

# Cisco Transport Manager Release 4.6

**Cisco® Transport Manager Release 4.6 is available for order. This product release offers many valuable new features and introduces support for the latest versions of the Cisco ONS Family of network elements.**

Cisco Transport Manager is an advanced element management system (EMS) for the Cisco ONS Family of products. It supports configuration, fault, performance, and security management. Cisco Transport Manager also serves as a foundation for integration into a larger, overall operations support system (OSS) environment.

## Cisco Transport Manager Release 4.6 Features

Cisco has improved the operational efficiencies of managing a Cisco optical transport network. The new features available in Cisco Transport Manager Release 4.6 include:

### **Distinct collection states for 15-minute and 1-day performance monitoring data per network element**

Users can now choose, for each network element, whether to collect no performance monitoring data, 15-minute performance monitoring data only, 1-day performance monitoring data only, or both 15-minute and 1-day performance monitoring data. This new feature enables more precise control over saved performance monitoring data.

### **Distinct robust performance monitoring for 15-minute and 1-day performance monitoring per network element**

Users can now choose, for each network element, whether to set no robust performance monitoring, 15-minute robust performance monitoring only, 1-day robust performance monitoring only, or both 15-minute and 1-day robust performance monitoring. Robust performance monitoring is where Cisco Transport Manager attempts to collect older performance monitoring data that was not collected due to a loss of communication. Previous releases of Cisco Transport Manager did not provide separate controls for 15-minute and 1-day robust performance monitoring. This new feature also enables more precise control over saved performance monitoring data.

### **Automatic subnetwork grouping based on network element connectivity**

Users can choose to activate a feature whereby Cisco Transport Manager automatically groups network elements together in subnetworks when they are topologically connected. When this feature is activated, the user is assured that network elements within a subnetwork are topologically connected. When this mode is



active and users add a circuit, they will only see network elements that are topologically connected to the source network element. Previous releases of Cisco Transport Manager did not ensure this, because there were cases where manual intervention was required. This new feature makes circuit provisioning much simpler.

### **User-defined default network maps**

Up to Cisco Transport Manager Release 3.2, there was one network map for each group, which was displayed to all users. In Cisco Transport Manager Release 4.0 and later, all users had their own network maps and there were no default network maps. In Cisco Transport Manager Release 4.6, all users have the ability to change their network maps, save any map as their network map for the group, and revert to the default map. Saving a map as the default network map for the group is subject to activation in the security profile. These changes make it possible to implement any one of several network map strategies. The available strategies range from one network map for a group that all users see to customized maps for each user. Users can select whether to use their own maps or the default maps.

### **Simple Network Time Protocol (SNTP) parameter setup on multiple network elements simultaneously**

Since SNTP settings do not vary from network element type to network element type, the user can provision one set of SNTP parameters to any number of network elements at once. This saves time when turning up the network elements—users do not have to open each network element explorer and make these changes; they are made all at once.

### **Viewing and changing the link cost parameter for manual links between Cisco ONS 15327, ONS 15454 SONET, ONS 15454 SDH, and ONS 15600 network elements**

Users may now see the link cost parameter for all links between Cisco ONS 15327, ONS 15454 SONET, ONS 15454 SDH, and ONS 15600 network elements. Users may set the link cost parameter only for manual links between these network element types. When circuits are added across such links, the link costs are taken into account. With this feature, users can exercise more control over automatic circuit routing over manual links.

### **New link layer-rate attribute**

Each link is tagged with a layer-rate attribute to represent connectivity between different domains, such as dense wavelength-division multiplexing (DWDM), SONET/SDH, and Layer 2. The layer-rate attribute is integrated into the network map displays, allowing users to see relationships between different layer rates. Users can see only links of a certain layer rate or all layer rates in one display. The inclusion of the layer-rate attribute also makes alarm correlation to links quicker—the user can pinpoint at which layer rate the alarm occurs.

