This appendix describes the administrative and service states for Cisco ONS 15454 SDH cards, ports, and cross-connects. For circuit state information, see Circuits and Tunnels. Administrative and service states in Software Release 5.0 and later are based on the generic state model defined in Telcordia GR-1093-CORE, Issue 2 and ITU-T X.731.

This appendix includes:

- Service States
- Administrative States
- Service State Transitions

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Service States

Service states include a Primary State (PST), a Primary State Qualifier (PSTQ), and one or more Secondary States (SST). Table B-1 lists the service state PSTs and PSTQs supported by the ONS 15454 SDH.

Table B-1: ONS 15454 SDH Service State Primary States and Primary State Qualifiers

Primary State, Primary State Qualifier	Definition
Unlocked-enabled	The entity is fully operational and will perform as provisioned.
Unlocked-disabled	The entity is not operational because of an autonomous event.
Locked-disabled	The entity is not operational because of an autonomous event and has also been manually removed from service.
Locked-enabled	The entity has been manually removed from service.

Table B-2 defines the SSTs supported by the ONS 15454 SDH.

Table B-2: ONS 15454 SDH Secondary States

Secondary State	Definition
automaticInService	The entity is delayed before transitioning to the Unlocked-enabled service state. The transition to the Unlocked-enabled state depends on the correction of conditions, or on a soak timer. Alarm reporting is suppressed, but traffic is carried. Raised fault conditions, whether or not their alarms are reported, can be retrieved on the CTC

	Conditions tab or by using the TL1 RTRV-COND command.
disabled	The entity was manually removed from service and does not provide its provisioned functions. All services are disrupted; the entity is unable to carry traffic. **Note:** STM-N ports and connections in the disabled state continue to send an Multiplex Section - Alarm Indication Signal Line (MS-AIS).
failed	The entity has a raised alarm or condition.
loopback	The entity is in loopback mode.
mismatchOfEquipment	An improper card is installed, a cross-connect card does not support an installed card, or an incompatible backplane is installed. For example, an installed card is not compatible with the card preprovisioning or the slot. This SST applies only to cards.
maintenance	The entity has been manually removed from service for a maintenance activity but still performs its provisioned functions. Alarm reporting is suppressed, but traffic is carried. Raised fault conditions, whether or not their alarms are reported, can be retrieved on the CTC Conditions tab or by using the TL1 RTRV-COND command.
outOfGroup	The virtual concatenation (VCAT) member cross-connect is not used to carry VCAT group traffic. This state is used to put a member circuit out of the group and to stop sending traffic. Locked-enabled,outOfGroup only applies to the cross-connects on an end node where VCAT resides. The cross-connects on intermediate nodes are in the Locked-enabled,maintenance service state.
softwareDownload	The card is involved in a software download. This SST applies only to cards.
unassigned	The card is not provisioned in the database. This SST applies only to cards.
notInstalled	The card is not physically present (that is, an empty slot). This SST applies only to cards.

Administrative States

Administrative states are used to manage service states. Administrative states consist of a PST and an SST. Table B-3 lists the administrative states supported by the ONS 15454 SDH. See Table B-2 for SST definitions.

Note: When an entity is put in the Locked,maintenance administrative state, the ONS 15454 SDH suppresses all standing alarms on that entity. All alarms and events appear on the Conditions tab. You can change this behavior for the LPBKFACILITY and LPBKTERMINAL alarms. To display these alarms on the Alarms tab, set the NODE.general.ReportLoopbackConditionsOnUnlocked,MaintenancePorts to TRUE on the NE Defaults tab.

Note: A change in the administrative state of an entity does not change the service state of supporting or supported entities.

Table B-3: ONS 15454 SDH Administrative States

Administrative State (PST,SST)	Definition
Unlocked	Puts the entity in service.
Unlocked,automaticInservice	Puts the entity in automatic in-service.
Locked,disabled	Removes the entity from service and disables it.
Locked,maintenance	Removes the entity from service for maintenance.
Locked,outOfGroup	(VCAT circuits only) Removes a VCAT member cross-connect from service and from the group of members.

Service State Transitions

This section describes the transition from one service state to the next for cards, ports, and cross-connects. A service state transition is based on the action performed on the entity.

Card Service State Transitions

Table B-4 lists card service state transitions.

