

Smart Call Home: Catalyst 6500

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Introduction

The Smart Call Home system combines with the Call Home IOS feature to provide a mechanism to generate, transport, store, process, and analyze device system messages and information. Smart Call Home provides the following items:

- Notifications and corrective action recommendations
- Reports to the network administrators
- The Cisco service contract and entitlement system for device registration and contract management
- The Technical Assistance Center (TAC) service request tracking system with the ability to create and update service requests as an option in the corrective action recommendation process
- Improved security options: information about a device that is communicating with Smart Call Home's back-end systems may be sent encrypted over the Internet, and the network administrator may access the device information and event history using the Smart Call Home Web application over a secure connection

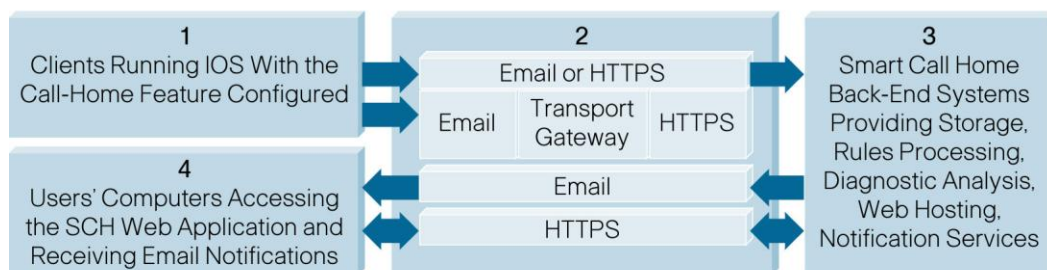
System Overview

The operation of Smart Call Home System may be divided into four main areas.

1. The client devices using the IOS Call Home feature to collect and package local information for transmission, using one of the Communications options to the back-end systems
2. The Communication options, which are used to transmit the data between:
 - The client devices and back-end system
 - The Web application/notification system and the user systems
3. The Smart Call Home back-end system that processes and stores information collected on client devices
4. User systems receiving notifications from the back-end notification system, and using the Web application to access the information stored in the back-end

Figure 1 shows how these four areas of the Smart Call Home system interact.

Figure 1. Smart Call Home System



IOS Call Home Client

The initial release of Smart Call Home supports the Catalyst® 6500 platform. A Catalyst 6500 with an IOS version that supports the Call Home feature is used as a Smart Call Home client device. A device must have Call Home configured and use one of the transport options to communicate with the Smart Call Home back-end. A client may send messages either periodically, as system events occur, or on demand by a user accessing the Command Line Interface (CLI) on the client to issue the Call Home command.

Periodic messages provide inventory and configuration information. Messages that are periodically generated by system events include the following message types.

- Diagnostic messages: Generated when GOLD (see [Generic Online Diagnostics on the Cisco Catalyst 6500 Series Switch](#)) failures occur
- Environmental messages: Sent when temperature, power, and other types of system related thresholds are crossed resulting in major, minor, or recovery alarms
- Inventory messages: Generated when changes occur, such as an online insertion and removal (OIR) of a module triggering an Inventory message
- Configuration messages: Triggered by a configuration event (exiting configuration mode)

Configuration, inventory, and diagnostic Call Home messages may also be sent using CLI Call Home commands.

Communication/Transport Options

Smart Call Home uses the two application layer protocols, HTTPS and SMTP, for its communications between clients, back-end systems, and application users. Three options are available to transport information collected from client devices. These are:

1. HTTPS from the client device to the back-end
2. SMTP to send e-mail via a local mail server to a Cisco Transport Gateway that forwards messages to the back-end using HTTPS
3. SMTP to send e-mail to the back-end via a local mail server

The transmission of information from the client to the back-end is secure when using options 1 and 2, because an additional encryption/authentication layer between HTTP and TCP is utilized for HTTPS. Communication between the back-end and users is accomplished using SMTP for e-mail notifications, and HTTPS for all Web application access.

Back-end

The Smart Call Home back-end handles a number of functions. These include:

- Reception, processing, analyzing, and storing of all supported messages
- Use of predefined rules on the processed data to analyze and respond to supported messages
- Communication with the Contract and Entitlement System to maintain client device registration
- Initiating optional service request creation in the TAC Service Request Tracking System
- Updating existing service requests when the service request option is enabled
- Hosting the Web application services
- Originating all e-mail notifications to users
- Management of client device and user registration
- Generation of reports

All of the Smart Call Home back-end functions are hosted at the Cisco systems facilities.

Notification and Web Application

A Smart Call Home user has the option to receive e-mail notifications, from the Smart Call Home system, when messages are received from client devices. These notifications may indicate one of the following:

- The need to register a device
- That updated inventory or configuration information is available
- Information about user events that are occurring on the client device

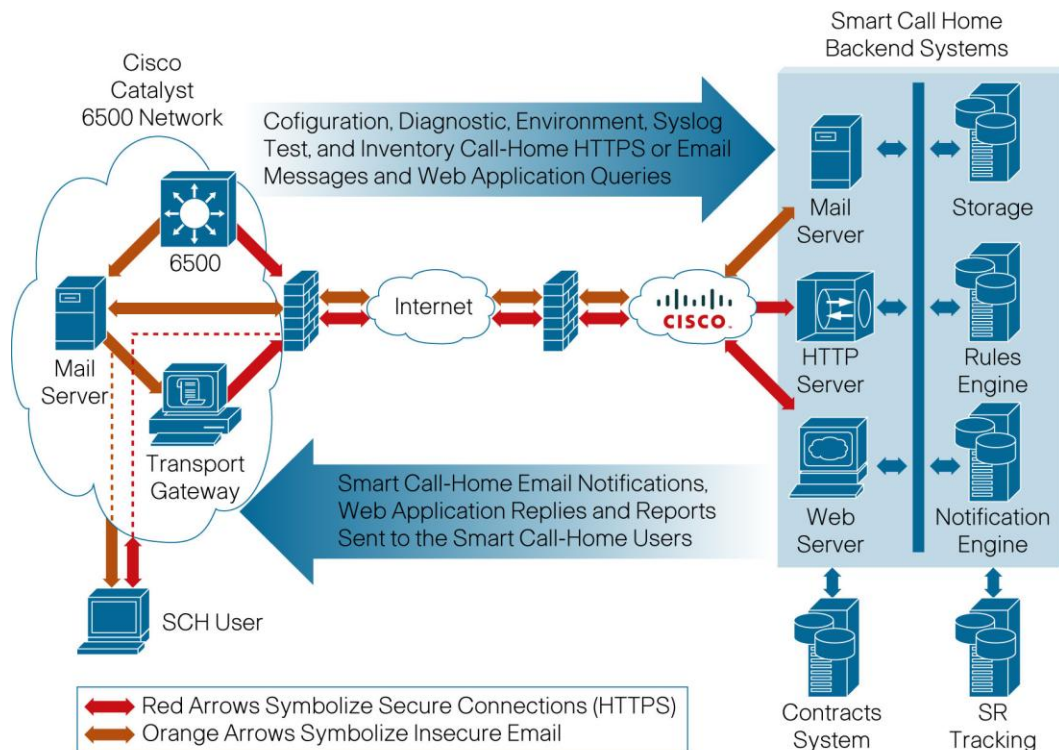
Analyses of events that have occurred on the device are stored along with the messages.