### **Performance monitoring data graphs**

The client can show a graph of performance monitoring data across time. This is available for all performance monitoring data collected by Cisco Transport Manager Release 4.6 and gives users a visual, easy-to-use tool for performance monitoring data analysis.

### **More detailed security settings in the network element explorer**

Cisco Transport Manager Release 4.6 gives users more control over network element explorer security settings. Each set of tabs is subject to its own security setting for each security profile. This benefits users who require the ability to control access to certain areas of the network element explorer without having to control only the ability to launch the network element explorer.



### **Product identifier (PID) and version identifier (VID) parameter display for the Cisco ONS 15327, ONS 15454 SONET, and ONS 15454 SDH network elements**

In version 4.6 of the network elements ONS 15327, ONS 15454 SONET and ONS 15454 SDH, each card supports these two new manufacturing parameters, PID and VID. These are displayed in Cisco Transport Manager 4.6 in all cases.

### **Optical Channel (OCH) circuits**

In the new DWDM functionality for the ONS 15454 SONET and ONS 15454 SDH, OCH circuits are used to trace connectivity across the DWDM network. These are inventoried and displayed in Cisco Transport Manager 4.6.

### **New circuit protection modes on the Cisco ONS 15327, ONS 15454 SONET, ONS 15454 SDH, and ONS 15600 network elements**

For each circuit, users can set whether to route protection circuits along the same links as working circuits or to route them across separate links.

### **Orderwire parameter setting**

Users can set orderwire parameters on network elements that support them.

### **New security parameters for the Cisco ONS 15327, ONS 15454 SONET, and ONS 15454 SDH network elements**

In version 4.6 of the network elements ONS 15327, ONS 15454 SONET and ONS 15454 SDH, there is an extensive set of new security parameters. Users can set them using Cisco Transport Manager 4.6. This enables users to more easily change security settings on a large number of network elements from one location.

### **Far-end performance monitoring for the Cisco ONS 15327 network element**

Far-end performance monitoring is supported in many network element types in previous releases of Cisco Transport Manager. Release 4.6 adds support for the Cisco ONS 15327.

### **Importing network DWDM parameters from MetroPlanner**

When setting up a DWDM network using the Cisco ONS 15454 SONET and ONS 15454 SDH, MetroPlanner is an indispensable tool. When the DWDM network is planned using MetroPlanner, the resulting parameters can be saved in a file to be imported into Cisco Transport Manager Release 4.6, which can send these parameters in bulk to the network elements it manages.

### **J1 path trace for the Cisco ONS 15600**

Cisco Transport Manager Release 4.6 can read and set J1 path trace parameters on the Cisco ONS 15600.

### **Type 2 small form-factor pluggables (SFPs) on the Cisco ONS 15530 and ONS 15540 network elements**

Type 2 SFPs used in the Cisco ONS 15530 and ONS 15540 network elements are inventoried by Cisco Transport Manager Release 4.6.



### **Virtual tributary and virtual circuit tunnel circuits are available on GateWay/CORBA**

Users can now view, add, and delete virtual tributary and virtual circuit tunnel circuits using the Common Object Request Broker Architecture (CORBA) OSS interface, Cisco Transport Manager Release 4.6 GateWay/CORBA.

### **Partial support for virtual concatenated circuits**

Cisco ONS 15454 SONET and ONS 15454 SDH Version 4.6 can use virtual concatenated circuits. Users can use Cisco Transport Manager Release 4.6 to view these circuits, but cannot add or delete them.

### **View Layer 2 service settings along with Ethernet port settings**

In the network element explorer, the view for an Ethernet port now includes Layer 2 service settings, such as VLAN ID, bridge group, port type, connection type, policing type, and policing settings.

### **Set service provider management, committed information rate (CIR), and best-effort bandwidth for each Layer 2 topology**

In Cisco Transport Manager Release 4.1, all Layer 2 topologies had the same settings for these parameters. Cisco Transport Manager Release 4.6 allows users to set these parameters for each Layer 2 topology.

