

The Edge of LTE

Deploying a MEC platform in today's networks



MEC Congress
Munich, DE
September 2016

ABOUT US

Scalable small cell systems for Mobile Operators to deliver coverage, capacity & services in Enterprises and Venues

BASED IN SILICON VALLEY (USA)

- Founded in early 2008
- Deploying scalable enterprise small cell systems since 2011
- First to market with dual-band 3G/LTE and LTE/LTE Small Cell Systems (June 2014)

Mobile Operator customers

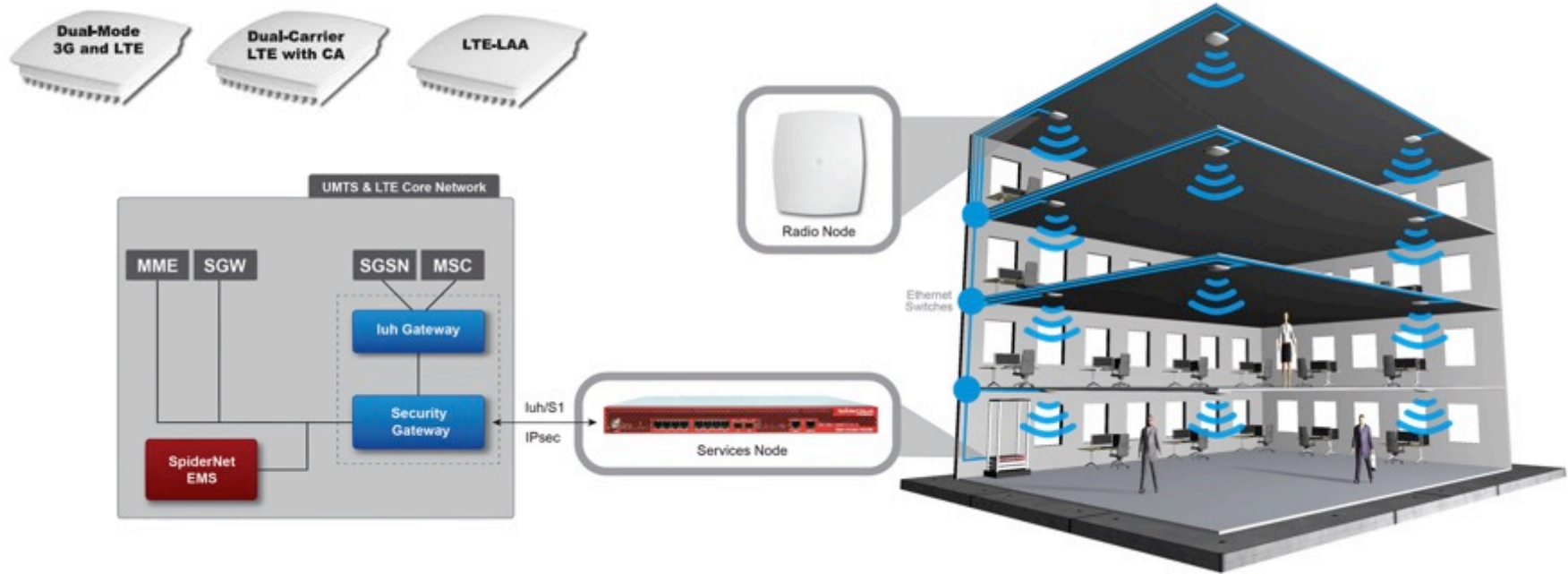


Business Partners

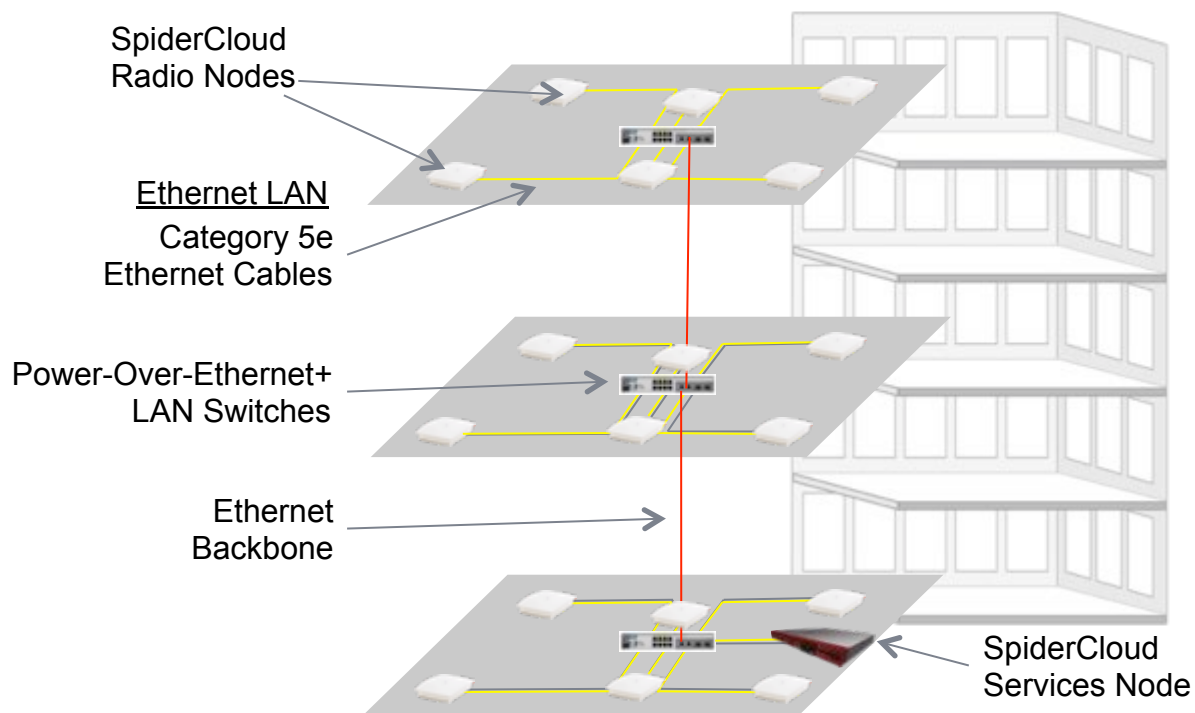


Scalable Small Cell Systems

- One system of 1 Services Node and 100 PoE-powered Radio Nodes can deliver 200 Sectors of capacity and scale to cover 1.5 Million Square Feet



Deployed over Gigabit Ethernet LAN



Fronthaul Options:

- Share existing enterprise LAN (using VLANs)
- Deploy on a dedicated Ethernet LAN.

Services Node



RF Coordination

- Handovers
- Interference management
- Synchronization

Self-Organizing Network

- Auto-configuration
- Auto-optimization
- Interface to network-layer SON

Aggregation

- Single network interface to core
- Eliminates MEC data/FSM context switch in the building

Multi-Access Edge Computing Platform

- Content caching / CDN