A Smart Call Home user may choose to have service requests created in the TAC Service Request Tracking System, if the results of the analyses include service request creation or updating. This option may be set per device by the Smart Call Home user. If the user has chosen this option, notifications related to Service Request (SR) activity will be sent to the user.

The user has access to the data stored in the Smart Call Home back-end systems with the Smart Call Home Web application. The Web application is used to register client devices and users with the Smart Call Home system. The Web application is also used to generate device and Call Home history reports. The user who has administration privileges is also able to manage user access to the system.

Figure 2 shows how messages, queries, replies, notifications and reports flow between a Catalyst 6500, the Smart Call Home back-end systems, and a Smart Call Home (SCH) User

Figure 2. Smart Call Home Information Flow



The Benefits of Smart Call Home

Smart Call Home will improve the customer service experience by reducing the average time to resolution. The following scenario is typical when Smart Call Home is not being used:

- System failures on a Catalyst 6500 are logged to the log buffer, sent to a Syslog server, or sent as SNMP traps to a network management station
- An operator may see this information and try to interpret and resolve the failure.
- If the operator is unable to interpret or resolve the issue a request may be made online or by phone to Cisco TAC for support. This will result in a TAC service request being opened.
- This service request is then placed in a queue based on certain technology or problem key words provided by the operator. The SR remains in the queue until a TAC Engineer is available.
- Upon taking ownership of the SR, a TAC engineer initiates contact with the customer via e-mail or by a phone call. The engineer may request information about the equipment or problem that may be in the form of outputs from the show tech-support and other CLI

commands and/or from observations made by the customer. In some cases the engineer may have to connect to the customer's network to gather the required information.

- When all of the information is collected and received by the engineer, a determination can be made about steps to take to resolve the problem. In some cases the original diagnosis or observations made by the customer may be incorrect and the SR may have to be placed in a different SR queue so that an engineer with the correct skill set could work on the problem.
- After the correct diagnosis is made, a solution may then be provided by the TAC engineer and implemented.

As is evident, this simplistic scenario required many steps with many opportunities for delay to be induced resulting in a time-to-resolution with significant variance. As a result, in most cases the SR requests may take from hours to days and even longer to resolve.

When a Catalyst 6500, with Call Home configured, encounters a failure, an e-mail or HTTP message is sent by the device to the Smart Call Home system. In most cases the message contains the information needed to perform a diagnosis by the Smart Call Home system or by a TAC engineer. The Smart Call Home system would process and apply diagnostic rules to the information in the message and provide a solution. The solution may be sent to the customer by e-mail or viewed using the Web application, and if it was necessary to engage a TAC engineer, the Smart Call Home system may also open a service request with all relevant information added. The TAC engineer will also have access to a database, maintained by Smart Call Home that contains the configuration, inventory and historical information from the switch.

Smart Call Home eliminates much of the delay involved in collecting and diagnosing a problem with improved diagnostics/fault isolation, using a consistent set of rules and faster notification of critical events and solutions.

Smart Call Home also assists with better network and device management by providing reports on the following items:

- Installed hardware and software.
- Tracking of technology and feature deployment.
- Field notices, PSIRT (Product Security Incident Response Team), and End of Life notifications.
- Historical event information and configuration best practices.

This information has the added benefit of providing better contract management and serves to improve hardware and software quality by identifying failure trends.

IOS Call Home Overview

Call Home is an IOS feature that monitors and reports on configuration, diagnostics, environmental, inventory, and system log (syslog) events. The Call Home functionality is available in IOS version 12.2(33) SXH, which is the minimum version required to support Call Home.

Note: Both Modular and Non-modular IOS are supported (for more modular information see [Cisco Catalyst 6500 with Cisco IOS® Software Modularity](#)).

For notification of these events, Call Home depends on the IOS Embedded Event Manager (EEM) subsystem (see [Embedded Event Manager \(EEM\) on the Cisco Catalyst 6500 Series](#)). Other IOS

subsystems such as the GOLD subsystem and other platform specific subsystems handle the detection and reporting of events to the Embedded Event Manager subsystem.

Call Home's capacity to respond to these event categories is configurable with options to support each event category under a special class called an alert group. Call Home also uses a structure called a profile that may be configured to handle multiple alert groups. Call Home supports inventory, configuration, diagnostic, environmental, and syslog alert groups. Call Home sends corresponding messages for the alert groups that are configured or subscribed to in a profile.

Call Home provides flexible message delivery and format options and uses the Extensible Markup Language (XML) format to communicate with the Smart Call Home system. XML is used because it provides a mechanism to identify structures within the message. Each XML message is also enclosed in an additional AML (Adaptive Messaging Language) Header and SOAP (Simple Object Access Protocol) wrapper. SOAP is XML-based and is a platform-and-language-independent communication protocol designed for use over the Internet for sending formatted messages for communication between applications.

Other Call Home message formats not supported by Smart Call Home include Clear Text Long and Short Text message formats. The Short Text format is suitable for pagers or printed reports and the Long Text format contains full formatted message information suitable for human reading. The XML messages contain the same data as the Clear Text Long message, but with the addition of XML tagging and AML-specific transport information to allow machine-readable parsing and routing of the message in the Smart Call Home system. The XML format is required when communicating with the Smart Call Home system.

Call Home offers options to transport messages using SMTP (e-mail) or HTTP. When the e-mail option is selected, messages may be sent to a Cisco Transport Gateway or the Smart Call Home system. When the HTTP transport option is used, messages are encrypted using HTTPS payload encryption and certificates. HTTPS is syntactically identical to HTTP, but it uses a different default port (443) and an additional encryption/authentication layer between HTTP and TCP. HTTP messages are sent by Call Home to a Smart Call Home HTTP server. The Cisco Transport Gateway also uses HTTPS to communicate with the Smart Call Home system.

Call Home Alert Groups

Call Home alert groups allow the system to group detectable events of a specific category for monitoring without having to specify each individual event. Each alert group has a fixed set of CLI commands that are invoked when an event in the alert group occurs. The purpose of the CLI commands is to obtain more information about the system and event at the time of the event. The output from each CLI command is included in the Call Home message that is sent.

The alert groups have additional qualifiers that can be specified. The diagnostic, environment, and syslog alert groups have severity qualifiers that allow monitoring of events that are greater than or equal to a configured severity level. The syslog alert group allows the user to specify a regular expression pattern to be matched when monitoring system log messages. The inventory and configuration alert groups allow the user to specify a periodic interval to generate notifications. This means that a "pseudo-event" will be generated at the interval specified, causing Call Home to generate and send a message.

An alert group may be completely disabled within the Call Home subsystem. When an alert group is disabled, a Call Home message will not be sent for an event in that alert group. But if the syslog

alert group is enabled, and the event in the disabled alert group generates a syslog message, then a syslog Call Home message may be sent.

