



Mobile Applications over Multi-Mode Devices

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The Mission: Quality Applications Easily Developed & Deployed

Classical Apps

- Voice
- SMS/Instant Messaging
- Contact Manager
- MP3 player

Up and Coming Apps

- Video Broadcast
- Interactive video
- Gaming / 3D
- Multimedia
- Mapping

Innovative Apps

- Dating
 - Stock trading
 - Social Networking
- Web Apps
Many Others

How?

GSM
GPRS
EDGE

W-
CDMA

HS
DPA
&
UPA

DVBH

GPS

FM

Blue-
tooth

WiFi

WiMAX

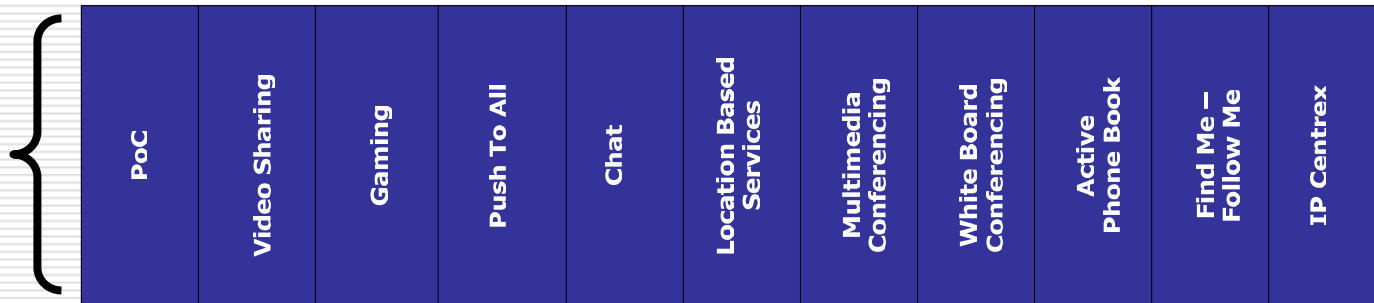
FMC Carrier trials have shown challenges with:

- ❑ Quality of VoIP
- ❑ Quality of Video Streaming
- ❑ Handoff Reliability
- ❑ Battery Life during Multimode Operation
- ❑ Interoperability

ODM/OEM's have had additional challenges:

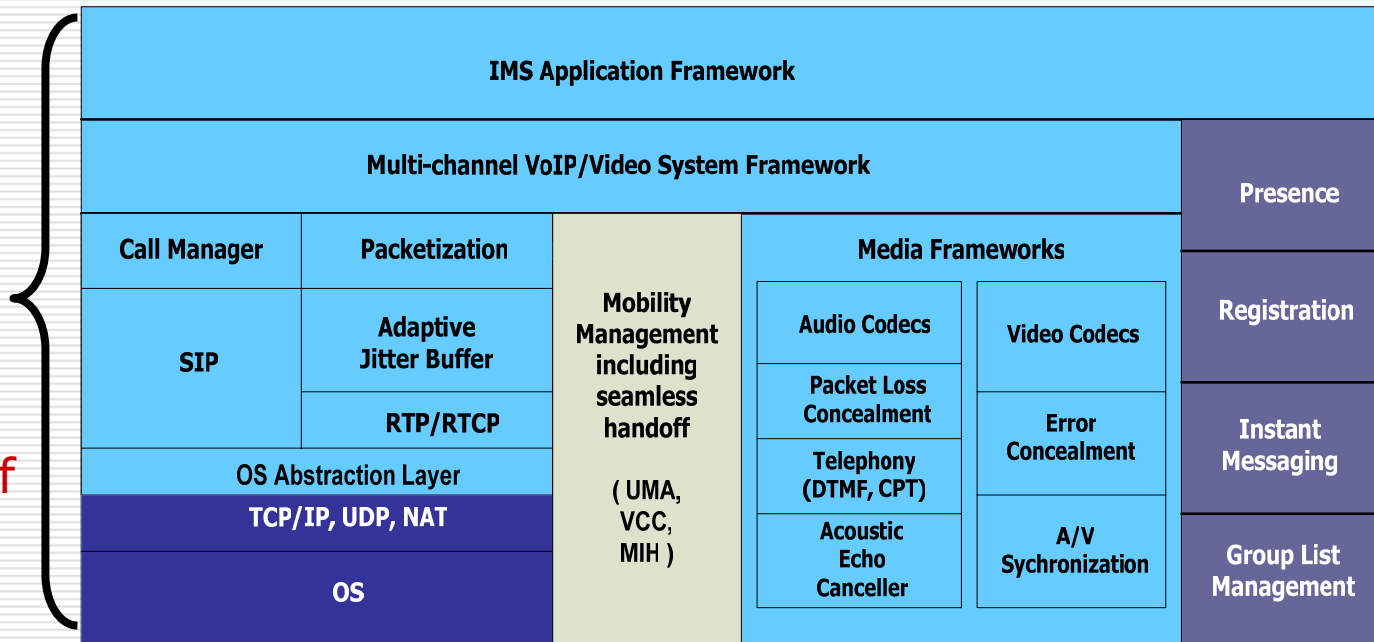
- ❑ Multiple application SIP stacks
- ❑ Memory footprint optimization
- ❑ Power optimization
- ❑ Deep diving into protocol stacks

