CHAPTER 5

Maintenance and Diagnostics for External Resources

Revised: July 21, 2009, OL-4495-10

Introduction

This chapter describes the administration, diagnostic, and maintenance (ADM) commands for external resources accessed by the Cisco BTS 10200 Softswitch. These include, status and control commands.

Note This chapter explains how to perform maintenance and diagnostics on external resources that have already been entered into the database. The procedures for entering these resources into the database are provided in the *Cisco BTS 10200 Softswitch Provisioning Guide*. For example, refer to Chapter 11, "SS7 Provisioning", in the *Cisco BTS 10200 Softswitch Provisioning Guide* for the procedure to add SS7 resources.

Service States—Overview

ADM commands control or show the status of an external resource. The Cisco BTS 10200 Softswitch monitors and administers resource states, and accesses the following external resources:

- Aggregation routers
- Media gateways (MGWs), including the following gateway types:
  - Residential gateways (RGWs)
  - Trunking gateways (TGWs)
- Trunk groups (TGs)
- Trunks
- Subscriber terminations

The following resources have dependencies:

- Allowed subscriber states depend upon the current RGW or IAD state.
- Allowed trunk states for ISDN depend upon the current TG state, which in turn depends upon the current TGW state.

- Allowed trunk states depend upon the TGW.

There are two types of service states for external resources:

- Administrative—The state that the Cisco BTS 10200 Softswitch operator has provisioned for the link to that resource
- Operational—The physical condition of the link to the resource (or the physical condition of the resource)

These two types of service states are independent of each other. This is illustrated with the following example:

> A Cisco BTS 10200 Softswitch operator executes the control command to place an MGW connection in service. The administrative state is now "In Service" (ADMIN_INS). However, the link between the Softswitch and the MGW might be out (cut, damaged, or placed out of service by the owner/operator of the MGW) or the MGW itself might be physically removed or placed out of service. Thus, the operational state of the MGW link is MGW_STATUS_DOWN. A status report of the MGW lists both the administrative state and operational state of the link to the MGW.

Status, Control, and Administrative Commands

This section explains how to use status, control, and other administrative commands applicable to external resources, including:

SIP Phone Address of Record and Registered Contact

This section describes the status and control commands related to SIP phone contact information.

Note The system automatically creates an Address of Record (AOR) to subscriber (aor2sub) record when a subscriber is created.

Use the **change** command to update the status of aor2sub and the **show** command to display the status of aor2sub.

The SIP register contact (**status sip-reg-contact**) command queries the status of the registered contact for the particular AOR (SIP phone subscriber). Calls can be originated from or terminated to a SIP subscriber only if the AOR has a currently registered contact. Calls cannot be originated or terminated if the registered contact for the AOR is expired or freed.

SIP-REG-CONTACT

Use the **status sip-reg-contact** command to display the operational status of the dynamic contact for a specific AOR.

Examples

```
status sip-reg-contact aor-id=4695551885@SYS44CA146.boston3.com;
```

Note In this example, the registered contact for this AOR ID has expired, and calls cannot be originated from or terminated to this host.

Example of system response:

```
AOR ID -> 4695551885@SYS44CA146.boston3.com;
USER -> 4692551885
HOST -> 64.101.150.141
PORT -> 5062
USER TYPE -> USER_IP_TYPE
EXPIRES -> 1800
EXPIRETIME -> Wed Jun 4 11:08:33 2003

STATUS -> EXPIRED CONTACT

Reply : Success:
```

```
status sip-reg-contact aor-id=7135551833@SYS12CA146.houston2.com;
```

Note In this example, the registered contact for this AOR ID is valid, and calls can be originated from and terminated to this host.

Example of system response:

```
AOR ID -> 7135551833@SYS12CA146.houston2.com;
USER -> 7132551833
HOST -> 64.100.120.125
PORT -> 5060
USER TYPE -> USER_IP_TYPE
EXPIRES -> 3600
EXPIRETIME -> Wed Jun 4 11:37:44 2003

STATUS -> REGISTERED CONTACT

Reply : Success:
```

Aggregation Status

This section describes the status command for an aggregation (aggr) router. Aggregation routers are used in cable and network-based call signaling (NCS) markets. In cable markets, they are used as cable modem termination systems (CMTSs). In NCS markets, they are used as edge routers.

Status Aggr Command

Use the following example to check the status of an aggregation router:

```
status aggr id=CMTS1
```

Reply Example:

```
Reply : Success:

AGGR ID -> CMTS1
OPER STATE -> AGGR IN Service
RESULT -> ADM configure result in success
REASON -> ADM executed successful
```

The following table provides the AGGR operational-state values and possible responses for the command:

AGGR Operational-state Value	Description	CLI Output
IN SERVICE	The TCP connection to the AGGR is up.	AGGR IN SERVICE
CONNECTING	The TCP connection to the AGGR is being set up.	AGGR CONNECTING
INITIALIZING	Identifies the initial state of the AGGR before a Call Agent (CA) attempts to connect to it.	AGGR INITIALIZING (This is a transitional state, which is rarely seen).
OUT OF SERVICE	The AGGR is out of service.	AGGR OUT OF SERVICE

Destination Point Code

This section describes the ADM status command for destination point codes (DPCs).

Examples

```
status dpc id=dpc1;
```

H.323 Gateway

This section describes the status and control commands for H.323 gateways.

The following table contains the RAS states for H.323 gateways:

RAS State	Description
CCH323_RAS_STATE_NONE	The H.323 gateway operational state is ADMIN OOS.
CCH323_RAS_STATE_GRQ	The H.323 gateway is in the Gatekeeper Discovery state.
CCH323_RAS_STATE_RRQ	The H.323 gateway is in the Gateway Registration state.
CCH323_RAS_STATE_IDLE	The H.323 gateway is ready for calls.
CCH323_RAS_STATE_URQ	The H.323 gateway is in the Un-registration state.

Status Command

This section describes the status command for H.323 gateways.

Command Types Status

Examples

```
status h323-gw id=CHINA-1;
```

Reply Example:

```
Reply : Success:

ADMIN_STATE -> ADMIN_INS
H3A PROCESS NUMBER -> 30
H3A PROCESS NAME -> H3A1
ENDPOINT ID ->
ACTIVE CALLS -> 0
RAS STATE -> CCH323_RAS_STATE_GRQ
RAS PORT -> 35881
IP ADDRESS -> 10.89.224.125
REGISTERED GATEKEEPER ID ->
PRIMARY GATEKEEPER ID ->
PRIMARY GATEKEEPER PORT -> 0
PRIMARY GATEKEEPER IP ->
H323 VERSION -> 4
TIME TO LIVE -> 0
NUM ALT GATEKEEPERS -> 0
ALT GATEKEEPER PERMANENT -> TRUE
THRESHOLD_ENABLED -> FALSE
OUT_OF_RESOURCES -> FALSE
ALT GATEKEEPER LIST ->
```

Control Command

This section describes the control command for H.323 gateways.

Examples

```
control h323-gw id=CHINA_1; target-state=INS;
```

Reply Example:

```
Reply : Failure:

INITIAL STATE -> ADMIN_INS
REQUEST STATE -> ADMIN_INS
RESULT STATE -> ADMIN_INS
FAIL REASON -> ADM entity in desired state
REASON -> ADM is in request state
RESULT -> ADM configure result in warning
H323GW ID -> CHINA_1
```

ISDN Switchover

This section describes the control command for ISDN switchover. For ISDN status, use the status trunk group command described in the "Trunk Group" section on page 5-18. This command is only applicable to nonfacility-associated signaling (NFAS). It switches the D channel that is active to standby, and the D channel that is standby to active.

Step 1 Use the following example to display the current TGs with ISDN D channels.

```
show isdn-dchan
```

Following is an example of the display:

```
TGN_ID=1700
DCHAN_TYPE=PRIMARY
SET_ID=backset1
DCHAN_SLOT=3
DCHAN_PORT=0
DCHAN_INTF=0

TGN_ID=1701
DCHAN_TYPE=PRIMARY
SET_ID=backset1
DCHAN_SLOT=3
DCHAN_PORT=1
DCHAN_INTF=0
```

Reply Example:

```
Reply : Success:  Entries 1-2 of 2 returned.
```

Step 2 Use the following example to switch over an ISDN D channel.

```
control isdn-dchan tgn-id=1;
```

Reply Example:

```
Reply : Success
```

Media Gateway

This section describes the status and control commands for media gateways.

Status Command

This section describes how to check the status of a media gateway.

Step 1 The following example checks the status of a media gateway:

```
status mgw id=c5300_197;
```

Reply Example:

```
Reply : Success:

MGW ID -> c5300_197
RESULT -> ADM configure result in success
REASON -> ADM executed successful
ADMIN STATE -> ADMIN_INS
OPER STATE -> Media gateway in working status
```

Table 5-1 lists the administrative states the system can return.

Table 5-1 Returnable Administrative States

State	Definition
ADMIN-INS	In-service
ADMIN-OOS	Out of service
ADMIN-MAINT	Maintenance Mode
ADMIN-OOS-PENDING	Transitioning to out of service
ADMIN-MAINT-PENDING	Transitioning to Maintenance Mode

The system can report the following MGW operational states:

- Media gateway in unknown status
- Media gateway in working status
- Media gateway in down status
- Media gateway cannot be reached

Control Command

This section shows how to control a media gateway in service. Modes can be either forced or graceful. Forced mode tears down all calls immediately; graceful mode allows calls in progress to complete before teardown.