Table B-4: ONS 15454 SDH Card Service State Transitions

Current Service State	Action	Next Service State
Unlocked-enabled	Change the administrative state to Locked,maintenance.	Locked-enabled,maintenance
	Delete the card.	Locked-disabled,unassigned
	Pull the card.	Unlocked-disabled,notInstalled
	Reset the card.	Unlocked-disabled,softwareDownload
	Alarm/condition is raised.	Unlocked-disabled,failed
Unlocked-disabled,automaticInService and mismatchOfEquipment	Pull the card.	Unlocked-disabled,automaticInService & notInstalled
	Delete the card.	Locked-disabled,unassigned if the card is valid Locked-disabled,mismatchOfEquipment & unassigned if the card is invalid
Unlocked-disabled,automaticInService & softwareDownload	Restart completed.	Unlocked-enabled
	Pull the card.	Unlocked-disabled,automaticInService & notInstalled
Unlocked-disabled,automaticInService & notInstalled	Insert a valid card.	Unlocked-disabled,automaticInService & softwareDownload
	Insert an invalid card.	Unlocked-disabled,automaticInService & mismatchOfEquipment
	Delete the card.	Locked-disabled,unassigned & notInstalled
Unlocked-disabled,mismatchOfEquipment	Pull the card.	Unlocked-disabled,notInstalled
	Delete the card.	Locked-disabled,unassigned if the card is valid Locked-disabled,mismatchOfEquipment & unassigned if the card is invalid
	Change the administrative state to Locked,maintenance.	Locked-disabled,mismatchOfEquipment & maintenance
Unlocked-disabled,softwareDownload	Restart completed.	Unlocked-enabled
	Pull the card.	Unlocked-disabled,notInstalled
Unlocked-disabled,notInstalled	Insert a valid card.	Unlocked-disabled,softwareDownload

	Insert an invalid card.	Unlocked-disabled,mismatchOfEquipment
	Delete the card.	Locked-disabled,unassigned & notInstalled
	Change the administrative state to Locked,maintenance.	Locked-disabled,maintenance & notInstalled
Unlocked-disabled,failed	Pull the card.	Unlocked-disabled,unequipped
	Delete the card.	Locked-disabled,unassigned
	Change the administrative state to Locked,maintenance.	Locked-disabled,failed & maintenance
	Reset the card.	Unlocked-disabled,softwareDownload
	Alarm/condition is cleared.	Unlocked-enabled
Locked-disabled,mismatchOfEquipment & maintenance	Change the administrative state to Unlocked.	Unlocked-disabled,mismatchOfEquipment
	Pull the card.	Locked-disabled,maintenance & notInstalled
	Delete the card.	Locked-disabled,unassigned if the card is valid Locked-disabled,mismatchOfEquipment & unassigned if the card is invalid
Locked-disabled,mismatchOfEquipment & unassigned	Pull the card.	Locked-disabled,unassigned & notInstalled
	Provision the card.	Unlocked-disabled,mismatchOfEquipment
Locked-disabled,maintenance & softwareDownload	Restart completed.	Locked-enabled,maintenance
	Pull the card.	Locked-disabled,maintenance & notInstalled
Locked-disabled,maintenance & notInstalled	Change the administrative state to Unlocked.	Unlocked-disabled,notInstalled
	Insert a valid card.	Locked-disabled,maintenance & softwareDownload
	Insert an invalid card.	Locked-disabled,mismatchOfEquipment & maintenance
	Delete the card.	Locked-disabled,unassigned & notInstalled
Locked-disabled,unassigned	Pull the card.	Locked-disabled,unassigned & notInstalled
	Provision an invalid card.	Unlocked-disabled,mismatchOfEquipment
	Provision a valid card.	Unlocked-disabled,softwareDownload
Locked-disabled,unassigned & notInstalled	Insert a valid card.	Unlocked-disabled,softwareDownload
	Insert an invalid card.	Locked-disabled,mismatchOfEquipment & unassigned

