



UPGRADING FIRMWARE

using HP Web Jetadmin

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OVERVIEW

HP Web Jetadmin has the ability to upgrade the firmware for both HP Jetdirect devices and printers over the network for multiple devices simultaneously. Upgrades to firmware can correct problems with devices and add new features to devices without replacing hardware. The ability to upgrade HP Jetdirect firmware over the network has always been available through a separate utility called HP Download Manager. However, this requires a separate utility to be loaded for each operating system. The integrated firmware downloader in HP Web Jetadmin can upgrade firmware on any platform, without the aid of a separate download utility, and can automatically locate the latest firmware revision on the Web.

FIRMWARE REPOSITORY

The firmware repository is the storage area in HP Web Jetadmin for both device and HP Jetdirect firmware. Firmware images must reside in the firmware repository before HP Web Jetadmin can attempt to upgrade firmware on devices. The repository can be accessed several ways, most commonly by selecting **Firmware > Repository** in the navigation tree (Figure 1).

Actions that can be performed directly from the repository include:

- Downloading firmware images from the Web
- Importing firmware images from a file folder into the repository
- Deleting images from the repository
- Editing the properties (Description, Qualified status) of images
- Upgrading firmware on devices

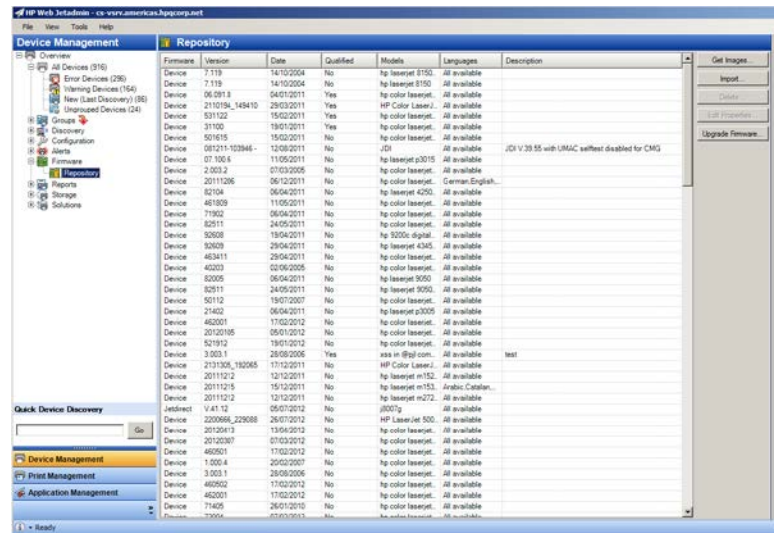


Figure 1—Firmware repository

DOWNLOAD THE FIRMWARE FROM THE WEB

HP Web Jetadmin allows for downloading firmware images directly from the Web rather than forcing users to search on their own. When **Get Images** is selected from the repository, a list of firmware images is made available and users can select which firmware images should be downloaded to the client (Figure 2). HP Web Jetadmin downloads an index file of images from the following locations to determine which images are available:

- www.hp.com/go/wja_firmware—HP Jetdirect firmware (firmware.glf index file)
- <ftp://ftp.hp.com/pub/networking/software/pfirmware>—Device firmware (pfirmware.glf index file)

When new firmware is introduced for a device, the image is first placed on the device's Web page for driver downloads. The image is also placed in the FTP location so that HP Web Jetadmin can download it from their central location. The pfirmware.glf file is modified to include any new version information. It is not uncommon for the firmware to appear on the device's Web page several days before it appears in the HP Web Jetadmin location.

After the firmware index file is obtained, HP Web Jetadmin uses it to display a list of available images to be downloaded to the client. HP Web Jetadmin knows exactly which images apply to which devices as defined in the .glf file. Images can be selected from the list of available images and downloaded to the client. After they are downloaded to the client, HP Web Jetadmin displays a box labeled **Import firmware images** to import the images to the HP Web Jetadmin server (Figure 3). The repository is designed to eliminate issues with Web access on servers. The server does not need proxy or Web access; only the client machine needs Web access through a browser. The images are simply downloaded to a user-defined folder on the client machine and imported to the HP Web Jetadmin server as needed. If a secure proxy is in place, HP Web Jetadmin displays a popup screen asking for credentials to traverse the proxy.

IMPORT THE FIRMWARE INTO HP WEB JETADMIN

The firmware repository has a button labeled **Import** that provides an opportunity to browse to any folder and select images to add to the repository (Figure 4). These might be images that HP Web Jetadmin previously downloaded from the Web and stored on a client machine or they might be images that were manually downloaded from device driver Web pages.

HP Jetdirect firmware images have a .dld extension, while the device firmware images have either an .rfu or .bdl extension. After being imported into the repository, the files physically exist under the following location on the HP Web Jetadmin server:

C:\Windows\ServiceProfiles\NetworkService\AppData\Local\HP Inc\HPWebJetadmin\WjaService\config\FirmwareUpgrade

