

IMS SIP Toolkit

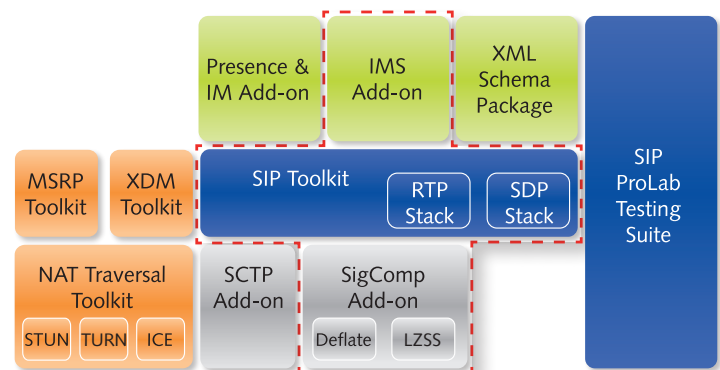


An advanced tool for developing IMS SIP-compliant applications and devices

For Developing IMS SIP Applications

The RADVISION IMS SIP Toolkit is a powerful and highly versatile set of tools to facilitate development of IMS SIP applications while reducing development time and costs. The Toolkit includes all the required components, including an extensive set of quick start sample applications, a GUI test application, and detailed documentation. The IMS SIP Toolkit is fully compliant with IETF, 3GPP, TISPAN, and PacketCable 2.0 specifications.

Part of RADVISION's standard-compliant SIP Developer Suite, the IMS SIP Toolkit is comprised of RADVISION's award-winning SIP Toolkit, IMS Add-On and SigComp Add-On components. The IMS SIP Toolkit is designed to dramatically accelerate development of IMS SIP applications.



--- RADVISION IMS SIP Toolkit

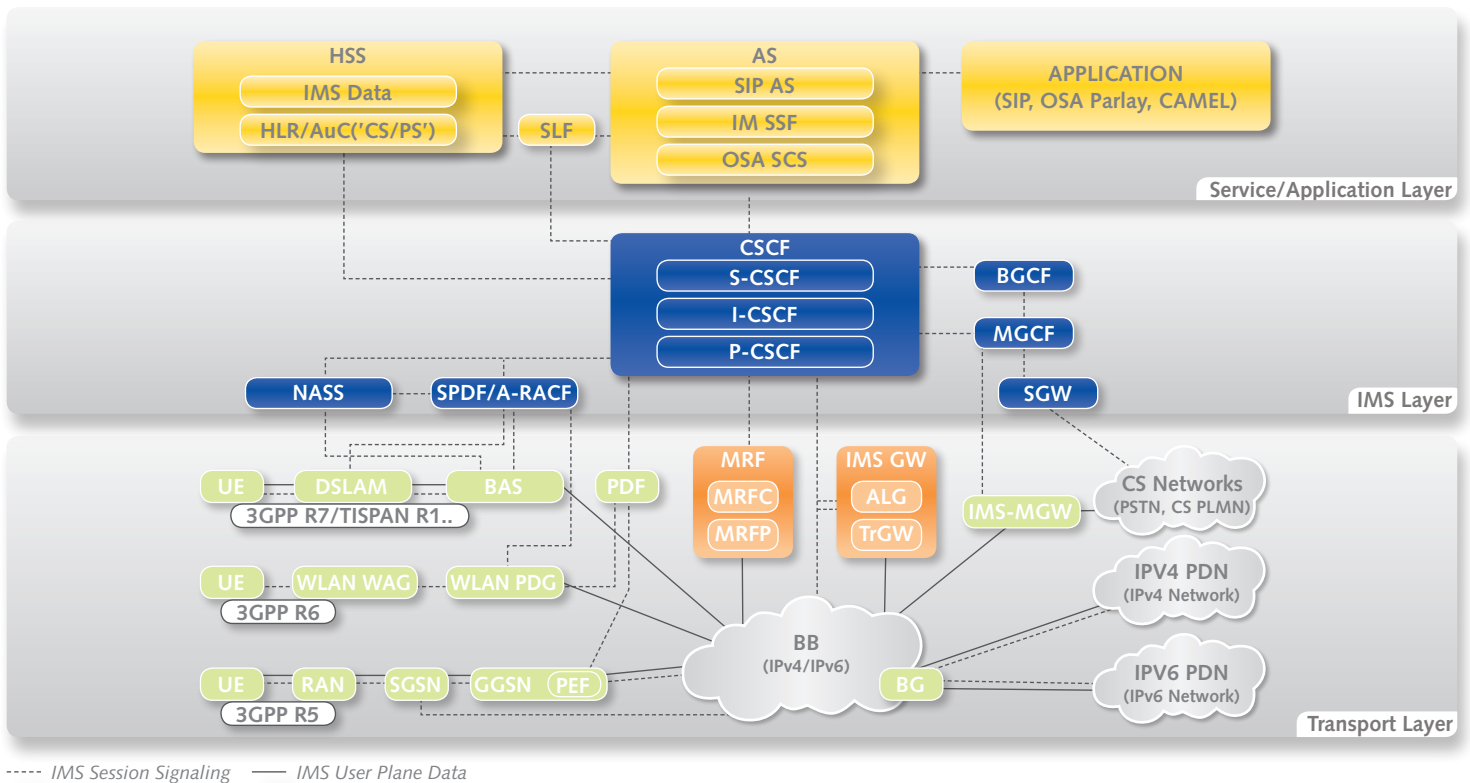
Products developed with the IMS SIP Toolkit

