IBM

Read This First

Thank you for your order. The material you have received is listed on the enclosed Packing List. Please review the Packing List to ensure you have received all items listed.

Please review the following publications prior to installing your SP system:

- *IBM RS/6000 SP: Planning, Volume 2, Control Workstation and Software Environment*
- *IBM @server Cluster 1600 Planning, Installation and Service*
- *IBM Parallel System Support Programs for AIX: Administrative Guide*
- *IBM Parallel System Support Programs for AIX: Installation and Migration Guide*

The most current information is available as READMEs on CD-ROM. Also included in this order is the most current recommended corrective service for this product. Please review the service README file for details on the installation of service. View the softcopy service README files the same way you would view the softcopy README for the product CD-ROM(s).

Note: For the most up-to-date copy of this document, please look in the following site under READ THIS FIRST:

`http://www.ibm.com/servers/eserver/pseries/library/sp_books/pssp.html`

Included in this Memo to Licensees are:

- Summary of Enhancements
- Additional Resource Information
- **PSSP Compatibility, Limitations, Restrictions, and Prerequisites**
- PSSP packaging
- Viewing the softcopy README documents from CD-ROM
- AIX 4.3.3 and AIX 5L 5.1 Minimal Image content
- List of Program Materials

Summary of Enhancements

The PSSP V3.4 Licensed Program provides enhanced quality and support for the AIX 5L 5.1 and AIX 4.3.3 operating systems. Functional enhancements include new or expanded support in the following areas:

- IBM @server Cluster 1600
- The SP Switch2
- Boot/install from Fibre Channel Storage Area Networks (SAN) DASD
- Secure remote command processing
- The Low-Level Application Programming Interface (LAPI)
- IBM Virtual Shared Disk support for Subsystem Device Driver
- Support for 64-bit applications running AIX 5L 5.1 on POWER nodes
- PSSP-related licensed programs

This is the last release of PSSP that supports the AIX 4.3.3 operating system.

Additional Resource Information

RS/6000 SP Resource Center

The SP Resource Center has been updated in this release. The SP Resource Center provides one simple interface for all softcopy documentation and information resources. It consists of HTML, Java, and Javascript files and runs in a Web browser. The SP Resource Center provides access to a variety of information including publications, manpages, READMEs, Redbooks, White Papers, and SP product information, as well as up-to-date service information. The SP Resource Center contains links to documents that are locally installed, or if a document is not installed, the link points to the document on the IBM World Wide Web site.

The latest version of the RS/6000 SP Resource Center may be downloaded from:

`http://www.ibm.com/servers/eserver/pseries/library/sp_books/resctr.html`

To preview or browse recently published RS/6000 SP documents for Parallel System Support Programs, visit our Web page at:

`http://www.ibm.com/servers/eserver/pseries/library/sp_books/pssp.html`

PSSP Compatibility, Limitations, Restrictions, and Prerequisites

Please refer to the README files within Parallel System Support Programs for AIX (PSSP for AIX) software for any restrictions or advisories as well as any required service before you begin to install your SP system.

Additional Restrictions and Considerations

Potential Security Vulnerability in File Collections management

* Problem Description:

  IBM has learned of a potential security vulnerability in the RS/6000 SP File Collections subsystem. The vulnerability could allow unauthorized network users to obtain copies of system files from the SP control workstation.

  The only files that are accessible through this vulnerability are those files that are included in a valid file collection on the SP control workstation. By default, this includes SP system configuration files and the AIX security database files.

  The file collections subsystem is enabled by default during SP system installation and configuration.

  This vulnerability exists in the file collections subsystem shipped with all currently supported releases of the RS/6000 SP PSSP product. Fixes are available from IBM for all currently supported releases of PSSP. Information concerning a workaround for unsupported releases of PSSP is provided below.

* Recommended Action:

  Obtain and apply the fix on all SP control workstations and nodes as soon as possible. See the instructions below for obtaining the appropriate PTF(s) containing the fix for each release of PSSP.

  Follow the instructions in the appropriate README file to enable secure file collections.

```
                                           PTF
PSSP Level  Documented Instructions    APAR #  Set  PTF Numbers
----------  ------------------------   ------- ---  ---------------
PSSP 3.1.1  ssp.sysman.README.IY20699  IY20699  24  U482380-U482384
PSSP 3.2    ssp.sysman.README.IY28063  IY28063  18  U482385-U482389
PSSP 3.4    ssp.sysman.README.IY28065  IY28065   7  U482395-U482399
```

  Note: IMPORTANT: Simply applying the PTF is not sufficient to correct the File Collections security vulnerability. The process to enable Secure File Collections, as documented in the README file, must be completed in order to correct the vulnerability.

  The fix can be obtained by ordering the specific PTF for your release from 1-800-CALLAIX or your country support center. The fix can also be downloaded by selecting the appropriate APAR number from IBM @server Support web page at:

  `http://techsupport.services.ibm.com/server/fixes`

  Customers with unsupported releases of PSSP can address the potential security vulnerability by disabling the file collections subsystem.

To disable File Collections, run the following command under the root userid on the SP control workstation:

```
spsitenv filecoll_config=false
```

To verify that File Collections has been disabled, run the following command:

```
splstdata -e | grep filecoll_config
```

Contact your IBM sales representative for more information.

Virtual Shared Disk (VSD) Kernel Low level API (KLAPI) Statement

- Parallel System Support Programs (PSSP) V3.4 now supports the KLAPI protocol in a Cluster 1600 with p690/p670 and the SP Switch2 in both a single- and two-plane configuration. This special protocol supports low-latency interprocessor communications among clustered p690/p670 servers running parallel applications in scientific and technical computing environments. Support for KLAPI with p690/p670 and the SP Switch2 is available with APAR number IY33251 The KLAPI protocol is not supported on the p690/p670 with the SP Switch.

VisualAge C++ Considerations

- PSSP 3.4 has prerequisites for certain files from the VisualAge C++ product. These files and their prerequisites are shipped with PSSP 3.4 at the following levels:

    vacpp.ioc.aix43.rte 5.0.2.0 or vacpp.ioc.aix50.rte 5.0.2.0

    vacpp.ioc.rte 5.0.2.0

    vacpp.cmp.rte 5.0.2.0

    xlC.aix43.rte 5.0.2.0 or xlC.aix50.rte 5.0.2.2

    xlC.rte 5.0.2.1

    Note: A problem exists with the files shipped from the VisualAge C++ product on the PSSP 3.4 CD labeled LCD4-3030-07 which prevents their installation. For the correct files, use the PSSP 3.4 CD labeled LCD4-3030-08, or later.

- In the following circumstances you will need to obtain and install higher levels of the VisualAge products and corresponding RSCT PTFs.

    1. If your SP already has xlC.aix43.rte 5.0.2.3 or higher or xlC.aix50.rte 5.0.2.3 or higher you will need to obtain and install one of the RSCT APARS shown below.

    2. If you plan to migrate your PSSP 3.4 system from AIX 4.3.3 to AIX 5.1 you will need to obtain APAR IY24302/U480558 for VisualAge C++ and APAR IY24895 for RSCT. On your control workstation install these PTFs while following Chapter 4 of the *PSSP: Installation and Migration Guide*, section "Migrating the Control Workstation from AIX 4.3.3 to AIX 5L 5.1" Step 4: Install the runtime prerequisites. PTFs for both APARS should be available in your AIX 5.1 lppsource before the start of any node migrations. They will be installed automatically during the migration.

    3. If you obtain APAR IY19290 for VisualAge C++ to fix a problem mentioned in the ssp.gui.README you will need to obtain and install one of the RSCT APARS shown below.

RSCT APARS: These are to fix a problem with core files caused by segmentation faults in haemqvar during a boot and in other start-up situations when xlC.aix43.rte or xlC.aix50.rte is at 5.0.2.3 or higher. Obtain APAR IY24881 for RSCT 1.2.1 (the RSCT shipped with PSSP 3.4 for use with AIX 4.3.3) or APAR IY24895 for RSCT 2.2.0 (the RSCT shipped with AIX 5.1).

IBM @server pSeries 670/690 Considerations

- The following additional restrictions and considerations apply if your Cluster 1600 system includes 7040 servers (pSeries 670 and/or pSeries 690):

    AIX, RSCT, and PSSP Considerations

    See the "Service Requirements" section of this document for required PSSP, RSCT, and AIX information.

    HMC Software Considerations

    PSSP 3.4 requires that the Hardware Management Console software be at Release 2 Version 1.1 or later. The PN for the CD image is 09P6722. The EC number is H12056B. Note that the HMC software level may require you to upgrade the System/Service Processor microcode on the pSeries 670/690 server to a compatible level. The minimum required level for Cluster 1600 attachment is RH20413 or higher. The required software and microcode levels should be installed prior to attaching the servers to your Cluster 1600 system.

    Note: When applying service to an HMC, the associated HMC daemon on the CWS must be stopped while the service is being applied.

    For example: The following p690 configuration,

```
[c529s]> SDRGetObjects Frame
frame_number hardware_protocol  control_ipaddrs domain_name
             1              HMC     9.114.177.59      c529fr1
             2              HMC     9.114.177.59      c529fr2
             3              HMC     9.114.177.59      c529fr3
             4              HMC     9.114.177.59      c529fr4
             5              HMC     9.114.177.60      c529fr5
             6              HMC     9.114.177.60      c529fr6
             7              HMC     9.114.177.60      c529fr7
```

    will cause 2 HMC daemons (hmcd) to get spawned. One for the HMC at 9.114.177.59 and one for the HMC at 9.114.177.60.

```
[c529s]> ps -ef | grep hmcd
/usr/lpp/ssp/install/bin/hmcd -d 0 9.114.177.59 4 c529fr1 1 5 c529fr2 2 7 c529fr3 3 9 c529fr4 4 11
                               ---- ------------ - ----------- ----------- ----------- ------------
                                 |    |          | |           |           | p690 @     | p690 @
                                 |    |          | |           | p690 @     |frame 3         frame 4
                                 |    |          | | p690 @     | frame 2
                                 |    |          | | frame 1
                                 |    | hmc ip   | # of p690s to
                      debug flags|    | address    follow
```

```
/usr/lpp/ssp/install/bin/hmcd -d 0 9.114.177.60 3 c529fr5 5 12 c529fr6 6 14 c529fr7 7 16
                            ---- ------------ - ------------ ------------ ------------
                              |    |          |  |            | p690 @     | p690 @
                              |    |          |  | p690 @     | frame 6      frame 7
                              |    |          |  | frame 5
                              |    | hmc       | # of p690's
                              |    | ip address  to follow
                       debug flags|
```

To stop the hmcd associated with the HMC at 9.114.177.59 when applying service to that HMC
use the hmcmds 'stopsup' command and specify any frame number associated with that HMC.
For example, any one of the following commands will work:

```
[c529s]> hmcmds -Gv stopsup 1:0
[c529s]> hmcmds -Gv stopsup 2:0
[c529s]> hmcmds -Gv stopsup 3:0
[c529s]> hmcmds -Gv stopsup 4:0
```

After the service has been applied and the HMC rebooted (if required), restart the hmcd
associated with the HMC at 9.114.177.59 using the hmcmds 'reboot' command and specify any
frame number associated with that HMC. For example, any one of the following commands will
work:

```
[c529s]> hmcmds -Gv reboot 1:0
[c529s]> hmcmds -Gv reboot 2:0
[c529s]> hmcmds -Gv reboot 3:0
[c529s]> hmcmds -Gv reboot 4:0
```

HMC Hardware Considerations

PSSP 3.4 supports the following Hardware Management Consoles:

– 6792-LTU Hardware Management Console

– 6578-D5U Hardware Management Console

IBM recommends the 6792-LTU HMC for better performance and hardware control processing.

HMC User Interface activity during SP operations

Use of the HMC User Interface should be kept to a minimum when PSSP related operations that
interact with the HMC are running. The performance of the following operations may suffer if
there is concurrent user activity at the HMC:

– "Get Adapter Physical Location Information" (spadaptr_loc)

– "Get Hardware Ethernet Addresses" (sphrdwrad)

– Network node installation (nodecond)

– Kerberos V4 keytab file transfer during node installation or customization (psspfb_script,
  get_keyfiles)

– Secure File Collections password file transfer (services_config, updsuppwd)

These PSSP operations will fail if you have existing virtual terminal sessions that were opened
with the HMC User Interface.

Redundant HMC Considerations

At this time, PSSP does not support automatic failover of Hardware Control and Monitoring (hardmon) communications to a redundant HMC. The pSeries Hardware Management Console allows you to configure two HMCs to control a single p690 or p670 server. The PSSP **spframe** command allows you to enter a list of IP addresses to be used for the hardware control point for the logical frame being defined for the p690 or p670 attached server. However, PSSP will only use the first IP address when attempting to establish a communication session with an HMC for the p690 or p670 server. If communication cannot be established to the first HMC in the list of IP addresses, the hardmon subsystem will report errors in the SP Hardware Log /var/adm/SPlogs/SPdaemon.log, and will not attempt to establish a communication session with any other IP addresses defined for that logical frame.

If you have set up two HMCs to control your p690 or p670 SP-attached servers, you should configure PSSP to use only one of those HMCs. If the chosen HMC goes down or is unable to communicate to the CWS, you have the option to re-configure PSSP to use the second HMC instead. To use the second HMC, you must ensure that it is also connected to the CWS-HMC trusted network. See the "Important Security Requirement for p690/p670 SP-attached Servers" section of this document for trusted network information. Once the HMC has been connected to the trusted network, follow the instructions in the *PSSP Installation and Migration Guide* for entering HMC information. Once you have entered PSSP information for the second HMC, you can then use the **spframe** command with the **-i** flag to specify a new HMC IP address for each existing logical SP frame that will now be controlled by this second HMC. Use the **spframe** command with the **-r yes** flag for the last frame being changed to stop and restart the hardmon subsystem. See the **spframe** man page in the *PSSP Command and Technical Reference, Volume 2* for details on command syntax and usage.

10/100 Mbps Ethernet PCI Adapter II Considerations

If your pSeries 670/690 server includes the 10/100 Mbps Ethernet PCI Adapter II (feature code 4962), ensure that the latest level of available microcode is installed on each of these adapters. The microcode can be downloaded from the following Web page:

`http://techsupport.services.ibm.com/server/mdownload/download.html`

LPAR Configuration Restrictions

Each LPAR object defined through the HMC for a pSeries 670/690 attached server is automatically recognized by the control workstation and configured as a PSSP node. Due to this fact, no resources managed by PSSP may be shared by more than one LPAR object, regardless of which objects are active at any given point in time. Resources assigned to LPARs which are managed by PSSP include local hard disks or external disks that contain rootvg physical volumes, SP administrative network Ethernet adapters, SP switch adapters, and any other adapters defined to PSSP. This restriction implies the following:

– When creating Affinity LPAR definitions for a pSeries 670/690 attached server, all existing standard LPAR definitions must first be deleted using the HMC GUI interface. The corresponding SP node definitions for those LPARs must also be deleted from the control workstation as currently documented in the *PSSP: Installation and Migration Guide*.

- Disjoint sets of LPAR objects can not be used to represent different resource configurations of a pSeries 670/690 attached server. Instead use multiple LPAR profiles for a single set of LPAR objects.

- When multiple LPAR profiles are defined for a given LPAR object, the current active profile must be the default profile for the LPAR object. In addition, the resources managed by PSSP for the SP node representing that LPAR object must be identical to the resources in the activated default profile. If a different profile is desired for an LPAR object, perform the following steps:

  - Shut down the LPAR object

  - Using the HMC User Interface, change the default profile from the old profile to the new profile

  - If PSSP-managed resources in the new profile are different from the old profile, use the control workstation to add and delete resources to and from the SP node representing the LPAR object as documented in the *PSSP: Installation and Migration Guide* to match the new profile. This will include setting the SP node to be customized.

  - Activate the new default profile.

Software Installation Considerations

Node State Information Not Updated:

When performing PSSP Hardware Control and Monitoring (Hardmon) operations to multiple LPARs managed by the same HMC, the state information for all SP nodes managed by that HMC may not change until the Hardmon operations have completed. Some operations such as powering on nodes (activating the LPARs), may take 30 to 60 seconds per node or longer to complete. Since these operations are processed serially by the HMC, updated state information may not be received by Hardmon for several minutes. This may cause the node's power state or LED value to appear to be hung.

LED E1F4, LED E1F1, LED C69, or LED A69 Hang During SP Operations:

It may be possible for your node to appear to hang with an LED value of E1F4, E1F1, C69, or A69 during any of the following PSSP operations:

- "Get Adapter Physical Location Information" (spadaptr_loc)

- "Get Hardware Ethernet Addresses" (sphrdwrad)

- Network node installation (nodecond)

- Kerberos V4 keytab file transfer during node installation or customization (psspfb_script, get_keyfiles)

- Secure File Collections password file transfer (services_config, updsuppwd)

These hangs may be due to the fact that these operations each use the VTERM connection to the LPAR and are waiting to obtain a lock to proceed. In this situation, one lock is created for each HMC. When there are multiple operations executing simultaneously, it is normal for nodes to pause at these LED values for some period of time, as long as 60 minutes in some instances.

When a process associated with one of these operations is aborted abnormally, it may fail to release the lock. Should this happen, none of the nodes that share the same HMC will be able to complete any of the operations listed above. To correct this problem, the lock file needs to be manually deleted. The lock file resides in /var/adm/SPlogs/spmon/nc/ and is of the form of .lock.<HMC IP address>.

