



CHAPTER 13

H.323 Provisioning

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This chapter describes how to provision the Cisco BTS 10200 Softswitch to communicate with an H.323 network for both outgoing and incoming calls. This chapter contains the following sections:

- [Provisioning H.323 Support, page 13-1](#)
- [H.323 Annex E UDP Support, page 13-7](#)
- [Interoperability with Cisco CallManager, page 13-9](#)

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*.

Provisioning H.323 Support

[Table 13-1](#) provides an example of the steps required to provision the Cisco BTS 10200 Softswitch to support H.323 traffic and lists example CLI commands with mandatory tokens. Click on each step for a description of the step.

Table 13-1 H.323 Provisioning Steps

	Description	CLI Command
Step 1	Add an H.323 Trunk Group Profile, page 13-2	add h323-tg-profile id=ras-tg; ras=y;
Step 2	Add a Service Provider, page 13-2	add service-provider id=ACME;
Step 3	Add a Technical Prefix Group Profile, page 13-3	add tech-prefix-grp-profile id=tech1;
Step 4	Add a Technical Prefix Group, page 13-3	add tech-prefix-grp id=tech1; sp-id=ACME; tech-prefix=111#;
Step 5	Add a Cause Code Map Profile, page 13-3	add cause-code-map-profile id=H323;
Step 6	Add a Cause Code Map, page 13-3	add cause-code-map id=H323; cause-code-type=GTD; recv-cause-code=34; action=retry;
Step 7	Add a Dial Plan Profile, page 13-4	add dial-plan-profile id=h323in;

Table 13-1 H.323 Provisioning Steps (continued)

	Description	CLI Command
Step 8	Add an H323 Trunk Group, page 13-4	add trunk-grp id=4091; tg-type=h323; tg-profile-id=h323ras; call-agent-id=CA101;
Step 9	Add an H.323 Gateway, page 13-4	add h323-gw id=TB01-GW; gw-h225-port=1720; tgn-id=4091;
Step 10	Change a Trunk Group, page 13-4	change TRUNK-GRP id=4091; call-agent-id=CA101; H323-gw-id=TB01-GW
Step 11	Add a Gatekeeper, page 13-5	add h323-gw2gk h323-gw-id=TB01-GW1; gk-id=Metro-GK;
Step 12	Add a Digit Manipulation Profile, page 13-5	add digman-profile id=gtd-tb09;
Step 13	Add Digit Manipulation, page 13-5	add digman id=gtd_tb09; rule=2;
Step 14	Add a Route, page 13-5	add route id=h323-4091; tgn1-id=4091;
Step 15	Add a Destination, page 13-6	add destination dest-id=4091; call-type=local; route-type=rid; route-id=h323-4091;
Step 16	Add a Route Guide, page 13-6	add route-guide id=rg-local; policy-type=route; policy-id=rt-h323-local;
Step 17	Add a Dial Plan, page 13-6	add dial-plan id=H323in; digit-string=703-484; dest-id=h323in1;
Step 18	Control a Trunk Group, page 13-6	control trunk-grp id=4091; mode=forced; target-state=ins; call-agent-id=CA101;
Step 19	Control an H.323 Gateway, page 13-7	control h323-gw id=TB01-GW; target-state=ins;

Add an H.323 Trunk Group Profile

The H.323 Trunk Group Profile (h323-tg-profile) table defines the characteristics of each H.323 trunk. An h323-tg-profile id must be created in this table before H.323 trunk group entries can be provisioned.

Command	Purpose
add h323-tg-profile id=ras-tg; ras=y;	Adds an H.323 trunk group profile

Add a Service Provider

The Service Provider (service-provider) table is used when there are multiple service providers furnishing service via a single logical Call Agent.

Command	Purpose
add service-provider id=ACME;	Adds a service provider

Add a Technical Prefix Group Profile

The Technical Prefix Group Profile (tech-prefix-grp-profile) table identifies the IDs used for the Technical Prefix Group table. These IDs must be created in this table before entries can be added to the Technical Prefix Group table.

