COMMSCOPE® + ARRIS® RUCKUS™

打造次世代的智慧校園

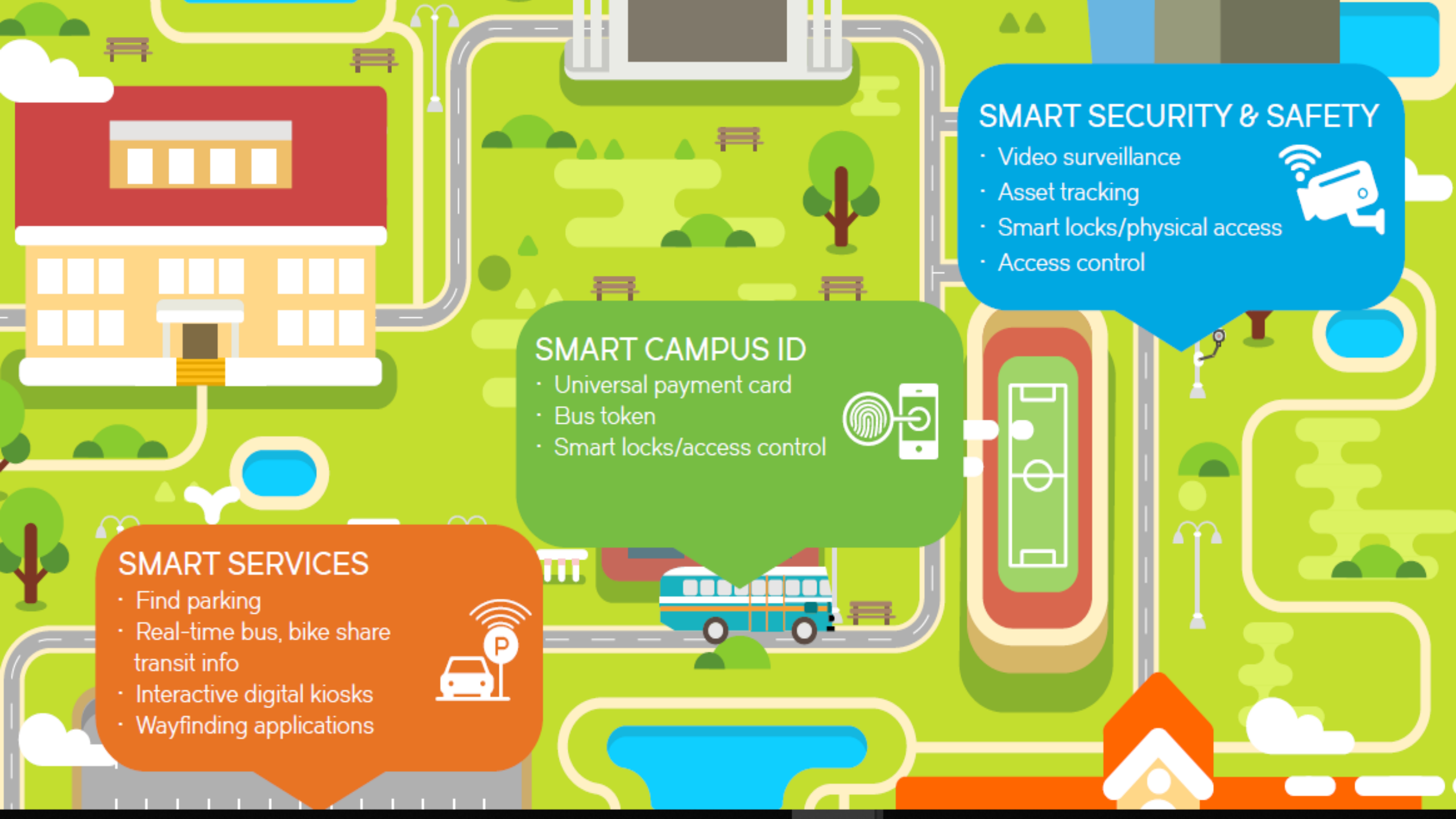
無線技術新趨勢

Dickens Lee

李棟楠

Technical Manager

RUCKUS™
an ARRIS company
ruckuswireless.com


SMART SECURITY & SAFETY
· Video surveillance
· Asset tracking
· Smart locks/physical access
· Access control
SMART CAMPUS ID
· Universal payment card
· Bus token
· Smart locks/access control
SMART SERVICES
· Find parking
· Real-time bus, bike share transit info
· Interactive digital kiosks
· Wayfinding applications
P

Smart Living

- Smart ID cards
- In-building LTE
- Smart lighting
- Smart parking / transit
- Wayfinding
- Personal networks

Smart Learning

- Flexible Learning Spaces
- Virtual Labs
- Distance Learning
- Lecture Capture

Smart Security

- Video surveillance
- Smart locks and access control
- Tracking assets
- Tracking people

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- Connectivity to People
- Connectivity to Information
- Efficiency
- Security
- Save Energy

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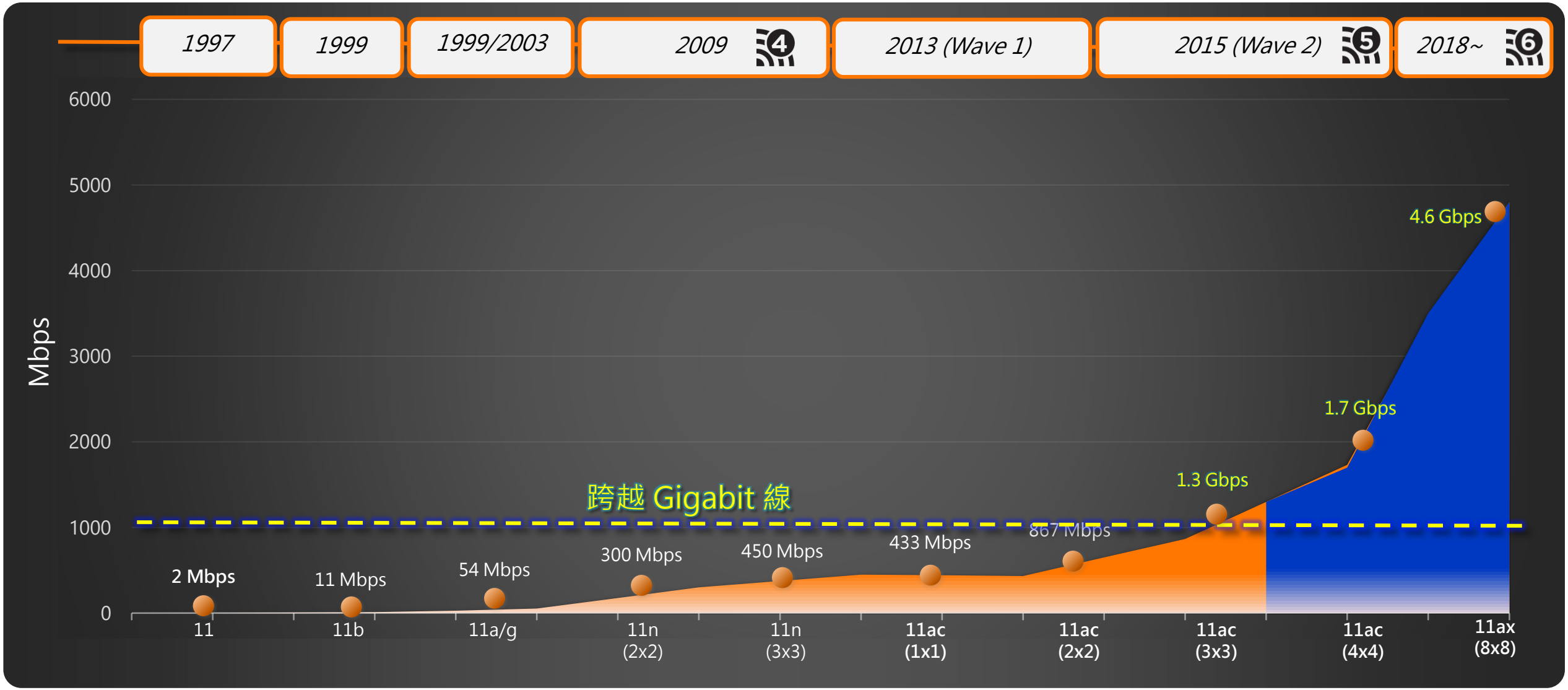
Connectivity is important



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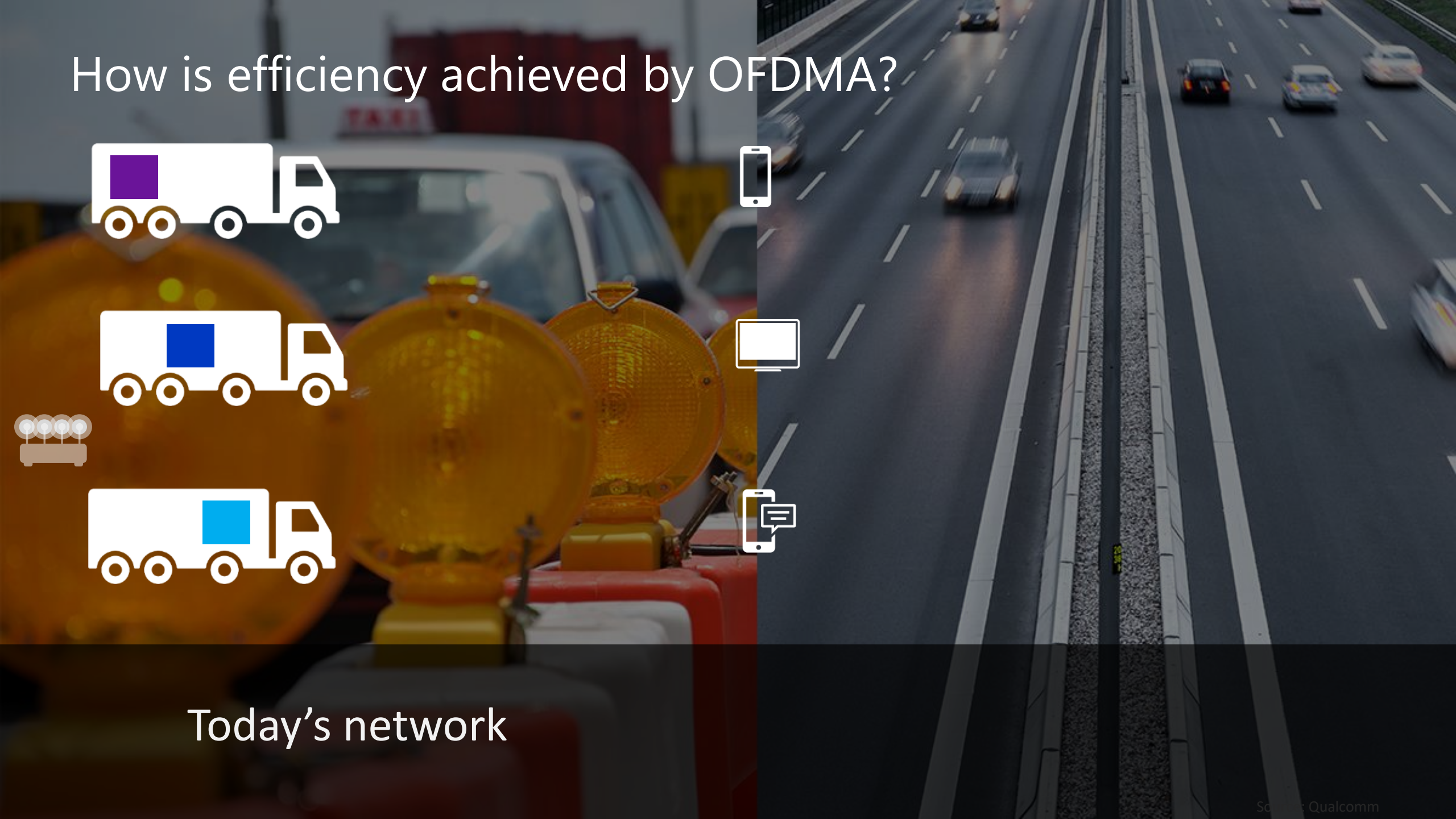
802.11AX – Not just speed
Designed for High Efficiency, Density , Huge IOT connections

