**C H A P T E R 6**

# Announcements, Centrex, MLHG, Voice Mail, and ENUM

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## Introduction

This chapter discusses the announcement Centrex, MLHG, Voice Mail, and ENUM features supported by the BTS 10200.

The BTS 10200 supports announcement features by sending requests to a customer-supplied announcement server. The BTS generates a request in response to either of the following:

- A call was released (did not go through), and an accompanying release cause code is activated on the BTS. The BTS signals the announcement server to play a designated audio file.

- The service provider has provisioned all calls to the target DN to be routed automatically to a designated announcement.

The announcement server accesses prerecorded audio files that can be played to the caller. The audio files are provided by one of the following servers:

- Cisco AS54xx series Announcement Server

- Cognitronics CX500 Media Resource Server

**Note** Contact Cisco for servers details. You supply the announcement server .

Announcements are tied to cause codes. A call release (internal cause code) triggers a specific announcement. The Call Agent controls announcement playback via Media Gateway Control Protocol (MGCP).

Industry-standard release cause code specifications are available in the following documents:

- [ANSI document *T1.650-1995, ISDN—Usage of the Cause Information Element in Digital Subscriber Signaling System Number 1 (DSS1)*

- ITU-T Recommendation Q.850, *Usage of Cause and Location in the Digital Subscriber Signalling System No. 1 and the Signalling System No. 7 ISDN User Part*

You can link any  supported cause code to any announcement ID; you can link an announcement ID  to an audio file. BTS triggers the recording to play when a cause code activates. *Release Cause Codes and Announcement IDs* shows default mapping of cause codes to announcement IDs and files. Use command-line interface (CLI) commands to provision the following changes to  default mapping:

- Use the **change release-cause** command to change the mapping of release cause codes to announcement IDs.
- Use the **change announcement** command to change the mapping of announcement IDs to audio files.

> ✎
> **Note**    If no announcement is available for a specific cause code, a reorder tone is played to the calling party.

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> **Tip**    With the Cisco AS54xx series Announcement Server, service providers can enter new announcement file names and use their own audio announcement files. The announcement files must be in 8-bit mu-Law encoded, Next/Sun AU format (.au extension).

## Announcements

You can provision all calls to a directory number (DN) to be routed to a designated announcement. This is provisioned using CLI commands in the DN2Subscriber table, as follows:

- Change the administrative status of the announcement service by setting the **status** token to **annc.**
- Designate the announcement to be played by setting the **annc-id** token to the appropriate announcement id. The announcement ID must be one that is listed in *Release Cause Codes and Announcement IDs*.

Table 6-1 has steps to provision the BTS to support an announcement server.

*Table 6-1      Announcement Server Provisioning Steps*

| | Task | Description and CLI Command |
|---|---|---|
| **Step 1** | Adding MGW profiles. | 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. |
| | | 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. |
| | | If necessary, change the value of other keepalive tokens in the mgw-profile table. |
| | | `add mgw-profile id-as5400; vendor=Cisco;`<br>`description=Announcements;` |
| **Step 2** | Adding MGWs. | 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: |
| | | • RGW—provisions a residential gateway, with the type token set to RGW |
| | | • TGW—provisions a trunking gateway, with the type token set to TGW. |
| | | Both commands provision the MGW table, but you can use them to provide user security to individuals. |
| | | `add mgw id=c5400.131; tsap-addr=AnnGW DNS/IP;`<br>`call-agent-id=CA101; mgw-profile-id=as5400; type=tgw;`<br>`ans=y;` |
| **Step 3** | Adding trunk group profiles. | The Announcement Trunk Profile (annc-tg-profile) table is required for interactive voice response (IVR) trunks. |
| | | `add annc-tg-profile id=1;ANNC=Y;IVR=N;`<br>`LOCAL_TRUNK_SELECTION=Y;` |
| **Step 4** | Adding trunk groups. | `add trunk-grp id=999; call-agent-id=CA166; tg_type=ANNC;`<br>`cost=1; MGCP_PKG_TYPE=TCL_CISCO; tg-profile-id=1;` |
| **Step 5** | Adding terminations. | `add termination prefix=S0/DS1-2/; port-start=1;`<br>`port-end=24; type=trunk; mgw-id=c5400.131;` |
| **Step 6** | Adding trunks. | `add trunk termination-prefix=S0/DS1-1/;`<br>`termination-port_start=1; termination-port_end=24;`<br>`cic_start=1; cic_end=24; tgn-id=999; mgw-id=c5400.131;` |
| **Step 7** | Adding routes. | `add route id=rt1_annc; lcr=y; tgn1-id=999;` |
| **Step 8** | Adding route guides. | `add route-guide id=annc1_rg; policy-type=ROUTE;`<br>`policy-id=rt1_annc;` |