Step 1 Use the following example to control a media gateway in service:

```
control mgw id=c5300_162; mode=forced; target-state=INS;
```

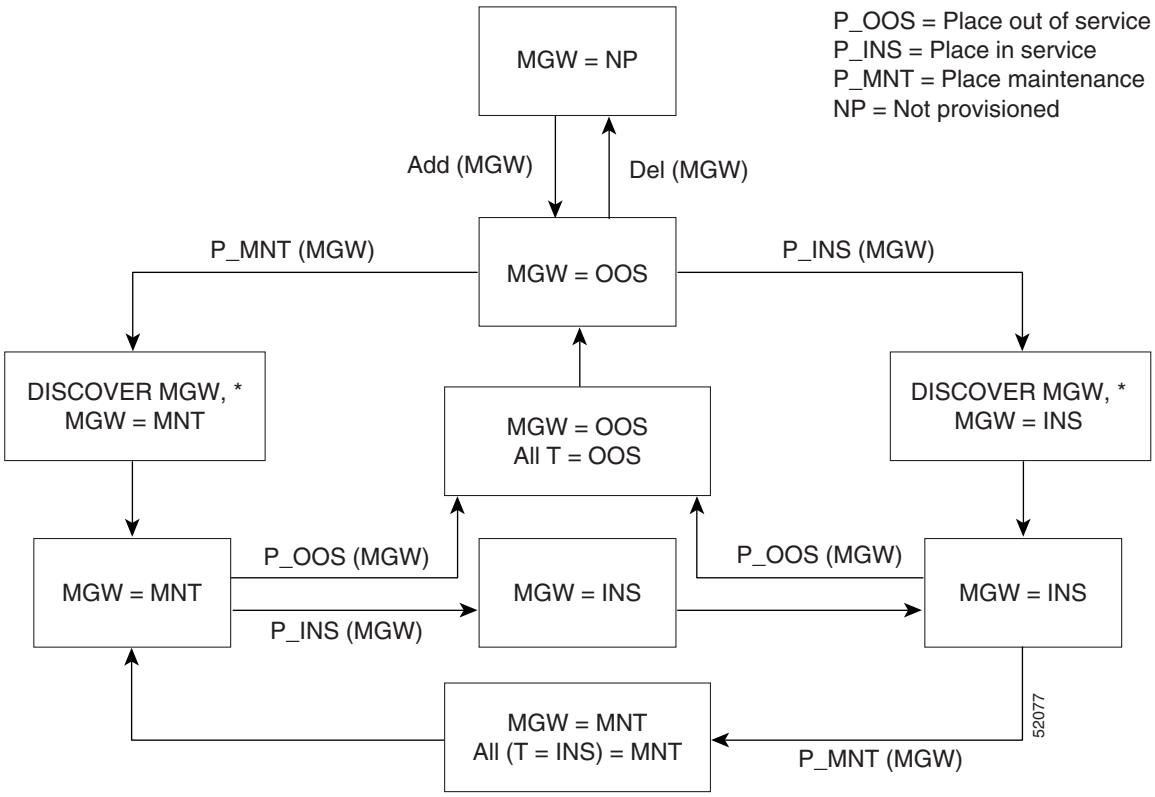
Reply Example:

```
Reply : Success: CLI change successful

MGW ID -> c5300_162
INITIAL STATE -> ADMIN_OOS
REQUEST STATE -> ADMIN_INS
RESULT STATE -> ADMIN_INS
FAIL REASON -> ADM found no failure
REASON -> ADM executed successful
RESULT -> ADM configure result in success
```

Note The rules for placing an MGW into the OOS, INS, and MAINT states are shown in Figure 5-1.

Figure 5-1 Administrative and Operational Maintenance States for MGW



* "Discover" means to establish MGCP communication with MGW

Signaling Gateway Process

This section describes the status command for the signaling gateway process (SGP) table.

Status Command

The SGP status command returns the state of the SGP.

Examples

```
status sgp id=sgp1;
```

Where sgp-id is the ID of the selected signaling gateway process in the sgp table. For example, sgp222. This is an optional token.

Stream Control Transmission Protocol Association

This section details the **status** and **control** commands for the Stream Control Transmission Protocol (SCTP) Association table. Use the **status** command to check the status of an SCT association. Use the **control** command to control an SCTP that is out of service. Forced is the only permitted mode—this mode immediately tears down all calls.

Status Command

Use the following command example to check the status of an SCTP association.

Examples

```
status sctp-assoc id=sctpassoc1;
```

Control Command

The following command example shows how to control an SCTP out of service. Forced mode tears down all calls immediately.

Examples

```
control sctp-assoc id=sctpassoc1; target-state=INS; mode=FORCED;
```

Subscriber Termination

This section describes the status and control commands for subscriber terminations. Either a range of subscribers can be specified by using *@mgw-id for the ID parameter, or a single subscriber can be specified (for example: sub-ctx1@Cisco.com).

Note When first provisioned, all subscriber terminations are in the unequipped (UEQP) state. A subscriber termination must also be in the UEQP state before it can be deleted.

Individual subscriber terminations can be placed into any of three administrative service states: INS, OOS, and MNT. The relationship between subscriber termination states and the residential gateway (RGW) state is provided in Table 5-2.

Table 5-2 RGW and Subscriber Termination States

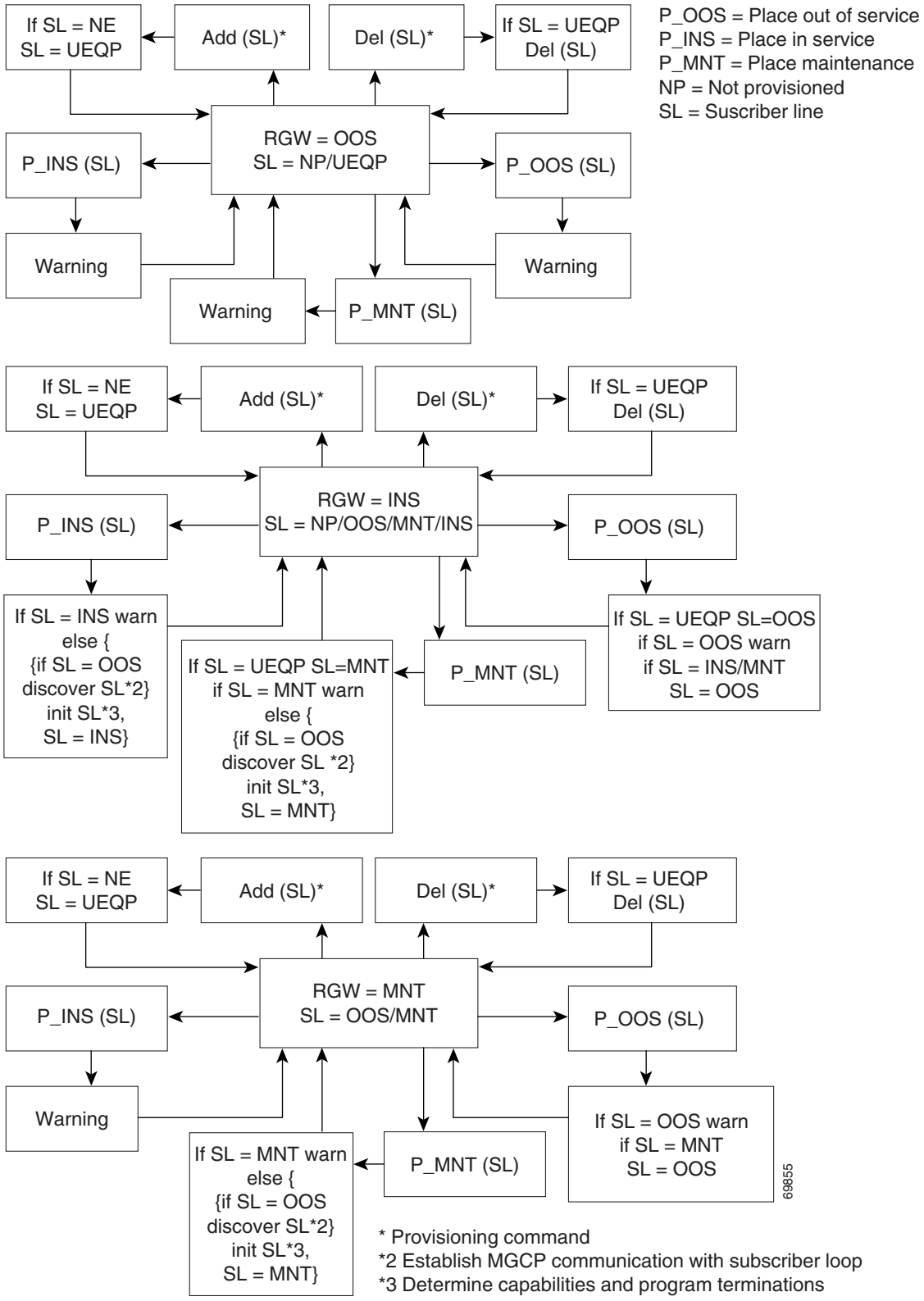
RGW State	Allowed Subscriber Termination States
OOS	• OOS • UEQP
INS	• OOS • MAINT • INS • UEQP
MAINT	• OOS • MAINT • UEQP

Where:

- OOS means out of service.
- MAINT means maintenance.
- INS means in-service.
- UEQP means unequipped.

The rules for placing RGW subscriber terminations into the OOS, INS, and MAINT states (which depend upon the RGW state) are shown in Figure 5-2.

Figure 5-2 Administrative and Operational Maintenance States for Residential Gateways



Status Command

This section describes how to show the status of subscriber terminations. It is organized as follows:

Single Subscriber Termination Status

This section describes how to check the status of a single subscriber termination.

The following example checks the status of a single subscriber termination:

```
status subscriber-termination id=ubr204_1;
```

Reply Example:

```
RESULT -> ADM configure result in success
REASON -> ADM executed successful
ADMIN STATE -> ADMIN_INS
OPER STATE -> Termination is idle
SUBCRIBER DN -> ubr204_1
FAULT REASON -> No fault reason available
```

Note Table 5-3 lists the administrative states the system can return.

Table 5-3 Returnable Administrative States

State	Definition
ADMIN-UEQP	Unequipped
ADMIN-INS	In-service
ADMIN-OOS	Out of service
ADMIN-MAINT	Maintenance Mode
ADMIN-OOS-PENDING	Transitioning to out of service
ADMIN-MAINT-PENDING	Transitioning to Maintenance Mode

All Subscriber Terminations Status

This section describes how to show the status of all subscriber-terminations on a particular gateway.

The following example shows the status of all subscriber-terminations on a particular gateway:

```
status subscriber-termination id=*@ubr235;
```

Reply Example:

```
SUBCRIBER DN -> ubr235_1
ADMIN STATE -> ADMIN_UEQP
```

```
OPER STATE -> Termination is unequiped
REASON -> ADM executed successful
RESULT -> ADM configure result in success
FAULT REASON -> No fault reason available

SUBCRIBER DN -> ubr235_2
ADMIN STATE -> ADMIN_UEQP
OPER STATE -> Termination is unequiped
REASON -> ADM executed successful
RESULT -> ADM configure result in success
FAULT REASON -> No fault reason available

Reply : Success:
```

Administrative State Token

The Administrative State (admin-state) token returns the administrative state of the subscriber termination. Valid values are:

- UEQP—Unequipped; resource is not commissioned. Resource is not registered.
- OOS—Termination was manually controlled out of service.
- INSQ Termination was manually controlled in service, but operationally may be available or unavailable.
- OOS-PENDING—Termination was manually controlled out of service with mode graceful, termination is still involved in a call.
- MAINT—Termination was in maintenance mode, can run diagnostic commands.
- MAINT-PENDING—Termination was manually controlled to MAINT state, but termination is still involved in call.
- ALL—Return all possible states.

The following command example returns only those trunk terminations that are in administrative state OOS (if any), and operating state IDLE (if any):

```
status trunk-termination tgn-id=12; cic=1-1000; admin-state=OOS; oper-state=idle
```

Operating State Token

The Operating State (oper-state) token expands the range of useful information returned by the status subscriber-termination command.

