

HP Online ROM Flash

User Guide



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About this guide

This guide describes how to use Smart Components for Online ROM Flash.

Audience assumptions

Because of the potential risk of damage to the target server ROM firmware and loss of data on target servers, the software described in this user guide should be used only by individuals who are experienced and knowledgeable in the usage and deployment of such software.

Where to go for additional help

For issues or problems not addressed by this guide, see the following resources for more information.

Online documentation

The following reference documentation is available:

- For information about the ProLiant Support Pack deployment utilities, see the *ProLiant Support Pack and Deployment Utilities User Guide* available at <http://h18013.www1.hp.com/products/servers/management/rdu/description.html>.
- For Smart Components for ROM Flash hardware and software support information, see <http://h18023.www1.hp.com/support/files/server/us/romflash.html>.

Telephone numbers

For the name of the nearest HP authorized reseller:

- In the United States, call 1-800-345-1518.
- In Canada, call 1-800-263-5868.

For HP technical support:

- In the United States and Canada, call 1-800-652-6672.
- Outside the United States and Canada, see <http://www.hp.com>.

Introduction

In a fast-changing IT environment, any loss of server availability translates into a loss of time and money. To protect customers from such losses, HP has developed technologies that ensure that HP servers provide maximum uptime with minimal maintenance. Many of these technologies, including Online ROM Flash, also reduce server management efforts, enabling administrators to work on issues and resolve problems without taking servers offline.

This guide provides information on upgrading system and options firmware in an online mode with Microsoft® Windows®, Novell NetWare, and Linux operating systems.

ROM technology

The process of upgrading system and option ROMs is referred to as *flashing the ROM*. A ROM flash uses software to replace the current system or option ROM on a target server with a new ROM image. Flash the ROM to achieve the following results:

- Support new features
- Correct problems in a previous ROM version

Types of ROMs include system and option ROMs. ROM upgrade methods include offline methods, such as ROMPaq and the ROM Update Utility, and online methods using Smart Components and their various deployment utilities.

System ROMs

A system reboot is required for a ROM upgrade to take effect. For disaster recovery or ROM downgrade purposes, backups of the most current ROM image are available in one of the following ways:

- Redundant ROM—The ROM image acts as two separate ROMs. One section of the ROM contains the most current ROM version, while the other section of the ROM contains a previous version.



NOTE: Systems with redundant ROM display a message during the Power-On Self Test (POST), as illustrated in Figure 1.

- Automatic backup—A backup copy of the ROM image existing on the target server is made in the ROM image backup subdirectory. See the “Backup of the original system ROM” sections in the following chapters for the location of the ROM image backup directory.

Figure 1 Redundant ROM message during POST

```
1024 MB Detected

ProLiant System BIOS - P27 (05/16/2002)
Copyright 1982,2002 Compaq Information Technologies, LTD. All rights reserved.

Processor 1 initialized at 1.5 GHz (256 KB L2,512 KB L3)

Advanced Memory Protection Mode: Advanced ECC Support
Redundant ROM Detected - This system contains a valid backup system ROM.

Compaq Integrated Lights-Out 1.06 May 14 2002

Slot 0  COMPAQ Smart Array 5i Controller  Initializing... ||

Online
```

Option ROMs

Smart Components for option ROMs provide for efficient administration of option ROM upgrades. Types of option ROMs include the following:

- Array controller ROMs



NOTE: An Online ROM Flash component is not available for the Smart Array 5312 Controller (SA5312). The SA5312 controller can only be upgraded offline, using the Options ROMPaq for Smart Array 5312 Controllers diskette. For more information, see <http://h18007.www1.hp.com/support/files/server/us/locate/7220.html>.

- Integrated Lights-Out (iLO) ROMs
- Remote Insight Lights-Out Edition II (RILOE II) ROMs
- Hard drive ROMs



NOTE: Online ROM Flash components are not available for hard drive ROMs.

HP Smart Update Manager

Beginning with the Firmware CD 7.5, the HP Smart Update Manager can be used to perform ROM upgrades. See the *HP Smart Update Manager User Guide* on <http://www.hp.com> for additional information.

Offline ROM upgrades

Offline ROM flash technology includes the following:

- ROMPaq
- ROM Update Utility

ROMPaq

The ROMPaq diskette is bootable and contains all of the necessary system and option ROM image files and configuration files required to upgrade the ROM firmware. ROMPaq diskettes can include ROM images for one or more servers that are part of the same family.

To flash the ROM using ROMPaq:

1. Download the system or option ROMPaq utility diskette for each target server or option for which a ROM flash is planned. ROMPaq downloads are available at <http://h18023.www1.hp.com/support/files/server/us/romflash.html>.
2. Shut down each server where the system or option ROM images are to be upgraded, and reboot using the correct ROMPaq diskette for that server.
3. Follow the interactive session in the ROMPaq utility, which enables you to select the devices to be flashed.
4. After the ROMPaq utility flashes the ROM for the selected devices, cycle the power manually to reboot the system back into the operating system.

This procedure works well with a small number of servers that are located in close physical proximity. However, for large, geographically dispersed networks, traditional ROM upgrades are time- and cost-prohibitive.



IMPORTANT: Option ROMPaqs have been retired as an upgrade delivery method for storage options. Firmware upgrades for storage options are now delivered using Smart Components and their respective deployment utilities. For more information, see Customer Note CN0130W at http://h20000.www2.hp.com/bizsupport/TechSupport/Document.jsp?objectID=PSD_CN0130W.

For additional information about ROMPaqs, see the documentation on your server or at <http://www.hp.com/servers/swdrivers>.

ROM Update Utility

The ROM Update Utility is offline ROM flash technology for the SmartStart CD 7.4 or earlier. To access the ROM Update Utility, boot a server from the HP SmartStart CD 6.0 or later or the HP Firmware Maintenance CD 7.0–7.4. Click the **Firmware** tab, and click **Install Firmware**. For the SmartStart CD 7.5 or later, use the HP Smart Update Manager.

Online ROM upgrades

Online ROM flash technology consists of a combination of components that enable you to upgrade system or option ROM images across a wide range of HP servers and server options. The ROM upgrades are performed locally or across a network from a single point of execution and are flashed individually or grouped together to perform multiple ROM upgrades in a single step. There are two types of ROM components: system ROM flash components and option ROM flash components. These ROM flash components are also known as Smart Components. Smart Components enable you to perform system and option ROM updates from a remote system with no physical presence at the server being flashed.

Smart Components for ROM Flash use online ROM flash technology and are operating system-dependent. They are available for Windows 2000 and Windows Server™ 2003; Novell NetWare 5.1, 6.0, and 6.5; and certified Linux versions found on the Linux server certification matrix website at <http://h18000.www1.hp.com/products/servers/linux/hplinuxcert.html>.



NOTE: Smart Components for system ROMs are ROM family-dependent.

Smart Components for ROM Flash include installation logic that automatically detects hardware, firmware, and operating system dependencies, installing only the correct ROM upgrades required by each target server.

Smart Components for ROM Flash are integrated with the ProLiant Remote Deployment Utility, the ProLiant Remote Deployment Console Utility, and other HP server management technologies, such as HP Systems Insight Manager. For information about using HP Systems Insight Manager, see <http://www.hp.com/go/hpsim>.

For additional information about the ProLiant Support Pack (PSP) deployment utilities, see the *HP ProLiant Support Pack and Deployment Utilities User Guide*, available at <http://h18013.www1.hp.com/products/servers/management/rdu/description.html>.

Obtaining Smart Components for ROM flash and deployment software

The only software required for flashing system and option ROMs locally is the individual Smart Component for ROM Flash executable file, specific to the system or option. To flash ROMs remotely, use the ProLiant Remote Deployment Utility or the ProLiant Remote Deployment Console Utility.

Smart Components for ROM Flash and the deployment utilities can be obtained from the following sources.

HP website

The latest ROM flash components and deployment utilities for supported Microsoft Windows, Novell NetWare, and Linux operating systems are available at <http://www.hp.com/servers/swdrivers>.

HP CD media

When web access is not available, ROM flash components can also be obtained from the ProLiant Firmware Maintenance CD.

The deployment utilities can be obtained from the following sources:

- SmartStart CD 6.00 or later for Windows and NetWare
- SmartStart CD 6.30 or later for Linux

Receive proactive notification when the latest SmartStart update is available by subscribing to Subscriber's Choice at <http://www.hp.com/go/subscriberschoice>.

ROM flashing in Microsoft Windows

Requirements

 **CAUTION:** Because of the potential risk of damage to the target server ROM and loss of data on target servers, Smart Components for ROM Flash should be used only by individuals who are experienced in the deployment of such components. Be sure that all data is backed up so that mission-critical systems are not disrupted if a failure occurs during the flash procedure. If a failure does occur while flashing a system or option ROM on a target server, see the “Downgrading ROM firmware to previous versions” and “Recovering from a failed ROM upgrade” sections in this chapter for information about downgrade and disaster recovery procedures.

The following minimum requirements must be met before using Smart Components for ROM Flash:

- A local administrative server running Windows 2000 or Windows Server 2003. For more information, see <http://h18023.www1.hp.com/support/files/server/us/winroms.html>.



NOTE: HP recommends that all target servers have the latest Microsoft service packs and HP PSPs installed for each operating system.

- One or more remote target servers running Windows 2000 or Windows Server 2003 and needing a system or option ROM upgrade. If the local administrative system is the only server that must be upgraded, remote target servers are unnecessary.
- HP drivers for all options installed in the target servers. If HP array controller ROM firmware must be flashed, the array controller drivers from the latest PSP must be installed on the target servers. To obtain the latest PSP, see <http://www.hp.com/servers/swdrivers>.
- All remote target servers connected on the network and accessible through TCP/IP from the administrative server.
- An account with administrator privileges on each target server. The administrator account must have the same user name and password as those used on the local administrative server. As an alternate, use a domain account on the local administrative server that has administrator privileges on the target servers.



NOTE: You can override the same user name and password requirement with the `NET USE` command. `NET USE` enables you to use a different administrator level user ID to attach to a remote server. For information on the syntax and usage of the `NET USE` command, see the Windows operating system documentation.

Some components might have additional minimum requirements. For an example, see <http://h18007.www1.hp.com/support/files/server/us/download/22660.html>. Look at the download page for the component to determine if there are additional prerequisites.

A list of system and option ROM families and servers currently supported by Smart Components for ROM Flash is available. To view the list, click the link for your operating system on the Smart Components for ROM Flash Web page at <http://h18023.www1.hp.com/support/files/server/us/romflash.html>.

To determine the ROM family and version of HP server products, see “Identifying the system ROM family for your server” at <http://h18023.www1.hp.com/support/files/server/us/romhowto.html>.

Overview of the ROM flash upgrade process

The ROM flash upgrade of a target system or option ROM occurs when individual Smart Components for ROM Flash are run locally from a command prompt on a target server. The flash upgrade can also occur remotely when the Remote Deployment Utility or the Remote Deployment Console Utility is used to deploy Smart Components for ROM Flash on a single target server or multiple target servers.

Using the Smart Components for ROM Flash locally

Launch the Smart Components for ROM Flash locally by clicking the Smart Component for ROM Flash executable file name or using the command line prompt. Using the command line prompt enables you to pass arguments to the Smart Component for ROM Flash to alter its installation behavior.



TIP: To facilitate local deployments of multiple Smart Components for ROM Flash, copy the component files and deployment utility files (SETUP.EXE, SETUPC.EXE, and SETUPCOR.DLL) into their own subdirectory on the target system. If deploying remotely, copy the files into their own subdirectory on the administrative system that will be used to update the target server.

Command line syntax

All Smart Components for ROM Flash use the following general command line syntax:

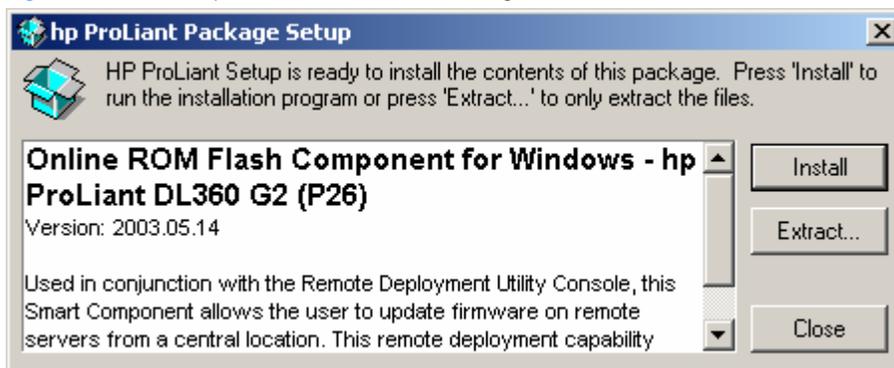
```
CPXXXXXX [/S[ILENT]] [/F[ORCE]] [/R[EBOOT]] [/H[ELP]] [/?]
```

All arguments and information enclosed in brackets are optional. See the “Command line arguments” section for a full description of the arguments the Smart Components for ROM Flash accept.

CPXXXXXX is the command that launches the Smart Component for ROM Flash on the target server. The six Xs represent the serialized number assigned to the component.

