



# CHAPTER 9

## Signaling

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### Introduction

This chapter explains how to set up BTS signaling.

### CAS

[Table 9-1](#) provides example steps to provision channel-associated signaling (CAS) trunk groups on the BTS and lists examples of CLI commands with mandatory tokens.

**Table 9-1** CAS Trunk Group Provisioning Steps

	Task	Description and CLI Command
Step 1	Adding NDCs.	The National Destination Code (ndc) table defines the home area codes supported by the Call Agent.  <code>add ndc digit-string=214;</code>
Step 2	Adding exchange codes.	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.  <code>add exchange-code ndc=214; ec=575;</code>
Step 3	Adding POPs.	CAs serve several regions or Metropolitan Statistical Areas (MSAs). Each region is a point of presence (POP). Each POP has its own unique dialing and routing characteristics in the Point of Presence (POP) table. Each originating entity (subscriber or trunk group) is assigned to a POP. POPs also performs policy routing, like routing calls to the nearest announcement server in the POP, or to the nearest interLATA carrier in a POP.  <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>

Table 9-1 CAS Trunk Group Provisioning Steps (continued)

	Task	Description and CLI Command
Step 4	Adding dial plan profiles.	<p>A profile is a template for provisioning dial plans. The Dial Plan Profile (dial-plan-profile) table creates dial-plan-profile-ids before they are assigned to subscribers or trunk groups.</p> <p>The dial-plan-profile-id links digit-string entries in the Dial Plan table within a dial plan. Assign different dial-plan-profile-ids to subscribers and trunk groups.</p> <pre>add dial-plan-profile id=dp1; description=dialing plan profile ID 1;</pre>
Step 5	Adding office codes.	<p>The Office Code (office-code) table specifies the office codes assigned to a particular CA. 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.</p> <pre>add office-code dn-group=XXXX; ndc=214; ec=575; call-agent-id=CA146;</pre>
Step 6	Adding subscriber profiles.	<p>The Subscriber Profile (subscriber-profile) table groups shared subscriber properties. Because CAs have several points of presence (POPs), and POPs are a subscriber profile token, you must create POP-specific subscriber profiles.</p> <pre>add subscriber-profile id=CasDT; dial-plan-id=dp1; pop-id=1;</pre>
Step 7	Adding MGW profiles.	<p>A profile is a template for provisioning MGWs by vendor. It has settings for communications between the BTS Call Agent (CA) and each type of MGW.</p> <p>Several tokens have values that can be overwritten after the CA queries the MGW for supported capabilities. If the MGW returns a different value from that provisioned, the returned value automatically replaces it.</p> <p>If necessary, change the value of other keepalive tokens in the mgw-profile table.</p> <pre>add mgw-profile id=Cas_DTProfile; vendor=Cisco;</pre>
Step 8	Adding MGWs.	<p>The MGW table has information about each MGW the CA manages. Address the MGW uniquely by domain name, IP address, or TSAP address. The MGW table has the following associated commands:</p> <ul style="list-style-type: none"> <li>• RGW—provisions a residential gateway, with the type token set to RGW</li> <li>• TGW—provisions a trunking gateway, with the type token set to TGW.</li> </ul> <p>Both commands provision the MGW table, but you can use them to provide user security to individuals.</p> <pre>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;</pre>

Table 9-1 CAS Trunk Group Provisioning Steps (continued)

