



## Q & A

# Cisco Transport Manager 6.0

## Cisco Transport Manager 6.0 Server and Client

**Q.** When will Cisco® Transport Manager Release 6.0 be available?

**A.** The planned release date for Cisco Transport Manager 6.0 is September 13, 2005.

**Q.** Are hard copy manuals shipped with Cisco Transport Manager 6.0?

**A.** No, the Cisco Transport Manager 6.0 kit includes .pdf documents on a CD that can also be ordered online. Hard copy documents in ring-binder format can be ordered separately:

- For the Cisco Transport Manager 6.0 User Guide, order DOC-7816845=
- For the Cisco Transport Manager 6.0 Installation Guide, order DOC-7816844=
- For the Cisco Transport Manager 6.0 GateWay/CORBA User Guide and Programmer Manual, order DOC-7816846=
- For the Cisco Transport Manager 6.0 High-Availability Installation Guide, order DOC-7816848=

**Q.** What are the major enhancements for Cisco Transport Manager 6.0?

**A.** New features for Cisco Transport Manager 6.0 include:

- Expanded support for the Cisco XR 12000 Series Router, Cisco MGX 8880 Media Gateway, and voice-enabled Cisco MGX 8850 and MGX 8830 multiservice switches. Cisco Transport Manager is now the single element manager system (EMS) solution for optical transport, core routing, and voice gateways devices.
- Fully integrated support for new releases of the following network elements: Cisco ONS 15327 SONET Multiservice Platform, Cisco ONS 15310-CL SONET Multiservice Platform, Cisco ONS 15454 Multiservice Transport Platform (MSTP), Cisco ONS 15454 Mutiservice Provisioning Platform (MSPP), and Cisco ONS 15600 SONET 6.0.
  - Data card broadcast and multicast configuration and EMS alarm on Resilient Packet Ring (RPR) wrapping
  - Support of Secure Mode connection between Cisco Transport Manager and its network elements
  - RADIUS server configuration on the network elements
  - OSI/G.7721 tunneling configuration
  - Bridge and Roll support for Cisco ONS 15454, ONS 15454E, ONS 15310-CL, and ONS 15327 multiservice platforms
- Extend real-time performance monitoring and graphics to Cisco IOS® XR Software-based devices.
- Enhance the CORBA Northbound Interface to support Fault and Inventory for Cisco Carrier Routing System (CRS-1), Cisco XR 12000 Series, Cisco MGX 8880 Media Gateway, and voice-enabled Cisco MGX 8850 and MGX 8830 multiservice switches.

For more information about Release 6.0, please refer to the Cisco Transport Manager 6.0 Product Bulletin, available at First Customer Shipment (FCS): [http://www.cisco.com/en/US/products/sw/opticsw/ps2204/prod\\_bulletins\\_list.html](http://www.cisco.com/en/US/products/sw/opticsw/ps2204/prod_bulletins_list.html).

**Q.** Does Cisco Transport Manager 6.0 Transaction Language One (TL1) gateway support all the network elements?

**A.** No, it supports only the ones with native TL1 protocol for communication with Cisco Transport Manager. The following network elements have a native TL1 protocol:

- Cisco ONS 15216 Erbium-Doped Fiber Amplifier 2 (EDFA2), EDFA3, 100-GHz Optical Add/Drop Multiplexer (OADM)
- Cisco ONS 15327 SONET Multiservice Platform
- Cisco ONS 15310-CL SONET Multiservice Platform
- Cisco ONS 15454 SONET Multiservice Platform
- Cisco ONS 15454 SDH Multiservice Platform (release 5.0 and later)
- Cisco ONS 15530 DWDM Multiservice Aggregation Platform
- Cisco ONS 15540 DWDM Extended Services Platform (ESP) and ESPx
- Cisco ONS 15600 SONET Multiservice Platform
- Cisco ONS 15800 DWDM ANSI Platform
- Cisco ONS 15801 DWDM ETSI Platform
- Cisco ONS 15808 DWDM Platform

**Q.** Is the GateWay/CORBA northbound interface available for all network element types?

**A.** Cisco Transport Manager 6.0 supports fault and inventory through the CORBA interface for all network element types. In addition the CORBA interface can be used for equipment and circuit provisioning on the Cisco ONS 15302, ONS 15305, ONS 15327, ONS 15310-CL, ONS 15454 SONET, ONS 15454 SDH, ONS 15600, and ONS 15600 SDH. The CORBA interface can be used for performance monitoring for the Cisco ONS 15302, ONS 15305, ONS 15327, ONS 15454 SONET, ONS 15454 SDH, ONS 15600, and ONS 15600 SDH.

