**ePDG (Evolved Packet Data Gateway)**

Our Evolved Packet Data Gateway enables mobile operators to provide secure and cost-effective integration of untrusted WiFi networks to IMS core networks for 4G LTE. It is a reliable, carrier-grade solution which comes with all the necessary features needed by service providers to benefit from untrusted Wi-Fi without facing the risks.

**Overview**

Media Routes ePDG supports seamless voice and video handover calls between Wi-Fi and cellular networks. It enables operators to improve their service quality and increase bandwidth without deploying additional infrastructure and incurring added expenditure. It uses GPRS Tunneling Protocol to provide mobility support to subscribers as they roam between mobile operator network and Wi-Fi or across different Wi-Fi networks.

**Features**

* High availability (99.99%)
* Support for 3GPP Release \_\_\_
* Functional software upgrades
* Geographical Redundancy
* Seamless handover through SIP
* Horizontal and Vertical Scalability

**Protocols and Interfaces**

* Swn interface with untrusted access point over RTP
* Diameter Gxb interface with PCRF
* GTP based S2b interface support on Serving Gateway SGW

**Use Cases**

**Wi-Fi Calling**

* Coverage and capacity with complementary network
* No additional infrastructure
* Lower costs

**P-CSCF (Proxy-Call Session Control Function)**

**Overview**

Media Routes P-CSCF SIP server forwards SIP messages to the UE and other IMS nodes, interacts with PCRF for billing and policy control, and compresses/decompresses SIP messages that are using air interface.

**Features**

* Proxies SIP user registration
* Validates registration
* Multiple IMPU
* Resolves home domain address
* Establishes security associations

* Proxies SIP session transactions
* Validates and forwards SIP messages
* Translates SDP and interacts with PCRF
* Compress/de-compress SIP messages
* NAT and session border controlling
* Acts as SIP UA
* 3rd party registration on behalf of UE
* Session control on behalf of UE
* Subscriber information exchange with S-CSCF etc.
* Subscribes to Registration event package
* Subscriber public information
* Network event notifications
* Supports PCRF/PDF
* Interacts with external PCRF/PDF
* Implements internal PDF
* QoS/Advanced QoS Features
* Charging

* Interface with CRF/CDF
* CDR
* Handles Emergency sessions
* Interface with external E-CSCF
* E-CSCF functions
* Mobility Support
* Visited P-CSCF functions

**Protocols and Interfaces**

* Diameter Rf,Ro interface for online charging
* SIP based Mw interface with I-CSCF and S-CSCF
* SIP based Gm interface with User Equipment to enable connectivity between UE and IMS network for registration, authentication, encryption and session control.
* Diameter Rx interface with PCRF to request for an appropriate policy for a session.

**I-CSCF (Interrogating Call Session Control Function)**

**Overview**

Media Routes Interrogating Call State Control Function is designed to forward initial SIP requests to relevant Serving CSCF for a given subscriber. It queries the Home Subscriber Server to discover which S-CSCF the subscriber is assigned to. If the subscriber is unregistered, it assigns a Serving CSCF to handle that SIP request.

**Features**

* Initial point-of-contact for all incoming network connections
* Diameter Cx interface to query HSS for retrieving user location
* Routes SIP request to assigned Serving CSCF
* Acts as stateless SIP proxy function by generating CDRs
* Provides Topology Hiding Inter-network Gateway (THIG)
* Hides capacity, configuration and network topology from outside

**Protocols and Interfaces**

* Mw interface with I-CSCF and S-CSCF over SIP
* Mg interface allows the MGCF to forward incoming SIP messages that the MGCF has interworked from the CS Network to the CSCF.
* Mi interface allows the Serving CSCF to forward the SIP messages to the Breakout Gateway Control Function for the purpose of MGCF selection for interworking with CS networks.
* Diameter Cx/Dx interface with HSS to enable IMS registration and passing of subscriber data to the S-CSCF

**S-CSCF (Serving Call Session Control Function)**

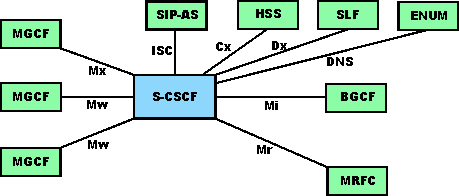
**Overview**

Media Routes Serving Call Session Control Function has actual access to user subscription data and handles session requests. It provides session setup, tear-down, routing and control functions.

