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 Parallel System Support Programs: Administrative Guide*
- *IBM Parallel System Support Programs: Installation and Migration Guide*

The most current information is available as READMEs, and is on the respective tape as indicated.

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 tape(s) (Instructions are included later in this document).

Included in this Memo to Licensees are:

- Summary of Enhancements
- Additional Resource Information
- **PSSP Compatibility, Limitations, Restrictions & Prerequisites**
- IBM Parallel System Support Programs for AIX packaging
- Viewing the softcopy README documents from tape
- AIX 4.2.1 and AIX 4.3.1 Minimal Images
- List of Program Materials

Summary of Enhancements

PSSP Version 2.4 provides new RS/6000 Scalable POWERparallel Systems (SP) node enablement on AIX Version 4.2.1 or AIX 4.3.1 (in binary compatibility mode), and improved SP Switch diagnostics.

Enhancements include:

- 332 MHz SMP Wide and Thin nodes that you can add to an existing SP system or use as the only node types in a new SP system. They are nodes with SMP PowerPCs that give you flexibility to purchase lower cost nodes with the system management and reliability benefits of the SP design. They also can be a stepping stone in your growth path for applications that exceed the capacity of one uniprocessor but do not justify conversion to a parallel application.
- SP Switch MX Adapter for switch communication with increased SP Switch bandwidth. It is required for use with 332 MHz nodes.
- Migration and coexistence. You can upgrade to PSSP V2.4 running on AIX 4.2.1, or later, or on AIX 4.3.1, in binary compatibility mode. Earlier releases of PSSP can coexist with PSSP 2.4.
- Improved switch diagnosis includes diagnostic documentation, messages, and more detailed entries in the AIX error log and switch logfiles for better problem isolation.
- Service Director(R) for RS/6000 is now standard with an SP.

PSSP V2.4 replaces PSSP V2.3, which will no longer be available after PSSP V2.4 becomes available.

Additional Resource Information

SP Documentation

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

`http://www.rs6000.ibm.com/resource/aix_resource/sp_books/pssp/index.html`

RS/6000 SP Resource Center

A beta version of the RS/6000 SP Resource Center is available to download from the web.

The Resource Center provides one simple interface for all softcopy SP documentation and information resources. It consists of HTML files, Java and Javascript and runs in a web browser. The Resource Center provides access to the following RS/6000 SP information:

- Publications, READMEs, Redbooks, White Papers, etc.
- Up to Date Service Information
- SP Product Information (Software & Hardware)
- Many other online resources useful to the RS/6000 SP user.

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

`http://www.rs6000.ibm.com/support/sp/resctr.html`

ITSO Redbooks

To preview or browse recently published redbooks, visit the ITSO redbooks home page:

`http://www.redbooks.ibm.com`

ITSO Publication Offerings: How to access ITSO redbooks home page on the INTERNET:

`http://www.redbooks.ibm.com/redbooks`

This home page provides access to lists of recent redbooks (ITSOPUB.TXT) the catalog of all available redbooks (ITSOCAT.TXT), sorted by product area, which may also be downloaded by anonymous FTP to:

```
FTP.ALMADEN.IBM.COM
CD / REDBOOKS
GET ITSOPUB.TXT
GET ITSOCAT.TXT
```

PSSP Compatibility, Limitations, Restrictions & Pre-requisites

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

Installation Corrections

- It is important to have the proper level of **perfagent** and **xlC.rte** installed on the control workstation prior to the installation of **pssp.installp**. For AIX 4.2.1, install a minimum of **perfagent** 2.2.1.4 or later and any required service (5765-654 feature 7014). For AIX 4.3.1, install **perfagent** 2.2.31.0 or later and any required service. For either AIX level (4.2.1 or 4.3.1) install **xlC.rte**.3.1.4.7, or **xlC.rte**.3.6.3.0.

  Note: The installation of service for **perfagent** to run on AIX 4.2.1, APAR IX68740 is required with PSSP 2.4

Installation Considerations

- In PSSP 2.4 (and PSSP 2.3), the Performance Toolbox Parallel Extensions graphical user interface (spperfmon) is now shipped as part of PSSP, in an install image called **ssp.ptpegui**. In PSSP 2.2, spperfmon was shipped with Performance Toolbox Parallel Extensions (ptpe), a priced feature of PSSP, in a fileset called **ptpe.gui**.

  In order to insure that spperfmon is properly installed on your system when you install PSSP 2.4, please observe the following guidelines:

  – If you are upgrading a system where ptpe and PSSP 2.2 are already installed, simply install PSSP 2.4, making sure that **ssp.ptpegui** gets installed as well. The installation process will correctly recognize that the **ssp.ptpegui** fileset shipped with PSSP 2.4 is a complete supersede of the **ptpe.gui** fileset shipped with ptpe.

  – If you are installing PSSP 2.4 on a new system, be aware that the **ssp.ptpegui** fileset will not install until you purchase and install ptpe, because **ssp.ptpegui** requires the base ptpe fileset, **ptpe.program**, to be installed first.

  – If for some reason you needed to reinstall ptpe after installing ptpe and PSSP 2.4, the install process would not allow the older **ptpe.gui** fileset to be installed over the new **ssp.ptpegui** fileset shipped with PSSP 2.4. This is the desired behavior, since the version of spperfmon shipped in **ptpe.gui** will not work with PSSP 2.4.

  – PSSP installation is strictly enforcing AIX pre-requirements that we require to either support or service the SP System. Following are the filesets and levels of the pre-reqs. They are included in the respective AIX Minimal image.

    Note: For AIX 4.1.5 customers it is recommended that you do a two step migration. First migrate AIX and insure that the pre-requirement checks have been installed and then migrate to PSSP V2.4.

```
AIX 421:
    xlC.rte.3.1.4.7
    bos.mp.4.2.1.12
    bos.up.4.2.1.12
    bos.diag.rte.4.2.1.8
    bos.diag.com.4.2.1.9
    bos.sysmgt.serv_aid.4.2.1.9
    bos.rte.serv_aid.4.2.1.4
    bos.net.nfs.client.4.2.1.10
    bos.net.tcp.client.4.2.1.15
    perfagent.server.2.2.1.4
    devices.chrp.base.rte.4.2.1.8
    devices.chrp.base.diag.4.2.1.5
    devices.rspc.base.diag.4.2.1.0
    devices.rspc.base.rte.4.2.1.0
    devices.common.rspcbase.rte.4.2.1.0
    devices.common.IBM.modemcfg.data.4.2.1.0
AIX431:
    xlC.rte 3.6.3.0
    bos.mp 4.3.1.0
    bos.up 4.3.1.0
    devices.chrp.base.rte 4.3.1.0
    bos.diag.rte 4.3.1.0
    bos.diag.com 4.3.1.0
    bos.sysmgt.serv_aid 4.3.1.0
    bos.rte.serv_aid 4.3.1.0
    bos.net.nfs.client 4.3.1.0
    bos.net.tcp.client 4.3.1.0
    perfagent.server.2.2.31.0
    devices.chrp.base.rte.4.3.1.0
    devices.chrp.base.diag.4.3.1.0
    devices.rspc.base.diag.4.3.1.0
    devices.rspc.base.rte.4.3.1.0
    devices.common.rspcbase.rte.4.3.1.0
    devices.common.IBM.modemcfg.data.4.3.1.0
```

- SP Model 500 systems (short frame) or SP Model 550 (tall frame) systems with the low cost switch must specify that the first frame is frame number 1 and any additional frames must be numbered consecutively.

System Administration Considerations

Note: The **cshutdown** and **cstartup** commands may be run by members of the shutdown group as well as root from the Control Workstation.*:* If you wish to use the System Partitioning Aid, either from the GUI ("spsyspar") or from the command line ("sysparaid"), you must not modify the expected.top* master topology files in /spdata/sys1/syspar_configs/topologies. If you modify them, either by directly editing them or by specifying them as the topology output file for the **Eannotator** command, unpredictable results will occur in the topology files created by the System Partitioning Aid.

Topology Services Consideration

- Prior to AIX 4.2.1, Topology Services required setting the network option **nonlocsrcroute** to 1 to enable IP source routing (The default is 0). In AIX 4.2.1 some additional network options have been added for IP source routing as follows: **ipsrcroutesend**, **ipsrcrouterecv**, and **ipsrcrouteforward**. The defaults are 1 for **ipsrcroutesend** and **ipsrcrouteforward** and 0 for **ipsrcrouterecv**. Topology Services sets all four of these options to 1 so that the Reliable message feature of Topology Services, which utilizes IP source routing will continue to work. Disabling any of these network options can prevent the Reliable messaging service from working properly.

New Administration Functions in the 332 MHz nodes

- Operating System Surveillance

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

  Operating system surveillance is not enabled by default. Through PSSP V2.4 code, we have enabled this feature.

  The option to query surveillance on an SP System is **/usr/lpp/diagnostics/bin/uspchrp -q sp-sen**

AIX Considerations

Note: 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/aix421/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.

