

# Release Notes for Cisco ONS 15327

## Release 3.3

---

### December, 2003

Release notes address closed (maintenance) issues, caveats, and new features for the Cisco ONS 15327 SONET multiplexer. For detailed information regarding features, capabilities, hardware, and software introduced with this release, refer to Release 3.3 of the *Cisco ONS 15327 Installation and Operations Guide*, *Cisco ONS 15327 Troubleshooting and Reference Guide*, and *Cisco ONS 15454 and Cisco ONS 15327 TL1 Command Guide, Release 3.3*. For the most current version of the *Release Notes for Cisco ONS 15327 Release 3.3*, visit the following URL:

<http://www.cisco.com/univercd/cc/td/doc/product/ong/15327/rnotes/index.htm>

Cisco also provides Bug Toolkit, a web resource for tracking defects. To access Bug Toolkit, visit the following URL:

[http://www.cisco.com/cgi-bin/Support/Bugtool/launch\\_bugtool.pl](http://www.cisco.com/cgi-bin/Support/Bugtool/launch_bugtool.pl)

## Contents

- [Changes to the Release Notes, page 2](#)
- [Caveats, page 2](#)
- [Resolved Software Caveats for Release 3.3, page 7](#)
- [New Features and Functionality, page 10](#)
- [Related Documentation, page 38](#)
- [Obtaining Documentation, page 38](#)
- [Obtaining Technical Assistance, page 39](#)



---

Corporate Headquarters:  
Cisco Systems, Inc., 170 West Tasman Drive, San Jose, CA 95134-1706 USA

Copyright © 2001. Cisco Systems, Inc. All rights reserved.

# Changes to the Release Notes

This section documents supplemental changes that have been added to the *Release Notes for Cisco ONS 15327 Release 3.3* since the production of the Cisco ONS 15327 System Software CD for Release 3.3.

The following changes have been added to the release notes for Release 3.3.

## Changes to Caveats

The following caveats have been added to the release notes.

[JRE Updates, page 2](#)

[JRE Updates, page 2](#)

[DDTS # CSCdx78825, page 3](#)

## Caveats

Review the notes listed below before deploying the ONS 15327. Caveats with DDTS tracking numbers are known system limitations that are scheduled to be addressed in a subsequent release. Caveats without DDTS tracking numbers are provided to point out procedural or situational considerations when deploying the product.

## Maintenance and Administration



### Caution

---

VxWorks is intended for qualified Cisco personnel only. Customer use of VxWorks is not recommended, nor is it supported by Cisco's Technical Assistance Center. Inappropriate use of VxWorks commands can have a negative and service affecting impact on your network. Please consult the troubleshooting guide for your release and platform for appropriate troubleshooting procedures. To exit without logging in, enter a Control-D (hold down the Control and D keys at the same time) at the Username prompt. To exit after logging in, type "logout" at the VxWorks shell prompt.

---

## JRE Updates

Cisco ONS platforms ship with a Java Runtime Environment (JRE) from Sun Microsystems. Occasionally Sun releases maintenance releases to the JRE. The Sun Microsystems website lists JRE maintenance releases and the issues resolved for each. Cisco recommends that you review these listings to determine if the issues resolved in any given JRE maintenance release warrant a JRE upgrade for your particular network. Cisco tests only with the specific JRE actually shipped with the ONS software CD.

## DDTS # CSCeb05404

PWR-A/B alarms can become stuck for an ONS 15327 node in the event of a transient power failure. The alarms will clear after resetting both XTCs. This issue is resolved in Release 4.6.

## DDTS # CSCdx78825

The ONS 15327 XTC reboots after the XTC has received 64 or more ARP requests on a subnet different from that of the XTC. This situation can occur when the network settings (IP address and netmask) are incorrect for the craft Ethernet environment. The node may respond to Ethernet ARP requests via its automatic host detection feature. If this feature is triggered more than 64 times, the node's XTC will reboot. Removing the craft Ethernet connection resets the count, so this situation is unlikely to occur with an End Network Element (ENE). To avoid this issue, ensure that the node is properly provisioned for its craft Ethernet environment. In particular, ensure that the netmask is correct. For ENEs that depend on automatic host detection, avoid leaving the craft Ethernet connected for more than one day at a time. This issue is resolved in Release 3.4.

## Upgrades from Release 1.0

If you wish to upgrade from Release 1.0 to Release 3.3, you must first upgrade to maintenance Release 1.0.2. If you are already running maintenance Release 1.0.1, you do not have to perform the intermediate upgrade.

## DDTS # CSCdx02680

If you create a VT circuit, set the DS1 port in service, generate any alarm, then set the port out of service, you may see VT alarms that will not clear. To clear the alarms, delete the VT circuit. This issue will be resolved in Release 3.4.

## DDTS # CSCds23552

You cannot delete the standby XTC once it is removed. If you have two XTC cards and then decide to operate with only one, you will get a standing minor alarm. The alarm cannot be removed by CTC. The XTC is a combo card, combining the functionality of the ONS 15454 TCC+, cross connect, DS1 and DS3 cards, with a protection group automatically provisioned. On the ONS 15454, similar behavior occurs for the TCC+ card. The cross connect card for the ONS 15454 can only be deleted if there are no circuits provisioned. DS1 and DS3 cards can only be deleted if they are not in a protection group. It is not known at this time when or if this issue will be resolved.

## DDTS # CSCdw71844

If a manual switch request is made when a higher priority request is present (in other words, SD/SF or lockout), the user request will not be denied. This issue will be resolved in Release 3.4. As of Release 3.4, if a user initiated switch should not cause an actual switch (because of a higher priority request), the switch will be denied.

If a switch is accepted but overridden at a later time because a higher priority request is initiated, the current switch will be cleared. This applies to 1+1, UPSR/SNCP and BLSR/MS-SPRing.

## DDTS # CSCdw95301

When there are large numbers of VT circuits (greater than 100) and when there is a lot of circuit activity (for example, when there are a lot of updates), the circuits pane can be extremely slow to repaint, and the user interface can fail to respond for several minutes. This issue will be resolved in a future release.

## DDTS # CSCdt30119

VT1.5 circuits might require new VT tunnels despite sufficient bandwidth on existing VT tunnels. In complex configurations of the Cisco ONS 15327 that use both 1+1 and UPSR protection, automatic circuit routing may fail to use existing VT tunnels. When you create new VT1.5 circuits with automatic circuit routing, the ONS 15327 might prompt you to create new VT tunnels even though sufficient bandwidth is available in existing VT tunnels. Use manual routing to specify a path for the VT1.5 circuit through the existing VT tunnels. This issue will be resolved in a future release.

## Line Cards

### DDTS # CSCdt50628

B3 errors might appear on an OC-12 span after an XTC side switch. A one-time burst of B3 errors might occur after an XTC side switch when the ONS 15327 is configured with an OC-12 line card. This is a rare condition which has been seen in approximately 1% of such XTC side switches. The result is less than 1 errored second. No traffic outage is associated with this burst of B3 errors. The issue only arises with OC-12 configurations. OC-48 configurations are not affected. This issue will be resolved in a future release.

## BLSR Functionality

### DDTS # CSCdw64086

For a given BLSR node equipped with two XTCs or two TCCs, say Node 1, if you back up the database, change the node ID of any of the other nodes in the ring, and then restore the database for Node 1, following completion of the database restoral, a node ID mismatch condition will exist. However, the node ID mismatch alarm may not be raised to warn you that BLSR will not function properly. If this occurs, after the database restoral has completed, you can change the local node's Node ID (you can then change it back to the previous ID if you prefer) to restore functionality of the BLSR (and clear the alarm, if it is raised). If you perform a database restoral on a BLSR node, always verify afterwards that all nodes in the ring have the correct ring map. This will ensure that any such issue for which an alarm is not raised can be found and corrected. This issue will be resolved in Release 3.4.

### DDTS # CSCdw66416

Traffic along a running ring segment cannot be restored while a participating node is rebooting. To see this problem, in a two fiber BLSR with circuits created along a given ring segment, you must isolate that ring segment by powering down two or more nodes where one of the nodes powered down is at the edge of the segment and the others are outside of the segment. Then power up and reboot the node at the edge of the segment. The circuits along this segment will not be restored even though the nodes on the segment are both up and running. You must restore power to all nodes before the traffic is restored.

## BLSR Support for Mixed Node Networks

The ONS 15327 is supported for BLSR in combination with ONS 15454 nodes only if Release 3.3 is installed and running on all BLSR nodes. If you wish to provision a BLSR on a combination of ONS 15327 and ONS 15454 nodes, you should upgrade to Release 3.3 on all ONS 15454 and ONS 15327 nodes first.

## UPSR Functionality

### DDTS # CSCdx40081

If, in an OC-48 UPSR network, there is an STS-3C circuit, using STS 4-6, that terminates on OC-12 IR cards, and 28 VT circuits are bulk provisioned between two nodes on the ring, the STS-3C circuit can take at least one traffic hit during the VT circuit provisioning process. This only occurs if an OC-12 IR card has been reset after the STS-3C circuit was created.

Deleting one or more VT circuits in the same situation may also cause an STS3C traffic hit. It is not known when or if this issue will be resolved.

## TL1



Note

---

To be compatible with TL1 and DNS, all nodes must have valid names. Node names should contain alphanumeric characters or hyphens, but no special characters or spaces.

---

## TL1 Gateway Network Elements

The ONS 15327 cannot act as a TL1 Gateway Network Element in Release 3.3.

## Changes in TL1

In Release 3.3, TL1 output has changed to conform to Telcordia standards as follows:

- The time period parameter has changed from 15MIN to 15-MIN, and its position in the output has shifted.
- The direction parameter, BTH, is no longer included in the output. Only TRMT, or RCV is valid.
- The mondat and montm parameters have been added to the end of output.

