



Using AutoInstall to Remotely Configure Cisco Networking Devices

AutoInstall enables remote, automatic configuration of networking devices. AutoInstall is typically used to set up new networking devices remotely. You can, however, use AutoInstall to configure existing networking devices after you remove the configuration file from their NVRAM. The AutoInstall process uses preexisting configuration files that are stored on a TFTP server.

In this module the term networking device means a router that runs Cisco IOS software. Also, the following terms are used interchangeably:

- initial configuration and startup configuration
- *set up* and *configure*
- [Finding Feature Information, page 1](#)
- [Prerequisites for Using AutoInstall to Remotely Configure Cisco Networking Devices, page 2](#)
- [Restrictions for Using AutoInstall to Remotely Configure Cisco Networking Devices, page 2](#)
- [Information About Using AutoInstall to Remotely Configure Cisco Networking Devices, page 3](#)
- [How to Use AutoInstall to Remotely Configure Cisco Networking Devices, page 14](#)
- [Additional References, page 16](#)
- [Feature Information for Using AutoInstall to Remotely Configure a Cisco Networking Device, page 17](#)

Finding Feature Information

Your software release may not support all the features documented in this module. For the latest caveats and feature information, see [Bug Search Tool](#) and the release notes for your platform and software release. To find information about the features documented in this module, and to see a list of the releases in which each feature is supported, see the feature information table at the end of this module.

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to www.cisco.com/go/cfn. An account on Cisco.com is not required.

Prerequisites for Using AutoInstall to Remotely Configure Cisco Networking Devices

- You have read Overview: Basic Configuration of a Cisco Networking Device module in the Cisco IOS Configuration Fundamentals Configuration Guide.
- This document is written specifically for networking devices running Cisco IOS Release 12.4(1) or newer. However most of the information in this document can be used to configure networking devices that support AutoInstall and are not running Cisco IOS release 12.4(1) or newer. The two key differences that you must allow for are:
 - Some Cisco networking devices use BOOTP instead of DHCP to request IP address addresses over LAN interfaces. Enabling BOOTP support on your DHCP server will resolve this issue.
 - Some Cisco networking devices use a DHCP client identifier format that is different from the format used by networking devices running Cisco IOS release 12.4(1) or newer. This document only explains the DHCP client identifier format used by networking devices running Cisco IOS release 12.4(1) or newer. Use the process described in Determining the Value for the DHCP Client Identifier Automatically to determine the DHCP client identifier format that your Cisco networking device is using.
- No configuration file resides in NVRAM on the networking device that is being configured with AutoInstall.
- The configuration files that you want to load on to the networking device using AutoInstall reside on a TFTP server that is connected to the network. In most cases there is more than one file; for example, a network file with the IP-to-hostname mappings and a device-specific configuration file.
- You have someone at the remote site to connect the networking device that is being configured with AutoInstall to the network and power it on.
- The network has the IP connectivity necessary to permit the networking device to load configuration files from the TFTP server during the AutoInstall process.
- A DHCP server is available on the network to provide IP addresses to networking devices that are using AutoInstall over a LAN connection.

Restrictions for Using AutoInstall to Remotely Configure Cisco Networking Devices

- (Serial interfaces only) AutoInstall over a serial interface using either HDLC or Frame Relay can be performed only over the first serial port on a new device (serial interface 0 or serial interface x/0).
- (LAN interfaces only) Only LAN Token Ring interfaces that set ring speed with physical jumpers support AutoInstall.
- AutoInstall does not automatically run on a T1 interface. For AutoInstall to work on a T1 interface, you have to manually configure the T1 interface to create a serial interface and then assign an IP address and network mask to that serial interface.

Information About Using AutoInstall to Remotely Configure Cisco Networking Devices

AutoInstall Overview

AutoInstall can be used to load a final full configuration, or a partial temporary configuration, on to a networking device that is being configured with AutoInstall.

**Tip**

When you use AutoInstall to load a partial temporary configuration, you must finish configuring the device manually.

Services and Servers Used by AutoInstall Dynamic Assignment of IP Addresses

The network must be able to provide the dynamic assignment of an IP address to the networking device that is being configured with AutoInstall. The type of IP address assignment server that is used depends on the type of connection that the networking that is being configured with AutoInstall has to the network.

AutoInstall uses these types of IP address servers:

DHCP Servers

Networking devices using AutoInstall over a LAN connection require a DHCP server to provide an IP address dynamically. This requirement applies to Ethernet, Token Ring, and FDDI interfaces. The network must be configured to provide IP connectivity between the DHCP server and any devices that are using AutoInstall over LAN connections.

DHCP (defined in RFC 2131) is an extension of the functionality provided by the Bootstrap Protocol (defined in RFC 951). DHCP provides the framework for passing configuration information to hosts on a TCP/IP network. DHCP adds the capability of automatic allocation of reusable network addresses and additional configuration options such as a router (gateway) IP address, a TFTP server IP address, the name of a boot file to load, and the domain name to use. DHCP servers can be configured on routers, UNIX servers, Microsoft Windows-based servers, and other platforms.

