

IMS Megaco/H.248 Toolkit



Designed for decomposed gateway architectures, Softil's highly-scalable Megaco/H.248 Toolkit is a set of software modules for developing Media Gateways or Media Gateway Controller applications. The Megaco/H.248 Toolkit provides all the necessary components for building fully-functional media devices and controllers.

As a driving force behind evolving technologies for IP-centric communications, Softil delivers the broadest and most complete set of V²oIP enabling technologies for real-time Voice and Video over IP. Softil's Megaco/H.248 Toolkit was designed to support interactive multimedia communication using decomposed gateway architectures. The Softil Megaco/H.248 Toolkit is fully compliant with IMS 3GPP, TISPAN, and Packet Cable 2.0 specifications, and is the ideal solution for developing IMS Megaco/H.248 network elements. The Toolkit is part of the Softil IMS Express™ – the Complete IMS Development Suite.

Products developed with the Megaco/H.248 Toolkit include:

- Access/Trunking Gateways
- Residential Gateways
- IMS MRFCs
- IMS MRFPs
- IMS BGFs
- IM-MGWs
- IMS MGCFs
- Softswitches/Call Agents
- IP-PBXs
- IP Phones
- Set-top Boxes
- Media Controllers
- Media Servers
- Interactive Voice Response (IVR)
- Announcement Servers
- Conference Bridges
- vMail Servers
- Call Centers

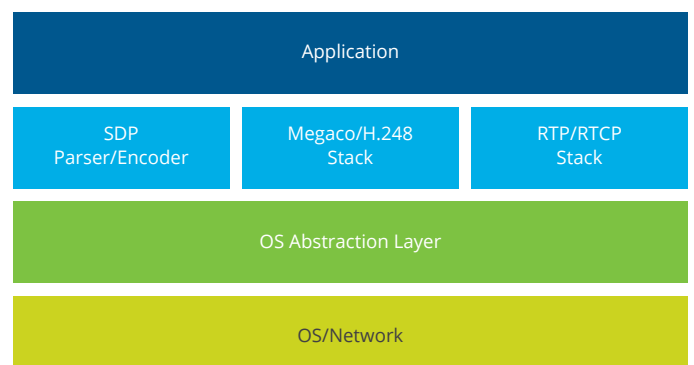
Megaco/H.248 Basics

Megaco/H.248 is the official industry standard protocol for interfacing between external call agents, called Media Gateway Controllers (MGCs) and Media Gateways (MGs). The standard is the result of a collaborative effort between the IETF and ITU standards organizations. It has been accepted industry-wide as the official standard for decomposed gateway architectures, and is sanctioned by both the IETF and the ITU. Megaco/H.248 has also been adopted by the 3GPP, TISPAN, and Packet Cable 2.0 organizations for all media control operations in the IMS architecture.

Megaco/H.248 is logically derived from the MGCP protocol, and enhances MGCP through:

- Support for multimedia and multipoint conferencing enhanced services
- Improved syntax for more efficient semantic message processing
- TCP and UDP transport options
- Formalized extension process for enhanced functionality
- Expanded definition of packages
- Improved security

Megaco/H.248 Toolkit Architecture



Megaco/H.248 Toolkit Enhanced Features

Media Device Manager

The Media Device Manager implements the semantics of the Megaco/H.248 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.

High Scalability

The Megaco/H.248 Stack has been specifically designed to scale from small embedded environments to large multi-processor systems, supporting thousands of endpoints. The Megaco/H.248 Stack also supports multi-threading, allowing it to take advantage of parallel processing architectures.

IPv6

IPv6 networks provide features for resolving many of today's tough VoIP issues, such as NAT traversal, mobility, and QoS. The Megaco/H.248 Stack seamlessly supports IPv6 networks.*

Megaco/H.248 Toolkit Components

Megaco/H.248 Stack

The Megaco/H.248 Stack implements the transport, syntax, and semantics of the Megaco/H.248 protocol. The Megaco/H.248 Stack complies with the following standards:

- ITU-T Recommendation H.248.1 v2 (Gateway Control Protocol, Version 2)
- ITU-T Recommendation H.248.1 v1 (Gateway Control Protocol, Version 1)
- ITU-T Recommendation H.248.8 (Error Codes and Service Change Reason Description)
- ITU-T Recommendation H.248.16 (Enhanced digit collection packages and procedures)
- H.248.1v3, sections 7.2.8, 11.4 and Annex F (Advanced redundancy)
- Announcement Package (H.248.7)
- Message Segmentation (H.248 v3)
- Inactivity Timer (H.248.14)
- Extend Digit Map (H.248.16)
- MGC Storage in Terminations (TS 183 022)
- Notification Regulation (H.248 v3)
- Stream Level Statistic (H.248 v3)
- IETF RFC 3525 (Megaco 1.0)
- IETF RFC 3015 (Megaco 1.0)

Session Description Protocol (SDP) Parser/Encoder

A standalone SDP Parser/Encoder is 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)
- IETF RFC 3266 (Support for IPv6 in Session Description | Protocol)

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 1889 (RTP: A Transport Protocol for Real-Time Applications)
- IETF RFC 1890 (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)
- IETF RFC 2833 (RTP Payload for DTMF Digits, Telephony Tones and Telephony Signals)

*Softil also offers the Advanced RTP/RTCP Toolkit, providing security, IPv6, RFC 3550 and 3551 and other capabilities.