***Table 6-1        Announcement Server Provisioning Steps (continued)***

| | Task | Description and CLI Command |
|---|---|---|
| Step 9 | Adding announcements. | The Announcement (annc) table holds routing information to get to an announcement. An announcement plays if a call cannot connect. BTS comes with default announcement audio files, but a you can create and load custom announcement files. Files are saved and stored on the service provider's announcement server. Use intercept announcements when calls need special treatment.<br><br>**Note**    Type underscores ( _ ) for announcement file names.<br><br>`add announcement id=500; type=SYSTEM;`<br>`announcement-file=iann_id_500.au;`<br>`route-guide-id=annc1_rg;` |
| Step 10 | Adding release causes. | The Release Cause (release-cause) table is an internal table call processing uses to map an SS7 release cause to an announcement ID. This table is preprovisioned, but you can modify it.<br><br>`add release-cause id=1110; annc-id=0500;` |
| Step 11 | Placing MGWs in service. | `control mgw id=5400.131; target-state=INS; mode=FORCED;`<br>`status mgw id=c5400.131;` |
| Step 12 | Placing trunk groups in service. | `control trunk-gp id=1;mode=forced;target-state=ins;` |
| Step 13 | Preparing subscriber trunk terminations for service. | `equip trunk-termination tgn-id=13; cic=all;` |
| Step 14 | Placing subscriber trunk terminations in service. | `control trunk-termination tgn-id=13; cic=all;`<br>`target-state=INS; mode=FORCED;`<br>`status trunk-termination tgn-id=13; cic=all;` |

# Centrex Group

Table 6-2 has steps to provision the BTS to connect to a Centrex group.

***Table 6-2        Centrex Provisioning Steps***

| | Task | Description and CLI Command |
|---|---|---|
| **Step 1** | Adding MGW profiles. | 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. |
| | | 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. |
| | | If necessary, change the value of other keepalive tokens in the mgw-profile table. |
| | | `add mgw-profile id=IAD2421; vendor=cisco;` |
| **Step 2** | Adding MGWs. | 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: |
| | | • RGW—provisions a residential gateway, with the type token set to RGW |
| | | • TGW—provisions a trunking gateway, with the type token set to TGW. |
| | | Both commands provision the MGW table, but you can use them to provide user security to individuals. |
| | | `add mgw id=c2421.192; call-agent-id=CA101; mgw-profile-id=IAD2421; type=rgw` |
| **Step 3** | Adding terminations. | `add termination prefix=aaln/S1/; port-start=1; port-end=16; type=line; mgw-id=c2421.192;` |
| **Step 4** | Adding custom dial plan profiles. | The Custom Dial Plan Profile (custom-dial-plan-profile) table defines custom dial plan IDs (CDP IDs) assigned to Centrex groups. |
| | | `add custom-dial-plan-profile id=Cisco_Plan;` |
| **Step 5** | Adding custom dial plans. | The Custom Dial Plan (custom-dial-plan) table translates dialed digits to specific destinations for Centrex calls. If the result of a custom dial plan (CDP) is a POTS access code, call processing uses the POTS Dial Plan table to translate the digits dialed after the POTS access code. |
| | | `add custom-dial-plan id=cdp1; digit-string=7; nod=pots-access; cat-string=11111111;` |
| **Step 6** | Adding digit maps. | POTS subscribers use a public dialing plan. Centrex subscribers use a customized dialing plan. |
| | | `add digit-map id=ctxg1; digit-pattern=0|3xx|9|*xx;` |
| **Step 7** | Adding subscriber profiles. | `add subscriber-profile id=ctxgspf; digit-map-id=ctxg1; dial-plan-id=dp1; pop-id=1;` |

