



CHAPTER 11

Provisioning Channel-Associated Signaling

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This chapter describes how to provision channel-associated signaling (CAS) on the Cisco BTS 10200 Softswitch.

CAS Provisioning

[Table 11-1](#) provides an example of the steps required to provision CAS trunk groups on the Cisco BTS 10200 Softswitch and lists example CLI commands with mandatory tokens. Click on each step for a description of the step.

For a more detailed description of all Cisco BTS 10200 Softswitch tables, tokens, and value ranges, refer to the *Cisco BTS 10200 Softswitch Command Line Interface Reference Guide*.

Table 11-1 CAS Trunk Group Provisioning Steps

	Description	CLI Command
Step 1	Add an NDC, page 11-2	add ndc digit-string=214;
Step 2	Add an Exchange Code, page 11-3	add exchange-code ndc=214; ec=575;
Step 3	Add a Pop, page 11-3	add pop id=1; state=tx; country=usa; digit-map-id=DIGITMAP1; itp=N; zero-minus=LEC; block-eawopic=Y; pic2-reqd=N; timezone=CDT;
Step 4	Add a Dial Plan Profile, page 11-3	add dial-plan-profile id=dp1; description=dialing plan profile ID 1;
Step 5	Add an Office Code, page 11-3	add office-code dn-group=XXXX; ndc=214; ec=575; call-agent-id=CA146;
Step 6	Add a Subscriber Profile, page 11-4	add subscriber-profile id=CasDT; dial-plan-id=dp1; pop-id=1;
Step 7	Add a Media Gateway Profile, page 11-4	add mgw-profile id=Cas_DTProfile; vendor=Cisco;
Step 8	Add a Media Gateway, page 11-4	add mgw ID=DTCas; TSAP-ADDR=64.101.150.181; CALL-AGENT-ID=CA146; MGW-PROFILE-ID=Cas_DTProfile; STATUS=INS; CALL-AGENT-CONTROL-PORT=2427; type=RGW;

Table 11-1 CAS Trunk Group Provisioning Steps (continued)

	Description	CLI Command
Step 9	Add a CAS Trunk Group Profile, page 11-5	add cas-tg-profile id=Cas_dt; OSS_SIG=Y; sig-type=MF;
Step 10	Add a Trunk Group, page 11-5	add trunk-grp id=1000; call-agent-id=CA146; tg-type=CAS; dial-plan-id=dp1; tg-profile-id=Cas_dt; MGCP_PKG_TYPE=DT;
Step 11	Add a Termination, page 11-5	add termination prefix=S2/DS1-0/; port_start=1; port_end=2; MGW-ID=DTCas; TYPE=TRUNK;
Step 12	Add a Route, page 11-6	add route id=Cas_dt_1000; tgn1-id=1000;
Step 13	Add a Route Guide, page 11-6	add route_guide id=Cas_rg_dt_1000; policy-type=ROUTE; policy-id=Cas_dt_1000;
Step 14	Add a Subscriber, page 11-6	add subscriber ID=Cas_sub_dt_1000; CATEGORY=PBX; NAME=Smith; STATUS=ACTIVE; BILLING_DN=214-575-9111; TERM-ID=S2/DS1-0/1; MGW-ID=DTCas; TGN-ID=1000; SUB-PROFILE-ID=CasDT; TERM-TYPE=ROUTE; POLICY-ID=Cas_dt_1000; Note Each subscriber must have a unique term-id.
Step 15	Change a Trunk Group, page 11-7	change trunk_grp id=1000; call-agent-id=CA146; main-sub-id=Cas_sub_dt_1000;
Step 16	Add CAS Trunks, page 11-7	add trunk termination-prefix=S2/DS1-0/; termination-port_start=1; termination-port_end=2; cic_start=1; cic_end=2; tgn-id=1000; mgw-id=DTCas;
Step 17	Change a Termination, page 11-7	change termination id=S2/DS1-0/1; mgw-id=DTCas; trunk-id=1; tgn-id=1000;
Step 18	Add a Destination, page 11-7	add destination DEST-ID=Cas_dest_dt_1000; CALL-TYPE=LOCAL; ROUTE-TYPE=ROUTE; ZERO-PLUS=N; INTRA-STATE=N; DESCRIPTION=CAS destination; route-guide-id=Cas_rg_dt_1000;
Step 19	Add a Dial Plan, page 11-7	add dial_plan id=dp1; digit-string=214-575; dest-id=Cas_dest_dt_1000; min-digits=7; max-digits=10; NOA=NATIONAL;
Step 20	Control the Media Gateway, page 11-8	control mgw id=DTCas; mode=forced; target-state=ins;
Step 21	Control the Trunk Group, page 11-8	control trunk-grp id=1000; call-agent-id=CA146; mode=forced; target-state=ins;
Step 22	Equip the CAS Trunk Terminations, page 11-9	equip trunk-termination tgn-id=1000; cic=all;
Step 23	Control the CAS Trunk Terminations, page 11-9	control trunk-termination tgn-id=1000; mode=forced; cic=all; target-state=ins;

Add an NDC

The National Destination Code (ndc) table defines the home area codes supported by the Call Agent.

