



Downloading Avaya 46xx IP Telephone Software Using Avaya Media Servers

Abstract

This paper provides information on using HTTP/HTTPS or TFTP file transfer protocols to transfer Avaya 46xx IP telephone software from Avaya Media Servers to Avaya 46xx IP telephones.

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1. Introduction

This paper provides information regarding the use of Avaya Media Servers to transfer configuration and software files to Avaya 46xx IP telephones. Avaya S8300B or later S8300 Media Servers can be used as TFTP file servers for Avaya 46xx IP telephones as long as the Media Server is running Communication Manager 2.1.1 or later releases. All Avaya S8xx0 series Media Servers can be used as HTTP/HTTPS file servers for Avaya 46xx IP telephones, as long as the S8xx0 Media Server is running Communication Manager 2.1.1 or later releases.

Every time an Avaya 46xx IP telephone powers-up or resets it obtains an IP address, via DHCP or manual programming, and then attempts to contact a file server to obtain the latest configuration and software files for operation. These files are provided together in an RPM file to support file transfers from Avaya Media Servers. Telephone software RPM files are available on support.avaya.com via tar file downloads (e.g., 46xx_cm2_2_wi2_0_ipt2_4_040706.tar or 46xx_cm3_1_wi2_0_ipt2_4_040706.tar).

Each telephone software RPM contains a 46xxupgrade.scr configuration file. This configuration file contains the names of the latest software files for each model of IP telephone. The 46xxsettings.txt configuration file contains parameter settings provided by the customer. Therefore, this file is customer changeable and not included with each download of telephone software to ensure customer settings do not get overwritten when a new telephone software updates are placed on the file server.

After obtaining configuration files from the file server, the telephone checks for the latest software files as specified by the 46xxupgrade.scr configuration file. The telephone then downloads the latest software files if necessary. Once the latest software files have been downloaded, the new software is stored in non-volatile memory and the telephone resets to begin running with this new software. The telephone then performs a second download of the configuration files, after which the telephone discovers it is running the latest software and proceeds to register with Communication Manager.

2. Overview

All 46xx IP telephones support telephone software downloads using TFTP. Prior to Communication Manager 2.1.1, an external TFTP server is required. With Communication Manager 2.1.1 or later releases, S8300B or later S8300 Media Servers can be used as TFTP servers for Avaya 46xx IP Telephones. The S8300B or later S8300 Media Servers are the only Media Servers that support TFTP telephone software file transfers and only with a limited number of telephones. See section [IP Telephone Software File Transfers Using TFTP](#) for further details.

A subset of 46xx IP telephones that support downloadable software can use HTTP/HTTPS as the download file transfer protocol. Prior to Communication Manager 2.1.1, use of HTTP/HTTPS as the download file transfer protocol on a Media Server for 46xx IP telephones is not supported. With Communication Manager 2.1.1 or later releases, S8xx0 series Media Servers can be used as HTTP/HTTPS servers to transfer downloadable software to Avaya 46xx IP Telephones. Minimum vintages of telephone software are required to support this operation. See section [IP Telephone Software File Transfers Using HTTP/HTTPS](#) for further details.

HTTP/HTTPS is recommended for 46xx IP telephone software file transfers because it provides better performance and is supported on all S8xx0 series Media Servers running Communication Manager 2.1.1 or later releases. In some situations it might be necessary to support 46xx IP telephone software file transfers via HTTP/HTTPS on a Media Server and other phone file transfers via TFTP or HTTP on a separate external server. Some 46xx IP telephones do not

support software file transfers via HTTP/HTTPS and many configurations might have a mixture of telephones that support HTTP/HTTPS downloads and telephones that only support TFTP downloads. See section [Configuring IP Telephones to use HTTP/HTTPS](#) for further details.

3. IP Telephone Software File Transfers Using TFTP

3.1. TFTP Protocol Support

Existing 46xx IP telephones support software downloads using TFTP. These software downloads can be found on the Avaya support website.

The S8300B or later S8300 Media Servers are the only Media Servers that support 46xx IP telephone file transfers using TFTP, and only when running Communication Manager 2.1.1 or later, and only when transferring files to no more than 20 telephones. See the [TFTP Performance](#) section for further details.

3.2. Configuring S8300 Media Servers for TFTP File Transfers

3.2.1. Enabling TFTP Network Services

Note: The configuration instructions and web page screen shots provided are intended as a general example and the specifics are different between different releases of Communication Manager. Communication Manager 3.1 was used for the examples in this document.

The TFTP Service and Firewall must be enabled on the S8300B or later S8300 Media Server via the Maintenance Web Pages. In Communication Manager 3.1 and later releases the TFTP Service must be enabled by clicking on **Server Access** under the **Security** heading and enabling the TFTP Service appropriately (See [Figure 1: Enabling](#)). In releases of Communication Manager earlier than 3.1 this step is not needed because the TFTP Service is enabled by default and the **Server Access** page is not available.

The Firewall must be enabled to support TFTP and this is done by clicking on **Firewall** under the **Security** heading and allowing input to the server via the TFTP port (See [Figure 2: Enabling](#)). In some releases of Communication Manager the **Advanced Setting** button must be clicked to allow input to the server via the TFTP port.