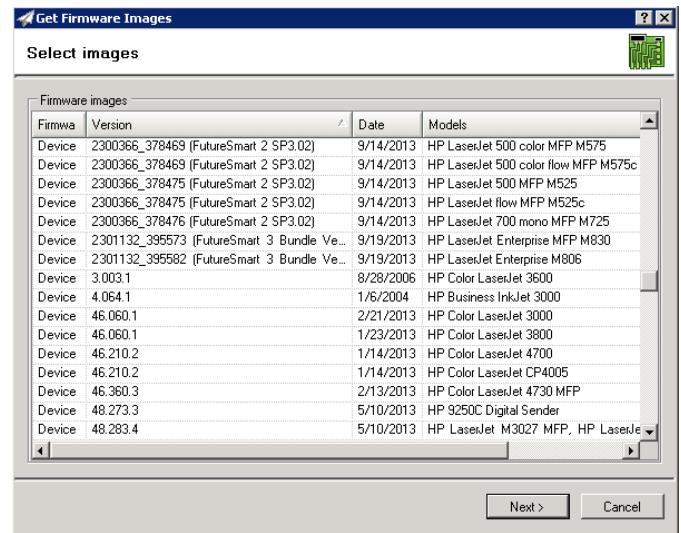


Figure 2—Select images to download from Web

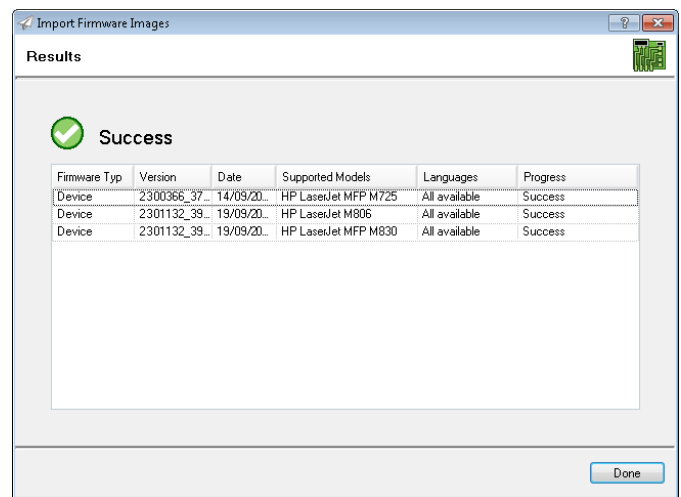


Figure 3—Downloading and importing

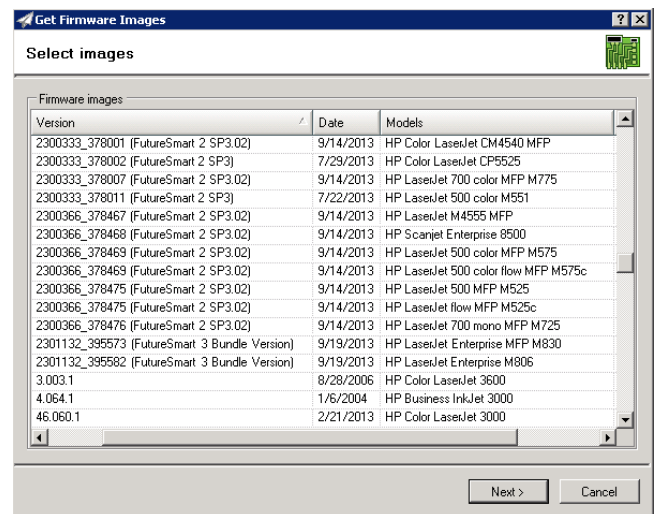


Figure 4—Import firmware images

UPGRADE DEVICES

HP Web Jetadmin can use the images in the repository to upgrade network-connected devices that have older firmware.

Note Upgrading the firmware for USB-connected devices and HP SNMP Proxy Agent or HP WS Pro Proxy Agent is not tested or supported.

Device Model	Sev	Hardware Address	Applications	Solutions	Printer Firmware - Severity	Printer Firmware - Availab	Jetdirect Firmware - Severity	Jetdirect Firmware - Available
HP Color LaserJet CM6040 MFP	✓	84B52FF76B73	5 Applications	0 Solutions	✓	Up-to-date	✓	Up-to-date
HP Color LaserJet flow MFP M880	✓	A0D3C183490E	<Not supported>	0 Solutions	✓	Up-to-date	✓	Up-to-date
HP Color LaserJet CP4520 Series	✓	00237D80F34D	0 Applications	0 Solutions	✓	Up-to-date	✓	Up-to-date
HP LaserJet 400 color M451dw	✗	2C769A3E8978	<Not supported>	<Not supported>	✓	Up-to-date	?	<Not supported>
HP LaserJet P2015 Series	✓	0014380ECAB5	<Unknown>	0 Solutions	✓	Up-to-date	✓	Up-to-date
HP LaserJet 700 color MFP M775	✓	A0B3CC3A7816	<Not supported>	0 Solutions	✓	Up-to-date	✓	Up-to-date
HP LaserJet P3010 Series	✗	8851FBEE71CC	0 Applications	0 Solutions	✓	Up-to-date	✓	Up-to-date
HP Color LaserJet CM2530 MFP	!	00215A918A00	0 Applications	0 Solutions	!	1 available	✓	Up-to-date
HP Color LaserJet CP5225dn	✓	D485643D4F99	<Unknown>	<Not supported>	✓	Up-to-date	✓	Up-to-date
HP LaserJet 400 MFP M425dn	✓	441EA13110C0	<Not supported>	<Not supported>	✓	Up-to-date	?	<Not supported>
HP Color LaserJet CM6040 MFP	!	D48564408B62	0 Applications	0 Solutions	✓	Up-to-date	✓	Up-to-date
HP LaserJet M4345 MFP	!	00237D7C8352	0 Applications	0 Solutions	✓	Up-to-date	✓	Up-to-date
HP LaserJet 500 color MFP M575	✓	9CB654173880	<Not supported>	0 Solutions	!	1 available	✓	Up-to-date
HP LaserJet Pro MFP M521dw	✓	38EAA76CAD55	<Not supported>	<Not supported>	✓	Up-to-date	?	<Not supported>
HP LaserJet 600 M603	✓	2C4138800F32	<Not supported>	0 Solutions	✓	Up-to-date	✓	Up-to-date
HP Color LaserJet MFP M476dn	✓	A0D3C1E84E85	<Not supported>	<Not supported>	✓	Up-to-date	?	<Not supported>
HP LaserJet flow MFP M525	✓	10604B15F78C	<Not supported>	0 Solutions	✓	Up-to-date	✓	Up-to-date
HP LaserJet L250	✓	000E7E75E3C9	0 Applications	<Not supported>	✓	Up-to-date	✓	2 available

Figure 5—Firmware columns

The **Printer Firmware - Severity** and **Jetdirect Firmware - Severity** columns can be added to a view to indicate which devices have older firmware (Figure 5). A green checkmark icon in the column indicates that the firmware is up-to-date. The **Printer Firmware - Severity** and **Jetdirect Firmware - Severity** columns can also be used to create device filters (Figure 6).

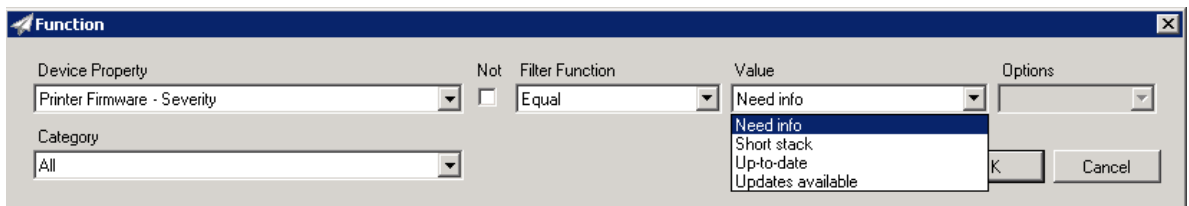


Figure 6—Firmware columns

HP Web Jetadmin checks if a new firmware file is available in the HP Web Jetadmin repository by default, or it checks if a newer qualified firmware file is available in the HP Web Jetadmin repository when using HP Web Jetadmin 10.4 SR2 or higher.

