



# IPv6 Stateless Autoconfiguration

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The IPv6 stateless autoconfiguration feature can be used to manage link, subnet, and site addressing changes.

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## 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.

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](http://www.cisco.com/go/cfn). An account on Cisco.com is not required.

## Information About IPv6 Stateless Autoconfiguration

### IPv6 Stateless Autoconfiguration

All interfaces on IPv6 nodes must have a link-local address, which is usually automatically configured from the identifier for an interface and the link-local prefix FE80::/10. A link-local address enables a node to communicate with other nodes on the link and can be used to further configure the node.

Nodes can connect to a network and automatically generate global IPv6 addresses without the need for manual configuration or help of a server, such as a Dynamic Host Configuration Protocol (DHCP) server. With IPv6, a device on the link advertises any global prefixes in Router Advertisement (RA) messages, as well as its

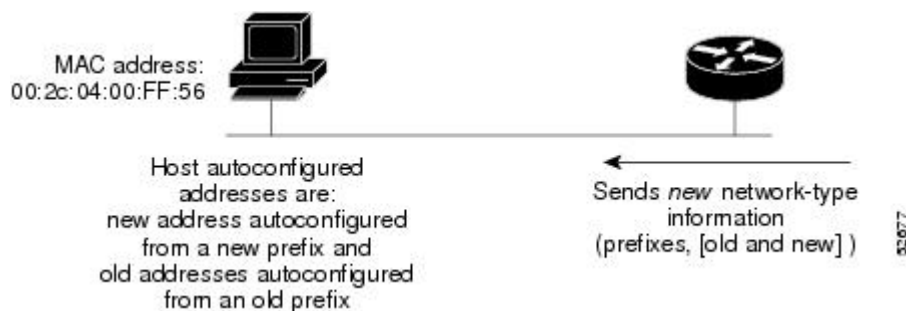
willingness to function as a default device for the link. RA messages are sent periodically and in response to device solicitation messages, which are sent by hosts at system startup.

A node on the link can automatically configure global IPv6 addresses by appending its interface identifier (64 bits) to the prefixes (64 bits) included in the RA messages. The resulting 128-bit IPv6 addresses configured by the node are then subjected to duplicate address detection to ensure their uniqueness on the link. If the prefixes advertised in the RA messages are globally unique, then the IPv6 addresses configured by the node are also guaranteed to be globally unique. Device solicitation messages, which have a value of 133 in the Type field of the ICMP packet header, are sent by hosts at system startup so that the host can immediately autoconfigure without needing to wait for the next scheduled RA message.

## Simplified Network Renumbering for IPv6 Hosts

The strict aggregation of the global routing table requires that networks be renumbered when the service provider for the network is changed. When the stateless autoconfiguration functionality in IPv6 is used to renumber a network, the prefix from a new service provider is added to RA messages that are sent on the link. (The RA messages contain both the prefix from the old service provider and the prefix from the new service provider.) Nodes on the link automatically configure additional addresses by using the prefix from the new service provider. The nodes can then use the addresses created from the new prefix and the existing addresses created from the old prefix on the link. Configuration of the lifetime parameters associated with the old and new prefixes means that nodes on the link can make the transition to using only addresses created from the new prefix. During a transition period, the old prefix is removed from RA messages and only addresses that contain the new prefix are used on the link (the renumbering is complete) (see the figure below).

**Figure 1: IPv6 Network Renumbering for Hosts Using Stateless Autoconfiguration**



# How to Configure IPv6 Stateless Autoconfiguration

## Enabling IPv6 Stateless Autoconfiguration

### SUMMARY STEPS

1. `enable`
2. `configure terminal`
3. `interface type number`
4. `ipv6 address autoconfig`

