



CNS Configuration Agent

Feature History

Release	Modification
12.2(2)T	This feature was introduced.
12.0(18)ST	This feature was integrated into Cisco IOS Release 12.0(18)ST.
12.0(22)S	This feature was integrated into Cisco IOS Release 12.0(22)S.

This feature module describes the CNS Configuration Agent feature. It includes the following sections:

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- [Supported Platforms, page 3](#)
- [Supported Standards, MIBs, and RFCs, page 3](#)
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Feature Overview

Cisco Networking Services (CNS) is a foundation technology for linking users to network services. CNS Software Developers Kit (SDK) accomplishes this linking by making applications network-aware and increasing the intelligence of the network elements. CNS SDK provides building blocks to a range of customers in market segments such as enterprise, service provider, independent software vendors, and system integrators.

The CNS Configuration Agent feature supports routing devices by providing the following:

- Initial configurations
- Incremental (partial) configurations
- Synchronized configuration updates

Initial Configuration

When a routing device first comes up, it connects to the configuration server component of CNS Configuration Agent by establishing a TCP connection through the use of **cns config initial**, a standard command-line interface (CLI) command. The device issues a request and identifies itself by providing a unique configuration ID to the configuration server.

When the CNS web server receives a request for a configuration file, it invokes the Java Servlet and executes the corresponding embedded code. The embedded code directs the CNS web server to access the directory server and file system to read the configuration reference for this device (configuration ID) and template. The Configuration Agent prepares an instantiated configuration file by substituting all the parameter values specified in the template with valid values for this device. The configuration server forwards the configuration file to the CNS web server for transmission to the routing device.

The CNS Configuration Agent feature accepts the configuration file from the CNS web server, performs XML parsing, checks syntax (optional), and loads the configuration file. The routing device reports the status of the configuration load as an event to which a network monitoring or workflow application can subscribe.

Incremental Configuration

Once the network is up and running, new services can be added using the CNS Configuration Agent. Incremental (partial) configurations can be sent to routing devices. The actual configuration can be sent as an event payload by way of the Event Gateway (push operation) or as a signal event that triggers the device to initiate a pull operation.

The routing device can check the syntax of the configuration before applying it. If the syntax is correct, the routing device applies the incremental configuration and publishes an event that signals success to the configuration server. If the device fails to apply the incremental configuration, it publishes an event that indicates an error status.

Once the routing device has applied the incremental configuration, it can write it to NVRAM, or wait until signaled to do so.

Synchronized Configuration

When a routing device receives a configuration, it has the option to defer application of the configuration upon receipt of a write-signal event. The CNS Configuration Agent feature allows the device configuration to be synchronized with other dependent network activities.

Benefits

- Provides an automatic mechanism for delivering configuration files to routing devices.
- Enables dynamic creation of configuration files using information from a directory repository.
- Employs an open scalable architecture.
- Supports event-based provisioning interface for partial configurations.

Related Documents

- Cisco IOS Release 12.2(2)T/12.0(18)ST/12.0(22)S “CNS Event Agent” feature module document:
http://www.cisco.com/univercd/cc/td/doc/product/software/ios122/122newft/122t/122t2/ftcns_ea.htm
- Data Sheet: “Cisco Networking Services 1.0”
http://www.cisco.com/warp/public/cc/pd/nemnsw/nesv/prodlit/cns12_ds.htm
- CSN Product Literature

<http://www.cisco.com/warp/customer/cc/pd/nemnsw/nesv/prodlit/index.shtml>

Supported Platforms

12.2(2)T and later

The CNS Configuration Agent feature is supported on the following platforms:

- Cisco 800 series
- Cisco 1400 series
- Cisco 1600 series
- Cisco 1700 series
- Cisco 2500 series
- Cisco 2600 series
- Cisco 3600 series
- Cisco 3800 series
- Cisco 4500
- Cisco 7100 series
- Cisco 7200 series
- Cisco 7500 series

12.0(18)ST

The CNS Configuration Agent feature is supported on all platforms using 12.0(18)ST or later, including:

- Cisco 7200 series
- Cisco 10000 series
- Cisco 10700
- Cisco 12000 series ('gsr' images)
- Cisco 15300 series

12.0(22)S

The CNS Configuration Agent feature is supported on all platforms using 12.0(22)S or later, including:

- Cisco 7200 series
- Cisco 7500/RSP series
- Cisco 10000 series
- Cisco 10720
- Cisco 12000 series

Supported Standards, MIBs, and RFCs

Standards

None

MIBs

None

For descriptions of supported MIBs and how to use MIBs, see the Cisco MIB web site on CCO at <http://www.cisco.com/public/sw-center/netmgmt/cmtk/mibs.shtml>.

RFCs

None

Configuration Tasks

To configure the CNS Configuration Agent on your routing device, use any of the following commands as needed:

Command	Purpose
Router(config)# cns config initial	Downloads an initial configuration to the router when it boots up.
Router(config)# cns event	Establishes a TCP connection with the Event Gateway. This is required for the router to request or receive incremental updates.
Router(config)# cns config partial	Enables the partial Configuration Agent. This is required for the router to request or receive updates.