For further details on coverage, refer to the Cisco Transport Manager GateWay/CORBA Release 6.0 User Guide and Programmer Manual, available at FCS: [http://www.cisco.com/en/US/products/sw/opticsw/ps2204/products\\_programming\\_reference\\_guides\\_list.html](http://www.cisco.com/en/US/products/sw/opticsw/ps2204/products_programming_reference_guides_list.html).

**Q.** Is the GateWay/CORBA interface based on an industry standard?

**A.** Yes, GateWay/CORBA is based on and compliant with TMF 814 (Version 2) as published by the TeleManagement Forum.

**Q.** Can Cisco Transport Manager 6.0 support a network with mixed releases of the same network element?

**A.** Yes, Cisco Transport Manager 6.0 can support a combination of the following releases (Table 1):

**Table 1.** Supported Network Elements

Network Element	Supported Releases
Cisco ONS 15216 100-GHz OADM1, 2, and 4	2.2.2, 2.2.3
Cisco ONS 15216 EDFA2	2.3, 2.4
Cisco ONS 15216 EDFA3	1.1
Cisco ONS 15216 100-GHz Red/Blue filters	Passive
Cisco ONS 15216 200-GHz Red/Blue filters	Passive
Cisco ONS 15216 200-GHz OADM1 and 2	Passive
Cisco ONS 15216 EDFA1	Passive
Cisco ONS 15216 OSC	Passive

Network Element	Supported Releases
Cisco ONS 15216 DCU	Passive
Cisco ONS 15216 FlexLayer	Passive
Cisco ONS 15302	2.0, 2.0.1, 2.0.2
Cisco ONS 15305	2.0, 2.0.1, 2.0.2
Cisco ONS 15310-CL	5.0, 5.0.2, 5.0.4, 6.0
Cisco ONS 15327	4.1.3, 4.1.4, 4.1.5, 4.1.6, 4.1.8, 4.6.2, 4.6.4, 5.0, 5.0.2, R5.0.4, 6.0
Cisco ONS 15454 SONET	4.0.3, 4.1.1, 4.1.3, 4.1.4, 4.1.5, 4.1.6, 4.1.7, 4.1.8, 4.6.2, 4.6.4, 4.6.5, 4.7, 5.0, 5.0.2, 5.0.3, 5.0.4, 6.0
Cisco ONS 15454 SDH	4.1.4, 4.6.3, 4.7, 5.0, 5.0.1, 5.0.2, 5.0.5, 6.0
Cisco ONS 15501	4.1 DC, 4.1 AC
Cisco ONS 15530	12.2(25)SV, 12.2(26)SV, 12.2(26)SV1
Cisco ONS 15540 ESP/ESPx	12.2(25)SV, 12.2(26)SV, 12.2(26)SV1
Cisco ONS 15600	1.1.1, 1.3.1, 5.0.2, 5.0.4, 6.0
Cisco ONS 15600 SDH	1.4
Cisco ONS 15800	2.1
15801	2.1
Cisco ONS 15808	2.2
Cisco CRS-1	3.0, 3.2, 3.2.1
Cisco XR 12000	3.2, 3.2.1
Cisco MSD 9000	Passive – Fabric Manager X-launch
Cisco MGX 8880 Voice Gateway	5.0.20 5.2.0
Voice-enabled Cisco MGX 8850 Multiservice Switch	5.0.20 5.2.0
Voice-enabled Cisco MGX 8830 Multiservice Switch	5.0.20 5.2.0
Cisco VISM-PR	3.3.00 3.3.10 3.2.20 (supporting 3.3.10 features only)
Cisco VXSM	5.0.20 5.0.70 (MR) 5.2.00
Cisco Catalyst® 6509	Catalyst OS 7.1(1) or newer

**Q.** Does the Cisco Transport Manager include the required hardware?

**A.** No, Cisco Transport Manager is a software-only application that is based on industry-standard, ready-to-deploy Sun and PC hardware platforms.