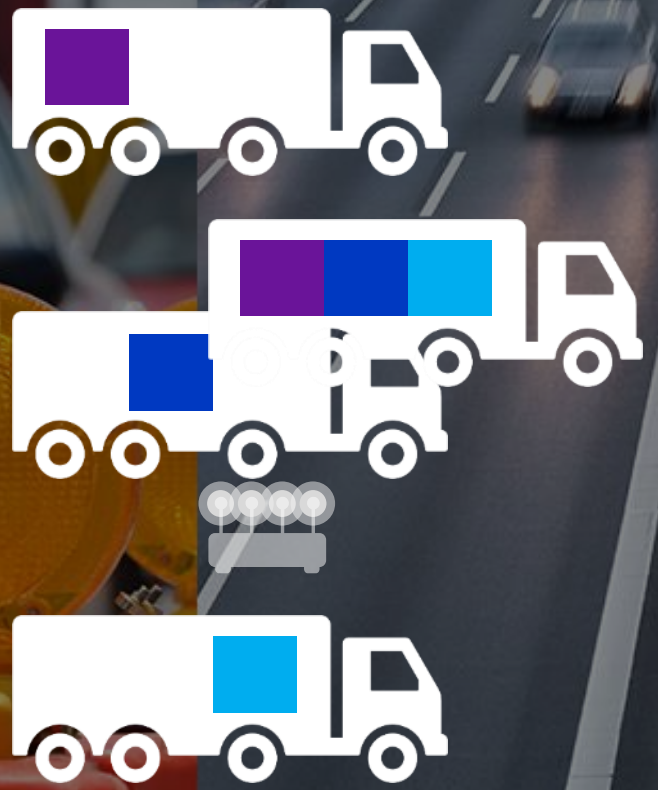
How is efficiency achieved by OFDMA?



Today’s network

Qualcomm

How is efficiency achieved by OFDMA?



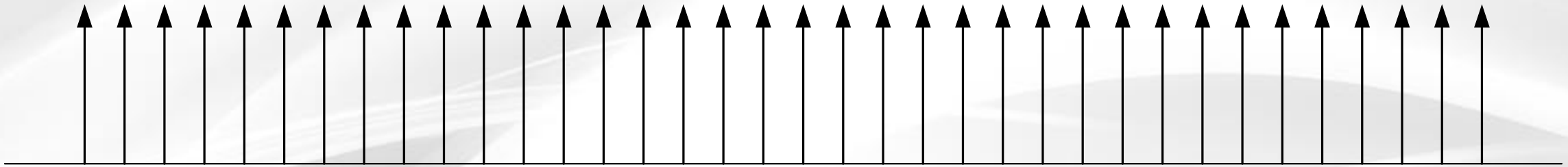
Tomorrow’s network (11ax)

Qualcomm

OFDM vs. OFDMA (802.11ax) – Better Spectrum Utilization

OFDM in 802.11ac

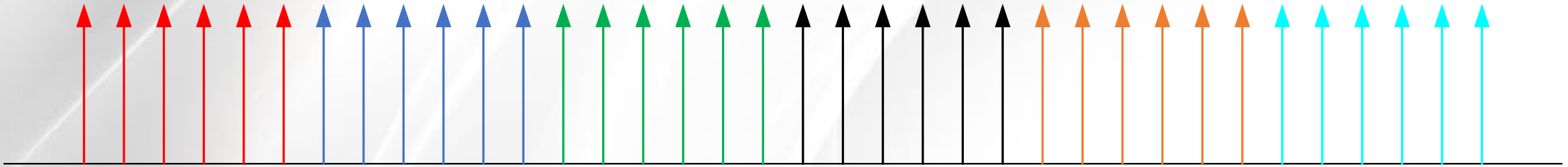
All Tones Assigned to Single Client



40/80M HZ, e.g channel 149/153/157/161

OFDMA (Resource Units RU)

Client 1 **Client 2** **Client 3** **Client 4** **Client 5** **Client 6**

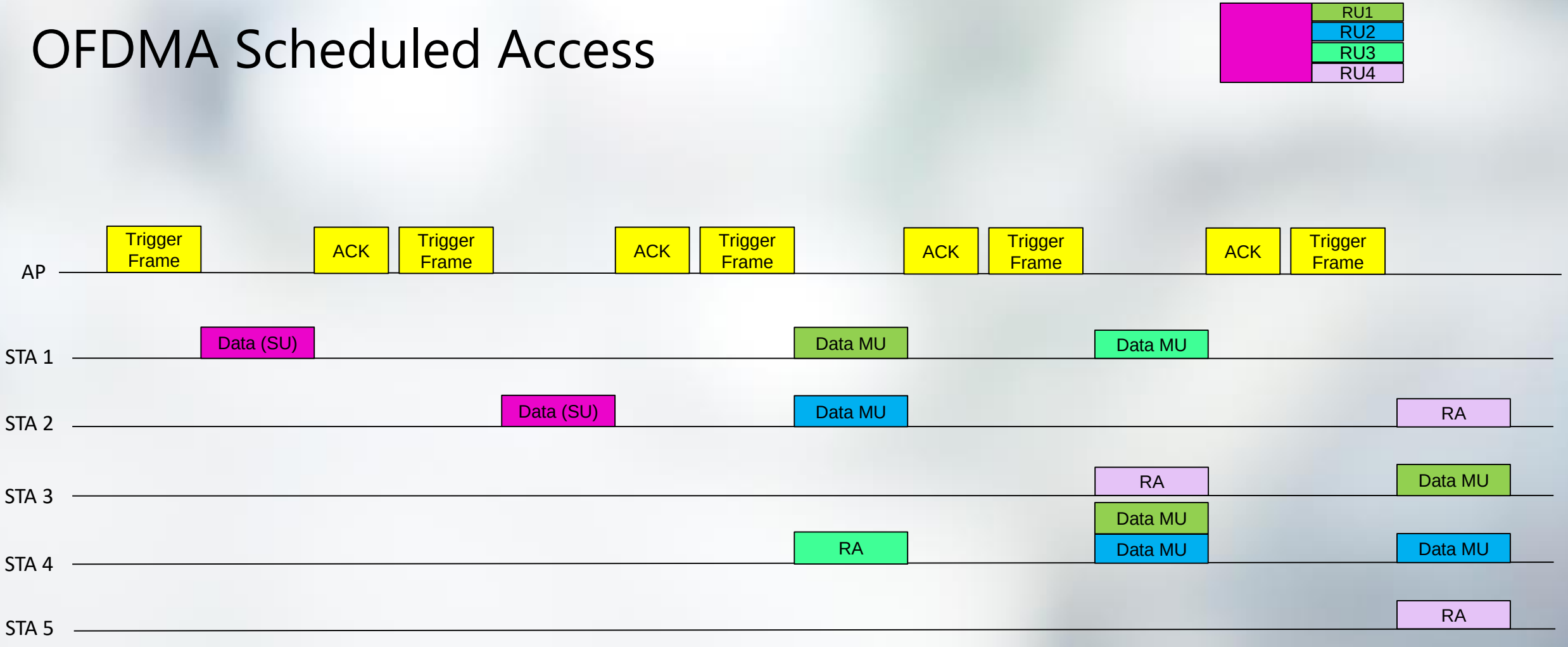


How is efficiency achieved?

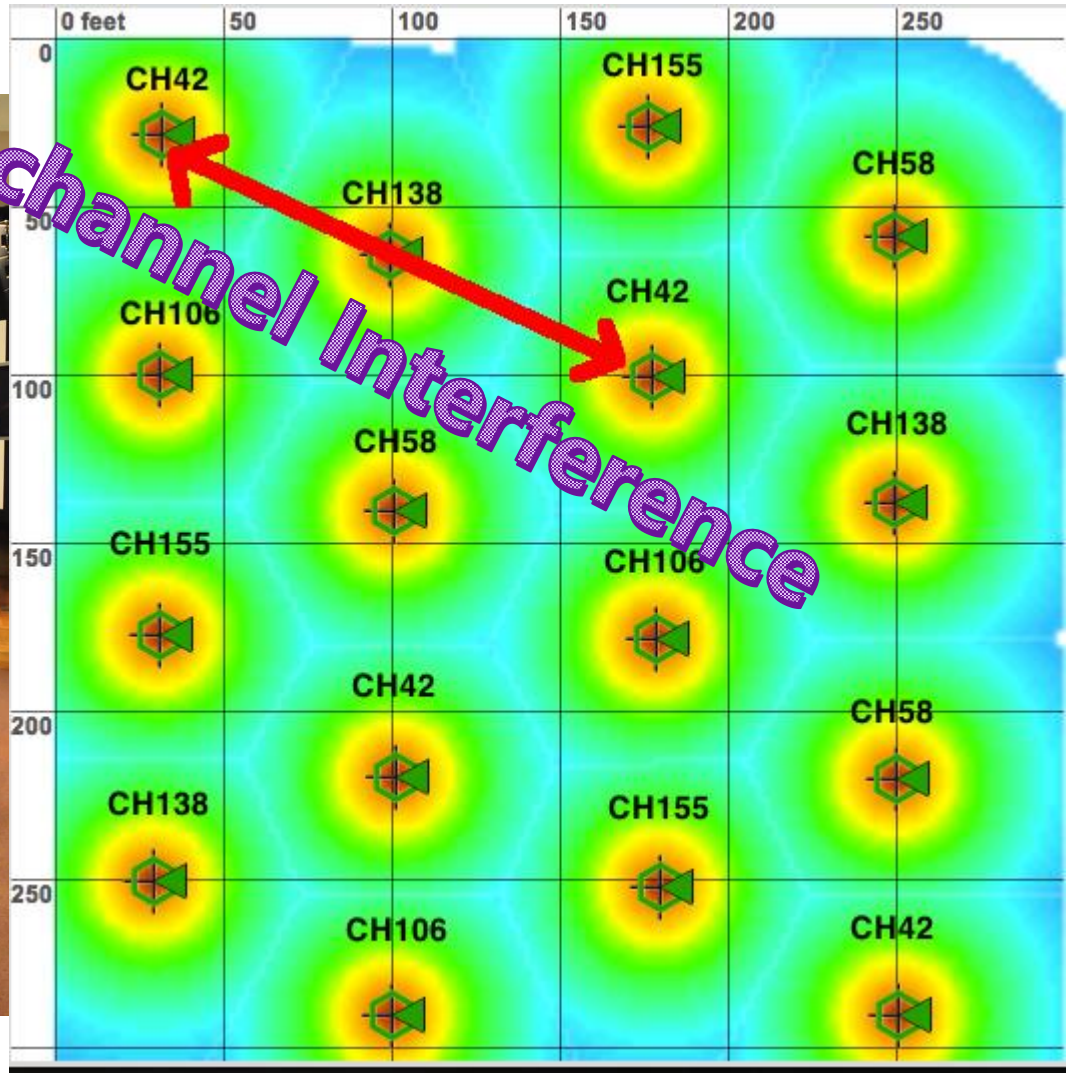
Contention Based (CSMA/CA)

