



NTP and Clock

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Network Time Protocol (NTP) is a networking protocol for clock synchronization between computer systems over variable-latency data networks. NTP is intended to synchronize all participating computers to within a few milliseconds of Coordinated Universal Time (UTC) and is designed to mitigate the effects of variable network latency. NTP can usually maintain time to within tens of milliseconds over the public Internet, and can achieve better than one millisecond accuracy in local area networks under ideal conditions.

NTP Authenticate

When authentication of incoming NTP packets is enabled, the gateway ensures that they come from an authenticated time source before using them for time synchronization on the gateway. Authentication keys are created and added to the trusted list.

To add a key to be used for authentication, take the following steps.

1. Create the key.

```
gateway (config)# ntp authentication-key 1 md5 password
```

2. Add the key to the trusted list.

```
gateway (config)# ntp trusted-key 1
```

3. Assign the key to the server/peer.

```
gateway (config)# ntp server 10.34.1.1 keyID 1
```

NTP Authentication Key

An authentication key may be created and used to authenticate incoming NTP packets. For the key to be used, make sure the following is in place.

1. It should be shared with the NTP server/peer sending the NTP packet.

2. It should be added to the trusted list.

3. NTP authenticate should be enabled on the system

NTP Commands

clock set

	clock set <hh:mm:ss> [<yyyy/mm/dd>] Sets the time and date.	
Syntax Description	hh:mm:ss	Time
	yyyy/mm/dd	Date
Default	N/A	
Configuration Mode	config	
History	8.0.0100	
Example	gateway (config) # clock set 23:23:23 2010/08/19	
Related Commands	show clock	
Notes	If not specified, the date will be left the same.	

clock timezone

	clock timezone [<zone-word> [<zone-word> [<zone-word> [<zone-word>]]] no clock timezone Sets the system time zone. The time zone may be specified in one of three ways: <ul style="list-style-type: none">• A nearby city whose time zone rules to follow. The system has a large list of cities which can be displayed by the help and completion system. They are organized hierarchically because there are too many of them to display in a flat list. A given city may be required to be specified in two, three, or four words, depending on the city• An offset from UTC. This will be in the form UTC-offset UTC, UTC-offset UTC+<0-14>, UTC-offset UTC-<1-12>
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	<ul style="list-style-type: none"> UTC (Universal Time, which is almost identical to GMT), and this is the default time zone <p>The no form of the command resets time zone to its default (GMT).</p>	
Syntax Description	zone-word	Possible forms this could take include: continent, city, continent, country, city, continent, region, country, city, ocean, and/or island.
Default	GMT	
Configuration Mode	config	
History	8.0.0100	
Example	gateway (config) # clock timezone America North United_States Other New_York	
Related Commands	show clock	
Notes		

ntp

	<pre>ntp {disable enable {peer server} <IP address> [version <number> disable]}</pre> <pre>no ntp {disable enable {peer server} <IP address> [version <number> disable]}</pre> <p>Configures NTP. The no form of the command negates NTP options.</p>	
Syntax Description	disable	Disables NTP.
	enable	Enables NTP.
	peer server	Configures an NTP peer or server node.
	IP address	IPv4 or IPv6 address.
	version <number>	Specifies the NTP version number of this peer. Possible values: 3 or 4
Default	NTP is enabled NTP version number is 4	
Configuration Mode	config	
History	8.0.0100	

Example	gateway (config) # no ntp peer 192.168.10.24 disable
Related Commands	
Notes	

ntpdate

	ntpdate <ip-address> Configures the system clock using the specified SNTP server.	
Syntax Description	ip-address	IP address of SNTP server.
Default	N/A	
Configuration Mode	config	
History	8.0.0100	
Example	gateway (config) # ntpdate 192.168.10.10 26 Feb 17:25:40 ntpdate[15206]: adjust time server 192.168.10.10 offset -0.000092 sec	
Related Commands		
Notes	This is a one-time operation and does not cause the clock to be kept in sync on an ongoing basis. It will generate an error if SNTP is enabled since the socket it requires will already be in use.	

