# HP ProLiant Essentials
# Rapid Deployment Pack—Linux Edition
# User Guide

June 2004 (Second Edition)
Part Number 347246-002
Product Version 1.10

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# About This Guide

This guide provides:

- Information for using the Rapid Deployment Pack as a server deployment solution
- A destription of the Web console, its basic functionality, and ProLiant-specific features
- A desciption of the files and directory structure comprising the Rapid Deployment Pack components
- Server deployment usage scenarios

## Audience Assumptions

To install and configure the Rapid Deployment Pack, it is assumed that you have knowledge of:

- Installing Linux® either from CD or by means of a network
- Basic Linux command line interface operations (for example, mounting and unmounting floppy and CD-ROM drives, creating directories, and copying files)
- Network infrastructure

To perform tasks after the installation is complete, it is assumed that you have knowledge of editing files within Linux and running scripts under Linux.

## Related Documents

HP recommends reviewing the following documentation before reading this guide:

- *HP ProLiant Essentials Rapid Deployment Pack Planning Guide*
- *HP ProLiant Essentials Rapid Deployment Pack—Linux Edition Support Matrix*
- *HP ProLiant Essentials Rapid Deployment Pack—Linux Edition Installation Guide*

All of the documents can be found in PDF format at http://www.hp.com/servers/rdp, on the product CD at /pim-lds/docs, and at /opt/altiris/deployment/adlserver/docs on the Deployment Server.

# Where to Go for Additional Help

Refer to the following sources for additional information about the Rapid Deployment Pack.

## Online Resources

- HP ProLiant Essentials Rapid Deployment Pack website at http://www.hp.com/servers/rdp
- HP ProLiant Essentials Rapid Deployment Pack Knowledge Base at http://www.hp.com/servers/rdp/kb
- HP ProLiant Essentials Rapid Deployment Pack What's New at http://www.hp.com/servers/rdp
- *ITRC User Forum "ProLiant Deployment, Provisioning (RDP, SmartStart)"* at http://forums.itrc.hp.com
- Altiris website at http://www.altiris.com

## Telephone Numbers

For the name of your 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, refer to http://www.hp.com.

# 1

# Introduction to the Rapid Deployment Pack-Linux Edition

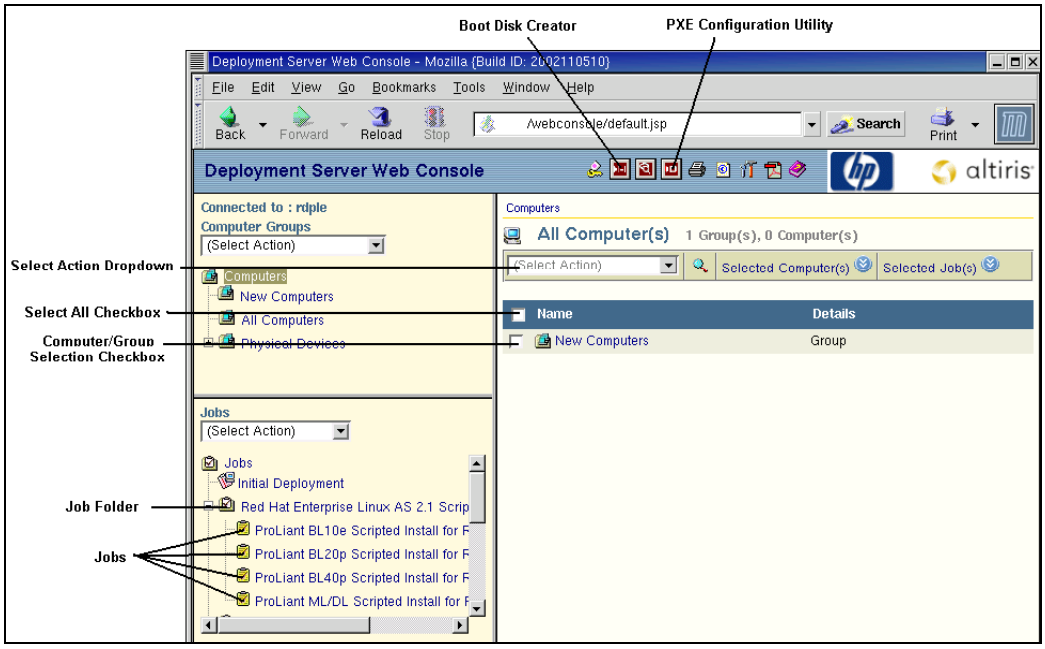
## Deployment Server for Linux Web Console Overview

The Deployment Server for Linux Web Console provides the means to view and deploy servers within your network. The information in this section provides a brief description of the views and functions provided with the Web console.

Access the Web console using a Web browser at http://*hostname*:8080/webconsole, where *hostname* is the host name of the Deployment Server or the static IP address of the Deployment Server in the form of *xxx.xxx.xxx.xxx*, for example, http://192.168.1.1:8080/webconsole.

## Web Console View

- Computer Groups pane—On the upper-left side of the Web console, displays New Computers and All Computers default listings. New servers connected to the Deployment Server and ready for initial deployment appear in the New Computers list.
- Jobs pane—On the lower-left side of the Web console, lists jobs provided with the ProLiant Integration Module for Linux Deployment Server.
- Details pane—On the right side of the Web console, displays details for selections highlighted within the Computers Groups pane or Jobs pane.
- Web console toolbar—At the top of the console under the menu toolbar, provides icons to access various Altiris functions, such as (left to right): Logout, Boot Disk Creator, ImageExplorer, PXE Configuration Utility, Print, About/Copyright/Licensing Information, Program Options, Deployment Server for Linux 5.6 Product Guide, and Help.



### Web Console Interactions

- View new computers or server status changes by refreshing the window using the Web browser Reload or Refresh function or by highlighting a Computer Groups selection.
- From any Web console pane, select an action in the (Select Action) list to perform the action on computers, computer groups, jobs, or job folders.
- From the Details pane, currently selected computers and jobs appear in the Selected Computer(s) and Selected Job(s) links. For example, after selecting several servers from the New Computers list, clicking **Selected Computer(s)** lists the servers. A selected job can then be performed on all selected servers.
- From the Details pane, select the Select All checkbox located on the column title bar to select all computers, groups, or jobs displayed in the list below the column title bar.
- From the Details pane, select the checkbox next to each computer, group, or job to select it.
- In the Computer Groups or Jobs pane, click the plus sign (**+**) icon before each selection name to expand the selections.

## ProLiant-Specific Features

This section describes enhancements made to the Altiris Deployment Server Console specifically for ProLiant servers.

### Integration with Lights-Out Management

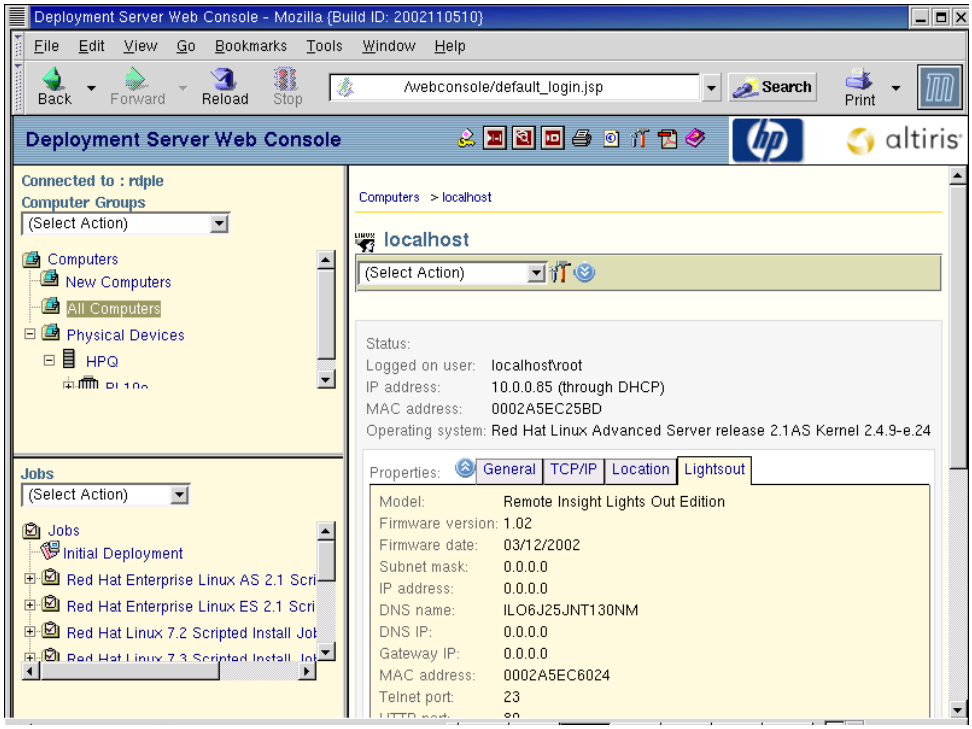
Lights-Out Management enables the management of remote servers and the performance of remote console operations regardless of the state of the operating system or hardware.

The Deployment Server provides the ability to use the power management features of Integrated Lights-Out (iLO) and Remote Insight Lights-Out Edition (RILOE) to power on, power off, or cycle power on the target server. Each time a server connects to the Deployment Server, the deployment server polls the target server to see if iLO or RILOE is installed; if either is installed, the server gathers information including the DNS name, IP address, and first user name. Security is maintained by requiring the user to enter the correct password for that user name.

To display the lights-out stored information for each server:

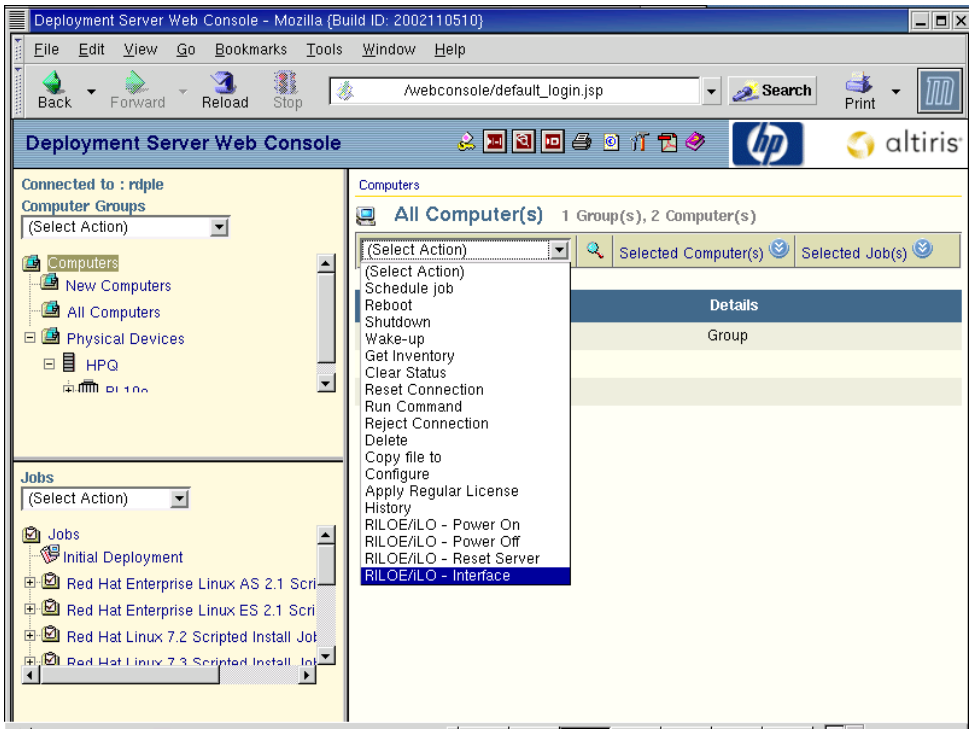
1. Within the Computer Groups pane, click **New Computers** or **All Computers.**
2. Within the Details pane, select the server name.

3. Click the **Properties** link, and then select the **Lightsout** tab.



To access the iLO or RILOE interface from the Web console:

1. Within the Computer Groups pane, select **New Computers** or **All Computers.**
2. In the Details pane, select the checkbox next to the server name.
3. From the (Select Action) list, select **RILOE/iLO – Interface.**




This provides easy access to such iLO and RILOE features as remote console.

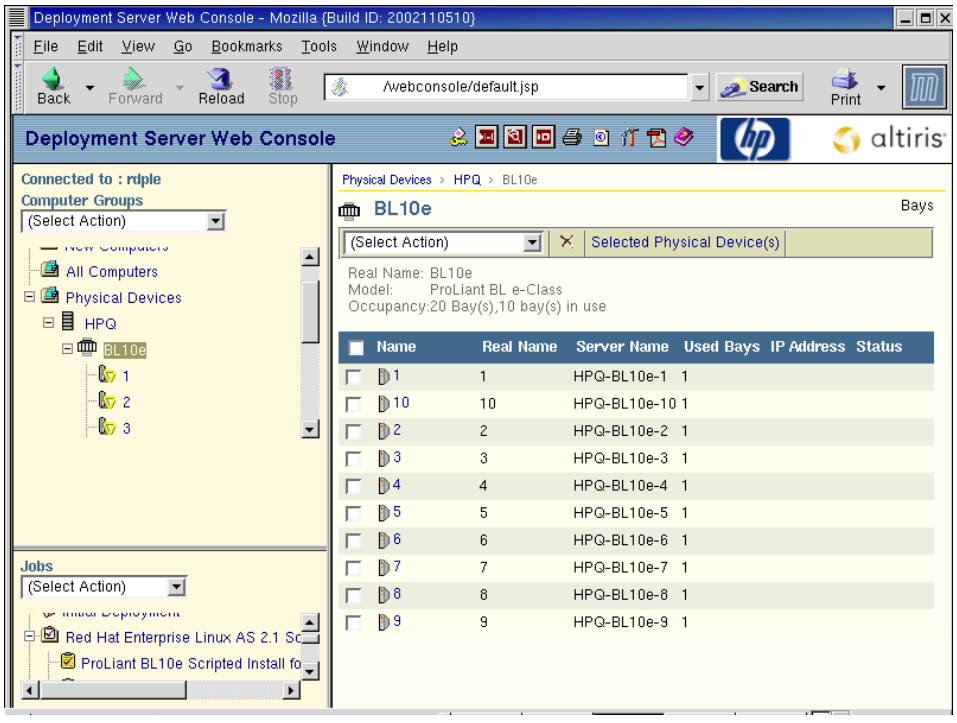
## Physical Devices View

The Rapid Deployment Pack detects and displays server blades based on their physical rack, enclosure, and bay locations. After server blades are connected to the Deployment Server, the Computer Groups pane displays the Physical Devices listing. The servers are viewed according to their Rack\Enclosure\Bay (R\E\B) settings. Because R\E\B is a new feature and is only available with server blades, this view option is only presented if the Deployment Server database contains R\E\B information for any computer. A job can be deployed on a server listed in this view.

Table 1-1 lists the server icons that are used in the Physical Devices View in the Web console.

**Table 1-1: Server Icons**

| Icon | Description |
|---|---|
| | Indicates a grouping of physical devices |
| | Indicates a rack |
| | Indicates an enclosure |
| | Indicates a single server blade in a bay |
| | Indicates an unconfigured server blade in a waiting state designated by the user |



## ProLiant BL Server Rip-and-Replace

ProLiant BL servers include rule-based deployment based on a change in physical location. This feature enables rapid serviceability when replacing failed server blades, a procedure called “rip-and-replace.”

The Deployment Server keeps track of the physical location of every ProLiant BL server and detects when a new server has been placed in a particular bay. The Change Rules feature can be configured to initiate one of several different deployment actions when the Deployment Server detects a new server placed into a previously occupied bay. Rules are set for individual server blades.

**NOTE:** A server blade must be discovered and deployed by the Deployment Server to access the server change rules.

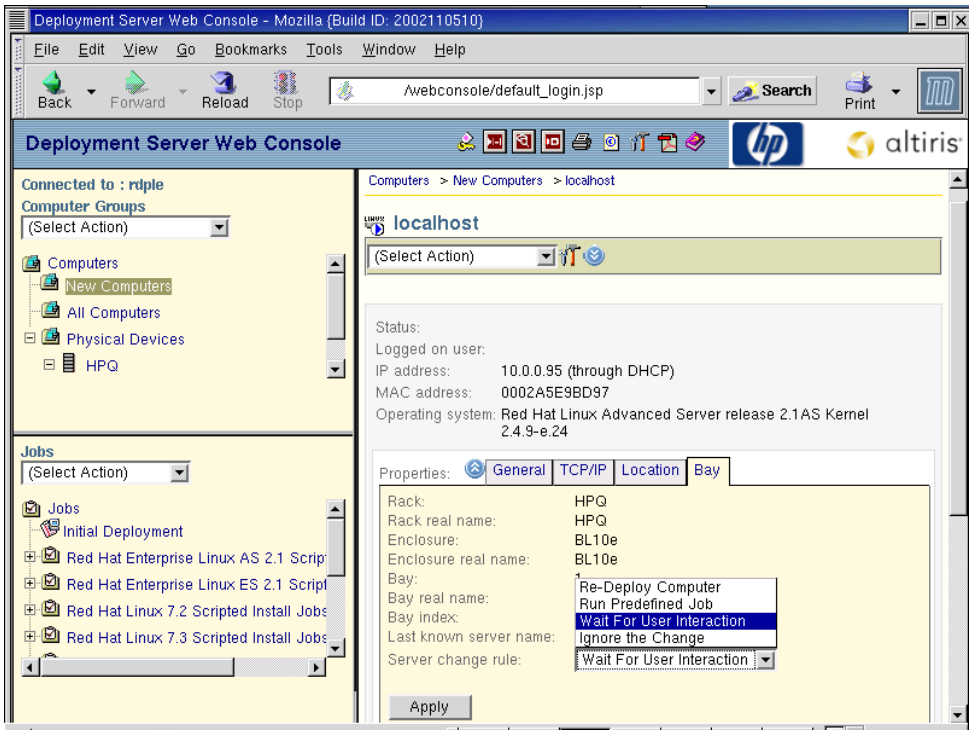
**IMPORTANT:** Licenses applied to a specific server cannot be removed or transferred to another server.

To access the server change rule:

1. Within the Computer Groups pane, click **New Computers** or **All Computers.**
2. Within the Details pane, select the server name.
3. Click the **Properties** link, and then select the **Bay** properties tab.

The following rules can be configured at the Bay properties tab:

- Re-Deploy Computer—Takes the previous server configuration history and replays it on the new server. All tasks and jobs in the server history replay starting from the most recent image or scripted installation job. This is only available after the server is deployed.
- Run Predefined Job—Processes any job specified by the user, including the Initial Deployment job.
- Wait for User Interaction—Performs no job or task. The Deployment Agent on the server is instructed to wait, and the icon on the Web console is changed to reflect a waiting server.
- Ignore the Change—Ignores the new server, meaning that no jobs are initiated. If the server existed in a previous bay, the history and parameters for the server are moved or associated with the new bay. If the server is a new one (never before seen), its properties are associated with the bay, and the normal process defined for new servers, if any, is followed.



