Cisco ATA-Supported MGCP Services

This section provides information about basic and additional MGCP services that the Cisco ATA supports:

- Important Basic MGCP Services, page 4-2—This section includes a list of parameters that you must configure in order for the Cisco ATA to function in a MGCP environment.
- Additional MGCP Services, page 4-3—This section contains information about additional, commonly used MGCP features, with references to the parameters for configuring these services.
- Complete Reference Table of all Cisco ATA MGCP Services, page 4-5—This section contains a complete listing of Cisco ATA services supported for MGCP, and includes cross references to the parameters for configuring these services. This section includes services not described in the sections about the key basic MGCP services and the commonly used additional MGCP services.
- Supported MGCP Connection Modes, page 4-7—This section provides a list of MGCP connection modes that the Cisco ATA supports.
- Supported Local Connection Options, page 4-7—This section provides a list of local connection options that the Cisco ATA supports for the MGCP LocalConnectionOption parameter.
- Supported Signals and Events, page 4-7—This section lists MGCP software packages that the Cisco ATA supports.
- Commands Supported with MGCP, page 4-10—This section lists the commands that the Cisco ATA supports for communication with the MGCP Call Agent.

Note For detailed information about these MGCP features and commands, refer to the MGCP Call Agent documentation from the service provider.

Note The term *Cisco ATA* is used throughout this manual to refer to both the Cisco ATA 186 and the Cisco ATA 188, unless differences between the Cisco ATA 186 and Cisco ATA 188 are explicitly stated.

Important Basic MGCP Services

This section provides descriptions and cross references for configuring required MGCP parameters and also for configuring other MGCP services:

- Required Parameters, page 4-2
- Setting the Codec, page 4-2
- Configuring Refresh Interval, page 4-2

Required Parameters

You must configure the following parameters for the Cisco ATA to work properly in MGCP mode:

- UseMGCP, page 5-10—This parameter must be set to 1 for MGCP mode. (Its default is 0—for SCCP mode.)
- EPID0orSID0 and EPID1orSID1, page 5-8—Use these parameters to specify the alphanumeric endpoint identifiers assigned to the port 0 (called **Phone 1** on the Cisco ATA) and port 1 (**Phone 2)** Cisco ATA FXS ports, respectively. The default dot (.) value of these parameters means that the Cisco ATA uses the standard MGCP naming convention for endpoints. For EPID0orSID0, the default endpoint name is *aaln/0;* for EPID1orSID1, the default endpoint name is *aaln/1*.

  The complete endpoint identifier sent to the Call Agent has the format:

  <EPID*x*>@<ip_addr>

  where *x* is port 0 or port 1 of the Cisco ATA, and ip_addr is the IP address of the MGCP endpoint.

  For more information about endpoints and connections, see the "Endpoints and Connections" section on page 4-3.

Note Setting the EPID0orSID0 and EPID1orSID1 parameters to 0 will not disable the phone lines.

- CA0UID, page 5-11—Set this parameter to the IP address or URL of the primary Call Agent. This parameter can also include a port number (default port is 2727). Separate the IP address from the port with a colon (:).

Note See Chapter 5, "Parameters and Defaults," for additional information about all Cisco ATA parameters.

Setting the Codec

The LBRCodec (low-bit-rate codec) parameter determines whether the G.723 or G.729A codec, in addition to G.711A-law and G.711µ-law, can be used for receiving and transmitting. For configuration information, see the "LBRCodec" section on page 5-14.

Configuring Refresh Interval

When the value specified in the CfgInterval parameter is reached, the Cisco ATA attempts to refresh its configuration file from the TFTP server. By opening a web page for the Cisco ATA, you can perform a refresh before the scheduled refresh. Set the CfgInterval parameter to an interval value (in seconds) for

refreshing the Cisco ATA configuration file. Cisco recommends that the interval be semi-random to prevent many simultaneous contacts with the TFTP server. For more information, see the "CfgInterval" section on page 5-5.

When the Cisco ATA contacts the TFTP server, it also checks to see if an upgrade signaling image has been placed on the TFTP server. If such an image exists, the Cisco ATA will download this image.