	Task	Description and CLI Command
Step 9	Adding CAS trunk group profiles.	<p>The Channel Associated Signaling (CAS) Trunk Group Profile (cas-tg-profile) table holds common information about a CAS trunk group.</p> <p>Use oss-sig=y to define an Operator Services trunk group.</p> <p>Use e911=y to define an E911 trunk group.</p> <pre>add cas-tg-profile id=Cas_dt; OSS_SIG=Y; sig-type=MF;</pre>
Step 10	Adding trunk groups.	<p>The Trunk Group table defines information based on trunk group type. It maps the trunk group to a media gateway.</p> <pre>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;</pre>
Step 11	Adding terminations.	<p>The Termination (termination) table has information about each termination the CA manages. Terminations include analog ports, DS0 ports, ISDN circuits, ISDN PRI, and multiline hunt groups (MLHGs).</p> <p>Termination events and signals are grouped into packages supported by termination types. The gateway determines the package type.</p> <p>If you enter the prefix token, the termination ID is generated by concatenating prefix and port-start value and incrementing the termination port number until the port number value reach port-end. The prefix, port-start, and port-end are not in the table as individual fields. Enter:</p> <p>Prefix: 1–32 ASCII characters</p> <p>Port-start: 0000–9999 (1–4 numeric characters) (default = 1)</p> <p>Port-end: 0000–9999 (1–4 numeric characters) (default = 24)</p> <pre>add termination prefix=S2/DS1-0/; port_start=1; port_end=2; MGW-ID=DTCas; TYPE=TRUNK;</pre>
Step 12	Adding routes.	<p>The Route (route) table lists 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.</p> <pre>add route id=Cas_dt_1000; tgn1-id=1000;</pre>
Step 13	Adding route guides.	<p>The Route Guide (route-guide) table holds routes based on policy-type.</p> <pre>add route_guide id=Cas_rg_dt_1000; policy-type=ROUTE; policy-id=Cas_dt_1000;</pre>
Step 14	Adding subscribers.	<pre>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;</pre> <p><b>Note</b> Each subscriber must have a unique term-id.</p>

**Table 9-1 CAS Trunk Group Provisioning Steps (continued)**

	<b>Task</b>	<b>Description and CLI Command</b>
<b>Step 15</b>	Assigning trunk groups to subscribers.	The Trunk (trunk) table maps it to a media gateway and specifies the Circuit Identification Code (CIC) range and terminations.  change trunk_grp id=1000; call-agent-id=CA146; main-sub-id=Cas_sub_dt_1000;
<b>Step 16</b>	Adding trunks.	Associates the subscriber with the trunk group.  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;
<b>Step 17</b>	Changing terminations.	change termination id=S2/DS1-0/1; mgw-id=DTCas; trunk-id=1; tgn-id=1000;
<b>Step 18</b>	Adding call types and routing for dialed digits.	The Destination (destination) table defines call type and routing information for the dialed digits. Multiple digit strings can use the same destination ID.  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;
<b>Step 19</b>	Adding dial plans.	Dial plans analyze, screen, and route calls using dialed digits. The Dial Plan (dial-plan) table has information for a specific call type; it defines valid dialing patterns and determines call routing.  add dial_plan id=dp1; digit-string=214-575; dest-id=Cas_dest_dt_1000; min-digits=7; max-digits=10; NOA=NATIONAL;
<b>Step 20</b>	Placing MGWs in service.	control mgw id=DTCas; mode=forced; target-state=ins;
<b>Step 21</b>	Placing trunk groups in service.	control trunk_grp id=1000; call-agent-id=CA146; mode=forced; target-state=ins;
<b>Step 22</b>	Preparing subscriber trunk terminations for service.	equip trunk-termination tgn-id=1000; cic=all;  <b>Note</b> This example equips all circuit identification codes (CICs) on the trunk termination.
<b>Step 23</b>	Placing subscriber trunk terminations in service.	control trunk-termination tgn-id=1000; mode=forced; cic=all; target-state=ins;

## SS7

This section describes how to provision the BTS to communicate with an SS7 PSTN network.

[Table 9-2](#) provides example steps to provision SS7 trunk groups on the BTS and lists examples of CLI commands with mandatory tokens.

