers (the three digits on the left side of the display) are shown as, *x. y : z:*, where:

Digit	*x* (1st digit)	*y* (2nd digit)	*z* (3rd digit)
Component	Node Processor Number	Processor Card Slot	Processor Card CPU Number

Values	0-15	1-4	0-1

To change the processor configuration, select the **node processor number** (1st digit). The processor state changes from the configured to deconfigured (or deconfigured to configured) state.

Memory configuration/deconfiguration menu: Use this option user to view and modify memory configuration.

Figure 3-4 is an example of the Memory Configuration/Deconfiguration Menu:

```
    Memory Configuration/Deconfiguration Menu

CARD SLOT   GROUP      DIMM's IN GROUP              STATUS
    1         1     : 2  4 10 12 18 20 26 28  :  Not Available
    1         2     : 6  8 14 16 22 24 30 32  :  Not Available
    1         3     : 1  3  9 11 17 19 25 27  :  Not Available
    1         4     : 5  7 13 15 21 23 29 31  :  Configured by system

    2         1     : 2  4 10 12 18 20 26 28  :  Not Available
    2         2     : 6  8 14 16 22 24 30 32  :  Not Available
    2         3     : 1  3  9 11 17 19 25 27  :  Not Available
    2         4     : 5  7 13 15 21 23 29 31  :  Configured by system

    3         1     : 2  4 10 12 18 20 26 28  :  Not Available
    3         2     : 6  8 14 16 22 24 30 32  :  Not Available
    3         3     : 1  3  9 11 17 19 25 27  :  Not Available
    3         4     : 5  7 13 15 21 23 29 31  :  Configured by system

    4         1     : 2  4 10 12 18 20 26 28  :  Not Available
    4         2     : 6  8 14 16 22 24 30 32  :  Configured by system
    4         3     : 1  3  9 11 17 19 25 27  :  Not Available
    4         4     : 5  7 13 15 21 23 29 31  :  Not Available

98. Return to Previous Menu

Enter card number and group number separated by a space  1>
```

The user can manually configure or deconfigure any memory group regardless of failure status, through this Service Processor menu. The configuration process takes place during the system power-up. Therefore, the configuration displayed in STANDBY mode reflects the configuration during the last boot.

To view the current configuration, access the Service Processor menu after the system starts. When the user selects a memory card and memory group, its state will toggle between configured and deconfigured. Memory groups that are not present are not listed. A memory group can be in any of the following four states:

Configured by System: The memory group is present, and has not exceeded the number of failure threshold. It is configured by the system and is available.

Deconfigured by System: The memory group is present, but has exceeded the number of failure threshold. It is deconfigured by the system and is currently unavailable.

Manually configured: The memory group is present and available. It is configured by the user through the Service Processor menus.

Manually deconfigured: The memory group is present, but unavailable. It has been deconfigured by the user through the Service Processor menus.

Note: The memory configuration/deconfiguration menu is not valid unless the system has been booted to progress code 'E0A1' once.

To change the memory configuration, select the **card and group number**. The group state changes from the configured to deconfigured (or deconfigured to configured) state.

Use Table 3-4 and Figure 2-10 to find specific DIMM AIX location code and physical location.

Table 3-4, Memory group location codes

Group 1A	Location Code		Group 2A	Location Code
J11A	P1-M1.2		J12A	P1-M1.6
J21A	P1-M1.4		J22A	P1-M1.8
J31A	P1-M1.10		J32A	P1-M1.14
J41A	P1-M1.12		J42A	P1-M1.16
J51A	P1-M1.18		J52A	P1-M1.22
J61A	P1-M1.20		J62A	P1-M1.24
J71A	P1-M1.26		J72A	P1-M1.30
J81A	P1-M1.28		J82A	P1-M1.32
Group 1B	**Location Code**		**Group 2B**	**Location Code**
J11B	P1-M1.1		J12B	P1-M1.5
J21B	P1-M1.3		J22B	P1-M1.7
J31B	P1-M1.9		J32B	P1-M1.13
J41B	P1-M1.11		J42B	P1-M1.15
J51B	P1-M1.17		J52B	P1-M1.21
J61B	P1-M1.19		J62B	P1-M1.23
J71B	P1-M1.25		J72B	P1-M1.29
J81B	P1-M1.27		J82B	P1-M1.31