DHCP servers typically assign IP addresses from a pool of IP addresses randomly. It is possible for a device that uses DHCP to obtain its IP address to have a different IP address every time it is connected to the network. This behavior creates a problem for the AutoInstall process when you want to ensure that a particular device is assigned a specific hostname during the AutoInstall process. For example, if you are installing routers on different floors in a remote site and each router is supposed to be assigned a name that indicates its location, such as **ChicagoHQ-1st** and **ChicagoHQ-2nd**, you need to ensure that each device gets the IP address that will be mapped to its correct hostname.

The process of ensuring that a device is assigned a specific IP address is referred to as *creating a reservation*. A reservation is a manually configured relationship between an IP address and a physical layer address of a LAN interface on the device. Many Cisco IOS-based devices do not use their MAC address when they request an IP address via DHCP. They use a much longer client identifier instead. Due to the complexity of identifying the client identifier so that you can preconfigure a reservation, and the complexity of finding out if the new

device uses its MAC address or the client identifier, we recommend that you allow a new device to obtain an IP address without using a DHCP reservation first in order to discover if the device is using its MAC address or a client identifier. When you have learned how the new device is identifying itself to the DHCP server, you can make a note of the format and create a reservation for it. The next time the new device is rebooted it should obtain the IP address that you reserved to ensure that the new device is assigned the correct hostname. Refer to the information on creating DHCP reservations that was provided with your DHCP server software. The process for creating reservations using Cisco IOS based DHCP servers is explained in the Using AutoInstall to Set Up Devices Connected to LANs section. This section includes instructions for identifying the client identifier before the device is connected to the network so that you can preconfigure the DHCP reservations.

**Note**

This document uses a Cisco router as the DHCP server for using AutoInstall to configure LAN-connected networking devices. If you are using a different device as your DHCP server ensure that you have the user documentation for it available in the event that you need help configuring it.

**Note**

There are several configuration parameters such as TFTP server addresses, DNS server addresses, domain names and so on, that can be provided to LAN-connected clients by DHCP servers during the process of assigning IP addresses to clients. These parameters are not required by AutoInstall, therefore they are not included in this document. If you know how to use these parameters, you can include them in your DHCP server configuration when you are using AutoInstall to set up your networking devices.

For more information on DHCP services visit the IETF RFC site (<http://www.ietf.org/rfc.html>) and look for RFCs about DHCP. Most server operating systems support DHCP servers. Refer to the documentation that was provided with your operating system for more information.

SLARP Servers

A router that is being configured with AutoInstall over a serial interface using HDLC encapsulation will send a Serial Line ARP (SLARP) request for an IP address over the serial interface that is connected to the staging router.

The serial interface of the staging router must be configured with an IP address in which the host portion is 1 or 2, such as 192.168.10.1 or 192.168.10.2. The staging router will send a SLARP response to the router that is being configured with AutoInstall that contains the value that the staging router is not using. For example, if the interface on the staging router that is connected to the router that is being configured with AutoInstall is using 192.168.10.1 as its IP address, the staging router will send a SLARP response with a value of 192.168.10.2 to the router that is being configured with AutoInstall.

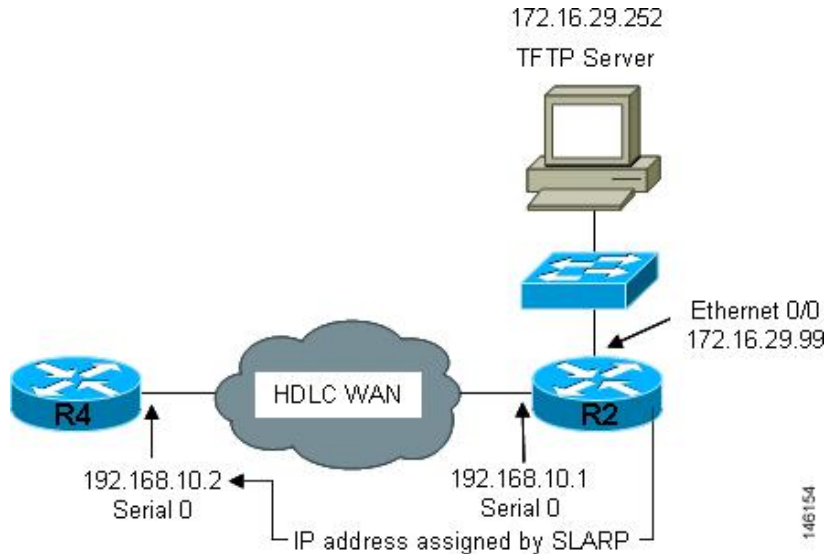
**Tip**

If you are using a mask of 255.255.255.252 on the serial interface of the staging router SLARP will assign the available IP host address to the new device. For example, if you assign IP address 198.162.10.5 255.255.255.252 to serial 0 on the staging router, SLARP will assign 198.162.10.6 to the new device. If you assign IP addresses 198.162.10.6 255.255.255.252 to serial 0 on the staging router SLARP will assign 198.162.10.5 to the new device.

The figure below shows an example of SLARP.

In the figure below, the IP address of serial interface 0 on the staging router (R2) is 192.168.10.1. SLARP therefore assigns the IP address 192.168.10.2 to serial interface 0 on the new device.

