



IPv6 Access Services: Stateless DHCPv6

The stateless Dynamic Host Configuration Protocol for IPv6 (DHCPv6) feature allows DHCPv6 to be used for configuring a node with parameters that do not require a server to maintain any dynamic state for the node.

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Finding Feature Information

Your software release may not support all the features documented in this module. For the latest feature information and caveats, see 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 document.

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.

Information About IPv6 Access Services: Stateless DHCPv6

Information Refresh Server Option

The DHCPv6 information refresh option can specify an upper boundary for the length of time a client should wait before refreshing information retrieved from DHCPv6. This option is used with stateless DHCPv6, because there are no addresses or other entities with lifetimes that can tell the client when to contact the DHCPv6 server to refresh its configuration.

SIP Server Options

Session initiation protocol (SIP) server options contain either a list of domain names or IPv6 addresses that can be mapped to one or more SIP outbound proxy servers. One option carries a list of domain names, and the other option carries a list of 128-bit IPv6 addresses.

SIP is an application-layer control protocol that can establish, modify and terminate multimedia sessions or calls. A SIP system has several logical components: user agents, proxy servers, redirect servers, and registrars. User agents may contain SIP clients; proxy servers always contain SIP clients.

SNTP Server Option

The SNTP server option provides a list of one or more IPv6 addresses of SNTP servers available to the client for synchronization. The clients use these SNTP servers to synchronize their system time to that of the standard time servers. The server may list the SNTP servers in decreasing order of preference, but clients must treat the list of SNTP servers as an ordered list.

How to Configure IPv6 Access Services: Stateless DHCPv6

Configuring the Stateless DHCPv6 Function

The server maintains no state related to clients; for example, no prefix pools and records of allocation are maintained. Therefore, this function is “stateless” DHCPv6.

Configuring the Stateless DHCPv6 Server

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **ipv6 dhcp pool *poolname***
4. **dns-server *ipv6-address***
5. **domain-name *domain***
6. **exit**
7. **interface *type number***
8. **ipv6 dhcp server *poolname* [**rapid-commit**] [**preference *value***] [**allow-hint**]**
9. **ipv6 nd other-config flag**
10. **end**

DETAILED STEPS

	Command or Action	Purpose
Step 1	enable Example: Device> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> • Enter your password if prompted.
Step 2	configure terminal Example: Device# configure terminal	Enters global configuration mode.
Step 3	ipv6 dhcp pool <i>poolname</i> Example: Device(config)# ipv6 dhcp pool dhcp-pool	Configures a Dynamic Host Configuration Protocol for IPv6 (DHCPv6) configuration information pool and enters DHCPv6 pool configuration mode.
Step 4	dns-server <i>ipv6-address</i> Example: Device(config-dhcp)# dns-server 2001:DB8:3000:3000::42	Specifies the Domain Name System (DNS) IPv6 servers available to a DHCPv6 client.
Step 5	domain-name <i>domain</i> Example: Device(config-dhcp)# domain-name example.com	Configures a domain name for a DHCPv6 client.
Step 6	exit Example: Device(config-dhcp)# exit	Exits DHCPv6 pool configuration mode, and returns the device to global configuration mode.
Step 7	interface <i>type number</i> Example: Device(config)# interface serial 3	Specifies an interface type and number, and places the device in interface configuration mode.
Step 8	ipv6 dhcp server <i>poolname</i> [rapid-commit] [preference <i>value</i>] [allow-hint] Example: Device(config-if)# ipv6 dhcp server dhcp-pool	Enables DHCPv6 on an interface.

	Command or Action	Purpose
Step 9	ipv6 nd other-config flag Example: Device(config-if)# ipv6 nd other-config flag	Sets the “other stateful configuration” flag in IPv6 router advertisements (RAs).
Step 10	end Example: Device(config-if)# end	Returns to privileged EXEC mode.

Configuring the Stateless DHCPv6 Client

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **interface *type number***
4. **ipv6 address autoconfig [default]**
5. **end**

DETAILED STEPS

	Command or Action	Purpose
Step 1	enable Example: Device> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> • Enter your password if prompted.
Step 2	configure terminal Example: Device# configure terminal	Enters global configuration mode.
Step 3	interface <i>type number</i> Example: Device(config)# interface serial 3	Specifies an interface type and number, and places the device in interface configuration mode.