***Table 6-2        Centrex Provisioning Steps (continued)***

|  | Task | Description and CLI Command |
|---|---|---|
| **Step 8** | Changing POPs. | If Centrex group members subscribe to the Calling Name Delivery (CNAM) feature and require name delivery, the cnam-option token must be specified in the Point of Presence (POP) table. Use the cnam-option values as follows:<br><br>• cnam-option=local—Display the name from the calling party's Subscriber table, if present.<br><br>• cnam-option=local-or-lidb—Set this option if external line information database (LIDB) CNAM queries are desired when the calling party's name is not present in the Subscriber table, for example, from an outside caller with no Subscriber table record.<br><br>• If external LIDB CNAM queries are to be allowed for non-Centrex group calls, set centrex-group internal-cnd-only=n and POP cnam_option=local-or-lidb.<br><br>`change pop id=1; cnam_option=local` |
| **Step 9** | Adding main subscribers. | The Subscriber (subscriber) table defines subscriber  or subscriber group characteristics in a CA. Set up the following terminations as subscribers:<br><br>• any termination reached by a DN<br><br>• any termination that can originate in the primary CA<br><br>• all terminations to customers<br><br>When the send-bdn-as-cpn token is  Y, the subscriber sends the billing DN as the CPN.<br><br>All terminations in the hunt group send the same DN as the main subscriber in the MLHG.<br><br>`add subscriber id=sub1; category=CTXG; name=main-sub;`<br>`dn1=123-456-7890; sub-profile-id=ctxgspf;` |
| **Step 10** | Adding Centrex groups. | Both CAs and POTS/Centrex/Tandem (PTC) FSs share the Centrex Group (centrex-grp) table. A Centrex group is typically assigned to a business group.<br><br>Subscribers within a Centrex group can reach each other by intercom (extension) dialing. A Centrex group is an emulation of a PBX by a Class 5 switch.<br><br>The Centrex Group table defines Centrex groups and their associated Call Agents. The PTC Feature Server provides Centrex group functionality. The properties assigned to the main subscriber ID are applicable to the whole Centrex group.<br><br>If external line information database (LIDB) Calling Name Delivery (CNAM) queries are to be allowed for non-Centrex group calls, set internal-cnd-only=n and the POP cnam-option=local-or-lidb.<br><br>`add centrex-grp id=cisco-ctxg; cdp-id=cdp1;`<br>`call-agent-id=CA101;main-sub-id=sub1;` |