Table 9-2 SS7 Provisioning Steps

	Task	Description and CLI Command
Step 1	Adding signaling gateways.	The Signaling Gateway (sg) table identifies signaling gateways the CA manages.  add sg id=sg1; add sg id=sg2;
Step 2	Associating signaling gateways.	A Signaling Gateway Group (sg-grp) table associates two signaling gateways.  add sg-grp id=sg-grp1; sg1-id=sg1; sg2-id=sg2;
Step 3	Adding signaling gateway processes.	The Signaling Gateway Process (sgp) table identifies signaling gateway processes associated with each signaling gateway.  add sgp id=sgp1; sg-id=sg1; add sgp id=sgp2; sg-id=sg2;
Step 4	Adding OPCs.	The Origination Point Code (opc) table stores information for origination point codes.  add opc id=opc1; point-code=1-1-1;
Step 5	Adding DPCs.	The Destination Point Code (dpc) table stores information for all the destination point codes in the system.  add dpc id=dpc1; point-code=1-1-2; add dpc id=stp1; point-code=1-1-3;
Step 6	Adding SCTP association profiles.	The Stream Control Transmission Protocol (SCTP) Association Profile (sct-assoc-profile) table defines each SCTP association and stores the configuration parameters that can be referenced by any SCTP association.  add sctp-assoc-profile id=sctp-prof1;
Step 7	Adding SCTP associations.	The SCTP Association (sctp-assoc) table identifies the association between local and remote signaling gateway platforms (SGPs). Add one SCTP association for the CA and one for the FS.  add sctp-assoc id=sgp1-sctp; sgp-id=sgp1; sctp-assoc-profile-id=sctp-prof1; platform-id=CA146; remote-port=2905; remote-tsap-addr=10.0.1.30; remote-tsap-addr2=10.128.1.230;
Step 8	Adding user part variant.	The User Part Variant (user-part-variant) table lists SS7 User Part variants and associated protocol families. The User Part Variant Base (user-part-variant-base) table defines supported variants and optional parameter values. When a variant is added, optional parameter values populate from the User Part Variant Base table.  add user-part-variant id=ANSISS7_GR317;
Step 9	Adding routing keys.	A routing key is unique routing data identifying an application server. The Routing Key (routing-key) table holds the information for MTP3-User Adaptation Layer (M3UA) and SCCP-User Adaptation Layer (SUA) routing keys.  add routing-key id=rk1; opc-id=opc1; sg-grp-id=sg-grp1; si=ISUP; rc=1; platform-id=CA146;

Table 9-2 SS7 Provisioning Steps (continued)

	Task	Description and CLI Command
Step 10	Adding call control routes.	<p>The Call Control Route (call-ctrl-route) table identifies call control routes between OPCs, DPCs, and signaling gateway (SG) groups.</p> <pre>add call-ctrl-route id=dpc1-route; dpc-id=dpc1; routing-key-id=rk1; si=ISUP; user-part-variant-id=ANSISS7_GR317;</pre> <p><b>Note</b> The call-ctrl-route must be associated with a specific signaling gateway.</p>
Step 11	Adding MGW profiles.	<p>A profile is a template for provisioning MGWs by vendor. It has settings for communications between the BTS Call Agent (CA) and each type of MGW.</p> <p>Several tokens have values that can be overwritten after the CA queries the MGW for supported capabilities. If the MGW returns a different value from that provisioned, the returned value automatically replaces it.</p> <p>If necessary, change the value of other keepalive tokens in the mgw-profile table.</p> <pre>add mgw-profile id=3660; vendor=Cisco; description=Cisco 3660;</pre>
Step 12	Adding MGWs.	<p>The MGW table has information about each MGW the CA manages. Address the MGW uniquely by domain name, IP address, or TSAP address. The MGW table has the following associated commands:</p> <ul style="list-style-type: none"> <li>• RGW—provisions a residential gateway, with the type token set to RGW</li> <li>• TGW—provisions a trunking gateway, with the type token set to TGW.</li> </ul> <p>Both commands provision the MGW table, but you can use them to provide user security to individuals.</p> <pre>add mgw id=c3660-1; call-agent-id=CA146; tsap-addr=c3660-1.lab.cisco.com; mgw-profile-id=3660; type=tgw;</pre>

Table 9-2 SS7 Provisioning Steps (continued)