Note: The following AIX 4.2.1 APAR is not in the minimal image and must be installed on both the control workstation and the nodes.

– Perfagent (PTX Agent component)

```
IX68740  harmld core dumps (compatibility problem)
```

Note: The following APARs are in the minimal image and must be installed on both the control workstation and the nodes should you choose not to use the minimal image.

– AIX 4.2.1 - **REQUIRED**

```
AIX 4.2.1 Maintenance APAR          - IX58183
AIX 4.2.1 Updates Required for PSSP - IX76856
AIX 4.2.1 Updates Req'd for Recoverable
          Virtual Shared Disk       - IX74867
```

– AIX 4.3.1 - **REQUIRED**

```
AIX 4.3.1 Maintenance APAR          - IX71948
```

General corrections for all PSSP 2.4 documents

- The level of AIX supported is AIX 4.3.1, not AIX 4.3.0, as stated.

Corrections to the Planning Guide, Volume 2

- The Boot/Install Server Requirements in chapter 3 on page 64, "Defining the Configuration that Fits Your Needs", should include this additional requirement: the control workstation must have a route to the NIM clients over the SP Ethernet.
- The two highlighted notes on page 78 of chapter three of *IBM RS/6000 SP: Planning, Volume 2, Control Workstation and Software Environment* are no longer valid. Both notes are listed under the subheading, "Examples of using node slot positions within a wide node or high node." These notes state that using an SP Switch Router in a switch port normally associated with a thin node will place restrictions on how that frame may be used. This is no longer the case. The SP Switch Router may now be logically placed in any valid switch port without placing restrictions on the entire frame.

Corrections to the Migration and Install Guide

- Chapter 4. Migrating to the Latest Level of PSSP

  Table 8. Migrating Paths for the Control Workstation

Note the following:

AIX Starting Point	PSSP Starting Point	Target Point	Install Method	Refer to:
4.1.5	2.2	AIX 4.2.1, PSSP 2.2 AIX migration only	Migration Install	"Migrating..... Workstation.... PSSP 2.4..... |Do steps 1-6,9,10, 12,15,16,19,22
4.2.1	2.3	AIX 4.3, PSSP 2.3 AIX migration only	Migration Install	"Migrating..... Workstation.... PSSP 2.4..... |Do steps 1-6,9,10, 12,15,16,19,22
4.2.1	2.4	AIX 4.3, PSSP 2.4 AIX migration only	Migration Install	"Migrating..... Workstation.... PSSP 2.4 ..... |Do steps 1-6,9,10, 12,15,16,19,22

- Migration Install of Nodes to PSSP 2.4

  Step 3: Run setup_server to Configure the Changes

  Note: Do not run setup_server on any nodes defined as a boot/install server until the boot/install servers have been migrated.

- The following step should be done after:

  Migrating the Control Workstation from PSSP 2.1 to PSSP 2.4 Step 21: Configure PSSP Services and Set Up the Site Environment, or

  Migrating the Control Workstation from PSSP 2.2 to PSSP 2.4 Step 19: Configure PSSP Services and Set Up the Site Environment, or

  Migrating the Control Workstation from PSSP 2.3 to PSSP 2.4 Step 19: Configure PSSP Services and Set Up the Site Environment

  Update the State of the Supervisor Microcode.

  Check which supervisors need to be updated by issuing:

  ```
  spsvrmgr -G -r status all
  ```

  If action is required then update the microcode by issuing:

  ```
  spsvrmgr -G -u <frame_number>:<slot_number>
  ```

  or to update all at once issue:

```
spsvrmgr -G -u all
```

Note: For more information on this step see Step 26: Update the State of the Supervisor Microcode in Chapter 2, Installing and Configuring a New RS/6000 SP System.

- Event Management - New hardware Resource Variables

  Additional hardware resource variables have been defined in PSSP 2.4. Some of these include the hardware resource variables for the new 332 MHz SMP nodes. After the control workstation (CWS) is migrated to PSSP 2.4 and the partition hardware resource variables is visible (e.g. to Perspectives or Event Management), the following procedure must be performed for each system partition:

  1. Shutdown all Event Management daemons in the system partition. Enter the command:

     ```
     "haemctrl -k" on the CWS and on each node.
     ```

  2. Verify that all **haem** daemons in the system partition have stopped before proceeding.
  3. After all daemons have been shutdown, re-start all Event Management daemons in the system partition. Enter the command:

     ```
     "haemctrl -s"  first on the CWS and then on each node.
     ```

  Note: This procedure can be performed at any convenient time after the CWS has been migrated or reinstalled at PSSP 2.4.

- Changes to **script.cust** customization script

  Prior to migrating any nodes to PSSP 2.4, please be aware that in PSSP 2.4 the **script.cust**, customer customization script, has been split into two scripts: **script.cust** and **firstboot.cust**. This means any customization you may have previously made to an older version of **script.cust** may now need to be moved to the new script **firstboot.cust**. For additional information refer to Appendix C - User Supplied Node Customization Scripts.

Migration considerations

- **Publications Considerations**

  Technical updates to the *IBM Parallel System Support Programs for AIX: Installation and Migration Guide* can be found on the Web under the following url:

  ```
  http://www.rs6000.ibm.com/resource/aix_resource/sp_books/pssp/index.html
  ```

- **Migrating**

  Before migrating your nodes to PSSP 2.4 you must ensure that the following pre-requirement filesets have been installed at the proper release level.

  Note: For AIX 4.1.5 customers it is recommended that you do a two step migration. First migrate AIX and insure that the pre-requirement checks have been installed and then migrate to PSSP V2.4.

```
devices.chrp.base.rte
devices.chrp.base.diag
devices.rspc.base.diag
devices.rspc.base.rte
devices.common.rspcbase.rte
devices.common.IBM.modemcfg.data
```

Before migrating your nodes to AIX 4.2.1 or AIX 4.3.1 you must ensure that the required APARs are included in your **lppsource** and built into your SPOT. If your have already built your SPOT without the APARs you will need to update your SPOT after you've included the fixes in your **lppsource**. Under "AIX Considerations" starting on page 5 you will find the required APARs and "How to update your SPOT".

- **SDR**

  If an SDR archive was created on an earlier level of the installed CWS PSSP, you cannot restore the archived SDR on a later level of PSSP.

- **HACWS Considerations**

  – **mksysb Considerations**

    In Chapter 6 of the *IBM Parallel System Support Programs for AIX: Installation and Migration Guide* **ADD** the following:

    In an HACWS environment, you should have a mksysb of both the primary and backup control workstations for restoration. After restoring the mksysb, do **NOT** run **install_cw** as instructed.

  – **Avoiding false Adapter Failures**

    To avoid false adapter failures on configurations without standby adapters in the "Managing a High Availability control workstation configuration" chapter of the Administrative Guide add the following after the **netmon.cf** file configuration:

    Issue **/usr/sbin/no -o bcastping=1**

    Note: This variable should be added to the /etc/rc.net file, on the control workstations, and also to the /tftpboot/tuning.cust file for the nodes.

SP Kerberos V4 Remote Commands and AIX 4.3.1 Considerations

The SP Kerberos 4 **kshd** daemon is not used when running on AIX 4.3.1. The SP Kerberos 4 **rsh** and **rcp** clients communicate with the AIX Secure remote commands daemon, **krshd**.

When AIX 4.3.1 is installed on your system, PSSP configuration code will make the necessary alterations. These alterations include:

1. Removing the **kshd** entry in **inetd.conf** and refreshing the **inetd** daemon.
2. Setting the authentication to include Kerberos 4 and Standard AIX.

3. Touching a dummy file required for the AIX command **chauthent** to work on an SP for Kerberos 4. This file is /usr/lib/libspk4rcmd.a.

The AIX Secure remote commands depend on an authentication method that is set using **chauthent**. The default authentication method is Standard AIX. The SP configuration code adds Kerberos 4 to the authentication methods to allow continued use of the SP Kerberos 4 **rsh** and **rcp** clients.

Two authentication methods MUST be in force for the SP Kerberos 4 Remote Commands to work. Those are "Kerberos 4" and "Standard AIX". You can check the authentication methods using the AIX command **lsauthent**.

Please be aware that using **chauthent** without options will REMOVE all authentication methods. To reset the authentication methods, issue:

chauthent -k4 -std

For more information, please refer to the AIX man pages for **rsh, rshd, krshd, lsauthent** and **chauthent**.

Hardware Requirements

- RS/6000 SP system, including one control workstation for each SP system.
- The control workstation must be operational prior to the RS/6000 SP system installation. It also must be operational before the Customer Service representative for the SP system is called for maintenance.

The capacity requirements of the application and connectivity to the supported nodes must be carefully evaluated.

Software Requirements

Customers ordering hardware separately must ensure access to the latest update of AIX.