Additional MGCP Services

This section provides information about MGCP features that the Cisco ATA supports as well as descriptions of Cisco ATA behavior in an MGCP environment. This section contains the following topics:

- Endpoints and Connections, page 4-3
- MGCP Endpoint Device Type, page 4-4
- Call Agent Redundancy with Configuration Parameters, page 4-4
- Cisco ATA Registration Process with MGCP, page 4-4

Endpoints and Connections

The Cisco ATA has two telephone Foreign Exchange Station (FXS) ports. These ports are called port 0 and port 1. Port 0 is labeled **Phone 1** on the Cisco ATA and port 1 is labeled **Phone 2**. Each port is an MGCP endpoint: Port 0 is MGCP endpoint 0, and port 1 is MGCP endpoint 1. The configurable parameters for MCGP endpoints are as follows:

- EPID0orSID0—for MGCP endpoint 0 (see the "EPID0orSID0 and EPID1orSID1" section on page 5-8).
- EPID1orSID1—for MGCP endpoint 1 (see the "EPID0orSID0 and EPID1orSID1" section on page 5-8).

Each MGCP endpoint supports one device, either an analog phone set or a fax machine, and up to two connections per device are allowed.

Each connection has a fixed ID, either 0, 1, 2, or 3. Connection IDs 0 and are 2 assigned to MGCP endpoint 0, and connection IDs 1 and 3 are assigned to MGCP endpoint 1.

The IP address of each MGCP endpoint identifier can be enclosed by square brackets by setting Bit 20 of the ConnectMode, enabling the use of square brackets. The use of brackets is disabled by default. (For more information, see the "ConnectMode" section on page 5-16.)

Example

This example shows an EPID1orSID1 parameter value with brackets around the IP address of the endpoint:

```
aaln/1@[128.107.139.111]
```

MGCP Endpoint Device Type

To request the device type from the Cisco ATA, the Call Agent must use the following syntax in the RequestedInfo (F:) parameter line of an AUEP command:

```
F: X-UA
```

The Cisco ATA responds with the following device-type:

```
X-UA: Cisco/ATA186
```

Call Agent Redundancy with Configuration Parameters

Call Agent (CA) redundancy is supported in two ways. You can use the following sets of parameters to configure the primary and secondary CA IP addresses or URLs:

- CA0orCM0, page 5-9, and CA0UID, page 5-11
- CA1orCM1, page 5-9, and CA1UID, page 5-11

If the CA is identified with the format CallAgentName@HostName, enter the CA name in the CAxUID parameter and enter the HostName in the CAxorCMx parameter (x is 0 or 1).

If the CA is identified using a URL, enter the URL in the CAxorCMx parameter. An optional port number can also be entered in the format CAxorCMx:Port# (x is 0 or 1).

When the Cisco ATA power ups or performs a configuration update, it tries to contact the primary CA at CA0orCM0. If there is no response or the address is not reachable, the Cisco ATA then tries to contact the secondary CA. The Cisco ATA continues to alternate attempts to contact the primary and secondary CAs until it gets a response.

If the CAxorCMx parameter is configured with a URL, the Cisco ATA contacts the DNS server to resolve the name. The Cisco ATA accepts up to four IP addresses from the DNS server. During operation, if contact is lost between the Cisco ATA and its CA, the Cisco ATA uses an exponential timeout period on each attempt to reach the CA at the IP addresses. The Cisco ATA cycles through the IP addresses until it gets a response.

Cisco ATA Registration Process with MGCP

When the Cisco ATA powers up, each MGCP endpoint is in a *disconnected* state. The Cisco ATA sends a Restart in Progress (RSIP) command for each MGCP endpoint to the preconfigured Call Agent using one of the following syntax definitions, selected by using Bit 24 in the ConnectMode parameter (see the "ConnectMode" section on page 5-16):

Syntax Type 1

```
RSIP EPID0@ip_address MGCPVersion
RM: restart
```

and

```
RSIP EPID1@ip_address MGCPVersion
RM: restart
```

Syntax Type 2

```
RSIP *@ip_address MGCPVersion
RM: restart
```

Upon a successful response from the Call Agent to the RSIP command, the Cisco ATA places each MGCP endpoint into the *connected* state and resumes normal operation. Destinations of subsequent Cisco ATA commands to the Call Agent are set according to the NotifyEntity header. Call Agent responses are always sent to the source address of the origin of the command.