If arguments are not specified on the command line, a dialog box similar to Figure 2 appears. Click **Install** to begin the installation of the Smart Component for ROM Flash.

Figure 2 Smart Component for ROM Flash dialog box



Command line arguments

The command line arguments that Smart Components recognize are listed in Table 1.

Table 1 Command line arguments

Command line argument	Description
/S [ILENT]	This argument specifies whether console messages are suppressed or displayed. Use this argument when scripting the Smart Component for ROM Flash to suppress console output. If this argument is omitted from the command line, console messages are displayed.
/F [ORCE]	This argument specifies whether an installation will be forced, regardless of the ROM version that is detected on the target server. The argument changes the Smart Component for ROM Flash installation in the following ways: <ul style="list-style-type: none"> • If the system or option ROM on the target server is current, the ROM reinstalls itself, and the installed version number remains the same. • If a newer version of the system or option ROM is already installed on the target server, the component installs itself and downgrades the ROM to the older version number. If this argument is omitted from the command line, the installation is not forced.
/R [EBOOT]	This argument specifies whether the target server will reboot if the Smart Component for ROM Flash requests a reboot and the request is supported by the system ROM family on the target server. If this argument is omitted from the command line, the server must be rebooted manually for the ROM upgrade to take effect.
/H [ELP] or /?	This argument displays command line Help information.

IMPORTANT: The /R argument must be used with caution when online ROM flash mode is supported by the target server. Because the argument enables the target server to reboot automatically, you cannot copy the existing system ROM image backup file to a standard 1.44-MB diskette. The Smart Component for ROM Flash generates this backup file before the original ROM is replaced with the updated version, except on systems with redundant ROM.

Command line examples

Although uppercase letters are used in the examples in Table 2, Smart Components for ROM Flash are not case-sensitive.

Table 2 Command line examples

Command line input	Result
CP004610	This command line deploys the CP004610.EXE system ROM flash component on the target server using the default settings.
CP004561 /F	This command line deploys the CP004561.EXE array controller ROM flash component on the target server, forcing the downgrade of the array controller ROM.
CP004610 /S	This command line deploys the CP004610.EXE system ROM flash component on the target server using the default settings. All console messages are suppressed.
CP004561 /S /F /R	This command line deploys the CP004561.EXE array controller ROM flash component on the target server, forcing the downgrade of the array controller ROM and allowing the server to reboot automatically if the feature is supported by the system ROM family on the target server. All user feedback is suppressed.

Backup of the original system ROM

Backups of the most current system ROM image are available using one of the following methods:

- Redundant ROM—The ROM image acts as two separate ROMs. One section of the ROM contains the most current ROM version, while the other section of the ROM contains a previous version.
- Automatic backup—If the target server ROM family supports online ROM flash, the Smart Component for ROM Flash automatically makes a backup copy of the existing ROM image before replacing the original ROM with the updated version. System ROM images are backed up in the `\CPQSYSTEM\FWBACKUP\SYSTEM` subdirectory. The system ROM image backup subdirectory is located off the root of the target server partition that contains the Windows `\SYSTEM32` subdirectory.



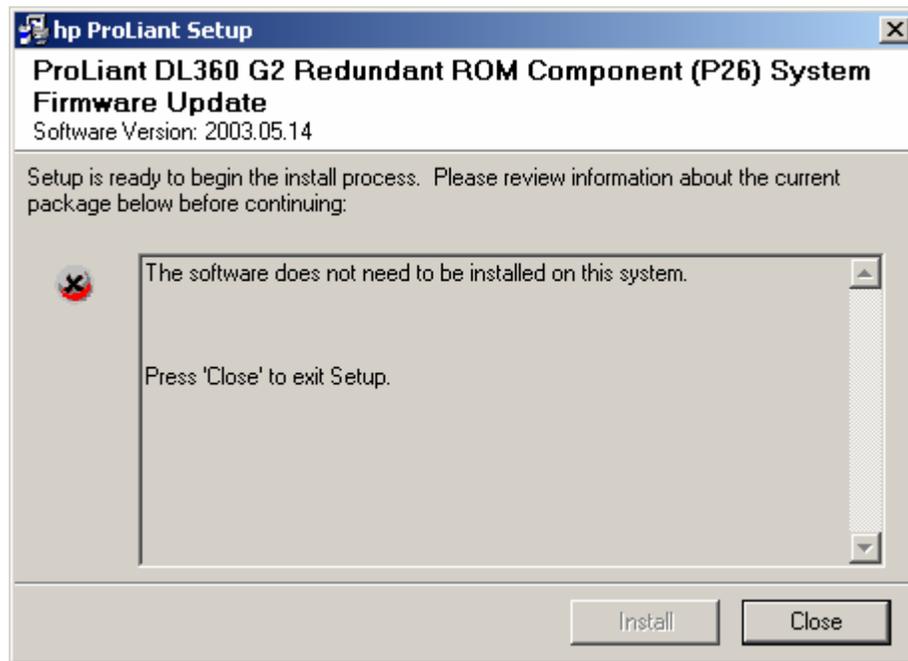
TIP: To have the backup ROM image readily available, copy the image to a standard 1.44-MB diskette before rebooting the target server. If a failure occurs during the ROM upgrade process, the diskette containing the backup ROM image can be used to restore the original ROM version.

When the installation is complete, a status screen appears, advising you to reboot the server for the ROM upgrade to take effect.

Unsuccessful upgrades

If a Smart Component for ROM Flash upgrade is attempted on a system that is not supported by the firmware type of the Smart Component, a failure status screen similar to Figure 3 appears.

Figure 3 Unsupported ROM installation



CAUTION: If an error such as a power failure, operating system lockup, or some other catastrophic event occurs before a ROM upgrade process is completed, the ROM image on the target server will be corrupted. If this occurs, you must implement downgrade procedures for ROM firmware and disaster recovery procedures for system ROM firmware. See the “Downgrading ROM firmware to previous versions” and “Recovering from a failed ROM upgrade” sections for information about downgrade and disaster recovery steps to follow.

Common installation log file

All ROM upgrade activity (including errors) is written by the individual Smart Component for ROM Flash to a common installation log file called CPQSETUP.LOG in the \CPQSYSTEM\LOG subdirectory on the target server. Information regarding subsequent installation activity is appended to the same log file, providing a chronological history of all component installation activity on the target server.

Return codes

When each Smart Component for ROM Flash has finished running on the target server, the component reports a return code to the operating system or calling application.

These return codes are processed by the `%errorlevel%` operating system variable and are used to determine the status of a flash upgrade procedure. You can also use return codes within a script file to control the execution of the file and determine any branching that is required in the file. Table 3 summarizes the Smart Components for ROM Flash return codes.

Table 3 Return codes

Error level	Meaning
0	The Smart Component for ROM Flash failed to install.
1	The Smart Component for ROM Flash installed successfully.
2	The Smart Component for ROM Flash installed successfully, but the system must be restarted to complete the installation of the component.
3	The installation of the Smart Component for ROM Flash was not attempted because the required target hardware was not present or the firmware on the target was current.

See the “Scripting the Remote Deployment Console Utility” section later in this chapter for information on scripting the Smart Components for ROM Flash with a deployment tool and for a sample script that employs return codes to alert the user of any ROM upgrade failure.



NOTE: The return codes generated by the Smart Components for ROM Flash are different from the return codes generated by the ProLiant Remote Deployment Utility.

Using the Smart Components for ROM Flash remotely

Smart Components for ROM Flash can be deployed remotely using either the Remote Deployment Utility or the Remote Deployment Console Utility.

Be sure that you have the latest version of the deployment utilities before using them to perform ROM upgrades. The latest deployment utilities are now available as a Smart Component, which can be obtained at <http://h18023.www1.hp.com/support/files/server/us/locate/9192.html>.

Online ROM flash upgrade process

Online flash mode is supported by the servers and options listed under your operating system at <http://h18023.www1.hp.com/support/files/server/us/romflash.html>.

The target server does not need to be rebooted before the system or option ROM flash upgrade begins.

During the online ROM upgrade process, the following events occur:

1. The access privileges are verified on the target server. If administrative privileges are not set up correctly on the target server, a message appears, and the ROM upgrade procedure stops.
2. The type of target operating system is determined. If the operating system running on the target server is not Windows 2000 or Windows Server 2003, the procedure stops.
3. System hardware and firmware dependencies are verified on the target server. If the ROM upgrade is not the correct ROM upgrade for the target server, the procedure stops.



NOTE: Servers with redundant ROM maintain a backup ROM image. On servers without redundant ROM, a backup of the current system ROM image is made on the target server in the `\CPQSYSTEM\FWBACKUP\SYSTEM` subdirectory. The ROM image backup subdirectory is located off the root directory of the partition that contains the Windows `\SYSTEM32` subdirectory. You can use the ROM image backup for disaster recovery or ROM downgrade purposes.

4. The system or option ROM of the target server is flashed by the Smart Component for ROM Flash while the server is still online.



IMPORTANT: iLO is equipped with a Security Override Switch that must be in the default “secure” position when the iLO ROM is flashed. If the jumper is not in the default position, you will receive an error message when you attempt to flash the ROM. To place the switch in the correct position, power down the server, open the server chassis, and reset the switch. Depending on your server, the iLO Security Override Switch might be a single jumper or a specific switch position on a dipswitch panel. To access and locate the iLO Security Override Switch, see the server documentation.

5. When the flash upgrade is complete, the target server remains online but must be restarted for system and option ROM upgrades to take effect.

All ROM upgrade activity (including errors) is written by the individual Smart Components for ROM Flash to a common installation log file called `CPQSETUP.LOG` in the `\CPQSYSTEM\LOG` subdirectory on every target server. This subdirectory is located off the root directory of the partition that contains the Windows `\SYSTEM32` subdirectory.

Information regarding subsequent installation activity is appended to the same log file, providing a chronological history of all component installation activity on the target server.

ProLiant Remote Deployment Utility

The Remote Deployment Utility can be used to deploy Smart Components for system and option ROM firmware to a single local or remote target server.

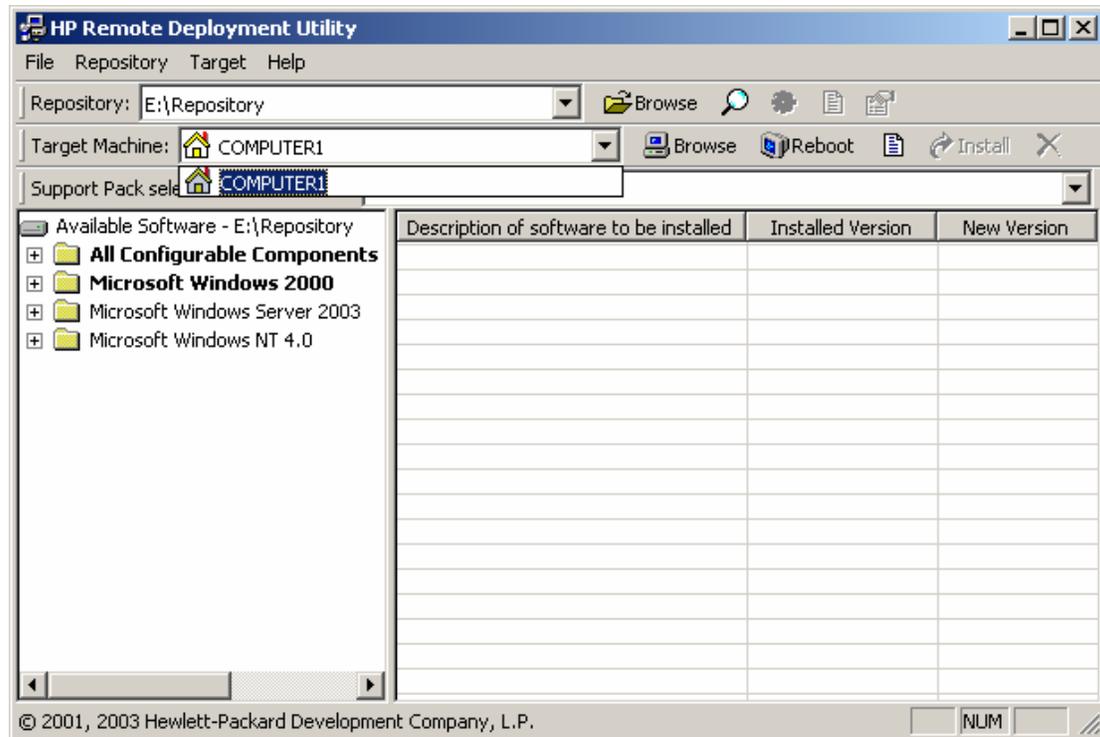


NOTE: The Remote Deployment Utility is located on the SmartStart CD. For additional information about the Remote Deployment Utility, see the *HP ProLiant Support Pack and Deployment Utilities User Guide* available at <http://h18013.www1.hp.com/products/servers/management/rdu/description.html>.

