Configuring Call Home for the Cisco CSR 1000v

Prerequisites for Call Home

The Call Home feature provides email-based and web-based notification of critical system events. A versatile range of message formats are available for optimal compatibility with pager services, standard email, or XML-based automated parsing applications. Common uses of this feature may include direct paging of a network support engineer, email notification to a network operations center, XML delivery to a support website, and use of Cisco Smart Call Home services for direct case generation with the Cisco Systems Technical Assistance Center (TAC).

Note The router supports the Call Home feature beginning with Cisco IOS XE Release 3.12S.

Consider the following points before you configure Call Home:

- Contact email address (required for full registration with Smart Call Home, optional if Call Home is enabled in anonymous mode), phone number (optional), and street address information (optional) should be configured so that the receiver can determine the origin of messages received.
- At least one destination profile (predefined or user-defined) must be configured. The destination profile you use depends on whether the receiving entity is a pager, an email address, or an automated service such as Cisco Smart Call Home.

- If the destination profile uses email message delivery, you must specify a Simple Mail Transfer Protocol (SMTP) server. Configuring the trustpoint CA is not required for HTTPS server connection since the trustpool feature enabled by default.
- The router must have IP connectivity to an email server or the destination HTTP(S) server.
- If Cisco Smart Call Home is used, an active service contract covering the device is required to provide full SCH service.

Information About Call Home

The Call Home feature can deliver alert messages containing information on configuration, inventory, syslog, snapshot, and crash events. It provides these alert messages as either email-based or web-based messages. Multiple message formats are available, allowing for compatibility with pager services, standard email, or XML-based automated parsing applications. This feature can deliver alerts to multiple recipients, which are Call Home destination profiles. Each destination profile has configurable message formats and content categories. A predefined destination profile is provided for sending alerts to the Cisco Smart Call Home server. The predefined profile defines both the email address and the HTTP(S) URL; the transport method configured in the profile determines whether the email address or the HTTP(S) URL is used.

Flexible message delivery and format options make it easy to integrate specific support requirements.

Benefits of Using Call Home

The Call Home feature offers the following benefits:

- Multiple message-format options
  - Short Text—Suitable for pagers or printed reports.
  - Long Text—Full formatted message information suitable for human reading.
  - XML—Machine-readable format using XML. The XML format enables communication with the Cisco TAC.
- Multiple concurrent message destinations
- Multiple message categories including configuration, inventory, syslog, snapshot, and crash events
- Filtering of messages by severity and pattern matching
- Scheduling of periodic message sending

Obtaining Smart Call Home Services

If you have a service contract directly with Cisco, you can register for the Smart Call Home service. Smart Call Home analyzes Call Home messages and provides background information and recommendations. For critical issues, Automatic Service Requests are generated with the Cisco TAC.

Smart Call Home offers the following features:

- Continuous device health monitoring and real-time alerts.
- Analysis of Smart Call Home messages and, if needed, Automatic Service Request generation routed to the correct TAC team, including detailed diagnostic information to speed problem resolution.

- Secure message transport directly from your device or through an HTTP proxy server or a downloadable Transport Gateway (TG). You can use a TG aggregation point to support multiple devices or in cases where security dictates that your devices may not be connected directly to the Internet.
- Web-based access to Smart Call Home messages and recommendations, inventory, and configuration information for all Smart Call Home devices provides access to associated field notices, security advisories, and end-of-life information.

You need the following items to register for Smart Call Home:

- SMARTnet contract number for your router
- Your email address
- Your Cisco.com username

For detailed information on Smart Call Home, see www.cisco.com/go/smartcallhome/index.html.

Anonymous Reporting

Smart Call Home is a service capability included with many Cisco service contracts and helps you to resolve problems. In addition, information is gained from; for example, crash messages to help Cisco understand issues occurring in the field. If you decide not to use Smart Call Home, you can still enable Anonymous Reporting to allow Cisco to securely receive minimal error and health information from the device. If you enable Anonymous Reporting, your customer identity will remain anonymous, and no identifying information is sent.

Note When you enable Anonymous Reporting, you acknowledge your consent to transfer the specified data to Cisco or to vendors operating on behalf of Cisco (including countries outside the United States). Cisco maintains the privacy of all customers. For information about how Cisco treats personal information, see the Cisco Online Privacy Statement .

When Call Home is configured in an anonymous way, only crash, inventory, and test messages are sent to Cisco. No identifying information is sent.

For more information about what is sent in these messages, see the Alert Group Trigger Events and Commands, on page 38.

How to Configure Call Home

How to Configure Call Home

The following sections show how you can configure Call Home using a single command:

- Configuring Smart Call Home (Single Command), on page 4
- Configuring and Enabling Smart Call Home, on page 5

The following sections show detailed or optional configurations:

- Enabling and Disabling Call Home , on page 5

Configuring Smart Call Home (Single Command)

To enable all Call Home basic configurations using a single command, perform the following steps:

SUMMARY STEPS

1. **configure terminal**
2. **call-home reporting** {**anonymous** | **contact-email-addr** *email-address*} [**http-proxy** {*ipv4-address* | *ipv6-address* | *name*} **port** *port-number*]

DETAILED STEPS

	Command or Action	Purpose
Step 1	**configure terminal** **Example:** `Router# configure terminal`	Enters global configuration mode.
Step 2	**call-home reporting** {**anonymous** | **contact-email-addr** *email-address*} [**http-proxy** {*ipv4-address* | *ipv6-address* | *name*} **port** *port-number*] **Example:** `Router(config)# call-home reporting contact-email-addr email@company.com`	Enables all Call Home basic configurations using a single command. • **anonymous**—Enables Call-Home TAC profile to only send crash, inventory, and test messages and send the messages in an anonymous way. • **contact-email-addr**—Enables Smart Call Home service full reporting capability and sends a full inventory message from Call-Home TAC profile to Smart Call Home server to start full registration process. • **http-proxy** {*ipv4-address* | *ipv6-address* | *name*}—An ipv4 or ipv6 address or server name. Maximum length is 64.

	Command or Action	Purpose
		• **port** *port-number*—Port number. Range is 1 to 65535. **Note** HTTP proxy option allows you to make use of your own proxy server to buffer and secure internet connections from your devices. **Note** After successfully enabling Call Home either in anonymous or full registration mode using the **call-home reporting** command, an inventory message is sent out. If Call Home is enabled in anonymous mode, an anonymous inventory message is sent out. If Call Home is enabled in full registration mode, a Full Inventory message for full registration mode is sent. For more information about what is sent in these messages, see the Alert Group Trigger Events and Commands, on page 38.

Configuring and Enabling Smart Call Home

For application and configuration information about the Cisco Smart Call Home service, see the Smart Call Home User Guide . See also the Cisco Support Community page for Smart Call Home.

The user guide includes configuration examples for sending Smart Call Home messages directly from your device or through a transport gateway (TG) aggregation point.

Note For security reasons, we recommend that you use the HTTPS transport options, due to the additional payload encryption that HTTPS offers. The Transport Gateway software is downloadable from Cisco.com and is available if you require an aggregation point or a proxy for connection to the Internet.

The implementation on the Cisco CSR 1000v/ISRv supports the trustpool feature (embedded CA certificates in IOS images). The trustpool feature simplifies configuration to enable Smart Call Home service on configured devices. It eliminates the requirement of manually configuring the trustpoint and provides automatic update of the CA certificate should it change in the future.

Enabling and Disabling Call Home

SUMMARY STEPS

1. **configure terminal**
2. **service call-home**
3. **no service call-home**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**configure terminal** **Example:** `Router# configure terminal`	Enters global configuration mode.
Step 2	**service call-home** **Example:** `Router(config)# service call-home`	Enables the Call Home feature. By default, Call Home is disabled.
Step 3	**no service call-home** **Example:** `Router(config)# no service call-home`	Disables the Call Home feature.

Configuring Contact Information

Each router must include a contact email address (except if Call Home is enabled in anonymous mode). You can optionally include a phone number, street address, contract ID, customer ID, and site ID.

To assign the contact information, perform the following steps:

SUMMARY STEPS

1. **configure terminal**
2. **call-home**
3. **contact-email-addr** *email-address*
4. **phone-number** +*phone-number*
5. **street-address** *street-address*
6. **customer-id** *text*
7. **site-id** *text*
8. **contract-id** *text*

DETAILED STEPS

	Command or Action	Purpose
Step 1	**configure terminal** **Example:** `Router# configure terminal`	Enters global configuration mode.
Step 2	**call-home** **Example:**	Enters the Call Home configuration submode.

	Command or Action	Purpose
	`Router(config)# call-home`	
Step 3	**contact-email-addr** *email-address* **Example:** `Router(cfg-call-home)# contact-email-addr username@example.com`	Designates your email address. Enter up to 200 characters in email address format with no spaces.
Step 4	**phone-number** *+phone-number* **Example:** `Router(cfg-call-home)# phone-number +1-800-555-4567`	(Optional) Assigns your phone number. **Note** The number must begin with a plus (**+**) prefix and may contain only dashes (-) and numbers. Enter up to 17 characters. If you include spaces, you must enclose your entry in quotes (“”).
Step 5	**street-address** *street-address* **Example:** `Router(cfg-call-home)# street-address "1234 Picaboo Street, Any city, Any state, 12345"`	(Optional) Assigns your street address where RMA equipment can be shipped. Enter up to 200 characters. If you include spaces, you must enclose your entry in quotes (“”).
Step 6	**customer-id** *text* **Example:** `Router(cfg-call-home)# customer-id Customer1234`	(Optional) Identifies customer ID. Enter up to 64 characters. If you include spaces, you must enclose your entry in quotes (“”).
Step 7	**site-id** *text* **Example:** `Router(cfg-call-home)# site-id Site1ManhattanNY`	(Optional) Identifies customer site ID. Enter up to 200 characters. If you include spaces, you must enclose your entry in quotes (“”).
Step 8	**contract-id** *text* **Example:** `Router(cfg-call-home)# contract-id Company1234`	(Optional) Identifies your contract ID for the router. Enter up to 64 characters. If you include spaces, you must enclose your entry in quotes (“”).