- S-CSCF – Serving Call Session Control Function
- I-CSCF – Interrogating Call Session Control Function
- P-CSCF – Proxy Call Session Control Function
- AS – Application Servers
- UE/UA – User Equipment (3G cellular phones and devices), wireless LAN and Wire line endpoints
- MRFC – Media Resource Function Controller
- MGCF – Media Gateway Control Function
- SGW – Signaling Gateway
- BGCF – Breaking Gateway Control Function
- FMC (Fixed to Mobile Convergence) Systems

A few examples of devices, services and applications that can be developed with the IMS SIP Toolkit:

- Dual mode handsets
- POC (Push to talk over cellular)
- Presence and instant messaging
- Advanced conferencing systems
- Video sharing
- Click-to-Talk

The IMS separates between the access plane and the user plane. The access plane can be a radio access network (RAN) or any other access layer. In the IMS the user plane is actually a Packet Switching network. This level is the transportation plane for all media and signaling, within and outside the IMS network. Above the user plane is the control plane. Entities in this layer control the mediastreams and signaling links between other entities – for example call control and media control. The application level, above the user level, handles delivery of advanced services that require service logic beyond session setup/teardown. IMS separates between entities that provide different network services, as opposed to earlier architectures that lacked this separation. IMS defines unique network entities for call control, service control, resource control, media control and packet switch control.



The Major IMS Entities

Call/session control function [CSCF] – SIP servers that make session or call control and decisions in the IMS network; CSCF uses IMS SIP signaling to control sessions.

Application servers [AS] – Implement service logic, such as in conferencing servers.

IP multimedia media gateway [IM-MGW] – Converts multimedia streams between the PS network and other networks.

Media gateway control function [MGCF] – Controls the IMMGW; IMSSIP enables signaling between CSCF and MGCF.

Signaling gateway [SGW] – Converts signaling between IMS and other signaling systems, such as SS7.

Media resource function processor [MRFP] – Implement service media processing, such as in conferencing servers.

Media resource function controller [MRFC] – Controls the MRFP and IMS SIP, enabling it to interact with the CSCF.

Breaking gateway control function [BGCF] – A SIP server that is used to select the external TDM network and the correct IMS media gateway when IMS sessions are terminated at non-IMS networks.

Home subscriber server [HSS] – Stores subscriber information; the IMS evolution of cellular HLR.

IMS Overview

IMS (IP Multimedia Subsystem) is a SIP-based network that serves as the infrastructure for services, call or session control in advanced networks. IMS deployment is planned for 3G networks, as well as many other types of networks, such as wire line telephony, packet cable, and WiMax. In 3G networks IMS is located above the packet switch (PS) layer, but it can interact with circuit switch (CS) networks and other packet-switched networks like the Internet.

IMS Standardization Process

The IMS network is defined by a set of standards established by the 3GPP (Third Generation Partnership Project) and IETF (Internet Engineering Task Force). The primary 3GPP standards that define IMS are TS-23.228, TS-24.228, and TS-24.229. These 3GPP standards refer to dozens of IETF RFCs and drafts, composed of SIP and SIP extensions. The IMS standardization process extends to other organizations, such as TISpan, OMA and others.