The **Printer Firmware - Available** and **Jetdirect Firmware - Available** columns show an up-to-date status if the versions of the firmware in the repository are older than the versions of the firmware on the device.

If the **Printer Firmware - Available** and **JetDirect Firmware - Available** should only consider qualified firmware files, then add the `ConsiderQualifiedFirmwareAsLatest` configuration option and set to `True`.

Add the following to the `FirmwareUpgrade.config.xml`:

```
<property name="ConsiderQualifiedFirmwareAsLatest" >
  <type>HP.Imaging.Wjp.Sdk.Core.Framework.ConfigurationItemString</type>
  <value>True</value>
</property>
```

Note If the above configuration option is already in the file, then only change the value to `True`.

By default, this file is located in:

```
C:\Windows\ServiceProfiles\NetworkService\AppData\Local\HP
Inc\HPWebJetadmin\WjaService\config
```

After changing the value, restart HP Web Jetadmin.

The **Printer Firmware - Available** and **Jetdirect Firmware - Available** columns show the number of firmware files in the HP Web Jetadmin repository that have the same version or a higher version than the device. In the highlighted line in Figure 5, the **Printer Firmware - Available** column shows **1 available** (which is the same version as on the device itself) and the **Printer Firmware - Severity** column shows that the firmware version on the device is up-to-date. The **Printer Firmware - Severity** column should be used to verify if the latest (qualified) firmware from the HP Web Jetadmin firmware repository is installed on the device.

Note To re-apply the same firmware, the **Printer Firmware - Available** column shows **1 available** even if the same version is already installed on the device.

To decide which device firmware to offer, HP Web Jetadmin compares the device model and version information in the header of the firmware RFU file against the information in the firmware-download-name SNMP object. The device model(s) from the *.rfu file is/are displayed in the **Models** column in the firmware Repository.

Some device models share the same firmware image and, therefore, return the same model name in the firmware-download-name SNMP object. This way HP Web Jetadmin knows to offer the same image for those models. If the device does not support the firmware-download-name SNMP object, HP Web Jetadmin matches the name of the device to the names in the firmware RFU file header.

For *.bd1 files, it's slightly different. After downloading the firmware file, HP Web Jetadmin is fetching the supported model and the Asset Identifier. The supported model from the *.bd1 file is displayed in the **Models** column in the firmware Repository. However, in the background HP Web Jetadmin is using the Firmware Asset Identifier from the *.bd1 file and comparing that with the Firmware Asset Identifier on the device. Different device models can have the same Firmware Asset Identifier. Thus it's possible that one *.bd1 file can be used to upgrade several different models.

After it is determined which devices to upgrade, simply highlight those devices and click the **Firmware** tab (Figure 7). A window opens indicating which devices have a newer version of firmware available. Highlight these devices and click **Upgrade** to begin the process. A new window opens that

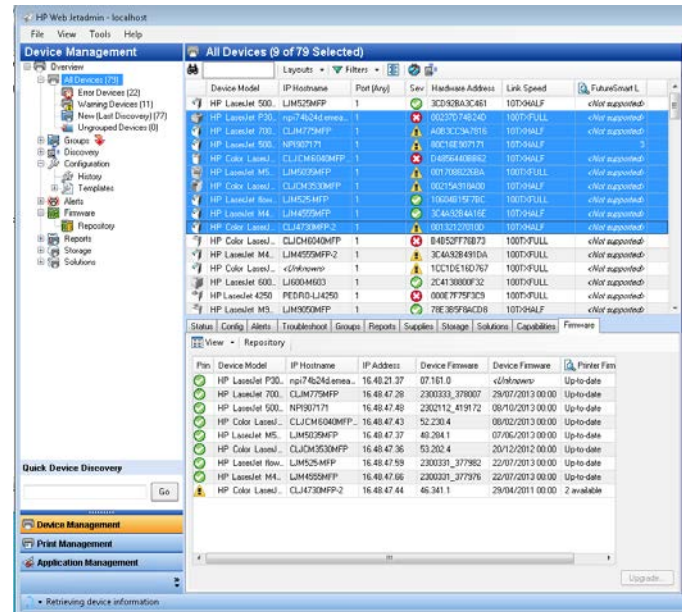


Figure 7—Upgrading firmware

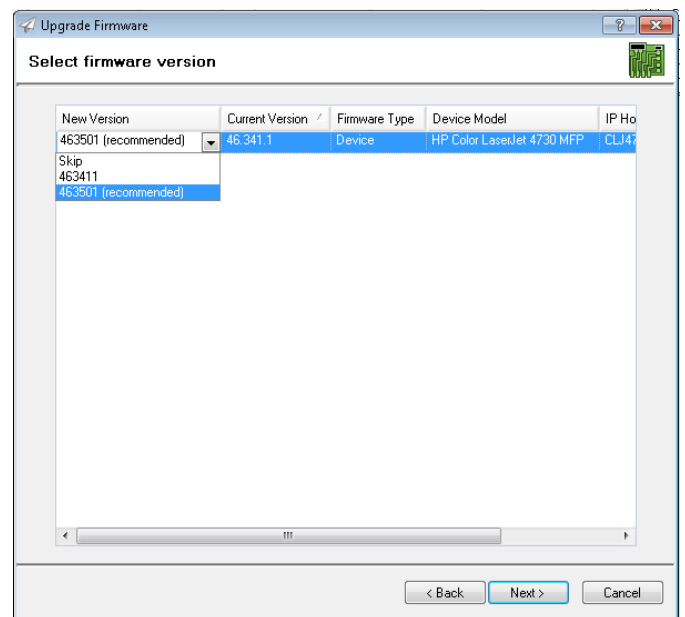


Figure 8—Version selection

allows users to select which version to download for each device or whether to skip certain devices (Figure 8). The default operation for each device is to upgrade to the recommended most recent version.

An alternative method for upgrading firmware is to click **Upgrade Firmware** from the firmware repository. A window opens offering the list of all the devices from which to make a selection (Figure 9).

No matter which method is used to begin the upgrade process, after a newer firmware image is selected to download, the firmware downloader sends the firmware image to the device. This process is fully fault-tolerant. If the firmware upgrade process is interrupted for reasons such as a power outage, it can be completely recovered by running the firmware downloader again and reinitiating the download.