Information About Destination Profiles

A destination profile contains the required delivery information for an alert notification. At least one destination profile is required. You can configure multiple destination profiles of one or more types.

You can create and define a new destination profile or copy and use the predefined destination profile. If you define a new destination profile, you must assign a profile name.

You can control which profile to be used for Smart Licensing by enabling or disabling smart-licensing data of that profile. Only one active profile can have smart-license data enabled. For more information about Smart Licensing, see Installing Cisco CSR 1000v Licenses.

Note If you use the Cisco Smart Call Home service, the destination profile must use the XML message format.

You can configure the following attributes for a destination profile:

- Profile name—String that uniquely identifies each user-defined destination profile. The profile name is limited to 31 characters and is not case-sensitive. You cannot use **all** as a profile name.
- Transport method—Transport mechanism, either email or HTTP (including HTTPS), for delivery of alerts.

  For both the CiscoTAC-1 profile and user-defined destination profiles, email is the default, and you can enable either or both transport mechanisms. If you disable both methods, email is enabled.

  For the predefined CiscoTAC-1 profile, you can enable either transport mechanism, but not both.
- Destination address—The actual address related to the transport method by which the alert should be sent.

In this version of the Call Home feature, you can change the destination of the CiscoTAC-1 profile.

- Message formatting—The message format used for sending the alert. The format options for a user-defined destination profile are long-text, short-text, or XML. The default is XML. For the predefined CiscoTAC-1 profile, only XML is allowed.
- Message size—The maximum destination message size. The valid range is 50 to 3,145,728 bytes. The default is 3,145,728 bytes.
- Reporting method—You can choose which data to report for a profile. You can enable reporting of Smart Call Home data or Smart Licensing Data, or both. Only one active profile is allowed to report Smart Licensing data at a time.
- Anonymous reporting—You can choose for your customer identity to remain anonymous, and no identifying information is sent.
- Subscribing to interesting alert-groups—You can choose to subscribe to alert-groups highlighting your interests.

This section contains the following subsections:

Creating a New Destination Profile

To create and configure a new destination profile, perform the following steps:

SUMMARY STEPS

1. **configure terminal**
2. **call-home**
3. **profile** *name*
4. [**no**] **destination transport-method** {**email** | **http**}
5. **destination address** {**email** *email-address* | **http** *url*}
6. **destination preferred-msg-format** {**long-text** | **short-text** | **xml**}
7. **destination message-size-limit** *bytes*

8. **active**
9. **reporting** {**all** | **smart-call-home-data**| **smart-licensing-data** }
10. **end**
11. **show call-home profile** {*name* | **all**}
12. **show call-home smart-licensing**
13. **show call-home smart-licensing statistics**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**configure terminal** **Example:** `Router# configure terminal`	Enters global configuration mode.
Step 2	**call-home** **Example:** `Router(config)# call-home`	Enters the Call Home configuration submode.
Step 3	**profile** *name* **Example:** `Router(config-call-home)# profile profile1`	Enters the Call Home destination profile configuration submode for the specified destination profile. If the specified destination profile does not exist, it is created.
Step 4	[**no**] **destination transport-method** {**email** | **http**} **Example:** `Router(cfg-call-home-profile)# destination transport-method email`	(Optional) Enables the message transport method. The **no** option disables the method.
Step 5	**destination address** {**email** *email-address* | **http** *url*} **Example:** `Router(cfg-call-home-profile)# destination address email myaddress@example.com`	Configures the destination email address or URL to which Call Home messages are sent. **Note** When entering a destination URL, include either **http://** or **https://**, depending on whether the server is a secure server.
Step 6	**destination preferred-msg-format** {**long-text** | **short-text** | **xml**} **Example:** `Router(cfg-call-home-profile)# destination preferred-msg-format xml`	(Optional) Configures a preferred message format. The default is XML.
Step 7	**destination message-size-limit** *bytes* **Example:**	(Optional) Configures a maximum destination message size for the destination profile.

	Command or Action	Purpose
	`Router(cfg-call-home-profile)# destination message-size-limit 3145728`	
Step 8	**active** **Example:** `Router(cfg-call-home-profile)# active`	Enables the destination profile. By default, the profile is enabled when it is created.
Step 9	**reporting** {**all** | **smart-call-home-data**| **smart-licensing-data** }	Configures the type of data to report for a profile. You can select either to report Smart Call Home data or Smart Licensing data. Selecting the all option reports data for both types of data.
Step 10	**end** **Example:** `Router(cfg-call-home-profile)# end`	Returns to privileged EXEC mode.
Step 11	**show call-home profile** {*name* | **all**} **Example:** `Router# show call-home profile profile1`	Displays the destination profile configuration for the specified profile or all configured profiles.
Step 12	**show call-home smart-licensing**	Displays the current Call Home Smart Licensing settings for the configured destination profiles.
Step 13	**show call-home smart-licensing statistics**	Displays the Call Home Smart Licensing statistics.

Copying a Destination Profile

To create a new destination profile by copying an existing profile, perform the following steps:

SUMMARY STEPS

1. **configure terminal**
2. **call-home**
3. **copy profile** *source-profile target-profile*

DETAILED STEPS

	Command or Action	Purpose
Step 1	**configure terminal** **Example:** `Router# configure terminal`	Enters configuration mode.

	Command or Action	Purpose
Step 2	**call-home** **Example:** `Router(config)# call-home`	Enters the Call Home configuration submode.
Step 3	**copy profile** *source-profile target-profile* **Example:** `Router(cfg-call-home)# copy profile profile1 profile2`	Creates a new destination profile with the same configuration settings as the existing destination profile.

Setting Profiles to Anonymous Mode

To set an anonymous profile, perform the following steps:

SUMMARY STEPS

1. **configure terminal**
2. **call-home**
3. **profile** *name*
4. **anonymous-reporting-only**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**configure terminal** **Example:** `Router# configure terminal`	Enters global configuration mode.
Step 2	**call-home** **Example:** `Router(config)# call-home`	Enters Call Home configuration submode.
Step 3	**profile** *name* **Example:** `Router(cfg-call-home) profile CiscoTAC-1`	Enables profile configuration mode.
Step 4	**anonymous-reporting-only** **Example:** `Router(cfg-call-home-profile)#` **`anonymous-reporting-only`**	Sets the profile to anonymous mode. **Note** By default, the profile sends a full report of all types of events subscribed in the profile. When **anonymous-reporting-only** is set, only crash, inventory, and test messages are sent.

Subscribing to Alert Groups

An alert group is a predefined subset of Call Home alerts supported in all routers. Different types of Call Home alerts are grouped into different alert groups depending on their type. The following alert groups are available:

- Configuration
- Inventory
- Syslog
- Crash
- Snapshot

This section contains the following subsections:

- Periodic Notification, on page 14
- Message Severity Threshold, on page 15
- Configuring Snapshot Command List, on page 16

The triggering events for each alert group are listed in Alert Group Trigger Events and Commands, on page 38, and the contents of the alert group messages are listed in Message Contents, on page 39.

You can select one or more alert groups to be received by a destination profile.

Note A Call Home alert is sent only to destination profiles that have subscribed to the alert group containing that Call Home alert. In addition, the alert group must be enabled.

To subscribe a destination profile to one or more alert groups, perform the following steps:

SUMMARY STEPS

1. **configure terminal**
2. **call-home**
3. **alert-group** {**all** | **configuration** | **environment** | **inventory** | **syslog** | crash | snapshot}
4. **profile** *name*
5. **subscribe-to-alert-group configuration**[**periodic** {**daily** *hh:mm* | **monthly** *date hh:mm* | **weekly** *day hh:mm*}]
6. **subscribe-to-alert-group inventory** *[***periodic** *{***daily** *hh:mm* | **monthly** *date hh:mm* | **weekly** *day hh:mm}]*
7. **subscribe-to-alert-group syslog**[**severity** {**catastrophic** | **disaster** |**fatal** | **critical** | **major** | **minor** | **warning** |**notification** | **normal** | **debugging**}][**pattern** *string*]
8. **subscribe-to-alert-group crash**
9. **subscribe-to-alert-group snapshot** [**periodic** {**daily** *hh:mm* | **hourly** *mm* | **interval** *mm* | **monthly** *date hh:mm* | **weekly** *day hh:mm*}]
10. **end**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**configure terminal** **Example:** `Router# configure terminal`	Enters global configuration mode.
Step 2	**call-home** **Example:** `Router(config)# call-home`	Enters Call Home configuration submode.
Step 3	**alert-group** {**all** | **configuration** | **environment** | **inventory** | **syslog** | crash | snapshot} **Example:** `Router(cfg-call-home)# alert-group all`	Enables the specified alert group. Use the keyword all to enable all alert groups. By default, all alert groups are enabled.
Step 4	**profile** *name* **Example:** `Router(cfg-call-home)# profile profile1`	Enters Call Home destination profile configuration submode for the specified destination profile.
Step 5	**subscribe-to-alert-group configuration**[**periodic** {**daily** *hh:mm* | **monthly** *date hh:mm* | **weekly** *day hh:mm*}] **Example:** `Router(cfg-call-home-profile)# subscribe-to-alert-group configurationperiodic daily 12:00`	Subscribes this destination profile to the Configuration alert group. The Configuration alert group can be configured for periodic notification, as described in Periodic Notification, on page 14.
Step 6	**subscribe-to-alert-group inventory** *[***periodic** *{***daily** *hh:mm* | **monthly** *date hh:mm* | **weekly** *day hh:mm}]* **Example:** `Router(cfg-call-home-profile)# subscribe-to-alert-group inventory periodic monthly 1 12:00`	Subscribes this destination profile to the Inventory alert group. The Inventory alert group can be configured for periodic notification, as described in Periodic Notification, on page 14.
Step 7	**subscribe-to-alert-group syslog**[**severity** {**catastrophic** | **disaster** |**fatal** | **critical** | **major** | **minor** | **warning** |**notification** | **normal** | **debugging**}][**pattern** *string*] **Example:** `Router(cfg-call-home-profile)# subscribe-to-alert-group syslog severity major`	Subscribes this destination profile to the Syslog alert group. The Syslog alert group can be configured to filter messages based on severity, as described in Message Severity Threshold, on page 15. You can specify a text pattern to be matched within each syslog message. If you configure a pattern, a Syslog alert group message is sent only if it contains the specified pattern and meets the severity threshold. If the pattern contains spaces, you must enclose it in quotes (“”). You can specify up to five patterns for each destination profile.

	Command or Action	Purpose
Step 8	**subscribe-to-alert-group crash** **Example:** `Router(cfg-call-home-profile)# subscribe-to-alert-group crash`	Subscribes to the Crash alert group in user profile. By default, the CiscoTAC-1 profile subscribes to the Crash alert group and cannot be unsubscribed.
Step 9	**subscribe-to-alert-group snapshot** [**periodic** {**daily** *hh:mm* | **hourly** *mm* | **interval** *mm* | **monthly** *date hh:mm* | **weekly** *day hh:mm*}] **Example:** `Router(cfg-call-home-profile)# subscribe-to-alert-group snapshot periodic daily 12:00`	Subscribes this destination profile to the Snapshot alert group. The Snapshot alert group can be configured for periodic notification, as described in Periodic Notification, on page 14. By default, the Snapshot alert group has no command to run. You can add commands into the alert group, as described in Configuring Snapshot Command List, on page 16. In doing so, the output of the commands added in the Snapshot alert group will be included in the snapshot message.
Step 10	**end** **Example:** `Router(cfg-call-home-profile)# end`	Exits configuration mode.

What to do next

Note As an alternative to subscribing to individual alert groups, you can subscribe to all alert groups by entering the **subscribe-to-alert-group all** command. However, entering this command causes a large number of syslog messages to generate. We recommend subscribing to alert groups individually, using appropriate severity levels and patterns when possible.

Periodic Notification

When you subscribe a destination profile to the Configuration, Inventory, or Snapshot alert group, you can choose to receive the alert group messages asynchronously or periodically at a specified time. The sending period can be one of the following:

- Daily—Specifies the time of day to send, using an hour:minute format hh:mm, with a 24-hour clock (for example, 14:30).
- Weekly—Specifies the day of the week and time of day in the format day hh:mm, where the day of the week is spelled out (for example, Monday).
- Monthly—Specifies the numeric date, from 1 to 31, and the time of day, in the format date hh:mm.
- Interval—Specifies the interval at which the periodic message is sent, from 1 to 60 minutes.
- Hourly—Specifies the minute of the hour at which the periodic message is sent, from 0 to 59 minutes.

Note Hourly and by interval periodic notifications are available for the Snapshot alert group only.

Message Severity Threshold

When you subscribe a destination profile to the Syslog alert group, you can set a threshold for the sending of alert group messages based on the level of severity of the message. Any message with a value lower than the destination profile specified threshold is not sent to the destination.

The severity threshold is configured using the keywords in Severity and Syslog Level Mapping and ranges from catastrophic (level 9, highest level of urgency) to debugging (level 0, lowest level of urgency).

Other alert groups do not allow setting a threshold for severity.

Note Call Home severity levels are not the same as system message logging severity levels.

Table 1: Severity and Syslog Level Mapping

Level	Keyword	Syslog Level	Description
9	**catastrophic**	—	Network-wide catastrophic failure.
8	**disaster**	—	Significant network impact.
7	**fatal**	Emergency (0)	System is unusable.
6	**critical**	Alert (1)	Critical conditions, immediate attention needed.
5	**major**	Critical (2)	Major conditions.
4	**minor**	Error (3)	Minor conditions.
3	**warning**	Warning (4)	Warning conditions.
2	**notification**	Notice (5)	Basic notification and informational messages. Possibly independently insignificant.
1	**normal**	Information (6)	Normal event signifying return to normal state.

Configuring Snapshot Command List

To configure the snapshot command list, perform the following steps:

SUMMARY STEPS

1. **configure terminal**
2. **call-home**
3. [**no** | **default**] **alert-group-config snapshot**
4. [**no** | **default**] **add-command** *command string*
5. **end**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**configure terminal** **Example:** `Router# configure terminal`	Enters global configuration mode.
Step 2	**call-home** **Example:** `Router(config)# call-home`	Enters Call Home configuration submode.
Step 3	[**no** | **default**] **alert-group-config snapshot** **Example:** `Router(cfg-call-home)# alert-group-config snapshot`	Enters snapshot configuration mode. The no or default command will remove all snapshot command.
Step 4	[**no** | **default**] **add-command** *command string* **Example:** `Router(cfg-call-home-snapshot)# add-command "show version"`	Adds the command to the Snapshot alert group. The no or default command will remove the corresponding command. • *command string*—IOS command. Maximum length is 128.
Step 5	**end** **Example:** `Router(cfg-call-home-snapshot)# end`	Exits and saves the configuration.

Configuring General email Options

To use the email message transport, you must configure at least one Simple Mail Transfer Protocol (SMTP) email server address. You can configure the from and reply-to email addresses, and you can specify up to four backup email servers.

Note the following guidelines when configuring general email options:

- Backup email servers can be defined by repeating the **mail-server** command using different priority numbers.
- The **mail-server priority** *number* parameter can be configured from 1 to 100. The server with the highest priority (lowest priority number) is tried first.

To configure general email options, perform the following steps:

SUMMARY STEPS

1. **configure terminal**
2. **call-home**
3. **mail-server** {[*ipv4-address* | *ipv6-address*] | *name*} **priority** *number*
4. **sender from** *email-address*
5. **sender reply-to** *email-address*
6. **source-interface** *interface-name*
7. **source-ip-address** *ipv4/ipv6 address*
8. **vrf** *vrf-name*

DETAILED STEPS

	Command or Action	Purpose
Step 1	**configure terminal** **Example:** `Router# configure terminal`	Enters global configuration mode.
Step 2	**call-home** **Example:** `Router(config)# call-home`	Enters Call Home configuration submode.
Step 3	**mail-server** {[*ipv4-address* | *ipv6-address*] | *name*} **priority** *number* **Example:** `Router(cfg-call-home)# mail-server stmp.example.com priority 1`	Assigns an email server address and its relative priority among configured email servers. Provide either of these: • The email server's IP address or • The email server's fully qualified domain *name* (FQDN) of 64 characters or less. Assign a priority *number* between 1 (highest priority) and 100 (lowest priority).
Step 4	**sender from** *email-address* **Example:** `Router(cfg-call-home)# sender from username@example.com`	(Optional) Assigns the email address that appears in the from field in Call Home email messages. If no address is specified, the contact email address is used.
Step 5	**sender reply-to** *email-address* **Example:**	(Optional) Assigns the email address that appears in the reply-to field in Call Home email messages.

	Command or Action	Purpose
	`Router(cfg-call-home)# sender reply-to username@example.com`	
Step 6	**source-interface** *interface-name* **Example:** `Router(cfg-call-home)# source-interface loopback1`	Assigns the source interface name to send call-home messages. • *interface-name*—Source interface name. Maximum length is 64. **Note** For HTTP messages, use the **ip http client source-interface** *interface-name* command in global configuration mode to configure the source interface name. This allows all HTTP clients on the device to use the same source interface.
Step 7	**source-ip-address** *ipv4/ipv6 address* **Example:** `Router(cfg-call-home)# source-ip-address 209.165.200.226`	Assigns source IP address to send call-home messages. • *ipv4/ipv6 address*—Source IP (ipv4 or ipv6) address. Maximum length is 64.
Step 8	**vrf** *vrf-name* **Example:** `Router(cfg-call-home)# vrf vpn1`	(Optional) Specifies the VRF instance to send call-home email messages. If no vrf is specified, the global routing table is used. **Note** For HTTP messages, if the source interface is associated with a VRF, use the **ip http client source-interface** *interface-name* command in global configuration mode to specify the VRF instance that will be used for all HTTP clients on the device.

