C H A P T E R 2

Call Agents and Feature Servers

Introduction

This chapter describes how to provision BTS Call Agents (CAs) and Feature Servers (FSs).

Call Agents

The CA provides signaling and call processing (call setup and teardown) for the BTS. This section describes adding the CA and associated office tables to the BTS. The following table provides example steps to provision the CA and lists examples of CLI commands with mandatory tokens. For all available tokens, see the Cisco BTS 10200 Softswitch CLI Database.

Step	Task	Description and CLI Command

Step 1	Adding CAs.	The Call Agent (call-agent) table has the domain name and tsap addresses of the CA as well as the primary and secondary IP addresses of the EMS.
		
		`add call-agent id=CA101;`
		`tsap-addr=sim-SYS04CA146.ipclab.cisco.com:9146;`

Step 2	Adding CA profiles.	The Call Agent Profile (ca-agent-profile) table defines the properties (functionality) of the CA. The CA reads this table once every 20 calls. This means that when the CA processes 20 calls per second, changes to this table take effect in one second.
		
		`add call-agent-profile id=CA146; cms-id=12345; mgc-supp=y;`
		`mgc-id=12345; feid=financial-entity-id1;`
		`cdb-billing-supp=y; em-billing-supp=n;`

Step	Task	Description and CLI Command

Step 3	Changing CA configurations.	The Call Agent Configuration (ca-config) table defines the defaults for each CA. The defaults are prepopulated at installation. Only change and show commands are valid.
		
		```show ca-config type=susp-tmr;```
		```change ca-config type=susp-tmr; datatype=integer;value=300```
		
		Note The **add** command is used during installation but additional parameters cannot be added.
		
		The Call Agent Configuration Base (ca-config-base) table is a static table in the EMS to perform constraint checks. This table is not provisionable. Only the show command is allowed. Information in the Call Agent Configuration Base table must match the information in the Call Agent Configuration table.

Step 4	Adding home area codes.	The National Destination Code (ndc-code) table defines the home area codes supported by the CA. ```add ndc digit-string=469;```
Step 5	Adding exchange codes.	The Exchange Code (exchange-code) table specifies the exchange codes assigned to a particular CA. ```add exchange-code ndc=469; ec=255;```

Step 6	Adding office codes.	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.
		
		```add office-code call-agent-id=CA146; ndc=469; ec=255;```
		```dn-group=xxxx;```

Step	Task	Description and CLI Command
| **Step 7** | Adding digit maps. | The Digit Map (digit-map) table tells a media gateway (MGW) how to collect and report dialed digits. The CA uses a default digit map ID for normal digit collection unless a specific digit map ID is assigned to the subscriber. POTS subscribers use a public dialing plan. Centrex subscribers use a customized dialing plan.<br><br>```
add digit-map id=default;
digit-pattern=0T|00|[2-9]11|[2-9]xx[2-9]xxxxxx|1[2-9]xx[2-9]xxxxxx|0[2-9]xx[2-9]xxxxxx|011xxxxxxxxxxxx.T|101xxxx|#|*[4-9]x|*[2-3]xx|11xx|[2-9]#|[2-4]x#|[2-9]T|[2-4]xT|01xxxxxxxxxx;
```<br><br>**Note** This digit pattern permits the creation of both 2- and 3-digit VSCs. If the first digit is 2 or 3, the length is 3 digits. If first digit is 4–9, the length is 2 digits. For example:<br>*2-3xxx<br>*4-9xx |
| **Step 8** | Adding points of presence. | The CA can serve several geographical regions or Metropolitan Statistical Areas (MSAs) simultaneously. Each geographical region is referred to as a point of presence (POP). Each POP has its own unique dialing and routing characteristics. The Point of Presence (pop) table contains a default dialing and routing characteristics. Each originating entity (subscriber or trunk group) is assigned to a POP. The POP also performs policy routing, for example, it routes the call to the nearest announcement server in the POP or to the nearest interLATA carrier location within a POP.<br><br>```
add pop id=1; state=tx; country=usa; timezone=CST;
``` |

Feature Servers

The FS provides access to features through a well-defined interface, Feature Control Protocol (FCP). BTS FS architecture separates feature control from call control with a clear interface defined between them. The CA uses FCP to provide an effective environment for interfacing with multiple FSs. This provides AIN, POTS, Centrex, and 800 services as required during call processing.

A FS is invoked from a detection point (DP). At the DP, the CA checks if any triggers are armed. If they are, the CA checks if the trigger applies to a subscriber, group, or office, in the order specified. If the trigger is applicable, the CA invokes the feature associated with that trigger.

The following table lists the steps for provisioning a BTS FS and provides commands with mandatory tokens.

For all available tokens, see the Cisco BTS 10200 Softswitch CLI Database.

Note When adding an FS, add the entries to the CA as well as the FS tables in the respective FSs. The POTS FS has the Feature Server table, but the AIN FS does not.