Enable/Disable CPU Guard: CPU or processor run-time deconfiguration is a function implemented in the system firmware, service processor firmware and AIX operating system (4.3.4 version or later) for dynamically removing CPUs from the system configuration during run-time. The objective is to minimize system failures or data integrity exposures caused by a faulty processor. The processor to be removed is the one that has experienced repeated run-time recoverable internal error (over a predefined threshold). The function utilizes the hardware error detection logic in the processor to capture run-time recoverable error indications. The firmware uses the error signatures in the hardware to analyze and isolate the error to a specific CPU. The firmware also maintains error threshold information. When a processor internal recoverable error reaches a predefined threshold, the firmware notifies the AIX operating system. The AIX operating system migrates all software processes and interrupts to another processor and puts the faulty processor in "stop state". CPUs that are deconfigured at run time remain offline for subsequent reboots via the CPU Boot Time Deconfiguration function, until the faulty CPU hardware is replaced. The user can also enable or disable this function via the AIX system management function.

Available values for this option are Enabled or Disabled.

Enable/Disable Memory Guard: Memory boot time deconfiguration is a function implemented in the service processor firmware for removing a memory segment or DIMM from the system configuration at boot time. The objective is to minimize system failures or data integrity exposure due to faulty memory hardware. The hardware resources to be removed are the ones that experienced the following failures:

* A boot-time test failure

* Run-time recoverable errors over threshold prior to the current boot phase

* Run-time unrecoverable errors prior to the current boot phase

This function utilizes firmware Power-On Self Test (POST) to discover and isolate memory hardware failures during boot time. It also utilizes the hardware error detection logic in the memory controller to capture run-time recoverable and unrecoverable error indications. The firmware uses the error signatures in the hardware to analyze and isolate the error to specific memory segment or DIMM.

The memory segment or DIMM that are deconfigured remain offline for subsequent reboots until the faulty memory hardware is replaced.

The function provides the option for the user to manually deconfigure or re-enable a previously deconfigured memory segment/DIMM via the Service Processor menu. The user can also enable or disable this function via the Service Processor menu.

Language selection menu

Note: Your ASCII terminal must support the ISO-8859 character set in order to properly display languages other than English.

This menu allows selecting languages into which service processor and system firmware menus and messages are displayed.

Available language options include:

1. English
2. Francais
3. Deutsh
4. Italiano
5. Espanol
6. Svenska

Call-in/call-out setup menu

All functions specific to this menu are not supported on this node.

Set system name

A name given the node to which the SP menus are currently being used. Appears near top of main menu.

Node power-on methods

- Power-on from control workstation (CWS), refer to the *IBM Parallel System Support Programs for AIX: Administration Guide*, (GC23-3897).

- Service Processor Menu power-on request - not supported on this node

- Unattended start mode - not supported on this node

- Timed power-on - refer to the `shutdown -t` command on nodes using AIX.

  Working in conjunction with AIX, the Service Processor in your node can operate a timer, much like the wake-up timer on your clock radio. You can set the timer so that your node powers on at a certain time after shutting down. The timer is battery operated, so power interruptions occurring while the node is off do not affect its accuracy. Refer to the **shutdown -t** command of AIX for details on setting the timer.

  Because of the potential for power loss, the Timed Power-On function of AIX can only be assured when Unattended Power-On Mode is enabled. If a Timed Power-On event occurs during a power loss, and if Unattended Power-On Mode is enabled, the system starts when power is restored.

  If Unattended Start Mode is disabled (the default), the system power state remains off when power is restored, regardless of the power state of the system when power loss occurred.

- Ring Indicate Power-On

  Enabling ring indicate power-on disables remote call-in. If ring indicate power-on is enabled, the node will power on at a predetermined number of rings. If the node is already on, no action is taken. In either case, the telephone call is not answered. The caller receives no feedback that the node powered on.

- Follow-up to a Failed Boot Attempt

  The service processor will initiate a power-on sequence upon detection of a failed boot attempt.

Service processor reboot/restart recovery

Reboot describes bringing the system hardware back up from scratch, for example, from a system reset or power on. The boot process ends when control passes to the operating system process.

Restart describes activating the operating system after the system hardware reinitialized. Restart must follow a successful reboot.

Failure during boot process: During the boot process, either initially after system power-on or upon reboot after a system failure, the Service Processor monitors the boot progress (via surveillance). If progress stops, the service processor can reinitiate the boot process (reboot) if enabled to do so. The service processor can re-attempt this process according to an entry on the Reboot/Restart Policy Setup Menu.