For example:

In Releases 1.0.x, you would see:

```
> rtrv-pm-oc12::fac-2-1:1::,, ,15min;
IP 1
<
  va327-22 1970-01-01 16:09:07
M 1 COMPLD
  "FAC-2-1:SEFS,0,COMPL,NEND,15MIN,BTH,,,"
  "FAC-2-1:CVL,0,COMPL,NEND,15MIN,BTH,,,"
  "FAC-2-1:ESL,0,COMPL,NEND,15MIN,BTH,,,"
  "FAC-2-1:SESL,0,COMPL,NEND,15MIN,BTH,,,"
  "FAC-2-1:UASL,0,COMPL,NEND,15MIN,BTH,,,"
```

```

" FAC-2-1:FCL,0,COMPL,NEND,15MIN,BTH,, "
" FAC-2-1:NPJC-PDET,0,COMPL,NEND,15MIN,RCV,, "
" FAC-2-1:PPJC-PDET,0,COMPL,NEND,15MIN,RCV,, "
" FAC-2-1:NPJC-PGEN,0,COMPL,NEND,15MIN,TRMT,, "
" FAC-2-1:PPJC-PGEN,0,COMPL,NEND,15MIN,TRMT,, "
" FAC-2-1:CVL,0,COMPL,FEND,15MIN,BTH,, "
" FAC-2-1:ESL,0,COMPL,FEND,15MIN,BTH,, "
" FAC-2-1:SESL,0,COMPL,FEND,15MIN,BTH,, "
" FAC-2-1:UASL,0,COMPL,FEND,15MIN,BTH,, "
" FAC-2-1:FCL,0,COMPL,FEND,15MIN,BTH,, "
;
>

```

While the Release 3.3 output differs as follows:

```

> rtrv-pm-oc12::fac-2-1:1::,0-up;
rtrv-pm-oc12::fac-2-1:1::,0-up;
va327-22 1970-01-01 16:03:04
M 1 COMPLD
" FAC-2-1,OC12:CVS,0,PRTL,NEND,RCV,15-MIN,01-01,16-00"
" FAC-2-1,OC12:ESS,0,PRTL,NEND,RCV,15-MIN,01-01,16-00"
" FAC-2-1,OC12:SESS,0,PRTL,NEND,RCV,15-MIN,01-01,16-00"
" FAC-2-1,OC12:SEFS,0,PRTL,NEND,RCV,15-MIN,01-01,16-00"
" FAC-2-1,OC12:CVL,0,PRTL,NEND,RCV,15-MIN,01-01,16-00"
" FAC-2-1,OC12:ESL,0,PRTL,NEND,RCV,15-MIN,01-01,16-00"
" FAC-2-1,OC12:SESL,0,PRTL,NEND,RCV,15-MIN,01-01,16-00"
" FAC-2-1,OC12:UASL,0,PRTL,NEND,RCV,15-MIN,01-01,16-00"
" FAC-2-1,OC12:FCL,0,PRTL,NEND,RCV,15-MIN,01-01,16-00"
;
>

```

## Commands not Supported in Release 3.3

The following commands are not supported:

- ED-CRS-<STS\_PATH>
- ED-CRS-VT1
- OPR-UPGRADE
- DLT-<MOD2>, ENT-<MOD2>, RMV-<MOD2>, and RST-<MOD2> do not apply to DS1, STS1, STS3C, STS12C, STS48C, VT1
- ED-EQPT
- RTRV-USER-SECU
- ED-VT1
- RTRV-VT1

These commands will be supported in a future release.

## Performance Monitoring

### DDTS # CSCdt10886

The far-end STS PM counts do not accumulate on an OC-48 linear 1+1 circuit even though the near-end STS PM counts on the other end are increasing. To see this issue, connect two nodes with an OC-12 or OC-48 linear 1+1 protected span. Place a piece of test equipment in the middle of the span and inject B3

errors. The near-end STS PM counts accumulate, but the far-end STS PM counts do not accumulate. To work around this issue, Use the near-end STS PM count from the adjacent node to see the far-end STS PM count for the current node. This issue will be resolved in a future release.

## Resolved Software Caveats for Release 3.3

The following items are resolved in Release 3.3.

### Line Cards

#### DDTS # CSCds78402

Exporting the Ethernet PM window does not save the data field. Click on an E10/100-4 card to display the CTC card view. Click the Performance tab. Export the History, Utilization, and Statistics windows as .html, .csv, .tsv files. When these files are opened, the data field does not show any details. This issue is resolved in Release 3.3.

### Performance Monitoring

#### DDTS # CSCdu06778

The UAS, ES, and SES PM counters on the ONS 15327 do not meet the Telcordia GR-253 requirements in Section 6.2.2; specifically, an interpretation of the block diagrams in fig. 6.19 of the specification (which see). Provision a circuit on an ONS 15327 and inject a high rate of bit errors. Go to the performance monitoring screen and look at the ES, SES, and UAS counters. According to the Telcordia GR-253 block diagrams, when 10 consecutive SES are declared, UAS should be declared and should start counting from 10. When UAS starts counting, SES and ES should also be decremented by 10. This issue is resolved in Release 3.3.

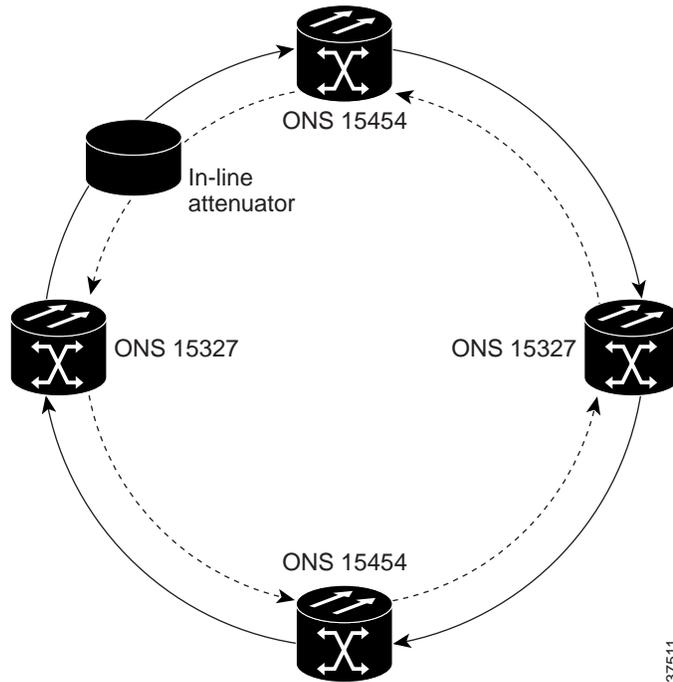
#### DDTS # CSCdu37695

The far-end line layer PM data on an ONS 15327 node are not inhibited by near-end LOS, LOF, or AIS-L. Provision an STS circuit between two ONS 15327 nodes connected through OC-12 or OC-48 cards and inject AIS-L on one end. From the CTC Performance Monitoring screen on the node where the AIS-L is injected, observe the far-end line layer registers and notice that they are not inhibited by the near-end AIS-L, nor are they set to be invalid. This is true for AIS-L, LOF, or LOS. This issue is resolved in Release 3.3.

#### DDTS # CSCdt08920

No far-end PM counts are reported for CV-VFE, ES-VFE, SES-VFE and UAS-VFE. Set up an OC-48 UPSR between Cisco ONS 15327s and Cisco ONS 15454s as shown in [Figure 1](#).

Figure 1 OC-48 UPSR



Provision a circuit over the UPSR with a DS-1 drop at each end. Clear all fifteen-minute counts on near-end and far-end bins. From the variable optical attenuator, increase the attenuation ~20 db. The OC-48 trunk card starts to see signal degrade (SD) on its line. The near-end DS-1 port on the ONS 15327 starts to accumulate CV-V and ES-V. The far-end DS-1 should also show PM counts (i.e. CV-V, ES-V, SES-V, UAS-V), but does not. This issue is resolved in Release 3.3.

### DDTS # CSCds66639

When the PM counters are zeroed, the entries for CV-V, ES-V, SES, and UAS-V are not colored yellow to mark them as "invalid." Provision VT circuits. In CTC, browse to the Performance Monitoring tab for one of the DS-1 facilities involved in the VT circuits. Attempt to zero the PM counters. The entries for the zeroed counters should turn yellow to indicate that they are invalid assessments of the current time period, but they do not change color. After zeroing the performance counters, all counters become valid at the same time. To determine if an affected counter is valid, note whether all other counters in the same time block are valid. This issue is resolved in Release 3.3.

### DDTS # CSCds77660

The ONS 15327 might report TCAs for VT-level unavailable seconds (UAS-V), errored seconds (ES-V), and coding violations (CV-V) when the PM counts are not changing. These TCAs have been seen on DS-1 Ports 3 and 5. From the CTC Circuits tab, use the Create button to build VT circuits from several DS-1 ports. Monitor the Alarms tab for TCAs. This issue is resolved in Release 3.3.

## Maintenance and Administration

### DDTS # CSCdv62990

Telcordia GR-815 requires that a new password must have at least 1 numeric character (0 to 9) and at least one special character from the character set {plus-sign (+), pound-sign (#), percent-sign (%)}. CTC normally issues a warning if the password is non-compliant, but allows you to create the password. However, CTC does not issue a warning when a new password is requested that has two special characters, but no numeric component. Thus, for example, there is no warning in CTC for the password “aaaa+,” which lacks the numeric character and is non-compliant. This issue is resolved in CTC Release 3.3.

### DDTS # CSCdu03513

A node can become permanently gray in the network view of a CTC session, and therefore inaccessible for that session. Under some conditions, CTC will stop trying to establish connection to a node and the node will turn gray in the network view, thus remaining inaccessible throughout the CTC session (at present you are not notified when this occurs). The conditions include:

- CTC encounters something unexpected in the CTC Cache—either a missing file, or a file that does not have the expected contents. This occurs most frequently when there are multiple topology hosts with overlapping topologies specified in the preferences file and you access the nodes during their reboot process (active card booted, standby card rebooting).
- The issue cannot be positively identified until after you are sure the node has had a reasonable length of time to be discovered. Wait at least fifteen minutes for a node to be discovered and represented as accessible.
- Also, some nodes may be validly represented as inaccessible during a CTC session when software versions are incompatible. The incompatible software version alarm might not always be raised in these circumstances.

If the inaccessible node is running a software version that differs from that of other nodes in the network, start CTC from the highest-versioned node in the network. If, however, the node ought to be accessible but is still grayed out, eliminate multiple nodes from a single topology from the group list. In other words, set up your group list such that one node can discover another node, rather than putting them into a topology host group. (Define the group list from the Edit > Preferences menu, and select it in the login dialog box when you launch CTC.) This issue is resolved in Release 3.3.

### DDTS # CSCds92475

The ACT/STBY LED of the active XTC is permanently amber after the Lamp Test button in CTC is clicked. (Display the CTC node view and click the **Maintenance > Diagnostic** tabs to view the Lamp Test.)

Under normal conditions, the ACT/STBY LED of the active XTC should be green. The ACT/STBY LED of the standby XTC should be amber. Browse to the **Maintenance > Diagnostic** tabs in CTC and click the Lamp Test button. The ACT/STBY LED of the active XTC turns amber and remains that way.

It is possible to return the node to a state where the active XTC has a green ACT/STBY LED by resetting the active XTC from the CTC. Note that in a node with redundant XTCs, this reset will force an XTC protection switch and cause an in-service traffic disruption of less than 60 ms. In a node with only one XTC, the traffic disruption will be longer and may be unacceptable. Determine which XTC is active by

selecting the XTC Protection Group (XTCPROTGRP) in the **Maintenance > Protection** tabs at the node view. Right-click the active XTC in the shelf graphic, and select “Reset” to reset the XTC. The standby XTC will come on line and its ACT/STBY LED will turn green.

This issue is resolved in Release 3.3.