To deploy components using the Remote Deployment Utility:

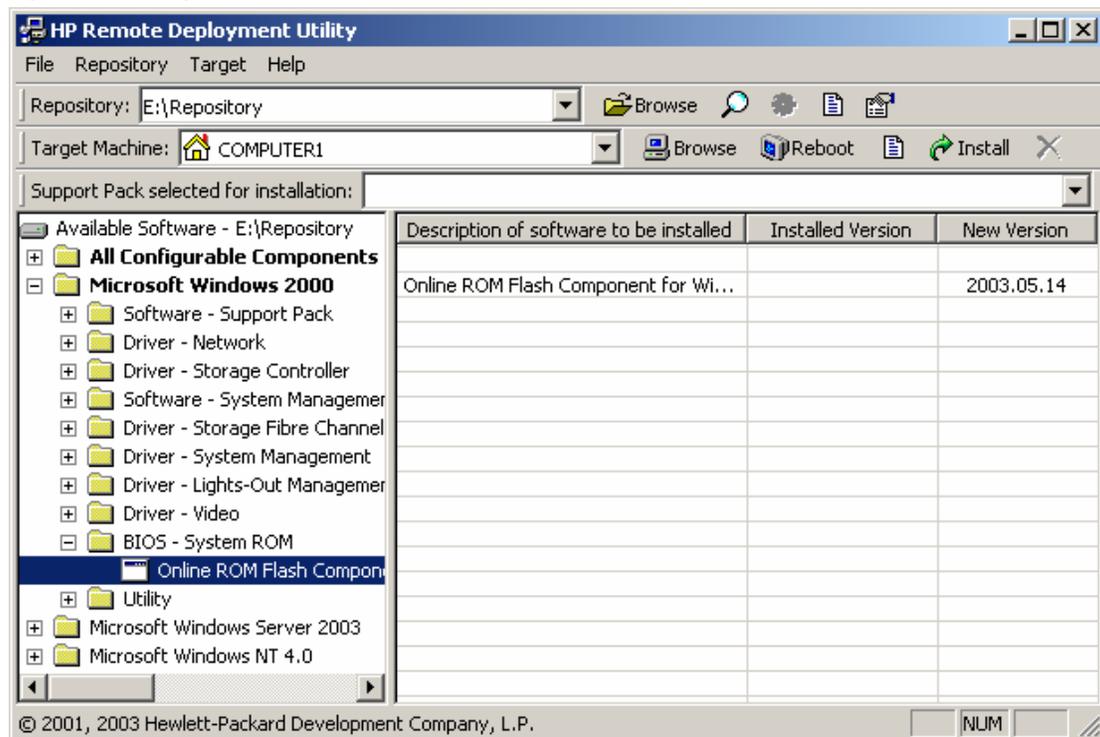
1. Copy the deployment utility files (SETUP.EXE, SETUPC.EXE, and SETUPCOR.DLL) into their own subdirectory on the administrative system that will be used to update the target server.
2. Copy the Smart Components for ROM Flash into the same subdirectory as the deployment utility files.
3. Double-click the SETUP.EXE file to launch the Remote Deployment Utility.
4. Open the Remote Deployment Utility, and select a target server from the target server dropdown menu.

Figure 4 Selecting a target server



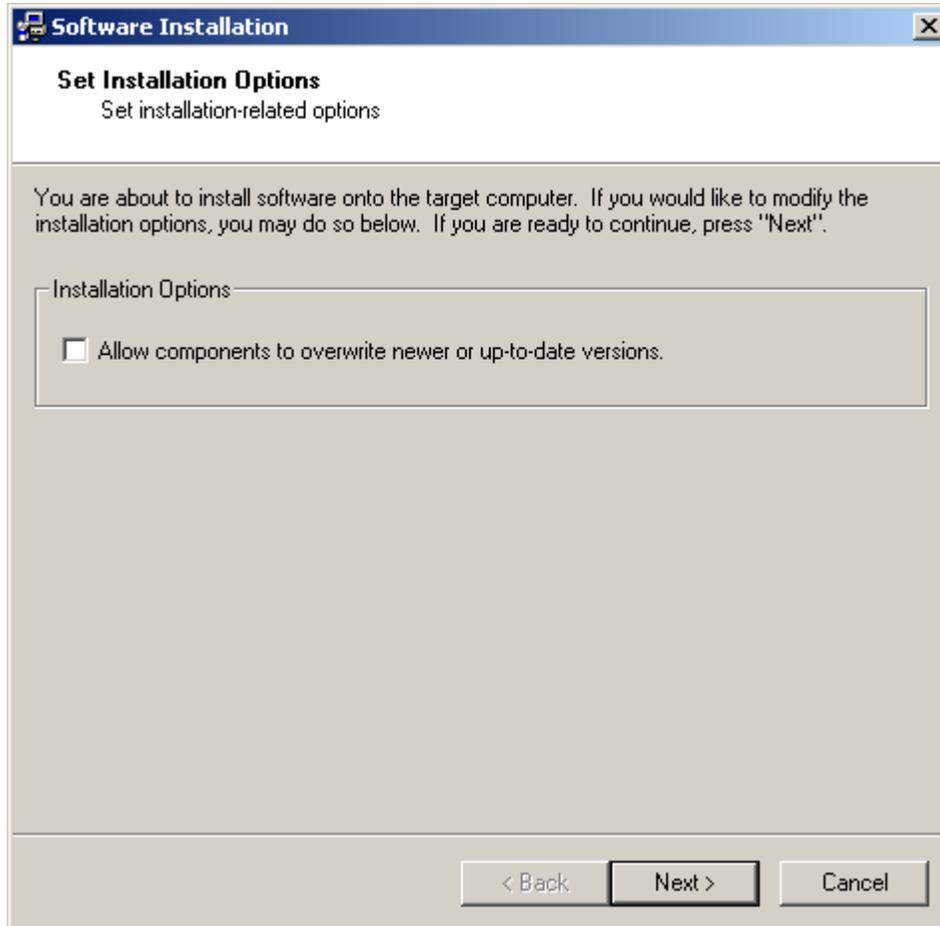
5. Select a ROM component from the repository, and drag it to the right pane of the window.

Figure 5 Selecting a ROM flash component



6. Deploy the component:
 - a. Click the **Install** button on the Target Machine toolbar. The following window appears.

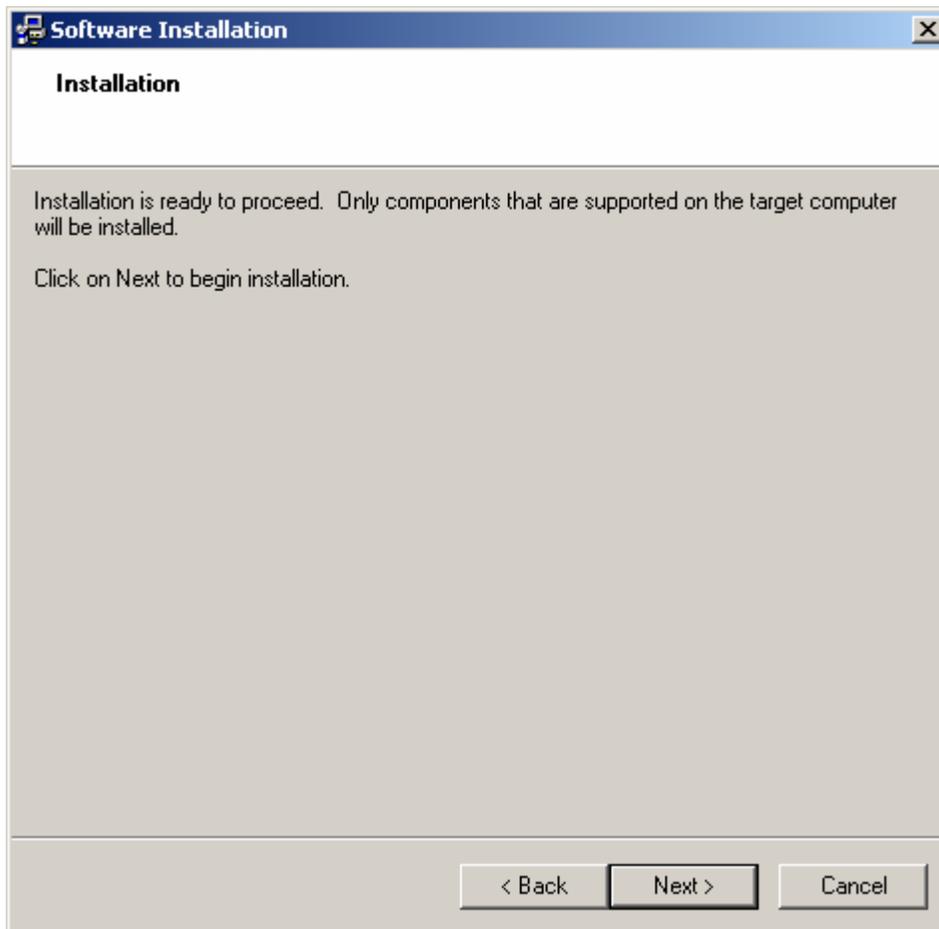
Figure 6 Setting installation options



- b. Set the installation options to your chosen settings.

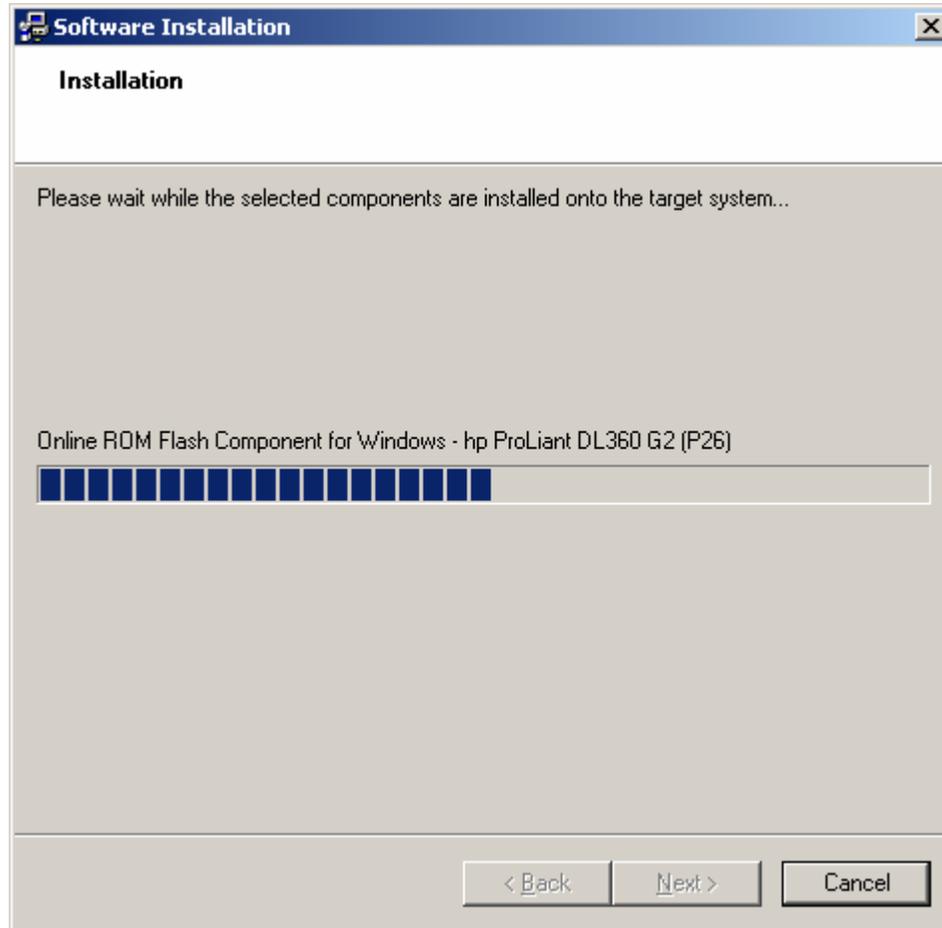
- c. Click **Next**. The following window appears.

Figure 7 Installation confirmation



- d. Click **Next**. The following window appears while the component is being installed.

Figure 8 Installation progress



7. When the installation is complete, restart the target machine by clicking the **Reboot** icon on the Target Machine toolbar.

ProLiant Remote Deployment Console Utility

The Remote Deployment Console Utility can be used to deploy Smart Components for ROM Flash for system and option ROM firmware on target servers. The utility enables you to deploy components locally or remotely, either on a single target server or on multiple target servers.



NOTE: The Remote Deployment Console Utility is located on the SmartStart CD. For additional information about the Remote Deployment Console Utility, see the *HP ProLiant Support Pack and Deployment Utilities User Guide* available at <http://h18013.www1.hp.com/products/servers/management/rdu/description.html>.

For automation and convenience, you can script the utility in a batch file with other operating system commands to perform the same action in a repetitive manner.



IMPORTANT: When the Remote Deployment Console Utility is used to upgrade system ROM firmware on target servers that support online ROM flash mode, a backup copy of the ROM image existing on the target server is made in the ROM image backup subdirectory. See the "Backup of the original system ROM" section in this chapter for the location of the ROM image backup directory.

