

Cisco Ethernet Subscriber Solution Engine

Service providers who deploy Ethernet in metro access networks to deliver broadband service need to define and manage the demarcation between access networks and customers. The Cisco Ethernet Subscriber Solution Engine offers a hardware-based solution for managing the service provider demarcation in metro Ethernet access networks, particularly the optical Ethernet demarcation delivered by Cisco ONT 1000 Gigabit Ethernet Series Optical Network Terminator.

Overview

The Cisco Ethernet Subscriber Solution Engine (ESSE) is a hardware-based management system for metro access networks that use the Cisco ONT 1000 Gigabit Ethernet Series Optical Network Terminator. The Cisco ESSE enables complete remote management and troubleshooting of the customer demarcation point for Ethernet over fiber. Remote management and diagnostics reduce operating expenses and increase profitability by eliminating the need for unnecessary visits to the customer premises. The Cisco ESSE runs on the Cisco 1105, which is one rack unit (1RU) high, enabling you to conveniently deploy the Cisco ESSE on the same rack with the rest of your Cisco metro Ethernet network aggregation equipment.

The Cisco ESSE automatically discovers all Cisco ONT 1000 Gigabit Ethernet Series devices in the metro access network, applies the designated configuration, and instantly begins collecting statistics and management information.

The Cisco ESSE offers the following important features:

- Remote management of the Cisco ONT 1000 Gigabit Ethernet Series, including inventory, configuration, and monitoring
- Remote troubleshooting of the Cisco ONT 1000 Gigabit Ethernet Series
- Web-based, lightweight, secure graphical user interface (GUI)
- Scalability to support up to 2000 Cisco ONT 1000 Gigabit Ethernet Series and multiple network operators per Cisco ESSE
- Upper-layer network management system/operation support system (NMS/OSS) integration with traps, historical data Extensible Markup Language (XML) export, configuration, and troubleshooting of ONT through application program interface (API)



Target Customers

The Cisco Ethernet Subscriber Solution Engine is ideal for service providers seeking to reduce operating expenses by implementing metro access networks with Ethernet over fiber. In many cases, service providers can eliminate customer onsite visits, which are time-consuming and expensive, by using the Cisco ESSE to perform complete remote configuration and troubleshooting of the Cisco ONT 1000 Gigabit Ethernet Series.

Application Features

The Cisco ESSE enables service providers to perform remote control of inventory, configuration, statistics, fault management, and troubleshooting on the Cisco ONT 1000 Gigabit Ethernet Series.

Remote Configuration and Monitoring of Optical Network Terminators

The Cisco ESSE offers full Layer 1 and Layer 2 monitoring and configuration of the optical network terminator (ONT). For example, a network operator can configure a customer interface so that it is limited to 10, 100, or 1000 Mbps; enable flow control; or disable autonegotiation to force the ONT customer interface to interoperate with any customer premises device.

In addition, the Cisco ESSE provides access to all Ethernet port registers and statistics on the Cisco ONT 1000 Gigabit Ethernet Series. Interval for statistic collection and storage is configurable. Statistics can also be exported for long-term storage and analysis.

An ONT can be easily identified through the solution engine by searchable, user-defined properties. Properties such as customer name, VLAN ID, street address, etc. can be associated with each ONT. Property values can be imported from another application in comma separated value (CSV) format.

Secure Management Network

The Cisco ESSE has a flexible, role-based user access model. Predefined and administrator-defined access roles control user feature access on the ESSE. For example, help-desk personnel can be limited by access role to view only configurations. Cisco ESSE users can be authenticated by several common authentication modules such as Terminal Access Controller Access Control System Plus (TACACS+), Remote Dial-In User Service (RADIUS), and Microsoft NT Domain. The Cisco ESSE allows 128-bit full encryption Secure Socket Layer (SSL) connections between the client Web browser and the ESSE application. Authorized users can configure, monitor, and generate reports for the ONT, even through firewalls. In addition to the Web-based GUI, Cisco IOS[®] Software-like command-line interface (CLI) provides direct console, Telnet, or secure shell (SSH) access to ESSE for basic configuration and troubleshooting.

Advanced Troubleshooting to resolve Network Problems

The Cisco ESSE offers advanced troubleshooting capabilities for both diagnosing problems in an ONT as well as in the network.

Using the Cisco ESSE, network operators can quickly discover network problem areas. The system autodiscovers the ONTs and continually checks whether a device is still reachable, updating the device state as necessary.

The ESSE aids in misconfiguration detection by keeping an audit log for every configuration change. Each audit log entry gives the user ID, timestamp, and configured ONT parameters. The ESSE also enables fast network debugging by automatically identifying the service provider equipment directly connected to each ONT.



The solution engine enables remote testing of an ONT, providing an interface to run a series of diagnostic tests, including memory and packet transmission and reception tests. The customer interface can be loop-backed remotely to check whether failure is occurring at an ONT or at another device such as a gateway or computer within the customer premises. The network operator can also remotely power cycle an ONT.

