RS/6000 7044-x70 System and Service Processor Firmware Update

Applies to : IBM RS/6000 7044-170, 7044-270, 7043-270

This document describes the installation of Licensed Machine Code, which is sometimes referred to generically as microcode or firmware.

Contents

1.0 Systems Affected

This update provides new System and Service Processor (SvP) firmware (FW) for RS/6000 7044-170, 7044-270 and 7043-270 systems *only*. Do **not** use on any other systems.

The firmware levels contained in this update are:

- **Sys FW: SPH05195**
- **SvP FW: sh040616**

These are companion levels and must be used together.

The typical time to install this firmware is 0.8 hours. The firmware does not become active when installed and requires a system reboot to become active. This reboot time will vary depending on

the system and the amount of features installed. This estimate is for an average system.

2.0 Firmware Description and Revision History

Table 2.1: System Firmware Update Descriptions and History

SPH05195	
SPH04194	• Added support for AIX 5.3. • Corrected problem with auto negotiation at 10/100 speeds for 10/100/1000 Base-T Ethernet PCI Adapter (FC 2975). • GUI SMS menus replaced with text based menus. • Enhancements to SMS network adapter menus to resolve various configuration issues and ping test failures. • Added support for PCI-X Dual Channel Ultra 320 SCSI RAID Adapter (FC 5703). • Added remote IPL support in GUI SMS settings menu for 10/100 Mbps Ethernet PCI Adapter II (FC 4962). • Added support to provide response to APR requests for Hot Standby Router Protocol (HSRP) or other network processes that generate ARP requests during NIM operations.
SPH03232	• Resolves ethernet adapter link errors reported in AIX error log during boot on systems equipped with IBM 4-Port 10/100 Ethernet Adapter (FC 4951), IBM Universal 4-Port 10/100 Ethernet Adapter (FC 4961) or integrated adapters based on these adapter types. • Added enhancements to prevent potential ping and NIM boot failures on SP and Cluster attached servers.
SPH03114	• Corrected boot failure with checkpoint E1F6 displayed after bootlist is set via AIX and more than 5 devices are specified. • Parameter change to limit bootlist entries set via AIX to 5. • Corrected boot failure with 'Default Catch' message displayed on console when booting from tape media containing large boot image. • Corrected error 20EE000B: unable to find boot record after restore on NIM install on 36GB or larger disks. • Corrected 'Default Catch' message displayed on console after SMS 'Change SCSI ID' utility screen is accessed.

SPH02254	• Change to allow modification to ethernet speed and duplex settings in SMS to apply immediately. • Corrected for problems booting from DASD connected to PCI Dual Channel Ultra3 SCSI Adapater (FC 6203, Type 4-Y). • Corrected problem booting from DVD RAM Drive (FC 2623 and 2627). • Corrected auto configuration, ping and NIM failures on ethernet adapters attached to a switch or router with Spanning Tree Algorithm enabled. • Corrected missing devices in SMS bootlist when bootlist set via AIX. • Added support for Ultra320 SCSI (FC 5702).
SPH02066	• Added support for new device id/vendor id for IBM Universal 4-Port 10/100 Ethernet Adapter (FC 4961, Type A-E). • Correction for handling xoff character transmitted to ASCII terminal during boot. Failure symptom: terminal would stop displaying data during boot. • Changed SMS "ping" routine: If "Server IP Address" is set to "0.0.0.0", only ping "Gateway IP Address". If "Server IP Address" is not set to "0.0.0.0", ping "Server IP Address". • Removed gateway IP address limitation for ping when client and server are on same subnet - gateway address no longer has to be specified as 0.0.0.0. • Correction to allow return to SMS Utilities menu after a ping on any token ring adapter.
SPH01316	• Added SMS menu support for IBM 10/100 Mbps Ethernet PCI Adapter II FC 4962, Type A-F). • Added support for IBM SP Switch2 MX2 Adapter (FC 4026, Type 6-M). • Corrects interruption of NIM boot (via TFTP packet transfer) that was caused by non-TFTP packet transfers. Failure symptoms vary: may hang at E1F7 or 611, trouble booting in maintenance mode.
SPH01271	• Added support for IBM Gigabit Fibre Channel Adapter for PCI Bus (FC 6227, Type 4-S). • Added support for IBM Gigabit Fibre Channel Adapter for 64-bit PCI Bus (FC 6228, Type 4-W). • Corrected erroneous checkstop error (4B2xxxC4) that occurred during boot in a 4-way system.
SPH01252	• Added support for 450MHz processor (FC 4364 and 4366).
SPH01184	• Added support for the IBM Cryptographic Accelerator Adapter (FC 4960, Type 6-J).
SPH01099	• Added support for the IBM PCI Dual Channel Ultra-3 SCSI Adapter (FC 6203, Type 4-Y).