Parallel System Support Programs Version 2 Release 4:

- AIX 4.2.1, or later (5765-C34, or 5765-655), or AIX 4.3.1, or later (5765-C34), on the control workstation.

  The following fixes have been applied to the minimal **mksysb** Image for AIX 4.2.1, or AIX 4.3.1. If you do not use this minimal **mksysb** image, the fixes must be applied to your AIX 4.2.1, or AIX 4.3.1 operating system prior to creating your **mksysb** image which you will use to install your nodes. Whichever AIX 4.2.1, or AIX 4.3.1 image you use you must update your SPOT and lppsource directory with these fixes.

```
AIX 4.2.1 Maintenance APAR  - IX58183
AIX 4.2.1 APAR              - IX76856

AIX 4.3.1 Maintenance APAR  - IX71948
```

- At least one concurrent use license of C for AIX compiler or C++ compiler installed on the SP complex, which includes the control workstation. It should be the version supported by the operating system on the nodes. For compatibility with PSSP 2.4 and Parallel Environment 2.3, currently available versions include:
  - AIX 4.2.1

    C for AIX, V3.1.4.7 or later

    C SET ++, V3.1.4.7 or later

    C and C++ Compilers V3.6 or later
  - AIX 4.3.1

    C for AIX, V4.3 or later

    C and C++ Compilers V3.6 or later

  Compilers are necessary for service of PSSP and Parallel Environment. Also, without the compiler, dump diagnosis tools like **crash** will not function fully. At least a one-user license must be obtained, but if you intend to do C development work, you will have to decide how many users you wish supported at a given time.

  If you are doing C or C++ development work, the runtime libraries on the nodes must be equal to or later than the level used to compile any of the nodes. PSSP and Parallel Environment were compiled with C SET++ 3.1.4.7. Your runtime libraries must be equal to or later than this level, or a newer version that is compatible with C SET++ 3.1.4.7 and supported on your operating system. See the announcements for the compilers for more details on compatibility.
- IBM Performance Toolbox V2.2, Agent Component (5765-654).

  Note: The service fix for APAR IX68740 must be installed prior to the operation of this product with PSSP V2.4.
- The LAPI function, which is within PSSP, requires Parallel Environment V2.3. If this optional function is not used then Parallel Environment is not required.

Note: The license for PSSP V2.4, with the exception of the HACWS and PTPE optional features, is included in the SP hardware price. However, PSSP must be separately ordered.

IBM Performance Toolbox Parallel Extensions (PTPE) (Separately priced feature of PSSP V2.2, V2.3, or V2.4.):

- Performance Toolbox for AIX V2.2 (5765-654)
  - The Agent Component must be installed on each node that you want to monitor.
  - Performance Manager on at least one node or workstation in the network for monitoring.

HACWS (a separately priced feature of PSSP V2.4):

- On both of the control workstations:
  - PSSP V2.4 (5765-529)

– Any level of AIX that is supported with PSSP 2.4.

– Any level of HACMP V4.2, or later (5765-A86) that is supported with the level of AIX that you are using. Refer to the appropriate HACMP documentation to determine what levels of HACMP are supported with the level of AIX you are using.

  Note: HACMP V4.2, or later, Enhanced Scalability feature is not supported on the control workstation.

Service

The URL address of the RS/6000 SP service and support information is located on the Internet at the following URL:

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

This page contains all the service bulletins and flashes as well as PTF and APAR reports for all current releases of PSSP, LoadLeveler, Parallel Environment, NetTAPE, and Recoverable Virtual Shared Disk.

Compatibility

Since the SP system and PSSP use IBM RS/6000 POWER2, PowerPC, POWER architecture, and AIX 4.2.1 or AIX 4.3.1, programs written for the RS/6000 will run on properly configured SP processor nodes without recompilation. In some cases, additional performance may be achieved by recompiling with the latest versions of the IBM XL Fortran compilers to further exploit the POWER2 and PowerPC technology.

PSSP V2.4 is a functional enhancement and complete replacement of AIX Parallel System Support Programs V2.3. PSSP V2.2 will remain orderable.

When running with PSSP V2.4, the following products must be at the levels specified below:

- LoadLeveler (5765-145) V1R3
- IBM Parallel Environment for AIX (5765-543) V2R3. APAR IX71306 must be applied to Parallel Environment for proper operation on PSSP 2.4.
- IBM Recoverable Virtual Shared Disk (5765-444) V1R2, or IBM Recoverable Virtual Shared Disk (5765-646) V2R1
- IBM Parallel ESSL for AIX (5765-422) V1R2, or IBM Parallel ESSL for AIX (5765-C41) V2R1
- Network Tape Access and Control System for AIX (5765-637) V1R2
- NetTape Tape Library Connection for AIX (5765-643) V1R2
- General Parallel File System (5765-B95) V1R1
- HACMP Enhanced Scalability feature **ONLY** (5765-A86) (on the SP nodes) V4.2, or later. Refer to HACMP Software Announcements for further information.
- CLI/OS (5648-129) V2R2

Refer to the *IBM RS/6000 SP: Planning, Volume 2, Control Workstation and Software Environment* (Form Number GA22-7281) for a matrix of supported combinations of SP licensed programs for compatibility statements on nodes running on different levels of AIX and PSSP.

Limitations

After installing PSSP V2.4 on the control workstation, if the previous version was not PSSP V2.3 run **/usr/lpp/ssp/css/rc.switch** on all the PSSP V2.1 and PSSP V2.2 nodes and then **Estart** the system. This is necessary to assure the microcode is at the same level for all nodes.

PSSP V2.4 is the last release that provides support for the High Performance Switch.

Nodes that have an integrated Ethernet adapter cannot be installed over any other adapter in a PCI or MCA slot.

Parallel Environment threaded MPI and threaded ESSL and PESSL are built with draft 7 version of **pthreads**. If you are combining other threaded applications you must also use draft 7. If you compile on an AIX 4.3 system you should specify the **-lpthreads_compat** before **-lpthreads** on your compile commands. The mp compiler commands for Fortran, C, and C++ already specify **-lpthreads**. Add **-lpthreads_compat** to the start of your mp compiler command. For example

```
mpxlf_r -lpthreads_compat  -lesslsmp mythread.f
```

Migration and Coexistence

The following service must be applied to your existing SP system prior to migrating your control workstation to PSSP 2.4. Coexistence also requires this service.

The minimum service level for PSSP 2.1 support is PTF set 28 which consists of the following PTFs:

PSSP PTFs by component	Pre-Req PTF	Curr PTF
ssp.authent	U443266	
ssp.basic	U443258	U454501
ssp.clients	U443261	U450058
ssp.cmi	U443265	
ssp.csd.hsd	U443264	U452191
ssp.csd.vsd	U443260	U452188
ssp.css	U443256	U454500
ssp.docs	U443268	U449900
ssp.gui	U443263	U450059
ssp.hacws		U449901
ssp.jm	U443262	U453379
ssp.public	U443259	U450754
ssp.sysctl	U443267	
ssp.sysman	U443257	U454499
ssp.top	U443255	

The minimum service level for PSSP 2.2 support is PTF set 15 which consists of the following PTFs:

PSSP PTFs by component	Pre-Req PTF	Curr PTF
ssp.authent		U454032
ssp.basic		U454853
ssp.clients		U454856
ssp.csd.gui		U449667
ssp.csd.hsd		U454043
ssp.csd.sysctl		U454842
ssp.csd.vsd		U454039
ssp.css		U454851
ssp.docs		U454849
ssp.gui		U454857
ssp.ha		U454854
ssp.hacws		U453229
ssp.jm		U451781
ssp.pman		U454844
ssp.public		U449209
ssp.sysctl		U454861
ssp.sysman		U454852

Performance Toolbox by component	Pre-Req PTF	Curr PTF
ptpe.docs		U451787
ptpe.gui		U454841
ptpe.program		U454855

The minimum service level for PSSP 2.3 support is PTF set 6 which consists of the following PTFs:

PSSP PTFs by component	Pre-Req PTF	Curr PTF
ssp.authent		U452777
ssp.basic		U454527
ssp.clients		U454530
ssp.csd.hsd		U451946
ssp.csd.sysctl		U452679
ssp.csd.vsd		U454598
ssp.css		U454526
ssp.docs		U454523
ssp.gui		U453684
ssp.ha		U454599
ssp.jm		U454532
ssp.perlpkg		U451949
ssp.pman		U454597
ssp.spmgr		U452778
ssp.st		U454533
ssp.sysctl		U454534
ssp.sysman		U454525
ssp.top		U452780
ssp.topsvcs		U454524

IBM Parallel System Support Programs for AIX 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

The IBM Parallel System Support Programs for AIX are packaged as the following **installp** images:

- **pssp**
- **spimg**
- **ssp.csd**
- **ssp.ptpegui**

The following are optional separately priced features:

- **ssp.hacws**
- **ptpe**

pssp

The **installp** image for **pssp** contains the code to install, operate and manage your RS/6000 SP system. The options in this package include:

ssp.basic: The following support functions are included in this option:

