Making the promise of Enterprise 5G Services real
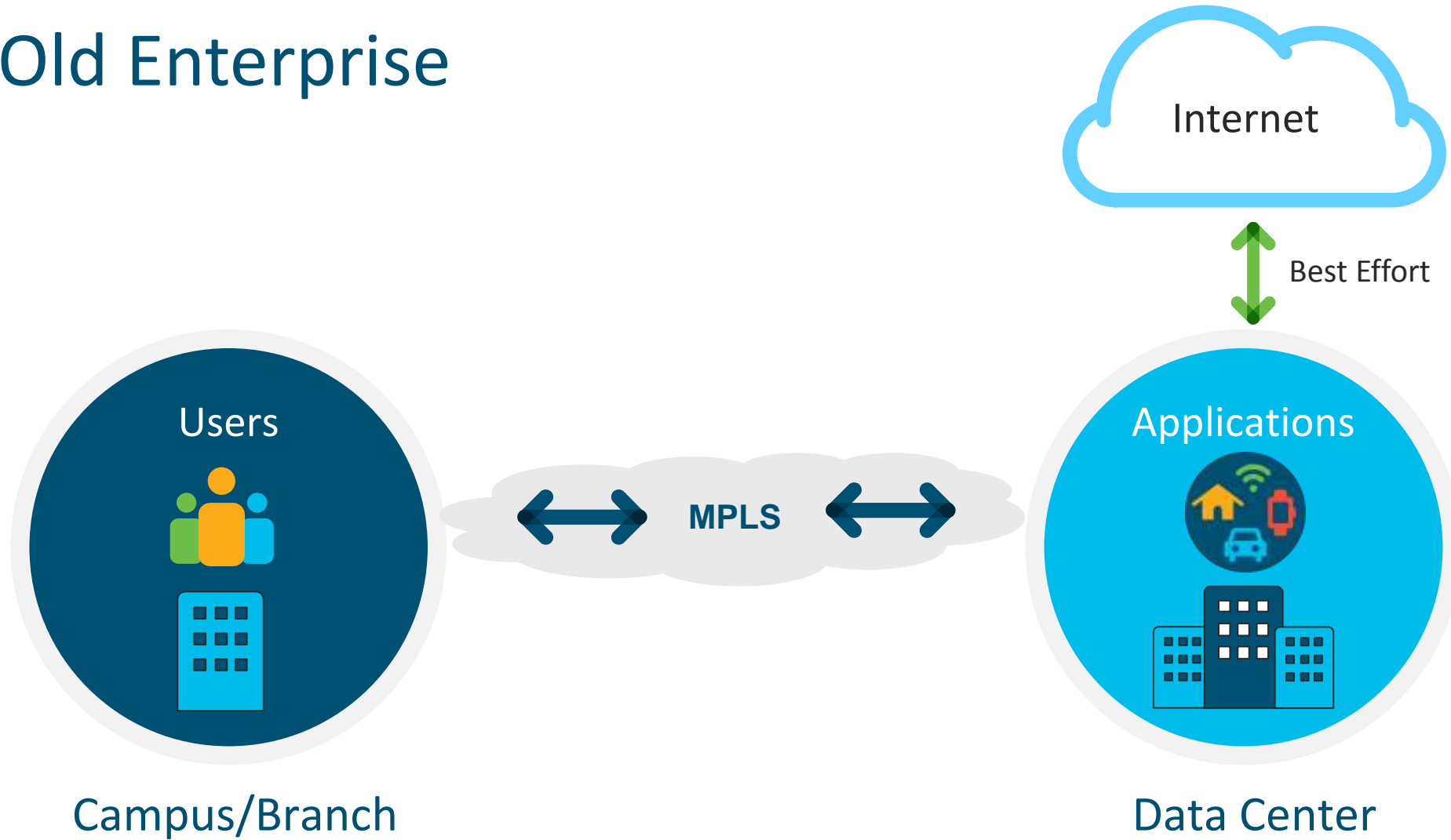