	• Corrected NIM boot/install failure with IBM 10/100/1000 Base-T Ethernet PCI Adapter when "Auto" option is selected for speed (FC 2975, Type A-A). • Corrected incorrect callout on a DIMM failure, and other FRU isolation enhancements.
SPH00221	• Added L2 algorithm and Lbist enhancements. • Miscellaneous serviceability enhancements. • Miscellaneous GUI enhancements.
SPH00157	• Config menu now supports more than 200 devices. • Corrected ping failure that occurs when the system is not visible from the local network. • Added support for IBM 4-Port 10/100 Ethernet Adapter. • Miscellaneous performance and availability enhancements.
SPH00056	• Improved reliability.
SPH99343	• Fixed serviceability issues.
SPH99323	• Original (GA) level.

Table 2.2: Service Processor Firmware Update Descriptions and History	
sh04061 6	• Corrected problem with system time changes during Daylight Savings Time transitions in locales where DST is not observed.
sh03081 9	• Corrects potential cause for errors 4B271151, 2B271122 or 4B20000A encountered on new or replacement 333MHz CPU FRUs. • Corrects potential cause for error 4B2711C4 during boot on systems equipped with 333MHz processors.
sh02030 7	• Correction for false occurrance of CPU error codes 4B2xxx51 and 4B2xxx52.
sh01092	• Corrected Service Processor firmware so that it would log checkstops in the

8	Service Processor error log.
sh010831	• Added support for 450MHz processor (FC 4364 and 4366).
sh010702	• Corrected incomplete power off problem that caused error code 40110001 even though the power supply did not fail.
sh010330	• Error reporting enhancements.
sh000808	• Miscellaneous serviceability enhancements.
sh000605	• Miscellaneous serviceability and usability enhancements.
sh000221	• Improved reliability.
sh991215	• Fixed serviceability issues.
sh991130	• Original (GA) level.

3.0 Cautions and Important Notes

ATTENTION: The firmware levels contained in this package MUST be installed before installing AIX 5.3.

The System and Service Processor firmware are combined into a single file. This allows all the firmware to be updated together and assures they are companion levels.

Don't be alarmed at the length of this document! For any given download/unpacking/update environment, the process is short. This document describes processes for several environments. One should be suitable for your needs, and these instructions guide you through just the environment you choose.

Firmware Update Installation Is Not Concurrent

Installation of the firmware will cause an unconditional reboot of the system. Therefore, all user operations should be gracefully terminated before firmware updates are to be applied.

Avoid Potential Firmware Update Corruption

Some firmware corruptions are recoverable in the field, and repeating the update will usually correct the problem. If the second update attempt fails, replace the card containing the corrupted firmware module. Here are some tips to help avoid the need for such recoveries.

Never power OFF the system during the firmware update process!
The update will be incomplete and **will** fail. Depending on where in the update process the power was lost, a recovery attempt will often succeed. One recovery attempt is worthwhile.

Replacement Parts May Require Updating

When a system planar is replaced, the system and service processor firmware must be checked to ensure they are at the latest **companion** levels. If they are not, update to the latest companion levels using the instructions in this document. Table 3.1 lists the released levels.