If the Cisco ATA does not receive a Call Agent response to a subsequent command when the maximum number of retransmissions of the command times out, the Cisco ATA puts both Call Agent endpoints back into the *disconnected* state. The Cisco ATA then sends RSIP messages to the destinations indicated in the NotifyEntity header. This is shown in the following example:

RSIP Message for Disconnect State

```
RSIP *@ip_address MGCPVersion
RM: disconnected
```

Complete Reference Table of all Cisco ATA MGCP Services

Table 4-1 is a reference table that lists all configurable features for the Cisco ATA (using MGCP), and includes links to the detailed descriptions of the parameters used for configuring these features.

Table 4-1 Configurable Features and Related Parameters for MGCP

Configurable Feature	Related Parameter
Caller ID format	CallerIdMethod, page 5-18
Call waiting	SigTimer, page 5-22
Cisco Discovery Protocol—disabling	OpFlags, page 5-21
Codec—Specify default preferred codec	PrfCodec, page 5-15
Codec names to use in LocalConnectionOption command	CodecName, page 5-13
Configuration-update interval	CfgInterval, page 5-5
DHCP usage—disabling	DHCP, page 5-7
Debug messages—configuring host	NPrintf, page 5-29
Domain name server	DNS1IP, page 5-18
Domain name of endpoint ID	Domain, page 5-19
Dual Tone Multi-frequency (DTMF) method	AudioMode, page 5-16
Encryption	EncryptKey, page 5-6
Endpoint-identifier specification	EPID0orSID0 and EPID1orSID1, page 5-8 (Also see the "Endpoints and Connections" section on page 4-3.)
Fax CED tone detection Fax CNG tone detection	AudioMode, page 5-16
Fax pass-through	AudioMode, page 5-16 ConnectMode, page 5-16

Table 4-1 Configurable Features and Related Parameters for MGCP (continued)

Configurable Feature	Related Parameter
G.711 codec	AudioMode, page 5-16
G.711 silence suppression	AudioMode, page 5-16
Hook-flash event time requirements	SigTimer, page 5-22
ID of primary Call Agent	CA0orCM0, page 5-9
ID of secondary Call Agent	CA1orCM1, page 5-9
Listening port for MGCP commands	MGCPPort, page 5-12
Low bit-rate codec selection	LBRCodec, page 5-14
MGCP mode enabled	UseMGCP, page 5-10
MGCP version string identifier	MGCPVer, page 5-11
Mid-call service style—Bellcore, Cisco VG248 or Cisco ATA	ConnectMode, page 5-16
Named Signaling Event (NSE) payload number	ConnectMode, page 5-16
Registration	ConnectMode, page 5-16 (Also see the "Endpoints and Connections" section on page 4-3 and the "Cisco ATA Registration Process with MGCP" section on page 4-4.)
Ring-cadence pattern	RingCadence, page 5-23
Real-Time Transfer Protocol (RTP) media port	MediaPort, page 5-30
Real-Time Transfer Protocol (RTP) packet size	NumTxFrames, page 5-20
Retransmission interval for MGCP commands	RetxIntv, page 5-12
Retransmission of commands—Maximum number of times to retransmit	RetxLim, page 5-12
Secondary domain name server	DNS2IP, page 5-19
Static network router probe	OpFlags, page 5-21
TFTP file—Set to not use internally generated name	OpFlags, page 5-21
Tones: BusyTone, CallWaitTone ConfirmTone, DialTone, ReorderTone, and RingBackTone parameters	Call-Progress Tone Parameters, page 5-24
Tracing	TraceFlags, page 5-30
UDP packet default IP precedence	UDPTOS, page 5-20
VLAN encapsulation	OpFlags, page 5-21
VLAN 802.1Qtags VLAN UDP and TCP COS fields	OpFlags, page 5-21
VLAN mode	OpFlags, page 5-21
Web configuration—disallowing	OpFlags, page 5-21

