



# PROMENTUM® ATCA-4500 Compute Processing Module

## FIRMWARE AND SOFTWARE UPGRADE INSTRUCTIONS

This document provides firmware and software upgrade instructions for the ATCA-4500 CPM and its optional ATCA-5400 RTM.

If the ATCA-4500 CPM is installed as part of a Promentum chassis, the CPM update can be coordinated with updates of the other modules in the system. Refer to the *ATCA Firmware and Software Update Instructions* for information about using the *rsys-update* utility to upgrade the CPM along with other modules in the chassis. The update instructions can be downloaded from the RadiSys Web site at [www.radisys.com/downloads](http://www.radisys.com/downloads).

If the CPM is not installed with other Promentum components, use the *rsys-update* instructions and manual upgrade procedures in this document to upgrade the CPM.

These CPM components can be upgraded:

- BIOS
- IPMI firmware and FPGA
- FRU data
- ComMux
- EEPROM
- Legacy FPGA
- RTM MMC firmware and FRU data
- RTM Alarm CPLD

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## Using rsys-update to update the CPM

The *rsys-update* utility can upgrade the CPM BIOS and IPMI. The *rsys-update* utility is installed in the `/usr/sbin` directory of the ATCA-4500 firmware update bundle. This allows *rsys-update* to start the update process using scripts contained within the update bundle.

### Installing the latest OS RPM packages

Before running *rsys-update*, you need to prepare the CPM by installing the latest OS RPMs. You can find the RPMs by decompressing the ATCA-4500 file ending in `<version>.tgz`.

These RadiSys RPMs are required to use the *rsys-update* utility:

- `rsys-update-<version>.noarch.rpm`
- `rsys-ipmitool-<version>.rpm`
- `rsys-ethtool-<version>.rpm`
- `fru-update-<version>.rpm`
- `fruinfo-<version>.rpm`
- `rsysbflash-<version>.rpm`
- `rsys_cpm_kernel-<version>.rpm`
- `amifldr-<version>.rpm`

**Note:** It is recommended that you install all RPMs, in addition to those required by *rsys-update*, so the latest files are available for the manual updates described in this document.

Follow these steps to install the RPMs:

1. Locate the `ATCA-4500-<version>.tgz` file appropriate for the ATCA-4500 in the Promentum CD image. Copy the `ATCA-4500-<version>.tgz` file to a temporary directory on the CPM. Choose a path and name that can be easily accessed for the remaining steps.
2. Decompress the `ATCA-4500-<version>.tgz` file by entering the following command from within the temporary directory:

```
tar -xzf <version>.tgz
```

This creates a directory named `<version>` in the temporary directory. The RPMs for each supported OS are located under the *packages* directory. For example, the packages for MontaVista CGE 4.0 can be found in this directory:

```
packages/radisys/releases/2.3/montavista/4/x86_pentium4/ATCA-4500/RPMS/
```

3. Install or update all RPMs by entering:

```
rpm -Uhv <path_to_packages>/*.rpm --replacepks
```

## *rsys-update* syntax and help

Two forms of help are available for *rsys-update* depending on whether an update bundle is specified in the help command. Use help to view the *rsys-update* command syntax in each case.

### Help on retrieving the update bundle

When the *rsys-update* help command is entered without specifying an update bundle, the utility only gives help on how it can be used to retrieve an update bundle. To obtain this help information, enter this command at the Linux shell:

```
rsys-update --help
```

### Help on updating the ATCA module

More detailed help is available when the update bundle is present and specified in the help command because the bundle contents provide information about which components can be updated. The help also includes information on how to update the firmware and software components on the CPM. Enter this command at the Linux shell:

```
rsys-update --help --path <update-bundle>
```

## *rsys-update* --path parameter

The *rsys-update* --path parameter specifies the path to or method to retrieve the `-firmware.tgz` bundle for *rsys-update*.

### Using URLs with *rsys-update*

The supported URL protocols are SFTP and TFTP. If the *wget* utility is installed on the CPM, then FTP, HTTP, and HTTPS are also supported.

When a URL is specified, the update bundle is downloaded to the CPM at `/<tmp-dir>/<update-bundle>.tgz`. The tarball is extracted into the directory `/<tmp-dir>/<update-bundle>/`. The URL format allows you to specify the method used to copy the bundle from the host to the module:

```
rsys-update --path sftp://<username>@<hostip>/<update-bundle>.tgz  
rsys-update --path tftp://<hostip>/<update-bundle>.tgz
```

The URL beginning with "sftp" uses SSH for data transfer, and uses the same authentication and provides the same security as SSH. The process prompts you for passwords or pass phrases if they are needed for authentication. The file name may contain a host and user specification to indicate the file is to be copied from that host. The *rsys-update* utility assumes that SSH is available on the remote host.

The URL beginning with "tftp" uses TFTP for data transfer. The *rsys-update* utility assumes that a TFTP server is accessible from the module and the update bundle is in the `/tftpboot` directory.

