

# MGCP Toolkit

for decomposed Multimedia Gateways and Gateway Controllers



Softil's MGCP Toolkit was designed to address the requirements of production IP telephony networks that were built using "decomposed" gateways. The MGCP Toolkit implements both the MG and the MGC side of the MGCP protocol. The MGCP Toolkit can seamlessly scale from small-embedded platforms all the way up to densely-populated parallel processing environments.

## Applicable Products

- Softswitches
- Residential gateways
- Trunking gateways
- Access gateways
- IP PBX/IP phones
- Media Control Units/media servers
- IVR announcement servers
- Conference bridges
- Set-top boxes

## MGCP Basics

The Media Gateway Control Protocol (MGCP) was designed to address the requirements of production IP telephony networks that were built using decomposed VoIP gateways. MGCP-based VoIP solutions separate call control (signaling) intelligence and media handling. MGCP functions as an internal protocol between the separate components of a decomposed MGCP-compliant VoIP gateway. More specifically, MGCP is a protocol used by external call control elements, called Media Gateway Controllers (MGCs), to control Media Gateways (MGs). Decomposed MGCP-compliant VoIP gateways appear to the outside as a single VoIP gateway.

Examples of VoIP gateways include:

- Trunking gateways that interface the circuit-switched telephony network to VoIP networks
- Residential gateways that provide traditional analog (RJ11) interfaces to VoIP networks
- Access gateways that provide traditional analog (RJ11) or digital PBX interfaces to VoIP networks
- IVR announcement servers that can provide interactive voice response and announcements to VoIP networks

## MGCP Toolkit Components

Softil's MGCP Toolkit is based on the IETF MGCP specification and supports the PacketCable™ NCS and TGCP profiles. The MGCP Toolkit contains three main components: the MGCP Stack, the SDP Parser/Encoder and the RTP/RTCP Stack.

### MGCP Stack

Implements transport, syntax and semantics of the MGCP protocol. The MGCP Stack complies with the following standards:

- IETF RFC 3435 (MGCP 1.0bis/2705bis)
- IETF RFC 2705 (MGCP 1.0)
- PacketCable™ NCS Profile
- PacketCable™ TGCP Profile

### Session Description Protocol (SDP) Parser/Encoder

A standalone SDP Parser/Encoder, used to describe multimedia session announcement, multimedia session invitation and other forms of multimedia session initiation. The SDP Parser/Encoder complies with the following standards:

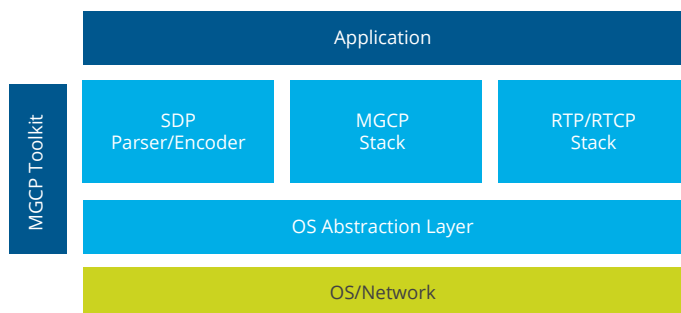
- IETF RFC 2327 (Session Description Protocol)
- IETF RFC 3266 (Support for IPv6 in Session Description Protocol)
- IETF RFC 2848 (PINT Telephone Numbers)
- IETF RFC 3108 (Conventions for the use of SDP for ATM Bearer Connections)

### RTP/RTCP Stack\*

Enables application developers to send and receive real-time voice, video and data over IP networks. The RTP/RTCP Stack complies with the following standards:

- IETF RFC 3550 (RTP: A Transport Protocol for Real-Time Applications)
- IETF RFC 3551 (RTP: Profile for Audio and Video Conferences with Minimal Control)
- IETF RFC 2032 (RTP Payload Format for H.261 Video Streams)
- IETF RFC 2190 (RTP Payload Format for H.263 Video Streams)

### MGCP Toolkit Architecture



\*Softil also offers a standalone Advanced RTP/RTCP Toolkit

## MGCP Stack APIs

### Semantic Layer

The Semantic Layer interprets the semantics of MGCP messages, allowing the application to be abstracted from the details of the protocol and thereby accelerating development.

### Endpoint Manager APIs

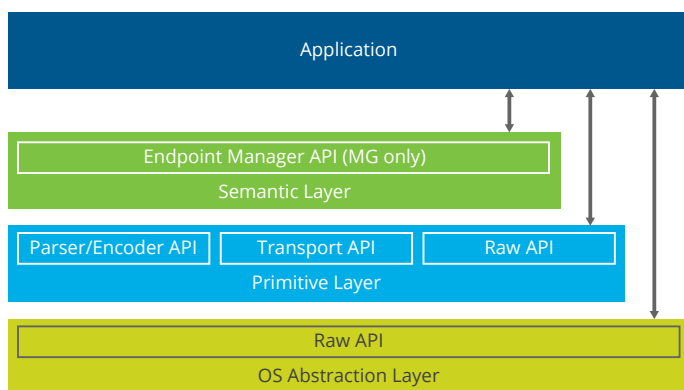
The Endpoint Manager abstracts the MGCP protocol, implements the semantics of the protocol and provides a high-level interface. Media Gateway applications are thus relieved of the tasks of semantic processing, such as Digitmap processing, wildcard matching and so on, as well as of creating, sending, and receiving messages; the Endpoint Manager implements the actual MGCP messaging without the need for the application's participation.