Command Reference

This section documents new commands. All other commands used with this feature are documented in the Cisco IOS Release 12.2 command reference publications.

- **cns config cancel**
- **cns config initial**
- **cns config partial**
- **cns config retrieve**
- **debug cns config**
- **debug cns xml-parser**
- **show cns config**

cns config cancel

To remove a partial CNS configuration from the list of outstanding partial configurations, use the **cns config cancel** command in EXEC mode.

cns config cancel *queue-id*

Syntax Description

<i>queue-id</i>	Indicates which partial configuration in the list of outstanding partial configurations to remove from the list. This list can be displayed by issuing the show cns config outstanding command in EXEC mode.
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Defaults

No default behavior or values.

Command Modes

EXEC

Command History

Release	Modification
12.2(2)T	This command was introduced.
12.0(18)ST	This command was integrated into Cisco IOS Release 12.0(18)ST.
12.0(22)S	This command was integrated into Cisco IOS Release 12.0(22)S.

Usage Guidelines

Use this command to remove a configuration specified by the *queue-id* variable.

Related Commands

Command	Description
show cns config	Displays information about the CNS Configuration Agent.

cns config initial

To start CNS Configuration Agent and initiate an initial configuration, use the **cns config initial** command in global configuration mode. To remove the existing **cns config initial** command from the running configuration of the routing device, use the **no** version of this command.

```
cns config initial {ip-address | hostname} [port-number] [page page] [event] [syntax-check]
[no-persist]
```

```
no cns config initial {ip-address | hostname} [port-number] [page page] [event] [syntax-check]
[no-persist]
```

Syntax Description		
<i>ip-address</i>		IP address of the configuration server.
<i>hostname</i>		Host name of the configuration server.
<i>port-number</i>		(Optional) Port number of the configuration server. The default port number is 80.
page <i>page</i>		(Optional) The web page of the initial configuration. The default is /Config/config.asp.
<i>event</i>		(Optional) Sends an event on success, failure, or warning of the configuration when the configuration is finished. Otherwise, no event is sent out.
<i>syntax-check</i>		(Optional) Turns on the syntax check. The syntax is checked when this parameter is entered.
<i>no-persist</i>		(Optional) Suppresses the default automatic writing to NVRAM of the configuration pulled as a result of issuing the cns config initial command. If not present, issuing the cns config initial command causes the resultant configuration to be automatically written to NVRAM.

Defaults Default port number is 80. Default web page of the initial configuration is /Config/config.asp.

Command Modes Global configuration

Command History	Release	Modification
	12.2(2)T	This command was introduced.
	12.0(18)ST	This command was integrated into Cisco IOS Release 12.0(18)ST.
	12.0(22)S	This command was integrated into Cisco IOS Release 12.0(22)S.

Usage Guidelines Use this command to start the CNS Configuration Agent and initiate an initial configuration. The Configuration Agent gets the initial configuration for the routing device from the specified server. When this command is used with the *event* argument, one of the following status messages will be displayed by the event bus:

- `cisco.cns.config.failure`—CNS Configuration Agent detected a syntax error or unsupported hardware.
- `cisco.cns.config.success`—CNS Configuration Agent successfully applied the initial configuration.
- `cisco.cns.config.warning`—CNS Configuration Agent fully applied the initial configuration, but encountered possible semantic errors.

Related Commands

Command	Description
<code>show cns config</code>	Displays information about the CNS Configuration Agent.

cns config partial

To start the CNS Configuration Agent and initiate a partial configuration, use the **cns config partial** command in global configuration mode. To shut down the partial Configuration Agent, use the **no** version of this command.

cns config partial {*ipaddress* | *hostname*} [*port-number*]

no cns config partial {*ipaddress* | *hostname*} [*port-number*]

Syntax Description

<i>ip-address</i>	IP address of the configuration server.
<i>hostname</i>	Host name of the configuration server.
<i>port-number</i>	(Optional) Port number of the configuration server. The default port number is 80.

Defaults

Default port number is 80.

Command Modes

Global configuration

Command History

Release	Modification
12.2(2)T	This command was introduced.
12.0(18)ST	This command was integrated into Cisco IOS Release 12.0(18)ST.
12.0(22)S	This command was integrated into Cisco IOS Release 12.0(22)S.

Usage Guidelines

Use this command to start the CNS Configuration Agent and initiate an partial configuration. One of the following status messages will be displayed by the event bus:

- `cisco.cns.config.failure`—CNS Configuration Agent detected a syntax error or unsupported hardware.
- `cisco.cns.config.success`—CNS Configuration Agent successfully applied the partial configuration.
- `cisco.cns.config.warning`—CNS Configuration Agent fully applied the partial configuration, but encountered possible semantic errors.