Valid values for the oper-state token are:

- FA—Faulty
- NF—Not faulty
- IDLE—Termination idle
- ACTIVE—Termination active
- DOWN—Termination down
- TERM-FA—Termination fault
- TEMP-DOWN—Termination temporarily down
- UNREACH—Termination unreachable
- INT-MAINT—Termination internal maintenance

- UEQP—Termination unequipped
- ALL—All states, same as executing command without oper-state token

The following example returns only those subscriber terminations that are FA (if any):

```
status subscriber-termination id=*@ubr235; oper-state=FA;
```

Note If the media gateway keep-alive is disabled the connectivity status (reachable/unreachable) in termination status command output is only last known status, however all other status information is the latest.

Table 5-4 Returnable Operational States

State	Definition
UNKNOWN	• The termination is not being audited for connectivity. • Capabilities, termination, and connection are not being synchronized with the termination. • When KEEPALIVE-METHOD=NONE in MGW-PROFILE, the termination status is UNKNOWN even if the transaction becomes UNREACHABLE. • Newly-provisioned terminations are in this state.
ACTIVE	• The termination is being audited for connectivity. • Capabilities, termination, and connection are being synchronized with the termination.
UNREACHABLE	• The termination is unreachable. • This occurs when MGW KEEPALIVE declares an MGW unreachable. • This changes to ACTIVE when MGW KEEPALIVE detects an MGW is reachable or any termination previously UNREACHABLE starts sending MGCP messages (NTFY, RSIP).
FAULTY	• The termination returneda permanent error code, making it unusable for future calls. **Note** The error code may occur only in certain circumstances and re-audit/auto-recovery may succeed. This does not mean the termination recovered from that condition. • The flag MGCP-MAX-FAULT-COUNT controls how many times BTS tries to recover the fault (performing re-audit/auto-recovery) before putting it in this state.
MTRANS	• Maintenance Transient, the termination is in the middle of anaudit/re-audit/auto-recovery. • This state may go along with other states (MTRANS-UNREACH).
IDLE	The termination is not involved in transient/active call
BUSY	• The termination is involved in Active/Transient call. • This state may go along with CTRANS state.

Table 5-4 Returnable Operational States

State	Definition
CTRANS	• Call Transient, the termination is involved in a Transient call. • This state always goes with BUSY.
RESERVED	The termination is reserved for a call during Busy Line Verification
SERV_EFFC_TEST	The termination is in a Service Effecting Network loopback or Network Continuity test.

Source Token

The source token specifies whether to query the Call Agent, or the EMS, for status information. It is an optional token.

Valid values for the source token are:

- EMS (Default)—Query the local EMS database for most current status.
- AGENT—Query the remote Call Agent database for most current status.

The following example returns the current status of a Call Agent:

```
status subscriber-termination id=*@ubr235; source=AGENT;
```

Control Command

This section describes how to control subscriber terminations on a particular gateway. To control a subscriber termination to the unequipped or equipped state, use the equip or unequip commands in the "Equip Command" section on page 5-16 and the "Unequip Command" section on page 5-16. This section is organized as follows:

Control a Single Subscriber Termination

Use the **control** command to control one subscriber-termination on a particular gateway.

Note To control a subscriber termination to the unequipped or equipped state, use the **equip** or **unequip** commands.

The following example controls a single subscriber termination into service:

```
control subscriber-termination id=*@c3810_167; mode=forced; target-state=INS;
```

Reply Example:

```
Reply : Success: CLI change successful

ID -> c3810_167
REQUEST STATE -> ADMIN_INS
RESULT STATE -> ADMIN_INS
```

```
FAIL REASON -> ADM found no failure
REASON -> ADM executed successful
RESULT -> ADM configure result in success
```

Control All Subscriber Terminations

This section describes how to control all subscriber-terminations on a particular gateway.

The following example controls to MAINT all subscriber-terminations on a particular gateway:

```
control subscriber-termination id=*@ubr235; mode=forced; target-state=MAINT
```

Reply Example:

```
Reply : Success: CLI change successful

ID -> ubr235
REASON -> ADM executed successful
RESULT -> ADM configure result in success
REQUEST STATE -> ADMIN_MAINT
RESULT STATE -> ADMIN_MAINT
FAIL REASON -> ADM found no failure
CLI>diag subscriber-termination
Reply : Success: Diagnostic Subscriber Menu.
```

Equip Command

The **equip** command changes the administrative state of terminations that are in the UEQP state to OOS state. It ignores the terminations in the states INS, MAINT, or OOS.

Use the following example to equip a subscriber termination:

```
equip subscriber-termination id=97_8@ipclab.cisco.com;
```

Reply Example:

```
Reply : Success: CLI change successful

ID -> Subcriber ID -> 97_8@ipclab.cisco.com
REASON -> ADM executed successful
RESULT -> ADM configure result in success
FAIL REASON -> ADM found no failure
```

Unequip Command

The unequip command changes the administrative state of subscriber terminations that are in OOS state into UEQP state. It ignores the terminations in the INS, MAINT, or UEQP states.

Use the following command to unequip a subscriber termination:

```
unequip subscriber-termination id=97_8@ipclab.cisco.com;
```

Reply Example:

```
Reply : Success: CLI change successful

ID -> Subcriber ID -> 97_8@ipclab.cisco.com
REASON -> ADM executed successful
RESULT -> ADM configure result in success
FAIL REASON -> ADM found no failure
FAIL REASON -> ADM found no failure
```

Subsystem Table

This section describes the **show**, **status** and **control** commands for the Subsystem table. This table holds the information for all the subsystems using signaling connection control part (SCCP). Because the Cisco BTS 10200 Softswitch supports multiple origination point codes (OPCs), both the subsystem ID and OPC_ID are required to determine subsystem information.

Show Command

Use the **show** command to display information about the provisioned subsystem(s), including IDs and OPC_IDs.

```
show subsystem;
```

Typical system response:

```
ID=LNP_SSN
LOCAL_SSN=248
REMOTE_SSN=248
SCCP_NW_ID=1
OPC_ID=opc
SCCP_VERSION=ANS92
TCAP_VERSION=ANS92
APPLICATION_VERSION=AIN01
STATUS=UIS
Reply : Success:  Entries 1-1 of 1 returned.
```

Status Command

The **status subsystem** command returns the state of a subsystem. You must enter the ID and OPC_ID in this command.

```
status subsystem id=LNP_SSN; opc_id=opc;
```

Typical system response:

```
SUBSYSTEM ID -> LNP_SSN
OPC ID -> opc
ADMIN STATE -> User in service
OPER STATE -> Subsystem allowed
REASON -> ADM executed successful
RESULT -> ADM configure result in success

Reply : Success:
```

Control Command

The following example shows how to control a subsystem out of service in forced mode:

```
control subsystem id=LNP_SSN; opc_id=opc; target-state=OOS; mode=FORCED;
```

Trunk Group

This section describes the **status** and **control** commands for trunk groups (TGs). Individual TGs can be placed into any of three administrative service states: INS, OOS, and MAINT. The relationship between TGW and TG state is provided in Table 5-5.

Table 5-5 ISDN TGW/TG State Relationships

TGW State	Allowed TG States
INS	• OOS • MAINT • INS
MAINT	• OOS • MAINT

Status Command

This section describes how to show the status of one TG ID.

The following example shows the status of a single TG ID:

```
status trunk-grp id=2;
```

Reply Example:

```
RESULT -> ADM configure result in success
REASON -> ADM executed successful
ADMIN STATE -> ADMIN_INS
OPER STATE -> Trunk group in-service
TGN ID -> 2
```

Table 5-6 lists the administrative states that the system can return.

Table 5-6 Returnable Administrative States

State	Definition
ADMIN-INS	In service.
ADMIN-OOS	Out of service.
ADMIN-MAINT	Maintenance Mode.
ADMIN-OOS-Pending	Transitioning to out of service.
ADMIN-MAINT-Pending	Transitioning to Maintenance Mode.
ACL	Congestion is at level 1
ACL	Congestion is at level 2
ACL	Congestion is at level 3
TFC	Congestion is at level 1
TFC	Congestion is at level 2
TFC	Congestion is at level 3

The system can return the following operating states:

- Trunk group in-service
- Trunk group out of service
- Trunk group manually busy
- Trunk group operate in wait state
- Trunk group operate in standby state
- Trunk group restore session request normal
- Trunk group restore session request switchover
- Trunk group restore session request maintenance
- Trunk group restore session fail normal
- Trunk group restore session fail switch-over
- Trunk group restore session fail maintenance
- Trunk group restore establish request normal
- Trunk group restore establish request switchover
- Trunk group restore establish request maintenance
- Trunk group restore establish fail normal
- Trunk group restore establish fail switchover
- Trunk group restore establish fail maintenance
- Trunk group in maintenance state
- Trunk group down session set fail soft normal
- Trunk group down session set fail hard normal
- Trunk group down session set fail soft maintenance
- Trunk group down session set fail hard maintenance
- Trunk group down establish request soft normal
- Trunk group down establish request hard normal
- Trunk group down establish request soft maintenance
- Trunk group down establish request hard maintenance
- Trunk group down establish fail soft normal
- Trunk group down establish fail hard normal
- Trunk group down establish fail soft maintenance
- Trunk group down establish fail hard maintenance
- Trunk group delete graceful
- Trunk group request remove release
- Trunk group request remove session set
- Trunk group remove graceful in-service and maintenance state
- DPC is inaccessible

Control Command

This section describes how to control one trunk group ID.

Note When performing the following commands in immediate succession, always wait at least one second before performing the second command:

control trunk-grp tgn-id=129; mode=forced; target-state=oos;
control trunk-grp tgn-id=129; mode=forced; target-state=ins;

The following example controls a single trunk group ID into service:

```
control trunk-grp id=2; mode=forced; target-state=INS;
```

Reply Example:

```
Reply : Success: CLI change successful

INITIAL STATE -> ADMIN_OOS
REQUEST STATE -> ADMIN_INS
RESULT STATE -> ADMIN_INS
FAIL REASON -> ADM found no failure
REASON -> ADM executed successful
RESULT -> ADM configure result in success
TGN ID -> 2
```

Caution When you control an ISDN trunk in-service, the media gateway must be in-service.
When you control an ISDN trunk group, all ISDN trunks in that trunk group are controlled to the same state.

Trunk Termination

This section describes the status and control commands for trunk terminations. Either a range (for example, cic=1-24;) or a single value (for example, cic=1;) for the CIC parameter can be specified for the status and control of trunk terminations.