**Features**

* Generates all records for billing for each session under its control.
* Invokes the Application servers, based upon IFCs it receives from the Home Subscriber Server.
* Acts as SIP registrar for VoLTE User Equipment assigned to it by I-CSCF and HSS.
* Queries HSS for all applicable subscriber profiles and handles related calls after they are registered.

**Protocols and Interfaces**

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* Mr interface with Media Resource Function ( MRF) to allow interaction with the media resource for specific supplementary services (e.g. conference call). The protocol used on the Mr interface is SIP.
* Mg interface allows the MGCF to forward incoming SIP/SDP messages that the MGCF has interworked from the CS Network to the CSCF
* Mx interface between S-CSCF and P-CSCF or I-CSCF over
* ISC interface with Telephony Application Server is used to interact with the MMTel supplementary services implemented on the TAS. The interface uses SIP protocol
* The Cx interface is between the I/S CSCF and HSS to enable IMS registration and passing of subscriber data to the S-CSCF. Protocol used is Diameter.

**Breakout Gateway Control Function (BGCF)**

**Overview**

Media Routes BGCF determines the next route for SIP messages. This is done on the basis of information that is received within SIP and routing configuration data.

**Features**

* Determines the network in which CS domain breakout is to occur and selects the appropriate Media Gateway Control Function (MGCF) for CS Domain terminations.
* Selects the appropriate IBCF to handle the interconnect to the peer IMS domain for terminations in peer IMS networks
* Provides directives to the MGCF/IBCF on which Interconnect or next network to select

**Protocols and Interfaces**

* The Mj reference point allows the Breakout Gateway Control Function to exchange SIP messages with the BGCF for the purpose of interworking with CS networks.
* The Mi reference point allows the Serving CSCF to forward the SIP messages to the Breakout Gateway Control Function for the purpose of MGCF selection for interworking with CS networks.

**Media Gateway (MGW)**

**Overview**

Media Gateway supports interworking of IP-based transport networks and circuit-switched domain in conjunction with Media Gateway Control Function. This includes interworking to CS Networks and may also include transcoding of media plane. MGW translates media arriving in a TDM-based time slot to a Real-time Transport Protocol stream (RTP) or vice versa.

Our MGCF/IMS-MGW can be used for converting voice and multimedia sessions in a variety of service provider and enterprise applications. MGW can be used by service providers for interworking distinctly formatted multimedia and voice traffic across different wired, wireless, core, access, IP and TDM networks.

**Features**

* Interworking of GSM, CDMA, UMTS and satellite networks in 3G and 4G architectures
* IP to IP media conversion for converged networks
* IP media processing for IMS architecture networks
* SIP based service delivery to TDM-based customers

**Media Gateway Control Function (MGCF)**

**Overview**

The MGCF/IMS-MGW is responsible for the control/media plane interworking at the network interconnect point to circuit-switched networks. This includes interworking to CS Networks based on SIP and may include transcoding of the media plane.

**Protocols and Interfaces**

* The Mn interface provides the Media Gateway Control for interworking between the IMS and CS domain (ISUP, BICC and SIP-I).
* Mj interface allows BGCF to exchange SIP messages with MGCF for interworking with CS networks.

**Media Resource Function (MRF)**

**Overview**

Media Routes MRF provides media resources for home network. It provides media plane processing independent of any application types such as multi-party conferencing, transcoding, network announcements, etc. under control of basic media processing functions and IMS Application Servers to I/S CSCFs.

The Media Resource Function is comprised of two parts i.e. Media Resource Function Controller (MRFC) and Media Resource Function Processor (MRFP).