Command	Purpose
<code>add tech-prefix-grp-profile id=tech1;</code>	Adds a technical prefix group profile

Add a Technical Prefix Group

The Technical Prefix Group (tech-prefix-grp) table provides a list of technical prefixes supported by a gateway. The same tech-prefix-list ID can be shared by multiple gateways. Each gateway must register the tech-prefixes supported to their respective gatekeepers. Technical prefixes allow the inclusion of special characters in a called number.

Command	Purpose
<code>add tech-prefix-grp id=tech1; sp-id=ACME; tech-prefix=111#;</code>	Adds a technical prefix group

Add a Cause Code Map Profile

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.

Command	Purpose
<code>add cause-code-map-profile id=H323;</code>	Adds a cause code map profile

Add a Cause Code Map

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.

When used for an outgoing interface, this table serves the following purposes:

- Determines what action the Cisco BTS 10200 Softswitch takes for cause codes received over an outgoing interface
- Maps received cause codes to normalized cause codes

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 Cisco BTS 10200 Softswitch uses the cause code as is.

Command	Purpose
<code>add cause-code-map id=H323; cause-code-type=GTD; recv-cause-code=34; action=retry;</code>	Adds a cause code map

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=h323in;</code>	Adds a dial plan profile

Add an H323 Trunk Group

The Cisco BTS 10200 Softswitch supports the following trunk group types: announcement, CAS, ISDN, SS7 and SOFTSW. The Trunk Group Profile table defines common information based on the trunk group type. The Cisco BTS 10200 Softswitch supports announcement, CAS, ISDN, SS7 and SOFTSW trunk group profiles.

The Trunk Group (trunk-grp) table identifies the trunk group and maps it to the associated media gateway.

Command	Purpose
<code>add trunk-grp id=4091; tg-type=h323; tg-profile-id=h323ras; call-agent-id=CA101;</code>	Adds a trunk group



Note

Refer to the Trunk Group table in Chapter 2 of the *Cisco BTS 10200 Softswitch Command Line Interface Reference Guide* to determine if specific tokens are mandatory or optional for each trunk group type.

Add an H.323 Gateway

The H.323 Gateway (h323-gw) table defines the capabilities of each H.323 protocol gateway. There can be four instances of an H.323 gateway running on the Call Agent at any one time.

Command	Purpose
<code>add h323-gw id=TB01-GW; gw-h225-port=1720; tgn-id=4091;</code>	Adds an H.323 gateway

Change a Trunk Group

Route the trunk group to the appropriate gateway.

Command	Purpose
<code>change TRUNK-GRP id=4091; call-agent-id=CA101; H323-gw-id=TB01-GW;</code>	Routes the trunk group to the appropriate gateway

Add a Gatekeeper

The H323 Gateway to Gatekeeper (h323-gw2gk) table describes gatekeeper characteristics for each gateway in an H.323 network. Multiple gateways can have the same gatekeeper, or there can be a different gatekeeper for each gateway. However, a gateway can be registered to only one gatekeeper *at a time*. A gatekeeper identifies, controls, counts, and supervises gateway traffic, including, but not limited to, gateway registration, address resolution, bandwidth control, and admission control.

Command	Purpose
<code>add h323-gw2gk h323-gw-id=TB01-GW1; gk-id=Metro-GK;</code>	Adds a gatekeeper

Add a Digit Manipulation Profile

The Digit Manipulation Profile (digman-profile) table is used to create unique IDs for digit manipulation. This ID must be created before provisioning the Digit Manipulation table.

Command	Purpose
<code>add digman-profile id=gtd-tb09;</code>	Adds a digit manipulation profile

Add Digit Manipulation

The Digit Manipulation (digman) table is used to perform digit and nature of address (NOA) manipulation.