Before deleting the lock, verify that the lock is not owned by an active process:

- Examine the nc.<frame_number>.<slot_number> log files in /var/adm/SPlogs/spmon/nc/ for the state of any active processes. If the logs of all active processes have paused at "Nodecond Status: pSeries 670/690 - attempting to obtain OF lock" for more than 60 seconds, this is a good indication that the lock is stale.

- Verify that the process id stored in the lock file is not the process id of any other active process on the system, such as a kfserver or srvsuppwd process.

If more than one HMC is configured in your system, take care to delete the lock file that corresponds to the correct HMC. All active processes currently waiting for the lock file will now continue normally.

To avoid having unreleased locks, do not send the SIGKILL signal (kill -9), or signals that cannot be caught, to processes associated with any of the operations listed above. To ensure that any lock held by the process is properly released, send the SIGTERM signal, which kill sends by default.

If there is no lock file present, and a node still appears to be hung at one of these LED values, a VTERM connection may have failed. Ensure that no active s1term write sessions for the node are running on the CWS and that no open VTERM sessions for the LPAR are running on the HMC. Retry the failed operation to establish a new VTERM connection.

Important Security Requirement for p690/p670 SP-attached Servers

- **Description:**

  Cluster 1600 configurations which contain pSeries 690 or 670 servers (e.g., SP-attached p690 or p670 servers) require additional security planning and configuration to protect password data transferred from the control workstation to a p690 or p670 Hardware Management Console (HMC).

  Cluster 1600 configurations which do not contain p690 or p670 servers do not require additional security planning and configuration.

- **Security Requirement:**

  In Cluster 1600 configurations with p690 or p670 servers, PSSP HardwareMonitor control of p690/ p670 servers is established through an IP network connection between the control workstation and an HMC. This IP network connection is also used to transfer PSSP Kerberos V4 keytab files (password files), the PSSP Secure File Collections password file, and HMC user id/password login data.

  In order to protect password data transferred from the control workstation to an HMC, a trusted network must be established between the control workstation and HMC.

  A trusted network is one where all hosts on the same network (LAN) are regarded as trusted, according to site security policies and procedures governing the hosts. Data on a trusted network can

be seen by all trusted hosts (and users on the trusted hosts), but the implied trust among and between the hosts assumes the data will not be intercepted or modified. Therefore, by way of implied mutual trust, traffic flowing across the trusted network is regarded as safe from unwanted or unintended interception or tampering. However, it **does not imply** that the data on the trusted network is itself private or encrypted.

Two types of trusted networks are available to satisfy the security requirement.

1. The SP Ethernet admin LAN is a trusted network

2. Establish a trusted network between the control workstation and the HMC

You will need to select a trusted network which best suits your environment.

- **Select a Trusted Network:**

   If you already consider the SP Ethernet admin LAN a trusted network, then no additional setup and configuration are required to satisfy the security requirement. Follow existing SP publications for p690 (and p670) SP-attached support. Specifically, refer to the guides *RS/6000 SP Planning Volume 1, Hardware and Physical Environment*, *RS/6000 SP Planning Volume 2, Control Workstation and Software Environment* v3.4, and the *PSSP: Installation and Migration Guide* V3.4.

   If you do not consider the SP Ethernet admin trusted network, then you must establish a trusted network between the control workstation and the HMC in order to satisfy the security requirement. The sections that follow contain planning information to establish a trusted network between the control workstation and the HMC.

- **Plan a Trusted Network Between the Control Workstation and the HMC:**

   A trusted network between the control workstation and an HMC requires that both hosts are connected via a network other than the SP Ethernet admin LAN. This "other" network is called the *HMC trusted network*.

   IBM strongly recommends that the only hosts connected to an HMC trusted network are SP control workstations and p690/p670 HMCs.

   The HMC trusted network requires a set of IP addresses all in the same subnet. This subnet should be reserved for use with hosts connected to the HMC trusted network. If you plan on connecting multiple control workstations and multiple HMCs to the HMC trusted network, ensure the subnet can accommodate the total number of trusted hosts (actual or expected).

   In order for a control workstation to be connected to both its SP Ethernet admin LAN and the HMC trusted network, each control workstation requires the installation and configuration of an additional network adapter. The additional network adapter will be configured for the HMC trusted network. For more information on planning for additional networks connected to the control workstation, refer to the "Additional LANs" area of the "Understanding the SP Networks" section in the *RS/6000 SP Planning Volume 1, Hardware and Physical Environment*.

   Note: Before configuring an additional network adapter to the control workstation, apply APAR IY29867 to your control workstation. This APAR corrects a setup_server problem relating to network adapters configured for networks other than the SP Ethernet admin LAN.

Each HMC must have a network adapter configured for and connected to the HMC trusted network. Connecting an HMC to the HMC trusted network will require the reconfiguration of an existing HMC network adapter. How the existing HMC network adapter is reconfigured depends on whether your p690 or p670 is a new SP-attached server install, or an existing SP-attached server.

New SP-attached Server Install

When your p690 or p670 is already installed and configured but not yet connected to your SP system (for example, if it will be a new SP-attached server install), you must reconfigure the existing HMC adapter for the HMC trusted network.

Existing SP-attached Server

When your p690 or p670 is already an SP-attached server, the SP Ethernet admin LAN is used to connect the HMC to the control workstation. Specifically, the HMC's network adapter is configured for the SP Ethernet admin LAN.

In this case you must unconfigure the HMC adapter, disconnect it from the SP Ethernet admin LAN, connect it to the HMC trusted network, and then configure it for the HMC trusted network.

- **Establish a Trusted Network Between the Control Workstation and the HMC:**

There are two procedures for establishing an HMC trusted network. You will use only one of the procedures. The procedure you choose will depend on whether your p690 or p670 is a new SP-attached server install, or an existing SP-attached server.

Procedure 1: p690, p670 new SP-attached server install

Use this procedure to establish an HMC trusted network when your p690 or p670 server is not configured to your SP system.

1. Configure the HMC network adapter for the HMC trusted network.

Reconfigure an existing HMC network adapter. After the instructions are completed continue with step 2.

Refer to the *IBM Hardware Management Console for pSeries Operations Guide* for HMC network adapter configuration information and procedures.

Reconfigure an existing HMC network adapter

1. Log into the HMC using an ID which is a member of the System Administrator.

2. Unconfigure the HMC network adapter.

3. (optional) Disconnect the network adapter from its existing LAN.

4. (optional) Connect the network adapter to the HMC trusted network.

   Note: Steps 3 and 4 are required only when the existing LAN will not be used as the HMC trusted network. (The HMC trusted networks IP addresses must all be in the same subnet. IBM strongly recommends that the only hosts connected to the HMC trusted network are SP control workstations and p690/p670 HMCs.)

5. Configure the network adapter for the HMC trusted network.

Use the HMC System Configuration interface to customize the network settings. Ensure the netmask is properly assigned, that all IP addresses have been registered with your name server and can be resolved, and that the HMC hostname is set. (The HMC hostname is associated with the HMC trusted network.)

6. Update the /etc/hosts file on each of the HMCs LPARs with the new HMC data, provided that the LPARs had the original HMC data in their /etc/hosts files.

7. Reboot the HMC.

8. (optional) As part of the HMC reboot, the cluster security Trusted Host List (THL) on the HMC and each of its LPARs will be updated to include the new HMC host name. However, the old HMC host name will not be pruned from the THLs. It is advised that the old HMC host name be removed from the THLs. Refer to the security chapter in the *RSCT Guide and Reference* for the location and format of a THL file, and instructions for modifying a THL

Note: The remaining steps are performed on the control workstation.

2. Install (add) a new network adapter to the control workstation and connect it to the HMC trusted network.

3. Configure the new control workstation network adapter for the HMC trusted network, including network routing and name server configuration, if necessary.

Note: If the IP address for the HMC trusted network is not DNS resolvable, then you must add both long and short hostname entries for this IP address to the control workstation's /etc/hosts file. (If the HMC trusted network IP address cannot be resolved to a hostname, then errors will be reported during setup_server and setup_CWS.)

4. On the control workstation, use the AIX ping command to verify that the control workstation has network connectivity to the HMC via the HMC trusted network:

ping *hmc_trusted_network_hostname_or_ipaddr*

where *hmc_trusted_network_hostname_or_ipaddr* is the host name or IP address of the HMC as configured in step 3. If the command fails, review your network and name server configurations on both the control workstation and the HMC and resolve the failure before moving on to the next step.

5. At this point you must continue with the installation steps associated with entering "Hardware Management Console (HMC) information", as outlined in the *PSSP: Installation and Migration Guide* V3.4.

– For new SP installations, go to chapter 2 and start with Task C, step 31, substep 2 which begins, "Define the previously-created HMC user ID to PSSP for **hardmon**".

– For SP reconfigurations, start with Step 6, substep 2, in chapter 6, which begins, "Define the previously created HMC user ID to PSSP for **hardmon**".

Note: For the remaining steps in the *PSSP: Installation and Migration Guide*, use the *hmc_trusted_network_hostname_or_ipaddr* (from step 1 above) where the guide states to use the *hmc_hostname_or_ipaddr*.

Procedure 2: p690, p670 existing SP-attached server

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Use this procedure to establish an HMC trusted network when your p690 or p670 server is already configured to your SP system.

1. Log into the HMC using an ID which is a member of the System Administrator role.

   1. Record the IP address and host name of the HMC adapter connected to the SP Ethernet LAN. This will be referred to later in the procedure as the

      original_hmc_hostname_or_ipaddr.

   2. Unconfigure the HMC network adapter from the SP Ethernet Administrative LAN.

   3. Disconnect the network adapter from the SP Ethernet Administrative LAN.

   4. Connect the network adapter to the HMC trusted network.

   5. Configure the network adapter for the HMC trusted network.

      Use the HMC *System Configuration* interface to customize the network settings. Ensure the netmask is properly assigned and that all IP addresses have been registered with your name server and can be resolved.

   6. Update the /etc/hosts file on each of the HMCs LPARs with the new HMC data, provided that the LPARs had the original HMC data in their /etc/hosts files.

   7. Reboot the HMC.

   8. (optional) As part of the HMC reboot, the cluster security Trusted Host List (THL) on the HMC and each of its LPARs will be updated to include the new HMC host name. However, the old HMC host name will not be pruned from the THLs. It is advised that the old HMC host name be removed from the THLs. Refer to the security chapter in the *RSCT Guide and Reference* for the location and format of a THL file, and instructions for modifying a THL.

   Note: The remaining steps are performed on the control workstation.

2. Install (add) a new network adapter to the control workstation and connect it to the HMC trusted network.

3. Configure the new control workstation network adapter for the HMC trusted network, including network routing and name server configuration, if necessary.

   Note: If the IP address for the HMC trusted network is not DNS resolvable, then you must add both long and short hostname entries for this IP address to the control workstation's /etc/hosts file. (If the HMC trusted network IP address cannot be resolved to a hostname, then errors will be reported during setup_server and setup_CWS.)

4. On the control workstation, use the AIX **ping** command to verify that the control workstation has network connectivity to the HMC via the HMC trusted network:

   ping *hmc_trusted_network_hostname_or_ipaddr*

   where *hmc_trusted_network_hostname_or_ipaddr* is the host name or IP address of the HMC as configured in step 1. If the command fails, review your network and name server configurations on

both the control workstation and the HMC and resolve the failure before moving on to the next step.

5. Stop the Hardware Monitor and then delete the HMC user ID originally defined to the Hardware Monitor on PSSP.

```
stopsrc -s hardmon
```

Run the following command *once* for each HMC:

```
/usr/lpp/ssp/bin/spdelhmcid original_hmc_hostname_or_ipaddr
```

where *original_hmc_hostname_or_ipaddr* is the host name or IP address of the HMC deleted in step 1 (above).

spdelhmcid removes previously-stored user ID and password information that the Hardware Monitor used to establish a remote client session with an HMC. This data was stored when your p690 or p670 was originally defined as an SP-attached server. Since the HMCs IP address/host name changed in step 1, the data stored on the control workstation is no longer valid.

> **Note:** This only deletes the data on the control workstation. It does not affect the HMC ID which was created through the HMC User Management interface.

6. Define the previously-created HMC user ID to PSSP for the Hardware Monitor. Run the following command once for each HMC:

```
/usr/lpp/ssp/bin/sphmcid hmc_trusted_network_hostname_or_ipaddr hmc_sysadmin_userid
```

where *hmc_trusted_network_hostname_or_ipaddr* is the host name or IP address of the HMC trusted network as configured in step 1 (above) and the *hmc_sysadmin_userid* is the system administrator user ID created through the HMC User Management interface. You will be prompted to enter the password for the *hmc_sysadmin_userid*.

7. Update the frame class with the HMC trusted network IP address for each p690 or p670 server and then start the Hardware Monitor.

Run the following command once for each p690 or p670 server connected to the HMC:

```
spframe -d domain_name -i hmc_trusted_network_ipaddr -r no frame_number
```

where *domain_name* is the identifier of the p690 or p670 server as it is known to the HMC, *hmc_trusted_network_ipaddr* is the IP address of the HMC trusted network as configured in step 1 (above), and *frame_number* is the frame number assigned with the spframe command during the original frame definition for the p690 or p670.

```
startsrc -s hardmon
```

At this point the remaining steps associated with entering "Hardware Management Console (HMC) information", as outlined in the *PSSP: Installation and Migration Guide*, V3.4 (chapter 6, Step 6, substep 3), do not need to be repeated. **Procedure 2 does not delete SP frame information.**

The only change made to frame information occurred in step 7, when the original HMC address was changed to the HMC trusted network address. All other SP frame information entered during the original p690 or p670 SP-attached server definition is valid.

In the event that any of the SP frame information is missing or incorrect, continue with the installation steps in chapter 6, Step 6, starting at substep 3, which begins, "Define the switch node numbers for your nodes".

Note: For the remaining steps in the *PSSP: Installation and Migration Guide*, use the *hmc_trusted_network_hostname_or_ipaddr* (from step 1 above) where the guide states to use the *hmc_hostname_or_ipaddr*.

SP Switch2 PCI Attachment Adapter Considerations

These procedures are necessary to check the proper installation of SP Switch2 PCI Attachment Adapter FC8397 in 7040-61D.

Notes for the following procedures:

- dsh can be used with the following procedure to upgrade multiple servers simultaneously.

- References to css1 are specifically for systems running in an SP Switch2 two-plane environment. If you are not running in a two-plane environment, you do not need to run commands marked with an *.

Procedure:

To check SP Switch2 PCI Attachment Adapter install status, execute the following command(s) on each node or via dsh from the control workstation:

```
    /usr/lpp/ssp/css/read_regs -l css0 -X | grep 0x00100030
 *  /usr/lpp/ssp/css/read_regs -l css1 -X | grep 0x00100030
```

An example of data returned from this command is:

```
  0x0F80000044900030    0x00100030          PCI Trace Reg 1
```

The third nibble will have have one of three values:

    8 - Adapter is operating properly in 64-bit mode

    4 - Adapter is not seated properly operating in 32-bit mode; contact CE

    0 - Adapter Xilinx code is downlevel - see upgrade instructions below:

Xilinx Update:

Starting with PSSP 3.4 PTF set 5, a new file

```
    /usr/lpp/ssp/css/xilinx_file_cor
```

is shipped for the SP Switch2 PCI Attachment Adapter (FC8397, used in 7040 servers, 7026 servers and 7017 servers) and SP Switch2 MX2 Adapter (FC4026, used in the 375/450MHz Thin And Wide Nodes of

the 9076 SP system.) After application of PSSP 3.4 PTF set 5, the xilinx code may need to be applied to these adapters. This procedure should be followed whenever a new

    /usr/lpp/ssp/css/xilinx_file_cor

file (included in the ssp.basic fileset) is applied or when an SP Switch2 PCI Attachment Adapter or an SP Switch2 MX2 Adapter is replaced or installed. The SP Switch2 PCI Attachment (FC8397) in 7040-61D requires PSSP 3.4 PTF Set 9 (for single plane environments, APAR IY30343, for two-plane environments, APAR IY30344).

Procedure:

On each node or using dsh from the control workstation:

1. /usr/lpp/ssp/css/load_xilinx_cor -l css0 -P -f /usr/lpp/ssp/css/xilinx_file_cor

   * /usr/lpp/ssp/css/load_xilinx_cor -l css1 -P -f /usr/lpp/ssp/css/xilinx_file_cor

   Note: This command may take several minutes to complete and it MUST NOT be interrupted.

   Depending on the level of Xilinx code currently loaded on the adapter, this command will produce one of the following 3 responses (a,b or c) listed below. Look for the response at the end of the command output.

   a. "WARNING - WARNING - WARNING - WARNING - WARNING - WARNING

          This Card Date code is 00004251 ....
          This card CANNOT be field updated ...
          Please replace card through normal channels ....

      WARNING - WARNING - WARNING - WARNING - WARNING - WARNING"

      *** Next step: This card can not be field-updated. ***

   b. "Reflash not needed ...."

      *** Next step: The xilinx is up to date. There is no further
            action required. ***

   c. "Programming function complete ..."

      *** Next step: Go to step 2. ***

2. If this is a SP Switch2 MX2 Adapter (FC 4026), reboot the node with:

   shutdown -Fr

   Skip to step 13 to verify update.   Otherwise, for a SP Switch2 PCI Attachment Adapter (FC 8397), proceed with step 3:

3. Quiesce all jobs running on the switch which are using the object node (i.e. the SP-attached server/LPAR upon which the Adapter Xilinx upgrade is to be performed).