### **Define different QoS parameters for each drop in a Layer 2 service**

In Cisco Transport Manager Release 4.1, all drops in a Layer 2 service had the same settings for these parameters. Cisco Transport Manager Release 4.6 allows users to set these parameters for each drop in a Layer 2 service.

### **Ability to apply both a QinQ and a dot1Q Layer 2 service to the same port**

In Cisco Transport Manager Release 4.1, users could only enable a port for either a QinQ or a dot1Q Layer 2 service. In Cisco Transport Manager Release 4.6, users can apply QinQ and dot1Q Layer 2 services to the same port.

## **Upgrade Paths**

The upgrade package for Cisco Transport Manager from Release 3.2(.x) to Release 4.6 is available for any customer currently using Cisco Transport Manager Release 3.2(.x) or earlier. The upgrade package for Cisco Transport Manager from Release 4.0(.x) to Release 4.6 is available for any customer currently using Cisco Transport Manager Release 4.0(.x). The upgrade package for Cisco Transport Manager from Release 4.1(.x) to Release 4.6 is available for any customer currently using Cisco Transport Manager 4.1(.x).

Database migration is supported from Cisco Transport Manager Release 4.0(.x) to Release 4.6 and from Cisco Transport Manager Release 4.1(.x) to Release 4.6. All existing right-to-use (RTU) licenses remain valid for Cisco Transport Manager Release 4.6.

Customers with an older, standalone version of Cisco Transport Manager can follow the migration steps to upgrade their software to Cisco Transport Manager Release 4.6 in a standalone configuration. Customers can then back up and import data to their new high-availability installations.

The Cisco Transport Manager Large Enterprise (LE) to Small System (SS) system bundle upgrade package is available for any customer currently using the Cisco Transport Manager 4.6 LE system bundle. The Cisco Transport Manager SS to SMK system bundle upgrade package is available for any customer currently using the Cisco Transport Manager 4.6 SS system bundle that wishes to upgrade to the Cisco Transport Manager 4.6 Software Media Kit.



These system bundle upgrade packages are not used to change a customer's version of Cisco Transport Manager.

### Cisco Transport Manager Release 4.6 Supported Network Elements

Following is a list of network elements and software versions supported by Cisco Transport Manager Release 4.6.

- Cisco ONS 15200 Releases 1.1(2), 1.1(3)
- Cisco ONS 15216 100-GHz optical add/drop multiplexer (OADM) Release 2.2
- Cisco ONS 15216 erbium-doped fiber amplifier 2 (EDFA2) Releases 2.2, 2.3
- Cisco ONS 15216 200-GHz OADM, EDFA1, DWDM Filters, optical supervisory channel (OSC), and dispersion compensation unit (DCU)
- Cisco ONS 15302 Release 1.0
- Cisco ONS 15305 Release 1.0
- Cisco ONS 15327 Releases 3.4.1, 3.4.2, 4.0, 4.0.1, 4.1, 4.1.3, 4.6
- Cisco ONS 15454 SONET Releases 3.0.3, 3.2.1, 3.3, 3.4.1, 3.4.2, 4.0, 4.0.1, 4.1, 4.1.1, 4.1.3, 4.6
- Cisco ONS 15454 SDH Releases 3.4.1, 3.4.2, 4.0, 4.0.1, 4.1, 4.1.3, 4.6
- Cisco ONS 15501 DC Releases 3.0, 4.0, 4.1
- Cisco ONS 15501 AC Release 4.1
- Cisco IOS® Software releases 12.1(12c)EV3 and 12.2(18)SV1 for the Cisco ONS 15530
- Cisco IOS® Software releases 12.1(12c)EV3 and 12.2(18)SV1 for the Cisco ONS 15540 ESP
- Cisco IOS® Software releases 12.1(12c)EV3 and 12.2(18)SV1 for the Cisco ONS 15540 ESPx
- Cisco ONS 15600 Releases 1.1, 1.1.1, 1.3
- Cisco ONS 15800 Releases 2.0, 2.1
- Cisco ONS 15801 Releases 2.0, 2.1
- Cisco ONS 15808 Releases 2.0, 2.1, 2.2