Individual ISDN trunks and trunking groups can be placed into any of three administrative service states:

- INS
- OOS
- MAINT

Note Use the following command to control all trunk terminations for a particular CIC group to INS. This command resets the circuits. The **forced** option brings the circuits to INS by using the reset procedure.

```
control trunk-termination tgn-id=17; cic=1-23; target-state=ins; mode=forced;
```

The relationship between trunk/trunk group state and the TGW state is provided in Table 5-7. For all other trunk types, the trunk state and trunk group state are independent.

Table 5-7 ISDN TGW/TG State Relationships

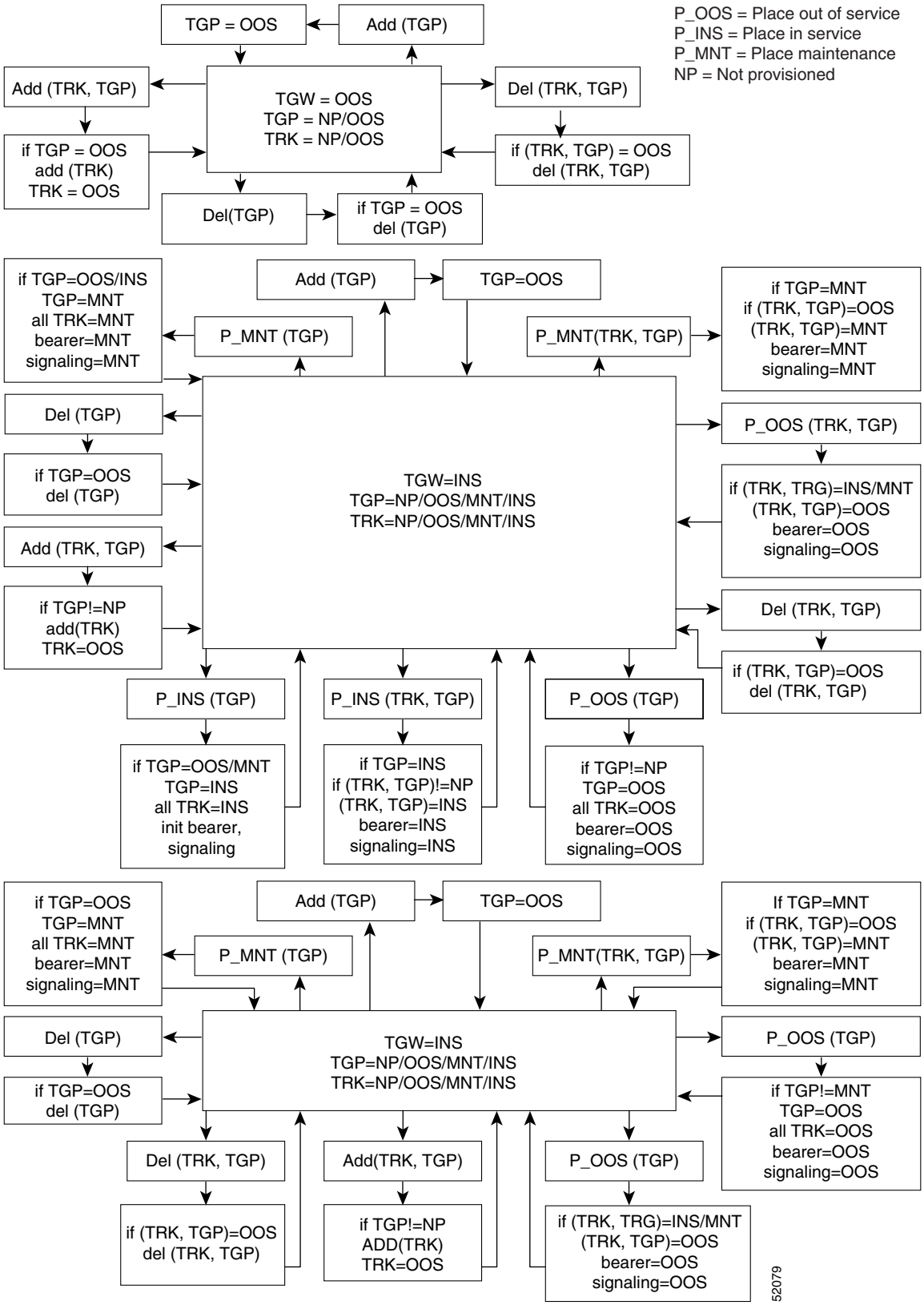
TGW State	Allowed TG States	Allowed Trunk States
INS	• OOS • MAINT • INS	• UEQP OOS • UEQP OSS, MAINT • UEQP OOS, MAINT, INS
MAINT	• OOS • MAINT	• UEQP OOS • UEQP OSS, MAINT

Where:

- TGW—trunking gateway
- TG—trunk group
- OOS—out of service
- MAINT—maintenance
- INS—in service
- UEQP—unequipped

The rules for placing trunks and TG into the OOS, INS, and MAINT states (which depend upon the TGW state) are shown in Figure 5-3.

Figure 5-3 ISDN Administrative and Operational Maintenance States for a Trunking Gateway



Using the Status Command to Check Trunk Termination Status

This section describes how to check trunk termination status. This section is organized as follows:

- Trunk Termination Status—Basic Command
- Trunk Termination Status—Optional Tokens
- Trunk Termination Status—"status tt" Command

Trunk Termination Status—Basic Command

This section describes how to check the status of one trunk termination. This command can be executed for one CIC (for example, cic=1;), a range of CICs (for example, cic=1-12;) or for all CICs (cic=all;).

Use the following example to check the status of one trunk termination:

```
status trunk-termination tgn-id=2; cic=8;
```

Reply Example:

```
Reply : Success:

RESULT -> ADM configure result in success
REASON -> ADM executed successful
TGN ID -> 2
CIC -> 8
TERM ADMIN STATE -> ADMIN_INS
TERM OPER STATE -> Termination is idle
TERM REASON -> No fault reason available
TRUNK STATIC STATE -> ACTV
TRUNK DYNAMIC STATE -> TRNS
TRUNK REASON -> NON_FAULTY
```

Note Table 5-8 lists the administrative states the system can return for the *term admin status* response.

Table 5-8 Returnable Administrative States

State	Definition
ADMIN-UNEQP	Unequipped.
ADMIN-INS	In Service.
ADMIN-OOS	Out of Service.
ADMIN-MAINT	Maintenance Mode.
ADMIN-OOS-PENDING	Transitioning to Out of Service.
ADMIN-MAINT-PENDING	Transitioning to Maintenance Mode.
ADMIN-NULL	Resource does not exist.

Trunk Termination Status—Optional Tokens

The following optional tokens can be used with the status trunk-termination command. They expand the range of useful information returned. Either all, or none of the tokens can be used, with the exception of the off-normal token, which must be used by itself (without any other tokens).

- Administrative State (admin-state). Valid values are:
  - UEQP—Unequipped; resource is not commissioned. Resource is not registered.
  - OOS—Termination was manually controlled out of service.
  - INS—Termination was manually controlled in service, but operationally may be available or unavailable.
  - OOS-PENDING—Termination was manually controlled out of service with the graceful mode, termination is still involved in a call.
  - MAINT—Termination was in maintenance mode, can run diagnostic commands.
  - MAINT-PENDING—Termination was manually controlled to the MAINT state, but termination is still involved in call.
  - ALL—Return all possible states.

  The following command example returns only those trunk terminations that are in administrative state OOS (if any), and operating state IDLE (if any):

  ```
  status trunk-termination tgn-id=12; cic=1-1000; admin-state=OOS; oper-state=idle
  ```

- Operating State (oper-state). Valid values for the oper-state token are:
  - FA—Includes FAULTY, UNREACH, TEMP-DOWN, and DOWN.
  - FAULTY—The MGCP endpoint returned a permanent error code.
  - UNREACH—The MGCP endpoint was declared as not reachable. This indicates gateway connectivity problems.
  - TEMP-DOWN—The MGCP endpoint is temporarily down.
  - DOWN—MGCP endpoint is down because GW termination has sent an RSIP-down message.
  - NF—Includes INT-MAINT, IDLE, BUSY, and ACTIVE.
  - INT-MAINT—Internal error recovery is in progress.
  - IDLE—Termination is not involved in a call, but is available.
  - BUSY— Termination is involved in transient call.
  - ACTIVE—Termination is involved in stable call.
  - UEQP—Termination is not equipped.
  - ALL—Returns all possible operational states.

  The following command example returns only those trunk terminations that are FA (if any):

  ```
  status trunk-termination tgn-id=12; cic=ALL; oper-state=FA;
  ```

- Static State (static-state). Valid values for the static-state token are:
  - UEQP—Unequipped resource is not commissioned. Resource is not registered.
  - LBLK—Termination is locally blocked: either manually taken OOS/MAINT (block reason can be MANUAL-OOS, MAINT-OOS), or automatically went out of service.
  - RBLK—Termination is remotely blocked (blocked by remote side).
  - ACTV—Available.
  - All—Returns all possible static states.

  The following command example returns only those terminations that are locally blocked (if any):

```
status trunk-termination tgn-id=101; cic=1-24; static-state=lblk;1
```

- Dynamic State (dynamic-state). Valid values for the dynamic-state token are:
  - IBSY—Trunk-termination is involved in an incoming active call.
  - OBSY—Trunk-termination is involved in an outgoing active call.
  - TRNS—Transient maintenance state (sent maintenance signaling message and waiting for response).
  - IDLE—Termination is not involved in a call.
  - IBSY-TRNS—Termination is involved in an incoming transient call.
  - OBSY-TRNS—Termination is involved in an outgoing transient call.
  - ALL—All possible dynamic states.

  The following command example returns only those terminations that are idle (if any):

  ```
  status trunk-termination tgn-id=101; cic=1-24; dynamic-state=idle;
  ```

- Off-normal State (off-normal)
  - Yes—Return all terminations in off-normal state.
  - No—Return all terminations in normal state.

  The following command example returns only those terminations in an off-normal state (if any).

  ```
  status trunk-termination tgn-id=101; cic=1-24; off-normal=yes;
  ```

  A termination is in an off-normal state when it is *not* in one of the state combinations shown in Table 5-9.

- Source (source)—Specifies whether to query the Call Agent or the Element Management System (EMS) for status information. It is an optional token.
  - EMS (Default)—Query the local EMS database for most current status.
  - AGENT—Query the remote Call Agent database for most current status.

