C H A P T E R 4

Operating the BTS

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Introduction

This chapter tells you how to operate the BTS. This chapter assumes the following are true:

- Connecting components have been correctly installed.
- Connecting components have been successfully started.
- You are a system administrator with past BTS experience.

Managing Subscribers

Table 4-1   Managing Subscribers

Task	Sample Command
Activating added subscribers	**`control subscriber-termination id=<subscriber id>; target-state=INS; mode=FORCED;`** Ensure you specify **`mode=FORCED;`**; when assigning a DN to a ported-out subscriber.
Deactivating subscribers	Force the subscriber OOS: **`control subscriber-termination target-state=oos; mode=forced; id=<subscriber id>;`** Force the subscriber's MTA OOS: **`control mgw id=<mgw-id>; target-state=oos; mode=forced;`** Disassociate the subscriber from VoIP service: **`delete subscriber-service-profile sub-id=<subscriber id>; service-id=1;`** Remove the subscriber from the BTS database: **`delete subscriber id=<subscriber-id>;`** Remove VoIP service from the subscriber's MTA: **`delete termination prefix=aaln/; port-start=1; port-end=2; mgw_id=<mgw-id>;`** Remove the subscriber's MTA from the BTS: **`delete mgw id=<mgw-id>;`**
Bypassing LNP queries for ported-in numbers	After activating a ported-in number, update the BTS so calls to this number from MTAs on the BTS directly route to the MTA associated with the ported-in number: **`change dn2subscriber office-code-index=`** **`    <office-code-index of ported TN's NPA-NXX>;`** **`dn=<XXXX of the ported TN>; lnp-trigger=N;`**
Ensuring LNP queries for ported-out numbers	Update the BTS so calls to this number perform an LNP query: **`change dn2subscriber office-code-index=`** **`    <office-code-index of ported TN's NPA-NXX>;`** **`dn=<XXXX of the ported TN>; lnp-trigger=y;`**
Assigning a DN ported-out status	**Note** Wait for the CLEC to confirm the transfer before changing the DN status on the BTS. Initially, calls to the DN may have to route to the porting-out subscriber's MTA using LNP. Ensure you specify **`mode=FORCED`**; when assigning a DN to a ported out subscriber. **`change dn2subscriber office-code-index=`** **`    <office-code-index of porting TN's NPA-NXX>;`** **`dn=<XXXX of the porting TN>; status=ported-out; sub-id=null;`**
Disconnecting service to ported subscribers	**1.** Assign time and date to disconnect service. **2.** Send service disconnection notice to NPAC SMS. **3.** NPAC SMS broadcasts this to all service providers. **4.** NPAC SMS removes the ported number from its database. **5.** All service providers remove the number from their LNP databases. **6.** Calls to the number route as if it was non-ported.

Table 4-1   *Managing Subscribers (continued)*

Task	Sample Command
Viewing subscribers voice mail indicator (VMI) status	`status subscriber ID=278-222-1917` **Note** For MGCP subscribers only.

Resetting subscribers voice mail waiting indicator (VMWI)	`control subscriber ID=278-222-1917; mwi=on`
	
	or
	
	`control subscriber ID=278-222-1917; mwi=off`

Reporting all subscribers that use "best effort" (non DQoS) calls in the network having or not having a specific aggr id	`report subscriber id=%; oper-status=qos-best-effort; aggr-id=aggr1; start_row=1; limit=5;`
	
	Displays the output as CLI as the output-type has not been mentioned
	
	or
	
	`report subscriber id=215-222-0502; oper-status=qos-best-effort; aggr-id=%; output-type=xml; start_row=1; limit=5; output=report;`
	
	Displays the output in the specific format (CSV/XML) based on the output-tpye specified
	
	Note The output displays only NCS subscribers.

Changing subscribers ring and call waiting tone	`change dn2subscriber DN=4692553010; RING_TYPE=4; CWT_TYPE=4;` **Note** The CWT_TYPE has no effect on SIP subscribers. Their IP phones control how they receive call waiting tones.