Table 3.1: Combined Firmware Levels, File Sizes and Checksums					
	Combined System and SvP Firmware			**Companion Levels Included**	
Distribution Date	*Filename*	*Size*	*Checksum*	*System FW*	*SvP FW*
August 2004	sx04194.img	1601378	56812	SPH04194	sh040616
August 2003	sx03232.img	1601546	07563	SPH03232	sh030819
June 2003	sx03114.img	1601362	13255	SPH03114	sh020307
November 2002	sx02254.img	1601362	46711	SPH02254	sh020307
March 2002	sx02066.img	1601362	21942	SPH02066	sh020307
December 2001	sx01316.img	1601334	40263	SPH01316	sh010928

October 2001	sx01271.img	1601334	52751	SPH01271	sh010928
September 2001	sx01252.img	1602222	17638	SPH01252	sh010831
July 2001	sx01184.img	1601014	54495	SPH01184	sh010702
June 2001	sx01099.img	1600866	60185	SPH01099	sh010330
October 2000	sx00221.img	1600658	46814	SPH00221	sh000808
June 2000	sx00157.img	1600602	23045	SPH00157	sh000605
April 2000	sx00056.img	1578282	43107	SPH00056	sh000221
Feb 2000	sx99343.img	1577958	22374	SPH99343	sh991215
Original (GA)	sx99323.img	1578142	55695	SPH99323	sh991130

AIX Instructions are CASE SENSITIVE

In the instructions that follow are specific AIX and DOS commands. AIX commands are CASE (lower and upper) SENSITIVE, and *must* be entered exactly as shown, including the filenames. DOS commands are not case sensitive, and may be entered without regard to the cases shown.

How to Determine the Firmware Release Date

Level identifiers for the SvP FW use the 8-digit Gregorian date code method in terms of year, month, and day (such as 040616 for sh040616 level). The System FW uses the 5-digit Julian date code method in terms of day number in a year (such as 05195 for SPH05195 level -- the 194th day of 2005 or July 14, 2005)

4.0 How to Determine Currently Installed Firmware Levels

DO NOT rely on the part number or firmware level marking/label on the EPROM/FLASH module because the content of the module may have been updated to a different level. To be safe, always check the firmware level electronically.

Two methods for reading the firmware levels are described below.

- If the operating system is running, use the AIX command-line method. Continue to paragraph 4.1 .
- If the operating system is not running, use the SMS Utilities method. Skip to paragraph 4.2 .

4.1 Using AIX to Read Currently Installed Firmware Levels

To check the firmware levels,

    Enter:
      lscfg -vp | grep alterable

This command will produce a system configuration report *similar* to the following.

ROM Level.(alterable).......sh030819 <== Service Processor FW level
ROM Level.(alterable).......SPH03232 <== System FW Level

The ROM Level lines list the levels of the currently installed firmware. In the above example, the current System firmware level is SPH03232, and the current Service Processor firmware level is sh030819.

If the right-most five characters (date) of the current System FW level are earlier than 05195 you should consider installing the update.

If the right-most six characters (date) of the current Service Processor FW level are earlier than 040616, you should consider installing the update.

If you find the firmware levels are not correct companions, or that they must be updated, proceed to Section 5.0.   If the firmware levels are correct companions and no update is needed, installation is complete.

4.2 Using SMS Utilities to Read Currently Installed Firmware Levels

The System Management Services (SMS) Utilities may be accessed in two ways.

- If using an ASCII terminal, continue to paragraph 4.2.1.
- If using a graphics console, skip to paragraph 4.2.2.

Instructions for these two methods are slightly different, so be sure to choose the correct instructions for your environment.

4.2.1 If Using an ASCII Terminal

Power on or shutdown and restart the system. At checkpoint E1F1 on the operator panel, watch the terminal for the time to press the "1" key. An indicator appears on the terminal as each system component is self-tested. When the word "keyboard" appears, quickly press the "1" key. The SMS menu will be displayed after startup testing has completed.

The current System and Service Processor firmware levels can be found under the "**Display**

Configuration" selection on the SMS main menu. The System firmware level is shown under "**System Information**" on the line "**Firmware Level**", and the Service Processor firmware level is shown under "**Service Processor Information**" on the line "**ROM Level**."

When you have read the current firmware levels, exit SMS as directed on the menu screens.

If the right-most five characters (date) of the current System FW level are earlier than 05195 you should consider installing the update.

If the right-most six characters (date) of the current Service Processor FW level are earlier than 040616, you should consider installing the update.