Today’s network

OFDMA Scheduled Access



Lecture Theater – High density and high ceiling



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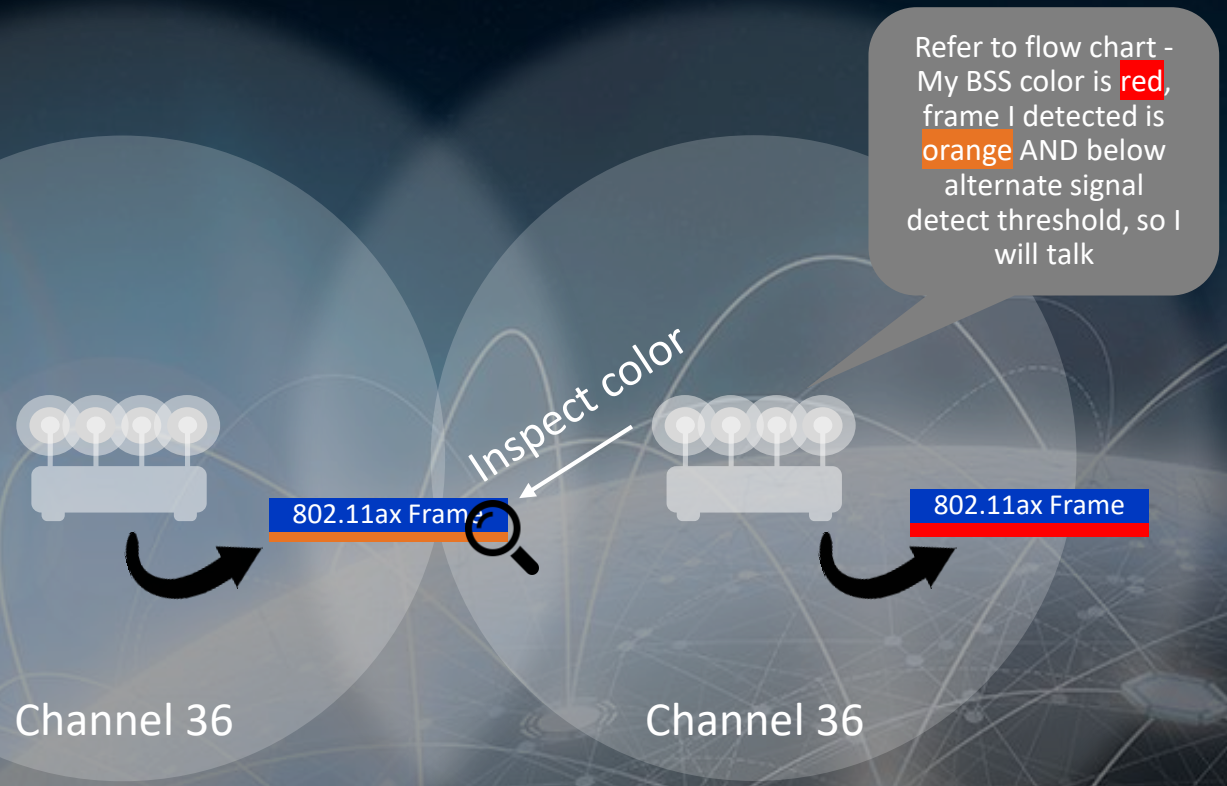
BSS Coloring - High Density



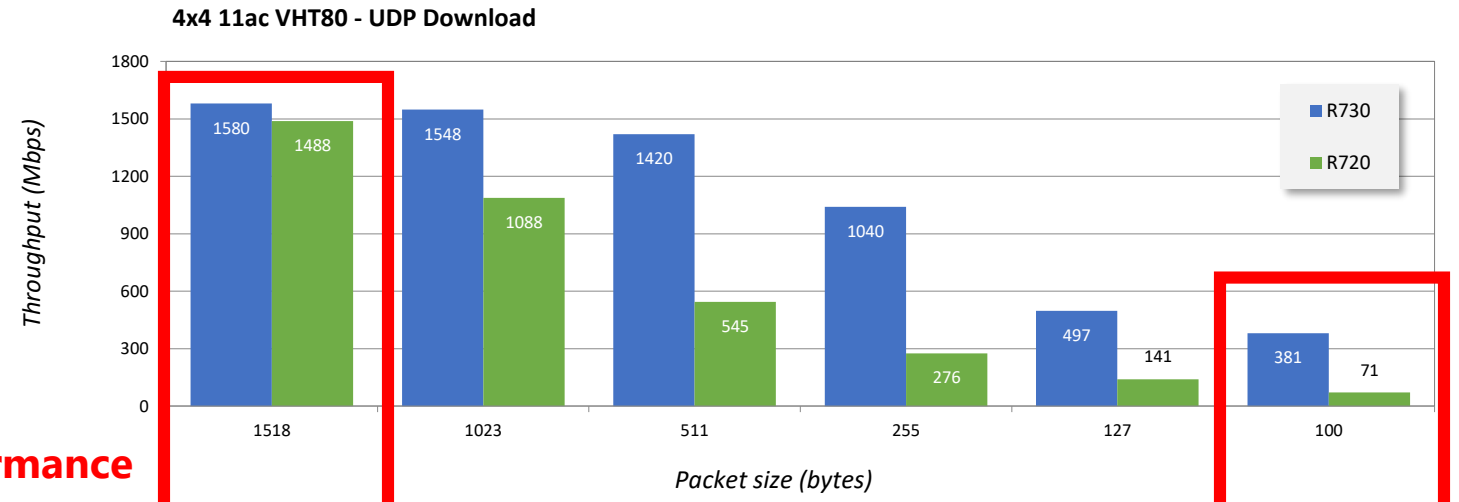
R730 – Indoor 8x8 802.11ax Wi-Fi Access Point

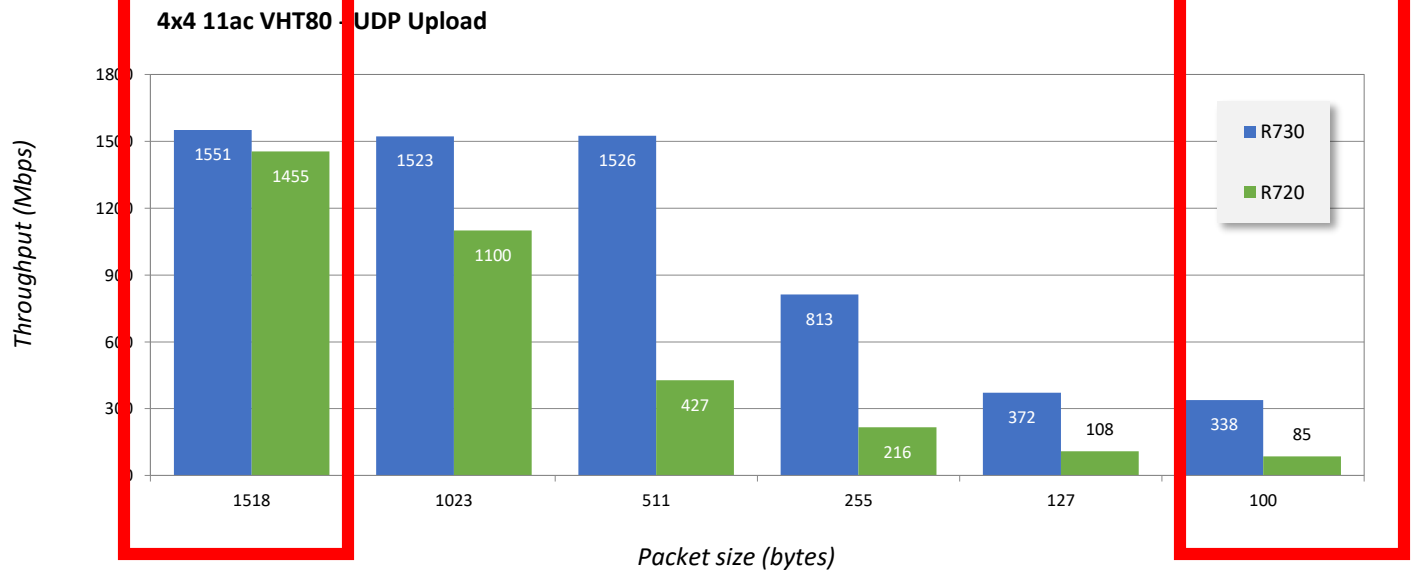
Highlights

- Dual band concurrent access point
- 2.4 GHz radio: 4x4:4 802.11b/g/n/ax
  - 1148 Mbps max PHY rate
- 5 GHz radio: 8x8:8 802.11a/n/ac/ax
  - 4800 Mbps max PHY rate
- Multi-User MIMO support
- Orthogonal Frequency Division Multiple Access (OFDMA)
- 160 / 80+80 MHz channel support
- BeamFlex+ adaptive antennas with Polarization Diversity (PD-MRC)
- IoT Ready: BLE & Zigbee
- Up to 1024 client associations
- WPA3 ready
- 1x 1/2.5/5Gbps and 1x 10/100/1000 Mbps Ethernet Ports

Wifi6 vs wifi5 -Small Packet Performance (single client)

Small-packet performance of R730 is more than 5 times that of R720 with 100 byte packets





Large packet performance

Are similar

Download speed:

381Mbps vs 71Mbsp

Five times!!!

Upload speed:

338Mbps vs 85Mbsp

Near four times!!!