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4. Efence xx (where xx=node_number of the SP-attached server / LPAR)

   RESPONSE: All nodes successfully fenced.

   On the object node (SP-attached server/LPAR):

5. /usr/lpp/ssp/css/ifconfig css0 down detach

   ** Note - In a two-plane environment, this could be performed on either css0 or css1.

   RESPONSE: driver unconfig OK

   RESPONSE: driver unloaded

6. stopsrc -s hats

   RESPONSE: 0513-044 The hats Subsystem was requested to stop

7. stopsrc -s hags

   RESPONSE: 0513-044 The hags Subsystem was requested to stop

8. /usr/lpp/ssp/css/css_cdn

   ** Note - This will kill the Worm on the object node

9. /usr/lpp/ssp/css/ucfgcor -I css0 (or css1)

10. Determine if the SP Switch2 PCI Attachment Adapter (css0 or css1) is running any processes via the command:

    fuser /dev/css0

    or

    fuser /dev/css1

    and kill any processes that are bound to the adapter.

11. Issue the following commands to remove power to the slot that the Adapter is plugged into. This is necessary to activate the Xilinx update.

    ```
    echo | /usr/sbin/drslot -R -c pci -l css0 -I
     * echo | /usr/sbin/drslot -R -c pci -l css1 -I
    ```

    If this command is issued from a dsh then: "echo | /usr/sbin/drslot -R -c pci -l css0 -I"
     * "echo | /usr/sbin/drslot -R -c pci -l css1 -I"

12. Reboot the node/partition:

    ```
    shutdown -Fr
    ```

13. To verify the xilinx upgrade, use:

    ```
    /usr/lpp/ssp/css/read_regs -l css0 -X | grep Segment
     *  /usr/lpp/ssp/css/read_regs -l css1 -X | grep Segment
    ```

    The right most 5 nibbles of the second field (i.e. the field after the hostname) should be "01252" (PSSP3.4, PTF Set 5), 05182" (PSSP3.4, PTF Set 9).

14. Eunfence xx (xx = node_number)

RESPONSE: All nodes successfully unfenced

Corrections for ALL Documents

- **Support for HMC Protocol Servers**

  All statements in the PSSP publications which refer to the p690 server also refer to the p670 server unless otherwise specified.

Scaling Statement for Clusters: A Cluster 1600 with PSSP can consist of 2 to 128 AIX operating system images. An operating system image, or LOGICAL NODE, can be:

1. A 7017 server (S70, S7A, S80, p680)

2. A 7026 server (H80, M80, p660, 6H0/6H1, 6M1)

3. A 7040 server (p670, p690) running as a full system partition

4. An LPAR of a 7040 server (p670, p690)

5. A 9076 SP node

Logical nodes are limited in a cluster running PSSP as described in the 7040 Cluster Limits table and the scaling rules that follow. Any cluster system which exceeds any of the announced supported logical node limits requires a special bid.

7040 Cluster Limits

```
                                         SP Switch2 (total
                                         switched plus non-
                              SP      SP      switched, subject     Switch-
     Maximum Values         Switch  Switch2  to other limits)(2)    less
     --------------------   ------  -------  -----------------      ------
     p690/p670 servers
         per cluster          32      32           32                32

     LPARs per p690 server     8      16           16                16

     LPARs per p670 server     4       4           16                16

     LPARs per Cluster       128     128          128               128

     Additional Information
     ----------------------

     Number of switch
       planes supported        1    1 or 2       1 or 2              0

     Number of p690/p670
         servers per HMC(1)    8       8            8                 8

     LPARs per HMC (1)        32      32           32                32
```

(1) Hardware Management Console (Note that redundant HMC's are not supported.)
(2) With the SP Switch, switched and non-switched logical nodes cannot be mixed.

Note: SP Switch and SP Switch2 fabrics cannot be mixed within a cluster.

A Cluster 1600 with PSSP must meet all of the following limits:

- No more than 128 logical nodes from the set {7040 LPAR, 7040, 7026, 7017, 9076}

- No more than 64 servers from the set {7026, 7040, 7017}

- No more than 32 servers from the set {7040, 7017}

- No more than 16 servers from the set {7017}

- No more than 128 9076 SP Nodes

  For example:

  – 32 p690s with 4 LPARs each or 16 p690s with 8 LPARs each
  – 16 p690s with 4 LPARs each and 64 p660s
  – 16 p690s with 4 LPARs each, 32 p660s and 32 SP nodes
  – 12 p690s with 4 LPARs each, 16 p680s, 16 p660s and 48 SP nodes

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RS/6000 SP: Planning Volume 2, Control Workstation and Software Environment Corrections

- An option in the configurator session displays a list of separate CWS configurations that are suggested for new customers. Marketing has the option of specifying alternative configurations for different customer environments. The new supported CWS configurations are listed below. These configurations are not in the book *RS/6000 SP: Planning Volume 2, Control Workstation and Software Environment*.

```
7028-6E1 - Entry/Small Tower

Feature   Description                              Quantity

7028-6E1 pSeries 610                                  1
         1.44MB 3.5-in Diskette Drive                 1
         Integrated Internal Ultra3 SCSI Adapter      1
         Integrated External Ultra3 SCSI Adapter      1
         Integrated Ethernet Adapter                  2
    2633 IDE CD-ROM 48x Speed                          1
    2848 POWER GXT135P Graphics Accelerator (PCI)      1
    2943 8-Port Async Adapter, EIA-232/422 (PCI)       1
    3263 18.2 GB Ultra3 SCSI Hot-Plug                  2
    3628 P260/P275 Color Monitor, Stealth Black,       1
         and Cable
    4120 512 MB (2x256MB) SDRAM DIMMs                  1
    4246 IDE 2-Drop Connector Cable                    1
    4248 SCSI Connector Cable and Repeater Card        1
    4249 SCSI 3-Drop Connector Cable                   1
    4962 10/100 Mbps Ethernet PCI Adapter II           1
    5005 Preinstall                                    1
    5300 1-Way Power3 - II 375MHz Processor Card,      1
         4MB L2 Cache
    6158 20GB/40GB 4mm Tape Drive                      1
    6277 Redundant Power Supply, 250 Watt AC, Hot      2
         Swap
    8700 Quiet Touch Keyboard, Stealth Black -         1
         English (US)
    8741 3-Button Mouse - Stealth Black                1
    9300 Language - English (US)                       1
    9800 Power Cord - US/Canada (125V, 15A)            1
```

7028-6E1 - Medium Tower

Feature	Description	Quantity
7028-6E1	pSeries 610	1
	1.44MB 3.5-in Diskette Drive	1
	Integrated Internal Ultra3 SCSI Adapter	1
	Integrated External Ultra3 SCSI Adapter	1
	Integrated Ethernet Adapter	2
2633	IDE CD-ROM 48x Speed	1
2848	POWER GXT135P Graphics Accelerator (PCI)	1
2943	8-Port Async Adapter, EIA-232/422 (PCI)	1
3264	36.4 GB Ultra3 SCSI Hot-Plug	2
3263	18.2 GB Ultra3 SCSI Hot-Plug	2
3628	P260/P275 Color Monitor, Stealth Black, and Cable	1
4120	512 MB (2x256MB) SDRAM DIMMs	1
4246	IDE 2-Drop Connector Cable	1
4248	SCSI Connector Cable and Repeater Card	1
4249	SCSI 3-Drop Connector Cable	1
4962	10/100 Mbps Ethernet PCI Adapter II	1
5005	Preinstall	1
5300	1-Way Power3 - II 375MHz Processor Card, 4MB L2 Cache	2
6158	20GB/40GB 4mm Tape Drive	1
6277	Redundant Power Supply, 250 Watt AC, Hot Swap	2
8700	Quiet Touch Keyboard, Stealth Black - English (US)	1
8741	3-Button Mouse - Stealth Black	1
9300	Language - English (US)	1
9800	Power Cord - US/Canada (125V, 15A)	1

7028-6C1 - Small Rack CWS

Feature	Description	Quantity
7028-6C1	pSeries 610	1
	1.44MB 3.5-in Diskette Drive	1
	Integrated Internal Ultra3 SCSI Adapter	1
	Integrated External Ultra3 SCSI Adapter	1
	Integrated Ethernet Adapter	2
2633	IDE CD-ROM 48x Speed	1
2848	POWER GXT135P Graphics Accelerator (PCI)	1
2943	8-Port Async Adapter, EIA-232/422 (PCI)	1
3263	18.2 GB Ultra3 SCSI Hot-Plug	2
3628	P260/P275 Color Monitor, Stealth Black, and Cable	1
4120	512 MB (2x256MB) SDRAM DIMMs	1
4242	6 ft. 15-pin D-shell to 15-pin D-shell Extender Cable	1
4246	IDE 2-Drop Connector Cable	1
4248	SCSI Connector Cable and Repeater Card	1
4249	SCSI 3-Drop Connector Cable	1
4962	10/100 Mbps Ethernet PCI Adapter II	1
5005	Preinstall	1
5300	1-Way Power3 - II 375MHz Processor Card,	1
	4MB L2 Cache - II 375MHz Processor Card,	1
6158	20GB/40GB 4mm Tape Drive	1
6277	Redundant Power Supply, 250 Watt AC, Hot	2
	Swapndant Power Supply, 250 Watt AC, Hot	2
8700	Quiet Touch Keyboard, Stealth Black -	1
	English (US)Keyboard, Stealth Black -	1
8741	3-Button Mouse - Stealth Black	1
9300	Language - English (US)	1
9800	Power Cord - US/Canada	1
9911	Rack Power Cord - ALL IBM Racks, 4m	1
7014-T00	Enterprise Rack - 36 EIA	1
0197	Content : 7028-6C1 (5 EIA)	1
0198	Content : 9910-P33 (2 EIA)	1
6088	Front Door for 1.8m Rack, Black	1
6098	Side Panel for 1.8 or 2.0m Rack, Black	2
9171	Power Distribution Unit, Side-Mount, 1 Phase	1
9300	Language - English (US)	1
9800	Rack Power Cord - US/Canada	1
9910-P33	Powerware 5125 3000VA, 200-240V - Rackmount	1
6630	Rail Kit	1
9010	Factory Install for P33/B38	1
9851	Power Cord set (L6-30)	1

7028-6C1 - Medium Rack CWS

Feature	Description	Quantity
7028-6C1	pSeries 610	1
	1.44MB 3.5-in Diskette Drive	1
	Integrated Internal Ultra3 SCSI Adapter	1
	Integrated External Ultra3 SCSI Adapter	1
	Integrated Ethernet Adapter	2
2633	IDE CD-ROM 48x Speed	1
2848	POWER GXT135P Graphics Accelerator (PCI)	1
2943	8-Port Async Adapter, EIA-232/422 (PCI)	1
3264	36.4 GB Ultra3 SCSI Hot-Plug	2
3628	P260/P275 Color Monitor, Stealth Black, and Cable	1
4121	1024 MB (2x512MB) SDRAM DIMMs	1
4242	6 ft. 15-pin D-shell to 15-pin D-shell Extender Cable	1
4246	IDE 2-Drop Connector Cable	1
4248	SCSI Connector Cable and Repeater Card	1
4249	SCSI 3-Drop Connector Cable	1
4962	10/100 Mbps Ethernet PCI Adapter II	1
5005	Preinstall	1
5300	1-Way Power3 - II 375MHz Processor Card, 4MB L2 Cache	2
6158	20GB/40GB 4mm Tape Drive	1
6277	Redundant Power Supply, 250 Watt AC, Hot Swap	2
8700	Quiet Touch Keyboard, Stealth Black - English (US)	1
8741	3-Button Mouse - Stealth Black	1
9300	Language - English (US)	1
9800	Power Cord - US/Canada	1
9911	Rack Power Cord - ALL IBM Racks, 4m	1
7014-T00	Enterprise Rack - 36 EIA	1
0197	Content : 7028-6C1 (5 EIA)	1
0198	Content : 9910-P33 (2 EIA)	1
6088	Front Door for 1.8m Rack, Black	1
6098	Side Panel for 1.8 or 2.0m Rack, Black	2
9171	Power Distribution Unit, Side-Mount, 1 Phase	1
9300	Language - English (US)	1
9800	Rack Power Cord - US/Canada	1
9910-P33	Powerware 5125 3000VA, 200-240V - Rackmount	1
6630	Rail Kit	1
9010	Factory Install for P33/B38	1
9851	Power Cord set (L6-30)	

```
All the Control Workstations require the same software.  An AIX
4.3.3 order is shown below, and can be substituted with AIX 5L
5.1 if desired:

Feature    Description                                 Quantity

5765-C34 AIX Version 4                                    1
    4061 AIX 4.3                                          1
    5005 Preinstall                                       1
    9001 Asset Registration                               1

5692-AIX System Software                                  1
    0598 AIX Welcome Center                               1
    0838 AIX 4.3 Update CD                                1
    0857 AIX 4.3                                          1
    0859 Preinstall AIX 4.3 Server Bundle                 1
    0905 AIX 4.3 Bonus Pack - Full Encryption             1
    1004 CD-ROM Process Charge                            1
    3410 CD-ROM                                           1
    5005 Preinstall                                       1
    5924 AIX 4.3 PII - English                            1
    9001 Asset Registration                               1
```

- Other supported control workstations:

```
MCA CWS
 RS/6000 7012 Models 37T, 370, 375, 380, 39H, 390, 397, G30, and G40
 RS/6000 7013 Models 570, 58H, 580, 59H, 590, 591, 595, J30, J40, & J50
RS/6000 7015 Models 97B, 970, 98B, 980, 990, R30, R40, and R50
RS/6000 7030 Models 3AT, 3BT, 3CT
```

PCI CWS

```
 RS/6000 7024 Models E20 and E30
 RS/6000 7025 Model F30
 RS/6000 7025 Model F40
 RS/6000 7025 Model F50 and F80
 IBM pSeries 620 Model 6F1 - 7025-6F1
 RS/6000 7026 Models H10 and H50
 RS/6000 7026 Model H80
 IBM  pSeries 660 Model 6H1 - 7026-6H1
 RS/6000 7043 Models 140, and 240
 RS/6000 7044 Model 170 - 44P-170
```

For details on the above supported control workstations, please read the planning guide.

- The book incorrectly states that all the supported SP rack-mounted nodes can be connected to the SP Switch2. The following table indicates which older but still supported nodes can connect to the SP Switch2. It is a replacement for Table 10 in Chapter 2.

Table 1 (Page 1 of 2). Nodes you might already have that can run PSSP 3.4						
Node (nodes to SP drawer)	**Speed**	**Processing at announce**	**Min to max memory**	**Min to max internal disk space**	**Max switch planes**	**PSSP level at announce**
H80	450, 500, 600, or 668 MHz	64-bit SMP w AIX 4.3.3	512MB to 32GB	0 to 36.4GB	2	3.2
S80	450 MHz	64-bit SMP w AIX 4.3.3	512MB to 64GB	4.5GB to 218GB	2	3.1.1
POWER3 High (1-2)	222 MHz	64-bit SMP w AIX 4.3.3	1 to 16GB	9.1 to 18.2GB mirrored	2	3.1.1
POWER3 Wide (1-1)	200 MHz	64-bit SMP w AIX 4.3.3	256MB to 4GB	4.5 to 36.4GB mirrored	1	3.1
POWER3 Thin (1-1/2)	200 MHz	64-bit SMP w AIX 4.3.3	256MB to 4GB	4.5GB to 18.2GB mirrored	1	3.1
S7A	262 MHz	64-bit SMP w AIX 4.3.3	512MB to 32GB	4.5GB to 218GB	1 ¬sps2	3.1
S70	125 MHz	64-bit SMP w AIX 4.3.3	512MB to 16GB	4.5GB to 218GB	1 ¬sps2	3.1
Wide (1-1)	332 MHz	32-bit SMP w AIX 4.2.1 or 4.3.2	256MB to 3GB	4.5GB to 36.4GB	1	2.4
Thin (1-1/2)	332 MHz	32-bit SMP w AIX 4.2.1 or 4.3.2	256MB to 3GB	4.5GB to 18.2GB	1	2.4
Thin (1-1/2)	160 MHz	32-bit SMP w AIX 4.2.1 or 4.3.2	64MB to 1GB	4.5GB to 18.2GB	1¬sps2	2.3
High (1-2)	200MHz	32-bit SMP w AIX 4.2.1 or 4.3.2	256MB to 4GB	4.5GB to 18.2GB	1¬sps2	2.3
Wide (1-1)	135 MHz	32-bit SMP w AIX 4.2.1 or 4.3.2	256MB to 3GB	4.5GB to 36.4GB	1¬sps2	2.2
Thin (2-1)	120 MHz	32-bit SMP w AIX 4.2.1 or 4.3.2	64MB to 1GB	2GB to 18.2GB	1¬sps2	2.2
High (1-2)	112MHz	32-bit SMP w AIX 4.2.1 or 4.3.2	64MB to 2GB	2GB to 6.6GB	1¬sps2	2.2

Table 1 (Page 2 of 2). Nodes you might already have that can run PSSP 3.4						
Node (nodes to SP drawer)	**Speed**	**Processing at announce**	**Min to max memory**	**Min to max internal disk space**	**Max switch planes**	**PSSP level at announce**
Wide (1-1)	77 MHz	32-bit w AIX 4.2.1 or 4.3.2	64MB to 2GB	4.5GB to 18GB	1¬sps2	1.2
Wide (1-1)	66 MHz	32-bit w AIX 4.2.1 or 4.3.2	64MB to 2GB	4.5GB to 18GB	1¬sps2	1.2
Thin (2-1)	66 MHz	32-bit w AIX 4.2.1 or 4.3.2	64MB to 512MB	2GB to 9GB	1¬sps2	1.2

Note:

- w = with, ¬sps2 = cannot connect to SP Switch2
- To have SP Switch2 optional connectivity, all nodes must run PSSP 3.4.
- Servers must run PSSP 3.4 to connect to the SP Switch2 or the SP Switch.
- Thin and wide SP nodes must run PSSP 3.4 to connect to the SP Switch2.
- The POWER3 high node can have up to six SP Expansion I/O Units to increase internal DASD and connectivity to external DASD and networks.