*Table 6-2        Centrex Provisioning Steps (continued)*

| | Task | Description and CLI Command |
|---|---|---|
| **Step 11** | Adding subscribers to Centrex groups. | `change subscriber id=sub1; ctxg-id=cisco-ctxg;` |
| **Step 12** | Adding services. | The Service (service) table defines services and features. A service is a collection of one or more features. Each feature within a service can have one or more triggers. You can group up to ten features into a service, and up to fifty services per subscriber. `add service id=3; fname1=CDP; fname2=CFU;` |
| **Step 13** | Adding subscriber service profiles. | The Subscriber Service Profile (subscriber-service-profile) table links services to subscribers. `add subscriber-service-profile sub-id=sub1; service-id=3;` |
| **Step 14** | Adding subscribers. | The Subscriber (subscriber) table defines subscribers and subscriber groups on a CA. Set up the following as subscribers: <br>• termination numbers reached by DNs <br>• termination numbers originating in the CA <br>• termination numbers to customers, such as MLHG or Centrex <br>`add subscriber id=sub2; category=ctxg-individual; name=Richardson2; dn1=469-255-1231; term-id=aaln/S1/4; mgw-id=c2421.192; sub-profile-id=ctxgspf; ctxg-id=cisco-ctxg;` <br>Table 3-6 lists subscriber types and their required tokens. <br>**Note**   Each subscriber must have a unique term-id. <br>**Note**   Do not use double quotation marks (""), single quotation marks ('), dashes (-), or underscores (_) in subscriber names. |
| **Step 15** | Adding extensions for subscribers. | The Ext2subscriber (ext2subscriber) table is populated when a Centrex subscriber is created to map extensions to subscriber IDs. `add ext2subscriber ctxg-id=cisco-ctxg; ext=332; sub-id=sub2;` |
| **Step 16** | Adding subscriber service profiles. | The Subscriber Service Profile (subscriber-service-profile) table links services to subscribers. `add subscriber-service-profile sub-id=sub2;service-id=3;` |
| **Step 17** | Adding a Call Park subscriber group. | The Call Park Subscriber Group (CPSG) table defines the Centrex-specific call park subscriber group identification and the call park timeout timer. Call park is similar to placing a call on hold, but the call is retrieved by dialing a call rather than by pressing a line button. `add cpsg id=cisco; tcprk=100; ctxg-id=cisco-ctxg;` |
| **Step 18** | Placing MGWs in service. | `control mgw id=c2421.192; target-state=INS; mode=forced;` |
| **Step 19** | Preparing subscriber trunk terminations for service. | `equip subscriber-termination id=c2421.192;` |
| **Step 20** | Placing subscriber trunk terminations in service. | `control subscriber-termination id=c2421.192;` |

# MLHG

provides an example of the steps required to provision a multiline hunt group and add subscribers to it. It lists example CLI commands with mandatory tokens.

The following concerns multi-line hunt group operation in a BTS with call forward services:

*Table 6-3        Multiline Hunt Group Provisioning Steps*

|  | Task | Description and CLI Command |
|---|---|---|
| Step 1 | Ensuring prerequisites are provisioned. | Ensure the following are already provisioned your network: <br>• pop<br>• mgw-profile<br>• dial-plan-profile<br>• dial-plan<br>• subscriber-profile |
| Step 2 | Adding MGWs. | 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:<br>• RGW—provisions a residential gateway, with the type token set to RGW<br>• TGW—provisions a trunking gateway, with the type token set to TGW.<br>Both commands provision the MGW table, but you can use them to provide user security to individuals.<br><br>`add mgw id=c2421.192; call-agent-id=CA146; mgw-profile-id=IAD2421; type=rgw;` |
| Step 3 | Adding MLHG terminations. | `add termination prefix=aaln/S1/; port-start=1; port-end=16; type=line; mgw-id=c2421.192;` |
| Step 4 | Adding main subscribers to the MLHG. | Setting category = mlhg identifies this subscriber as the main subscriber of a MLHG.<br><br>`add subscriber id=sub1; sub-profile-id=mlhgprof; name=mlhg1-main; dn1=212-555-7777; term-type=none; category=mlhg;` |
| Step 5 | Adding MLHGs and assigning main subscribers. | `add mlhg id=mlhg1; call-agent-id=CA146; main-sub-id=sub1;` |
| Step 6 | Assigning main subscribers to MLHGs. | `change subscriber id=sub1; mlhg-id=mlhg1;` |