- Installation and configuration
- System operation and monitoring
- Distributed shell
- Login control
- System Data Repository (SDR)

ssp.gui: This option contains the SP Perspectives GUI as well as the graphical user interface for the System Monitor.

ssp.sysman: This option contains the following functions:

- Time services
- User management
- File collections
- Accounting
- Parallel management commands

- Error Log Management

ssp.jm: This option contains the **Resource Manager** facility for allocating nodes to run parallel jobs, and for tracking parallel jobs across the RS/6000 SP system. It allows space sharing and time sharing of nodes as well as interactive and batch execution of parallel jobs.

ssp.st: This option contains a library and commands that support an internal application programming interface for loading, unloading, and querying the status of job switch tables.

ssp.css: **Communications Subsystem Support** performs switch initialization during system bring-up, and automatic switch reconfiguration following switch detected errors. CSS also provides software error detection codes for all messages, and concurrent servicing of SP nodes and frames through message retry following a switch fault. This option also contains the switch clock API.

ssp.spmgr: This option contains the SNMP Manager support that acts as a trap monitor.

ssp.top: This option contains directories and files for supported system partitioning configurations, as well as the System Partitioning Aid, a tool for creating customized system partition configurations to suit your needs. **ssp.top** includes:

- Subdirectories for SP system sizes
- Subdirectories for partition configurations for SP system sizes
- Layout directories for partition configurations
- A layout text file that describes the configuration
- Topology and nodelist files for the configuration
- The System Partitioning Aid

ssp.top.gui contains the graphical user interface for the System Partitioning Aid.

ssp.topsvcs: This option contains the Topology Services/Enhanced Scalability function.

ssp.ha: This option contains subsystems for high availability, including heartbeat, Group Services, and Event Management.

ssp.ha_clients: This option contains the Event Management client API.

ssp.pman: This option contains the Problem Management subsystem. The Problem Management subsystem provides configurable access to Event Management client and resource monitor function. It includes daemons, commands, utilities, and scripts.

ssp.authent: This option contains the server (daemon) code that provides Kerberos ticket-granting services, and primary and secondary database administration. It also contains a number of privileged utility commands for manipulating the local Kerberos database. This option can be installed on the control workstation or on other RS/6000 workstations that are configured as Kerberos server systems. It is not installed on the RS/6000 SP nodes.

ssp.sysctl: **Sysctl** is an authenticated client/server system for running commands remotely and in parallel. Sysctl consists of a server daemon, commands, configuration files, and a client shell program.

ssp.clients: This option provides the nonprivileged (user) Kerberos commands, as well as client support for authenticated services, namely the SP System Monitor that runs on an RS/6000 SP control workstation and the **kshell** service of the SP authenticated remote commands (Kerberos-authenticated **rsh** and **rcp**). This option is required on the control workstation and is automatically installed on every SP node. It can also be installed on any other RS/6000 workstation on which you desire these capabilities.

ssp.perlpkg: This option contains Perl 4.036 and Perl 5.002 programs and libraries.

ssp.public: This option contains tar files of full public distributions of Perl (Practical Extraction and Report Language), NTP (Network Time Protocol), SUP (System Update Protocol), Tcl (Tool Command Language), TclX (Tool Command Language Extended), Tk (Tcl-based Tool Kit for X-windows), and Expect (Programmed dialogue with interactive programs).

ssp.docs: This option contains the PostScript, man page, and html files for PSSP documentation.

spimg

The **spimg** installp image contains a **mksysb**, or multiple **mksysb**s, of an AIX 4.2.1 or AIX 4.3.1 system that you can use to install AIX 4.2.1 or AIX 4.3.1 version on the nodes in your RS/6000 SP system, after you have successfully installed and configured your control workstation. This minimal system is composed of the basic operating system, extensions, networking and basic utilities. It is provided as a base for getting your RS/6000 SP system up and running quickly.

To install an **spimg** for a particular AIX operating system level, choose the appropriate **spimg** fileset to install. For example, to install the AIX 4.2.1 level of the **spimg**, choose the fileset named **spimg.421** and replace the package name "**spimg**" in the instructions with the chosen fileset name "**spimg.421**".

Note: The AIX 4.3.1 **spimg** is approximately 25 MB larger than the AIX 4.2.1 **spimg**.

The images currently provided are: **spimg.421**, and **spimg.431**

You should customize one of these images to meet the needs of your production environment. Instructions for customizing the minimal image are in the *Parallel System Support Programs: Installation and Migration Guide*.

ssp.csd

This image provides the IBM Virtual Shared Disk and the IBM Virtual Shared Disk Data Striping Device (HSD) function for the SP system. The IBM Virtual Shared Disk function allows each node in the cluster to access a disk as if it were local to the node, even though the disk is not physically attached to all RS/6000 SP nodes. The HSD is a device driver that lets application programs stripe data across the physical disks in multiple IBM Virtual Shared Disks. The **csd** image is split into five install options:

ssp.csd.vsd IBM Virtual Shared Disk Device Driver, Methods and Commands.

ssp.csd.cmi IBM Virtual Shared Disk Configuration Management Support which includes the SMIT panels and the commands to interface with the System Data Repository (SDR).

ssp.csd.hsd IBM Virtual Shared Disk Data Striping Device.

The **ssp.csd.vsd** and **ssp.csd.cmi** options must be installed on all SP nodes that are to be used as either IBM Virtual Shared Disk server or client nodes. The **ssp.csd.hsd** option must be installed on all nodes with IBM Virtual Shared Disks, if data striping will be used.

ssp.csd.sysctl IBM Virtual Shared Disk commands that use Sysctl function.

ssp.csd.gui The graphical user interface for IBM Virtual Shared Disks.

ssp.ptpegui

This option contains the graphical user interface for the Performance Toolbox Parallel Extensions for AIX. It completely supersedes the **ptpe.gui** option shipped with the Performance Toolbox Parallel Extensions (ptpe) install image. If you intend to use the ptpe graphical user interface with PSSP 2.4, you must install **ssp.ptpegui** after the ptpe.program option contained in the ptpe install image has been successfully installed.

ssp.hacws

The **ssp.hacws** install option supports the High Availability Control Workstation (HACWS) function. HACWS provides automatic fail over and reintegration to a backup control workstation should the primary control workstation become unavailable.

Note: This is an optional separately priced feature.

ptpe

This image provides the Performance Toolbox Parallel Extensions for AIX, a performance monitor that provides access to performance information about RS/6000 SP hardware and software. The **ptpe** image is split into three options:

ptpe.docs Performance Toolbox Parallel Extensions for AIX documentation, including a PostScript file and hypertext version (accessible with the **InfoExplorer** tool).

ptpe.gui The graphical user interface for the Performance Toolbox Parallel Extensions for AIX.

Note: This option will work only with PSSP 2.2. In order to use the ptpe graphical user interface with PSSP 2.4, you must install the **ssp.ptpegui** install image after successfully installing the **ptpe.program** option.

ptpe.program The Performance Toolbox Parallel Extensions for AIX program.

Note: This is an optional separately priced feature.

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 from tape

To view a softcopy of any READMEs from the IBM Software Manufacturing Solutions (ISMS) tape:

- View the components on the tape with this command:

  ```
  installp -l -d /dev/rmt0.1
  ```

  Find the desired component name.

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

  ```
  installp -i -d /dev/rmt0.1  ssp
  installp -i -d /dev/rmt0.1  ssp.csd
  installp -i -d /dev/rmt0.1  ssp.hacws (Optional - separate tape)
  installp -i -d /dev/rmt0.1  ssp.ptpe (Optional - separate tape)
  installp -i -d /dev/rmt0.1  spimg (separate tape)
  ```

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

  ```
  /usr/lpp/ssp/README
  /usr/lpp/csd/README
  /usr/lpp/hacws/README (Optional)
  /usr/lpp/ptpe/README (Optional)
  /usr/lpp/spimg/README
  ```

AIX System Minimal mksysb Image and Required AIX PTFs

AIX 4.2.1 Image Content

The following fixes have been applied to the minimal **mksysb** image for AIX 4.2.1. If you do not use this minimal **mksysb** image, the fixes must be applied to your AIX 4.2.1 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 Considerations" under "Additional Restrictions" in this document.

```
   IX58183      IX69993      IX70175      IX74063      IX76856
```