Andreas Enotiadis
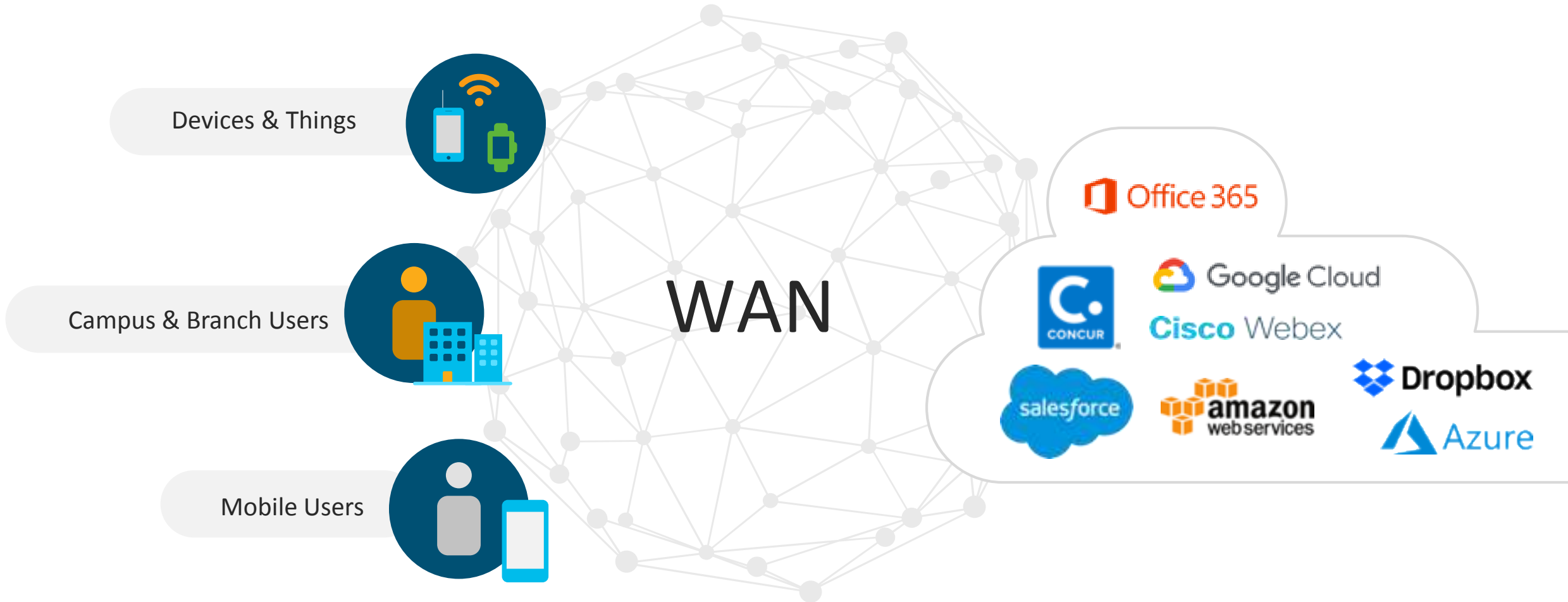
CTO, Vodafone Group & LGI, Cisco EMEAR