  The following command example returns the current status of the Call Agent:

  ```
  status trunk-termination tgn-id=101; cic=1-24; source=AGENT;
  ```

Table 5-9 Valid Normal Trunk Termination States

State/Token	ADMIN-STATE	OPER-STATE	STATIC-STATE	DYNAMIC-STATE
UNEQP	UNEQP	ANY	UEQP	IDLE
MANUALLY OOS	OOS	ANY	LBLK	IDLE
MANUALLY MAIN	MAINT	IDLE	LBLK	IDLE
IDLE	INS	IDLE	ACTV	IDLE
ACTIVE INCOMING	INS	IDLE	ACTV	IDLE
ACTIVE OUTGOING	INS	ACTIVE	ACTV	OBSY
TRANSIENT INCOMING	INS	ACTIVE	ACTV	IBY-TRNS
TRANSIENT OUTGOING	INS	BUSY	ACTV	OBSY-TRNS

Trunk Termination Status—"status tt" Command

The following command example (**status tt**) returns current status in a tabular format.

```
CLI>status tt tgn_id=6004;cic=all;
```

6004	1	ADMIN_INS	TERM_ACTIVE_CTRANS_BUSY	ACTV	TRNS_IBSY	NON_FAULTY

```
 6004  1   ADMIN_INS     TERM_ACTIVE_CTRANS_BUSY   ACTV   TRNS_IBSY   NON_FAULTY
 6004  2   ADMIN_INS     TERM_ACTIVE_BUSY      ACTV   IBSY   NON_FAULTY
 6004  3   ADMIN_INS     TERM_ACTIVE_BUSY      ACTV   IBSY   NON_FAULTY
 6004  4   ADMIN_INS     TERM_ACTIVE_BUSY      ACTV   IBSY   NON_FAULTY
 6004  5   ADMIN_INS     TERM_ACTIVE_BUSY      ACTV   IBSY   NON_FAULTY
 6004  6   ADMIN_INS     TERM_ACTIVE_BUSY      ACTV   IBSY   NON_FAULTY
 6004  7   ADMIN_INS     TERM_ACTIVE_CTRANS_BUSY   ACTV   TRNS_IBSY   NON_FAULTY
 6004  8   ADMIN_INS     TERM_ACTIVE_BUSY      ACTV   IBSY   NON_FAULTY
 6004  9   ADMIN_INS     TERM_ACTIVE_BUSY      ACTV   IBSY   NON_FAULTY
 6004  10   ADMIN_INS     TERM_ACTIVE_CTRANS_BUSY   ACTV   IBSY   NON_FAULTY
 6004  11   ADMIN_INS     TERM_ACTIVE_BUSY      ACTV   IBSY   NON_FAULTY
 6004  12   ADMIN_INS     TERM_ACTIVE_BUSY      ACTV   IBSY   NON_FAULTY
 6004  13   ADMIN_INS     TERM_ACTIVE_IDLE      ACTV   IDLE   NON_FAULTY

PROPOSED COMMAND OUTPUT
TGN ID  CIC  ADMIN_STATE   OPER_STATE   STATIC_STATE     DYNAMIC_STATE      REASON
 6004   1   ADMIN_INS     TERM_ACTIVE_CTRANS_BUSY       ACTV TRNS_IBSY     NON_FAULTY
 6004   2   ADMIN_INS     TERM_ACTIVE_BUSY              ACTV IBSY          NON_FAULTY
 6004   3   ADMIN_INS     TERM_ACTIVE_BUSY              ACTV IBSY          NON_FAULTY
 6004   4   ADMIN_INS      TERM_ACTIVE_BUSY             ACTV IBSY          NON_FAULTY
 6004   5       ADMIN_INS    TERM_ACTIVE_BUSY                        ACTV
IBSY               NON_FAULTY
 6004   6       ADMIN_INS    TERM_ACTIVE_BUSY                        ACTV
IBSY               NON_FAULTY
 6004    7        ADMIN_INS     TERM_ACTIVE_CTRANS_BUSY             ACTV
TRNS_IBSY          NON_FAULTY
```

```
 6004    8       ADMIN_INS     TERM_ACTIVE_BUSY                        ACTV
IBSY                 NON_FAULTY
 6004    9       ADMIN_INS     TERM_ACTIVE_BUSY                        ACTV
IBSY                 NON_FAULTY
 6004   10        ADMIN_INS     TERM_ACTIVE_CTRANS_BUSY            ACTV
IBSY                 NON_FAULTY
```

Reply Example:

TGN ID	CIC	ADMIN_STATE	OPER_STATE	STATIC_STATE	DYNAMIC_STATE	REASON
6004	1	ADMIN_INS	TERM_ACTIVE_CTRANS_BUSY			NON_FAULTY
						NON_FAULTY

```
994   1    ADMIN_INS      TERM_ACTIVE_IDLE       ACTV    IDLE    NON_FAULTY
994   2    ADMIN_INS      TERM_ACTIVE_IDLE       ACTV    IDLE    NON_FAULTY
994   3    ADMIN_INS      TERM_ACTIVE_IDLE       ACTV    IDLE    NON_FAULTY
994   4    ADMIN_INS      TERM_ACTIVE_IDLE       ACTV    IDLE    NON_FAULTY
994   5    ADMIN_INS      TERM_ACTIVE_IDLE       ACTV    IDLE    NON_FAULTY
994   6    ADMIN_INS      TERM_ACTIVE_IDLE       ACTV    IDLE    NON_FAULTY
994   7    ADMIN_INS      TERM_ACTIVE_IDLE       ACTV    IDLE    NON_FAULTY
994   8    ADMIN_INS      TERM_ACTIVE_IDLE       ACTV    IDLE    NON_FAULTY
994   9    ADMIN_INS      TERM_ACTIVE_IDLE       ACTV    IDLE    NON_FAULTY
994   10    ADMIN_INS      TERM_ACTIVE_IDLE       ACTV    IDLE    NON_FAULTY
994   11    ADMIN_INS      TERM_ACTIVE_IDLE       ACTV    IDLE    NON_FAULTY
994   12    ADMIN_INS      TERM_ACTIVE_IDLE       ACTV    IDLE    NON_FAULTY
994   13    ADMIN_INS      TERM_ACTIVE_IDLE       ACTV    IDLE    NON_FAULTY
994   14    ADMIN_INS      TERM_ACTIVE_IDLE       ACTV    IDLE    NON_FAULTY
994   15    ADMIN_INS      TERM_ACTIVE_IDLE       ACTV    IDLE    NON_FAULTY
994   16    ADMIN_INS      TERM_ACTIVE_IDLE       ACTV    IDLE    NON_FAULTY
994   17    ADMIN_INS      TERM_ACTIVE_IDLE       ACTV    IDLE    NON_FAULTY
994   18    ADMIN_INS      TERM_ACTIVE_IDLE       ACTV    IDLE    NON_FAULTY
994   19    ADMIN_INS      TERM_ACTIVE_IDLE       ACTV    IDLE    NON_FAULTY
994   20    ADMIN_INS      TERM_ACTIVE_IDLE       ACTV    IDLE    NON_FAULTY
994   21    ADMIN_INS      TERM_ACTIVE_IDLE       ACTV    IDLE    NON_FAULTY
994   22    ADMIN_INS      TERM_ACTIVE_IDLE       ACTV    IDLE    NON_FAULTY
994   23    ADMIN_INS      TERM_ACTIVE_IDLE       ACTV    IDLE    NON_FAULTY
994   24    ADMIN_INS      TERM_ACTIVE_IDLE       ACTV    IDLE    NON_FAULTY

Reply : Success:
```

Control Command—Trunk Terminations

This section describes how to control trunk terminations. The section is organized as follows:

- Controlling One Trunk Termination
- Controlling All Trunk Terminations

Controlling One Trunk Termination

This section describes how to control a trunk termination.

Use the following example to control one trunk termination into OOS:

```
control trunk-termination tgn-id=22; cic=1; target-state=OOS; mode=forced;
```

Reply Example:

```
Reply : Success: CLI change successful

TGN ID -> 22
REASON -> ADM executed successful
RESULT -> ADM configure result in success
CIC START -> 1
CIC END -> 1
FAIL REASON -> ADM found no failure
REQUEST STATE -> ADMIN_OOS
RESULT STATE -> ADMIN_OOS
```

Controlling All Trunk Terminations

This section describes how to control all trunk terminations for a group of circuit identification codes (CICs).

Use the following example to control all trunk terminations for a particular CIC group to OOS:

```
control trunk-termination tgn-id=17; cic=1-23; target-state=oos; mode=forced;
```

Reply Example:

```
Reply: Request was successful.
TGN ID -> 17
REASON -> ADM executed successful
RESULT -> ADM configure result in success
CIC START -> 1
CIC END -> 24
FAIL REASON -> ADM found no failure
REQUEST STATE -> ADMIN_OOS
RESULT STATE -> ADMIN_OOS
```

Reset Command to Clear Manual and Blocked States

The **reset** command clears all manual and blocked states as well as any active/transient calls on a trunk termination, with the exception of SS7 trunk terminations. It brings a trunk into INS mode. This section is organized as follows:

- Reset a Single CIC
- Reset a Range of CICs
- Reset All CICs

Reset a Single CIC

This section describes how to reset a single CIC.

The following example resets a single CIC on a specific trunk:

```
reset trunk-termination tgn-id=22; cic=1
```

Reply Example:

```
Reply : Success:

TGN ID -> 22
REASON -> ADM executed successful
RESULT -> ADM configure result in success
CIC START -> 1
CIC END -> 1
FAIL REASON -> ADM found no failure
```

Reset a Range of CICs

This section describes how to reset a range of CICs.

The following example resets a range of CICs on a specific trunk:

```
reset trunk-termination tgn-id=13; cic=1-6;
```

Reply Example:

```
TGN ID -> 13
REASON -> ADM executed successful
RESULT -> ADM configure result in success
CIC START -> 1
CIC END -> 6
FAIL REASON -> ADM found no failure
```

Reset All CICs

This section describes how to reset all CICs.

The following example resets all CICs on a specific trunk:

```
reset trunk-termination tgn-id=13; cic=all;
```

Reply Example:

```
TGN ID -> 13
REASON -> ADM executed successful
RESULT -> ADM configure result in success
CIC START -> 1
CIC END -> 24
FAIL REASON -> ADM found no failure
```

Equip Command

The **equip** command changes the administrative state of terminations that are in the UEQP state to the OOS state. It ignores the terminations in the INS, MAINT, or OOS states.

Use the **equip** command or the **control trunk-grp** command to change the termination state for a subscriber to an ISDN trunk. The control trunk-grp command changes all trunks in the specified trunk group to the specified state. For trunk types other than ISDN, use the equip command to set the subscriber termination state. Thereafter, to change the termination state, use the control command.

A subscriber termination state must set to unequipped before it can be deleted.

You cannot use the control command to change a termination state to UEQP. Furthermore, you cannot use the control command to change the state of any subscriber termination that is already in the UEQP state.