RADVISION IMS SIP Toolkit Specifications

The RADVISION IMS SIP Toolkit provides all necessary SIP, SDP and RTP services such as encoding, sending, receiving, and parsing SIP messages. The SIP messages can be transferred over several transportation layers such as UDP, TCP, and SCTP over IPv4 or IPv6 and using several security schemes such as TLS and IPsec. RADVISION SIP Toolkit implements and supports many extensions and layers above the SIP message.

IMS special features:

- SigComp – signaling compression between UE and PCSCF as defined in RFC 3320, 3321, 4896, 5049, 4077 and related standards
- All IMS specific P-Headers including RFC3325 RFC3455 RFC3313
- Preconditions (RFC 4032) and IMS Resource reservation (RFC 3312)
- GRUU (Globally Routable UA URI)
- SIP Outbound
- IPv6 support
- Support for event packages (useful for presence and reg-event)
- Parsing more URI schemas like PRES URI, TEL URI and IM URI
- ENUM – translation of telephone numbers to SIP URI
- Flexibility to support new headers with new syntax, as needed

Call control:

- Support for Mobile Registration with Path/Service-Route headers
- Support for preloaded SIP routes
- Dynamic local address
- Support for IMS SDP extensions
- Session timers

Security:

- Support for MD5-AKA and IKE
- Security Agreement (RFC 3329)
- Supporting all access network flavors including 3GPP/LTE, TISPAN and Packet Cable 2.0.
- The IMS Toolkits comes with a special quickstart application with sample code for each of the access network flavors
- IPsec with ESP transport mode and manual keying. as well as Tunnel Mode
- TLS
- HTTP digest with MD5 and “auth-int” extension

Presence and events packages support

- Support for general event package with subscribe-notify mechanism as defined in RFC 3265

General support for SIP extensions

- RADVISION SIP TK supports dozens of SIP protocol extensions for IMS/non-IMS applications

The IMS SIP Toolkit is delivered with:

- Source Code
- Sample Programs
- GUI Test Application with full signaling capabilities
- Complete Documentation

Major features required for IMS SIP signaling:

- P-headers: private SIP headers for IMS
- IPv6 support: the mandatory IMS transportation level
- Signaling compression: mandatory IMS requirement for signaling between UE and P-CSCF
- Support for IM URI, PRES URI, and TEL URI

- ENUM: translation between phone numbers or TEL URI to SIP URI
- Support for instant messaging (IM)
- HTTP DIGEST using 3GPP AKA Authentication -“AKAv1- MD5”
- IPsec: IP security
- Security agreement negotiation, as defined in RFC 3329
- Support for mobile registration using Service-route and Path headers
- Preconditions and IMS resource reservation, mechanisms for Quality of Service

RADVISION IMS SIP Toolkit Design Principles

Coded in ANSI C and cross-platform compatible, the IMS SIP Toolkit is available for all common operating systems. The Toolkit features an open, object-oriented architecture, which makes it programmer-friendly and highly flexible. It provides multiple layers of APIs including:

- High-level APIs that hide the complexity of the protocol and enable rapid development of applications
- Mid- and low-level APIs that expose the protocol’s internal mechanisms and allow for more power and customization based on application requirements

The toolkit is inherently designed to offer both extensive functionality and complete flexibility

IMS SIP Toolkit Architecture

SIP Stack

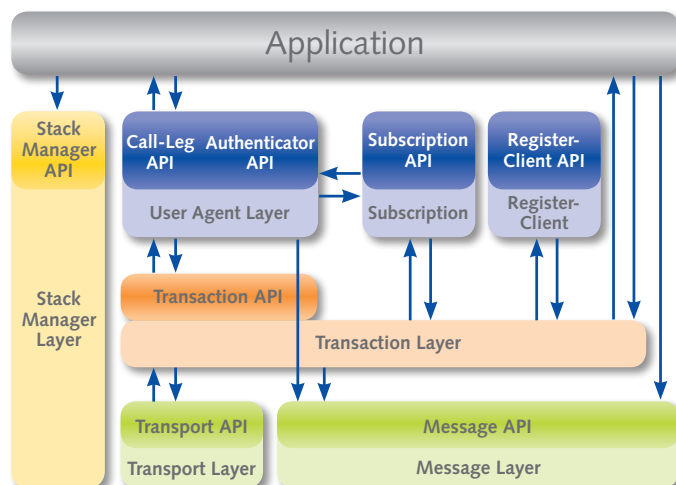
The SIP Stack is an internally multi-threaded (configurable) library containing all SIP-specific Toolkit functionality, including message encoding and decoding, transaction and call management and SIP extensions.