Failure during normal system operation: When the boot process completes and control transfers to the operating system (OS), the service processor can monitor operating system activity (see the Service Processor Setup Menu item Set Surveillance Parameters). If OS activity stops, the service processor can initiate a reboot/restart process based on the settings in the Service Processor Reboot/Restart Policy Setup Menu and the OS automatic restart settings (see OS documentation).

If the operating system is AIX, the menu item under SMIT for setting the restart policy is Automatically Reboot After Crash (True/False), and the default is False. When the setting is True, and if the service processor parameter, Use OS-Defined Restart Policy, is Yes (the default), service processor takes over for AIX to reboot/restart after a Check Stop or Surveillance failure.

Service processor reboot/restart policy controls: The operating system's automatic restart policy (see operating system documentation) indicates the OS response to a system crash. The service processor can be instructed to refer to that policy, or not, by the Use OS-Defined Restart Policy menu item.

If the operating system has no automatic restart policy, or if it is disabled, then the service processor restart policy can be controlled from the service processor Menus by using the Enable Supplemental Restart Policy selection.

Use OS-defined restart policy?: The **Use OS-Defined restart policy** default setting is YES. This causes the service processor to refer to the OS Automatic Restart Policy setting and take action, the same action the OS would take if it could have responded to the problem causing the restart.

When this setting is NO, or if the OS did not set a policy, the service processor refers to Enable supplemental restart policy for its action.

Enable supplemental restart policy?: The default setting is NO. If set to YES, the service processor restarts the system when the system loses control as detected by service processor surveillance, and either:

1. The **Use OS-Defined restart policy** is set to NO OR

2. The **Use OS-Defined restart policy** is set to YES and the operating system has NO automatic restart policy.

    Refer to "Service processor reboot/restart recovery".

The following provides a more thorough understanding of the relations among the OS and service processor restart controls:

OS automatic reboot/restart after crash setting	Service processor to use OS-defined restart policy?	Service processor enable supplemental restart policy?	System response
None	No	No[1]	
None	No	Yes	Restarts
None	Yes[1]	No[1]	
None	Yes[1]	Yes	Restarts
False[2]	No	No[1]	
False[2]	No	Yes	Restarts
False[2]	Yes[1]	No[1]	
False[2]	Yes[1]	Yes	
True	No	No[1]	
True	No	Yes	Restarts
True	Yes[1]	No[1]	Restarts
True	Yes[1]	Yes	Restarts

Note:

[1] Service processor default
[2] AIX default

Service processor system monitoring - surveillance

Surveillance is a function in which the service processor monitors the system, and the system monitors the service processor. This monitoring is accomplished by periodic samplings called heartbeats.

Surveillance is available during two phases:

1. System firmware bring up (automatic) and

2. Operating system run time (optional).

System firmware surveillance: Provides the service processor with a means to detect boot failures while the system firmware is running.

System firmware surveillance is automatically enabled during system power-on. It cannot be disabled via a user selectable option.

If the service processor detects no heartbeats during system IPL (for 7 minutes), it cycles the system power to attempt a reboot. The maximum number of retries is set from the service processor menus. If the fail condition repeats, the service processor leaves the machine powered on, logs an error and offers menus to the user. If Call-out is enabled, the service processor calls to report the failure and displays the operating system surveillance failure code on the operator panel.

Operating system surveillance: Provides the service processor with a means to detect hang conditions, hardware or software failures while the operating system is running. It also provides the operating system with a means to detect a service processor failure by the lack of a return heartbeat.

Operating system surveillance is not enabled by default. This is to allow the user to run operating systems that do not support this service processor option.

Operating system surveillance can be enabled and disabled via:

- Service Processor Menus
- Service Processor Service Aids

Three parameters must be set for operating system surveillance:

1. Surveillance enable/disable

2. Surveillance interval

   This is the maximum time the service processor should wait for a heartbeat from the operating system before timeout.

3. Surveillance delay

   This is the length of time to wait from when the operating system is started to when the first heartbeat is expected.

Surveillance will not take effect until the next time the operating system is started after setting the parameters.

If operating system surveillance is enabled (and system firmware has passed control to the operating system), and the service processor does not detect any heartbeats from the operating system, the service processor assumes the system is hung. The machine is left powered on and Service Processor enters standby phase, displaying the operating system surveillance failure code on the operator panel. If Call-out is enabled, the service processor calls to report the failure.