	Description	Description and CLI Command
Step 1	Adding FSs.	The Feature Server (feature-server) table identifies the location and type of FS (POTS or AIN). It also identifies the IP address of the primary and secondary EMS and MGWs used by the FS. It is updated at both the CA and the applicable FS. The FS can be prepopulated during installation using a script, and it is used to automatically provision the Service Trigger table. `add feature-server id=FSAIN201; tsap-addr-sidea= trn1AIN.trnglab.cisco.com:11205; type=AIN;`
Step 2	Adding features.	The Feature (feature) table defines characteristics for the features supported by the BTS. Repeat this step for each feature you want to add to the system. `add feature fname=CFU; tdp1=termination-attempt-authorized; tid1=termination-attempt-authorized; ttype1=r; tdp2=collected-information; tid2=vertical-service-code; ttype2=r; feature-server-id=FSPTC231; fname1=CFUA; fname2=CFUD;`
Step 3	Adding VSCs.	The Vertical Service Code (vsc) table translates a vertical service code, also known as a star code (*XX), to a feature name. This table is preprovisioned, based on the Feature table customer records, during installation. `add vsc digit-string=*72; fname=CFUA;`
Step 4	Adding services.	A service is a collection of one or more features that are invoked when a trigger is reached. Each feature within a service can have one or more triggers. Services can be dynamically created within the BTS 10200. The service provider defines a service and the features associated with it. Up to 10 commonly used features can be grouped into a service, and up to 50 services can be provisioned per subscriber. The subscriber is then provisioned with a service-id instead of individual features. `add service id=1; fname1=CFU; fname2=CFB; fname3=CFNA; fname4=CW;`

The following table lists the service types and features available on a POTS or Centrex or Tandem FS.

Service Type	Feature Name
Class of Service Restrictions	900 Blocking
	Directory Assistance Blocking
	International Blocking
	976 Blocking
	National Black/White List
	International Black/White List
	Casual Black/White List
	Account Codes
	Authorization Codes
Screening	Selective Call Forwarding
	Selective Call Acceptance
	Selective Call Rejection, Call Block
	Distinctive Ringing/Call Waiting
POTS	Analog Direct Inward Dial (DID) for PBX (FXO)
	Direct Outward Dial (DOD) for PBX
	Multiple Directory Numbers (Teen Service)

Service Type	Feature Name
Common (POTS and Centrex)	Call Forwarding Unconditional
	Remote Activation of Call Forwarding
	Remote Call Forwarding
	Call Forwarding On Busy
	Call Forwarding No Answer
	Call Forwarding Redirection
	Calling Number Delivery Blocking
	Calling Name Delivery Blocking
	Calling Identity Delivery and Suppression
	Calling Number Delivery
	Calling Name Delivery (No External Query)
	Calling Identity Delivery on Call Waiting
	Anonymous Call Rejection
	Automatic Callback (Repeat Dialing)
	Automatic Recall (Call Return)
	Call Block (Reject Caller)
	Call Waiting
	Cancel Call Waiting
	Customer-Originated Trace
	Do Not Disturb
	Hotline Service
	Warmline Service
	Interactive Voice Response Functions
	Multiline Hunt Group (MLHG)
	Speed Call (1-digit and 2-digit)
	Three-Way Calling
	Usage-Sensitive Three-Way Calling
	Visual Message Waiting Indicator

Service Type	Feature Name
Basic Centrex	Customized Dialing Plan
	Intercom Dialing
	Semi/Fully Restricted Lines
	DID
	Distinctive Alerting/Call Waiting Indication on DID
	DOD
	Incoming/Outgoing Simulated Facility Group
	Call Transfer
	Call Hold
	Call Park and Call Retrieve
	Directed Call Pickup (With and Without Barge-in)
	Group Speed Call
Tandem	ANI Screening

Timezones

Table 2-1 lists the various world timezones that the BTS currently supports. Valid time zone values and their associated descriptions are also given.

Table 2-1   Supported Timezones

ID	Description	Billing Field Value	GMT Offset Hours	GMT Offset Minutes	Daylight Start 2004	Daylight End 2004
LOCAL	Local System Time (BDMS)	0				
NWE	Northwestern Europe	1	+0	0	03-28-01-00	10-31-02-00
WA	Western Africa	2	+0	0		
WE	Western Europe	3	+1	0	03-28-02-00	10-31-03-00
WCA	West Central Africa	4	+1	0		
MAL	Malta	5	+1	0	03-28-02-00	10-31-03-00
NAM	Namibia	6	+1	0	09-05-02-00	04-04-02-00
CE	Central Europe	7	+1	0	03-28-03-00	10-31-04-00
ECA	East Central Africa	8	+2	0		
ECE	East Central Europe	9	+2	0	03-28-02-00	10-31-03-00
EGY	Egypt	10	+2	0	04-30-00-00	10-01-00-00
GAZ	Gaza	11	+2	0	04-16-00-00	10-15-00-00
ISR	Israel	12	+2	0	04-07-01-00	09-22-01-00
JOR	Jordan	13	+2	0	03-25-00-00	10-22-01-00