Deleting subscribers secondary DNs	Delete one secondary DN for a subscriber:
	
	`delete dn2subscriber FDN=4692553010;`
	
	Delete all secondary DNs for a subscriber:
	
	`delete dn2subscriber SUB_ID=SUBSCRIBER_1; VIRTUAL_DN=Y;`

Table 4-1   Managing Subscribers (continued)

Task	Sample Command

Changing subscribers announcements	Delete the changed-number entry.
	
	`delete changed-number old-DN=<old-DN>;`
	
	Change the status of the old DN to DISC in the dn2subscriber table.
	
	`change dn2subscriber DN=<old-DN>; status=DISC;`

Table 4-1   *Managing Subscribers (continued)*

Task	Sample Command

Changing subscribers DNs	Change the subscriber DN to the new DN.
	
	`change sub id=<id>; dn1=<new-DN>; CN-REFERRAL=Y;`
	
	Example:
	
	`change sub id=sub1; dn1=206-222-1841; CN-REFERRAL=Y;`
	
	The CN-REFERRAL token adds an entry in the changed-number table for the changed subscriber DN. By default, the CN-REFERRAL token is set to Y. If the CN-REFERRAL token is set to N, the changed-number table is not updated with the changed number information.
	
	Use the show subscriber command to verify the new DN.
	
	`show sub id=<id>`
	
	Example:
	
	`show sub id=sub1;`
	`Dn1 indicates 206-222-1841`
	
	Verify that the changed number (old DN) of the subscriber is being tracked in the changed-number table.
	
	`show changed-number old-dn=<old-dn>`
	
	Example:
	
	`show changed-number OLD-DN=206-222-2345`
	
	Use the dn2subscriber table to verify that the old DN is in CN state and new DN is in assigned state. Check if the status of the old DN is CN.
	
	`show dn2subscriber FDN=<old-DN>;`
	
	Example:
	
	`show dn2subscriber FDN=206-222-2345;`
	
	Check if the status of the new DN is assigned.
	
	`show dn2subscriber FDN=<new-DN>;`
	
	Example:
	
	`show dn2subscriber FDN=206-222-1841;`
	
	Place an incoming call to the new DN and verify the call is setup successfully.
	
	Place an incoming call to the old DN and verify that the announcement played is "<old DN> has been changed to <new DN>."
	
	If an announcement is not played, do the following:
	
	Verify if the release cause id maps to annc-id=118.
	
	`show release-cause id=22;`
	
	Verify if the announcement id maps to announcement-number 301.
	
	`show annc id=118;`
	Note If there is no referral number (that is, when CN-REFERRAL is set to N where the new number is private), the BTS 10200 plays a generic announcement indicating that the number has changed. No further information is provided on the new number.

Viewing Calls

These tasks allows you to view information related to call forwarding features.

If A calls B and the call is forwarded to C:

- Querying A shows A is connected to C and provide C's information.
- Querying C shows C is connected to A and provide A's information.
- Querying B shows A is calling C and the call is forwarded through B.
- Even when the call is forwarded through B, B can originate another call. B can also forward multiple calls.

When viewing Three-Way Call and Call Waiting calls remember the output shows both calls.

Table 4-2   Viewing Calls

Task	Sample Command
Viewing active calls	`query call-trace subscriberDN/FQDN/NPA-NXX-****/aaln/*@*`
Viewing call trace summaries, started when subscriber presses *57	`report call-trace-summary` **Note** The report appears on the screen andit does not generate in HTML.

Using Status and Control Commands

Table 4-3   Using Status and Control Commands

Task	Sample Command
Viewing BTS system status	`status system;`

Viewing component states	`status element-manager id=EM01;`
	
	Possible states:
	
	• STARTUP—During platform startup, the two sides are communicating to determine which side will come up active.
	
	  – INIT-NORMAL—primary will be active, secondary will be standby; switchover allowed.
	
	  – INIT-FORCED—primary will be forced to active or standby, secondary will be forced to standby or active; no switchover allowed.
	
	• ACTIVE-NORMAL—primary is active, secondary is standby; switchover allowed.
	
	• ACTIVE-FORCED—primary or secondary has been forced to active; no switchover allowed.
	