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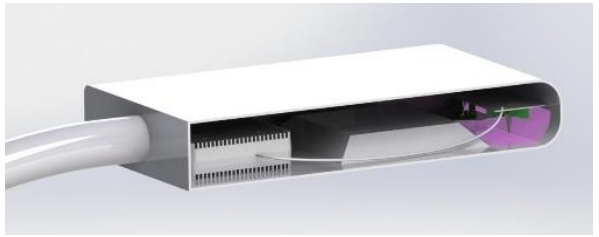
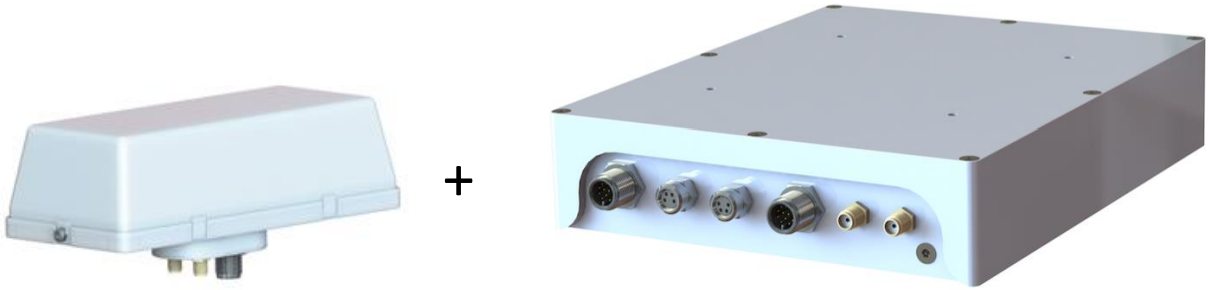
Ruckus E510

Modular Embedded Access Point for Outdoor Smart Lighting , Lamp pole Lighting, Smart Cities

Highlights

- Dual band concurrent access point
- 2.4 GHz radio: 2x2:2 802.11b/g/n
  - 400 Mbps max PHY rate
- 5 GHz radio: 2x2:2 802.11a/n/ac Wave 2
  - 866 Mbps max PHY rate
- Field-accessible USB Port for IoT radios e.g. BLE
- Up to 512 client associations
- IP67 Outdoor Rating
- -40 to +70C Operating temperature
- Rail certified EN 50155
- Embeddable form-factor





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1. Video cam – AI to analyze people
2. BLE/WIFI
3. Temp., humid, wind speed
4. Smart LED
5. Geo-QR code
6. RFID Cane navigation

E510

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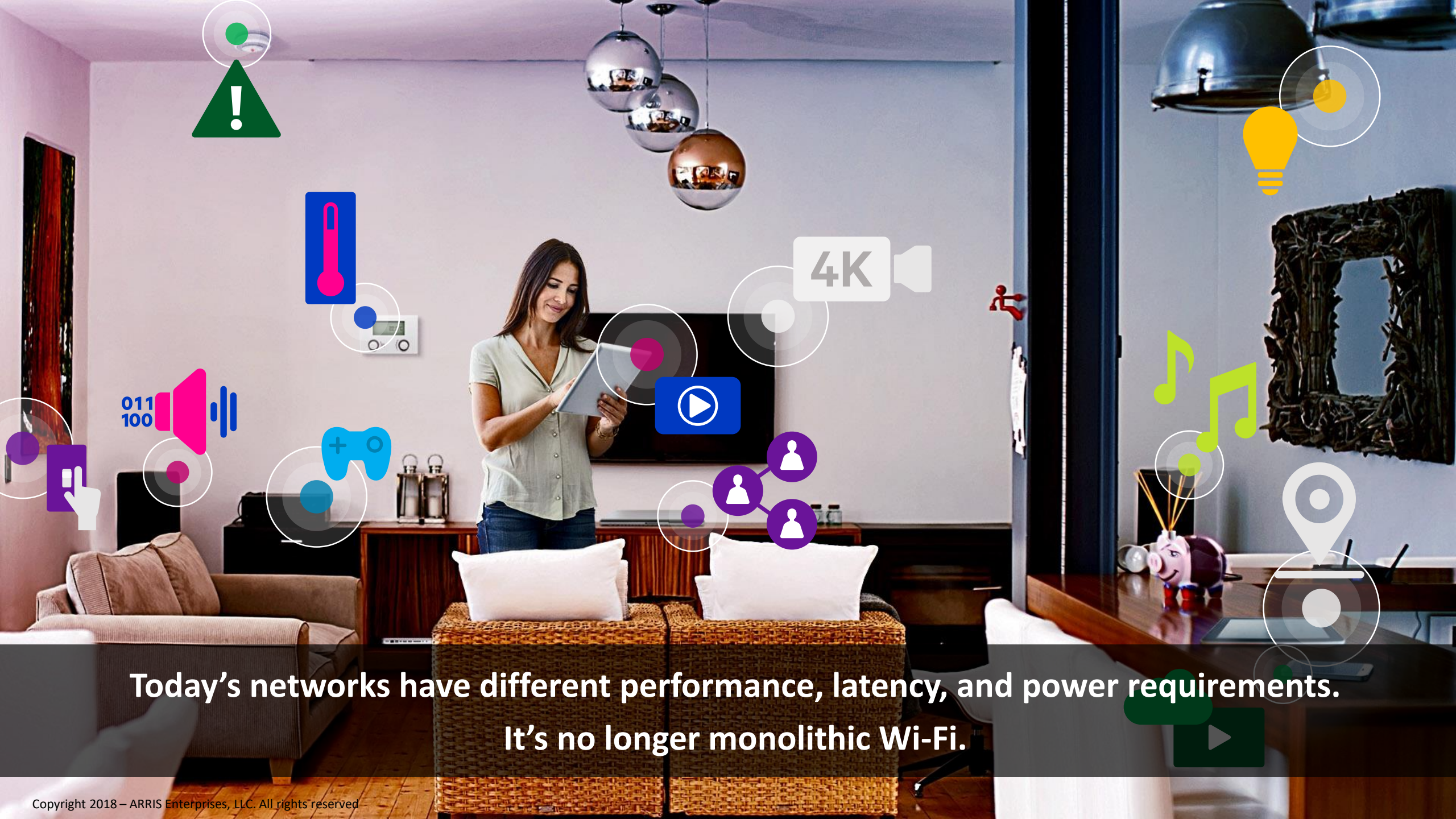

Today's networks have different performance, latency, and power requirements.

It's no longer monolithic Wi-Fi.

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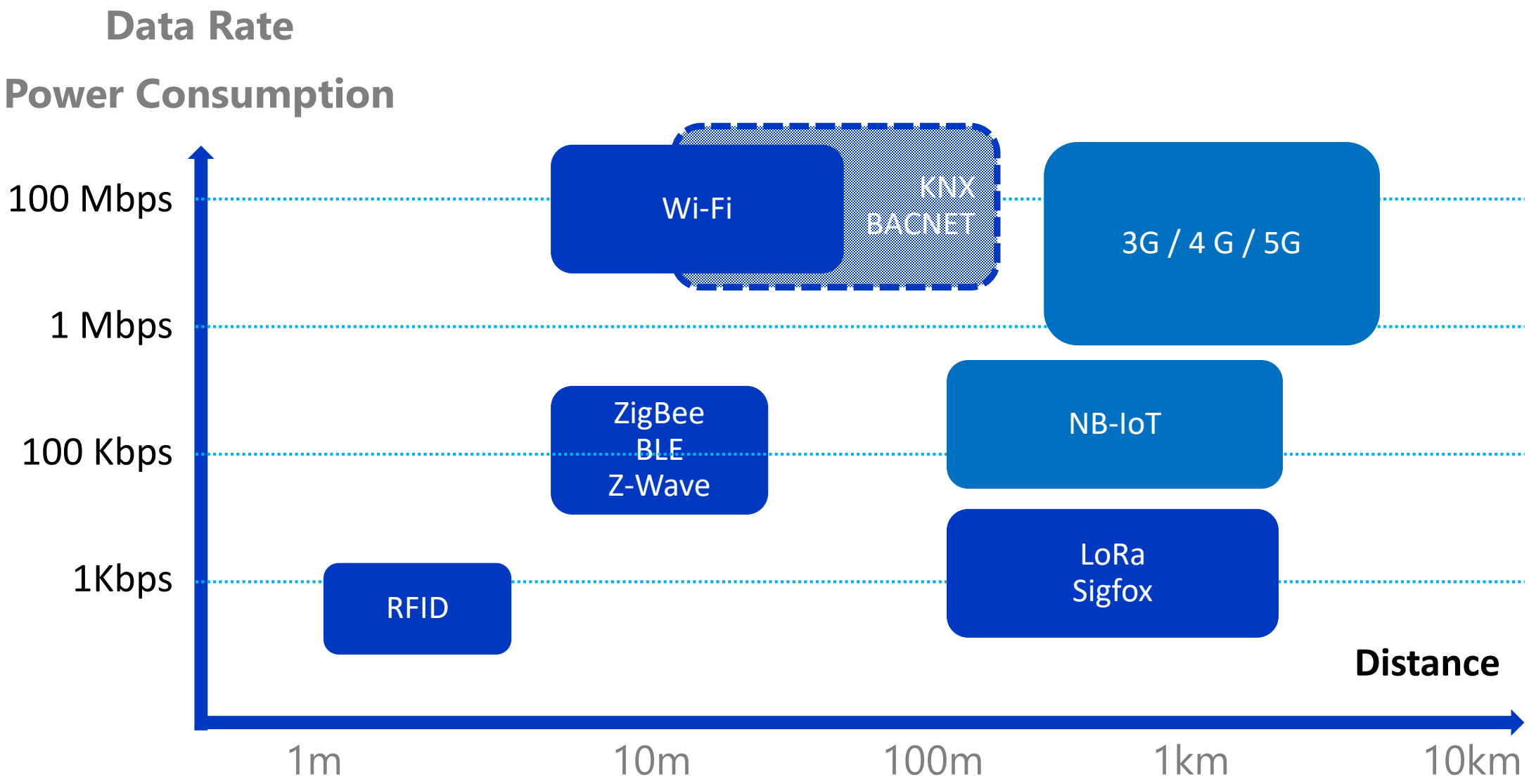
IoT Technology Overview