Figure 1: Enabling TFTP Service

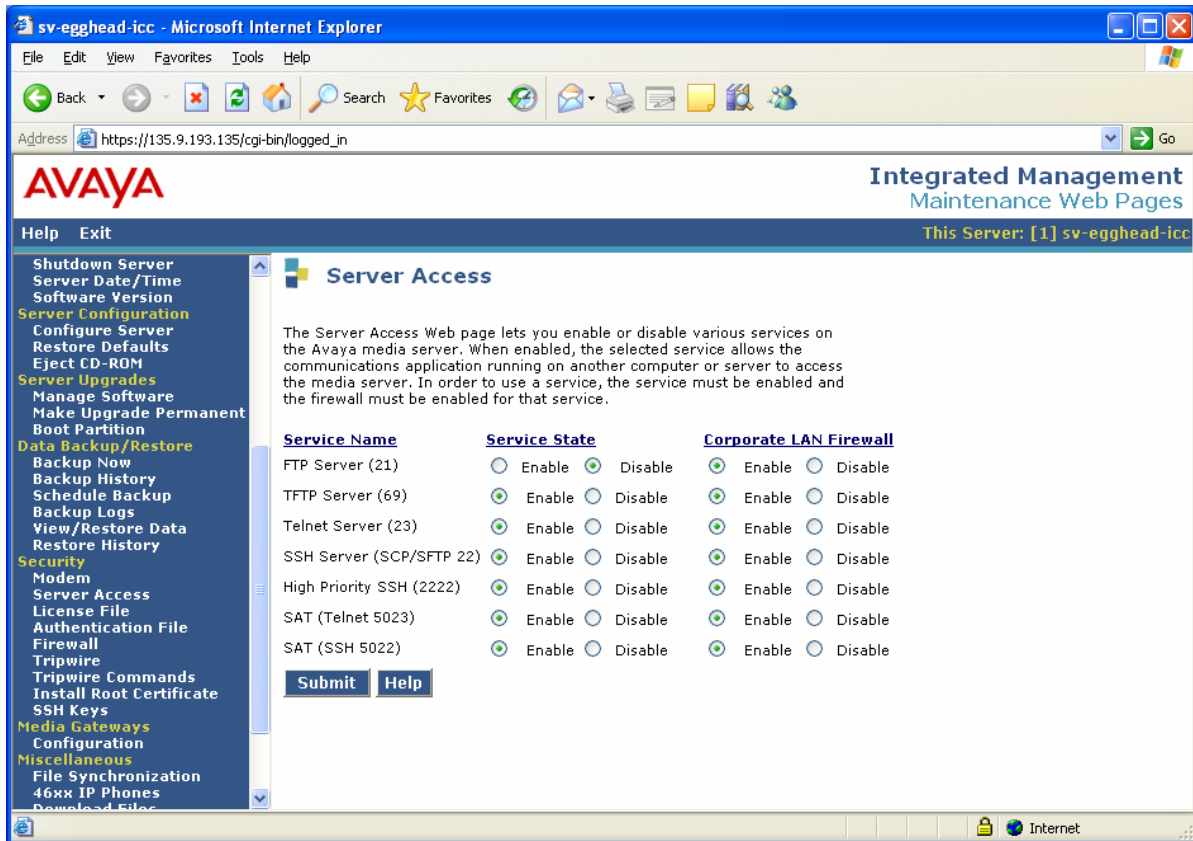
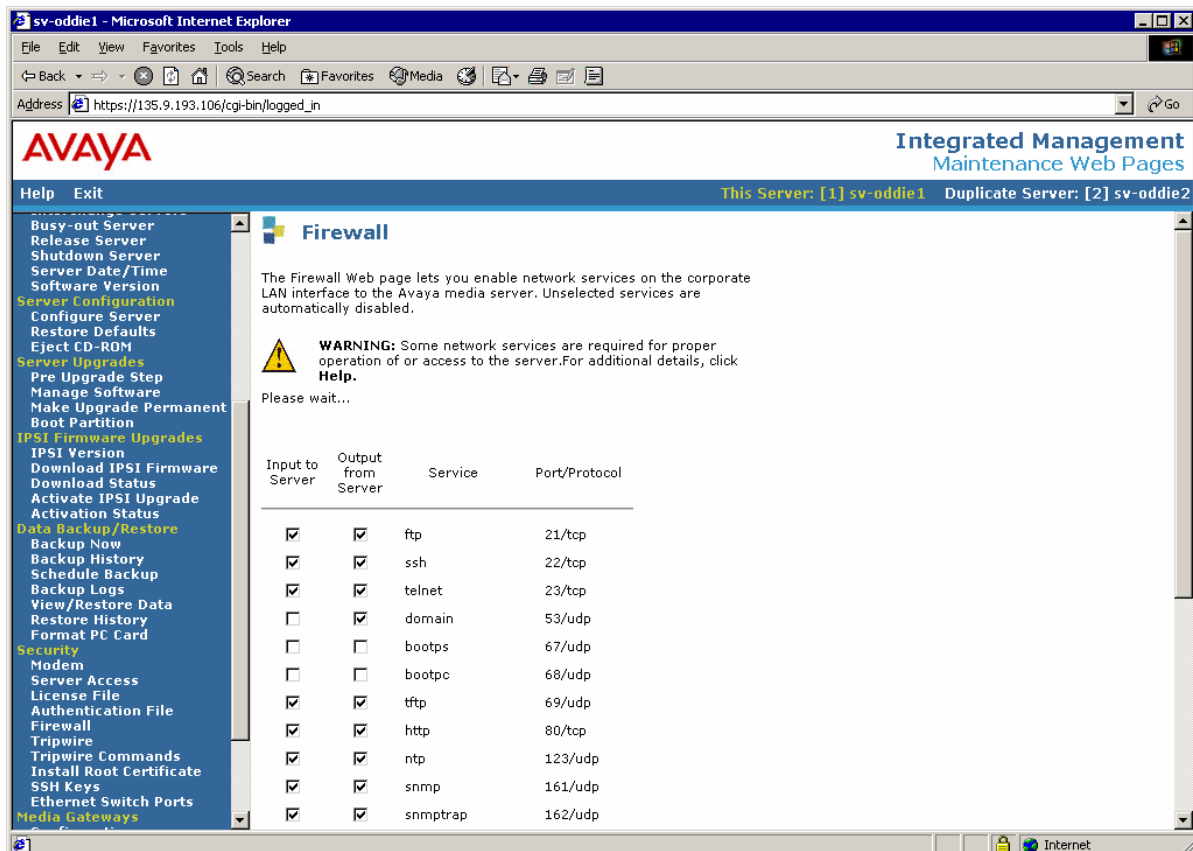


Figure 2: Enabling Firewall for TFTP



3.2.2. Putting Software RPMs on the Media Server

The method used to download 46xx IP telephone software RPMs onto a Media Server is the same whether TFTP or HTTP/HTTPS is being used. This information is covered in the [Downloading Software RPMs onto Media Servers](#) section of this document.