For most device firmware, HP Web Jetadmin opens a port 9100 connection and sends the .rfu file as a print job. The device power cycles itself at the conclusion of the upgrade. For HP Jetdirect firmware, HP Web Jetadmin uses the TFTP protocol to complete the upgrade.

Newer HP devices can use Web Services over HTTP to perform firmware upgrades. These firmware files have a .bd1 extension. While header information is no longer PJI as found in .rfu files, the firmware bundle provides attributes similar to that of the PJI header and HP Web Jetadmin supports parsing this new header type to determine which image to send.

SET THE FIRMWARE LEVEL FOR DEVICES WITH HP FUTURESMArt 3

By default, devices that are upgraded to HP FutureSmart Bundle 3.x receive the latest fixes and maintain the look and feel of the previous firmware. In order to obtain the latest functionality on those devices, the HP FutureSmart level must be changed to the highest available setting.

Figure 10 shows a device that has a minimum of HP FutureSmart 3.

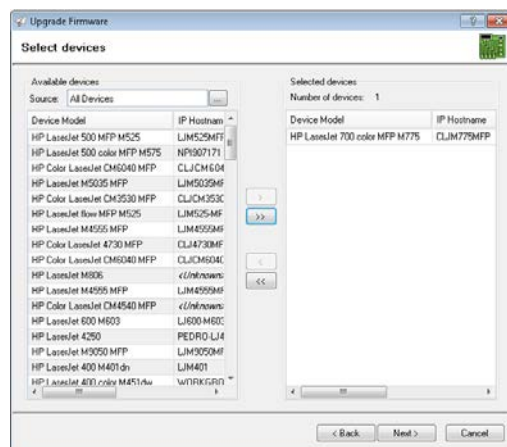


Figure 9—Upgrading from the repository

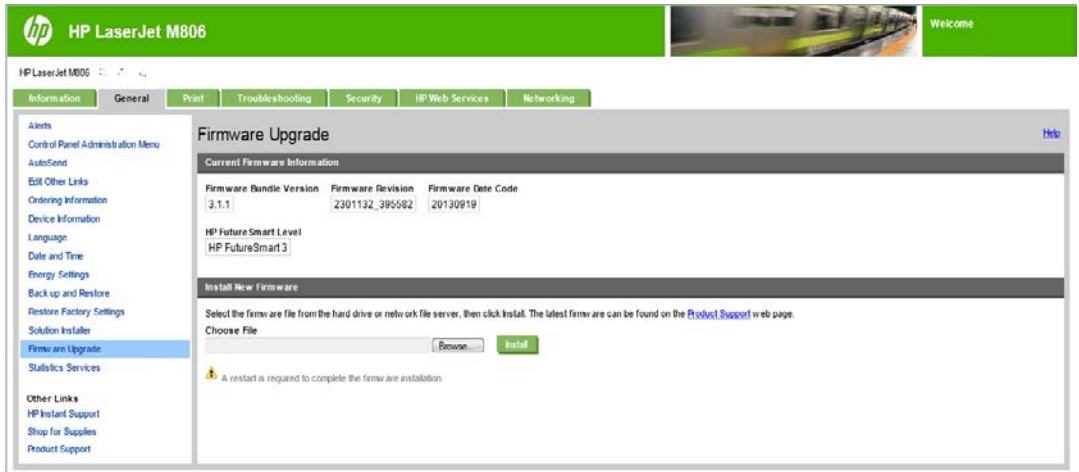


Figure 10—EWS page for a device with HP FutureSmart 3

With HP FutureSmart 3, the same information also appears on the device's configuration page (Figure 11).

Firmware Revision:	2301132_395582
Firmware Datecode:	20130919
HP FutureSmart Level:	HP FutureSmart 3

Figure 11—Configuration page for a device with HP FutureSmart 3

With HP Web Jetadmin 10.3 SR4, you can view the current HP FutureSmart level (Figure 11) and change the HP FutureSmart level if the device has HP FutureSmart 3 installed. Non-HP FutureSmart devices always display **Not Supported** for the HP FutureSmart level. HP FutureSmart devices display a value instead of **Not Supported** if they have at least HP FutureSmart 3 installed and if a selection for the HP FutureSmart level can be made. For example, when the HP LaserJet M806 device was introduced, HP FutureSmart Level 3 was available and was the initial firmware for the device. The device cannot be set to a lower version. Therefore, HP Web Jetadmin shows **Not Supported** for the HP FutureSmart level of this device until a newer version is installed on the device.

The **FutureSmart Level** configuration option is available from the **Device** category on the **Config** tab (Figure 12).