	Preprovision a card.	Unlocked-disabled,automaticInService & notInstalled
Locked-disabled,failed & maintenance	Pull the card.	Locked-disabled,maintenance & notInstalled
	Delete the card.	Locked-disabled,unassigned
	Change the administrative state to Unlocked.	Unlocked-disabled,failed
	Reset the card.	Locked-disabled,maintenance & softwareDownload
	Alarm/condition is cleared.	Unlocked-enabled
Locked-enabled,maintenance	Change the administrative state to Unlocked.	Unlocked-enabled
	Delete the card.	Locked-disabled,unassigned
	Pull the card.	Locked-disabled,maintenance & notInstalled
	Reset the card.	Locked-disabled,maintenance & softwareDownloadunassigned
	Alarm/condition is raised.	Locked-disabled,failed & maintenance

Port and Cross-Connect Service State Transitions

Table B-5 lists the port and cross-connect service state transitions. Port states do not impact cross-connect states with one exception. A cross-connect in the Unlocked-disabled,automaticInService service state cannot transition autonomously into the Unlocked-enabled service state until the parent port is in the Unlocked-enabled service state.

You cannot transition a port from the Unlocked-enabled service state to the Locked-enabled,disabled state. You must first transition the port to the Locked-enabled,maintenance state. Once a port is in the Locked-enabled,maintenance state, the NODE.general.AllowServiceAffectingPortChangeToDisabled default setting of TRUE allows you to put a port in Locked-enabled,disabled even if the following conditions exist:

- The port is a timing source.
- The port is used for line, section, or tunneling DCC.
- The port supports 1+1 protection or multidirectional multiplex section-shared protection ring (MS-SPRing).
- Cross-connects are present on the port.
- Overhead connections or overhead terminations are in use (such as, express or local orderwire, or user data channels).

To change this behavior so that you cannot put a port in Locked-enabled,disabled if any of these conditions exist, set the NODE.general.AllowServiceAffectingPortChangeToDisabled default setting to FALSE. For the procedure to change node defaults, refer to the "Maintain the Node" chapter in the *Cisco ONS 15454 SDH Procedure Guide*.

The following ports do not support all of the service states listed in Table B-5:

- E-Series Ethernet ports do not support service states; these ports are either enabled or disabled.

- FC_MR-4 ports support the Unlocked-enabled; Locked-enabled,disabled; and Locked-enabled,maintenance service states; they do not support the Unlocked-disabled, automaticInService service state.

Note: Deleting a port or cross-connect removes the entity from the system. The deleted entity does not transition to another service state.

Table B-5: ONS 15454 SDH Port and Cross-Connect Service State Transitions

Current Service State	Action	Next Service State
Unlocked-enabled	Put the port or cross-connect in the Locked,maintenance administrative state.	Locked-enabled,maintenance
	Put the port or cross-connect in the Unlocked,automaticInService administrative state.	Unlocked-disabled,automaticInService[1]
	Put the VCAT cross-connect in the Locked,outOfGroup administrative state.	Locked-enabled,maintenance & outOfGroup
	Alarm/condition is raised.	Unlocked-disabled,failed Unlocked-disabled,failed & outOfGroup for a VCAT member
	(Cross-connect only) Put the cross-connect in the Locked,disabled administrative state.	Locked-enabled,disabled Locked-enabled,disabled & outOfGroup for a VCAT cross-connect
Unlocked-disabled,automaticInService	Put the port or cross-connect in the Unlocked administrative state.	Unlocked-enabled
	Put the port or cross-connect in the Locked,maintenance administrative state.	Locked-enabled,maintenance
	Put the port or cross-connect in the Locked,disabled administrative state.	Locked-enabled,disabled Locked-enabled,disabled & outOfGroup for a VCAT cross-connect
	Put the VCAT cross-connect in the Locked,outOfGroup administrative state.	Locked-enabled,maintenance and outOfGroup
	Alarm/condition is raised.	Unlocked-disabled,automaticInService & failed Unlocked-disabled,automaticInService & failed & outOfGroup for a VCAT member
Unlocked-disabled,automaticInService & failed	Alarm/condition is cleared.	Unlocked-disabled,automaticInService
	Put the port or cross-connect in the Unlocked administrative state.	Unlocked-disabled,failed
	Put the port or cross-connect in the Locked,disabled administrative state.	Locked-enabled,disabled