Command	Purpose
<code>add digman id=gtd_tb09; rule=2;</code>	Adds digit manipulation

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 EMS provisions the Call Agent ID field based on the Trunk Group table.

Command	Purpose
<code>add route id=h323-4091; tgn1-id=4091;</code>	Adds a route

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=4091; call-type=local; route-type=rid; route-id=h323-4091;</code>	Adds a destination

Add a Route Guide

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

Command	Purpose
<code>add route-guide id=rg-local; policy-type=route; policy-id=rt-h323-local;</code>	Adds a route guide

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
<code>add dial-plan id=H323in;digit-string=703-484; dest-id=h323in1;</code>	Adds a dial plan for incoming H.323 calls

Control a Trunk Group

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

Command	Purpose
<code>control trunk-grp id=4091; mode=forced; target-state=ins; call-agent-id=CA101;</code>	Places a trunk group 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 trunk-grp id=4091;
```

Control an H.323 Gateway

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

Command	Purpose
<code>control h323-gw id=TB01-GW; target-state=ins;</code>	Places an H.323 gateway in-service

Enter the following CLI command to verify that the H.323 gateway is in ==service:

```
status h323gw id=tb01-gw;
```

H.323 Annex E UDP Support

[Annex E implementation allows H.323 signaling to be transported between the Cisco BTS 10200 Softswitch and the far-end H.323 endpoint using User Datagram Protocol (UDP) (connectionless) signaling instead of TCP (connection-oriented) signaling.

This section highlights the special parameters that must be provisioned to support Annex E functionality.

For basic H.323 provisioning, refer to [Provisioning H.323 Support, page 13-1](#).



Caution

In the following steps, the changes for Annex E support in the H323-GW table will not take effect until the H323-GW is controlled out of service (OOS) and then in service (INS). Therefore, it is recommended that you perform these steps during a maintenance window.

Step 1 Log in to a CLI session on the Cisco BTS 10200 Softswitch.

Step 2 To provision Annex E support for the H.323 GW instance on the Cisco BTS 10200 Softswitch, enter the following command.

```
change h323-gw id=citylgw; 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**—The name used to identify the H.323 GW instance. This value must be a string from 1 to 16 ASCII characters, assigned by the service provider.
- **annexe-supp**—Indicates whether this H.323 GW instance supports Annex E. The default value is Y (yes). This value must be kept as Y to support Annex E. If the remote H.323 endpoint does not support Annex E UDP signaling, the Cisco BTS 10200 Softswitch automatically adjusts and uses TCP signaling toward that endpoint.
 - If the Cisco BTS 10200 Softswitch H323-GW instance is configured as Annex E enabled (**annexe-supp=Y**), the Cisco BTS 10200 Softswitch indicates its Annex E capabilities while registering with the H.323 gatekeeper (GK).
 - For RAS routed calls, the GK negotiates all Annex E capabilities between the Cisco BTS 10200 Softswitch and the far-end H.323 endpoint, and notifies the originating endpoint to use Annex E.

- If the Cisco BTS 10200 Softswitch H323-GW instance is Annex E enabled (*annexe-supp=Y*), but the far-end H.323 endpoint is not, the Cisco BTS 10200 Softswitch can still complete calls using regular TCP mode.
- If the Cisco BTS 10200 Softswitch H323-GW instance is configured as Annex E disabled (*annexe-supp=N*), the Cisco BTS 10200 Softswitch 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 Cisco BTS 10200 Softswitch automatically adjusts and uses slow-start mode toward that endpoint. The fast-start parameter is based on the fast-connect procedures described in ITU-T Standard H.323.
- **annexe-udp-port**—Specifies the port to be used to receive incoming Annex E messages. The default value is 2517, but a unique value must be assigned to each H.323 GW instance on the Cisco BTS 10200 Softswitch.
- **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 number from 1 to 30,000 (in milliseconds). The default value is 500.
- **annexe-retransmit-multiplier**—The multiplication factor of previous retransmit interval used for subsequent Annex E packet retransmissions. The valid range is 1 to 10, and the default value 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 to 10. The default value is 8.

