



VoLTE Optimization

Improving the VOIP Network

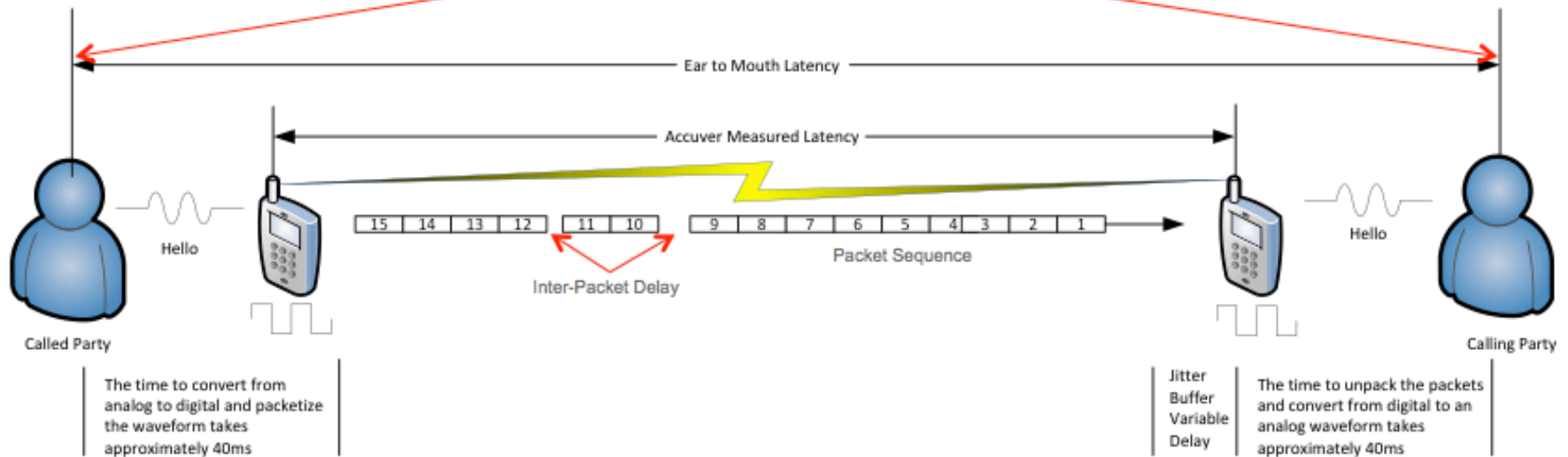
Presented by Patrick Casey



Optimizing the Transport Network

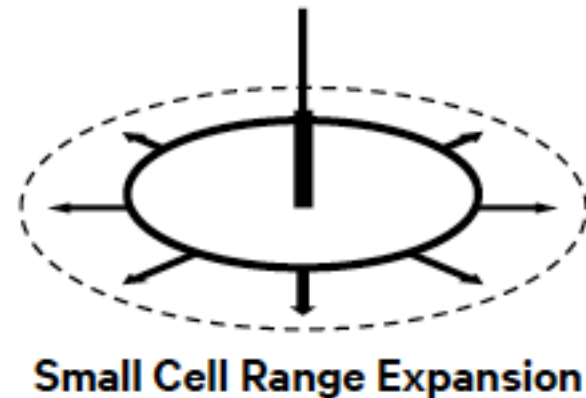
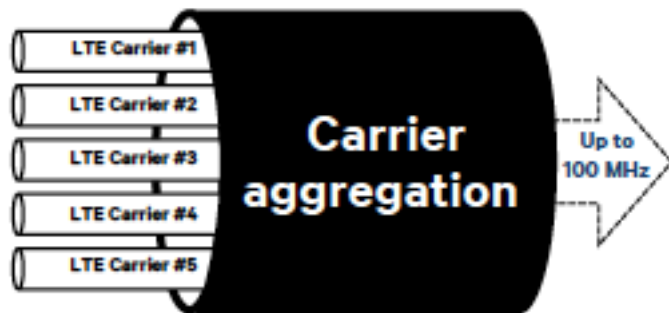
- Backhaul/Fronthaul
 - Low latency paths
 - Manage jitter, frame/packet loss, frame delay variation

285ms of Ear to Mouth latency is the maximum value before the subscriber begins to notice impairment (assuming low jitter and no packet loss.)