ntp authenticate

	ntp authenticate no ntp authenticate Enables NTP authentication. The no form of the command disables NTP authentication.	
Syntax Description	N/A	
Default	Disabled	
Configuration Mode	config	
History	8.0.0100	

Example	gateway (config) # ntp authenticate
Related Commands	
Notes	

ntp authentication-key

	<pre>ntp authentication-key <key-id> <encrypt-type> [<password>] no ntp authentication-key <key-id></pre> <p>Enables NTP authentication. The no form of the command disables NTP authentication.</p>	
Syntax Description	key-id	Specifies a key ID, whether existing or a new one to be added. Range: 1-65534
	encrypt-type	Specifies encryption type to use (md5, or sha 1)
	password	Password string
Default	Disabled	
Configuration Mode	config	
History	8.0.0100	
Example	<pre>gateway (config) # ntp authentication-key 123 md5 examplepass gateway (config) # ntp authentication-key 1234 sha1 Password: ** Confirm: **</pre>	
Related Commands		
Notes	If a password is not entered, a prompt appears requiring that a password is introduced.	

ntp peer disable

	<pre>ntp peer <ip-address> disable no ntp peer <ip-address> disable</pre>
--	---

	Temporarily disables this NTP peer. The no form of the command enables this NTP peer.	
Syntax Description	ip-address	IP address of the peer.
Default	Disabled	
Configuration Mode	config	
History	8.0.0100	
Example	gateway (config) # ntp peer 10.10.10.10 disable	
Related Commands		
Notes	<ul style="list-style-type: none"> • IP addresses must be in IPv4 format (e.g., '192.168.0.1') or IPv6 format with scope zone ID for IPv6 link-local addresses (e.g., '2001:db8:701f::8f9' or 'fe80::21c:23f:ec1:4fb%7'.) • The length of a hostname is limited to 255 characters. Each label (node delimited by a dot in the hostname) is limited to 63 characters and may contain letters, numbers and hyphens ('-'), but may not begin with a hyphen. 	

ntp peer keyID

	ntp peer <ip-address> keyID <key-id> no ntp peer <ip-address> keyID <key-id> Specifies the KeyID of the NTP peer. The no form of the command removes key ID configuration from the NTP peer.	
Syntax Description	ip-address	IP address of the peer.
	key-id	Range: 1-65534
Default	Disabled	
Configuration Mode	config	
History	8.0.0100	
Example	gateway (config) # ntp peer 10.10.10.10 keyID 120	
Related Commands		

Notes	<ul style="list-style-type: none"> • IP addresses must be in IPv4 format (e.g., '192.168.0.1') or IPv6 format with scope zone ID for IPv6 link-local addresses (e.g., '2001:db8:701f::8f9' or 'fe80::21c:23f:ec1:4fb%7'). • The length of a hostname is limited to 255 characters. Each label (node delimited by a dot in the hostname) is limited to 63 characters and may contain letters, numbers and hyphens ('-'), but may not begin with a hyphen.
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ntp peer version

	<pre>ntp peer <ip-address> version <ver-num></pre> <pre>no ntp peer <ip-address> version <ver-num></pre> <p>Specifies the NTP version number of this peer. The no form of the command defaults NTP to version 4.</p>	
Syntax Description	ip-address	IP address of the peer.
	ver-num	NTP version. Possible values: 3 or 4
Default	4	
Configuration Mode	config	
History	8.0.0100	
Example	gateway (config) # ntp peer 10.10.10.10 version 4	
Related Commands		
Notes	<ul style="list-style-type: none"> • IP addresses must be in IPv4 format (e.g., '192.168.0.1') or IPv6 format with scope zone ID for IPv6 link-local addresses (e.g., '2001:db8:701f::8f9' or 'fe80::21c:23f:ec1:4fb%7'). • The length of a hostname is limited to 255 characters. Each label (node delimited by a dot in the hostname) is limited to 63 characters and may contain letters, numbers and hyphens ('-'), but may not begin with a hyphen. 	