Supported MGCP Connection Modes

The Cisco ATA supports the following MGCP connection modes:

- SendOnly
- RecvOnly
- SendRecv
- Inactive
- Confrnce

Supported Local Connection Options

The Cisco ATA supports the following local connection options for the MGCP LocalConnectionOption parameter:

- Codec type: a
- TOS: t
- Packet size: p
- Echo canceller: e
- Silence suppression: s

The LocalConnectionOption parameter is used as "L:" in an MGCP message. The "L:" parameter provides information for the connection, such as packetization period, codec to use, turning echo cancellation on and off, and turning silence suppression on and off.

Related CIsco ATA Parameter

CodecName, page 5-13—Use this parameter to specify the encoders and decoders to use in the LocalConnectionOption parameter.

Supported Signals and Events

The Cisco ATA supports the following persistent events:

- On-hook transition (hu)
- Off-hook transition (hd)
- Hookflash (hf)

The Call Agent must request all other notified events:

- E: Event
- ES: Event with auditable event state
- BR: Brief signal
- OO: On/off signal
- TO: Timeout signal
- C: Event or signal applicable to a connection

Note By default, hu, hd, and hf are set as persistent events. These events can be disabled by setting bits 18 and 19 in the Cisco ATA ConnectMode parameter. For more information, see the "ConnectMode" section on page 5-16.

The applicable signals and events are included in the following sections, which show the software packages of commands that the Cisco ATA supports:

- NCS 1.0 L-Package Supported by the Cisco ATA with MGCP, page 4-8
- MGCP 0.1-1.0 L-Package Supported by the Cisco ATA with MGCP, page 4-9
- MGCP 0.1-1.0 G-Package Supported by the Cisco ATA with MGCP, page 4-9
- MGCP 0.1-1.0 D-Package Supported by the Cisco ATA with MGCP, page 4-10

NCS 1.0 L-Package Supported by the Cisco ATA with MGCP

Table 4-2 Network-Based Call Signaling (NCS) 1.0 L-Package

Code	Description	Type
0-9,*,#, A, B, C, D	Dual tone multifrequency (DTMF) tones	E, BR
bz	Busy tone	TO
cf	Confirmation tone	BR
ci (ti, nu, na)	Caller ID (on-hook or off-hook)	BR
dl	Dial tone	TO
ft	Fax answer tone (2100 Hz)	E
hd	Off-hook transition	ES
hf	Hookflash	E
hu	On-hook transition	ES
l	DTMF long-duration	E
ld	Long-duration connection	E, C
mwi	Message-waiting indication tone	TO
oc	Operation complete	E
of	Operation failed	E
ot	Off-hook warning	TO
r0-r7	Distinctive ringing	TO
rg	Ringing	TO
ro	Reorder tone	TO
rs	Ring splash	BR
rt	Ringback tone	TO, C
sl	Intermittent dial tone	TO
t	Timer (DTMF input)	E

Table 4-2 Network-Based Call Signaling (NCS) 1.0 L-Package (continued)

Code	Description	Type
wt1, wt2, wt3, wt4	Call-waiting tone	TO
x	DTMF tones wildcard	E

MGCP 0.1-1.0 L-Package Supported by the Cisco ATA with MGCP

Table 4-3 MGCP 0.1-1.0 L-Package

Code	Description	Type
bz	Busy tone	TO
ci (ti, nu, na)	Caller ID (on-hook or off-hook)	BR
dl	Dial tone	TO
hd	Off-hook transition	ES
hf	Hook flash	E
hu	On-hook transition	ES
mwi	Message-waiting indication tone	BR
nbz	Network busy tone	TO
oc	Operation complete	E
of	Operation failed	E
ot	Off-hook warning	TO
r0-r7	Distinctive ringing	TO
rg	Ringing	TO
ro	Reorder tone	TO
rs	Ring splash	BR
sl, sdl	Intermittent dial tone	TO
wt	Call-waiting tone	TO
wt1, wt2, wt3, wt4	Alternative call-waiting tone	TO