Table 2-1   *Supported Timezones (continued)*

ID	Description	Billing Field Value	GMT Offset Hours	GMT Offset Minutes	Daylight Start 2004	Daylight End 2004
LEB	Lebanon	14	+2	0	03-28-00-00	10-31-00-00
SYR	Syria	15	+2	0	04-01-00-00	10-01-00-00
WB	West Bank	16	+2	0	04-07-01-00	09-22-01-00
EA	Eastern Africa	17	+3	0		
PG	Persian Gulf	18	+3	0		
GEO	Georgia	19	+3	0	03-28-00-00	10-31-00-00
IRQ	Iraq	20	+3	0	04-01-03-00	10-01-04-00
RUS2	Russia Zone 2	21	+3	0	03-28-02-00	10-31-03-00
IRA	Iran	22	+3	30	03-21-00-00	09-21-00-00
AZE	Azerbaijan	23	+4	0	03-28-01-00	10-31-01-00
WIO	Western Indian Ocean	24	+4	0		
ME	Middle East	25	+4	0		
WAS	Western Asia	26	+4	0	03-28-02-00	10-31-03-00
AFG	Afghanistan	27	+4	30		
KYR	Kyrgystan (also Kyrgyzstan)	28	+5	0	03-28-02-30	10-31-02-30
ECAS	Eastern Central Asia	29	+5	0		
IO	Indian Ocean	30	+5	0		
WCAS	West Central Asia	31	+5	0	03-28-02-00	10-31-03-00
IND	India	32	+5	30		
NEP	Nepal	33	+5	45		
CAS	Central Asia	34	+6	0	03-28-02-00	10-31-03-00
SAS	Southern Asia	35	+6	0		
BC	Burma – Cocos	36	+6	30		
RUS6	Russia Zone 6	37	+7	0	03-28-02-00	10-31-03-00
SEAS	South Eastern Asia	38	+7	0		
EAS	Eastern Asia	39	+8	0		
MON	Mongolia	40	+8	0	03-27-02-00	09-25-03-00
RUS7	Russia Zone 7	41	+8	0	03-28-02-00	10-31-03-00
WAU	Western Australia	42	+8	0		
FEAS	Far Eastern Asia	43	+9	0		
RUS8	Russia Zone 8	44	+9	0	03-28-02-00	10-31-03-00
NAU	Northern Australia	45	+9	30		
SAU	Southern Australia	46	+9	30	10-31-02-00	03-28-03-00
EAU	Eastern Australia	47	+10	0	10-31-02-00	03-28-03-00
QUE	Queensland Australia	48	+10	0		

Table 2-1   Supported Timezones (continued)

ID	Description	Billing Field Value	GMT Offset Hours	GMT Offset Minutes	Daylight Start 2004	Daylight End 2004
RUS9	Russia Zone 9	49	+10	0	03-28-02-00	10-31-03-00
TAS	Tasmania	50	+10	0	10-03-02-00	03-28-03-00
WP	Western Pacific	51	+10	0		
LAU	Lord Howe Island – Australia	52	+10	30	10-31-02-00	03-28-02-00
RUS10	Russia Zone 10	53	+11	0	03-28-02-00	10-31-03-00
WCP	Western Central Pacific	54	+11	0		
NOR	Norfolk Island	55	+11	30		
NZ	New Zealand	56	+12	0	10-03-02-00	03-21-03-00
RUS11	Russia Zone 11	57	+12	0	03-28-02-00	10-31-03-00
SPO	Southern Pacific Ocean	58	+12	0		
CI	Chatham Island	59	+12	45	10-03-02-45	03-21-03-45
SEPO	South Eastern Pacific Ocean	60	+13	0		
LI	Line Islands	61	+14	0		
SMO	Samoa	62	-11	0		
HAW	Hawaii	63	-10	0		
AI	Aleutian Islands	64	-10	0	04-04-02-00	10-31-02-00
GI	Gambier Islands	65	-9	0		
MI	Marquesas Islands	66	-9	30		
ALA	Alaska	67	9	0	04-04-02-00	10-31-02-00
SON	Sonora Mexico	68	-8	0		
PI	Pitcairn Islands	69	-8	0		
PAC	North American Pacific	70	-8	0	04-04-02-00	10-31-02-00
EBC	Eastern British Columbia	71	-8	0		
MNT	North American Mountain	72	-7	0	04-04-02-00	10-31-02-00
ARI	Arizona	73	-7	0		
SASK	Saskatechewan	74	-6	0		
GAL	Galapagos Islands	75	-6	0		
EI	Easter Island	76	-6	0	10-09-10-00	03-13-10-00
CA	Central America	77	-6	0		
CEN	North American Central	78	-6	0	04-04-02-00	10-31-02-00
WSAM	Western South America	79	-5	0		
WCAR	Western Caribbean	80	-5	0		
SOU	Southampton Canada	81	-5	0		
IDA	Indiana	82	-5	0		
EST	North American Eastern	83	-5	0	04-04-02-00	10-31-02-00

Table 2-1   Supported Timezones (continued)