	Task	Description and CLI Command
Step 13	Adding terminations.	<p>The Termination (termination) table has information about each termination the CA manages. Terminations include analog ports, DS0 ports, ISDN circuits, ISDN PRI, and multiline hunt groups (MLHGs).</p> <p>Termination events and signals are grouped into packages supported by termination types. The gateway determines the package type.</p> <p>If you enter the prefix token, the termination ID is generated by concatenating prefix and port-start value and incrementing the termination port number until the port number value reach port-end. The prefix, port-start, and port-end are not in the table as individual fields. Enter:</p> <p>Prefix: 1–32 ASCII characters</p> <p>Port-start: 0000–9999 (1–4 numeric characters) (default = 1)</p> <p>Port-end: 0000–9999 (1–4 numeric characters) (default = 24)</p> <pre>add termination prefix=S1/DS1-0/; port-start=1; port-end=24; mgw-id=c3660-1; type=trunk;</pre>
Step 14	Adding SS7 ANSI trunk group profiles.	<p>The Signaling System 7 ANSI Trunk Group Profile (ss7-ansi-tg-profile) table holds information like continuity test (COT). This table can be shared by SS7 trunk groups.</p> <pre>add ss7-ansi-tg-profile id=ss7-prof1;</pre>
Step 15	Adding SS7 trunk groups.	<p>The Trunk Group table defines information based on trunk group type. It maps the trunk group to a media gateway.</p> <pre>add trunk-grp id=1; call-agent-id=CA146; tg-type=SS7; num_of_trunks=24; tg-profile=ss7-prof1; call-ctrl-route-id=dpcl-route;</pre>
Step 16	Adding trunks.	<p>Adds trunks to the trunk group.</p> <pre>add trunk cic-start=1; cic-end=24; tgn-id=1; mgw-id=c3660-1; termination-prefix=S1/DS1-0/; termination-port-start=1; termination-port-end=24;</pre>
Step 17	Adding routes.	<p>The Route (route) table lists 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.</p> <pre>add route id=ss7rt; tgn1-id=1;</pre>
Step 18	Adding route guides.	<p>The Route Guide (route-guide) table holds routes based on policy-type.</p> <pre>add route-guide id=ss7rg; policy-type=ROUTE; policy-id=ss7rt;</pre>
Step 19	Adding call types and routing for dialed digits.	<p>The Destination (destination) table defines call type and routing information for the dialed digits. Multiple digit strings can use the same destination ID.</p> <pre>add destination dest-id=ss7dest; call-type=toll; route-type=route; route-guide-id=ss7rg;</pre>

Table 9-2 SS7 Provisioning Steps (continued)

	Task	Description and CLI Command
Step 20	Adding dial plans.	Dial plans analyze, screen, and route calls using dialed digits. The Dial Plan (dial-plan) table has information for a specific call type; it defines valid dialing patterns and determines call routing.  add dial-plan id=dp1; digit-string=813565; noa-national; dest-id=ss7dest;
Step 21	Adding POPs.	CAs serve several regions or Metropolitan Statistical Areas (MSAs). Each region is a point of presence (POP). Each POP has its own unique dialing and routing characteristics in the Point of Presence (POP) table. Each originating entity (subscriber or trunk group) is assigned to a POP. POPs also performs policy routing, like routing calls to the nearest announcement server in the POP, or to the nearest interLATA carrier in a POP.  change pop id=1; opc-id=opc;
Step 22	Adding SCCP networks.	The Signaling Connection Control Part (SCCP) Network (sccp-nw) table has SS7 network attributes. Each network has one point code. There is one-to-one mapping, but it supports multiple point codes.  add sccp-nw id=1; net-ind=NATIONAL; sub-svc=NATIONAL; hop-count=3;
Step 23	Adding subsystem groups.	The Subsystem Group (subsystem-grp) table defines SSN-IDs at a BTS level to support multiple origination point codes (OPCs).  add subsystem-grp id=SSN_LNP; platform-id=FSAIN205; tcap-version=ANS-92;
Step 24	Adding subsystems.	The Subsystem (subsystem) table has subsystems that use SCCP. Because the BTS supports up to 30 OPCs, the combined OPC-ID and SSN-ID is the primary key.  add subsystem id=SSN_LNP; opc-id=opc; local-ssn=247; remote-ssn=247; sccp-nw-id=1; sccp-version=ANS92; tcap-version=ANS92; application-version=AIN01;
Step 25	Adding routing keys.	A routing key is unique routing data identifying an application server. The Routing Key (routing-key) table holds the information for MTP3-User Adaptation Layer (M3UA) and SCCP-User Adaptation Layer (SUA) routing keys.  add routing-key id=rk_lnp; opc-id=opc1; ssn-id=SSN_LNP; sg-grp-id=sg-grp1; si=SCCP; rc=2; platform-id=FSAIN205;
Step 26	Adding SCCP routes.	The SCCP Route (sccp-route) table provides redundant routes to signaling gateways. You can also specify a backup point code for ISUP.  add sccp-route subsystem-grp-id=SSN_LNP; opc-id=opc1; dpc-id=stpl; rk-id=rk_lnp;
Step 27	Adding service logic host route profiles.	The Service Logic Host Route Profile (slhr-profile) table identifies an SLHR.  add slhr-profile id=slhr_lnp;