# Deployment Agent for Linux

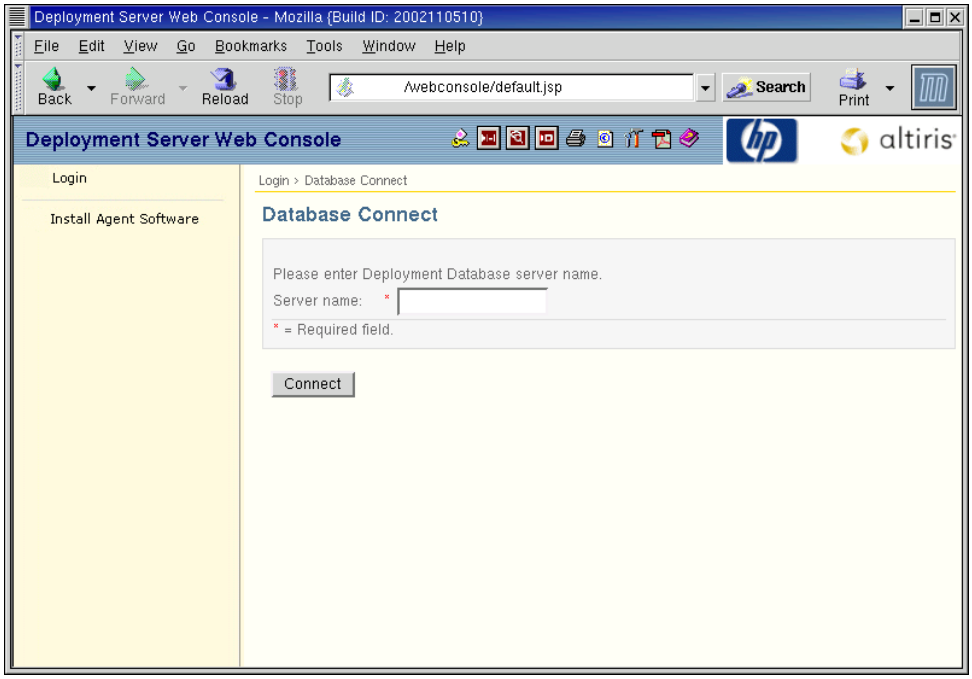
The Altiris Deployment Agent for Linux enables a server to be managed by the Deployment Server. The Deployment Agent enables server redeployment, pre- and post-imaging configuration, and processing of various commands, such as software installation.

The Deployment Agent is installed as part of the scripted installation jobs provided with the Rapid Deployment Pack. However, the Deployment Agent for Linux can be downloaded and installed on an existing Linux server.

The following section provides steps to download the Deployment Agent for Linux using the Web console. The agent installation file can also be distributed to the intended server using various file transfer methods (such as e-mail, FTP site, and so on). The installation file is located on the Deployment Server at /opt/altiris/deployment/adlserver/ altiris-adlagent-*x.xx-yyy*.i386.rpm, where *x.xx-yyy* is the agent version number. Install the agent using the steps in the "Install the Deployment Agent for Linux" section.

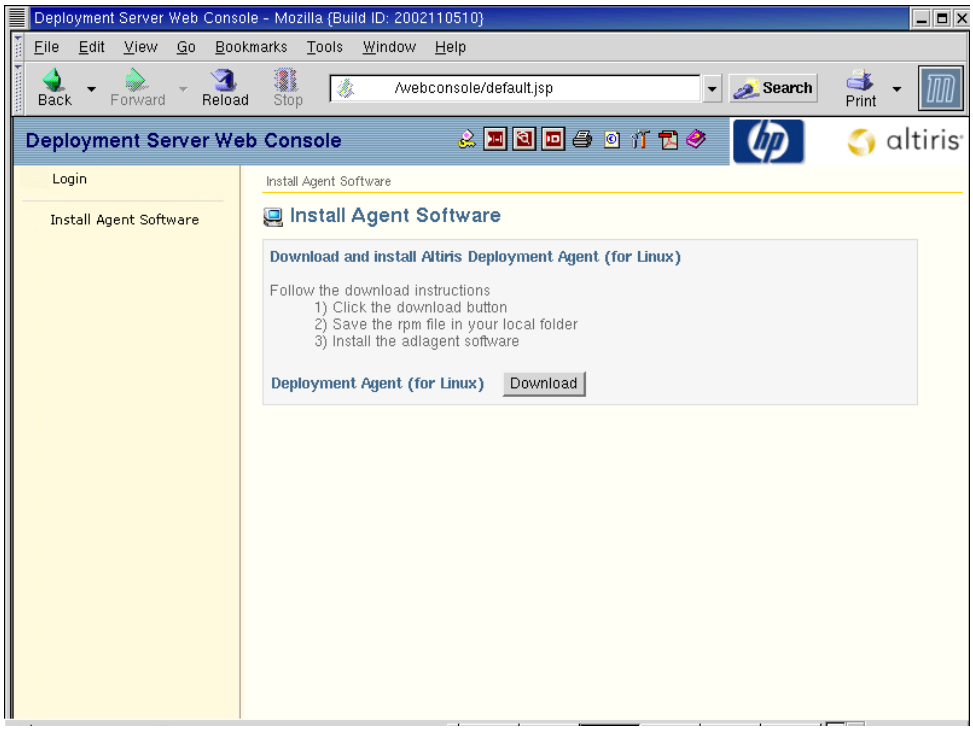
## Download the Deployment Agent for Linux

1. On the intended server, access the Web console by opening a Web browser at http://*hostname*:8080/webconsole, where *hostname* is the host name of the Deployment Server or the static IP address of the Deployment Server in the form of *xxx.xxx.xxx.xxx*. Do not log in and connect to the console.
2. Click **Install Agent Software** in the left pane.



3. Click **Download** and save the installation file, (altiris-adlagent-*x.xx-yyy*.i386.rpm, where *x.xx-yyy* is the agent version number), to the local directory on the server.

   **NOTE:** If Rapid Deployment Pack upgrades have been installed, multiple installation files might exist. Select the file with the highest version number.




## Install the Deployment Agent for Linux

1. On the intended server, log in as `root` or as a user with administrator rights.
2. Using the command line, change directories to the location that the installation file was saved and run the installation file:

   `rpm -ivh altiris-adlagent-x.xx-yyy.i386.rpm`

   where *x.xx-yyy* is the version number of the downloaded Deployment Agent for Linux.

   The Deployment Agent for Linux is installed in the /opt/altiris/deployment/adlagent directory.
3. When the agent is installed, change the settings in the configuration file by editing the adlagent.conf file located in /opt/altiris/deployment/conf or running the /opt/altiris/deployment/adlagent/bin/configure script.
4. After making any edits to the configuration file, restart the Deployment Agent for Linux:

   `/etc/rc.d/init.d/adlagent restart`

**NOTE:** The agent, adlagent, restarts automatically if the configure script is used.

You can now view and manage the Linux server from the Web console.

# 2

# Using the Rapid Deployment Pack

The usage scenario in this chapter uses server blades as an example to:

- Deploy an operating system using scripted installation
- Perform an image capture
- Deploy a captured image simultaneously to other similar server blades
- Perform a server configuration
- Set a deployment rule to enable rip-and-replace on a deployed server blade

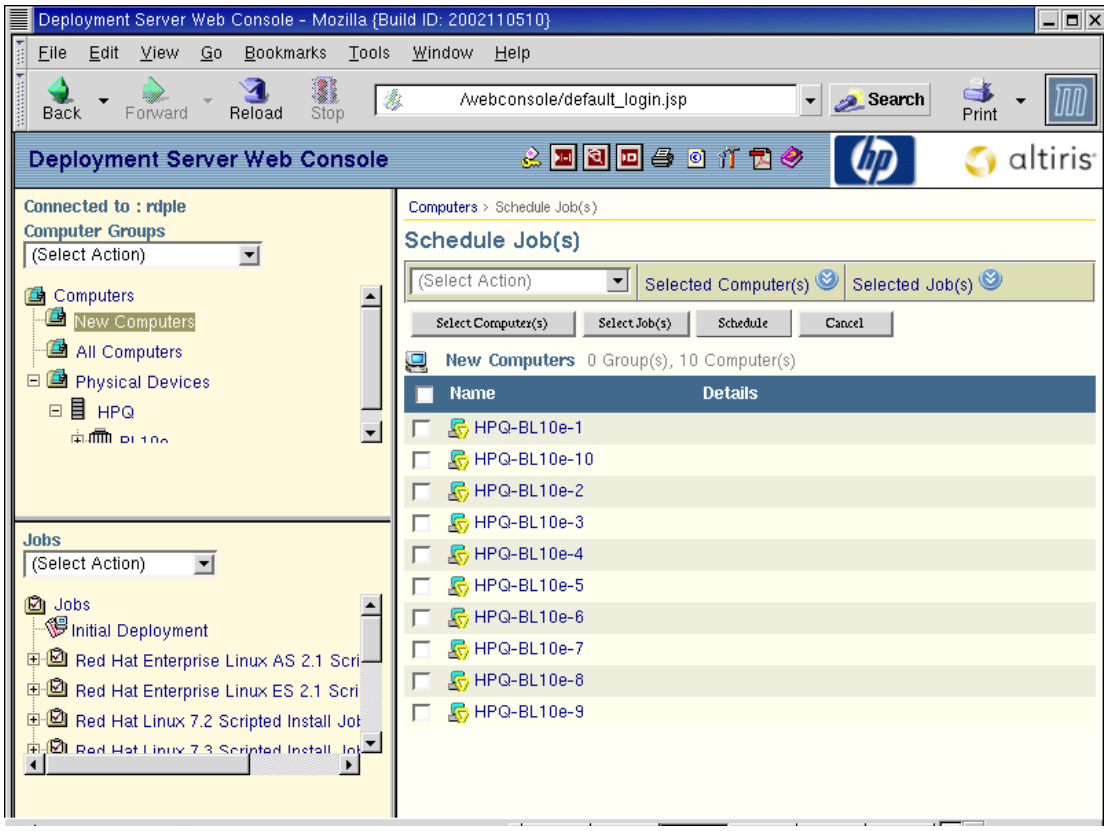
Although this scenario uses server blades, the process can be duplicated for other supported ProLiant servers. When performing an image capture and deployment, the hardware configuration of the target servers must be identical to the hardware configuration of the reference server.

This scenario presumes that all necessary installation and pre-deployment steps provided in the *HP ProLiant Essentials Rapid Deployment Pack—Linux Edition Installation Guide* have been performed.

**IMPORTANT:** If you plan to change the default rack and enclosure names, set these names before the first server in an enclosure connects to the Deployment Server. After the server blades are powered up for the first time and the rack and enclosure names are recorded in Web console database, the server blades must be rebooted for new rack and enclosure names to be discovered. For more information, refer to "Configuring ProLiant BL Server Enclosures" in the *HP ProLiant Essentials Rapid Deployment Pack—Linux Edition Installation Guide.*

Connect an enclosure of server blades to the network and power on the enclosure. The server blades connect to the network. The Deployment Server detects all server blades that come online and displays them in the Computer Groups pane of the Web console under New Computers or Physical Devices by utilizing Preboot eXecution Environment (PXE).

Server blades are indicated in the Web console by rack name-enclosure name-bay number. For example, in the following figure, the rack name of the first server is HPQ, the enclosure name is BL10e, and the bay number is 1. Each server blade is denoted by an icon, which specifies that the server blade is waiting for instructions.

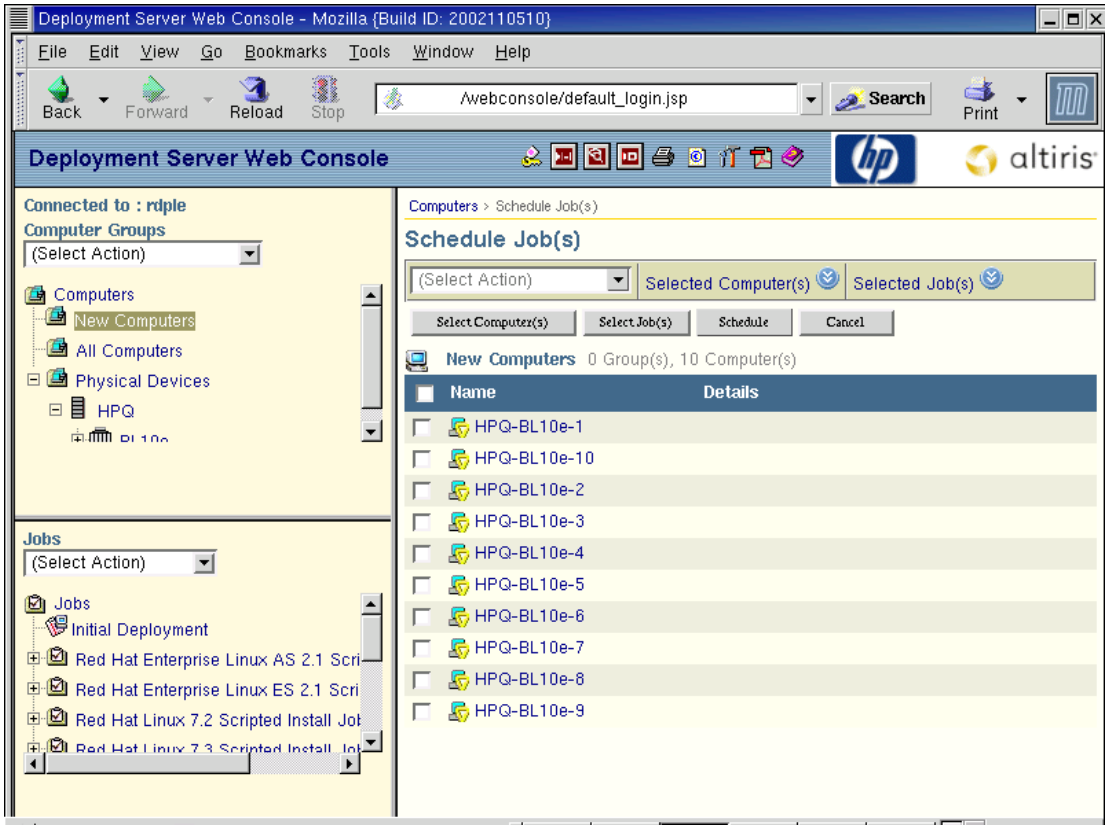


# Scripted Installation Deployment for ProLiant BL Servers

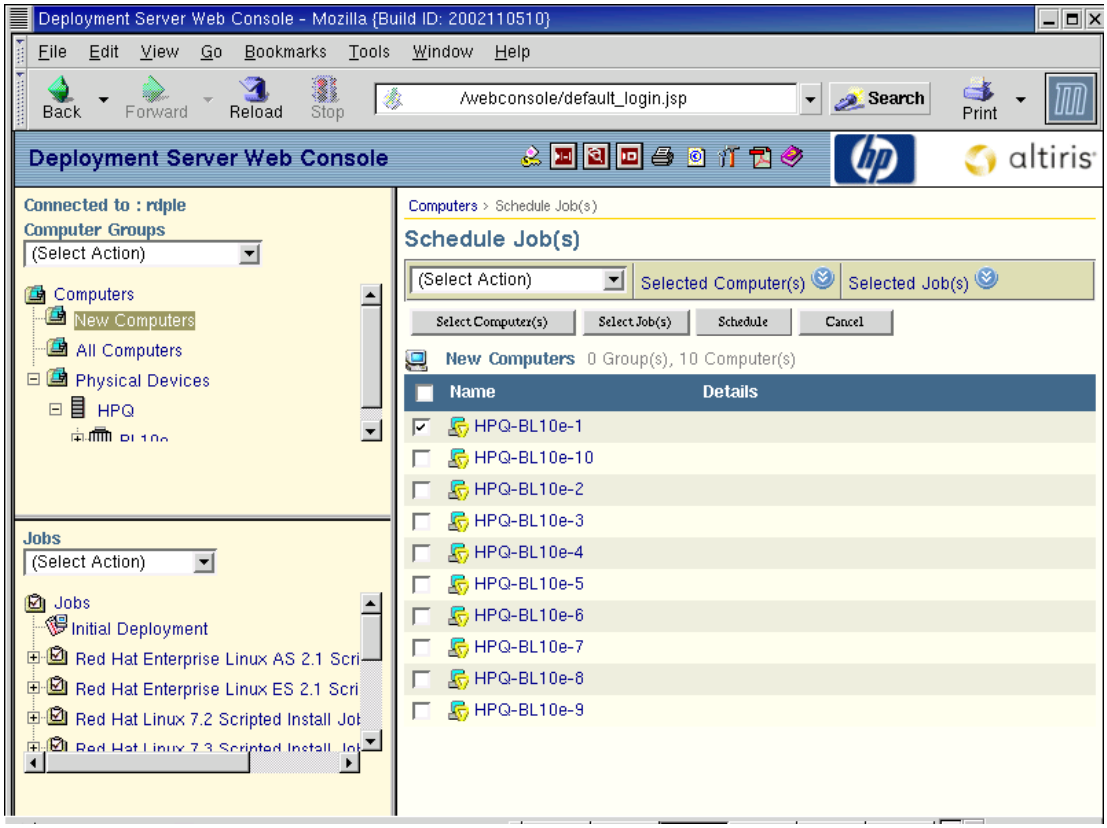
You can deploy all of the server blades in an enclosure using a scripted install job. However, it is faster to run the scripted install on the first server blade, which becomes the reference server, and then capture and deploy the reference server image to all the other server blades in the enclosure simultaneously.