PLUG-IN APPLICATIONS

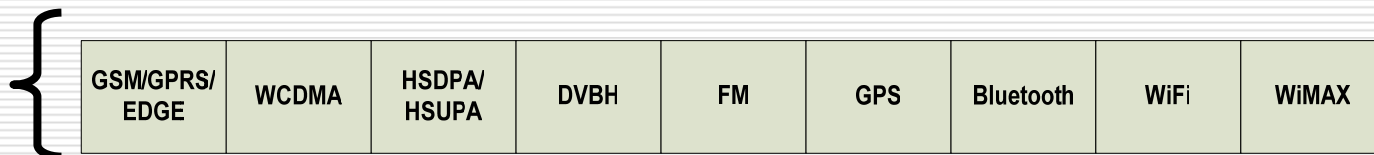


APPLICATIONS FRAMEWORK

- * IMS
- * VoIP
- * Media Transport
- * Media Codecs
- * Seamless Handoff
- * Multimode I/F



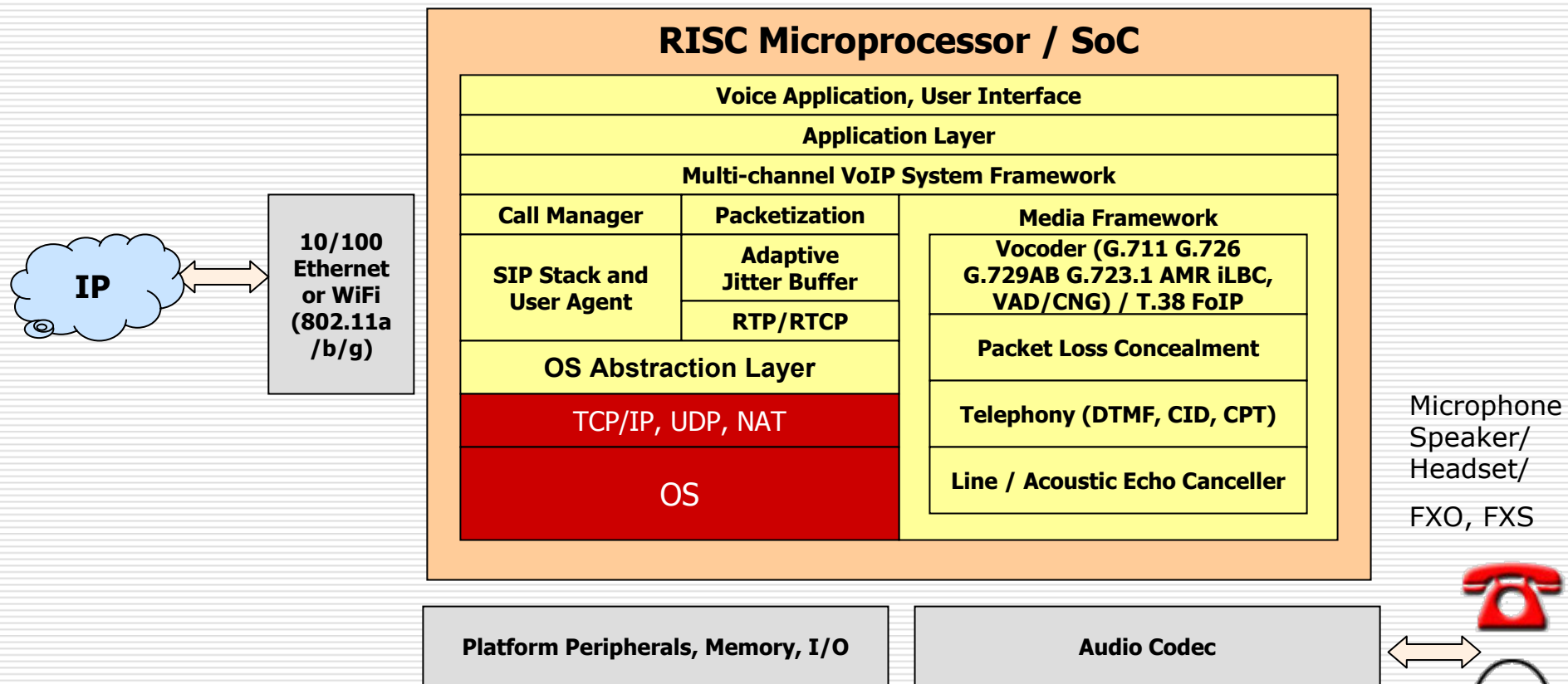
MULTI-MODE MODEMS



The Details:

An Optimal VoIP Solution
for
Mobile Devices

VoIP Software Stack

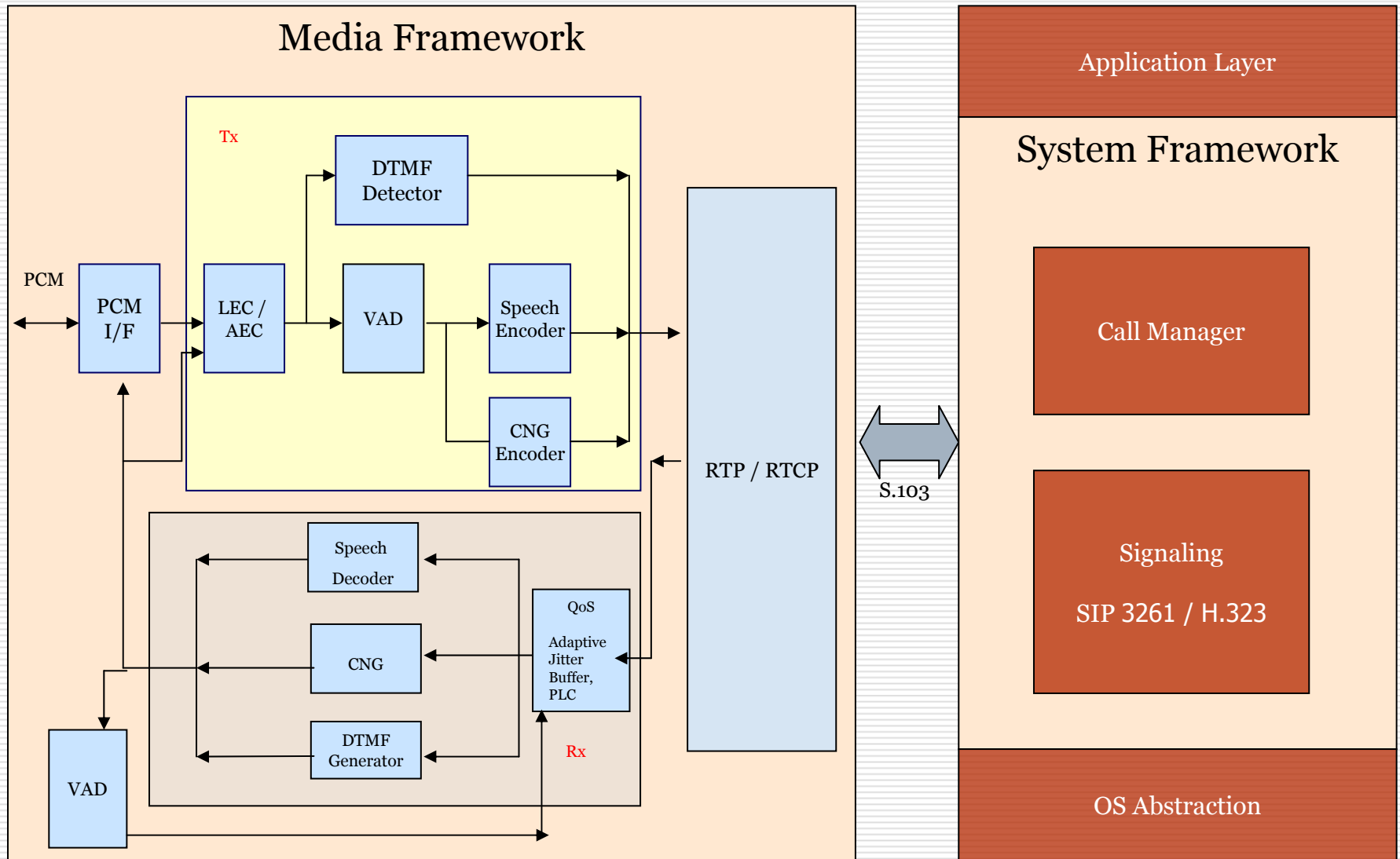


- ❑ Complete VoIP Software Solution For IP Phones, Analog Adaptors, Residential Gateways, VoWLAN Handsets, Dual mode Cellular Phones
- ❑ Lowest cost BOM for 1-4 channel devices based on single RISC processor architectures (eg. ARM, MIPS) without separate DSP

Legend:



An Optimal Voice Architecture



Traditional Two processor solution - 2 voice channels

Microcontroller plus
DSP processor

- Complex System Design
 - a) Multiple processor cores
 - b) Multiple buses
 - c) Multiple memories
 - d) uC: RTOS/NW/Control
 - e) DSP: Codec/LEC/DTMF
- Higher development cost
- Larger Size
- Higher power consumption
- Higher Cost