ID	Description	Billing Field Value	GMT Offset Hours	GMT Offset Minutes	Daylight Start 2004	Daylight End 2004
CUB	Cuba	84	-5	0	03-28-00-00	10-31-01-00
BAH	Bahamas	85	-5	0	04-04-02-00	10-31-02-00
ACR	Acre Brazil	86	-5	0		
SAM	Central South America	87	-4	0		
PAR	Paraguay	88	-4	0	09-05-00-00	04-04-00-00
FI	Falkland Islands	89	-4	0	09-05-02-00	04-18-02-00
CHI	Chile	90	-4	0	10-10-00-00	03-14-00-00
CG	Central Greenland	91	-4	0		
CAR	Caribbean	92	-4	0		
ATL	North American Atlantic	93	-4	0	04-04-02-00	10-31-02-00
NWF	Newfoundland Canada	94	-3	30	04-04-12-01	10-31-12-01
ELAB	Eastern Labrador Canada	95	-3	30	04-04-02-00	10-31-02-00
SPM	St.Pierre and Miquelon	96	-3	0	04-04-02-00	10-31-02-00
SBRZ	Southern Brazil	97	-3	0	10-17-00-00	02-15-00-00
ESAM	Eastern South America	98	-3	0		
EG	Eastern Greenland	99	-3	0		
EBRZ	Eastern Brazil	100	-2	0		
FEG	Far Eastern Greenland	101	-1	0		
CV	Cape Verde	102	-1	0		
AZO	Azores	103	-1	0	03-28-00-00	10-31-01-00
ICE	Iceland	104	+0	0		

Timezone Localities

Table 2-2 describes the localities covered by the various world timezones that the BTS supports.

Table 2-2   Time zone Localities

ID	Description	Locality Served
LOCAL	Local System Time	
NWE	Northwestern Europe	Faroe Islands, Guernsey, Ireland, Isle of Man, Portugal, Canary Islands, United Kingdom
WA	Western Africa	Burkina Faso, Cote d'Ivore, Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Mauritania, Morocco, Sao Tome and Principe, Senegal, Sierra Leone, St.Helena, Togo, Western Sahara

Table 2-2   Time zone Localities (continued)

ID	Description	Locality Served
WE	Western Europe	Albania, Andorra, Austria, Belgium, Bosnia and Herzegovina, Croatia, Czech Republic, Denmark, France, Germany, Gibraltar, Hungary, Italy, Lichtenstein, Luxembourg, Macedonia, Monaco, Netherlands, Norway, Poland, San Marino, Serbia, Montenegro, Kosovo, Slovakia, Slovenia, Spain, Sweden, Switzerland, Vatican City
WCA	West Central Africa	Algeria, Angola, Benin, Cameroon, Central African Republic, Chad, Congo, Democratic Republic of Congo (west), Equatorial Guinea, Gabon, Niger, Nigeria, Tunisia
MAL	Malta	Malta
NAM	Namibia	Namibia
CE	Central Europe	Bulgaria, Cyprus, Estonia, Finland, Latvia, Lithuania, Moldova, Romania, Turkey, Ukraine
ECA	East Central Africa	Botswana, Burundi, Democratic Republic of Congo (east), Lesotho, Libya, Malawi, Mozambique, Rwanda, South Africa, Swaziland, Zambia, Zimbabwe
ECE	East Central Europe	Belarus, Greece, Russia (Zone1)
EGY	Egypt	Egypt
GAZ	Gaza	Gaza Strip
ISR	Israel	Israel
JOR	Jordan	Jordan
LEB	Lebanon	Lebanon
SYR	Syria	Syria
WB	West Bank	West Bank
EA	Eastern Africa	Comoros, Djibouti, Eritrea, Ethiopia, Kenya, Madagascar, Mayotte, Somalia, Sudan, Tanzania, Uganda
PG	Persian Gulf	Bahrain, Kuwait, Qatar, Saudi Arabia, Yemen
GEO	Georgia	Georgia
IRQ	Iraq	Iraq
RUS2	Russia Zone 2	Russia (Zone2)
IRA	Iran	Iran
AZE	Azerbaijan	Azerbaijan
WIO	Western Indian Ocean	Mauritius, Reunion, Seychelles
ME	Middle East	Oman, United Arab Emirates
WAS	Western Asia	Armenia, Kazakhstan (West), Russia (Zone3)
AFG	Afghanistan	Afghanistan
KYR	Kyrgystan	Kyrgystan
ECAS	Eastern Central Asia	Pakistan, Tajikistan, Turkmenistan, Uzbekistan
IO	Indian Ocean	Kerguelen, Maldives
WCAS	West Central Asia	Kazakhstan (Central), Russia (Zone4)

Table 2-2   Time zone Localities (continued)