From the Web console, to deploy a single server blade:

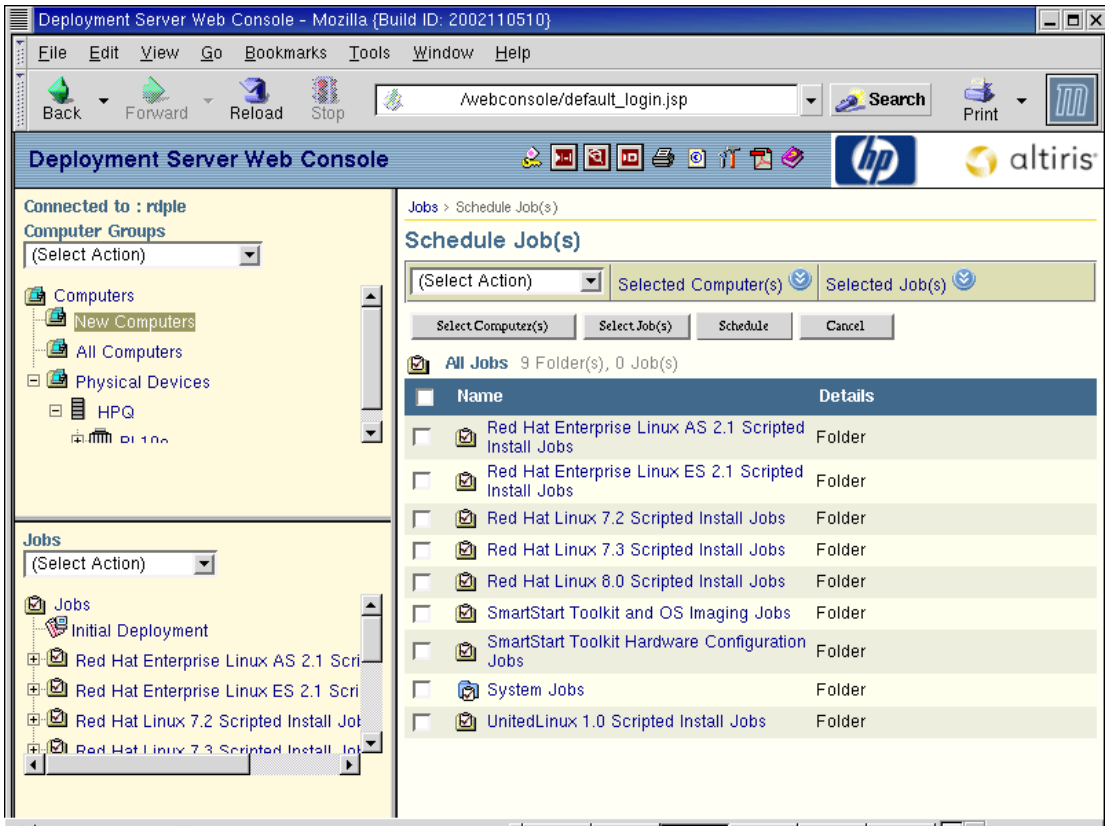
1. In the Computer Groups pane, select **New Computers.**



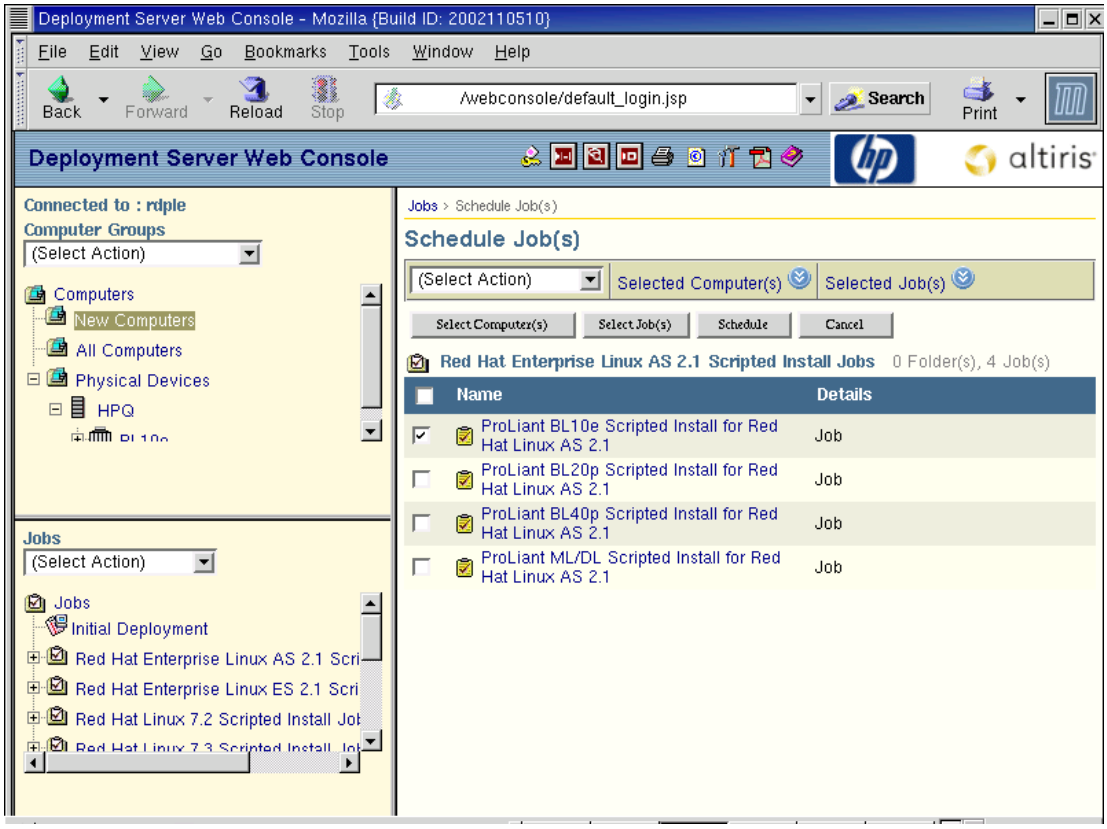
2. In the Details pane, select a single server to deploy by selecting the checkbox next to the server name.



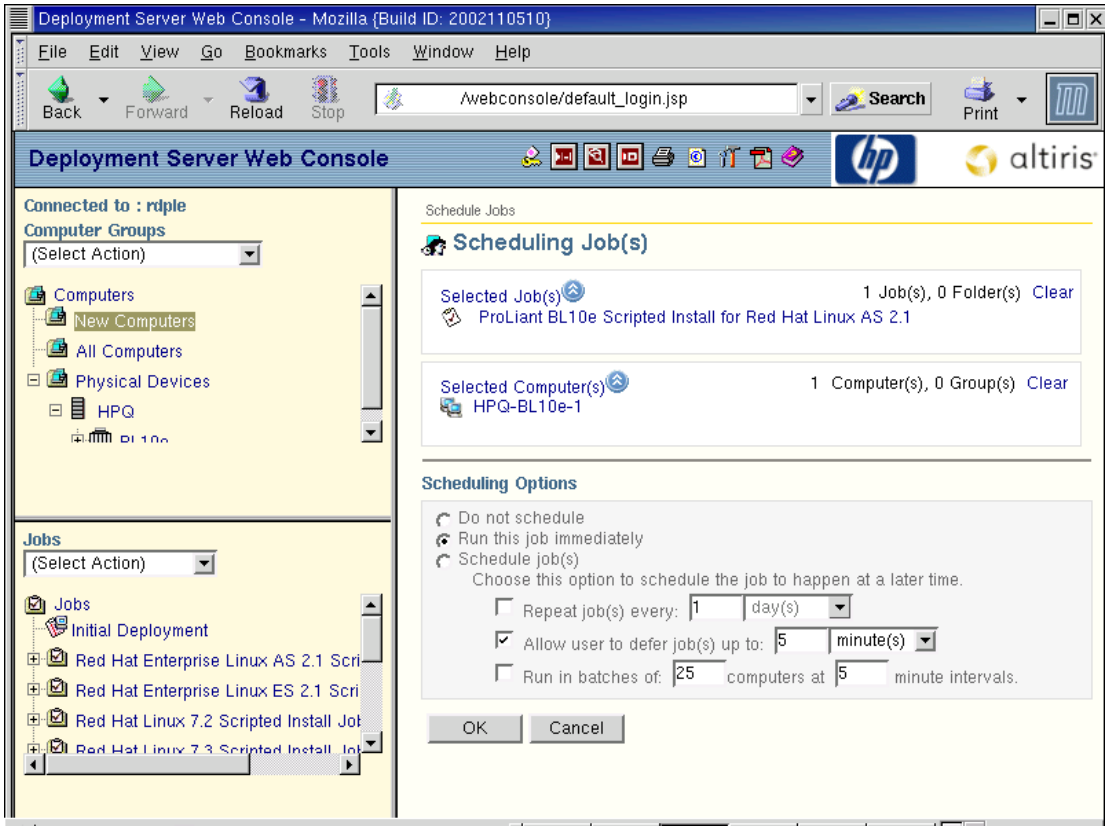
3. In the Details pane, select **Schedule Job** from the (Select Action) list. The Details pane displays a list of jobs and job folders available for the selected server.



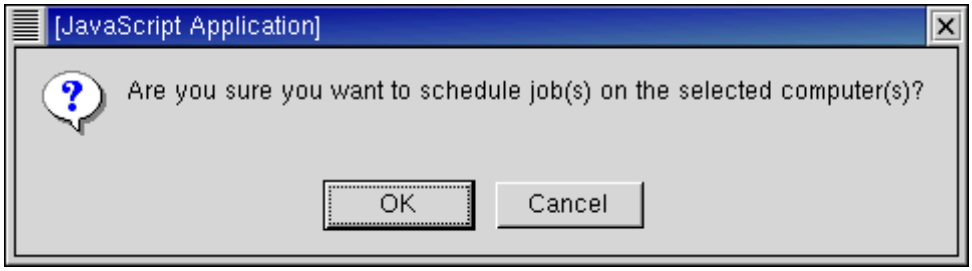
4. Click the job folder title to display jobs within that job folder in the Details pane. Select a job to deploy by selecting the checkbox next to the job name.
5. Click **Schedule.**



6. Click **OK** with **Run this job immediately** selected.



7. Click **OK** when prompted to confirm the action.




At the bottom of the Details pane, the scheduled jobs appear.

When the server deployment is complete and the Web console is refreshed or when New Computers is selected in the Computer Groups pane, the server icon changes. The server name for the deployed server is changed to the default hostname, localhost for this example. After you make any necessary post-installation modifications, this server can be used as your reference server.

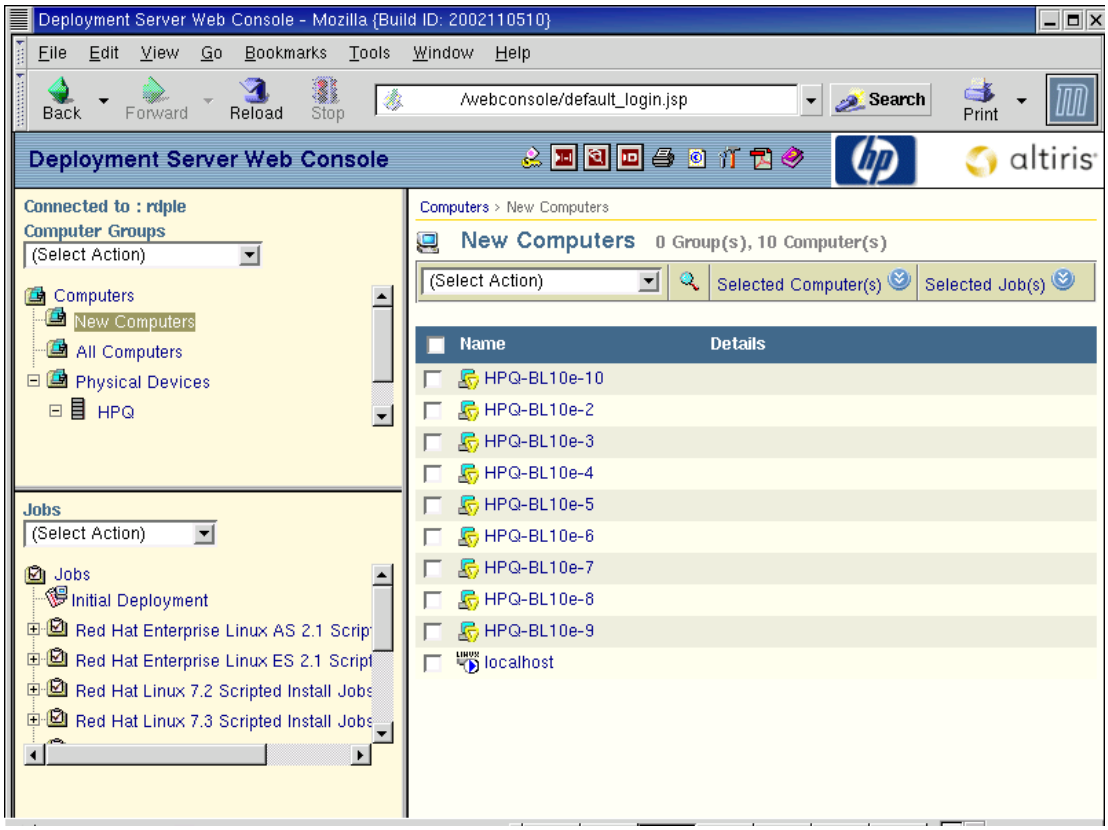
**NOTE:** The status of the job might change to Complete before the actual completion of the installation since the status of the installation is not communicated to the Deployment Server during the operating system portion of the scripted install job. After the installation completes, the Deployment Agent is loaded on the target server. The Deployment Agent connects to the Deployment Server automatically and displays the blue server icon. Only then can you visually confirm that the deployment is complete.

# Image Capture for ProLiant BL Servers

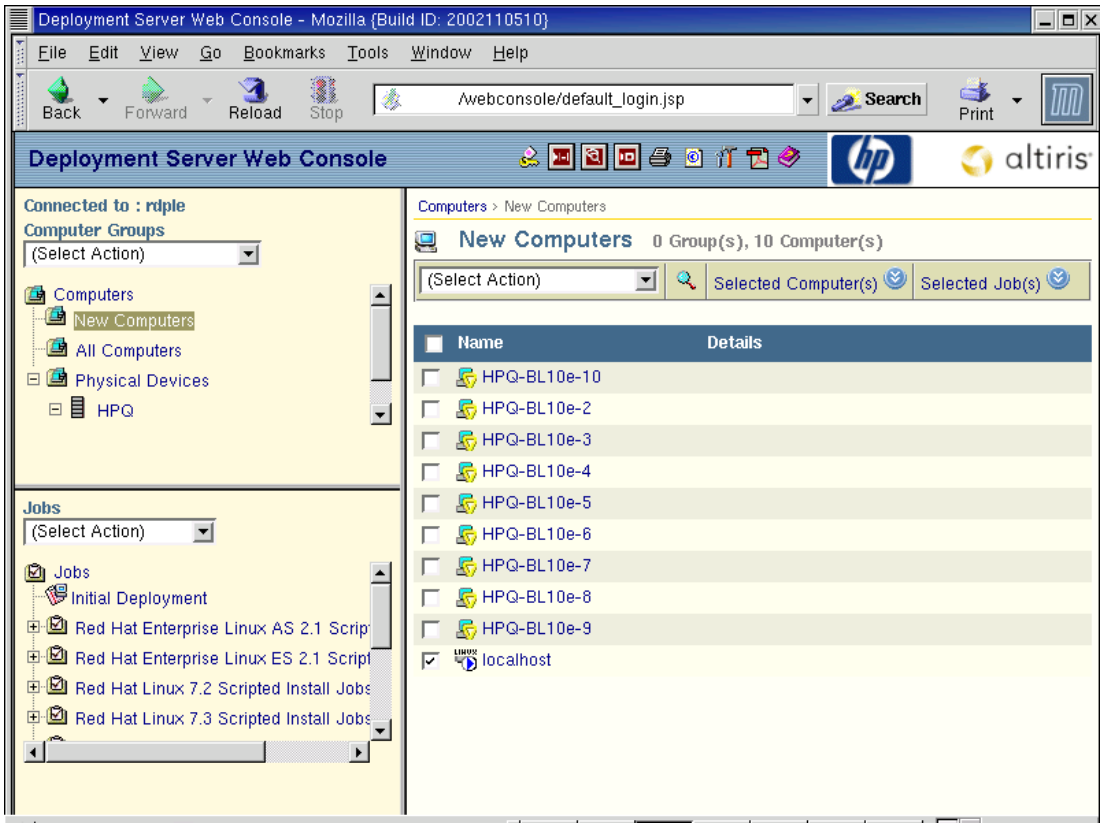
After a scripted install and any post-configuration of the reference server are complete, you can perform the image capture and deploy that image to multiple similar servers.

From the Web console, to capture a server blade image:

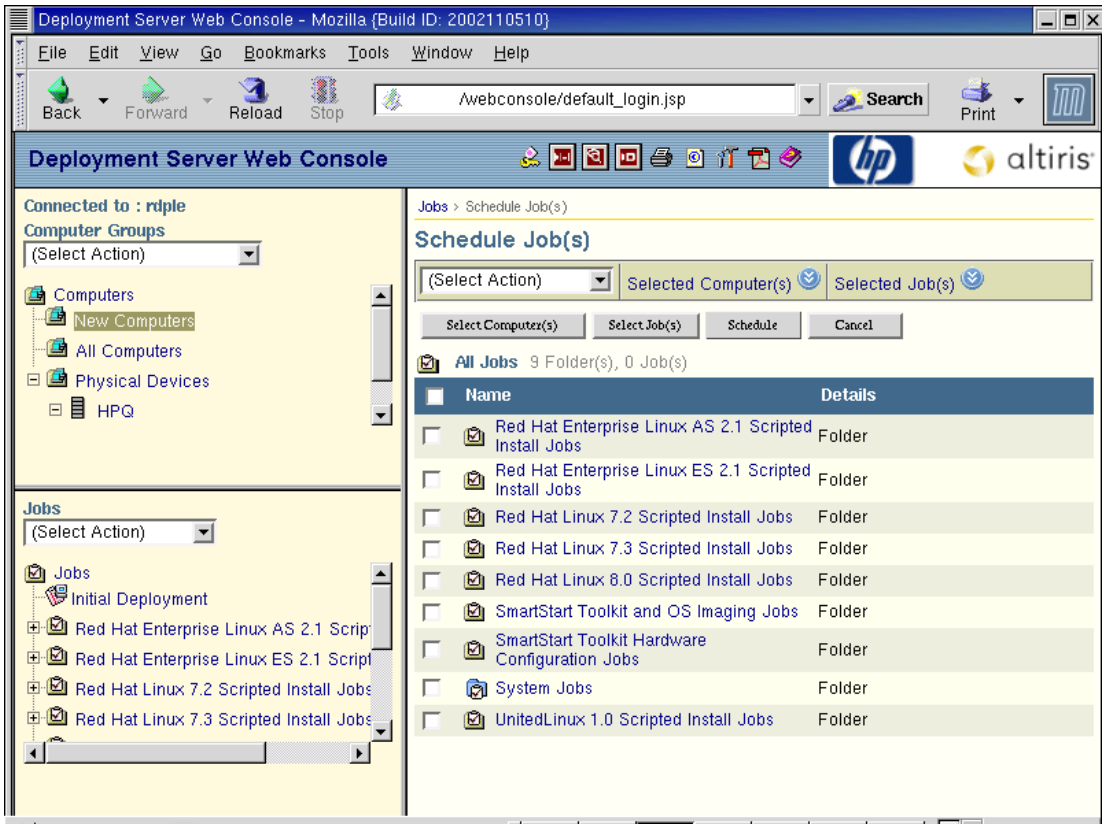
1. In the Computer Groups pane, select **New Computers.**



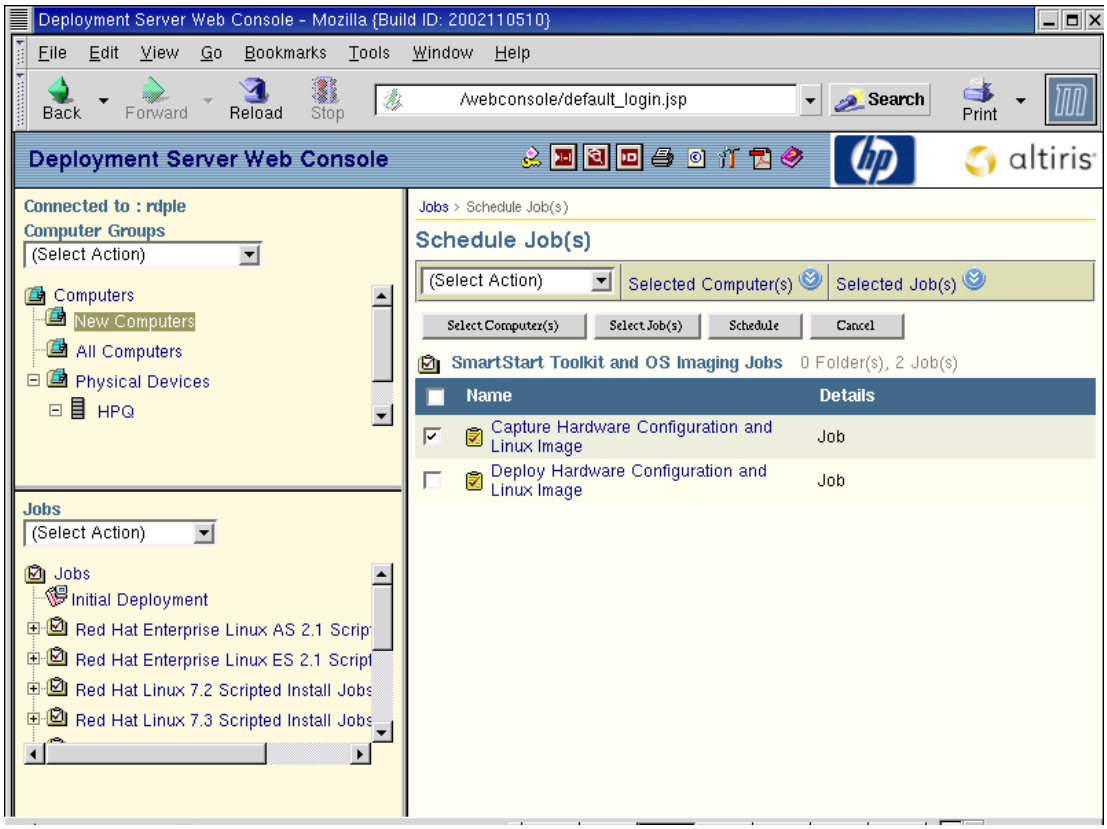
2. In the Details pane, select the reference server by selecting the checkbox next to the server name, then select **Schedule Job** from the (Select Action) list.