Example

The following example shows the configuration of general email parameters, including a primary and secondary email server:

```
Router# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)# call-home
Router(cfg-call-home)# mail-server smtp.example.com priority 1
Router(cfg-call-home)# mail-server 192.168.0.1 priority 2
Router(cfg-call-home)# sender from username@example.com
```

```
Router(cfg-call-home)# sender reply-to username@example.com
Router(cfg-call-home)# source-interface america
Router(cfg-call-home)# source-ip-address 209.165.200.231
Router(cfg-call-home)# vrf vpn2
Router(cfg-call-home)# end
Router(config)#
```

Specifying Rate Limit for Sending Call Home Messages

To specify the rate limit for sending Call Home messages, perform the following steps:

SUMMARY STEPS

1. **configure terminal**
2. **call-home**
3. **rate-limit** *number*

DETAILED STEPS

	Command or Action	Purpose
Step 1	**configure terminal** **Example:** `Router# configure terminal`	Enters global configuration mode.
Step 2	**call-home** **Example:** `Router(config)# call-home`	Enters Call Home configuration submode.
Step 3	**rate-limit** *number* **Example:** `Router(cfg-call-home)# rate-limit 40`	Specifies a limit on the number of messages sent per minute. • *number*—Range is 1 to 60. The default is 20.

Specifying HTTP Proxy Server

To specify an HTTP proxy server for sending Call Home HTTP(S) messages to a destination, perform the following steps:

SUMMARY STEPS

1. **configure terminal**
2. **call-home**
3. **http-proxy** {*ipv4-address* | *ipv6-address* | *name*} **port** *port-number*

DETAILED STEPS

	Command or Action	Purpose
Step 1	**configure terminal** **Example:** `Router# configure terminal`	Enters global configuration mode.
Step 2	**call-home** **Example:** `Router(config)# call-home`	Enters Call Home configuration submode.
Step 3	**http-proxy** {*ipv4-address* | *ipv6-address* | *name*} **port** *port-number* **Example:** `Router(cfg-call-home)# http-proxy 1.1.1.1 port 1`	Specifies the proxy server for the HTTP request.

Enabling AAA Authorization to Run IOS Commands for Call Home Messages

To enable AAA authorization to run IOS commands that enable the collection of output for a Call Home message, perform the following steps:

SUMMARY STEPS

1. **configure terminal**
2. **call-home**
3. **aaa-authorization**
4. **aaa-authorization** [**username** *username*]

DETAILED STEPS

	Command or Action	Purpose
Step 1	**configure terminal** **Example:** `Router# configure terminal`	Enters global configuration mode.
Step 2	**call-home** **Example:**	Enters Call Home configuration submode.

	Command or Action	Purpose
	`Router(config)# call-home`	
Step 3	**aaa-authorization** **Example:** `Router(cfg-call-home)# aaa-authorization`	Enables AAA authorization. **Note** By default, AAA authorization is disabled for Call Home.
Step 4	**aaa-authorization** [**username** *username*] **Example:** `Router(cfg-call-home)# aaa-authorization username user`	Specifies the username for authorization. • **username** *username*—Default username is callhome. Maximum length is 64.

Configuring Syslog Throttling

To enable or disable Call Home syslog message throttling and avoid sending repetitive Call Home syslog messages, perform the following steps:

SUMMARY STEPS

1. **configure terminal**
2. **call-home**
3. [**no**] **syslog-throttling**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**configure terminal** **Example:** `Router# configure terminal`	Enters configuration mode.
Step 2	**call-home** **Example:** `Router(config)# call-home`	Enters Call Home configuration submode.
Step 3	[**no**] **syslog-throttling** **Example:** `Router(cfg-call-home)# syslog-throttling`	Enables or disables Call Home syslog message throttling and avoids sending repetitive Call Home syslog messages. Repeating syslog messages will only display after 24 hours. By default, syslog message throttling is enabled. **Note** Debug level syslogs like debug trace are not throttled.

Configuring Call Home Data Privacy

The **data-privacy** command scrubs data, such as IP addresses, from running configuration files to protect the privacy of customers. Enabling the **data-privacy** command can affect CPU utilization when scrubbing a large amount of data. Currently, **show** command output is not being scrubbed except for configuration messages in the **show running-config all** and **show startup-config** data.

SUMMARY STEPS

1. **configure terminal**
2. **call-home**
3. **data-privacy** {**level** {**normal** | **high**} | **hostname**}

DETAILED STEPS

	Command or Action	Purpose
Step 1	**configure terminal** **Example:** `Router# configure terminal`	Enters configuration mode.
Step 2	**call-home** **Example:** `Router(config)# call-home`	Enters the Call Home configuration submode.
Step 3	**data-privacy** {**level** {**normal**	**high**}	**hostname**} **Example:** `Router(cfg-call-home)# data-privacy level high`	Scrubs data from running configuration file to protect the privacy of the user. The default data-privacy level is normal. **Note** Enabling the data-privacy command can affect CPU utilization when scrubbing a large amount of data. • **normal**—Scrubs all normal-level commands. • **high**—Scrubs all normal-level commands plus the IP domain name and IP address commands. • **hostname**—Scrubs all high-level commands plus the **hostname** command. **Note** Scrubbing the hostname from configuration messages can cause Smart Call Home processing failure on some platforms.

Sending Call Home Communications Manually

Sending Call Home Communications Manually

You can manually send several types of Call Home communications. To send Call Home communications, perform any necessary tasks in sections from Sending a Call Home Test Message Manually, on page 23 to Manually Sending Command Output Message for One Command or a Command List, on page 25.

Sending a Call Home Test Message Manually

You can use the **call-home test** command to send a user-defined Call Home test message.

To manually send a Call Home test message, perform the following step:

SUMMARY STEPS

1. **call-home test** [“*test-message*”] **profile** *name*

DETAILED STEPS

	Command or Action	Purpose
Step 1	**call-home test** [“*test-message*”] **profile** *name* **Example:** `Router# call-home test profile profile1`	Sends a test message to the specified destination profile. The user-defined test message text is optional but must be enclosed in quotes (“”) if it contains spaces. If no user-defined message is configured, a default message is sent.

Sending Call Home Alert Group Messages Manually

You can use the **call-home send** command to manually send a specific alert group message.

Note the following guidelines when manually sending a Call Home alert group message:

- Only the snapshot, crash, configuration, and inventory alert groups can be sent manually. Syslog alert groups cannot be sent manually.
- When you manually trigger a snapshot, configuration, or inventory alert group message and you specify a destination profile name, a message is sent to the destination profile regardless of the profile’s active status, subscription status, or severity setting.
- When you manually trigger a snapshot, configuration, or inventory alert group message and do not specify a destination profile name, a message is sent to all active profiles that have either a normal or periodic subscription to the specified alert group.

To manually trigger Call Home alert group messages, perform the following steps:

SUMMARY STEPS

1. **call-home send alert-group snapshot** [**profile** *name*]
2. **call-home send alert-group crash** [**profile** *name*]
3. **call-home send alert-group configuration** [**profile** *name*]
4. **call-home send alert-group inventory** [**profile** *name*]

DETAILED STEPS

	Command or Action	Purpose
Step 1	**call-home send alert-group snapshot** [**profile** *name*] **Example:** `Router# call-home send alert-group snapshot profile profile1`	Sends a snapshot alert group message to one destination profile if specifed or to all subscribed destination profiles.

	Command or Action	Purpose
Step 2	**call-home send alert-group crash** [**profile** *name*] **Example:** `Router# call-home send alert-group crash profile profile1`	Sends a crash alert group message to one destination profile if specified or to all subscribed destination profiles.
Step 3	**call-home send alert-group configuration** [**profile** *name*] **Example:** `Router# call-home send alert-group configuration profile profile1`	Sends a configuration alert group message to one destination profile if specified or to all subscribed destination profiles.
Step 4	**call-home send alert-group inventory** [**profile** *name*] **Example:** `Router# call-home send alert-group inventory profile profile1`	Sends an inventory alert group message to one destination profile if specified or to all subscribed destination profiles.

Submitting Call Home Analysis and Report Requests

You can use the **call-home request** command to submit information about your system to Cisco to receive helpful analysis and report information specific to your system. You can request a variety of reports, including security alerts, known bugs, best practices, and command references.

Note the following guidelines when manually sending Call Home analysis and report requests:

- If a **profile** *name* is specified, the request is sent to the profile. If no profile is specified, the request is sent to the CiscoTAC-1 profile. The recipient profile does not need to be enabled for the call-home request. The profile should specify the email address where the transport gateway is configured so that the request message can be forwarded to the CiscoTAC-1 profile and the user can receive the reply from the Smart Call Home service.
- The **ccoid** *user-id* is the registered identifier of the Smart Call Home user. If the *user-id* is specified, the response is sent to the email address of the registered user. If no *user-id* is specified, the response is sent to the contact email address of the device.
- Based on the keyword specifying the type of report requested, the following information is returned:
  - **config-sanity**—Information on best practices as related to the current running configuration.
  - **bugs-list**—Known bugs in the running version and in the currently applied features.
  - **command-reference**—Reference links to all commands in the running configuration.
  - **product-advisory**—Product Security Incident Response Team (PSIRT) notices, End of Life (EOL) or End of Sales (EOS) notices, or field notices (FN) that may affect devices in your network.