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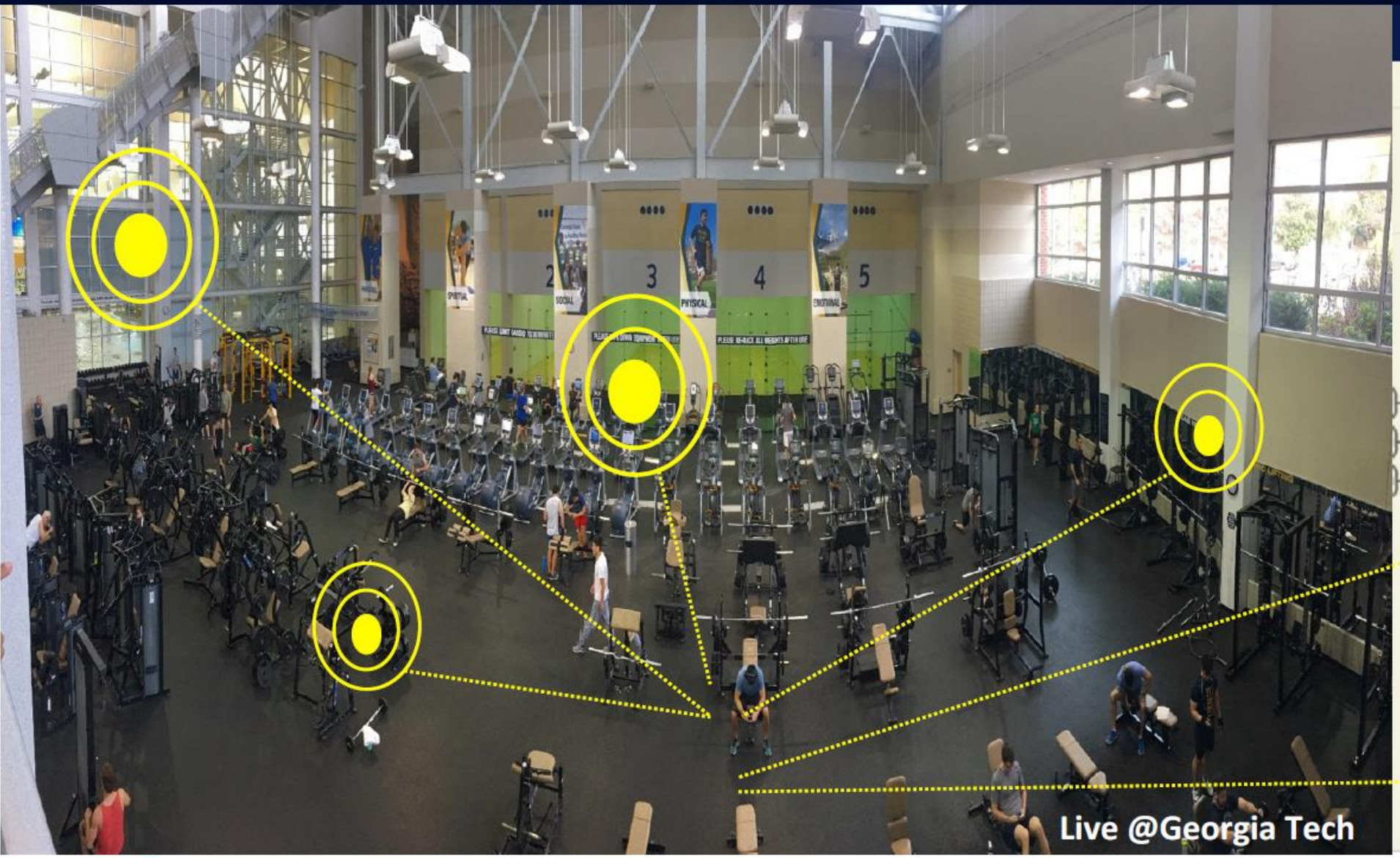
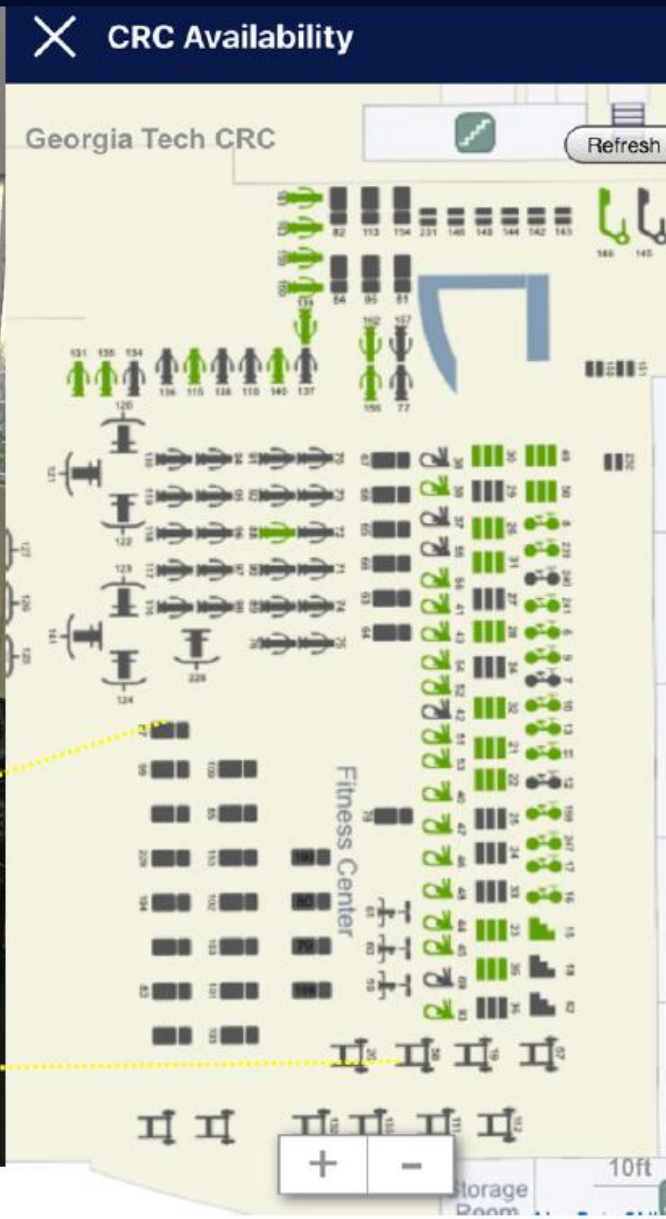
1. Smart Spaces - IoT network deployed in the Campus Recreation Centre delivers real time visibility and availability of equipment and space to both students and staff.