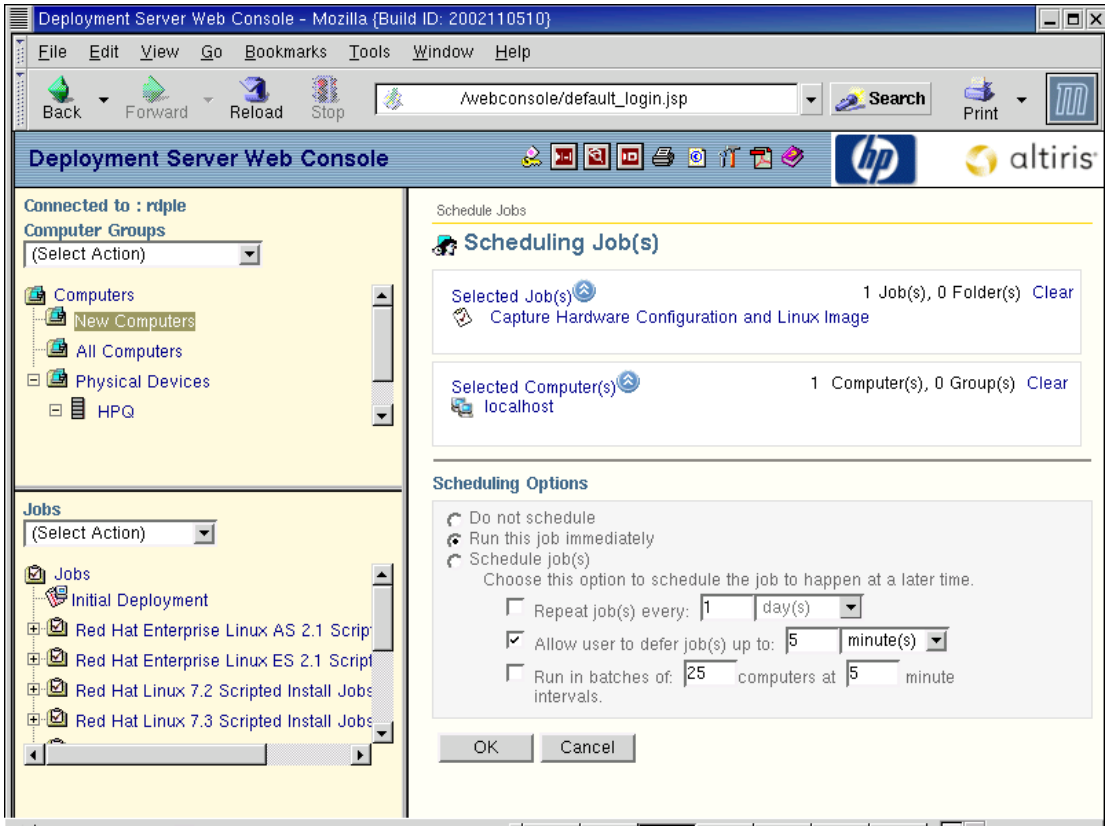
3. The Details pane displays a list of jobs and job folders available for the selected server. Select the **SmartStart Toolkit and OS Imaging Jobs** folder.



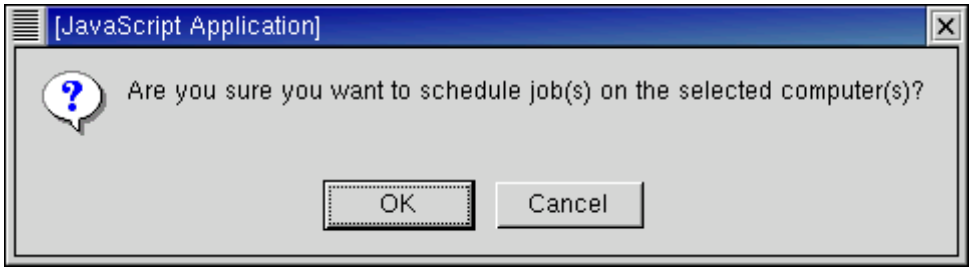
4. The Details pane displays the list of jobs within that job folder. Select the checkbox next to the **Capture Hardware Configuration and Linux Image** job.
5. Click **Schedule.**



6. Click **OK** with **Run this job immediately** selected.



7. Click **OK** when prompted to confirm the action.




**IMPORTANT:** The jobs provided with the Rapid Deployment Pack create and deploy images using a predefined image name. If you use the provided jobs without modification, each time you capture a new image it overwrites the previous image. To capture images for different server configurations you must copy and rename the job, then modify the file name variables within the job so that the files are saved with a unique name. For information about the provided jobs, refer to Chapter 3.

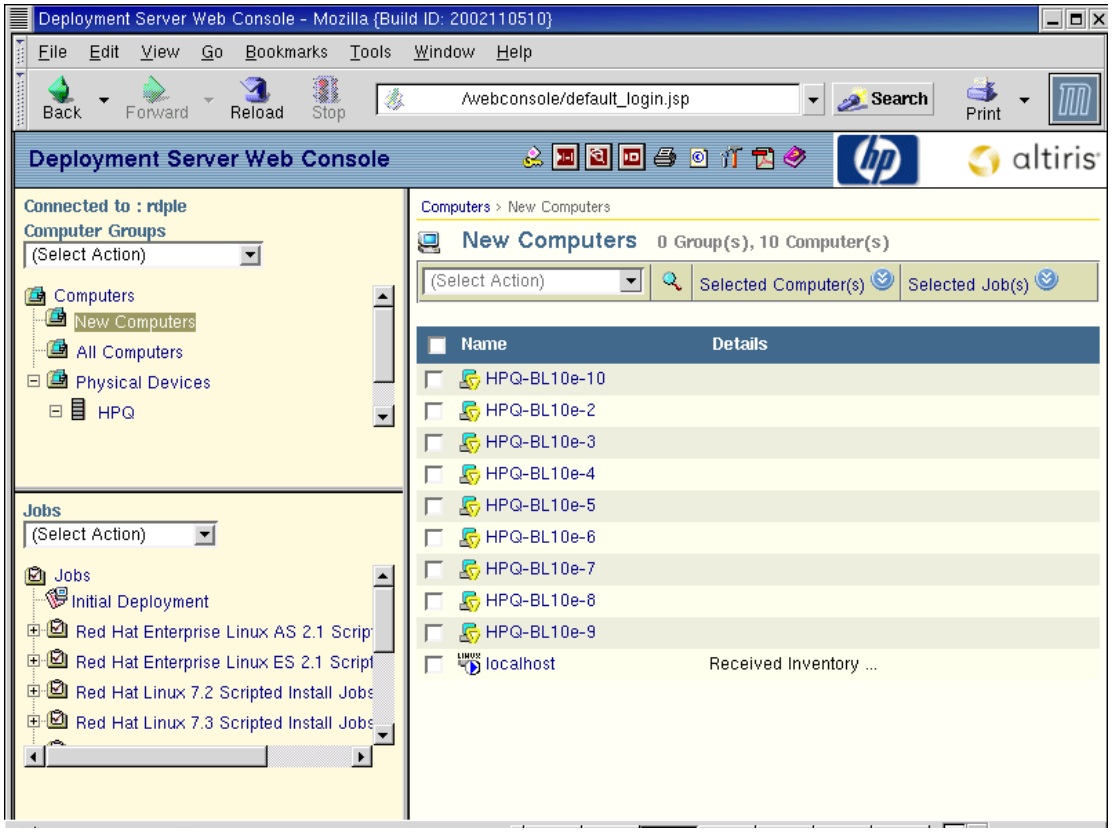
The server reboots and performs the specified tasks.

When the image capture is complete and the Web console is refreshed or when New Computers is selected in the Computer Groups pane, the server icon changes to indicate a Linux server is connected to the Deployment Server.

# Image Deployment for ProLiant BL Servers

From the Web console, to deploy a set of server blades using imaging:

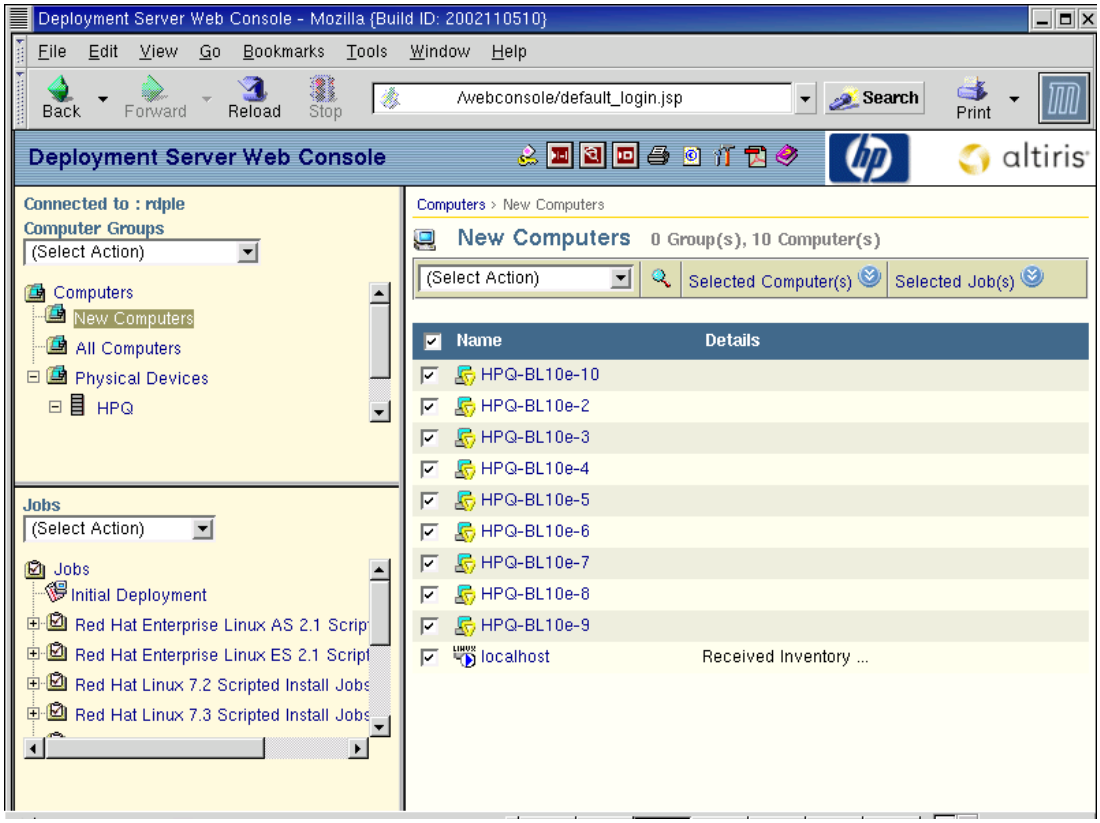
1. In the Computer Groups pane, select **New Computers.**



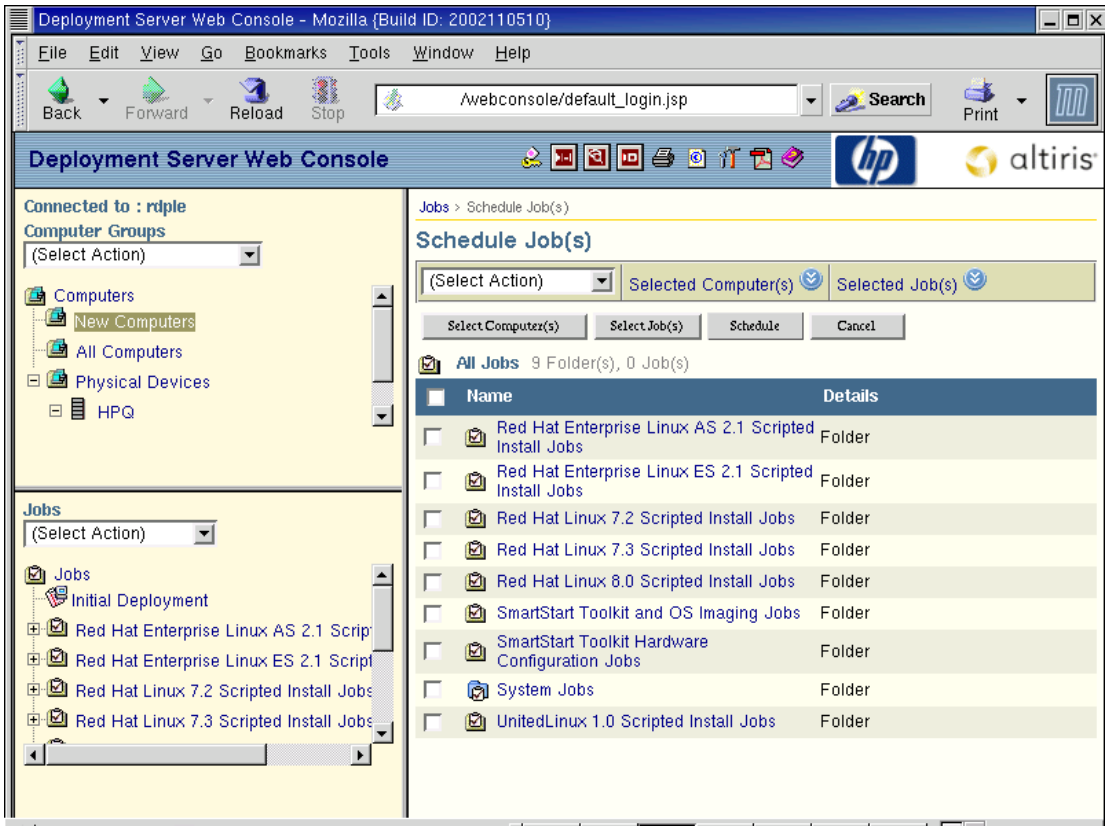
2. In the Details pane, select all the servers to deploy the image to by selecting the checkbox next to the Name column heading, then select **Schedule Job** from the (Select Action) list box.

**NOTE:** If you are deploying the image to all the server blades in an enclosure, you can select the enclosure from the Physical Devices view.

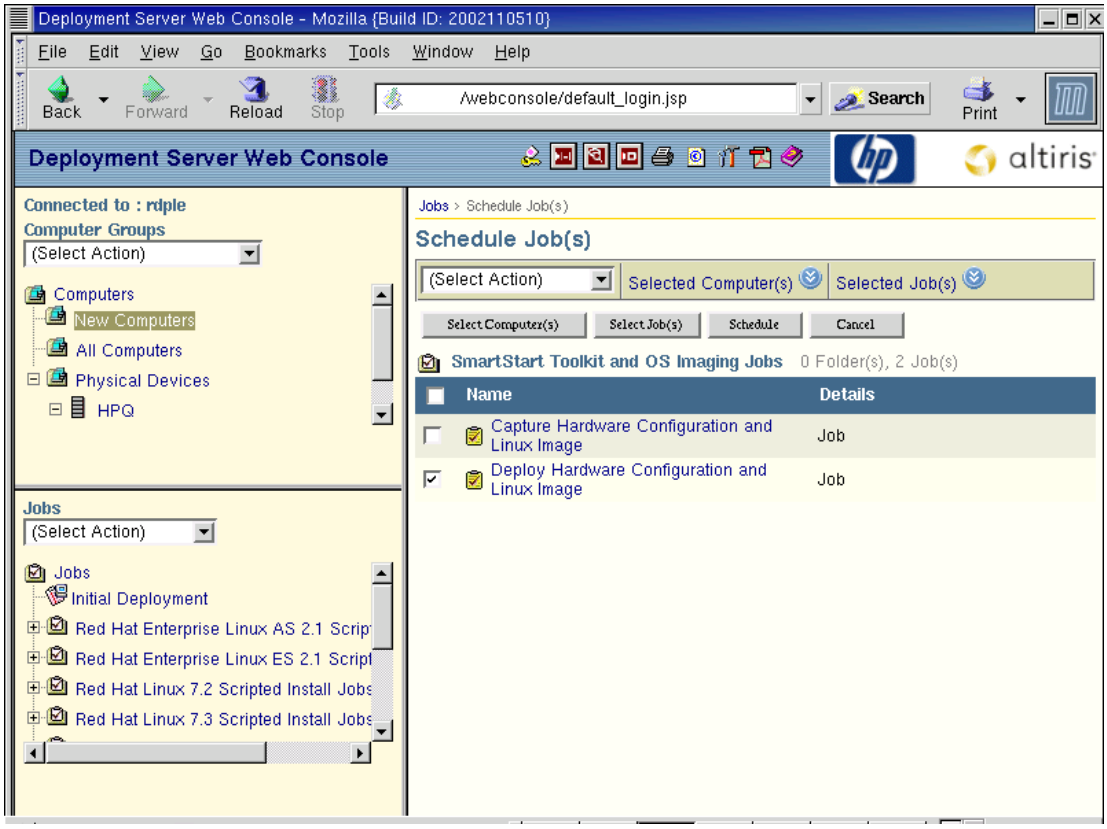
**NOTE:** Redeploying the captured image to the same reference server allows you to take advantage of the speed of image deployment if the reference server is ever replaced with rip-and-replace enabled.