Service processor flash EPROM updates (and system firmware)

The service processor EPROM may need to be updated for two different reasons:

1. The UPDATE (composite) portion of the EPROM has become corrupted.

2. Service processor firmware upgrades, without any corruption present.

The use of a Flash EPROM allows updates to occur without physically replacing the memory.

Firmware updates: The firmware in your node can be updated using one of two available initiation processes:

1. SMS Utilities initiation

2. Diagnostic Service Aids initiation

Each initiation method is described below. In each case, the process prompts you for your authority and shows the contents of the update media. Verify the file with which to perform the update, and follow any other instructions that may appear. After initiation, the processes are identical and automatic.

There are two areas in each firmware module that may need updating:

1. The gold code or base code or EPROM area

2. The custom or main program or FLASH area

Each update file contains matching gold and custom firmware, so it is not possible to update to a conflicting set.

Before the update process begins, the versions of each of the two areas of the target firmware module are compared to the versions on the update file. Only the area(s) that need updating are updated. In most cases, only the custom area is updated.

An update file can be acquired from the Support page on the Internet or from your service team. The Internet address is:

`http://www.rs6000.ibm.com/support/micro`

The update files will need to be loaded onto the control workstation prior to distribution to the nodes. This can be done by putting the files on a diskette in TAR or DOS format, and then using the appropriate **tar** or **dosread** command at the control workstation. Alternatively, you might be able to FTP the files directly onto the control workstation.

Checking current firmware levels: If the node is running AIX or in Service Mode, you may check the current firmware level by performing the first step of the procedure in "Updating firmware from diagnostic service aids". Otherwise, refer to the downloaded update instructions, the System Management Services, or Service Processor menus on page 23, to determine the level of the processor node or service processor flash.

Distributing firmware files to nodes before update

Note: This step must be done to propagate the firmware files on the hard drive of the node prior to initiating the firmware update.

1. Locate the required firmware file(s), which may be one or more of the following.

   `WILyyjjj.IMG` - image file used for system firmware
   `wcyymmdd.bin` - binary file used to burn the service processor EEPROM
   `wcyymmdd.img` - image file used for service processor Flash update
   (where: yy=year, jjj=julian date, mm=month, dd=day)

2. Transfer the firmware file(s) to the control workstation. The file can be put into any directory. Creating a firmware directory or using **/tmp** is suggested.

3. Make sure each node that will be updated is IPLed.

4. From the control workstation or each node, use the **ftp** command to transfer the files to each node. Make sure to use "image" or "binary" mode to ensure that the files are exact duplicates. The file(s) may be put in any directory although a directory with the name **/tmp** is suggested.

5. You may recheck that the distributed files are exact duplicates by running the following command against the original and distributed files:

   `chksum` *filename*

Updating firmware from the SMS utilities

Notes:

1. From the SMS menus, select "Utilities," then select option to "Update System Firmware" or "Update Service Processor."

2. Select update from filesystem. (Diskette is not supported)

3. Enter the directory and file name of the firmware file.

4. When firmware is completed, the system may reboot.

5. You should recheck the firmware level.

Note: The node must be powered-on to bring up the SMS Menus.

Updating firmware from diagnostic service aids

Note: This procedure can be run from Service Mode or from AIX.

1. Check current level of firmware:

   a. From Service Mode, select "Task Selection (Service Aids)," then select "Display Hardware Vital Product Data," select "All Resources," then press the commit key. Continue at 1c below.

   b. From AIX, use **lscfg -pv | pg** to list VPD information. Continue at 1c below.

   c. Scan the output for the following (towards the bottom):

   ```
   - System Firmware:
       ROM Level (alterable).......Lyyjjj

   - SP_CARD_
       ...
       ROM Level (non-alterable)...yyyymmdd
       ROM Level (alterable).......yyyymmdd
   ```

2. If running from AIX, enter the **diag** command, then select "Task Selection (Service Aids)."

3. From the "TASK SELECTION LIST," select "Update System or Service Processor Flash" (near the bottom of the list).

4. Select "FILESYSTEM" (diskette not supported).

5. Enter the directory and file name of the firmware file.

6. When firmware is completed, the system may reboot.

7. You should recheck the firmware level.

Service processor error logs

The service processor error logs contain error conditions detected by the service processor.

```
                        Error Log

 19970626223337   0. Loss of Redundant Fan #5
                        40210091



    Press "C" to clear error log, any other key to continue.  >
```

The time stamp in this error log is Coordinated Universal Time (CUT), also known as. Greenwich Mean Time (GMT). AIX error logs have more information available and are able to time stamp with local time.