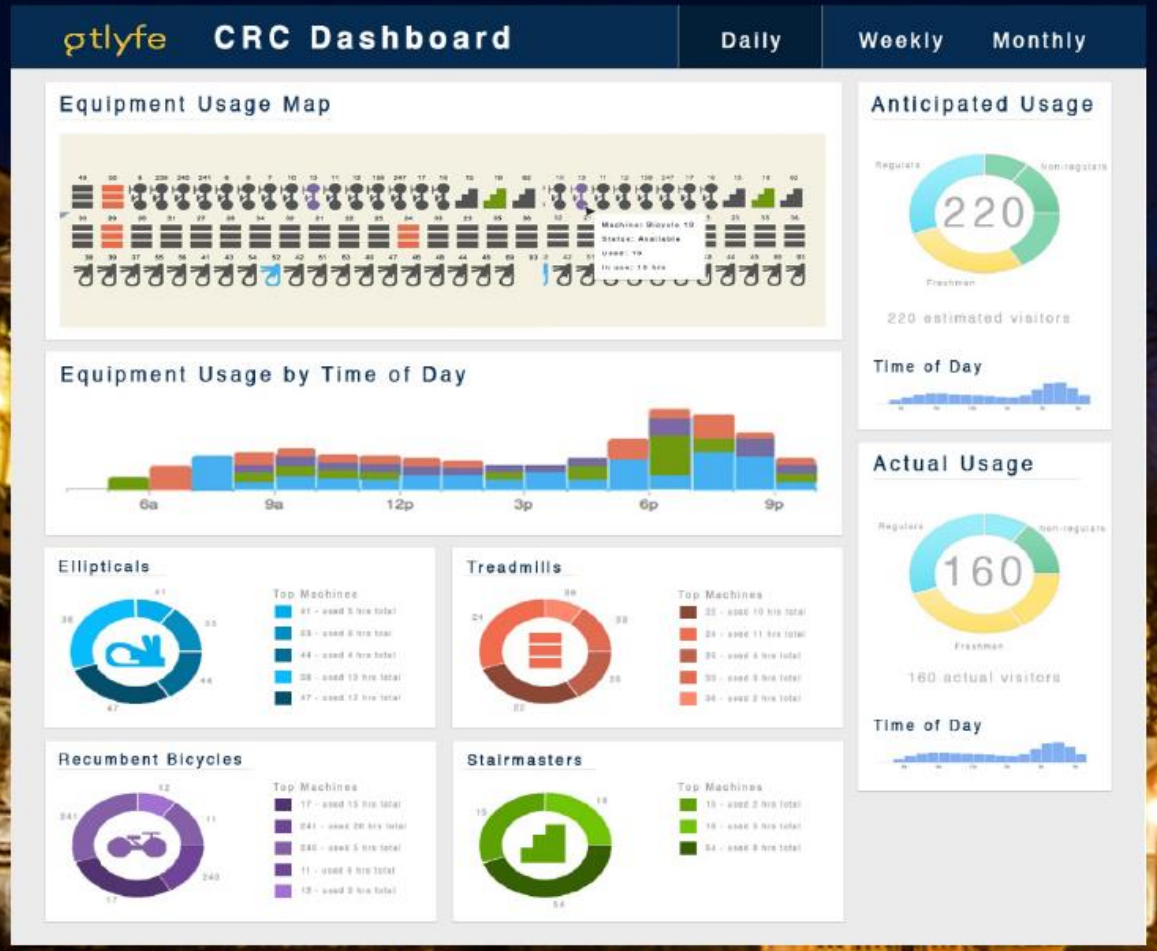


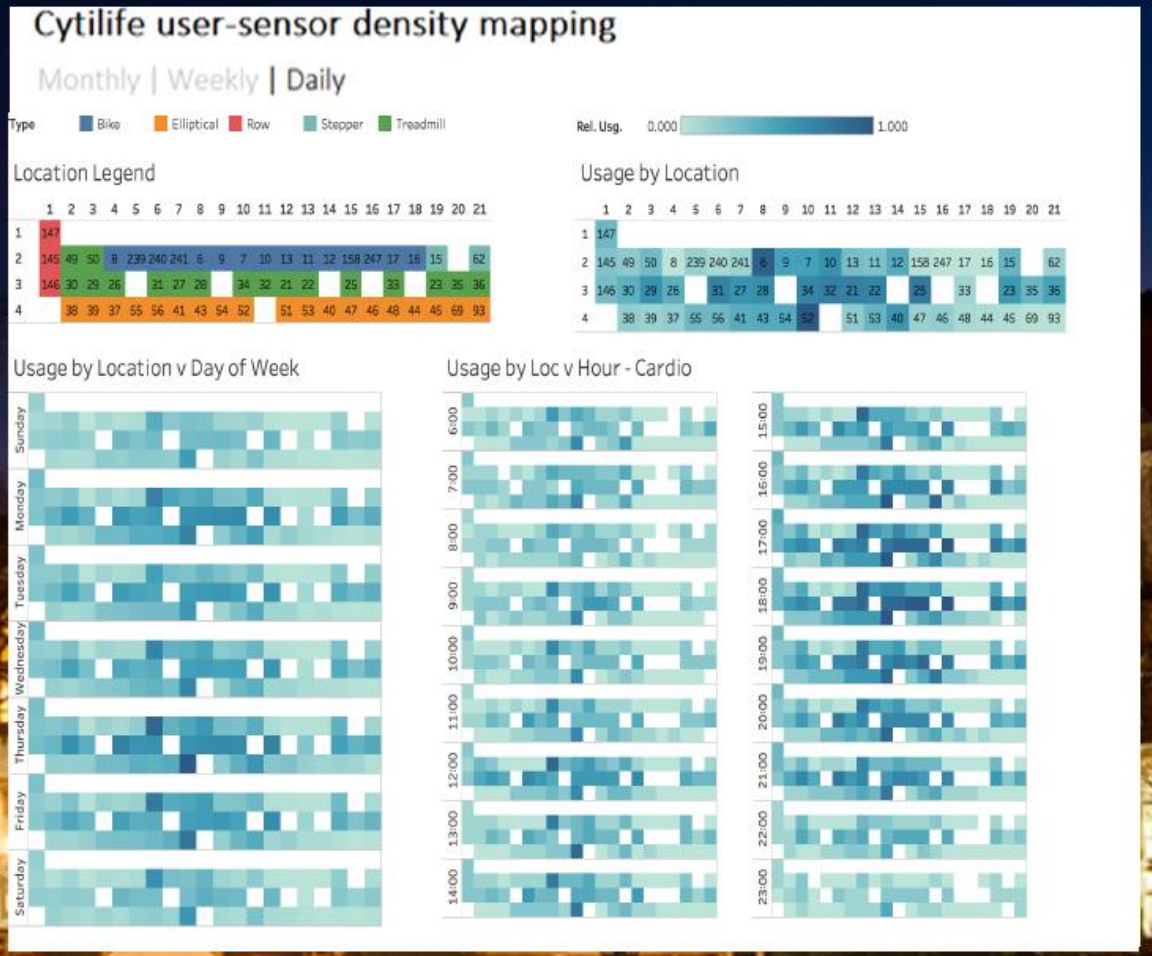


cytilife

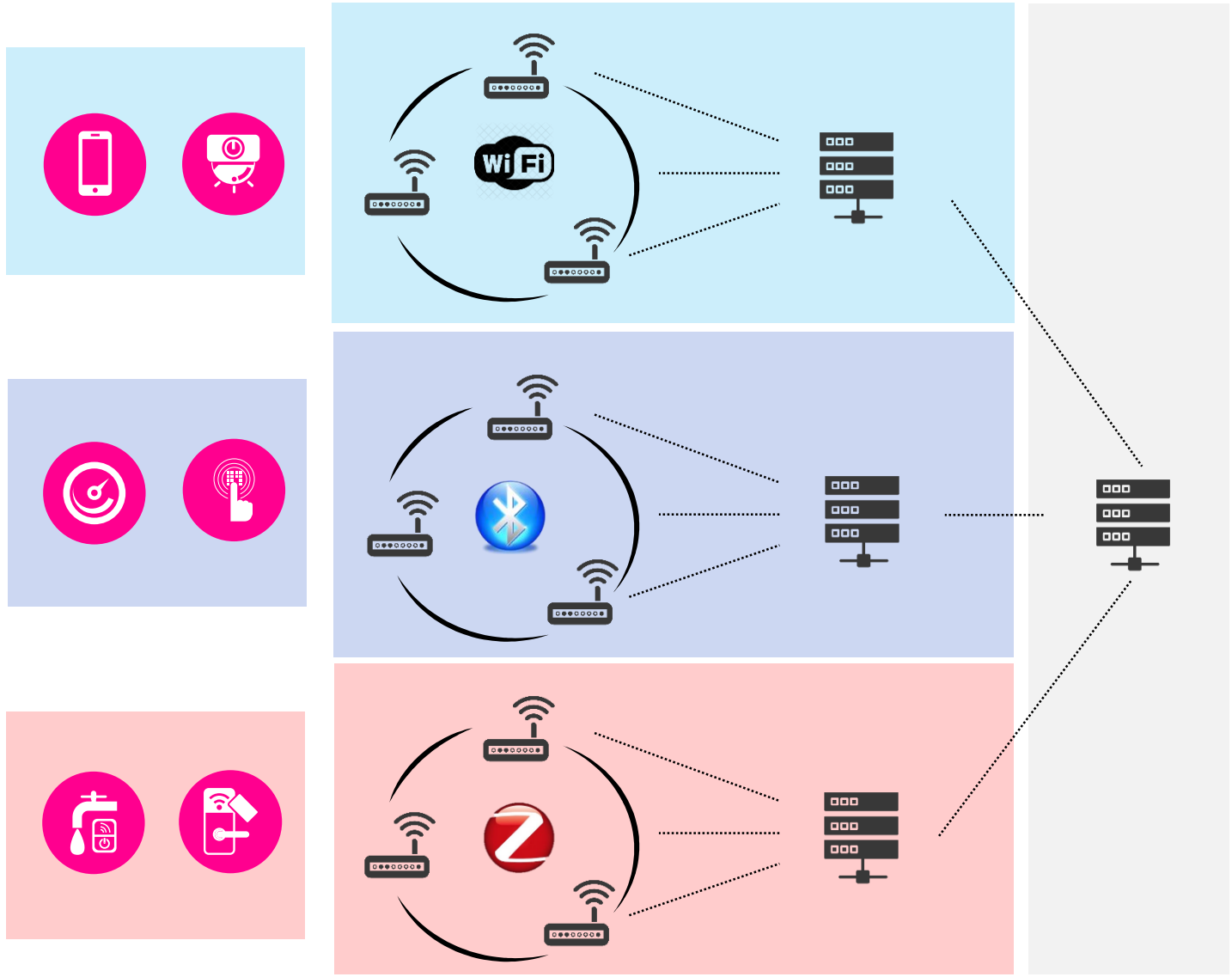
2. Smart Decisions – Real time data and predictive insights on student behavior and infrastructure utilization provided to Rec Center staff via a web and mobile portal.

ACTUAL DATA DASHBOARDS FOR GEORGIA TECH





Access Network Silos



Separate Networks for Wi-Fi and IoT

- Possibly per IoT device vendor

Larger Physical Infrastructure

- More switches, switch ports, cables

Complex Network Management

- Burdensome Security Policies

High Costs Resulting in Questionable ROI

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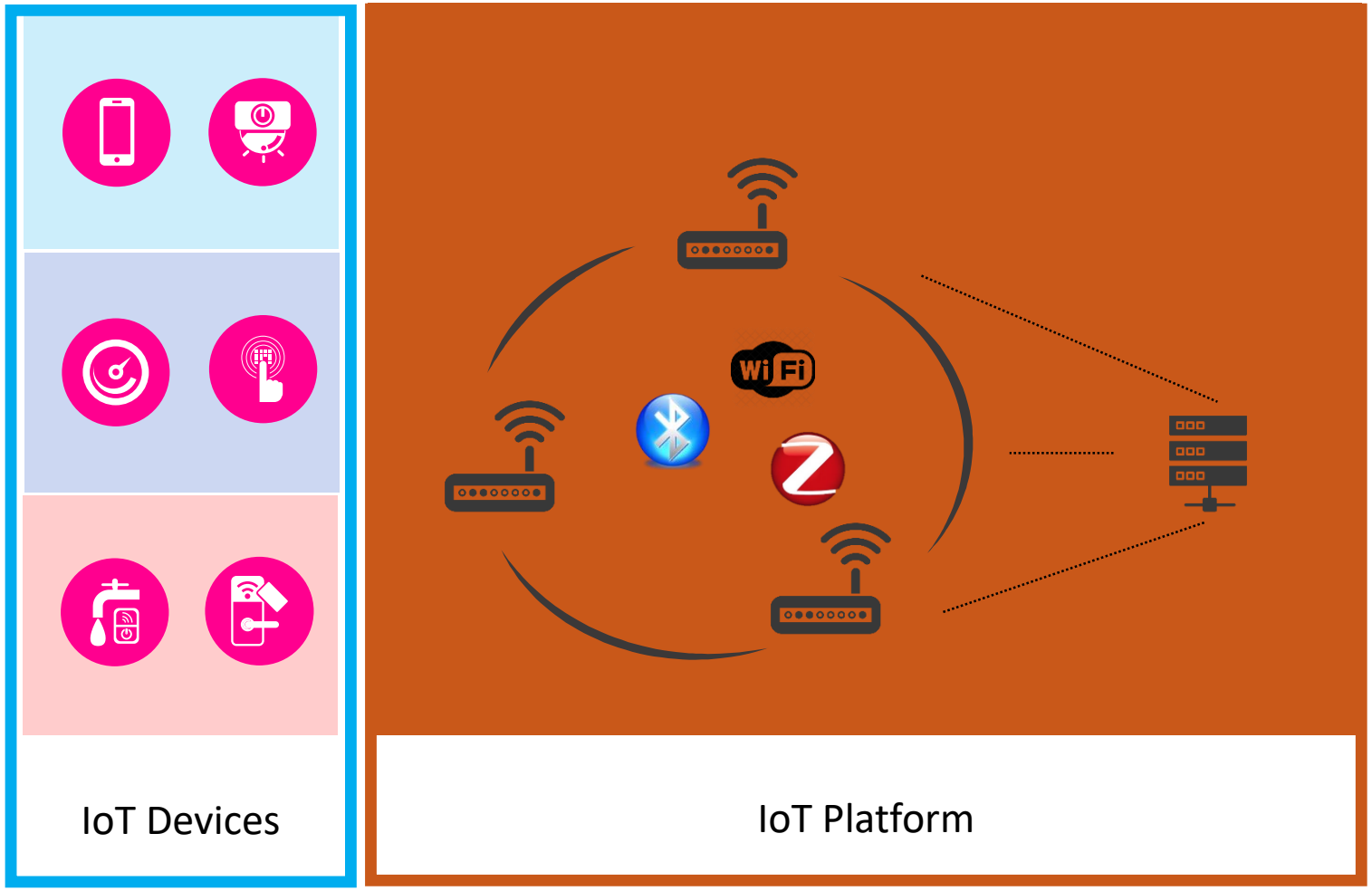
Converged IoT Access Network



- IoT Enabled Wi-Fi Access Points
- Reduced Physical Infrastructure
  - Less switches, switch ports, cables
- Single Network Management