***Table 6-3       Multiline Hunt Group Provisioning Steps (continued)***

| | Task | Description and CLI Command |
|---|---|---|
| **Step 7** | Addinga terminals (physical lines) to MLHGs. | Additional considerations:<br><br>• Provision the category as mlhg-individual or mlhg-pref-indiv.<br><br>• Set up any termination reachable through an individual DN as subscribers.<br><br>• Set up terminations to physical lines with unique term-ids.<br><br>• Set up terminations to make outgoing calls as subscribers.<br><br>`add subscriber id=sub2; category=mlhg-individual; grp=y; name=Richardson2; dn1=972-555-1232; term-id=aaln/S1/4; mgw-id=c2421.192; sub-profile-id=mlhgprof; mlhg-id=mlhg1;` |
| **Step 8** | Adding MLHG terminals. | `add mlhg-terminal mlhg-id=mlhg1; terminal=17; term-id=aaln/S1/4; mgw-id=c2421.192;`<br>`add mlhg-terminal mlhg-id=mlhg1; terminal=102; term-id=aaln/S1/5; mgw-id=c2421.192;` |
| **Step 9** | Placing MGWs in service. | `control mgw id=c2421.192; target-state=INS; mode=forced;` |
| **Step 10** | Preparing subscriber trunk terminations for service. | `equip subscriber-termination id=*@c2421.192;` |
| **Step 11** | Placing subscriber trunk terminations in service. | `control subscriber-termination id=*@c2421.192; target-state=INS; mode=forced;` |

# Hunt List

provides steps to provision a  hunt list and add subscribers to it. It lists example CLI commands with mandatory tokens.

***Table 6-4       Preferential Hunt List Provisioning Steps***

| | Task | Description and CLI Command |
|---|---|---|
| **Step 1** | Adding hunt lists to MLHGs. | `add mlhg-pref-list id=prefhuntlist33; mlhg-id=mlhg1;` |
| **Step 2** | Assigning subscribers hunt lists. | `change subscriber id=sub2; mlhg-pref-list-id=prefhuntlist33;` |
| **Step 3** | Assigning positions to phones in hunt lists. | `change mlhg-pref-list id=prefhuntlist33; mlhg-id=mlhg1; rel-terminal1=102; rel-terminal2=17;` |

# MLHG Provisioning for SIP Endpoints

This section demonstrates how to provision SIP subscribers to be members of a MLHG. It is similar to the procedure for provisioning MGCP and NCS subscribers in a MLHG, but includes several values specific to SIP subscribers.

**Step 1**   Office provisioning—If you have not already provisioned the following office parameters on your system, enter commands similar to those in the following examples.

**`add call_agent id=CA146; tsap_addr=prica88;`**

```
add dial_plan_profile id=BASIC_DPP;

add pop id=1; state=TX; country=USA; timezone=CST;

add serving_domain_name domain_name=prica88; auth_reqd=N;

add destination dest_id=DEST_LOCAL; call_type=LOCAL; route_type=SUB;

add subscriber_profile id=SUB_PROFILE; pop_id=1; dial_plan_id=BASIC_DPP;
```

**Step 2**   Office code and dial plan provisioning—If you have not already provisioned office code and dial plan parameters on your system, enter commands similar to those in the following examples.

```
add ndc digit_string=777;

add exchange_code ndc=777; ec=555;

add office_code ndc=777; ec=555; dn_group=xxxx; call_agent_id=CA146;

add dial_plan id=BASIC_DPP; digit_string=777555; min_digits=10; dest_id=DEST_LOCAL;
```

**Step 3**   Add the main subscriber for the MLHG (the subscriber associated with the pilot number for the MLHG). This command example is for a SIP-based main subscriber.

> ✎
>
> **Note**   Enter term_type=SIP if you want to have a physical SIP endpoint associated with the pilot number. Enter term_type=NONE if you do not want a physical endpoint associated with the pilot number. Enter category=mlhg to identify this subscriber as the main subscriber for the MLHG. (The system does not allow you to enter the MLHG ID yet. This will be done in a later step.)

```
add subscriber id=7775559900; name=7775559900; billing_dn=7775559900; dn1=7775559900;
sub_profile_id=SUB_PROFILE; term_type=SIP; policy_id=NULL; aor_id=7775559900@prica88;
category=MLHG;
```

**Step 4**   Add an individual subscriber for the MLHG. This command example is for a SIP-based MLHG individual subscriber. Repeat this command as needed to provision additional subscribers.