Figure 1: Using SLARP to Assign an IP Address to a New Device



Note AutoInstall over a serial interface using HDLC can be performed only over the first serial port on a new device (serial interface 0 or serial interface x/0). The staging router and new device must be directly connected using the first serial interface port on the new device; for example, serial 0/0 or if the first serial port is in the second slot of the device, serial 2/0.



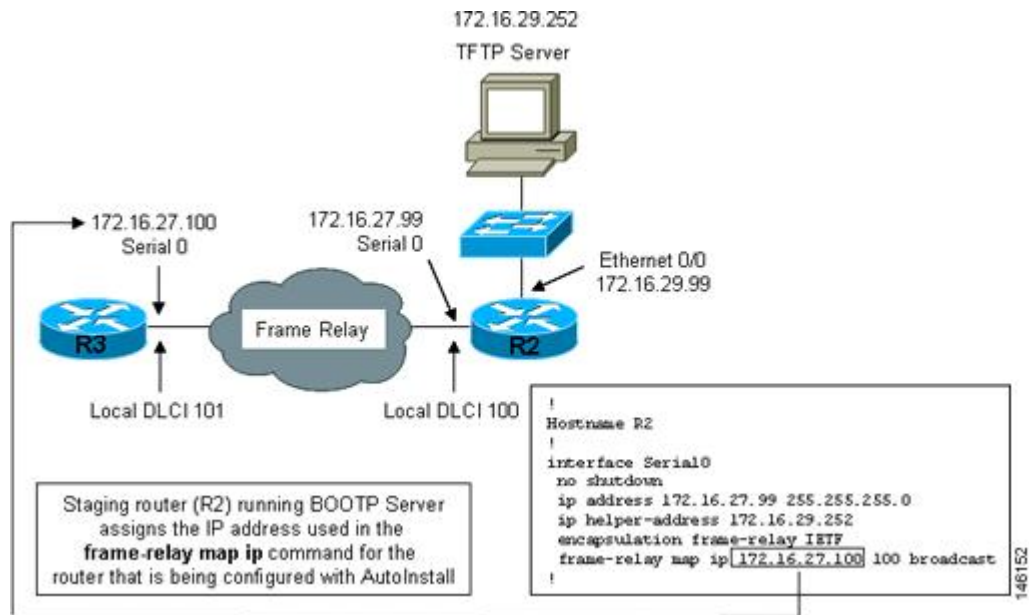
Tip The IP address that is assigned to the router that is being configured with AutoInstall by SLARP from the staging router is the IP address that you must use in the **ip host hostname ip-address** command in the AutoInstall network-config or ciscoet.cfg file to ensure that the router that is being configured with AutoInstall is assigned the correct hostname so that it can request its host-specific configuration file.

BOOTP Servers

A router that is being configured with AutoInstall over a serial interface using Frame Relay encapsulation will send a BOOTP request for an IP address over the serial interface that is connected to the staging router. The staging router learns the correct IP address to provide in its BOOTP response to the router that is being configured with AutoInstall by examining the **frame-relay map ip ip-address dlc** command that is configured on the interface that it is using to connect to the router that is being configured with AutoInstall.

In the figure below R2 is the staging router. R2 has the **frame-relay map ip 172.16.27.100 100** broadcast command configured on interface serial 0. When R2 receives the BOOTP request for an IP address from R3 during the AutoInstall process, R3 will reply with 172.16.27.100.

Figure 2: Example of Using BOOTP for Autoinstall Over a Frame Relay Network



Tip

The limitation imposed by SLARP in which the IP addresses for the new device and the staging router must end in either .1 or .2 does not apply to BOOTP. BOOTP for AutoInstall over Frame Relay supports all host addresses for the IP address subnet that is assigned to the Frame Relay circuit between the router that is being configured with AutoInstall and the staging router.



Tip

The IP address that is assigned to the router that is being configured with AutoInstall by BOOTP from the staging router is the IP address that you must use in the **ip host hostname ip-address** command in the AutoInstall network-conf or ciscoenet.cfg file to ensure that the router that is being configured with AutoInstall is assigned the correct hostname so that it can request its host-specific configuration file.



Note

AutoInstall over a serial interface using Frame Relay encapsulation can be performed only over the first serial port on a new device (serial interface 0 or serial interface x/0). The staging router and new device must be directly connected using the first serial interface port on the new device; for example, serial 0/0 or if the first serial port is in the second slot of the device, serial 2/0.

Services and Servers Used by AutoInstall IP-to-Hostname Mapping

If you want the networking device to load a full configuration file during the AutoInstall process, the networking device must be able to determine its hostname so that it can request the configuration file that you created specifically for it.

The following caveats apply to the provisioning of IP address to hostname mapping for AutoInstall:

- Any networking device that is being configured with AutoInstall can determine its hostname by loading one of the AutoInstall network configuration files (`network-config` or `cisconet.cfg`) from the TFTP server that contain the `iphosthostnameip-address` commands. For example, to map host R3 to IP address 198.162.100.3, the `network-config` or `cisconet.cfg` file must contain the `iphostr3198.162.100.3` command.
- A networking device that is being configured with AutoInstall over a LAN interface can also determine its hostname by querying a DNS server. If the DNS server is not connected to the same LAN the device must learn the IP address of the DNS server from the DHCP server during the process of obtaining its dynamically assigned IP address from the DHCP server.