PSSP: Installation and Migration Guide Corrections: The following statement applies to the step specified below and throughout the rest of the book:

- In "Chapter 2. Installing and configuring a new RS/6000 SP system", "Task A. Prepare the control workstation", "Step 14: Copy the AIX LP images and other required AIX LPs and PTFs"

  - For an AIX 4.3.3 lppsource, all filesets must be placed in the following directory:

        /spdata/sys1/install/<name>/lppsource

  - For an AIX 5L 5.1 lppsource, all filesets in installp format must be placed in the following directory:

        /spdata/sys1/install/<name>/lppsource/installp/ppc

    and all filesets in RPM format must be placed in the following directory:

        /spdata/sys1/install/<name>/lppsource/RPMS/ppc

  - If you are copying the file sets over manually, you must create the appropriate directory structure for the lppsource.

  - If you are using NIM or the bffcreate command to create your lppsource, you must tell the command, regardless of AIX version, that the target directory is :

        /spdata/sys1/install/<name>/lppsource

  - For AIX 5L 5.1 systems, NIM and bffcreate will create the appropriate directories needed beneath that directory.

- In "Chapter 2. Installing and configuring a new RS/6000 SP system", "Task A. Prepare the control workstation", "Step 14: Copy the AIX LP images and other required AIX LPs and PTFs", "Additional files you may want to add to your lppsource"

  – Add the following section:

  ```
  csm.clients Required for pSeries 690 servers
  ```

  – Edit the CIMOM section as follows:

  The CIMOM file set (RPMS/noarch/openCIMOM-0.61-1.aix4.3.noarch.rpm) needs to be copied to the following location:

  ```
  /spdata/sys1/install/<name>/lppsource/RPMS/ppc
  ```

  – After copying all additional files to your lppsource, if you choose not to use bffcreate, you need to run the inutoc script as follows:

  ```
  AIX 4.3.3 cd /spdata/sys1/install/<name>/lppsource
    inutoc .
  AIX 5L 5.1 cd /spdata/sys1/install/<name>/lppsource/installp/ppc
    inutoc .
  ```

- In "Chapter 2. Installing and configuring a new RS/6000 SP system", "Task A. Prepare the control workstation", "Step 14: Copy the AIX LP images and other required AIX LPs and PTFs", and "Chapter 4, Migrating the Software of your RS/6000 SP System", "Migrating the control workstation from AIX 4.3.3 to AIX 5L 5.1", "Step 9: Copy the AIX LP images and other required AIX LPs and PTFs":

  Change the following file names in the Minimal list of AIX 5L 5.1 file sets:

  – IMMSearch.rte.* should be IMNSearch.rte.* (change the second M to N.)

  – box.msg.en_US.* should be bos.msg.en_US.*

  – sysmgmt.help.msg.en_US.* should read sysmgt.help.msg.en_US.*

  – sysmgmt.msg.en_US.websm.* should read sysmgt.msg.en_US.websm.*

  – sysmgmt.sguide.* should read sysmgt.sguide.*

  – sysmgmt.websm.* should read sysmgt.websm.*

  In the last part of this step where it describes how to run the **inutoc** script, on machines running AIX 4.3.3, execute what is listed in the publication. On machines running AIX 5.1, execute the following:

  ```
  cd /spdata/sys1/install/<name>/lppsource/installp/ppc
  inutoc .
  ```

  In the same two sections, under the heading "Additional files you may want to add to your lppsource" Java130.xml4j needs to have a .* added to it, ie. Java130.xml4j.*

  In the same two sections, the CIMOM file is also required for pSeries 670/690 servers.

- In "Chapter 2. Installing and configuring a new RS/6000 SP system", "Task B, Install PSSP on the control workstation": "Step 16.3: Move prerequisite files"

  In the section of code right before the last paragraph, replace "inutoc." with "inutoc .".

- In "Chapter 2. Installing and configuring a new RS/6000 SP system", "Task B, Install PSSP on the control workstation": "Step 17: Copy a basic AIX (mksysb) image"

  This step shows the use of smit Install_latest to copy an spimg from a CD. With AIX 5.1 Maintenance package 02 (IY28102) that will fail. To bypass the problem first mount the CD using the command:

  ```
  mount -v cdrfs -r /dev/cd0 /mnt
  ```

  Then, when using smit install_latest select /mnt instead of /dev/cd0 as the input device. Alternately, use the installp from the command line as shown in Step 17.

- In "Chapter 2. Installing and configuring a new RS/6000 SP system", "Task B, Install PSSP on the Control Workstation", "Step 18.3: Install the runtime files" and "Chapter 4. Migrating the software on your RS/6000 SP system", "Migrating the control workstation to PSSP 3.4", "Step 14: Installing the runtime prerequisites", Both sections reference the AIX Fix Distribution Service web site at:

  ```
  http://techsupport.services.ibm.com/rs6k.
  ```

  This site has been replaced by:

  ```
  http://techsupport.services.ibm.com/server/support.
  ```

  On this page select "Fixes" from the left panel.

- In "Chapter 2. Installing and configuring a new RS/6000 SP system", "Task B, Install PSSP on the control workstation", "Step 18.5: Install pSeries 690 Files (optional)", replace the section with the following text:

  Install pSeries 670/690 files using the following commands:

  ```
  installp -agXd /spdata/sys1/install/<name>/lppsource/installp/ppc \
  Java130.rte Java130.xml4j
  /bin/rpm -i \
  /spdata/sys1/install/<name>/lppsource/RPMS/ppc/openCIMOM-0.61-1.aix4.3.noarch.rpm
  ```

- In "Chapter 2. Installing and configuring a new RS/6000 SP system", "Task C. Enter site environment, frame, node, switch, and security information", "Step 31: Enter Hardware Management Console (HMC) information (optional)", add the following steps under "Perform the following steps for each HMC and each pSeries 690 server:"

  8. Use the HMC Maintenance: System Configuration interface to enable the Remote Virtual Terminal. By default, virtual terminal connections by remote clients are disabled. This option must be enabled to allow PSSP hardware control and monitor functions to open a virtual terminal connection to each LPAR on the server. This function is required by operations such as the s1term, sphrdwrad, spadaptr_loc, and nodecond commands, and by PSSP administrative processes to transfer sensitive data files. Ensure that this option is enabled prior to performing PSSP related functions on the pSeries 670/690 server.
  9. Use the HMC System Manager Security: Object Manager Security interface to configure the security mode of the Object Manager to "Plain Socket". The PSSP hardware control and monitor functions will fail if the Object Manager security mode is set to use SSL protocols.
  10. IBM recommends that the default pSeries 670/690 server policy to "Power off the system after all the logical partitions are powered off" be disabled. If this option is enabled and a cshutdown -r command is issued to all the nodes (LPARs) on a pSeries 670/690 server, the command may not

be able to power on the nodes after the shutdown completes, as the system may be powered off. An error message will be issued when this happens. The system must then be powered on manually by issuing the hmcmds -G on **<frame_number>:0** command.

Use the HMC Server and Partition: Server Management interface to disable this option for each pSeries 670/690 server managed by the HMC. Open the managed system's properties window, select the "Policy" tab, and uncheck the option. This should be repeated for each managed system.

- In "Chapter 2. Installing and configuring a new RS/6000 SP system", "Task E. Power on and install the nodes", "Step 68: Network boot optional boot/install servers", add the following text to the end of the step:

  After the network installation of all your boot/install servers has completed, run the following command on the control workstation to refresh the partition-sensitive subsystems:

  ```
  /usr/lpp/ssp/bin/syspar_ctrl -r
  ```

- In "Chapter 2. Installing and configuring a new RS/6000 SP system", "Task E. Power on and install the nodes", "Step 70: Network boot the remaining RS/6000 SP nodes", add the following text to the end of the step:

  After the network installation of all your remaining nodes has completed, run the following command on the control workstation to refresh the partition-sensitive subsystems:

  ```
  /usr/lpp/ssp/bin/syspar_ctrl -r
  ```

- In "Chapter 4, Migrating the software on your RS/6000 SP System", under the "Paths to migrate the nodes to PSSP 3.4" heading, the text within the box labelled "Important" has been expanded to include:

  If the starting point for a node migration is PSSP 2.4 and AIX 4.3.3, you must first customize to PSSP 3.4 and AIX 4.3.3. A migration is then required to go from PSSP 3.4 and AIX 5L 5.1. The two steps cannot be combined.

- In "Chapter 4, Migrating the software on your RS/6000 SP System", "Migrating the control workstation from AIX 4.3.3 to 5L 5.1", add the following step after "Step 11: Obtain additional PSSP prerequisites":

  Step 11.5: Install pSeries 690 files (optional)

  Install the pSeries 670/690 files using the following commands:

  ```
  installp -agXd /spdata/sys1/install/<name>/lppsource/installp/ppc \
  Java130.rte Java130.xml4j
  /bin/rpm -i \
  /spdata/sys1/install/<name>/lppsource/RPMS/ppc/openCIMOM-0.61.aix4.3.noarch.rpm
  ```

- In "Chapter 5, Reconfiguring security", "Enabling restricted root access (RRA)", the first bullet should be replaced by:

  * Use the spsitenv command to enable restricted root access. For example:

  ```
  spsitenv restrict_root_rcmd=true
  ```

The third bullet should be replaced by:

*If you currently use nodes as boot/install servers follow the directions below in "Using multiple boot/install servers with RRA".

- In "Chapter 6. Reconfiguring the RS/6000 SP system", "Adding nodes", "Step 19: Network boot optional boot/install servers", replace the section "SP-attached server and clustered enterprise server installation" with the following text:

SP-attached server and clustered enterprise server installation

Perform the following steps to add an SP-attached server or clustered enterprise server and preserve your existing software environment. The target node must have been set to customize. To verify issue the command:

```
splstdata -b -l <node_number>
```

If the node is not set to customize return to Step 9: Set up nodes to be installed.

Step 19.1: Upgrade AIX: The target SP node must be at the required AIX 4.3.3 or AIX 5L 5.1 software levels as specified in Chapter 2 "Step 14: Copy the AIX LP images and other required AIX LPs and PTFs", in the "Read This First" document, and in updated PTF documentation and README files.

Step 19.2: Set up name resolution of the SP-attached server or clustered enterprise server: In order to do PSSP customization, the following must be resolvable on the SP-attached server or clustered enterprise server:

  - The control workstation host name
  - The name of the boot/install server's interface that is attached to the SP-attached server's or clustered enterprise server's SP Ethernet administrative LAN adapter interface.

Step 19.3: Set up routing to the control workstation host name: If you have a default route set up on the SP-attached server or clustered enterprise server, you will have to delete it. If you do not remove the route, customization will fail when it tries to set up the default route defined in the SDR. In order for customization to occur, you must define a static route to the control workstation's host name. For example, the control workstation's host name is its token ring address, such as 9.114.73.256:

```
route add -host 9.114.73.76 9.114.73.256
```

Step 19.4: FTP the SDR_dest_info and install customization files: During customization, certain information will be read from the SDR. In order to get to the SDR, you must FTP the /etc/SDR_dest_info file from the control workstation to the /etc/SDR_dest_info file on the SP-attached server or clustered enterprise server and check the mode and ownership of the file.

If you are using an installation customization script, you must FTP the /tftpboot/firstboot.cust and /tftpboot/script.cust files from the control workstation to the /tftpboot directory on the target node.

Step 19.5: Install Prerequisites Required by ssp.basic: Ensure that proper AIX, RSCT, and perfagent file sets are installed on the target node. These filesets should already be available in the LPPSOURCE and PSSP directories on the control workstation. Mount the LPPSOURCE directory from the target node,and install the required AIX and RSCT prerequisite filesets. Unmount the AIX LPPSOURCE filesystem when install is complete. For additional information,

refer to Chapter 2, Step 18.2: Install the perfagent.tools file set, Step 18.3 Install the runtime files, and Step 18.4: Install the RSCT files.

For example, on an AIX 5L 5.1 node, you would run the following commands to mount the LPPSOURCE directory from the CWS and install the filesets:

```
mount k3cws:/spdata/sys1/install/aix51/lppsource/installp/ppc /mnt
installp -aXgd /mnt  rsct.basic.sp  vacpp.ioc.aix50.rte perfagent.tools xlC.aix50.rte
umount /mnt
```

For example, on an AIX 4.3.3 node, you would run the following commands to mount the LPPSOURCE directory from the CWS and install the filesets:

```
mount k3cws:/spdata/sys1/install/aix433/lppsource /mnt
installp -aXgd /mnt  vacpp.ioc.aix43.rte perfagent.tools xlC.aix43.rte
umount /mnt
```

Step 19.6: Mount and Install ssp.basic: Mount the PSSP directory /spdata/sys1/install/pssplpp/ on the boot/install server from the target node, and install ssp.basic on the target node. Unmount the PSSP directory when the install is complete. For example:

```
mount k3cws:/spdata/sys1/install/pssplpp/  /mnt
installp -aXgd /mnt/PSSP-3.4  ssp.basic  2>&1 | tee /tmp/install.log
umount /mnt
```

Step 19.7: Run pssp_script and customization scripts: Run the pssp_script by issuing:

```
/usr/lpp/ssp/install/bin/pssp_script
```

If you are using PSSP customization scripts, set up permissions and run the scripts. For example:

```
chmod +x /tftpboot/script.cust /tftpboot/firstboot.cust
/tftpboot/script.cust
/tftpboot/firstboot.cust
```

Step 19.8: Reboot: Perform a reboot. For example:

```
shutdown -Fr
```

- In "Chapter 6. Reconfiguring the RS/6000 SP system", "Reconfiguring IBM @server pSeries 690 logical partitions (LPARs)", "Changing modes of operation", add the following text:

If you intend to run your pSeries 670 or 690 attached server in Logical Partition mode or in Affinity Logical Partition mode and occasionally change to Full System Partition (SMP) mode, you should ensure your SP switch adapters that will be configured while in SMP mode are physically located as follows:

  – For a single plane SP Switch2 configuration, the SP Switch2 PCI Attachment Adapter should be plugged in slot 3 of the first I/O drawer.

  – For a two-plane SP Switch 2 configuration, the SP Switch2 PCI Attachment Adapters should be plugged in slots 3 and 5 of the first I/O drawer.

  – For an SP Switch configuration, the RS/6000 SP System Attachment Adapter should be plugged in slot 8 of the first I/O drawer.

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- In "Chapter 7, Performing Software maintenance", Installing program updates", "Installing updates on a per node basis", "Task E: Update the SPOT when installing AIX BOS service updates", should be replaced by:

  1. On the control workstation and on all of the boot/install servers, deallocate the SPOT from all clients using the **unallnimres** command. To verify that the SPOT was deallocated from all clients, issue:

     `lsnim -l spot_lppsource_name`

     If the *alloc_count* is not zero, issue the following command to determine which machine is still using the SPOT:

     `lsnim -l -t standalone`

  2. On the control workstation only, copy the install images from the AIX Update CD-ROM to the lppsource directory that corresponds to the appropriate SPOT. For example, the directory could be:

     `/spdata/sys1/install/aix433/lppsource`

     or

     `/spdata/sys1/install/aix51/lppsource/installp/ppc`

  3. For Boot/Install Server (BIS) nodes, you must ensure that the BIS host name is in the **/.rhosts** file on the control workstation.

  4. On the control workstation only, run **nim -o check** *lpp_source* to create a new **.toc** file.

  5. **Note:** In a multiple Boot/Install Server (BIS) environment, the following actions can only be performed on one BIS at a time due to an AIX constraint regarding the **inutoc** command and the **.toc** file:

     – Creating the SPOT

       For more information, see the "NIM" errors in a multiple boot/install server (BIS) environment" section of the "Diagnosing NIM problems" chapter of the *PSSP: Diagnosis Guide*.

       On the control workstation and on each BIS node, issue **smit nim_res op**

       a. Select the appropriate SPOT.

       b. Select the **update_all** function.

       c. Hit **F4** in the "Source of Install Images" field and select the appropriate **lppsource**.

       d. Hit **Enter** twice to initiate the update.

       e. After the update completes, run **setup_server** to reallocate the SPOT to the necessary clients.

  6. If you added **.rhosts** entries in Step 3, you can now delete them.

Implementing a Firewalled RS/6000 SP System Guide corrections

1. The "Note" under section "Defining groups of related services" has been updated.

   In the "Defining groups of related services" section (in chapter 5), the Note should read as follows:

   Note: The rshrcp_svcgrp is optional, given that the shell, kshell, and kerberos services are optional. When an untrusted node is installed through the firewall, or when spbootins is issued for an untrusted node, the BIS server for the untrusted node, which is the firewall node, must issue an AIX rsh into the control workstation to complete some of its install or customize tasks. The rsh command will exploit shell, kshell, and/or kerberos services, depending on which AIX remote command security protocols are enabled on the firewall node and control workstation. The rshrcp_svcgrp must contain the services used by rsh.