Step 3 Control the H323-GW instance OOS (if necessary), and then INS.



Caution

The changes to the *annexe-supp* parameter and other configurations in the *h323-gw* table do not take effect until H323-GW is controlled out of service (OOS), then in service (INS). Use this step to control the H323-GW OOS (if currently INS), and then INS.

- a. To display the service status of the H323-GW instance, enter the following command

```
status h323-gw id=citylgw;
```
- b. View the display to see the status of the H323-GW instance.
- c. If the displayed status is OOS, skip steps d. and e. If the status is INS continue with step d.
- d. To place the H323-GW instance OOS, enter the following command:



Caution

This step will clear all calls on this H323-GW instance.

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

- e. To verify that the status of the H323-GW instance is displayed as OOS, enter the following command:

```
status h323-gw id=citylgw;
```
- f. To place the H323-GW instance in service, enter the following command:

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


- g. To verify that the status of the H323-GW instance is displayed as INS, enter the following command:

```
status h323-gw id=citylgw;
```

- Step 4** To provision Annex E support on the outgoing H.323 trunk groups (TGs), enter the following command.

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

where

- ***h323-tg-profile id***—The unique ID for this H323-TG-PROFILE. The value is 1 to 16 ASCII characters, assigned by the service provider.
- ***ras***—Specifies whether RAS signaling to H.323 gatekeeper (GK) 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 GK.
- ***annexe-supp***—This flag indicates whether this H323-TG-PROFILE supports Annex E. The default value is Y (yes). This value must be kept as Y (yes) to support Annex E. If the remote H.323 endpoint does not support Annex E UDP signaling, the Cisco BTS 10200 Softswitch automatically adjusts and uses TCP signaling toward that endpoint.
- ***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 Cisco BTS 10200 Softswitch will adjust automatically to use TCP mode. This token must be set to UDP-MODE before ***annexe-supp*** can be set to Y.

- Step 5** If not already done, enable Annex E support on the far-end H.323 endpoint.



Note

To enable Annex E support for a particular H.323 TG, you must enable Annex E for the H.323 GW instance on the Cisco BTS 10200 Softswitch, and also enable Annex E support for the far-end H.323 endpoint.

Interoperability with Cisco CallManager

Provision the Cisco BTS 10200 Softswitch interface to Cisco CallManager as you would for any H.323 gateway (see [Add an H.323 Gateway, page 13-4](#)). In addition, perform the following provisioning tasks to support interoperability between the two switches:

- [Assign a Main Subscriber ID to the Trunk Group \(Optional\), page 13-10](#)
- [Provision a QoS Codec Type on the Trunk Group, page 13-10](#)
- [Disable GTD, page 13-11](#)

Assign a Main Subscriber ID to the Trunk Group (Optional)

The Cisco BTS 10200 Softswitch connects to Cisco CallManager via an H.323 trunk group. Assign a main subscriber ID only if Cisco CallManager is used as a PBX. This subscriber ID is used to perform screening and routing. If Cisco CallManager is not used as a PBX, do not assign a main subscriber ID, and the system uses the TG properties to perform screening and routing.

**Caution**

Assign a main subscriber ID only if Cisco CallManager is used as a PBX.

Verify that a main subscriber ID is provisioned on the trunk groups connecting the Cisco BTS 10200 Softswitch to Cisco CallManager.

-
- Step 1** Log in to a CLI session on the Cisco BTS 10200 Softswitch.
- Step 2** To find out if a main subscriber ID is already assigned to the trunk group toward Cisco CallManager, enter the following command:
- ```
show trunk-grp id=TG001;
```
- Step 3** View the system response and note the displayed value of the main subscriber ID parameter (MAIN-SUB-ID).
- Step 4** If no value has been provisioned for MAIN-SUB-ID, enter the appropriate value using a command similar to the following:
- ```
change trunk-grp id=TG001; main-sub-id=CallManager001;
```
-

Provision a QoS Codec Type on the Trunk Group

Verify that an appropriate codec is provisioned on the trunk groups toward Cisco CallManager.