Here is the lslpp -l output from the AIX 4.2.1 minimal image:

```
  Fileset                      Level  State  Description
  ----------------------------------------------------------------------------
  bos.acct                   4.2.1.1    C    Accounting Services
  bos.adt.base               4.2.1.0    C    Base Application Development
                                             Toolkit
  bos.adt.debug              4.2.1.6    C    Base Application Development
                                             Debuggers
  bos.adt.include           4.2.1.12    C    Base Application Development
                                             Include Files
  bos.adt.lib                4.2.1.1    C    Base Application Development
                                             Libraries
  bos.diag.com               4.2.1.9    C    Common Hardware Diagnostics
  bos.diag.rte               4.2.1.8    C    Hardware Diagnostics
  bos.diag.util              4.2.1.4    C    Hardware Diagnostics Utilities
  bos.iconv.com              4.2.1.0    C    Common Language to Language
                                             Converters
  bos.ifor_ls.client         4.2.1.0    C    iFOR/LS License System Client
                                             Utilities
  bos.info.en_US.smit_help   4.2.1.0    C    Help for SMIT - U.S. English
  bos.loc.iso.en_US          4.2.1.0    C    Base System Locale ISO Code Set
                                             - U.S. English
  bos.mp                    4.2.1.12    C    Base Operating System
                                             Multiprocessor Runtime
  bos.msg.en_US.diag.rte     4.2.0.1    C    Hardware Diagnostics Messages -
                                             U.S. English
  bos.msg.en_US.mp           4.2.0.0    C    Base Operating System MP Runtime
                                             Msgs - U.S. English
  bos.msg.en_US.net.tcp.client
                             4.2.0.6    C    TCP/IP Messages - U.S. English
  bos.msg.en_US.rte          4.2.0.3    C    Base Operating System Runtime
                                             Messages - U.S. English
  bos.net.ncs                4.2.1.0    C    Network Computing System 1.5.1
  bos.net.nfs.client        4.2.1.10    C    Network File System Client
```

```
bos.net.nis.client         4.2.1.2    C    Network Information Service
                                             Client
bos.net.tcp.client        4.2.1.15    C    TCP/IP Client Support
bos.net.tcp.server         4.2.1.9    C    TCP/IP Server
bos.net.tcp.smit           4.2.1.0    C    TCP/IP SMIT Support
bos.rte                    4.2.1.2    C    Base Operating System Runtime
bos.rte.Dt                 4.2.0.0    C    Desktop Integrator
bos.rte.ILS                4.2.1.0    C    International Language Support
bos.rte.SRC                4.2.1.1    C    System Resource Controller
bos.rte.X11                4.2.0.0    C    AIXwindows Device Support
bos.rte.aio                4.2.1.2    C    Asynchronous I/O Extension
bos.rte.archive            4.2.1.2    C    Archive Commands
bos.rte.bind_cmds          4.2.1.5    C    Binder and Loader Commands
bos.rte.boot               4.2.1.2    C    Boot Commands
bos.rte.bosinst            4.2.1.0    C    Base OS Install Commands
bos.rte.commands           4.2.1.3    C    Commands
bos.rte.compare            4.2.1.0    C    File Compare Commands
bos.rte.console            4.2.1.2    C    Console
bos.rte.control            4.2.1.7    C    System Control Commands
bos.rte.cron               4.2.1.1    C    Batch Operations
bos.rte.date               4.2.1.1    C    Date Control Commands
bos.rte.devices            4.2.0.0    C    Base Device Drivers
bos.rte.devices_msg        4.2.1.1    C    Device Driver Messages
bos.rte.diag               4.2.1.3    C    Diagnostics
bos.rte.edit               4.2.1.0    C    Editors
bos.rte.filesystem         4.2.1.4    C    Filesystem Administration
bos.rte.iconv              4.2.1.0    C    Language Converters
bos.rte.ifor_ls            4.2.1.0    C    iFOR/LS Libraries
bos.rte.im                 4.2.1.1    C    Input Methods
bos.rte.install            4.2.1.4    C    LPP Install Commands
bos.rte.jfscomp            4.2.0.0    C    JFS Compression
bos.rte.libc              4.2.1.10    C    libc Library
bos.rte.libcfg             4.2.1.0    C    libcfg Library
bos.rte.libcur             4.2.1.4    C    libcurses Library
bos.rte.libdbm             4.2.1.0    C    libdbm Library
bos.rte.libnetsvc          4.2.1.1    C    Network Services Libraries
bos.rte.libpthreads        4.2.1.2    C    libpthreads Library
bos.rte.libqb              4.2.1.0    C    libqb Library
bos.rte.libs               4.2.1.7    C    libs Library
bos.rte.loc                4.2.1.0    C    Base Locale Support
bos.rte.lvm               4.2.1.10    C    Logical Volume Manager
bos.rte.man                4.2.1.0    C    Man Commands
bos.rte.methods            4.2.1.1    C    Device Config Methods
bos.rte.misc_cmds          4.2.1.2    C    Miscellaneous Commands
bos.rte.net                4.2.0.1    C    Network
bos.rte.odm                4.2.1.2    C    Object Data Manager
bos.rte.printers           4.2.1.4    C    Front End Printer Support
```

```
bos.rte.security           4.2.1.7    C    Base Security Function
bos.rte.serv_aid           4.2.1.4    C    Error Log Service Aids
bos.rte.shell              4.2.1.9    C    Shells (bsh, ksh, csh)
bos.rte.streams            4.2.1.2    C    Streams Libraries
bos.rte.tty               4.2.1.10    C    Base TTY Support and Commands
bos.sysmgt.loginlic        4.2.1.0    C    License Management
bos.sysmgt.serv_aid        4.2.1.9    C    Software Error Logging and Dump
                                           Service Aids
bos.sysmgt.smit            4.2.1.1    C    System Management Interface Tool
                                           (SMIT)
bos.sysmgt.sysbr           4.2.1.6    C    System Backup and BOS Install
                                           Utilities
bos.sysmgt.trace           4.2.1.2    C    Software Trace Service Aids
bos.terminfo.com.data      4.2.0.0    C    Common Terminal Definitions
bos.terminfo.dec.data      4.2.1.0    C    Digital Equipment Corp. Terminal
                                           Definitions
bos.terminfo.ibm.data      4.2.0.0    C    IBM Terminal Definitions
bos.terminfo.pc.data       4.2.0.0    C    Personal Computer Terminal
                                           Definitions
bos.terminfo.rte           4.2.1.0    C    Run-time Environment for AIX
                                           Terminals
bos.up                    4.2.1.12    C    Base Operating System
                                           Uniprocessor Runtime
devices.base.diag          4.2.1.1    C    Base System Diagnostics
devices.base.rte           4.2.1.1    C    RISC System 6000 Base Device
                                           Software
devices.chrp.base.diag     4.2.1.5    C    RISC CHRP Base System Device
                                           Diagnostics
devices.chrp.base.rte      4.2.1.8    C    RISC PC Base System Device
                                           Software (CHRP)
devices.chrp.pci.rte       4.2.1.0    C    PCI Bus Software (CHRP)
devices.common.IBM.ARTIC.diag
                           4.2.1.0    C    Common ARTIC Diagnostics
devices.common.IBM.async.diag
                           4.2.1.0    C    Common Serial Adapter
                                           Diagnostics
devices.common.IBM.cx.rte  4.2.1.0    C    CX Common Adapter Software
devices.common.IBM.disk.rte
                           4.2.1.0    C    Common IBM Disk Software
devices.common.IBM.ethernet.rte
                           4.2.1.1    C    Common Ethernet Software
devices.common.IBM.fda.diag
                           4.2.0.0    C    Common Diskette Adapter and
                                           Device Diagnostics
devices.common.IBM.fda.rte
                           4.2.0.0    C    Common Diskette Device Software
```

```
devices.common.IBM.ktm_std.diag
                          4.2.1.0    C    Common Keyboard, Mouse, and
                                          Tablet Device Diagnostics
devices.common.IBM.modemcfg.data
                          4.2.1.0    C    Sample Service Processor Modem
                                          Configuration Files
devices.common.IBM.ppa.diag
                          4.2.1.0    C    Common Parallel Printer Adapter
                                          Diagnostics
devices.common.IBM.ppa.rte
                          4.2.0.0    C    Common Parallel Printer Adapter
                                          Software
devices.common.IBM.scsi.rte
                          4.2.1.0    C    Common SCSI I/O Controller
                                          Software
devices.common.base.diag  4.2.1.0    C    Common Base System Diagnostics
devices.common.rspcbase.rte
                          4.2.1.0    C    RISC PC Common Base System
                                          Device Software
devices.graphics.com      4.2.1.0    C    Graphics Adapter Common Software
devices.mca.8d77.diag     4.2.1.0    C    8-bit SCSI I/O Controller
                                          Diagnostics
devices.mca.8d77.rte      4.2.1.0    C    8-bit SCSI I/O Controller
                                          Software
devices.mca.8d77.ucode    4.2.0.0    C    8-bit SCSI I/O Controller
                                          Microcode
devices.mca.8ee4.diag     4.2.0.0    C    Color Graphics Display Adapter
                                          Diagnostics
devices.mca.8ee4.rte      4.2.1.0    C    Color Graphics Display Adapter
                                          Software
devices.mca.8ef2.com      4.2.1.0    C    Common Integrated Ethernet
                                          Software
devices.mca.8ef2.rte      4.2.1.0    C    Integrated Ethernet Adapter
                                          (8ef2) Software
devices.mca.8ef3.rte      4.2.1.0    C    Integrated Ethernet Adapter
                                          (8ef3) Software
devices.mca.8ef5.diag     4.2.1.0    C    Ethernet High-Performance LAN
                                          Adapter (8ef5) Diagnostics
devices.mca.8ef5.rte      4.2.1.0    C    Ethernet High-Performance LAN
                                          Adapter (8ef5) Software
devices.mca.8efc.com      4.2.1.0    C    Common 16-bit SCSI I/O
                                          Controller Software
devices.mca.8efc.rte      4.2.1.0    C    16-bit SCSI I/O Controller
                                          Software
devices.mca.8f62.rte      4.2.1.9    C    IBM MCA 10/100 Mb Ethernet
                                          Adapter Software (8f62)
devices.mca.8f70.diag     4.2.0.0    C    Portmaster Adapter/A Diagnostics
devices.mca.8f95.rte      4.2.1.0    C    Ethernet High-Performance LAN
                                          Adapter (8f95) Software
```

```
devices.mca.8f98.rte       4.2.1.0    C    Integrated Ethernet Adapter
                                             (8f98) Software
devices.mca.8fba.com       4.2.1.0    C    Common NCR53C7XX SCSI Software
devices.mca.8fba.rte       4.2.1.0    C    Standard NCR53C720 SCSI Software
devices.mca.8fc8.com       4.2.1.0    C    Common Token Ring Software
devices.mca.8fc8.diag      4.2.1.0    C    Token Ring High-Performance
                                             Adapter (8fc8) Diagnostics
devices.mca.8fc8.rte       4.2.1.0    C    Token Ring High-Performance
                                             Adapter (8fc8) Software
devices.mca.8fc8.ucode     4.2.0.0    C    Token Ring High-Performance
                                             Adapter (8fc8) Microcode
devices.mca.df5f.com       4.2.0.0    C    Standard I/O Adapter Common
                                             Software
devices.mca.df5f.rte       4.2.0.0    C    Standard I/O (df5f) Adapter
                                             Software
devices.mca.df9f.rte       4.2.0.0    C    Direct Attached Disk Software
devices.mca.edd0.com       4.2.1.0    C    Common Async Adapter Support
devices.mca.edd0.rte       4.2.0.0    C    8-Port Asynchronous Adapter
                                             EIA-232 Software
devices.mca.eff0.diag      4.2.0.0    C    X.25 CoProcessor/2 or
                                             Multiport/2 Adapter Diagnostics
devices.mca.eff0.rte       4.2.1.0    C    X.25 CoProcessor/2 or
                                             Multiport/2 Adapter Software
devices.msg.en_US.base.com
                           4.2.0.2    C    Base System Device Software
                                             Messages - U.S. English
devices.msg.en_US.diag.rte
                           4.2.0.2    C    Device Diagnostics Messages -
                                             U.S. English
devices.msg.en_US.rspc.base.com
                           4.2.0.0    C    RISC PC Software Messages - U.S.
                                             English
devices.msg.en_US.sys.mca.rte
                           4.2.0.0    C    Micro Channel Bus Software
                                             Messages - U.S. English
devices.rs6ksmp.base.rte   4.2.0.0    C    Multiprocessor Base System
                                             Device Software
devices.rspc.base.rte      4.2.1.0    C    RISC PC Base System Device
                                             Software
devices.scsi.disk.diag.com
                           4.2.1.0    C    Common Disk Diagnostic Service
                                             Aid
devices.scsi.disk.diag.rte
                           4.2.1.0    C    SCSI CD_ROM, Disk Device
                                             Diagnostics
devices.scsi.disk.rspc     4.2.0.0    C    RISC PC SCSI CD-ROM, Disk,
                                             Read/Write Optical Device
                                             Software
```

```
devices.scsi.disk.rte      4.2.1.0    C    SCSI CD-ROM, Disk, Read/Write
                                           Optical Device Software
devices.scsi.tape.diag     4.2.1.0    C    SCSI Tape Device Diagnostics
devices.scsi.tape.rspc     4.2.1.0    C    RISC PC SCSI Tape Device
                                           Software
devices.scsi.tape.rte      4.2.1.0    C    SCSI Tape Device Software
devices.sio.fda.diag       4.2.0.0    C    Diskette Adapter and Device
                                           Diagnostics
devices.sio.fda.rte        4.2.1.0    C    Diskette Adapter Software
devices.sio.ktma.com       4.2.0.0    C    Common Keyboard Tablet & Mouse
                                           Device and Adapter Software
devices.sio.ktma.diag      4.2.1.0    C    Keyboard Tablet & Mouse Device
                                           and Adapter Diagnostics
devices.sio.ktma.rte       4.2.1.0    C    Keyboard Tablet & Mouse Device
                                           and Adapter Software
devices.sio.ppa.diag       4.2.0.0    C    Parallel Printer Adapter
                                           Diagnostics
devices.sio.ppa.rte        4.2.1.0    C    Parallel Printer Adapter
                                           Software
devices.sio.sa.diag        4.2.0.0    C    Built-in Serial Adapter
                                           Diagnostics
devices.sio.sa.rte         4.2.0.0    C    Built-in Serial Adapter Software
devices.sys.mca.rte        4.2.1.0    C    Micro Channel Bus Software
devices.sys.pci.rte        4.2.1.0    C    PCI Bus Software
devices.sys.slc.diag       4.2.0.0    C    Serial Optical Link Diagnostics
devices.sys.slc.rte        4.2.1.0    C    Serial Optical Link Software
devices.tty.rte            4.2.1.4    C    TTY Device Driver Support
                                           Software
printers.msg.en_US.rte     4.2.0.0    C    Printer Backend Messages - U.S.
                                           English
printers.rte               4.2.1.0    C    Printer Backend
xlC.cpp                    3.1.4.4    C    C for AIX Preprocessor
xlC.msg.en_US.cpp          3.1.4.2    C    C for AIX Preprocessor Messages
                                           en_US
xlC.msg.en_US.rte          3.1.4.0    C    C Set ++ for AIX Application
                                           Runtime Messages en_US
xlC.rte                    3.1.4.7    C    C Set ++ for AIX Application
                                           Runtime
```