**Note:** If problems occur with the TFTP data transfer, make sure that the TFTP server is accessible from the CPM. Do this by attempting to connect to the TFTP server using the TFTP utility from the Linux shell.

## Using local directories

If a directory is used and the update command exists in the update-bundle directory, the directory is used as-is and no file is extracted. The format of the command is:

```
/<tmp-dir>/<update-bundle>
```

## Using full path lists after retrieving the update bundle

If a full path is specified and the tarball file with a file name ending in “.tgz” exists, the tarball bundle contents are extracted into the directory /<tmp-dir>/<update-bundle>. The full path format is:

```
/<tmp-dir>/rsys-update/<update-bundle>.tgz
```

**Note:** This path can be used after *rsys-update* is run once on a bundle, allowing *rsys-update* to use the previously extracted version.

## Installing the BIOS update driver for *rsys-update*

Before running *rsys-update* to update the CPM BIOS, an appropriate *amifldr* RPM and the *rsysbflash* utility need to be installed.

For a standard RadiSys-provided kernel OS package, install the corresponding *biosver.rpm* and *amifldr.rpm* from the CD. The installation names the driver *amifldr\_mod.o* and places it in the following directory:

```
/lib/modules/'uname -r'/extra/amifldr/
```

If an appropriate *amifldr.rpm* package is not on the CD due to the type of kernel in use on the CPM, the flash update driver must be built using the *rsysbflash* utility. Follow these steps to build and install the flash update driver:

1. From the CD, install *biosver.rpm* and the *rsysbflash* RPM package for your operating system.
2. If the CPM uses a cross-compiled version of Wind River 2.0, you must specify the `ARCH` and `CROSS_COMPILE` environment variables before running the `rsysbflash` command in [step 3](#). The same settings are used that are used to cross-compile the kernel.

See the Wind River documentation for details about the `ARCH` and `CROSS_COMPILE` environment variables and compiling the kernel.

3. Run *rsysbflash*, passing it the arguments to build the driver.

```
rsysbflash /MAKEDRV
```

The utility produces the driver file *amifldr\_mod.o*. If the driver is built successfully, a message similar to the following is generated by *rsysbflash*:

```
+-----+
| AMI Firmware Update Utility(APTIO) v2.27          |
| Copyright (C)2009 American Megatrends Inc. All Rights Reserved. |
+-----+
- Program initializing ..
- Make AFULNX driver .... ok
- Program ended normally.
```

4. Install the driver to `/lib/modules/'uname -r'/extra/amifldr/`. This enables *rsys-update* to work with the new driver.

## Verifying the BIOS driver

Before running *rsys-update*, verify the BIOS driver is present by entering this command:

```
rsys-update --path /<path><update-bundle> --versions
```

The `--versions` option shows version information for all active, standby, and update bundle components.

See the *ATCA Firmware and Software Update Instructions* for details about *rsys-update*. The update instructions can be downloaded from the RadiSys Web site at [www.radisys.com/downloads](http://www.radisys.com/downloads).

## Updating all redundant components

This procedure updates these redundant components on the CPM:

- IPMC application
- IPMC FPGA
- CPU BIOS

The `rsys-update` utility upgrades redundant components by updating the bank that is currently not in use, then activating or switching to that bank. For example, if a board uses BIOS bank 0, BIOS bank 1 is updated and the board reboots to use bank 1. You run `rsys-update` a second time to update bank 0, then reboot a second time. By using this process, the board can use the unmodified original bank if problems occur.

After completing these steps, proceed to [Updating non-redundant devices on page 7](#).

To update the redundant components on the CPM:

1. Log in to the CPM.
2. Check the active and standby flash bank versions to confirm the update decision:

```
rsys-update --path /<tmp-dir>/<update-bundle> --versions
```

**Note:** Throughout these steps, to point to a compressed update bundle specify the `--path` option to the ".tgz" file instead. For example:

```
--path /<tmp-dir>/rsys-update/<update-bundle>.tgz
```

See [rsys-update --path parameter on page 3](#) for details about using the `--path` option.

3. Make sure the CPM is in the intended bank by using the `dry-run` option of `rsys-update`. This command displays a simulation of the update procedure, and identifies the current active bank and the targeted update bank.

```
rsys-update --path /<tmp-dir>/<update-bundle> --dry-run --automatic
```

4. Update the standby flash banks (BIOS and IPMI firmware):

```
rsys-update --path /<tmp-dir>/<update-bundle> --automatic
```

This results in a reboot to the standby (newly updated) flash bank.

**Note:** If the BIOS configuration settings for the standby bank do not match the first bank, you may need to enter CMOS setup and configure the BIOS to boot the board.

5. Once the board has rebooted, flash the remaining (original active) flash bank.

```
rsys-update --path /<tmp-dir>/<update-bundle> --automatic
```

This results in a reboot to the original active (now updated) flash bank.