To submit a request for analysis and report information from the Cisco Output Interpreter tool, perform the following steps:

SUMMARY STEPS

1. **call-home request output-analysis "***show-command***"** [**profile** *name*] [**ccoid** *user-id*]
2. **call-home request** {**config-sanity** | **bugs-list** | **command-reference** | **product-advisory**} [**profile** *name*] [**ccoid** *user-id*]

DETAILED STEPS

	Command or Action	Purpose
Step 1	**call-home request output-analysis "***show-command***"** [**profile** *name*] [**ccoid** *user-id*] **Example:** `Router# call-home request output-analysis "show diag" profile TG`	Sends the output of the specified **show** command for analysis. The **show** command must be contained in quotes (").
Step 2	**call-home request** {**config-sanity** | **bugs-list** | **command-reference** | **product-advisory**} [**profile** *name*] [**ccoid** *user-id*] **Example:** `Router# call-home request config-sanity profile TG`	Sends the output of a predetermined set of commands such as the **show running-config all**, **show version** or **show module** commands, for analysis. In addition, the **call home request product-advisory** subcommand includes all inventory alert group commands. The keyword specified after **request** specifies the type of report requested.

Manually Sending Command Output Message for One Command or a Command List

You can use the **call-home send** command to execute an IOS command or a list of IOS commands and send the command output through HTTP or email protocol.

Note the following guidelines when sending the output of a command:

- The specified IOS command or list of IOS commands can be any run command, including commands for all modules. The command must be contained in quotes (").
- If the email option is selected using the "email" keyword and an email address is specified, the command output is sent to that address.
- If neither the email nor the HTTP option is specified, the output is sent in long-text format with the specified service request number to the Cisco TAC (attach@cisco.com).
- If neither the "email" nor the "http" keyword is specified, the service request number is required for both long-text and XML message formats and is provided in the subject line of the email.
- If the HTTP option is specified, the CiscoTAC-1 profile destination HTTP or HTTPS URL is used as the destination. The destination email address can be specified so that Smart Call Home can forward the message to the email address. The user must specify either the destination email address or an SR number but they can also specify both.

To execute a command and send the command output, perform the following step:

SUMMARY STEPS

1. **call-home send** {*cli command* | *cli list*} [**email** *email* **msg-format** {**long-text** | **xml**} | **http** {**destination-email-address** *email*}] [**tac-service-request** *SR#*]

DETAILED STEPS

	Command or Action	Purpose

Step 1	**call-home send** {*cli command* | *cli list*} [**email** *email* **msg-format** {**long-text** | **xml**} | **http** {**destination-email-address** *email*}] [**tac-service-request** *SR#*]
	Example:
	`Router# call-home send "show version;show running-config;`
	`show inventory" email support@example.com msg-format xml`
		Executes the CLI or CLI list and sends output via email or HTTP.
		• {*cli command* | *cli list*}—Specifies the IOS command or list of IOS commands (separated by ';'). It can be any run command, including commands for all modules. The commands must be contained in quotes ("").
		• **email** *email* **msg-format** {**long-text** | **xml**}—If the **email** option is selected, the command output will be sent to the specified email address in long-text or XML format with the service request number in the subject. The email address, the service request number, or both must be specified. The service request number is required if the email address is not specified (default is attach@cisco.com for long-text format and callhome@cisco.com for XML format).
		• **http** {**destination-email-address** *email*}—If the **http** option is selected, the command output will be sent to Smart Call Home backend server (URL specified in the CiscoTAC-1 profile) in XML format. **destination-email-address** *email* can be specified so that the backend server can forward the message to the email address. The email address, the service request number, or both must be specified.
		• **tac-service-request** *SR#*—Specifies the service request number. The service request number is required if the email address is not specified.

Configuring Diagnostic Signatures

Configuring Diagnostic Signatures

The Diagnostic Signatures feature downloads digitally signed signatures to devices. Diagnostic Signatures (DS) files are formatted files that collate knowledge of diagnostic events and provide methods to troubleshoot them without a need to upgrade the Cisco software. The aim of DS is to deliver flexible intelligence that can detect and collect troubleshooting information that can be used to resolve known problems in customers networks.

Prerequisites for Diagnostic Signatures

Before you download and configure diagnostic signatures (DSs) on a device, you must ensure that the following conditions are met:

- You must assign one or more DSs to the device. See the Diagnostic Signature Downloading, on page 28 for more information on how to assign DSs to devices.
- HTTP/Secure HTTP (HTTPS) transport is required for downloading DS files. You must install the certification authority (CA) certificate to enable the authentication of the destination HTTPS server.

Note If you configure the trustpool feature, the CA certificate is not required.

Information About Diagnostic Signatures

Diagnostic Signatures Overview

Diagnostic signatures (DS) for the Call Home system provides a flexible framework that allows the defining of new events and corresponding CLIs that can analyze these events without upgrading the Cisco software.

DSs provide the ability to define more types of events and trigger types than the standard Call Home feature supports. The DS subsystem downloads and processes files on a device as well as handles callbacks for diagnostic signature events.

The Diagnostic Signature feature downloads digitally signed signatures that are in the form of files to devices. DS files are formatted files that collate the knowledge of diagnostic events and provide methods to troubleshoot these events.

DS files contain XML data to specify the event description, and these files include CLI commands or scripts to perform required actions. These files are digitally signed by Cisco or a third party to certify their integrity, reliability, and security.

The structure of a DS file can be one of the following formats:

- Metadata-based simple signature that specifies the event type and contains other information that can be used to match the event and perform actions such as collecting information by using the CLI. The signature can also change configurations on the device as a workaround for certain bugs.
- Embedded Event Manager (EEM) Tool Command Language (Tcl) script-based signature that specifies new events in the event register line and additional action in the Tcl script.
- Combination of both the formats above.

The following basic information is contained in a DS file:

- ID (unique number): unique key that represents a DS file that can be used to search a DS.
- Name (ShortDescription): unique description of the DS file that can be used in lists for selection.
- Description: long description about the signature.
- Revision: version number, which increments when the DS content is updated.
- Event & Action: defines the event to be detected and the action to be performed after the event happens.

Diagnostic Signature Downloading

To download the diagnostic signature (DS) file, you require the secure HTTP (HTTPS) protocol. If you have already configured an email transport method to download files on your device, you must change your assigned profile transport method to HTTPS to download and use DS.

Cisco software uses a PKI Trustpool Management feature, which is enabled by default on devices, to create a scheme to provision, store, and manage a pool of certificates from known certification authorities (CAs). The trustpool feature installs the CA certificate automatically. The CA certificate is required for the authentication of the destination HTTPS servers.

There are two types of DS update requests to download DS files: regular and forced-download. Regular download requests DS files that were recently updated. You can trigger a regular download request either by using a periodic configuration or by initiating an on-demand CLI. The regular download update happens only when the version of the requested DS is different from the version of the DS on the device. Periodic download is only started after there is any DS assigned to the device from DS web portal. After the assignment happens, the response to the periodic inventory message from the same device will include a field to notify device to start its periodic DS download/update. In a DS update request message, the status and revision number of the DS is included such that only a DS with the latest revision number is downloaded.

Forced-download downloads a specific DS or a set of DSes. You can trigger the forced-download update request only by initiating an on-demand CLI. In a force-download update request, the latest version of the DS file is downloaded irrespective of the current DS file version on the device.

The DS file is digitally signed, and signature verification is performed on every downloaded DS file to make sure it is from a trusted source.

Diagnostic Signature Workflow

The diagnostic signature feature is enabled by default in Cisco software. The following is the workflow for using diagnostic signatures:

1. Find the DS(es) you want to download and assign them to the device. This step is mandatory for regular periodic download, but not required for forced download.
2. The device downloads all assigned DS(es) or a specific DS by regular periodic download or by on-demand forced download.
3. The device verifies the digital signature of every single DS. If verification passes, the device stores the DS file into a non-removable disk, such as bootflash or hard disk. This is so that DS files can be read after the device is reloaded. For example, on the Cisco CSR 1000v, the DS file is stored in the bootflash:/call home directory.
4. The device continues sending periodic regular DS download requests to get the latest revision of DS and replace the older one in device.
5. The device monitors the event and executes the actions defined in the DS when the event happens.

Diagnostic Signature Events and Actions

The events and actions sections are the key areas used in diagnostic signatures. The event section defines all event attributes that are used for event detection. The action section lists all actions which should be performed after the event happens, such as collecting s**how** command outputs and sending them to Smart Call Home to parse.

Diagnostic Signature Event Detection

Event detection in a DS is defined in two ways: single event detection and multiple event detection.

Diagnostic Signature Actions

The diagnostic signature (DS) file consists of various actions that must be initiated when an event occurs. The action type indicates the kind of action that will be initiated in response to a certain event.

Variables are elements within a DS that are used to customize the files.

DS actions are categorized into the following four types:

- call-home
- command
- emailto
- script

DS action types call-home and emailto collect event data and send a message to call-home servers or to the defined email addresses. The message uses “diagnostic-signature” as its message type and DS ID as the message sub-type.

The commands defined for the DS action type initiate CLI commands that can change configuration of the device, collect show command outputs, or run any EXEC command on the device. The DS action type script executes Tcl scripts.