Optimizing the Radio Resource

- Application of advanced features in the hardware
 - TTI Bundling
 - Uplink Comp
 - Carrier Aggregation
 - Higher Peak Data rates
 - More capacity for 'bursty' LTE traffic
 - Spectral Efficiency per coverage area (Small Cells)



TTI bundling is a technique used to send a transport block multiple times in consecutive TTIs without waiting for HARQ ACK/NACK messages.

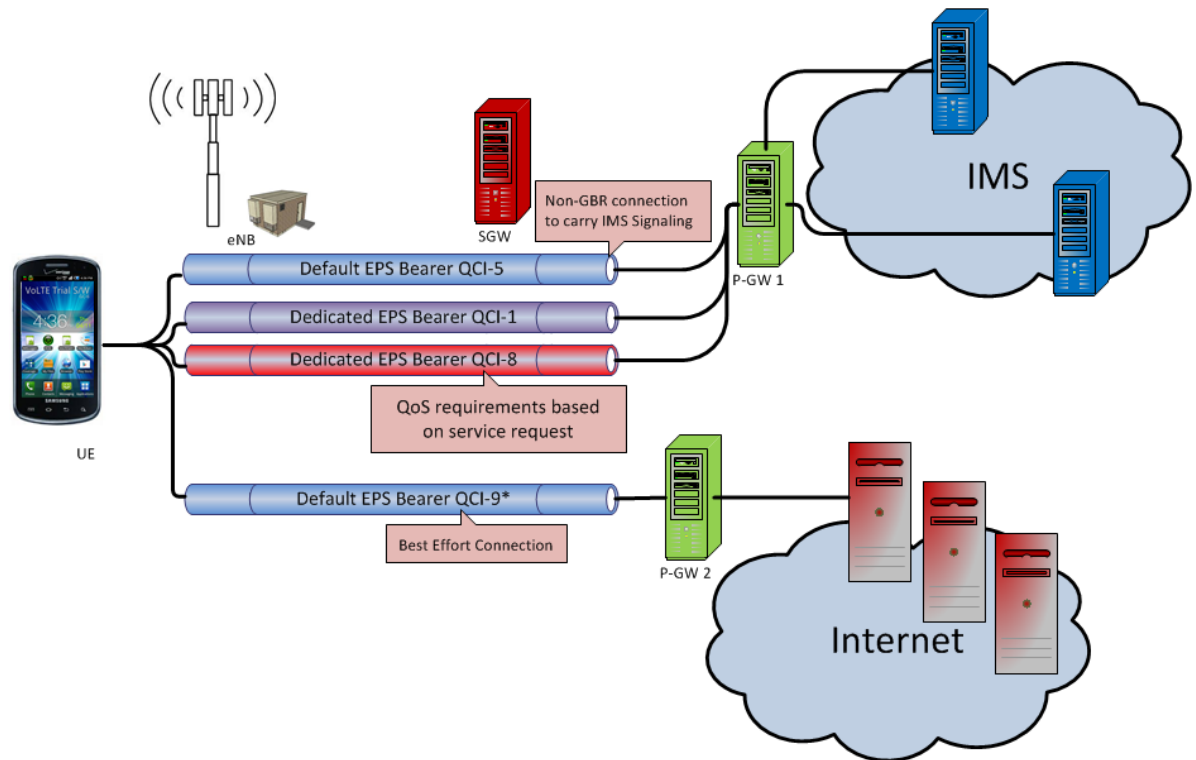
Optimizing the Antenna System

- Improving the Antenna System
 - MIMO
 - 4xRx (multi-Rx antennas)
 - TTA
 - RET
 - High power Licenses
- Improve LTE Signal Quality
 - Improve areas of RSRP > -105 and C/I < 0
 - Azimuth changes & antenna downtilts
 - Goal is to reduce the number of servers (no more than 3)
 - Replace antennas with narrower horizontal beam width where it is applicable