DNS Servers

DNS servers are used to provide a network service that maps hostnames to IP addresses and IP addresses to hostnames (reverse DNS lookups). Anytime that you use a hostname to initiate an IP connection to a host, your PC must determine the IP address that is assigned to the hostname that you want to contact. For example, when you visit Cisco's website (<http://www.cisco.com/>) your PC sends a DNS query to a DNS server to discover the current IP address that can be used to contact Cisco's website.

For more information on DNS services visit the IETF RFC site (<http://www.ietf.org/rfc.html>) and look for RFCs about DNS. The Name Server LookUp tool (nslookup) is very useful for learning more about DNS. There are several excellent websites available about nslookup that you can find by searching for them.

Services and Servers Used by AutoInstall Storage and Transmission of Configuration Files

TFTP is a protocol used to transfer files between devices on a network. A TFTP server is a device that uses TFTP to transfer files to devices. TFTP servers can be configured on UNIX servers, Microsoft Windows-based PCs and servers, and other platforms.



Tip

If you do not have a TFTP server available you can configure a Cisco IOS-based router as a TFTP server using the `tftp-serverfile-system:filename` command. Refer to the Configuring Basic File Transfer Services feature for more information on configuring your router as a TFTP server.

Cisco routers use TFTP to load the configuration files that are required for AutoInstall. You must have a TFTP server deployed in your network to provide file storage and file transmission services to the devices that will be using AutoInstall.

For more information on TFTP services visit the IETF RFC site (<http://www.ietf.org/rfc.html>) and look for RFCs about TFTP. There are several excellent websites available about TFTP that you can find by searching for them. Several freeware and shareware versions of TFTP servers for various operating systems and hardware platforms are available from the Internet.

The following caveats apply to the provisioning of TFTP servers for AutoInstall:

- Devices using AutoInstall over a LAN--If the TFTP server and the devices using AutoInstall are on different LAN segments, you must either configure the **ip helper-address** *address* command on all of the interfaces that will receive TFTP session initialization requests from the devices that are using AutoInstall.
- Devices using AutoInstall over a WAN--If the devices using AutoInstall are connected to a WAN, you must configure the **ip helper-address** *address* command on all of the interfaces that will receive TFTP session initialization requests from devices that are using AutoInstall.

ip helper-address

If the new device does not learn the IP address of the TFTP server via DHCP option 150, it will transmit the TFTP session initialization requests as network layer broadcasts using the IP destination broadcast address of 255.255.255.255. Routers block network layer broadcast datagrams which prevents the TFTP session initialization requests from reaching the TFTP server, and AutoInstall will fail. The solution to this problem is to use the **ip helper-address** *address* command. The **ip helper-address** *address* command changes the broadcast address of TFTP session initialization request from 255.255.255.255 to the address that is configured with the *address* argument. For example, the **ip helper-address 172.16.29.252** command will change IP destination broadcast address of 255.255.255.255 to 172.16.29.252.

Networking Devices Used by AutoInstall

Device That Is Being Configured with AutoInstall

A device that is being configured with AutoInstall can be any Cisco IOS-based router that supports AutoInstall and does not have a configuration file in its NVRAM.

Staging Router

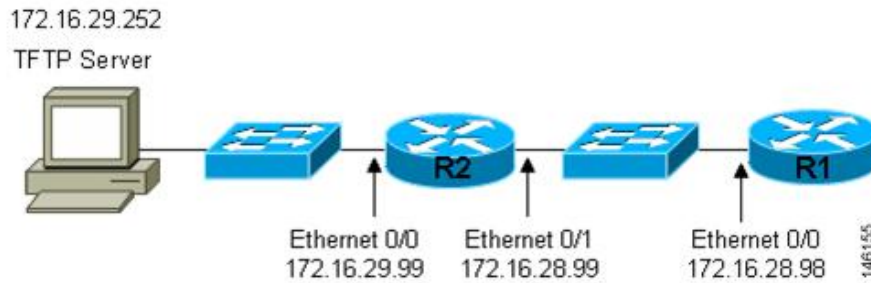
A staging router acts as an intermediary between the TFTP server (to which it must have IP connectivity) and a device that is being configured with AutoInstall when the new device and the TFTP server are connected to different networks. In the figure below R1 requires a staging router because it is connected to a different LAN segment than the TFTP server.

Staging routers are required in the following situations:

- Devices using AutoInstall over a LAN--If the TFTP and/or DHCP servers and the devices using AutoInstall are on different LAN segments you must use a staging router.