ID	Description	Locality Served
IND	India	India
NEP	Nepal	Nepal
CAS	Central Asia	Kazakhstan (East), Russia (Zone5)
SAS	Southern Asia	Bangladesh, Bhutan, Sri Lanka
BC	Burma – Cocos	Burma, Cocos (Keeling) Islands
RUS6	Russia Zone 6	Russia (Zone6)
SEAS	South Eastern Asia	Christmas Island, Cambodia, Indonesia (West), Laos, Thailand, Vietnam
EAS	Eastern Asia	Brunei Darussalem, China, Hong Kong, Indonesia (Central), Macau, Malaysia, Philippines, Singapore, Taiwan
MON	Mongolia	Mongolia
RUS7	Russia Zone 7	Russia (Zone7)
WAU	Western Australia	Australia (Western Australia)
FEAS	Far Eastern Asia	Indonesia (East), Japan, North Korea, South Korea, Palau, Timor-Leste
RUS8	Russia Zone 8	Russia (Zone8)
NAU	Northern Australia	Australia (Northern Territory)
SAU	Southern Australia	Australia (South Australia)
EAU	Eastern Australia	Australia (New South Wales, Victoria, Capital Territory)
QUE	Queensland Australia	Australia (Queensland)
RUS9	Russia Zone 9	Russia (Zone9)
TAS	Tasmania	Australia (Tasmania)
WP	Western Pacific	Guam, Micronesia (Chuuk Islands), Northern Mariana Islands, Papua New Guinea
LAU	Lord Howe Island – Australia	Australia (Lord Howe Island)
RUS10	Russia Zone 10	Russia (Zone10)
WCP	Western Central Pacific	Micronesia (Senyavin Islands), New Caledonia, Solomon Islands, Vanuatu
NOR	Norfolk Island	Norfolk Island
NZ	New Zealand	New Zealand
RUS11	Russia Zone 11	Russia (Zone11)
SPO	Southern Pacific Ocean	Fiji, Kiribati (Gilbert Islands), Marshall Islands, Nauru, Tuvalu, Wallis and Futuna
CI	Chatham Island	Chatham Island
SEPO	South Eastern Pacific Ocean	Kiribati (Phoenix Islands), Tonga
LI	Line Islands	Kiribati (Line Islands)
SMO	Samoa	American Samoa, Niue, Samoa
HAW	Hawaii	Cook Islands, French Polynesia (Society Archipelago, Tuamotu Archipelago, Tubuai Islands), US (Hawaii)
AI	Aleutian Islands	US (Aleutian Islands)

Table 2-2   Time zone Localities (continued)

ID	Description	Locality Served
GI	Gambier Islands	French Polynesia (Gambier Islands)
MI	Marquesas Islands	French Polynesia (Marquesas Islands)
ALA	Alaska	US (Alaska)
SON	Sonora Mexico	Mexico (Sonora)
PI	Pitcairn Islands	Pitcairn Islands
PAC	North American Pacific	Canada (Yukon, British Columbia), Mexico (Baja California), US (Washington, Oregon, Idaho-Northern, California, Nevada)
EBC	Eastern British Columbia	Canada (Eastern British Columbia)
MNT	North American Mountain	Canada (Northwest Territory, Nunavut-Western, British Columbia-Southeast, Alberta, Saskatchewan-West), Mexico (Baja California Sur, Chihuahua, Sinaloa, Nayarit), US (Oregon-East, Idaho-Southern, Montana, Wyoming, North Dakota-Southwest, South Dakota-West, Nebraska-West, Kansas-West, Utah, Arizona-Navajo Reservation, Colorado, New Mexico, Texas-Far West)
ARI	Arizona	Arizona
SASK	Saskatchewan	Canada (Saskatchewan)
GAL	Galapagos Islands	Ecuador (Galapagos Islands)
EI	Easter Island	Easter Island
CA	Central America	Belize, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua
CEN	North American Central	Canada (Nunavut-Central, Ontario-Western, Saskatchewan-East, Manitoba), Mexico (Coahuila, Nuevo Leon, Tamaulipas, Zacatecas, Jalisco, San Luis Potosi, Guanajuato, Aquascalientes, Queretara, Yucatan, Quintana Roo, Campeche, Tabasco, Chiapas, Oaxaca, Veracruz, Guerrero, Michoacan, Colima, Morelos, Tlaxacala, Durango, Edo de Mexico, Hidalgo, Puebla, Federal District), US (North Dakota, South Dakota-Eastern, Nebraska-Eastern, Kansas-Eastern, Minnesota, Iowa, Missouri, Wisconsin, Illinois, Michigan-Western Upper Peninsula, Oklahoma, Texas, Arkansas, Louisiana, Indiana-Southwestern, Indiana-Northwestern, Kentucky-Western, Tennessee-Western, Mississippi, Florida-Far Western)
WSAM	Western South America	Columbia, Ecuador, Peru
WCAR	Western Caribbean	Cayman Islands, Grand Cayman, Haiti, Jamaica, Panama
SOU	Southampton Canada	Canada (Nunavut-Southampton)
IDA	Indiana	US (Indiana)
EST	North American Eastern	Canada (Nunavut-Eastern, Quebec, Ontario-Eastern), Turks and Caicos Islands, US (Michigan, New York, Maine, New Hampshire, Vermont, Massachusetts, Connecticut, Rhode Island, Indiana-Southeastern, Kentucky-Eastern, Tennessee-Eastern, Ohio, Pennsylvania, Virginia, North Carolina, New Jersey, Delaware, Maryland, Washington DC, West Virginia, Alabama, South Carolina, Georgia, Florida)
CUB	Cuba	Cuba
BAH	Bahamas	Bahamas
ACR	Acre Brazil	Brazil (Acre)

Table 2-2   Time zone Localities (continued)