**Table 9-2 SS7 Provisioning Steps (continued)**

	Task	Description and CLI Command
<b>Step 28</b>	Adding service logic host routes.	The Service Logic Host Route (slhr) table has information to route a Trigger Detection Point (TDP) request message to a service control point (SCP).  add slhr id=slhr_lnp; opc-id=opc; dpc-id=stp1; subsystem-grp-id=SSN_LNP; gtt-req=Y; tt=11; gtt-addr-type=CDPN;
<b>Step 29</b>	Adding CA configurations.	The Call Agent Configuration (ca-config) table defines CA defaults populated at installation. Only change and show commands are valid.  add ca-config type=DEFAULT-LNP-SLHR-ID; datatype=string; value=slhr_lnp;
<b>Step 30</b>	Placing SCTP associations in service.	control sctp-assoc id=sgp1-sctp; target-state=INS; mode=FORCED;
<b>Step 31</b>	Placing subsystems in service.	control subsystem id=SSN_LNP; target-state=UIS; mode=FORCED;
<b>Step 32</b>	Placing subsystem groups in service.	control subsystem-grp id=SSN_LNP; target-state=UIS; mode=FORCED;

## BTS-PGW ISUP Transparency

Table 9-3 provides example steps to provision SS7 trunk groups on the BTS and lists examples of CLI commands with mandatory tokens.

See PGW documentation for how to configure ISUP transparency on the PGW.

**Table 9-3 BTS and PGW for ISUP Transparency Provisioning Steps**

	Task	Description and CLI Command
<b>Step 1</b>	Setting connection parameters to support SIP-GTD calls.	ADD SOFTSW-TG-PROFILE ID=SIPGTD_PROFILE; PROTOCOL_TYPE=SIP_T; SIPT_ISUP_VER=GTD; GTD_PARMS=ALL;
<b>Step 2</b>	Adding dial plans.	ADD DIAL_PLAN ID=CDP1; DIGIT_STRING=703001; DEST_ID=local_sub; SPLIT_NPA=NONE; DEL_DIGITS=0; MIN_DIGITS=10; MAX_DIGITS=10; NOA=NATIONAL;
<b>Step 3</b>	Adding SIP-GTD trunk groups.	ADD TRUNK-GRP ID=1000; CALL-AGENT-ID=CA146; TG-TYPE=SOFTSW; SOFTSW_TSAP_ADDR=10.0.5.125:5060; TG-PROFILE-ID=SIPGTD_PROFILE; STATUS=INS; DIRECTION=BOTH; SEL_POLICY=ASC; GLARE=SLAVE; ALT_ROUTE_ON_CONG=N; SIGNAL_PORTED_NUMBER=N; POP_ID=69; DIAL-PLAN-ID=cdp1; DEL_DIGITS=0; OPER_STATUS=NF; TRAFFIC_TYPE=LOCAL; ANI_BASED_ROUTING=N; MGCP_PKA_TYPE=NA; ANI_SCREENING=N; SEND_RDN_AS_CPN=N;  <b>Note</b> The SOFTSW-TSAP-ADDR must match the IP address and port provisioned on the Cisco PGW.
<b>Step 4</b>	Configuring PGWs.	<a href="http://www.cisco.com/en/US/products/hw/vcallcon/ps2152/producs_tech_note09186a008025fa96.shtml">http://www.cisco.com/en/US/products/hw/vcallcon/ps2152/producs_tech_note09186a008025fa96.shtml</a>