## Updating non-redundant devices

Run the *rsys-update* utility again and specify the `--non-redundant` option to update any non-redundant devices on the CPM, such as the IPMC FRU data.

To update the non-redundant devices:

1. Use the `dry-run` option of *rsys-update*. This command displays a simulation of the update procedure and identifies the targeted non-redundant devices.

```
rsys-update --path /<tmp-dir>/<update-bundle> --dry-run --automatic  
--non-redundant
```

2. Update the non-redundant devices:

```
rsys-update --path /<tmp-dir>/<update-bundle> --automatic --non-redundant
```

Example:

```
rsys-update --path /tmp/rsys-update/ATCA-4500-2.3.24-1-rh-firmware/  
--automatic --non-redundant --log-file logfile
```

The previous command updates the device using the factory recommended order and produces a log file if errors occur. The default path for the log file is `/<tmp-dir>`, and the path can be either relative or absolute. The default file name for the log file is `rsys-update.log`.

3. Enter this command to confirm the new version:

```
rsys-update --path /<tmp-dir>/<update-bundle> --versions --non-redundant
```

## Updating the CPM EEPROM

This procedure updates the entire ATCA-4500 EEPROM except for the MAC address.

### Determine the eth interface

Based on when the Ethernet drivers initialize relative to each other, the device name assigned to each controller can change between boot-ups. To identify which device name is assigned to a controller, use the following code command:

```
for i in /sys/class/net/*; do
    dev=$(basename $i)
    if [ "$(cat ${i}/type)" == "1" ]; then
        bus_info=$(rsys-ethtool -i $dev | sed -n 's/bus-info: \(.*\)/\1/p')
        echo "$dev ${bus_info#0000:}"
    fi
done
```

Match up the PCI Bus Number in the following table:

Table 1. eepupdate Ethernet controller selection

Controller	PCI bus number	Image file
Base	03:00.0	BASE_X.eep
Fabric	0e:00.0	OPLIN_X.eep
Front	23:00.0	FRONT_X.eep

**Note:** The PCI bus number may change with a newer BIOS release. The PCI bus number to BIOS version mapping needs to be maintained.

For example, if the code command above gave the following output:

```
eth0 03:00.0
eth1 03:00.1
eth2 23:00.0
eth3 03:00.1
eth4 0e:00.0
eth5 0e:00.1
```

You would reprogram the Fabric controller using this command:

```
eepupdate_oplin -f OPLIN_4.eep eth4
```

## Perform the update

1. After booting the ATCA-4500 with Linux, install `eepupdate.rpm` and `rsys-ethtool.rpm`. This installs the `eepupdate` and `eepupdate_oplin` scripts in the `/usr/sbin` directory. The `eepupdate` script only updates the front and base Ethernet controller, and `eepupdate_oplin` only updates the Fabric Ethernet controller
2. Copy all eep files to the ATCA-4500 running Linux.
3. Flash the front Ethernet controller (verify which eth interface is the front):
 

```
eepupdate -f FRONT_3.eep ethX
```
4. Flash the base Ethernet controller (verify which eth interface is the Base):
 

```
eepupdate -f BASE_3.eep ethX
```
5. Flash the Fabric Ethernet controller (verify which eth interface is the Fabric):
 

```
eepupdate_oplin -f OPLIN_6.eep ethX
```

**Warning!** The `eepupdate` script should be run on only the *first* eth interface. It will update both interfaces at the same time.
6. Reboot the Linux OS to make the change effective.

## Verify the EEPROM version

To verify the correct EEPROM version, use `rsys-ethtool` to read the version field from the EEPROM:

```
rsys-ethtool -e <dev> offset <offset> length 2 raw on | xxd
```

In the command, `<dev>` is the Ethernet device to verify and `<offset>` is from the following table:

Table 2. EEPROM version offset

Controller	Type	Offset
Base	0	0x0C
Fabric	1	0x2A
Front	2	0x0C

The following example shows that this fabric EEPROM (type = 01) is version 6:

```
rsys-ethtool -e eth0 offset 0x2a length 2 raw on | xxd
```

The result is 0000000: 0601.

## Updating the CPM legacy FPGA, SPI flash, and ComMux

The legacy FPGA, legacy SPI flash, and ComMux can be programmed either from the running OS's command line or externally using a programming cable. Currently, the command line utility is the recommended way to program these components.

### Update the legacy FPGA

The released software packages can be found on the ATCA-4500 product CD. Browse the latest release and find the tarball for the ATCA-4500 (for example, ATCA-4500/ATCA-4500-2.3.24-1.tgz). This tarball contains packages for all supported OS's.