SDP (Session Description Protocol) Stack

The SDP Stack is a library for SDP message processing. The SDP Stack complies with RFC 2327 and enables parsing/encoding of any SDP message field. The SDP Stack also provides an SDP Message Layer for creating, browsing, and editing SDP message parts.

RTP/RTCP Stack*

The RTP/RTCP Stack is a library for sending and receiving RTP and RTCP packets



IMS SIP Toolkit APIs

The SIP Toolkit is standards-based and enhanced with intuitive object oriented APIs to provide optimal control over SIP Stack activities.

- SIP Message Layer for creating, browsing, editing, and comparing SIP messages and message parts
- Dialog Control Engine for rapid SIP application development
- Subscription Control Engine
- Transaction Control Engine
- Connection Management
- SIP Stack Manager Layer for setting system configuration, memory allocation, logging and other resources

Standards Supported

- The RADVISION IMS SIP Toolkit supports over 150 IETF standards including:
 - 3GPP TS.24.229 IMS SIP extensions
 - TISPAN ES 283 003 IMS Extensions
 - SigComp related RFCs and drafts
 - IETF RFC 3266 support for IPv6 in SDP
 - IETF RFC 3261 (Session Initiation Protocol – SIP)
 - IETF RFC 3262 (Reliability of Provisional Responses in SIP)
 - IETF RFC 3263 (Locating SIP Servers)
 - IETF RFC 2327 (Session Description Protocol – SDP)
 - IETF RFC 3264 (An Offer/Answer Model with SDP)
 - IETF RFC 3265 (SIP Specific Event Notification)
 - IETF RFC 3266 (Support for IPv6 in SDP)
 - IETF RFC 1889 and 1890 (RTP/RTCP)
 - IETF RFC 3329 SIP security agreement
 - IETF RFC 3455 Private headers
 - Support for general SIP header – ease of implementing any IMS SIPheader based standard
 - GRUU (Globally Routable User Agent URIs) Support
 - IETF RFC 4032 - Preconditions
 - IETF RFC 3312 - IMS Resource reservation
 - SIP Outbound
 - Numerous Internet drafts for various SIP extensions For the completelist, please contact RADVISION.

Operating Systems*

The RADVISION IMS SIP Toolkit supports a wide range of operating systems and can easily be ported to other operating systems. A sample of the operating systems supported includes:

- Windows
- Android
- Symbian
- Linux
- Embedded Linux
- vxWorks
- Solaris
- Windows Mobile
- Nucleus
- 64 bit operating systems

*Inquire about additional operating systems that are available.

The RADVISION SIP family also includes:

- SIP Developer Suite - A powerful and highly versatile set of tools, Add-Ons and testing tools that enables developers to combine the necessary components for building an ideal development environment for an application's specific needs. The IMS SIP Toolkit is part of the SIP Developer Suite.
- SIP Server Platform - a comprehensive SIP server development solution with complete standards-based functionality of Proxy, B2BUA, events, Redirect and Registrar servers
- ProLab™ Testing Suite - a versatile VoIP testing solution, based on RADVISION's award-winning SIP Toolkit, that is suitable for use in different stages of the product development and network testing cycle
- Multimedia Terminal Framework - a complete set of building blocks for developing SIPbased IP phone applications in RTOS or embedded environments
- Advanced RTP/RTCP Toolkit - a standalone RTP/RTCP stack providing IPv4/IPv6, security and advanced functionality
- Java SIP toolkit - a powerful and versatile set of tools that simplifies and dramatically reduces development time of Java-based SIP applications.
- Professional Services - a full range of design, integration and deployment consulting services

About RADVISION

RADVISION (NASDAQ: RVSN) is the industry's leading provider of market-proven products and technologies for unified visual communications over IP and 3G networks. With its complete set of standards based video networking infrastructure and developer toolkits for voice, video, data and wireless communications, RADVISION is driving the unified communications evolution by combining the power of video, voice, data and wireless – for high definition video conferencing systems, innovative converged mobile services, and highly scalable video-enabled desktop platforms on IP, 3G and emerging next generation networks. For more information about RADVISION, visit www.radvision.com

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