If you find the firmware levels are not correct companions, or that they must be updated, proceed to Section 5.0.   If the firmware levels are correct companions and no update is needed, installation is complete.

4.2.2 If Using a Graphics Console

Power on or shutdown and restart the system. At checkpoint E1F1 on the operator panel, watch the console for the time to press the "F1" key.   An indicator appears on the console as each system component is self-tested. When the keyboard icon appears, quickly press the "F1" key. The SMS menu will appear when all the component tests have completed.

The current System and Service Processor firmware levels can be found under the "**Config**" selection on the SMS main menu. The System firmware level is shown under "**System Information**" on the line "**Firmware Level**", and the Service Processor firmware level is shown under "**Service Processor Information**" on the line "**ROM Level**."

When you have read the current FW levels, exit SMS as directed on the menu screens.

If the right-most five characters (date) of the current System FW level are earlier than 05195 you should consider installing the update.

If the right-most six characters (date) of the current Service Processor FW level are earlier than 040616, you should consider installing the update.

If you find the firmware levels are not correct companions, or that they must be updated, proceed to Section 5.0.   If the firmware levels are correct companions and no update is needed, installation is complete.

5.0 Downloading and Unpacking the Firmware Update Package

Instructions for downloading and unpacking the firmware update package follow.

5.1 Internet Package

The System and Service Processor Firmware, in AIX and DOS formats, are located at the web

site

http://techsupport.services.ibm.com/server/mdownload2/download.html

Follow the instructions on this page. You must read and agree to the license agreement to obtain the firmware packages.

In the table for System/Service Processor Combined Microcode, scroll down to the entry for 7044-170, 7044-270 and 7043-270.

The download choices at that entry are:

- Description   (Instructions document)
- AIX Format   (For downloading to an AIX system or workstation)
- DOS Format   (For downloading to a Windows workstation)

You will want a copy of the description (instructions document) and one of the format choices. You may transfer files to the target system in one of several ways.

- By downloading files directly to the target system.
- By downloading files to an intermediate AIX system and then using either ftp or diskettes for transferring to the target system.
- By downloading files to a Windows workstation from which you will use diskettes for transferring to the target system.

Detailed download/unpacking instructions follow for each of the downloading preferences.

- If using an AIX system for downloading, continue to paragraph 5.1.1.
- If using a Windows workstation for downloading, skip to paragraph 5.1.2.

5.1.1 Downloading the AIX Format File

Use this method to download to an AIX system.

> **Note:** In the instructions that follow are specific AIX commands.
> AIX commands are CASE (lower and upper) SENSITIVE, and *must* be entered exactly as shown, including the filenames.

 a) Provide a directory on an AIX system to receive the AIX format file.

   Enter:
   mkdir /tmp/fwupdate

   Note: If the directory /tmp/fwupdate already exists,
    make sure it is empty before proceeding.

 b) Transfer the AIX format file to the /tmp/fwupdate directory (using "Save as ...").
    You'll see the filename is 7044x70F.BIN

 c) Unpack the file by executing the instructions below.

Enter the commands:

```
cd   /tmp/fwupdate
chmod   +x   7044x70F.BIN
./7044x70F.BIN
```

[Don't overlook the periods (.) in the above command.]

These files will be added to /tmp/fwupdate.

```
 sx05195.img
ReadMe.TXT
```

If the above procedure was used to transfer files directly to the target system, you are ready to use the combined update process. Proceed to Section 6.0, Updating the Firmware.

Otherwise, on the intermediate AIX system, choose one of the following methods for transferring to the target system.

- To transfer files to the target system via the ftp method, continue to paragraph 5.1.1.1.
- To transfer files to the target system via the diskettes method, skip to paragraph 5.1.1.2.

5.1.1.1 The FTP Transfer Method

This method presumes you have ftp access to the target system.

On the intermediate AIX system,

Enter the commands:

```
ftp  {name of target system}
{Login with a valid userid and password}

bin
lcd  /tmp/fwupdate
mkdir   /tmp/fwupdate
cd   /tmp/fwupdate
put  sx05195.img
quit
```

Proceed to Section 6.0, Updating the Firmware.