3.3. Configuring IP Telephones to use TFTP

3.3.1. Configuring Phones to Obtain Software from Media Servers via TFTP

To allow 46xx IP Telephones to use an S8300B or later S8300 Media Server for downloading software via TFTP the telephone can be configured statically (on the telephone itself) or configured by using the appropriate DHCP server options.

All 46xx IP telephones supported by a specific DHCP server can be configured to use TFTP and an S8300B or later S8300 Media Server to obtain software updates by adding the string “TFTPSRVR=nnn.nnn.nnn.nnn” to the current DHCP option string (option 176 in most cases). In this example nnn.nnn.nnn.nnn is the IP address of the desired S8300B or later S8300 Media Server. This method should be used only in cases where the DHCP server is supporting 20 or fewer 46xx IP telephones.

Each individual 46xx IP telephone can be programmed to use TFTP and an S8300B or later S8300 Media Server to obtain software updates by programming “FileSv=nnn.nnn.nnn.nnn” on the telephone where nnn.nnn.nnn.nnn is the IP address of the desired Media Server. The telephone will then attempt to obtain software updates from the specified S8300B or later S8300 Media Server. A maximum of 20 46xx IP telephones should be programmed in this manner.

Additional information can be found in the *IP Telephone LAN Administrator Guide* document available on the Avaya support website.

3.3.2. Configuring Telephone Settings

Once the appropriate 46xx IP telephone software RPMs have been downloaded to the S8300B or later S8300 Media Server and the phones have been configured to use the Media Server as a TFTP server, telephone settings can be changed via the Maintenance Web Pages on the Media Server.

See section [Configuring Telephone Settings via the Media Server](#) in this document for information on configuring telephone settings via the Maintenance Web Pages on the Media Server.

4. IP Telephone Software File Transfers Using HTTP/HTTPS

4.1. HTTP/HTTPS Protocol Support

To distribute 46xx IP telephone software via HTTP/HTTPS on S8xx0 series Media Servers, the 46xx IP telephone software already on the telephone must be at a minimum release. [Figure 3: IP Telephones Supporting TFTP & HTTP/HTTPS Downloads](#) provides a list of 46xx IP telephones that support downloading software via HTTP/HTTPS and the minimum 46xx IP telephone software release required on the telephone.

Figure 3: IP Telephones Supporting TFTP & HTTP/HTTPS Downloads

IP Telephone	IP Telephone Software Releases	
	TFTP	HTTP/HTTPS
4606 / 4612 / 4624	All Releases	Not Supported
4630 / 4630SW	All Releases	Not Supported
4625SW	All Releases	Not Supported
4610SW	All Releases	R2.1.3 or later
4620 / 4620SW / 4621SW / 4622SW	All Releases	R2.1.3 or later
4602SW / 4602	All Releases (except SIP R1.x)	R2.2 or later (and SIP R1.x)
4601	All Releases	R2.2 or later

Support for HTTP/HTTPS software downloads on older IP telephones is not provided and TFTP must be used. New IP telephones that become available after the publishing date of this document will support software updates via HTTP/HTTPS using RPMs. Software RPMs that support HTTP/HTTPS can be found on the Avaya support website via tar file downloads. Note: Communication Manager 3.1 and later releases require different 46xx IP telephone software RPMs than Communication Manager 2.1.1 through 3.0.1 releases. For example, the tar file 46xx_cm2_2_wi2_0_ipt2_4_040706.tar is for Communication Manager 2.1.1 through 3.0.1 releases and the tar file 46xx_cm3_1_wi2_0_ipt2_4_040706.tar is for Communication Manager 3.1 and later releases.

The S8xx0 series Media Servers support HTTP/HTTPS file transfers. The Media Server must be running Communication Manager 2.1.1 or later.

It is strongly recommended that using Media Servers for HTTP/HTTPS file transfers is limited to configurations where files are transferred to 300 or less telephones. See section [Media Server Performance Impact](#) for further details.

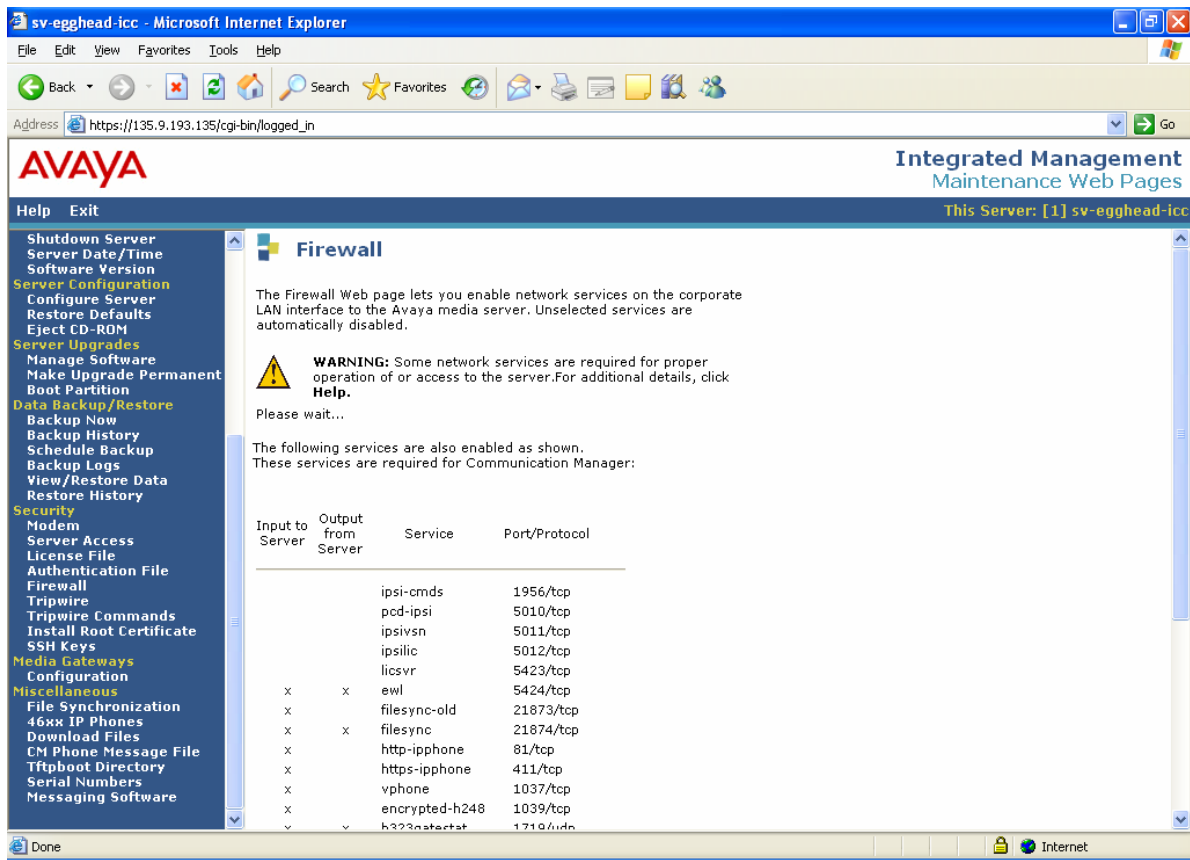
4.2. Configuring Media Servers for HTTP/HTTPS downloads