	Put the port or cross-connect in the Locked,maintenance administrative state.	Locked-disabled,failed & maintenance
	Put the VCAT member in the Locked,outOfGroup administrative state.	Locked-disabled,failed & maintenance & outOfGroup
Unlocked-disabled,automaticInService & failed & outOfGroup	Alarm/condition is cleared.	Unlocked-disabled,automaticInService or Locked-enabled,maintenance • If an In Group member is Unlocked-enabled or Unlocked-disabled,automaticInSe the member transitions to Unlocked-disabled,automaticInSe • If an In Group member is Locked-enabled,maintenance, the member transitions to Locked-enabled,maintenance.
	Put the VCAT member in the Unlocked administrative state.	Unlocked-disabled,failed and outOfGroup
	Put the VCAT member in the Locked,disabled administrative state.	Locked-enabled,disabled and outOfGroup
	Put the VCAT member in the Locked,maintenance administrative state.	Locked-disabled,failed & maintenance & outOfGroup
Unlocked-disabled,failed	Alarm/condition is cleared.	Unlocked-enabled
	Put the port or cross-connect in the Unlocked,automaticInService administrative state.	Unlocked-disabled,automaticInService & failed
	Put the port or cross-connect in the Locked,disabled administrative state.	Locked-enabled,disabled Locked-enabled,disabled & outOfGroup for a VCAT member
	Put the port or cross-connect in the Locked,maintenance administrative state	Locked-disabled,failed & maintenance
	Put the VCAT member in the Locked,outOfGroup administrative state.	Locked-disabled,failed & maintenance & outOfGroup
Unlocked-disabled,failed and outOfGroup	Alarm/condition is cleared.	Unlocked-enabled or Locked-enabled,maintenance • If an In Group member is Unlocked-enabled or Unlocked-disabled,automaticInSe the member transitions to Unlocked-enabled. • If an In Group member is Locked-enabled,maintenance, the member transitions to

		Locked-enabled,maintenance.
	Put the VCAT member in the Unlocked,automaticInService administrative state.	Unlocked-disabled,automaticInService & failed & outOfGroup
	Put the VCAT member in the Locked,disabled administrative state.	Locked-enabled,disabled & outOfGroup
	Put the VCAT member in the Locked,maintenance administrative state.	Locked-disabled,failed & maintenance & outOfGroup
Locked-disabled,failed & loopback & maintenance	Release the loopback.	Locked-disabled,failed & maintenance
	Alarm/condition is cleared.	Locked-enabled,loopback & maintenance
Locked-disabled,failed & loopback & maintenance & outOfGroup	Release the loopback.	Locked-disabled,failed & maintenance & outOfGroup
	Alarm/condition is cleared.	Locked-enabled,maintenance & outOfGroup
Locked-disabled,failed & maintenance	Alarm/condition is cleared.	Locked-enabled,maintenance
	Put the port or cross-connect in the Unlocked administrative state.	Unlocked-disabled,failed
	Put the port or cross-connect in the Unlocked,automaticInService administrative state.	Unlocked-disabled,automaticInService & failed
	Put the port or cross-connect in the Locked,disabled administrative state.	Locked-enabled,disabled Locked-enabled,disabled & outOfGroup for a VCAT member
	Put the port or cross-connect in a loopback.	Locked-disabled,failed & loopback & maintenance
	Put the VCAT member in the Locked,outOfGroup administrative state.	Locked-disabled,failed & maintenance & outOfGroup
Locked-disabled,failed & maintenance & outOfGroup	Alarm/condition is cleared.	Locked-enabled,maintenance & outOfGroup
	Put the VCAT member in the Unlocked administrative state. **Note:** VCAT In Group members are in the Unlocked-disabled,failed or Unlocked-enabled service state.	Unlocked-disabled,failed & outOfGroup
	Put the VCAT member in the Unlocked,automaticInService administrative state. **Note:** VCAT In Group members are in the Unlocked-disabled,automaticInService & failed or Unlocked-enabled service state.	Unlocked-disabled,automaticInService & failed & outOfGroup