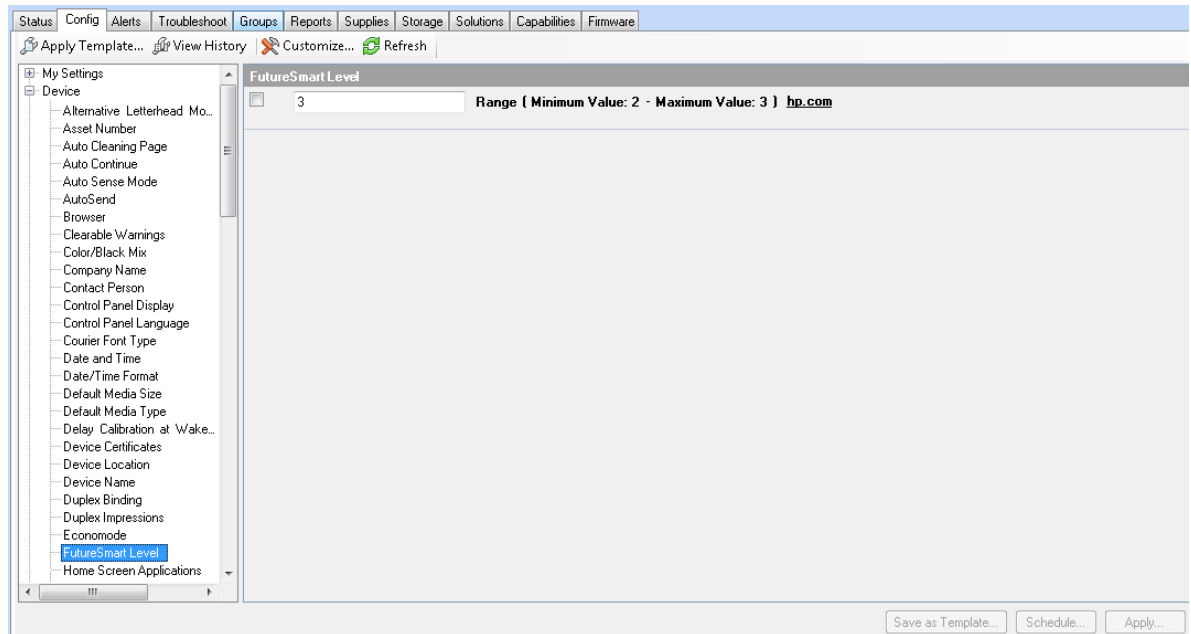


Figure 12—FutureSmart Level configuration option

Use the **FutureSmart Level** configuration option to specify a number for the HP FutureSmart level that is available in the firmware that is currently installed on the device. HP Web Jetadmin displays the range of HP FutureSmart levels that the device supports. If you enter a number outside of the range that the device supports, HP Web Jetadmin automatically changes the version number to the nearest minimum or maximum level that the device supports. After changing the HP FutureSmart level, the device restarts automatically. For more information about HP FutureSmart, see the [HP FutureSmart Solution](#) website.

DEFINE THE FIRMWARE PROPERTIES

The properties of a firmware image in the repository can be applied by selecting **Edit Properties** (Figure 13). Properties include providing an optional description of the firmware image or defining whether the image is internally qualified.

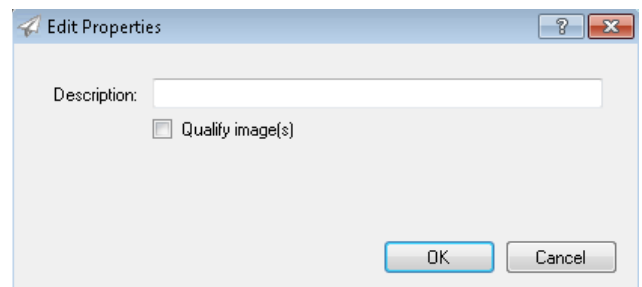


Figure 13—Edit Image Properties

An excellent example of where a description might become useful is for devices such as the HP LaserJet M5035

where a separate firmware image is required for Asian languages. The header files for both the English and Asian versions are identical, so uploading both images would result in two identical images appearing in the repository and two identical images offered for upgrades. To distinguish one image from the other, a description can be applied to one of the images. Therefore, when attempting to upgrade firmware, it is apparent which image is the appropriate language image to be applied.

Images might also need to be internally tested and qualified as acceptable before allowing HP Web Jetadmin to offer those images for upgrades. HP Web Jetadmin provides a checkbox to define

whether the **Image is qualified**. An administrator can provide permissions through roles to allow firmware upgrades with qualified images only. Or the administrator can change the `FirmwareUpgrade.config.xml` (in HP WebJetadmin 10.4 SR2 and above) file by adding the following:

```
<property name="ConsiderQualifiedFirmwareAsLatest">
  <type>HP.Imaging.Wjp.Sdk.Core.Framework.ConfigurationItemString</type>
  <value>True</value>
</property>
```

Note If the above configuration option is already in the file, then only change the value to True.

By default, this file is located in:

```
C:\Windows\ServiceProfiles\NetworkService\AppData\Local\HP
Inc\HPWebJetadmin\WjaService\config
```

```
C:\Windows\ServiceProfiles\NetworkService\AppData\Local\HP
Inc\HPWebJetadmin\WjaService\config
```

After changing the value, restart HP Web Jetadmin.

AUTOMATIC UPGRADES USING POLICIES

HP Web Jetadmin can automatically apply firmware upgrades on devices through the use of group policies (Figure 14). A trigger can be set to apply the policy when a device is either added to or removed from the group. If the group is defined as an automatic group, certain filter criteria can dictate which devices are automatically added. This means that discovered devices can be automatically added to a group and HP Web Jetadmin can automatically perform a firmware upgrade on those devices. Policy actions include upgrading either the device firmware or HP Jetdirect firmware to the latest version or a qualified version in the repository. If more than one version is qualified, a screen prompts the user to select a version.

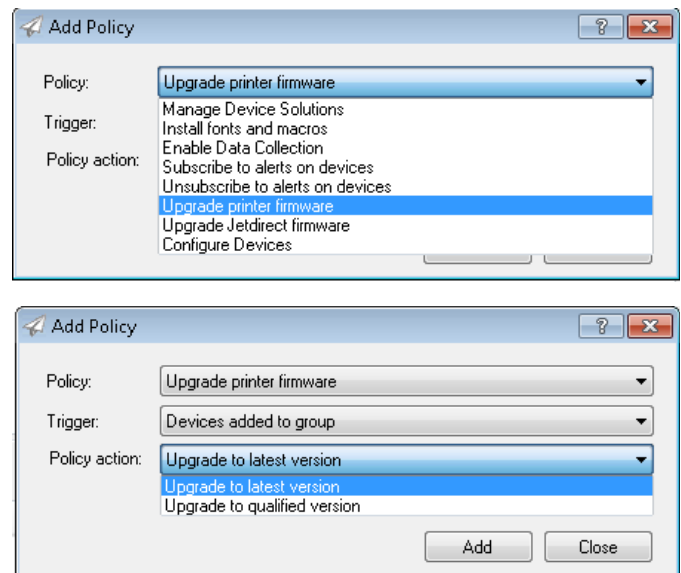


Figure 14—Automatic upgrades using policies

DOWNGRADE THE FIRMWARE

By default, HP Web Jetadmin only offers upgrades of either device firmware or HP Jetdirect firmware. If older versions of firmware are present in the repository, they are not offered for downgrade. Some earlier versions of HP Web Jetadmin might have offered firmware downgrades, but downgrades are now disabled for several reasons. Downgrades of HP Jetdirect firmware require a special `.d1d` image made specifically for downgrades. If the downgrade of a regular version of HP Jetdirect firmware is attempted, not all components are rolled back properly to the older versions, causing abnormalities in behavior. Device firmware is slightly more friendly during attempted downgrades in that new functionality is erased as old functionality is applied. However, for some devices, DC Controller or JDI firmware are not rolled back to older versions, causing abnormalities in behavior.