Command line syntax

The Remote Deployment Console Utility is scripted or used from a command line prompt. The following is the general command line syntax for the Remote Deployment Console Utility:

```
SETUPC [/?] [/HELP] [/USE-LATEST] [/T[ARGET]:COMPUTER] [/F[ORCE]]  
[/R[EBOOT] [:TIMEOUT]] [/REBOOT-ALWAYS[:TIMEOUT]] [USE LOCATION:FILESHARE]  
[/USER:USERNAME] [/PASSWD:PASSWORD] [OVERRIDE-EXISTING-CONNECTION] [COMPONENT]  
[SUPPORT PACK] . . .
```

All arguments and information enclosed in brackets are optional. See the “Command line arguments” section for a full description of the arguments the Remote Deployment Console Utility accepts.

SETUPC is the command that launches the Remote Deployment Console Utility on the administrative server. The utility can be combined with other operating system commands to achieve multiple remote target server functionality. For additional information on combining SETUPC with other operating system commands, see the operating system documentation.



NOTE: HP recommends placing the Remote Deployment Console Utility in its own subdirectory on the administrative system. The Remote Deployment Console Utility file is SETUPC.EXE.

Command line arguments

Table 4 lists the command line arguments that the Remote Deployment Console Utility recognizes.

Table 4 Command line arguments

Command line argument	Description
/HELP or /?	This argument displays command line help information.
/USE-LATEST	This argument instructs SETUPC to automatically install the latest available Support Pack for the target operating system. “Latest available” means the latest available version for the target operating system that can be found in the file share specified by the /USE LOCATION parameter or in the directory containing SETUPC.EXE. Any additional components or Support Packs passed on the command line will be ignored.
/T [ARGET] : COMPUTER	This argument specifies the name of the computer to use as the target for the deployment operation. If this parameter is not specified, the local system is used by default.
/F [ORCE]	This argument changes the behavior of a component installation in one of the following ways: <ul style="list-style-type: none">• If the component is already installed and current, it reinstalls itself and the installed version number remains the same.• If a newer version of the component is already installed, the component installs itself and downgrades the component to the older version number.
/R [EBOOT] [: TIMEOUT]	This argument causes the target system to reboot if the installation requires a reboot to complete installation. A timeout in seconds can be specified. The timeout value must be between 15 and 3600 (1 hour). The default timeout is 15 seconds. The reboot takes place only if no installation errors occur.
/REBOOT-ALWAYS [: TIMEOUT]	This argument causes the target system to reboot after installation, even if a reboot is not required to complete installation. A timeout in seconds can be specified. The timeout value must be between 15 and 3600 (1 hour). The default timeout is 15 seconds.
/USE-LOCATION : FILESHARE	This argument instructs SETUPC to look in the specified directory or file share for Support Packs and components. If this parameter is not specified, the directory containing SETUPC.EXE is used by default. The current logged-in account must already have access to this location.
/USER : USERNAME	This argument specifies the user name to use to connect to the target computer.
/PASSWD : PASSWORD	This argument specifies the password to use to connect to the target computer.

Table 4 Command line arguments

Command line argument	Description
<code>/OVERRIDE_EXISTING_CONNECTION</code>	This argument instructs SETUPC.EXE to connect to the target computer and override any existing connection that might be present. HP recommends that you do not use this flag as a default. It overrides important safety checks that ensure that only one client is connected to a target computer at the same time. This parameter should only be used for recovery in a situation in which the Remote Deployment Console Utility is reporting that a connection to a target computer is present, even if no connection exists. This situation can occur if one of the remote deployment utilities does not shut down properly.

NOTE: The `/USER:` and `/PASSWD:` arguments do not have any effect when attempting to access the file share. They are only used when connecting to a target computer. See the “Command line examples” section for a usage example.

Command line examples

Although uppercase letters are used in the examples in Table 5, the Remote Deployment Console Utility is not case-sensitive.



IMPORTANT: When combining the `SETUPC` command with other operating system commands to achieve multiple remote target server functionality, do not mix the case of operating system environment variables. These variables are generally case-sensitive. For example, the operating system environment variable `%A` is not the same as the variable `%a`.

Table 5 Command line examples

Command line input	Result
<code>SETUPC /TARGET:COMPUTER1 CP004393.EXE</code>	This command installs the ROM flash component named <code>CP004393.EXE</code> from the current directory on the computer named <code>COMPUTER1</code> .
<code>SETUPC /TARGET:COMPUTER2 CP004393.EXE CP004366.EXE</code>	This command installs the ROM flash components named <code>CP004393.EXE</code> and <code>CP004366.EXE</code> located in the current directory on the computer named <code>COMPUTER2</code> .
<code>SETUPC /TARGET:COMPUTER2 /F CP004393.EXE</code>	This command forces the deployment of the ROM flash component named <code>CP004393</code> located in the current directory on the computer named <code>COMPUTER2</code> .
<code>FOR %S IN <COMP1 COMP2 COMP3> DO SETUPC /T:%S CP004393.EXE</code>	This command installs the ROM flash component named <code>CP004393.EXE</code> located in the current directory on the remote servers named <code>COMP1</code> , <code>COMP2</code> , and <code>COMP3</code> .

NOTE: For information about the syntax of the `FOR ... IN ... DO` operating system command, see the operating system documentation.

Scripting the Remote Deployment Console Utility

Command line instructions entered at the keyboard of the administrative server provide a quick way to upgrade system and option ROM firmware on target servers. However, if the instructions are used on a repetitive basis or the ROM upgrade process is complicated because of the network environment, you can script the Remote Deployment Console Utility to automate the ROM upgrade procedures.

Scripting the deployment utility and the Smart Components for ROM Flash enables you to achieve full integration with other HP software maintenance and deployment tools, such as the SmartStart Scripting Toolkit suite of operating system deployment utilities.

See the *HP SmartStart Scripting Toolkit User Guide* for additional information about the SmartStart Scripting Toolkit utilities. The user guide is available at <http://www.hp.com/servers/sstoolkit>.

In addition, scripting the deployment utility decreases the chances of errors. The ROM upgrade batch file scripts that are created can be run by virtually anyone by entering the name of the script and pressing the **Enter** key on the administrative server keyboard.



IMPORTANT: For local and remote ROM upgrades to succeed, be sure that the points outlined in the “Requirements” section are met before initiating the ROM upgrade process.

To script the Remote Deployment Console Utility, use any text editor to create a batch file with either a .BAT or .CMD extension. Use syntax that is accepted by the Remote Deployment Console Utility, and include only commands that are recognized by the operating system.

Common batch file-specific operating system commands

Several batch file-specific operating system commands can be used in the ROM upgrade batch file scripts. The following operating system commands are commonly used in batch files:

- **CALL**—Runs a second batch file and then returns to the first batch file.
- **ECHO**—Displays messages on the screen and turns the DOS echo feature on or off.
- **FOR**—Performs a command for a group of files or directories.
- **GOTO**—Switches to commands in another part of the batch file and continues processing commands from that point.
- **IF**—Performs a command based on the result of a condition.
- **PAUSE**—Temporarily stops the batch file from running. The batch file resumes when a key is pressed.
- **REM**—Annotates the batch file for documentation purposes.
- **SHIFT**—Changes the position of replaceable parameters.

For more information on batch files and syntax on each of these commands, see the operating system documentation.

Return codes

In addition to using batch file-specific operating system commands in script files, you can also use return codes reported to the operating system by each Smart Component for ROM Flash after it has finished running on the target server.

These return codes are processed by the %errorlevel% operating system variable, and the codes are used to determine the status of a flash upgrade procedure. You can also use the return codes within the script file to control the execution of the script file and determine any branching that is required.

In addition to the Smart Component for ROM Flash return codes, the Remote Deployment Console Utility also provides error-level feedback to the operating system. Table 6 summarizes the Remote Deployment Console Utility return codes.

Table 6 Return codes

Error level	Meaning
0	Installation was successful for all components.
1	An application error occurred that prevented installation from completing successfully. The following errors are possible: <ul style="list-style-type: none"> • Failure to communicate across the network connection • Failure to start the installation of a component • Failure to determine the installation results
2	One or more components failed to install correctly.
3	A user error occurred that prevented the application from continuing. This error is most likely caused by incorrect command line options passed on to the Remote Deployment Console Utility.

Scripting example

The following text is an example .CMD script file that uses the operating system FOR . . . IN . . . DO command. This script is used to deploy a system and a Smart Array Smart Component for ROM Flash stored in a centralized, network-based software repository on three different target servers accessible over a network connection.



IMPORTANT: Before running a script file from an administrative server, be sure that all requirements in the “Requirements” section in this chapter are met.

The script file also checks the error level returned by the Remote Deployment Console Utility and determines whether an error occurred during any portion of the ROM upgrade procedure.

In this example, the network-based software repository is mapped to the M drive, and the Smart Components for ROM Flash and Remote Deployment Console Utility are stored in the \ROMFILES subdirectory of the repository.

```
@echo off
REM *** Define an operating system environment variable set
REM *** exists_error=
REM *** In script files, two % signs are used to refer to
REM *** operating system variables
REM *** All operating system variables are case-sensitive
REM *** Target system ROM upgrade starts after this line on
REM *** remote network servers
echo Updating system ROM on Compaq ProLiant 3000 servers, ROM family P09
for %%a in (server1 server2 server3) do m:\romfiles\setupc /t :%%a /f /s
    m:\romfiles\cp000238.exe
if "%errorlevel%"=="2" set exists_error=yes
REM *** Target array controller ROM upgrade starts after this line
REM *** on remote network servers
echo Updating Integrated Smart Array Controller ROM
for %%b in (server4 server5 server6) do m:\romfiles\setupc /t:%%c /f /s
    m:\romfiles\cp000252.exe
if "%errorlevel%"=="2" set exists_error=yes
if "%exists_error%"=="yes" echo Attention!!!: There has been an error in the ROM
procedure...
echo Installation complete
echo See the C:\CPQSYSTEM\LOG\CPQSETUP.LOG installation log file on each target
echo server for details on the ROM upgrade performed.
```

The /F argument forces all ROM upgrades, regardless of the ROM versions that exist on the target servers. The /S argument suppresses console messages of the Remote Deployment Console Utility during the deployment process.

Downgrading ROM firmware to previous versions

In certain server environments, a previous ROM version might work better than the latest ROM version. Backups of the previous ROM image are made using redundant ROM or an automatic backup. See the “Backup of the original system ROM” section in this chapter for the location of the ROM image backup directory.

Five methods for downgrading to a previous system or option ROM version are available:

- Smart Component downgrade
- Deployment utility downgrade
- ROM Update Utility downgrade
- ROMPaq downgrade
- Redundant ROM downgrade

Smart Component downgrade

Use the Smart Component downgrade method for the required ROM version downgrade available in Smart Component for ROM Flash format. This downgrade method can be used locally on a target server.

To downgrade a system or option ROM using a Smart Component:

1. Obtain the previous version of the system or option Smart Component for ROM Flash for the target server that must be downgraded.
See the “Obtaining Smart Components for ROM flash and deployment software” section in Chapter 1 for information about how to obtain the file.
2. Be sure that all requirements in the “Requirements” section in this chapter are met.
3. Double-click the component to install it.
4. After the Smart Component for ROM Flash has installed successfully, reboot the target server for the ROM downgrade to take effect.

Deployment utility downgrade

Use the deployment utility method for the required ROM version downgrade available in Smart Component for ROM Flash format. This downgrade method can be used locally or remotely on a target server. This method also allows for ROM downgrades on one or more target servers.

To downgrade a system or option ROM using the automatic method:

1. Obtain the previous version of the system or option Smart Component for ROM Flash for the target server that must be downgraded.
See the “Obtaining Smart Components for ROM flash and deployment software” section in Chapter 1 for information about how to obtain the file.
2. Be sure that all requirements in the “Requirements” section in this chapter are met.
3. Use the Remote Deployment Console Utility from a command line prompt on an administrative server with the /F argument. For more information, see the “Command line arguments” section in this chapter.



NOTE: If you are downgrading multiple target systems over a network connection, the target systems must be accessible, and the account that is running the Remote Deployment Console Utility must have administrative access to the target systems.

4. After the Smart Component for ROM Flash has installed successfully, reboot the target server for the ROM downgrade to take effect.