These two packages are required to update the legacy FPGA, based on your OS:

#### Red Hat 5

- `ispVMEmbedded-<version>.i686.rpm`
- `cpm_ioport_module-<version>el5.i686.rpm`

#### MontaVista 4

- `ispVMEmbedded-<version>.i686.rpm`
- `cpm_ioport_module-<version>rsys0cpm.i686.rpm`

#### MontaVista 5

- `ispVMEmbedded-<version>.x86_em64t.rpm`
- `cpm_ioport_module-<version>_mvlcge500_pc_target_x86_em64t0rsys3.x86_em64t.rpm`

#### Wind River 2

- `ispVMEmbedded-<version>.x86_64.rpm`
- `cpm_ioport_module-<version>_hrt1_cfs_v22_grsec_rsys4.x86_64.rpm`

Make sure the right packages are used based on your OS and kernel variant.

The current legacy FPGA svf file (\*.svf) is also needed. There are two svf files in the firmware update *legacyFpga* folder: one for use with the RTM installed, and one for use without the RTM installed.

If the RTM is installed, use this file that has both the ComMux and the Alarm CPLD bypassed:

```
cpm7_legacy_commux_bypass_alarm_bypass_<version>.svf
```

If the RTM is not installed, use this file that only has the ComMux bypassed:

```
cpm7_legacy_commux_bypass_<version>.svf
```

The following are example steps to program the legacy FPGA from a running MV4 system. Modify the file names in the commands according to your OS.

**Note:** These steps must be performed with root permissions.

1. Install or update the required software packages.

```
rpm -Uvh ispVMEmbedded-1.2-5.i686.rpm  
cpm_ioport_module-1.04-1.2.6.10_15rsys0cpm.i686.rpm
```

2. Start the ioport service. This step can be skipped if you have rebooted or already started the ioport service since installation of the above software packages.

```
/etc/init.d/cpm_ioport_module start
```

3. Convert the svf file to vme. Note that the ISP tools require lower case extensions.

```
rsys-svf2vme -infile <file>.svf -outfile <file>.vme
```

4. Program the FPGA.

```
rsys-ispVME <file>.vme
```

**Warning!** Upon successful completion of the legacy FPGA update, the ATCA-4500 will reboot without shutting down the operating system. It is recommended that you mount the file systems as read-only prior to updating the FPGA to prevent any corruption.

5. Verify the version of the legacy FPGA:

```
dd if=/dev/port bs=1 count=2 skip=1536 2>/dev/null | xxd
```

## Update the legacy SPI flash

To update the legacy SPI flash, first see [Update the legacy FPGA on page 10](#) for the two required packages based on your OS.

The current legacy SPI flash svf file (\*.svf) is also needed. There are two svf files in the firmware update *legacyFpga* folder: one for use with the RTM installed, and one for use without the RTM.

If the RTM is installed, use this SPI flash file that has the ComMux and Alarm CPLD bypassed:

```
cpm7_legacy_spi_flash_commux_bypass_alarm_bypass_1_6.svf
```

If the RTM is not installed, use this file that only has the ComMux bypassed:

```
cpm7_legacy_spi_flash_commux_bypass_1_6.svf
```

The following are example steps to program the legacy SPI flash from a running MV4 system. Modify the file names in the commands according to your OS.

**Note:** These steps must be performed with root permissions.

1. Install or update the required software packages if they were not already installed during [Update the legacy FPGA on page 10](#).

```
rpm -Uvh ispvMEmbedded-1.2-5.i686.rpm
cpm_ioport_module-1.04-1.2.6.10_15rsys0cpm.i686.rpm
```

2. Start the ioport service. This step can be skipped if you have rebooted or already started the ioport service since installation of the above software packages.

```
/etc/init.d/cpm_ioport_module start
```

3. Convert the svf file to vme. Note that the ISP tools require lower case extensions.

```
rsys-svf2vme -infile <file>.svf -outfile <file>.vme
```

4. Program the legacy SPI flash:

```
rsys-ispVME <file>.vme
```

## Update the ComMux

To update the ComMux, first see [Update the legacy FPGA on page 10](#) for the two required packages based on your OS.

The current ComMux svf file (\*.svf) is also needed. There are two svf files in the firmware update *commux* folder: one for use with the RTM installed, and one for use without the RTM installed.

If the RTM is installed, use this ComMux update file that has both the legacy SPI flash and the Alarm CPLD bypassed:

```
cpm7_commux_legacy_bypass_alarm_bypass_03.svf
```

If the RTM is not installed, use this update file that only has the legacy SPI flash bypassed:

```
cpm7_commux_legacy_bypass_03.svf
```

The following are example steps to program the ComMux from a running MV4 system. Modify the file names in the commands according to your OS.

**Note:** These steps must be performed with root permissions.

1. Install or update the required software packages if they were not already installed during [Update the legacy FPGA on page 10](#) or [Update the legacy SPI flash on page 11](#).

```
rpm -Uvh ispVMEEmbedded-1.2-5.i686.rpm
cpm_ioport_module-1.04-1.2.6.10_15rsys0cpm.i686.rpm
```

2. Start the ioport service. This step can be skipped if you have rebooted or already started the ioport service since installation of the above software packages.

```
/etc/init.d/cpm_ioport_module start
```

3. Convert the svf file to vme. Note that the ISP tools require lower case extensions.

```
rsys-svf2vme -infile <file>.svf -outfile <file>.vme
```

4. Program the ComMux:

```
rsys-ispVME <file>.vme
```

## Updating the RTM MMC firmware, FRU, and alarm CPLD

These procedures describe how to update the firmware and software for the ATCA-5400 RTM.

