

Deploying Premium SIP Voice Services over WiMAX

WiMAX technology is well positioned to enable premium delivery of wireless broadband services, such as feature-rich SIP-based voice services. One of the strengths of the IEEE 802.16 standards platform is its ability to dynamically allocate quality of service (QoS) to the individual application and subscriber. What this means for the subscriber is nearly flawless delivery of IP data. For the Wireless Internet Service Provider (WISP), it means the ability to offer high-quality, revenue-generating applications such as voice over IP, streaming video, gaming and commercial services.

Four innovation leaders in the fields of wireless IP transport and telephony, namely AudioCodes, CableMatrix, Emergent and VCom, have come together to demonstrate the power of WiMAX in deploying crystal clear telephony services over the air.



Architecture

In order to deploy premium delivery applications that take advantage of the underlying QoS capabilities inherent in the base and subscriber stations, a network element called the Policy Decision Function (PDF) is responsible for dynamically allocating network resources on behalf of authorized applications whether voice, video, or gaming. For SIP communications, the PDF acts in concert with the intelligent edge Session Border Controller (SBC) and P-CSCF (Call Session Control Function), which performs SIP Proxy functions, among other functions, to reserve and commit resources when a SIP call is initiated either by Analog Terminal Adapter (ATA) or Multi-line Terminal Adapter (MTA) on behalf of the WISP subscriber. Feature Server capability is also available for more advanced features. Once appropriate resources are committed on the wireless link, SIP call setup continues by completing the call with the Media Gateway (MGW). The ATA/MTA and Media Gateways use the predefined vocoder, in this case Adaptive Multirate Vocoder (AMR), the same vocoder used in GSM & UMTS systems, is used over the WiMAX radio link to provide bandwidth efficient, high voice quality. This architecture is shown in Figure 1.

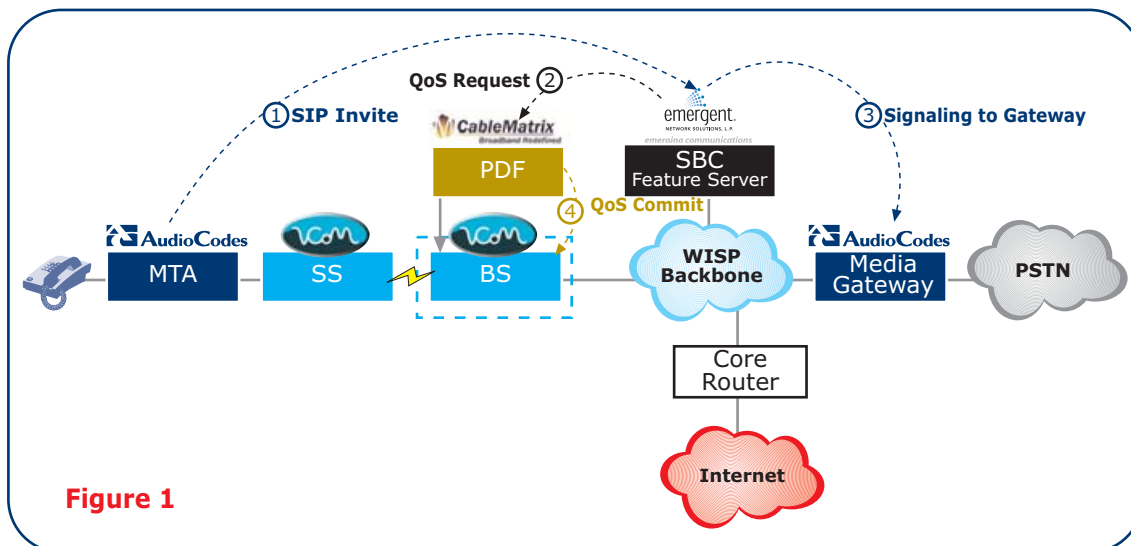


Figure 1

Process

A simple call flow for providing this service includes:

1. A SIP call is initiated either by the WISP subscriber at the ATA/MTA to the SBC (acting as the P-CSCF). Similarly, the call could be initiated through the Media Gateway. [Step 1]
2. The SBC receives the call invite and determines whether the WISP subscriber is authorized for premium delivery by querying the subscriber database, called the HSS. If the WISP subscriber is authorized for premium delivery voice service, the SBC informs the PDF of the call. The SBC's embedded Feature Server further determines the applicable features for the call such as 3-way conferencing.
3. PDF determines the location of the WISP subscriber base station and whether resources are available for the voice session. If so, the PDF reserves the CODED-specific network resources on the base station. [Step 2]
4. The SBC signals the Media Gateway to set-up the call to the called party, whether off or on-net. The selected vocoder for the call is set up. [Step 3]
5. The call is answered, the relevant Network Elements are notified, the base station commits the necessary resources, the voice path is established and the voice call can commence. [Step 4]

Solution Benefits

- Empowers WISPs to maintain control over the air network in support of differentiating, revenue generating services
- Maximize subscriber satisfaction by ensuring quality of service on behalf of authorized applications such as SIP voice
- Deploy feature-rich, carrier class SIP services to commercial and residential customers
- Platform compatible with industry standards such as IEEE 802.16-2000, WiMAX, and IP Multimedia Subsystem maximizes economies of scale as well as compatibility with next-generation architectures
- Vertical and horizontal scalability – wide choice of MTA/ATA, Media Gateway sizes to address varying subscriber concentrations; scalable server based control software to cost-effectively scale with subscriber demand; and flexible WiMAX radio deployment
- Deployable a complete voice over WiMAX solution today; pre-integrated and configured

Ordering Information

Media Gateway and Terminal Adapter

AudioCodes	Mediant™ 8000	384-16,128 Channel VoIP MGW (16-224 T1/E1s, 3-24 T3s or 1-8 OC-3s/STM-1s)
AudioCodes	Mediant™ 5000	480-6,048 Channel VoIP MGW (16-80 T1/E1s, 3-9 T3s or 1-3 OC-3s/STM-1s)
AudioCodes	Mediant™ 3000	2,016 Channel VoIP Media Gateway (3 T3s or 1 OC-3/STM-1)
AudioCodes	Mediant™ 2000	48-480 Channel VoIP Media Gateway (2, 4, 8 or 16 T1/E1s)
AudioCodes	MP-202	2 line VoIP Analog Terminal Adapter (ATA) with WAN/LAN
AudioCodes	MP-11x series	2, 4, 8 or 24 line analog Multi-line Terminal Adapter (MTA) VoIP GW

Policy Decision Function (PDF)

CableMatrix ODSP-W-WSAM ODSP WiMAX P DF with web services application manager

Session Border Controller/CSCF/Feature Server

Emergent ENTICE E-REV-WS SIP SBC with embedded Class 5 Feature Server

Base Station/Subscriber Station

VCom	OBR-3500	VistaMax 3.5 GHz WiMAX base station transceiver
VCom	OSR-3500	VistaMax 3.5 GHz WiMAX subscriber station transceiver
VCom	OBR-5800	VistaMax 5.8 GHz WiMAX base station transceiver
VCom	OSR-5800	VistaMax 5.8 GHz WiMAX subscriber station transceiver

Company Profiles

AudioCodes Ltd. provides its customers and partners with a diverse range of flexible, converged media gateway, media server and CPE gateways, based on VoIPerfect™ - AudioCodes' underlying, best-of-breed, core media gateway architecture.



For more information, visit www.audiocodes.com.

CableMatrix Technologies, Inc. provides IMS compatible quality of service policy management software solutions that enable broadband operators to maximize their revenues while delivering media-rich IP applications and services.



For more information, visit www.cablematrix.com.

Emergent Network Solutions, Inc. has developed a suite of software products which all operate under Emergent's ENTICE architecture and combine the best of proven and emerging telecommunications technologies designed to interface to new or existing networks to provide control services.



For more information, visit www.emergent-netsolutions.com.

VCom, Inc. is a world-leading designer and manufacturer of Data over Cable, Digital Video, and Broadband Wireless telecom products including its high performance WiMAX compatible transceiver product line.



For more information, visit www.vcom.com.

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