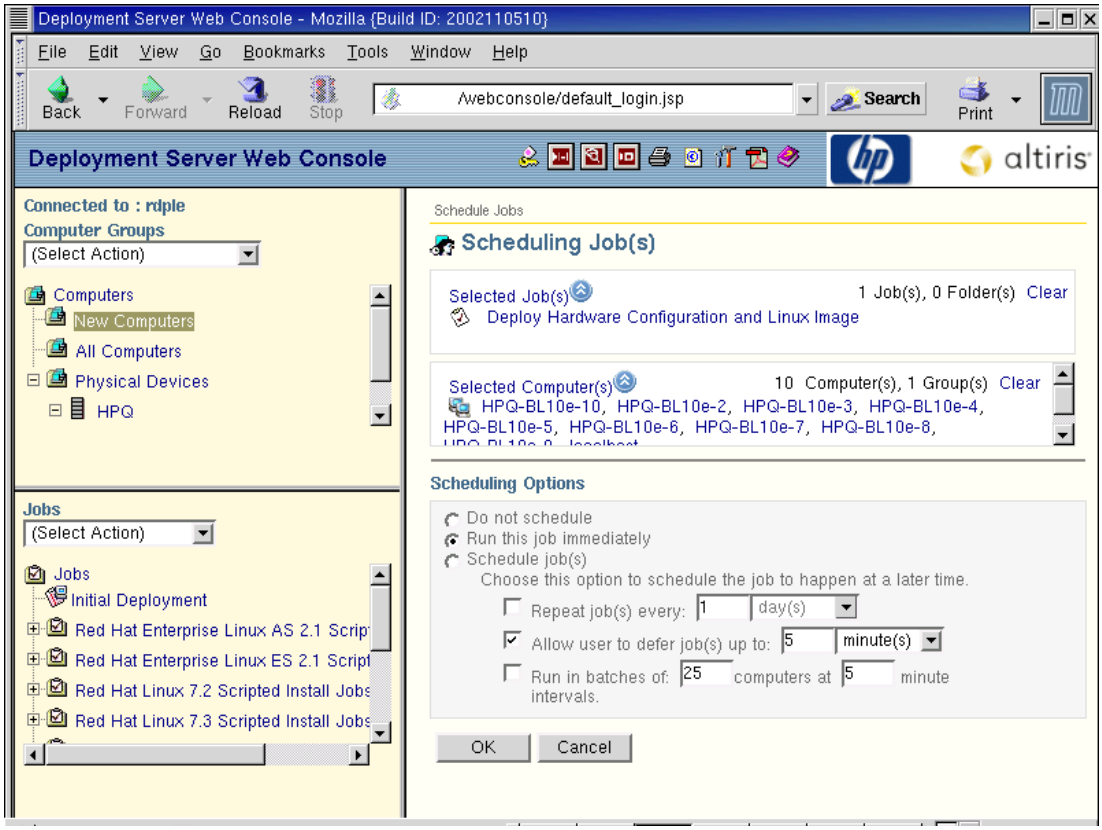
3. The Details pane displays a list of jobs and job folders available for the selected server. Select the **SmartStart Toolkit and OS Imaging Jobs** job folder.



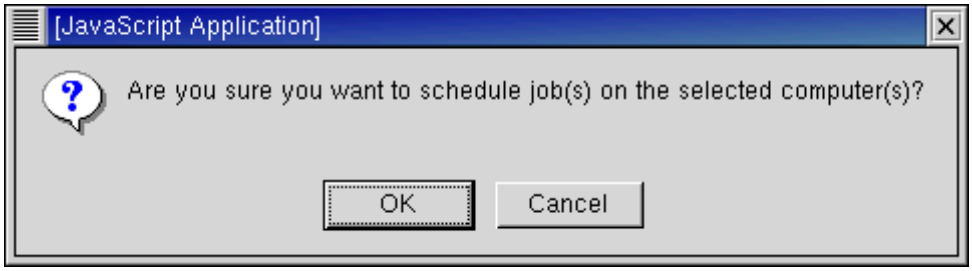
4. The Details pane displays the list of jobs within that job folder. Select the **Deploy Hardware Configuration and Linux Image** job.
5. Click **Schedule.**



6. Click **OK** with **Run this job immediately** selected.

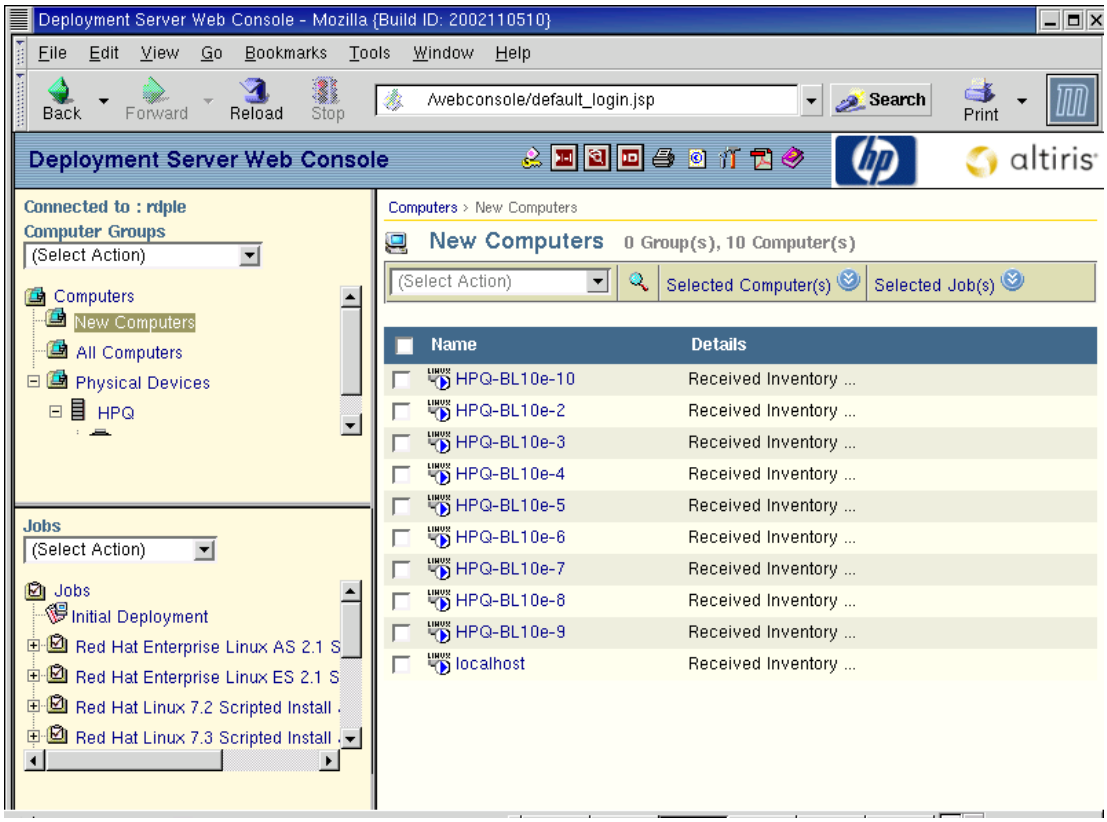


7. Click **OK** when prompted to confirm the action.




The image of the reference server previously captured is deployed to all of the selected server blades simultaneously.

When the server deployment is complete and the Web console is refreshed or when New Computers is selected in the Web console, the server icons change to indicate a Linux server is connected to the Deployment Server.



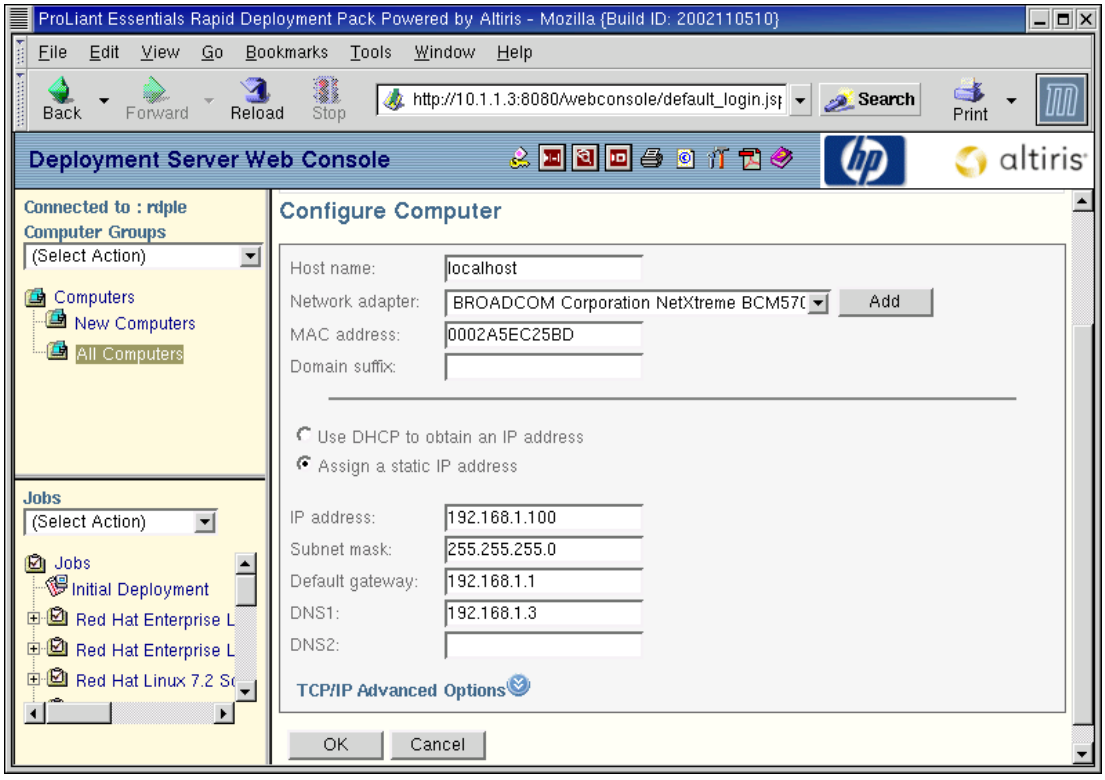
# Configuration of Deployed Servers

When deploying an image, the target server is automatically reconfigured to use the computer name and IP address information specified in the Deployment Server database. This Deployment Server feature can also be used to reconfigure existing servers or servers deployed using scripted install.

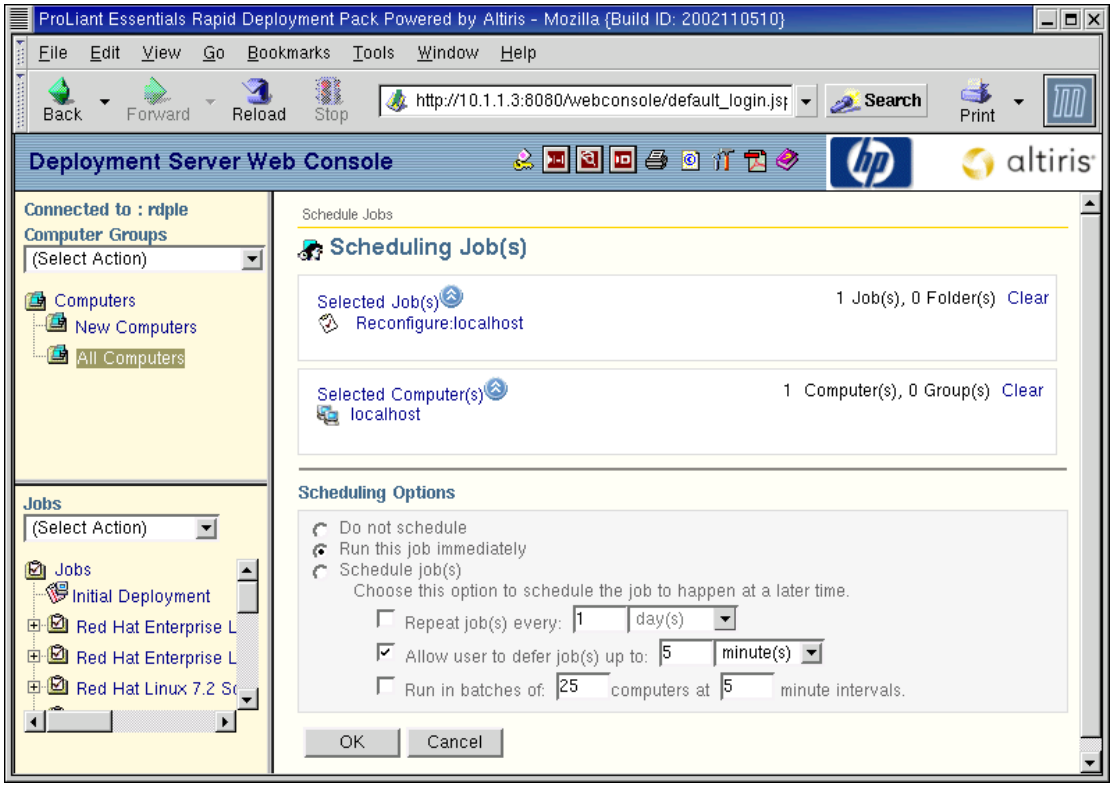
In the previous example, the reference server blade was installed using a scripted install job. This server was named localhost, the default Linux hostname.

To change the name of the reference server to match those deployed using imaging:

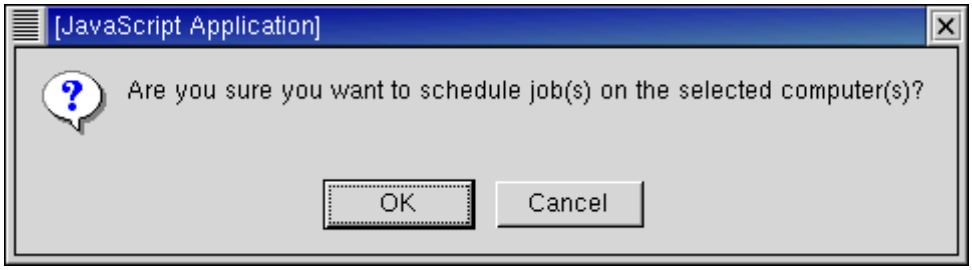
1. In the Computer Groups pane, select **New Computers.**
2. In the Details pane, select the reference server (localhost in this example) by selecting the checkbox next to the server name.
3. Select **Configure** from the (Select Action) list.
4. Click **OK** when prompted to start configuration of the selected servers.
5. At the Configure screen, enter a new name for the computer in the Host name field.
6. To change from the default DHCP configuration to a fixed IP address, select **Assign a static IP address,** and then enter the IP address information for the server. Click **OK.**



7. Click **OK** with **Run this job immediately** selected.




8. Click **OK** when prompted to confirm the action.

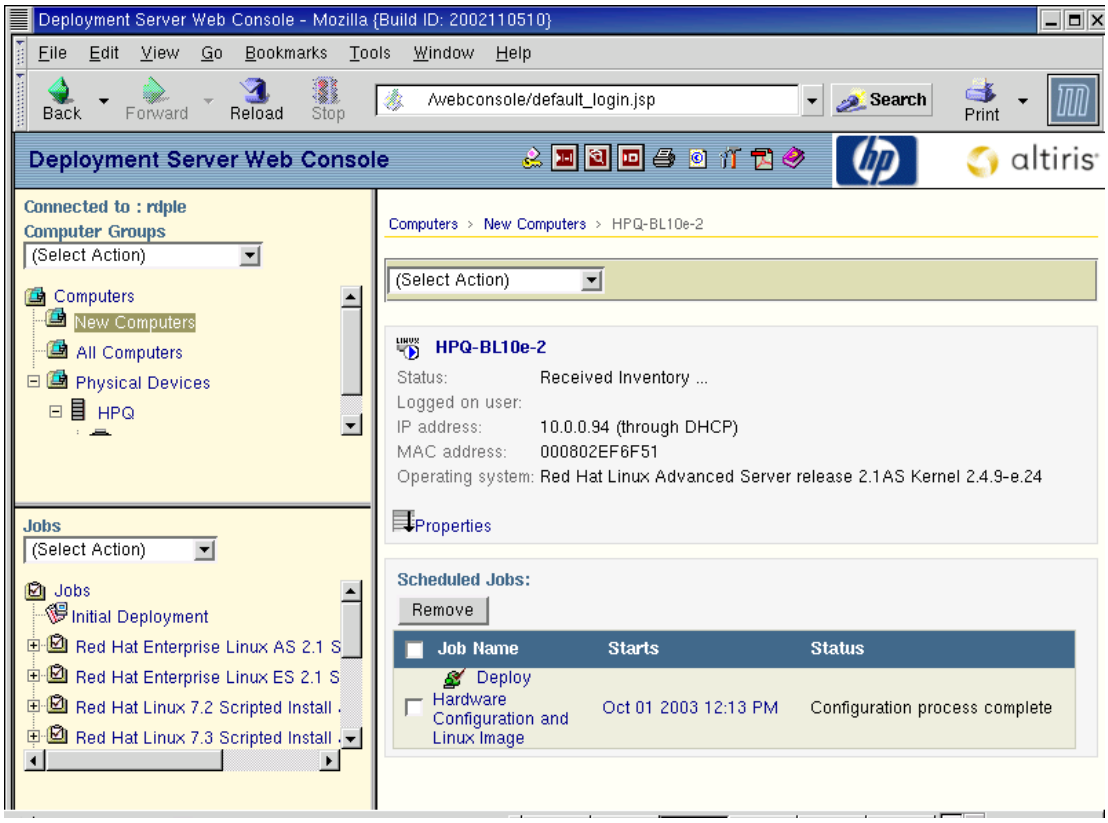



The server configuration changes. This change is reflected in the Deployment Server Web console.

# Rip-and-Replace for ProLiant BL Servers

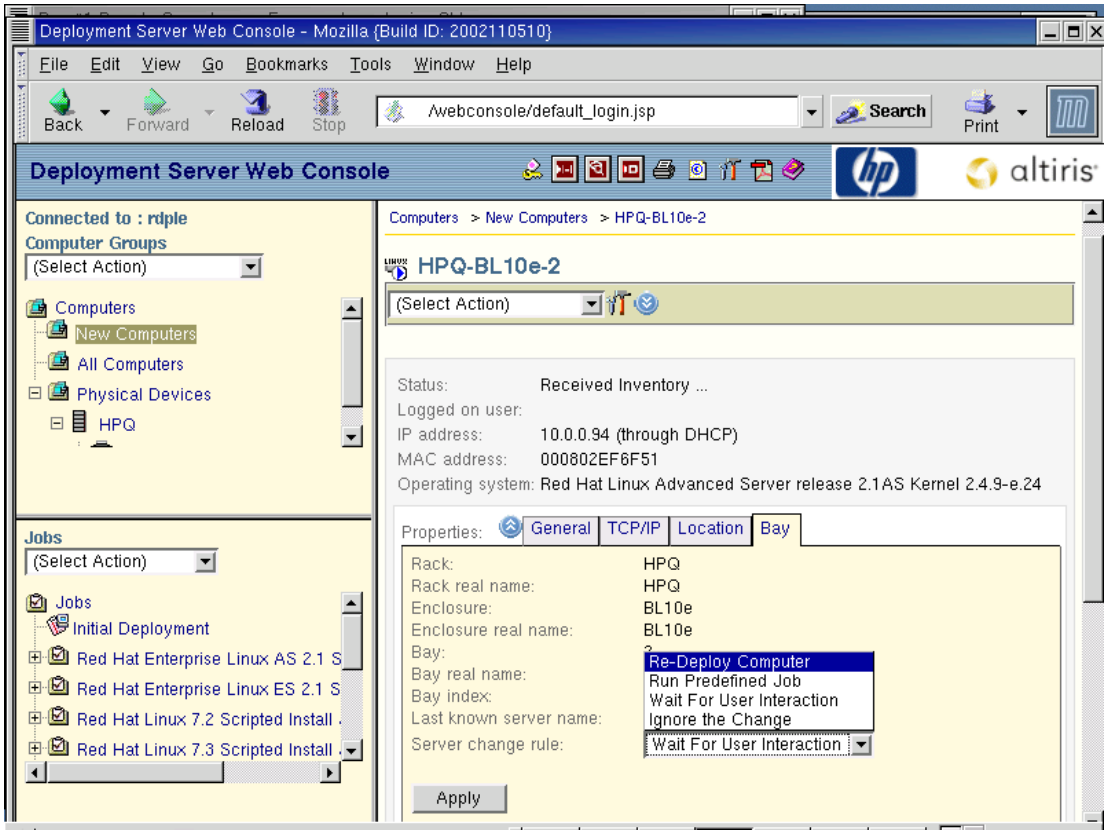
From the Web console, to set a deployment rule on one of the deployed server blades:

1. In the Computer Groups pane, select **New Computers.**
2. Select a single server. The Details pane changes to reflect the details for the selection.