Command	Purpose
<code>add ndc digit-string=214;</code>	Adds an NDC.

Add an Exchange Code

The Exchange Code (exchange-code) table specifies the office codes assigned to a particular Call Agent. This table defines the office-code-index (normalized office code) that is used as an index in the DN2Subscriber table.

Command	Purpose
<code>add exchange-code ndc=214; ec=575;</code>	Adds an exchange code.

Add a Pop

The Cisco BTS 10200 Softswitch Call Agent can serve several geographical regions or Metropolitan Statistical Areas (MSAs) simultaneously. Each geographical region is referred to as a point of presence (POP). Each POP has its own unique dialing and routing characteristics. The Point of Presence (POP) table contains the default dialing and routing characteristics. Each originating entity (subscriber or trunk group) is assigned to a POP. The POP also performs policy routing, for example, to route the call to the nearest announcement server in the POP, or to the nearest interLATA carrier location within a POP.

Command	Purpose
<code>add pop id=1; state=tx; country=usa; digit-map-id=DIGITMAP1; itp=N; zero-minus=LEC; block-eawopic=Y; pic2-reqd=N; timezone=CDT;</code>	Adds a POP.

Add a Dial Plan Profile

The Dial Plan Profile (dial-plan-profile) table creates dial-plan-profile ids before they are assigned to subscribers or trunk groups. The dial-plan-profile id links digit-string entries in the Dial Plan table within a dial plan. Different dial-plan-profile ids are assigned to subscribers and trunk groups. A dial-plan-id must be created in this table before entries can be added to the Dial Plan table.

Command	Purpose
<code>add dial-plan-profile id=dpl; description=dialing plan profile ID 1;</code>	Adds a dial plan profile.

Add an Office Code

The Office Code (office-code) table specifies the office codes assigned to a particular Call Agent. The office codes defined in this table normally terminate to a subscriber. This table defines the office-code-index (normalized office code) that is used as an index in the DN2Subscriber table.

Command	Purpose
<code>add office-code dn-group=XXXX; ndc=214; ec=575; call-agent-id=CA146;</code>	Adds an office code.

Add a Subscriber Profile

The Subscriber Profile (subscriber-profile) table groups properties that are shared by a group of subscribers. For example, a Centrex group consisting of several subscribers can share a subscriber-profile. Because a Call Agent consists of several point of presences (POPs), and POP is one of the tokens in the subscriber profile, POP-specific subscriber profiles must be created.

Command	Purpose
<code>add subscriber-profile id=CasDT; dial-plan-id=dp1; pop-id=1;</code>	Adds a subscriber profile.

Add a Media Gateway Profile

A media gateway (MGW) profile provides a template for provisioning one or more media gateways by vendor. It identifies the specifications and settings necessary for communications between the Call Agent and each type of media gateway.

Several tokens have values that can be overwritten after the Call Agent queries the media gateway for supported capabilities. If the media gateway returns a value different from the value you originally provisioned, the returned value automatically replaces the originally provisioned value.

Command	Purpose
<code>add mgw-profile id=Cas_DTPProfile; vendor=Cisco;</code>	Adds a media gateway profile



Tip

The `mgcp-max1-retries` and `mgcp-max2-retries` tokens in the `mgw-profile` table can be adjusted, if necessary, to improve response if there are network bandwidth or reliability issues, or if an MGW is slow in responding to commands from the CA. For a detailed explanation of how these and other parameters affect the audit-endpoint and keepalive processes, see the applicable appendix ([Release 4.4.x Keepalive](#) or [Release 4.5.x Keepalive](#)) in the *Cisco BTS 10200 Softswitch Troubleshooting Guide*.

Add a Media Gateway

The Media Gateway (mgw) table holds information about each media gateway managed by the Call Agent. The media gateway can be uniquely addressed by domain name, an IP address, or the TSAP address.

The Media Gateway table has two associated commands: RGW and TGW. The RGW command provisions a gateway as only a residential gateway, with the type token automatically set to RGW. The TGW command provisions a gateway as a trunking gateway only, with the type token automatically set to TGW. Both of these commands provision the Media Gateway table, but a service provider can use these commands to provide user security to certain individuals based on their roles.

Command	Purpose
<code>add mgw ID=DTCas; TSAP-ADDR=64.101.150.181; CALL-AGENT-ID=CA146; MGW-PROFILE-ID=Cas_DTPProfile; STATUS=INS; CALL-AGENT-CONTROL-PORT=2427; type=RGW;</code>	Adds a media gateway

**Note**

The RGW command could also be used to provision the media gateway in this instance. Refer to the *Cisco BTS 10200 Softswitch Command Line Interface Reference Guide* for detailed information about the RGW and TGW commands.