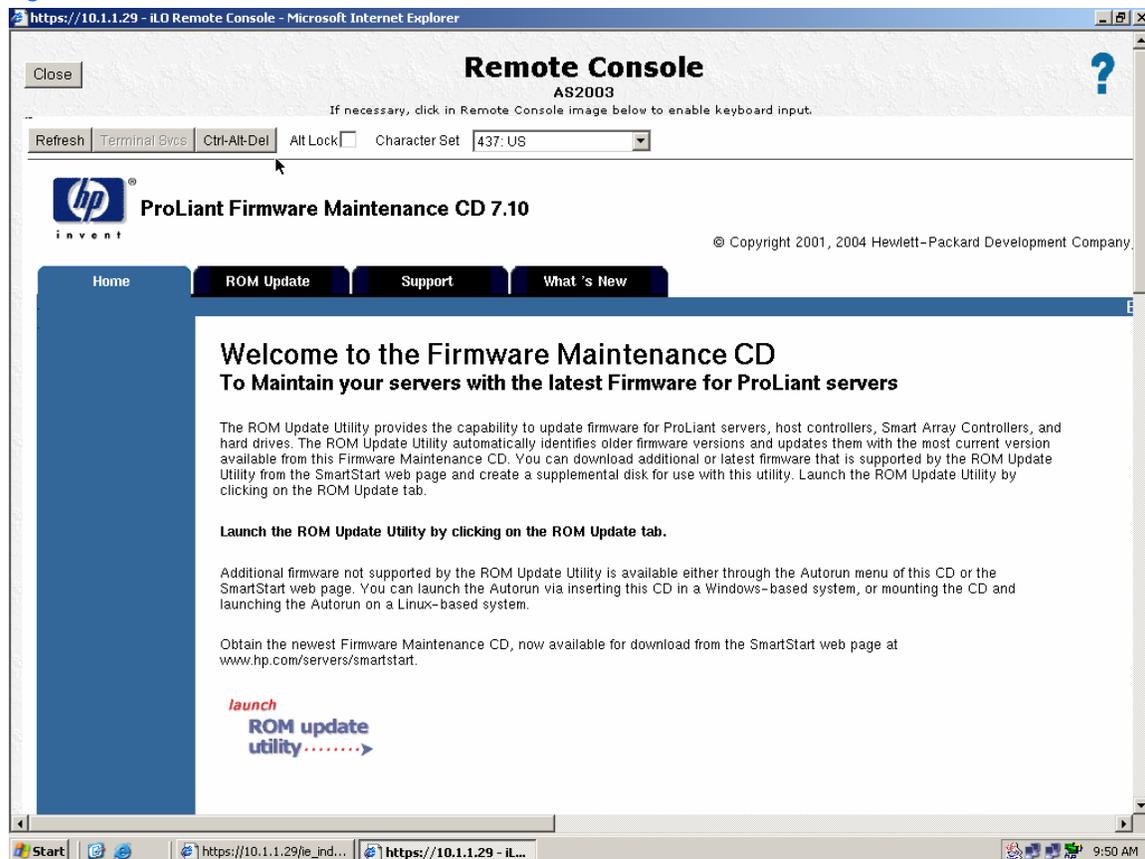


NOTE: Integrated Lights-Out ROM flash components do not require a system reboot for a ROM downgrade to take effect.

ROM Update Utility downgrade

To access the ROM Update Utility to perform a ROM downgrade, boot a server from the HP SmartStart CD 6.00 or later or the HP Firmware Maintenance CD 7.0 or later. The screen in Figure 9 appears.

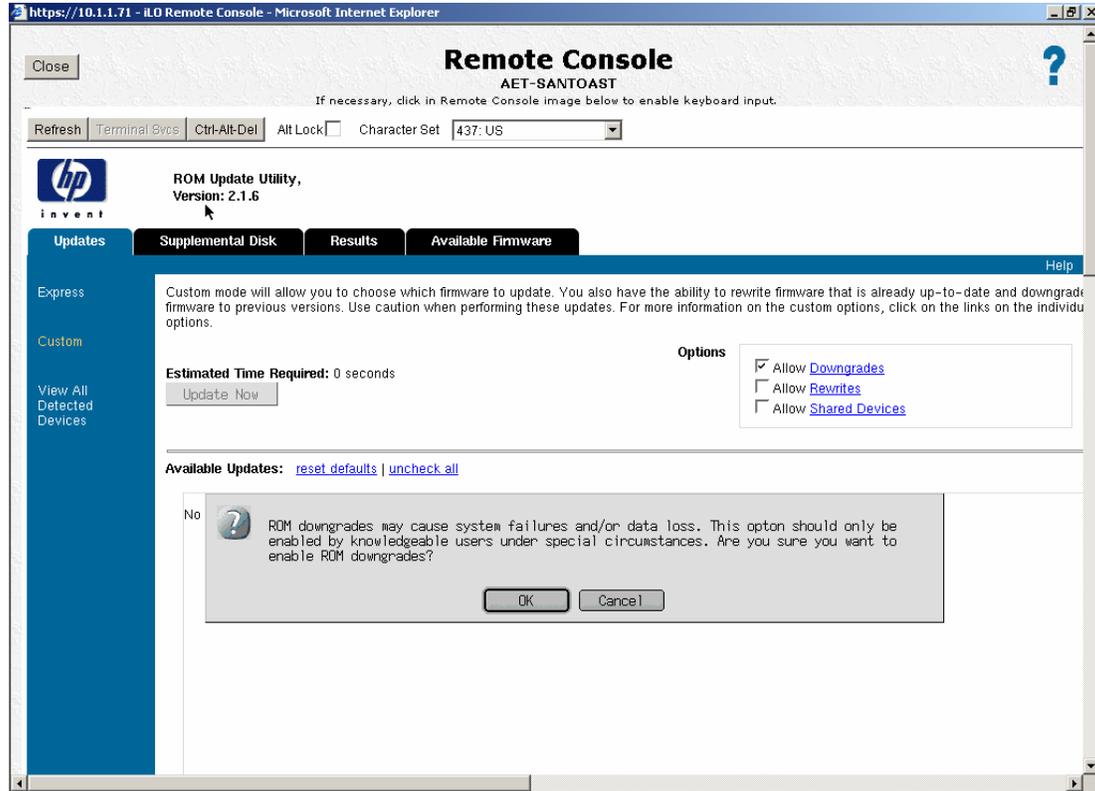
Figure 9 ProLiant Firmware Maintenance CD



To perform a ROM downgrade using the ROM Update Utility:

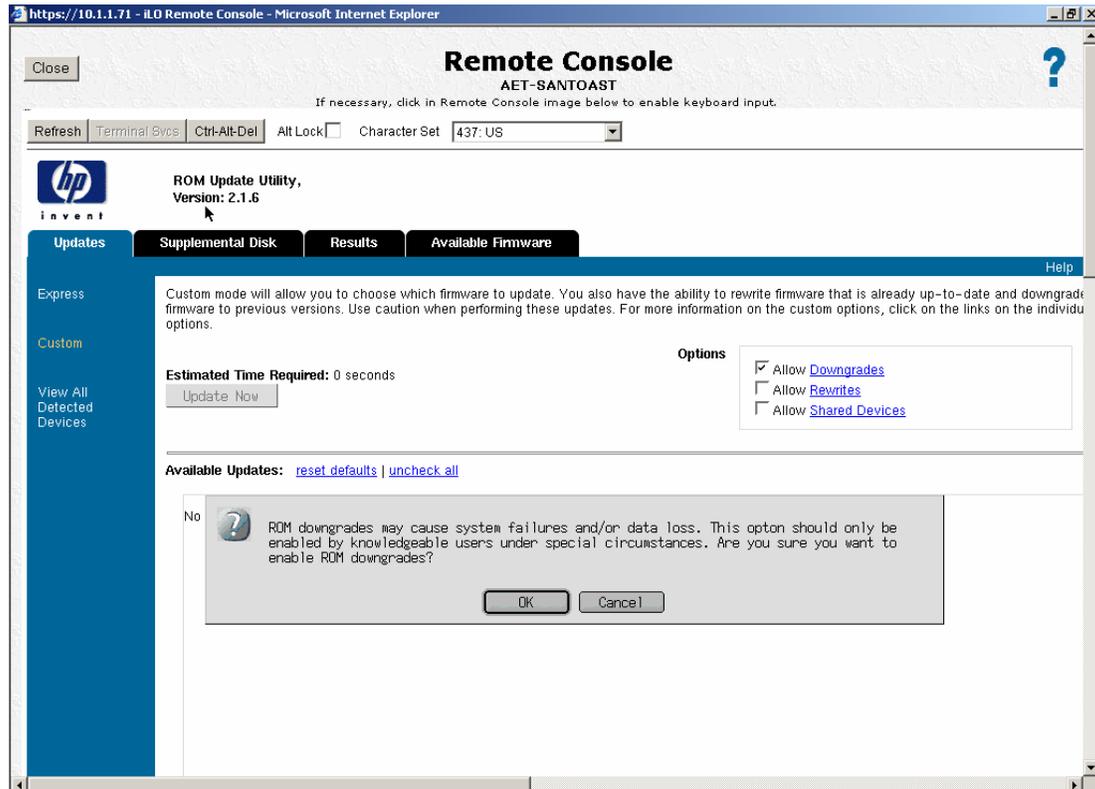
1. Click **Launch ROM Update Utility**. The following window appears.

Figure 10 Updates tab



2. Select **Custom** from the menu on the left side of the window.
3. In the Options section, select **Allow Downgrades**. A warning message appears, as shown in Figure 11.

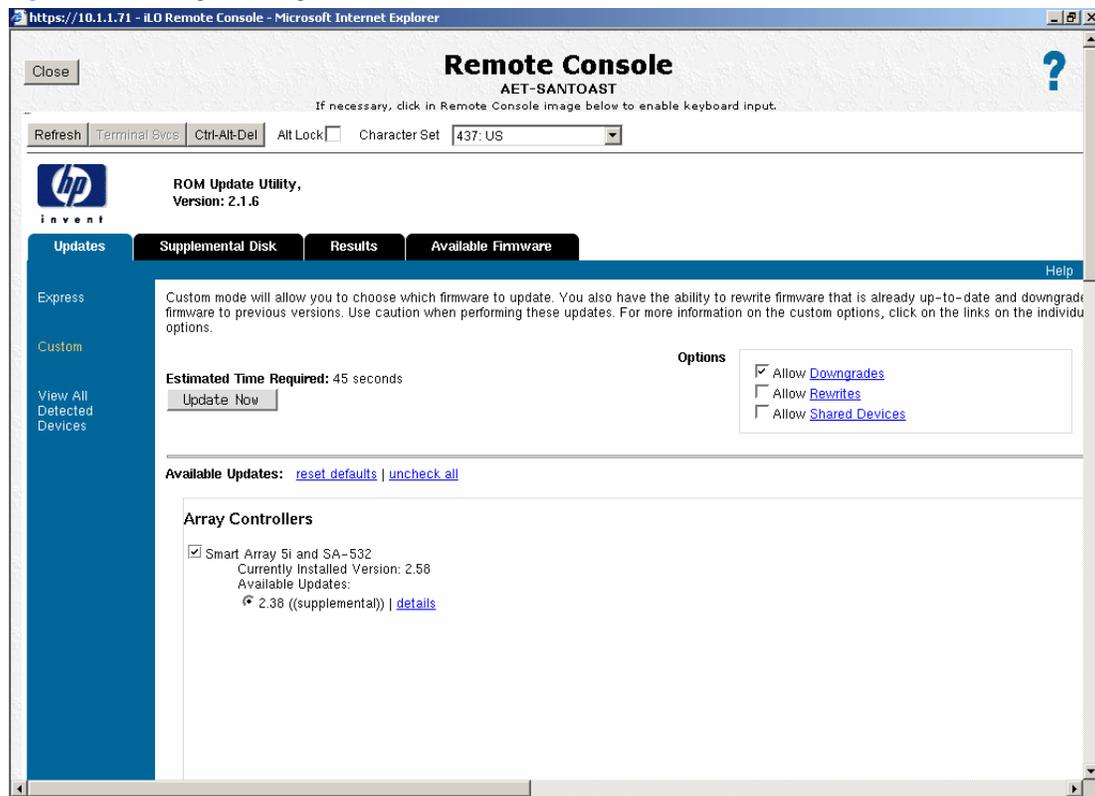
Figure 11 Downgrade warning message



4. Click **OK**.

5. Select a firmware downgrade, as shown in Figure 12.

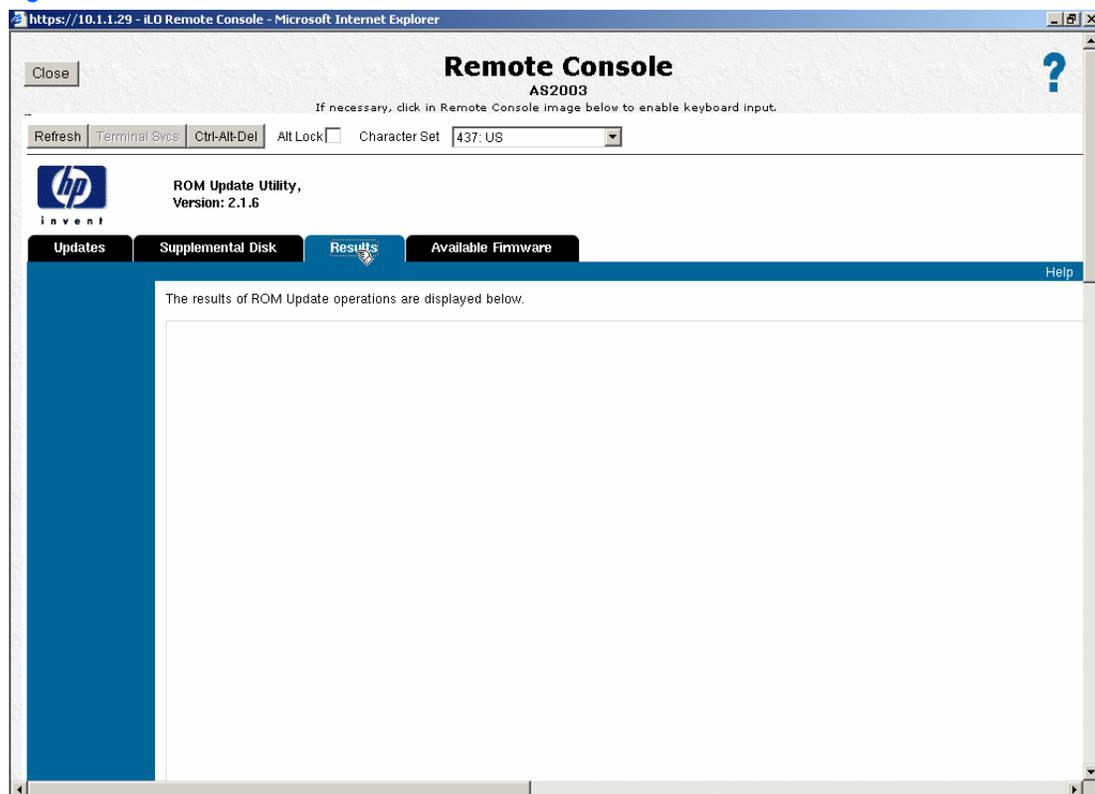
Figure 12 Selecting a downgrade



6. Click **Update Now**.

7. To determine whether the downgrade was successful, click the **Results** tab.

Figure 13 Results tab



ROMPaq downgrade

The traditional ROMPaq method can also be used to downgrade the system or option ROM firmware.