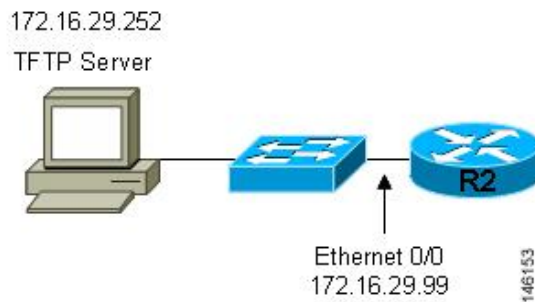
- Devices using AutoInstall over a WAN--If the devices using AutoInstall are connected to a WAN, you must configure the **ip helper-address** *address* command on all of the directly connected interfaces that will receive TFTP session initialization requests from the devices that are using AutoInstall.

Figure 3: Example of AutoInstall That Requires a Staging Router



Staging routers are not required when the new device that is being configured with AutoInstall is connected to the same LAN segment as the TFTP and DHCP servers. In the figure below R2 does not require a staging server to use AutoInstall because it is on the same LAN segment as the TFTP server.

Figure 4: Example of AutoInstall That Does Not Require a Staging Router



Intermediate Frame Relay-ATM Switching Device

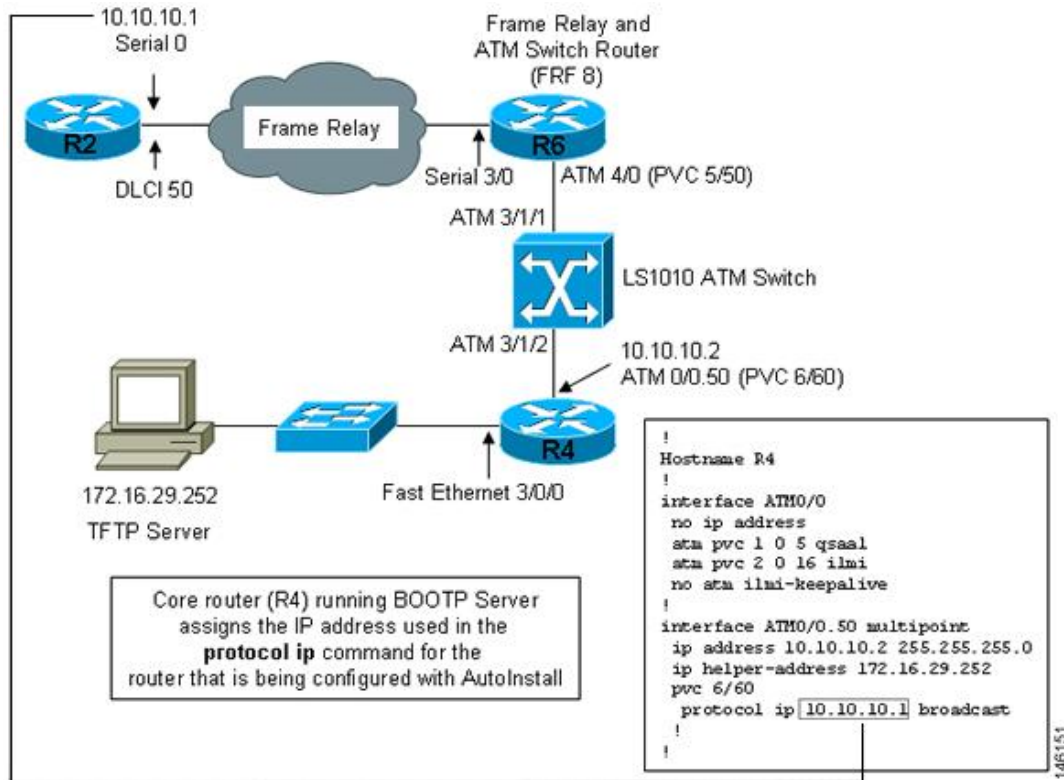
An intermediate Frame Relay-ATM switching device is one that can perform both routing and switching operations. Frame Relay-ATM switching devices are used to connect Frame Relay and ATM networks.

The AutoInstall over Frame Relay-ATM Interworking Connections feature modifies the AutoInstall process to use Frame Relay encapsulation defined by the IETF standard instead of the Frame Relay encapsulation defined by Cisco.

The figure below shows an example topology using AutoInstall over Frame Relay-ATM Interworking Connections. Router R6 does the Frame Relay to ATM Service Internetworking (FRF8) conversion for Frame

Relay DLCI 50 to ATM VPI/VCI 5/50. The LS1010 switch routes the VPI/VCI combination used by R6 (5/50) to the VPI/VCI combination used by R4 (6/60).

Figure 5: Example Topology for AutoInstall over Frame Relay-ATM Interworking Connections



TCL Script Files Used by AutoInstall

Instead of downloading configuration files, you can choose to provision your own Tool Command Language (TCL) installation script to complete the AutoInstall process. Your TCL script may retrieve a configuration file or an image from a file server and reload it on the device.

Configuration Options for AutoInstall

You can provision your network to support AutoInstall using several different combinations of devices and services. For example:

- You can provision all of the services required for AutoInstall (except dynamic IP address assignment using Serial Line Address Resolution Protocol (SLARP) or Bootstrap Protocol (BOOTP) that must be preformed by a Cisco router) on one network server, or you can provision each service on a different network server.
- You can provision the Dynamic Host Configuration Protocol (DHCP) service on a Cisco router.