**Q.** Does Cisco Transport Manager 6.0 support a high-availability configuration?

**A.** Yes, Cisco Transport Manager 6.0 can be installed on redundant servers in a failover configuration. The redundant servers can either be co-located or geographically separated. Information on the high-availability solution can be found later in the document, and at:

[http://www.cisco.com/en/US/products/sw/opticsw/ps2204/prod\\_white\\_papers\\_list.html](http://www.cisco.com/en/US/products/sw/opticsw/ps2204/prod_white_papers_list.html).

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- Q.** Can I download Cisco Transport Manager 6.0 from Cisco.com?
- A.** No, you must order the software, which is delivered on CD. Documentation is available for download through Cisco.com.
- Q.** Is Cisco Transport Manager 6.0 compatible with earlier versions of the Cisco Transport Manager client, such as Release 3.0, Release 4.7, or Release 5.0?
- A.** No, all Cisco Transport Manager clients must be upgraded to the new Cisco Transport Manager 6.0 client.
- Q.** Can the same Cisco Transport Manager licenses obtained for use with earlier versions of Cisco Transport Manager, including 2.x be used with Release 6.0?
- A.** Yes, all network element and client right-to-use (RTU) licenses that have been purchased in the past are still valid for Cisco Transport Manager 6.0 with no upgrade charge. Server, CORBA, and high-availability licenses must be upgraded.
- Q.** Does Cisco Transport Manager 6.0 require license keys?
- A.** Yes, license keys are required for Cisco Transport Manager 6.0 and must be purchased for legal use of the software.
- Q.** What warranty is included with Cisco Transport Manager 6.0?
- A.** Cisco Transport Manager 6.0 includes a standard software warranty from Cisco Systems® that warrants for 90 days from the date of delivery to you that (a) the media on which the software is furnished will be free of defects in materials and workmanship under normal use; and (b) the software substantially conforms to its published specifications.
- Q.** Is there a service contract available for Cisco Transport Manager 6.0?
- A.** Yes, you must purchase a Cisco Software Application Support plus Upgrades (SASU) contract to receive access to technical assistance through Cisco Technical Assistance Center (TAC) or Cisco.com. Cisco SASU also provides you with the Cisco Transport Manager software updates (maintenance, minor and major) as they are made available for the duration of your contract.
- Q.** Does Cisco Transport Manager 6.0 support all the configuration and provisioning features provided in the Cisco Transport Controller for the Cisco ONS Family?
- A.** No, there are some feature differences between Cisco Transport Manager 6.0 and Cisco Transport Controller for the Cisco ONS 15310-CL, ONS 15327, ONS 15454 SONET, ONS 15454 SDH, ONS 15600 SONET, and ONS 15600 SDH. These differences are identified in the Cisco Transport Manager 6.0 User Guide.
- Q.** What TCP ports does Cisco Transport Manager use?
- A.** This information is documented in the Cisco Transport Manager 6.0 User Guide.
- Q.** Is the Cisco Transport Manager database schema published?
- A.** Yes, the database schema is published for each Cisco Transport Manager release and can be found at: [http://www.cisco.com/en/US/products/sw/opticsw/ps2204/prod\\_technical\\_reference\\_list.html](http://www.cisco.com/en/US/products/sw/opticsw/ps2204/prod_technical_reference_list.html).

## Cisco Transport Manager 6.0 High Availability

### General

- Q.** Is there a high-availability version of Cisco Transport Manager 6.0?
- A.** Cisco Transport Manager 6.0 software used in the standalone and high-availability configurations are the same. There is no special Cisco Transport Manager high-availability version.



For the Cisco Transport Manager High-Availability Agent Release 2.2, both VERITAS high-availability clustering software and third-party hardware are needed to set up a high-availability environment.