	• STANDBY-NORMAL—primary should be active, secondary should be standby; switchover allowed.
	
	• STANDBY-FORCED—primary or secondary has been forced to standby; no switchover allowed.
	
	• TRANSITION-TO-ACTIVE-NORMAL—primary is going to active, secondary is going to standby; switchover allowed.
	
	• TRANSITION-TO-ACTIVE-FORCED—primary has been forced to active or standby; secondary has been forced to standby or active; no switchover allowed.
	
	• TRANSITION-TO-STANDBY-NORMAL—primary is going to standby, secondary is going to standby; switchover allowed.
	
	• TRANSITION-TO-STANDBY-FORCED—primary has been forced to active or standby; secondary has been forced to standby or active; no switchover allowed.
	
	Tip Use `status application` for more detailed information.

Table 4-3   Using Status and Control Commands (continued)

Task	Sample Command
Changing states of component pairs (EMS, BDMS, CA, and FS)	`control call-agent id=CA146; target-state=FORCED-STANDBY-ACTIVE;` Possible states: • ACTIVE_STANDBY • STANDBY_ACTIVE • NORMAL—Primary is active and secondary is standby. • FORCED-ACTIVE-STANDBY—Primary has been forced to active and secondary is standby. • FORCED-STANDBY-ACTIVE—Primary has been forced to standby and secondary is active.
Viewing component application states	`status application id=CA146;`
Changing component applications states (in-service or OOS)	`control application id=CA146; action=star;node=prica06` ⚠ **Caution** This negatively impacts the performance of the BTS host.
Activating media gateways	Ensure the MG exists, then enter: `control mgw id=<mgw-id>; target-state=ins; mode=forced;` where • `mgw id`—the voice port on the subscriber's MTA (the voice port's MAC address without hyphens) • `target-state`—ins to show in service for all activations • `mode`—forced for all activations
Setting subsystem groups/OPC in or OOS	`control subsystem_grp id=CNAM; mode=forced; target_state=UOS;` This sets the state of the individual subsystems within the subsystem group as well. If a subsystem/OPC combination is taken OOS individually, the state of the subsystem group may be in service while some members of the group are out of service.
Viewing subsystem groups/OPC status	`status subsystem_grp id=CNAM`

Using Show and Change Commmands

Table 4-4   Using Show and Change Commands

Task	Sample Command
Viewing subscriber-related batch data: subscribers, terminations, subscriber service profiles	`show subscriber limit=1000; start_row=<next page value>;display=id,sub_service_profile; order=id;` Where • `limit`—Page size for the maximum number of rows (or lines) to display • `start_row`—Which page to display first • `display=id`—Sorts data by `id` column • `order=id`—Provides a key for ordering or sorting the data
Viewing database usage statistics	`show db-usage table-name=dial_plan;` **Note** Do not use hyphens in table names; instead use underscores. or 1. Go to http://www.cisco.com/iam/BTSCLI/BTS.html. 2. From the first drop-list, select "Table Sizing Configuration".
Changing database usage statistics	`change db-usage table-name=dial-plan; minor-threshold=70;major-threshold=80; critical-threshold=95;`

Using ERAC Commands

Using prepared SQL statements Extended Read Access Commands (ERAC) commands perform a complex read against the BTS database. This SQL optimization and multitable and nested SELECT(s) quickly return data that would otherwise take several database dips and a lot of back end data post processing. Use the following interfaces to access ERAC:

• CLI and MAINT shells

• CORBA/XML adapters

• EPOM (uses CORBA/XML)

• SPA

Directory number (DN) and telephone number (TN) refer to the same BTS entity but with different sources:

• TN—EC database value + the Office Code table's NDC field

• DN—DN2 Subscriber table's DN field

The TN/DN is a concatenation of 14 (or less) digits. Commands fail if a partial TN is supplied.

Note   Commands allow for wild card support. When you enter a subscriber, subscriber account code, or DN , the value can have the wild card percent (%) search criteria.

These are standard commands and their parameters. Several are associated with BTS tables. However, several parameters are derived from multiple sources and do not map directly to a table. They may have real database representation but be modified for ease of use or readability.