### Ordering Information

Cisco Transport Manager Release 4.6 products are available for order from your sales representative, or online at:

<http://www.cisco.com>

Cisco Transport Manager is made up of the base media kit, additional optional functional components (GateWay/CORBA and high-availability), and RTU licenses. Tables 1-4 list the product names and descriptions associated with Cisco Transport Manager Release 4.6.

Table 1 Cisco Transport Manager Release 4.6 Software Product Kits

Product Name	Product Description
<b>CTM-4.6-SMK=</b>	Cisco Transport Manager Release 4.6 Software Media Kit
<b>CTM-3.2-4.6-UPG=</b>	Cisco Transport Manager Release 4.6 Upgrade Kit for 3.2[.x] to 4.6
<b>CTM-4.0-4.6-UPG=</b>	Cisco Transport Manager Release 4.6 Upgrade Kit for 4.0[.x] to 4.6
<b>CTM-4.1-4.6-UPG=</b>	Cisco Transport Manager Release 4.6 Upgrade Kit for 4.1[.x] to 4.6



Table 1 Cisco Transport Manager Release 4.6 Software Product Kits

Product Name	Product Description
<b>CTM-4.6-CORBA=</b>	Cisco Transport Manager Release 4.6 GateWay/CORBA Northbound Interface
<b>CTM-4.6-CORBA-UPG=</b>	Cisco Transport Manager Release 4.6 GateWay/CORBA Northbound Interface Upgrade Kit
<b>CTM-4.6-HA=</b>	Cisco Transport Manager Release 4.6 High-Availability Agent 2.1
<b>CTM-4.6-HA-UPG=</b>	Cisco Transport Manager Release 4.6 High-Availability Agent 2.1 Upgrade Kit
<b>CTM-4.6-SE-BDL=</b>	Cisco Transport Manager Release 4.6 SE System Bundle
<b>CTM-4.6-LE-BDL=</b>	Cisco Transport Manager Release 4.6 LE System Bundle
<b>CTM-4.6-SS-BDL=</b>	Cisco Transport Manager Release 4.6 SS System Bundle

Table 2 Cisco Transport Manager System Bundle Upgrades

Product Name	Product Description
<b>CTM-4.6-LE-SS-UPG=</b>	Cisco Transport Manager LE to SS System Bundle License Upgrade
<b>CTM-4.6-SS-SMK-UP=</b>	Cisco Transport Manager SS System Bundle to Software Media Kit License Upgrade

Table 3 Cisco Transport Manager RTU License Bundles

Product Name	Product Description
<b>CTML-15200-001</b>	Cisco Transport Manager RTU License for Cisco ONS 15200—1 RTU
<b>CTML-15200-010</b>	Cisco Transport Manager RTU License for Cisco ONS 15200—10-block
<b>CTML-15200-025</b>	Cisco Transport Manager RTU License for Cisco ONS 15200—25-block
<b>CTML-15200-050</b>	Cisco Transport Manager RTU License for Cisco ONS 15200—50-block
<b>CTML-15216-001</b>	Cisco Transport Manager RTU License for Cisco ONS 15216—1 RTU
<b>CTML-15216-010</b>	Cisco Transport Manager RTU License for Cisco ONS 15216—10-block
<b>CTML-15216-025</b>	Cisco Transport Manager RTU License for Cisco ONS 15216—25-block
<b>CTML-15216-050</b>	Cisco Transport Manager RTU License for Cisco ONS 15216—50-block
<b>CTML-15302-001</b>	Cisco Transport Manager RTU License for Cisco ONS 15302—1 RTU
<b>CTML-15302-025</b>	Cisco Transport Manager RTU License for Cisco ONS 15302—25-block
<b>CTML-15302-050</b>	Cisco Transport Manager RTU License for Cisco ONS 15302—50-block
<b>CTML-15302-100</b>	Cisco Transport Manager RTU License for Cisco ONS 15302—100-block
<b>CTML-15305-001</b>	Cisco Transport Manager RTU License for Cisco ONS 15305—1 RTU
<b>CTML-15305-025</b>	Cisco Transport Manager RTU License for Cisco ONS 15305—25-block