 **CAUTION:** This ROM downgrade method can only be performed locally on the target server. If an error such as a power failure, operating system lockup, or some other catastrophic event occurs during the ROM downgrade process, the ROM downgrade will not complete and the ROM image on the target server will be corrupted. If this occurs, the server will not operate correctly, and you must implement ROM disaster recovery procedures to regain server functionality.

 **NOTE:** With the exception of the SA5312 Controller, storage option ROMs cannot be downgraded using the ROMPaq method. ROMPaqs have been retired as a delivery method for storage options. To downgrade storage option ROMs, use one of the other methods discussed in this chapter. For more information about the SA5312 controller, see <http://h18007.www1.hp.com/support/files/server/us/locate/7220.html>.

To downgrade a system or option ROM using the ROMPaq method:

 **NOTE:** RILOE II ROM flash components do not use the ROMPaq method for downgrading ROM firmware. To downgrade RILOE II ROM flash components, use the Smart Component downgrade method described in the previous section.

1. Obtain the previous version of the ROMPaq files for the target server that must be downgraded. The ROMPaq files can be obtained in the same way as the Smart Components for ROM Flash. See the “Obtaining Smart Components for ROM flash and deployment software” section in Chapter 1 for sources for the ROMPaq files.
2. Create the ROMPaq diskette that will be used to restore the system ROM.

 **IMPORTANT:** If the ROM is corrupted on the target server because the ROMPaq ROM restoration procedure was interrupted, the initial ROMPaq attempt might have affected the contents of the ROMPaq diskette. HP recommends creating a new ROMPaq diskette.

3. Insert the ROMPaq diskette into the target server.
4. Reboot the server.
5. Flash the ROM.
6. Reboot the server again to enable the upgrade to take effect.

See the documentation on the ROMPaq diskette for additional information about using the ROMPaq diskette to flash the ROM firmware of the target server.

Redundant ROM downgrade

On servers with the redundant ROM feature, the ROM acts as two separate ROMs. In the standard implementation, one side of the ROM contains the current ROM version, while the other side of the ROM contains the backup version, enabling you to switch easily to the backup version.

To switch between ROM versions:

1. Access RBSU by pressing the **F9** key when prompted at startup.
2. Select **Redundant ROM** in the Advanced Options menu of RBSU.
3. Select one of the ROM banks as the system ROM.
4. Press the **Enter** key.
5. Press the **Esc** key to exit the current menu, or press the **F10** key to exit RBSU.
6. Restart the server.

Recovering from a failed ROM upgrade

The following sections explain the procedure for recovering from system and option ROM upgrade failures.

System ROM upgrade failure

Recovery from a system ROM upgrade failure can be accomplished using the redundant ROM feature of a server or using ROMPaq.

Redundant ROM recovery

On servers with the redundant ROM feature, the ROM acts as two separate ROMs. In the standard implementation, one side of the ROM contains the current ROM version, while the other side of the ROM contains the backup version, enabling you to switch easily to the backup version. This feature protects the previous ROM version, even if a power failure occurs while flashing the ROM.

When the server boots, the system identifies whether the current ROM bank is corrupt. If a corrupt ROM is detected, the system boots from the backup ROM and alerts you through POST that the ROM bank is corrupt.

If RBSU is inaccessible, you can switch ROM images by changing the switch settings on the system configuration switch. See your server documentation for more information.

If both ROM images are corrupt, use the following ROMPaq recovery.

ROMPaq recovery

The ROM upgrade process must be complete for the ROM upgrade to be successful.



CAUTION: If a power failure, operating system lockup, or other catastrophic event occurs during the system ROM upgrade process, the ROM upgrade will not complete and the ROM image on the target server will be corrupted. If this occurs, the server will not operate correctly, and you must implement ROM disaster recovery procedures to regain server functionality.

Because the target server does not operate correctly when the system ROM is corrupted, you cannot implement disaster recovery procedures by using the Smart Components for ROM Flash. Instead, use ROMPaq diskettes to restore the corrupted target server system ROM.



NOTE: Although ROMPaq disaster recovery is supported on HP ProLiant servers, each server has unique directions for powering down, opening the chassis, and locating the system maintenance switch block on the server system board. For server-specific information and warnings, see the server user guide.

To perform ROMPaq disaster recovery on any HP server that has a corrupted ROM image:

1. Obtain the latest ROMPaq version for the target server.
The ROMPaq files are obtained in the same way as the Smart Components for ROM Flash. See the “Obtaining Smart Components for ROM flash and deployment software” section in Chapter 1 for ROMPaq file sources.
2. Create the ROMPaq diskette that will be used to restore the server system ROM.



IMPORTANT: If the ROM is corrupted on the target server because the ROMPaq ROM restoration procedure was interrupted, the initial ROMPaq attempt might have affected the contents of the ROMPaq diskette. HP recommends creating a new ROMPaq diskette.

3. Power down the server that contains the system ROM that must be restored.
4. Open the server chassis.
5. Set the disaster recovery mode switches. See the server documentation and hood labels for the location and proper configuration of these switches.
6. Insert the ROMPaq diskette into the diskette drive.
7. Power up the target server. The keyboard, mouse, and monitor will all be inactive. When the server is powered up, two long beeps indicate that the server is in disaster recovery mode. The server then reads the ROMPaq diskette for the latest ROM image and flashes the system ROM on the target server. A quick series of beeps indicates successful completion of the system ROM recovery process.
8. When the disaster recovery process has successfully completed:
 - a. Remove the ROMPaq diskette from the drive, and power down the server.
 - b. Return the configuration switches to their original positions.
 - c. Reassemble the server chassis.
 - d. Power up the server.

Option ROM upgrade failure

Perform recovery for option ROMs using one of the following methods.



NOTE: Storage option ROMs cannot be downgraded using the ROMPaq method because ROMPaqs have been retired as a delivery method for storage options. To downgrade storage option ROMs, use one of the other methods discussed in this chapter.

Array Controller ROMs

The following controllers support Recovery ROM, which protects against a ROM corruption: SA5i, SA5i Plus, SA532, SA641/642, SA5312, SA5302/5304, SA5312, and SA6402/6404.

Recovery ROM is a redundancy feature that ensures continuous system availability by providing a backup ROM. During the flash process, a new version of the firmware can be flashed to the ROM while the controller maintains the last known version of the firmware. If the firmware becomes corrupt, the controller reverts back to the redundant version of the firmware and continues operating.

iLO ROMs

To perform disaster recovery for iLO ROMs:

1. Power down the server.
2. Open the server chassis.
3. Locate the iLO Security Override Switch.



NOTE: Depending on your server, the iLO Security Override Switch might be a single jumper or a specific switch position on a dipswitch panel. To access and locate the iLO Security Override Switch, see the server documentation.

4. Set the switch to the “override” position.
5. Proceed as described in the “Downgrading ROM firmware to previous versions” section in this chapter.
6. Reset the Security Override Switch to the default “secure” position.

RILOE II ROMs

The RILOE II component includes a utility that can be used for disaster recovery. To perform disaster recovery for RILOE II ROMs:



NOTE: A ROM upgrade failure for a RILOE II ROM occurs if the board has been left in an inert state, which happens if power is removed from the board during the upgrade process.

1. Extract MAKEDISK.BAT from the RILOE II component.
2. Run MAKEDISK.BAT to create a bootable diskette.
3. Power down the server.
4. Open the server chassis.
5. Locate dipswitch 3. See the server documentation to determine the location of the dipswitch.
6. Change the position of the dipswitch.
7. Power on the server.
8. Run the bootable diskette created in step 2.

ROM flashing in Novell NetWare

Requirements

-  **CAUTION:** Because of the potential risk of damage to the target server ROM and loss of data on target servers, Smart Components for ROM Flash should be used only by individuals who are experienced in the deployment of such components. Be sure that all data is backed up so that mission-critical systems are not disrupted if a failure occurs during the flash procedure. If a failure does occur while flashing a system or option ROM on a target server, see the “Downgrading system ROM firmware to previous versions” and “Recovering from a failed system ROM upgrade” sections in this chapter for information about downgrade and disaster recovery procedures.

Before using the Smart Components for ROM Flash, be sure that a local target server configured with one of the following is available:

- NetWare 5.1—Base installation. However, HP recommends Support Pack 6 or later.
- NetWare 6.0—Base installation. However, HP recommends Support Pack 3 or later.
- NetWare 6.5—Base installation.

-  **NOTE:** Only the base installation of NetWare 6.5 is supported. The Smart Components for ROM Flash are not supported with NetWare 6.5 Support Pack 1 or later. For more information, see Engineering Advisory (EA) EN040604_CW01 at http://h20000.www2.hp.com/bizsupport/TechSupport/Document.jsp?objectID=PSD_EN040604_CW01.

To determine the ROM family and version of HP server products, see “Identifying the system ROM family for your server” at <http://h18023.www1.hp.com/support/files/server/us/romhowto.html>.

Overview of the ROM flash upgrade process

The ROM flash upgrade of a system ROM occurs when individual Smart Components for ROM Flash are run interactively from a command prompt on a server.

-  **NOTE:** Smart Components for ROM Flash that are run interactively will only upgrade ROM firmware locally.

The server does not need to be rebooted before the system ROM flash upgrade begins.

During the online ROM upgrade process, the following events occur:

1. The type of target operating system is determined. If the operating system running on the target server is not supported by the Smart Component, the procedure stops.
2. System hardware and firmware dependencies are verified on the server. If the ROM upgrade is not the correct ROM upgrade for the server, the procedure stops.

-  **NOTE:** Servers with redundant ROM maintain a backup ROM image. On servers without redundant ROM, a backup of the current system ROM image is made in the SYS:\ETC\FWBACKUP\SYSTEM subdirectory. You can use the ROM image backup for disaster recovery or ROM downgrade purposes.

3. The system ROM of the server is flashed by the Smart Component while the server is still online.
4. When the flash upgrade is complete, the server remains online. The server must be restarted for system ROM upgrades to take effect.

-  **NOTE:** All ROM upgrade activity (including errors) is written by the individual Smart Components for ROM Flash to a common installation log file called SYS:\ETC\CPQLOG.LOG on every server. This subdirectory is located off the root directory of the SYS volume. Information regarding subsequent installation activity is appended to the same log file, providing a chronological history of all component installation activity on the server.

Using the Smart Components for ROM Flash locally

Launch the Smart Components for ROM Flash locally by using a command line prompt. Using a command line prompt enables you to pass arguments to the Smart Component for ROM Flash to alter its installation behavior.

Command line syntax

All Smart Components for ROM Flash use the following general command line syntax :

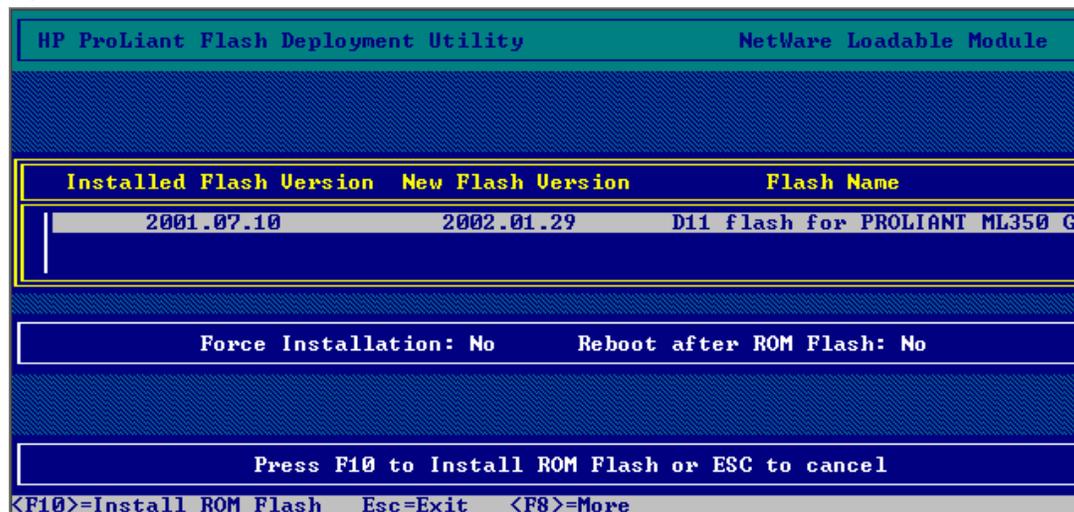
```
CPXXXXXX [/S[ILENT]] [/F[ORCE]] [/R[EBOOT]] [/H[ELP]] [/?]
```

All arguments and information enclosed in brackets are optional. See Table 7 for a full description of the arguments the Smart Components for ROM Flash accept.