For example, consider a case in which 24 CICs in a trunk group are in the following initial states:

- CICs 1–10 in OOS state
- 11–15 in UEQP state
- 16–24 in MAINT state

For this case, issuing the **control**, **equip**, or **unequip** commands will affect the initial state of the CICs as follows:

- If a **control** command is used with target-state = ins, the final states of all the CICs are:
  - CICs 1–10 in INS state
  - CICs 11–15 in UEQP state
  - CICs 16–24 in INS state
- If an **equip** command is applied to the CICs in the initial states, the final states of all the CICs are:
  - CICs 1–10 in OOS state
  - CICs 11–15 in OOS state
  - CICs 16–24 in MAINT state
- If an **unequip** command is applied to the CICs in the initial states, the final states of the CICs are:
  - CICs 1–10 in UEQP state
  - CICs 11–15 in UEQP state
  - CICs 16–24 in MAINT state

Use the following example to equip a trunk termination:

```
equip trunk-termination tgn-id=13; cic=all;
```

Reply Example:

```
Reply : Success: CLI change successful

TGN ID -> 13
REASON -> ADM executed successful
RESULT -> ADM configure result in success
CIC START -> 1
CIC END -> 24
FAIL REASON -> ADM found no failure
```

Unequip Command

The **unequip** command changes the administrative state of terminations that are in the OOS state into the UEQP state. It ignores the terminations in the INS, MAINT, or UEQP states.

Use the following example to unequip terminations:

```
unequip trunk-termination tgn-id=13; cic=all;
```

Reply Example:

```
Reply : Success: CLI change successful
```

```
TGN ID -> 13
REASON -> ADM executed successful
RESULT -> ADM configure result in success
CIC START -> 1
CIC END -> 24
```

Diagnostic Tests

This section describes diagnostic tests that can be performed on media gateways, subscriber terminations, and trunk terminations. All media gateways, subscriber and trunk terminations must be in the MAINT state for testing. The following tests are described in this section:

- Media Gateway Tests
- Subscriber Termination Tests
- SS7 Trunk Termination Tests
- ISDN Trunk Termination Tests
- CAS Trunk Termination Tests
- Announcement Trunk Termination Tests

Media Gateway Tests

This section describes the tests that can be performed on media gateways. A gateway must be in the MAINT state.

Step 1 Force the media gateway into MAINT state. Enter the following command:

```
control mgw id=c2421.65; mode=forced; target-state=maint;
```

Reply Example:

```
Reply : Success: CLI change successful

MGW ID -> c2421.65
INITIAL STATE -> ADMIN_INS
REQUEST STATE -> ADMIN_MAINT
RESULT STATE -> ADMIN_MAINT
FAIL REASON -> ADM found no failure
REASON -> ADM executed successful
RESULT -> ADM configure result in success
```

Step 2 Display the Test Menu. Enter the following command:

```
diag mgw
```

Reply Example:

```
Reply: Diagnostic MGW Menu.
===
(1) MGW Network Connectivity Test
(2) MGW MGCP Connectivity Test
(3) ALL
```

Note Test #1 tests if there is a path to the device (ping).
Test #2 tests if MGCP has access to the device.
Test #3 performs tests 1 and 2.

Step 3 To perform a specific test, use the following examples as guides.

```
diag mgw id=ubr-03; test=1;
```

Reply Example:

```
MEDIA GATEWAY LINE DIAGNOSTIC TEST EXECUTED -> diag mgw
ID -> ubr-03
TEST-TYPE -> ADM-MGW-NETW-CONNECTIVITY-TEST
TEST-DURATION -> 0
RESULT -> TEST-SUCCESS
REASON -> PASSED
Reply: Diagnostic command executed.
```

```
diag mgw id=ubr-03; test=2;
```

Reply Example:

```
MEDIA GATEWAY LINE DIAGNOSTIC TEST EXECUTED -> diag mgw
ID -> ubr-03
TEST-TYPE -> ADM-MGW-MGCP-CONNECTIVITY-TEST
TEST-DURATION -> 0
RESULT -> TEST-SUCCESS
REASON -> PASSED
Reply: Diagnostic command executed.
```

```
diag mgw id=ubr-03; test=3;
```

Reply Example:

```
MEDIA GATEWAY LINE DIAGNOSTIC TEST EXECUTED -> diag mgw
ID -> ubr-03
TEST-TYPE -> ADM-MGW-NETW-CONNECTIVITY-TEST
TEST-DURATION -> 11
RESULT -> TEST-SUCCESS
REASON -> PASSED

MEDIA GATEWAY LINE DIAGNOSTIC TEST EXECUTED -> diag mgw
ID -> ubr-03
TEST-TYPE -> ADM-MGW-MGCP-CONNECTIVITY-TEST
TEST-DURATION -> 0
RESULT -> TEST-SUCCESS
REASON -> PASSED
Reply: Diagnostic command executed.
```

Subscriber Termination Tests

This section describes the tests that can be performed on subscriber terminations. All terminations must be in the MAINT state.

Step 1 Force the subscriber termination into MAINT state. Enter the following command:

```
control subscriber-termination id=sub2-ctx2; mode=forced; target-state=maint;
```

Step 2 Display the Test Menu. Enter the following command:

```
diag subscriber-termination;
```

Reply Example:

```
Reply: Diagnostic Subscriber Menu.
===
(1) Subscriber MGCP Connectivity Test
(2) Subscriber Termination Connection Test
(3) Subscriber Termination Ring Test
(4) ALL
```

Note Test #1 tests if MGCP has access to the termination.
Test #2 tests if there is a path to the device (ping).
Test #3 tests if the subscriber can be rung. The Ring parameter must be specified in seconds for this test. The default is 5 seconds.
Test #4 performs tests 1 through 3.

Step 3 To perform a specific test, use the following examples as guides.

```
diag subscriber-termination id=sub2-ctx2; test=1;
```

Reply Example:

```
SUBSCRIBER LINE DIAGNOSTIC TEST EXECUTED -> diag subscriber-termination
ID -> sub2-ctx2
TEST-TYPE -> ADM-MGW-MGCP-CONNECTIVITY-TEST
TEST-DURATION -> 10
RESULT -> TEST-SUCCESS
REASON -> PASSED: Reason: AUEP-NACK received with RespCode = 510
Reply: Diagnostic command executed.
```

```
diag subscriber-termination id=sub-ubr3-1@cisco.com; test=2;
```

Reply Example:

```
SUBSCRIBER LINE DIAGNOSTIC TEST EXECUTED -> diag subscriber-termination
ID -> sub-ubr3-1@Cisco.com
TEST-TYPE -> ADM-TERM-CONNECTION-TEST
TEST-DURATION -> 55
RESULT -> TEST-SUCCESS
REASON -> PASS successfully.
Reply: Diagnostic command executed.
```

```
diag subscriber-termination id=sub-ubr3-1@cisco.com; test=3; ring-duration=10;
```

Reply Example:

```
SUBSCRIBER LINE DIAGNOSTIC TEST EXECUTED -> diag subscriber-termination
ID -> sub-ubr3-1@Cisco.com
TEST-TYPE -> ADM-TERM-RING-TEST
TEST-DURATION -> 9989
RESULT -> TEST-SUCCESS
REASON -> PASSED
Reply: Diagnostic command executed.
```

Note Ring-duration values are 0–999 (Default = 5). Maximum ring time is 30 seconds regardless of whether the duration is set higher than or equal to 31.

SS7 Trunk Termination Tests

This section describes the tests that can be performed on SS7 trunk terminations. All terminations must be in the MAINT state for testing.

Note In Release 4.4.0, diag ss7-trunk-termination test=7 will not execute all tests successfully because Test 1 and Test 2 require the trunk to be in MAINT state while Test 3 through Test 6 require the trunk to be in INS state. Test 7 will not execute successfully regardless of the trunk state.

Step 1 Force the SS7 trunk termination into MAINT state. Enter the following command:

```
control ss7-trunk-termination tgn-id=103; mode=forced; target-state=maint;
```

Note Set COT, CVM, and CQM on the terminating gateway or switch to perform these tests. Otherwise, the test or tests will fail.

Step 2 Display the Test Menu. Enter the following command:

```
diag ss7-trunk-termination
```

Reply Example:

```
Reply: Diagnostic SS7 Trunk Group Menu.
===
(1) SS7 MGCP Connectivity Test
(2) SS7 Termination Connection Test
(3) SS7 COT Test
(4) SS7 CQM Test
(5) SS7 CVT Test
(6) ALL
```

Note Test #1 tests if MGCP has access to the SS7 trunk termination.
Test #2 tests if there is a path to the device (ping).
Test #3 tests the integrity of the SS7 Bearer Path.
Test #4 queries the SS7 circuit (or group of circuits) status. A range of CICs can be specified (to a maximum of 24). Both remote and local trunk states are displayed in the results.
Test #5 tests to ensure that each end of the circuit has sufficient and consistent information for using the circuit in call connections. CLLI names are included.
Test #6 performs tests 1 through 5.

Step 3 To perform a specific test, use the following examples as guides:

```
diag ss7-trunk-termination tgn-id=103; cic=13; test=1;
```

Reply Example:

```
TRUNK DIAGNOSTIC TEST EXECUTED -> diag trunk
TG-NUM -> 103
CIC -> 13
TEST-TYPE -> ADM-MGW-MGCP-CONNECTIVITY-TEST
TEST-DURATION -> 0
RESULT -> TEST-SUCCESS
REASON -> PASSED: Reason: AUEP-NACK received with RespCode = 510
Reply: Diagnostic command executed.
```

diag ss7-trunk-termination tgn-id=103; cic=13; test=2;

Reply Example:

```
TRUNK DIAGNOSTIC TEST EXECUTED -> diag trunk
TG-NUM -> 103
CIC -> 13
TEST-TYPE -> ADM-TERM-CONNECTION-TEST
TEST-DURATION -> 33
RESULT -> TEST-SUCCESS
REASON -> PASS successfully.
Reply: Diagnostic command executed.
```

diag ss7-trunk-termination tgn-id=103; cic=14; test=3;