> ✎
>
> **Note**   Enter category=mlhg_individual to identify this subscriber as a member of the MLHG. (The system does not allow you to enter the MLHG ID yet. This is done in a later step.)

```
add subscriber id=7775559901; name=7775559901; billing_dn=7775559901; dn1=7775559901;
sub_profile_id=SUB_PROFILE; term_type=SIP; policy_id=NULL; aor_id=7775559901@prica88;
category=MLHG_INDIVIDUAL;
```

**Step 5**   Enter the following command to create the MLHG and identify the main subscriber as the subscriber you provisioned in Step 3.

```
add mlhg id=MLGROUP0; call_agent_id=CA146; main_sub_id=7775559900;
```

**Step 6**   Link the main subscriber record and all of the individual subscriber records to the MLHG.

```
change subscriber id=7775559900; mlhg_id=MLGROUP0;

change subscriber id=7775559901; mlhg_id=MLGROUP0;
```

**Step 7**  If the main subscriber is associated with a physical endpoint (and you entered term_type=SIP in Step 3), add the terminal. You must enter term_type=SUB_ID and include the specific subscriber ID for the SIP endpoint. (However, if you entered term_type=NONE in Step 3, the main subscriber is virtual and cannot be a terminal; in that case, omit this step and do not add a mlhg-terminal for the main subscriber.)

```
add mlhg_terminal mlhg_id=MLGROUP0; terminal=1; term_type=SUB_ID;
sub_id=7775559900;
```

**Step 8**  Add a terminal for each MLHG individual. If you entered term_type=SIP in Step 4, you must enter term_type=SUB_ID and include the specific subscriber ID for the SIP endpoint.

```
add mlhg_terminal mlhg_id=MLGROUP0; terminal=2; term_type=SUB_ID;
sub_id=7775559901;
```

> ✎
> **Note**  If you entered term_type=TERM in Step 4 (applicable to MGCP and NCS endpoints but not to SIP endpoints), you can enter either SUB_ID or TERM as the term_type, along with appropriate additional parameters, in the mlhg_terminal table.

**Step 9**  (Optional) If you want to provision a specific subscriber as a nonhunt line (so that calls to this DN do not invoke a hunt under any conditions), enter a command similar to this:

```
change subscriber id=7775559901; mlhg_id=MLGROUP0; mlhg_non_hunt_terminal=Y;
```

> 🔎
> **Tip**  The mlhg_non_hunt_terminal parameter is valid for MGCP, NCS, and SIP subscribers.

**Step 10**  (Optional) If you want the system to deliver calls to a SIP endpoint even when all MLHG lines are busy, enter a command similar to this:

```
change subscriber id=7775559901; mlhg_id=MLGROUP0; mlhg_sip_deliver_if_busy=Y;
```

**Step 11**  For each SIP subscriber, place the AOR in service.

```
change aor2sub aor_id=7775559900@prica88; status=INS;
```

```
change aor2sub aor_id=7775559901@prica88; status=INS;
```

# MLHG Nonhunt

To support the MLHG Nonhunt feature, Cisco added to the Cisco BTS 10200 a new token (MLHG_NON_HUNT_TERMINAL), inserting it in the SUBSCRIBER table. The token MLHG_NON_HUNT_TERMINAL is initialized to N by default. This token only applies for subscribers that belong to the various MLHG categories (the subscriber should have a valid non-NULL MLHG_ID field).

You can set the token MLHG_NON_HUNT_TERMINAL to Y when you initially provision the subscriber or you can change it from the default (N) some time after you initially provision the subscriber.

Table 6-5 provides steps for provisioning a subscriber as a non-hunt subscriber. The table lists sample CLI commands with mandatory tokens.

***Table 6-5        MLHG Non Hunt Provisioning Steps***

|  | Task | CLI Command |
|---|---|---|
| **Step 1** | Determine the setting of the token MLHG_NON_HUNT_TERMINAL for the subscriber (sub1). | `show SUBSCRIBER ID=sub1;` |
| **Step 2** | Set the subscriber sub1 as a non-hunting subscriber. | `change SUBSCRIBER ID=sub1;`<br>`MLHG_NON_HUNT_TERMINAL=Y;` |
| **Step 3** | Set the subscriber sub1 back to a hunting subscriber. | `change SUBSCRIBER ID=sub1;`<br>`MLHG_NON_HUNT_TERMINAL=N;` |

**Note**      For complete CLI information, see the Cisco BTS 10200 Softswitch CLI Database.
For details on provisioning MLGH, see the *Cisco BTS 10200 Softswitch Provisioning Guide, Release 6.0.3*.
For information on the MLHG feature, see Chapter 3: "Subscriber Features," in the *Cisco BTS 10200 Softswitch Network and Subscriber Feature Descriptions, Release 6.0.3*.