- The device using AutoInstall can determine its IP address from a Domain Name System (DNS) server, or you can use one of the AutoInstall network configuration files (network-config or cisco.net.cfg) that contain the **ip host** *hostname ip-address* commands.
- You can use AutoInstall provision to load and execute a Tool Command Language (TCL) script. The TCL script provides a flexible way to complete the installation of the device, allowing you to complete the configuration by programming the script.

This module focuses on some of the most common methods for provisioning AutoInstall. Refer to the How to Use AutoInstall to Remotely Configure Cisco Networking Devices for information on the most common methods for provisioning AutoInstall.

The AutoInstall Process

The AutoInstall process begins when a networking device that does not have any files in its NVRAM is connected to the network.

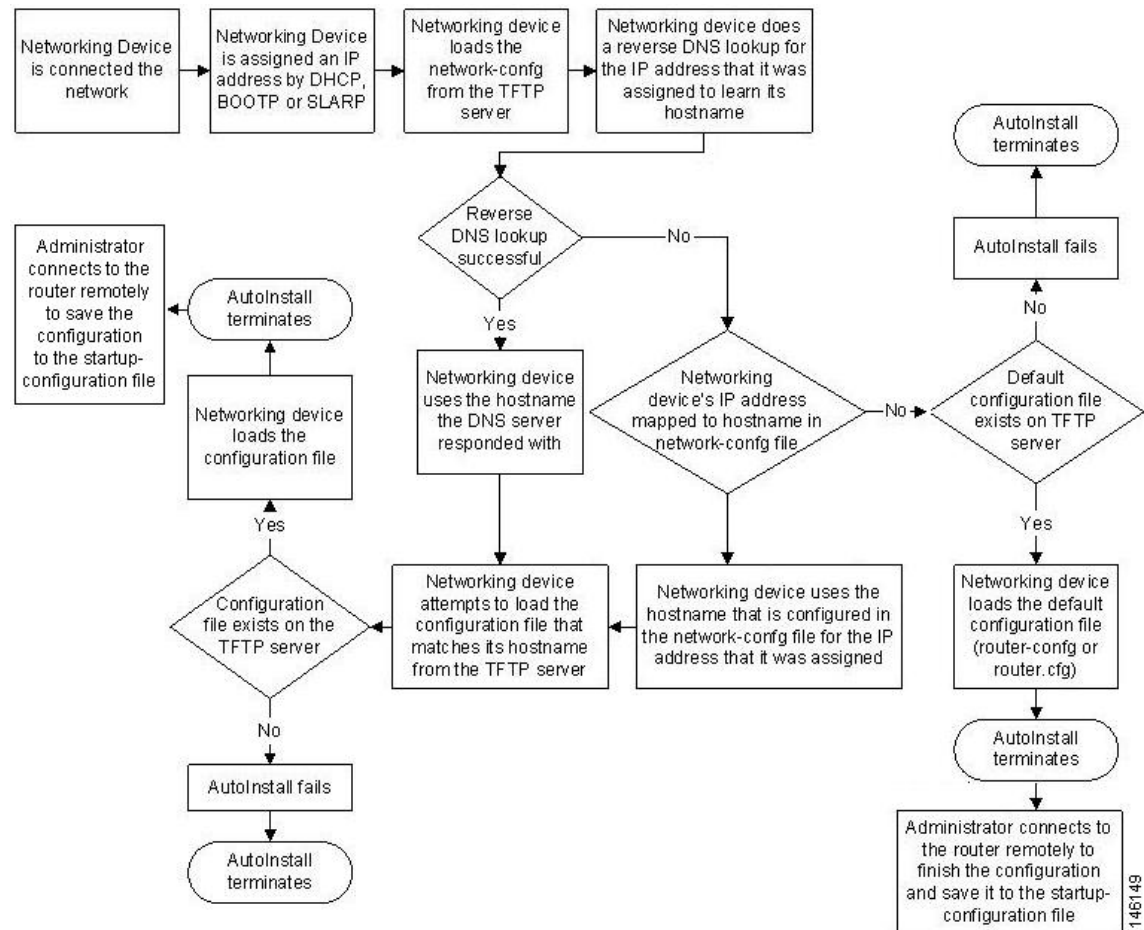


Timesaver

You can decrease the time that the AutoInstall process takes to complete by only connecting the interface on the networking device that you want to use for AutoInstall until the AutoInstall process has finished. For example, if you want the networking device to perform AutoInstall over a WAN interface and you connect its LAN interfaces and its WAN interfaces the networking device will attempt to perform AutoInstall over the LAN interfaces before it attempts to use the WAN interfaces. Leaving the LAN interfaces disconnected until the AutoInstall process is finished causes the networking device to initiate the AutoInstall process over its WAN interface immediately.

The following figure shows the basic flow of the AutoInstall process using the configuration files.

Figure 6: AutoInstall Process Flowchart (Using Configuration Files)



Benefits of Using AutoInstall to Remotely Configure a Cisco Networking Device

AutoInstall facilitates the deployment of Cisco routers by allowing you to manage the setup procedure for routers from a central location. The person responsible for physically installing the router does not require specific networking skills. The ability to physically install the router, connect the power and networking cables, and power it on are the only skills required by the installer. The configuration files are stored and managed on a central TFTP server. By using AutoInstall one skilled network technician based at a central site can manage the deployment of several routers in a short period of time.