3. Click the **Properties** link.
4. Select the **Bay** properties tab.

5. Select **Re-Deploy Computer** from the Server change rule list.




6. Click **Apply.**

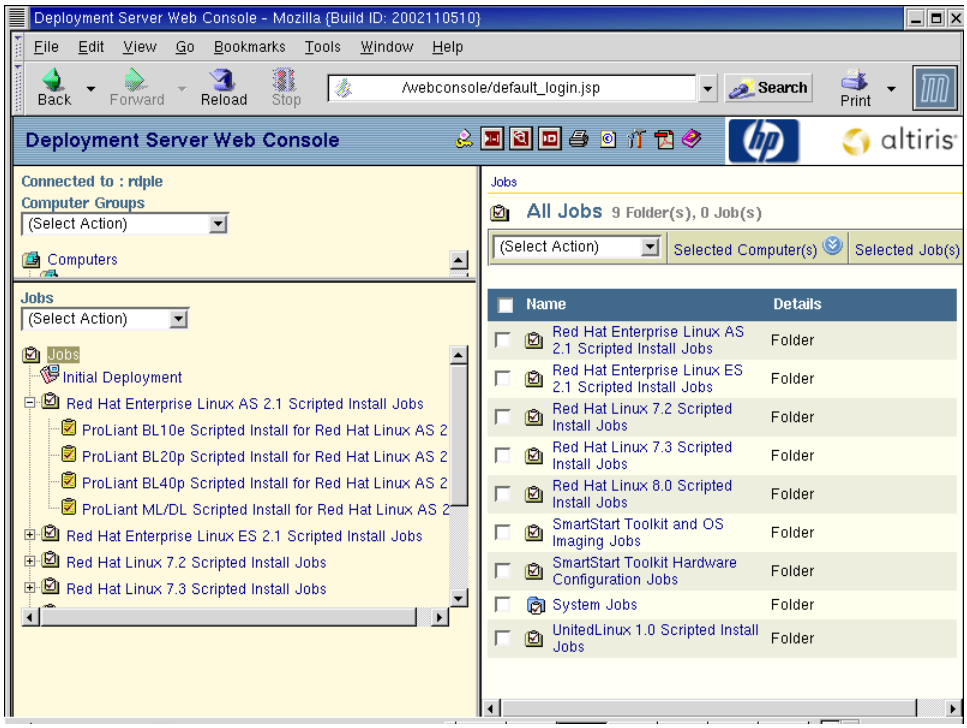
When this server blade is replaced, the deployment history is replayed on the new server. The tasks and jobs in the server history run beginning with the most recent image or scripted installation job, which for this example is the image deployment.

# 3

# Understanding the ProLiant Integration Module for Linux Deployment Server

## Rapid Deployment Pack Jobs

Several sets of deployment jobs are imported into the Web console during installation of the Rapid Deployment Pack. They are not physical files on the Deployment Server.




These jobs are organized into the following categories:

- Scripted install jobs for specific operating systems
- SmartStart Toolkit and OS Imaging jobs
- SmartStart Toolkit Hardware Configuration jobs

## Scripted Install Jobs

A scripted install job enables you to perform a scripted hardware configuration and operating system installation of Red Hat Linux or UnitedLinux on a configured or unconfigured server.

**NOTE:** UnitedLinux 1.0 refers to Conectiva Enterprise Linux, SCO Linux Server 4.0, SuSE Linux Enterprise Server 8, and TurboLinux Enterprise Server 8 powered by UnitedLinux 1.0.

The scripted install jobs perform the following operations consecutively:

1. Run a batch file that configures the hardware, using the CONREP and ACR utilities from the SmartStart Scripting Toolkit.
2. Reboot the computer.
3. Run a batch file that partitions the hard drive, using the CPQDISK utility.
4. Reboot the computer.
5. Run a batch file that copies support files to the hard drive of the target server and starts the operating system-specific scripted installation mechanism.

## Red Hat Linux Scripted Install Jobs

Table 3-1 provides the breakdown for a ProLiant ML/DL scripted install for a Red Hat Linux job. Each bold line represents one of the tasks in the job. Under each script task is a condensed listing of the script and a description of its functionality.

**Table 3-1: Contents of the Red Hat Linux Scripted Install Job**

| |
|---|
| **Run Script (Set Hardware Configuration)** |
| `set osfile=linux-h.ini` |
| `set hwrfile=mldl-h.ini` |
| `set aryfile=mldl-a.ini` |
| `call f:\deploy\tools\scripts\setcfg.bat`<br>This external batch file sets the hardware and array configuration settings. First, it calls CONREP with the linux-h.ini file to set the hardware operating system settings. Next, it calls CONREP with the mldl-h.ini file to set the rest of the hardware settings. Finally, it calls ACR with the mldl-a.ini file to set the array configuration settings. |
| **Shutdown/Restart (Reboot)** |
| **Run Script (Set Disk Partition)** |
| `set prtfile=linux-p.ini` |
| `call f:\deploy\tools\scripts\setpart.bat`<br>This external batch file sets the disk partition configuration settings. It calls CPQDISK with the linux-p.ini file to set the disk partition settings. |
| **Shutdown/Restart (Reboot)** |
| **Run Script (Install OS)** |
| `set nfsserver=0.0.0.0` |
| `set ss=ss.`*xxx*<br>where *xxx* is the ProLiant Support Pack version installed. For example, ss.640 represents version 6.40. |
| `set os=rhyy`<br>where `yy` is the Red Hat Linux version. For example, `rhas21` represents Red Hat Enterprise Linux AS 2.1. |
| `set ksfile=ks.cfg` |
| `call f:\deploy\tools\scripts\rhyy.bat`<br>This external batch file prepares the target server for a Red Hat Linux scripted installation. First, it formats the hard drive. Next, it copies over Red Hat Linux boot files to the target server. Finally, it creates an autoexec.bat file. The autoexec.bat file contains a line that executes loadlin similar to the following:<br>`loadlin vmlinuz ks=nfs:%nfsserver%:/usr/cpqrdp/%ss%/%os%/%ksfile% initrd=initrd.img`<br>The *nfsserver* variable tells loadlin where to get the kickstart file. The *os* and *ss* variables are used to determine the location of the boot files to copy and determine the location of the kickstart file. The *ksfile* variable denotes the name of the kickstart file (.cfg) to use.<br>Additional command line parameters may also be included to support specific console needs. |

Upon rebooting, the target server boots to the C: drive and runs autoexec.bat, which loads the Linux setup kernel. This reboot begins the Linux NFS-based scripted installation.

### Default Hardware Configuration

Hardware configuration is accomplished by means of automatic "smart default" methods provided by the SmartStart Scripting Toolkit utilities. The BIOS is configured to accept default parameters, and the array controller (if any) is configured according to one of the following methods:

- If the system contains one hard drive, the system is configured for RAID 0.
- If the system contains two hard drives, the system is configured for RAID 1.
- If the system contains three hard drives, the system is configured for RAID 5.
- If the system contains four or more hard drives, the system is configured for RAID ADG, if supported. Otherwise, the system is configured for RAID 5.

### Default Red Hat Installation Settings

The provided deployment jobs specify certain default configuration parameters. To deploy servers with specific configuration settings, you must modify the scripted install job or underlying files as necessary.

**Table 3-2: Red Hat Default Settings**

| Component | Default Settings |
|---|---|
| Linux root password | The root password for servers created using the provided scripts is `password`. This password is stored as clear text in the kickstart file. HP recommends changing the root password and in encrypted form within the kickstart file. For instructions, refer to the *Red Hat Linux Customization Guide* at http://www.redhat.com/docs/manuals/linux. |
| Linux bootloader | GRUB is the default Linux bootloader and its password is `password`. This password is stored as clear text in the kickstart file. HP recommends changing the GRUB password and in encrypted form within the kickstart file. For instructions, refer to the *Red Hat Linux Customization Guide* at http://www.redhat.com/docs/manuals/linux . |
| Drive configuration | When configuring the disk partition for a scripted operating system installation, a 75-MB boot partition is created and the remainder of the disk space is partitioned according to Linux default specifications. |
| Packages | Basic Linux packages are installed for a scripted operating system installation. The GNOME and KDE packages are not installed. |
| Firewall | Firewall settings are disabled. |
| ProLiant Support Pack files | HP installs the latest support pack drivers and agents. The default Linux Web Agent password is `password`. This password is stored as clear text in the input file, linuxpsp.txt, located on the NFS server. |

## UnitedLinux Scripted Install Jobs

Table 3-3 provides the breakdown for a ProLiant ML/DL scripted install for a UnitedLinux job. Each bold line represents one of the tasks in the job. Under each script task is a condensed listing of the script and a description of its functionality.

**Table 3-3: Contents of the UnitedLinux Scripted Install Job**

| |
|---|
| **Run Script (Set Hardware Configuration)** |
| `set osfile=linux-h.ini` |
| `set hwrfile=mldl-h.ini` |
| `set aryfile=mldl-a.ini` |
| `call f:\deploy\tools\scripts\setcfg.bat`<br>This external batch file sets the hardware and array configuration settings. First, it calls CONREP with the linux-h.ini file to set the hardware operating system settings. Next, it calls CONREP with the mldl-h.ini file to set the rest of the hardware settings. Finally, it calls ACR with the mldl-a.ini file to set the array configuration settings. |
| **Shutdown/Restart (Reboot)** |
| **Run Script (Set Disk Partition)** |
| `set prtfile=linux-p.ini` |
| `call f:\deploy\tools\scripts\setpart.bat`<br>This external batch file sets the disk partition configuration settings. It calls CPQDISK with the `linux-p.ini` file to set the disk partition settings. |
| **Shutdown/Restart (Reboot)** |
| **Run Script (Install OS)** |
| `set nfsserver=0.0.0.0` |
| `set ss=ss.`*xxx*<br>where *xxx* is the ProLiant Support Pack version installed. For example, ss.640 represents version 6.40. |
| `set os=ulyy`<br>where `yy` is the UnitedLinux version. For example, `ul10` represents UnitedLinux 1.0. |
| `set ctlfile=mldl.xml` |
| `call f:\deploy\tools\scripts\ulyy.bat`<br>This external batch file prepares the target server for a UnitedLinux 1.0 scripted installation. First, it formats the hard drive. Next, it copies over UnitedLinux 1.0 boot files. Finally, it creates an autoexec.bat file. The autoexec.bat file contains a line that executes loadlin.<br>The *nfsserver* variable tells loadlin where to get the control (.xml) and UnitedLinux yy operating system files. The *os* and *ss* variables are used to determine the location of the boot files to copy and also are combined to determine the location of the control file. The *ctlfile* variable denotes the name of the control (.xml) file to use.<br>Additional command line parameters may also be included to support specific console needs. |

Upon rebooting, the target server boots to the C: drive and runs autoexec.bat, which loads the Linux setup kernel. This reboot begins the Linux NFS-based scripted installation.

### Default Hardware Configuration

Hardware configuration is accomplished by means of automatic "smart default" methods provided by the SmartStart Scripting Toolkit utilities. The BIOS is configured to accept default parameters, and the array controller (if any) is configured according to one of the following methods:

- If the system contains one hard drive, the system is configured for RAID 0.
- If the system contains two hard drives, the system is configured for RAID 1.
- If the system contains three hard drives, the system is configured for RAID 5.
- If the system contains four or more hard drives, the system is configured for RAID ADG, if supported. Otherwise, the system is configured for RAID 5.

### Default UnitedLinux Installation Settings

The deployment jobs provided with Rapid Deployment Pack use several default configuration parameters. To deploy servers with specific configuration settings, you must modify the scripted install job or underlying files as necessary.

**Table 3-4: UnitedLinux Default Settings**

| Component | Default Settings |
|---|---|
| Linux root password | The root password for servers created using the provided scripts is `password`. This password is stored in encrypted form in the control file. HP recommends changing the root password in the control file. For instructions, refer to the *AutoYaST2-Automatic Linux Installation and Configuration with YAST2* guide at http://www.suse.de/~nashif/autoinstall/8.1. |
| Linux bootloader | GRUB is the default Linux bootloader. No default bootloader password is set. |
| Drive configuration | When configuring the disk partition for a scripted operating system installation, the disk space is partitioned according to UnitedLinux default specifications. |
| Packages | Basic Linux packages are installed for a scripted operating system installation. The GNOME and KDE packages are not installed. |
| Firewall | Firewall settings are disabled. |
| ProLiant Support Pack files | HP updates and installs the latest support pack drivers and agents provided by the Rapid Deployment Pack release. The default Linux Web Agent password is `password`. This password is stored as clear text in the input file, linuxpsp.txt, located on the NFS server. |

## SmartStart Toolkit and OS Imaging Jobs

SmartStart Toolkit and OS Imaging Jobs capture an exact copy of a server hardware configuration and hard drive image and deploy them to other ProLiant servers.

Replicating servers by means of imaging only works when the reference server and the target server are the same server model and have the same hardware configuration.

The Capture Hardware Configuration and Linux Image Job performs the following tasks:

1. Runs several commands to remove cached DHCP information from reference server.
2. Runs the Altiris imaging tool to capture the target server hard drive image.
3. Runs a batch file that captures the hardware configuration, using the CONREP and ACR utilities from the SmartStart Scripting Toolkit.

The Deploy Hardware Configuration and Linux Image Job performs the following tasks:

1. Runs a batch file that deploys the hardware configuration, using the CONREP and ACR utilities from the SmartStart Scripting Toolkit.
2. Reboots the computer.
3. Runs the Altiris imaging tool to deploy a hard drive image to the target server.

Linux systems are imaged using the default Altiris imaging mechanism. This procedure requires that the Altiris Deployment Agent for Linux is running on the system to be imaged. The imaging task instructs the Deployment Agent to perform preimaging configuration tasks on the system to be imaged, then the system reboots in DOS mode so the imaging can be performed. When the imaging is complete, the system reboots in Linux mode, where the Deployment Agent recreates the previous configuration of that system. The preimaging configuration is necessary so that when deploying a Linux image to a target system, the Deployment Agent can perform post-image configuration tasks.

## SmartStart Toolkit Hardware Configuration Jobs

The SmartStart Toolkit Hardware Configuration Jobs can quickly deploy a server hardware configuration to other ProLiant servers.

The SmartStart Toolkit Hardware Configuration Jobs:

- Run a batch file that captures or deploys the hardware configuration using the CONREP and ACR utilities from the SmartStart Scripting Toolkit
- Reboot the computer (a reboot is required after configuring the array controller).

Replicating servers by means of imaging only works when the reference server and the target server are the same server model and have the same hardware configuration.

The SmartStart Toolkit Hardware Configuration Jobs also include the System Erase utility. This utility can be used to erase all the data on a system, including the hardware configuration and hard drives.

**CAUTION:** Using the System Erase utility erases all data on the system. Ensure that all appropriate backups have been made before using the System Erase utility to prevent any data loss.

# Understanding the Linux Deployment Server Directory Structure

During the ProLiant Integration Module for Linux Deployment Server installation, the directory /opt/altiris/deployment/adlserver is populated with tools, scripts, and configuration files.

Table 3-5 provides an overview of the directory structure for /opt/altiris/deployment/adlserver.

**Table 3-5: Directory structure for /opt/altiris/deployment/adlserver**

| Reference Name | Directory Path | Directory Description |
|---|---|---|
| Images | ./images | Contains the default image files created during an image capture task or deployed during an image deployment task. |
| Configurations | ./deploy/configs | Contains hardware, array, and partitioning configuration files. |
| Tools | ./deploy/tools | Contains various applications used specifically for Rapid Deployment Pack not provided by the SmartStart Scripting Toolkit. |
| Scripts | ./deploy/tools/scripts | Contains operating system-specific batch files. |
| SmartStart Scripting Toolkit | ./deploy/tools/ssst | Contains the SmartStart Scripting Toolkit, which includes the SmartStart Scripting Toolkit documentation. |
| Linux Boot Files | ./deploy/cds/compaq/ss.*xxx*/*yyyy* | Contains Linux-specific installation kernels and initial RAM disk images for starting the operating system-specific scripted installation. *xxx* represents the ProLiant Support Pack version installed and *yyyy* represents the Linux distribution shortcut name. |
| Documentation | ./docs | Contains documentation for Rapid Deployment Pack—Linux Edition. |

## Images

When performing the Capture Hardware Configuration and Linux Image, and Deploy Hardware Configuration and Linux Image jobs, the Linux Image files are saved in this directory. These provided jobs use the default image file, lnxcap.img, which is specified within the imaging tasks of the jobs. If you use the jobs without modification, each time you capture a new image it overwrites the previous image. To capture or deploy images for different server configurations, you must copy and rename the jobs, then modify the image file name in the imaging task so that the files are saved with a unique name.

## Configurations

The various initialization files for setting the server hardware, array, and drive partitions during the scripted installation jobs are found in this directory.

When performing the Capture Hardware Configuration and Linux Image and Deploy Hardware Configuration and Linux Image jobs, the default initialization files representing hardware configuration and array configuration are lnxcap-h.ini and lnxcap-a.ini, respectively. When these files are stored in the ./configs directory, the file names are converted to all capital letters.

When performing the Capture Hardware Configuration and Deploy Hardware Configuration jobs, the default initialization files representing hardware configuration and array configuration are cpqcap-h.ini and cpqcap-a.ini, respectively. When these files are stored into the ./configs directory, the file names are converted to all capital letters.

If you use the capture jobs without modification, each time you capture a new configuration, it overwrites the previous configuration. To capture and deploy configurations for different servers, you must copy and rename the jobs, then modify the configuration file name variable within the jobs so that the files are saved with a unique name.

**Table 3-6: Configuration Files**

| Files | Used for |
|---|---|
| *-h.ini | CONREP.EXE |
| *-a.ini | ACR.EXE |
| *-p.ini | CPQDISK.EXE |

## Tools

This directory contains tools used during server deployment that are not included in the SmartStart Scripting Toolkit.

## Scripts

The scripts contained in this directory are used for:

- Wrapping utilities in the SmartStart Scripting Toolkit to detect and report errors back to the operating system
- Setting up the target server to begin an operating system installation

**Table 3-7: Script Files**

| Files | Used for |
|---|---|
| acr.bat | Calls ACR.EXE |
| conrep.bat | Calls CONREP.EXE |
| cpqdisk.bat | Calls CPQDISK.EXE |
| set*.bat | Sets operating system, hardware, array, and partition settings |
| get*.bat | Gets operating system, hardware, array, and partition settings |
| *yyyy*.bat | Prepares hardware for Linux install, where *yyyy* is the Linux distribution shortcut name |

## Linux Boot Files

One directory per operating system is created to store the Linux boot files in the ./deploy/cds/compaq/ss.*xxx* directory. The directory names are derived from the operating system name to distinguish each Linux operating system version. For example, ./deploy/cds/compaq/ss.640/rhas21 is the directory name for the ProLiant Support Pack version 6.40 and Red Hat Enterprise Linux AS 2.1.

The files located within each of these directories are used by the scripted installation jobs to start the Linux installation. The following files are used:

- initrd.img—the initial ram disk Linux image
- vmlinuz—Linux boot kernel
- loadlin.exe—executable to load the Linux image and run the kernel

## Documentation Files

The Rapid Deployment Pack documentation is installed in the ./docs directory in Portable Document Format (.pdf). The X Window System package for viewing .pdf files can be used to view these files on a Linux server. These files can also be viewed from a Windows computer using Adobe Acrobat Reader.