23rd October 2019

The Old Enterprise

Internet

Best Effort

Users

MPLS

Applications

Campus/Branch

Data Center

Then the Way We Worked Changed

Devices & Things

Campus & Branch Users

Mobile Users

WAN

Office 365

Google Cloud

CONCUR

Cisco Webex

salesforce

amazon web services

Dropbox

Azure

Applications Moved to Not One Cloud, but Many

Devices & Things

Campus & Branch Users

Mobile Users

WAN

DC/Private Cloud

SaaS

IaaS
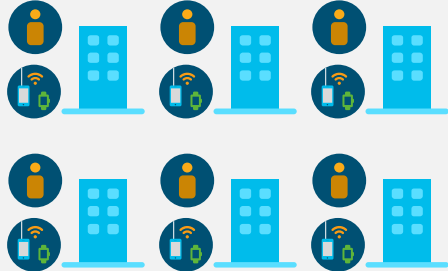
Resulting in a Highly Complex & Dynamic Network

Campus X2-5

Branches X100+

Mobile Users X1000s

WAN

DC/Private Cloud

SaaS

IaaS

More user, things and applications, everywhere

Enter 5G

Data Consumed and ARPU per Wireless Device (2009 to 2018)
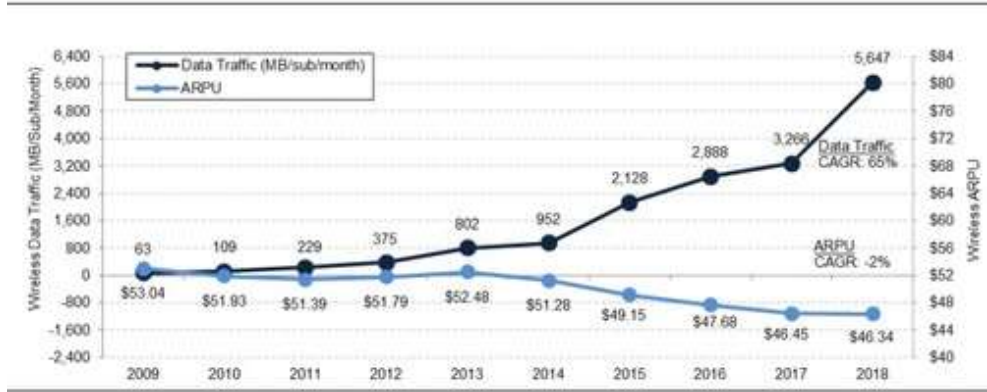
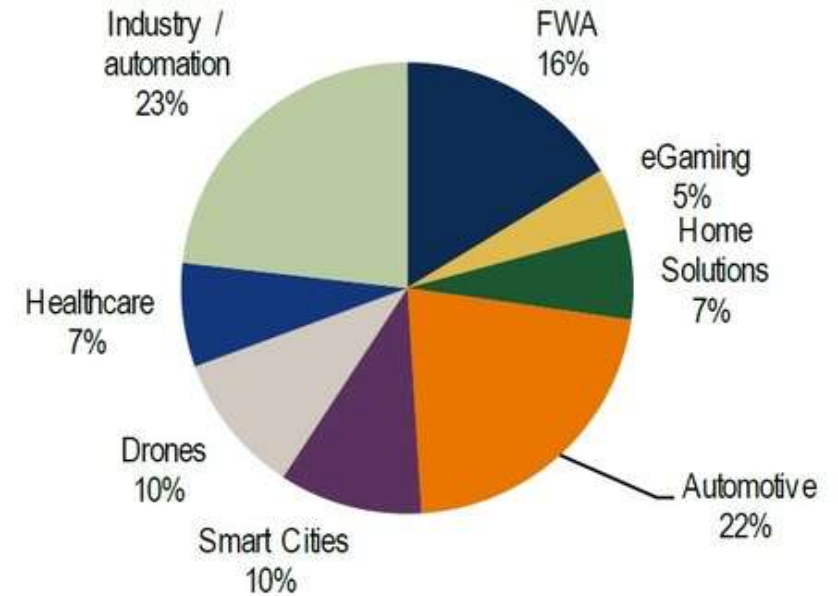Source: CTIA, MoffettNathanson estimates and analysis

More for less – race to the bottom

Enterprise is where the service lies

5G revenue opportunities breakdown by verticals

- Industry / automation 23%
- FWA 16%
- eGaming 5%
- Home Solutions 7%
- Automotive 22%
- Smart Cities 10%
- Drones 10%
- Healthcare 7%