## DDTS # CSCdt22538

Nodes that are connected to the LAN only by the DCC do not have their time set by an SNTP server on the LAN. The time and date do not synchronize with that of the SNTP server.

This occurs with the following configuration: Node 2---(DCC)---Node 1---LAN

Node 2 does not have a LAN connection. Provision Node 2 to use an SNTP server to obtain the correct date and time. The remote node will not be able to connect to the SNTP server. The default date and time will be displayed.

There are two workarounds.

1. Set up a static route to the SNTP server. The static route must be provisioned on the node with the LAN connection. Here is an example:

Static route:

Destination: (IP address of SNTP server goes here)

Mask: 255.255.255.255

Next Hop: (IP address of LAN connected node goes here)

Cost: 2

2. Disable use of an SNTP server and set the date and time manually in CTC. An XTC protection switch will not cause the date and time to be reset, but if both XTCs are powered down simultaneously (or a simplex XTC is reset) the date and time will return to the default values.

This issue is resolved in Release 3.3.

## New Features and Functionality

This section highlights new features and functionality for Release 3.3. For detailed documentation of each of these features, consult the user documentation.

### Hardware

#### Industrial Temperature

With Release 3.3., the ONS 15327 and its line cards are certified for Industrial Temperature (I-temp) operation. I-temp certification specifies that equipment operate in temperatures between -40 to +65 degrees C. The ONS 15327 Ethernet (E100-4) and OC48-I-IR 1310nm cards are not certified for I-temp. Each I-temp certified product indicates its certification by a “-T” in the part number.

## Fan Tray Assembly

Releases 1.0.x of the ONS 15327 included a fan tray with two fans. Release 3.3 introduces a fan tray unit that uses six fans, and is I-temp certified. The new fan tray is backward compatible with any existing ONS 15327 chassis. The fan tray assembly consists of six fans, a status LED on the faceplate, and a fan control PCB.

## Wall Mounted Enclosure

The Release 3.3 ONS 15327 hardware can be mounted in a wall mount enclosure. The enclosure contains the ONS 15327 chassis, a rectifier, and battery backup. The rectifier can be plugged into a 110 VAC wall socket to power everything in the enclosure.

## OC3/STM1-IR-4 (1310)

The OC3/STM1-IR-4 provides four Telcordia GR-253 SONET/SDH compliant interfaces per card. Each interface operates at 155.52 Mbps over a single mode fiber span and may be provisioned for both concatenated and non-concatenated payloads on an STS-1 basis.

The OC3/STM1-IR-4 has 4 standard GR-253/G.957 compliant OC3/STM-1 interfaces running TCP/IP over the Section DCCs enabling it to interoperate with a Cisco ONS 15327 OC3/STM-1 interface or a Cisco ONS 15303/15304 OC3/STM-1 interface for all transport applications. The OC3/STM1-IR-4 card may be installed in any high-speed slot in the shelf assembly.

Each interface features a 1310 nm laser to support spans without repeaters at distances up to approximately 15 kilometers depending on the condition of facilities. Each interface contains a transmitter and receiver. The OC3/STM1-IR-4 is only available with LC connectors.

Each OC3/STM-1 port on the OC3/STM1-IR-4 can participate in a 1+1 Line Switched protection scheme, STS-1/VT1.5 Path Switched protection scheme (UPSR), or Cisco's Path Protected Mesh Networks (PP-MN). BLSR protection is not supported on the OC3/STM1-IR-4 card.

## OC12/STM4-LR-1 (1550)

The OC12/STM4-LR-1550 Long Reach optical transceiver module provides one Telcordia GR-253/G.957 SONET/SDH OC12/STM-4 compliant interface per card. Each interface provides 622.08 Mbps over a single mode fiber span and may be provisioned for both concatenated and non-concatenated services on an STS-1 basis.

The OC12/STM4-LR-1550 card can be installed in any of the high-speed slots in the Cisco ONS 15327 shelf assembly. Each interface features a 1550nm laser to support spans with no repeaters at distances of approximately 80 kilometers, depending on the condition of the facilities. Each interface contains a transmitter and receiver using SC optical connections.

The OC12/STM4-LR-1550 supports 1+1 Line Switched, BLSR, Path Switched protection scheme (UPSR), or Cisco's Path Protected Mesh Network (PPMN). The OC12/STM4-LR-1550 has a standard GR-253/G.957 compliant OC12/STM-4 interface running TCP/IP protocol over the section DCCs, enabling it to interoperate with a Cisco ONS 15454 OC12/STM-4 interface for all transport applications.

## OC48/STM-16-LR-1 (1550)

The OC48/STM16-LR-1550 Long Reach optical transceiver module provides one Telcordia GR-253/G.957 SONET/SDH OC48/STM-16 compliant interface per card. Each interface provides 2488.32 Mbps over a single mode fiber span and may be provisioned for both concatenated and non-concatenated services on an STS-1 basis.

The OC48/STM16-LR-1550 card may be installed in any of the high-speed slots in the Cisco ONS 15327 shelf assembly. Each interface features a 1550nm laser to support spans with no repeaters at distances of approximately 80 kilometers, depending on the condition of the facilities. Each interface contains a transmitter and receiver using SC optical connections.

The OC48/STM16-LR-1550 supports 1+1 Line Switched, BLSR, Path Switched protection scheme (UPSR), or Cisco's Path Protected Mesh Network (PPMN). The OC48/STM16-LR-1550 has a standard GR-253/G.957 compliant OC12/STM-4 interface running TCP/IP protocol over the Section DCCs, enabling it to interoperate with a Cisco ONS 15454 OC12/STM-4 interface for all transport applications.

## Software



### Note

The CTC and network element software of the ONS 15327 have, in the past, retained separate version numbers. Release 1.0.x of the ONS 15327 software contains network element software 1.0.x and CTC software 2.3.x. Release 3.3 introduces the alignment of the ONS 15327, ONS 15454, and ONS 15454 SDH platform network element software. CTC enhancements and some other features introduced in ONS 15454 Releases 2.2.1-3.1 have also been added to the ONS 15327 for Release 3.3. Therefore, much of the content in the following sections is derived from those releases.

## Automatic Host Detection

Automatic host detection, commonly referred to as “ARP sniffing,” has been added for the ONS 15327 XTC Ethernet port for Release 3.3. Automatic host detection allows a CTC workstation on a different subnet from the ONS 15327 node to directly connect to the node and launch CTC. Once automatic host detection is enabled it remains active at all times.

To enable automatic host detection, enter the IP address of the workstation as a default gateway for LAN connection. (In Microsoft Windows NT or 2000, choose Start > Settings > Control Panel > Network and Dial-up Connections > Local Area Connection > Properties. Select Internet Protocol, click the Properties button, click Advanced, click Add, and enter the IP address.) Once you have set up your workstation you must launch CTC before automatic host detection begins.



### Note

If you ping a node on a different subnet from the workstation before automatic host detection has started for that workstation, the ping will fail to reach the node.

## Proxy Server Feature Set

The Proxy Server feature set allows a CTC session to access ONS 15327s while at the same time restricting unauthorized IP connectivity. Proxy server features can also reduce the amount of network setup required for external routers and CTC workstations. For a complete description of Proxy Server feature combinations and their use, and for important SNTP and DHCP configuration notes, consult the *Cisco ONS 15327 User Documentation*.

Proxy Server is a set of three options (checkboxes) in the Provisioning > Network tabs listed under Gateway Settings: Craft Access Only, Enable Proxy and Enable Firewall. These new features can be used individually or in combination. Each is described briefly in the following sections.

### Enable Proxy Server

When you select Enable Proxy, a proxy server task is activated on the ONS 15327 causing the ONS 15327 to behave in a similar manner to a SOCKS proxy for any other ONS 15327s that it has a DCC connection to. A CTC workstation connected to an ONS 15327 proxy server has CTC visibility to DCC-connected ONS 15327s and ONS 15454s even if there is no direct IP connectivity. All that is required is that the CTC workstation has connectivity to the ONS 15327 that has proxy server enabled.

### Firewall

The Firewall feature can prevent CTC workstations from using an ONS 15327's DCC communications path to access other workstations on the DCN. When Firewall is enabled, unnecessary IP communications are restricted between the ONS 15327's DCC channels and the XTC Ethernet port. The node accomplishes this by discarding craft Ethernet packets not addressed to itself and DCC packets not addressed to itself or to a DCC peer.

### Craft Access Only

In previous releases, when an ONS 15327 XTC card detected an active link on its LAN port it would advertise a route to other DCC connected ONS 15327s indicating that all packets with a destination matching its own subnet should be routed to its LAN port. If two or more ONS 15327s were on the same subnet and had active links, multiple routes would result for packets on this subnet. This would cause some packets to be sent to one of the ONS 15327s and others to be sent to another resulting in loss of connectivity to some of the nodes in CTC. In previous releases, this behavior could be prevented by entering a static host route in the ONS 15327 with the connected CTC workstation as its destination.

The Craft Access Only feature allows multiple CTC sessions to ONS 15327 which are all on the same subnet, without the need to enter static host routes. When the feature is enabled, the ONS 15327 will not advertise routes to other 15327s it has DCC connectivity to. The ONS 15327 will only send packets for the connected CTC workstation through its LAN port. Other packets arriving from or being sent to other DCC connected nodes will be routed as though the CTC workstation is not connected.

## Hitless Software Upgrades

Software upgrades from a previous release to Release 3.3 can be accomplished with no bit errors on traffic traversing or terminating in the ONS 15327 outside of the standard thresholds for hitless provisioning (60ms). The exception to this capability is the E-series Ethernet cards. Due to the necessary topology change observed by the software during a XTC reset, and subsequent spanning tree re-convergence, E-series cards do not pass traffic from the time of the active XTC reset (during activation) until the E-series cards reboot, plus approximately 30 to 45 seconds for spanning tree re-convergence. The total down time for E-series Ethernet traffic is approximately five minutes.



#### Note

---

G-series Ethernet cards operate at layer one and do not lose traffic during an upgrade.

---

## Network Time Protocol

The Network Time Protocol (NTP) feature enhances the SNTP (Simple Network Time Protocol) functionality of the ONS 15327 for Release 3.3. Now NTP servers are supported. Previously, the ONS 15327 supported only an SNTP server.

## Routing Improvements

Release 3.3 supports the ability to add a default route for connection to external systems. When the default route is added to one node, it is then advertised to all other DCC connected ONS 15454s and ONS 15327s.

## Spanning Tree Control

Release 3.3 adds the ability to Turn Spanning Tree off for Ethernet circuits. You can disable or enable spanning tree on a circuit-by-circuit basis on unstitched Ethernet cards in a point-to-point configuration. This feature allows you to mix spanning tree protected circuits with unprotected circuits on the same card, to reuse VLANs, and to set up two single-card E-series Ethernet cards on the same node to form an intranode circuit.