AIX 4.3.1 Image Content

The following fixes have been applied to the minimal **mksysb** image for AIX 4.3.1. If you do not use this minimal **mksysb** image, the fixes must be applied to your AIX 4.3.1 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 Considerations" under "Additional Restrictions" in this document.

IX71948

Here is the lslpp -l output from the AIX 4.3.1 minimal image:

```
  Fileset                      Level  St Description
  ----------------------------------------------------------------------------
Path: /usr/lib/objrepos
  bos.acct                   4.3.1.0  C  Accounting Services
  bos.adt.base               4.3.1.0  C  Base Application Development
                                         Toolkit
  bos.adt.debug              4.3.1.0  C  Base Application Development
                                         Debuggers
  bos.adt.include            4.3.1.0  C  Base Application Development
                                         Include Files
  bos.adt.lib                4.3.1.0  C  Base Application Development
                                         Libraries
  bos.diag.com               4.3.1.0  C  Common Hardware Diagnostics
  bos.diag.rte               4.3.1.0  C  Hardware Diagnostics
  bos.diag.util              4.3.1.0  C  Hardware Diagnostics Utilities
  bos.help.msg.en_US.com     4.3.1.0  C  WebSM/SMIT Context Helps -
                                         U.S. English
  bos.help.msg.en_US.smit    4.3.1.0  C  SMIT Context Helps - U.S.
                                         English
  bos.html.en_US.topnav.navigate
                             4.3.1.0  C  Top Level Navigation - U. S.
                                         English
  bos.iconv.com              4.3.1.0  C  Common Language to Language
                                         Converters
  bos.iconv.ucs.com          4.3.0.0  C  Unicode Base Converters for
                                         AIX Code Sets/Fonts
  bos.loc.iso.en_US          4.3.1.0  C  Base System Locale ISO Code
                                         Set - U.S. English
  bos.mp                     4.3.1.0  C  Base Operating System
                                         Multiprocessor Runtime
  bos.msg.en_US.diag.rte     4.3.1.0  C  Hardware Diagnostics 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
                             4.3.1.0  C  TCP/IP Messages - U.S. English
```

```
bos.msg.en_US.rte          4.3.1.0  C  Base Operating System Runtime
                                         Msgs - U.S. English
bos.net.ncs                4.3.0.0  C  Network Computing System 1.5.1
bos.net.nfs.client         4.3.1.0  C  Network File System Client
bos.net.nis.client         4.3.1.0  C  Network Information Service
                                         Client
bos.net.tcp.client         4.3.1.0  C  TCP/IP Client Support
bos.net.tcp.server         4.3.1.1  A  TCP/IP Server
bos.net.tcp.smit           4.3.1.0  C  TCP/IP SMIT Support
bos.rte                    4.3.1.0  C  Base Operating System Runtime
bos.rte.Dt                 4.3.0.0  C  Desktop Integrator
bos.rte.ILS                4.3.1.0  C  International Language Support
bos.rte.SRC                4.3.1.0  C  System Resource Controller
bos.rte.X11                4.3.0.0  C  AIXwindows Device Support
bos.rte.aio                4.3.1.0  C  Asynchronous I/O Extension
bos.rte.archive            4.3.1.0  C  Archive Commands
bos.rte.bind_cmds          4.3.1.0  C  Binder and Loader Commands
bos.rte.boot               4.3.1.0  C  Boot Commands
bos.rte.bosinst            4.3.1.0  C  Base OS Install Commands
bos.rte.commands           4.3.1.0  C  Commands
bos.rte.compare            4.3.1.0  C  File Compare Commands
bos.rte.console            4.3.1.0  C  Console
bos.rte.control            4.3.1.0  C  System Control Commands
bos.rte.cron               4.3.1.0  C  Batch Operations
bos.rte.date               4.3.1.0  C  Date Control Commands
bos.rte.devices            4.3.1.0  C  Base Device Drivers
bos.rte.devices_msg        4.3.1.0  C  Device Driver Messages
bos.rte.diag               4.3.1.0  C  Diagnostics
bos.rte.edit               4.3.1.0  C  Editors
bos.rte.filesystem         4.3.1.0  C  Filesystem Administration
bos.rte.iconv              4.3.1.0  C  Language Converters
bos.rte.ifor_ls            4.3.1.0  C  iFOR/LS Libraries
bos.rte.im                 4.3.1.0  C  Input Methods
bos.rte.install            4.3.1.0  C  LPP Install Commands
bos.rte.jfscomp            4.3.1.0  C  JFS Compression
bos.rte.libc               4.3.1.0  C  libc Library
bos.rte.libcfg             4.3.1.0  C  libcfg Library
bos.rte.libcur             4.3.1.0  C  libcurses Library
bos.rte.libdbm             4.3.1.0  C  libdbm Library
bos.rte.libnetsvc          4.3.0.0  C  Network Services Libraries
bos.rte.libpthreads        4.3.1.0  C  pthreads Library
bos.rte.libqb              4.3.1.0  C  libqb Library
bos.rte.libs               4.3.0.0  C  libs Library
bos.rte.loc                4.3.1.0  C  Base Locale Support
bos.rte.lvm                4.3.1.0  C  Logical Volume Manager
bos.rte.man                4.3.1.0  C  Man Commands
bos.rte.methods            4.3.1.0  C  Device Config Methods
bos.rte.misc_cmds          4.3.1.0  C  Miscellaneous Commands
```

```
bos.rte.net                 4.3.1.0  C  Network
bos.rte.odm                 4.3.1.0  C  Object Data Manager
bos.rte.printers            4.3.1.0  C  Front End Printer Support
bos.rte.security            4.3.1.0  C  Base Security Function
bos.rte.serv_aid            4.3.1.0  C  Error Log Service Aids
bos.rte.shell               4.3.1.0  C  Shells (bsh, ksh, csh)
bos.rte.streams             4.3.1.0  C  Streams Libraries
bos.rte.tty                 4.3.1.0  C  Base TTY Support and Commands
bos.sysmgt.loginlic         4.3.1.0  C  License Management
bos.sysmgt.serv_aid         4.3.1.0  C  Software Error Logging and
                                        Dump Service Aids
bos.sysmgt.smit             4.3.1.0  C  System Management Interface
                                        Tool (SMIT)
bos.sysmgt.sysbr            4.3.1.0  C  System Backup and BOS Install
                                        Utilities
bos.terminfo.rte            4.3.1.0  C  Run-time Environment for AIX
                                        Terminals
bos.up                      4.3.1.0  C  Base Operating System
                                        Uniprocessor Runtime
devices.base.diag           4.3.1.0  C  Base System Diagnostics
devices.base.rte            4.3.1.0  C  RISC System 6000 Base Device
                                        Software
devices.chrp.base.diag      4.3.1.0  C  RISC CHRP Base System Device
                                        Diagnostics
devices.chrp.base.rte       4.3.1.0  C  RISC PC Base System Device
                                        Software (CHRP)
devices.chrp.pci.rte        4.3.1.0  C  PCI Bus Software (CHRP)
devices.common.IBM.ARTIC.diag
                            4.3.1.0  C  Common ARTIC Diagnostics
devices.common.IBM.async.diag
                            4.3.1.0  C  Common Serial Adapter
                                        Diagnostics
devices.common.IBM.disk.rte
                            4.3.1.0  C  Common IBM Disk Software
devices.common.IBM.ethernet.rte
                            4.3.1.0  C  Common Ethernet Software
devices.common.IBM.fda.diag
                            4.3.1.0  C  Common Diskette Adapter and
                                        Device Diagnostics
devices.common.IBM.fda.rte
                            4.3.1.0  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
                            4.3.1.0  C  Common Keyboard, Tablet, and
                                        Mouse Software
```

```
devices.common.IBM.ppa.diag
                          4.3.1.0  C  Common Parallel Printer
                                      Adapter Diagnostics
devices.common.IBM.ppa.rte
                          4.3.1.0  C  Common Parallel Printer
                                      Adapter Software
devices.common.IBM.scsi.rte
                          4.3.1.0  C  Common SCSI I/O Controller
                                      Software
devices.common.IBM.tokenring.rte
                          4.3.1.0  C  Common Token Ring Software
devices.common.base.diag  4.3.1.0  C  Common Base System Diagnostics
devices.common.rspcbase.rte
                          4.3.1.0  C  RISC PC Common Base System
                                      Device Software
devices.graphics.com      4.3.1.0  C  Graphics Adapter Common
                                      Software
devices.mca.8d77.diag     4.3.1.0  C  8-bit SCSI I/O Controller
                                      Diagnostics
devices.mca.8d77.rte      4.3.1.0  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      4.3.1.0  C  AIXwindows Color Graphics
                                      Display Adapter Software
devices.mca.8ee4.diag     4.3.1.0  C  Color Graphics Display Adapter
                                      Diagnostics
devices.mca.8ee4.rte      4.3.1.0  C  Color Graphics Display Adapter
                                      Software
devices.mca.8ef5.diag     4.3.1.0  C  Ethernet High-Performance LAN
                                      Adapter (8ef5) Diagnostics
devices.mca.8ef5.rte      4.3.1.0  C  Ethernet High-Performance LAN
                                      Adapter (8ef5) Software
devices.mca.8f70.diag     4.3.0.0  C  Portmaster Adapter/A
                                      Diagnostics