ID	Description	Locality Served
SAM	Central South America	Argentina (Mendoza, San Juan), Bolivia, Brazil (Amazonas, Rondonia, Roraima, Mato Grosso, Para-West, Mato Grosso Do Sul), Guyana, Venezuela
PAR	Paraguay	Paraguay
FI	Falkland Islands	UK (Falkland Islands)
CHI	Chile	Chile
CG	Central Greenland	Denmark (Central Greenland)
CAR	Caribbean	Anguilla, Antigua and Barbuda, Aruba, Barbados, British Virgin Islands, Dominican Republic, Dominica, Grenada, Guadeloupe, Martinique, Montserrat, Netherlands Antilles, Puerto Rico, St.Kitts and Nevis, St. Lucia, St Vincent and The Grenadines, Trinidad and Tobago, US Virgin Islands
ATL	North American Atlantic	Bermuda, Canada (Labrador, New Brunswick, Nova Scotia, Prince Edward Island)
NWF	Newfoundland Canada	Canada (Newfoundland)
ELAB	Eastern Labrador Canada	Canada (Labrador-Far Eastern)
SPM	St Pierre and Miquelon	France (St Pierre and Miquelon)
SBRZ	Southern Brazil	Brazil (Minas Gerais, Goias, Distrito Federal, Parana, Espirito Santo, Rio De Janeiro, Sao Paulo, Rio Grande Do Sul, Santa Catarina)
ESAM	Eastern South America	French Guiana, Suriname, Uruguay, Brazil (Para-Eastern, Amapa, Maranhao, Tocantins, Piaui, Ceara, Rio Grande Do Norte, Paraiba, Alagoas, Sergipe, Bahia), Argentina (Buenos Aires, Catamarca, Chaco, Chubut, Cordoba, Corrientes, Entre Rios, Formosa, Jujuy, La Pampa, La Rioja, Misiones, Neuquen, Rio Negro, Salta, San Luis, Santa Cruz, Santa Fe, Santiago del Estero, Tierra del Fuego, Tucuman)
EG	Eastern Greenland	Denmark (Greenland-Eastern)
EBRZ	Eastern Brazil	Brazil (Pernambuco, Fernando de Noronha)
FEG	Far Eastern Greenland	Denmark (Greenland-Far Eastern)
CV	Cape Verde	Cape Verde
AZO	Azores	Portugal (Azores)
ICE	Iceland	Iceland

Timezone Recommendations

lists recommended timezones per region.

⚠️

Caution   Do not use settings like GMT_MINUS5 or GMT_PLUS5.

If your timezone is not listed, please contact your Cisco representative.

Table 2-3   Timezone Recommendations

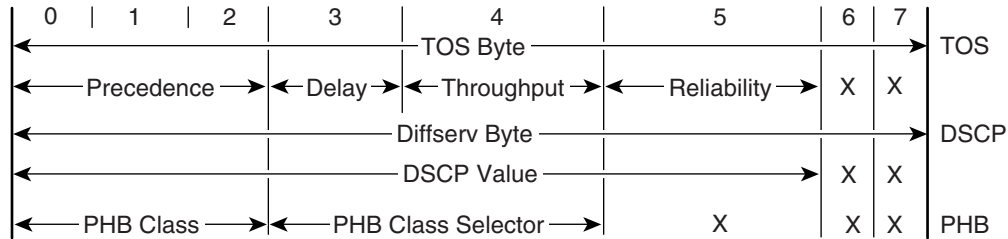| BTS Setting	Solaris Setting
US_ALASKA	US/Alaska
US_ALEUTIAN	US/Aleutian
US_ARIZONA	US/Arizona
US_CENTRAL	US/Central Use this instead of CST or CDT.
US_EAST_INDIANA	US/East-Indiana
US_EASTERN	US/Eastern Use this instead of EST or EDT.
US_HAWAII	US/Hawaii
US_MICHIGAN	US/Michigan
US_MOUNTAIN	US/Mountain Use this instead of MST or MDT.
US_PACIFIC	US/Pacific Use this instead of PST or PDT.
US_SAMOA	US/Samoa
Canada	
CANADA_ATLANTIC	Canada/Atlantic Use this instead of AST or ADT.
CANADA_EAST_SASKATCHEWAN	Canada/East-Saskatchewan
CANADA_MOUNTAIN	Canada/Mountain
CANADA_PACIFIC	Canada/Pacific
CANADA_CENTRAL	Canada/Central
CANADA_EASTERN	Canada/Eastern
CANADA_NEWFOUNDLAND	Canada/Newfoundland
CANADA_YUKON	Canada/Yukon

TOS, DSCP, and PHB

This section describes how BTS supports Type of Service (TOS), Differentiated Services Codepoint (DSCP), and Per-Hop Behavior (PHB). For more information, see the following IETF documents:

- TOS—*RFC 791, Internet Protocol*

- DSCP—*RFC 2474, Definition of the Differentiated Services Field (DS Field) in the IPv4 and IPv6 Headers*

- PHB—*RFC 2597, Assured Forwarding PHB Group*, and *RFC 3246, An Expedited Forwarding PHB (Per-Hop Behavior)*

Figure 2-1 shows how the TOS, DSCP, and PHB standards are related.

Figure 2-1   Relationship of TOS, DSCP, and PHB Standards

On the BTS, the parameters for TOS, DSCP, and PHB are provisioned differently depending on the token.

⚠️
Caution   Restart or swtichover the CA to effect changes you make in the ca-config table.