There might be circumstances where users want to downgrade firmware. For example, new firmware might have disrupted an important feature, creating a need to roll back to the previous version. Nothing on the device prohibits a downgrade. While HP discourages downgrades, the ability to downgrade firmware is built into HP Web Jetadmin. The functionality is disabled by default to protect against accidentally downgrading a fleet of devices, which might have catastrophic consequences. To enable downgrading firmware, perform the following steps:

WARNING! Be aware that downgrading firmware has the potential to cause serious consequences on devices. This action should be considered carefully. Test all firmware images thoroughly before running HP Web Jetadmin firmware updates on production devices.

Note After enabling the firmware downgrade functionality in HP Web Jetadmin, the **Printer Firmware - Available** and **Jetdirect Firmware - Available** columns list the total number of available device and Jetdirect firmware versions that are available for a device instead of only the current and newer firmware versions.

1. Use a text editor to edit the existing file on the HP Web Jetadmin host system:

```
C:\Windows\ServiceProfiles\NetworkService\AppData\Local\HP Inc\HPWebJetadmin\WjaService\config\FirmwareUpgrade.config.xml
```

2. For `AllowJetdirectFirmwareDowngrades` and `AllowPrinterFirmwareDowngrades`, change the values from `false` to `true`:

```
<ipmc:configuration
xmlns:ipmc="www.hp.com/schemas/imaging/ipmc/config/2004/02/24">
  <property name="AllowJetdirectFirmwareDowngrades">
    <type>HP.Imaging.Wjp.Sdk.Core.Framework.ConfigurationItemString
    </type>
    <value>true</value>
  </property>
  <property name="AllowPrinterFirmwareDowngrades">
    <type>HP.Imaging.Wjp.Sdk.Core.Framework.ConfigurationItemString
    </type>
    <value>true</value>
  </property>
</ipmc:configuration>
```

3. Either device firmware or HP Jetdirect firmware downgrades can be enabled or disabled by toggling the `<true>/<false>` values in the XML file.
4. Save the file and restart the HP Web Jetadmin service (HPWJA Service). Notify all users logged into the system about the service restart and ensure that active HP Web Jetadmin tasks are stopped or rescheduled to avoid problems with the restart.

Note Use the standard XML format when creating this file. Use a simple text editor, such as Microsoft® Notepad. Line breaks should only occur after the appropriate tag at the end of a statement. Documentation viewers might add what appear to be line breaks in the XML content shown above.

INCREASE THE PERFORMANCE

Firmware upgrade attempts on devices, either manual or scheduled, can be set to occur again automatically at a future time for those devices that fail. This eliminates the need to reselect all the devices that failed and manually retry the upgrades. The number of retries can be set as well as the frequency of the retries by going to **Tools > Options > Device Management > Firmware > General** (Figure 15).

This same **Firmware upgrade options** window allows for defining multiple threads to perform firmware upgrades in a parallel fashion rather than serially by using the **Maximum concurrent upgrades** setting. The default setting is to upgrade 8 devices simultaneously. For HP Web Jetadmin 10.3 SR8 and later, this setting can be increased to 50 devices in a single task.

WARNING! Increasing the **Maximum concurrent upgrades** to a value above 10 should only be done on powerful servers that have limited tasks beside the firmware upgrades.

Note If the maximum number of concurrent firmware upgrades is set to 11 or higher, the `FirmwareUpgradeThreadsize` section in the `PerformanceTuning.config.xml` file must also be changed to match the value specified in the **Maximum concurrent upgrades** box. For instructions on changing the `FirmwareUpgradeThreadsize` section, see [Increase the firmware upgrade thread pool size on page 12](#).

Firmware installation is faster when multiple devices are upgraded at the same time, but more network traffic is generated. Operating limitations might also restrict how many devices can receive upgrades simultaneously. This setting applies to the number of devices inside a single task or multiple tasks; 50 tasks is the maximum regardless.

If it is still taking too long to perform batch firmware upgrades, one additional technique can be used to significantly decrease the time it takes to complete a batch firmware upgrade process. There is a trade-off in the accuracy of reporting status, but the gains in time can be very significant.

The normal process for upgrading device firmware involves opening a thread, sending the firmware file through either a port 9100 connection or Web Services connection, monitoring the upgrade status on the device until it completes its power cycle and reports that the new firmware is in place, and then closing the thread. If the maximum thread count is set to 10, after all 10 threads complete the process, 10 more threads are attempted. This technique allows HP Web Jetadmin to very accurately report success or failure. However, the constant status checking after delivering the firmware file can take upwards of 90% of the total time to complete the process.

HP Web Jetadmin 10.3 SR2 and later allows for manipulating the same `FirmwareUpgrade.config.xml` file mentioned in the previous section to bypass the status-checking portion of the upgrade process. This means that HP Web Jetadmin delivers the firmware file to the device and reports success after the file is delivered in its entirety. This can eliminate potentially 90% of the transaction time per device, meaning many more devices are completed in a fraction of the time when status checking is employed.

Edit the following entries in the `FirmwareUpgrade.config.xml` file in the directory provided in the previous section, and change the settings to `False` to bypass status checking for HP Jetdirect and device firmware and significantly speed up batch upgrades:

```
<property
  name="IsJetdirectMonitorRequired">
  <type>HP.Imaging.Wjp.Sdk.Core.Framework.ConfigurationItemString
  </type>
  <value>False</value>
</property>
<property name="IsPrinterMonitorRequired">
  <type>HP.Imaging.Wjp.Sdk.Core.Framework.ConfigurationItemString
```

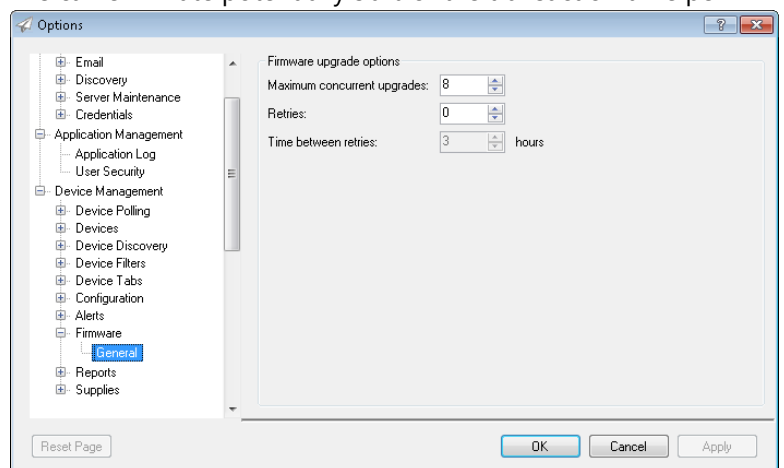


Figure 15—Firmware upgrade options

```
</type>  
<value>False</value>  
</property>
```

Since HP Web Jetadmin now reports success only after completing the file delivery file, to check the completion status for the devices, view the **Device Firmware Version** and **Device Firmware Date** columns to determine if the upgrade is successful.