MGCP 0.1-1.0 G-Package Supported by the Cisco ATA with MGCP

Table 4-4 MGCP 0.1-1.0 G-Package

Code	Description	Type
cf	Confirmation tone	BR
cg	Network congestion tone	TO
ft	Fax answer tone (2100 Hz)	E
ld	Long-duration connection	E, C
oc	Operation complete	E

Table 4-4 MGCP 0.1-1.0 G-Package (continued)

Code	Description	Type
of	Operation failed	E
rbk(###)	rt@connection id	TO, C
rt	Ringback tone	TO, C

MGCP 0.1-1.0 D-Package Supported by the Cisco ATA with MGCP

Table 4-5 MGCP 0.1-1.0 D-Package

Code	Description	Type
0-9, *, #, A, B, C, D	DTMF tones	E, BR
l	DTMF long-duration	E
of	Operation failed	E
t	Timer (DTMF input)	E
x	DTMF tones 0-9 wildcard	E

Commands Supported with MGCP

The Cisco ATA supports the following commands for communication with the Call Agent:

- CRCX (Create Connection)
- MDCX (Modify Connection)
- DLCX (Delete Connection)
- RQNT (Notification Request)
- AUEP (Audit Endpoint)
- AUCX (Audit Connection)
- NTFY (Notify)
- RSIP (Restart in Progress)

These commands are included in the following sections, which list various categories of parameters and the commands in which they are used:

- Parameters in Commands Sent to the Call Agent, page 4-11
- Parameters in Responses Sent to the Call Agent, page 4-11
- Parameters in Commands Received from the Call Agent Processed by the Cisco ATA, page 4-12
- Parameters in Responses Received from the Call Agent Processed by the Cisco ATA, page 4-12

Parameters in Commands Sent to the Call Agent

Table 4-6 Parameters in Commands Sent to the Call Agent

Parameter	Usage
ResponseAck	NTFY (notify). Supported for 1.0 and NCS.
RequestIdentifier	NTFY, RQNT
ObservedEvents	NTFY
RestartMethod	RSIP

Parameters in Responses Sent to the Call Agent

Table 4-7 Parameters in Responses Sent to the Call Agent

Parameter	Usage
ConnectionID	CRCX
LocalConnectionDescriptor	CRCX, MDCX
DeviceType	AUEP
CallId	AUCX
Connection Mode	AUCX
Request Identifier	AUEP
Requested Events	AUEP
Signal Requests	AUEP
Notified Entity	AUEP
Digit Map	AUEP
Detect Events	AUEP
Event State	AUEP
Capability	AUEP

Parameters in Commands Received from the Call Agent Processed by the Cisco ATA

Table 4-8 Parameters in Commands Received from the Call Agent Processed by the Cisco ATA

Parameter	Usage
ResponseAck	CRCX, MDCX, DLCX, RQNT, AUEP, AUCX
CallId	CRCX, MDCX, DLCX
ConnectionID	MDCX, DLCX, AUCX
RequestIdentifier	CRCX, MDCX, DLCX, RQNT
LocalConnectionOption	CRCX, MDCX
ConnectionMode	CRCX, MDCX
RequestedEvents	CRCX, MDCX, DLCX, RQNT
SignalRequests	CRCX, MDCX, DLCX, RQNT
NotifiedEntity	CRCX, MDCX, DLCX, RQNT
DigitMap	CRCX, MDCX, DLCX, RQNT
RequestedInfo	AUEP, AUCX
QuarantineHandling	CRCX, MDCX, DLCX, RQNT
DetectEvents	CRCX, MDCX, DLCX, RQNT
RemoteConnectionDescriptor	CRCX, MDCX

Parameters in Responses Received from the Call Agent Processed by the Cisco ATA

Table 4-9 Parameters in Responses Received from the Call Agent Processed by the Cisco ATA

Parameter	Usage
ResponseAck	DLCX, NTFY (1.0, NCS)
NotifiedEntity	RSIP