# Voice Mail

Table 6-6 provides steps to provision the BTS to support voice mail and automated attendant. It lists example CLI commands with mandatory tokens.

***Table 6-6        Voice Mail Provisioning Steps***

|  | Task | Description and CLI Command |
|---|---|---|
| **Step 1** | Adding trunk group profiles. | `add softsw-tg-profile id=10; protocol-type=SIP;` |
| **Step 2** | Adding trunk groups. | `add trunk-grp id=21;`<br>`softsw-tsap-addr=ipunity.ipclab.cisco.com;5060;`<br>`call-agent-id=CA146; tg-type=softsw; tg-profile-id=10;`<br>`dial-plan-id=cdp1;` |

***Table 6-6        Voice Mail Provisioning Steps (continued)***

| | Task | Description and CLI Command |
|---|---|---|
| **Step 3** | Adding subscribers. | The Subscriber (subscriber) table defines subscribers and subscriber groups on a CA. Set up the following as subscribers:<br><br>• termination numbers reached by DNs<br><br>• termination numbers originating in the CA<br><br>• termination numbers to customers, such as MLHG or Centrex<br><br>`add subscriber id=VM; category=PBX; dn1=972-789-3000; tgn-id=21; sub-profile-id=sp1; term-type=TG;`<br><br>Table 3-6 lists subscriber types and their required tokens.<br><br>**Note**    Each subscriber must have a unique term-id.<br><br>**Note**    Do not use double quotation marks (""), single quotation marks ('), dashes (-), or underscores (_) in subscriber names. |
| **Step 4** | Adding automated attendant subscribers. | Automated attendants manage incoming calls by answering them without a live operator.<br><br>`add subscriber id=AA; category=PBX; dn1=972-789-4000; tgn-id=22; sub-profile-id=sp1; term-type=tg;` |

# ENUM

Table 6-7 provides steps to provision the BTS to support ENUM. It lists example CLI commands with mandatory tokens.

***Table 6-7        ENUM Provisioning Steps***

| | Task | Description and CLI Command |
|---|---|---|
| **Step 1** | Configuring DNS servers. | Configure local DNS servers with ENUM server information; the BTS determines ENUM server IP addresses using DNS server SRV records.<br><br>For example, the BTS in region1 normally communicates with enumSF1. The BTS sends ENUM queries to enumSF2 only when the ENUM servers pointed to by enumSF1 are unavailable. |
| **Step 2** | Adding ENUM profiles. | The BTS uses the ENUM PROFILE table to find which ENUM servers to communicate with.<br><br>`add enum-profile id=privateENUM;`<br>`ENUM_SERVER_DOMAIND=region1.enumSF;`<br>`ENUM_SERVER_DOMAIN_TTL=5`<br>`TOP_LEVEL_DOMAIN=e164.sp.com`<br>`PFX-DIGITS=1;`<br>`DEL_DIGITS=0;`<br>`ENUM_QUERY_TIMEOUT=300`<br>`TEST_QUERY_INTERVAL=30` |

