





## Wi-Fi to the rescue

Telecommunication Operators have always struggled to achieve 100% coverage, and to provide basic services like voice and text everywhere. LTE networks are beginning to be a reality but the increase in spectrum and network efficiency will not solve the in-building coverage problems especially in high-frequencies starting from 1.8 GHz. That is why a solution like voice over Wi-Fi for poor indoor coverage has been on the Operator's agendas for the past years and will continue to be with VoLTE.

Subscribers have solved their coverage problem by using OTT services like Skype or Viber. These OTT applications, as we know, used to be a niche novelty but now they represent a serious threat to Telecommunication Operators. According to a recent study by Fortune<sup>1</sup>, telecom companies count \$386 billion in lost revenue to Skype and other OTT apps.

Telecommunication Operators have always striven to protect their voice revenues, including revenues from roaming. This has been the key argument for not adopting a voice over Wi-Fi approach, even when the technology was available. Times have changed, and the recent version of iOS8 brings native support for VoWiFi, and as a consequence this will drive subscriber demand for voice over Wi-Fi. Some Android models also bring native support. T-Mobile in the US has launched a Wi-Fi Calling solution in September 2014. Other operators are taking similar approaches, allowing users to make and receive voice and text communications while connected to a Wi-Fi network.

In 2015, the OTTs are likely to launch innovative services around voice, in the same way they have around messaging, taking advantage of 4G networks and Wi-Fi. Voice over Wi-Fi provides an opportunity for mobile operators to extend the reach of their voice services to Wi-Fi, tablets and web before the OTTs can build critical mass.

## Product Overview

Voice over Wi-Fi is designed to help Mobile Operators off-load mobile traffic from cellular to Wi-Fi networks, while maintaining the best possible call quality. The solution allows subscribers to continue using the mobile phone with poor cellular coverage, and whilst roaming abroad, connected to Wi-Fi networks. And it provides mobile operators new revenue opportunities from their voice services across tablets, PC and web.

WIT Voice over Wi-Fi solution provides a suite of apps that allow the subscriber to select Wi-Fi networks that they wish to use to receive voice calls and SMS messages. These whitelisted Wi-Fi networks, either home or office or abroad, effectively extend the reach for the mobile operator's network. The subscriber no longer has to use alternatives like Skype when out of cellular network coverage.

WIT offers the capability for users to experience Calls and SMS from several device end-points, such as smartphones (Android and iPhone), Tablets (Android and iPad), PC (Windows and Mac) and web browsers (Chrome, Firefox, Opera, Safari and Internet Explorer). These end-points can be branded and customized for the mobile operator, with a fast time-to-market and agility to be combined with other services (such as RCS).

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<sup>1</sup> <http://fortune.com/2014/06/23/telecom-companies-count-386-billion-in-lost-revenue-to-skype-whatsapp-others/>

## Network Configuration / Architecture

WIT Voice over Wi-Fi solution is designed for IMS and pre-IMS networks.

For IMS networks WIT can provide a wide range of downloadable applications as well as several network elements that will enhance the end-user's experience in multi-device: a Common Message Store (CMS) and a Network Address Book (NAB). Figure 1 shows the VoWiFi Apps connecting directly to the IMS Core, while the Web end-points connect through the WIT's WebRTC Gateway. In this network configuration the IMS Core is responsible for routing both SMS and calls to the Apps when needed.