To complete the RTM firmware and FRU updates you need to determine IPMB and IPMB-L addresses. See [IPMB and IPMB-L addresses on page 17](#) for information about RTM and AMC IPMB-L addresses. For further details, refer to the specific shelf or carrier documentation.

### Update the RTM MMC firmware

Update the firmware using *ipmitool* and the \*.hpm firmware image.

1. Run *ipmitool* with the following syntax:

```
ipmitool -I lan -H <Shelf IP Address> -A none -T <Carrier IPMB Address>
-B 0 -t <RTM IPMB-L Address> -b 7 hpm upgrade <Upgrade Image> activate
```

Example:

```
ipmitool -I lan -H 10.2.113.200 -A none -T 0x86 -B 0 -t 0x90
-b 7 hpm upgrade upgrade.hpm activate
```

**Note:** Some Shelf Managers may require authentication. If **-A none** does not allow an RMCP connection, refer to your Shelf Management documentation and `ipmitool --help` to determine how to establish an RMCP session.

2. The tool may warn about the possibility of services being interrupted during the upgrade process, although most often they will not be.

Enter **y** to continue.

Components will be skipped if the tool determines they are already up to date. This is especially important for the bootloader. If the firmware is reset or loses power while updating the bootloader, the module may need to be returned to the factory.

3. Use the following command to verify the upgrade:

```
ipmitool -I lan -H <Shelf IP Address> -A none -T <Carrier IPMB Address>
-B 0 -t <RTM IPMB-L Address> -b 7 hpm check <Upgrade Image>
```

### Update the RTM FRU data

Update the RTM FRU information and (optionally) set the hard disk drive information by entering these *rmcpta* commands:

```
rmcpta -h <Shelf IP Address>
targetfwd <Carrier IPMB Address> <RTM IPMB-L Address>
setdriveinfo (see Using setdriveinfo on page 14 for details)
updatefru <RTM FRU Update File> backup.bin
```

Enter **help** on the *rmcpta* command line for a list of available commands.

## Using `setdriveinfo`

The `setdriveinfo` command sets the drive information for the type of hard disk drive installed on the RTM (SAS or SATA). This procedure is needed only if you change the hard disk drive on the RTM.

1. Complete the following fields:

```
Enter the number of drives installed (1):
Enter the drive type, 0 - FC, 1 - SATA, 2 - SAS, 0xFF - None (0xFF): 2
Enter drive manufacturer name ( ):
Enter drive model ( ):
Enter drive serial number ( ):
Enter the desired number of custom info fields (0):
```

The entered information is displayed to verify the entries:

```
# Radisys Record ID      = 0x0A Drive Information Record
# Record Format Version  = 0x00
# Drive Number 1
#   Drive Type           = SAS (0x02)
#   Manufacturer Name    =
#   Model                 =
#   Serial Number        =
```

2. Write the data to the device by entering **yes**:

```
Write the data to the device? [yes/no] yes
Writing the data back to the device FRU 0 information area...
Detected support of RadiSys OEM Group Write FRU Data command. (0x2E 0x0A)
```

## Completing the FRU update

Before updating the device FRU data, the current data is saved to the file `backup.bin`, which can be used to recover the information.

In this example, the final `parsefru` command verifies the FRU information:

```
rmcpta -h 10.2.113.200
targetfwd 0x86 0x90
setdriveinfo
updatefru ATCA-5400-RTM-FRU-v01-00.fru backup.bin
parsefru 0
```

A line of periods appears as the FRU information is written, or it may state the FRU information is already up to date.

During the update process, you may be prompted for input to resolve differences in format between the old and new FRU data. You may also receive a warning if the update file does not match the targeted device to prevent it from being updated with incorrect data. Use the `--auto` option to avoid prompts.

## Update the RTM FRU data on a non-RadiSys shelf

Use the *rmcpta* OpenSession command to upgrade the RTM IPMC FRU on a non-RadiSys shelf. The following example uses a CMM to update the RTM FRU:

```
rmcpta -h <Active-CMM-IP>
OpenSession 14 4 2 root cmmrootpass
targetfwd <Carrier IPMB Address> <RTM IPMB-L Address>
setdriveinfo (optional - only used if a hard disk drive is installed)
updatefru <RTM FRU Update File> backup.bin
```

The following list defines the OpenSession command options:

- **14** is the IPMI channel number
- **4** is the requested privilege level
- **2** is the requested authentication type
- **root** is the default username
- **cmmrootpass** is the default user password

## Update the RTM alarm CPLD

The procedures for updating the CPLD for the RTM are similar to the procedures in [Update the legacy FPGA on page 10](#). See that section for the two RPM files that need to be installed based on your OS. This svf file for updating the CPLD is in the *ATCA-5400-RTM-02.00-1/firmware/cpld* folder on the product CD:

```
cpm7_alarm_commux_bypass_legacy_bypass.svf
```

The following are example steps to program the alarm CPLD from a running MV4 system. Modify the file names in the commands according to your OS.