# 4

# Understanding the ProLiant Integration Module for NFS Server

Installing the ProLiant Integration Module for NFS populates the /usr/cpqrdp directory with the operating system distribution files, Linux installation files, and ProLiant Support Pack files according to selections made during installation. Table 4-1 provides an overview of the directory structure within /usr/cpqrdp.

**Table 4-1: NFS Directory Structure**

| Reference Name | Directory Path | Directory Description |
|---|---|---|
| Linux distribution files | /usr/cpqrdp/*yyyy** | Contains the operating system source files from the Linux OS distribution CDs. |
| Linux installation files | /usr/cpqrdp/ss.*xxx*/*yyyy** | Contains the Linux installation files. |

* where *xxx* represents the ProLiant Support Pack version installed and *yyyy* represents the operating system/distribution shortcut name

## Linux Distribution Files

Within the /usr/cpqrdp directory, one directory is created per operating system for storing the Linux distribution source files. The directory names are derived from the operating system name to distinguish each Linux operating system version. For example, /usr/cpqrdp/rhas21 is the directory name for the Red Hat Enterprise Linux AS 2.1 files.

**NOTE:** Red Hat distribution CD-ROM .iso images can be used in place of the source files at this location. For more information, refer to the Rapid Deployment Pack Knowledge Base at http://www.hp.com/servers/rdp/kb.

## Linux Installation Files

In addition to the operating system directory path created in the /usr/cpqrdp directory, a path associated with the support version, ss.*xxx*, is also created, where *xxx* represents the ProLiant Support Pack version.

### Red Hat

For each Red Hat Linux distribution, the kickstart installation files are stored in the /usr/cpqrdp/ss.*xxx*/rh*yy* directory, where rh*yy* represents the Red Hat distribution shortcut name. For example, Red Hat Enterprise Linux AS 2.1 installation files are saved in the /usr/cpqrdp/ss.*xxx*/rhas21 directory. Different kickstart files are provided based on server model because of differences in technology and/or installation requirements.

The ProLiant Support Pack files associated with Red Hat are located in the /usr/cpqrdp/ss.*xxx*/rh*yy*/csp directory. A script file, rh*yy*.sh, installs the support pack components during a Linux scripted install. The script file uses an input file, linuxpsp.txt, to set various parameters. For additional information about the input file and installing the ProLiant Support Pack, refer to the ProLiant Support Pack and Deployment Utilities documentation.

### UnitedLinux

For UnitedLinux, the control installation files are stored in the /usr/cpqrdp/ss.*xxx*/ul*yy*/control directory, where ul*yy* represents the UnitedLinux distribution shortcut name. For example, UnitedLinux 1.0 installation files are saved in the /usr/cpqrdp/ss.*xxx*/ul10/control directory. Different control files are provided based on server model because of differences in technology and/or installation requirements.

UnitedLinux updates are located within the control directory at /usr/cpqrdp/ss.*xxx*/ul*yy*/control/updates. Custom package selection files are provided within the update directory.

The ProLiant Support Pack files associated with UnitedLinux are located in the /usr/cpqrdp/ss.*xxx*/ul*yy*/csp directory. A script file, ul*yy*.sh, installs the support pack components during a Linux scripted install. The script file uses an input file, linuxpsp.txt, to set various parameters. For additional information about the input file and installing the ProLiant Support Pack, refer to the ProLiant Support Pack and Deployment Utilities documentation.

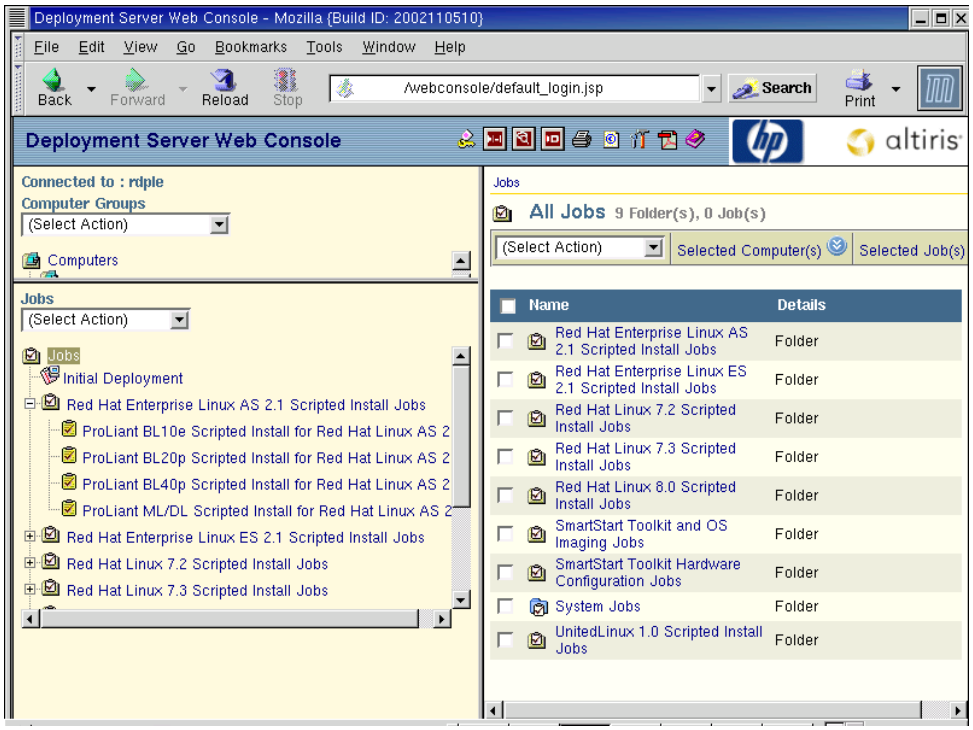
# 5

# Customizing the Provided Jobs, Scripts, Tools, and Configuration Files

## Customizing the Web Console Jobs Pane

The Web console is the user interface for managing and deploying servers. Within the Web console, all the jobs are categorized in a folder hierarchy in the Jobs pane. You can rearrange the folders and edit the jobs.

This section explains how to add, copy, and delete job folders and jobs. For additional information about the customization features of the Web console, refer to the *Altiris Deployment Solution 5.6 for Linux Product Guide*, which can be found at http://www.hp.com/servers/rdp.

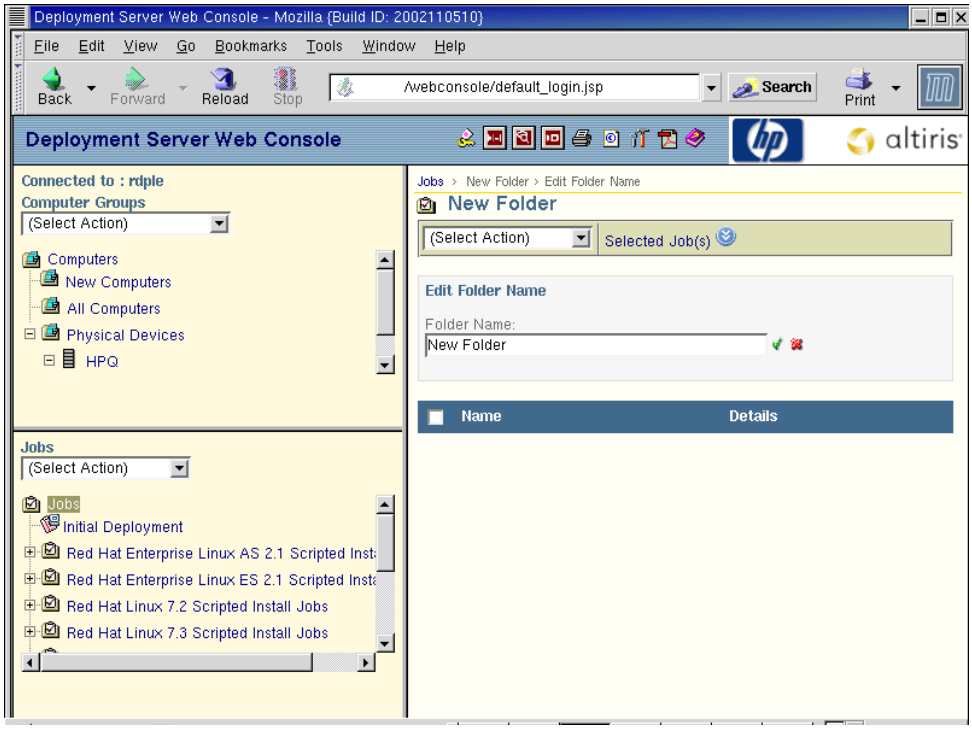



**IMPORTANT:** Be sure to make copies of the provided jobs and files for backup to ensure that a working version exists in case you encounter a problem.

## Adding a New Job Folder

To add a new job folder:

1. In the Jobs pane, click the Jobs top-level folder, or click a job folder to create a new subfolder. This highlights the folder name.
2. From the (Select Action) list, select **New Job Folder.**
3. In the Details pane, enter a descriptive name in the Folder Name field.

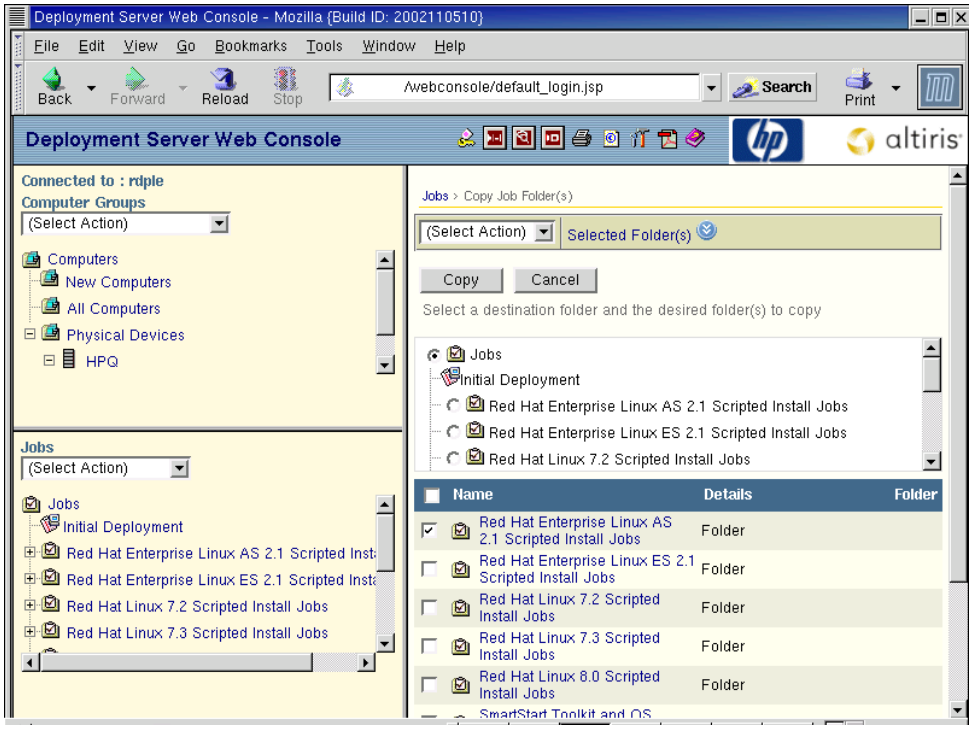



4. Click the green check mark icon at the end of the Folder Name.

## Copying a Job Folder

To copy a job folder:

1. In the Jobs pane, select **Copy Job Folder(s)** from the (Select Action) list.
2. In the Details pane, select the folder to which you want to copy the selected job folders.
3. Select the folders from which to make copies. Selecting a job folder within the Jobs pane before step 1 preselects that job for step 3.



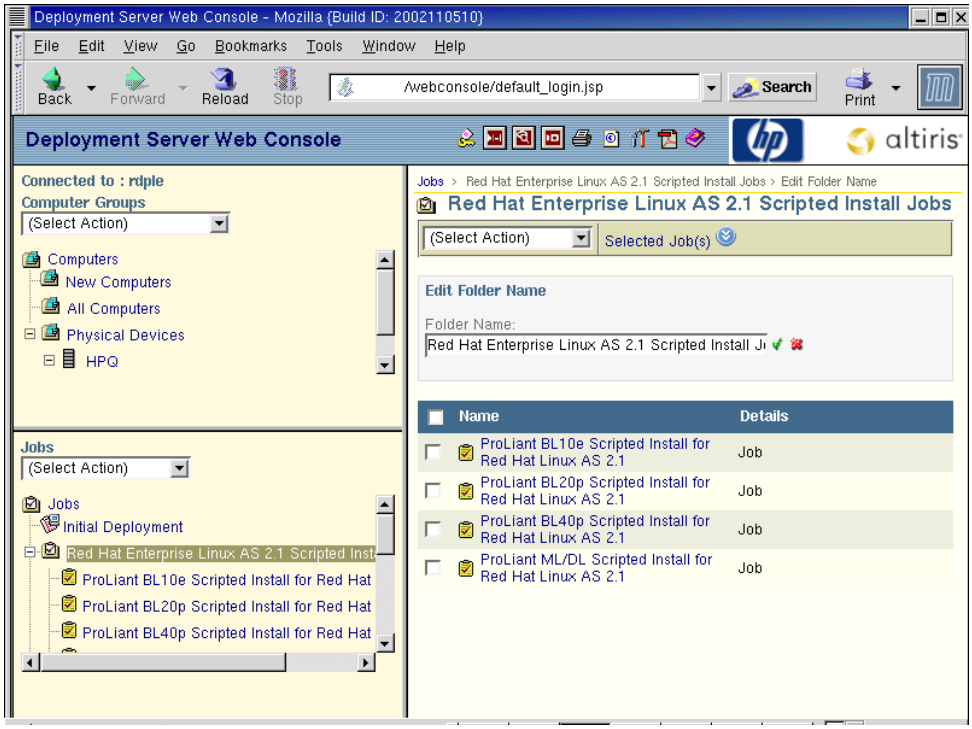

4. Click **Copy.**

**IMPORTANT:** The job folders in the Rapid Deployment Pack use long names to be descriptive. However, when attempting to copy these folders, the name exceeds the 64-character limit of the Web console and truncates because Altiris places “Copy of” in front of the folder name.

## Renaming a Job Folder

To rename a job folder:

1. In the Jobs pane, click the folder.
2. In the Details pane, click the folder name located above the (Select Action) list.
3. In the Details pane, enter a descriptive name in the Folder Name field.



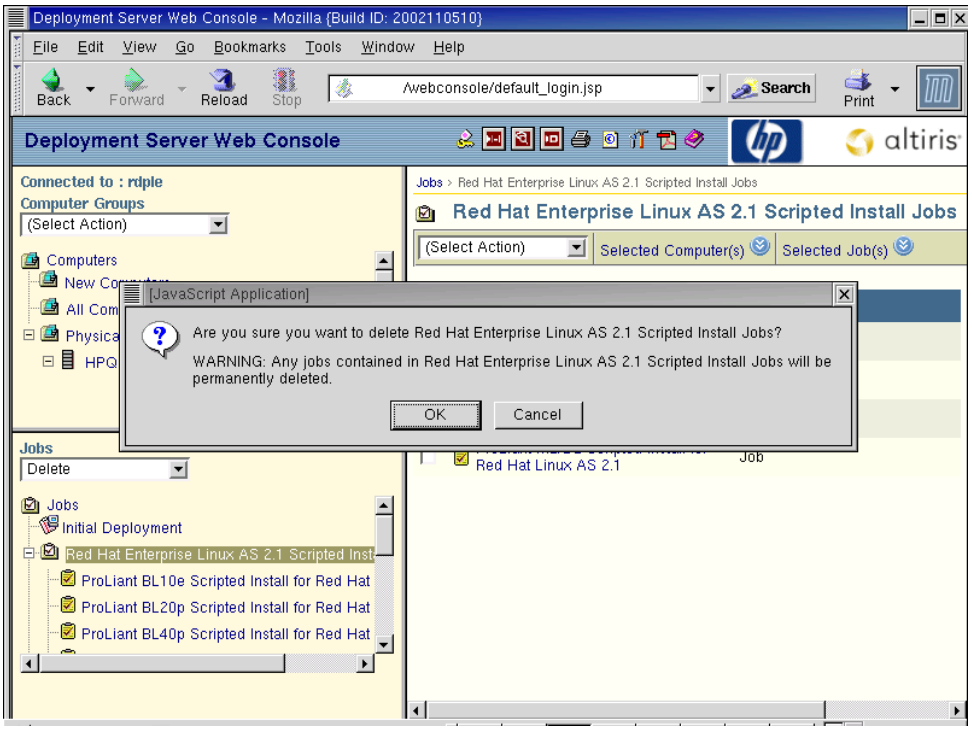

4. Click the green check mark icon at the end of the Folder Name field.

## Deleting a Job Folder or Job

To delete a job folder or job:

1. From the Jobs pane, click the folder or job to highlight it.
2. From the Jobs pane, select **Delete** from the (Select Action) list.
3. Click **OK** when prompted to confirm the action.

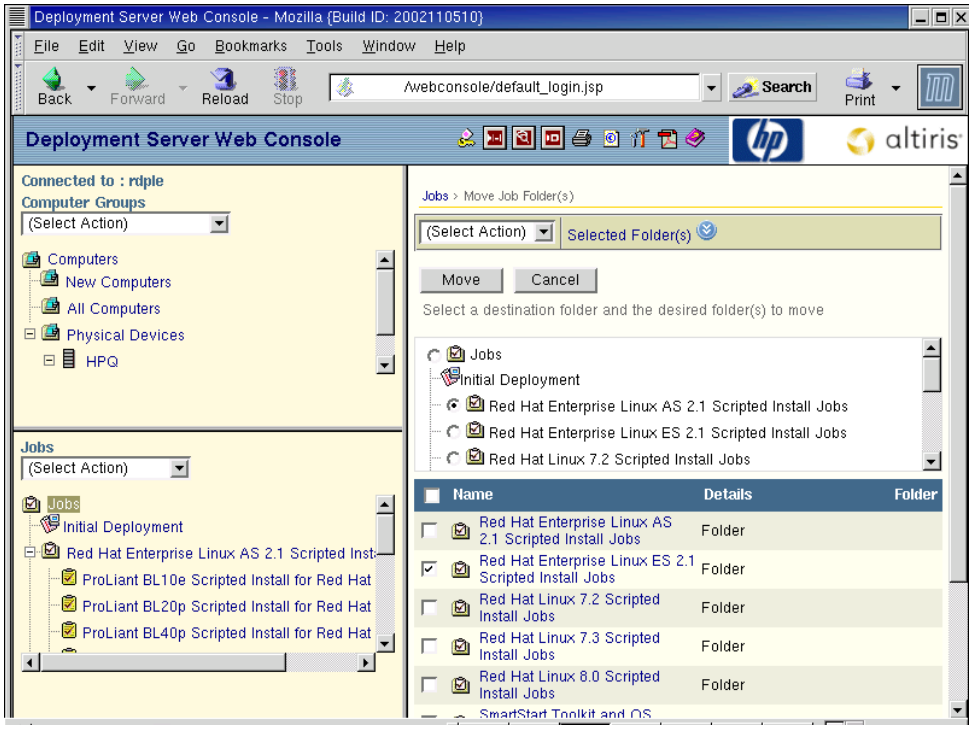
**IMPORTANT:** Deleting a folder permanently deletes all jobs within that folder.