AutoInstall Using DHCP for LAN Interfaces

The AutoInstall Using DHCP for LAN Interfaces feature enhances the benefits of AutoInstall by replacing the use of the Bootstrap Protocol (BOOTP) with the use of the Dynamic Host Configuration Protocol (DHCP) for Cisco IOS AutoInstall over LAN interfaces (specifically Ethernet, Token Ring, and FDDI interfaces).

DHCP (defined in RFC 2131) is an extension of the functionality provided by the BOOTP (defined in RFC 951). DHCP provides the framework for passing configuration information to hosts on a TCP/IP network. DHCP adds the capability of automatic allocation of reusable network addresses and additional configuration options. In Cisco IOS Release 12.1(5)T, and later releases, the IP address procurement phase of the AutoInstall process is now accomplished using DHCP for Ethernet, Token Ring, and FDDI interfaces. Prior to this release, IP addresses for LAN interfaces were obtained using BOOTP or RARP during the AutoInstall process. Additionally, this feature allows for the uploading of configuration files using unicast TFTP.

AutoInstall over Frame Relay-ATM Interworking Connections

The AutoInstall over Frame Relay-ATM Interworking Connections feature further enhances the benefits of AutoInstall by allowing you to use a router with an ATM interface as a BOOTP server for new routers being connected at remote locations.

AutoInstall Using TCL Script

The AutoInstall Support for TCL Script feature enhances the AutoInstall feature by providing flexibility in the installation process. This feature enables you to program the device to get information about what to download, to choose the type of file server, and to choose the required file transfer protocol.

Instead of allowing the DHCP server to return the image and the configuration file and downloaded from a file server, you have the flexibility to place the information about image and configuration file location under the control of an external server. This flexibility allows the device itself to retrieve this information from the external server during the installation process.

This feature allows you to download a Tool Command Language (TCL) script instead of the configuration file and to use the script to make the device operational. The script can consult a third-party server for information before downloading the image, configuration file, and other required files. The script location must be provisioned in the DHCP server, along with the other usual options, such as network and host-specific configuration files, needed in an AutoInstall setup.

If you choose script-based deployment, you can program and execute the installation process on the device itself instead of having the installation process driven by a centralized server.



Note

- The script uses the available FTPs to communicate with the configuration server, and these protocols are supported by the platform system code.
- The TCL script should be supported by the platform.
- Script commands that are required to perform script tasks should be supported by the platform code system.



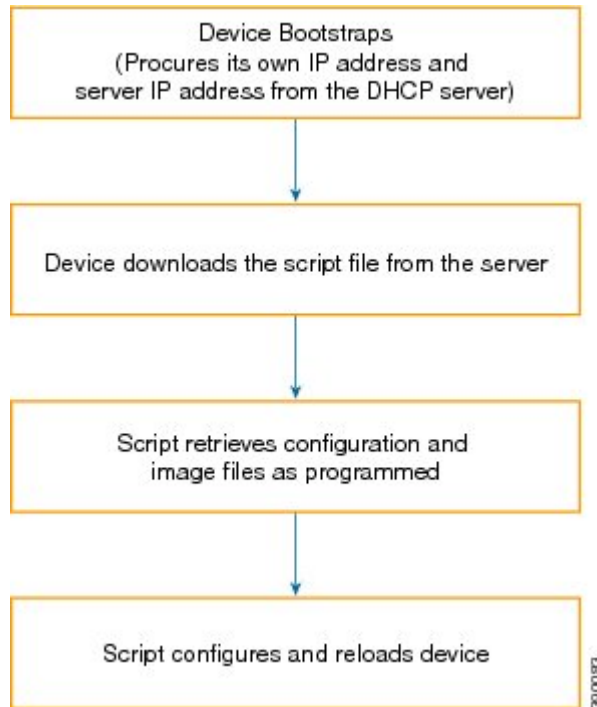
Note

The script-based deployment is triggered when there is no startup configuration in NVRAM upon powering up.

For more details on how the script executes and also for sample scripts, see the *Cisco IOS Scripting with TCL Configuration Guide*.

The following figure shows the basic flow of the AutoInstall process using a TCL script.

Figure 7: AutoInstall Process Flowchart (TCL Script File)



How to Use AutoInstall to Remotely Configure Cisco Networking Devices

This section describes the how to prepare a router for AutoInstall, how to use AutoInstall with Frame Relay to ATM Service Internetworking, and how to use AutoInstall for new routers connected to LANs. Additional examples for using AutoInstall for new routers connected to LANs, HDLC WANs, and Frame Relay networks that do not use Frame Relay to ATM Service Internetworking, are provided in the Configuration Examples for Using AutoInstall to Remotely Configure Cisco Networking Devices section.

In most cases you need to configure a staging router through which a new device running AutoInstall sends TFTP, BOOTP, and DNS requests.



Tip

In all cases, you must verify and save the configuration on the networking device after the AutoInstall process is complete. If you do not save the configuration, you must repeat the entire process.