Related Commands

Command	Description
show cns config	Displays information about the CNS Configuration Agent.

cns config retrieve

To get the configuration of a routing device—if the partial CNS Configuration Agent is started and configured in the routing device—use the **cns config retrieve** command in EXEC mode.

cns config retrieve [**page** *page*] [*no-syntax-check*] [*no-persist*]

Syntax Description		
page <i>page</i>	(Optional)	The web page of partial configuration. The default is /Config/config.asp.
<i>no-syntax-check</i>	(Optional)	Turns off the syntax check. The syntax is checked when this parameter is not entered.
<i>no-persist</i>	(Optional)	Suppresses the automatic writing of the retrieved configuration to NVRAM as a result of issuing the cns config retrieve command. If not present, issuing the cns config retrieve command causes the resultant configuration to be automatically written to NVRAM.

Defaults Default web page of the initial configuration is /Config/config.asp.

Command Modes EXEC

Command History	Release	Modification
	12.2(2)T	This command was introduced.
	12.0(18)ST	This command was integrated into Cisco IOS Release 12.0(18)ST.
	12.0(22)S	This command was integrated into Cisco IOS Release 12.0(22)S.

Usage Guidelines Use this command to get the configuration of a routing device using CNS.

Related Commands	Command	Description
	show cns config	Displays information about the CNS Configuration Agent.

debug cns config

To turn on debug messages related to the CNS Configuration Agent, use the **debug cns config** command in EXEC mode. To turn off debug messages related to the Configuration Agent, use the **no** version of this command.

debug cns config { *all* | *connection* | *agent* | *syntax* }

no debug cns config { *all* | *connection* | *agent* | *syntax* }

Syntax Description

<i>all</i>	Displays all debug messages.
<i>connection</i>	Displays connection handler messages.
<i>agent</i>	Displays Configuration Agent messages.
<i>syntax</i>	Displays syntax messages.

Defaults

No default behavior or values.

Command Modes

EXEC

Command History

Release	Modification
12.2(2)T	This command was introduced.
12.0(18)ST	This command was integrated into Cisco IOS Release 12.0(18)ST.
12.0(22)S	This command was integrated into Cisco IOS Release 12.0(22)S.

Usage Guidelines

Use this command to turn on or turn off debug messages related to the Configuration Agent.

Related Commands

Command	Description
cns config cancel	Cancels a CNS configuration.
cns config initial	Starts the initial CNS Configuration Agent.
cns config partial	Starts the partial CNS Configuration Agent.
cns config retrieve	Gets the configuration of a routing device using CNS.
show cns config	Displays information about the CNS Configuration Agent.

debug cns xml-parser

To turn on debug messages related to the XML parser, use the **debug cns xml-parser** command in EXEC mode. To turn off debug messages related to the XML parser, use the **no** version of this command.

debug cns xml-parser

no debug cns xml-parser

Syntax Description	xml-parser	Turns on debug messages related to the XML parser.
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Defaults	No default behavior or values.
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Command Modes	EXEC
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Command History	Release	Modification
	12.2(2)T	This command was introduced.
	12.0(18)ST	This command was integrated into Cisco IOS Release 12.0(18)ST.
	12.0(22)S	This command was integrated into Cisco IOS Release 12.0(22)S.

Usage Guidelines	Use this command to turn on or turn off debug messages related to the XML parser.
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Related Commands	Command	Description
	cns event	Configures the Event Gateway.
	show cns event	Displays information about the Event Agent.

show cns config

To show information about the CNS Configuration Agent, use the **show cns config** command in EXEC mode.

```
show cns config {status | outstanding | stats}
```

Syntax Description

status	Displays the status of the Configuration Agent. Use this option to display the following information about the Configuration Agent: <ul style="list-style-type: none"> • Status of the partial Configuration Agent, for example, whether it has been configured properly. • IP address and port number of the trusted server that the partial Configuration Agent is using. • Configuration ID, the unique ID for the Configuration Agent.
outstanding	Displays information about the outstanding configurations. An outstanding configuration is a partial configuration that has been started but not completed. Use this keyword to display information about the following outstanding partial configurations: <ul style="list-style-type: none"> • Queue ID of the configuration—An identifier of the configuration in the configuration queue. • Identifier—along with the configuration ID, the identifier is used to uniquely identify each partial configuration. Typically this value may be used to define a group of configurations. • Configuration ID—Along with the identifier, the configuration ID is used to uniquely identify each partial configuration. Typically this value will uniquely identify configuration data within the group specified by the identifier.
stats	Displays the following statistics on the Configuration Agent: <ul style="list-style-type: none"> • The number of configurations completed. • The number of configurations failed. • The time stamp of the last configuration received.

Defaults

No default behavior or values.

Command Modes

EXEC

Command History

Release	Modification
12.2(2)T	This command was introduced.
12.0(18)ST	This command was integrated into Cisco IOS Release 12.0(18)ST.
12.0(22)S	This command was integrated into Cisco IOS Release 12.0(22)S.

Usage Guidelines Use this command to display information about the Configuration Agent.

Related Commands	Command	Description
	cns config cancel	Cancels a CNS configuration.
	cns config initial	Starts the initial CNS Configuration Agent.
	cns config partial	Starts the partial CNS Configuration Agent.
	cns config retrieve	Gets the configuration of a routing device using CNS.

■ show cns config