Source: BofA Merrill Lynch Global Research estimates

So what's is 5G really?
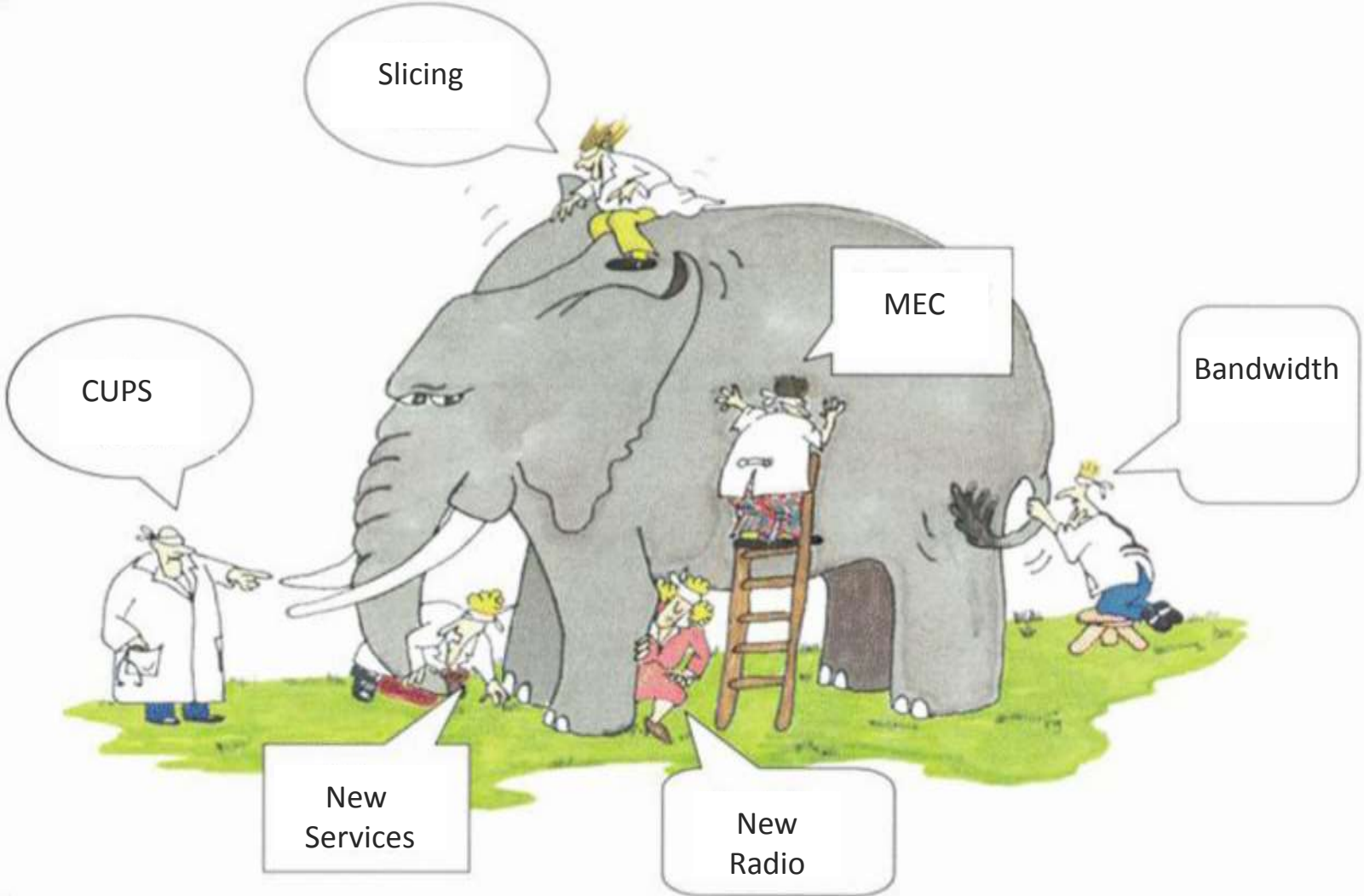
Enterprise Expectation - 5 minutes to service.

∟ 2m30s credit card clearing

∟ The rest is;

Intent understood & programmed

Provisioned, tested & delivered

... *and **if it works** we'll **buy** some **more**, since I am now **moving faster***