Table 3 Cisco Transport Manager RTU License Bundles (Continued)

Product Name	Product Description
<b>CTML-15305-050</b>	Cisco Transport Manager RTU License for Cisco ONS 15305—50-block
<b>CTML-15305-100</b>	Cisco Transport Manager RTU License for Cisco ONS 15305—100-block
<b>CTML-15530-001</b>	Cisco Transport Manager RTU License for Cisco ONS 15530—1 RTU
<b>CTML-15530-005</b>	Cisco Transport Manager RTU License for Cisco ONS 15530—5-block
<b>CTML-15530-010</b>	Cisco Transport Manager RTU License for Cisco ONS 15530—10-block
<b>CTML-15540-001</b>	Cisco Transport Manager RTU License for Cisco ONS 15540—1 RTU
<b>CTML-15540-005</b>	Cisco Transport Manager RTU License for Cisco ONS 15540—5-block
<b>CTML-15540-010</b>	Cisco Transport Manager RTU License for Cisco ONS 15540—10-block
<b>CTML-15327-001</b>	Cisco Transport Manager RTU License for Cisco ONS 15327—1 RTU
<b>CTML-15327-025</b>	Cisco Transport Manager RTU License for Cisco ONS 15327—25-block
<b>CTML-15327-050</b>	Cisco Transport Manager RTU License for Cisco ONS 15327—50-block
<b>CTML-15327-100</b>	Cisco Transport Manager RTU License for Cisco ONS 15327—100-block
<b>CTML-15454-001</b>	Cisco Transport Manager RTU License for Cisco ONS 15454—1 RTU
<b>CTML-15454-025</b>	Cisco Transport Manager RTU License for Cisco ONS 15454—25-block
<b>CTML-15454-050</b>	Cisco Transport Manager RTU License for Cisco ONS 15454—50-block
<b>CTML-15454-100</b>	Cisco Transport Manager RTU License for Cisco ONS 15454—100-block
<b>CTML-15454-500</b>	Cisco Transport Manager RTU License for Cisco ONS 15454—500-block
<b>CTML-15600-001</b>	Cisco Transport Manager RTU License for Cisco ONS 15600—1 RTU
<b>CTML-15600-005</b>	Cisco Transport Manager RTU License for Cisco ONS 15600—5-block
<b>CTML-15600-025</b>	Cisco Transport Manager RTU License for Cisco ONS 15600—25-block
<b>CTML-1580X-001</b>	Cisco Transport Manager RTU License for Cisco ONS 1580X—1 RTU
<b>CTML-1580X-005</b>	Cisco Transport Manager RTU License for Cisco ONS 1580X—5-block
<b>CTML-1580X-010</b>	Cisco Transport Manager RTU License for Cisco ONS 1580X—10-block
<b>CTML-1580X-025</b>	Cisco Transport Manager RTU License for Cisco ONS 1580X—25-block



Note: Passive Cisco ONS 15216 network elements that are not actively managed by Cisco Transport Manager, namely the Cisco ONS 15216 200-GHz Filter, ONS 15216 200-GHz OADM, ONS 15216 EDFA1, ONS 15216 OSC, ONS 15216 DCU, and the ONS 15216 Unidirectional Filter do not require a Cisco Transport Manager RTU. The active Cisco ONS 15216 network elements, namely the Cisco ONS 15216 100-GHz OADM and ONS 15216 EDFA2, do require a Cisco Transport Manager RTU.