## AIS Off Mode for J1 Path Trace

In previous releases, when a J1 trace mismatch is detected the ONS 15327 inserts AIS path in the timeslot. The AIS off mode feature will allow customers to choose between sending or not sending AIS-P downstream from the TIM-P defect. When AIS-P is inserted downstream the likelihood of a traffic outage increases. The AIS off mode feature does not require any special configurations other than J1 compatible modules. See the *Cisco ONS 15327 User Documentation* for details on J1 compatibility.

## Orderwire Passthrough

Orderwire passthrough allows you to use Local/Express Orderwire between two ONS 15454 nodes that each have the AIC card, but have intermediate nodes between them that have no AIC card installed. As of Release 3.3 the ONS 15327 is supported for acting as an intermediate node in Orderwire passthrough.

## Line Buildout

Release 3.3 allows setting the Line Buildout (LBO) distance for the ONS 15327 BITS out signal. This setting is located in the Provisioning > Timing tabs. The setting is only applicable to the BITS Out signal and has no effect on the BITS in signal.

## Add Node Button

The Add Node button in CTC Release 3.3 allows you to easily add nodes to your CTC session view. The Add Node button appears in the upper left corner of the CTC window in any view. For more information on this feature, see *Cisco ONS 15327 User Documentation*, Release 3.3.

## Span Upgrades

In Release 3.3, in-service span upgrades are supported.

A span is the optical fiber connection between two ONS 15327 nodes. In a span upgrade, the transmission rate of a span is upgraded from a lower to a higher OC-N signal but all other span configuration attributes remain unchanged. With multiple nodes, a span upgrade is a coordinated series of upgrades on all nodes in the ring or protection group in which traffic carried at a lower OC-N rate is transferred to a higher OC-N.

You can perform in-service span upgrades for the OC-12 to OC-48 ONS 15327 cards.

The supported configurations for a span upgrade are:

1+1 Unprotected PPMN

1+1 Linear ADM

2-Fiber BLSR

UPSR

To perform a successful span upgrade, the higher-rate optical card must replace the lower-rate card in the same slot. If the upgrade is conducted on spans residing in a BLSR, all spans in the ring must be upgraded. The protection configuration of the original lower-rate optical card (two-fiber BLSR, UPSR, and 1+1) is retained for the higher-rate optical card.

When performing span upgrades on a large number of nodes, Cisco recommends that you upgrade all spans in a ring consecutively and in the same maintenance window. Until all spans are upgraded, mismatched card types will be present. No other maintenance operations should be performed or circuits added during a span upgrade.

Cisco recommends using the Span Upgrade Wizard to perform span upgrades. Although you can also use the manual span upgrade procedures, the manual procedures are mainly provided as error recovery for the wizard.

The Span Upgrade Wizard and the manual span upgrade procedures require at least two technicians (one at each end of the span) who can communicate with each other during the upgrade. Upgrading a span is non-service affecting and will cause no more than three switches, each of which is less than 50 ms in duration. For more information on span upgrades, see the *Cisco ONS 15327 User Documentation*, Release 3.3.

Span upgrades do not upgrade SONET topologies, for example, a 1+1 group to a two-fiber BLSR. See *Cisco ONS 15327 User Documentation*, Release 3.3 for topology upgrade procedures.

## Span Upgrade Wizard

In Release 3.3, the Span Upgrade Wizard automates all steps in the manual span upgrade procedure (BLSR, UPSR, and 1+1). The wizard can upgrade both lines of a 1+1 group; the wizard upgrades UPSRs and two-fiber BLSRs one line at a time. The Span Upgrade Wizard requires that spans have DCC enabled.

The Span Upgrade Wizard provides no way to back out of an upgrade. In the case of an abnormal error, you must exit the wizard and initiate the manual procedure to either continue with the upgrade or back out of it. To continue with the manual procedure, examine the standing conditions and alarms to identify the stage in which the wizard failure occurred. For more information on the Span Upgrade Wizard, see the *Cisco ONS 15327 User Documentation*, Release 3.3.

## Alarm Suppression

At the card level, you can suppress alarms on specific ports. At the node level, you can suppress alarms on specific cards or the entire node.

If alarms are suppressed, they do not appear on the CTC Alarm screen. On the History and Conditions screens a message states that the alarm or alarms are suppressed. The node sends out autonomous messages to clear any raised alarms. When alarm suppression is turned off, the node sends out autonomous messages to raise any suppressed alarms.

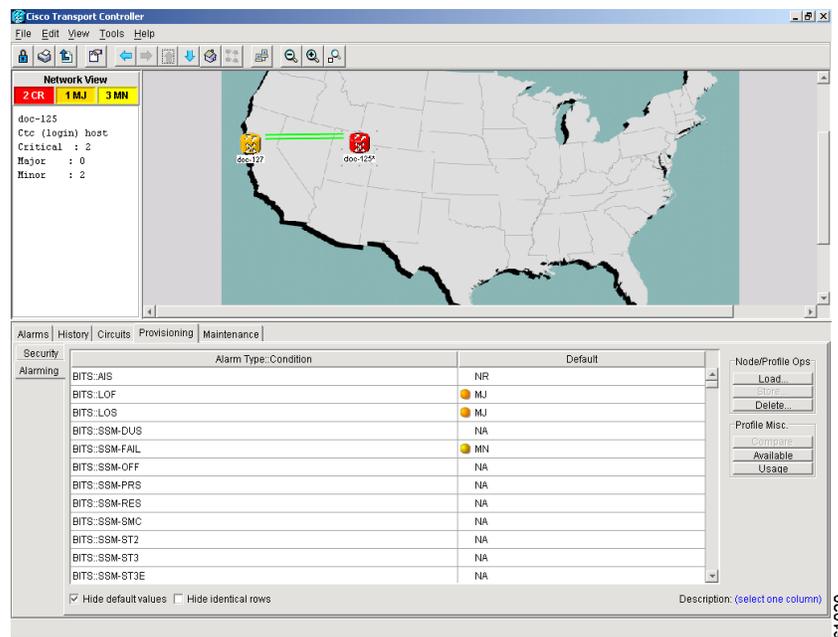
## Alarm Profiles

The ONS 15327 includes an alarm profile feature. This allows you to change the default alarm severities (for example, change an alarm severity from minor to major) and apply the new severities at the card, port, node, or network level.

## Default Reporting of AIS and RFI

To improve compliance with Telcordia GR-253, Release 3.0.x reports AIS and RFI failures as not alarmed (NA). These will appear on the conditions pane only. Users can change this default with the Alarm Profile feature described in the [“Alarm Profiles”](#) section on page 16.

*Figure 2 Creating alarm profiles with the Alarming tab*



Every alarm has a default profile. To create a new profile, clone the default profile in CTC, rename it, and choose the severity settings for the new profile. Activating and changing profiles are simple procedures in CTC.

61020

## Intermediate-Path Performance Monitoring

Release 3.3 supports Intermediate-Path Performance Monitoring (IPPM), which is the transparent monitoring of a constituent channel of an incoming transmission signal by a node that does not terminate that channel. IPPM allows you to monitor near-end PM data on individual STS payloads and report the associated threshold crossing alerts (TCAs) for user-selected STS payloads passing through a Cisco ONS 15327 OC-N card. Far-end PM monitoring is not presently supported.

An ONS 15327 performing IPPM examines the overhead in the monitored path and derives all of the near-end PM parameters in the incoming transmission direction while allowing the path signal to pass bidirectionally through the NE completely unaltered.

IPPM parameters are derived as follows: a bidirectional path is cross-connected through the ONS 15327 (non-PTE equipped) and has path terminations at path terminating equipment (PTE) 1 and PTE 2. Four sets of PM parameters are accumulated when IPPM is activated. For the path signal received on facility 1, these include the near-end parameters monitored on the path from PTE 1 to the SONET Line Terminating Equipment (LTE). For the path signal received on facility 2, these include the near-end parameters.

## Intermediate J1 and C2 Monitor and Report

Release 3.3 provides intermediate monitoring of the SONET J1 and C2 bytes, which means the LTE NE can provide on-demand diagnostics to detect and report the contents of the STS Path Trace and Signal Label in non-terminated STS Paths designated by the user. The J1 Byte contains a repetitive 64-byte message used to verify continuity between STS PTEs transmitting the byte. The J1 byte reports when an expected 64-byte message is not received. The C2 Signal Label byte provides a similar functionality. The C2 byte contains binary values or codes that define a specific type of payload transmitted in the STS SPE. The C2 byte is provisioned at the PTE. It is used to both identify the SPE payload and support STS Payload Defect Indication (PDI-P). Release 3.3 allows you to monitor these bytes at intermediate (LTE) nodes and monitor specific STS Paths. You can provision an expected J1 or C2 value so that the node reports when an expected value for either byte is not received at the intermediate node.

## Section Performance Monitoring

The SONET Section PM feature enables the Cisco ONS 15327 to accumulate and report the section layer performance monitoring parameters on any OC-N card. The section layer deals with the transport of an STS-N frame across the physical medium. This layer handles framing, scrambling, and error monitoring. All types of SONET devices terminate the section layer. A SONET regenerator, however does not process beyond the physical and section layers. When a non-Cisco regenerator is used on the span between two ONS 15327s operating as LTEs, the ONS 15327 Section PM isolates the side of the regenerator that is causing any bit errors.

The ONS 15327 monitors the following section-layer parameters:

- Severely Errored Framing Seconds (SEFS-S): the number of seconds an SEF defect was present
- Errored Seconds (ES-S): the number of seconds during which at least 1 section BIP error was detected, or an SEF or LOS defect was present.
- Severely Errored Sections (SES-S): the number of sections during which K or higher section BIP errors were detected or an SES or LOF was present (K is bit-rate dependent).
- Coding Violations (CV-S): a count of the number of section-layer BIP errors.

## Auto-refresh PM Data

You can auto-refresh PM data using a check box and pull-down menu providing valid options on the Performance Monitoring screen in the card view. When selected, the information auto refreshes the screen every  $x$  seconds (where  $x$  is selected from the valid options or manually configured). The auto-refresh only works while the selected card is in card view. When you are not viewing this card in card view, PM data is not auto-refreshed. However, when you return to the card, the auto-refresh option has not changed. This parameter can be specified and remembered for each card individually and for each node separately.

## BLSR Support

### Two by Two Fiber BLSR

Prior to Release 3.3, the ONS 15327 only supported 1+1, UPSR and PPMN protection schemes. With Release 3.3, two fiber BLSR protection is fully supported and fully interoperable with ONS 15454 two fiber BLSR. The ONS 15327 node can support up to two 2 fiber BLSR configurations on any of the 4 high speed slots (Slots 1-4). The following guidelines should be used when implementing two fiber BLSR:

- You can have one BLSR operating at OC-12 and the other BLSR operating at OC-48.
- You can have both BLSRs operating at OC-12.
- You can have both BLSRs operating at OC-48.
- BLSRs are not supported with OC-3.