The Endpoint Manager synthesizes MGCP messages based on events reported to it by the application, and invokes callbacks in response to incoming messages. The callbacks indicate to the application when to play signals, connect/disconnect media, and so on.

The Endpoint Manager performs the following semantic processing:

- Quarantine handling
- Wildcard matching
- Digitmap processing
- Automatic audit processing
- Signal scheduling
- Event filtering, triggering and buffering
- Codec negotiation

## MGCP Stack APIs



### Primitive Layer

The Primitive Layer provides the mechanism for encoding and decoding MGCP messages. This layer also performs duplicate transaction removal and transaction retransmission services, and provides a transparent interface to UDP network transports. Developers access the Primitive Layer through the Parser/Encoder API, the Transport API and the Raw API.

### Parser/Encoder API

The Parser/Encoder API provides functions for creating, destroying, accessing and modifying MGCP message fields.

### Transport API

The Transport API provides functions for reliably transporting MGCP messages between MGs and MGCs, including:

- Transaction management
- Entity management
- Retransmission
- Duplicate transaction removal

### Raw API

The Raw API provides the application with the flexibility to access messages in raw MGCP format in the Receive Path or the Send Path.

### OS Abstraction Layer

The OS Abstraction Layer provides platform independence for the other layers, insulating the rest of the Toolkit from OS and processor differences.

The MGCP Toolkit is delivered with:

- Source code (ANSI C)
- Sample MG and MGC application
- Analog phone simulator
- SNMP network management client
- Log Viewer utility
- Release notes
- Complete documentation

## Enhanced Features

### Endpoint Manager

The Endpoint Manager implements the semantics of the MGCP protocol. The API greatly simplifies the development of media gateways by reducing the number of API calls an application developer needs to learn and use.

### Highly Scalable

The MGCP Stack was specifically designed to scale from small-embedded environments to large multi-processor systems supporting thousands of endpoints. The MGCP Stack supports multithreading, allowing it to take advantage of parallel processing architectures.

### Blocking and Non-Blocking Interfaces

The Primitive Layer and the Endpoint Manager APIs support blocking and non-blocking operation. Non-blocking operation can greatly improve throughput by eliminating head-of-line blocking.

# MGCP Toolkit

for decomposed Multimedia Gateways and Gateway Controllers

**SOFTIL**  
INNOVATIVE COMMUNICATIONS

## Operating Systems\*\*

- Windows
- Solaris
- Linux
- VxWorks
- Monta Vista Linux
- pSOS
- Nucleus
- INTEGRITY

## Standards Compliance

- IETF RFC 3435 (MGCP 1.0bis/2705bis)
- IETF RFC 2705 (MGCP 1.0)
- PacketCable™ NCS Profile
- PacketCable™ TGCP Profile
- IETF RFC 2327 (Session Description Protocol)
- IETF RFC 3266 (Support for IPv6 in Session Description Protocol)
- IETF RFC 2848 (PINT Telephone Numbers)
- IETF RFC 3108 (Conventions for the use of SDP for ATM Bearer Connections)
- IETF RFC 3550 (RTP: A Transport Protocol for Real-Time Applications)
- IETF RFC 3551 (RTP: Profile for Audio and Video Conferences with Minimal Control)
- IETF RFC 2032 (RTP Payload Format for H.261 Video Streams)
- IETF RFC 2190 (RTP Payload Format for H.263 Video Streams)

## The Softil V<sup>2</sup>oIP MGCP family also includes:

- **Advanced RTP/RTCP Toolkit** - A standalone RTP/RTCP Stack providing IPv4/IPv6, security and advanced functionality.
- **IP Phone Toolkit** - A complete set of building blocks for developin IP phone applications in RTOS or embedded environments.
- **Professional Services** - A full range of design, integration and deployment consulting services.

## MGCP Toolkit Features

- Flexible multiplexing of any codec
- High performance, small footprint
- Object-Oriented Design/ANSI C
- Thread safety
- Proven interoperability
- Multi-threaded, highly scalable across tightly-coupled parallel processors
- Blocking and non-blocking operation
- Supports multiple Stack instances per process space
- IPv4 and IPv6 network support
- Comprehensive failover support via DNS
- Supports both MG and MGC applications
- Helper functions for PacketCable™ NCS and TGCP profiles
- Standard packages support
- Extensible package mechanism
- “Canned” message facility for fast message generation
- Endpoint Manager:
  - Message-less application interface
  - All standard packages
  - Additional proprietary packages (events, signals, and so on) of arbitrary complexity
  - Semantic level processing on the MG, including:
    - Quarantine handling
    - Wildcard matching
    - Digitmap processing
    - Automatic audit processing
    - Signal scheduling
    - Event filtering, triggering and buffering
    - Codec negotiation
- Fully functional sample MG and MGC
- Soft analog phone simulator
- Extensive statistics
- Instrumented for SNMP
- Extensive online documentation

\*\*Inquire about support for other operating systems that may be available

For more information, contact Softil at [info@softil.com](mailto:info@softil.com)

© 2017 Softil, Ltd. All of the company names and/or brand names and/or product names and/or logos referred to in this document, including the name “Softil” and its logo device, are either registered trademarks or trademarks pending registration in accordance with relevant national laws. All rights reserved. Specifications subject to change without notice.

Rev. A | 07/17

  
**SOFTIL**  
INNOVATIVE COMMUNICATIONS