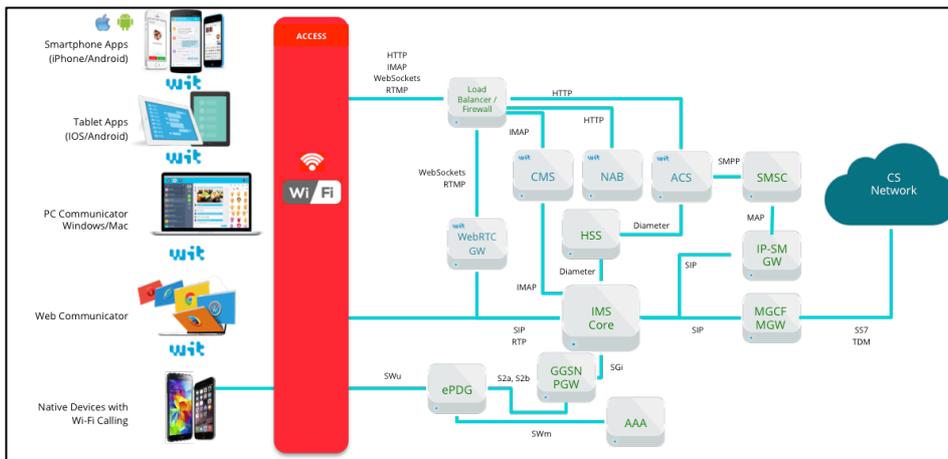


Figure 1 - WIT Voice over Wi-Fi solution for IMS networks

For pre-IMS networks WIT can provide an Application Server, integrated with the existing network elements, such as the SMSC to ensure delivery and reception of SMS, and the Media Gateway for voice calls. The application server also interfaces the HLR and SCP for an accurate routing of calls. Figure 2 shows the elements of the solution and how they integrate with the existing network.

