



CHAPTER 4

Configuring DNS

This chapter describes how to configure the Domain Name Server (DNS) client.

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Information About DNS Clients

This section includes the following topics:

- [DNS Client Overview, page 4-1](#)
- [High Availability, page 4-2](#)
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DNS Client Overview

If your network devices require connectivity with devices in networks for which you do not control name assignment, you can assign device names that uniquely identify your devices within the entire internetwork using the domain name server (DNS). DNS uses a hierarchical scheme for establishing host names for network nodes. This allows local control of the segments of the network through a client-server scheme. The DNS system can locate a network device by translating the host name of the device into its associated IP address.

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On the Internet, a domain is a portion of the naming hierarchy tree that refers to general groupings of networks based on organization type or geography. Domain names are pieced together with periods (.) as the delimiting characters. For example, Cisco is a commercial organization that the Internet identifies by a *com* domain, so its domain name is *cisco.com*. A specific host name in this domain, the File Transfer Protocol (FTP) system, for example, is identified as *ftp.cisco.com*.

Name Servers

Name servers keep track of domain names and know the parts of the domain tree for which they have complete information. A name server may also store information about other parts of the domain tree. To map domain names to IP addresses in Cisco NX-OS, you must first identify the host names, then specify a name server, and enable the DNS service.

Cisco NX-OS allows you to statically map IP addresses to domain names. You can also configure Cisco NX-OS to use one or more domain name servers to find an IP address for a host name.

DNS Operation

A name server handles client-issued queries to the DNS server for locally defined hosts within a particular zone as follows:

- An authoritative name server responds to DNS user queries for a domain name that is under its zone of authority by using the permanent and cached entries in its own host table. If the query is for a domain name that is under its zone of authority but for which it does not have any configuration information, the authoritative name server simply replies that no such information exists.
- A name server that is not configured as the authoritative name server responds to DNS user queries by using information that it has cached from previously received query responses. If no router is configured as the authoritative name server for a zone, queries to the DNS server for locally defined hosts will receive nonauthoritative responses.

Name servers answer DNS queries (forward incoming DNS queries or resolve internally generated DNS queries) according to the forwarding and lookup parameters configured for the specific domain.

High Availability

Cisco NX-OS supports stateless restarts for the DNS client. After a reboot or supervisor switchover, Cisco NX-OS applies the running configuration.

Virtualization Support

Cisco NX-OS supports multiple instances of the DNS clients that run on the same system. You can configure a DNS client in each VDC. You can optionally have a different DNS client configuration in each VRF within a VDC. By default, Cisco NX-OS places you in the default VDC and default VRF unless you specifically configure another VDC and VRF. See the *Cisco Nexus 7000 Series NX-OS Virtual Device Context Configuration Guide, Release 4.0* and [Chapter 14, “Configuring Layer 3 Virtualization.”](#)

Licensing Requirements for DNS Clients

The following table shows the licensing requirements for this feature:

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Product	License Requirement
NX-OS	DNS requires no license. Any feature not included in a license package is bundled with the Cisco NX-OS system images and is provided at no extra charge to you. For a complete explanation of the NX-OS licensing scheme, see the <i>Cisco Nexus 7000 Series NX-OS Licensing Guide, Release 4.0</i> .

Prerequisites for DNS Clients

The DNS client has the following prerequisites:

- You must have a DNS name server on your network.
- If you configure VDCs, install the Advanced Services license and enter the desired VDC (see to the *Cisco Nexus 7000 Series NX-OS Virtual Device Context Configuration Guide, Release 4.0*).

Configuration Guidelines and Limitations

You configure the DNS client in a specific VRF. If you do not specify a VRF, Cisco NX-OS uses the default VRF.

Configuring DNS Clients

This section describes how to configure DNS clients and includes the following topics:

- [Configuring the DNS Client, page 4-3](#)
- [Configuring Virtualization, page 4-5](#)



Note

If you are familiar with the Cisco IOS CLI, be aware that the Cisco NX-OS commands for this feature might differ from the Cisco IOS commands that you would use.

Configuring the DNS Client

You can configure the DNS client to use a DNS server on your network.