4.2.1. Enabling HTTP/HTTPS Network Services

It is not necessary to configure HTTP/HTTPS network services on S8xx0 Media Servers to support 46xx IP Telephone software downloads. HTTP and HTTPS access for IP Telephone software downloads is allowed on ports reserved for this activity by default in Communication Manager 2.1.1 or later releases. HTTP IP Telephone software download access is provided on port 81 and HTTPS IP Telephone software download access is provided on port 411.

In Communication Manager 3.1 or later releases these network services and ports can be viewed by clicking **Firewall** under the **Security** heading, then clicking on the **Advanced Setting** button. See [Figure 4: Displaying HTTP/HTTPS Network Service](#).

Figure 4: Displaying HTTP/HTTPS Network Service



4.2.2. Putting Software RPMs on the Media Server

The method used to download software RPMs on the Media Server is the same whether TFTP or HTTP/HTTPS is being used. This information is covered in the [Downloading Software RPMs onto Media Servers](#) section of this document.

4.3. Configuring IP Telephones to use HTTP/HTTPS

4.3.1. Configuring Phones to Obtain Software from Media Servers via HTTP

To allow 46xx IP Telephones to use the Media Server for downloading software via HTTP/HTTPS the telephone can be configured statically (on the telephone itself) or configured by using the appropriate DHCP server options.

All 46xx IP telephones supported by a specific DHCP server can be configured to use HTTP/HTTPS and a Media Server to obtain software updates by adding the string "HTTPSRVR=nnn.nnn.nnn.nnn, TLSSRVR=nnn.nnn.nnn.nnn" to the current DHCP option string (option 176 in most cases). In this example nnn.nnn.nnn.nnn is the Corporate LAN IP address of the desired Media Server. Again, only 46xx IP telephones that are running software releases that support HTTP/HTTPS will acquire software updates from the Media Server via HTTP/HTTPS.

Each individual telephone can be programmed to use HTTP/HTTPS and a Media Server to obtain software updates by programming "FileSv=nnn.nnn.nnn.nnn" on the telephone where nnn.nnn.nnn.nnn is the Corporate LAN IP address of the desired Media Server. The telephone will then attempt to obtain software updates from the desired Media Server using HTTP/HTTPS as long as the telephone software currently running supports HTTP/HTTPS downloads. See

[Figure 3: IP Telephones Supporting TFTP & HTTP/HTTPS Downloads](#) for a list of minimum telephone software releases that support HTTP/HTTPS downloads.

In some situations it is necessary to support 46xx IP telephone software file transfers via HTTP/HTTPS on a Media Server and other telephone software file transfers using TFTP or HTTP on a separate external server. Some 46xx IP telephones do not support software downloads via HTTP/HTTPS and some configurations have a mixture of telephones that support HTTP/HTTPS downloads and telephones that support TFTP downloads only. In this case telephones can be programmed individually by programming “FileSv=nnn.nnn.nnn.nnn” on each telephone where nnn.nnn.nnn.nnn is either the IP address of the separate TFTP server or the Corporate LAN IP address of the desired Media Server that will provide HTTP/HTTPS downloads.

Instead of configuring each telephone separately, a more likely scenario to support mixed TFTP and HTTP/HTTPS 46xx IP telephone software downloads is to configure phones via a DHCP server. To configure 46xx IP telephones that support HTTP/HTTPS to use HTTP/HTTPS from a Media Server, and telephones that only support TFTP to use a separate TFTP server, the string “HTTPSRVR=nnn.nnn.nnn.nnn, TLSSRVR=nnn.nnn.nnn.nnn, TFTPSSRVR=xxx.xxx.xxx.xxx” should be added to the current DHCP option string. In this example nnn.nnn.nnn.nnn is the Corporate LAN IP address of the desired Media Server for HTTP/HTTPS downloads and xxx.xxx.xxx.xxx is the IP address of the desired separate TFTP server for TFTP downloads. In this example telephones that are running software that supports both HTTP/HTTPS and TFTP downloads will use the Media Server and HTTP/HTTPS for software downloads, while telephones that are running software that supports TFTP downloads only will use the specified TFTP server for software downloads. Telephones running software that supports both HTTP/HTTPS and TFTP downloads select HTTP/HTTPS over TFTP if configured to use HTTP/HTTPS as shown above.

Additional information can be found in the *IP Telephone LAN Administrator Guide* document available on Avaya’s support website.

4.3.2. Configuring Telephone Settings

Once the appropriate 46xx IP telephone tar file containing the RPM file has been downloaded to the Media Server, telephone settings can be changed via the Maintenance Web Pages on the Media Server.

See section [Configuring Telephone Settings via the Media Server](#) for information on configuring telephone settings via the Maintenance Web Pages on the Media Server.

4.4. External HTTP/HTTPS Servers

Currently, external third party servers are not supported for 46xx IP telephone file transfers using HTTPS because Avaya 46xx IP telephones only establish encrypted TLS connections with servers using Avaya signed digital certificates. In instances where 300 or less 46xx IP telephones are being served software downloads it is not necessary to use an external server because an Avaya Media Server can be used. However, in instances where more than 300 46xx IP telephones must be supported, an external server is strongly recommended. If an external server is used, HTTPS is not supported and HTTP must be used.