Table 4 Cisco Transport Manager Client RTU License Bundles

Product Name	Product Description
<b>CTM-CLIENT-001</b>	Cisco Transport Manager Client RTU License—1 RTU
<b>CTM-CLIENT-010</b>	Cisco Transport Manager Client RTU License—10-RTU block
<b>CTM-CLIENT-050</b>	Cisco Transport Manager Client RTU License—50-RTU block

#### Cisco Transport Manager Annual Maintenance Contracts

A Cisco Software Application Support Plus Upgrades (SASU) contract must be purchased to receive access to technical support through the Cisco Technical Assistance Center (TAC) or Cisco.com (Table 5). Cisco SASU also provides Cisco Transport Manager software upgrades as they are made available, for the duration of the customer’s contract. Cisco SASU does not cover third-party products.

Table 5 Cisco Transport Manager Maintenance Contracts

Product Name	Product Description
<b>SP-SAU-CTM-40</b>	Cisco SASU maintenance contract associated with CTM-4.6-SMK, CTM-4.6-SE-BDL, CTM-3.2-4.6-UPG, and CTM-4.0-4.1-4.6-UPG for service provider customers
<b>CON-SAU-CTM-40</b>	Cisco SASU maintenance contract associated with CTM-4.6-SMK, CTM-4.6-SE-BDL, CTM-3.2-4.6-UPG, and CTM-4.0-4.1-4.6-UPG for enterprise customers
<b>SP-SAU-CTMSE-40</b>	Cisco SASU maintenance contract associated with CTM-4.6-SE-BDL or CTM-3.2-4.6-UPG and CTM-4.0-4.1-4.6-UPG for service provider customers with a SE system bundle
<b>CON-SAU-CTMSE-40</b>	Cisco SASU maintenance contract associated with CTM-4.6-SE-BDL or CTM-3.2-4.6-UPG and CTM-4.0-4.1-4.6-UPG for enterprise customers with a SE system bundle
<b>SP-SAU-CTMLE-40</b>	Cisco SASU maintenance contract associated with CTM-4.6-LE-BDL or CTM-3.2-4.6-UPG and CTM-4.0-4.1-4.6-UPG for service provider customers with an LE system bundle
<b>CON-SAU-CTMLE-40</b>	Cisco SASU maintenance contract associated with CTM-4.6-LE-BDL or CTM-3.2-4.6-UPG and CTM-4.0-4.1-4.6-UPG for enterprise customers with an LE system bundle
<b>SP-SAU-CTMSS-40</b>	Cisco SASU maintenance contract associated with CTM-4.6-SS-BDL or CTM-3.2-4.6-UPG and CTM-4.0-4.1-4.6-UPG for service provider customers with an SS system bundle
<b>CON-SAU-CTMSS-40</b>	Cisco SASU maintenance contract associated with CTM-4.6-SS-BDL or CTM-3.2-4.6-UPG and CTM-4.0-4.1-4.6-UPG for enterprise customers with an SS system bundle
<b>SP-SAU-CTM-CORBA-40</b>	Cisco SASU maintenance contract associated with CTM-4.6-CORBA or CTM-4.6-CORBA-UPG for service provider customers
<b>CON-SAU-CTM-CORBA-40</b>	Cisco SASU maintenance contract associated with CTM-4.6-CORBA or CTM-4.6-CORBA-UPG for enterprise customers

Table 5 Cisco Transport Manager Maintenance Contracts (Continued)

Product Name	Product Description
<b>SP-SAU-CTM-HA-40</b>	Cisco SASU maintenance contract associated with CTM-4.6-HA or CTM-4.6-HA-UPG for service provider customers
<b>CON-SAU-CTM-HA-40</b>	Cisco SASU maintenance contract associated with CTM-4.6-HA or CTM-4.6-HA-UPG for enterprise customers