*Table 6-7        ENUM Provisioning Steps (continued)*

| | Task | Description and CLI Command |
|---|---|---|
| Step 3 | Adding alternative ENUM profiles. | The BTS can resend the enum-query using when it receives a "no record found". Specify this by provisioning enum-profile records and pointing the NEXT_ENUM_PROFILE field in the enum-profile table to a new record.<br><br>`add enum-profile id=carrierENUM;`<br>`ENUM_SERVER_DOMAIND=region1.enumSF;`<br>`TOP_LEVEL_DOMAIN=e164.sp2.com`<br><br>`change enum-profile`<br>`id=privateENUM;NEXT_ENUM_PROFILE=carrierENUM` |
| Step 4 | Adding ENUM query profiles. | The DEFAULT-ENUM-PROFILE in the CA-CONFIG table specifies the profile used for ENUM queries.<br><br>`add CA-CONFIG type=default-enum-profile;value=privateENUM;`<br><br>**Note**    Specify the ENUM-PROFILE-ID in the destination table. If the ENUM-PROFILE-ID in the destination table is set to NULL, use the DEFAULT-ENUM-PROFILE ID specified in the CA-CONFIG. |
| Step 5 | Enabling ENUM routing. | Enable the ENUM dip for the destination.<br><br>`change DESTINATION`<br>`DEST-ID=Local;PERFORM-ENUM-ROUTING=y;ENUM-PROFILE-ID=NULL;`<br><br>If a different top-level domain needs to be used for the above destination, define multiple ENUM-PROFILEs. |
| Step 6 | Enabling ENUM to provide LNP. | The TCAP-based interface is prevented from retrieving LNP information from the SCP database.<br><br>`Change CA-CONFIG type=ENUM-DB-LNP-CAPABLE;value=y;`<br><br>• ENUM-DB-LNP-CAPABLE value=Y—disables TCAP for LNP<br><br>• PERFORM-ENU M-ROUTING =Y—gets URI and LNP information from the ENUM server. Perform domain-based routing. If it fails, use LRN for routing. Get URI from ENUM server and LNP from SCP using TCAP interface. Perform domain-based routing. If it fails, use LRN for routing.<br><br>• ENUM-DB-LNP-CAPABLE value=N—enables TCAP for LNP<br><br>• PERFORM-ENU M-ROUTING =N—gets LNP information from the ENUM server. Perform routing based on the received LRN. Get LNP information from the SCP database using TCAP interface server. Perform routing based on the received LRN. |

*Table 6-7        ENUM Provisioning Steps (continued)*

| | Task | Description and CLI Command |
|---|---|---|
| **Step 7** | Specifying domain-based routing  for ENUM responses. | The commands shown in this section specify the domain-based routing on BTS1 for Region 1 where calls to BTS1-B and BTS1-C are routed over the direct SIP routes. Calls to Region 2 are routed by means of the route to the SIP route proxy. Calls to other service providers are routed to the PSTN interface.<br><br>These commands are based on the assumption that routes ROUTE-BTS-1B, ROUTE-BTS-1C, ROUTE-SCP, ROUTE-MGC, and all of their associated trunk group records are already defined.<br><br>• Route calls to BTS-1B if the domain part of the ENUM response has bts-1b.region1.sp.net and towards BTS-1C in case the domain part of the ENUM response has bts-1c.region1.sp.net.<br><br>`add domain2route`<br>`domain=bts-1b.region1.sp.net;route-type=RID;route_id=ROUTE`<br>`-BTS1B`<br>`add domain2route`<br>`domain=bts-1C.region1.sp.net;route-type=RID;route_id=ROUTE`<br>`-BTS1B`<br><br>• Route calls toward the SRP if the domain part of the ENUM response has region2.sp.net.<br><br>`add domain2route`<br>`domain=region2.sp.net;route-type=RID;route_id=ROUTE-SRP`<br><br>To distribute the traffic toward multiple SIP Route Proxies (SRPs) for a particular domain based on an existing policy-based routing feature, such as percentage-based routing, set route-type to RG and define appropriate policies with the RG.<br><br>• Route calls toward the MGC if the domain part of the ENUM response has region10.sp.net. This step is unnecessary if the route specified in the DESTINATION table is the same as ROUTE-MGC.<br><br>`add domain2route`<br>`domain=region10.sp.net;route-type=RID;route_id=ROUTE-MGC` |
| **Step 8** | Enabling ENUM at the CA level. | `change CALL-AGENT-PROFILE ID=region1cms-1A;ENUM-SUPP=y;` |

ENUM