System POST errors

If POST (Power-On Self Test) errors occur during startup, this error log help isolate faults when used with the diagnostics.

Chapter 4, FRU removals and replacements

Update the following removal and replacement procedures:

Removing a DASD

Processor node procedure

1. Ensure ESD antistatic wrist device is attached.
2. Remove the cooling assembly (see: "Removing the cooling assembly").
3. Loosen the DASD tray mounting screws.
4. Slide the DASD tray assembly forward from the processor assembly.
5. Loosen the captive screw holding the cable retainer.
6. Disconnect the DASD SCSI cable.
7. Disconnect the DASD power cable.
8. Remove the DASD tray assembly from the DASD bay.
9. Remove the screws that secure the DASD to the tray assembly.
10. Remove the DASD from the tray assembly.
11. Check DASD jumper positions (if any) for address settings. Record jumper positions for proper setting on replacement DASD.

    Note: Make sure grounding strips, located around the edges, are firmly in place.

Replacing a DASD

Processor node procedure

1. Ensure ESD antistatic wrist device is attached.
2. Set jumper positions on DASD (if any) as recorded in removal procedure.
3. Install DASD in the DASD tray and tighten with screws retained in the removal procedure.
4. Place the DASD tray assembly partially in the DASD bay.
5. Reinstall the DASD power cable.
6. Reinstall the DASD SCSI cable.
7. Tighten the captive screw holding the cable retainer.

    * **Do not** loop the cables, this will create a mechanical interference.

8. Slide the DASD tray assembly fully into the processor assembly.
9. Tighten the DASD tray mounting screws.
10. Replace the cooling assembly (see: "Replacing the cooling assembly").
11. Return to the procedure that directed you here.

Removing the switch adapter

Note: To access components in the rear of the node, it may be helpful (but not necessary) to remove the cable management bracket. Be sure to replace the bracket after replacing the FRU.

Processor node procedure

1. Place the node into the service position (see: "Placing a POWER3 SMP High Node into the service position").
2. Ensure ESD antistatic wrist device is attached.
3. Remove the SP switch cable at the rear of the node.
4. Remove the screws on the edge of the I/O assembly cover. Remove the cover by sliding it back and lifting the edge closest to you.
5. If you are removing a switch adapter, remove the hold-down screw from the adapter mounting bracket.
6. Grasp the adapter by the pull tabs and pull it out of the slot.
7. Remove the protective cover from port P1 and retain for later use.

Replacing the switch adapter

Processor node procedure

1. Ensure ESD antistatic wrist device is attached.
2. Install the protective cover, that was previously removed, on port P1 (if necessary).
3. Align the switch adapter with the slot, then push card into the slot.
4. Reinstall and tighten the hold-down screw for the adapter mounting bracket.
5. Install the I/O assembly cover and tighten the screws on the edge of the assembly.
6. Install the SP switch cable at the rear of the node.
7. Remove the node from the service position (see: "Removing a POWER3 High Node from the service position").
8. Return to the procedure that directed you here.

Removing the node I/O planar

Attention: Licensed programs frequently rely on network configuration and system information stored on the VPD on the I/O planar (see Figure 2-11). If the MAPs indicate that the I/O planar should be replaced, swap the VPD from the old I/O planar to the new one. If the old VPD module has to be replaced, call technical support for recovery instructions. If recovery is not possible, notify the system owner that new keys from licensed programs may be required.

Note: To access components in the rear of the node, it may be helpful (but not necessary) to remove the cable management bracket. Be sure to replace the bracket after replacing the FRU.