Increasing demand on all wireless networks

Requirements:
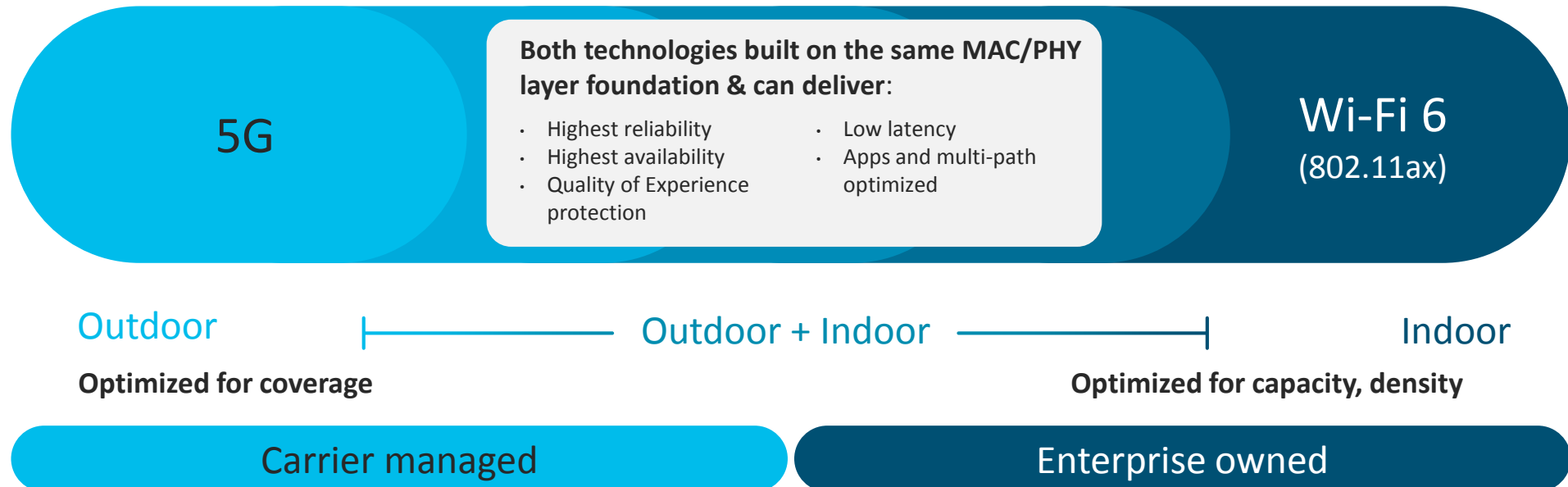
- Coverage: Indoor/Outdoor venues
- Throughput: More bandwidth per device
- Determinism: Guarantees for QoS, Latency, Reliability
- Security: comprehensive, multi-layer, end to end

Challenges:

- Availability of usable spectrum
- Seamless operation across multiple spectrum sources
- Convergence across wireline and wireless networks
- Unified service experience across: Ent / Telco / Cloud

New Wireless Technologies

5G

Both technologies built on the same MAC/PHY layer foundation & can deliver:

- Highest reliability
- Highest availability
- Quality of Experience protection
- Low latency
- Apps and multi-path optimized

Wi-Fi 6
(802.11ax)

Outdoor

Outdoor + Indoor

Indoor

Optimized for coverage

Optimized for capacity, density

Carrier managed

Enterprise owned

Enterprise Services – Stages of Evolution

Evolution
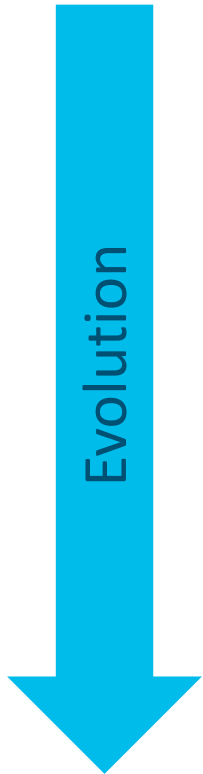
1. Public Network, Private APN