-
- Step 1** Log in to a CLI session on the Cisco BTS 10200 Softswitch.
- Step 2** To find the QoS ID applicable to the trunk group toward Cisco CallManager, enter the following command:
- ```
show trunk-grp id=TG001;
```
- Step 3** View the system response and note the displayed value of the QoS ID parameter. If the QoS ID is present, go to step 5.
- Step 4** If the trunk group Qos ID parameter is not present, a default value is used. To set the trunk group Qos\_ID to the value specified in the QoS table, enter the following command:
- ```
change trunk-grp id=TG001; qos_id=gold3;
```
- Step 5** To display the codec associated with this QOS ID, enter the following command:
- ```
show qos id=gold3;
```
- Step 6** View the system response and determine the value of the CODEC-TYPE parameter.
- If the value is different than the CODEC-TYPE required by your local work order, change the value by entering the following command:
- ```
change qos id=gold3; codec-type=PCMU;
```

- b. If the value is the same as the CODEC-TYPE required by your local work order, no further action is required on this QOS ID.

Step 7 Repeat [Step 2](#) to verify that CODEC-TYPE is set to the desired value.

Step 8 Repeat [Step 2](#) through [Step 7](#) for any additional trunk groups toward Cisco CallManager.

Disable GTD

Cisco recommends that generic transport descriptor (GTD) be disabled on the trunk groups toward Cisco CallManager. This can be done either by disabling the GTD at the Call Agent (CA) level or at the trunk group level.



Caution

If you disable GTD at the CA level, this disables GTD completely for the Cisco BTS 10200 Softswitch. If you disable GTD only on the trunk groups toward Cisco CallManagers, the Cisco BTS 10200 Softswitch can still use GTD toward other H.323 GWs that are GTD compatible.

Option to Disable GTD at CA Level

If specified in your local work order, you can disable GTD at the CA level. However, if your local work order requires GTD to be disabled only for certain trunks, skip these steps and go to [Option to Disable GTD at TG Level, page 13-11](#).



Caution

After disabling GTD at the CA level, you cannot enable GTD on any trunk groups.

Step 1 Log in to a CLI session on the Cisco BTS 10200 Softswitch.

Step 2 To display the GTD support status in the Call Agent Profile table, enter the following command:

```
show call-agent-profile id=CA146;
```

Step 3 View the system response and determine the value of GTD-SUPP.

- a. If the value is Y (yes), change it to N (no) by entering the following command:


```
change call-agent-profile id=CA146; gtd-supp=N;
```
- b. If the value is already set to N, GTD is already disabled and no change is required on GTD.

Step 4 Repeat [Step 2](#) to verify that GTD-SUPP is set to N.

Option to Disable GTD at TG Level

If specified in your local work order, you can disable GTD at the individual trunk group level.

Step 1 Log in to a CLI session on the Cisco BTS 10200 Softswitch.

Step 2 To display the GTD support status in the H323 Trunk Group Profile table, enter the following command:

```
show h323-tg-profile id=TG501;
```

- Step 3** View the system response and determine the value of GTD-SUPP.
- If the value is Y (yes), change it to N (no) by entering the following command:

```
change h323-tg-profile id=TG501; gtd-supp=N;
```
 - If the value is N (no), GTD is already disabled for this H323-TG-PROFILE and no further action is required.
- Step 4** Repeat [Step 2](#) to verify that GTD-SUPP is set to N in the H323-TG-PROFILE table.
- Step 5** Repeat [Step 2](#) through [Step 4](#) for any additional Cisco BTS 10200 Softswitch H.323 trunk groups toward other Cisco CallManagers.
-