4.4.1. Configuring Phones to use External HTTP Servers

To allow 46xx IP Telephones to use an external server for downloading software via HTTP the telephone can be configured statically (on the telephone itself) or configured by using the appropriate DHCP server options.

All 46xx IP telephones supported by a specific DHCP server can be configured to use HTTP and an external server to obtain software updates by adding the string “HTTPSRVR=nnn.nnn.nnn.nnn” to the current DHCP option string (option 176 in most cases). In this example nnn.nnn.nnn.nnn is the IP address of the desired external server. Again, only 46xx IP telephones that are running software releases that support HTTP/HTTPS will acquire software updates from the external server via HTTP.

Each individual telephone can be programmed to use HTTP and an external server to obtain software updates by programming “FileSv=nnn.nnn.nnn.nnn” on the telephone where nnn.nnn.nnn.nnn is the IP address of the external HTTP server. The telephone will then attempt to obtain software updates from the external server via HTTP as long as the telephone software currently running supports HTTP/HTTPS downloads. See [Figure 3: IP Telephones Supporting TFTP & HTTP/HTTPS Downloads](#) for a list of minimum telephone software releases that support HTTP/HTTPS downloads.

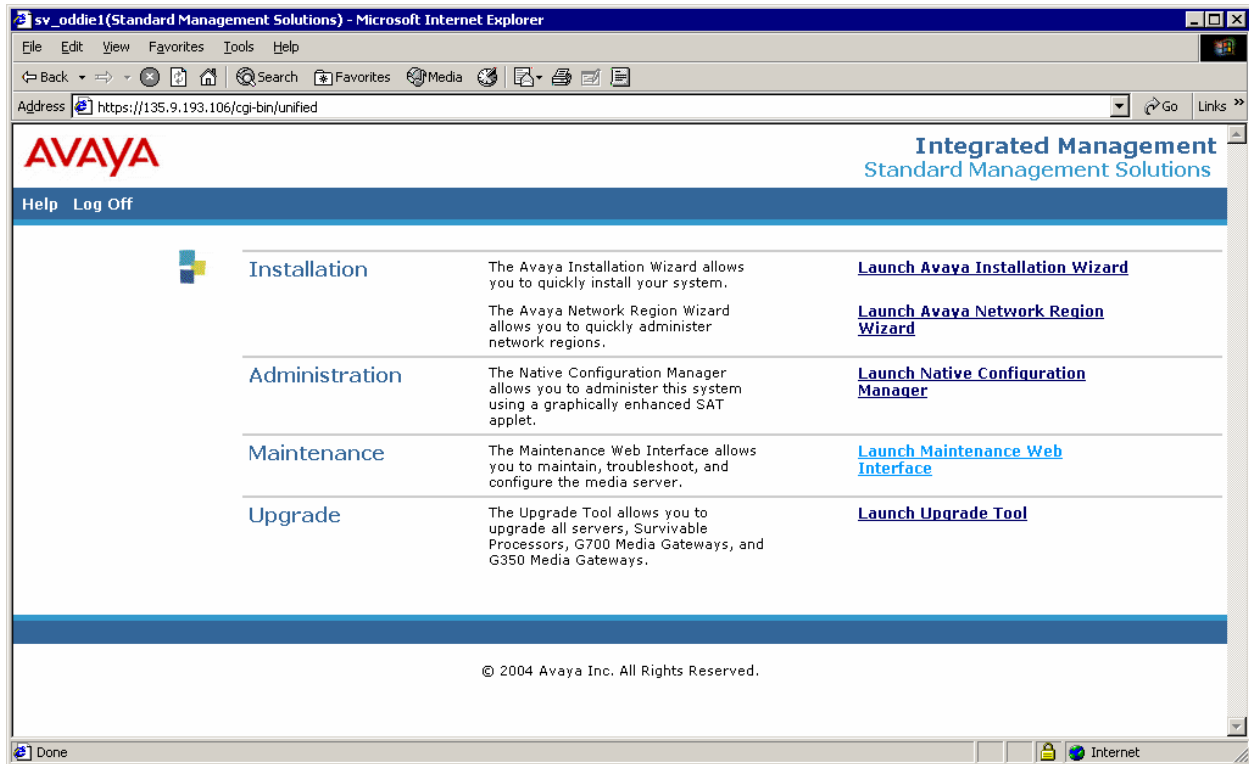
Additional information can be found in the *IP Telephone LAN Administrator Guide* document available on Avaya’s support website.

5. Downloading Software RPMs onto Media Servers

To transfer a 46xx IP telephone tar file containing a 46xx IP telephone RPM file onto the local *tftpboot* directory of a Media Server running Communication Manager 2.1.1 or later releases perform the following steps:

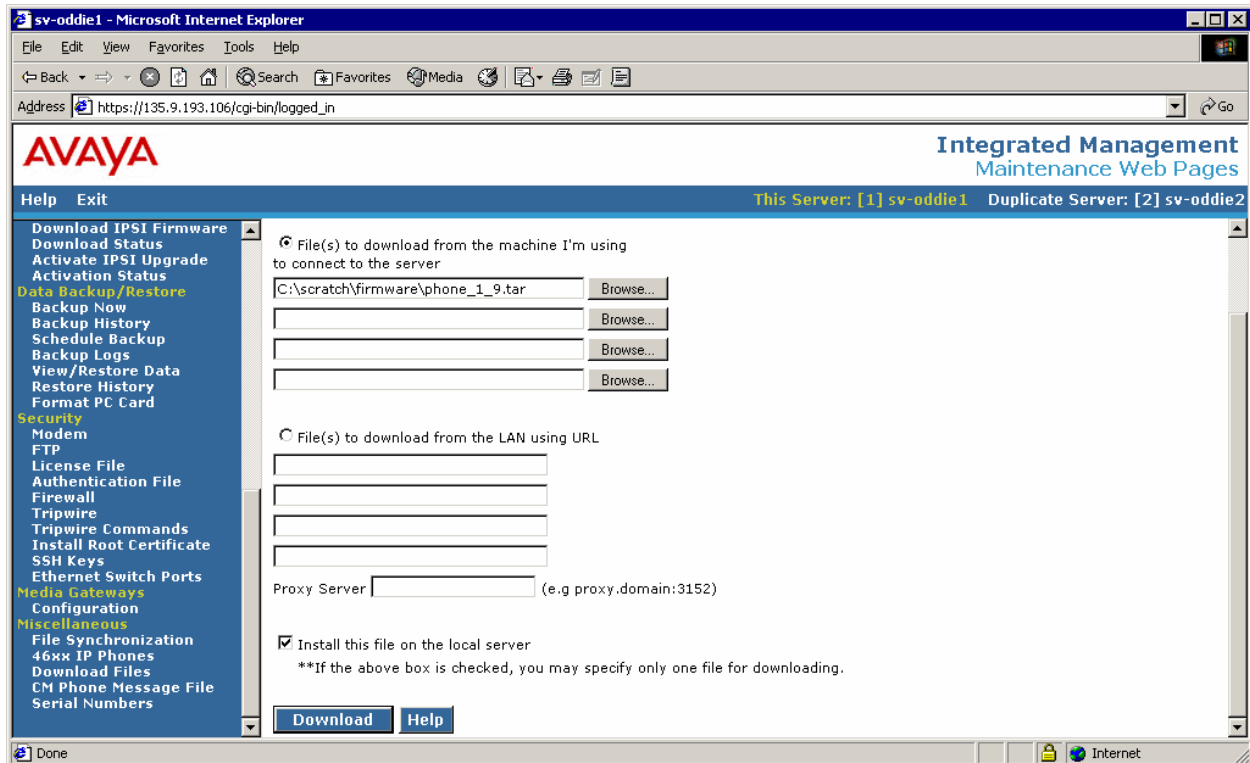
1. Access the Maintenance Web Pages on the Media Server by putting in the appropriate server name (assuming DNS is used) or the Corporate LAN IP address of the Media Server in the address line on a web browser.
2. Enter an appropriate login and password when prompted and click the *Logon* button.
3. Click the [Launch Maintenance Web Interface](#) link. See [Figure 5: Launch Maintenance Web Pages](#).

Figure 5: Launch Maintenance Web Pages



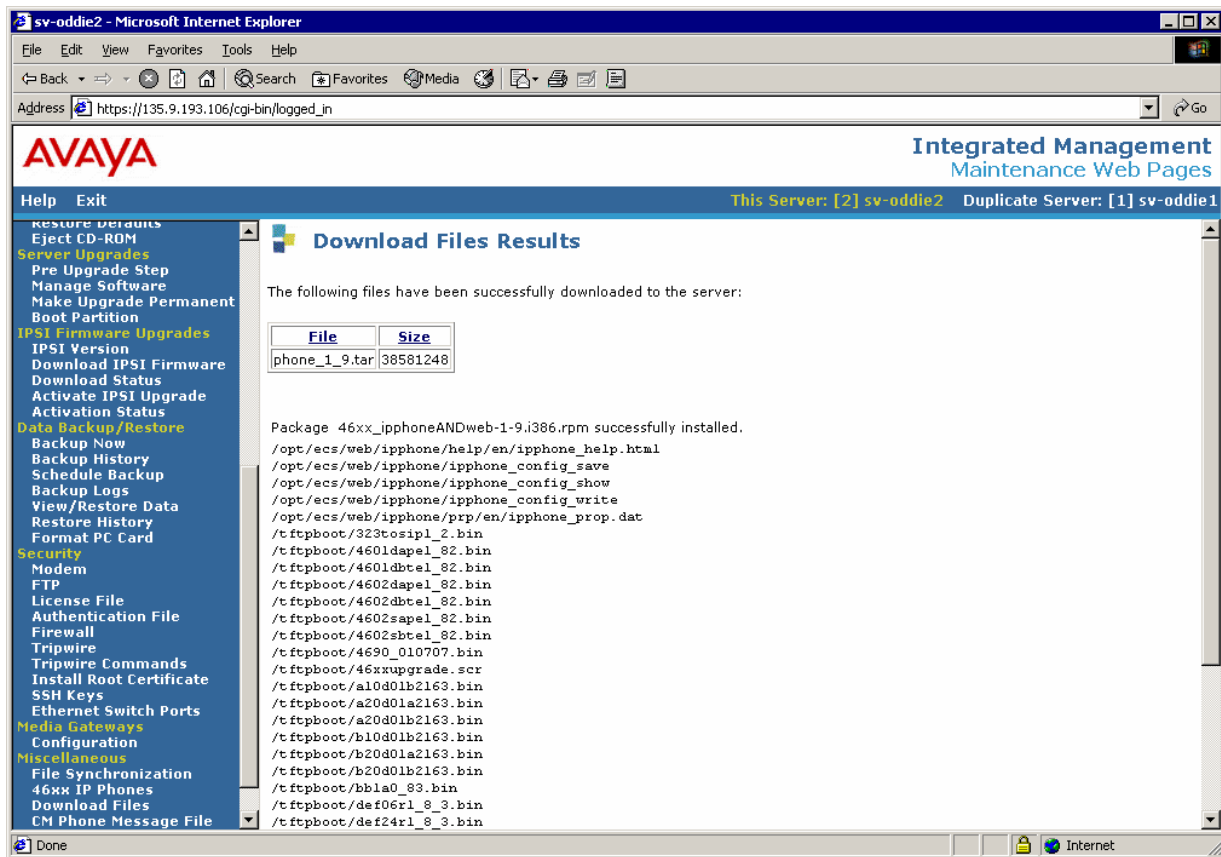
4. Click *Download Files* under the *Miscellaneous* heading.
5. Enter or browse to the 46xx IP telephone tar file containing the telephone software RPM file to be downloaded in the first *File(s) to download* field. Make sure to check the *Install this file on the local server* check box. Then click the *Download* button. [See Figure 6: Maintenance Web Page Downloads.](#)

Figure 6: Maintenance Web Page Downloads



6. Verify the 46xx IP telephone software files successfully downloaded to the Media Server.
See [Figure 7: Software RPM Downloaded Successfully](#).