**Q.** Is there a migration mechanism for standalone Cisco Transport Manager 5.x customers to migrate to Cisco Transport Manager 6.0 in a high-availability configuration?

**A.** You can migrate your current standalone Cisco Transport Manager to the standalone Cisco Transport Manager 6.0, provided you follow the correct migration steps outlined in the installation guide. There is no documented mechanism to migrate a standalone to a high-availability configuration; however it is possible to do this manually.

**Q.** What is the virtual IP address?

**A.** The virtual IP address is created by the VERITAS software during installation. This virtual address hides or masks the physical IP addresses normally assigned to the Sun server Ethernet ports. By masking the physical IP address, all network elements, clients, and OSSs target the virtual IP address. In the event of a hardware failover, the standby UNIX server assumes this virtual IP address. Only the active UNIX server has the virtual IP address, so all entities are communicating with the same IP address.

**Q.** Is the functionality of the Cisco Transport Manager clients, network-element access, or OSS impacted with a high-availability design?

**A.** All services and features are designed to operate identically to a standalone configuration.

**Q.** What about redundant router connectivity to the data communication network (DCN)?

**A.** You may wish to set up redundant routers from your UNIX servers to the DCN.

**Q.** Can the high-availability solution be installed on an existing standalone server?

**A.** No, there is no migration path from a standalone Cisco Transport Manager configuration to a high-availability configuration. The VERITAS File System and Volume Manager software technologies (included in VERITAS Database Edition/High-Availability for Oracle) need to be installed immediately after the Solaris 8 operating system is installed.

**Q.** Where can I obtain the Cisco Transport Manager High-Availability Agent 2.2?

**A.** It is included on the installation CD with Cisco Transport Manager 6.0 and also available for evaluation from your Cisco sales representative. The product part numbers are CTM-6.0-HA and CTM-6.0-HA-UPG.

**Q.** What licenses will I need with Cisco Transport Manager in a high-availability environment?

**A.** You will need to purchase the Cisco Transport Manager High-Availability Agent 2.2 RTU license. When the license is purchased, all high-availability documentation will be shipped to you. Please refer to Cisco.com to download the latest soft copy of the Cisco Transport Manager release notes.

**Q.** Is any other Cisco software necessary, other than Cisco Transport Manager 6.0 and the Cisco Transport Manager High-Availability Agent 2.2?

**A.** No.

**Q.** Is there any customization needed in the high-availability environment?

**A.** You may wish to modify specific aspects of the high-availability configuration to fit your environment, such as adding more Ethernet modules, not mirroring internal disks, modifying steps that are documented in the Cisco Transport Manager High-Availability Installation Guide.

**Q.** What does the High-Availability Agent do?

**A.** It is a sophisticated software module that monitors processes and assesses the status of the primary server to help ensure that Cisco Transport Manager, Oracle, and the hardware are operating correctly.

**Q.** Will Cisco provide information on how to back up the Cisco Transport Manager in a high-availability solution?

**A.** Cisco provides an application note similar to the one provided for the Cisco Transport Manager standalone servers.

**Q.** What options do I have for backing up data?

**A.** For more information, please see the CTM 6.0 User Guide where all the options for backing up data are reported.

**Q.** What information is included in the Cisco Transport Manager High-Availability Installation Guide?

**A.** The document discusses all the reference hardware, part numbers, diagrams, and the complete installation instructions for all the software (Solaris, all hardware and software patches, VERITAS, Oracle, Cisco Transport Manager 6.0, and Cisco Transport Manager High-Availability Agent 2.2).

**Q.** Where can I find other documentation about the Cisco Transport Manager and High-Availability Agent?

**A.** The complete high-availability package – all documentation on the Cisco Transport Manager High-Availability Agent – is available on Cisco.com at a password-protected location. After customers have purchased a license to operate the High-Availability Agent, they will receive a complete hard copy of all high-availability documents and a password to access Cisco.com. This site also contains the most up-to-date Cisco Transport Manager release notes.