Increase the firmware upgrade thread pool size

The maximum number of concurrent firmware upgrades is defined by the firmware upgrade thread pool size. The value specified for the firmware upgrade thread pool size must match the value specified in the **Maximum concurrent upgrades** box.

To increase the firmware upgrade thread pool size, perform the following steps:

1. Make a backup copy of the `PerformanceTuning.config.xml` file. This file is available in the following directory on the HP Web Jetadmin server:

```
C:\Windows\ServiceProfiles\NetworkService\AppData\Local\HP
Inc\HPWebJetadmin\
WjaService\config
```

2. Use Notepad or a similar editor to open the `PerformanceTuning.config.xml` file.
3. Change the `<value>xx</value>` entry in the `FirmwareUpgradeThreadsize` section. For example, specify 30.

```
<property name="FirmwareComponent.FirmwareUpgradeThreadsize">
  <type>HP.Imaging.Wjp.Sdk.Core.Framework.ConfigurationItemString
  </type>
  <value>xx</value>
</property>
```

Note The `FirmwareUpgradeThreadsize` section is available in the `PerformanceTuning.config.xml` file only for new installations of HP Web Jetadmin 10.3 SR8 and later. For installations that have been upgraded to HP Web Jetadmin 10.3 SR8 or later, this section must be manually added to the `PerformanceTuning.config.xml` file.

4. Close and save the file.
5. Restart the HP Web Jetadmin service (HPWJAService).
6. Launch the HP Web Jetadmin client.
7. Change the value of the maximum number of concurrent firmware upgrades.

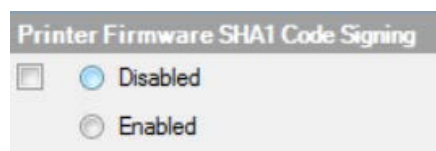
SUPPORTED DEVICE FIRMWARE

HP Web Jetadmin requires a properly formatted `.rfu` or `.bdl` file in order to allow upgrades of HP devices from the **Firmware** tab. Samsung devices require an `.hds` file.

Note Do not change the firmware filename for a Samsung device. HP Web Jetadmin cannot decrypt the file and relies on the filename for the firmware information.

Some devices might offer a firmware file that is not properly formatted. In such cases, any technique for sending the firmware file as a print job to the device suffices. Some devices offer a separate download utility to upgrade firmware one device at a time. HP Web Jetadmin could also be used in such cases to upgrade multiple devices if the files are uploaded to the PJI file repository and sent to multiple devices using the **PJI Configuration** configuration option in a configuration template.

Many devices also allow for blocking device firmware upgrades. The **Security** tab for a device that supports this feature includes an item named **Printer Firmware Update** and **Printer Firmware SHA1 Code Signing**.



When the printer firmware update is set to **Disabled**, the functionality is different depending on what file is used to upgrade the printer. When the printer is using `rfu` files, the firmware upgrade is

blocked. When FutureSmart devices are upgraded using a .bd1 file, the firmware upgrade via port 9100 and the FTP ID are blocked. If HP Web Jetadmin has the correct credentials for the printer, the firmware upgrade via HP Web Jetadmin is possible. This is the same setting as the option in the EWS of the FutureSmart device:

Firmware Upgrade Security

- Allow firmware upgrades sent as print jobs (port 9100)**
- Allow installation of legacy packages signed with SHA-1 Hashing algorithm**

TROUBLESHOOTING

If firmware upgrades are always failing with specific devices or device firmware, then the issue might be caused by a security setting on the device (for example, blocking port 9100 on non-FutureSmart devices). On IWS devices that have SNMPV2 set to read-only and SNMPv3 disabled, firmware upgrades are pending at 0%, even when port 9100 is open. This happens as a SNMP setting must be changed before the firmware upgrade process is started, and HP Web Jetadmin is trying to make this change in the background. For these kind of devices, HP Web Jetadmin does require SNMP write access as well.

If firmware upgrades are failing fairly frequently, a very likely culprit is timing. Especially on slower networks, HP Web Jetadmin might not receive the returning packets from the device during the transaction in a reasonable time, or the entire upgrade operation exceeds the default allotted time for completion. Configuration settings to increase timeouts for HP FutureSmart devices and non-HP FutureSmart devices can be added to HP Web Jetadmin configuration files. These settings force HP Web Jetadmin to wait longer for packets to be returned or operations to be completed.

For non-HP FutureSmart devices:

Using a text editor, edit the existing file on the HP Web Jetadmin host system in the following location:

```
C:\Windows\ServiceProfiles\NetworkService\AppData\Local\HP Inc\HPWebJetadmin\WjaService\config\FirmwareUpgrade.config.xml
```

The following settings are related to timeouts:

```
<property name="JetdirectResponseTimeoutMinutes">
  <type>HP.Imaging.Wjp.Sdk.Core.Framework.ConfigurationItemString
  </type>
  <value>30</value>
</property>
<property name="PrinterResponseTimeoutMinutes">
  <type>HP.Imaging.Wjp.Sdk.Core.Framework.ConfigurationItemString
  </type>
  <value>90</value>
</property>
<property name="SocketConnectionTimeoutMinutes">
  <type>HP.Imaging.Wjp.Sdk.Core.Framework.ConfigurationItemString
  </type>
  <value>10</value>
</property>
```

Try tripling the values to see if they make enough of a difference for the upgrades to succeed.

For HP FutureSmart devices:

Perform the following steps to upgrade the firmware via FTP (Figure 17):

1. FTP to the device from a command prompt:

```
ftp <HP Jetdirect IP address> user: <user ID>
```

The HP Jetdirect print server accepts all passwords or blanks for the username, so just press **Enter**.

2. **password: <administrator p/w>**

The HP Jetdirect print server accepts all passwords or blanks for the password, so just press **Enter**.

3. **bin**

4. **hash**

This command is optional. It merely displays the download progress.

5. **put <filename.dld> /DOWNLOAD**

Be sure to enter the full path to the file and enter the filename correctly. This command is case-sensitive.

6. **bye**

After a couple of minutes, the FTP session closes. HP Jetdirect should restart and prepare to run the new code. The hash command shows the file transfer in progress. However, no download status can be presented during this period because of an FTP restriction.