CPXXXXXX is the command that launches the Smart Component for ROM Flash on the target server. The six Xs represent the serialized number assigned to the component.

If arguments are not specified on the command line, a screen similar to Figure 14 appears. Press the **F10** key to begin the installation of the Smart Component for ROM Flash.

Figure 14 Smart Components for ROM Flash information]



Command line arguments

The command line arguments that Smart Components for ROM Flash recognizes are listed in Table 7.

Table 7 Command line arguments

Command line argument	Description
/H[ELP] or /?	This argument displays command line Help information.
/S[ILENT]	This argument runs the installation without user interaction and without feedback.
/F[ORCE]	This argument specifies whether an installation will be forced, regardless of the ROM version that is detected on the target server. This argument is only applicable with the /S flag. If this argument is omitted from the command line, the installation is not forced.
/R[EBOOT]	This argument specifies whether the target server will reboot if the Smart Component is successfully installed. If this argument is omitted from the command line, the server must be rebooted manually for the ROM upgrade to take effect.
/X	This argument extracts all files in the package to the specified path.

IMPORTANT: The /R argument must be used with caution when online ROM flash mode is supported by the server. Because the argument enables the target server to reboot automatically, you cannot copy the existing ROM image backup file to a standard 1.44-MB diskette. The Smart Component for ROM Flash generates this backup file before the original ROM is replaced with the updated version, except on systems with redundant ROM. If a failure occurs during the ROM upgrade process, it might be necessary to implement system ROM recovery procedures. See the “Downgrading system ROM firmware to previous versions” and “Recovering from a failed system ROM upgrade” sections in this chapter for details.

Command line examples

Although uppercase letters are used in the examples in Table 8, Smart Components for ROM Flash are not case-sensitive.

Table 8 Command line examples

Command line input	Result
CP000236	This command line deploys the CP000236.NLM system ROM flash component to the server using the defaults of the component.
CP000238 /S	This command line deploys the CP000238.NLM system ROM flash component to the server using the defaults of the component. All console messages are suppressed.

Backup of the original system ROM

Backups of the most current ROM image are available using one of the following methods:

- Redundant ROM—The ROM image acts as two separate ROMs. One section of the ROM contains the most current ROM version, while the other section of the ROM contains a previous version.
- Automatic backup—If the target server ROM family supports online ROM flash, the Smart Component for ROM Flash automatically makes a backup copy of the existing ROM image in the \ETC\FWBACKUP\SYSTEM subdirectory. The ROM image backup subdirectories are located off the root of the SYS volume.



NOTE: If you want to have the backup ROM image readily available, copy the image to a standard 1.44-MB diskette before rebooting the server. If a failure occurs during the ROM upgrade process, the diskette containing the backup ROM image can be used to restore the original ROM version.

Unless you are running in silent mode, a status screen appears when the installation is complete. If you have elected to reboot the server, the server will reboot after you exit the installation. If you have installed using silent mode, look at the SYS:\ETC\CPQLOG.LOG file to determine if the flash was successful.

Unsuccessful upgrades

If a Smart Component ROM flash upgrade is attempted on a system that is not supported by the firmware type of the Smart Component, an error message appears, indicating that the ROM flash component was not installed.



CAUTION: If an error such as a power failure, operating system lockup, or some other catastrophic event occurs before a ROM upgrade process is completed, the ROM image on the server will be corrupted. If this occurs, implement disaster recovery procedures for system ROM firmware. See the “Downgrading system ROM firmware to previous versions” and “Recovering from a failed system ROM upgrade” sections for information about downgrade and disaster recovery steps to follow.

Common installation log file

All ROM upgrade activity (including errors) is written by the individual Smart Component for ROM Flash to a common installation log file called SYS:\ETC\CPQLOG.LOG on the server. Information regarding subsequent installation activity is appended to the same log file, providing a chronological history of all component installation activity on the server.

Downgrading system ROM firmware to previous versions

In certain server environments, a previous ROM version might work better than the latest ROM version. Backups of the previous ROM image are made using redundant ROM or an automatic backup. See the “Backup of the original system ROM” section in this chapter for the location of the ROM image backup directory.

Two methods for downgrading to a previous system ROM version are available:

- Smart Component downgrade
- ROMPaq downgrade

Smart Component downgrade

Use the Smart Component downgrade method if the ROM version you want to downgrade is available in Smart Component for ROM Flash format.

To downgrade a system ROM using the automatic method:

1. Obtain the previous version of the system Smart Component for ROM Flash for the server that must be downgraded.
See the “Obtaining Smart Components for ROM flash and deployment software” section in Chapter 1 for information about how to obtain the file.
2. Be sure that all requirements under the “Requirements” section in this chapter are met.
3. Install the Smart Component for ROM Flash with the `FORCE` option (`/F`).
4. After the Smart Component for ROM Flash has installed successfully, reboot the server for the ROM downgrade to take effect.

ROMPaq downgrade

The traditional ROMPaq method can also be used to downgrade the system ROM.

 **CAUTION:** This ROM downgrade method can only be performed locally on the server. If an error such as a power failure, operating system lockup, or some other catastrophic event occurs during the ROM downgrade process, the ROM downgrade will not complete and the ROM image on the server will be corrupted. If this occurs, the server will not operate correctly, and you must implement ROM disaster recovery procedures to regain server functionality.

To downgrade a system ROM using the ROMPaq method:

1. Obtain the previous version of the system ROMPaq files for the server that must be downgraded.
The ROMPaq files can be obtained in the same way as the Smart Components for ROM Flash. See the “Obtaining Smart Components for ROM flash and deployment software” section in Chapter 1 for sources for the ROMPaq files.
2. Create the ROMPaq diskette that will be used to restore the system ROM.

 **IMPORTANT:** If the ROM is corrupted on the target server because the ROMPaq ROM restoration procedure was interrupted, the initial ROMPaq attempt might have affected the contents of the ROMPaq diskette. HP recommends creating a new ROMPaq diskette.

3. Insert the ROMPaq diskette into the target server.
4. Reboot the server.
5. Flash the ROM.
6. Reboot the server again to enable the upgrade to take effect.

See the documentation on the ROMPaq diskette for additional information about using the ROMPaq diskette to flash the ROM firmware of the server.

Redundant ROM downgrade

On servers with the redundant ROM feature, the ROM acts as two separate ROMs. In the standard implementation, one side of the ROM contains the current ROM version, while the other side of the ROM contains the backup version, enabling you to switch easily to the backup version.

To switch between ROM versions:

1. Access RBSU by pressing the **F9** key when prompted at startup.
2. Select **Redundant ROM** in the Advanced Options menu of RBSU.
3. Select one of the ROM banks as the system ROM.
4. Press the **Enter** key.
5. Press the **Esc** key to exit the current menu, or press the **F10** key to exit RBSU.
6. Restart the server.

Recovering from a failed system ROM upgrade

Recovery from a system ROM upgrade failure can be accomplished using the redundant ROM feature of a server or using ROMPaq.

Redundant ROM recovery

On servers with the redundant ROM feature, the ROM acts as two separate ROMs. In the standard implementation, one side of the ROM contains the current ROM version, while the other side of the ROM contains the backup version, enabling you to switch easily to the backup version. This feature protects the previous ROM version, even if a power failure occurs while flashing the ROM.

When the server boots, the system identifies whether the current ROM bank is corrupt. If a corrupt ROM is detected, the system boots from the backup ROM and alerts you through POST that the ROM bank is corrupt.

If RBSU is inaccessible, you can switch ROM images by changing the switch settings on the system configuration switch. See your server documentation for more information.

If both ROM images are corrupt, use the following ROMPaq recovery procedure.

ROMPaq recovery

The entire ROM upgrade process must be completed for the ROM upgrade to be successful.

 **CAUTION:** If an error such as a power failure or some other catastrophic event occurs during the system ROM upgrade process, the ROM upgrade will not complete and the system ROM image on the server will be corrupted. If this occurs, the server will not operate correctly, and you must implement ROM disaster recovery procedures to regain server functionality.

Because the server does not operate correctly when the system ROM is corrupted, you cannot implement disaster recovery procedures by using the Smart Components for ROM Flash. Instead, use ROMPaq diskettes to restore a corrupted system ROM.

 **NOTE:** Each server has unique directions for powering down, opening the chassis, and locating the system maintenance switch block on the server system board. For server-specific information and warnings, see the server user guide.

To perform ROMPaq disaster recovery on any HP server that has a corrupted ROM image:

1. Obtain the latest ROMPaq version for the server.
The ROMPaq files can be obtained in the same way as the Smart Components for ROM Flash. See the "Obtaining Smart Components for ROM flash and deployment software" section in Chapter 1 for sources for the ROMPaq files.
 2. Create the ROMPaq diskette that will be used to restore the system ROM.
-

 **IMPORTANT:** If the system ROM is corrupted because the ROMPaq ROM restoration procedure was interrupted, the initial ROMPaq attempt might have affected the contents of the ROMPaq diskette. HP recommends creating a new ROMPaq diskette.

3. Power down the server that contains the system ROM that must be restored.
4. Open the server chassis.
5. Set the disaster recovery mode switches. See the server documentation and hood labels for the location and proper configuration of these switches.
6. Insert the ROMPaq diskette into the diskette drive.
7. Power up the server. The keyboard, mouse, and monitor will all be inactive. When the server has powered up, the server emits two long beeps to indicate that it is in disaster recovery mode. The server then reads the ROMPaq diskette for the latest ROM image and flashes the system ROM on the server. A quick series of beeps indicates successful completion of the system ROM recovery process.
8. When the disaster recovery process has successfully completed:
 - a. Remove the ROMPaq diskette from the drive, and power down the server.
 - b. Return the configuration switches to their original positions.
 - c. Reassemble the server chassis.
 - d. Power up the server.

ROM flashing in Linux

Requirements

 **CAUTION:** Because of the potential risk of damage to the target server ROM and loss of data on target servers, Smart Components for ROM Flash should be used only by individuals who are experienced in the deployment of such components. Be sure that all data is backed up so that mission-critical systems are not disrupted if a failure occurs during the flash procedure. If a failure does occur while flashing a system or option ROM on a target server, see the “Downgrading ROM firmware to previous versions” and “Recovering from a failed ROM upgrade” sections in this chapter for information about downgrade and disaster recovery procedures.

Before using the Smart Components for ROM Flash, you must log in to the target server as the root user.

 **NOTE:** Certified Linux software versions can be found on the Linux server certification matrix website at <http://h18000.www1.hp.com/products/servers/linux/hplinuxcert.html>.

A list of system and option ROM families and servers currently supported by the Smart Components for ROM Flash is available. To view the list, click the link for your operating system on the web page at <http://h18023.www1.hp.com/support/files/server/us/romflash.html>.

To determine the ROM family and version of HP server products, see “Identifying the system ROM family for your server” at <http://h18023.www1.hp.com/support/files/server/us/romhowto.html>.

When upgrading option ROM firmware, be sure that the latest drivers for the options are installed on the target servers.

For an updated list of servers, system ROM families, and server options supported by the Smart Components for ROM Flash, see the documentation included in the SoftPaq download or at <http://www.hp.com/servers/swdrivers>.

Overview of the ROM flash upgrade process

The ROM flash upgrade of a target system ROM or option ROM occurs when individual Smart Components for ROM Flash are run interactively from a shell prompt on a target server.

The Smart Components for ROM Flash use an online upgrade process when implemented with Linux-based servers. Smart Components for ROM Flash that are run interactively upgrade ROM firmware locally. If remote ROM upgrades are required, Smart Components for ROM Flash must be used with the standard Linux remote utilities, such as FTP, Telnet, RSH, or SSH. See the Linux operating system documentation for specific instructions.

 **IMPORTANT:** Do not reboot the target server while the upgrade is in progress.

During the online ROM upgrade process, the following events occur:

1. The access privileges are verified on the target server. If administrative privileges are not set up correctly on the target server, a message appears, and the ROM upgrade procedure stops.
2. System hardware and firmware dependencies are verified on the target server. If the ROM upgrade is not the correct ROM upgrade for the target server, the procedure stops.
3. For system ROM, a backup of the current ROM image is made on the target server in the /var/cpq/backup subdirectory. The ROM image backup can be used for disaster recovery or ROM downgrade purposes.

 **NOTE:** Servers with redundant ROM maintain a backup ROM image and therefore do not automatically back up the ROM image during the flash process.