Traffic from one BLSR is cross-connected to the other BLSR at both the VT1.5 and STS-1 payload mappings.

To provision two 2 fiber BLSRs within the same node, from the node view, click Provisioning > Ring. BLSR provisioning is the same as in the ONS 15454 platform. Refer to the Cisco ONS 15327 User Documentation, Release 3.3 for BLSR provisioning. When provisioning two 2 fiber BLSRs within the same node, the Ring ID must be unique for each BLSR. However, the Node ID for each BLSR can be identical.

After two 2 fiber BLSRs have been provisioned, the two rings are viewable in the network view of the CTC.

### 16 Node BLSR Support

With Release 3.3, a BLSR can support a mix of up to 32 ONS 15454 and ONS 15327 nodes. BLSR switch times will be within 50 ms (compliant with Telcordia GR-1230-CORE), for BLSRs which are provisioned with up to 16 nodes. If more than 16 nodes are provisioned on one BLSR (a maximum of 32 is officially supported), Cisco cannot guarantee that switch times will be within the 50 ms range.

### Non-Revertive BLSR

With Release 3.3, you can provision a BLSR to be revertive or non-revertive. Non-revertive BLSR switching only applies to automatically initiated switch requests (for example, signal fail or signal degrade). When a manual BLSR switch to protect is executed in CTC, traffic will return to the working channels after a Clear command is issued. In non-revertive mode, when traffic is placed on the protect channels after an automatic switch, traffic will remain on the protection channels even after the failure condition has cleared. Traffic is returned to the working channels in the following situations:

- A lockout span is executed from either the working or the protect side of the BLSR

- A force ring is executed from the protect side of the BLSR
- A manual ring executed from the protect side of the BLSR
- A facility failure occurs on the protect channels

To provision a BLSR to be non-revertive, from the node view, click Provisioning > Ring. In the Ring Reversion pull-down menu, select “never,” then click Apply. Perform this step for each node in the BLSR.

## BLSR Exercise Ring

The Exercise Ring feature is used to detect non-alarmed, silent failures present on the ring. When implemented, ring protection switching will be “exercised” without completing a bridge and switch. This ensures that traffic is unaffected during the execution of the Exercise Ring command. To execute the Exercise Ring command for a BLSR, in node view, click Maintenance > Ring. You can execute the Exercise Ring command for either the West Switch or the East Switch. Click on the pull-down menu under the West Switch or the East Switch and select Exercise Ring; then click Apply.

Once the Exercise Ring command has been executed, the non-alarmed condition “Exercise Ring” will be raised against the facility for which the command was implemented. To terminate the Exercise Ring function, from the Maintenance > Ring tabs, select Clear under the West or East Switch, then click Apply.

## CTC Platforms

The Cisco Transport Controller runs on PC computers and Sun and H-P workstations. CTC can be launched by Netscape Navigator and Microsoft Internet Explorer on the following platforms: Netscape Navigator 4.x - Windows 95, Windows NT 4.0, Windows 98, Windows 2000, Solaris 2.6.x, Sun Solaris 2.5.x, Microsoft Internet Explorer 5.x - Windows 95, Windows NT 4.0, Windows 98, Windows 2000, Solaris 2.6.x, and Sun Solaris 2.5.x.

CTC supports Java 2Runtime Environment (JRE) Release 1.2.2\_05 or later on the following operating systems: Windows 95, Windows NT 4.0, Windows 98, Windows 2000, Solaris 2.6.x, Sun Solaris 2.5.x, (O) HP UX 11.x, and (O) HP UX 10.x.

CTC is optimized for laptop PC computers with the following specifications: Pentium II 300 MHz with 128 MB of RAM, and a 2 GB hard drive, with Windows NT Workstation 4.x, and Netscape Navigator 4.x.

CTC can manage 25 nodes concurrently. The 25 nodes can be on a single DCC or split across multiple DCCs. Four concurrent CTC sessions can interact with the same ONS 15327 node at the same time.

## CTC Installation

First-time use of the Cisco Transport Controller requires a computer loaded with a CTC-compatible Internet browser, a CTC-compatible version of the Java Runtime Environment, a target ONS 15327, and TCP/IP DCN connectivity. The Java policy file required for first-time use of CTC is distributed with the CTC archive file(s) on the XTC. The file can also be downloaded from the web, or installed automatically by the CTC Setup Wizard.

The CTC Setup Wizard guides the user through the first CTC download and installation. The setup wizard supports user input directory paths and custom installation, and guides user action when necessary to ensure smooth, continuous execution of the download and installation process.

## DCC Tunnels

SONET provides four data communications channels (DCCs) for network element operations, administration, maintenance, and provisioning: one on the SONET Section layer and three on the SONET Line layer. With Release 3.3 the ONS 15327 uses the Section DCC (SDCC) for ONS 15327 management and provisioning. You can use the Line DCCs (LDCCs) and the SDCC (when the SDCC is not used for ONS 15327 DCC terminations) to tunnel third-party SONET equipment across ONS 15327 networks.

A DCC tunnel is a series of connection points that map third-party equipment SDCCs to ONS 15327 LDCCs. DCC tunnel end-points are defined by Slot, Port, and DCC type, where DCC can be either the SDCC, Tunnel 1, Tunnel 2, or Tunnel 3 (LDCCs). You can link an SDCC to an LDCC (Tunnel 1, Tunnel 2, or Tunnel 3), and an LDCC to an SDCC. You can also link LDCCs to LDCCs and link SDCCs to SDCCs.

The ONS 15327 OC-3 card supports tunnels on all four ports. Each ONS 15327 and 15454 can support up to 32 DCC tunnels. The maximum number of optical ports available on a 15327 is 16 (four-port OC-3 cards installed in all high-speed slots). Each port can support four different DCC tunnels (one section and three line). This allows 64 (4 x 16) tunnel terminations. Because each tunnel must have two terminations, the ONS 15327 can support a maximum of 32 DCC tunnel connections.

For details on DCC tunnels you can create on the ONS 15327 and instructions on how to create them, consult the Cisco ONS 15327 User Documentation, Release 3.3.

## Port Naming

Release 3.3 provides the ability to store a name with each ONS 15327 traffic card port. Right-click the port to view the name. Other port naming features include:

- Node and network alarm and history panels: when an alarm affects a named port, or a circuit that traverses a named port, the port name is displayed in the alarm.
- Circuit creation: if a port is named, CTC displays the port name and port number.
- Node and network circuit list: if either or both circuit end points are named, CTC displays the port name and port number.
- Node provisioning: if any port is named, CTC displays the port name and the port number (panes affected include line and threshold).
- Node maintenance: if any port is named, CTC displays the port name and the port number (loopback).
- Node performance data: if any port is named, CTC displays the port name and port number.

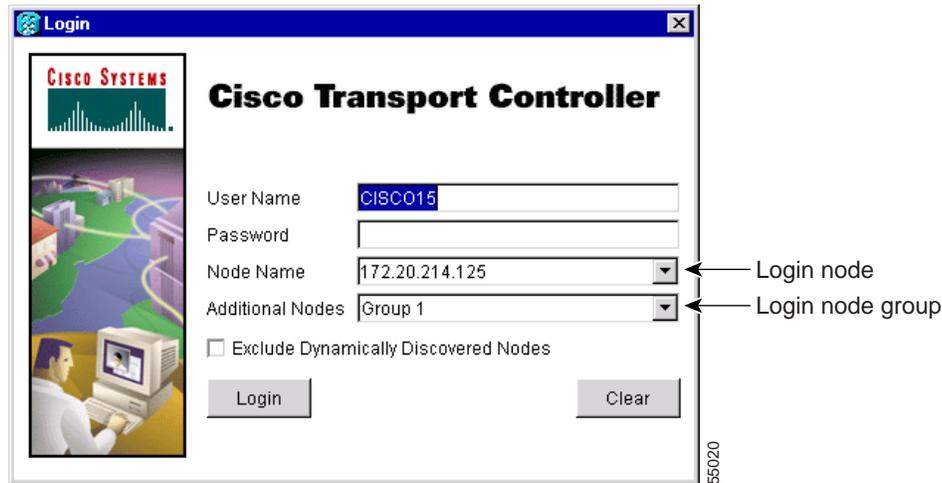
## Search for Circuit by Name

Release 3.3 allows you to search for circuits by circuit name, or by a substring included in the circuit name. The substring search allows you to jump down an alphabetically sorted list of circuits to those beginning with a particular letter. Enter the circuit name (or a substring included in the name) in the Circuit Name Search dialog box and click "Find Next." You can search up or down the list of circuits. The search tool selects the circuit bearing the name you type. Once you have found the circuit, you can open it by double-clicking the selected row.

## Limit DCC Autodiscovery at Login

A check box on the CTC Login dialog box allows you to limit DCC autodiscovery so you can open a single or selected group of ONS 15327s residing in a network.

Figure 3 Login Dialog Box



## Multi-Circuit Operations

CTC allows you to modify selector settings on a set of circuits. If you select a set of circuits and make changes to selectors, the changes are applied end-to-end along each of the selected circuits.

## Baseline Button

In CTC Release 3.3, the Baseline button located on the far right of the Performance Monitoring screen clears the PM count displayed in the Current column, but does not clear the PM count on the card. When the current 15-minute or 24-hour time interval passes or the screen view changes, the total number of PM counts on the card and on the screen appear in the appropriate column.

## Clear Button

The Clear button located on the far right of the Performance Monitoring screen clears certain PM counts depending on the option selected. When the Clear button is clicked, three options appear in the Clear Statistics menu: Selected interfaces, All interfaces on port x, and All interfaces on card.

When you clear selected interfaces, all PM counts associated with the selected radio buttons are erased. For example, if the “15 min” and the Near End buttons are selected and you click the Clear button, all near-end PM counts in the current 15-minute interval are erased from the card and the screen display.

When you clear all interfaces on port x, all PM counts associated with all combinations of the radio buttons on the selected port are erased from the card and the screen. This means the 15-minute near-end and far-end counts and 24-hour near-end and far-end counts are cleared from the card and the screen.

When you clear all interfaces on the card, PM counts for all data and ports on all interfaces are erased from the card and the screen.

**Caution**

The Clear button can mask problems if used incorrectly. This button is commonly used for testing purposes.

**Note**

The Ethernet cards are the only cards without the Clear button option.

## Filtering of Circuit View Window

In the CTC circuit window, you can filter circuits to the current network/node/card level. This option restricts the circuits listed to only those items meeting the filter criteria and associated with the current view (for example, the circuits on the node or card being viewed).

## CTC Preferences

Release 3.0.x allows you to set CTC preferences from a new Preferences dialog box.

### Change the CTC Network Image

The CTC Preferences dialog box allows you to change the image displayed in CTC network view. Any JPEG or GIF image accessible from a local or network drive can be used.