TOS

If the BTS requires TOS parameters as precedence strings, provision tokens as follows:

- PRECEDENCE = NETCONTROL, INTERNETCONTROL, CRITICAL, FLASHOVERRIDE, FLASH, IMMEDIATE, PRIORITY, or ROUTINE
- LOWDELAY = Y or N
- THROUGHPUT = Y or N
- RELIABILITY = Y or N

Diffserv

If the BTS requires Diffserv parameters as bytes, provision a single token as an integer, 0 - 255. The Diffserv byte is based on 8 bits, 2 more bits than the DSCP value. For example, if you want a DSCP value of 24, provision it with 96.

DSCP

If the system requires parameters to be provisioned in the DSCP value format, provision a single token as an integer between 0 and 63. The DSCP value is the decimal equivalent of the first 6 bits of the Diffserv byte.

PHB

If the system requires parameters to be provisioned in the PHB format, provision a single token as one of the following values: CS0, CS1, CS2, CS3, CS4, CS5, CS6, CS7, AF11, AF12, AF13, AF21, AF22, AF23, AF31, AF32, AF33, AF41, AF42, AF43, EF, DEFAULT.

Note Entering the value "DEFAULT" has the same effect as entering "CS0." These values are included in Table 2-5.

Combined PHB/DSCP Format

Some tokens can be provisioned in either the alphanumeric PHB format or the numeric DSCP value format. In this case provision the token as one of the following values: an integer between 0 and 63, CS0, CS1, CS2, CS3, CS4, CS5, CS6, CS7, AF11, AF12, AF13, AF21, AF22, AF23, AF31, AF32, AF33, AF41, AF42, AF43, EF, DEFAULT.

Refer to RFC 791 for additional information on the PRECEDENCE values. The relationship between PRECEDENCE and CSx values is as follows: NETCONTROL=CS7, INTERNETCONTROL=CS6, CRITICAL=CS5, FLASHOVERRIDE=CS4, FLASH=CS3, IMMEDIATE=CS2, PRIORITY=CS1, ROUTINE=CS0/DEFAULT.

Allowed and Default Values

This section lists the provisionable TOS, DSCP, and PHB tokens applicable to each protocol.

Caution Cisco recommends against using any value other than the default. Changing these values from their defaults can significantly impact network performance. Contact Cisco TAC for further information.

Caution If you change any parameters in the ca-config table, these changes do not take effect until the CA platform switches over or restarts.

MGCP Signaling

The MGCP-SIG-DSCP parameter from the CA_CONFIG table is used for signaling between the BTS 10200 and MGWs.

SIP Signaling

The SIA-TRUNK-GRP-LEVEL-SIG-TOS parameter from the CA_CONFIG table applies to SIP signaling. For its changes to take effect, you must performa switchover.

- Y: Use the value provisioned for SIP-SIG-DSCP in the SIP-ELEMENT table for the applicable SIP trunk group.
- N: Use the value provisioned for the system-wide parameter SIA-SIG-DSCP in the CA-CONFIG table.

The SIA-SIG-DSCP parameter from the CA_CONFIG table defines system-level DSCP for SIP calls.

The SIP-SIG-DSCP parameter in the SIP_ELEMENT table applies to trunk-level SIP signaling.

CA to FS Signaling

TheSIM-SIG-DSCP parameter from the CA_CONFIG table applies.

FS to CA Signaling

The following values from the CA_CONFIG table apply:

- The FSAIN-SIG-DSCP value is used for internal AIN Feature Server (FSAIN) to CA signaling.
- The FSPTC-SIG-DSCP value is used for internal POTS/Tandem/Centrex Feature Server (FSPTC) to CA signaling.

DQoS Signaling

DQoS signaling uses the Common Open Policy Service (COPS) protocol. The RTP-DSCP from the QOS table applies.

H.323 Signaling

The SIG-DSCP parameter from the H323_GATEWAY table applies.

COPS and RADIUS Signaling

This section lists the tokens used in provisioning COPS and RADIUS signaling from the QOS and CA_CONFIG tables.

Tip   The tokens in this section are provisioned using values between 0 and 255. For an explanation of how to calculate these values, see the "Diffserv" section on page 2-16.

The QOS table contains the following token (applicable to voice traffic):

- DQOS-CMTS-DSCP-TOS—This value is used for the packets about to enter a provider backbone from the CMTS.
- DQOS-DSCP-TOS-BITMASK—This token specifies particular bits within the IPv4 DSCP/TOS byte.
- DOCSIS-DSCP-TOS—Identifies the DSCP/TOS value that must be matched for packets to be classified onto the IP flow.
- DOCSIS-DSCP-TOS-BITMASK—This token determines what bits in the DSCP/TOS byte are to be used as filters in classifying packets.

Table 2-4 lists the allowed values and default value for each of these tokens.

Table 2-4   COPS Signaling Parameters (from QoS Table)

Token	Allowed Values	Default Value
DQOS-CMTS-DSCP-TOS	0–255	160
DQOS-DSCP-TOS-BITMASK	0–255	224
DOCSIS-DSCP-TOS	0–255	160
DOCSIS-DSCP-TOS-BITMASK	0–255	224

The following parameters from the CA_CONFIG table apply:

- COPS-DSCP-TOS—This value is used for the signaling packets on COPS interfaces between the CMS and the CMTS.

- RADIUS-DSCP-TOS—This value is used for the signaling packets on RADIUS interfaces between the CMS and the RKS, and the CMS and the DF server.