4. Smart Components for ROM Flash flashes the system ROM or option ROM of the target server while the server is still online.
5. When the flash upgrade is complete, the target server remains online.
6. For system ROM, copy the backup ROM image to a diskette.
7. The server must be rebooted to start using the new ROM.

All ROM upgrade activity (including errors) is written by the individual Smart Components for ROM Flash to a common installation log file called `component.log` in the `/var/cpq` subdirectory on every target server.

Information regarding subsequent installation activity is appended to the same log file, providing a chronological history of all component installation activity on the target server.

Using Smart Components for ROM Flash locally

Launch the Smart Components for ROM Flash locally by using a shell prompt, which passes arguments to the Smart Component for ROM Flash to alter its installation behavior.

Command line syntax

All Smart Components for ROM Flash use the following general command line syntax:

```
CPXXXXXX.scexe [-s [-f] [-r]]
```

All arguments and information enclosed in brackets are optional. See Table 9 for a complete description of the arguments that the Smart Components for ROM Flash accept.

`CPXXXXXX` is the command that launches the Smart Component for ROM Flash on the target server. The six `x`s represent the serialized number assigned to the component.

If arguments are not specified on the command line, you will be prompted for the required inputs.

Command line arguments

Table 9 lists the command line arguments recognized by Smart Components for ROM Flash. The command line arguments are case-sensitive.

Table 9 Command line arguments

Command line argument	Description
<code>-s</code> or <code>--silent</code>	This argument specifies whether console messages are suppressed or displayed. Use this argument when scripting the Smart Components for ROM Flash to suppress console output. If this argument is omitted from the command line, console messages are displayed.
<code>-f</code> or <code>--force</code>	This argument specifies whether an installation will be forced, regardless of the ROM version that is detected on the target server. This argument will be ignored if the <code>-s</code> or <code>--silent</code> argument is not also present. The argument changes the Smart Component for ROM Flash installation in the following ways: <ul style="list-style-type: none">• If the system ROM on the target server is current, the ROM reinstalls itself, and the installed version number remains the same.• If a newer version of the system ROM is already installed on the target server, the component installs itself and downgrades the ROM to the older version number. If this argument is omitted from the command line, the installation is not forced.
<code>-r</code> or <code>--reboot</code>	This argument specifies whether the target server will reboot if the Smart Component for ROM Flash requests a reboot and the request is supported by the system ROM family on the target server. This argument will be ignored if the <code>-s</code> or <code>--silent</code> argument is not also present. If this argument is omitted from the command line, the server must be rebooted manually for the ROM upgrade to take effect.

IMPORTANT: For system ROM updates, the `-r` argument must be used with caution when online ROM flash mode is supported by the target server. Because the argument enables the target server to reboot automatically, you cannot copy the existing ROM image backup file to a standard 1.44-MB diskette. The Smart Component for ROM Flash generates this backup file before the original ROM is replaced with the updated version, except on systems with redundant ROM. If a failure occurs during system or option ROM upgrade process, it might be necessary to implement system ROM recovery procedures. See “Downgrading ROM firmware to previous versions” and “Recovering from a failed ROM upgrade” for additional details.

Command line examples

Table 10 shows examples of interactive use of the Smart Components for ROM Flash. The command lines are case-sensitive.

Table 10 Command line examples

Command line input	Result
<code>CP123456.scexe</code>	This command deploys the CP123456.scexe ROM flash component to the target server using the defaults of the component.
<code>CP123456.scexe -s</code>	This command line deploys the CP123456.scexe ROM flash component to the target server using the defaults of the component. All console messages are suppressed.
<code>CP654321.scexe -s -f -r</code>	This command line deploys the CP654321.scexe ROM flash component to the target server, forcing the downgrade of the ROM and allowing the server to reboot automatically if the ROM family on the target server supports the feature. All console messages are suppressed.

Backup of the original system ROM

 **CAUTION:** Option ROMs are not backed up. Instead, option ROMs are restored using a previous version of a Smart Component or an option ROMPaq. These tools are available on the Web at <http://www.hp.com/servers/swdrivers>.

Backups of the most current ROM image are available using one of the following methods:

- Redundant ROM—The ROM image acts as two separate ROMs. One section of the ROM contains the most current ROM version, while the other section of the ROM contains a previous version.
- Automatic backup—If the target server ROM family supports online ROM flash mode, the Smart Components for ROM Flash automatically make a backup copy of the existing system ROM image in the `/var/cpq/backup` subdirectory before replacing the original system ROM with the updated version.

 **TIP:** To have the backup ROM image readily available, copy the image to a standard 1.44-MB diskette before rebooting the target server. If a failure occurs during the ROM upgrade process, the diskette containing the backup ROM image can be used to restore the original ROM version.

When the installation is complete, a status screen appears, advising you to reboot the server for the ROM upgrade to take effect.

Unsuccessful upgrades

If a Smart Component for ROM Flash upgrade is attempted on a system that is not supported by the firmware type of the Smart Component, the following message appears:

The software is not supported for installation on this system.

 **CAUTION:** If an error such as power failure, operating system lockup, or some other catastrophic event occurs before a ROM upgrade process is complete, the ROM image on the target server will become corrupted. If this occurs, implement disaster recovery procedures for system ROM firmware. See the “Downgrading ROM firmware to previous versions” and “Recovering from a failed ROM upgrade” sections in this chapter for information about downgrade disaster recovery steps to follow.

Common installation log file

All ROM upgrade activity (including errors) is written by the individual Smart Component for ROM Flash to a common installation log file called `Component.log` in the `/var/cpq` subdirectory on the target server. Information regarding subsequent installation activity is appended to the same log file, providing a chronological history of all component installation activity on the target server.

Return codes

When each Smart Component for ROM Flash has finished running on the target server, the component reports a return code to the operating system or calling application.

You can determine the status of the flash upgrade by using a shell script. You can use return codes within the script to control the execution of the file and determine any branching that is required. Table 11 summarizes the Smart Components for ROM Flash return codes.

Table 11 Return codes

Error level	Meaning
0	The Smart Component for ROM Flash installed successfully.
2	The installation of the Smart Component for ROM Flash was not attempted because the required target hardware was not present or the software on the target was current.
3	The Smart Component for ROM Flash failed to install because of some unrecoverable error.

Downgrading ROM firmware to previous versions

In certain server environments, a previous ROM version might work better than the latest ROM version. Backups of the previous ROM image are made using redundant ROM or an automatic backup. See the “Backup of the original system ROM” section in this chapter for the location of the ROM image backup directory.

Two methods for downgrading to a previous system or option ROM version are available:

- Smart Component downgrade
- ROMPaq downgrade

Smart Component downgrade

Use the Smart Component downgrade method when the ROM version required to downgrade the system ROM is available in Smart Components for ROM Flash format.



IMPORTANT: This ROM downgrade method can be used locally on a target server or remotely.

To downgrade a Smart Component:

1. Obtain the previous version of the system Smart Component for ROM Flash for the target that must be downgraded.
See the “Obtaining Smart Components for ROM flash and deployment software” section in Chapter 1 for information about how to obtain the file.
2. Be sure that all requirements under the “Requirements” section in this chapter are met.
3. Run the Smart Component as described in the “Using Smart Components for ROM Flash locally” section of this chapter.
4. After the Smart Component for ROM Flash has installed successfully, reboot the target server for the ROM downgrade to take effect.

ROMPaq downgrade

The traditional ROMPaq method can also be used to downgrade the system or option ROM firmware.



CAUTION: This ROM downgrade method can be performed only locally on the target server. If an error such as a power failure, operating system lockup, or some other catastrophic event occurs during the ROM downgrade process, the ROM downgrade will not complete and the ROM image on the target server will be corrupted. If this occurs, the server will not operate correctly, and you must implement ROM disaster recovery procedures to regain server functionality.



NOTE: With the exception of the SA 5312 Controller, storage option ROMs cannot be downgraded using the ROMPaq method. ROMPaqs have been retired as a delivery method for storage options. To downgrade storage option ROMs, use one of the other methods discussed in this chapter. For more information about the SA 5312 controller, see <http://h18007.www1.hp.com/support/files/server/us/locate/7220.html>.

To downgrade a system or option ROM using the ROMPaq method:

1. Obtain the previous version of the ROMPaq files for the target that must be downgraded.
The ROMPaq files can be obtained in the same way as the Smart Components for ROM Flash. See the “Obtaining Smart Components for ROM flash and deployment software” section in Chapter 1 for sources for the ROMPaq files.
2. Create the ROMPaq diskette to be used to restore the server system ROM.



IMPORTANT: If the ROM is corrupted on the target server because the ROMPaq ROM restoration procedure was interrupted, the initial ROMPaq attempt might have affected the contents of the ROMPaq diskette. HP recommends creating a new ROMPaq diskette.

3. Insert the ROMPaq diskette into the target server.
4. Reboot the server.
5. Flash the ROM.
6. Reboot the server again to enable the upgrade to take effect.

Redundant ROM downgrade

On servers with the redundant ROM feature, the ROM acts as two separate ROMs. In the standard implementation, one side of the ROM contains the current ROM version, while the other side of the ROM contains the backup version, enabling you to switch easily to the backup version.

To switch between ROM versions:

1. Access RBSU by pressing the **F9** key when prompted at startup.
2. Select **Redundant ROM** in the Advanced Options menu of RBSU.
3. Select one of the ROM banks as the system ROM.
4. Press the **Enter** key.
5. Press the **Esc** key to exit the current menu, or press the **F10** key to exit RBSU.
6. Restart the server.

Recovering from a failed ROM upgrade

The following sections explain the procedure for recovering from system and option ROM upgrade failures.

System ROM upgrade failure

Recovery from a system ROM upgrade failure can be accomplished using the redundant ROM feature of a server or using ROMPaq.

Redundant ROM recovery

On servers with the redundant ROM feature, the ROM acts as two separate ROMs. In the standard implementation, one side of the ROM contains the current ROM version, while the other side of the ROM contains the backup version, enabling you to switch easily to the backup version. This feature protects the previous ROM version, even if a power failure occurs while flashing the ROM.

When the server boots, the system identifies whether the current ROM bank is corrupt. If a corrupt ROM is detected, the system boots from the backup ROM and alerts you through POST that the ROM bank is corrupt.

If RBSU is inaccessible, you can switch ROM images by changing the switch settings on the system configuration switch. See your server documentation for more information.

If both ROM images are corrupt, use the following ROMPaq recovery procedure.

ROMPaq recovery

The system ROM upgrade process must be complete for the system ROM upgrade to be successful.



CAUTION: If an error such as a power failure, operating system lockup, or some other catastrophic event occurs during the system ROM upgrade process, the ROM upgrade will not complete and the system ROM image on the target server will be corrupted. If this occurs, the server will not operate correctly, and you must implement ROM disaster recovery procedures to regain server functionality.

Because the target server does not operate correctly when the system ROM is corrupted, you cannot implement disaster recovery procedures by using the Smart Components for ROM Flash. Instead, use ROMPaq diskettes to restore the corrupted target server system ROM.



NOTE: Although ROMPaq disaster recovery is supported on all HP servers, each server has unique directions for powering down, opening the chassis, and locating the system maintenance switch block on the system board. For server-specific information and warnings, see the server user guide.

To perform ROMPaq disaster recovery on any HP server with a corrupted ROM image:

1. Obtain the latest ROMPaq version for the target server.
The ROMPaq files can be obtained in the same way as the Smart Components for ROM Flash. See the “Obtaining Smart Components for ROM flash and deployment software” section in Chapter 1 for sources for the ROMPaq files.
2. Create the ROMPaq diskette that will be used to restore the server system ROM.



IMPORTANT: If the system ROM is corrupted on the target server because the ROMPaq ROM restoration procedure was interrupted, the initial ROMPaq attempt might have affected the contents of the ROMPaq diskette. HP recommends that a new ROMPaq diskette be created.

3. Power down the server that contains the system ROM to be restored.
4. Open the server chassis.
5. Set the disaster recovery mode switches. See the server documentation and hood labels for the location and proper configuration of these switches.
6. Insert the ROMPaq diskette into the diskette drive.
7. Power up the target server. The keyboard, mouse, and monitor are all inactive. When the server has powered up, two long beeps indicate that the server is in disaster recovery mode. The server then reads the ROMPaq diskette for the latest ROM image and flashes the system ROM on the target server. A quick series of beeps indicates successful completion of the system ROM recovery process.
8. When the disaster recovery process is complete:
 - a. Remove the ROMPaq diskette from the drive and power down the server.
 - b. Return the configuration switches to their original positions.
 - c. Reassemble the server chassis.
 - d. Power up the server.

Option ROM upgrade failure

Disaster recovery for array controller ROMs can be performed using the Recovery ROM feature. The following controllers support Recovery ROM, which protects against a ROM corruption: SA5i, SA5i Plus, SA532, SA641/642, SA5312, SA5302/5304, SA5312, and SA6402/6404.

Recovery ROM is a redundancy feature that ensures continuous system availability by providing a backup ROM. During the flash process, a new version of the firmware can be flashed to the ROM while the controller maintains the last known version of the firmware. If the firmware becomes corrupt, the controller reverts back to the redundant version of the firmware and continues operating.

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