### Limit History

The CTC Preferences dialog box allows you to modify the number of records shown in the CTC alarm history.

### Modify Span Colors

The CTC Preferences dialog box allows you to modify the background and foreground of active and standby spans. Span colors can be selected from color swatches on the Circuit pane of the Preferences dialog box.

### Firewall Access

In Release 3.3, workstations can access the ONS 15327 using a firewall-compliant connection. Specify the port to connect through in the Firewall pane of the Preferences dialog box.

## Loopback Indication

CTC provides a visual indication for ports, circuits, and circuit records that are involved in a loopback.

## AutoDelete Cleared Alarms Checkbox

When you check AutoDelete Cleared Alarms, CTC remembers the setting between sessions.

## Column Sizes

If you change the column width of table data in a CTC window, CTC will retain that width for the rest of the CTC session (unless you change it again). CTC Release 3.3 allows the operator to save individual column widths for each type of table.

## OSPF Support

Open Shortest Path First (OSPF) support allows OSPF hello notifications to be exposed through the LAN interface to external routers which automatically update their static route tables. OSPF can be configured so that OSPF routes are not displayed automatically. The default setting is off (not advertising OSPF).

## Inhibit Switch to Protection Support

CTC reflects protection switches issued by TL1 commands. CTC also supports Lockout inhibition when set by TL1 or CTC.

## Online Help

ONS 15327 Release 3.3 documentation can be viewed in an online help window accessed through the CTC Help menu. The help is installed from the ONS 15327 Release 3.3 software CD or the documentation CD, using the new CTC Setup Wizard. The help window includes a table of contents and an index in frames adjacent to the body text. It also provides access to PDF versions of the manuals and a search tool.

## SONET/SDH Combination Card

CTC reflects each port's mode configuration (SONET/SDH) visually in inventory and card view. Each port can be set to SDH or SONET. If a port is configured as SDH, CTC prevents VT and STS-1 cross connection.

For SDH, CTC functionally provides the same operation that was supported when the units were configured for SONET services only.

Each port on all OC-12 cards (OC12 IR 1310, OC12 LR 1310, OC12 LR 1550) can be provisioned as STM-4. Each port on all OC-48 cards (OC48 IR 1310, OC48 LR 1310, OC48 LR 1550) can be provisioned as STM-16.

All CTC fault management functions are provided for these cards.

## Performance Management

All CTC performance management functionality:

- Provides for SDH
- Reports existing PM information (SONET and Async)
- Reports threshold crossing alarms

## Configuration Management

- CTC graphically and visually designates the SDH/SONET combo card and each port's current mode (SONET or SDH mode).

- CTC supports the ability to cross connect an STM circuit to an appropriate size STS circuit (for example, STM1 to STS-3C).
- CTC circuit management functionality provides for SDH circuits.
- To provision an SDH circuit, an appropriate STS-N circuit is defined. The section and line information on the inbound signal will be terminated. The STS-N carries the SDH path information and SDH payload. At the SDH handoff, SDH section and line header information is reintroduced so that an SDH signal departs.

## Node Diversity

Release 3.3 supports node diversity as an option during automated circuit provisioning across UPSR segments in a mesh (PPMN) network. This option does not apply to 1:1, unprotected, and BLSR portions of the network. Node diversity means that, except for the source and destination, the circuit's working and protect paths do not traverse any of the same nodes. This feature ensures that the failure of a single node will not eliminate the benefit of SONET protection.

## DHCP Relay Support

Release 3.3 allows Dynamic Host Configuration Protocol (DHCP) requests/responses to traverse the ONS 15327 network. This allows craft PCs to request and receive appropriate IP addresses. In addition, the combination of DHCP relay and Proxy ARP allows the craft PC to work without any ONS 15327 or PC configuration in most subnetting environments. In combination with static route support, the craft PC can work with an ONS 15327 even when multiple nodes on the same DCC share a subnet and other crafts are connected. DHCP relay support includes support for User Datagram Protocol (UDP) and listening on Port 67 (the standard BOOTP/DHCP port). DHCP relay is configured as "on" or "off" in CTC; the default is "off."

## Lamp Test

You can activate ONS 15327 lamp tests from CTC. When the test is invoked, all ONS 15327 LEDs illuminate at the same time for 10 seconds. Bicolored LEDs cycle from green to yellow.

## Improved Management Routing

The following improvements have been made to management routing:

- Route advertisement over LAN interface: the surface mechanism (OSPF) eliminates the need to add to static route tables in an affiliate router when a Cisco ONS ring is deployed. Only the node IP address is sent to external systems via OSPF; IP addresses on cards are not sent. You can configure OSPF so that node IPs are not sent. The default configuration is off (not advertising OSPF).
- Craft attachment: Craft attachment and management of all nodes on a DCC (regardless of subnetting) without the addition of static routes to the craft PC is now possible. Automatic Host Detection and Proxy Server are supported to provide this capability. Multiple craft attachments to the same DCC can occur at the same time.
- Route learning and aging support: redundant physical connections to an ONS 15327 ring are supported, including rerouting messages through an alternate route and/or an alternate ONS 15327 gateway. Nodes can reroute messages (including the primary and secondary gateway nodes). This feature is not affected by subnet configuration (all nodes on one subnet, all nodes on different subnets, or any combination).

## Improved GUI on Circuit Creation Wizard

A panel was added to the Circuit Creation Wizard to record entries from previous pages. This panel is visible during the selection process and displays user selections.

## Network Topology Map

In Release 3.3, you can use a Zoom command to change the network topology map display:

- You can store a preferred zoom configuration as the default map view.
- When you zoom in or out, nodes are repositioned so that DCC spans do not overlap. DCCs are clearly delineated while nodes retain their geographic positions (as placed by the user or longitude/latitude coordinates).
- With zooming, it is possible to see and select one of up to ten DCC spans.
- The size of the ONS 15327 icon has been reduced to allow for more nodes in a view.

## Common Security Profiles

CTC allows user security information (userid, password, permissions) to be shared across the nodes it manages:

- You can set SNMP community strings and access privileges.
- You can perform user management operations (such as creating a user or changing a password) at the network level. When a change is made on this screen, it applies to all CTC-managed nodes.

## Multiple Circuit Creation

You can define multiple circuits between the same nodes in one easy step using the Number of Circuits field in the Circuit Provisioning Wizard.

## CTC Managed Software Download

CTC Managed Software Download allows you to download CTC software to multiple nodes serially and in parallel.



Note

---

Cisco advises that you limit concurrent software downloads to 3 nodes at once.

---

## Directional Arrows on Circuit Maps

Arrowheads have been added to circuit lines displayed on the circuit map to distinguish unidirectional and bidirectional circuits.

## CTC Enhancements

The following features are new for CTC in Release 3.3.

## CTC Node View

With Release 3.3 the node view has been enhanced to match the physical appearance of the MIC and XTC cards. An LED has been added to the view for each line card showing the current state of that card. There are three states:

- Loading—the card is booting
- Standby—the card is fully booted and the port is not in service
- Active—the card is active and the port is in service

## Worldwide Time Zone Support

CTC now supports the following US and worldwide standard time zones. It also supports Daylight Savings time. CTC supports time zones with and without Daylight Savings; users can configure the time zone of a network element and opt for Daylight Savings or no Daylight Savings. All time zones are listed relative to GMT.

- (GMT-11:00) Midway Islands, Samoa
- (GMT-10:00) Honolulu
- (GMT-09:00) Anchorage
- (GMT-08:00) Los Angeles, Tijuana, Vancouver
- (GMT-07:00) Aklavik, Denver, Edmonton
- (GMT-07:00) Phoenix
- (GMT-06:00) Chicago, Mexico City
- (GMT-06:00) Costa Rica, Managua, San Salvador
- (GMT-06:00) Winnipeg
- (GMT-05:00) Bogota, Lima, Quito
- (GMT-05:00) Montreal, New York
- (GMT-05:00) Havana
- (GMT-05:00) Indianapolis, Nunavut
- (GMT-04:00) Asuncion
- (GMT-04:00) Caracas, La Paz, San Juan
- (GMT-04:00) Charlottetown, Halifax, Saint John
- (GMT-04:00) Santiago
- (GMT-04:00) Thule (Qaanaaq)
- (GMT-03:30) St. John's - Newfoundland
- (GMT-03:00) Brasilia, Rio de Janeiro, Sao Paulo
- (GMT-03:00) Buenos Aires, Georgetown
- (GMT-03:00) Godthab (Nuuk)
- (GMT-02:00) Mid-Atlantic
- (GMT-01:00) Azores, Scoresbysund (Ittoqqortoormiit)
- (GMT-01:00) Praia - Cape Verde

- (GMT-00:00) Casablanca, Reykjavik
- (GMT) Greenwich Mean Time
- (GMT+00:00) Dublin, London, Lisbon
- (GMT+01:00) Amsterdam, Berlin, Rome, Paris
- (GMT+01:00) Algiers, Lagos, Luanda
- (GMT+01:00) Windhoek (Namibia)
- (GMT+02:00) Al Jizah, Alexandria, Cairo
- (GMT+02:00) Amman
- (GMT+02:00) Athens, Bucharest, Helsinki, Istanbul
- (GMT+02:00) Beirut
- (GMT+02:00) Cape Town, Harare, Johannesburg, Tallinn
- (GMT+02:00) Jerusalem
- (GMT+02:00) Kaliningrad, Minsk
- (GMT+03:00) Aden, Antananarivo, Khartoum, Nairobi
- (GMT+03:00) Baghdad
- (GMT+03:00) Moscow, St. Petersburg, Novgograd
- (GMT+03:30) Tehran
- (GMT+04:00) Abu Dhabi, Mauritius, Muscat
- (GMT+04:00) Aqtau, T'bilisi
- (GMT+04:00) Baku
- (GMT+04:00) Yerevan, Samara
- (GMT+04:30) Kabul
- (GMT+05:00) Chelyabinsk, Prem, Sverdlovsk, Ufa
- (GMT+05:00) Islamabad, Karachi, Tashknet
- (GMT+05:30) Calcutta, Madras, Mumbai (Bombay), New Delhi
- (GMT+05:45) Kathmandu
- (GMT+06:00) Almaty
- (GMT+06:00) Colombo, Dhaka
- (GMT+06:00) Novsibrisk
- (GMT+06:30) Cocos, Rangoon
- (GMT+07:00) Bangkok, Hanoi, Jakarta
- (GMT+07:00) Krasnoyarsk, Norilsk, Novokuznetsk
- (GMT+08:00) Beijing, Shanghi, Hong Kong, Urumqi,
- (GMT+08:00) Perth
- (GMT+08:00) Singapore, Manila, Taipei, Kuala Lumpur
- (GMT+09:00) Chita, Yakutsk
- (GMT+09:00) Osaka, Sapporo, Tokyo
- (GMT+09:00) Palau, Pyongyang, Seoul