# H.323

Table 9-4 provides example steps to provision H.323 support on the BTS and lists examples of CLI commands with mandatory tokens.

**Table 9-4 H.323 Provisioning Steps**

	Task	Description and CLI Command
<b>Step 1</b>	Adding trunk group profiles.	The H.323 Trunk Group Profile (h323-tg-profile) table defines the characteristics of H.323 trunks.  add h323-tg-profile id=ras-tg; ras=y;
<b>Step 2</b>	Adding service providers.	The Service Provider (service-provider) table allows multiple service providers to use a single logical CA.  add service-provider id=ACME;
<b>Step 3</b>	Adding technical prefix group profiles.	The Technical Prefix Group Profile (tech-prefix-grp-profile) table lists IDs for the Technical Prefix Group table.  add tech-prefix-grp-profile id=tech1;
<b>Step 4</b>	Adding technical prefix groups.	The Technical Prefix Group (tech-prefix-grp) table lists technical prefixes the gateway supports. Gateways can share tech-prefix-list ID. Each gateway must register its tech-prefixes supported to their respective gatekeepers. Technical prefixes allow the inclusion of special characters in a called number.  add tech-prefix-grp id=tech1; sp-id=ACME; tech-prefix=111#;
<b>Step 5</b>	Adding cause code map profiles.	The Cause Code Map Profile (cause-code-map-profile) table defines cause code map IDs, default mappings to a standard cause code (Q.850), and default actions to take. If the cause code ID is assigned to a trunk group, then default-std-cause-code and default-action are not used. If the default cause code ID is based on a particular protocol, or a protocol variant is chosen, then default-std-cause-code and default-action are used by the protocol adapter for mapping to a standard cause code. These IDs must be provisioned before provisioning either the Cause Code table or the Trunk Group table.  add cause-code-map-profile id=H323;

Table 9-4 H.323 Provisioning Steps (continued)

	Task	Description and CLI Command
Step 6	Adding cause code maps.	<p>The Cause Code Map (cause-code-map) table processes cause codes received from an outgoing interface, and also when sending cause codes to a previous switch over an incoming interface. It also specifies why a call was released.</p> <p>When used for an outgoing interface, this table serves the following purposes:</p> <ul style="list-style-type: none"> <li>• Determines what action the BTS takes for cause codes received over an outgoing interface</li> <li>• Maps received cause codes to normalized cause codes</li> </ul> <p>When used for an incoming interface, the table maps normalized cause codes to a cause code sent over the incoming interface. If no entry is found in the table, the BTS uses the cause code as is.</p> <pre>add cause-code-map id=H323; cause-code-type=GTD; recv-cause-code=34; action=retry;</pre>
Step 7	Adding dial plan profiles.	<p>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.</p> <pre>add dial-plan-profile id=h323in;</pre>
Step 8	Adding H.323 trunk groups.	<p>The Trunk Group table defines information based on trunk group type. It maps the trunk group to a media gateway.</p> <pre>add trunk-grp id=4091; tg-type=h323; tg-profile-id=h323ras; call-agent-id=CA101;</pre>
Step 9	Adding H.323 gateways.	<p>The H.323 Gateway (h323-gw) table defines the capabilities of H.323 gateways. One CA supports four H.323 gateways.</p> <pre>add h323-gw id=TB01-GW; gw-h225-port=1720; tgn-id=4091;</pre>
Step 10	Adding trunks to H.323 gateways.	<p>Route the trunk group to the appropriate gateway.</p> <pre>change TRUNK-GRP id=4091; call-agent-id=CA101; H323-gw-id=TB01-GW</pre>
Step 11	Adding H.323 gateways to gatekeepers.	<p>The H.323 Gateway to Gatekeeper (h323-gw2gk) table describes gatekeeper characteristics. Multiple gateways can have the same gatekeeper. However, a gateway can be registered to only one gatekeeper. A gatekeeper identifies, controls, counts, and supervises gateway traffic, including, but not limited to, gateway registration, address resolution, bandwidth control, and admission control.</p> <pre>add h323-gw2gk h323-gw-id=TB01-GW1; gk-id=Metro-GK;</pre>
Step 12	Adding digit manipulation profiles.	<p>The Digit Manipulation Profile (digman-profile) table creates unique IDs for digit manipulation.</p> <pre>add digman-profile id=gtd-tb09;</pre>
Step 13	Adding digit manipulations.	<p>The Digit Manipulation (digman) table performs digit and nature of address (NOA) manipulation.</p> <pre>add digman id=gtd_tb09; rule=2;</pre>

