

VOICE OVER LTE (VOLTE)

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Agenda

- ⦿ LTE
- ⦿ HD voice
- ⦿ VoIP
- ⦿ Challenges
- ⦿ VoLGA
- ⦿ VoLTE
- ⦿ Summary

LTE

- ⦿ High speed "all-IP" network
- ⦿ Only packet switched
- ⦿ No separate voice channel
- ⦿ HD video
- ⦿ *HD voice*

HD voice

- ⦿ Human speech: 80Hz – 14KHz
- ⦿ Regular voice/narrowband 300Hz – 3.4KHz
- ⦿ LTE: Adaptive multi-rate wideband codec (multiple samplerate depending on the audio)
- ⦿ 16KHz sampling (regular phone:8kHz)
- ⦿ “Capture” 50Hz to 7kHz

VoIP

- Voice over IP
- Encapsulate the voice payload in IP-packets
- Looks and feels like a regular IP-packet
- Has to be prioritized

4-bit	8-bit	16-bit	32-bit	
Ver.	Header Length	Type of Service	Total Length	
Identification			Flags	Offset
Time To Live	Protocol		Checksum	
Source Address				
Destination Address				
Options and Padding				

Challenges

- ⦿ Time critical traffic
- ⦿ Packet loss
- ⦿ Quality of Service
- ⦿ Asynchrony uplink and downlink
- ⦿ Unequal power UE and BTS (different packet loss rate)