- Edge-based security applications
- Traffic analytics

Site Overview



- Call Center
 - 140,000 square feet
 - 500 SIMS in each outer User area
 - Unlimited data plans on devices
 - 100% of devices on single operator
 - (4) BC 4/13 RN-310's per User area
 - (5) RN-310 - Training area in middle
 - Backhaul - 1 Gb port/100Mb CIR
- Test Strategy
 - Normal usage by employees
 - This site has never allowed devices on Wi-Fi.
 - 10 hour workday
 - VoLTE & Video are used extensively

INDOOR PERFORMANCE RESULTS

Average Daily Backhaul Usage

Downlink: 125Gb (this is very large volume)

Uplink: 10Gb

Traffic Average: 50Mbps

Average RAB's

530,000 per day

ERAB Drop Rate 0.50%

CSSR and HO

Consistent 99% or better range

RF Link Capacity

Operating peaks don't exceed 20-30%

Analysis

Usage is much higher than normally expected as 100% of devices are on same operator

System Scalability

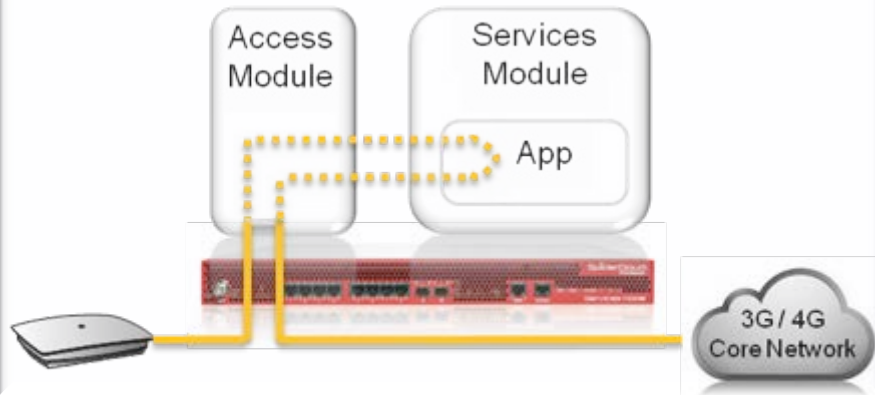
RF link and Ethernet fronthaul capacity have plenty of headroom

Backhaul capacity is the controlling factor for system scaling

Data Plane Routing Enhancements

- 'Bump in the wire' support

- Ability to route all Uplink and Downlink data packets through an application hosted on the Services Module
- No change in signaling route