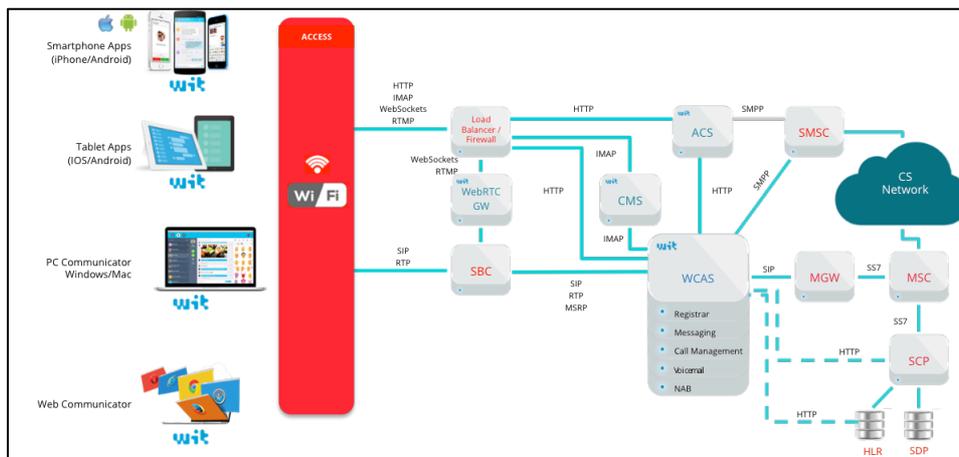


Figure 2 - WIT Voice over Wi-Fi solution for pre-IMS networks



## Features

Feature	Function	Description
Features	Whitelist Wi-Fi Network	<ul style="list-style-type: none"> <li>User selects the list of trustable Wi-Fi networks</li> <li>App registers automatically for VoIP-in and SMS-in when entering whitelisted Wi-Fi networks</li> </ul>
	VoIP in	<ul style="list-style-type: none"> <li>User receives calls inside the App when connected to a whitelisted Wi-Fi networks</li> <li>Can ring sequentially or in parallel on all user devices</li> </ul>
	VoIP out	<ul style="list-style-type: none"> <li>App initiated calls are routed to the CS Network. User continues to make calls from a phone without cellular network coverage</li> <li>User can also make calls from the PC, Tablet and Web browser</li> </ul>
	SMS in	<ul style="list-style-type: none"> <li>VoWiFi Application Server registers "message copy" in the SMSC</li> <li>SMS is received in all registered user devices</li> <li>Android app also able to intercept native SMS</li> </ul>
	SMS out	<ul style="list-style-type: none"> <li>Send text messages from a phone without cellular network coverage</li> <li>Send text messages also from the PC, Tablet and web browser</li> </ul>
	Handover	<ul style="list-style-type: none"> <li>App suggests user to re-establish the call on handover to CS</li> <li>App can re-connect automatically if the smartphone has IP connectivity (example: fallback from Wi-Fi to 3G)</li> </ul>
	Platforms	Android
iOS		<ul style="list-style-type: none"> <li>iPhone</li> <li>iPod Touch</li> <li>iPad</li> <li>iOS versions supported:               <ul style="list-style-type: none"> <li>- iOS 7: 7.0; 7.1</li> <li>- iOS 8: 8.0; 8.0.1; 8.02</li> </ul> </li> </ul>
Desktop		<ul style="list-style-type: none"> <li>Windows Supported versions: Vista, 7 and 8</li> <li>Mac Supported versions: OSX 10.7 "Lion", 10.8 "Mountain Lion", 10.9 "Mavericks" and 10.10 "Yosemite"</li> </ul>
Web Browser		<ul style="list-style-type: none"> <li>Google Chrome (version 34 and above)</li> <li>Mozilla Firefox (version 33 and above)</li> <li>Opera (version 25 and above)</li> <li>Safari (version 7 and above)</li> <li>Microsoft Internet Explorer (version 10 and above)</li> </ul>
Security		Protocols
Specifications	Voice over IP	<ul style="list-style-type: none"> <li>GSMA IR.92 "IMS Profile for Voice and SMS v4.0"</li> <li>3GPP TS 24.229 "IP multimedia call control protocol based on Session Initiation Protocol (SIP) and Session Description Protocol (SDP)"</li> </ul>



		<ul style="list-style-type: none"> <li>• 3GPP TS 24.610 "Communication HOLD (HOLD) using IP Multimedia (IM) Core Network (CN) subsystem"</li> <li>• IETF RFC 3095 "RObust Header Compression (ROHC)"</li> <li>• IETF RFC 3550 "RTP: A Transport Protocol for Real-Time Applications"</li> </ul>
	SMS over IP	<ul style="list-style-type: none"> <li>• GSMA IR.92 "IMS Profile for Voice and SMS v4.0"</li> <li>• 3GPP TS 24.341 "Support of SMS over IP networks; Stage 3"</li> </ul>
Codecs	Audio Codecs	<ul style="list-style-type: none"> <li>• AMR-WB</li> <li>• Opus</li> </ul>
Integrations	HSS	<ul style="list-style-type: none"> <li>• Diameter or REST interface</li> </ul>
	SMSC	<ul style="list-style-type: none"> <li>• SMPP 3.4</li> </ul>
	Media Gateway	<ul style="list-style-type: none"> <li>• SIP</li> </ul>
	HLR	<ul style="list-style-type: none"> <li>• HTTP or other</li> </ul>
	SCP	<ul style="list-style-type: none"> <li>• HTTP or other</li> </ul>

## Benefits

VoWiFi solves the following problems:

- Cellular networks are rapidly becoming saturated
- Poor in-building coverage
- Subscriber expectations to be able to use voice and SMS on SIM-less devices

Benefits for Mobile Operators:

- Offload traffic from cellular network to Wi-Fi
- Increase network coverage
- Reduce cost in femtocells or repeaters
- Increase customer satisfaction
- Offer an alternative to Skype, and use tariff minutes
- Resist OTT erosion of voice revenues

Benefits for Subscribers:

- No more need to rely on Skype
- No more network coverage problems
- Calls and messages across multiple devices
- Ability to call anyone and be reached anywhere with their own phone number

## About WIT Software

WIT is a software development company specialized in advanced solutions for mobile telecommunications companies. The company has over 14 years of experience and a deep expertise in mobile communications and network technologies including IP Multimedia Subsystem (IMS), mobile voice (Mobile VoIP and Voice over LTE), messaging (SMS, MMS and IM), Rich Communication Suite (RCS) and Multimedia Telephony Services (MMTel).

URL: <http://www.wit-software.com>