Diagnostic Signature Variables

Variables are referenced within a DS and are used to customize the DS file. All DS variable names have the prefix ds_ to separate them from other variables. The following are the supported DS variable types:

- System variable: variables assigned automatically by the device without any configuration changes. The Diagnostic Signatures feature supports two system variables: ds_hostname and ds_signature_id.
- Environment variable: values assigned manually by using the **environment** *variable-name variable-value* command in call-home diagnostic-signature configuration mode. Use the **show call-home diagnostic-signature** command to display the name and value of all DS environment variables. If the DS file contains unresolved environment variables, this DS will stay in pending status until the variable gets resolved.
- Prompt variable: values assigned manually by using the **call-home diagnostic-signature install** *ds-id* command in privileged EXEC mode. If you do not set this value, the status of the DS indicates pending.
- Regular expression variable: values assigned from a regular expression pattern match with predefined CLI command outputs. The value is assigned during the DS run.
- Syslog event variable: values assigned during a syslog event detection in the DS file. This variable is valid only for syslog event detection.

How to Configure Diagnostic Signatures

Configuring the Call Home Service for Diagnostic Signatures

Configure the Call Home Service feature to set attributes such as the contact email address where notifications related with diagnostic signatures (DS) are sent and destination HTTP/secure HTTP (HTTPS) URL to download the DS files from.

You can also create a new user profile, configure correct attributes and assign it as the DS profile. For periodic downloads, the request is sent out just following full inventory message. By changing the inventory periodic configuration, the DS periodic download also gets rescheduled.

Note The predefined CiscoTAC-1 profile is enabled as a DS profile by default and we recommend using it. If used, you only need to change the destination transport-method to the **http** setting.

SUMMARY STEPS

1. **configure terminal**
2. **service call-home**
3. **call-home**
4. **contact-email-addr** *email-address*
5. **mail-server** {*ipv4-addr* | *name*} **priority** *number*
6. **profile** *profile-name*
7. **destination transport-method** {**email** | **http**}
8. **destination address** {**email** *address* | **http** *url*}
9. **subscribe-to-alert-group inventory** [**periodic** {**daily** *hh*:*mm* | **monthly** *day hh*:*mm* | **weekly** *day hh*:*mm*}]
10. **exit**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**configure terminal** **Example:** `Router# configure terminal`	Enters global configuration mode.
Step 2	**service call-home** **Example:** `Router(config)# service call-home`	Enables Call Home service on a device.
Step 3	**call-home** **Example:** `Router(config)# call-home`	Enters call-home configuration mode for the configuration of Call Home settings.
Step 4	**contact-email-addr** *email-address* **Example:** `Router(cfg-call-home)# contact-email-addr userid@example.com`	(Optional) Assigns an email address to be used for Call Home customer contact.

	Command or Action	Purpose
Step 5	**mail-server** {*ipv4-addr* | *name*} **priority** *number* **Example:** `Router(cfg-call-home)# mail-server 10.1.1.1 priority 4`	(Optional) Configures a Simple Mail Transfer Protocol (SMTP) email server address for Call Home. This command is only used when sending email is part of the actions defined in any DS.
Step 6	**profile** *profile-name* **Example:** `Router(cfg-call-home)# profile user1`	Configures a destination profile for Call Home and enters call-home profile configuration mode.
Step 7	**destination transport-method** {**email** | **http**} **Example:** `Router(cfg-call-home-profile)# destination transport-method http`	Specifies a transport method for a destination profile in the Call Home. **Note** To configure diagnostic signatures, you must use the **http** option.
Step 8	**destination address** {**email** *address* | **http** *url*} **Example:** `Router(cfg-call-home-profile)# destination address http https://tools.cisco.com/its/service/oddce/services/DDCEService`	Configures the address type and location to which call-home messages are sent. **Note** To configure diagnostic signatures, you must use the **http** option.
Step 9	**subscribe-to-alert-group inventory** [**periodic** {**daily** *hh*:*mm* | **monthly** *day hh*:*mm* | **weekly** *day hh*:*mm*}] **Example:** `Router(cfg-call-home-profile)# subscribe-to-alert-group inventory periodic daily 14:30`	Configures a destination profile to send messages for the Inventory alert group for Call Home. • This command is used only for the periodic downloading of DS files.
Step 10	**exit** **Example:** `Router(cfg-call-home-profile)# exit`	Exits call-home profile configuration mode and returns to call-home configuration mode.

What to do next

What to Do Next

Set the profile configured in the previous procedure as the DS profile and configure other DS parameters.

Configuring Diagnostic Signatures

The Diagnostic Signatures feature downloads digitally signed signatures to devices. Diagnostic Signatures (DS) files are formatted files that collate knowledge of diagnostic events and provide methods to troubleshoot them without a need to upgrade the Cisco software. The aim of DS is to deliver flexible intelligence that can

detect and collect troubleshooting information that can be used to resolve known problems in customers networks.

Configuration Examples for Diagnostic Signatures

The following example shows how to enable the periodic downloading request for diagnostic signature (DS) files. This configuration will send download requests to the service call-home server daily at 2:30 p.m. to check for updated DS files. The transport method is set to HTTP.

```
Router> enable
Router# configure terminal
Router(config)# service call-home
Router(config)# call-home
Router(cfg-call-home)# contact-email-addr userid@example.com
Router(cfg-call-home)# mail-server 10.1.1.1 priority 4
Router(cfg-call-home)# profile user-1
Router(cfg-call-home-profile)# destination transport-method http
Router(cfg-call-home-profile)# destination address http
https://tools.cisco.com/its/service/oddce/services/DDCEService
Router(cfg-call-home-profile)# subscribe-to-alert-group inventory periodic daily 14:30
Router(cfg-call-home-profile)# exit
Router(cfg-call-home)# diagnostic-signature
Router(cfg-call-home-diag-sign)# profile user1
Router(cfg-call-home-diag-sign)# environment ds_env1 envarval
Router(cfg-call-home-diag-sign)# end
```

The following is sample output from the **show call-home diagnostic-signature** command for the configuration displayed above:

```
Router# show call-home diagnostic-signature
Current diagnostic-signature settings:
Diagnostic-signature: enabled
Profile: user1 (status: ACTIVE)
Environment variable:
ds_env1: abc
Downloaded DSes:
DS ID    DS Name                         Revision Status     Last Update (GMT+00:00)
-------- ------------------------------- -------- ---------- -------------------
6015     CronInterval                    1.0      registered 2013-01-16 04:49:52
6030     ActCH                           1.0      registered 2013-01-16 06:10:22
6032     MultiEvents                     1.0      registered 2013-01-16 06:10:37
6033     PureTCL                         1.0      registered 2013-01-16 06:11:48
```

Displaying Call Home Configuration Information

You can use variations of the **show call-home** command to display Call Home configuration information.

SUMMARY STEPS

1. **show call-home**
2. **show call-home detail**
3. **show call-home alert-group**
4. **show call-home mail-server status**
5. **show call-home profile** {**all** | *name*}
6. **show call-home statistics** [**detail** | **profile** *profile-name*]

DETAILED STEPS

	Command or Action	Purpose
Step 1	**show call-home** **Example:** `Router# show call-home`	Displays the Call Home configuration in summary.
Step 2	**show call-home detail** **Example:** `Router# show call-home detail`	Displays the Call Home configuration in detail.
Step 3	**show call-home alert-group** **Example:** `Router# show call-home alert-group`	Displays the available alert groups and their status.
Step 4	**show call-home mail-server status** **Example:** `Router# show call-home mail-server status`	Checks and displays the availability of the configured email server(s).
Step 5	**show call-home profile** {**all** | *name*} **Example:** `Router# show call-home profile all`	Displays the configuration of the specified destination profile. Use the **all** keyword to display the configuration of all destination profiles.
Step 6	**show call-home statistics** [**detail** | **profile** *profile-name*] **Example:** `Router# show call-home statistics`	Displays the statistics of Call Home events.

Examples

Examples 1 to 7 show sample output when using different options of the **show call-home** command.

Call Home Information in Summary

```
Router# show call-home
Current call home settings:
    call home feature : enable
    call home message's from address: router@example.com
    call home message's reply-to address: support@example.com
    vrf for call-home messages: Not yet set up
    contact person's email address: technical@example.com
    contact person's phone number: +1-408-555-1234
    street address: 1234 Picaboo Street, Any city, Any state, 12345
    customer ID: ExampleCorp
```

```
    contract ID: X123456789
    site ID: SantaClara
    source ip address: Not yet set up
    source interface: GigabitEthernet1
    Mail-server[1]: Address: 192.168.2.1 Priority: 1
    Mail-server[2]: Address: 209.165.254.254 Priority: 2
    http proxy: 192.168.1.1:80
    aaa-authorization: disable
    aaa-authorization username: callhome (default)
    data-privacy: normal
    syslog throttling: enable
    Rate-limit: 20 message(s) per minute
    Snapshot command[0]: show version
    Snapshot command[1]: show clock
Available alert groups:
    Keyword                  State   Description
    ------------------------ ------- --------------------------------
    configuration            Enable  configuration info
    crash                    Enable  crash and traceback info
    inventory                Enable  inventory info
    snapshot                 Enable  snapshot info
    syslog                   Enable  syslog info
Profiles:
    Profile Name: campus-noc
    Profile Name: CiscoTAC-1
```