- Implementation Options

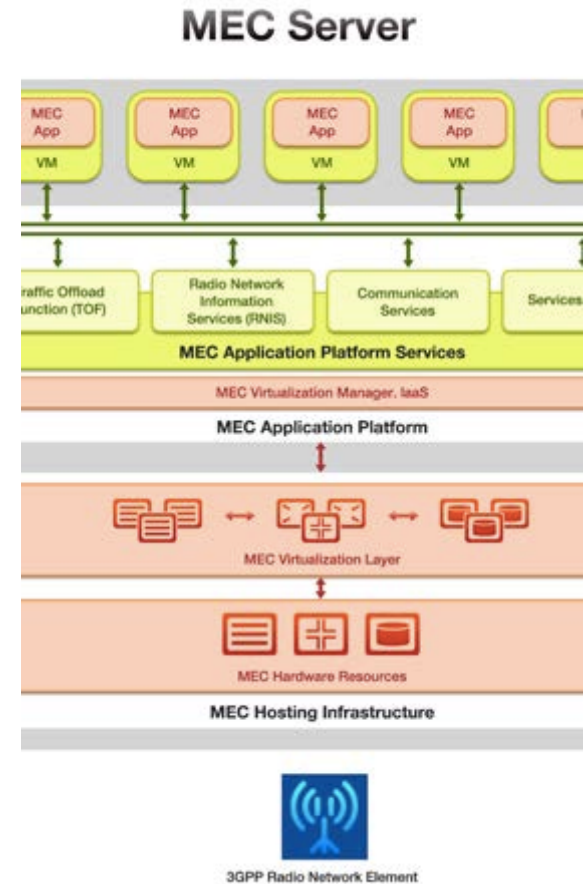
- App inline as Back to Back Iuh and/or S1
- Onboard with User Plane flow
- External with Control and User Plane flows

- Onboard or External

- Interest has been primarily External
1. RAN Vendor Independence
 2. Eliminate dimensioning issues for Apps

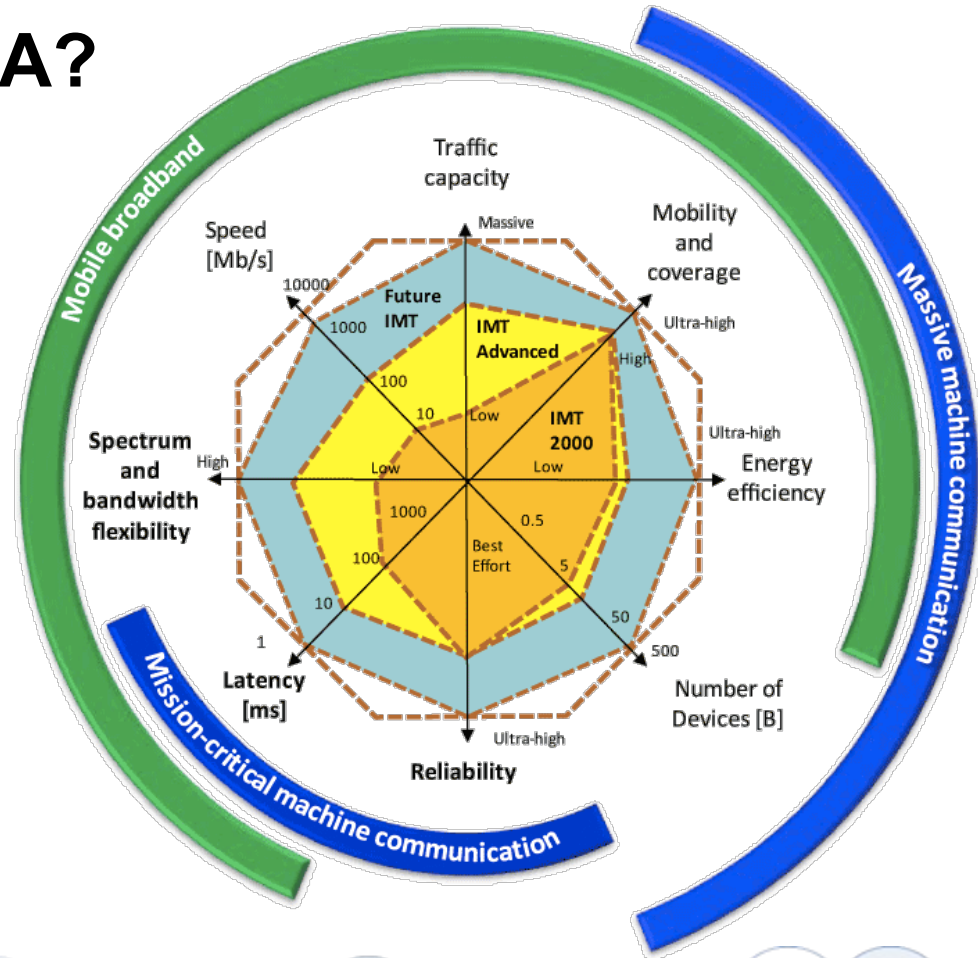
Improving Live Networks Today

- Easiest with performance improvement functions
 - Caching
 - Performance optimization (video streaming)
 - Content Delivery Network
- Quality of Experience up
- Backhaul consumption down



What about 5G and LTE-A?

- Observation:
 - Much of 5G and LTE-A are RF improvements.
 - MEC sits between the edge and core
- App latency goal in 5G may be met with MEC server “one hop away”
- URLLC - Network slicing participation



Monetizing MEC

How to get to ROI?

Operator Owned

- Internal or Enterprise
- Line of sight value to buyer

Enterprise Owned

- As enterprise's buy RAN
- Monetize mobile core & API's



www.spidercloud.com