Table 9-4 H.323 Provisioning Steps (continued)

	Task	Description and CLI Command
Step 14	Adding routes.	The Route (route) table lists 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 EMS provisions the Call Agent ID field based on the Trunk Group table.  add route id=h323-4091; tgn1-id=4091;
Step 15	Adding call types and routing for dialed digits.	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.  add destination dest-id=4091; call-type=local; route-type=rid; route-id=h323-4091;
Step 16	Adding route guides.	The Route Guide (route-guide) table holds routing information based on policy-type.  add route-guide id=rg-local; policy-type=route; policy-id=rt-h323-local;
Step 17	Adding dial plans.	Dial plans analyze, screen, and route calls using dialed digits. The Dial Plan (dial-plan) table has information for a specific call type; it defines valid dialing patterns and determines call routing.  add dial-plan id=H323in; digit-string=703-484; dest-id=h323in1;
Step 18	Placing H.323 trunk groups in service.	control trunk-grp id=4091; mode=forced; target-state=ins; call-agent-id=CA101;
Step 19	Placing H.323 gateways in service.	control h323-gw id=TB01-GW; target-state=ins;

## H.323 UDP

Annex E allows H.323 signaling travel between the BTS and the far-end H.323 endpoint using User Datagram Protocol (UDP) (connectionless) signaling instead of TCP (connection-oriented) signaling.



### Caution

Provision H.323 UDP only during a maintenance window. Changes do not take effect until the H.323 gateway is taken out of service, then placed back in service.

**Step 1** Log in to a CLI session on the BTS.

**Step 2** To support UDP, enter:

```
change h323-gw id=city1gw; annexe-supp=Y; call-start-mode=FAST-START;
annexe-udp-port=2517; annexe-retransmit-timer=500; annexe-retransmit-multiplier=2;
annexe-retransmit-attempts=8;
```

where:

- **h323-gw id**—Identifies the gateway (1 -16 ASCII characters)
- **annexe-supp**—Indicates if this H.323 gateway supports Annex E. If the remote H.323 endpoint does not support Annex E UDP signaling, the BTS automatically uses TCP.