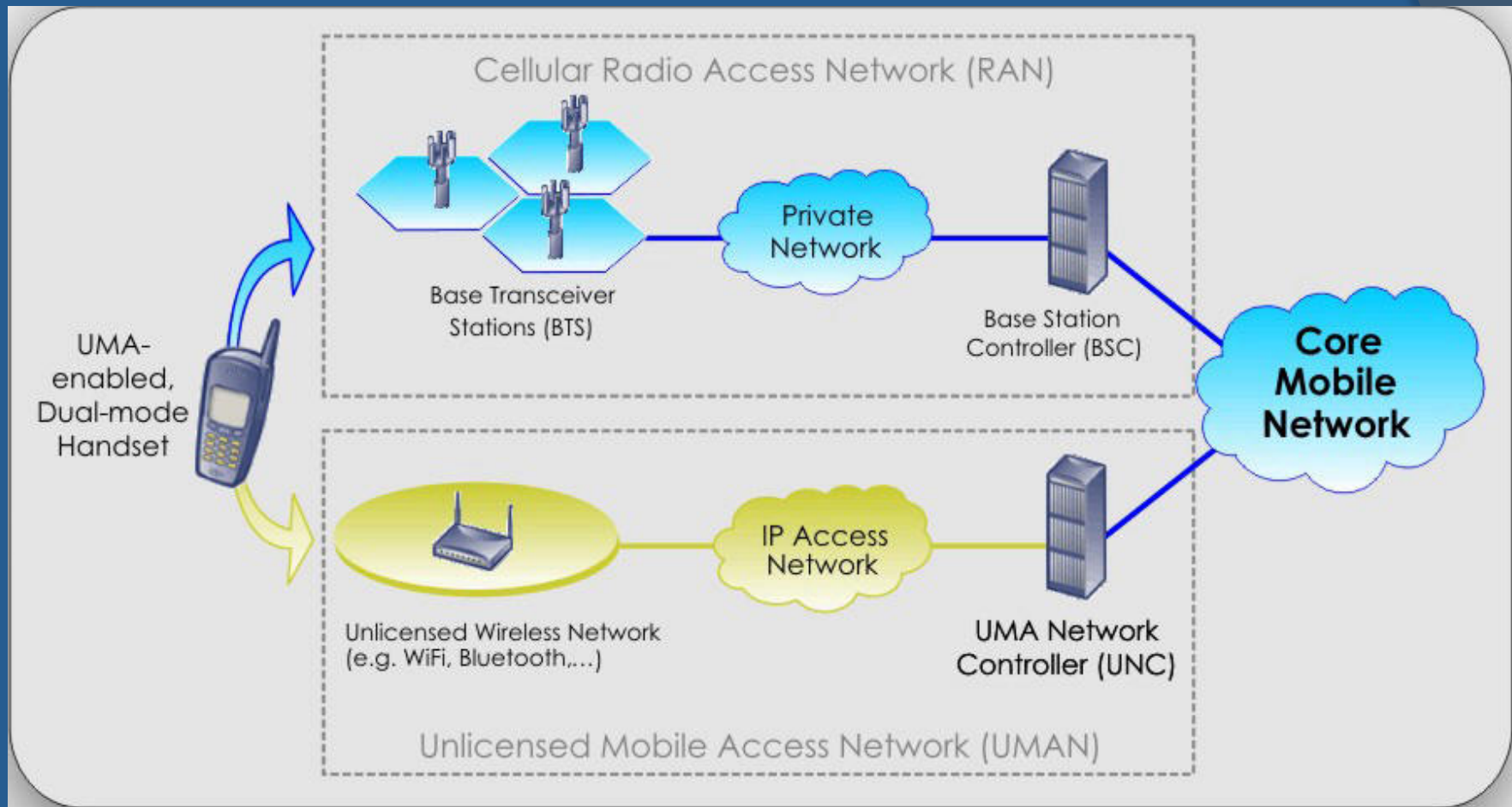
Circuit switched fallback

- ⦿ Falls back to 3G/GSM for voice
- ⦿ LTE only for data
- ⦿ Telenor

VoLGA

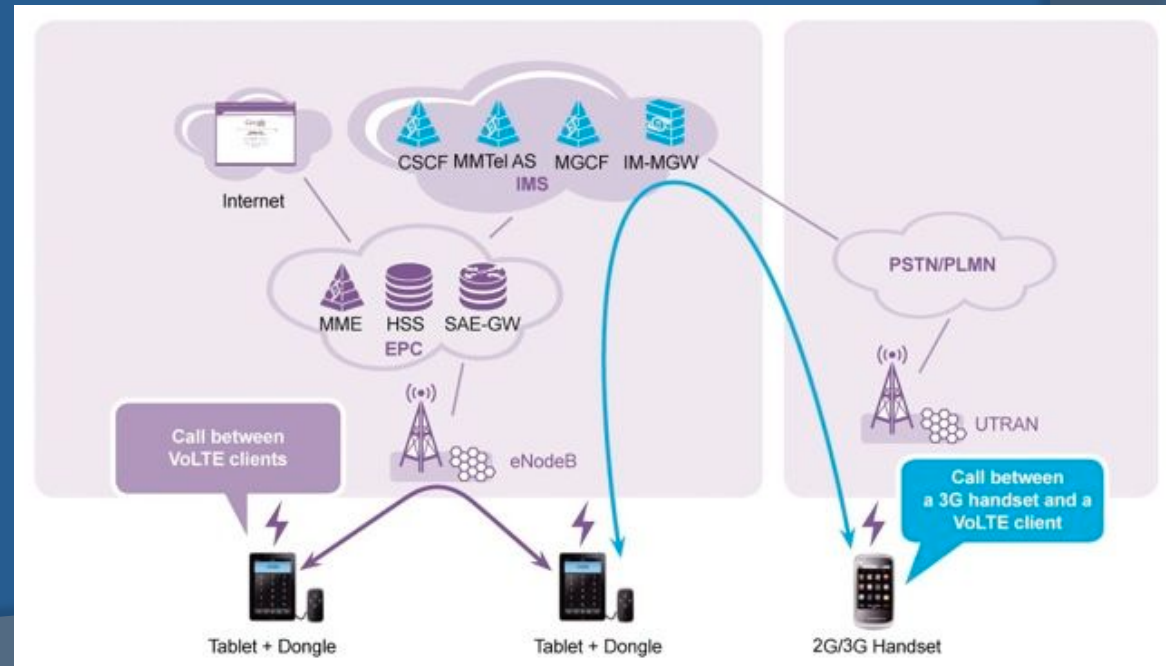
- ⦿ Voice over LTE via GAN (Generic Access Network)
- ⦿ GAN uses wifi or cell network to connect to the core network
- ⦿ VoLGA replace wifi with LTE