- (GMT+09:30) Adelaide, Broken Hill
- (GMT+09:30) Darwin
- (GMT+10:00) Brisbane, Port Moresby
- (GMT+10:00) Canberra, Melbourne, Sydney
- (GMT+10:00) Hobart
- (GMT+10:00) Khabarovsk, Vladivostok
- (GMT+10:30) Lord Howe Island
- (GMT+11:00) Honiara, Magadan, Noumea
- (GMT+11:30) Kingston - Norfolk Island
- (GMT+08:00) Perth
- (GMT+08:00) Singapore, Manila, Taipei, Kuala Lumpur
- (GMT+09:00) Chita, Yakutsk
- (GMT+09:00) Osaka, Sapporo, Tokyo
- (GMT+09:00) Palau, Pyongyang, Seoul
- (GMT+09:30) Adelaide, Broken Hill
- (GMT+09:30) Darwin
- (GMT+10:00) Brisbane, Port Moresby
- (GMT+10:00) Canberra, Melbourne, Sydney
- (GMT+10:00) Hobart
- (GMT+10:00) Khabarovsk, Vladivostok
- (GMT+10:30) Lord Howe Island
- (GMT+11:00) Honiara, Magadan, Noumea
- (GMT+11:30) Kingston - Norfolk Island
- (GMT+12:00) Anadyr, Kamchatka
- (GMT+12:00) Auckland, Wellington
- (GMT+12:00) Marshall Islands
- (GMT+12:00) Suva - Fiji
- (GMT+12:45) Chatham Island
- (GMT+13:00) Nuku'alofa
- (GMT+13:00) Rawaki, Phoenix Islands
- (GMT+14:00) Kiritimati, Christmas Islands

## Software Download Collision Avoidance

Release 3.3 allows multiple users connected to an ONS 15327 ring to download software simultaneously. This functionality avoids collisions by prohibiting multiple software downloads from occurring on any single node. No special configurations are needed to use this feature.

## Default Usernames

With Release 3.3, the default username, CERENT454, has been removed. The username, CISCO15, is the supported default username. This username has no password. The CISCO15 username can be renamed and assigned a password at your discretion. If a password is assigned to the CISCO15 username, you cannot change the password back to no password without deleting the database. Once a password is assigned to CISCO15 it must always have a password.

## Prevention of Identical User ID and Password

As of Release 3.3, CTC and TL1 prevent the creation of a userid and password that are identical. The userid and password are identical if they contain the same characters in the same numbers and sequence, irrespective of case. For example, “betsy” and “BeTSy” are considered to be the same, while “betsy”, “ysteb” and “betssy” are all different.

As of Release 3.3, CTC and TL1 prevent the creation of a password containing as a subset of characters the associated userid. The password contains the associated userid if it contains anywhere within it the same characters in the same numbers and sequence that make up the entire userid, irrespective of case. For example, password “SBeTSyXC” and userid “betsy” are disallowed, while password “betsy” and userid “SBeTSyXC”, or password “bet3sy” and userid “BeTSy” are allowed.

## Enforce Password Complexity

Both TL1 and CTC will not allow creation of new passwords that do not comply with Telcordia GR-815. A new password must have at least 1 numeric character (0 to 9) and at least one special character from the character set {plus-sign (+), pound-sign (#), percent-sign (%)}



Note

---

Existing passwords do not need to be changed in TL1 or CTC. Both warn on entry only when a pre-existing non-GR815 compliant password is used, permitting the user to continue.

---

## Password Toggling Prevention

As of Release 3.3 TL1 and CTC prevent users from changing a password to the current password value. For example, if the existing password is “\*@nite”, the new password cannot also be “\*@nite”.

## TL1 Enhancements



Note

---

TL1 for the ONS 15327 has been made completely compatible with TL1 for the ONS 15454 in Release 3.3.

---



Note

---

See also [Prevention of Identical User ID and Password, page 29](#), [Enforce Password Complexity, page 29](#), and [Password Toggling Prevention, page 29](#).

---

## CTAGs

In accordance with Telcordia GR-831, all TL1 commands must include a CTAG. Commands without CTAGs will be rejected by TL1 with the error Invalid Correlation Tag (IICT).

## Test Access

TL1 Test Access enables you to monitor and test circuits. Commands to connect, disconnect and change the test access (TACC) and test access connections have been added to TL1 for ONS 15327 Release 3.3. Refer to the *Cisco ONS 15454 and Cisco ONS 15327 TL1 Command Guide, Release 3.3* for more information.

## Additional Feature Support

The following feature enhancements have been added to TL1 for Release 3.3.

- Support for STS9c and 24c
- Enhanced Setting of Timing Source (RTRV-NE-GEN, ED-NE-GEN)
- Support for reporting database changes

## New Alarms as of ONS 15327 Release 3.3

The following TL1 alarms are new as of ONS 15327 Release 3.3:

- PEER-NORESPONSE
- MFGMEM

## New AIDs as of ONS 15327 Release 3.3

TL1 supports the following new AIDs as of ONS 15327 Release 3.3.

- BLSR
- ALL (added to the VT1\_5 AID table)

## Parameter Value Changes as of ONS 15327 Release 3.3

TL1 supports the following parameter value changes as of ONS 15327 Release 3.3.

- TMPER input/output value changed from 15MIN to 15-MIN
- SENDDONOTUSE changed to SENDDUS
- BLSR\_MODE (new parameter)
- BLSR\_TYPE (new parameter)
- MOD-TACC
- TACC-MODE

## New Conditions as of ONS 15327 Release 3.3

TL1 supports the following new conditions as of ONS 15327 Release 3.3.

- NHSWPR - Inhibit switch to protect request on equipment
- NHSWWKG - Inhibit switch to working request on equipment

The following new BER alarm conditions have been added:

Condition	Alarm Description	Type
SD-L	BER Threshold exceeded for Signal Degrade	Line
SD-P	BER Threshold exceeded for Signal Degrade	Path
SF-L	BER Threshold exceeded for Signal Failure	Line
SF-P	BER Threshold exceeded for Signal Failure	Path

### Conditions Replaced as of ONS 15327 Release 3.3

The SWFTDWN condition has been changed to SFTWDOWN.

### Changed Conditions as of ONS 15327 Release 3.3

The following condition is changed as of ONS 15327 Release 3.3.

The FAIL\_DS3\_NE\_FRM\_MISMATCH condition is renamed to DS3-MISM.

### New Parameters as of ONS 15327 Release 3.3

The following TL1 parameters are new in the Condition table (new conditions) as of ONS 15327 Release 3.3:

- EQPT-MISS — Replaceable equipment/unit is missing
- EXERCISE-RING-FAIL — Exercise ring failed
- EXERCISE-SPAN-FAIL — Exercise span failed
- EXERCISE-RING-REQ — Exercise ring request
- EXERCISE-SPAN-REQ — Exercise span request
- EXERCISING-RING — Exercise ring completed
- EXERCISING-SPAN — Exercise span completed
- FE-EXERCISING-RING — Far end exercise ring completed
- FE-EXERCISING-SPAN — Exercise span completed
- WTR-RING — SONET ring is in Wait to Restore state

The following TL1 parameters are new in the ALL\_MONTYPE table as of ONS 15327 Release 3.3:

- CVS
- ESS
- SESS

The following TL1 parameters are new in the EQPT\_TYPE table as of ONS 15327 Release 3.3:

- AIP
- BP
- DS3E-12
- DS3NE-12
- FTA

## Release 1.0.X TL1 Commands Replaced as of CTC Release 3.3

Category	Command	Replacement
Equipment	RTRV-FFP-EQPT DLT-FFP-EQPT ED-FFP-EQPT ENT-FFP-EQPT	RTRV-EQPT DLT-EQPT ED-EQPT ENT-EQPT
	// Pre-provisioning cards ENT-<MOD2>	ENT-EQPT
	// Enable facility for service RST-<MOD2>	RST-<MOD_PORT> // Setting attributes of port/facilities // including enable facility ED-<OCN_TYPE> ED-EC1 ED-T1 ED-T3
	// Un-provisioning cards DLT-<MOD2>	DLT-EQPT
	// Remove facility from service RMV-<MOD2>	RMV-<MOD_PORT> // Setting attributes of port/facilities // including disable facility ED-<OCN_TYPE> ED-EC1 ED-T1 ED-T3
	OPR-PROTNSW-EQPT	SW-TOPROTN-EQPT SW-TOWKG-EQPT
System	ED-NE	ED-NE-GEN
	RTRV-NE	RTRV-NE-GEN
Testing	OPR-LPBK-<OCN_TYPE>	OPR-LPBK-<MOD2_IO>
	RLS-LPBK-<OCN_TYPE>	RLS-LPBK-<MOD2_IO>
Fault	RTRV-ALM-LOG	RTRV-LOG

## Release 1.0.X TL1 Commands Changed as of Release 3.3

TL1 COMMAND	DESCRIPTION OF CHANGES
ALW-MSG-ALL INH-MSG-ALL	The two commas at the end of the command are not needed anymore.
ALW-SWDX-EQPT	Semi-colons after the CTAG field are not required anymore.
DLT-CRS-<STS_PATH> DLT-CRS-VT1	Trailing semi-colons after the CTAG are optional.
ED-BITS	Added support for the Sync Message field. An extra colon is needed after CTAG field. The colon after the PST field is not necessary. The Name string in Name/Value parameter changed.
ED-EC1	Added support for the Rx Equalization attribute for an EC1 port. The extra colon after the PST field is not required anymore.
ED-T1	Removed support for the ID field. Three colons after the CTAG field are now required, instead of two. The extra colon after the PST field is not required anymore. Added support for Test Access.
ED-T3	Three colons are needed after CTAG field, instead of two. The extra colon after the PST field is not required anymore. Added support for Test Access.
ED-<OCN_TYPE>	Added support for the send DUS and Synchronous Status Message fields. The extra colon after the PST field is not required anymore. Three colons are needed after the CTAG field instead of two.
ENT-CRS-<STS_PATH>	Cross-connect types are optional. The default is 2WAY. Supported Cross Connect types are now limited to 1WAY and 2WAY.
ENT-FFP-<OCN_TYPE> ED-FFP-<OCN_TYPE>	An extra colon after the CTAG field is required. Name field in name/value parameters have changed.
ED-EQPT ENT-EQPT RTRV-EQPT	This family of commands was functionally expanded to edit/enter/retrieve equipment attributes and electrical 1:1 and 1:N Protection Group. Use these commands instead of ED/ENT/RTRV-FFP-EQPT.
ED-USER-SECU	Added support for a NEW USER ID field. Fields are now positional instead of name/value pairs.
ENT-USER-SECU	An extra comma is needed after the PASSWORD field.
ED-<STS_PATH>	Added support for following fields: Revertive Mode, Revertive Time, Expected Path Trace, Path Trace Message, and Path Trace Mode. Added support for Test Access.
INIT-SYS	Phase Field (Level of Initialization) is not supported anymore.
OPR-LPBK-<MOD2_IO> RLS-LPBK-<MOD2_IO>	The Loopback Type field is now optional.