2. Firewall node to itself definitions

   In the subsection titled "Firewall node to itself" (chapter 5, section "General rules required by PSSP"), when DCE is not configured on the firewall node an additional rule may be required if the firewall node is used to install or update the Untrusted nodes through the firewall node's BIS.

   This additional rule is to allow NIM client requests issued on the firewall node to connect to the local BIS server.

   ```
   SourceName: firewall_node_group
   TargetName: firewall_node_group
   ServiceName: nim
   ```

   Comment(s): Optional rule, only required when NIM client requests are generated during spbootins or setup_server for an Untrusted node.

3. Additional NIM/BIS information

   The following "Note" should appear immediately after rule six (6) in the subsection "Installing and customizing through the firewall" (chapter 5, section "Optional rules for PSSP"):

   Note: When an Untrusted node is installed through the firewall, or when spbootins is issued for an Untrusted node, the BIS server for the Untrusted node, which is the firewall node, must issue an AIX rsh into the control workstation to complete some of its install or customize tasks. The rsh command will exploit shell, kshell, and/or kerberos services, depending on which AIX remote command security protocols are enabled on the firewall node and control workstation. The rshrcp_svcgrp must contain the services used by rsh.

4. Extended DCE server ports formula

   The formula in the "On the DCE server side" section (of chapter 6) is valid when DCE is running within a firewalled SP system and PSSP is not enabled for DCE security services.

   When PSSP is configured and enabled for DCE security services, the formula needs to be extended to account for PSSP servers that exploit DCE ports.

   When PSSP is enabled for DCE security service, the formula is:

   (Number of DCE servers on the host) + 1 (local RPC) + 2 (for PSSP services)

The addition of two (2) more DCE server ports reflects DCE RPC port requirements by Hardmon and Sysctl (on the control workstation).

The addition of two more DCE server ports requires that two (2) additional DCE service objects be defined to the firewall application. Defining the additional DCE service objects is done in the same manner as described in the "Defining DCE services" section (of chapter 6).

Once the additional DCE service objects are defined, they must be added to your DCE firewall rules. Adding the additional DCE service objects to your DCE rules is done in the same manner as described in the "Defining DCE rules" section (of chapter 6).

5. Correction to DCE service object definition

   In the "Non-DCE endpoint mapper daemon services" section (in chapter 6), the third example shows the service name as "dce_sv31". It should read "dce_svc3".

6. SP Accounting

   When the SP Accounting master is on the control workstation, no addition firewall rules are required in order for summary reports to be gathered from the nodes within the firewalled SP system.

   When the SP Accounting master is on the firewall node (instead of the control workstation), then the following rule is required:

   ```
   SourceName: firewall_node_group
   TargetName: firewall_node_group, trusted_node_group
   ServiceName: sunrpc-udp, nfsd-tcp, nfsd-udp, mountd-tcp, mountd-udp
   ```

   Comment(s): Optional rule, only required when the SP Accounting master is on the firewall node.

   Note: This rule need only be enabled during the period(s) when summary reports are run.

   In addition to the above rule, the /var/adm/acct accounting entry in /etc/exports file on each Untrusted node must be updated to include the firewall node's en1 host name, also referred to as the second SP Ethernet LAN interface. (This is the Ethernet adapter that connects the firewall node to the Untrusted nodes.)

   The en1 host name must be added to the "root=" and "access=" options on the /var/adm/acct entry.

   After the en1 host name is added to /etc/exports, run exportfs to make the file system available to NFS clients.

   Example:

   The firewall node's en1 host name is fwen1.lab.ibm.com and is added to /etc/exports and the file system is made available to NFS clients.

   ```
   untrustednode8/ # cat /etc/exports
   /var/adm/acct
   -root=CCWS:ccws.lab.ibm.com:ccwse.lab.ibm.com:fwen0.lab.ibm.com
   :fwen1.lab.ibm.com,access=CCWS:ccws.lab.ibm.com:ccwse.lab.ibm.com
   :fwen0.lab.ibm.com:fwen1.lab.ibm.com

   untrustednode8/ # exportfs /var/adm/acct
   ```

7. Additional diagnostic information

Scenario

Rules exist that permit (successfully allow) a client request going from the control workstation to an Untrusted node, but the client request is blocked by the firewall.

Action(s)

Review the firewall log and look for an entry that shows the client's outbound request and the return response from the server.

If no outbound log entry appears, yet a response from the Untrusted node's server is logged in response to the client's original request, then there is a problem with the network routing between the control workstation and the Untrusted node. In this case the client's request is being routed to the Untrusted node through the firewall node, but the Untrusted node's reply to the client's request is being routed through firewall node to the control workstation. As such, the firewall only "sees half of the communication between the client and server--the server's response--so it cannot properly match the request to existing rules.

Examine the physical and logical network connections and routes between the control workstation and the Untrusted node. Ensure that the control workstation's route to the Untrusted node is through the firewall node.

Scenario

When PSSP DCE security service is enabled, Sysctl and Hardmon on the control workstation don't initialize (or function) properly.

Action(s)

Review the Sysctl and Hardmon logs and look for the following type of error:

```
"SP Security Services error message: 2502-606 DCE error in
rpc_server_use_all_protseqs: Cannot bind  socket (dce / rpc)"
```

This indicates that not enough DCE RPC ports were allocated for DCE services on the control workstation.

Refer to the item number one above, titled "Extended DCE server port s formula", for the information on how to correct this problem.

Scenario

allnimres/NIM failure when installing an Untrusted node from the firewall node.

Action(s)

Review the NIM and PSSP logs and look for the following messages:

```
0042-001 nim: processing error encountered on "master":
0042-048 m_allocate: "<client_node_hostname>" is unable to access
the "<lppsource_name>" resource due to network routing

allnimres: 0016-254 A problem was encountered while attempting to
allocate lppsource resource <lppsource_name> from server node
<node_Number> (<firewall_node_hostname>) to client node
<client_node_number> (<client_node_hostname>).
```

The return code from the "nim -o al locate" command is 1.

The NIM route definitions are incorrect between clients and BIS nodes.

Review your BIS definitions between the control workstation and firewall node, and between the firewall node and the Untrusted nodes.

Scenario

Failures for the haem service appear in the firewall log every two seconds.

Action(s)

Review the sp_rsct service group definition and ensure that the haem service is a member of this group.

If haem is a member of this group, ensure that the haem service object definition has the correct port, protocol, and source port range definitions.

If haem's service object definition is correct, and failures are still being logged, recycle the HAEM daemon on the source host.

If this still does not correct the problem, verify that PSSP Event definition is correct (in terms of where the event is detected and where the action is to be run.)

PCI Adapter Placement Reference (publication # SA38-0538-15) corrections

- In "Chapter 18, 7040 @server pSeries 670 configuration" and in "Chapter 19, 7040 @server pSeries 690 configuration", add the following text:

  If you intend to run your pSeries 670 or 690 attached server in Logical Partition mode or in Affinity Logical Partition mode and occasionally change to Full System Partition (SMP) mode, you should ensure your SP switch adapters that will be configured while in SMP mode are physically located as follows:

  – For a single plane SP Switch2 configuration, the SP Switch2 PCI Attachment Adapter should be plugged in slot 3 of the first I/O drawer.

  – For a two-plane SP Switch 2 configuration, the SP Switch2 PCI Attachment Adapters should be plugged in slots 3 and 5 of the first I/O drawer.

  – For an SP Switch configuration, the RS/6000 SP System Attachment Adapter should be plugged in slot 8 of the first I/O drawer.

Service Requirements

- The URL address of the service and support information is located on the Internet at the following URL:

  http://techsupport.services.ibm.com/server/fixes

  This page contains all the service bulletins and flashes as well as PTF and APAR reports for all current releases of AIX, RSCT, PSSP, LoadLeveler, and Parallel Environment.

PSSP Service

- With the installation of APAR IY28193, support for the nodes on and off the switch function on SP Switch2 systems is expanded. This function can now be used in coexistence environments. Please see /usr/lpp/ssp/READMES/ssp.basic.README.IY28193 for additional information.

- With the installation of APAR IY28194, support for disabling the system partitioning function in switchless SP systems has been added. This will allow you to add more SP Attached Servers to your system than you have available switch node numbers for. Please see /usr/lpp/ssp/READMES/ssp.basic.README.IY28194 for additional information.

- For those customers who will be using the pSeries 670/690, the following service is required:

  - APAR IY25274 - Required Service for PSSP 3.4 on AIX 5.1

  - APAR IY29560 - Required Service for PSSP 3.4 on AIX 5.1

  - APAR IY30343 - PSSP Support for p690/p670 using the SP Switch 2 in a single-plane environment

  - APAR IY30344 - PSSP Support for p690/p670 using the SP Switch 2 in a two-plane environment (Check Service for availability of this APAR.)

  - APAR IY30345 - PSSP Support for p690/p670 in a switchless environment

- With the installation of APARs IY32331 and IY31786, support for AIX Large Pages and AIX Memory Affinity is added. These functions are enabled for each node using the AIX **vmtune** command on the LPAR in the pSeries 670/690 server .

- With the installation of APAR IY33251, support for KLAPI with p690/p670 and the SP Switch2 is available.

- For **ALL** customers, the following PTF level for all file sets for PSSP 3.4 is required and can be obtained by ordering packaging PTF U481428 from 1-800-CALLAIX or by selecting the packaging APAR number IY26912 from FixDist.

Scaling Improvements

The IBM @server Cluster 1600 scaling limit has been increased to support clusters with as many as 32 IBM @server pSeries 690/670 servers with a maximum of 128 Logical Partitions (LPARs). A single cluster can now employ 1024 POWER4 processors. Obtain the latest service available with APAR number IY33420.

The scaling limit for Hardware Management Console (HMC) is increased. The HMC can now control up to 8 IBM @server pSeries 690/670 servers in a cluster with a maximum of 32 LPARs per HMC. Obtain the latest service available with APAR number IY33420.

RSCT Service

- The following RSCT APARS must be installed before including 7040 servers (pSeries 670/690) in your Cluster 1600 system:

```
IY29615 - hagsd core dump at rsct 2.2.1.0 level
IY29526 - S/S Following switch fault, nodes did not regain cssMembership
IY29870 - hagsglsm daemon hung during signal handling
```

- The following RSCT APAR must be installed on the control workstation, placed in your AIX 5.1 lppsource, and applied to any AIX 5L 5.1 mksysb images you have made which may contain RSCT file sets. RSCT file sets in the mksysb images shipped with PSSP may not contain this APAR.

  ```
  IY25010 - REQUIRED RSCT SERVICE FOR PSSP 3.4 SUPPORT
  ```

- The following RSCT APAR must be installed on the control workstation, placed in your PSSP 3.4 lppsource, and applied to any mksysb images you have made which may contain RSCT file sets. RSCT file sets are not included in the AIX 4.3.3 mksysb images shipped with PSSP.

  ```
  IY25008 - REQUIRED RSCT SERVICE FOR PSSP 3.4 SUPPORT
  ```

AIX Service

- The following APAR is included in the AIX 4.3.3 minimal image and must be installed on both the control workstation and the nodes.

  – AIX 4.3.3 - **REQUIRED**

    ```
    IY22024 - AIX 4330-09 RECOMMENDED MAINTENANCE FOR AIX 4.3
    ```

- The following APAR is included in the AIX 5L 5.1 minimal image and must be installed on both the control workstation and the nodes.

  – AIX 5L 5.1 - **REQUIRED**

    ```
    IY21957 - AIX 5100-01 RECOMMENDED MAINTENANCE FOR AIX 5L 5.1
    ```

- The following AIX 5L 5.1 APAR must be installed on the control workstation and applied to all AIX 5L 5.1 lppsource, SPOT, and mksysb images used to install 7040 servers (pSeries 670/690) and LPARs in your Cluster 1600 system:

  ```
  IY28102  -  AIX 5100-02 RECOMMENDED MAINTENANCE FOR AIX 5L 5.1
  ```

- Checkpoint/Restart support is available for both 32-bit and 64-bit applications running AIX 5L V5.1. Support for LoadLeveler V3.1, PSSP V3.4, and Parallel Environment V3.2 is made available with APAR numbers IY24116, IY24117, IY31786 and IY31964.

  Note: APAR # IY31964 is not currently available; However a temporary patch can be obtained from the following URL:

  ```
  ftp://service.software.ibm.com/aix/efixes/iy31964/
  ```

  until APAR# IY31964 becomes available.

- The following AIX 5L 5.1 APAR is **HIGHLY RECOMMENDED** to be installed on the control workstation and applied to all AIX 5L 5.1 lppsource, SPOT, and mksysb images used to install 7040 servers (pSeries 670/690) and LPARs in your Cluster 1600 system:

  ```
  IY31716  -  AIX UPDATES AS OF MAY 2002
  ```

- **When using a *mksysb*, any AIX corrective service (PTFs) applied to that *mksysb* must also be placed in the lppsource directory and the Shared Product Object Tree (SPOT) must be updated.**

The AIX corrective service applied to the minimal images is listed under the "Software Requirements" section in this document.

In order to update the SPOT, perform the following steps on the control workstation and all of the boot/install servers:

– Deallocate the SPOT from all clients using the **unallnimres** command.

– On the control workstation only, copy the install images for PTFs to the lppsource directory that corresponds to the appropriate SPOT. For example, copy the PTFs into /spdata/sys1/install/aix433/lppsource.

– For Boot Install Server (BIS) nodes, it is necessary to add the BIS hostname to the /.rhosts file on the control workstation.

– Issue **inutoc .** in the lppsource directory.

– Issue **nim -o check -F** <**lppsourceName**>

– Issue **smit nim_res_op**

– Select the appropriate SPOT.

– Select the "update_all" function.

– Hit <F4> in the "Source of Install Images" field and select the appropriate lppsource.

– Hit enter twice to initiate the update

– After the update completes, run **setup_server** to reallocate the SPOT to the necessary clients.

Limitations

- PSSP V3.4 will support limited Internet Protocol(IP), V6 networks on the control workstation and the nodes.

- An SP system does not support C2 evaluation.

- The firewalled RS/6000 SP system has restrictions, within the context of a firewalled SP system. These restrictions/limitations are covered by the firewalled SP system manual.

- The HACWS function does not support DCE.

- An SP system with more than one control workstation requires special procedures to maintain hardware control for control workstation fail-over. For details contact your IBM representative.

- The Virtual Shared Disk function of PSSP V3.4 requires the use of a switch (SP Switch or SP Switch2).

- HACWS is not supported on non-SP nodes in the cluster.

- Network Information Service (NIS+)

  While no dependencies or adverse interactions between PSSP and NIS+ have been identified, the use of NIS+ on the SP system has not been tested.

- LDAP Directory Integration Support

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While no dependencies or adverse interactions between PSSP and LDAP have been identified, the use of LDAP on the SP system has not been tested.

- User Space windows

The following table lists the maximum number of User Space windows supported for the various SP Switch and SP Switch2 adapters. Window availability and usage is reported by the PSSP **chgcss** command.

SP Switch Adapters:

```
     ADAPTER NAME                                          MAXIMUM NUMBER
(as displayed in SMIT)                                of USER SPACE WINDOWS
-----------------------------------------------       ---------------------
(F/C 4020) SP Switch Adapter                                   4
(F/C 4022) SP Switch MX Adapter                               4
(F/C 8396) IBM RS/6000 SP System Attachment Adapter           4
```

SP Switch2 Adapters:

```
     ADAPTER NAME                                          MAXIMUM NUMBER
(as displayed in SMIT)                                of USER SPACE WINDOWS
-----------------------------------------------       ---------------------
(F/C 4025) SP Switch2 Adapter                                 16
(F/C 8397) SP Switch2 PCI Attachment Adapter                  64
(F/c 4026) SP Switch2 MX2 Adapter                             8
```

Migration and Coexistence

- The following service must be applied to your existing SP system prior to migrating your control workstation to PSSP 3.4. Coexistence also requires this service.