Reply Example:

```
TRUNK DIAGNOSTIC TEST EXECUTED -> diag trunk
TG-NUM -> 103
CIC -> 14
TEST-TYPE -> ADM-SS7-COT-TEST
TEST-DURATION -> 0
RESULT -> TEST-FAILURE
REASON -> ADM-MAINT-STATE-REQUIRED
Reply: Diagnostic command executed.
```

diag ss7-trunk-termination tgn-id=2;cic=1-24;test=4

Reply Example:

```
Reply : Success:

TGN ID -> 2
START CIC -> 1
END CIC -> 24
TEST TYPE -> ADM running SS7 circuit query message test
TEST DURATION -> 0
RESULT -> ADM ran test successfully
REASON -> CQM test pass
CIC COUNT -> 24
CIC STATES ->

        Remote State         Local State

        CIC 1 -> CS_IDLE     ACTV    IDLE

        CIC 2 -> CS_IDLE     ACTV    IDLE

        CIC 3 -> CS_IDLE     ACTV    IDLE

        CIC 4 -> CS_IDLE     ACTV    IDLE

        CIC 5 -> CS_IDLE     ACTV    IDLE
```

```
CIC 6 -> CS_IDLE    ACTV   IDLE

CIC 7 -> CS_IDLE    ACTV   IDLE

CIC 8 -> CS_IDLE    ACTV   IDLE

CIC 9 -> CS_IDLE    ACTV   IDLE

CIC 10 -> CS_IDLE   ACTV   IDLE

CIC 11 -> CS_IDLE   ACTV   IDLE

CIC 12 -> CS_IDLE   ACTV   IDLE

CIC 13 -> CS_IDLE   ACTV   IDLE

CIC 14 -> CS_IDLE   ACTV   IDLE

CIC 15 -> CS_IDLE   ACTV   IDLE

CIC 16 -> CS_IDLE   ACTV   IDLE

CIC 17 -> CS_IDLE   ACTV   IDLE

CIC 18 -> CS_IDLE   ACTV   IDLE

CIC 19 -> CS_IDLE   ACTV   IDLE

CIC 20 -> CS_IDLE   ACTV   IDLE

CIC 21 -> CS_IDLE   ACTV   IDLE

CIC 22 -> CS_IDLE   ACTV   IDLE

CIC 23 -> CS_IDLE   ACTV   IDLE

CIC 24 -> CS_IDLE   ACTV   IDLE
```

diag ss7-trunk-termination tgn_id=78;cic=3;test=5

Reply Example:

```
TGN ID -> 78
REASON -> CV_FAIL_GLARE_NOT_ALL_CCT
RESULT -> ADM ran test fail
START CIC -> 3
END CIC -> 3
TEST TYPE -> ADM running SS7 circuit validation test
TEST DURATION -> 0
CLLI ->
```

```
                Local State                 Remote State

COT CHECK       CP_COT_REQS_STATISTICAL     CP_COT_REQS_NONE
->

ALARM           CP_ALARM_CARR_UNKNOWN       CP_ALARM_CARR_UNKNOWN
CARRIER->

DOUBLE SEIZE    CP_DUAL_SEIZE_NO_CONTROL    CP_DUAL_SEIZE_NO_CONTROL
->

GROUP           CP_CCT_GRP_CARR_DIGITAL     CP_CCT_GRP_CARR_DIGITAL
CARRIER->

TRUNK NUMBER    0003
->

OFFICE A        ***********
->

OFFICE Z        ***********
```

ISDN Trunk Termination Tests

This section describes the tests that can be performed on ISDN trunk terminations. All terminations must be in the MAINT state for testing.

Step 1 Force the ISDN trunk termination into MAINT state. Enter the following command:

```
control isdn-trunk-termination tgn-id=17; mode=forced; target-state=maint;
```

Step 2 Display the Test Menu. Enter the following command:

```
diag isdn-trunk-termination
```

Reply Example:

```
Reply: Diagnostic ISDN Trunk Group Menu.
===
(1) ISDN MGCP Connectivity Test
(2) ISDN Termination Connection Test
(3) ALL
```

Note Test #1 tests if MGCP has access to the ISDN termination.
Test #2 tests if there is a path to the device (ping).
Test #3 performs tests 1 and 2.

Step 3 To perform a specific test, use the following examples as guides. Enter the following command:

```
diag isdn-trunk-termination test=1; tgn-id=17; cic=1;
```

Reply Example:

```
TRUNK DIAGNOSTIC TEST EXECUTED -> diag trunk
TG-NUM -> 17
CIC -> 1
TEST-TYPE -> ADM-MGW-MGCP-CONNECTIVITY-TEST
```

```
TEST-DURATION -> 0
RESULT -> TEST-SUCCESS
REASON -> PASSED: Reason: AUEP-NACK received with RespCode = 510
Reply: Diagnostic command executed.
```

diag isdn-trunk-termination test=2; tgn-id=17; cic=1;

Reply Example:

```
TRUNK DIAGNOSTIC TEST EXECUTED -> diag trunk
TG-NUM -> 17
CIC -> 1
TEST-TYPE -> ADM-TERM-CONNECTION-TEST
TEST-DURATION -> 0
RESULT -> TEST-SUCCESS
REASON -> PASSED: Reason: AUEP-NACK received with RespCode = 510
Reply: Diagnostic command executed.
```

CAS Trunk Termination Tests

This section describes the tests that can be performed on CAS trunk terminations. All terminations must be in the MAINT state for testing.

Step 1 Force the CAS trunk termination into MAINT state. Enter the following command:

control cas-trunk-termination tgn-id=64; mode=forced; target-state=maint;

Step 2 Display the Test Menu. Enter the following command:

diag cas-trunk-termination

Reply Example:

```
Reply: Diagnostic CAS Trunk Group Menu.
===
(1) CAS MGCP Connectivity Test
(2) CAS Termination Connection Test
(3) ALL
```

Note Test #1 tests if MGCP has access to the CAS termination.
Test #2 tests if there is a path to the device (ping).
Test #3 performs tests 1 and 2.

Step 3 To perform a specific test, use the following examples as guides:

diag cas-trunk-termination tgn-id=64;cic=1;test=1;

Reply Example:

```
TRUNK DIAGNOSTIC TEST EXECUTED -> diag trunk
TG-NUM -> 64
CIC -> 1
TEST-TYPE -> ADM-MGW-MGCP-CONNECTIVITY-TEST
TEST-DURATION -> 0
RESULT -> TEST-SUCCESS
REASON -> PASSED: Reason: AUEP-NACK received with RespCode = 510
Reply: Diagnostic command executed.
```

diag cas-trunk-termination tgn-id=64;cic=1;test=2;

Reply Example:

```
TRUNK DIAGNOSTIC TEST EXECUTED -> diag trunk
TG-NUM -> 64
CIC -> 1
TEST-TYPE -> ADM-TERM-CONNECTION-TEST
TEST-DURATION -> 32
RESULT -> TEST-SUCCESS
REASON -> PASS successfully.
Reply: Diagnostic command executed.

diag cas-trunk-termination tgn-id=64;cic=1;test=3;
```

Reply Example:

```
TRUNK DIAGNOSTIC TEST EXECUTED -> diag trunk
TG-NUM -> 64
CIC -> 1
TEST-TYPE -> ADM-MGW-MGCP-CONNECTIVITY-TEST
TEST-DURATION -> 11
RESULT -> TEST-SUCCESS
REASON -> PASSED: Reason: AUEP-NACK received with RespCode = 510

TRUNK DIAGNOSTIC TEST EXECUTED -> diag trunk
TG-NUM -> 64
CIC -> 1
TEST-TYPE -> ADM-TERM-CONNECTION-TEST
TEST-DURATION -> 32
RESULT -> TEST-SUCCESS
REASON -> PASS successfully.
Reply: Diagnostic command executed.
```

Announcement Trunk Termination Tests

This section describes the tests that can be performed on Announcement trunk terminations. All terminations must be in the MAINT state for testing.

Step 1 Force the Announcement trunk termination into MAINT state. Enter the following command:

control annc-trunk-termination tgn-id=13; mode=forced; target-state=maint;

Step 2 Display the Test Menu. Enter the following command:

diag annc-trunk-termination:

Reply Example:

```
Reply: Diagnostic ANC Trunk Group Menu.
===
(1) ANC MGCP Connectivity Test
(2) ANC Termination Connection Test
(3) ALL
```

Note Test #1 tests if MGCP has access to the ANC termination.
Test #2, tests if there is a path to the device (ping).
Test #3 performs tests 1 and 2.

Step 3 To perform a specific test, use the following examples as guides.

```
diag annc-trunk-termination;test=1;tgn-id=13;cic=1
```

Reply Example:

```
TRUNK DIAGNOSTIC TEST EXECUTED -> diag trunk
TG-NUM -> 13
CIC -> 1
TEST-TYPE -> ADM-MGW-MGCP-CONNECTIVITY-TEST
TEST-DURATION -> 0
RESULT -> TEST-SUCCESS
REASON -> PASSED: Reason: AUEP-NACK received with RespCode = 510
Reply: Diagnostic command executed.
```

```
diag annc-trunk-termination;test=2;tgn-id=13;cic=1
```

Reply Example:

```
TRUNK DIAGNOSTIC TEST EXECUTED -> diag trunk
TG-NUM -> 13
CIC -> 1
TEST-TYPE -> ADM-TERM-CONNECTION-TEST
TEST-DURATION -> 33
RESULT -> TEST-SUCCESS
REASON -> PASS successfully.
Reply: Diagnostic command executed.
```

```
diag annc-trunk-termination;test=3;tgn-id=13;cic=1
```

Reply Example:

```
TRUNK DIAGNOSTIC TEST EXECUTED -> diag trunk
TG-NUM -> 13
CIC -> 1
TEST-TYPE -> ADM-MGW-MGCP-CONNECTIVITY-TEST
TEST-DURATION -> 11
RESULT -> TEST-SUCCESS
REASON -> PASSED: Reason: AUEP-NACK received with RespCode = 510

TRUNK DIAGNOSTIC TEST EXECUTED -> diag trunk
TG-NUM -> 13
CIC -> 1
TEST-TYPE -> ADM-TERM-CONNECTION-TEST
TEST-DURATION -> 33
RESULT -> TEST-SUCCESS
REASON -> PASS successfully.
Reply: Diagnostic command executed.
```

Command Responses

This section describes success and failure responses to commands, as well as values for the term-reason and trunk-reason responses. The topics in this section include:

Generic Responses to Status or Control Command Failures

Generic **status** and **control** commands apply to all MGWs, subscribers, trunks, and TGs. If a command fails, it can return one of the following generic failure reasons, as well as ones specific to the command (shown in following sections).

- Subscriber, media gateway, trunk group *or* trunk database was not found in shared memory.
- Component is already in the requested state.
- Graceful mode only. Appears when a command is executed and operation is INS going OSS or INS going MAINT.
- A required resource is not available.

  If the MGW for a subscriber is down, the subscriber cannot be added.

  For ISDN

  – A trunk cannot be added unless *both* the MGW and trunk group are available.

  – A trunk group cannot be added unless the MGW is available, and vice versa.

  For SS7, CAS, Announcement

  – A trunk cannot be added unless *both* the MGW and trunk group are available.

  – A trunk group does *not* require the MGW to be available, and vice versa.
- An associated resource of the database cannot be found.
- An assigned resource is not valid (supported). For example: A subscriber is assigned to a PBX and the PBX is not supported.

Generic Success and Failure Responses

The following message is returned upon the success of a command:

- Configuration Command Executed.