OPR-PROTNSW-<OCN_TYPE>	Added support for the SWITCH command field.
INIT-REG-<MOD2> RTRV-PM-<MOD2>	Added support for an optional Location field. Now only one comma is needed (instead of two) after the Time Period field.
REPT ALM BITS REPT ALM SYNCN	Output – The Condition description field is now optional.
REPT ALM <MOD2ALM> REPT ALM EQPT REPT EVT <MOD2ALM>	The Description and Equipment Type fields are now optional.
REPT ALM EVT	The positions of the Description and Equipment Type fields have changed.
REPT EVT SYNCN	Output – Condition and Condition Description are now optional. Requires 7 commas (instead of 6) after the Condition Effect field. Added support for the Aid Type field.
RTRV-ALM-BITS RTRV-ALM-SYNCN	Output – Added support for the Aid Type field.
RTRV-BITS	Output – Added support for the Sync Messaging field.
RTRV-COND-ALL	One less comma is needed after the Condition field.
RTRV-COND-BITS RTRV-COND-SYNCN	Requires two commas (instead of three) after the Condition field.
RTRV-CRS-<STS_PATH> RTRV-CRS-VT1	Semi-colons after the CTAG are no longer required.
RTRV-ALM-EQPT RTRV-COND-EQPT RTRV-ALM-MOD2 RTRV-COND-MOD2 RTRV-ALM-ALL	Use one less comma after the Service Affect field.
RTRV-EC1	The four colons after the CTAG field are now optional. Output – Added support for the Rx Equalization field.
RTRV-FFP-EQPT	Output – Name field in Name/Value parameters changed.
RTRV-INV	Output – Requires two colons (instead of one) after the Aid Type field.
RTRV-LOG	Requires an additional logname field.
RTRV-<OCN_TYPE>	The four colons after the CTAG field are now optional. Output – Added support for the following fields: Sync Status Messaging, Send DUS, Ring ID, and BLSR Type. Dropped support for Revertive Time.

RTRV-<STS_PATH>	Output – Added support for the following fields: Revertive Mode, Revertive Time, Expected Path Trace, Path Trace Message, Incoming Path Trace, Path Trace Mode and Test Access.
RTRV-SYCN	Output – Replaced the Primary, Secondary, and Third fields with Rank of Synchronization Reference, Value of a Sync Ref, Quality of Sync Source, and Status of Signal Source.
RTRV-TOD	Output – Requires one comma (instead of two) after the Seconds field.
RTRV-T1 RTRV-T3	The four colons after the CTAG field are now optional. Output – Dropped support for the ID field.
SET-TOD	The Name string in the Name/Value parameter has been changed from USEDST to DST
SW-DX-EQPT	The comma after the optional Mode field is no longer necessary.

### TL1 Commands New for ONS 15327 Release 3.3



Note

Refer to the TL1 Command Guide for new command descriptions.

CATEGORY	COMMAND
BLSR	ED-BLSR RTRV-BLSR RTRV-COND-RING REPT ALM RING REPT COND RING REPT EVT RING RTRV-ALM-RING RTRV-ALM-COND
ENVIRONMENT	RTRV-ATTR-CONT RTRV-ATTR-ENV RTRV-EXT-CONT SET-ATTR-CONT SET-ATTR-ENV OPR-EXT-CONT REPT EVT ENV RTRV-COND-ENV REPT EVT COM RLS-EXT-CONT

EQUIPMENT	ALW-SWTOPROTN-EQPT ALW-SWTOWKG-EQPT INH-SWTOPROTN-EQPT INH-SWTOWKG-EQPT SW-SWTOPROTN-EQPT SW-SWTOWKG-EQPT ED-EQPT INH-SWDX-EQPT EX-SW
FAULT	REPT ALM COM // Autonomous message
PERFORMANCE	RTRV-PMMODE-<STS_PATH> SET-PMMODE-<STS_PATH>
SECURITY	REPT EVT SECU // Autonomous message CANC // Autonomous message
SYNCHRONIZATION	OPR-SYNCSW RLS-SYNCSW REPT EVT BITS
SYSTEM	ED-NE-GEN CHG-ACCMD-<MOD_TACC> CONN-TACC-<MOD_TACC> DISC-TACC
	RTRV-NE-GEN RTRV-NE-IPMAP
PORTS	RMV-<MOD_PORT> RST-<MOD_PORT>
STS & VT PATHS	RTRV-PHTRC-<STS_PATH> ED-VT1 RTRV-VT1
SYNCHRONIZATION	ED-NE-SYNCN RTRV-NE-SYNCN

UPSR SWITCHING	OPR-PROTNSW-<STS_PATH> OPR-PROTNSW-VT1 RLS-PROTNSW-<STS_PATH> RLS-PROTNSW-VT1 REPT SW // Autonomous message
DATABASE	ALW-MSG-DBCHG INH-MSG-DBCHG REPT DBCHG

## Related Documentation

### Release-Specific Documents

- *Release Notes for the Cisco ONS 15327, Release 1.0.2*
- *Release Notes for the Cisco ONS 15454 SDH, Release 3.3*
- *Release Notes for the Cisco ONS 15454, Release 3.3*
- *Cisco ONS 15327 Software Upgrade Guide, Release 3.3*

### Platform-Specific Documents

- *Cisco ONS 15327 User Documentation, Release 3.3*
- *Cisco ONS 15454 and Cisco ONS 15327 TL1 Command Guide, Release 3.3*
- *Cisco ONS 15327 Product Overview, Release 3.3*

## Obtaining Documentation

The following sections provide sources for obtaining documentation from Cisco Systems.

### World Wide Web

You can access the most current Cisco documentation on the World Wide Web at the following sites:

- <http://www.cisco.com>
- <http://www-china.cisco.com>
- <http://www-europe.cisco.com>

## Documentation CD-ROM

Cisco documentation and additional literature are available in a CD-ROM package, which ships with your product. The Documentation CD-ROM is updated monthly and may be more current than printed documentation. The CD-ROM package is available as a single unit or as an annual subscription.

## Ordering Documentation

Cisco documentation is available in the following ways:

- Registered Cisco Direct Customers can order Cisco Product documentation from the Networking Products MarketPlace:  
[http://www.cisco.com/cgi-bin/order/order\\_root.pl](http://www.cisco.com/cgi-bin/order/order_root.pl)
- Registered Cisco.com users can order the Documentation CD-ROM through the online Subscription Store:  
<http://www.cisco.com/go/subscription>
- Nonregistered Cisco.com users can order documentation through a local account representative by calling Cisco corporate headquarters (California, USA) at 408 526-7208 or, in North America, by calling 800 553-NETS(6387).

## Documentation Feedback

If you are reading Cisco product documentation on the World Wide Web, you can submit technical comments electronically. Click **Feedback** in the toolbar and select **Documentation**. After you complete the form, click **Submit** to send it to Cisco.

You can e-mail your comments to [bug-doc@cisco.com](mailto:bug-doc@cisco.com).

To submit your comments by mail, use the response card behind the front cover of your document, or write to the following address:

Attn Document Resource Connection  
Cisco Systems, Inc.  
170 West Tasman Drive  
San Jose, CA 95134-9883

We appreciate your comments.

## Obtaining Technical Assistance

Cisco provides Cisco.com as a starting point for all technical assistance. Customers and partners can obtain documentation, troubleshooting tips, and sample configurations from online tools. For Cisco.com registered users, additional troubleshooting tools are available from the TAC website.

## Cisco.com

Cisco.com is the foundation of a suite of interactive, networked services that provides immediate, open access to Cisco information and resources at anytime, from anywhere in the world. This highly integrated Internet application is a powerful, easy-to-use tool for doing business with Cisco.

Cisco.com provides a broad range of features and services to help customers and partners streamline business processes and improve productivity. Through Cisco.com, you can find information about Cisco and our networking solutions, services, and programs. In addition, you can resolve technical issues with online technical support, download and test software packages, and order Cisco learning materials and merchandise. Valuable online skill assessment, training, and certification programs are also available.

Customers and partners can self-register on Cisco.com to obtain additional personalized information and services. Registered users can order products, check on the status of an order, access technical support, and view benefits specific to their relationships with Cisco.

To access Cisco.com, go to the following website:

<http://www.cisco.com>

## Technical Assistance Center

The Cisco TAC website is available to all customers who need technical assistance with a Cisco product or technology that is under warranty or covered by a maintenance contract.

### Contacting TAC by Using the Cisco TAC Website

If you have a priority level 3 (P3) or priority level 4 (P4) problem, contact TAC by going to the TAC website:

<http://www.cisco.com/tac>

P3 and P4 level problems are defined as follows:

- P3—Your network performance is degraded. Network functionality is noticeably impaired, but most business operations continue.
- P4—You need information or assistance on Cisco product capabilities, product installation, or basic product configuration.

In each of the above cases, use the Cisco TAC website to quickly find answers to your questions.

To register for Cisco.com, go to the following website:

<http://www.cisco.com/register/>

If you cannot resolve your technical issue by using the TAC online resources, Cisco.com registered users can open a case online by using the TAC Case Open tool at the following website:

<http://www.cisco.com/tac/caseopen>

### Contacting TAC by Telephone

If you have a priority level 1 (P1) or priority level 2 (P2) problem, contact TAC by telephone and immediately open a case. To obtain a directory of toll-free numbers for your country, go to the following website:

<http://www.cisco.com/warp/public/687/Directory/DirTAC.shtml>

P1 and P2 level problems are defined as follows:

- P1—Your production network is down, causing a critical impact to business operations if service is not restored quickly. No workaround is available.
- P2—Your production network is severely degraded, affecting significant aspects of your business operations. No workaround is available.

---

This document is to be used in conjunction with the documents listed in the [“Related Documentation”](#) section.

CCIP, the Cisco *Powered* Network mark, the Cisco Systems Verified logo, Cisco Unity, Follow Me Browsing, FormShare, Internet Quotient, iQ Breakthrough, iQ Expertise, iQ FastTrack, the iQ Logo, iQ Net Readiness Scorecard, Networking Academy, ScriptShare, SMARTnet, TransPath, and Voice LAN are trademarks of Cisco Systems, Inc.; Changing the Way We Work, Live, Play, and Learn, Discover All That’s Possible, The Fastest Way to Increase Your Internet Quotient, 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, IOS, IP/TV, LightStream, MGX, MICA, the Networkers logo, Network Registrar, *Packet*, PIX, Post-Routing, Pre-Routing, RateMUX, Registrar, SlideCast, StrataView Plus, Stratm, SwitchProbe, TeleRouter, 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. (0203R)

Copyright © 2001, Cisco Systems, Inc.  
All rights reserved.