Table 2-5 lists the allowed value and default value for each of these tokens.

Table 2-5   COPS and RADIUS Signaling Parameters (from CA-CONFIG Table)

Value	Allowed Values	Default Value
COPS-DSCP-TOS	0–255	96
RADIUS-DSCP-TOS	0–255	96

Stream Control Transmission Protocol Signaling

The SCTP-DSCP parameter from the CA_CONFIG table applies. Table 2-6 lists the allowed values and default value for this token.

Table 2-6   SCTP-DSCP Signaling Parameters (from CA-CONFIG Table)

Token	Allowed Values	Default Value
SCTP-DSCP	DEFAULT, CS1, CS2, CS3, CS4, CS5, CS6, CS7, AF11, AF12, AF13, AF21, AF22, AF23, AF31, AF32 AF33, AF41, AF42, AF43, EF	CS3

Note   The value "DEFAULT" is mapped to a value of "CS0" as shown in Table 2-5.

ISDN Signaling

The following parameters from the BACKHAUL_SET table apply:

- SIG-TOS-LOWDELAY

- SIG-TOS-PRECEDENCE

- SIG-TOS-RELIABILITY

- SIG-TOS-SUPP—Allowed values are Y/N; default is N.

- SIG-TOS-THROUGHPUT

Table 2-7 lists the allowed values and default value for the -PRECEDENCE, -LOWDELAY, -THROUGHPUT, and -RELIABILITY tokens.

Table 2-7   SIG-TOS Values (from BACKHAUL-SET Table)

Token	Allowed Values	Default Value
SIG-TOS-LOWDELAY	Y/N	N
SIG-TOS-PRECEDENCE	NETCONTROL	CRITICAL
	INTERNETCONTROL	
	CRITICAL	
	FLASHOVERRIDE	
	FLASH	
	IMMEDIATE	
	PRIORITY	
	ROUTINE	
SIG-TOS-RELIABILITY	Y/N	N
SIG-TOS-THROUGHPUT	Y/N	N

Mapping of Provisionable TOS, DSCP, and PHB Values

Table 2-8 shows how the provisionable values in the PHB format are mapped to the values in TOS and DSCP formats.

⚠

Caution   Cisco recommends using the combinations of values in the table. BTS accepts other combinations, depending on format; however, the combinations shown have been tested by Cisco.

✎

Note   Binary and Hex values are informational and not used for provisioning.

Table 2-8   Mapping of Provisionable Values in PHB Format to TOS and DSCP Formats[1]

Value in PHB Format	Value of TOS PRECEDENCE Bits			Other Provisionable TOS Bits			Binary	DSCP Value Format	Diffserv Byte Format	Hex Value [2]
	Binary [3]	TOS String Format, Based On RFC 791	TOS Integer Format	D [4]	T	R				
CS0 or DEFAULT	000	ROUTINE	0	N	N	N	000 000 00	0	0	0x0

Table 2-8   *Mapping of Provisionable Values in PHB Format to TOS and DSCP Formats[1] (continued)*

Value in PHB Format	Value of TOS PRECEDENCE Bits		TOS Integer Format	Other Provisionable TOS Bits			Binary	DSCP Value Format	Diffserv Byte Format	Hex Value [2]
	Binary [3]	TOS String Format, Based On RFC 791		D [4]	T	R				
CS1	001	PRIORITY	1	N	N	N	001 000 00	8	32	0x20
AF11				N	Y	N	001 010 00	10	40	0x28
AF12				Y	N	N	001 100 00	12	48	0x30
AF13				Y	Y	N	001 110 00	14	56	0x38
CS2	010	IMMEDIATE	2	N	N	N	010 000 00	16	64	0x40
AF21				N	Y	N	010 010 00	18	72	0x48
AF22				Y	N	N	010 100 00	20	80	0x50
AF23				Y	Y	N	010 110 00	22	88	0x58
CS3	011	FLASH	3	N	N	N	011 000 00	24	96	0x60
AF31				N	Y	N	011 010 00	26	104	0x68
AF32				Y	N	N	011 100 00	28	112	0x70
AF33				Y	Y	N	011 110 00	30	120	0x78
CS4	100	FLASHOVERRIDE	4	N	N	N	100 000 00	32	128	0x80
AF41				N	Y	N	100 010 00	34	136	0x88
AF42				Y	N	N	100 100 00	36	144	0x90
AF43				Y	Y	N	100 110 00	38	152	0x98
CS5	101	CRITICAL	5	N	N	N	101 000 00	40	160	0xA0
EF				Y	Y	N	101 110 00	46	184	0xB8
CS6	110	INTERNETWORK CONTROL	6	N	N	N	110 000 00	48	192	0xC0
CS7	111	NETWORK CONTROL	7	N	N	N	111 000 00	56	224	0xE0

1.Cisco recommends that you use the combinations of values shown in the table. The system will accept certain other combinations of values, depending on the format; however, the combinations shown in the table have been tested by Cisco for proper behavior.

2.Hexadecimal equivalent. This value is listed for convenience. It is not used in provisioning the BTS.

3.Binary equivalent. This value is listed for convenience. It is not used in provisioning the BTS.

4.D = Delay, T = Throughput, R = Reliability. To provision these tokens, enter N for 0 or Y for 1.