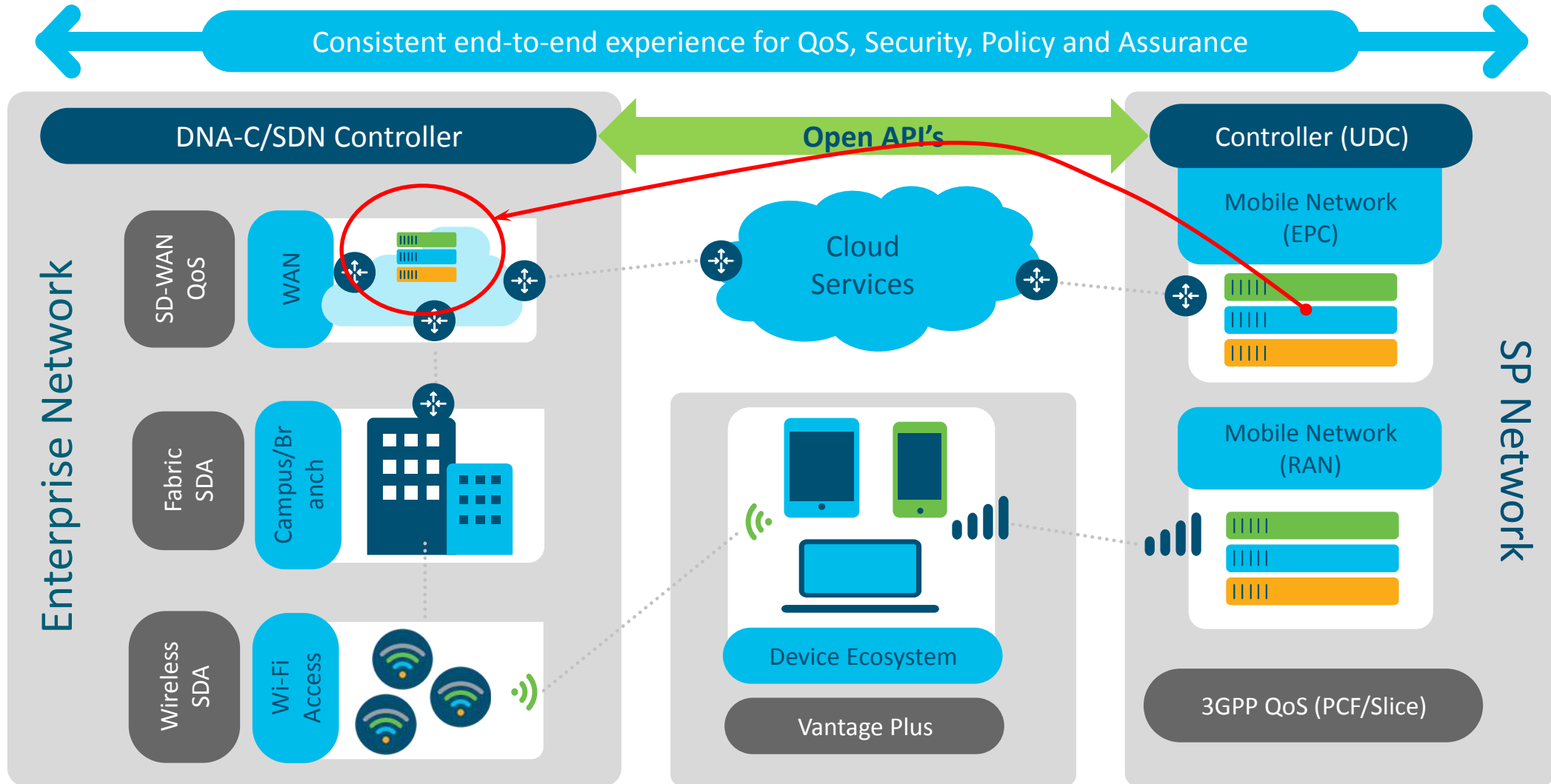2. Public Network Policy Selection and Assurance Visibility

3. Policy Selection and Assurance Visibility over Public Network, Private APN

4. Enterprise Network, Private APN

5. Policy Selection and Assurance Visibility consistently applied over Enterprise Network, Private APN and Public Network

Intent-based wireless with Cisco DNA

Consistent end-to-end experience for QoS, Security, Policy and Assurance

Enterprise Network

DNA-C/SDN Controller

Open API's

Controller (UDC)

SP Network

SD-WAN QoS

WAN

Cloud Services

Mobile Network (EPC)

Fabric SDA

Campus/Branch

Wireless SDA

Wi-Fi Access

Device Ecosystem

Vantage Plus

Mobile Network (RAN)

3GPP QoS (PCF/Slice)

Secure Industrial Use Cases
Applicable for Private LTE/5G and/or Wi-Fi 802.11

Increasing need for assurance and determinism

Critical sensor control systems

Wireless sensor monitors

Wireless bridging and routing

Wireless machine instrumentation

Wireless non-critical sensor monitors

Physical security

Asset location tracking

Workforce location tracking

Remote expert connectivity into secure plant equipment

Mobile workforce with smart-devices

The End Goal

5G

Opportunity For →

Smart+Connected Communities

Connected Industries

Sports & Entertainment

Connected Energy

Connected Transportation

Healthcare

Retail

Carpeted Space (General IT)