Integration with OSS

The Cisco ESSE provides a rich set of North-Bound application program interfaces (API) for integrating with OSS or any other application. APIs can be used to configure, troubleshoot or fetch ONT data. Industry-standard World Wide Web Consortium protocols are used for defining these APIs. HTTPS provides the transport layer. Data is encoded in XML with the Simple Object Access Protocol (SOAP) as a standard header for specifying the remote functions to be executed. SOAP is an industry standard lightweight XML-based protocol designed for information exchange on the Web.

Asynchronous Notifications

Asynchronous notification is a powerful way to report major events in the network to an all-encompassing fault system. The ESSE can generate SNMPv2c traps with XML data based on the polled ONT information. Traps can be generated by the following conditions: a newly identified ONT in the network, removal of an ONT, ONT link status change on the subscriber or service provider interfaces, and ONT reach-ability status change. The generated traps are forwarded to any trap receiver registered with the Cisco ESSE. The trap log is also viewable through the browser GUI.

Features and Benefits

Table 1 summarizes features and benefits of the Cisco ESSE.

Table 1 Cisco Ethernet Subscriber Solution Engine Features and Benefits

Feature	Benefit
Complete remote management including autodiscovery, configuration, and monitoring	Grow metro access customers quickly and cheaply with autodiscovery of new ONT devices and easy configuration
Remote troubleshooting of the Cisco ONT 1000 Gigabit Ethernet Series	Saves time and resources by eliminating customer onsite visits with complete remote configuration and troubleshooting
Searchable, user-defined ONT properties	ONT can be quickly identified for configuration, monitoring or troubleshooting by searching on a user-defined property; up to 10 properties, such as customer name, VLAN ID, and street address, can be associated with each ONT
Web-based, lightweight, secure GUI	Reduces capital costs through standard, inexpensive PC technology for network operators; powerful GUI features such as ONT search capability allow easy navigation and quick operations, saving time and reducing operations cost
North Bound application program interface (API)	Integrating the Cisco ESSE with other applications or OSS used for managing rest of the network enables centralized management from one console



Table 1 Cisco Ethernet Subscriber Solution Engine Features and Benefits (Continued)

Feature	Benefit
Asynchronous notifications from polled ONT data	Traps generated by ESSE can be received by a common fault system used for detecting faults in rest of the network; centralized fault management will help in quick identification and resolution of network issues
Scalability for up to 2000 ONTs and multiple network operators	Supports large metro access networks cost-effectively

Technical Specifications

Table 2 outlines the technical specifications of the Cisco ESSE.

Table 2 Cisco ESSE Technical Specifications

Drives	
Hard-disk drives	Two 1-in. form-factor IDE hard-disk drives
CD-ROM drive	IDE
Diskette Drive	3.5 in., 1.44-MB diskette drive included with standard system
Ports	
Serial	Two 9-pin connectors
RJ-45	Two RJ-45 connectors for connection to two 10/100/1000 Ethernet controllers
Power	
AC power supply wattage	125 W
AC power supply voltage	100 to 120 V at 50 Hz/200 to 240 V at 60 Hz
System battery	CR2032 3-V lithium coin cell
Physical	
Height	1.7 in. (4.3 cm)
Width	16.7 in. (42.5 cm)
Depth	22 in. (55 cm)
Weight	23 lb (10 kg) maximum
Environmental (PE)	
Operating temperature	50 -95 F (0 -35 C)
Storage temperature	-40 -149 F (-40 -65 C)
Operating relative humidity	8—80% (noncondensing) with a humidity gradation of 10% per hour
Storage relative humidity	5—95% (noncondensing)
Operating maximum vibration	.025 G (half-sine wave) at a sweep of 3–200 Hz for 15 minutes



Table 2 Cisco ESSE Technical Specifications

Storage maximum vibration	0.5 G at 3–200 H for 15 minutes
Operating maximum shock	Six consecutively executed shock pulses in the positive and negative x, y, and z axes (one pulse on each side of the system) of 41 G for 2 ms
Operating altitude	-16 to 3048 m (-50 to 10,000 ft)
Storage altitude	-16 to 10,600 m (-50 to 35,000 ft)

Supported Cisco Devices

The Cisco ESSE supports the following Cisco devices:

Device	Software Version
Cisco ONT 1000 Gigabit Ethernet Series	Not applicable
Cisco Catalyst 4006, 4503, 4506, 4507R	Cisco IOS 12.1(12c)EW
Cisco Catalyst 3550-12G	Cisco IOS 12.1(11)EA1
Cisco Catalyst 6006 and 6500 Series	Cisco IOS 12.1(13)E
Catalyst [®] Operating System 6.2(2), 7.3(1)	

Supported Web Browsers

The Cisco ESSE is accessible through the following Netscape and Internet Explorer browsers running on systems with low CPU and memory requirements:

- Netscape 6.2
- Microsoft Internet Explorer 5.5 with Service Pack 2 and IE 6.0

For More Information

Programmer's Manual for the Cisco Ethernet Subscriber Solution Engine for more information on programming the northbound API for the Cisco Ethernet Subscriber Solution Engine.

Cisco ONT 1000 Series Data Sheet for more information on the Cisco 1000 Gigabit Ethernet Series.

Ordering Information

To place an order, contact your Cisco sales representative.

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