Megaco/H.248 Stack APIs

Semantic Layer

The Semantic Layer interprets the semantics of Megaco/H.248 messages, allowing the application to be abstracted from the details of the protocol and thereby accelerating development.

Media Device Manager API

The Softil Media Device Manager API provides an interface to the Media Device Manager, an innovative component that implements the semantics of the Megaco/H.248 protocol.

The Media Device Manager processes Megaco/H.248 messages and interprets their meaning, thus relieving applications of the complex tasks of message syntax and semantic processing. This reduces application development time and eliminates the need for developers to have in-depth knowledge of Megaco/H.248.

The Media Device Manager implements all of the most difficult semantic operations, including:

- Digit map processing
- Wildcard matching
- Service change state machine
- Lockstep handling
- Event filtering, triggering and buffering
- Signal scheduling
- Audit handling

Primitive Layer

The Primitive Layer provides the mechanism for encoding and decoding Megaco/H.248 messages. This layer also performs duplicate transaction removal and transaction retransmission services, and provides a transparent interface to TCP and UDP network transports. Developers access the Primitive Layer through the Parser/Encoder API, Transport API, and Raw API.

Parser/Encoder API

The Parser/Encoder API provides functions for creating, destroying, accessing and setting message information. Supports pretty text, compact text, and binary encoding schemes.

Transport API

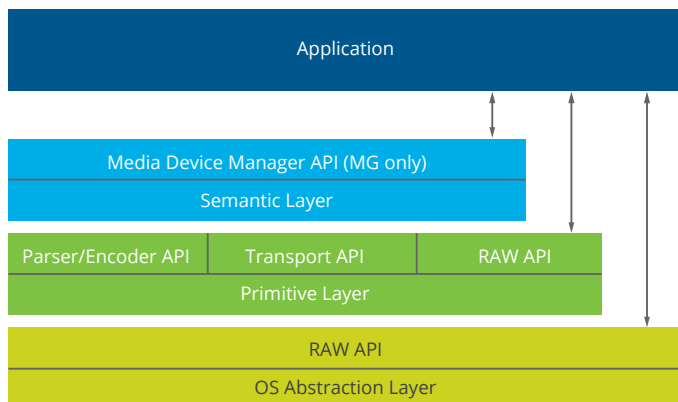
The Transport API provides functions for reliably transporting Megaco/H.248 messages between MGs and MGCS. Supports both UDP/ALF and TCP transports.

Raw API

The Raw API provides the application with the flexibility to access messages in raw Megaco/H.248 format in either the receive path or the send path.

OS Abstraction Layer

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



The Megaco/H.248 Toolkit is delivered with:

- Source Code (ANSI C)
 - A Sample MG and MGC Application
 - A Test Application
 - Release Notes
 - Complete Documentation
 - A Porting Guide
- Operating Systems**
- | | | |
|-----------|--------------------|-------------|
| ■ Windows | ■ VxWorks | ■ pSOS |
| ■ Solaris | ■ Monta Vista | ■ OSE |
| ■ Linux | ■ Linux | ■ Nucleus |
| ■ Tru64 | ■ Wind River Linux | ■ INTEGRITY |

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

Megaco/H.248 Toolkit Features

- High performance/small footprint
- Object Oriented Design/ANSI C
- Thread-safe
- 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
- Supports Transport, Syntax and Semantic processing
- Supports both MG and MGC applications
- Media Device Manager
- Digit map processing
- Wildcard matching
- Service change state machine
- Lockstep handling
- Event filtering, triggering and buffering
- Signal scheduling
- Audit handling
- TCP and UDP transports
- Auto Piggybacking
- Security: Interim AH (MD5, SHA1 or other)
- "Canned" message facility for fast message generation
- Encoding schemes
- Pretty text
- Compact text
- Binary
- SDP Parser/Encoder
- Extensible Package API
- Fully-functional sample MG and MGC
- Extensive documentation

Softil IMS Developer Suite

The Softil Megaco/H.248 Toolkit is part of the IMS Express™, Softil's complete IMS Developer Solution, which includes all the signaling and media Protocol Toolkits and products needed to easily and cost-effectively meet the IMS challenge. The Megaco/H.248 Toolkit works seamlessly with all of Softil's signaling Protocol Toolkits.

Protocol Toolkits

- IMS SIP Developer Suite -IMS SIP Toolkit
 - XDM Toolkit
 - MSRP Toolkit
 - ICE/STUN/TURN NAT Traversal Toolkits
- IMS Megaco/H.248 Toolkit
- IMS Diameter Toolkit
- IMS Advanced-RTP/RTCP Toolkit

IMS Application Server Platform

IMS SIP Server Framework

IMS Client Suite

Standards Compliance

- IETF RFC 3525 (Megaco 1.0)
- IETF RFC 3015 (Megaco 1.0)
- ITU-T Recommendation H.248.1 v2 (Gateway Control Protocol: Version 2)
- ITU-T Recommendation H.248.1 v1 (Gateway control protocol: Version 1)
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