Call Home Profiles

The Call Home profile provides a structure to bundle together several alert groups, to select transport methods for assigning multiple destination addresses, and to specify message format options. Call Home provides a default profile that is preconfigured for use with the Smart Call Home system. It also has the ability for multiple user-definable Call Home profiles to be configured. Each profile must be configured with a unique name. The default profile is called CiscoTAC-1. A profile may be configured, but its status may be inactive.

Figure 3 shows an example of an active Default Profile.

Figure 3. Call Home Active Default Profile

```
Cat6513-01#show call-home profile CiscoTAC-1

Profile Name: CiscoTAC-1
Profile status: ACTIVE
Preferred Message Format: xml
Message Size Limit: 3145728 Bytes
Preferred Transport Method: http
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 15 day of the month at 15:41
Periodic inventory info message is scheduled every 15 day of the month at 15:26

Alert-group          Severity
-----
diagnostic           minor
environment          minor

Syslog-Pattern      Severity
-----
.*                  major
```

In each profile, alert groups are configured with their qualifiers. These qualifiers may include the severity level, periodic scheduling options, and expression patterns for syslog messages. Up to five different syslog patterns may be defined for a syslog alert group per profile. The profile also contains the delivery options for Call Home messages generated for each alert group. Multiple destination addresses, message format options, and transport methods may be used in the delivery of Call Home messages related to alert group selections. Each profile has a default message size limit of 3,145,728 bytes. Since most messages will be much smaller than this size, there is no need to change it.

The only options that may be modified in the default profile are its activation state (inactive by default) and the transport method. Both e-mail and HTTP transport methods may be selected in a user-defined profile. Only one HTTP address or one e-mail address may be used to send messages to the Smart Call Home system. Therefore, if both transport methods are enabled, only one should be used to send messages to the Smart Call Home system. The CiscoTAC-1 default profile includes the Smart Call Home e-mail and HTTP addresses. Since the destination addresses cannot be configured in the CiscoTAC-1 default profile, only one transport method can be enabled. The default profile is defined to send periodic configuration and inventory messages once per

month, all diagnostic and environment messages of minor or higher serverity, and all syslog messages of major or higher severity.

Call Home Message Types

Call Home is capable of sending test, inventory, configuration, diagnostic, environmental, and syslog message types.

1. **TEST:** A Test message includes the output from the `show version`, `remote command switch show version`, `show install running`, and `show module` CLI commands. A Test message may be sent when an operator issues the `Call Home Test` CLI command.
2. **INVENTORY:** An Inventory message includes the output from the `show version`, `remote command switch show version`, `show install running`, `show module`, `show inventory`, `show diagbus`, and `show idprom all` CLI commands. Inventory messages may be triggered by an OIR event, sent periodically if a Profile has a periodic inventory configured, or by issuing the `Call Home send alert-group inventory` CLI command. Inventory messages have a sub-type of Delta if the message was triggered by an OIR event. Periodic messages, and messages sent using the `Call Home` command, have a sub-type of Full. An Inventory message is sent once per month when the default CiscoTAC-1 profile is active on a device.
3. **CONFIGURATION:** Configuration messages include the output from the `show version`, `remote command switch show version`, `show install running`, `show running-config`, and `show startup-config` CLI commands. Security-sensitive customer information, such as passwords, is removed. A configuration message may be triggered by a configuration event (exiting configuration mode) sent periodically if a profile has a periodic configuration configured, or sent by issuing the `Call Home send alert-group configuration` CLI command. Configuration messages have a sub-type of Delta if the message was triggered by a change in the running configuration. A configuration Delta message may be sent after device start-up because the running configuration changes as the start-up configuration is loaded. Periodic messages, and messages sent using the `Call Home` command, have a sub-type of Full. A Configuration message is sent once per month when the default CiscoTAC-1 Profile is active on a device.
4. **DIAGNOSTIC:** Diagnostic messages include the output from the `show version`, `remote command switch show version`, `show install running`, `show diagnostic result Module <module #> detail`, `show module`, `show inventory`, `show buffers`, `show logging`, and `show diagnostic result module all` CLI commands. Diagnostic Call Home messages are sent when consecutive GOLD major or minor failures thresholds are reached for certain module tests. They may also be sent using the `Call Home send alert-group diagnostic module` CLI command.
5. **ENVIRONMENT:** An environment message includes the output from the `show module`, `show environment`, `show power`, and `show logging` CLI commands. Environmental Call Home messages are sent when temperature, power and other types of system related thresholds are crossed resulting in major, minor, or recovery alarms. Environment thresholds are defined for clock count and status, voltage termination (VTT), fan operation, power supply output and usage, and inlet and outlet temperatures.
6. **SYSLOG** – A syslog message includes the output from the `show logging` CLI command. A syslog Call Home message is sent when an event occurs that results in the creation of a syslog message.

Call Home CLI Commands

Call Home has commands to perform the following operations:

1. Configuration: These commands are used to setup Call Home and its options in configuration mode. The `service Call Home` command is used to enable the Call Home feature. The following are some of the commands within Call Home configuration mode:

- `alert-group`: Enable or disable alert-groups
- `contact-email-addr`: System contact's e-mail address
- `contract-id`: Cisco contract identification (optional)
- `copy`: Copy a Call Home profile
- `customer-id`: Cisco Customer identification (optional)
- `default`: Set a command to its defaults
- `mail-server`: Configure Call Home mail servers
- `phone-number`: Phone number of the contact person (optional)
- `profile`: Enter Call Home profile configuration mode
- `rate-limit`: Configure Call Home message rate-limit threshold
- `sender`: Call Home message sender and reply-to e-mail addresses (optional)
- `site-id`: Cisco Site identification (optional)
- `street-address`: Street address for RMA part shipments (optional)

The contact person's phone number a street address, a site ID, a customer ID, and a contract ID are all included in the XML header of the Call Home message but are not required by the Smart Call Home system. The following are some of the commands, within profile configuration mode:

- `active`: Activate the current profile
- `default`: Set a command to its defaults
- `destination`: To set the following message destination related configuration to this profile
 - `address`: To add e-mail or HTTP addresses
 - `message-size-limit`: To specify message size limits
 - `preferred-msg-format`: To specify XML, Long, or Short message formats
 - `transport-method`: To specify e-mail or HTTP transport methods
- `subscribe-to-alert-group`: To select and setup the configuration, diagnostic, environment, inventory and syslog alert groups

A Call Home configuration script may be downloaded from the software center to automate the Call Home configuration and installation of the public key certificate. A complete listing and explanation of the Call Home commands and information on the Call Home configuration script are covered in the Catalyst 6500 [Software Configuration Guide](#) and [Command Reference](#) for IOS 12.2(SX).

Figure 4 shows an example of a configuration showing only Call Home commands.