**Media Resource Function Controller (MRFC)**

The Media Resource Function Controller takes SIP requests from Application Server and manages media resources by interpreting information received from S-CSCF and AS to control the media resources of MRFP.

MRFC can also interact with more than one Application Servers where a different logical role is carried out by each AS while interacting with MRFC.

Invoke: AS invokes MRFC by creating a SIP based signaling path between MRFC and itself.

Control: AS defines which service has to be executed on MRFC

Service: AS gives resources and service data for MRFC

, an MRFC can also interact with multiple ASs where each AS carries out a different logical role in its interaction with the MRFC: • Invoke role: AS invokes the MRFC by setting up a SIP signalling path between itself and the MRFC • Control role: AS determines which service is to be executed on the MRFC • Service role: AS provides service data and resources for the MRFC

**Media Resource Function Processor (MRFP)**

The Media Resource Function Processor processes all the media resources directly and performs a number of functions including:

* Managing media stream source ( multimedia announcements)
* Mixing incoming media streams from multiple parties
* Processing media stream (media analysis, transcoding)

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**Features**

* Tone transmission, DTMF detection, Transcoding, announcement transmission, audio conferencing
* Media resources provision
* Media resources control and management
* AS interworking over SIP i.e. Application Server, Billing Server, Call processing
* Group and channel management, including group session management
* International standards compliance including 3GPP Ts 22.228, 23.218, 24.228, RFC 3261, RFC3262, etc.

**Protocols and Interfaces**

* Mr interface between MRF and S-CSCF allows interaction with media resource for supplementary services such as conference calling. Protocol used on Mr interface is SIP.
* Nb interface is media bearer plane between User Equipment and network elements interacting with the bearer, such as MRF. Protocol used is RTP.
* Mr’ interface between Application Server and MRF allows interaction with media resource for supplementary services such as conference calling. Protocol used is SIP.
* Cr interface between Application Server and MRF sends/receives XML encoded media services served by MRF. The interface works on SIP protocol.

**IBCF/TrGW (Interconnection Border Control Function/Transition Gateway)**

**Overview**

IBCF offers boundary control between service provider networks. It implements Topology Hiding Internetwork Gateway (THIG) sub function that performs session screening, topology hiding and IPv4 and IPv6 translations. When non-IPv6 or non-SIP networks are connected, IBCF performs admission control and bandwidth allocation with the help of Inter-Working Function through interfacing with PCRF or by using local policies. For boundary control, IBCF interacts with Transition Gateway (TrGW) at the transport layer. IBCF/TrGW may also be implemented in Interconnect Session Border Controller.

**Features**

* IPv4 to IPv6 interworking
* Network/Port Translation
* Network topology hiding
* Transport Plane Entity control
* SIP signaling compensation
* SIP signaling information screening
* Call Detail Record

**Protocols and Interfaces**

* Nb interface over RTP
* Ici interface is between two IBCFs or IBCF and I-CSCF from another IMS network. Protocol used on Ici is SIP
* Izi interface is between two TrGWs or TrGW and a media handling node from another IMS network. Protocol used is RTP.

**Voice over IP Suite**

**Virtual Private Network**

**Overview**

Media Routes VPN can be used by businesses to connect their remote users and offices securely using affordable third-party internet access as an alternative to expensive long distance dial links.

**Features**

* High bandwidth connectivity, including Ethernet, DSL or cable.
* High security with encrypted IPSec and authentication technology

**Benefits**

Our IPSec VPN is a primary solution that helps connect remote offices, users or business partners. It provides:

* Secure communications along with access rights personalized for individual users including employees, partners and contractors
* Increased productivity with an extended corporate network
* Increased flexibility and reduced communication costs

**Safe Labs**

**Features**

* High security with encrypted IPSec and authentication technology
* Secure communications along with access rights personalized for individual users
* Blockage of access to Adult websites
* Online privacy with no interception of confidential data by third parties

**Terms of Service**

Safe Labs uses standardized and third party blacklists, along with input from our community to ensure a safe browsing experience to our clients. We ensure inaccessibility of all illegal and inappropriate adult content to our clients.

**Support FAQs.**