Figure 7: Software RPM Downloaded Successfully



7. It is possible that telephone software RPMs fail to download because previously downloaded RPMs cannot be overwritten. In this case the following error message might be encountered and the existing RPM(s) must be removed:

```
Package <rpm_file_name>.rpm FAILED to install.  
Package <rpm_file_name> is already installed.
```

If existing telephone software RPMs must be removed from the Media Server for any reason the following bash command, which requires super-user privileges, should be used:

```
rpm -e <rpm_file_name>
```

6. Configuring Telephone Settings via the Media Server

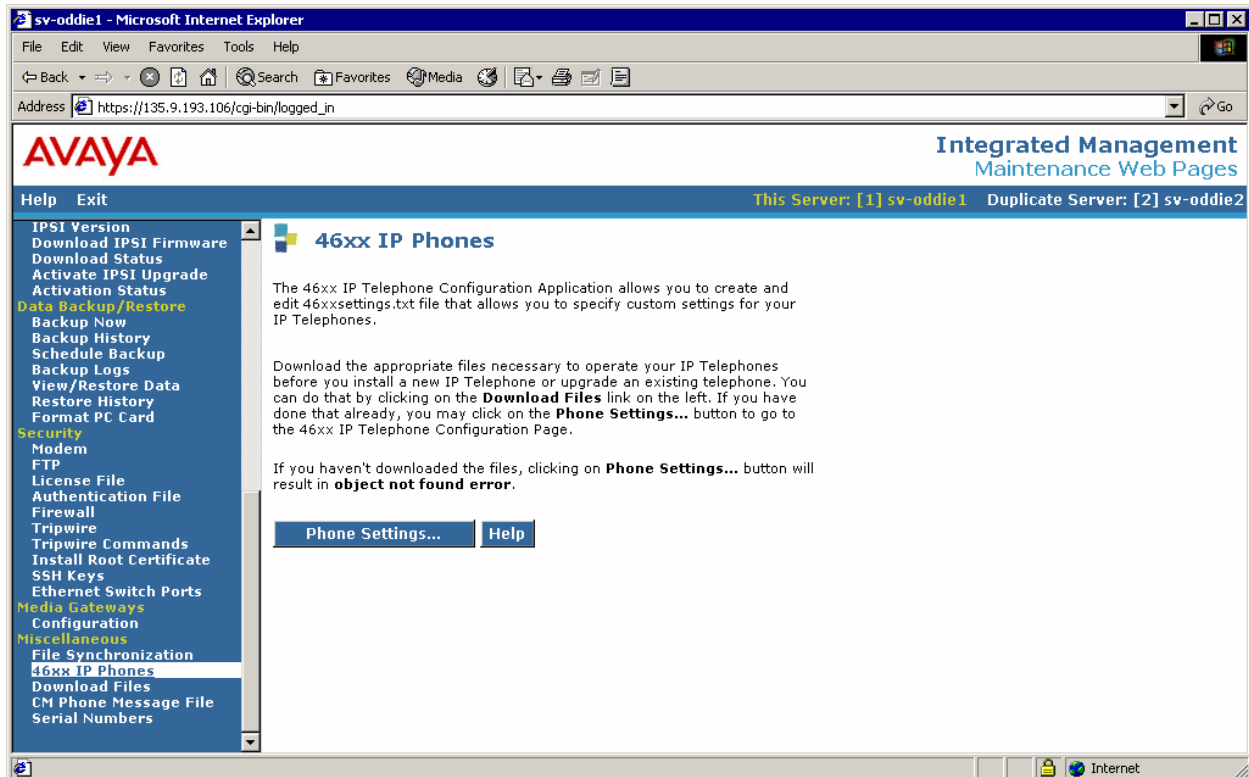
Once a 46xx IP telephone software RPM has been successfully downloaded to the Media Server, 46xx IP telephone configuration settings can be updated using the Maintenance Web Pages. The following steps are used to configure telephone settings via the Maintenance Web Pages on the Media Server:

1. Access the Maintenance Web Pages on the Media Server. Use steps 1 – 3 in the [Downloading Software RPMs onto Media Servers](#) section of this document.
2. Click the [46xx IP Phones](#) link under the *Miscellaneous* heading. If a software RPM has never been downloaded on the Media Server a page similar to [Figure 8: IP Telephone Settings Unavailable](#) is displayed. If a software RPM has been downloaded on the Media Server the [Figure 9: IP Telephone Settings Page](#) is displayed.

Figure 8: IP Telephone Settings Unavailable



Figure 9: IP Telephone Settings Page



3. Click on the *Phone Settings...* button. This displays [Figure 10: IP Telephone Configuration Page](#). This page is used to configure 46xx IP telephones. If a phone

settings file *46xxsettings.txt* is placed in the *tftpboot* directory the fields on the [Figure 10: IP Telephone Configuration Page](#) are populated with the information in the *46xxsettings.txt* file. The *46xxsettings.txt* file is not part of the 46xx IP telephone software RPM and is not placed in the *tftpboot* directory when the telephone software RPM is downloaded onto the Media Server. This file must manually be placed in the *tftpboot* directory or created by populating the phone settings fields on the [Figure 10: IP Telephone Configuration Page](#) and clicking the *Save Configuration* button at the very bottom of the web page. Not all phone configuration settings are supported. Additional information on phone configuration settings can be found in the *IP Telephone LAN Administrator Guide* document available on support.avaya.com.

Figure 10: IP Telephone Configuration Page

The screenshot shows a web browser window titled "sv-st10-2 - Microsoft Internet Explorer" displaying the Avaya Integrated Management Maintenance Web Pages. The address bar shows "https://135.9.192.66/cgi-bin/logged_in". The page title is "46xx IP Telephone Configuration". A warning message states: "Warning: Configuration file does not exist on the server. New configuration file will be created on saving this form data." The "Common Settings" section includes fields for Domain Name, Script File Server Authentication, List of HTTP Server IP Addresses or DNS Names, Manual Override of Call Server IP Address, DNS Server IP Addresses, Handset Automatic Gain Control (AGC), Headset Automatic Gain Control (AGC), Speakerphone Automatic Gain Control (AGC), Differentiated Services Code Point (Audio), Differentiated Services Code Point (Signaling), Layer 2 Frame Tagging, Layer 2 Priority Value (Audio), and Layer 2 Priority Value (Signaling).