	Command or Action	Purpose
Step 4	ipv6 address autoconfig [default] Example: Device(config-if)# ipv6 address autoconfig	Enables automatic configuration of IPv6 addresses using stateless autoconfiguration on an interface and enables IPv6 processing on the interface.
Step 5	end Example: Device(config-if)# end	Returns to privileged EXEC mode.

Enabling Processing of Packets with Source Routing Header Options

SUMMARY STEPS

1. enable
2. configure terminal
3. ipv6 source-route
4. end

DETAILED STEPS

	Command or Action	Purpose
Step 1	enable Example: Device> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> • Enter your password if prompted.
Step 2	configure terminal Example: Device# configure terminal	Enters global configuration mode.
Step 3	ipv6 source-route Example: Device(config)# ipv6 source-route	Enables processing of the IPv6 type 0 routing header.

	Command or Action	Purpose
Step 4	end Example: Device(config-if)# end	Returns to privileged EXEC mode.

Importing Stateless DHCPv6 Server Options

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **ipv6 dhcp pool** *poolname*
4. **import dns-server**
5. **import domain-name**
6. **end**

DETAILED STEPS

	Command or Action	Purpose
Step 1	enable Example: Router> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> • Enter your password if prompted.
Step 2	configure terminal Example: Router# configure terminal	Enters global configuration mode.
Step 3	ipv6 dhcp pool <i>poolname</i> Example: Router(config)# ipv6 dhcp pool pool1	Configures a DHCPv6 configuration information pool and enters DHCPv6 pool configuration mode.
Step 4	import dns-server Example: Router(config-dhcp)# import dns-server	Imports the DNS recursive name server option to a DHCPv6 client.

	Command or Action	Purpose
Step 5	import domain-name Example: Router(config-dhcp)# import domain-name	Imports the domain search list option to a DHCPv6 client.
Step 6	end Example: Router(config-dhcp)# end	Returns to privileged EXEC mode.

Configuring the SNTP Server Option

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **ipv6 dhcp pool** *poolname*
4. **sntp address** *ipv6-address*
5. **end**

DETAILED STEPS

	Command or Action	Purpose
Step 1	enable Example: Device> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> • Enter your password if prompted.
Step 2	configure terminal Example: Device# configure terminal	Enters global configuration mode.
Step 3	ipv6 dhcp pool <i>poolname</i> Example: Device(config)# ipv6 dhcp pool pool1	Configures a DHCPv6 configuration information pool and enters DHCPv6 pool configuration mode.

	Command or Action	Purpose
Step 4	sntp address <i>ipv6-address</i> Example: Device(config-dhcp)# sntp address 2001:DB8:2000:2000::33	Specifies the SNTP server list to be sent to the client.
Step 5	end Example: Device(config-dhcp)# end	Returns to privileged EXEC mode.

Importing SIP Server Information

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **ipv6 dhcp pool** *poolname*
4. **import sip address**
5. **import sip domain-name**
6. **end**

DETAILED STEPS

	Command or Action	Purpose
Step 1	enable Example: Router> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> • Enter your password if prompted.
Step 2	configure terminal Example: Router# configure terminal	Enters global configuration mode.
Step 3	ipv6 dhcp pool <i>poolname</i> Example: Router(config)# ipv6 dhcp pool pool1	Configures a DHCPv6 configuration information pool and enters DHCPv6 pool configuration mode.

	Command or Action	Purpose
Step 4	import sip address Example: Router(config-dhcp)# import sip address	Imports the SIP server IPv6 address list option to the outbound SIP proxy server.
Step 5	import sip domain-name Example: Router(config-dhcp)# import sip domain-name	Imports a SIP server domain-name list option to the outbound SIP proxy server.
Step 6	end Example: Router(config-dhcp)# end	Returns to privileged EXEC mode.

Importing the SNTP Server Option

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **ipv6 dhcp pool *poolname***
4. **import sntp address *ipv6-address***
5. **end**

DETAILED STEPS

	Command or Action	Purpose
Step 1	enable Example: Device> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> • Enter your password if prompted.
Step 2	configure terminal Example: Device# configure terminal	Enters global configuration mode.