Figure 4. Call Home Configuration

```

!
service call-home
!
call-home
sender from 6513-callhome@cisco.com
sender reply-to TestUser-1@cisco.com
contact-email-addr TestUser-1@cisco.com
phone-number "+555-555-555"
street-address "Building X - Testing Lab, San Jose CA"
customer-id "Test_123"
contract-id "1234-5678"
site-id "SJ-X"
alert-group configuration
alert-group diagnostic
alert-group environment
alert-group inventory
alert-group syslog
mail-server 10.1.1.1 priority 50
mail-server backup.cisco.com priority 60
profile "CiscoTAC-1"
active
no destination transport-method http
destination transport-method email
destination address email callhome@cisco.com
destination address http https://tools.cisco.com/its/service/oddce/services/DDCEService
subscribe-to-alert-group diagnostic severity minor
subscribe-to-alert-group environment severity minor
subscribe-to-alert-group syslog severity major pattern ".*"
subscribe-to-alert-group configuration periodic monthly 15 15:41
subscribe-to-alert-group inventory periodic monthly 15 15:26
profile "Testing"
active
no destination transport-method http
destination transport-method email
destination address email TestUser-1@cisco.com
destination address email TestUser-2@cisco.com
subscribe-to-alert-group configuration
subscribe-to-alert-group diagnostic severity debug
subscribe-to-alert-group environment severity debug
subscribe-to-alert-group inventory
!

```

A Call Home configuration script may be downloaded from the software center to automate the Call Home configuration and installation of the public key certificate. A complete listing and explanation of the Call Home commands and information on the Call Home configuration script are covered in the Catalyst 6500 [Software Configuration Guide](#) and [Command Reference](#) for IOS 12.2(SX).

2. Show: Configuration and activity statistics for Call Home may be viewed with the `show Call Home` command. Call Home status, sender's e-mail address, contact e-mail address, site e-mail addresses, state of the available alert groups, and all profile names are displayed with this command. If the `detail` keyword is appended to this command, all profile details will be listed also.

All mail servers and their current status are listed with the `show Call Home mail-server status` command. The available alert groups and their states are listed with the `show Call Home alert-group` command.

Individual profile details can be seen when the `show Call Home profile` command with the profile name is used. All profiles are displayed when the `all` keyword is used instead of a profile name.

The `show Call Home statistics` command displays the number of Successful Call Home Events and Dropped Call Home Events due to Rate Limiting.

3. Exec: Call Home messages may be sent on-demand using the `Call Home CLI` command. A test message may be sent using the `Call Home test <test message> profile <profile name>` command. The `Call Home send alert-group` may be used to send a configuration, an inventory, or a diagnostic message. A full inventory or configuration message is sent.

When an on-demand diagnostic message is being sent, the `module` keyword and module number must be specified. The message is sent to all destination addresses in all active profiles that subscribe to the alert-group. If the `profile` keyword and the name of an active or inactive profile are used with this command, the message is sent to all destination addresses in that profile.

4. Debugging: Call Home debugging may be performed on the device using the `debug Call Home` command. Different levels of debugging may be enabled using `trace`, `error`, `detail`, and `all` keywords.

Call Home Configuration Guidelines and Restrictions

For Call Home operation to take place it has to be enabled using the `service Call Home IOS` configuration command. At least one Call Home Profile (default or user defined) must be active; if the preferred transport method in any profile is e-mail, then at least one e-mail server address must be configured. Call Home will not send any message until the contact person's e-mail address is configured. If the preferred transport method in any profile is HTTP, a valid public-key certificate must be installed on the Call Home device.

Only one HTTP address or one e-mail address may be used to send messages to the Smart Call Home system. Therefore, if both transport methods are enabled only one should be used to send messages to the Smart Call Home system. Since destination addresses cannot be configured in the CiscoTAC-1 default profile, only one transport method can be enabled.

Call Home may be configured with optional administrative information. The contact person's phone number, a street address, a site ID, a customer ID, and a contract ID are all optional. This information is included in the XML header of the Call Home message but is not required by the Smart Call Home system. The message sender's e-mail address and the sender's reply-to e-mail address may be configured. If the message sender's reply-to e-mail address is not configured, Call Home will use the contact's e-mail address as the sender's reply-to e-mail address in all Call Home messages.

Call Home may be configured to send messages to backup e-mail servers if the e-mail transport method in any profile is enabled. The name or address of each e-mail server and a priority must be configured. The priority number is used to determine which server will be used as the active server initially and during failures. The priority numbers range from the highest priority of 1 to the lowest priority of 100. The server with the highest priority that the device is able to establish a connection with will become the active e-mail server.

A Call Home configuration script may be downloaded from the software center to automate the Call Home configuration and installation of the public key certificate. This script will be updated periodically with a newer copy of the public-key certificate and may be downloaded and installed prior to expiration of the certificate that is in use by the device.

Call Home Operation

When an event occurs, it is reported to the EEM by an event detector. The EEM then notifies the Call Home subsystem of the event. The Call Home subsystem requests information on the event so that it can process the event and then notifies the EEM when processing has completed. As part of the processing the following tasks are performed:

- Call Home looks up the alert group associated with the event, executes the CLI commands for that alert group, and collects the results.
- Call Home looks up the destination profiles that have selected the alert group for the event to obtain the destination addresses, message formats, and preferred transport methods.
- Call Home then formats a message for each message type defined for all of the destination profiles that selected the alert group. Each message is then sent using the preferred transport method to the destination address.
- To improve performance for the case where an event requires multiple messages (due to several formats being configured), Call Home queues the messages and a special process handles the actual message transmission.
- When the transport method is e-mail, Call Home will try to use the highest priority SMTP server to send the message. If a server cannot be accessed or the transmission fails, Call Home will retry this server three times before it attempts to connect to the next highest priority SMTP server.
- If Call Home is unable to establish a connection with any of the configured servers, it will retry all the servers in the same sequence again. If this second round fails, an error message will be logged and no further processing will occur for the event.

Catalyst 6500 System and Network Requirements

For Smart Call Home support a Catalyst 6500 must be IOS version 12.2(33) SXH or later.

Note: Both Modular and Non-modular IOS are supported (for more information about modular see [Cisco Catalyst 6500 with Cisco IOS® Software Modularity](#)).

IOS software modularity images are supported on the following types of Supervisor Engine:

- Supervisor Engine 32 (PFC3B)
- Supervisor Engine 720 (PFC3A, 3B, 3BXL)

Each supervisor should have a minimum of 512 Mbytes of DRAM on the RP, 512 Mbytes of DRAM on the SP, and 256 Mbytes of Flash.

If the Catalyst 6500 system will be using the e-mail option to communicate with the Smart Call Home back-end systems or with the Cisco Transport Gateway then it must have connectivity to an e-mail server that conforms to the SMTP standard (RFC 2821). For Call Home e-mail server redundancy, a minimum of two e-mail servers should be available. The e-mail servers must have access to the Internet.

If the Catalyst 6500 system will be using the HTTP option or the Cisco Transport Gateway to communicate with the Smart Call Home back-end systems then connectivity with the Cisco Smart Call Home HTTP server must be available and related traffic to and from TCP port 443 must be allowed.