devices.mca.8fc8.diag     4.3.1.0  C  Token Ring High-Performance
                                      Adapter (8fc8) Diagnostics
devices.mca.8fc8.rte      4.3.1.0  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.df5f.com      4.3.1.0  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      4.3.1.0  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       4.3.1.0  C  X.25 CoProcessor/2 or
                                       Multiport/2 Adapter Software
devices.msg.en_US.base.com
                           4.3.0.0  C  Base System Device Software
                                       Msgs - U.S. English
devices.msg.en_US.diag.rte
                           4.3.1.0  C  Device Diagnostics Messages -
                                       U.S. English
devices.msg.en_US.rspc.base.com
                           4.3.0.0  C  RISC PC Software Messages -
                                       U.S. English
devices.msg.en_US.sys.mca.rte
                           4.3.1.0  C  Micro Channel Bus Software
                                       Messages - U.S. English
devices.rs6ksmp.base.rte   4.3.1.0  C  Multiprocessor Base System
                                       Device Software
devices.rspc.base.diag     4.3.1.0  C  RISC PC Base System Device
                                       Diagnostics
devices.rspc.base.rte      4.3.1.0  C  RISC PC Base System Device
                                       Software
devices.scsi.disk.diag.com
                           4.3.1.0  C  Common Disk Diagnostic Service
                                       Aid
devices.scsi.disk.diag.rte
                           4.3.1.0  C  SCSI CD_ROM, Disk Device
                                       Diagnostics
devices.scsi.disk.rspc     4.3.0.0  C  RISC PC SCSI CD-ROM, Disk,
                                       Read/Write Optical Software
devices.scsi.disk.rte      4.3.1.0  C  SCSI CD-ROM, Disk, Read/Write
                                       Optical Device Software
devices.scsi.tape.diag     4.3.1.0  C  SCSI Tape Device Diagnostics
devices.scsi.tape.rspc     4.3.0.0  C  RISC PC SCSI Tape Device
                                       Software
devices.scsi.tape.rte      4.3.1.0  C  SCSI Tape Device Software
devices.sio.fda.diag       4.3.0.0  C  Diskette Adapter and Device
                                       Diagnostics
devices.sio.fda.rte        4.3.1.0  C  Diskette Adapter Software
devices.sio.ktma.diag      4.3.1.0  C  Keyboard Tablet & Mouse Device
                                       and Adapter Diagnostics
devices.sio.ktma.rte       4.3.1.0  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        4.3.1.0  C  Parallel Printer Adapter
                                       Software
```

```
  devices.sio.sa.diag        4.3.0.0  C  Built-in Serial Adapter
                                           Diagnostics
  devices.sio.sa.rte         4.3.1.0  C  Built-in Serial Adapter
                                           Software
  devices.sys.mca.rte        4.3.1.0  C  Micro Channel Bus Software
  devices.sys.pci.rte        4.3.1.0  C  PCI Bus Software
  devices.sys.slc.diag       4.3.1.0  C  Serial Optical Link
                                           Diagnostics
  devices.sys.slc.rte        4.3.1.0  C  Serial Optical Link Software
  devices.tty.rte            4.3.1.0  C  TTY Device Driver Support
                                           Software
  ifor_ls.base.cli           4.3.1.0  C  License Use Management Runtime
                                           Code
  ifor_ls.client.base        4.3.1.0  C  SystemView License Use
                                           Management Client Runtime
  ifor_ls.msg.en_US.base.cli
                             4.3.0.0  C  LUM Runtime Code Messages -
                                           U.S. English
  printers.msg.en_US.rte     4.3.1.0  C  Printer Backend Messages -
                                           U.S. English
  printers.rte               4.3.1.0  C  Printer Backend
  xlC.cpp                    3.1.4.4  C  C for AIX Preprocessor
  xlC.msg.en_US.cpp          3.1.4.2  C  C for AIX Preprocessor
                                           Messages en_US
  xlC.msg.en_US.rte          3.6.3.0  C  C Set ++ for AIX Application
                                           Runtime Messages en_US
  xlC.rte                    3.6.3.0  C  C Set ++ for AIX Application
                                           Runtime

Path: /etc/objrepos
  bos.acct                   4.3.1.0  C  Accounting Services
  bos.diag.com               4.3.1.0  C  Common Hardware Diagnostics
  bos.diag.rte               4.3.1.0  C  Hardware Diagnostics
  bos.diag.util              4.3.1.0  C  Hardware Diagnostics Utilities
  bos.html.en_US.topnav.navigate
                             4.3.1.0  C  Top Level Navigation - U. S.
                                           English
  bos.mp                     4.3.1.0  C  Base Operating System
                                           Multiprocessor Runtime
  bos.net.ncs                4.3.0.0  C  Network Computing System 1.5.1
  bos.net.nfs.client         4.3.1.0  C  Network File System Client
  bos.net.nis.client         4.3.1.0  C  Network Information Service
                                           Client
  bos.net.tcp.client         4.3.1.0  C  TCP/IP Client Support
  bos.net.tcp.server         4.3.1.0  C  TCP/IP Server
  bos.rte                    4.3.1.0  C  Base Operating System Runtime
  bos.rte.Dt                 4.3.0.0  C  Desktop Integrator
  bos.rte.SRC                4.3.1.0  C  System Resource Controller
```

```
bos.rte.aio                 4.3.1.0  C  Asynchronous I/O Extension
bos.rte.boot                4.3.1.0  C  Boot Commands
bos.rte.commands            4.3.1.0  C  Commands
bos.rte.control             4.3.1.0  C  System Control Commands
bos.rte.cron                4.3.1.0  C  Batch Operations
bos.rte.devices             4.3.1.0  C  Base Device Drivers
bos.rte.diag                4.3.1.0  C  Diagnostics
bos.rte.filesystem          4.3.1.0  C  Filesystem Administration
bos.rte.jfscomp             4.3.1.0  C  JFS Compression
bos.rte.lvm                 4.3.1.0  C  Logical Volume Manager
bos.rte.printers            4.3.1.0  C  Front End Printer Support
bos.rte.security            4.3.1.0  C  Base Security Function
bos.rte.serv_aid            4.3.1.0  C  Error Log Service Aids
bos.rte.shell               4.3.1.0  C  Shells (bsh, ksh, csh)
bos.rte.tty                 4.3.1.0  C  Base TTY Support and Commands
bos.sysmgt.loginlic         4.3.1.0  C  License Management
bos.sysmgt.serv_aid         4.3.1.0  C  Software Error Logging and
                                        Dump Service Aids
bos.sysmgt.sysbr            4.3.1.0  C  System Backup and BOS Install
                                        Utilities
bos.up                      4.3.1.0  C  Base Operating System
                                        Uniprocessor Runtime
devices.base.rte            4.3.1.0  C  RISC System 6000 Base Device
                                        Software
devices.common.IBM.ktm_std.rte
                            4.3.1.0  C  Common Keyboard, Tablet, and
                                        Mouse Software
devices.graphics.com        4.3.1.0  C  Graphics Adapter Common
                                        Software
devices.mca.8ef5.diag       4.3.1.0  C  Ethernet High-Performance LAN
                                        Adapter (8ef5) Diagnostics
devices.mca.8ef5.rte        4.3.1.0  C  Ethernet High-Performance LAN
                                        Adapter (8ef5) Software
devices.mca.8fc8.diag       4.3.1.0  C  Token Ring High-Performance
                                        Adapter (8fc8) Diagnostics
devices.mca.8fc8.rte        4.3.1.0  C  Token Ring High-Performance
                                        Adapter (8fc8) Software
devices.rs6ksmp.base.rte    4.3.1.0  C  Multiprocessor Base System
                                        Device Software
devices.rspc.base.diag      4.3.1.0  C  RISC PC Base System Device
                                        Diagnostics
devices.rspc.base.rte       4.3.1.0  C  RISC PC Base System Device
                                        Software
devices.sys.slc.rte         4.3.1.0  C  Serial Optical Link Software
devices.tty.rte             4.3.1.0  C  TTY Device Driver Support
                                        Software
```

```
  ifor_ls.base.cli           4.3.1.0  C  License Use Management Runtime
                                           Code
  ifor_ls.client.base        4.3.1.0  C  SystemView License Use
                                           Management Client Runtime
  printers.rte               4.3.1.0  C  Printer Backend

Path: /usr/share/lib/objrepos
  bos.terminfo.com.data      4.3.0.0  C  Common Terminal Definitions
  bos.terminfo.dec.data      4.3.0.0  C  Digital Equipment Corp.
                                           Terminal Definitions
  bos.terminfo.ibm.data      4.3.0.0  C  IBM Terminal Definitions
  bos.terminfo.pc.data       4.3.0.0  C  Personal Computer Terminal
                                           Definitions
  devices.common.IBM.modemcfg.data
                             4.3.1.0  C  Sample Service Processor Modem
                                           Configuration Files

State Codes:
 A -- Applied.
 B -- Broken.
 C -- Committed.
 O -- Obsolete.  (partially migrated to newer version)
 ? -- Inconsistent State...Run lppchk -v.
```