**Note:** These steps must be performed with root permissions.

1. Install or update the required software packages.

```
rpm -Uvh ispVMEEmbedded-1.2-5.i686.rpm
cpm_ioport_module-1.04-1.2.6.10_15rsys0cpm.i686.rpm
```

2. Start the ioport service. This step can be skipped if you have rebooted or already started the ioport service since installation of the above software packages.

```
/etc/init.d/cpm_ioport_module start
```

3. Convert the CPLD svf file to vme. Note that the ISP tools require lower case extensions:

```
rsys-svf2vme -infile <file>.svf -outfile <file>.vme
```

4. Program the alarm CPLD:

```
rsys-ispVME <file>.vme
```

## Appendix A: Updating components using rsys-ipmitool

The *rsys-update* utility is the preferred method for updating the BIOS, IPMC firmware, and FRU data on the CPM, RTM and AMC. However, if an unsupported OS is used or the system has become corrupt, the updates can be performed using the instructions in this appendix.

The following procedures describe how to manually update CPM components using the *rsys-ipmitool* utility.

### Compiling the RadiSys version of ipmitool

If you are using Linux, you can use the *rsys-ipmitool* RPM for one of the provided operating systems. If you are running Windows then you need to have Cygwin installed to compile *ipmitool*.

1. Download ipmitool v1.8.9 source *ipmitool-1.8.9.tar.gz* from <http://sourceforge.net/projects/ipmitool/>.
2. Place *ipmitool.patch* and *ipmitool-1.8.9.tar.gz* in same directory. The *ipmitool.patch* file is located in the firmware/ipmi directory for the ATCA-5400-RTM/ATCA-5400 <version>.tgz file on the CD.

3. Run the following commands from a Linux or Cygwin prompt:

```
tar -zxvf ipmitool-1.8.9.tar.gz
patch -p0 --binary < ipmitool.patch
cd ipmitool-1.8.9
./configure
make
```

4. Executable *ipmitool* or *ipmitool.exe* is created in the ipmitool-1.8.9/src directory and is ready for use.

### Determining the correct versions of the upgrade tools

Ensure you are using the correct versions of the software tools. The tools and their current versions are listed in the *ATCA-4500 CPM Release Notes*.

Run the following command to check the version of *rsys-ipmitool*:

```
rsys-ipmitool -V
```

Other software tools can be checked by running them with no command line arguments. If the software tools are not in your PATH, you may need to specify a preceding *./* or their full path to run them if they exist in your current directory.

Examples:

```
./rsys-ipmitool hpm check cpm7_all.hpm
/home/user/amcfirmware/ipmitool ...
```

## IPMB and IPMB-L addresses

This section lists the IPMB and IPMB-L addresses of slots and modules in Promentum shelves.

**Table 3. Hex IPMB addresses of slots and modules in larger Promentum shelves**

Slot or FRU	IPMB address / location			
	ATCA-6000 shelf	ATCA-6006 shelf	ATCA-6014 shelf	ATCA-6016 shelf
Active Shelf Manager	20	20	20	20
Front slot 1	9A	82	9A	9E
Front slot 2	96	84	96	9A
Front slot 3	92	86	92	96
Front slot 4	8E	88	8E	92
Front slot 5	8A	8A	8A	8E
Front slot 6	86	8C	86	8A
Front slot 7	82	n/a	82	86
Front slot 8	84	n/a	84	82
Front slot 9	88	n/a	88	84
Front slot 10	8C	n/a	8C	88
Front slot 11	90	n/a	90	8C
Front slot 12	94	n/a	94	90
Front slot 13	98	n/a	98	94
Front slot 14	9C	n/a	9C	98
Front Slot 15	n/a	n/a	n/a	9C
Front Slot 16	n/a	n/a	n/a	A0
PEM 1 (left PEM when viewed from rear)	C4	66	60, FRU ID 6	60, FRU ID 6
PEM 2 (right PEM when viewed from rear)	C6	68	60, FRU ID 7	60, FRU ID 7
Fan 1 (viewed from front)	C8 / Left top AMM	5A / Right fan tray	60, FRU ID 3 / Left fan tray	60, FRU ID 3 / Left fan tray
Fan 2 (viewed from front)	CA / Right top AMM	5C / Left fan tray	60, FRU ID 4 / Center fan tray	60, FRU ID 4 / Center fan tray
Fan 3 (viewed from front)	CC / Left recessed AMM	n/a	60, FRU ID 5 / Right fan tray	60, FRU ID 5 / Right fan tray
Fan 4 (viewed from front)	CE / Right recessed AMM	n/a	n/a	n/a
Virtual SPM (represents the active ATCA-5010 SPM)	50	n/a	n/a	n/a
SPM 1 <sup>a</sup> (rear slot 7)	E4	n/a	n/a	n/a
SPM 2 <sup>a</sup> (rear slot 8)	E6	n/a	n/a	n/a
Virtual RCM (represents the active RCM)	n/a	n/a	60	60
RCM 1 (left)	n/a	n/a	10	10
RCM 2 (right)	n/a	n/a	12	12
Shelf alarm panel	n/a	52	n/a	n/a