	Command or Action	Purpose
Step 3	ipv6 dhcp pool <i>poolname</i> Example: Device(config)# ipv6 dhcp pool pool1	Configures a DHCPv6 configuration information pool and enters DHCPv6 pool configuration mode.
Step 4	import sntp address <i>ipv6-address</i> Example: Device(config-dhcp)# import sntp address 2001:DB8:2000:2000::33	Imports the SNTP server option to a DHCPv6 client.
Step 5	end Example: Device(config-dhcp)# end	Returns to privileged EXEC mode.

Configuration Examples for IPv6 Access Services: Stateless DHCPv6

Example: Configuring the Stateless DHCPv6 Function

The following example shows how to use the Dynamic Host Configuration Protocol for IPv6 (DHCPv6) function to configure clients with information about the name lookup system. The server is configured with a DHCP pool, which contains the name lookup information that is to be passed to clients. It does not need to contain a prefix pool. This DHCP pool is attached to the access link to customers (Ethernet 0/0) when you enter the **ipv6 dhcp server** command. The access link also has the **ipv6 nd other-config-flag** command enabled. Router advertisement (RA) messages sent from this interface inform clients that they should use DHCPv6 for “other” (for example, nonaddress) configuration information.

```

ipv6 dhcp pool dhcp-pool
 dns-server 2001:DB8:A:B::1
 dns-server 2001:DB8:3000:3000::42
 domain-name example.com
!
interface Ethernet 0/0
 description Access link down to customers
 ipv6 address 2001:DB8:1234:42::1/64
 ipv6 nd other-config-flag
 ipv6 dhcp server dhcp-pool

```

The client has no obvious DHCPv6 configuration. However, the **ipv6 address autoconfig** command on the uplink to the service provider (Ethernet 0/0) causes the following two events:

- Addresses are autoconfigured on the interface, based on prefixes in RA messages received from the server.
- If received RA messages have the “other configuration” flag set, the interface attempts to acquire the other (for example, nonaddress) configuration from any DHCPv6 servers.

Additional References

The following sections provide references related to configuring the DHCP ODAP manager.

Related Documents

Related Topic	Document Title
DHCP commands: complete command syntax, command modes, command history, defaults, usage guidelines, and examples	<i>Cisco IOS IP Addressing Services Command Reference</i>
DHCP conceptual information	“DHCP Overview” module
DHCP server configuration	“Configuring the Cisco IOS XE DHCP Server” module
DHCP client configuration	“Configuring the Cisco IOS XE DHCP Client” module
DHCP relay agent configuration	“Configuring the Cisco IOS XE DHCP Relay Agent” module
DHCP advanced features	“Configuring DHCP Services for Accounting and Security” module

Standards

Standards	Title
No new or modified standards are supported by this functionality.	--

MIBs

MIBs	MIBs Link
No new or modified MIBs are supported by this feature.	To locate and download MIBs for selected platforms, Cisco IOS XE software releases, and feature sets, use Cisco MIB Locator found at the following URL: http://www.cisco.com/go/mibs

RFCs

RFCs	Title
RFC 951	<i>Bootstrap Protocol (BOOTP)</i>
RFC 1542	<i>Clarifications and Extensions for the Bootstrap Protocol</i>
RFC 2131	<i>Dynamic Host Configuration Protocol</i>
RFC 2685	<i>Virtual Private Networks Identifier</i>
RFC 3046	<i>DHCP Relay Information Option</i>

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/public/support/tac/home.shtml

Feature Information for IPv6 Access Services: Stateless DHCPv6

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.

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Table 1: Feature Information for IPv6 Access Services: Stateless DHCPv6

Feature Name	Releases	Feature Information
IPv6 Access Services: Stateless DHCPv6	12.2(33)SRA 12.2(18)SXE 12.3(4)T 12.4 12.4(2)T	<p>Stateless DHCPv6 allows DHCPv6 to be used for configuring a node with parameters that do not require a server to maintain any dynamic state for the node.</p> <p>The following commands were introduced or modified:</p> <p>dns-server, domain-name, import dns-server, import domain-name, import sip address, import sip domain-name, import sntp address, ipv6 address autoconfig, ipv6 dhcp pool, ipv6 dhcp server, ipv6 nd other-config-flag, ipv6 source-route, sntp address.</p>