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Ruckus IoT-Enabled APs

Unified Transport

Wi-Fi, Zigbee, BLE supported by Single Network

Coexistence by design

Data Abstraction

Normalize IP and non-IP data for northbound communication

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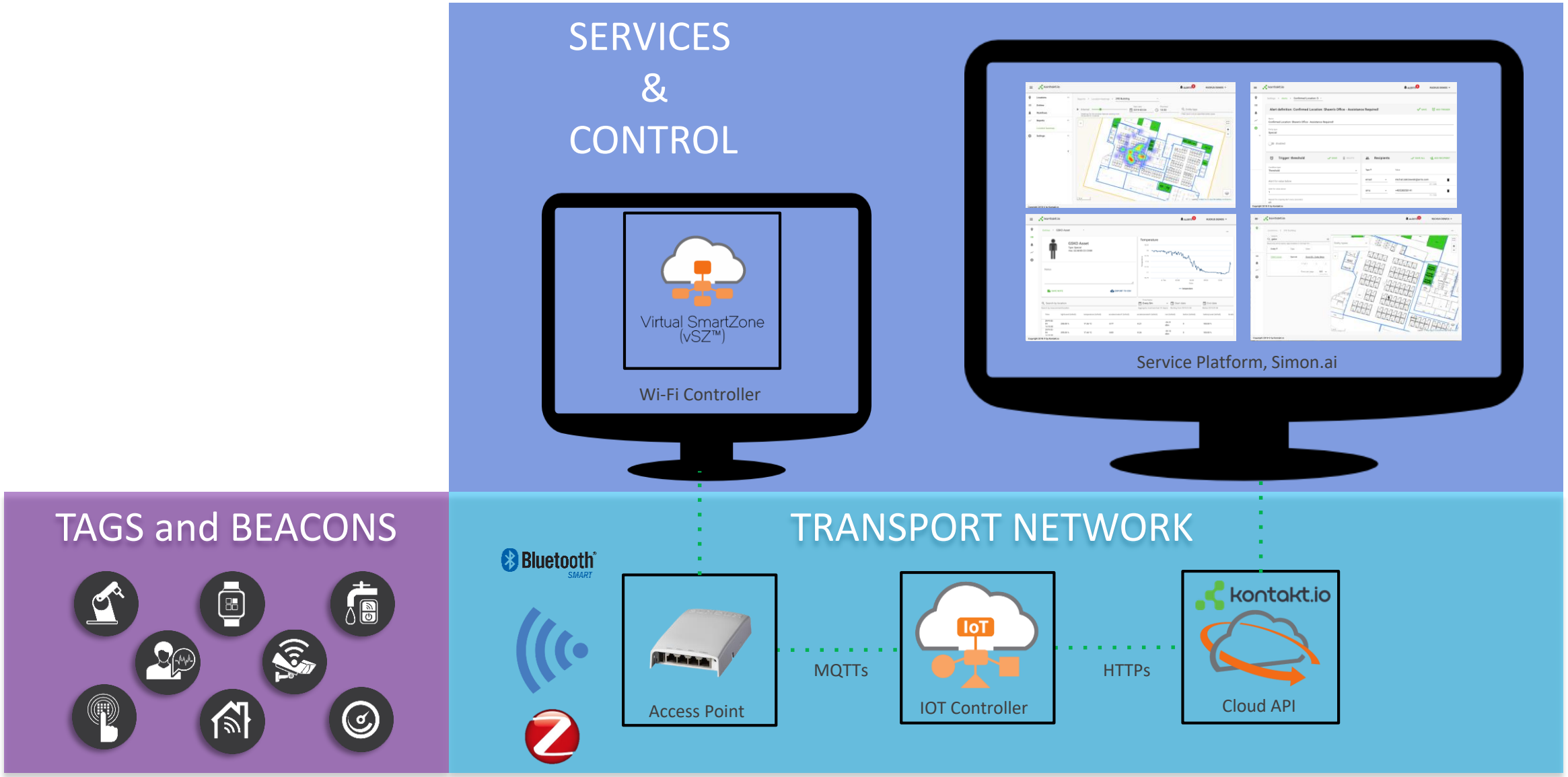
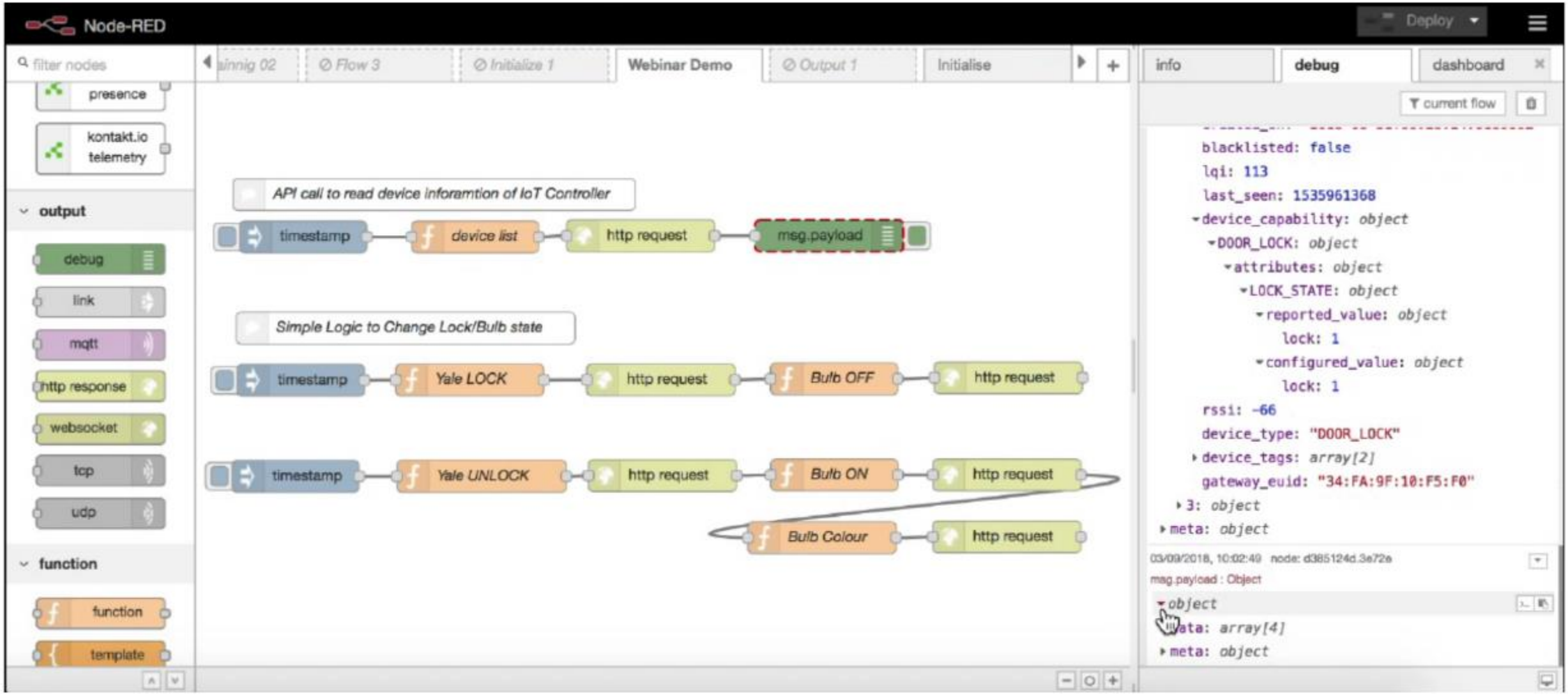
Service Architecture



API calls using Node-Red Rules Engine



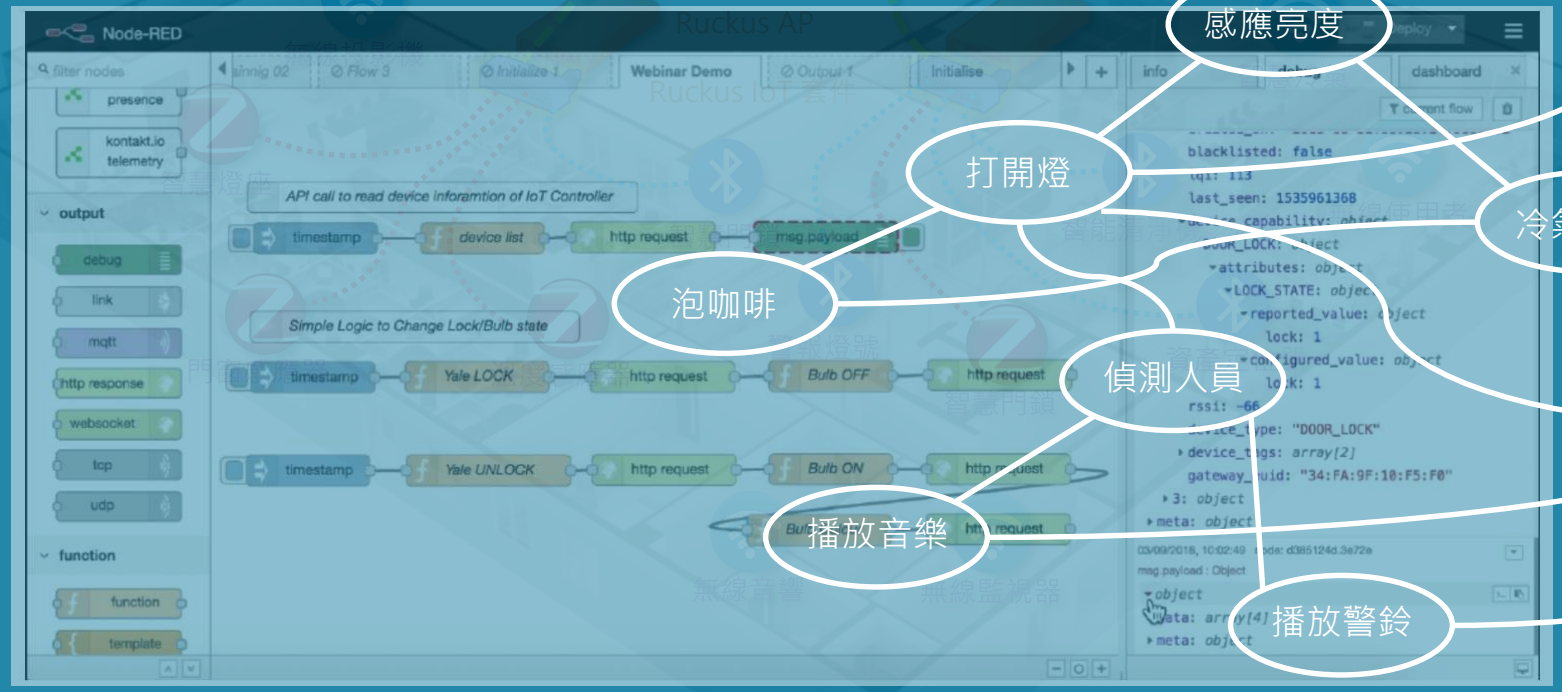
給你一個Smart Campus平台

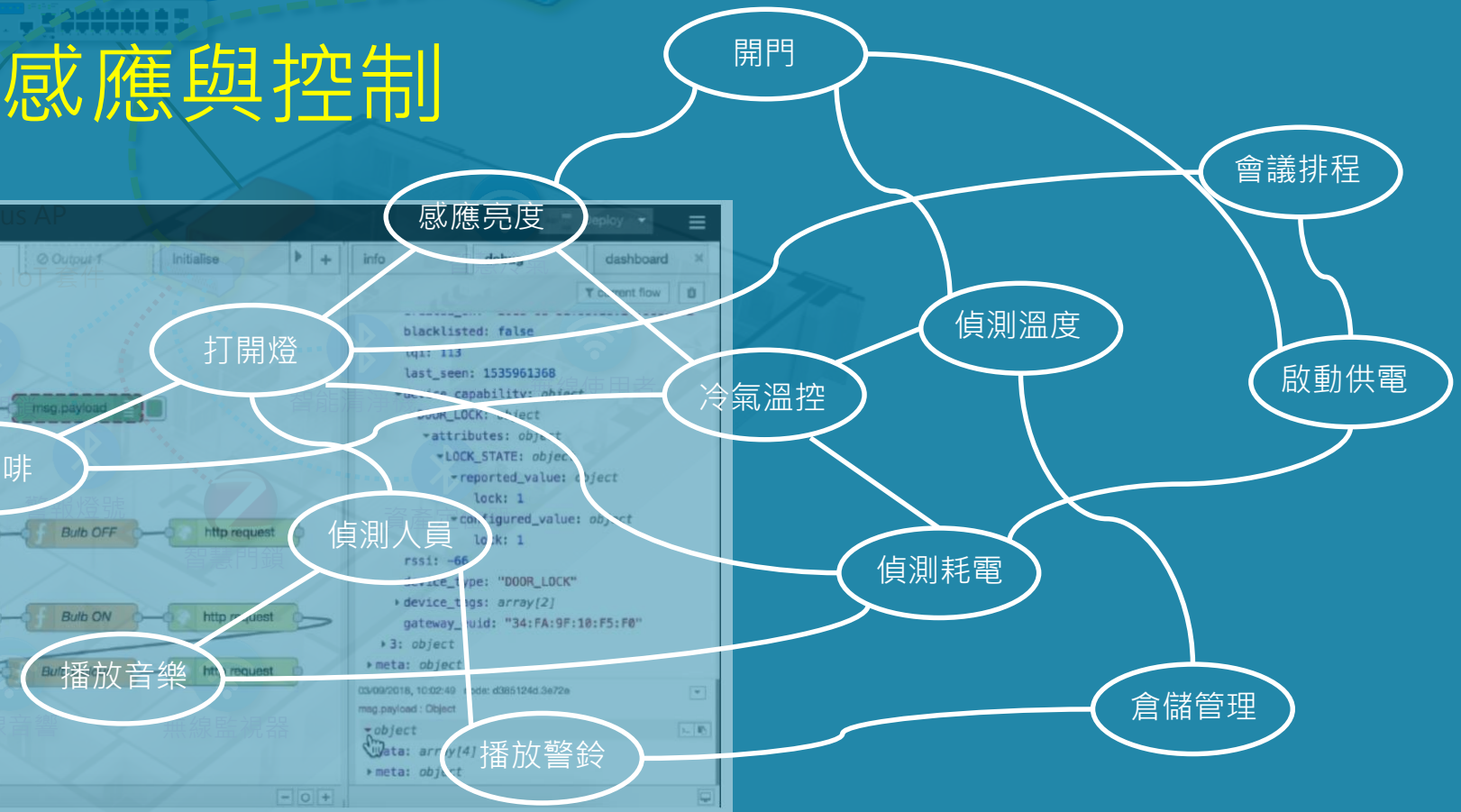
Ruckus 無線控制器

網路骨幹

Ruckus IoT 控制器

軟體定義自動化感應與控制





Simply your network: Do you really need a Chassis?