Tasks	Descriptions	Examples
Viewing account IDs	An account id can be assigned to one or more subscribers. An account id is used only for identification purposes. The account id is not associated with feature grouping behavior during call processing. The account id is included in billing record. This is for operational identification purpose only. This is an optional field of 1-20 text characters.	`account-id=ABC123456789;`
Viewing DNs	The DN is the telephone number. This number is a derived value composed of the office-code.ndc, office-code.ec and the dn2subscriber.dn fields. It is a concatenation to provide a consistent view of the primary directory number for a subscriber. It is 1-14 numbers.	`show 4692550529`

Viewing DNs by subscriber	This command returns a list of all DNs associated with a specified subscriber or account id. In this command, the subscriber id field or the new account-id field determines the DN(s) to list. Each row of data represents a DN entry. The additional data is supplied to provide further information about the DN.	`show sub-dn-list`
		`sub_id=foo_123;`
		`account-id=ABC123456789;`

Viewing line features by DN	This command returns a list of all features associated with a specified DN. In this command the DN is supplied to qualify the data search.
	
	The data returned is not in the form of services and service packages. This query dips into the service packages and finds the actual features associated with each service assigned to the DN and its subscriber.
		`show dn-line-feat`
		`dn=4692550529;`
		`sub-id=foo_123;`
		`account-id=-ABC123456789;`

Viewing feature summaries by DN	This command returns the list of all features associated with a specified entity. In this command the DN, Subscriber ID or Account ID is supplied to qualify the data search. The command returns the list of all the services of the associated subscriber or DN and all features associated with each specific service package. This also includes the service profiles association.	`show dn-feat-list`
		`dn=4692550529;`
		`sub-id=foo_123;`
		`account-id=ABC123456789;`

Tasks	Descriptions	Examples

Viewing speed dial settings by DN	This command returns a list of all speed dial telephone numbers by the specified DN or primary subscriber directory number. All one digit speed dial values are returned as well as the feature state of speed dial. T Only a single row is returned with the complete list of speed dial numbers. If a number is not defined, it is left blank.	`show dn-sd-list dn=4692550529;`
		`sub-id=foo_123;`
		`account-id=ABC123456789;`

Viewing domestic long distance blocking by subscriber or account id	This command returns the cos-restrict information for a specified subscriber. In this command the subscriber ID field or the new account-id field determines the subscriber. This command keys on the use of the Nature of Dial (NOD) means for restricting subscriber activity.	`show sub-id-block`
		`sub-id=foo_123;`
		`account-id=ABC123456789;`

Viewing international long distance blocking settings by subscriber or account id	This command returns the COS_RESTRICT information for all DN(s) associated with a specified subscriber or account. In this command the subscriber ID field or the new ACCOUNT_ID field determines the subscriber. This command keys on the use of the NOD as the means for restricting subscriber activity.	`show sub-intl-block`
		`sub-id=foo-123;`
		`account-id=ABC123456789;`

Viewing DA blocking by subscriber or account id	This command returns the cos-restrict information a specified subscriber or account. In this command the subscriber id field or the new account_id field determines the subscriber. This command keys on the use of the NOD as the means for restricting subscriber activity.	`show sub-da-block`
		`sub-id=foo-123;`
		`account-id=ABC123456789;`

Viewing OA blocking by subscriber or account id	This command returns the Operator assistance blocking information for a specified subscriber or account. In this command the subscriber ID field or the new ACCOUNT_ID field determines the subscriber. One row of data exists for each actual BTS 10200 subscribers.	`show sub-oper-block`
		`sub-id=foo-123;`
		`account-id=ABC123456789;`

Viewing call hunt groups by subscriber or account id	This command returns the list of one or more hunt groups associated with a specified subscriber. In this command the subscriber Id field or the new account_id field determines the subscriber. Each row of data represents a hunt group membership.	`show hg-dn-listdn=4692550529;`
		`sub-id=foo-123;`
		`account-id=ABC123456789;`