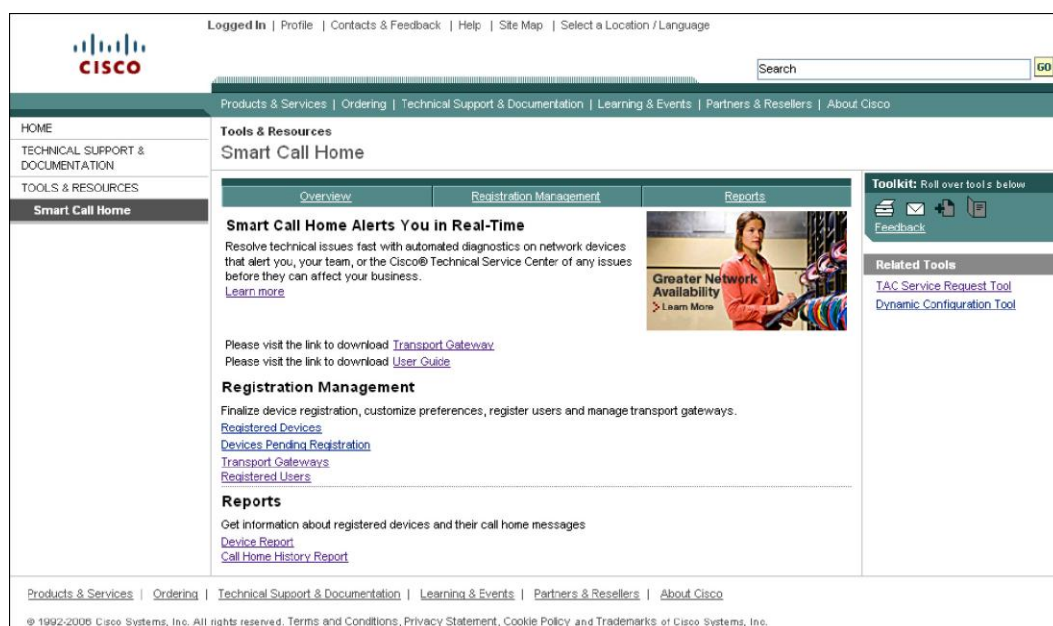
The Catalyst 6500 system must be supported under a valid Cisco service contract or warranty. The contact person's user profile must contain a valid service Cisco service contract that supports the Catalyst 6500.

Smart Call Home Customer Web Application

One of the primary functions of the Smart Call Home system is to host the Smart Call Home customer web application. The Smart Call Home system requires users and devices to be registered with the system. The Smart Call Home customer web application permits a customer to register in the Smart Call Home system, administer device registrations and preferences, administer Transport Gateway registrations, and generate reports. A Cisco employee with Smart Call Home administrator access privileges is also permitted to view and delete devices and users and to generate reports.

Figure 5 shows a Smart Call Home device home page on the customer Web application.

Figure 5. Smart Call Home Device Home Page



System Access

The Smart Call Home system offers two access levels for customers, they are: administrator and user. Administrator is the higher level of access and is attained by confirming a device registration associated with a Company or when an administrator registers another person as an administrator. The user access level is achieved when an administrator grants a person user access associated with a company.

These access levels provide different access to the Smart Call Home system. The administrator has permission to perform the following tasks:

- Administer device registrations and preferences.

- Administer Transport Gateway registrations and preferences.
- Add and delete user registrations.
- View device and user lists.
- Generate reports for associated Companies.

A user can view device and user lists, and is able to generate reports for associated companies, but is not able to:

- Delete any device or user registrations for a Company
- Edit any device registrations for a Company
- Add any user registrations for a Company
- View or delete any Transport Gateway registrations for a Company
- Be a Service Request contact person for any device registered to a Company
- Modify device preferences for a Company

A user can access the Smart Call Home customer web application with a valid Cisco.com ID and password. Use of the Smart Call Home customer web application requires acceptance of the application's current legal agreement. The legal agreement is presented when the user has not accepted the latest copy of the agreement. The user must agree to the legal terms and conditions before further access is granted within the Smart Call Home customer web application. A user who was added by an administrator will have status 'Pending Legal Agreement' until the legal agreement is accepted.

The Smart Call Home device registration process supports customers having one or more Cisco direct or Cisco Branded Reseller contracts in their Cisco.com user profile.

Reports

The Smart Call Home customer web application currently offers access to two types of reports. There are device reports and Call Home history reports. Each report provides information on registered devices only. All displayed reports may be exported to PDF or Excel formats.

Device Report

The Device Report lets you search for and get access to all the inventory and configuration data for a device.

Figure 6 shows an example of Smart Call Home device report results.

Figure 6. Smart Call Home Device Report Results

Logged In | Profile | Contacts & Feedback | Help | Site Map | Select a Location / Language

Products & Services | Ordering | Technical Support & Documentation | Learning & Events | Partners & Resellers | About Cisco

HOME
TECHNICAL SUPPORT & DOCUMENTATION
TOOLS & RESOURCES
Smart Call Home

Smart Call Home

Device Report | [Call Home History Report](#) | [Global Summary Report](#)

Device Report Results

Selection Criteria:

| Company | Host Name | Serial Number |
|---------------------|-----------------|--------------------|
| CISCO SYSTEMS, INC. | ALL | N/A |
| Chassis Model Name | Card Model Name | Card Serial Number |
| N/A | N/A | N/A |

| Serial Number | Host Name | Description | Company Name | Product ID | HW Version | SW Version | Part Number/Rev | Last Invented/ed |
|---------------|-----------|---|---------------------|------------|------------|----------------------|-----------------|-------------------------|
| IBAG5430157 | pcn-6500 | Cisco Systems Catalyst 6500 9-slot Chassis System | CISCO SYSTEMS, INC. | WS-C6509 | 3.0 | 12.2(20070307:1516)3 | 73-3438-05 AD | 06-Mar-2007 03:38:42 AM |

Export Call Home Report: [Excel](#) | [PDF](#)

Run New Report

An * denotes a required field.
Use an "*" as wildcard character for the partial search.

Company:

Host Name:

Serial Number:

Chassis Model Name:

Card Model Name:

Card Serial Number:

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The device report is generated using one or more of the following search criteria:

- Company: Company for which the user has a completed user registration
- Host Name: Full or partial host name
- Serial Number: Full or partial chassis serial number
- Chassis Model Name: A full or partial name can be used to register the device
- Card Model Name: Full or partial name of card
- Card Serial Number – Full or partial serial number of card

The bottom of the page has fields for you to specify different report criteria, to generate a new device report.

Figure 7 shows partial output of a Smart Call Home device details report showing modules and power supplies.