ntp server disable

	<pre>ntp server <ip-address> disable</pre> <pre>no ntp server <ip-address> disable</pre> <p>Temporarily disables this NTP server. The no form of the command enables this NTP server.</p>	
Syntax Description	ip-address	IP address of the peer.
Default	Disabled	
Configuration Mode	config	
History	8.0.0100	
Example	gateway (config) # ntp server 10.10.10.10 disable	
Related Commands		
Notes	<ul style="list-style-type: none"> • IP addresses must be in IPv4 format (e.g., '192.168.0.1') or IPv6 format with scope zone ID for IPv6 link-local addresses (e.g., '2001:db8:701f::8f9' or 'fe80::21c:23f:ec1:4fb%7'.) • The length of a hostname is limited to 255 characters. Each label (node delimited by a dot in the hostname) is limited to 63 characters and may contain letters, numbers and hyphens ('-'), but may not begin with a hyphen. 	

ntp server keyID

	<pre>ntp server <ip-address> keyID <key-id></pre> <pre>no ntp server <ip-address> keyID <key-id></pre> <p>Specifies the KeyID of the NTP server. The no form of the command removes key ID configuration from the NTP server.</p>	
Syntax Description	ip-address	IP address of the peer.
	key-id	Range: 1-65534
Default	Disabled	
Configuration Mode	config	
History	8.0.0100	
Example	gateway (config) # ntp server 10.10.10.10 keyID 120	

Related Commands	
Notes	<ul style="list-style-type: none"> • IP addresses must be in IPv4 format (e.g., '192.168.0.1') or IPv6 format with scope zone ID for IPv6 link-local addresses (e.g., '2001:db8:701f::8f9' or 'fe80::21c:23f:ec1:4fb%7'.) • The length of a hostname is limited to 255 characters. Each label (node delimited by a dot in the hostname) is limited to 63 characters and may contain letters, numbers and hyphens ('-'), but may not begin with a hyphen.

ntp server-role disable

	<pre>ntp server-role disable no ntp server-role disable</pre> <p>Disables the gateway's default ability to function as an NTP server. The no form of the command restores the gateway's ability to function as an NTP server.</p>
Syntax Description	N/A
Default	N/A
Configuration Mode	Configure terminal
History	8.0.0100
Role	Admin
Example	gateway (config) # ntp server-role disable
Related Commands	show ntp
Notes	This command is configurable.

ntp server trusted-enable

	<pre>ntp server <ip-address> trusted-enable no ntp server <ip-address> trusted-enable</pre> <p>Trusts this NTP server; if authentication is configured this will additionally force all time updates to only use trusted servers.</p>
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	The no form of the command removes trust from this NTP server.	
Syntax Description	ip-address	IP address of the peer.
Default	N/A	
Configuration Mode	config	
History	8.0.0100	
Example	gateway (config) # ntp server 10.10.10.10 trusted-enable	
Related Commands		
Notes	<ul style="list-style-type: none"> • IP addresses must be in IPv4 format (e.g., '192.168.0.1') or IPv6 format with scope zone ID for IPv6 link-local addresses (e.g., '2001:db8:701f::8f9' or 'fe80::21c:23f:ec1:4fb%7'.) • The length of a hostname is limited to 255 characters. Each label (node delimited by a dot in the hostname) is limited to 63 characters and may contain letters, numbers and hyphens ('-'), but may not begin with a hyphen. • NTP trusted servers can be used as a mitigation for Sybil attacks which is a vulnerability caused by NTP peers sharing the same NTP key base. This mitigation adds the concept of trusted servers which if enabled in conjunction with NTP authentication ensures that time information will only be obtained from trusted servers. 	