### DETAILED STEPS

|               | Command or Action   | Purpose   |
|---------------|---|---|
| <b>Step 1</b> | <b>enable</b><br><br><b>Example:</b><br>Device> enable  | Enables privileged EXEC mode. <ul style="list-style-type: none"> <li>• Enter your password if prompted.</li> </ul>                                |
| <b>Step 2</b> | <b>configure terminal</b><br><br><b>Example:</b><br>Device# configure terminal                            | Enters global configuration mode.   |
| <b>Step 3</b> | <b>interface type number</b><br><br><b>Example:</b><br>Device(config)# interface GigabitEthernet<br>0/0/0 | Specifies an interface type and number, and places the device in interface configuration mode.  |
| <b>Step 4</b> | <b>ipv6 address autoconfig</b><br><br><b>Example:</b><br>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. |

# Configuration Examples for IPv6 Stateless Autoconfiguration

## Example: Displaying IPv6 Interface Statistics

In the following example, the **show ipv6 interface** command is used to verify that IPv6 addresses are configured correctly for GigabitEthernet interface 0/0/0. Information is also displayed about the status of IPv6 neighbor redirect messages, IPv6 neighbor discovery messages, and stateless autoconfiguration.

```
Device# show ipv6 interface gigabitethernet 0/0/0

GigabitEthernet0/0/0 is up, line protocol is up
IPv6 is stalled, link-local address is FE80::1
Global unicast address(es):
  2001:DB8:2000::1, subnet is 2001:DB8:2000::/64
  2001:DB8:3000::1, subnet is 2001:DB8:3000::/64
Joined group address(es):
  FF02::1
  FF02::2
  FF02::1:FF00:1
MTU is 1500 bytes
ICMP error messages limited to one every 100 milliseconds
ICMP redirects are enabled
ND DAD is enabled, number of DAD attempts: 1
ND reachable time is 30000 milliseconds
ND advertised reachable time is 0 milliseconds
ND advertised retransmit interval is 0 milliseconds
ND router advertisements are sent every 200 seconds
ND router advertisements live for 1800 seconds
Hosts use stateless autoconfig for addresses.
```

## Additional References

### Related Documents

| Related Topic                    | Document Title   |
|----------------------------------|--|
| IPv6 addressing and connectivity | <i>IPv6 Configuration Guide</i>                              |
| Cisco IOS commands               | <a href="#">Cisco IOS Master Commands List, All Releases</a> |
| IPv6 commands                    | <i>Cisco IOS IPv6 Command Reference</i>                      |
| Cisco IOS IPv6 features          | <a href="#">Cisco IOS IPv6 Feature Mapping</a>               |

### Standards and RFCs

| Standard/RFC  | Title            |
|---------------|------------------|
| RFCs for IPv6 | <i>IPv6 RFCs</i> |

**MIBs**

| <b>MIB</b>  | <b>MIBs Link</b>   |
|---|--|
| No new or modified MIBs are supported by this feature, and support for existing MIBs has not been modified by this feature. | To locate and download MIBs for selected platforms, Cisco IOS releases, and feature sets, use Cisco MIB Locator found at the following URL:<br><a href="http://www.cisco.com/go/mibs">http://www.cisco.com/go/mibs</a> |

**Technical Assistance**

| <b>Description</b>  | <b>Link</b>   |
|---|---|
| The Cisco Support and Documentation website provides online resources to download documentation, software, and tools. Use these resources to install and configure the software and to troubleshoot and resolve technical issues with Cisco products and technologies. Access to most tools on the Cisco Support and Documentation website requires a Cisco.com user ID and password. | <a href="http://www.cisco.com/cisco/web/support/index.html">http://www.cisco.com/cisco/web/support/index.html</a> |

## Feature Information for IPv6 Stateless Autoconfiguration

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 Stateless Autoconfiguration**

| <b>Feature Name</b>              | <b>Releases</b>  | <b>Feature Information</b>  |
|----------------------------------|--|---|
| IPv6 Stateless Autoconfiguration | 12.2(2)T<br>12.2(17a)SX1<br>12.2(25)SEA<br>12.2(33)SRA<br>12.2(25)SG<br>15.0(2)SG<br>15.3(1)S<br>Cisco IOS XE Release 2.1<br>3.2.0SG | The IPv6 stateless autoconfiguration feature can be used to manage link, subnet, and site addressing changes.<br><br>The following command was introduced or modified: <b>ipv6 address autoconfig</b> . |