Call Home Information in Detail

```
Router# show call-home detail

Current call home settings:
    call home feature : enable
    call home message's from address: router@example.com
    call home message's reply-to address: support@example.com
    vrf for call-home messages: Not yet set up
    contact person's email address: technical@example.com
    contact person's phone number: +1-408-555-1234
    street address: 1234 Picaboo Street, Any city, Any state, 12345
    customer ID: ExampleCorp
    contract ID: X123456789
    site ID: SantaClara
    source ip address: Not yet set up
    source interface: GigabitEthernet1
    Mail-server[1]: Address: 192.168.2.1 Priority: 1
    Mail-server[2]: Address: 209.165.254.254 Priority: 2
    http proxy: 192.168.1.1:80
    aaa-authorization: disable
    aaa-authorization username: callhome (default)
    data-privacy: normal
    syslog throttling: enable
    Rate-limit: 20 message(s) per minute
    Snapshot command[0]: show version
    Snapshot command[1]: show clock
Available alert groups:
    Keyword                  State   Description
    ------------------------ ------- --------------------------------
    configuration            Enable  configuration info
    crash                    Enable  crash and traceback info
    inventory                Enable  inventory info
    snapshot                 Enable  snapshot info
    syslog                   Enable  syslog info
Profiles:
Profile Name: campus-noc
```

```
    Profile status: ACTIVE
    Preferred Message Format: xml
    Message Size Limit: 3145728 Bytes
    Transport Method: email
    Email address(es): noc@example.com
    HTTP  address(es): Not yet set up
    Alert-group               Severity
    ------------------------  ------------
    configuration             normal
    crash                     normal
    inventory                 normal
    Syslog-Pattern            Severity
    ------------------------  ------------
 .*CALL_LOOP.*             debug
Profile Name: CiscoTAC-1
    Profile status: INACTIVE
    Profile mode: Full Reporting
    Preferred Message Format: xml
    Message Size Limit: 3145728 Bytes
    Transport Method: email
    Email address(es): callhome@cisco.com
    HTTP  address(es): https://tools.cisco.com/its/service/oddce/services/DDCEService
    Periodic configuration info message is scheduled every 14 day of the month at 11:12
    Periodic inventory info message is scheduled every 14 day of the month at 10:57
    Alert-group               Severity
    ------------------------  ------------
    crash                     normal

    Syslog-Pattern            Severity
    ------------------------  ------------
 .*CALL_LOOP.*             debug
```

Available Call Home Alert Groups

```
Router# show call-home alert-group

Available alert groups:
    Keyword                   State   Description
    ------------------------ ------- --------------------------------
    configuration             Enable  configuration info
    crash                     Enable  crash and traceback info
    inventory                 Enable  inventory info
    snapshot                  Enable  snapshot info
    syslog                    Enable  syslog info
```

email Server Status Information

```
Router# show call-home mail-server status
Please wait. Checking for mail server status ...
    Mail-server[1]: Address: 192.168.2.1 Priority: 1 [Not Available]
    Mail-server[2]: Address: 209.165.254.254 Priority: 2 [Available]
```

Information for All Destination Profiles

```
Router# show call-home profile all
Profile Name: campus-noc
    Profile status: ACTIVE
    Preferred Message Format: xml
    Message Size Limit: 3145728 Bytes
    Transport Method: email
```

```
    Email address(es): noc@example.com
    HTTP  address(es): Not yet set up
    Alert-group               Severity
    ------------------------  ------------
    configuration             normal
    crash                     normal
    inventory                 normal
    Syslog-Pattern            Severity
    ------------------------  ------------
 .*CALL_LOOP.*             debug
Profile Name: CiscoTAC-1
    Profile status: INACTIVE
    Profile mode: Full Reporting
    Preferred Message Format: xml
    Message Size Limit: 3145728 Bytes
    Transport Method: email
    Email address(es): callhome@cisco.com
    HTTP  address(es): https://tools.cisco.com/its/service/oddce/services/DDCEService
    Periodic configuration info message is scheduled every 14 day of the month at 11:12
    Periodic inventory info message is scheduled every 14 day of the month at 10:57
    Alert-group               Severity
    ------------------------  ------------
    crash                     normal

    Syslog-Pattern            Severity
    ------------------------  ------------
 .*CALL_LOOP.*             debug
```

Information for a User-Defined Destination Profile

```
Router# show call-home profile campus-noc
Profile Name: campus-noc
    Profile status: ACTIVE
    Preferred Message Format: xml
    Message Size Limit: 3145728 Bytes
    Transport Method: email
    Email address(es): noc@example.com
    HTTP  address(es): Not yet set up
    Alert-group               Severity
    ------------------------  ------------
    configuration             normal
    crash                     normal
    inventory                 normal
    Syslog-Pattern            Severity
    ------------------------  ------------
 .*CALL_LOOP.*             debug
```

Call Home Statistics

```
Router# show call-home statistics
Message Types    Total                Email                HTTP
-------------   -------------------- -------------------- ------------------
Total Success   3                    3                    0
    Config      3                    3                    0
    Crash       0                    0                    0
    Inventory   0                    0                    0
    Snapshot    0                    0                    0
    SysLog      0                    0                    0
    Test        0                    0                    0
    Request     0                    0                    0
    Send-CLI    0                    0                    0
```

```
Total In-Queue  0                    0                    0
    Config      0                    0                    0
    Crash       0                    0                    0
    Inventory   0                    0                    0
    Snapshot    0                    0                    0
    SysLog      0                    0                    0
    Test        0                    0                    0
    Request     0                    0                    0
    Send-CLI    0                    0                    0
Total Failed    0                    0                    0
    Config      0                    0                    0
    Crash       0                    0                    0
    Inventory   0                    0                    0
    Snapshot    0                    0                    0
    SysLog      0                    0                    0
    Test        0                    0                    0
    Request     0                    0                    0
    Send-CLI    0                    0                    0
Total Ratelimit
      -dropped  0                    0                    0
    Config      0                    0                    0
    Crash       0                    0                    0
    Inventory   0                    0                    0
    Snapshot    0                    0                    0
    SysLog      0                    0                    0
    Test        0                    0                    0
    Request     0                    0                    0
    Send-CLI    0                    0                    0
Last call-home message sent time: 2011-09-26 23:26:50 GMT-08:00
```

Default Settings

Table 2: Default Call Home Settings

Parameters	Default
Call Home feature status	Disabled
User-defined profile status	Active
Predefined CiscoTAC-1 profile status	Inactive
Transport method	email
Message format type	XML
Alert group status	Enabled
Call Home message severity threshold	Debug
Message rate limit for messages per minute	20
AAA authorization	Disabled
Call Home syslog message throttling	Enabled
Data privacy level	Normal

Alert Group Trigger Events and Commands

Call Home trigger events are grouped into alert groups, with each alert group assigned commands to execute when an event occurs. The command output is included in the transmitted message. The *Call Home Alert Groups, Events, and Actions* section lists the trigger events included in each alert group, including the severity level of each event and the executed commands for the alert group.

Table 3: Call Home Alert Groups, Events, and Actions

Alert Group	Call Home Trigger Event	Syslog Event	Severity	Description and Commands Executed
Crash	SYSTEM_CRASH	—	—	Events related to system crash. Commands executed: **show version**, **show logging**, **show region**, **show stack**.
—	TRACEBACK	—	—	Detects software traceback events. Commands executed: **show version**, **show logging**, **show region**, **show stack**.
Configuration	—	—	—	User-generated request for configuration or configuration change event. Commands executed: **show platform**,**show running-config all**, **show startup-config**, **show version**.
Inventory	—	—	—	User-generated request for inventory event. Commands executed: **show diag all eeprom detail | include MAC**, **show license all** , **show platform**, **show platform hardware qfp active infrastructure chipset 0 capabilities**, **show platform software vnic-if interface-mapping**, **show version**.
Syslog	—	—	—	User-generated Syslog event. Commands executed: **show logging**

Message Contents

The following tables display the content formats of alert group messages:

- The section and table below, "Format for a Short Text Message", shows the content fields of a short text message.
- The section and table below, "Common Fields for All Long Text and XML Messages", shows the content fields that are common to all long text and XML messages. The fields specific to a particular alert group message are inserted at a point between the common fields. The insertion point is identified in the table.

To see a sample syslog message alert, see Sample Syslog Alert Notification in XML Format, on page 42.