Pay as you growth
Stacking to increase the port density, just like adding a line card

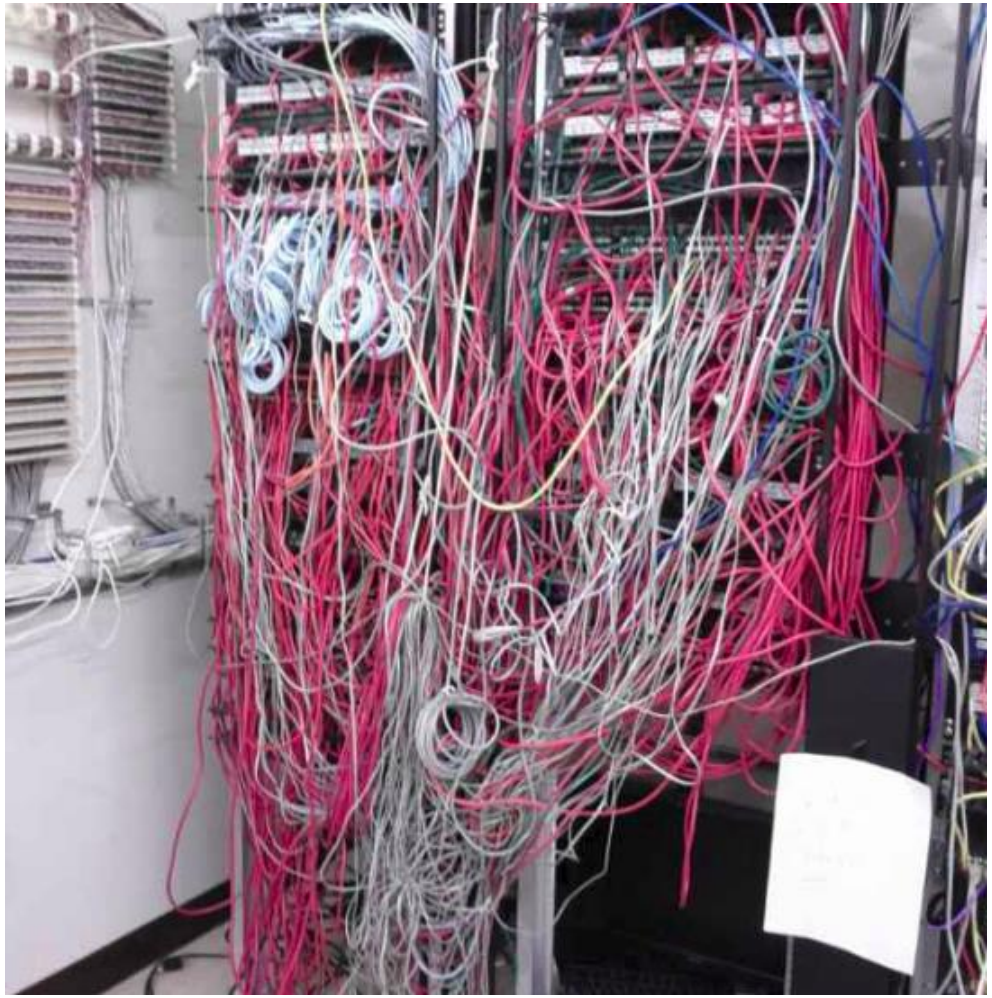
7850-48F

Go Green Certification !!!

- Save Rack Space – 12 U => 1U
- Power Cost Saving in long time
- 1U provides 128 10G/25G port

Traditional Cable System vs Fiber to Classroom at Floor Cabinet

Floor Cabinet



Traditional Cable System

Fiber to Classroom

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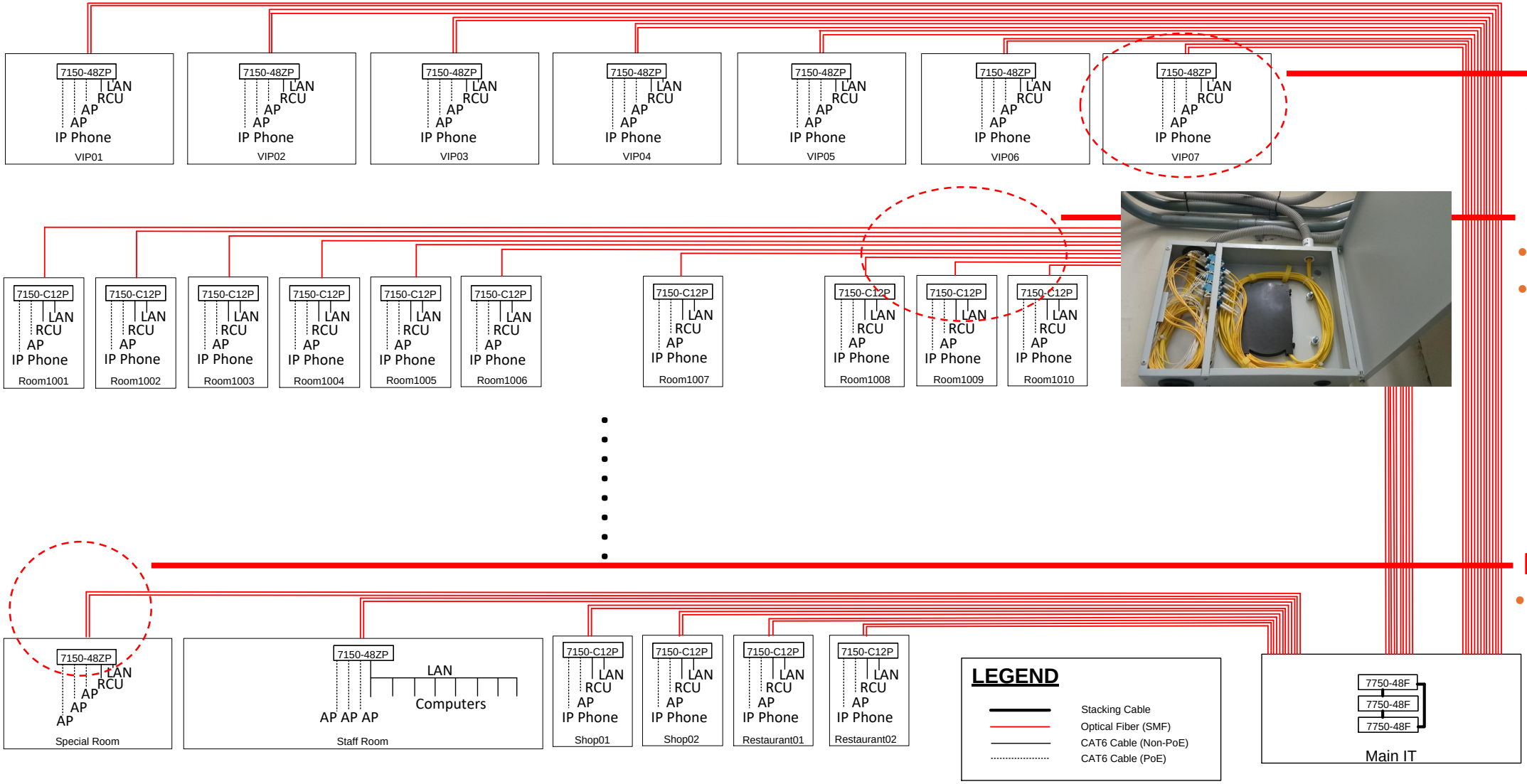
NEW - Fiber to the Classroom Solution



Free up IDF Space
- Additional Room

Fiber
- 10G/40G Ready
- Easy to upgrade (In Room Change only)

MultiGig Switch
- 1G/2.5G/5G/10G

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Hybrid Solution of Fiber to the room

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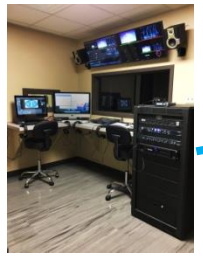
Internet

TV Room



Internal Server

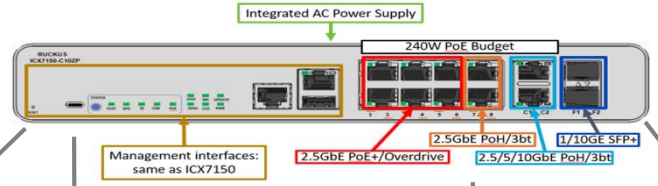
100G/40G/10G Core Switch

High Bandwidth location 10G Fiber Ball room/ Restaurants / Guest Area

Cost Effective 1G/10G Fiber to Guest Floor / Guestroom

802.11ac wave 2 / ax WIFI
Pan Tilt HD CCTV at corridors
Multicast Video Streaming
4K Video

Up to 4.8G WIFI
4K Camera Source
Digital Signage
Power up Pan Tilt HD CCTV
4K Video LCD Display



Support 70 HD Video Streaming

4K Video

NO Power Cabling for Signage

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COMMSCOPE®

Ruckus 架構完整的有無線整合方案

- 合理的 Multi-Gigabit 市場領導解決方案
- 完美推動 60w (PoH / UPoE) / 90w(.3bt) 供電需求

ICX *7150*Z 系列 交換器

2.5 GbE + 33.5W PoH

802.11ac W2

1,733Mbps + 800Mbps

Ruckus R720

ICX *7650*Z 系列 交換器

5 GbE + 31W PoH

802.11ax

4.8Gbps + 1.15Gps

Ruckus R730

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Summary for Higher Education

Cloudpath

- Pre-boarding for 'Move-in Day'
- No password tyranny
- 24/7 self-service portal
- eduroam made easier
- Migration tool to Ruckus
- Secure IoT

SmartZone

- Push troubleshooting to edge
- No more wireless captures!!
- Powerful mapping tool
- APIs for IT tool development and engagement solutions

IoT

- Smart ID Cards
- In-building LTD
- Smart Lighting
- Smart parking/transit
- Wayfinding
- Personal networks
- IPTV

Access Points

- H510 for ResHall and IPTV
- Best outdoor APs available!
- Fewer APs per deployment
- BeamFlex+

ICX Switches

- Best performance value
- Campus Fabric easy to manage
- Small campus datacenter
- Long distance stackable

Open G

- Lower TCO than traditional DAS systems
- Strong in-building LTE connectivity
- More secure than a WiFi network

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COMMSCOPE FAST FACTS.

TOGETHER WE HOLD
15,000
PATENTS

BROADEST
PORTFOLIO

Choice for
constant,
low-latency, and
ultra-high speed
connections

WE INVEST
$800+
MILLION
EACH YEAR IN
R&D

A global team of
approximately
30,000
TALENTED
INNOVATORS.

FORTUNE
250
SIZED

TRACK
RECORD
of operating in a
socially responsible
and SUSTAINABLE
MANNER.

>10,000
PARTNERS
SUPPORTING CUSTOMERS
IN MORE THAN
150 COUNTRIES

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COMMSCOPE® + ARRIS® RUCKUS™

Thank You

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