Disabling the SDM Default Configuration File

Perform this task if Security Device Manager (SDM) was preinstalled on your device and you want to use AutoInstall to configure the device instead. SDM remains on the device.

SUMMARY STEPS

1. Connect the console cable, shipped with your device, from the console port on the device to a serial port on your PC. Refer to the hardware installation guide for the device for instructions.
2. Connect the power supply to the device, plug the power supply into a power outlet, and turn on the device. Refer to the quick start guide for the device for instructions.
3. Use Hyperterminal or a similar terminal emulation program on your PC, with the following terminal emulation settings, to connect to the device:
4. **enable**
5. **configure terminal**
6. **erase startup-config**
7. **reload**

DETAILED STEPS

	Command or Action	Purpose
Step 1	Connect the console cable, shipped with your device, from the console port on the device to a serial port on your PC. Refer to the hardware installation guide for the device for instructions.	
Step 2	Connect the power supply to the device, plug the power supply into a power outlet, and turn on the device. Refer to the quick start guide for the device for instructions.	
Step 3	Use Hyperterminal or a similar terminal emulation program on your PC, with the following terminal emulation settings, to connect to the device:	<ul style="list-style-type: none"> • 9600 baud • 8 data bits, no parity, 1 stop bit • No flow control
Step 4	enable Example: Device> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> • Enter your password if prompted.
Step 5	configure terminal Example: Device# configure terminal	Enters global configuration mode.
Step 6	erase startup-config Example: Device# erase startup-config	Erases the existing configuration in NVRAM.
Step 7	reload Example: Device# reload	Initiates the reload process. The device will initiate the AutoInstall process after it finishes the reload process.

Additional References

The following sections provide references related to using AutoInstall to remotely configure Cisco networking devices.

Related Documents

Related Topic	Document Title
Cisco IOS commands	Cisco IOS Master Command List, All Releases
Configuration Fundamentals commands	Cisco IOS Configuration Fundamentals Command Reference
Frame Relay-to-ATM Service Interworking (FRF.8)	<ul style="list-style-type: none"> • Frame Relay-ATM Interworking Supported Standards module in the <i>Cisco IOS Wide-Area Networking Configuration Guide</i> • Configuring Frame Relay-ATM Interworking module in the <i>Cisco IOS Wide-Area Networking Configuration Guide</i>
Overview of Cisco IOS setup mode and AutoInstall for configuring Cisco networking devices	Overview: Basic Configuration of a Cisco Networking Device module in the <i>Cisco IOS Configuration Fundamentals Configuration Guide</i>
Using setup mode to configure a Cisco networking device	Using Setup Mode to Configure a Cisco Networking Device module in the <i>Cisco IOS Configuration Fundamentals Configuration Guide</i>

MIBs

MIB	MIBs Link
IF-MIB	<p>The IFNAME object in the IF-MIB can be used to identify the values for the short interface names used in the DHCP Client Identifier for Cisco IOS devices when they are configured as DHCP clients.</p> <p>To locate and download MIBs for selected platforms, Cisco IOS releases, and feature sets, use Cisco MIB Locator found at the following URL:</p> <p>http://www.cisco.com/go/mibs</p>

Standards and RFCs

RFC	Title
No new or modified RFCs are supported by this feature, and support for existing RFCs has not been modified by this feature	--

Technical Assistance

Description	Link
<p>The Cisco Support website provides extensive online resources, including documentation and tools for troubleshooting and resolving technical issues with Cisco products and technologies.</p> <p>To receive security and technical information about your products, you can subscribe to various services, such as the Product Alert Tool (accessed from Field Notices), the Cisco Technical Services Newsletter, and Really Simple Syndication (RSS) Feeds.</p> <p>Access to most tools on the Cisco Support website requires a Cisco.com user ID and password.</p>	http://www.cisco.com/cisco/web/support/index.html

Feature Information for Using AutoInstall to Remotely Configure a Cisco Networking Device

The following table provides release information about the feature or features described in this module. This table lists only the software release that introduced support for a given feature in a given software release train. Unless noted otherwise, subsequent releases of that software release train also support that feature.

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to www.cisco.com/go/cfn. An account on Cisco.com is not required.

Table 1: Feature Information for Using AutoInstall to Remotely Set Up a Cisco Networking Device

Feature Name	Releases	Feature Configuration Information
AutoInstall Support for TCL Script	Cisco IOS XE Release 3.3SE 15.2(1)E 15.3(1)T 15.3(1)S	The AutoInstall Using TCL Script feature enhances the AutoInstall feature by providing more flexibility in the installation process. This feature allows the users to program the device to get information about what to download, and to choose the type of file server, and the required file transfer protocol.
AutoInstall Using DHCP for LAN Interfaces	12.1(5)T 12.2(33)SRC	The AutoInstall Using DHCP for LAN Interfaces feature enhances the benefits of AutoInstall by replacing the use of the Bootstrap Protocol (BOOTP) with the use of the Dynamic Host Configuration Protocol (DHCP) for Cisco IOS AutoInstall over LAN interfaces (specifically Ethernet, Token Ring, and FDDI interfaces).