HelloSoft's single RISC processor solution - 2 voice channels



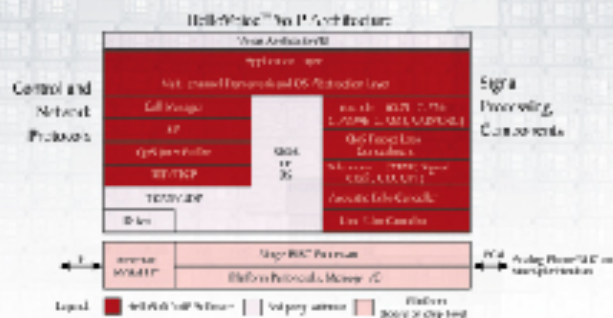
Single RISC processor

- Single Architecture
 - Simpler hardware config
 - Less memory required
 - All Networking, Control and "DSP" components run on the ARM processor under a single RTOS.
- More efficient development
- Smaller footprint/gatecount
- Lower power consumption
- Lower Cost/No DSP royalty

HelloSoft HelloVoice on TI OMAP™ Processor



- Complete VoIP suite on a single OMAP RISC processor.
- Single channel executes on 40% of ARM CPU, leaving the remaining processing power and DSP for the other applications.
- Industry best performance for media processing algorithms.
- Coexist seamlessly with existing cellular stack
- Flexible architecture to support VoWLAN.