BEFORE YOU BEGIN

Ensure that you have a domain name server on your network.

Ensure that you are in the correct VDC (or use the **switchto vdc** command).

SUMMARY STEPS

1. **config t**
2. **ip host name address1 [address2... address6]**
3. **ip domain-name name [use-vrf vrf-name]**

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4. **ip domain-list** *name* [**use-vrf** *vrf-name*]
5. **ip name-server** *server-address1* [*server-address2...* *server-address6*] [**use-vrf** *vrf-name*]
6. **ip domain lookup**
7. **show hosts**
8. **copy running-config startup-config**

DETAILED STEPS

	Command	Purpose
Step 1	config t Example: switch# config t switch(config)#	Enters configuration mode.
Step 2	ip host <i>name address1</i> [<i>address2...</i> <i>address6</i>] Example: switch(config)# ip host cisco-rtp 192.0.2.1	Defines up to six static host name-to-address mappings in the host name cache. The address can be either an IPv4 address or an IPv6 address.
Step 3	ip domain-name <i>name</i> [use-vrf <i>vrf-name</i>] Example: switch(config)# ip domain-name myserver.com	<p>(Optional) Defines the default domain name server that Cisco NX-OS uses to complete unqualified host names. You can optionally define a VRF that Cisco NX-OS uses to resolve this domain name server if it cannot be resolved in the VRF that you configured this domain name under.</p> <p>Cisco NX-OS appends the default domain name to any host name that does not contain a complete domain name before starting a domain-name lookup.</p>
Step 4	ip domain-list <i>name</i> [use-vrf <i>vrf-name</i>] Example: switch(config)# ip domain-list mycompany.com	<p>(Optional) Defines additional domain name servers that Cisco NX-OS can use to complete unqualified host names. You can optionally define a VRF that Cisco NX-OS uses to resolve this domain name server if it cannot be resolved in the VRF that you configured this domain name under.</p> <p>Cisco NX-OS uses each entry in the domain list to append that domain name to any host name that does not contain a complete domain name before starting a domain-name lookup. Cisco NX-OS continues this for each entry in the domain list until it finds a match.</p>
Step 5	ip name-server <i>address1</i> [<i>address2...</i> <i>address6</i>] [use-vrf <i>vrf-name</i>] Example: switch(config)# ip name-server 192.0.2.22	<p>(Optional) Defines up to six name servers. The address can be either an IPv4 address or an IPv6 address.</p> <p>You can optionally define a VRF that Cisco NX-OS uses to reach this name server if it cannot be reached in the VRF that you configured this name server under.</p>

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	Command	Purpose
Step 6	ip domain-lookup Example: switch(config)# ip domain-lookup	(Optional) Enables DNS-based address translation. Enabled by default.
Step 7	show hosts Example: switch(config)# show hosts	(Optional) Displays information about DNS.
Step 8	copy running-config startup-config Example: switch(config)# copy running-config startup-config	(Optional) Saves this configuration change.

The following example shows how to configure a default domain name and enable DNS lookup:

```
switch# config t
switch(config)# ip domain-name cisco.com 192.0.2.1 use-vrf management
switch(config)# ip domain-lookup
switch(config)# copy running-config startup-config
```

Configuring Virtualization

You can configure a DNS client within a VRF. If you do not enter vrf configuration mode, your DNS client configuration applies to the default VRF.

You can optionally configure a DNS client to use a specified VRF other than the VRF under which you configured the DNS client as a backup VRF. For example, you can configure a DNS client in the Red VRF but use the Blue VRF to communicate with the DNS server if the server cannot be reached through the Red VRF.

BEFORE YOU BEGIN

Ensure that you have a domain name server on your network.

Ensure that you are in the correct VDC (or use the **switchto vdc** command).