Add a CAS Trunk Group Profile

The Channel Associated Signaling (CAS) Trunk Group Profile (cas-tg-profile) table holds common information about a CAS trunk group. It supports the following signaling types: DTMF loopstart, DTMF groundstart, MF imstart, MF winkstart, DTMF imstart, DTMF winkstart. A cas-tg-profile record can be shared by multiple CAS trunk groups.

Use oss-sig=y only if you are defining a CAS Operator Services trunk group. Do not use oss-sig=y for 911 or E911 trunk groups or regular CAS trunk groups. Use e911=y only if defining a CAS trunk group to be used for E911.

Command	Purpose
<code>add cas-tg-profile id=Cas_dt; OSS_SIG=Y; sig-type=MF;</code>	Adds a media gateway

Add a Trunk Group

The Trunk Group table defines common information based on the trunk group type. It identifies the trunk group and maps it to the associated media gateway. The Cisco BTS 10200 Softswitch supports announcement, CAS, ISDN, SS7 and SOFTSW trunk group profiles.

Command	Purpose
<code>add trunk-grp id=1000; call-agent-id=CA146; tg-type=CAS; dial-plan-id=dpl; tg-profile-id=Cas_dt;MGCP_PKG_TYPE=DT;</code>	Adds a trunk group.

Add a Termination

The Termination (termination) table holds information about each termination/endpoint managed by the Call Agent. Termination structure uniformly addresses analog ports, DS0 ports, ISDN circuits, and allows termination groupings for ISDN PRI and multiline hunt groups (MLHGs) for a single subscriber. Termination events and signals are grouped into packages, which are groupings of events and signals supported by a particular type of endpoint. For instance, one package supports a certain group of events and signals for analog access lines, while another package supports another group of events and signals for video lines. One or more packages can exist for a given endpoint type. The package type is determined by the gateway used.

This table can use commands that do not match command-to-field of the database. If the prefix token is used during provisioning, the termination ID is generated by concatenating prefix and port-start value and incrementing the termination port number until the port number value reaches port-end. The prefix, port-start, and port-end are not in the table as individual fields.

The user enters:

prefix: 1–32 ASCII characters

port-start: 0000–9999 (1–4 numeric characters) (default = 1)

port-end: 0000–9999 (1–4 numeric characters) (default = 24)

Command	Purpose
<code>add termination prefix=S2/DS1-0/; port_start=1; port_end=2; MGW-ID=DTCas; TYPE=TRUNK;</code>	Adds a termination

Add a Route

The Route (route) table contains a list of up to ten trunk groups to route a call. If all the trunk groups are busy or not available, call processing uses the alt-route-id (if specified) to route the call. The Element Management System (EMS) provisions the Call Agent ID field based on the Trunk Group table.

Command	Purpose
<code>add route id=Cas_dt_1000;tgn1-id=1000;</code>	Adds a route

Add a Route Guide

The Route Guide (route-guide) table holds routing information based on policy-type.

Command	Purpose
<code>add route-guide id=Cas_rg_dt_1000; policy-type=ROUTE; policy-id=Cas_dt_1000;</code>	Adds a route guide

Add a Subscriber

The Subscriber (subscriber) table defines the characteristics of a subscriber or group of subscribers in a Call Agent. All termination numbers reached by a directory number (DN) must be set up as a subscriber. Any termination that can originate in the primary Call Agent must be set up as a subscriber (Residential, PBX, Business, Centrex, and so on). All terminations to customers, such as multiline hunt (MLH), Centrex, must be defined as well.

Command	Purpose
<code>add subscriber ID=Cas_sub_dt_1000; CATEGORY=PBX; NAME=Smith; STATUS=ACTIVE; BILLING_DN=214-575-9111; TERM-ID=S2/DS1-0/1; MGW-ID=DTCas; TGN-ID=1000; SUB-PROFILE-ID=CasDT; TERM-TYPE=ROUTE; POLICY-ID=Cas_dt_1000;</code>	Adds a subscriber
	Note Each subscriber must have a unique term-id.

Change a Trunk Group

Command	Purpose
<code>change trunk_grp id=1000; call-agent-id=CA146; main-sub-id=Cas_sub_dt_1000;</code>	Associates the subscriber with the trunk group

Add CAS Trunks

The Trunk (trunk) table identifies a trunk group and maps it to the associated media gateway. It also specifies the Circuit Identification Code (CIC) range and terminations.

Command	Purpose
<code>add trunk termination-prefix=S2/DS1-0/; termination-port_start=1; termination-port_end=2; cic_start=1; cic_end=2; tgn-id=1000; mgw-id=DTCas;</code>	Adds CAS trunks.