Figure 7. Smart Call Home Device Details

The screenshot shows the Cisco Smart Call Home interface. The main content area is titled 'Device Details' and displays the following information:

Device Details: Serial Number: FOX08060029, Host Name: UAT-6502-01

Contact: (Section header)

Hardware Module/Submodule:

| Module | Ports | Card Type | Model | HW | FW | SW | Serial Number | Part Number | Part Number Revision | Status |
|--------|-------|--------------------------------------|----------------|-----|--------|--------------|---------------|-------------|----------------------|-----------|
| 2 | 48 | SPM-capable 48-port 10/100 Mbps RJ45 | WS-X8548-RJ-45 | 5.2 | 6.3(1) | 8.7(D.6)LR | SAL0807L0P6 | 73-8280-01 | CB | Ok |
| 1 | 2 | Supervisor Engine 720 (Active) | WS-SUP720-BASE | 2.1 | 7.7(1) | 12.2(SIERRA_ | SAD071600XW | 73-7405-10 | CB | Mail fail |

Power-Supply:

| Power Supply Number | Manufacturer | Product ID | Serial Number | Part Number | Part Number Revision | Inv. Revision |
|-------------------------------|---------------------|------------|---------------|-------------|----------------------|---------------|
| 1 - AC power supply, 350 watt | Cisco Systems, Inc. | PWR-350-AC | ABC06126001 | 34-1547-01 | B0 | 1.0 |
| 2 - AC power supply, 350 watt | Cisco Systems, Inc. | PWR-350-AC | ABC08126007 | 34-1547-01 | B0 | 1.0 |

The device report displays an overview of the inventory and configuration data for a device and is retrieved from the inventory and configuration Call Home messages. The device details page contains information in five categories:

- Contact
- Hardware module/submodule
- Power-supply
- Software
- Configuration

These five categories provide the following information:

- Last inventory date: Date/time when the Inventory message was created on the device
- Last configuration date: Date/time when the Configuration message was created on the device
- Device contact information for the SR contact person: Name, phone number, e-mail address, contract number

- Device data: Host name, chassis serial number, product ID, hardware and software versions, part number and revision
- Module/card details: Slot number, ports, card type, product ID, serial number, part number, part number revision, hardware version, firmware version, software version, and status
- Sub-module details: Module, submodule, product ID, serial number, part number, part number revision, hardware version, and operational status
- Power supply details: Power supply number, manufacturer, product ID, serial number, part number, part number revision, and hardware version
- Software details: Processor, processor revision, image name, IOS version, feature set, ROM version, main memory, IO memory, install memory, non-volatile configuration memory, system Flash, last restarted, last reset reason, uptime, config register, and boot version
- Configuration details: Configuration date (date/time when the configuration message was created on the device), startup config details hyperlink, running config details hyperlink, and technologies and features

Call Home History Report

The Call Home history report lets you search for, and get access to, all the Call Home messages that were sent from the Call Home device to the Smart Call Home back-end, within the last 3 months.

Figure 8 shows an example of Smart Call Home history report results.

Figure 8. Smart Call Home History Report Results

Report Criteria:

| Report Criteria: | Company | Host Name | Serial Number |
|------------------|---------------------|--|---------------|
| | CISCO SYSTEMS, INC. | N/A | N/A |
| | Message Type | Message Received: | |
| | DIAGNOSTIC | From: 03/06/07 12:00 AM To: 03/07 8:23 AM | |

| Serial Number | Host Name | Time Message Received (UTC PST) | Product ID | Contract Number | Company Name | Serial Number (Chassis) | SES Contact | Message Severity/Level | Message Type/Results | SES Status | Notification Sent |
|---------------|-----------|---------------------------------|------------|-----------------|---------------------|-------------------------|-------------|------------------------|----------------------|------------|-------------------|
| TB485430157 | pcm-6500 | 08-Mar-2007 07:12:04 AM | WS-CB509 | 1370692 | CISCO SYSTEMS, INC. | Yes | SCH Test | 5 | Diagnostic | 605337845 | Yes |
| TB485430157 | pcm-6500 | 08-Mar-2007 07:04:02 AM | WS-CB509 | 1370692 | CISCO SYSTEMS, INC. | Yes | SCH Test | 1 | Diagnostic | N/A | N/A |
| TB485430157 | pcm-6500 | 08-Mar-2007 05:10:45 AM | WS-CB509 | 1370692 | CISCO SYSTEMS, INC. | Yes | SCH Test | 1 | Diagnostic | N/A | N/A |

Export Call Home Report: [Excel](#) | [PDF](#)

Run New Report

An * denotes a required field.
Use an "" as wildcard character for the partial search.

Company*:

Host Name:

Serial Number:

Message Type*:

Message Received*:
Start Date/Time:
End Date/Time:

The Call Home history report is generated using one or more of the following search criteria:

- Company: company for which the user has a completed user registrations
- Host name: Full or partial host name
- Serial number: Full or partial chassis serial number
- Message type: One or all of the supported Call Home message types

- Messages received – Date and time period that Call Home messages were received by Smart Call Home

The Call Home history report displays an overview of all Call Home messages that have been received in the last 3 months. The following information is provided in the overview for each message:

- Serial number and product ID of the device
- Host name of the device that sent the message
- Date and time that the message was received by Smart Call Home
- Contract number used to register the device or 'Under Warranty' in case the device is under warranty
- Company for which the device is registered
- Serial number entitlement status indicating if the device is covered by contract/warranty
- Service Request contact person for the device
- Message severity level
- Message type/results indicating the type Call Home message and a hyperlink to the actual Call Home message and message content processing results
- SR raised indicator with an SR number indicating if a SR was created or updated or "No" if no Service Request was created or updated
- Notification sent indicator to indicate if an e-mail notification was sent to the customer

More details on the Web application may be found in the [Smart Call Home User's Guide](#).

Smart Call Home Notifications and Service Requests

The Smart Call Home system provides e-mail notifications to the customer contacts when certain events related to a device, or to administrative activities in the Smart Call Home Web application. Some of the e-mail notifications are optional and are sent only if the notification option is enabled in the device preferences. Even if the notification option is disabled, e-mail notifications will always be sent when a service request is created or updated, or during registration activities that are related to a user, device, or Transport Gateway.

The e-mail notification option is enabled by default. The e-mail notifications are sent to the reply-to, or contact (if reply-to is not configured) e-mail address configured on the device and all e-mail addresses (including the person confirming device registration) that were stored within the device preferences. Email notifications may include some of the following details:

- Reason for the notification
- Host-name of the device it is related to
- Time-stamp from the message
- Message name which is the Call Home message type or the user text message sent within a Test message
- Series of the device
- Cisco Contract ID
- A hyperlink to additional details related to the message

The following are some of the conditions that may trigger e-mail notifications by the Smart Call Home system:

- Receipt of a Call Home message from a device that is not registered that initiates registrations
- Receipt of a full inventory message which updates the device inventory in the database
- Receipt of a configuration message which updates the device configuration in the database
- Receipt and analysis of an environment message containing a minor, major or recovery environmental alarm
- Receipt and analysis of a diagnostic message with a minor or higher severity alarm
- Receipt of a Call Home test message
- Receipt of an unsupported Call Home message
- Receipt of a Call Home message that is missing information
- Receipt of Call Home messages from a device that is not covered by a supported contract
- The contact person for a service request no longer has permission to manage service requests
- Device no longer entitled (contract or warranty expired) for service request creation
- Service request is created or updated or creation fails (resulting from analysis of an environment or a diagnostic message)
- Registration of a device for a trial period
- A device is registered for a trial period – sent every 2 weeks
- Contract for a device is about to expire or has expired
- A registration has been created for a new user (sent to the new user) and to accept the legal agreement
- Deleting a user registration by an administrator (sent to the deleted user)
- Contract associated with the Cisco.com profile of a SR contact is about to expire or has expired

The option is also available to create TAC service requests automatically or to update an existing service request when environmental events and diagnostic failures occur on a device. The option to create or update TAC service requests may be enabled or disabled in the device preferences and is enabled by default. A service request may be created or updated if analysis of a Call Home message and use of Smart Call Home rules determine that an event will require the assistance of the Cisco TAC.