VOIP For Mobile Handsets

NeoMagic + HelloSoft



Better Sound Quality

- G.729AB, G.723.1, G.711, G.726 audio codecs
- Acoustic echo cancellation
- Adaptive jitter buffer
- Lost packet concealment

Rapid Time to Market

- Complete end-to-end solution

Long talk time

- Fully power optimized

Combine VOIP with:

- Digital Mobile TV
- Still Camera and Video Camcorder
- 3D gaming

HelloSoft

- ❑ Lowest MHz requirements → Least power dissipation
- ❑ Minimum fetches from External Memory → Least Power fro driving external memory buses
- ❑ Effective VAD/CNG → Reduces average MHz requirements and hence minimizes power
- ❑ High-compression codecs → Minimizes the Tx and Rx power for the WiFi Interface
- ❑ Reduced Data transmitted and received due to effective VAD/CNG → Minimizes the Tx and Rx power for the WiFi Interface
- ❑ Least number of threads in system and lowest memory footprint → Least over-head in MHz and memory requirements translate into reducing power consumption for the system

HelloSoft's VoIP Advantages

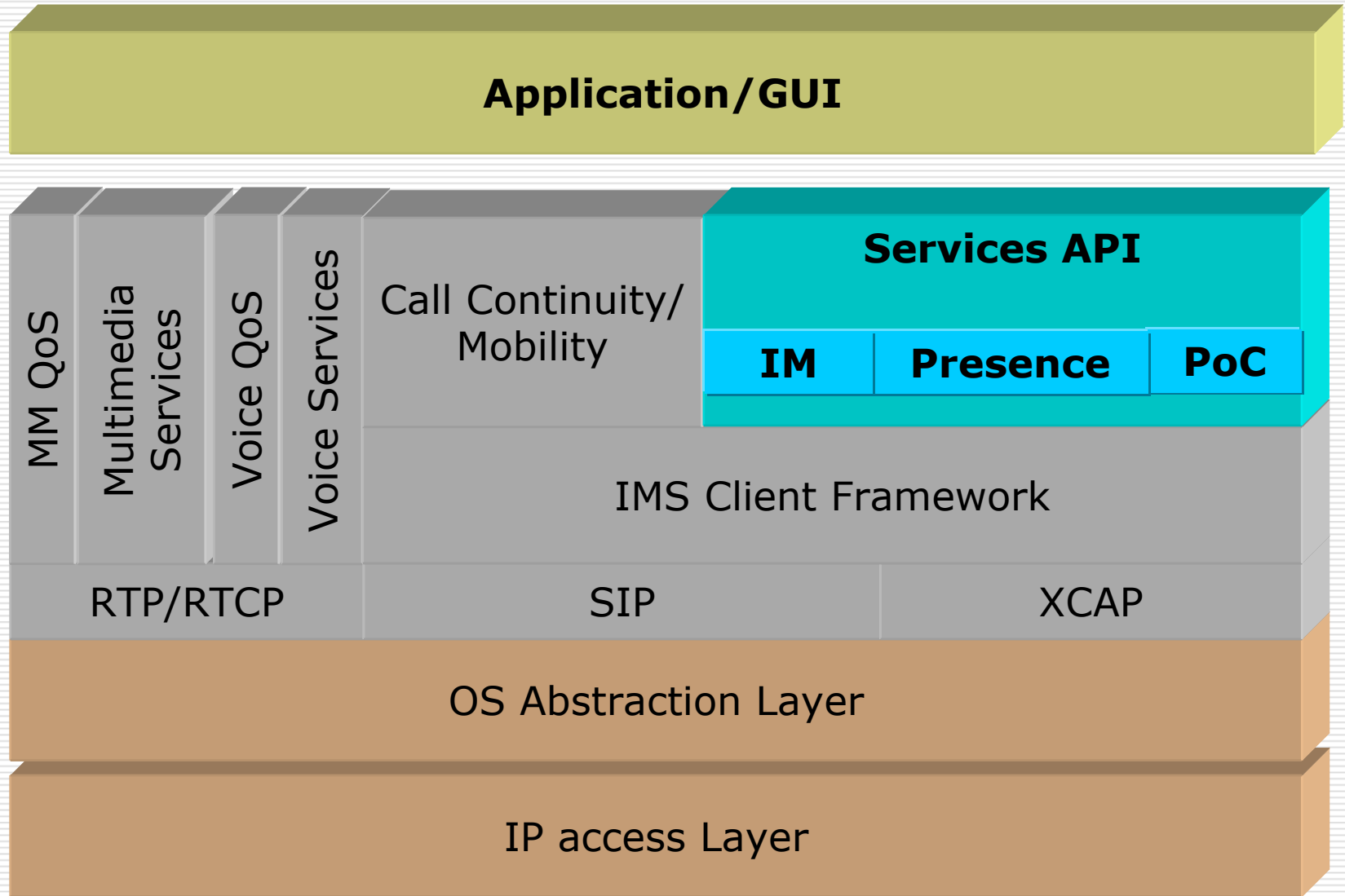
- Complete Voice Over Packet Software Stack with all necessary Media Processing, Signaling, Framework and System Software as a Integrated Solution.
- Industry-best Performance for Media Processing Algorithms like Voice Coders and Echo Cancellers on Industry Standard ARM processors
- Highly Optimized Solution, Architected for Single ARM Processor Designs.
- Scalable and Modular System Architecture.
- Designed for Portability to Different OS/RTOS using OS Abstraction Layer.
- Complete IMS stack underway
- Available for Cellular Phones, Dual Mode Cellular Phones, VoWLAN Handsets, ATAs Residential Gateways, Set-top boxes and other CPE client devices.
- Chosen by Major Semiconductor Manufacturers and OEM/ODM customers.