Table 4: Format for a Short Text Message

Data Item	Description
Device identification	Configured device name
Date/time stamp	Time stamp of the triggering event
Error isolation message	Plain English description of triggering event
Alarm urgency level	Error level such as that applied to a system message

Table 5: Common Fields for All Long Text and XML Messages

Data Item(Plain Text and XML)	Description(Plain Text and XML)	Call-Home Message Tag (XML Only)
Time stamp	Date and time stamp of event in ISO time notation: *YYYY-MM-DD HH:MM:SS GMT+HH:MM*.	CallHome/EventTime
Message name	Name of message. Specific event names are listed in Alert Group Trigger Events and Commands, on page 38.	For short text message only
Message type	Specifically “Call Home”.	CallHome/Event/Type
Message subtype	Specific type of message: full, delta, test	CallHome/Event/SubType
Message group	Specifically “reactive”. Optional because default is “reactive”.	For long-text message only

Data Item(Plain Text and XML)	Description(Plain Text and XML)	Call-Home Message Tag (XML Only)
Severity level	Severity level of message (see table "Severity and Syslog Level Mapping" in section Message Severity Threshold, on page 15).	Body/Block/Severity
Source ID	Product type for routing through the workflow engine. This is typically the product family name.	For long-text message only
Device ID	Unique device identifier (UDI) for end device generating message. This field should be empty if the message is nonspecific to a fabric switch. The format is *type@Sid@seria* l. • *type* is the product model number from backplane IDPROM. • **@** is a separator character. • *Sid* is C, identifying the serial ID as a chassis serial number. • *serial* is the number identified by the Sid field. Example: `CISCO3845@C@12345678`	CallHome/CustomerData/ContractData/DeviceId
Customer ID	Optional user-configurable field used for contract information or other ID by any support service.	CallHome/CustomerData/ContractData/CustomerId
Contract ID	Optional user-configurable field used for contract information or other ID by any support service.	CallHome/CustomerData/ContractData/ContractId

Data Item(Plain Text and XML)	Description(Plain Text and XML)	Call-Home Message Tag (XML Only)
Site ID	Optional user-configurable field used for Cisco-supplied site ID or other data meaningful to alternate support service.	CallHome/CustomerData/ContractData/SiteId
Server ID	If the message is generated from the fabric switch, this is the unique device identifier (UDI) of the switch. The format is *type@Sid@serial*. • *type* is the product model number from backplane IDPROM. • **@** is a separator character. • *Sid* is C, identifying the serial ID as a chassis serial number. • *serial* is the number identified by the Sid field. Example: `CISCO3845@C@12345678`	For long text message only
Message description	Short text describing the error.	CallHome/MessageDescription
Device name	Node that experienced the event. This is the host name of the device.	CallHome/CustomerData/SystemInfo/NameName
Contact name	Name of person to contact for issues associated with the node experiencing the event.	CallHome/CustomerData/SystemInfo/Contact
Contact email	email address of person identified as contact for this unit.	CallHome/CustomerData/SystemInfo/ContactEmail

Data Item(Plain Text and XML)	Description(Plain Text and XML)	Call-Home Message Tag (XML Only)
Contact phone number	Phone number of the person identified as the contact for this unit.	CallHome/CustomerData/SystemInfo/ContactPhoneNumber
Street address	Optional field containing street address for RMA part shipments associated with this unit.	CallHome/CustomerData/SystemInfo/StreetAddress
Model name	Model name of the router. This is the “specific model as part of a product family name.	CallHome/Device/Cisco_Chassis/Model
Serial number	Chassis serial number of the unit.	CallHome/Device/Cisco_Chassis/SerialNumber
System object ID	System Object ID that uniquely identifies the system.	`CallHome/Device/Cisco_Chassis/AdditionalInformation/AD@name=“sysObjectID”`
System description	System description for the managed element.	`CallHome/Device/Cisco_Chassis/AdditionalInformation/AD@name=“sysDescr”`

Table 6: Inserted Fields Specific to a Particular Alert Group Message

Data Item(Plain Text and XML)	Description(Plain Text and XML)	Call-Home Message Tag (XML Only)
The following fields may be repeated if multiple commands are executed for this alert group.		
Command output name	Exact name of the issued command.	/aml/Attachments/Attachment/Name
Attachment type	Attachment type. Usually “inline”.	/aml/Attachments/Attachment@type
MIME type	Normally “text” or “plain” or encoding type.	/aml/Attachments/Attachment/Data@encoding
Command output text	Output of command automatically executed (see table "Call Home Alert Groups, Events, and Actions" in section Alert Group Trigger Events and Commands, on page 38).	/mml/attachments/attachment/atdata

Sample Syslog Alert Notification in XML Format

```
<?xml version="1.0" encoding="UTF-8"?>
<soap-env:Envelope xmlns:soap-env="http://www.w3.org/2003/05/soap-envelope">
<soap-env:Header>
<aml-session:Session xmlns:aml-session="http://www.cisco.com/2004/01/aml-session"
```

```
soap-env:mustUnderstand="true"
soap-env:role="http://www.w3.org/2003/05/soap-envelope/role/next">
<aml-session:To>http://tools.cisco.com/neddce/services/DDCEService</aml-session:To>
<aml-session:Path>
<aml-session:Via>http://www.cisco.com/appliance/uri</aml-session:Via>
</aml-session:Path>
<aml-session:From>http://www.cisco.com/appliance/uri</aml-session:From>
<aml-session:MessageId>M8:9S1NMSF22DW:51AEAC68</aml-session:MessageId>
</aml-session:Session>
</soap-env:Header>
<soap-env:Body>
<aml-block:Block xmlns:aml-block="http://www.cisco.com/2004/01/aml-block">
<aml-block:Header>
<aml-block:Type>http://www.cisco.com/2005/05/callhome/syslog</aml-block:Type>
<aml-block:CreationDate>2013-06-05 03:11:36 GMT+00:00</aml-block:CreationDate>
<aml-block:Builder>
<aml-block:Name>CSR1000v</aml-block:Name>
<aml-block:Version>2.0</aml-block:Version>
</aml-block:Builder>
<aml-block:BlockGroup>
<aml-block:GroupId>G9:9S1NMSF22DW:51AEAC68</aml-block:GroupId>
<aml-block:Number>0</aml-block:Number>
<aml-block:IsLast>true</aml-block:IsLast>
<aml-block:IsPrimary>true</aml-block:IsPrimary>
<aml-block:WaitForPrimary>false</aml-block:WaitForPrimary>
</aml-block:BlockGroup>
<aml-block:Severity>2</aml-block:Severity>
</aml-block:Header>
<aml-block:Content>
<ch:CallHome xmlns:ch="http://www.cisco.com/2005/05/callhome" version="1.0">
<ch:EventTime>2013-06-05 03:11:36 GMT+00:00</ch:EventTime> <ch:MessageDescription>*Jun  5
03:11:36.041: %CLEAR-5-COUNTERS: Clear counter on all interfaces by
console</ch:MessageDescription> <ch:Event> <ch:Type>syslog</ch:Type> <ch:SubType></ch:SubType>
 <ch:Brand>Cisco Systems</ch:Brand> <ch:Series>CSR1000v Cloud Services Router</ch:Series>
</ch:Event> <ch:CustomerData> <ch:UserData> <ch:Email>weijuhua@cisco.com</ch:Email>
</ch:UserData>
<ch:ContractData>
<ch:CustomerId></ch:CustomerId>
<ch:SiteId></ch:SiteId>
<ch:ContractId></ch:ContractId>
<ch:DeviceId>CSR1000v@C@9S1NMSF22DW</ch:DeviceId>
</ch:ContractData>
<ch:SystemInfo>
<ch:Name>qiang-vm</ch:Name>
<ch:Contact></ch:Contact>
<ch:ContactEmail>weijuhua@cisco.com</ch:ContactEmail>
<ch:ContactPhoneNumber></ch:ContactPhoneNumber>
<ch:StreetAddress></ch:StreetAddress>
</ch:SystemInfo>
<ch:CCOID></ch:CCOID>
<ch:IdToken></ch:IdToken>
</ch:CustomerData>
<ch:Device>
<rme:Chassis xmlns:rme="http://www.cisco.com/rme/4.0">
<rme:Model>CSR1000v</rme:Model>
<rme:HardwareVersion></rme:HardwareVersion>
<rme:SerialNumber>9S1NMSF22DW</rme:SerialNumber>
<rme:AdditionalInformation>
<rme:AD name="PartNumber" value="" />
<rme:AD name="SoftwareVersion" value="15.4(20130604:093915)" /> <rme:AD name="SystemObjectId"
 value="1.3.6.1.4.1.9.1.1537" /> <rme:AD name="SystemDescription" value="Cisco IOS Software,
 CSR1000v Software (X86_64_LINUX_IOSD-ADVENTERPRISEK9-M), Experimental Version
15.4(20130604:093915) [mcp_dev-qiazhou-ultra_ut 100] Copyright (c) 1986-2013 by Cisco
Systems, Inc.
```

```
Compiled Tue 04-Jun-13 02:39 by jsmith" /> <rme:AD name="ServiceNumber" value="" /> <rme:AD
 name="ForwardAddress" value="" /> </rme:AdditionalInformation> </rme:Chassis> </ch:Device>
 </ch:CallHome> </aml-block:Content> <aml-block:Attachments> <aml-block:Attachment
type="inline"> <aml-block:Name>show logging</aml-block:Name> <aml-block:Data encoding="plain">
 <![CDATA[show logging Syslog logging: enabled (0 messages dropped, 1 messages rate-limited,
 0 flushes, 0 overruns, xml disabled, filtering disabled)
No Active Message Discriminator.
No Inactive Message Discriminator.
    Console logging: level debugging, 391 messages logged, xml disabled,
                     filtering disabled
    Monitor logging: level debugging, 0 messages logged, xml disabled,
                     filtering disabled
    Buffer logging:  level debugging, 391 messages logged, xml disabled,
                    filtering disabled
    Exception Logging: size (4096 bytes)
    Count and timestamp logging messages: disabled
    Persistent logging: disabled
No active filter modules.
    Trap logging: level informational, 56 message lines logged
        Logging Source-Interface:       VRF Name:
Log Buffer (4096 bytes):
*Jun  5 03:11:18.295: %SYS-5-CONFIG_I: Configured from console by console
qiang-vm#]]></aml-block:Data> </aml-block:Attachment> </aml-block:Attachments>
</aml-block:Block> </soap-env:Body> </soap-env:Envelope>
```