Smart Call Home Device Registration

In order for the Smart Call Home system to process messages from a device, the device must first be registered. The registration process is initiated when the Smart Call Home system receives a supported message from the device. A supported Call Home message is one that has Call Home message-type Test, Inventory with sub-type Full, Configuration with sub-type Full, diagnostic or environment. Before the device is registered all supported Call Home messages from the device will be stored but not processed. Processing of these messages will occur after registration is successful.

After receiving the first Call Home message from a device the Smart Call Home system will send a 'Pending Registration' e-mail notification to the contact person for the device using the sender reply-to e-mail address in the message.

To successfully register a device for Smart Call Home a user must have:

1. A valid Cisco service contract that covers the device and entitles the user to submit service requests to the Cisco Technical Assistance Center;
2. A valid Cisco.com User ID, which includes the service contract that covers a device.

The user can confirm a device registration via the customer Web application by:

- Entering the security token or using the link received in the 'Pending Registration' e-mail notification.
- Selecting one or more devices from a list of devices with pending registrations. The list will contain devices associated with the company for which the customer has already been registered.

If the device is covered by a valid Cisco contract or warranty, it will be registered for the appropriate company without additional user intervention.

If the device serial number exists in the Cisco Installed Base database, but the device is not covered by a valid Cisco contract, the customer may be able to register the device for a trial period, using one of the contracts in his/her Cisco.com user profile. Eligible contracts include those that are Cisco Direct (i.e. a contract purchased by a Customer directly from Cisco) or Cisco Branded Reseller (i.e. a contract purchased by a Cisco reseller, that covers Customer devices) contracts. Contracts must also carry the "CONTRACT" entitlement key for the "Remote Tech Support Access" business process.

If the device serial number does not exist in the Cisco Installed Base the customer may be able to register the device using one of the eligible contracts in their Cisco.com user profile. Eligible contracts include those described above that also include at least one covered product from the Catalyst 6500 Series product family.

In case the device is covered by a contract but the customer does not have the required contract in their Cisco.com user profile the device registration cannot be completed.

Figure 9 shows an example of a Smart Call Home registered devices report.

Figure 9. Smart Call Home Registered Devices

The screenshot displays the Cisco Smart Call Home Registered Devices page. At the top, there is a navigation bar with links for Products & Services, Ordering, Technical Support & Documentation, Learning & Events, Partners & Resellers, and About Cisco. Below this is a search bar and a sidebar with navigation options like HOME, TECHNICAL SUPPORT & DOCUMENTATION, and TOOLS & RESOURCES. The main content area is titled 'Smart Call Home' and contains a 'Registered Devices' section. This section includes a search form with fields for Host Name, Contract, Company, Registration Status, and Entitlement Status. Below the search form is a table of registered devices.

| Serial Number | Host Name | Product ID | Contract | Company | Registration Status Date Stamp | Entitlement Status End Date | |
|--------------------------|----------------------------------|------------|----------|---------|--------------------------------|-------------------------------------|---|
| <input type="checkbox"/> | TBA05430157 Info | pcm-8500 | WS-C6509 | 1370892 | CISCO SYSTEMS, INC. | Complete 05-Mar-2007 03:38:47 PM | SR Trial Capable 31-Dec-2009 03:59:59 PM |

At the bottom of the page, there is a footer with copyright information: © 1992-2006 Cisco Systems, Inc. All rights reserved. Terms and Conditions, Privacy Statement, Cookie Policy and Trademarks of Cisco Systems, Inc.

Message Handling by Smart Call Home

Smart Call Home is capable of handling all valid supported Call Home message types. A valid message is one that has the correct XML and AML format. A supported Call Home message is one that has one of the following Call Home message types:

- Test
- Inventory with sub-type Full
- Configuration with sub-type Full
- Diagnostic
- Environment

The Syslog Call Home message type will be supported in a future release of Smart Call Home. Call Home inventory and configuration messages with sub-type Delta are not supported.

When a message is received, the message type and format is checked. If the message is valid and supported, a check is performed to confirm that the device is registered. Message processing proceeds if the device is registered. If the device is not registered, it is placed in a pending registration state and a pending registration notification e-mail is sent to the customer.

If any data required for processing is missing from a supported Call Home message, processing is halted and Smart Call Home Support is notified. If a failure occurs during data parsing or mapping, Smart Call Home Support is notified and processing continues.

Messages from a device that has never been registered or that has an expired registration are stored. Only the inventory and configuration Call Home messages will be processed and the results stored when sent by a device that has an expired registration. All messages from an unregistered device will not be processed.

It is important to note that service requests may be created and customer notification e-mails may be sent when the options to do so are enabled in the preferences for the device. Anytime a service

request is updated or created a notification e-mail is always sent. Valid supported messages are stored.

Messages are processed according to their type:

1. **TEST:** These messages are stored and a notification may be sent to the customer.
2. **INVENTORY:** An inventory message is processed to gather device information to be displayed on the Smart Call Home customer web application. Smart Call Home uses mapping rules to map the chassis, modules, memory, and IOS image information, and to store them in the Smart Call Home database (DB).

If there is a failure in mapping the inventory data Smart Call Home sends a notification to the customer and Smart Call Home support indicating the failure and continues with further processing and storing in the Smart Call Home DB.

The Inventory information is used to generate device reports by the customer Web application and for use by Cisco support staff. After the Smart Call Home DB has been updated, a notification is sent to the customer indicating that an updated device inventory report is available, if the notification option is enabled for the device.

3. **CONFIGURATION:** A configuration message is processed to identify configured IOS technology and feature information to be displayed by the Smart Call Home customer Web application. Smart Call Home uses mapping rules to create a technology/feature list which is stored in the Smart Call Home DB.

The Configuration information is used to generate technology/feature reports by the customer web application, and for use by Cisco support staff. After the configuration database has been updated, a notification is sent to the customer indicating that an updated device configuration report is available, if the notification option is enabled for the device.

4. **DIAGNOSTIC:** A diagnostic message is processed, stored and diagnosis rules are applied to determine appropriate actions to take. Depending on the failure, the action may be to create a service request that will result in automatic customer notification, if these options are enabled for the device. The diagnosis of some messages may result in only a customer notification, with recommendations and no SR creation. Other messages may not result in a customer notification. The stored information is used to generate historical reports by the customer Web application and for use by Cisco support staff.
5. **ENVIRONMENT:** An environment message is processed, stored and diagnosis rules are applied to determine appropriate actions to take. Depending on the message, the action may be to create or update a service request that will result in automatic customer notification. The diagnosis of some messages may only result in a customer notification, with recommendations and no SR creation. Other messages, such as recovery messages, may update existing SRs and result in a customer notification.