<sup>a</sup> With the ATCA-5010 and ATCA-5014, use the virtual SPM address.

## Typical RTM and AMC IPMB-L addresses

RadiSys carriers have the following AMC IPMB-L addressing configuration. Depending on the carrier, slots 2-4 may or may not be present as various carriers have a varying number of AMC slots.

- Slot 1: 0x7A (uppermost physical slot)
- Slot 2: 0x7C
- Slot 3: 0x7E
- Slot 4: 0x80

All RadiSys AMC.0-based RTMs have an IPMB-L address of 0x90. According to the AMC.0 specification, AMC IPMB-L addresses are always in the even-numbered range of 0x70-0xA4.

## Determining the AMC/RTM IPMI firmware version

To acquire the IPMI firmware version for the AMC and RTM you need to determine the following:

- The IP address of the Shelf Manager
- The IPMB address of the CPM that has the AMC installed in it
- The IPMB-L address of the AMC or RTM

See [IPMB and IPMB-L addresses on page 17](#) to determine the IPMB and IPMB-L addresses. For further details, refer to the specific shelf or carrier documentation.

Enter these commands to check the current firmware version:

```
rmcpta -h <Shelf IP Address>
targetfwd <Carrier IPMB Address> <RTM IPMB-L Address>
getdeviceid
```

To check the backup firmware version:

```
rsys-ipmitool -I lan -H <Shelf IP Address> -A none -T <Carrier IPMB Address>
-B 0 -t <RTM IPMB-L Address> -b 7 hpm check
```

## Reverting to the backup firmware

Use this command only if you need to revert to the backup version of firmware stored on the RTM. After reverting, you will not be able to run the new version again except by performing a full upgrade.

```
rsys-ipmitool -I lan -H <Shelf IP Address> -A none -T <Carrier IPMB Address>
-B 0 -t <RTM IPMB-L Address> -b 7 hpm rollback
```

A 0xD5 error code may be returned if there is no rollback version.

## Appendix B: Alternate methods for updating the BIOS

These instructions describe how to update the BIOS flash from DOS or the EFI shell.

### Updating the flash from DOS

1. Copy AFUDOS.exe, BIOS.rom (BIOS image file), and update.bat to a DOS bootable USB flash drive and boot it.
2. Run the batch file, update.bat.

### Updating the flash from the EFI shell

1. Copy AFUEFIx64.efi, BIOS.rom, and update.nsh to a USB flash drive and boot into the EFI shell.
2. Switch to the file system that you use for the flash update (usually fs0:).

**fs0:**

3. Run the batch file, update.nsh.
4. To switch the active BIOS bank without rebooting, use the following IPMI LAN commands from another blade/head system:

```
rsys-ipmitool -I lan -H <ShMgrIP> -A none -t <BladeIPMB> raw 0x30 0xa9 0x4<bank>
```

```
rsys-ipmitool -I lan -H <ShMgrIP> -A none -t <BladeIPMB> raw 0x30 0xa9 0x8<bank>
```

For both commands, <bank> is either 0 or 1.

By switching the active BIOS bank, you can update both BIOS banks without needing to first reboot into the other bank.

5. To check which bank is active use the following command:

```
rsys-ipmitool -I lan -H <ShMgrIP> -A none -t <BladeIPMB> raw 0x30 0xaa 0x00
```

## Appendix C: Alternate methods for updating IPMI FW and FPGA

These firmware upgrade instructions comply with the PICMG HPM.1 specification from PICMG. The IPMI controller and associated circuitry include a number of upgradeable components. Some of these components are upgraded individually, while others are upgraded as a group.

You can upgrade the IPMI firmware and FPGA using either the KCS interface or the LAN interface over IPMB-L. See [IPMB and IPMB-L addresses on page 17](#) for information about IPMB-L addresses. For further details, refer to the specific shelf or carrier documentation.

### Preparing rsys-ipmitool

Before using *rsys-ipmitool*, verify that the version is RadiSys build 2.15 or newer. Additionally, if you have copied the *rsys-ipmitool* file using a Microsoft Windows system, you must make the file an executable. Enter these commands at the Linux prompt:

```
chmod +x rsys-ipmitool
./rsys-ipmitool -V
```

### Updating from the KCS interface

When *rsys-ipmitool* is run from the payload processor (Linux OS), it uses the local KCS payload interface.