VoLGA

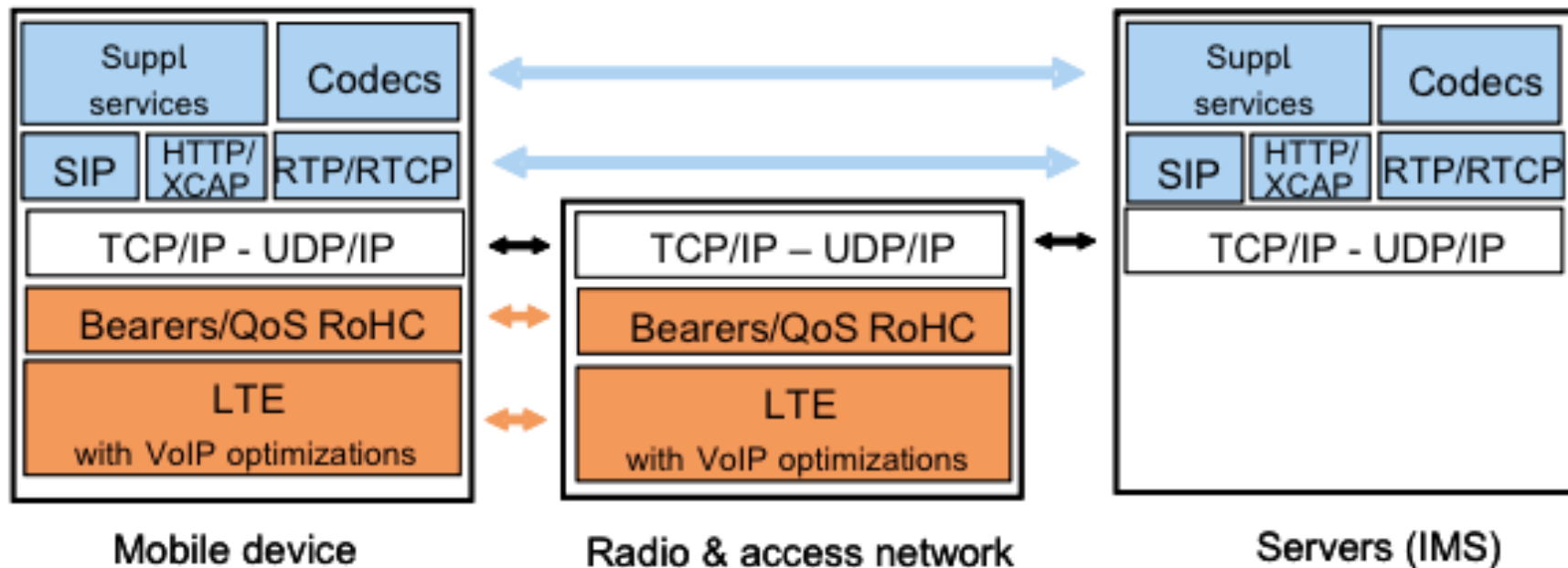


VoLTE

- Voice over LTE
- IP Multimedia System (IMS)
- SIP -> IMS servers
- RTP to receiver



VoLTE



Summary

- ⦿ All-IP network gives different challenges
- ⦿ New requirements to the network
- ⦿ High Definition voice
- ⦿ QoS in the entire network
- ⦿ Circuit switched fallback
- ⦿ VoLGA uses GAN for talking to the core
- ⦿ VoLTE uses IMS and IMS servers