Viewing sequence by hunt group	This command returns the hunt sequence as a list of telephone numbers (TNs) associated with a specified Hunt Group. Each row of data equates to a relative terminal in the hunt group. This avoids static lists with a fixed number of terminals.	`show hg-sequence`
		`mlhg-id=foo-123;`
		`account-id=ABC123456789;`

Tasks	Descriptions	Examples
Viewing list DNs that not in a hunt group	This command returns a list of all DNs associated with a specified subscriber and that are not associated with a hunt group. Under the present definition, the list can be long. Each row of the data indicates a TN with a free association. It is strongly recommended that some qualifications are provided to narrow the scope of the command. For example, list all free DNs in a particular account where the account ID is some specific value.	`show sub-dn-find account-id=ABC1234%; sub-id=foo-123;`

Viewing Outbound Caller ID with Name Value by DN	This command returns the caller ID and NAME for a specified TN. Each row of data represents a separate subscriber TN. The read is based on the actual TN of a subscriber.	`show sub-cid sub-id=foo-123;`
		
		`account-id=ABC123456789;`

Managing Transactions

The Transaction Queue tracks updates to EMS database, and the shared memory of the CAs andFSs. Entries should remain in the transaction queue for a few seconds, unless an EMS, CA, or FS in an error state. In case of an error state, the transaction queue to stores entries for later updates.

Table 4-5   Viewing and Deleting Transactions

Task	Sample Command
Viewing transaction queue entries	`show transaction-queue target=CA146; status=pending;` Following is an example of the system response to this command. TRANSACTION_ID=901208641475967405 USER_ID=optiuser TERMINAL_ID=USR1 SEQUENCE_NUM=0 TARGET=CA146 STATEMENT=INSERT INTO CARRIER (ID) VALUES ("3434") TIMESTAMP=2006-11-10 11:36:41 ACTIVE_TARGET=Y STATUS=PENDING
Deleting transaction queue entries	`delete transaction-queue target=CA146` ⚠ **Caution** This command causes a database inconsistency. Call TAC before using it.
Viewing maximum download capacity for transaction queuing	`show queue-throttle`

Table 4-5   Viewing and Deleting Transactions (continued)

Task	Sample Command

Enabling/Disabling queue throttling	1. Go to the bts.properties file.
	
	`/opt/ems/etc/bts.properties`
	
	2. To enable throttling, set throttleEnable to Y. To disable throttling, set throttleEnable to N.
	
	`throttleEnable=Y`
	
	3. Restart the platform.

Viewing number of commands executed from CLI, MNT, FTP, CORBA, SNMP, or SOAP interfaces	`show config-interval;`

Setting number of commands executed from CLI, MNT, FTP, CORBA, SNMP, or SOAP interfaces	`change command-throttle-threshold session-type=CORBA; threshold=2000;`
	
	`change command-throttle-threshold session=CORBA; enable=N;`

Scheduling Commands

The Hour and Minute Command Scheduling feature allows you to schedule command execution for a specific hour and minute.

Using start-time and recurrence command tokens, schedule command time and frequency (hourly, daily, weekly, monthly, etc.). You can remove the command at any time; if it is recurring and currently executing, it completes and is removed.

Limitations

To prevent overload and subsequent EMS degradation, limit commands to 10, each taking less than a minute.

If you schedule a command to execute, but an earlier occurence of that command is still executing, the second might fail.

Table 4-6   Scheduling Commands

Task	Sample Command
Adding scheduled commands using minutes	`add scheduled_command verb=report;noun=system_health;keys=period;key_values=720;recurrence=MINUTE;on_minute=3,10,25,59;start_time=2007-11-08 00:00:00;`

Adding scheduled commands using hours	`add scheduled_command verb=report;`
	`noun=system_health;start_time=2007-06-30 00:00:00;`
	`key_values=720;keys=period; recurrence=HOURLY;`

Table 4-6   Scheduling Commands (continued)

Task	Sample Command
Viewing scheduled commands	`show scheduled_command recurrence=HOURLY;key_values=720;`
Changing scheduled commands	`change scheduled_command id=3871788758088233209;recurrence=MINUTE;on_minute=19;`