Monitoring the VoLTE KPI's

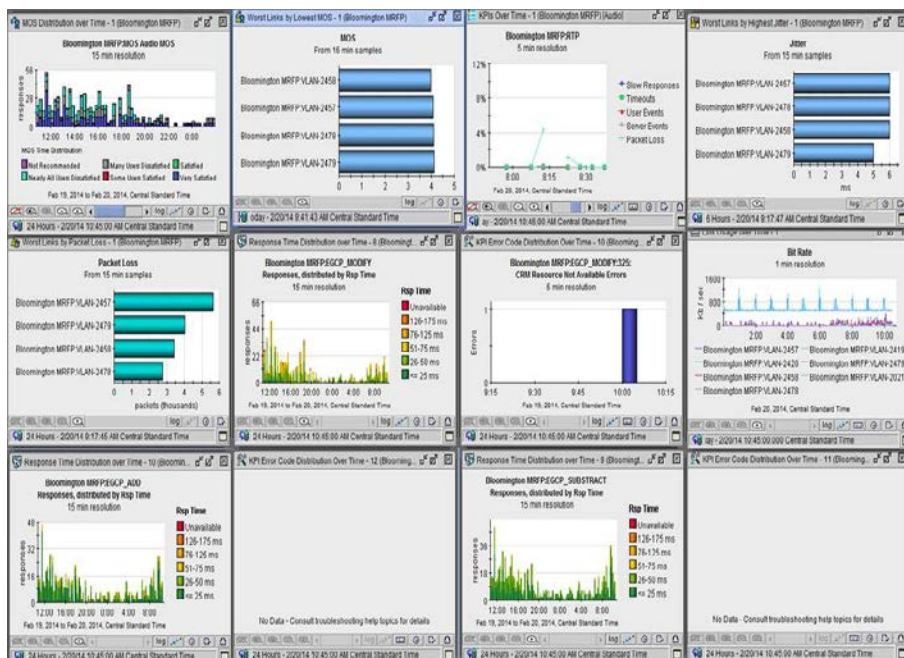
- Retainability
 - QCI 1 Bearer Drop
- Accessibility
 - RRC Setup Fail%
 - QCI 5 Setup Fail%
 - SIP Success Rate
 - QCI 1 Setup Fail
- Reliability
 - VoLTE IA%
 - VoLTE LC%
 - SEER %



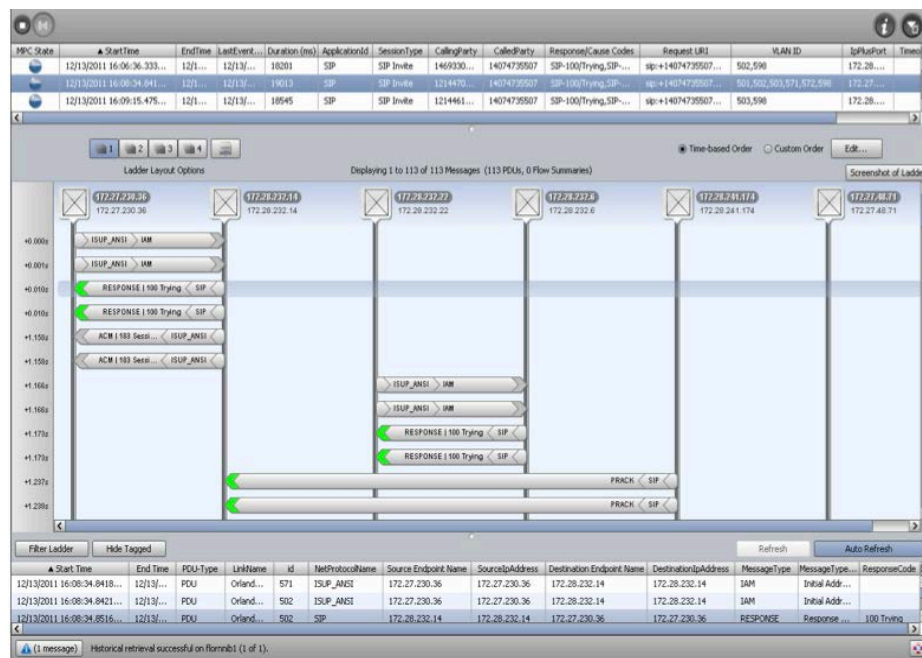
Network Tools

- New Technology requires more advanced tools
- Monitor Performance and Operation of EPC & RAN
- Evolution from legacy network monitoring (Circuit Switch/Voice)

Infinistream Product



Tektronics Product





THANK YOU!