- If the BTS H.323 gateway instance is configured as Annex E enabled (*annexe-supp=Y*), the BTS indicates so when registering with the gatekeeper.
  - For RAS routed calls, the gatekeeper negotiates capabilities between the BTS and the far-end H.323 endpoint, and notifies the originating endpoint to use Annex E.
  - If the BTS H.323 gateway is configured as Annex E disabled (*annexe-supp=N*), the BTS will not receive any inbound Annex E UDP calls. It will receive inbound calls using TCP signaling only.
- *call-start-mode*—Specifies the preferred call start mode for outgoing H.323 calls. Possible values are FAST-START (default value) and SLOW-START. **This parameter must be set to FAST-START to use Annex E functionality.** If the remote H.323 endpoint does not support fast-start parameters, the BTS automatically uses slow-start mode.
  - *annexe-udp-port*—Specifies the port to receive incoming Annex E messages. The default value is 2517, but you must assign a unique value to each H.323 gateway.
  - *annexe-retransmit-timer*—The initial value of the retransmit timer which determines when to resend Annex E packets if an ACK message has not been received. All subsequent retransmissions will be based on exponential back-off algorithm using *annexe-retransmit-multiplier*. The valid range is a 1 - 30,000 milliseconds, and the default is 500.
  - *annexe-retransmit-multiplier*—The multiplication factor of previous retransmit interval used for subsequent Annex E packet retransmissions. The valid range is 1 - 10, and the default is 2.
  - *annexe-retransmit-attempts*—Specifies how many attempts to resend a message to the remote entity before dropping the message. The valid range is 1 - 10, and the default is 8.

**Step 3** Place the H.323 gateway instance out of service:

```
control h323-gw id=citylgw; target-state=OOS;
```

**Step 4** Place the H.323 gateway instance in service.

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

**Step 5** To provision Annex E support on the outgoing H.323 trunk groups (TGs), enter :

```
change h323-tg-profile id=h323tg01; ras=Y; annexe-supp=Y; transport-pref-mode=UDP-MODE;
```

where


- *h323-tg-profile id*—Identifies the trunk group (1 -16 ASCII characters)
- *ras*—Specifies whether RAS signaling to H.323 gatekeeper is supported. The allowed values are Y (yes) and N (no). Default value is Y. Set this value to Y to enable communications with the gatekeeper.
- *annexe-supp*
- *transport-pref-mode*—Specifies what transport layer protocol to use to transmit H.323 signaling messages. Valid values are as follows:
  - TCP-MODE—Use TCP to transport messages.
  - UDP-MODE (default value)—Use Annex E UDP-based message transport facility. If the remote H.323 endpoint does not support UDP, the BTS will adjust automatically to use TCP mode. This token must be set to UDP-MODE before *annexe-supp* can be set to Y.

**Step 6** Enable Annex E support on the far-end H.323 endpoint.

## CallManager

Provision the BTS interface to Cisco CallManager as you would for any H.323 gateway, then do the following steps.

**Table 9-5 CallManager Provisioning Steps**

	Task	Description and CLI Command
<b>Step 1</b>	Assigning main subscriber IDs to the trunk groups. (optional)	<p>If CallManager is acting as a PBX, assign a main subscriber ID to the connecting trunk group. This subscriber ID is used to perform screening and routing.</p> <pre>change trunk-grp id=TG001; main-sub-id=CallManager001;</pre>
<b>Step 2</b>	Provisioning QoS codecs on trunk groups.	<p><b>a.</b> View the Qos_ID .</p> <pre>show qos id=gold3;</pre> <p><b>b.</b> Set the Qos value to match that displayed:</p> <pre>change trunk-grp id=TG001; qos_id=gold3;</pre> <p><b>c.</b> Set the CODEC-TYPE required by your local work order.</p> <pre>change qos id=gold3; codec-type=PCMU;</pre>
<b>Step 3</b>	Disabling GTD.	<p>Cisco recommends disabling generic transport descriptor (GTD) on trunk groups toward CallManager.</p> <ul style="list-style-type: none"> <li>Disable GTD at the CA level</li> </ul> <pre>change call-agent-profile id=CA146; gtd-supp=N;</pre> <ul style="list-style-type: none"> <li>Disable GTD at trunk group level</li> </ul> <pre>change h323-tg-profile id=TG501; gtd-supp=N;</pre> <p> <b>Caution</b> Disabling GTD at the CA level disables GTD for the entire BTS. If you disable GTD only on the trunk groups toward CallManagers, BTS can still use GTD toward other H.323 gateways.</p>