ntp server version

	<pre>ntp server <ip-address> version <ver-num></pre> <pre>no ntp server <ip-address> version <ver-num></pre> Specifies the NTP version number of this server. The no form of the command defaults NTP to version 4.	
Syntax Description	ip-address	IP address of the peer.
	ver-num	NTP version. Possible values: 3 or 4
Default	4	
Configuration Mode	config	

History	8.0.0100
Example	gateway (config) # ntp server 10.10.10.10 version 4
Related Commands	
Notes	<ul style="list-style-type: none"> • IP addresses must be in IPv4 format (e.g., '192.168.0.1') or IPv6 format with scope zone ID for IPv6 link-local addresses (e.g., '2001:db8:701f::8f9' or 'fe80::21c:23f:ec1:4fb%7') • The length of a hostname is limited to 255 characters. Each label (node delimited by a dot in the hostname) is limited to 63 characters and may contain letters, numbers and hyphens ('-'), but may not begin with a hyphen

ntp trusted-key

	<pre>ntp trusted-key <key(s)> no ntp trusted-key <key(s)></pre> <p>Adds one or more keys to the trusted key list. The no form of the command removes keys from the trusted key list.</p>	
Syntax Description	key(s)	Range: 1-65534
Default	Disabled	
Configuration Mode	config	
History	8.0.0100	
Example	<pre>gateway (config) # ntp trusted-key 1,3,5 gateway (config) # ntp trusted-key 1-5</pre>	
Related Commands		
Notes	Keys may be separated with commas without any space, or they may be set as a range using a hyphen.	

show clock

	show clock Displays the current system time, date and time zone.
Syntax Description	N/A
Default	N/A
Configuration Mode	Any command mode
History	8.0.0100
Example	gateway (config) # show clock Time: 02:48:41 Date: 2018/1/1 Time zone: UTC (Etc/UTC) UTC offset: same as UTC
Related Commands	
Notes	

show ntp

	show ntp Displays the current NTP settings.
Syntax Description	N/A
Default	N/A
Configuration Mode	Any command mode
History	8.0.0100
Example	gateway (config)# show ntp NTP is administratively : enabled NTP Authentication administratively: disabled NTP server role : enabled Clock is synchronized: Reference: 10.7.7.134 Offset : -0.038 ms Active servers and peers: 10.7.7.134: Conf Type : serv

	Status : sys.peer(*) Stratum : 3 Offset(msec) : -0.038 Ref clock : 192.14.55.225 Poll Interval (sec): 128 Last Response (sec): 101 Auth state : none
Related Commands	
Notes	

show ntp configured

	show ntp configured Displays NTP configuration.
Syntax Description	N/A
Default	N/A
Configuration Mode	Any command mode
History	8.0.0100
Example	<pre> gateway (config) # show ntp configured NTP enabled: yes NTP Authentication enabled: no NTP peer 0.us.pool.ntp.org # Hostname peer configuration Resolved as: 45.79.111.114 Enabled: yes NTP version: 4 Key ID: none NTP peer 2.3.1.3 # IP peer configuration Enabled: yes NTP version: 4 Key ID: none NTP server vnc23 # Hostname server configuration Resolved as: 10.7.2.23 Enabled: yes NTP version: 4 Key ID: none Trusted: no NTP server 1.2.3.4 # IP server configuration </pre>

Enabled: yes NTP version: 4 Key ID: none Trusted: no NTP server idontexist (DNS resolution failed. Reset or reconfigure NTP to try again) Enabled: yes NTP version: 4 Key ID: none Trusted: no	
Related Commands	
Notes	

show ntp keys

	show ntp configured Displays NTP keys.
Syntax Description	N/A
Default	N/A
Configuration Mode	Any command mode
History	8.0.0100
Example	gateway (config) # show ntp keys NTP Key 1 Trusted: yes Encryption Type: MD5 NTP Key 2 Trusted: yes Encryption Type: MD5 NTP Key 3 Trusted: yes Encryption Type: MD5 NTP Key 4 Trusted: yes Encryption Type: md5
Related Commands	
Notes	

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