7. Downloading Software on the Telephones

Transfer of 46xx IP telephone software via TFTP or HTTP/HTTPS on a Media Server will occur automatically whenever a 46xx IP telephone resets if the following conditions are met:

1. The Media Server has been configured correctly.
2. A 46xx IP telephone software RPM has been successfully downloaded onto the Media Server.
3. 46xx IP telephones have been correctly configured to obtain software updates from the Media Server.
4. The 46xx IP telephone software that currently resides on the IP telephone supports telephone software transfers via HTTP/HTTPS in the case an HTTP/HTTPS transfer is being used.

8. Security

HTTP/HTTPS is recommended for 46xx IP telephone software file transfers because it provides better performance and security than TFTP and is supported on all S8xx0 series Media Servers running Communication Manager 2.1.1 or later releases.

Transport Layer Security (TLS) is a protocol that enables authentication and data encryption over insecure networks. TLS runs on top of TCP and adds security to any protocol that uses reliable connections. It is most commonly used with HTTP to form HTTPS.

When using Avaya S8xx0 Media Servers to download 46xx IP telephone software via HTTP/HTTPS, the telephone configuration files are transferred using the HTTP over TLS (HTTPS) protocol and the software binaries are transferred using the HTTP protocol. This is done for performance reasons since HTTPS is slower than HTTP and the software binaries are large.

Avaya 46xx IP telephones establish encrypted TLS connections only with servers using Avaya signed digital certificates. This limits the servers that can be used for HTTP/HTTPS 46xx IP telephone software downloads to Avaya S8xx0 Media Servers.

9. Media Server Performance Impact

9.1. TFTP Performance

46xx IP telephone software file transfer impact to processor occupancy on Media Servers is much greater when using TFTP opposed to HTTP/HTTPS. For this reason, it is recommended that HTTP/HTTPS is used whenever possible. Furthermore, use of TFTP file transfers on an Avaya Media Server are only supported on an S8300B or later S8300 Media Server running Communication Manager 2.1.1 or greater and only when 20 or fewer 46xx IP phones are using the Media Server to obtain software updates. If software updates are provided to more than 20 46xx IP telephones it is likely the Media Server will go into an overload condition and the ability to process calls will be negatively impacted, or the media server will reset.

9.2. HTTP/HTTPS Performance

HTTP/HTTPS is recommended for 46xx IP telephone software file transfers because it provides better performance and security than TFTP and is supported on all S8xx0 series Media Servers running Communication Manager 2.1.1 or later releases.

It is strongly recommended that using Media Servers for HTTP/HTTPS file transfers is limited to configurations where files are transferred to 300 or less telephones. This limit is necessary because transfers to more than 300 telephones can cause timeouts and some telephones might abort the software update leaving older software on the telephone.

Performance measurements were taken using an Avaya S8500 Media Server. Testing included 12 real telephones and all remaining phones were simulated with a test script. The following test results were obtained:

1. 0 to 300 telephones took up to 5 minutes for all phones to download new software and come back into service. Processor occupancy increased 7 to 10% briefly a couple of times during the 5 minute interval.
2. 400 to 1,000 telephones took up to 8 minutes for all telephones to come back into service. Most of the phones downloaded new software prior to coming back into service, but a number of them did not. This is due to a timer in the phone that aborts the software update if the 46xxupgrade script is not transferred in a given amount of time. Some phones were blocked from transferring files until this timer expired and were brought

back into service before updated software could be downloaded. Processor occupancy increased 7 to 10% consistently throughout the 8 minute download interval.

Due to these test results, it is not recommended to use the Avaya Media Server to download 46xx IP telephone software to more than 300 telephones when using HTTP/HTTPS.

Additionally, the impact to processor occupancy when downloading telephone software depends on the Media Server configuration and other activities that are occurring on the Media Server while 46xx IP telephones are downloading software. For instance, if a duplicated S8710 server pair is in the process of shadowing memory from the active server to the standby server while downloading 46xx IP telephone software, the impact to processor occupancy can be more severe than the impact resulting from the tests performed on the S8500 Media Server.

Due to the processor intensive nature of downloading software to IP telephones it is recommended that this activity be coordinated and performed during times when the Media Server is relatively inactive (non busy times), especially if the maximum number of recommended phones (300) are all being updated at the same time.

Currently there is no tracking of IP telephone downloads to assure the phones download the updated software prior to coming into service. Therefore, when downloading software to more than 300 phones using a Media Server, which is not recommended, it might be necessary to perform the download again on any phones that timed out during the initial “mass” update. The SAT commands *reset ip-stations ip-network-region rrr* and *reset ip-stations ipaddr xxx.xxx.xxx.xxx yyy.yyy.yyy.yyy* can be used to reset specific 46xx IP telephones to target them for software updates.

10. Known Issues

The following are issues to be aware of when implementing and using Avaya Media Servers to download 46xx IP telephone software.

1. Communication Manager Software releases earlier than 3.1 do not save the 46xx IP telephone configuration settings in the *46xxsettings.txt* file, located in the *tftpboot* directory, when backing up and restoring data on a Media Server. The workaround is to manually save the file to an external source after making any settings changes.
2. The 46xx IP telephone software binaries and configuration/settings files are not preserved in the *tftpboot* directory during an upgrade of Communication Manager. The workaround is to save the phone software and settings files to an external source prior to an upgrade and move the files back into the *tftpboot* directory after the upgrade is completed. Or, the 46xx IP telephone software can be re-downloaded onto the Media Server after the upgrade is completed.
3. In Communication Manager Software releases earlier than 3.1.2 do not transfer the 46xx IP telephone configuration settings *46xxsettings.txt* file to the secondary server in a server pair when file synchronization occurs. The workaround is to manually move the *46xxsettings.txt* file onto the secondary server when updates are made.
4. 46xx IP telephone software RPMs must be downloaded onto both Media Servers in a server pair when the active alias IP address is used.
5. The Maintenance Web Page error message *Object not found!*, provided when attempting to access the *46xx IP Phones* link and a 46xx IP phone software RPM has never been downloaded, isn't very descriptive.

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