Processor node procedure

1. Record the location of any I/O adapter cables, SP Expansion I/O Unit cables, and cards you are going to remove (to aid in later installation).
2. Place the node into the service position (see: "Placing a POWER3 High Node into the service position").
3. Ensure ESD antistatic wrist device is attached.
4. Remove any SP switch adapter cables attached at the rear of the node.
5. Remove any I/O adapter cables attached at the rear of the node.
6. Remove any SP Expansion I/O Unit cables attached at the rear of the node.
7. Remove the screws on the edge of the I/O assembly cover. Remove the cover by sliding it back and lifting the edge closest to you.
8. Remove the SPS MX2 adapter (if present).
9. Check for internal connections to other adapter cards or cables. Record these connections before removing them.
10. If the adapter card has an card extender that holds the front end of the adapter, release the extender by pressing the locking tab to the side.
11. Grasp the adapter by the pull tabs and pull it out of the slot.
12. Record any jumper or switch settings on the card.
13. Remove the screws holding the node supervisor card to the node rear panel, and remove the card.
14. Remove the screw holding the riser card to the upper card guide bracket, and remove the card.
15. Remove the standoffs holding to SP Expansion I/O Unit adapters to the node rear panel.
16. Remove the screw holding the rear panel to the chassis and remove the panel.
17. Remove the SP Expansion I/O Unit adapters from the node I/O planar.
18. Remove the screws holding the node supervisor upper card guide bracket to the chassis.
19. Remove the screws holding the air baffle assembly to the I/O assembly, and remove the baffle.
20. Remove all the cables connected to the node I/O planar.
21. Remove the air baffle standoffs from the planar and save for installation on the new planar.
22. Remove the screws holding the node supervisor lower card guide bracket to the I/O planar and remove the bracket.
23. Remove the screws holding the node I/O planar to the I/O assembly.
24. Remove the node I/O planar

Replacing the node I/O planar

Attention: Licensed programs frequently rely on network configuration and system information stored on the VPD on the I/O planar (see Figure 2-11). If the MAPs indicate that the I/O planar should be replaced, swap the VPD from the old I/O planar to the new one. If the old VPD module has to be replaced, call technical support for recovery instructions. If recovery is not possible, notify the system owner that new keys from licensed programs may be required.

Attention: The system ID will change when replacing a High Node I/O planar if keeping the VPD module supplied with the FRU. Inform the Customer, **before** removing and replacing the I/O planar, that some software applications that use the system ID number for licensing purposes may be impacted by this change.

Note: Inform the customer:

1. The boot address will need to be updated.

   - Refer the customer to "Resetting the clock and bootlist after servicing the node" or *IBM Parallel System Support Programs for AIX: Installation Guide* for this procedure.

2. The Ethernet hardware address will need to be updated.

   - Refer the customer to "Updating the Ethernet hardware address".

Processor node procedure

1. Ensure ESD antistatic wrist device is attached.
2. Install the node I/O planar.
3. Install the screws holding the node I/O planar to the I/O assembly.
4. Install the node supervisor lower card guide bracket to the I/O planar and tighten the screws.
5. Install the air baffle standoffs removed from the old planar.
6. Install the air baffle assembly to the I/O assembly and tighten the screws.
7. Install all the cables connected to the node I/O planar.
8. Install the node supervisor upper card guide bracket to the chassis and tighten the screws.
9. Install the SP Expansion I/O Unit adapters to the node I/O planar.
10. Install the rear panel and tighten the screws.
11. Install the standoffs to secure the SP Expansion I/O Unit adapters.
12. Install the riser card to the I/O planar (at **J9**) and tighten the screw to the upper card guide bracket.
13. Install the node supervisor card, and tighten the screws.
14. Check for any jumpers or switches to be set on the adapters, and set as appropriate.
15. Align adapters, and push into the slots.

    Note: If this card has any internal connections to other adapters or cables, reconnect them, as appropriate

16. Install the SPS MX2 adapter (if present).
17. Install the I/O assembly cover and tighten the screws on the edge of the assembly.
18. Install any SP Expansion I/O Unit cables in the rear of the node.
19. Install any I/O adapter cables in the rear of the node.
20. Remove the node from the service position (see: "Removing a POWER3 SMP High Node from the service position").
21. Return to the procedure that directed you here.

Removing a PCI adapter card

Notes:

1. If the node has been updated to AIX 4.3.3.10 or higher and the PCI adapter is hot-pluggable, you may not have to power down the node or SP Expansion I/O Unit to remove a PCI adapter from the SP Expansion I/O Unit. Before you perform these procedures, ensure that the customer has followed all appropriate procedures to take the adapter offline (out of operation) and put it in the proper state for removal. Physically removing a PCI adapter before the appropriate steps are taken to put the adapter in the "Action" state, may cause the node and all attached SP Expansion I/O Units to crash.

2. Only PCI adapters supported in the SP Expansion I/O Unit **are** hot-pluggable.

   - Refer to *RS/6000 SP Planning Volume 1, Hardware and Physical Environment* for a list of supported adapters.