1. Verify that communication is possible to the IPMC:

```
./rsys-ipmitool mc info
```

2. If the previous command is successful, continue to step 3. Otherwise, check that the IPMI drivers are successfully installed and retry the command.
3. Use FTP to copy the hpm image file into the OS.
4. Check the firmware images on the ATCA-4500:

```
./rsys-ipmitool hpm check cpm7_all.hpm
```

This command identifies the active, backup, and file versions, providing a snapshot of upgradeable components.

5. Upgrade and activate the ATCA-4500:

```
./rsys-ipmitool hpm upgrade cpm7_all.hpm activate
```

If the command fails, retry it three times before calling Support for assistance.

All components on the target (boot, application, and FPGA) that do not match the version provided in the hpm file are upgraded.

6. After the upgrade is complete, upgrade and activate the application component again. This is necessary because the application component has a backup copy.

```
./rsys-ipmitool hpm upgrade cpm7_all.hpm component 1 activate
```

## Updating from the LAN (Shelf Manager)

Write down the IP address of the active Shelf Manager and the IPMB address of the ATCA module to be upgraded. For the example commands in this procedure, the IP address is 10.100.18.20 and the target module is in slot 10 (IPMB address 0x8C).

1. Verify that LAN connectivity to the Shelf Manager IP address is established:

```
./rsys-ipmitool -I lan -H 10.100.18.20 -A none mc info
```

If the command is successful then continue to the next step. If the command fails, contact your system administrator to re-establish the LAN interface for the Shelf Manager.

**Note:** Some shelf manager RMCP servers require levels of authentication, including a username and password. See the *rsys-ipmitool* man page for other required options.

2. Make sure the target ATCA module exists and is communicating:

```
./rsys-ipmitool -I lan -H 10.100.18.20 -A none -t 0x8c mc info
```

If the command fails, the module cannot be upgraded in its current state. Extract and reinsert the target module, then retry the command. If it still fails, contact Support for assistance.

3. Verify if the firmware was updated to the latest version:

```
./rsys-ipmitool -I lan -H 10.100.18.20 -A none -t 0x8c hpm check
cpm7_all.hpm
```

This identifies the active, backup, and file versions. It is a snapshot of upgradeable components.

4. Start the upgrade with this command:

```
./rsys-ipmitool -I lan -H 10.100.18.20 -A none -t 0x8c hpm upgrade
cpm7_all.hpm activate
```

The following prompt appears:

```
Services may be affected during upgrade. Do you wish to continue? y/n
```

**Caution:** Do not interrupt the upgrade once you start it.

Enter **y** to continue. The upgrade takes several minutes. All components are upgraded on the target (boot, application, and FPGA) that do not match the version provided in the hpm file.

If the command fails, retry it three times before contacting Support for assistance.

**Warning!** Do not power off the blade before contacting Support.

The output should be similar to the following :

Performing upgrade stage:

```
-----
```

ID	Name	Versions			Upload Progress			Upload Time	Image Size
		Active	Backup	File	0%	50%	100%		
1	AMC Boot	X.YY	---	X.YY	Skip			---	----
*0	AMC Runtime	X.YY	---	X.ZZ	.....			00.41	099d9

```
-----
```

(\* ) Component requires Payload Cold Reset

Firmware upgrade procedure successful

Components are skipped if the tool determines they are already up to date. This is especially important for the bootloader. If the firmware is reset or loses power while updating the bootloader, the firmware needs to be reprogrammed over JTAG.

5. After the upgrade is complete, upgrade and activate the application component again. This command updates the backup copy:

```
./rsys-ipmitool -I lan -H 10.100.18.20 -A none -t 0x8c hpm upgrade  
cpm7_all.hpm component 1 activate
```

6. Enter **y** to continue when the following prompt appears:

```
Services may be affected during upgrade. Do you wish to continue? y/n
```

7. Enter this command to verify that the new firmware versions are being used:

```
./rsys-ipmitool -I lan -H 10.100.18.20 -A none -t 0x8c hpm check  
cpm7_all.hpm
```

## Appendix D: Alternate methods for updating the CPM FRU

1. From a module or head system with access to the Shelf Manager, verify that these files from the CD image are present:
  - FRU .bin and .cfg files
  - fru\_update utility
  - frutool utility
  - rsys-ipmitool utility
2. Run the *fru\_update* command using the following format:

```
fru_update "-I lan -H <shelf IP address> -A none -t <blade IPMB address>"  
cpm7_rs_frud_00_09.cfg cpm7_rs_frud_00_09.bin
```

**Note:** Some Shelf Manager RMCP servers require levels of authentication, including a username and password. The parameters in the quoted string are passed directly to *rsys-ipmitool* and may need to be modified accordingly. See the *rsys-ipmitool* man page for any additional options.