The minimum service level for PSSP 2.4 support is PTF set 24. To determine which PTF filesets are installed on your PSSP 2.4 system, use the command **lslpp -h ssp.***. The necessary PTF filesets and their corresponding release levels are listed below:

```
PSSP PTFs by Comp     File Set Lvl   PSSP PTFs by comp     File Set Lvl
  ssp.authent            2.4.0.6       ssp.gui                 2.4.0.7
  ssp.basic              2.4.0.22      ssp.ha                  2.4.0.16
  ssp.clients            2.4.0.16      ssp.pman                2.4.0.5
  ssp.csd.cmi            2.4.0.3       ssp.st                  2.4.0.4
  ssp.csd.hsd            2.4.0.4       ssp.sysman              2.4.0.13
  ssp.csd.sysctl         2.4.0.6       ssp.top                 2.4.0.2
  ssp.csd.vsd            2.4.0.11      ssp.topsvcs             2.4.0.11
  ssp.css                2.4.0.21      ssp.ucode               2.4.0.3
  ssp.docs               2.4.0.9       ssp.public              2.4.0.3
  ssp.jm                 2.4.0.4
```

The minimum service level for PSSP 3.1.1 support is PTF set 19. To determine which PTF filesets are installed on your PSSP 3.1.1 system, use the command **lslpp -h ssp.***. The necessary PTF filesets and their corresponding release levels are listed below:

```
PSSP PTFs by Comp      File Set Lvl  PSSP PTFs by comp      File Set Lvl
  ssp.authent            3.1.1.1       ssp.tecad              3.1.1.2
  ssp.basic              3.1.1.7       ssp.top                3.1.1.1
  ssp.clients            3.1.1.12      ssp.top.gui            3.1.1.1
  ssp.css                3.1.1.17      ssp.ucode              3.1.1.2
  ssp.docs               3.1.1.4       ssp.vsdgui             3.1.1.2
  ssp.gui                3.1.1.4       vsd.hsd                3.1.1.1
  ssp.hacws              3.1.1.4       vsd.rvsd.hc            3.1.1.1
  ssp.pman               3.1.1.2       vsd.rvsd.scripts       3.1.1.10
  ssp.st                 3.1.1.3       vsd.sysctl             3.1.1.4
  ssp.sysctl             3.1.1.2
  ssp.sysman             3.1.1.12
```

The minimum service level for PSSP 3.2 support is PTF set 12. To determine which PTF filesets are installed on your PSSP 3.2 system, use the command **lslpp -h ssp.***. The necessary PTF filesets and their corresponding release levels are listed below:

```
PSSP PTFs by Comp      File Set Lvl   PSSP PTFs by Comp      File Set Lvl
  ssp.authent            3.2.0.2        ssp.ptpegui            3.2.0.1
  ssp.basic              3.2.0.12       ssp.resctr             3.2.0.1
  ssp.cediag             3.2.0.5        ssp.st                 3.2.0.5
  ssp.clients            3.2.0.9        ssp.sysctl             3.2.0.5
  ssp.css                3.2.0.12       ssp.sysman             3.2.0.7
  ssp.docs               3.2.0.7        ssp.top.gui            3.2.0.1
  ssp.gui                3.2.0.2        ssp.ucode              3.2.0.1
  ssp.hacws              3.2.0.1        ssp.vsdgui             3.2.0.2
  ssp.jm                 3.2.0.1        vsd.vsdd               3.2.0.11
  vsd.cmi                3.2.0.4        vsd.rvsd.rvsdd         3.2.0.7
  vsd.hsd                3.2.0.1        vsd.rvsd.scripts       3.2.0.7
  vsd.rvsd.hc            3.2.0.3        vsd.sysctl             3.2.0.4
```

Migration Consideration of non-ASCII Characters in the SDR for PSSP-2.4 and PSSP-3.1.1

If you might have non-ASCII characters in the SDR, then you should run SDRScan. If there are non-ASCII characters in the SDR prior to migrating from PSSP 2.4 or PSSP-3.1.1, the migration will fail. The most likely cause of non-ASCII characters in the SDR is an NLS configuration that includes non-ASCII characters. Note that only the en_US LANG setting is supported in releases earlier than PSSP 3.2. A tool is being provided that checks the SDR for the existence of non-ASCII characters. This tool should be run before migrating to PSSP 3.4 and if any non-ASCII characters are detected they need to be removed. The tool is /usr/lpp/ssp/bin/SDRScan and is available via APAR IY23244 in PSSP 2.4 and IY23701 in PSSP 3.1.1. A man page is also provided, and should be referred to for more information on SDRScan.

Migration Consideration of /etc/sysctl* files (APAR IY16027)

If migrating from pre-PSSP V3.1 Release to the PSSP V3.4 Release, you must merge any customization that you made to the /etc/sysctl*.acl file with the new /etc/sysctl*.acl files delivered in the PSSP V3.4 release. You can find the saved /etc/sysctl*.acl files in the /lpp/save.config/etc directory after the install.

If migrating from the PSSP V3.2 or V3.3 release to the PSSP V3.4 Release, you can simply copy the /lpp/save.config/etc/sysctl*.acl files to the /etc directory after the install. No new entries were put in these files for PSSP V3.4.

PSSP Packaging

The RS/6000 SP system software includes the IBM Parallel System Support Programs for AIX (PSSP), a comprehensive suite of applications for the installation, operation, management, and administration of the RS/6000 SP system. PSSP provides a single point of control for administrative tasks and helps increase productivity by letting administrators view, monitor, and control system operation.

Packaging information is located in the *PSSP: Installation and Migration Guide*.

Other IBM Products

A large number of system and application software products developed by IBM can be run on the SP system. For example:

- IBM LoadLeveler
  - Distributed, network-wide job management
- IBM Parallel Environment for AIX
  - Parallel application development and execution
  - Message passing parallel task communications
- IBM General Parallel File System for AIX (GPFS)
  - Data file system for parallel access to large files
- ADSM/6000
  - System and user data management
- PTX/6000
  - Performance monitoring
- NetView for AIX
  - Enterprise network management
- Trouble Ticket for AIX
  - Problem management
- PSF/6000
  - Printing support
- Job Scheduler for AIX
  - Schedules production batch workload in a distributed AIX environment

Independent Software Vendor Products

There is an aggressive program in place to enable and encourage independent software vendors to enable and port their applications to the RS/6000 SP system.

Viewing softcopy of the README documents

To view a softcopy of any READMEs from the IBM Software Distribution Facility (SDF) media:

- View the components on the media with one of these commands:

  ```
  installp -l -d /cdrom        (for CD-ROM)
  ```

  Find the desired component name.

- View a softcopy of any README from the SDF CD-ROM with the following command. Please note it may take several minutes to display each file.

  ```
  installp -i -d /dev/cd0    ssp          (PSSP install options)
  installp -i -d /dev/cd0    rsct.basic   (RS/6000 Cluster Technology options)
  installp -i -d /dev/cd0    rsct.clients (RS/6000 Cluster Technology options)
  installp -i -d /dev/cd0    ssp.vsd      (IBM Virtual Shared Disk)
  installp -i -d /dev/cd0    spimg        (separate CD-ROM)
  ```

- After installation, the READMEs can be found in the following directories:

  ```
  /usr/lpp/ssp/READMES
  /usr/sbin/rsct/README
  /usr/lpp/ssp.hacws/README
  /usr/lpp/csd/READMES
  /usr/lpp/spimg/README
  ```

AIX System Minimal mksysb Image and Required AIX PTFs

AIX 5L 5.1 Image Content

The following service is required and is included in the minimal **mksysb** image for AIX 5L 5.1. If you do
not use this minimal **mksysb** image, the service must be applied to your AIX 5L 5.1 operating system
prior to creating your **mksysb** image which you will use to install your nodes. Whichever image you use
you must update your SPOT and lppsource directory with these fixes according to the instructions listed in
"AIX Service" under "Service Requirements" in this document.

IY21957 - AIX 5100-01 RECOMMENDED MAINTENANCE FOR AIX 5L 5.1

```
    AIX 5.1 Image Content
---------------------------------------------------------------------
 Here is the lslpp -l output from the AIX 5.1 minimal image:

 Fileset                   Level   State  Type  Description (Uninstaller)
-------------------------------------------------------------------------
 X11.apps.aixterm         5.1.0.10   C     F    AIXwindows aixterm Application
 X11.apps.pm              5.1.0.0    C     F    AIXwindows Power Management GUI
                                                Utility
 X11.apps.rte             5.1.0.0    C     F    AIXwindows Runtime Configuration
                                                Applications
 X11.apps.util            5.1.0.0    C     F    AIXwindows Utility Applications
 X11.base.common          5.1.0.0    C     F    AIXwindows Runtime Common
                                                Directories
 X11.base.lib             5.1.0.10   C     F    AIXwindows Runtime Libraries
 X11.base.rte             5.1.0.10   C     F    AIXwindows Runtime Environment
 X11.base.smt             5.1.0.10   C     F    AIXwindows Runtime Shared Memory
                                                Transport
 X11.fnt.defaultFonts     5.1.0.0    C     F    AIXwindows Default Fonts
 X11.fnt.iso1             5.1.0.0    C     F    AIXwindows Latin 1 Fonts
 X11.loc.en_US.base.rte   5.1.0.0    C     F    AIXwindows Locale Configuration
                                                - U.S. English
 X11.motif.lib            5.1.0.10   C     F    AIXwindows Motif Libraries
 X11.motif.mwm            5.1.0.0    C     F    AIXwindows Motif Window Manager
 bos.64bit                5.1.0.10   C     F    Base Operating System 64 bit
                                                Runtime
 bos.acct                 5.1.0.10   C     F    Accounting Services
 bos.adt.base             5.1.0.10   C     F    Base Application Development
                                                Toolkit
 bos.adt.include          5.1.0.10   C     F    Base Application Development
                                                Include Files
 bos.adt.lib              5.1.0.10   C     F    Base Application Development
                                                Libraries
 bos.diag.com             5.1.0.10   C     F    Common Hardware Diagnostics
 bos.diag.rte             5.1.0.10   C     F    Hardware Diagnostics
 bos.diag.util            5.1.0.10   C     F    Hardware Diagnostics Utilities
 bos.help.msg.en_US.com   5.1.0.0    C     F    WebSM/SMIT Context Helps - U.S.
                                                English
```

```
bos.help.msg.en_US.smit      5.1.0.0    C    F    SMIT Context Helps - U.S.
                                                  English
bos.iconv.com                5.1.0.0    C    F    Common Language to Language
                                                  Converters
bos.iconv.ucs.com            5.1.0.0    C    F    Unicode Base Converters for AIX
                                                  Code Sets/Fonts
bos.loc.iso.en_US            5.1.0.0    C    F    Base System Locale ISO Code Set
                                                  - U.S. English
bos.mp                       5.1.0.10   C    F    Base Operating System
                                                  Multiprocessor Runtime
bos.mp64                     5.1.0.10   C    F    Base Operating System 64-bit
                                                  Multiprocessor Runtime
bos.msg.en_US.diag.rte       5.1.0.0    C    F    Hardware Diagnostics Messages -
                                                  U.S. English
bos.msg.en_US.mp             5.1.0.0    C    F    Base Operating System MP
                                                  Messages - U.S. English
bos.msg.en_US.net.tcp.client
                             5.1.0.0    C    F    TCP/IP Messages - US English
bos.msg.en_US.rte            5.1.0.0    C    F    Base Operating System Runtime
                                                  Msgs - U.S. English
bos.net.nfs.client           5.1.0.10   C    F    Network File System Client
bos.net.tcp.client           5.1.0.10   C    F    TCP/IP Client Support
bos.net.tcp.server           5.1.0.10   C    F    TCP/IP Server
bos.net.tcp.smit             5.1.0.10   C    F    TCP/IP SMIT Support
bos.net.uucp                 5.1.0.10   C    F    Unix to Unix Copy Program
bos.perf.perfstat            5.1.0.10   C    F    Perf. Statistics Interface
bos.perf.tools               5.1.0.10   C    F    Base Performance Tools
bos.powermgt.rte             5.1.0.10   C    F    Power Management Runtime
                                                  Software
bos.rte                      5.1.0.10   C    F    Base Operating System Runtime
bos.rte.Dt                   5.1.0.0    C    F    Desktop Integrator
bos.rte.ILS                  5.1.0.10   C    F    International Lang Support
bos.rte.SRC                  5.1.0.10   C    F    System Resource Controller
bos.rte.X11                  5.1.0.0    C    F    AIXwindows Device Support
bos.rte.aio                  5.1.0.10   C    F    Asynchronous I/O Extension
bos.rte.archive              5.1.0.10   C    F    Archive Commands
bos.rte.bind_cmds            5.1.0.10   C    F    Binder and Loader Commands
bos.rte.boot                 5.1.0.10   C    F    Boot Commands
bos.rte.bosinst              5.1.0.10   C    F    Base OS Install Commands
bos.rte.commands             5.1.0.10   C    F    Commands
bos.rte.compare              5.1.0.0    C    F    File Compare Commands
bos.rte.console              5.1.0.0    C    F    Console
bos.rte.control              5.1.0.10   C    F    System Control Commands
bos.rte.cron                 5.1.0.0    C    F    Batch Operations
bos.rte.date                 5.1.0.10   C    F    Date Control Commands
bos.rte.devices              5.1.0.10   C    F    Base Device Drivers
bos.rte.devices_msg          5.1.0.10   C    F    Device Driver Messages
```

```
bos.rte.diag              5.1.0.10    C   F   Diagnostics
bos.rte.edit              5.1.0.10    C   F   Editors
bos.rte.filesystem        5.1.0.10    C   F   Filesystem Administration
bos.rte.iconv             5.1.0.0     C   F   Language Converters
bos.rte.ifor_ls           5.1.0.0     C   F   iFOR/LS Libraries
bos.rte.im                5.1.0.0     C   F   Input Methods
bos.rte.install           5.1.0.10    C   F   LPP Install Commands
bos.rte.jfscomp           5.1.0.0     C   F   JFS Compression
bos.rte.libc              5.1.0.10    C   F   libc Library
bos.rte.libcfg            5.1.0.0     C   F   libcfg Library
bos.rte.libcur            5.1.0.10    C   F   libcurses Library
bos.rte.libdbm            5.1.0.0     C   F   libdbm Library
bos.rte.libnetsvc         5.1.0.0     C   F   Network Services Libraries
bos.rte.libpthreads       5.1.0.10    C   F   libpthreads Library
bos.rte.libqb             5.1.0.0     C   F   libqb Library
bos.rte.libs              5.1.0.0     C   F   libs Library
bos.rte.loc               5.1.0.10    C   F   Base Locale Support
bos.rte.lvm               5.1.0.10    C   F   Logical Volume Manager
bos.rte.man               5.1.0.10    C   F   Man Commands
bos.rte.methods           5.1.0.10    C   F   Device Config Methods
bos.rte.misc_cmds         5.1.0.10    C   F   Miscellaneous Commands