Change a Termination

Command	Purpose
<code>change termination id=S2/DS1-0/1; mgw-id=DTCas; trunk-id=1; tgn-id=1000;</code>	

Add a Destination

The Destination (destination) table defines the call type and the routing information for the dialed digits. Multiple digit strings in the Dial Plan table can use the same destination ID.

Command	Purpose
<code>add destination DEST-ID=Cas_dest_dt_1000; CALL-TYPE=LOCAL; ROUTE-TYPE=ROUTE; ZERO-PLUS=N; INTRA-STATE=N; DESCRIPTION=CAS destination; route-guide-id=Cas_rg_dt_1000;</code>	Adds a destination

Add a Dial Plan

Dial plans analyze, screen, and route calls based on dialed digits. The Dial Plan (dial-plan) table holds dial plan information for a specific type of call. It defines valid dialing patterns and determines call routing. All records that share a common dial-plan-profile id are considered a dial plan.

Command	Purpose
add dial_plan id=dp1; digit-string=214-575; dest-id=Cas_dest_dt_1000; min-digits=7; max-digits=10; NOA=NATIONAL;	Adds a dial plan

Control the Media Gateway

The control command sets the administrative state (OOS, INS) of media gateways, subscriber terminations, trunks, and trunk groups.

Command	Purpose
control mgw id=DTCas; mode=forced; target-state=ins;	Places the MGW in-service.

The status command displays the state of media gateways, subscriber terminations, trunks, and trunk groups. Enter the following CLI command to verify that the media gateway is in-service:

```
status mgw id=10.89.227.161;
```

Reply Example:

```
Reply :Success:Entry 1 of 1 returned.
```

```
MGW_ID -> DTCAS
RESULT -> ADM configure result in success
REASON -> ADM executed successful
ADMIN_STATE -> ADMIN_INS
OPER_STATE -> Media gateway in down status
```

Control the Trunk Group

Command	Purpose
control trunk_grp id=1000; call-agent-id=CA146; mode=forced; target-state=ins;	Places the MGW in-service

After controlling the trunk group in-service, enter the following command to verify its status:

```
status trunk-grp id=1000;
```

Reply example:

```
TGN_ID -> 1000
RESULT -> ADM configure result in success
REASON -> ADM executed successful
ADMIN_STATE -> ADMIN_INS
OPER_STATE -> Trunk group in-service
PRIMARY_OPER_STATE -> NOT USED
BACKUP_OPER_STATE -> NOT USED
```

```
Reply :Success:Entry 1 of 1 returned.
```

Equip the CAS Trunk Terminations

The `equip` command enables the subscriber trunk terminations to be placed in-service.

Command	Purpose
<code>equip trunk-termination tgn-id=1000; cic=all;</code>	Equips CAS trunk terminations



Note

This example equips all circuit identification codes (CICs) on the trunk termination.

Control the CAS Trunk Terminations

Command	Purpose
<code>control trunk-termination tgn-id=1000; mode=forced; cic=all; target-state=ins;</code>	Controls the CAS trunk terminations

Verify the trunk termination status.

```
status trunk-termination tgn-id=1000; cic=all;
```

Reply Example:

Reply :Success: Entries 1-24 of 24 returned.

```
TGN_ID -> 1000
CIC -> 1
RESULT -> ADM configure result in success
REASON -> ADM executed successful
TERM_ADMIN_STATE -> ADMIN_INS
TERM_OPER_STATE -> Termination is idle
TERM_REASON -> No fault reason available
TRUNK_STATIC_STATE -> ACTV
TRUNK_DYNAMIC_STATE -> IDLE
TRUNK_REASON -> NON_FAULTY
```

```
TGN_ID -> 1000
CIC -> 2
RESULT -> ADM configure result in success
REASON -> ADM executed successful
TERM_ADMIN_STATE -> ADMIN_INS
TERM_OPER_STATE -> Termination is idle
TERM_REASON -> No fault reason available
TRUNK_STATIC_STATE -> ACTV
TRUNK_DYNAMIC_STATE -> IDLE
TRUNK_REASON -> NON_FAULTY
...
```

```
TGN_ID -> 1000
CIC -> 24
RESULT -> ADM configure result in success
REASON -> ADM executed successful
TERM_ADMIN_STATE -> ADMIN_INS
TERM_OPER_STATE -> Termination is idle
TERM_REASON -> No fault reason available
TRUNK_STATIC_STATE -> ACTV
TRUNK_DYNAMIC_STATE -> IDLE
```

TRUNK_REASON -> NON_FAULTY



Note This status applies to all corresponding circuits in the CAS trunk group (for example, 1 to 24).

The CAS trunk group circuits are ready to originate and receive calls.