Using Technologies Beyond Macro Radio

Mobile SDWAN

SP API Exposure
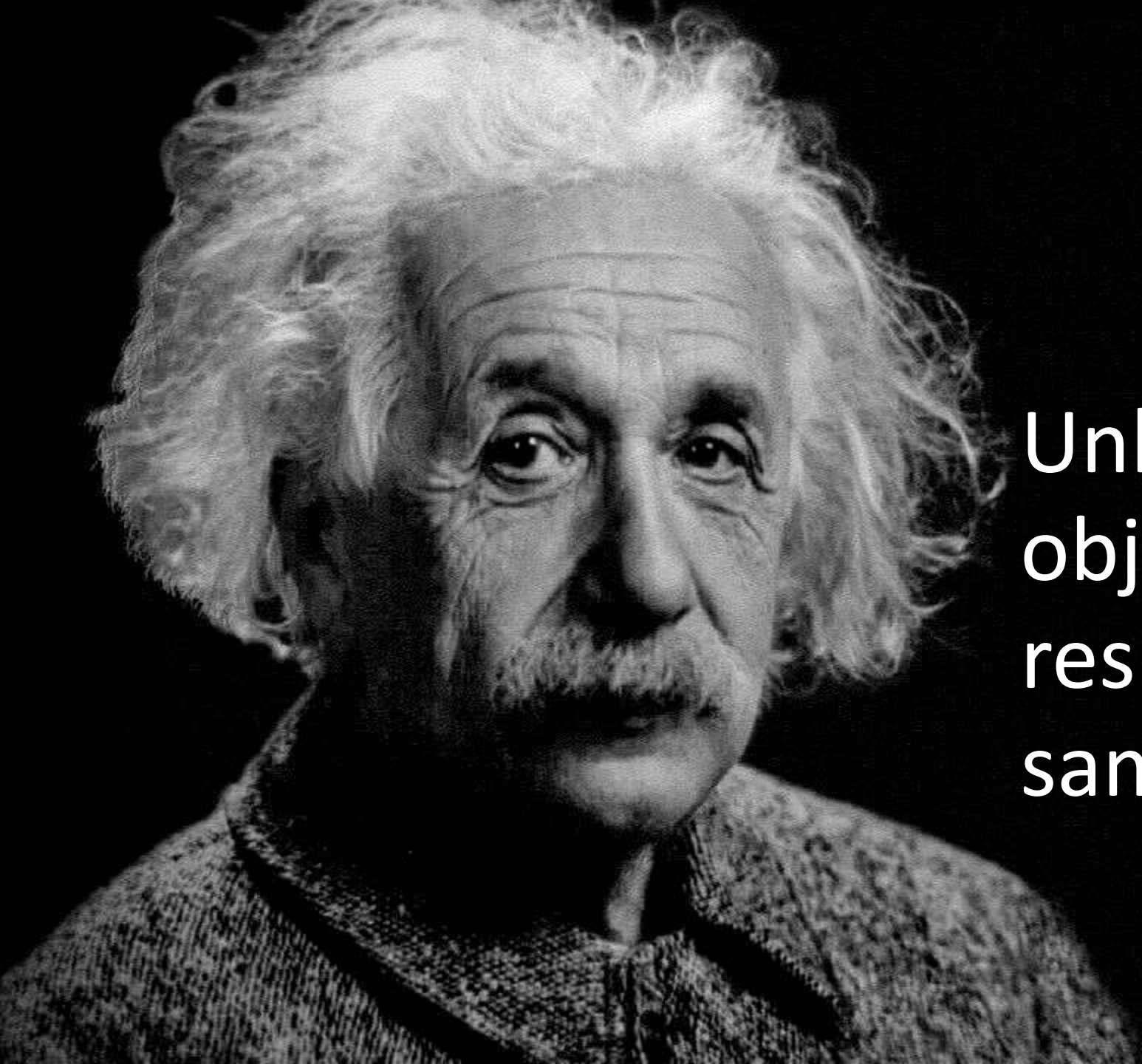
Multi- Radio private 5G

Open Roaming

Secure Internet Gateway Edge Services

Enterprise Network- to- Network Interconnect

Slice Friendly Protocols

Minimum Set
Immediate Need

Unless we change the objective, the end result will remain the same.