bos.rte.net               5.1.0.0     C   F   Network
bos.rte.odm               5.1.0.10    C   F   Object Data Manager
bos.rte.printers          5.1.0.10    C   F   Front End Printer Support
bos.rte.security          5.1.0.10    C   F   Base Security Function
bos.rte.serv_aid          5.1.0.10    C   F   Error Log Service Aids
bos.rte.shell             5.1.0.10    C   F   Shells (bsh, ksh, csh)
bos.rte.streams           5.1.0.10    C   F   Streams Libraries
bos.rte.tty               5.1.0.10    C   F   Base TTY Support and Commands
bos.sysmgt.loginlic       5.1.0.0     C   F   License Management
bos.sysmgt.nim.client     5.1.0.10    C   F   Network Install Manager Client
                                              Tools
bos.sysmgt.serv_aid       5.1.0.10    C   F   Software Error Logging and Dump
                                              Service Aids
bos.sysmgt.smit           5.1.0.10    C   F   System Management Interface Tl
                                              (SMIT)
bos.sysmgt.sysbr          5.1.0.10    C   F   System Backup and BOS Install
                                              Utilities
bos.sysmgt.trace          5.1.0.10    C   F   Software Trace Service Aids
bos.terminfo.com.data     5.1.0.0     C   F   Common Terminal Definitions
bos.terminfo.dec.data     5.1.0.0     C   F   Digital Equipment Corp Terminal
                                              Definitions
bos.terminfo.ibm.data     5.1.0.0     C   F   IBM Terminal Definitions
bos.terminfo.pc.data      5.1.0.0     C   F   Personal Computer Terminal
                                              Definitions
bos.terminfo.rte          5.1.0.0     C   F   Run-time Environment for AIX
                                              Terminals
```

```
bos.up                       5.1.0.10    C    F    Base Operating System
                                                   Uniprocessor Runtime
devices.chrp.base.diag       5.1.0.10    C    F    RISC CHRP Base System Device
                                                   Diagnostics
devices.chrp.base.rte        5.1.0.10    C    F    RISC PC Base System Device
                                                   Software (CHRP)
devices.chrp.pci.rte         5.1.0.0     C    F    PCI Bus Software (CHRP)
devices.common.IBM.async.diag
                             5.1.0.0     C    F    Common Serial Adapter
                                                   Diagnostics
devices.common.IBM.disk.rte
                             5.1.0.0     C    F    Common IBM Disk Software
devices.common.IBM.ethernet.rte
                             5.1.0.10    C    F    Common Ethernet Software
devices.common.IBM.fda.diag
                             5.1.0.0     C    F    Common Diskette Adapter and
                                                   Device Diagnostics
devices.common.IBM.fda.rte
                             5.1.0.0     C    F    Common Diskette Device SW
devices.common.IBM.ktm_std.diag
                             5.1.0.0     C    F    Common Keyboard, Mouse, and
                                                   Tablet Device Diagnostics
devices.common.IBM.ktm_std.rte
                             5.1.0.0     C    F    Common Keyboard, Tablet, and
                                                   Mouse Software
devices.common.IBM.modemcfg.data
                             5.1.0.0     C    F    Sample Service Processor Modem
                                                   Configuration Files
devices.common.IBM.pmmd_chrp.rte
                             5.1.0.0     C    F    CHRP Power Management Software
devices.common.IBM.ppa.diag
                             5.1.0.0     C    F    Common Parallel Printer Adapter
                                                   Diagnostics
devices.common.IBM.ppa.rte
                             5.1.0.0     C    F    Common Parallel Printer Adapter
                                                   Software
devices.common.IBM.scsi.rte
                             5.1.0.10    C    F    Common SCSI I/O Controller
                                                   Software
devices.common.IBM.tokenring.rte
                             5.1.0.10    C    F    Common Token Ring Software
devices.common.base.diag     5.1.0.10    C    F    Common Base System Diagnostics
devices.common.rspcbase.rte
                             5.1.0.0     C    F    RISC PC Common Base System
                                                   Device Software
devices.isa_sio.IBM0017.diag
                             5.1.0.10    C    F    Audio Device Diagnostics
```

```
devices.isa_sio.IBM0017.rte
                        5.1.0.0    C    F    Audio Device
devices.isa_sio.IBM0019.diag
                        5.1.0.0    C    F    ISA Tablet Software (IBM0019)
                                             Diagnostics
devices.isa_sio.IBM0019.rte
                        5.1.0.0    C    F    ISA Tablet Software (IBM0019)
devices.isa_sio.PNP0303.diag
                        5.1.0.0    C    F    ISA Keyboard Diagnostics
                                             (PNP0303)
devices.isa_sio.PNP0400.rte
                        5.1.0.10   C    F    RISC PC Standard Parallel Port
                                             Adapter Software (PNP0400)
devices.isa_sio.PNP0501.rte
                        5.1.0.0    C    F    RISC PC Standard Serial Adapter
                                             Software (PNP0501)
devices.isa_sio.PNP0700.rte
                        5.1.0.0    C    F    RISC PC Diskette Adapter
                                             Software (PNP0700)
devices.isa_sio.PNP0F03.diag
                        5.1.0.0    C    F    ISA Mouse Diagnostics (PNP0F03)
devices.isa_sio.baud.rte    5.1.0.0    C    F    Audio Device Software
devices.isa_sio.chrp.8042.diag
                        5.1.0.0    C    F    ISA Keyboard & Mouse Diagnostics
                                             (CHRP)
devices.isa_sio.chrp.8042.rte
                        5.1.0.0    C    F    ISA Keyboard & Mouse Software
                                             (CHRP)
devices.isa_sio.chrp.ecp.diag
                        5.1.0.0    C    F    CHRP IEEE 1284 Parallel Port
                                             Adapter Diagnostics
devices.isa_sio.chrp.ecp.rte
                        5.1.0.10   C    F    CHRP IEEE1284 Parallel Port
                                             Adapter Software
devices.isa_sio.km.diag     5.1.0.0    C    F    ISA Keyboard & Mouse Diagnostics
devices.isa_sio.km.rte      5.1.0.0    C    F    ISA Keyboard, Tablet, and Mouse
                                             Software
devices.isa_sio.pnpPNP.400.diag
                        5.1.0.0    C    F    Standard Parallel Adapter
                                             Diagnostic (pnpPNP,400) Software
devices.isa_sio.pnpPNP.400.rte
                        5.1.0.0    C    F    RISC PC Standard Parallel Port
                                             Adapter Software (pnpPNP,400)
devices.isa_sio.pnpPNP.501.diag
                        5.1.0.0    C    F    CHRP Serial Adapter Diagnostics
                                             (pnpPNP.501)
devices.isa_sio.pnpPNP.501.rte
                        5.1.0.0    C    F    CHRP Serial Adapter Software
                                             (pnpPNP.501)
```

```
devices.isa_sio.pnpPNP.700.diag
                        5.1.0.0    C    F    CHRP Diskette Adapter Diagnostic
                                                Software (pnpPNP.700)
devices.isa_sio.pnpPNP.700.rte
                        5.1.0.0    C    F    CHRP Diskette Adapter Software
                                                (pnpPNP.700)
devices.msg.en_US.base.com
                        5.1.0.0    C    F    Base System Device Software Msgs
                                                - U.S. English
devices.msg.en_US.diag.rte
                        5.1.0.0    C    F    Device Diagnostics Messages -
                                                U.S. English
devices.msg.en_US.rspc.base.com
                        5.1.0.0    C    F    RISC PC Software Messages - U.S.
                                                English
devices.msg.en_US.sys.mca.rte
                        5.1.0.0    C    F    Micro Channel Bus Software
                                                Messages - U.S. English
devices.pci.00100100.com  5.1.0.10   C    F    Common Symbios PCI SCSI I/O
                                                Controller Software
devices.pci.00100300.diag
                        5.1.0.11   C    F    PCI 16-bit SCSI I/O Controller
                                                Diagnostics
devices.pci.00100f00.diag  5.1.0.0    C    F    SYM53C8xxA PCI SCSI I/O
                                                Controller Diagnostics
devices.pci.00100f00.rte  5.1.0.10   C    F    SYM53C8xxA PCI SCSI I/O
                                                Controller Software
devices.pci.14103e00.diag
                        5.1.0.10   C    F    IBM PCI Tokenring Adapter
                                                (14103e00) Diagnostics
devices.pci.14103e00.rte  5.1.0.10   C    F    IBM PCI Token-Ring Adapter
                                                Software
devices.pci.14109f00.rte   2.2.0.0    C    F    IBM 4758 PCI Cryptographic
                                                Coprocessor
devices.pci.23100020.diag
                        5.1.0.10   C    F    IBM PCI 10/100 Mb Ethernet
                                                Adapter (23100020) Diagnostics
devices.pci.23100020.rte  5.1.0.10   C    F    IBM PCI 10/100 Ethernet Adapter
                                                Software
devices.pci.48110040.diagsa
                        5.1.0.10   C    F    SK-NET FDDI PCI Flash Update
                                                Utility
devices.pci.86808404.com  5.1.0.0    C    F    Common ISA Bus Software
devices.pci.86808404.rte  5.1.0.0    C    F    ISA Bus Software
devices.pci.PNP0A03.rte   5.1.0.0    C    F    PCI Bus Bridge Software
devices.pci.isa.rte       5.1.0.0    C    F    ISA Bus Bridge Software (CHRP)
devices.pci.pci.rte       5.1.0.0    C    F    PCI Bus Bridge Software (CHRP)
```

```
devices.scsi.disk.diag.com
                          5.1.0.10    C    F    Common Disk Diagnostic Service
                                                Aid
devices.scsi.disk.diag.rte
                          5.1.0.10    C    F    SCSI CD-ROM, Disk Device
                                                Diagnostics
devices.scsi.disk.rspc    5.1.0.0     C    F    RISC PC SCSI CD-ROM, Disk,
                                                Read/Write Optical Software
devices.scsi.disk.rte     5.1.0.10    C    F    SCSI CD-ROM, Disk, Read/Write
                                                Optical Device Software
devices.scsi.tape.diag    5.1.0.10    C    F    SCSI Tape Device Diagnostics
devices.scsi.tape.rspc    5.1.0.0     C    F    RISC PC SCSI Tape Device
                                                Software
devices.scsi.tape.rte     5.1.0.10    C    F    SCSI Tape Device Software
devices.sio.sa.diag       5.1.0.0     C    F    Built-in Serial Adapter
                                                Diagnostics
devices.sys.pci.rte       5.1.0.10    C    F    PCI Bus Software
devices.tty.rte           5.1.0.10    C    F    TTY Device Driver Support
                                                Software
invscout.ldb              1.3.0.0     C    F    Inventory Scout Logic Database
invscout.rte              1.3.0.0     C    F    Inventory Scout Runtime
ipfx.msg.en_US.rte        2.2.0.0     C    F    English ISO8859-1 message and
                                                grammar files
ipfx.rte                  2.2.0.0     C    F    IBM Information Presentation
                                                Facility/6000
perfagent.tools           5.1.0.10    C    F    Local Performance Analysis &
                                                Control Commands
perl.rte                  5.6.0.0     C    F    Perl Version 5 Runtime
                                                Environment
printers.msg.en_US.rte    5.1.0.0     C    F    Printer Backend Messages - U.S.
                                                English
printers.rte              5.1.0.0     C    F    Printer Backend
rsct.basic.hacmp          2.2.0.10    C    F    RSCT Basic Function (HACMP/ES
                                                Support)
rsct.basic.rte            2.2.0.10    C    F    RSCT Basic Function
rsct.basic.sp             2.2.0.10    C    F    RSCT Basic Function (PSSP
                                                Support)
rsct.compat.basic.hacmp   2.2.0.10    C    F    RSCT Event Management Basic
                                                Function (HACMP/ES Support)
rsct.compat.basic.rte     2.2.0.10    C    F    RSCT Event Management Basic
                                                Function
rsct.compat.basic.sp      2.2.0.10    C    F    RSCT Event Management Basic
                                                Function (PSSP Support)
rsct.compat.clients.hacmp
                          2.2.0.10    C    F    RSCT Event Management Client
                                                Function (HACMP/ES Support)
rsct.compat.clients.rte   2.2.0.10    C    F    RSCT Event Management Client
                                                Function
```

```
rsct.compat.clients.sp     2.2.0.10   C    F    RSCT Event Management Client
                                                Function (PSSP Support)
rsct.core.utils            2.2.0.10   C    F    RSCT Utilities
rsct.msg.EN_US.core.utils  2.2.0.0    C    F    RSCT Utilities Msgs - U.S.
                                                English (UTF)
rsct.msg.en_US.core.utils  2.2.0.0    C    F    RSCT Utilities Msgs - U.S.
                                                English
vacpp.cmp.rte              5.0.2.0    C    F    VisualAge C++ Compiler
                                                Application Runtime
vacpp.ioc.aix50.rte        5.0.2.0    C    F    IBM Open Class Library AIX 5.0
                                                Application Runtime
vacpp.ioc.rte              5.0.2.0    C    F    IBM Open Class Library
                                                Application Runtime
xlC.aix50.rte              5.0.2.2    C    F    C Set ++ Runtime for AIX 5.0
xlC.cpp                    5.0.2.0    C    F    C for AIX Preprocessor
xlC.msg.en_US.cpp          5.0.2.0    C    F    C for AIX Preprocessor
                                                Messages--U.S. English
xlC.msg.en_US.rte          5.0.2.0    C    F    C Set ++ Runtime Messages--U.S.
                                                English
xlC.rte                    5.0.2.1    C    F    C Set ++ Runtime
State codes:
 A -- Applied.
 B -- Broken.
 C -- Committed.
 O -- Obsolete.  (partially migrated to newer version)
 ? -- Inconsistent State...Run lppchk -v.

Type codes:
 F -- Installp Fileset
 P -- Product
 C -- Component
 T -- Feature
 R -- RPM Package
```