**More Information**

For more information about Cisco Transport Manager Release 4.6, visit:

<http://www.cisco.com/en/US/products/sw/opticsw/ps2204/index.html>



**Corporate Headquarters**

Cisco Systems, Inc.  
170 West Tasman Drive  
San Jose, CA 95134-1706  
USA  
www.cisco.com  
Tel: 408 526-4000  
800 553-NETS (6387)  
Fax: 408 526-4100

**European Headquarters**

Cisco Systems International BV  
Haarlerbergpark  
Haarlerbergweg 13-19  
1101 CH Amsterdam  
The Netherlands  
www-europe.cisco.com  
Tel: 31 0 20 357 1000  
Fax: 31 0 20 357 1100

**Americas Headquarters**

Cisco Systems, Inc.  
170 West Tasman Drive  
San Jose, CA 95134-1706  
USA  
www.cisco.com  
Tel: 408 526-7660  
Fax: 408 527-0883

**Asia Pacific Headquarters**

Cisco Systems, Inc.  
Capital Tower  
168 Robinson Road  
#22-01 to #29-01  
Singapore 068912  
www.cisco.com  
Tel: +65 6317 7777  
Fax: +65 6317 7799

**Cisco Systems has more than 200 offices in the following countries and regions. Addresses, phone numbers, and fax numbers are listed on the Cisco Web site at [www.cisco.com/go/offices](http://www.cisco.com/go/offices)**

Argentina • Australia • Austria • Belgium • Brazil • Bulgaria • Canada • Chile • China PRC • Colombia • Costa Rica • Croatia Czech Republic • Denmark • Dubai, UAE • Finland • France • Germany • Greece • Hong Kong SAR • Hungary • India • Indonesia • Ireland Israel • Italy • Japan • Korea • Luxembourg • Malaysia • Mexico • The Netherlands • New Zealand • Norway • Peru • Philippines • Poland Portugal • Puerto Rico • Romania • Russia • Saudi Arabia • Scotland • Singapore • Slovakia • Slovenia • South Africa • Spain • Sweden Switzerland • Taiwan • Thailand • Turkey • Ukraine • United Kingdom • United States • Venezuela • Vietnam • Zimbabwe

All contents are Copyright © 1992–2004 Cisco Systems, Inc. All rights reserved. CCIP, CCSP, the Cisco Arrow logo, the Cisco Powered Network mark, Cisco Unity, Follow Me Browsing, FormShare, and StackWise are trademarks of Cisco Systems, Inc.; Changing the Way We Work, Live, Play, and Learn, and iQuick Study are service marks of Cisco Systems, Inc.; and Aironet, ASIST, BPX, Catalyst, CCDA, CCDP, CCIE, CCNA, CCNP, Cisco, the Cisco Certified Internetwork Expert logo, Cisco IOS, the Cisco IOS logo, Cisco Press, Cisco Systems, Cisco Systems Capital, the Cisco Systems logo, Empowering the Internet Generation, Enterprise/Solver, EtherChannel, EtherSwitch, Fast Step, GigaStack, Internet Quotient, IOS, IP/TV, iQ Expertise, the iQ logo, iQ Net Readiness Scorecard, LightStream, MGX, MICA, the Networkers logo, Networking Academy, Network Registrar, Packet, PIX, Post-Routing, Pre-Routing, RateMUX, Registrar, ScriptShare, SlideCast, SMARTnet, StrataView Plus, Stratm, SwitchProbe, TeleRouter, The Fastest Way to Increase Your Internet Quotient, TransPath, and VCO are registered trademarks of Cisco Systems, Inc. and/or its affiliates in the U.S. and certain other countries.

All other trademarks mentioned in this document or Web site are the property of their respective owners. The use of the word partner does not imply a partnership relationship between Cisco and any other company. (0304R) ETMG 203202—LB 01.04