## Moving a Job Folder

To move a job folder:

1. In the Jobs pane, select **Move Job Folder(s)** from the (Select Action) list.
2. In the Details pane, select the folder to which you want to move the job folder.
3. Select the folders to move underneath the folder selected in step 2. Selecting a job folder within the Jobs pane before step 1 preselects that job for step 3.

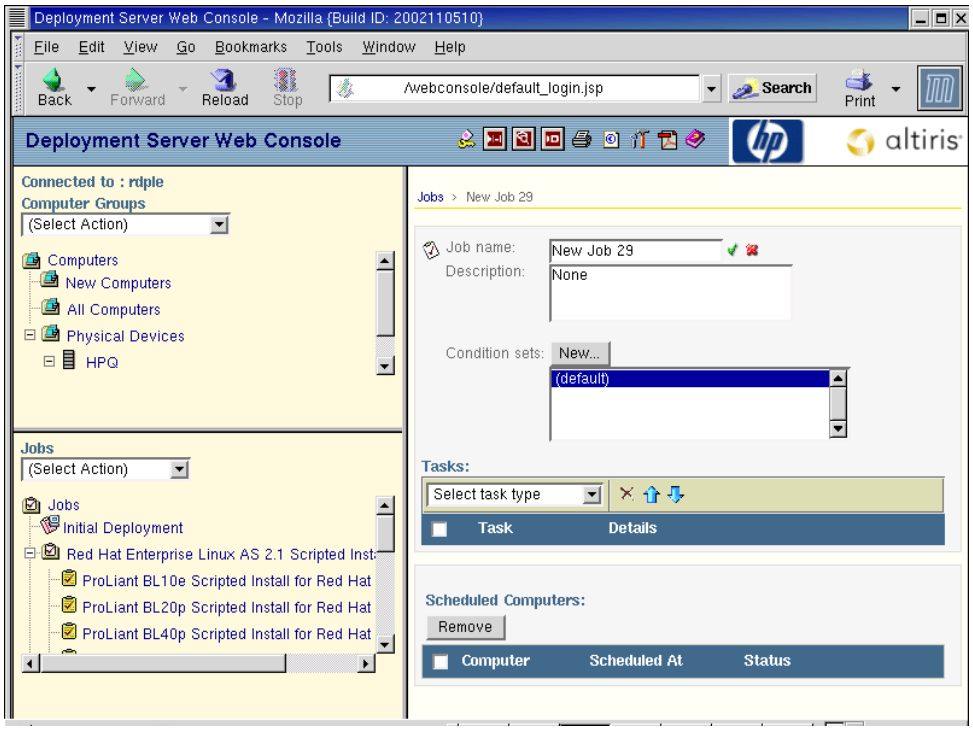



4. Click **Move.**

## Adding a Job

To add a new job:

1. In the Jobs pane, click the Jobs top-level folder to create a new top-level job, or click a job folder to create a new job within the folder. This action highlights the folder name.
2. From the (Select Action) list, select **New Job.**
3. In the Details pane, enter a descriptive name in the Job name field and a job description in the Description field.

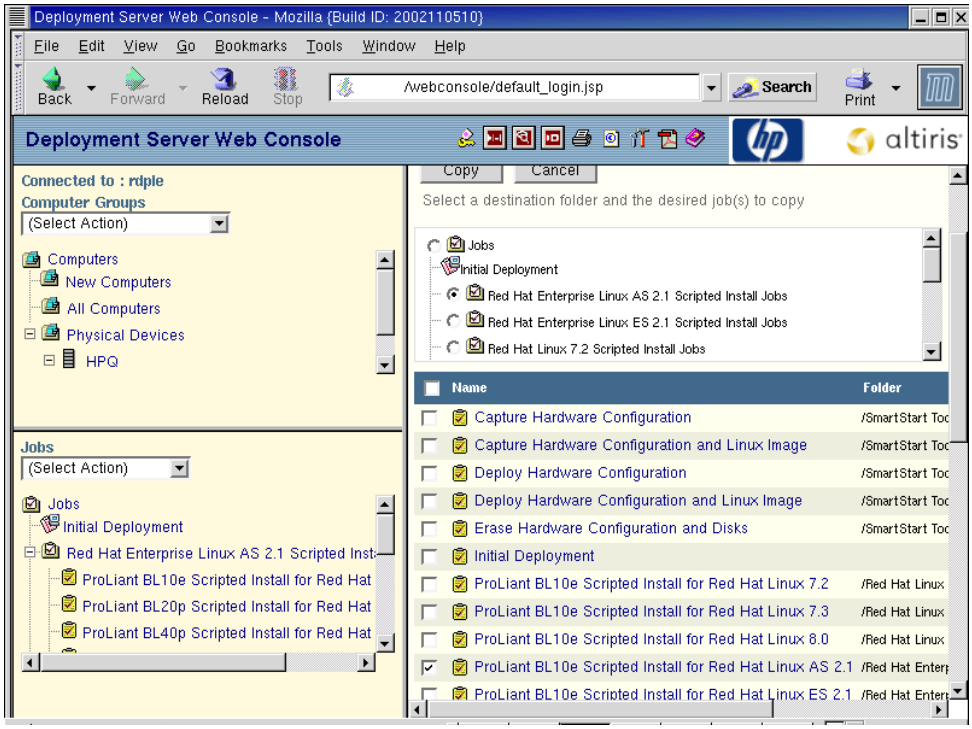



4. Click the green check mark icon at the end of the Job name field.

## Copying a Job

To copy a job:

1. From the (Select Action) list, select **Copy Job(s).**
2. In the Details pane, select the folder to which you want to copy the selected jobs.
3. Select the jobs from which to make copies. Selecting a single job within the Jobs pane before step 1 preselects that job for step 3.



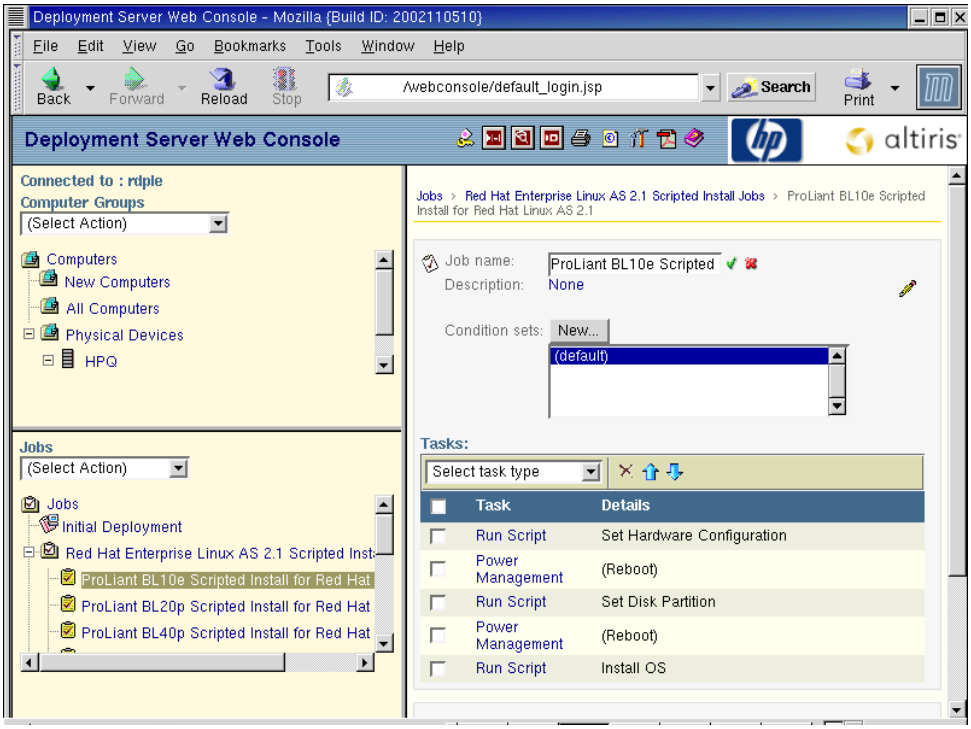

4. Click **Copy.**

**IMPORTANT:** Rapid Deployment Pack jobs use long names to be descriptive. However, when attempting to copy these jobs, the name exceeds the 64-character limit of the Web console and truncates because Altiris places “Copy of” in front of the job name.

## Renaming a Job

To rename a job:

1. In the Jobs pane, click the job to highlight the job name.
2. In the Details pane, click the job name or pencil icon.
3. Enter a descriptive name in the Job name field.

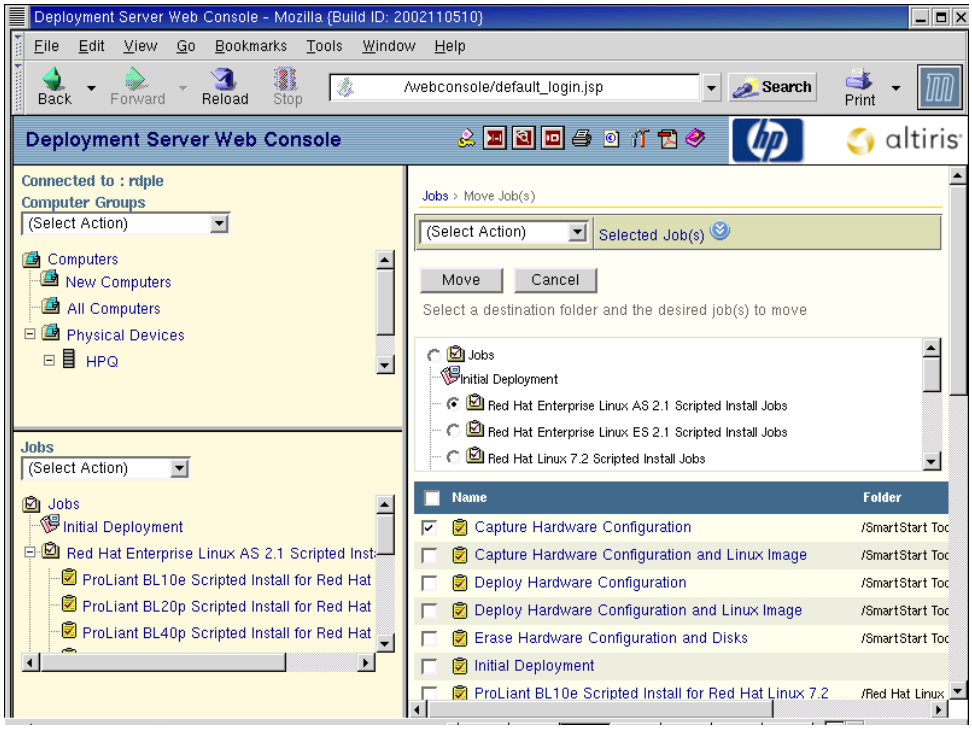



4. Click the green check mark icon at the end of the Job name field to submit your changes.

## Moving a Job

To move a job:

1. In the Jobs pane, select **Move Job(s)** from the (Select Action) list.
2. In the Details pane, select the folder to which you want to move the job.
3. Select the jobs to move underneath the folder selected in step 2. Selecting a job within the Jobs pane before step 1 preselects that job for step 3.



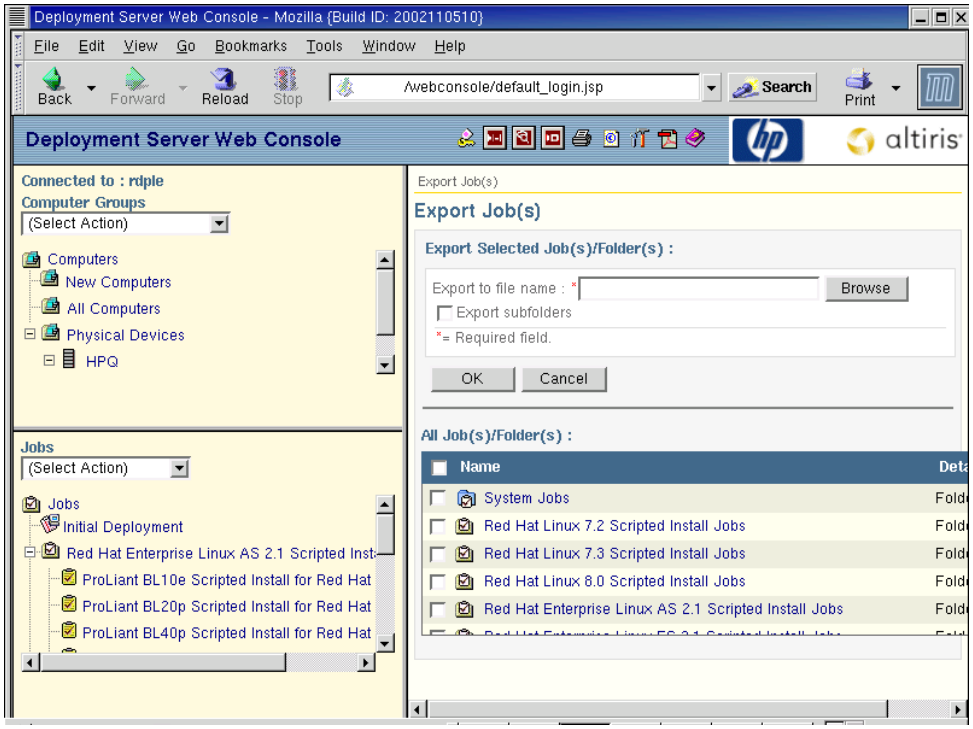

4. Click **Move.**

## Exporting a Job or Folder

To export a job or a folder:

1. In the Jobs pane, select **Export Job(s)** from the (Select Action) list.
2. In the Details pane, click **Browse** to indicate a directory and job file, or type in the path and file name in the Export to file name field.

**NOTE:** Job files are usually denoted with the .bin extension.

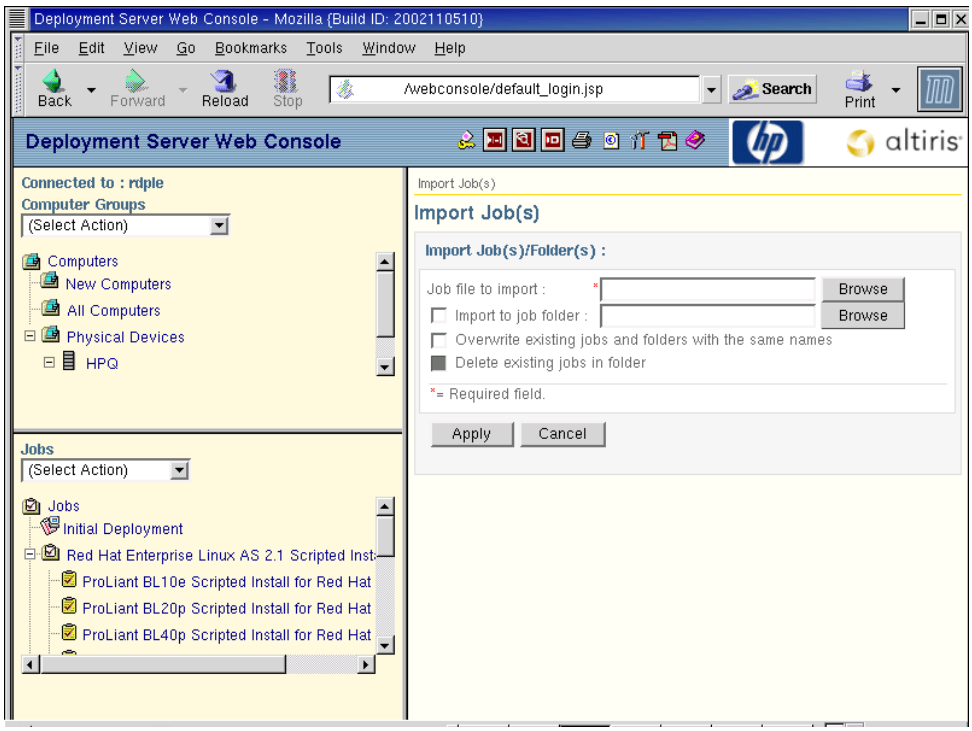



3. Select the **Export subfolders** checkbox if applicable for a folder.
4. Select the job or folder to export. Selecting a job within the Jobs pane before step 1 preselects that job for step 4.
5. Click **OK.**

## Importing a Job or Folder

To import a job or a folder:

1. Place the job file (.bin) onto the Deployment Server in a specified directory.
2. In the Jobs pane, select **Import Job(s)** from the (Select Action) list.
3. In the Details pane, click **Browse** to locate the directory and job file, or type in the path and file name in the Job file to import field. Job files are usually denoted with the .bin extension.




4. Select the checkboxes that apply.
5. Click **Apply.**

**NOTE:** The Deployment Server does not support importing jobs exported from the Deployment Server running on a Windows operating system.

# Customizing the ProLiant Integration Modules for Linux Deployment Server and NFS Server

The following sections provide information about customizing the ProLiant Integration Module for Linux Deployment Server and the NFS server.

## Customizing the Red Hat Linux Kickstart File

You might want to customize the provided kickstart files to:

- Change default root or grub passwords
- Change partitions, types, and sizes
- Change Linux packages that are installed
- Add errata kernel installation

For information about editing the kickstart files, refer to the *Red Hat Linux Customization Guide* located at http://www.redhat.com.

Refer to Chapter 3 of this guide for the location of the *ksfile=* variable within the provided scripted install jobs, and Chapter 4 for the kickstart file location on the NFS server. For each Linux distribution, there are several jobs and associated kickstart files for specific ProLiant models and families. If you want to make a change to the kickstart file for a particular server or type of server, copy, rename, and edit the kickstart file and the associated job to reference the new kickstart file.

## Customizing the UnitedLinux Control File

You might want to customize the provided control files to:

- Change default root password
- Change partitions, types, and sizes
- Change Linux packages that are installed

For information on editing control files, refer to the AutoYast guide at http://www.suse.de/~nashif/autoinstall/index.html.

Refer to Chapter 3 of this guide for the location of the *ctlfile=* variable within the provided scripted install jobs, and Chapter 4 for the control file location on the NFS server. For each Linux distribution, there are several jobs and associated control files for specific ProLiant models and families. If you want to make a change to the control file for a particular server or type of server, copy, rename, and edit the control file and the associated job to reference the new control file.

## Customizing the Hardware Configuration Settings

**IMPORTANT:** The hardware configuration files are not operating-system specific. The Linux scripted install jobs use these files. Changing the supplied files might have unwanted consequences.

You might want to customize the provided configuration files to:

- Enable or disable Advanced Server Recovery (ASR)
- Change the default boot order
- Explicitly set the RAID level or number of logical drives

For information about editing configuration files, refer to the SmartStart Scripting Toolkit User Guide or http://www.hp.com/servers/sstoolkit.

Refer to Chapter 3 of this guide for locations of the *hwrfile*= and the *aryfile*= variables within the provided scripted install jobs and the location of the physical file on the Deployment Server.

## Customizing the ProLiant Support Pack Files

You might want to update your jobs to reference new support files if you have:

- Created your own jobs
- Customized provided jobs
- Selected not to overwrite the existing provided jobs when performing a Rapid Deployment Pack upgrade

Refer to Chapter 3 of this guide, for the location of the *ss*= variable within the provided scripted install jobs and file location on the Deployment Server.

To update Linux scripted install jobs, the installation files in the ProLiant Integration Module for NFS Server must also be modified. Refer to Chapter 4 of this guide for information about the ProLiant Integration Module for NFS Server directory structure.

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