One of the following messages can be returned upon the failure of a command:

- ADM found no failure.
- ADM MGW(s) cannot be found.
- ADM subscriber(s) cannot be found.
- ADM trunk group(s) cannot be found.
- ADM trunk(s) cannot be found.

- ADM no termination(s) found in MGW.
- ADM no trunk group(s) found in trunking gateway.
- ADM no trunk(s) found in trunk group.
- ADM fail while in termination table.
- ADM fail while in trunk group table.
- ADM fail while in trunk table.
- ADM fail while looking to find trunk index.
- ADM fail while getting MGW administration state.
- ADM fail while getting trunk group administration state.
- ADM fail while looking for MGW index.
- ADM administration state invalid.
- ADM failed to allocate IPC message(s).
- ADM failed to dispatch IPC message(s).
- ADM operational state invalid.
- ADM MGW(s) state change and pending.
- ADM subscriber(s) state change and pending.
- ADM trunk group(s) state change and pending.
- ADM trunk(s) state change and pending.
- ADM found subscriber category invalid.
- ADM found trunk group type invalid.
- ADM found trunk group state invalid.
- ADM found MGW admin state not ready.
- ADM found trunk group admin state not ready.
- ADM entity in desired state.
- ADM not allow trunk to reset.
- ADM not allow subscriber to reset.
- ADM change to out-of-service state required.
- ADM change to request graceful mode error.
- ADM found entity unequipped in initial state.
- ADM operation not allowed because D Channel(s) is down.
- The H.323 Gateway was not found in DBM.
- ADM found unknown failure reason(s).

System Error Response

The following error message applies to system processes, not to processes for individual databases:

- *Shared memory conflict between processes*

Termination Reason Responses

The following values can be returned for the termination reason (term-reason) response for subscriber termination and trunk termination commands:

- The media gateway is down.
- The media gateway is unreachable.
- The media gateway is in a faulty state.
- The media gateway is transitioning to another state.
- The transaction could not be executed due to a transient error.
- The transaction could not be executed because the endpoint is unknown.
- The transaction could not be executed because the endpoint is not ready.
- The transaction could not be executed, endpoint does not have enough resources available.
- The transaction could not be executed because a protocol error was detected.
- The transaction could not be executed because the command contained an unrecognized extension.
- The transaction could not be executed because the gateway is not equipped to detect one of the requested events.
- The transaction could not be executed because the gateway is not equipped to generate one of the requested signals.
- The transaction could not be executed because the gateway cannot send the specified announcement.
- Invalid conn identifier.
- Invalid call ID.
- Unsupported mode or invalid mode.
- Unsupported or unknown package.
- Endpoint does not have a digit map.
- The transaction could not be executed because the endpoint is restarting.
- Endpoint redirected to another Call Agent.
- No such event or signal.
- Unknown action or illegal combination of actions.
- Internal consistency in local connection options.
- Unknown extensions in local connection options.
- Insufficient bandwidth.
- Missing remote connection descriptor.
- Incompatible protocol version.
- Internal hardware failure.
- CAS signaling protocol error.
- Failure of a group of trunks.
- Unsupported values on local connection options.
- Response too big.
- Endpoint malfunctioning.

- Loss of lower connectivity.
- Endpoint taken out of service.
- No fault reason available.

Trunk Reason Responses

The following statements can be returned for the trunk reason (trunk-reason) response. One or more statements can be returned, depending upon the operating conditions of the Call Agent.

- NON-FAULTY—Not blocked, available for service.
- MAINT-OOS—trunk-termination is manually controlled OOS.
- MAINT-BUSY—trunk-termination is in maintenance state; controlled to MAINT.
- TERM-FAULT—Bearer termination is in faulty condition.
- SIGNALLING-FAULT—Signaling link (for example, SS7 link, or ISDN D-channel) is faulty.
- MAINT-BLOCK—trunk-termination is manually controlled OOS (controlled mode=GRACE).
- HARDWARE-BLOCK—trunk-termination is manually controlled OOS (controlled mode=FORCED).
- OUTGOING_RESTRICTED—the outgoing call is not allowed
- DPC_INACCESSIBLE—the DPC is not accessible.
- ACL_CONGESTION_LEVEL_1—Automatic Congestion Level (ACL) congestion is at level 1.
- ACL_CONGESTION_LEVEL_2—ACL congestion is at level 2.
- ACL_CONGESTION_LEVEL_3—ACL congestion is at level 2.
- TFC_CONGESTION_LEVEL_1—Transfer Controlled (TFC) congestion is at level 1.
- TFC_CONGESTION_LEVEL_2—TFC congestion is at level 2.
- TFC_CONGESTION_LEVEL_3—TFC congestion is at level 3.

Trunk Termination Reason Responses—SS7 Only

The following values can be returned for the trunk terminations on SS7 trunks. One or more values can be returned, depending upon the operating conditions of the Call Agent, in addition to the reason responses listed under "Trunk Reason Responses".

- ACT_LOC_INIT_RESET—Reset circuit at startup.
- ACT_LOC_MML_RESET—Craft reset request.
- ACT_LOC_QUERY—Circuit query.
- ACT_LOC_UPU—Action to perform user part unavailable.
- ACT_LOC_VALIDATE—Circuit validation.
- ACT_LOC_COTTEST—COT test.
- ACT_LOC_STOP—Action to stop the call.
- BLK_LOC_UPU—Trunk is blocked because user part is unavailable.
- DES_LOC_GRACE—Local hardware RSIP graceful.

- DES_LOC_SIG—SS7 signaling fault (link fail).
- DES_LOC_FORCE—Local hardware RSIP forced.
- DES_LOC_MML—MML; also used for unsolicited blocks from MDL due to circuit query reservation (CQR).
- DES_LOC_UPU—Trunk needs to be blocked because of user part unavailability.
- JOB_PENDING—Ongoing job in progress.
- JOB_REC—Job was received by the MDL component and is being processed.
- OPER_ACTIVE—Trunk is available for calls.
- REMOTE_GRACE—Trunk is blocked remotely because of a CLI command on the remote switch.
- REMOTE_FORCE—Trunk is blocked remotely because of a hardware failure on the remote switch.
- RESERVE_SPARE1—Reserved for future use.
- RESERVE_SPARE2—Reserved for future use.
- TERM_GRACE—Trunk is gracefully blocked because of an RSIP graceful from the MGW.

Fault Reason Responses

The following statements can be returned for the fault reason (fault-reason) response for a subscriber termination command. One or more statements can be returned, depending upon the operating conditions of the Call Agent.

- The media gateway is down.
- The media gateway is unreachable.
- The media gateway is in a faulty state.
- The media gateway is transitioning to another state.
- The transaction could not be executed, due to a transient error.
- The transaction could not be executed because the endpoint is unknown.
- The transaction could not be executed because the endpoint is not ready.
- The transaction could not be executed, endpoint doesn't have enough resources available.
- The transaction could not be executed because a protocol error was detected.
- The transaction could not be executed because the command contained an unrecognized extension.
- The transaction could not be executed because the gateway is not equipped to detect one of the requested events.
- The transaction could not be executed because the gateway is not equipped to generate one of the requested signals.
- The transaction could not be executed because the gateway cannot send the specified announcement.
- Invalid conn identifier.
- Invalid call ID.
- Unsupported mode or invalid mode.
- Unsupported or unknown package.
- Endpoint does not have a digit map.

- The transaction could not be executed because the endpoint is restarting.
- Endpoint redirected to another Call Agent.
- No such event or signal.
- Unknown action or illegal combination of actions.
- Internal consistency in local connection options.
- Unknown extensions in local connection options.
- Insufficient bandwidth.
- Missing remote connection descriptor.
- Incompatible protocol version.
- Internal hardware failure.
- CAS signaling protocol error.
- Failure of a group of trunks.
- Unsupported values on local connection options.
- Response too big.
- Endpoint malfunctioning.
- Loss of lower connectivity.
- Endpoint taken out of service.
- No fault reason available.

Status Update Processor

The Status Update Processor (SUP) configuration table stores configurable values used by the SUP process to poll various components on the CA/FS. Each value is used to "tweak" the SUP so that the collection of statuses is least intrusive depending on the number of MGWs, trunk groups, and terminations. Most of the values are used for performance tuning.

Note This table is initially provisioned with default values at installation. During upgrades the values in these tables are not maintained.

Examples

show sup-config

change sup-config type= refresh-rate; value=600

Usage Guidelines

Primary Key Token(s): type

Table Lock Set: None

Change Rules: None

"*" in the table below indicates token is mandatory

Syntax Description

*TYPE	Identifies the configurable property of the SUP process to change or show. Primary key. VARCHAR: 1–64 ASCII characters. Permitted values are: REFRESH-RATE—Specifies the interval between each collection period in seconds. The valid range is an integer from 30 to MAXINT, and the default value is 600. **Note** MAXINT is defined as the largest possible 4-byte integer, [2 to the power 32] - 1 = 2,147,483,647. PRIORITY—Specifies the inner priority of the Collection Thread. The value can range from 1 to 10 and the default value is 5. Modifying this value has a minor effect in changing the CPU utilization of the SUP. SUBTERM-MGW-BLOCK—Specifies the block of sub terms within a gateway to retrieve and update at a time. The range is 0 to MAXINT. The default value is 5 SUB term blocks at a time. SUBTERM-BLOCK-PAUSE—Specifies the time to pause between each sub term block from each subterm-mgw-block retrieved. The value is in milliseconds. The range is 0 to MAXINT, and the default value is 9000 milliseconds (9 seconds). SUBTERM-STATUS-PAUSE—Specifies the time to pause between each bulk subterm status command. The value is in milliseconds. The range is 0 to MAXINT, and the default value is 0 milliseconds. TRUNKTERM-TG-BLOCK—Specifies the block of trunk terms within a trunk group to retrieve and update at a time. The range is 0 to MAXINT. The default value is 5 Trunk Term blocks at a time. TRUNKTERM-BLOCK-PAUSE—Specifies the time to pause between each trunk term block for each trunkterm-tg-block retrieved. The value is in milliseconds. The range is 0 to MAXINT, and the default value is 9000 milliseconds (9 seconds). TRUNKTERM-STATUS-PAUSE—Specifies the time to pause between each bulk trunk term status command. The value is in milliseconds. The range is 0 to MAXINT, and the default value is 0 milliseconds. TRUNKTERM-RANGE-BLOCK—Specifies the range of CICs to retrieve on each bulk trunk term status. The range is 0 to MAXINT, and the default value is 1000 CICs per query. TRUNKTERM-RANGE-PAUSE—Specifies the time to pause between each block of the trunkterm-range-block retrieved. The value is in milliseconds. The range is 0 to MAXINT, and the default value is 20000 milliseconds (20 seconds).
*VALUE	Identifies the values of the configurable property specified in the type token. VARCHAR: 1–64 ASCII characters.