5.1.1.2 The Diskette Transfer Method

This method can be used for cases in which electronic connections between the intermediate AIX system and the target system are inconvenient.

Two 2MB (HD) new or freshly formatted diskettes are required.

With the first diskette loaded in the drive,

Enter the commands (this process will request additional diskettes as each is filled):

cd /tmp/fwupdate
ls sx05195.img | backup -i -v -f/dev/rfd0

This will produce AIX backup diskettes. Label these diskettes, respectively,

"Volume 1: AIX Backup: Combined System (SPH05195) and SvP (sh040616) FW
              for IBM 7044-x70 and 7043-270"

"Volume 2: AIX Backup: Combined System (SPH05195) and SvP (sh040616) FW
              for IBM 7044-x70 and 7043-270"

Proceed to .

5.1.2 Downloading the DOS Format File

Use this method to download to a Windows workstation.

a) Prepare a directory for receiving the DOS format file.
   This directory can be in any partition with 6MB available space.
   Executing in such a partition, called [path] in these instructions
   (ex. c:\download),

   Enter:
    md [path]**\fwupdate**

      Note: If the directory [path]\fwupdate already exists,
      make sure it is empty before proceeding.

b) Transfer the DOS format file to the [path]\fwupdate directory (using "Save as ...").
   You'll see the filename is 7044x70F.EXE

c) Unpack the file by executing the instructions below.

   Enter the commands:

    cd [path]**\fwupdate**
    7044x70F

These files will be added to the fwupdate subdirectory:

   44x70_B1.exe
   44x70_B2.exe
   readme.txt

5.1.2.1 Diskettes for AIX Command-Line Update Method

Two 2MB (HD) new or freshly formatted DOS diskettes are required.

a) With the first diskette loaded in the drive,

   Enter the commands:

   cd [path]**\fwupdate**
   44x70_B1

 Label this diskette,

   "Volume 1: AIX Backup: Combined System (SPH05195) and SvP (sh040616) FW
           for IBM 7044-x70 and 7043-270"

b) With the second diskette loaded in the drive,

   Enter the commands:

   cd [path]**\fwupdate**
   44x70_B2

 Label this diskette,

   "Volume 2: AIX Backup: Combined System (SPH05195) and SvP (sh040616) FW
           for IBM 7044-x70 and 7043-270"

   Note: Any diskette labeled: 'AIX Backup: . . . .' is in a format that can be used
             directly with a computer running AIX as it's operating system. This
             diskette cannot be read using PC tools or command line operations.

Proceed to Section 6.0 Updating the Firmware.

5.2 CORE Package

   System and Service Processor firmware are provided in the package under
   pSeries-RS/6000-Microcode-System/Service. Look for 7044-170, 7043-270 and 7043-270.

You will want to read the update description and the latest installation instructions.

When you launch the firmware update selection in CORE, follow the instructions on the screen to
access the instructions and make diskettes.

 Note: Any diskette labeled: 'AIX Backup: . . . .' is in a format that can be used
         directly with a computer running AIX as it's operating system. This
         diskette, once made on the MoST platform, cannot be read using normal
         platform tools or command line operations.

After reading the instructions and making the diskettes from CORE, proceed to Section 6.0
Updating the Firmware.

5.3 Downloading from the Microcode Update Files and Discovery Tool CD

Follow the instructions that come with the Microcode Update Files and Discovery Tool CD. The firmware file, sx05195.img, you download from the CD is in the /tmp/fwupate directory.

If you are installing the code manually:

Enter:
   mkdir /tmp/fwupdate

Note: If the directory /tmp/fwupdate already exists,
  make sure it is empty before proceeding.

Copy the sx05195.img file to the /tmp/fwupate directory.   Proceed to Section 6.0 Updating the Firmware.

5.4 Remote Installation of Firmware

 To install firmware on a remote system, login to the remote system as root. Copy (in binary format) the firmware file, sx05195.img, to the /tmp/fwupdate directory on the remote system. Proceed to Section 6.0 Updating the Firmware.