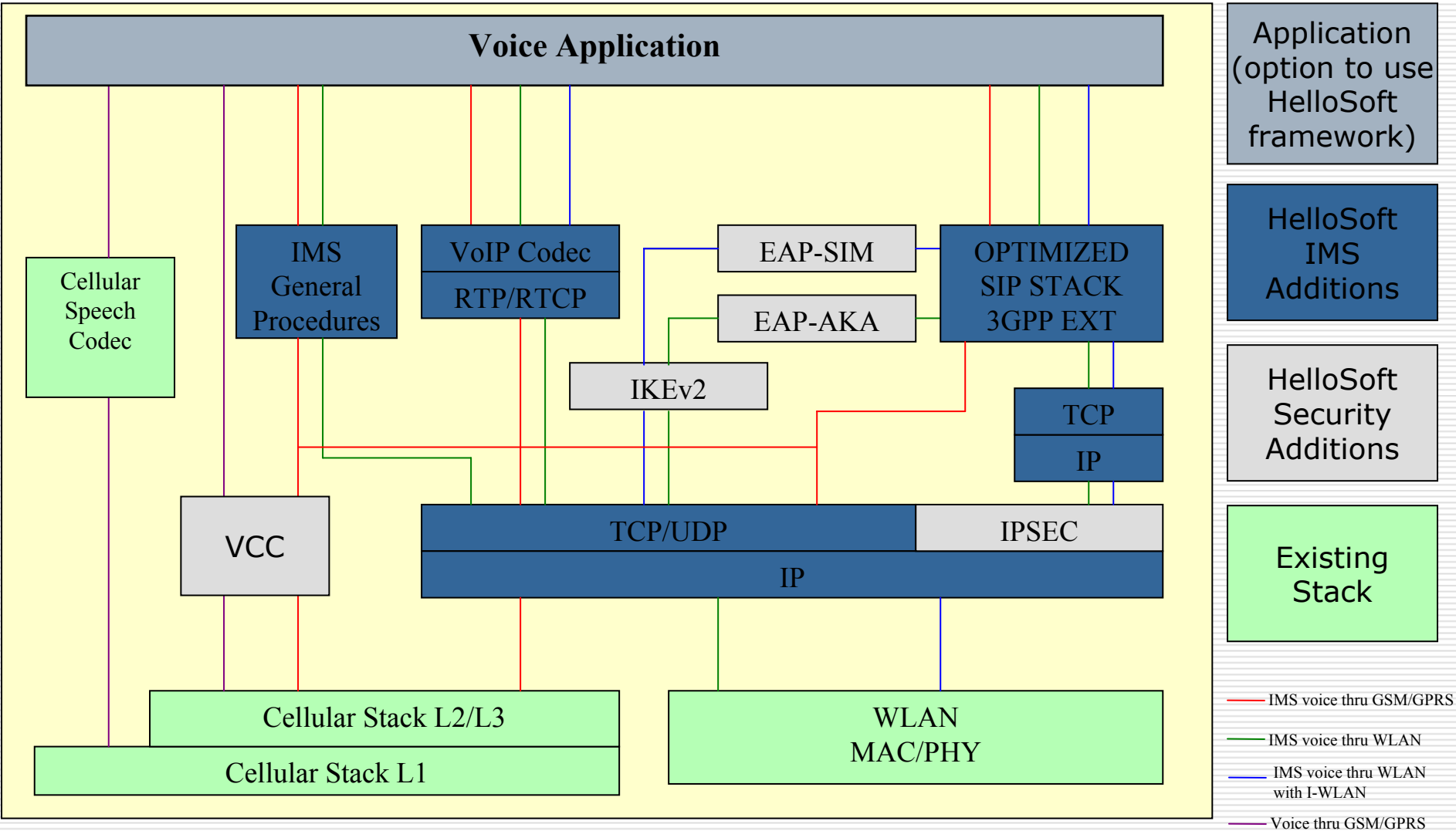


An Optimal IMS Client Application Framework

- ❑ An IMS client which is a complete embedded software framework toolkit for developing new IMS-based client applications.
- ❑ A platform that provides signaling, media access and device management functionalities required to develop IMS client applications residing on the handset.
- ❑ An IMS client that provides a set of reusable components that provide a programmable interface (APIs) for development of various IMS applications and services.
- ❑ Must support full range of IMS applications development such as IM, Chat, Presence enabled active phonebook, Voice Messaging, PoC, Content sharing and Video Sharing applications.

- ❑ Horizontal service architecture to support multiple applications on top
- ❑ Extensive set of high level APIs that hide the complexity of IMS and SIP signaling and helps developers to focus on innovative applications.
- ❑ Platform independent client implying that the application developed can be deployed across handsets and operating systems.
- ❑ Modular and extensible with low footprint so that it makes it easy for mixing and matching, fine tuning and modifying applications with minimal effort.