SUMMARY STEPS

9. **config t**
10. **vrf context** *vrf-name*
11. **ip domain-name** *name* [**se-vrf** *vrf-name*]
12. **ip domain-list** *name* [**use-vrf** *vrf-name*]
13. **ip name-server** *server-address1* [*server-address2... server-address6*] [**use-vrf** *vrf-name*]
14. **ip domain lookup**
15. **show hosts**
16. **copy running-config startup-config**

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DETAILED STEPS

	Command	Purpose
Step 1	<pre>config t</pre> <p>Example: <pre>switch# config t switch(config)#</pre></p>	Enters configuration mode.
Step 1	<pre>vrf context vrf-name</pre> <p>Example: <pre>switch(config)# vrf context Red switch(config-vrf)#</pre></p>	Creates a VRF and enters VRF configuration mode.
Step 2	<pre>ip domain-name name [use-vrf vrf-name]</pre> <p>Example: <pre>switch(config)# ip domain-name myserver.com</pre></p>	<p>(Optional) Defines the default domain name server that Cisco NX-OS uses to complete unqualified host names. You can optionally define a VRF that Cisco NX-OS uses to resolve this domain name server if it cannot be resolved in the VRF that you configured this domain name under.</p> <p>Cisco NX-OS appends the default domain name to any host name that does not contain a complete domain name before starting a domain-name lookup.</p>
Step 3	<pre>ip domain-list name [use-vrf vrf-name]</pre> <p>Example: <pre>switch(config)# ip domain-list mycompany.com</pre></p>	<p>(Optional) Defines additional domain name servers that Cisco NX-OS can use to complete unqualified host names. You can optionally define a VRF that Cisco NX-OS uses to resolve this domain name server if it cannot be resolved in the VRF that you configured this domain name under.</p> <p>Cisco NX-OS uses each entry in the domain list to append that domain name to any host name that does not contain a complete domain name before starting a domain-name lookup. Cisco NX-OS continues this for each entry in the domain list until it finds a match.</p>
Step 4	<pre>ip name-server address1 [address2... address6] [use-vrf vrf-name]</pre> <p>Example: <pre>switch(config)# ip name-server 192.0.2.22</pre></p>	<p>(Optional) Defines up to six name servers. The address can be either an IPv4 address or an IPv6 address.</p> <p>You can optionally define a VRF that Cisco NX-OS uses to reach this name server if it cannot be reached in the VRF that you configured this name server under.</p>
Step 5	<pre>ip domain-lookup</pre> <p>Example: <pre>switch(config-vrf)# ip domain-lookup</pre></p>	(Optional) Enables DNS-based address translation for this VRF. Enabled by default.

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	Command	Purpose
Step 6	show hosts Example: switch(config)-vrf# show hosts	(Optional) Displays information about DNS.
Step 7	copy running-config startup-config Example: switch(config-vrf)# copy running-config startup-config	(Optional) Saves this configuration change.

The following example shows how to configure a default domain name and enable DNS lookup within a VRF:

```
switch# config t
switch(config)# vrf context Red
switch(config-vrf)# ip domain-name cisco.com 192.0.2.1 use-vrf management
switch(config-vrf)# ip domain-lookup
switch(config-vrf)# copy running-config startup-config
```

Verifying the DNS Client Configuration

To verify the DNS client configuration, use the following commands:

Command	Purpose
show hosts	Displays information about DNS.

DNS Client Example Configuration

This example establishes a domain list with several alternate domain names:

```
ip domain list csi.com
ip domain list telecomprog.edu
ip domain list merit.edu
```

This example configures the host name-to-address mapping process and specifies IP DNS-based translation. The example also configures the addresses of the name servers and the default domain name.

```
ip domain lookup
ip name-server 192.168.1.111 192.168.1.2
ip domain name cisco.com
```

Default Settings

Table 4-1 lists the default settings for DNS Client parameters.

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Table 4-1 **Default DNS Client Parameters**

Parameters	Default
DNS client	Enabled

Additional References

For additional information related to implementing DNS Client, see the following sections:

- [Related Documents, page 4-8](#)
- [Standards, page 4-8](#)

Related Documents

Related Topic	Document Title
DNS Client CLI commands	<i>Cisco Nexus 7000 Series NX-OS Unicast Routing Command Reference, Release 4.0</i>
VDCs and VRFs	<i>Cisco Nexus 7000 Series NX-OS Virtual Device Context Configuration Guide, Release 4.0</i>

Standards

Standards	Title
No new or modified standards are supported by this feature, and support for existing standards has not been modified by this feature.	—