6.0 Updating the Firmware

The AIX command-line method applies the combined companion System and Service Processor firmware update in one pass. The combined update process uses a single file, sx05195.img, whose content includes **both** System and Service Processor firmware updates. This allows both the System Firmware and Service Processor Firmware to be updated together and assures they are companion levels.

***
WARNING:

Do not power off the target system at any time before the update process completes.
***

Note: Checksums can be used to verify files have not been corrupted or altered during transmission.

At the AIX command line, enter:

 sum sx05195.img

This command will produce the following output:

  56812 1564   sx05195.img

 The checksum is -----> 56812

Note: In the instructions that follow are specific AIX commands.
AIX commands are CASE (lower and upper) SENSITIVE, and **must** be entered exactly as shown, including the filenames.

6.1 Using the AIX Command-Line Method

You must have root authority on the target system to update its firmware. Because the update process will cause an automatic AIX reboot, be sure the system is not running any user applications.

This method allows updating either from files already loaded into the target system or from diskettes.

- If the files are loaded in the target system, continue to paragraph 6.1.1.
- If the files are on AIX backup diskettes, skip to paragraph 6.1.2.

6.1.1 Updating with Files Already Loaded in the Target System

With the files are located in the /tmp/fwupdate subdirectory,

  Enter the commands:

```
cd  /usr/lpp/diagnostics/bin
./update_flash  -f  /tmp/fwupdate/sx05195.img
```

[Don't overlook the periods (.) in the above command.]

You will be asked for confirmation to proceed with the firmware update and the required reboot. If you confirm, the system will apply the new firmware, reboot and return to the AIX prompt. This may take up to ten minutes, depending on the configuration of the target system.

While the update is in progress, you will see "Rebooting . . ." on the display for as long as three minutes.

The firmware update is complete. You will want to verify the update as described in paragraph 6.2.

6.1.2 Updating from AIX Backup Diskettes

The AIX backup diskettes support the combined firmware update process.

 On the target system,

  Enter the commands:

```
mkdir /tmp/fwupdate
```

  Note: If the directory /tmp/fwupdate already exists,
   make sure it is empty before proceeding.

cd /tmp/fwupdate
restore

You will be prompted to mount volume 1 on /dev/rfd0

In the drive of the target system, put the AIX backup diskette labeled,

 "Volume 1: AIX Backup: Combined System (SPH05195) and SvP (sh040616) FW
                    for 7044-x70 and 7043-270"

When prompted for volume 2,

In the drive of the target system, put the AIX backup diskette labeled,

 "Volume 2: AIX Backup: Combined System (SPH05195) and SvP (sh040616) FW
                    for 7044-x70 and 7043-270"

The file is now located in the /tmp/fwupdate subdirectory.

   Enter the commands:

   cd /usr/lpp/diagnostics/bin
   ./update_flash -f /tmp/fwupdate/sx05195.img

   [Don't overlook the periods (.) in the above command.]

You will be asked for confirmation to proceed with the firmware update and the required reboot. If you confirm, the system will apply the new firmware, reboot and return to the AIX prompt. This may take up to ten minutes, depending on the configuration of the target system.

While the update is in progress, you will see "Rebooting . . ." on the display for as long as three minutes.

The firmware update is complete. You will want to verify this update as shown in paragraph 6.2.

Don't forget to retrieve and file any firmware update diskette that may still be in the system's diskette drive. A good time to do this is after the reboot has completed.

6.2 Verifying the Updates

To verify your firmware update was successful, use the following AIX command after the automatic reboot.

To check the firmware levels

   Enter:
   lscfg -vp | grep alterable

This command will produce a system configuration report ***similar*** to the following.

```
ROM Level.(alterable).......sh040616 <== SvP FW level
ROM Level.(alterable).......SPH05195 <== System FW level
```

The ROM Level lines list the levels of the newly installed System and Service Processor firmware. For System FW, the level should now be SPH05195. For Service Processor FW, the level should now be sh040616.

6.3 Archiving the Update Files

In the event it becomes necessary to restore the system to a certain firmware level, it is suggested you identify and archive the materials for each update you install.

If the download process produced diskettes, label and store them in a safe place.

If the download process produced files, archive and identify the files for convenient retrieval.

7.0 Machine Records

None at this time.

End of Installation Instructions