- ❑ Superior VoIP Quality in Interference Environments
- ❑ Reduced power consumption from system optimizations
- ❑ “Horizontal” architecture for media subsystem
 - VoIP media subsystem is readily available to all applications
- ❑ Dual Mode roaming performance improvements in mobility manager

- Framework is available for a wide range of platforms
 - Windows Mobile 5.0
 - Embedded Linux
 - Embedded OS's (VxWorks, Nucleus, ThreadX, etc)
 - Symbian (in development)
- VoIP is available across EV/DO or WiFi
 - Supports Diffserv
 - Currently reviewing optimization for predicted jitter/delay distributions
 - Policy Database implemented to support EV/DO

- ❑ 3GPP IMS
- ❑ 3GPP2 IMS
- ❑ Siemens AG IMS 3.0
- ❑ Industry Consortium PoC Release 1.0
- ❑ IETF
- ❑ OMA
- ❑ SIP standard compliant

Summary - Product Benefits

- ❑ High Quality Voice
- ❑ Low MCPS required
- ❑ Small Footprint
- ❑ Seamless WLAN roaming
- ❑ Branding and localization for differentiated services
- ❑ Complete standards compliant IMS and feature set
- ❑ Rapid platform integration
- ❑ IOT with multiple IMS core and Application servers
- ❑ Easy integration of 3rd party applications
- ❑ Multiple language support



THANK YOU