Cisco Transport Gateway

One of the communication options available for transporting Call Home messages from a device to the Smart Call Home system utilizes the services of the Cisco Transport Gateway. The Transport Gateway resides in a customer's network and retrieves Call Home messages sent by Call Home client devices to a mailbox on a POP3 or IMAP mail server. The client devices use the e-mail transport option to communicate with the e-mail server that the Transport Gateway accesses. The Transport Gateway stores the messages and, depending on its configuration, may then forward

them to the Smart Call Home system using an HTTPS connection. The Transport Gateway forwards all Call Home message types. Every message that the Transport Gateway sends to the Smart Call Home system is authenticated using a unique ID and password that are generated during registration. If the current password is older than 30 days it is transparently changed for added security. This section covers only the operation of the Transport Gateway with Smart Call Home.

The Cisco Transport Gateway is a software package that is supported on platforms running Windows 2000, Windows 2003, Windows XP and Solaris. The [Transport Gateway](#) software may be found in the Network Management section of the Software Downloads (Center) on Cisco.com. Plug-ins are included in the package, with the Transport Gateway software that allows the Transport Gateway to be customized to support additional features. Plug-ins may be installed separately when the associated feature is needed, without having to re-install the Transport Gateway itself. The Call Home mailbox plug-in must be installed to enable the Transport Gateway to retrieve Call Home messages sent by client devices to a mail server. The installation process for the Transport Gateway is divided into two parts. The first part is to install the package on the computer, and the second part includes selection of proxy settings, configuration, and registration of the Transport Gateway.

Registration

A Transport Gateway is required to be registered with the Smart Call Home system. Registration is performed automatically with the Smart Call Home system after a user enters a Cisco.com user id and password, and configures a Transport Gateway name. The Smart Call Home system provides a Transport Gateway ID and password that is stored by the Transport Gateway and logs the registration date and time. A user may reset the Transport Gateway Password, and the password expires after 30 days. In both cases, the Smart Call Home system will automatically provide a new password upon receipt of any Call Home message. The Transport Gateway ID and password are sent in the HTTP header over an SSL connection. The application authenticates the Transport Gateway ID and password for every Transport Gateway request made to the Smart Call Home system. The user who installed and participated in registering a Transport Gateway becomes an administrator for that Transport Gateway. Other administrators from the company to which this device is registered also become administrators for this Transport Gateway. An administrator can delete a Transport Gateway registration in the Smart Call Home system.

Figure 10 shows an example of Smart Call Home Transport Gateway registrations.

Figure 10. Smart Call Home Transport Gateway Registrations

The screenshot displays the Cisco Smart Call Home interface for Transport Gateway Registrations. At the top, there is a navigation bar with links for Products & Services, Ordering, Technical Support & Documentation, Learning & Events, Partners & Resellers, and About Cisco. Below this, a sidebar on the left contains links for HOME, TECHNICAL SUPPORT & DOCUMENTATION, TOOLS & RESOURCES, and Smart Call Home. The main content area is titled 'Transport Gateway Registrations' and includes a search form with fields for Transport Gateway ID (containing 'TG_*'), Transport Gateway Name, and Company (a dropdown menu). A 'Search' button is located below the form. Below the search form is a table with the following data:

| Name | Transport Gateway ID | Company | Registration Status |
|------------------|----------------------|---|---------------------|
| TG_Test_Name | SC15 | Company info updates on first message from device | Completed |
| TG_WITHOUTUI | SC46 | Company info updates on first message from device | Completed |
| TG_TEST_WINDOWS | SC50 | Company info updates on first message from device | Completed |
| TG_EST_WITHOUTUI | SC57 | Company info updates on first message from device | Completed |

At the bottom of the page, there is a 'Delete Registration' button and a footer with copyright information for Cisco Systems, Inc. (1992-2006).

Transport Gateway Call Home Mailbox

A Transport Gateway must be configured to retrieve Call Home messages from a mailbox for transmission to the Smart Call Home system. The configuration parameters include:

- The type of mail server (POP3 or IMAP)
- The IP address or host-name of the mail server
- The mailbox account name and password
- The port number from where the Call Home messages need to be retrieved
- The Send-Call-Home-Messages flag is used to indicate that the Call Home messages need to be forwarded to the Smart Call Home system. (Default is on/forward)
- A flag indicating whether the Customer needs to be notified if the mail store becomes full (Default is off/do not notify)
- The maximum mail-store size
- The e-mail address for mail-store-full notifications

The Transport Gateway establishes a connection with the mail server to access the mailbox and retrieve messages. If the Transport Gateway is unable to establish the connection with the mail server, or access the mailbox, an error is logged indicating the date/time, event and reason for the error and the Transport Gateway will retry to access the mailbox every minute, until successful. The Transport Gateway retrieves new messages and deletes them from the mailbox every 3 seconds.

If the Send-Call-Home-Messages flag is set to 'Yes', the Transport Gateway will forward the messages in the mail store to the Smart Call Home system. If the Send-Call-Home-Messages flag is set to 'No', or new messages retrieved from the mailbox are over three hours old, the messages will remain in the mail store and will have to be manually sent or deleted by the customer. Call Home messages that are older than 2 days will be automatically deleted from the Transport Gateway mail store.

Log Files

Communication and message retrieval logs files are maintained and may be viewed by a customer. New log files are created weekly and files older than 3 months are deleted. These files use basic formatting to make them human readable, and include records for:

1. Communication with the back-end, indicating when a message was sent to the Cisco Smart Call Home system and the status or reason for any failures
2. Call Home messages retrieved from the mailbox, indicating when the message was received, the e-mail subject, the block id, and the status

The Transport Gateway provides the Customer with the functionality to zip one or all log files and to designate where the zipped file will be stored. If assistance is needed these zipped files may be sent to Smart Call Home Support.

The application interface, installation, configuration, and use of the Transport Gateway are covered in the online Help of the Transport Gateway and the [Smart Call Home User's Guide](#).

Conclusion

Smart Call Home is simple to configure on a Catalyst 6500 and to implement in a network, requires few additional network resources, will reduce the time to resolution of network failures, and improves network and product management. Deciding to use Smart Call Home is a proactive step toward a highly available network.

Additional Information

Smart Call Home presentation – www.cisco.com/go/smartcall

Generic Online Diagnostics on the Cisco Catalyst 6500 Series Switch – cisco.com/en/US/products/hw/switches/ps708/products_white_paper0900aecd801e659f.shtml

Cisco Catalyst 6500 Series with Cisco IOS Software Modularity – www.cisco.com/en/US/products/hw/switches/ps708/prod_bulletin0900aecd80313e15.html

Embedded Event Manager (EEM) on the Cisco Catalyst 6500 Series – cisco.com/en/US/products/hw/switches/ps708/products_white_paper0900aecd805457c3.shtml

Catalyst 6500 Call Home Configuration Guide – *Available soon* – <http://www.ciscosystems.ch/en/US/docs/switches/lan/catalyst6500/ios/12.2SX/configuration/guide/callhome.html>

Catalyst 6500 Command Reference – <http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/ios/12.2SXF/hybrid/command/reference/CRbook.pdf>

Smart Call Home User's Guide – http://www.cisco.com/en/US/docs/switches/lan/smart_call_home/book.html



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