Customizations: /etc/rc.net was modified to reflect the following:

```
added:   /usr/sbin/no -o sb_max=163840
         /usr/sbin/no -o udp_sendspace=32768
         /usr/sbin/no -o udp_recvspace=65536
changed: /usr/sbin/no -o tcp_sendspace=65536
         /usr/sbin/no -o tcp_recvspace=65536
```

The /(root) filesystem has been 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, either 8mm or 4mm tape media.

Environment	Feature Number	Distribution Medium
PSSP for AIX	6237	8-mm tape cartridge
SP AIX Min Image	6237	8-mm tape cartridge
Cumulative service for PSSP	6237	8-mm tape cartridge
HACWS (Optional)	5915	8-mm tape cartridge
PTPE (Optional)	5908	8-mm tape cartridge
PSSP for AIX	6238	4-mm tape cartridge
SP AIX Min Image	6238	4-mm tape cartridge
Cumulative service for PSSP	6238	4-mm tape cartridge
HACWS (Optional)	5380	4-mm tape cartridge
PTPE (Optional)	5371	4-mm tape cartridge

- Documentation

Title	Order Number
IBM RS/6000 SP: Planning, Volume 2, Control Workstation and Software Environment	GA22-7281
IBM Parallel System Support Programs for AIX: Administration Guide	GC23-3897
IBM Parallel System Support Programs for AIX: Installation and Migration Guide	GC23-3898
IBM Parallel System Support Programs for AIX: Diagnosis and Messages Guide	GC23-3899
IBM Parallel System Support Programs for AIX: Command and Technical Reference	GC23-3900
IBM Parallel System Support Programs for AIX: Event Management Programming Guide and Reference	SC23-3996
IBM Parallel System Support Programs for AIX: Group Services Programming Guide and Reference	SC28-1675
IBM Parallel System Support Programs for AIX: Licensed Program Specification	GC23-3901
IBM RS/6000 SP: Managing Shared Disks:	SA22-7279
IBM Performance Toolbox Parallel Extensions for AIX: Guide and Reference	SC23-3997

To order all the above manuals use the following number:

IBM Parallel System Support Programs for AIX Library	SBOF-8587

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April 1998

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