3. For more information about hot-plugging PCI adapters, accessing hot-plug management functions, and interpreting adapter slot LED status, see "Servicing SP Expansion I/O Unit hot-plug PCI adapters."

Expansion unit procedure

1. Ensure ESD antistatic wrist device is attached.
2. To remove FRU:

   - With power off:

     a. Place the SP Expansion I/O Unit into the service position (see: "Placing an SP Expansion I/O Unit into the service position").

     b. Remove the I/O adapter cover plate by loosening the screws and lifting it from the unit.

     c. Check for internal connections to other adapter cards or cables. Record **all** adapter cable connections before removing any cables or cards.

     d. Unseat the adapter by pulling the adapter card release tab at the top of the card. Then remove the card by pulling it toward you.

     e. Record any appropriate jumper or switch settings on the card.

   - With power on:

     a. Access the hot-plug management function (see: "Servicing SP Expansion I/O Unit hot-plug PCI adapters.")

     b. Select "Unconfigure Devices" (this step must successfully complete **before** starting any remove or replace operation).

     c. Select "Replace/Remove a PCI Hot Plug Adapter" (adapter slot LED will go to the "Action" state; the LED for the adapter slot will flash rapidly).

     d. Remove the I/O adapter cover plate by loosening the screws and lifting it from the unit.

     e. Check for internal connections to other adapter cards or cables. Record **all** adapter cable connections before removing any cables or cards.

     f. Unseat the adapter by pulling the adapter card release tab at the top of the card. Then remove the card by pulling it toward you.

     g. Record any appropriate jumper or switch settings on the card.

Replacing a PCI adapter card

Expansion unit procedure

1. Ensure ESD antistatic wrist device is attached.
2. To replace FRU:

   - With power off:

     a. Set any jumpers or switches on this card, as appropriate.

     b. If this card has any internal connections to other adapters or cables, reconnect them, as appropriate.

     c. Slide the adapter into the unit and align the card with the planar connector.

     d. Push the adapter card release tab to seat the adapter.

     e. Install the I/O adapter cover plate and tighten the screw.

     f. Remove the expansion unit from the service position (see: "Removing an SP Expansion I/O Unit from the service position").

     g. Return to the procedure that directed you here.

- With power on:

    a. Set any jumpers or switches on this card, as appropriate.

    b. If this card has any internal connections to other adapters or cables, reconnect them, as appropriate.

    c. Slide the adapter into the unit and align the card with the planar connector.

    d. Push the adapter card release tab to seat the adapter.

    e. Install the I/O adapter cover plate and tighten the screw.

    f. Make certain the adapter is still in the "Action" state (the LED for the adapter slot is flashing rapidly).

    g. Select "Configure Devices" (adapter slot LED will go to the "On" state).

    h. Return to the procedure that directed you here.

Removing the I/O planar

Expansion unit procedure

1. Ensure ESD antistatic wrist device is attached.
2. Place the SP Expansion I/O Unit into the service position (see: "Placing an SP Expansion I/O Unit into the service position").
3. Record the location of any I/O adapter cables and cards you are removing for later installation.
4. Remove all PCI adapter cards (see "Removing a PCI adapter card").
5. Remove the supervisor card (see "Removing the supervisor card").
6. Label and remove both I/O interposer loop cables (external cables attached to the SP expansion I/O interposer).
7. Pull down on the power supply handles to disengage both of the power supplies from the I/O planar.
8. Remove the center cover plate by unlocking the screw and lifting the cover from the unit.
9. Unplug the fan assembly power cables and remove the fan assembly.
10. Unplug the cables attached to the I/O planar at J13, J14 and J50.
11. Loosen the top screw of the cover plate and remove the plate.
12. Pry up on the planar locking tab located on the planar's centerline and in front of the interposer card jacks.
13. Remove the planar by pulling it toward you.
14. Remove the screws and nuts holding the interposers to the planar.
15. Remove the SP expansion I/O interposer.

Replacing the I/O planar

Note: Inform the customer that after this procedure:

    1. The boot address will need to be updated.

        - Refer the customer to "Resetting the clock and bootlist after servicing the node" or *IBM Parallel System Support Programs for AIX: Installation Guide* for this procedure.

    2. The Ethernet hardware address will need to be updated.

        - Refer the customer to "Updating the Ethernet hardware address."