## **Hardware Configuration**

**Q.** Can I deviate from this reference architecture?

**A.** Absolutely. In fact, Cisco anticipates that you will use your own disk arrays, Fibre Channel adapter cards, or Sun servers. If you deviate from the Cisco referenced architecture, however, you will need to establish your own high-availability support infrastructure and ensure the hardware you plan to deploy (such as disk arrays and Sun servers) is supported by VERITAS.

**Q.** If I deploy the high-availability hardware infrastructure exactly as referenced, does this ensure qualification for high-availability support from Cisco?

**A.** The purpose of the reference architecture is to provide a template from which to build the high-availability infrastructure. You will still be responsible for establishing your own high-availability support from Cisco, as well as from the third-party vendor whose components you deploy.

**Q.** What is RAID?

**A.** RAID stands for Redundant Array of Independent Disks. Essentially, it allows customers to use a combination of hardware and software to configure a multitude of disk drives in various configurations (for example, RAID 0, 1, 1+0, 5, and so on). Each numeric value represents mirroring, striping, parity striping, or a combination of both (“+”).

**Q.** What RAID configuration can I use?

**A.** You may select any RAID configuration you would like to deploy. The reference configuration used has been set up as RAID 5+0 in the Cisco Transport Manager High-Availability Installation Guide.

## Installation and Support

**Q.** What maintenance contracts are required for a high-availability configuration?

**A.** The maintenance contracts required are:

- External high-availability support from third-party vendors (consists of support for Sun servers, VERITAS software, and Oracle).
- Annual Cisco Transport Manager maintenance contract from Cisco
- Disk array support (EMC, Hitachi, etc.)
- Tape or system backup support

**Q.** What are the options for external high-availability support?

**A.** You can obtain support from the individual third-party vendors mentioned previously, through joint support alliances, or rely on your own in-house expertise.

**Q.** Does the annual Cisco Transport Manager maintenance contract differ for installation on high-availability servers versus standalone servers?

**A.** Yes. For installation on high-availability servers, you need to purchase the standard Cisco Transport Manager maintenance support (SASU), along with the high-availability support (SASU). The minimum baseline joint support alliance contract is also required, but you can purchase higher levels of support – such as 2-hour hardware replacement, fly-to-site, priority queuing, and more – from each vendor.

**Q.** Because the Cisco Transport Manager high-availability solution consists of two Sun servers, does this require the purchase of two copies of Cisco Transport Manager and two maintenance contracts?

**A.** No, only the Cisco Transport Manager software and a single maintenance contract are required.

**Q.** Why has Cisco chosen to recommend outsourced support for my high-availability infrastructure?

**A.** Because timely resolution of critical problems is best managed by those with the expertise to assist with problems that may occur with these third-party products.

## Third-Party Hardware and Software

**Q.** Can I deviate from the specified Sun Solaris and Oracle releases with Cisco Transport Manager in a high-availability environment?

**A.** No, Cisco Transport Manager 6.0 has been validated on specific Solaris 8 and Oracle 9i releases, as specified in the installation guide. Deviation from the specified Solaris or Oracle release in the standalone or high-availability architecture may cause problems that the Cisco TAC team would be unable to reproduce.

**Q.** What hardware release of Solaris is used in the high-availability and standalone Cisco Transport Manager configurations?

**A.** Both have been validated with Solaris 8 Hardware Release 02/04.

**Q.** What software is required to run on the high-availability configuration?

**A.** The software requirements for the high-availability configurations are as follows:

- Sun Microsystems Solaris administration (Solaris 8 02/04)
- Cisco Transport Manager 6.0
- Cisco Transport Manager high-availability Agent Release 2.2
- Oracle Enterprise Database Edition 9i Release 2 64-bit production (Oracle9i) for Sun Solaris 8

- VERITAS Database Edition/high-availability Release 4.0 for Oracle on Solaris
- VERITAS Volume Manager (VxVM) 4.0
- VERITAS File System (VxFS) 4.0
- VERITAS Cluster Server (VCS) 4.0
- VERITAS Cluster Server Oracle Agent 4.0

For geographic redundancy, add:

- VERITAS Volume Replicator 4.0
- VERITAS Cluster Server VVR Agent 4.0
- VERITAS Global Cluster Manager 4.0 (with data-replication option)

In addition, all software patches for Solaris, VERITAS, PCI adapters, and Oracle are required.