	Put the VCAT member in the Locked,disabled administrative state.	Locked-enabled,disabled & outOfGroup
	Put the VCAT member in the Locked,maintenance administrative state. **Note:** VCAT In Group members are in the Locked-enabled,failed & maintenance service state.	Locked-enabled,failed & maintenance
	Operate a loopback.	Locked-enabled,failed & loopback & maintenance & outOfGroup
Locked-enabled,disabled	Put the port or cross-connect in the Unlocked administrative state.	Unlocked-enabled
	Put the port or cross-connect in the Unlocked,automaticInService administrative state.	Unlocked-disabled,automaticInService
	Put the port or cross-connect in Locked,maintenance.	Locked-enabled,maintenance
	Put the VCAT cross-connect in the Locked,outOfGroup administrative state.	Locked-enabled,maintenance & outOfGroup
	Put the VCAT member in the Locked,outOfGroup administrative state.	Locked-enabled,maintenance & outOfGroup
Locked-enabled,loopback & maintenance	Release the loopback. **Note:** While in Locked-enabled, loopback & maintenance service state, both Cisco Transport Controller (CTC) and Transaction Language One (TL1) allow a cross-connect to be deleted, which also removes the loopback. This applies only to the cross-connect, not the ports.	Locked-enabled,maintenance
	Alarm/condition is raised.	Locked-disabled,failed & loopback & maintenance Locked-disabled,failed & loopback & maintenance & outOfGroup for a VCAT member
Locked-enabled,loopback & maintenance & outOfGroup	Alarm/condition is raised.	Locked-disabled,failed & loopback & maintenance & outOfGroup
Locked-enabled,maintenance	Put the port or cross-connect in the Unlocked administrative state.	Unlocked-enabled
	Put the port or cross-connect in the Unlocked,automaticInService administrative state.	Unlocked-disabled,automaticInService
	Put the port or cross-connect in the Locked,disabled.	Locked-enabled,disabled

		Locked-enabled,disabled & outOfGroup for a VCAT cross-connect
	Put the port or cross-connect in a loopback.	Locked-enabled,loopback & maintenance
	Put the VCAT cross-connect in the Locked,outOfGroup administrative state.	Locked-enabled,maintenance & outOfGroup
	Alarm/condition is raised.	Locked-disabled,failed & maintenance Locked-disabled,failed & maintenance & outOfGroup for a VCAT member
Locked-enabled,maintenance & outOfGroup	Alarm/condition is raised.	Locked-disabled,failed & maintenance & outOfGroup

1. For a VCAT member, an Unlocked-enabled to Unlocked-disabled,automaticInService transition will not occur with a Loss of Multiframe (LOM) or Sequence Mismatch (SQM) condition on the member.

Pluggable Equipment Service State Transitions

The service state transitions for pluggable equipment are the same as for other equipment with the exceptions listed in Table B-6.

Note: Pluggable equipment (pluggable interface modules [PIMs] and pluggable port modules [PPMs]) will transition out of the UAS state when inserted if the software can read the EEPROM and identify information on the pluggable equipment. If the software cannot read the pluggable equipment, the equipment is considered invalid and will not transition out of the UAS state.

Table B-6: ONS 15454 SDH Pluggable Equipment Service State Transitions

Current Service State	Action	Next Service State
Unlocked-enabled	Reset the pluggable equipment.	Unlocked-enabled
	Provision an unsupported service rate.	Unlocked-disabled,mismatchOfEquipment
	Pluggable equipment does not work with the board configuration.	
Unlocked-disabled,automaticInService & notInstalled	Insert valid pluggable equipment.	Unlocked-enabled
	Insert pluggable equipment with the incorrect rate.	Unlocked-disabled,mismatchOfEquipment
	Pluggable equipment does not work with the board configuration.	
Locked-disabled,mismatchOfEquipment	Delete unsupported service rate or modify provisioning so that the pluggable	Unlocked-enabled

	equipment is no longer a mismatch.	
Locked-disabled,notInstalled	Insert valid pluggable equipment.	Unlocked-enabled
Locked-disabled,mismatchOfEquipment & maintenance	Delete unsupported service rate or modify provisioning so that the pluggable equipment is no longer a mismatch.	Locked-enabled,maintenance
Locked-disabled,maintenance & notInstalled	Insert valid pluggable equipment.	Locked-enabled,maintenance
Locked-disabled,unassigned	Provision valid pluggable equipment.	Unlocked-enabled
Locked-disabled,unassigned & notInstalled	Insert valid pluggable equipment.	Unlocked-enabled
	Insert pluggable equipment with the incorrect rate.	Unlocked-disabled,mismatchOfEquipment
	Pluggable equipment does not work with the board configuration.	
Locked-enabled,maintenance	Reset the pluggable equipment.	Locked-enabled,maintenance
	Provision an unsupported service rate.	Locked-disabled,mismatchOfEquipment & maintenance
	Pluggable equipment does not work with the board configuration.	