Expansion unit procedure

1. Ensure ESD antistatic wrist device is attached.
2. Plug the interposers into the planar.
3. Install the screws and nuts used to hold the interposers to the planar.
4. Install the I/O planar and push it into the unit until it locks into position.
5. Install the cover plate and tighten the screw.
6. Install and tighten the SP expansion I/O interposer standoffs.

7. Plug the cables attached to the I/O planar at J13, J14 and J50.
8. Lower the fan assembly into the unit with the louvers toward the rear of the unit.
9. Align fan assembly on the locator pins.
10. Replug the fan assembly power cables.
11. Install the center cover plate and tighten the locking screw.
12. Push the power supplies into the unit and engage each supply by lifting on the latching handle.
13. Install the SP expansion I/O interposer cables.
14. Install the supervisor card (see "Replacing the supervisor card").
15. Install all PCI adapters that were removed (see "Replacing a PCI adapter card").
16. Remove the expansion unit from the service position (see: "Removing an SP Expansion I/O Unit from the service position").
17. Return to the procedure that directed you here.

Chapter 5, Parts catalog

Assembly 2

Update part number:

- 03N4183 Memory card (was 07L6608)

Assembly 6

Update part number:

- 05N6685 Supervisor card (was 31L8752)

Add parts:

- 21L2986 Hot-plug mechanism

- 31L7189 Hot-plug actuator

RS/6000 SP memory part numbers

Table 5-2, POWER3 SMP High Node DIMM options

Description	Number of DIMMs	Total capacity	FRU number
Base card (for 128 MB DIMMs)	NA	32 DIMMs	03N4183
128 MB DIMM	1	128 MB	93H4702
128 MB DIMM set	4	0.5 GB	12K0404
256 MB DIMM	1	256 MB	07L9030
256 MB DIMM set	4	1 GB	12K0405
Note: DIMMs are ordered separately from base cards.			

Appendix A, Messages and codes

Update the following error codes in these tables:

Table A-2, POWER3 SMP High Node firmware error codes

Error Code	Description	Action / Possible Failing FRU	FRU Location Code
26020001	Invalid PCI adapter vendor ID	1. Run diagnostics 2. Replace adapter 3. Replace I/O planar	Px-Ix Px
26020002	Invalid PCI adapter device ID	1. Run diagnostics 2. Replace adapter 3. Replace I/O planar	Px-Ix Px
26020003	Invalid PCI adapter class code	1. Run diagnostics 2. Replace adapter 3. Replace I/O planar	Px-Ix Px
26020007	Failed to allocate bus resources to adapter	1. Run diagnostics 2. Replace adapter 3. Replace I/O planar	Px-Ix Px

Error Code	Description	Action / Possible Failing FRU	FRU Location Code
28030001	RTC not updating—RTC initialization required	Errors reported against the Real Time Clock (RTC) can be caused by low gold cap voltage and (rarely) power outages that occur during normal system usage. These errors are warnings that the RTC data content needs to be reestablished and do not require any FRU replacement unless the error is persistent. When one of these errors occurs, the time and date information has been lost. • To set/restore the time and date, use the operating system facility • Check NVRAM jumper, make certain it is in the "charge" position. • If the error is persistent replace node I/O planar (P2) **Note:** The gold cap is charged by the supervisor bus and will maintain the RTC and NVRAM data for about five days with the node disconnected from the supervisor bus.	P2

Table A-3, POWER3 SMP High Node service processor error codes

Error Code	Description	Action / Possible Failing FRU	FRU Location Code
40111112	High 1.8-volt reading detected	1. Replace CPU card 2. Replace system planar 3. Replace I/O planar	P1-Cx P1 P2
40111122	Low 1.8-volt reading detected	1. Replace CPU card 2. Replace system planar 3. Replace I/O planar	P1-Cx P1 P2
40210017	Fan Circuitry Problem	1. Replace Fan Control Card 2. Replace I/O Planar	P3-X1 P2

Error Code	Description	Action / Possible Failing FRU	FRU Location Code
40D00201	Chip id test fail	1. Replace Switch Adapter 2. Replace system planar 3. Replace I/O planar 4. Replace CPU card	P2-W1 to P2-W3 P1 P2 P1-C1 to P1-C4
40D00203	Chip BIST test fail	1. Replace Switch Adapter 2. Replace system planar 3. Replace I/O planar 4. Replace CPU card	P2-W1 to P2-W3 P1 P2 P1-C1 to P1-C4