**Q.** How many licenses are required?

**A.** Table 2 lists the required software licenses for the Cisco Transport Manager high-availability configuration.

**Table 2.** Software Licenses for the Cisco Transport Manager High-Availability Configuration

Software	Number of Required Licenses
Cisco Transport Manager 6.0	1 license
Cisco Transport Manager High-Availability Agent 2.2	1 license
Oracle Database 9i	See vendor for options
VERITAS Database Edition/High-Availability 4.0 for Oracle on Solaris	1 license per server
VERITAS Volume Replicator 4.0	1 license per server
VERITAS Cluster Server VVR Agent 4.0	1 license per server
VERITAS Global Cluster Manager 4.0	1 license (with data-replication option) per site

Please contact your VERITAS sales representative for more details on configurations and pricing of the VERITAS Global Clustering solutions.

**Q.** What are the options for Oracle licenses?

**A.** You can pay Oracle based on the number of CPUs installed in your system, or based on the number of named users. The Cisco Transport Manager 6.0 Standalone Installation Guide provides detailed information on the number of named users required. Full Oracle licensing is required for the primary Sun server; no additional Oracle licenses are required for the secondary Sun server.

An Oracle sales representative can offer the best advice on exact licensing fees, based on your hardware configuration.

**Q.** Are extra Oracle named users required in a with-data-replication option high-availability environment?

**A.** As specified earlier, the Cisco Transport Manager 6.0 software used in the high-availability environment is identical to the standalone Cisco Transport Manager 6.0 software. There are no extra named users or licenses needed to operate in a high-availability configuration.

**Q.** What does VERITAS Database Edition/High-Availability 4.0 for Oracle on Solaris consist of?

**A.** The VERITAS Database Edition/High-Availability 4.0 for Oracle on Solaris is comprised of the following:

- VERITAS Volume Manager (VxVM) 4.0
- VERITAS File System (VxFS) 4.0
- VERITAS Cluster Server (VCS) 4.0

- VERITAS Cluster Server Oracle Agent 4.0

**Q.** Will the high-availability agent work with any Sun hardware?

**A.** Yes, if the Sun hardware is configured with Solaris 8. Customers should ensure the hardware they plan to deploy (servers and disk arrays) has been validated and will be supported by VERITAS. Confirmation of this can be found at <http://www.veritas.com>.

**Q.** Is Sun Cluster Server or Oracle Parallel Server part of the high-availability configuration?

**A.** No, there are a variety of ways that high availability can be deployed using a multitude of vendor software and hardware. The goal is to provide customers with an architecture that has been tested using Cisco Transport Manager High-Availability Agent 2.2. VERITAS was selected because it is a leading software high-availability solution integrator and uses best-in-class Sun hardware and Oracle Relational Database Management System (RDBMS).

## **Failover**

**Q.** What causes the secondary server to assume the role of the primary server?

**A.** The secondary server assumes the load of the primary server in the event of primary server failure. Essentially, a number of criteria parameters must be met for the high-availability agent to determine the primary server has failed. When the high-availability agent has detected a failure, the primary system is shut down in an orderly sequence (assuming no system failures on the CPU, motherboard, etc.) and the secondary server activates all appropriate daemons, launches Oracle, activates the virtual IP, and restarts the Cisco Transport Manager.

**Q.** What is the impact on the network in the case of a primary server failure?

**A.** Any alarms sent to the primary server when the systems are switching to the secondary server (which assumes virtual IP address identity) will be lost until the Cisco Transport Manager resynchronizes with the network element and receives an updated alarm status. When the secondary Cisco Transport Manager server comes online and has assumed the virtual IP address, the Cisco Transport Manager can synchronize either manually or automatically to every network element to obtain the latest alarm status.

**Q.** Will the secondary server toggle back to the primary server if the high-availability agent detects a failure in the secondary server?

**A.** No, this requires a platform manager intervention, and prevents the systems from toggling back and forth until someone investigates what caused the initial failover situation.

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