AIX 4.3.3 Image Content

The following service is required and is included in the minimal **mksysb** image for AIX 4.3.3. If you do not use this minimal **mksysb** image, the service must be applied to your AIX 4.3.3 operating system prior to creating your **mksysb** image which you will use to install your nodes. Whichever image you use you must update your SPOT and lppsource directory with these fixes according to the instructions listed in "AIX Service" under "Service Requirements" in this document.

```
IY22024 - AIX 4330-09 RECOMMENDED MAINTENANCE FOR AIX 4.3

    AIX 4.3.3 Image Content
-----------------------------------------------------------------------
 Here is the lslpp -l output from the AIX 4.3.3 minimal image:


Fileset                    Level  State  Description
----------------------------------------------------------------------------
X11.apps.pm                4.3.3.0   C  AIXwindows Power
                                        Management GUI Utility
bos.acct                   4.3.3.75  C  Accounting Services
bos.adt.base               4.3.3.75  C  Base Application
                                        Development Toolkit
bos.adt.debug              4.3.3.75  C  Base Application
                                        Development Debuggers
bos.adt.include            4.3.3.75  C  Base Application
                                        Development Include Files
bos.adt.lib                4.3.3.10  C  Base Application
                                        Development Libraries
bos.adt.libm               4.3.3.50  C  Base Application
                                        Development Math Library
bos.adt.syscalls           4.3.3.50  C  System Calls Application
                                        Development Toolkit
bos.diag.com               4.3.3.75  C  Common Hardware Diagnostics
bos.diag.rte               4.3.3.75  C  Hardware Diagnostics
bos.diag.util              4.3.3.75  C  Hardware Diagnostics
                                        Utilities
bos.docregister.com        4.3.3.10  C  Docregister Common
bos.help.msg.en_US.com     4.3.3.0   C  WebSM/SMIT Context Helps -
                                        U.S. English
bos.help.msg.en_US.smit    4.3.3.0   C  SMIT Context Helps -
                                        U.S. English
bos.iconv.com              4.3.3.75  C  Common Language to
                                        Language Converters
bos.iconv.ucs.com          4.3.3.25  C  Unicode Base Converters
                                        for AIX Code Sets/Fonts
```

```
bos.loc.iso.en_US               4.3.3.25  C  Base System Locale ISO
                                             Code Set - U.S. English
bos.mp                          4.3.3.75  C  Base Operating System
                                             Multiprocessor Runtime
bos.msg.en_US.diag.rte          4.3.3.0   C  Hardware Diagnostics
                                             Messages - U.S. English
bos.msg.en_US.docregister.com   4.3.1.0   C  Docregister Common
                                             Messages - U.S. English
bos.msg.en_US.mp                4.3.0.0   C  Base Operating System MP
                                             Messages - U.S. English
bos.msg.en_US.net.tcp.client    4.3.3.0   C  TCP/IP Messages - U.S.
                                             English
bos.msg.en_US.rte               4.3.3.0   C  Base Operating System
                                             Runtime Msgs - U.S. English
bos.msg.en_US.txt.tfs           4.3.1.0   C  Text Formatting Services
                                             Messages - U.S. English
bos.net.ncs                     4.3.3.25  C  Network Computing System
                                             1.5.1
bos.net.nfs.client              4.3.3.75  A  Network File System Client
bos.net.tcp.client              4.3.3.75  A  TCP/IP Client Support
bos.net.tcp.server              4.3.3.75  C  TCP/IP Server
bos.net.tcp.smit                4.3.3.75  C  TCP/IP SMIT Support
bos.powermgt.rte                4.3.3.0   C  Power Management Runtime
                                             Software
bos.rte                         4.3.3.75  C  Base Operating System
                                             Runtime
bos.rte.Dt                      4.3.0.0   C  Desktop Integrator
bos.rte.ILS                     4.3.3.75  C  International Language
                                             Support
bos.rte.SRC                     4.3.3.75  C  System Resource Controller
bos.rte.X11                     4.3.0.0   C  AIXwindows Device Support
bos.rte.aio                     4.3.3.75  C  Asynchronous I/O Extension
bos.rte.archive                 4.3.3.75  C  Archive Commands
bos.rte.bind_cmds               4.3.3.75  C  Binder and Loader Commands
bos.rte.boot                    4.3.3.75  C  Boot Commands
bos.rte.bosinst                 4.3.3.75  C  Base OS Install Commands
bos.rte.commands                4.3.3.75  C  Commands
bos.rte.compare                 4.3.3.75  C  File Compare Commands
bos.rte.console                 4.3.3.75  C  Console
bos.rte.control                 4.3.3.75  C  System Control Commands
bos.rte.cron                    4.3.3.75  C  Batch Operations
bos.rte.date                    4.3.3.75  C  Date Control Commands
bos.rte.devices                 4.3.3.0   C  Base Device Drivers
bos.rte.devices_msg             4.3.3.75  C  Device Driver Messages
bos.rte.diag                    4.3.3.75  C  Diagnostics
bos.rte.edit                    4.3.3.75  C  Editors
bos.rte.filesystem              4.3.3.75  C  Filesystem Administration
bos.rte.iconv                   4.3.3.0   C  Language Converters
```

```
bos.rte.ifor_ls            4.3.3.75   C   iFOR/LS Libraries
bos.rte.im                 4.3.3.75   C   Input Methods
bos.rte.install            4.3.3.75   C   LPP Install Commands
bos.rte.jfscomp            4.3.1.0    C   JFS Compression
bos.rte.libc               4.3.3.75   C   libc Library
bos.rte.libcfg             4.3.3.75   C   libcfg Library
bos.rte.libcur             4.3.3.75   C   libcurses Library
bos.rte.libdbm             4.3.3.0    C   libdbm Library
bos.rte.libnetsvc          4.3.0.0    C   Network Services Libraries
bos.rte.libpthreads        4.3.3.75   C   libpthreads Library
bos.rte.libqb              4.3.3.75   C   libqb Library
bos.rte.libs               4.3.3.0    C   libs Library
bos.rte.loc                4.3.3.75   C   Base Locale Support
bos.rte.lvm                4.3.3.75   C   Logical Volume Manager
bos.rte.man                4.3.3.75   C   Man Commands
bos.rte.methods            4.3.3.75   C   Device Config Methods
bos.rte.misc_cmds          4.3.3.75   C   Miscellaneous Commands
bos.rte.net                4.3.3.75   C   Network
bos.rte.odm                4.3.3.75   C   Object Data Manager
bos.rte.printers           4.3.3.75   C   Front End Printer Support
bos.rte.security           4.3.3.75   C   Base Security Function
bos.rte.serv_aid           4.3.3.75   C   Error Log Service Aids
bos.rte.shell              4.3.3.75   C   Shells (bsh, ksh, csh)
bos.rte.streams            4.3.3.75   C   Streams Libraries
bos.rte.tty                4.3.3.75   A   Base TTY Support and
                                          Commands
bos.sysmgt.loginlic        4.3.3.0    C   License Management
bos.sysmgt.nim.client      4.3.3.75   A   Network Install Manager -
                                          Client Tools
bos.sysmgt.serv_aid        4.3.3.75   C   Software Error Logging and
                                          Dump Service Aids
bos.sysmgt.smit            4.3.3.75   C   System Management Interface
                                          Tool (SMIT)
bos.sysmgt.sysbr           4.3.3.75   C   System Backup and BOS
                                          Install Utilities
bos.sysmgt.trace           4.3.3.75   C   Software Trace Service Aids
bos.terminfo.com.data      4.3.3.0    C   Common Terminal Definitions
bos.terminfo.dec.data      4.3.3.0    C   Digital Equipment Corp.
                                          Terminal Definitions
bos.terminfo.ibm.data      4.3.3.0    C   IBM Terminal Definitions
bos.terminfo.pc.data       4.3.2.50   C   Personal Computer Terminal
                                          Definitions
bos.terminfo.rte           4.3.3.0    C   Run-time Environment for
                                          AIX Terminals
bos.txt.spell              4.3.3.0    C   Writer's Tools Commands
bos.txt.spell.data         4.3.0.0    C   Writer's Tools Data
bos.txt.tfs                4.3.3.0    C   Text Formatting Services
                                          Commands
```

```
bos.txt.tfs.data                4.3.2.0   C  Text Formatting Services
                                             Data
bos.up                          4.3.3.75  C  Base Operating System
                                             Uniprocessor Runtime
devices.base.diag               4.3.3.75  C  Base System Diagnostics
devices.base.rte                4.3.3.50  C  RISC System 6000 Base
                                             Device Software
devices.chrp.base.diag          4.3.3.75  C  RISC CHRP Base System
                                             Device Diagnostics
devices.chrp.base.rte           4.3.3.75  C  RISC PC Base System Device
                                             Software (CHRP)
devices.chrp.pci.rte            4.3.3.75  C  PCI Bus Software (CHRP)
devices.common.IBM.ARTIC.diag   4.3.3.0   C  Common ARTIC Diagnostics
devices.common.IBM.async.diag   4.3.3.25  C  Common Serial Adapter
                                             Diagnostics
devices.common.IBM.disk.rte     4.3.3.0   C  Common IBM Disk Software
devices.common.IBM.ethernet.rte 4.3.3.75  C  Common Ethernet Software
devices.common.IBM.fda.diag     4.3.3.50  C  Common Diskette Adapter
                                             and Device Diagnostics
devices.common.IBM.fda.rte      4.3.3.0   C  Common Diskette Device
                                             Software
devices.common.IBM.ktm_std.diag 4.3.0.0   C  Common Keyboard, Mouse,
                                             and Tablet Device
                                             Diagnostics
devices.common.IBM.ktm_std.rte  4.3.3.0   C  Common Keyboard, Tablet,
                                             and Mouse Software
devices.common.IBM.modemcfg.data 4.3.1.0  C  Sample Service Processor
                                             Modem Configuration Files
devices.common.IBM.pmmd_chrp.rte 4.3.3.0  C  CHRP Power Management
                                             Software
devices.common.IBM.ppa.diag     4.3.3.25  C  Common Parallel Printer
                                             Adapter Diagnostics
devices.common.IBM.ppa.rte      4.3.3.0   C  Common Parallel Printer
                                             Adapter Software
devices.common.IBM.scsi.rte     4.3.3.75  C  Common SCSI I/O
                                             Controller Software
devices.common.IBM.tokenring.rte 4.3.3.50 C  Common Token Ring Software
devices.common.base.diag        4.3.3.75  C  Common Base System
                                             Diagnostics
devices.common.rspcbase.rte     4.3.3.0   C  RISC PC Common Base System
                                             Device Software
devices.graphics.com            4.3.3.75  C  Graphics Adapter Common
                                             Software
devices.graphics.voo            4.3.3.0   C  Graphics Adapter VOO and
                                             Stereo Software
devices.isa_sio.IBM0017.diag    4.3.3.75  C  Ultimedia Integrated Audio
                                             Diagnostics
```

```
devices.isa_sio.IBM0017.rte      4.3.2.0   C  AIX Ultimedia Services RISC
                                               PC Audio Device (CS4232)
devices.isa_sio.IBM0019.diag     4.3.3.0   C  ISA Tablet Software
                                               (IBM0019) Diagnostics
devices.isa_sio.IBM0019.rte      4.3.3.25  C  ISA Tablet Software
                                               (IBM0019)
devices.isa_sio.PNP0303.diag     4.3.3.50  C  ISA Keyboard Diagnostics
                                               (PNP0303)
devices.isa_sio.PNP0400.rte      4.3.3.75  C  RISC PC Standard Parallel
                                               Port Adapter Software
                                               (PNP0400)
devices.isa_sio.PNP0501.rte      4.3.3.50  C  RISC PC Standard Serial
                                               Adapter Software (PNP0501)
devices.isa_sio.PNP0700.rte      4.3.3.25  C  RISC PC Diskette Adapter
                                               Software (PNP0700)
devices.isa_sio.PNP0F03.diag     4.3.3.25  C  ISA Mouse Diagnostics
                                               (PNP0F03)
devices.isa_sio.baud.rte         4.3.2.1   C  AIX Ultimedia Services New
                                               RISC PC Audio Device
devices.isa_sio.chrp.8042.diag   4.3.0.0   C  ISA Keyboard & Mouse
                                               Diagnostics (CHRP)
devices.isa_sio.chrp.8042.rte    4.3.3.50  C  ISA Keyboard & Mouse
                                               Software (CHRP)
devices.isa_sio.chrp.ecp.diag    4.3.1.25  C  CHRP IEEE 1284 Parallel
                                               Port Adapter Diagnostics
devices.isa_sio.chrp.ecp.rte     4.3.3.75  C  CHRP IEEE1284 Parallel
                                               Port Adapter Software
devices.isa_sio.km.diag          4.3.3.50  C  ISA Keyboard & Mouse
                                               Diagnostics
devices.isa_sio.km.rte           4.3.3.50  C  ISA Keyboard, Tablet, and
                                               Mouse Software
devices.isa_sio.pnpPNP.400.diag  4.3.1.0   C  Standard Parallel Adapter
                                               Diagnostic (pnpPNP,400)
                                               Software
devices.isa_sio.pnpPNP.400.rte   4.3.0.0   C  RISC PC Standard Parallel
                                               Port Adapter Software
                                               (pnpPNP,400)
devices.isa_sio.pnpPNP.501.diag  4.3.0.0   C  CHRP Serial Adapter
                                               Diagnostics (pnpPNP.501)
```

```
devices.isa_sio.pnpPNP.501.rte    4.3.3.0   C  CHRP Serial Adapter
                                                Software (pnpPNP.501)
devices.isa_sio.pnpPNP.700.diag   4.3.0.0   C  CHRP Diskette Adapter
                                                Diagnostic Software
                                                (pnpPNP.700)
devices.isa_sio.pnpPNP.700.rte    4.3.3.0   C  CHRP Diskette Adapter
                                                Software (pnpPNP.700)
devices.mca.8d77.diag             4.3.3.50  C  8-bit SCSI I/O Controller
                                                Diagnostics
devices.mca.8d77.rte              4.3.3.0   C  8-bit SCSI I/O Controller
                                                Software
devices.mca.8d77.ucode            4.3.0.0   C  8-bit SCSI I/O Controller
                                                Microcode
devices.mca.8ee4.X11              4.3.3.10  C  AIXwindows Color Graphics
                                                Display Adapter Software
devices.mca.8ee4.diag             4.3.3.0   C  Color Graphics Display
                                                Adapter Diagnostics
devices.mca.8ee4.rte              4.3.3.0   C  Color Graphics Display
                                                Adapter Software
devices.mca.8ef5.diag             4.3.3.0   C  Ethernet High-Performance
                                                LAN Adapter (8ef5)
                                                Diagnostics
devices.mca.8ef5.rte              4.3.3.0   C  Ethernet High-Performance
                                                LAN Adapter (8ef5) Software
devices.mca.8efc.com              4.3.3.0   C  Common 16-bit SCSI I/O
                                                Controller Software
devices.mca.8efc.diag             4.3.3.0   C  16-bit SCSI I/O Controller
                                                Diagnostics
devices.mca.8efc.rte              4.3.3.10  C  16-bit SCSI I/O Controller
                                                Software
devices.mca.8f70.diag             4.3.3.0   C  Portmaster Adapter/A
                                                Diagnostics
devices.mca.8f95.diag             4.3.3.50  C  Ethernet High-Performance
                                                LAN Adapter (8f95)
                                                Diagnostics
devices.mca.8f95.rte              4.3.3.50  C  Ethernet High-Performance
                                                LAN Adapter (8f95) Software
devices.mca.8f9a.X11              4.3.3.50  C  AIXwindows GXT150M Graphics
                                                Adapter Software
devices.mca.8f9a.diag             4.3.3.0   C  GXT150M Graphics Adapter
                                                Diagnostics
devices.mca.8f9a.rte              4.3.3.0   C  GXT150M Graphics Adapter
                                                Software
devices.mca.8f9a.ucode            4.3.0.0   C  GXT150M Graphics Adapter
                                                Microcode
devices.mca.8fa2.diag             4.3.3.0   C  Token Ring High-Performance
                                                Adapter (8fa2) Diagnostics
```

```
devices.mca.8fa2.rte              4.3.3.10   C  Token Ring High-
                                                 Performance Adapter (8fa2)
                                                 Software
devices.mca.8fc8.diag             4.3.3.0    C  Token Ring High-
                                                 Performance Adapter (8fc8)
                                                 Diagnostics
devices.mca.8fc8.rte              4.3.3.75   C  Token Ring High-
                                                 Performance Adapter (8fc8)
                                                 Software
devices.mca.8fc8.ucode           4.3.0.0    C  Token Ring High-
                                                 Performance Adapter (8fc8)
                                                 Microcode
devices.mca.dee6.rte             4.3.0.0    C  Standard I/O (dee6) Adapter
                                                 Software
devices.mca.df5f.com             4.3.3.0    C  Standard I/O Adapter Common
                                                 Software
devices.mca.df5f.rte             4.3.0.0    C  Standard I/O (df5f) Adapter
                                                 Software
devices.mca.edd0.com             4.3.3.50   C  Common Async Adapter
                                                 Support
devices.mca.eff0.diag            4.3.0.0    C  X.25 CoProcessor/2 or
                                                 Multiport/2 Adapter
                                                 Diagnostics
devices.mca.eff0.rte             4.3.3.0    C  X.25 CoProcessor/2 or
                                                 Multiport/2 Adapter
                                                 Software
devices.msg.en_US.base.com       4.3.3.0    C  Base System Device Software
                                                 Msgs - U.S. English
devices.msg.en_US.diag.rte       4.3.3.0    C  Device Diagnostics
                                                 Messages - U.S. English
devices.msg.en_US.rspc.base.com 4.3.2.2    C  RISC PC Software
                                                 Messages - U.S.  English
devices.msg.en_US.sys.mca.rte    4.3.3.0    C  Micro Channel Bus Software
                                                 Messages - U.S. English
devices.pci.00100100.com         4.3.3.75   C  Common Symbios PCI SCSI I/O
                                                 Controller Software
devices.pci.00100300.diag        4.3.3.76   C  PCI 16-bit SCSI I/O
                                                 Controller Diagnostics
devices.pci.00100f00.diag        4.3.0.25   C  SYM53C8xxA PCI SCSI I/O
                                                 Controller Diagnostics
devices.pci.00100f00.rte         4.3.3.75   C  SYM53C8xxA PCI SCSI I/O
                                                 Controller Software
devices.pci.14103e00.diag        4.3.3.75   C  IBM PCI Tokenring Adapter
                                                 (14103e00) Diagnostics
devices.pci.14103e00.rte         4.3.3.75   C  IBM PCI Token-Ring Adapter
                                                 Software
```

```
devices.pci.23100020.diag      4.3.3.50  C   IBM PCI 10/100 Mb Ethernet
                                             Adapter (23100020)
                                             Diagnostics
devices.pci.23100020.rte       4.3.3.75  C   IBM PCI 10/100 Ethernet
                                             Adapter Software
devices.pci.86808404.com       4.3.0.0   C   Common ISA Bus Software
devices.pci.86808404.rte       4.3.3.0   C   ISA Bus Software
devices.pci.isa.rte            4.3.3.0   C   ISA Bus Bridge Software
                                             (CHRP)
devices.pci.pci.rte            4.3.3.0   C   PCI Bus Bridge Software
                                             (CHRP)
devices.rs6ksmp.base.rte       4.3.3.50  C   Multiprocessor Base System
                                             Device Software
devices.rspc.base.diag         4.3.3.50  C   RISC PC Base System Device
                                             Diagnostics
devices.rspc.base.rte          4.3.3.75  C   RISC PC Base System Device
                                             Software
devices.scsi.disk.diag.com     4.3.3.75  C   Common Disk Diagnostic
                                             Service Aid
devices.scsi.disk.diag.rte     4.3.3.75  C   SCSI CD-ROM, Disk Device
                                             Diagnostics
devices.scsi.disk.rspc         4.3.3.25  C   RISC PC SCSI CD-ROM, Disk,
                                             Read/Write Optical Software
devices.scsi.disk.rte          4.3.3.75  C   SCSI CD-ROM, Disk,
                                             Read/Write Optical Device
                                             Software
devices.scsi.tape.diag         4.3.3.75  C   SCSI Tape Device
                                             Diagnostics
devices.scsi.tape.rspc         4.3.3.25  C   RISC PC SCSI Tape Device
                                             Software
devices.scsi.tape.rte          4.3.3.10  C   SCSI Tape Device Software
devices.sio.fda.diag           4.3.2.0   C   Diskette Adapter and
                                             Device Diagnostics
devices.sio.fda.rte            4.3.3.0   C   Diskette Adapter Software
devices.sio.ktma.diag          4.3.3.0   C   Keyboard Tablet & Mouse
                                             Device and Adapter
                                             Diagnostics
devices.sio.ktma.rte           4.3.3.0   C   Keyboard Tablet & Mouse
                                             Device and Adapter Software
devices.sio.ppa.diag           4.3.1.0   C   Parallel Printer Adapter
                                             Diagnostics
devices.sio.ppa.rte            4.3.3.75  C   Parallel Printer Adapter
                                             Software
devices.sio.sa.diag            4.3.0.0   C   Built-in Serial Adapter
                                             Diagnostics
devices.sio.sa.rte             4.3.2.0   C   Built-in Serial Adapter
                                             Software
devices.sys.mca.rte            4.3.3.0   C   Micro Channel Bus Software
devices.sys.pci.rte            4.3.3.75  C   PCI Bus Software
```

```
devices.sys.slc.diag          4.3.3.0  C   Serial Optical Link
                                            Diagnostics
devices.sys.slc.rte           4.3.3.0  C   Serial Optical Link
                                            Software
devices.tty.rte               4.3.3.0  C   TTY Device Driver Support
                                            Software
ifor_ls.base.cli              4.3.3.25 C   License Use Management
                                            Runtime Code
ifor_ls.client.base           4.3.3.0  C   License Use Management
                                            Client Runtime
ifor_ls.client.gui            4.3.3.0  C   License Use Management
                                            Client GUI
ifor_ls.msg.en_US.base.cli    4.3.3.0  C   LUM Runtime Code Messages -
                                            U.S. English
perfagent.tools               2.2.33.75 C  Local Performance
                                            Analysis & Control Commands
perl.rte                      5.5.3.75 C   Perl Version 5 Runtime
                                            Environment
printers.msg.en_US.rte        4.3.3.0  C   Printer Backend Messages -
                                            U.S.  English
printers.rte                  4.3.3.75 C   Printer Backend
xlC.aix43.rte                 4.0.2.1  C   C Set ++ Runtime for AIX 4.3
xlC.cpp                       4.3.0.1  C   C for AIX Preprocessor
xlC.msg.en_US.cpp             4.3.0.1  C   C for AIX Preprocessor
                                            Messages en_US
xlC.msg.en_US.rte             4.0.2.0  C   C Set ++ Runtime Messages -
                                            U.S.  English
xlC.rte                       4.0.2.0  C   C Set ++ Runtime
xlsmp.msg.en_US.rte           1.3.1.0  C   XL SMP Runtime Messages -
                                            U.S.  English
```

Customizations:

The /(root) filesystem should be increased to 8MB.

The /var filesystem should be increased to 50MB.

Default number of licensed users was set to >64.

Default maximum number of processes allowed per user was set to 256.

Restrictions/Considerations: You should clean out **/tmp** after the image is installed, so there is maximum working space.

Note: AIX X-Windows has been removed (to reduce the image size) from the spimg in this release.

After you have installed your nodes, you should increase the dump space on each node to at least 32 MB. This is the minimum dump space required for the minimal image pre-installed on each SP node and

supplied in the "spimg" installp image. If you are using a larger image, more dump space may be required. You may cause the dump space on a node to be increased during installation by specifying the **extendlv** command in the **script.cust** script. If **script.cust** is run multiple times (i.e. customization of nodes) then all statements will also be run multiple times. Refer to the sample **script.cust** in **/usr/lpp/ssp/samples**.

List of Program Materials

The Program Material consists of the following materials.

- Basic machine readable material - CD-ROM.

```
External Label ID      Feature Number     Distribution Medium
--------------------   --------------     -----------------------
Para Sys Supt Pgm        5813             CD-ROM - 2 volumes
SP AIX Min Image         5813

SP Resource Center       5812             CD-ROM
```

- Documentation- Softcopy, ONLY

```
                                                        Publication
         Title                                          Number
-------------------------------------------------------  ------------
IBM RS/6000 SP:
     Planning, Volume 2, Control Workstation and Software
     Environment                                         GA22-7281
IBM Parallel System Support Programs for AIX:
     Administration Guide                                SA22-7348
IBM Parallel System Support Programs for AIX:
     Installation and Migration Guide                    GA22-7347
IBM Parallel System Support Programs for AIX:
     Diagnosis Guide                                     GA22-7350
IBM Parallel System Support Programs for AIX:
     Messages Reference                                  GA22-7352
IBM Parallel System Support Programs for AIX:
     Command and Technical Reference                     SA22-7351
RS/6000 Cluster Technology:
     Event Management Programming Guide and Reference    SA22-7354
RS/6000 Cluster Technology:
     Group Services Programming Guide and Reference      SA22-7355
RS/6000 Cluster Technology:
     First Failure Data Capture Programming Guide
     and Reference                                       SA22-7454
IBM Parallel System Support Programs for AIX:
     Managing Shared Disks:                              SA22-7349
```

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