If the "Netout: Software caused connection abort" appears, use FTP again to upgrade the firmware a second time. The new firmware image is complete and functional with only one firmware upgrade. If the second upgrade is not performed, the HP Jetdirect print server uses only English for any of the management interfaces, such as print control panel menus, EWS, and configuration page. Upgrade a second time to install additional languages.

The firmware upgrade is complete when the message "Transfer complete" appears.

Use FTP to upgrade device firmware

If the HP LaserJet product uses a direct network connection, you can use FTP to update the HP LaserJet firmware. Take note of the TCP/IP address on the configuration pages.

Note Make sure that the device is not in Powersave mode. Also, make sure that any error messages are cleared from the control panel display.

1. Open a DOS command window on the computer.
2. Type **ftp <TCP/IP device address>**. For example, if the TCP/IP address is 192.168.0.90, type **ftp 192.168.0.90**.
3. Press **Enter**.
4. When prompted for the user name and password, press **Enter** for each.
5. Type **bin** at the > prompt.
6. Press **Enter**.
7. Type **put <path>**, where <path> is the location where the .RFU file was downloaded from the Web. For example, type:

```
put C:\LJXXX\ljXXXXFW.RFU
```
8. Press **Enter**.
9. Type **bye** at the command prompt after the download process begins and the firmware is updated on the device.

10. Press **Enter** to exit the FTP session.

Use FTP with an Internet browser

Device firmware can be upgraded by following these steps:

1. Ensure that the **Enable folder view for FTP sites** checkbox is selected on the **Advanced** tab under **Tools > Internet Options**.
2. Open the browser, and type **ftp://192.168.0.90** (this is an example).
3. Use the TCP/IP address of the device from step 1. The display shows a folder labeled **Port 1**.
4. Open Windows Explorer, and navigate to the directory where the .rfu file is located.
5. Drag the rfu file from Windows Explorer to the Port 1 folder in step 2.
6. Verify that the device control panel displays **Performing Upgrade**.

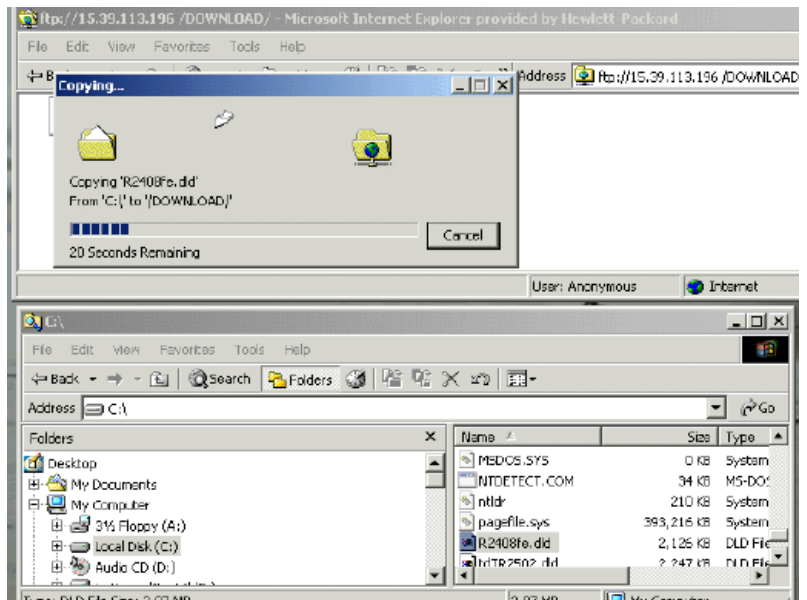


Figure 18—FTP from browser

The same technique can be used to upgrade an HP Jetdirect print server (Figure 18).

1. Instead of typing **http://** in the browser, begin by typing **ftp://**.
2. Type the IP address of the HP Jetdirect, a space, and **/DOWNLOAD**.
3. Open Windows Explorer, and locate the firmware image file.
4. Copy and paste or drag and drop the file into the browser window.

Note If Telnet is disabled, an FTP download is not allowed. If Telnet is enabled and an administrator password is set, the administrator password must be entered at the password prompt to gain access to FTP download capability. The username prompt can be left blank or can be one of four valid usernames: *root*, *admin*, *administrator*, or *supervisor*.

HP Embedded Web Server

HP Embedded Web Server (EWS) is another technique that can be used to upgrade both the HP Jetdirect and device firmware. EWS can only be used to upgrade the firmware one device at a time.

The UI implementation of the firmware upgrade via the EWS can be different per device model and firmware.

For example, FutureSmart devices:

Printers connected to a PC via USB

Before you can send a firmware upgrade through the USB port, you must know the name of the computer the device is connected to and you must enable device sharing. These steps are for Windows® XP. Other versions of Windows operating systems are similar, but have slightly different operations.

Find the name of the computer:

1. Click the **Start** button, **Programs**, **Accessories**, **System Tools**, and then select **System Information**.
2. The computer's name is in the right window-pane next to **System Name**.
3. Write down this name as it will be needed later.

Share the connected device:

1. Click the **Start** button, **Settings**, and **Printers and Faxes**.
2. Right-click the device you need to send the upgrade to, and then select **Sharing**.
3. Select the **Share this printer** option.
4. Type a name for the share (for example, HP LaserJet mfp). Make it short and easy to remember. Write down the share name as it will be needed later.
5. Click **Apply**.

Send the firmware upgrade using a USB connection

1. Open a DOS command prompt.
In Windows NT® 4.0, 2000, or XP, click **Start**, **Run**. Type **CMD**, and then click **OK**.
In Windows 9x, click **Start**, **Programs**, **Accessories**, and then click **MSDOS Prompt**. Locate the directory where you saved the firmware file.
2. Type **copy /b filename \\computer name\share name** (for example, **copy /b ljXXXXmfpfw_0X.00X.X.rfu \\computer1\HP LaserJet mfp printer**).
3. Press **Enter**.

Note When the upgrade process completes, the HP LaserJet device reboots. After the device is back online, print a Configuration Page and verify that the new firmware has been installed.

SUMMARY

HP Web Jetadmin makes downloading firmware images to HP Jetdirect devices and printers easier than ever. The integrated firmware downloader in HP Web Jetadmin can upgrade firmware on any supported platform and does not rely on a separate download utility to perform the upgrade. HP Web Jetadmin can also automatically locate the latest firmware revisions on the Web during the upgrade process. Additional utilities also exist for upgrading HP Jetdirect firmware if the need arises, allowing for more flexibility.

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