Enterprise Wi-Fi 6 for WISPs
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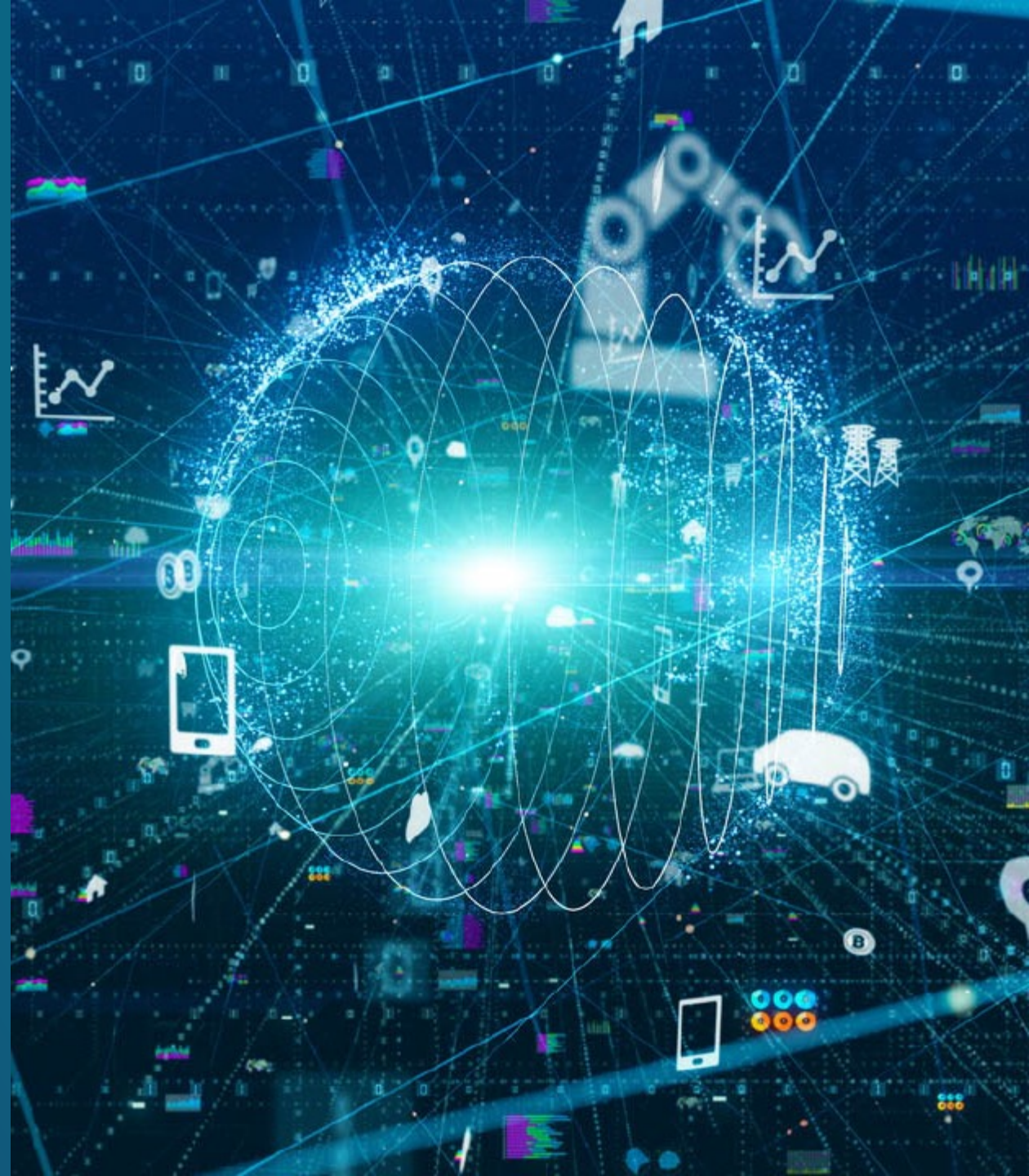
Agenda

Wi-Fi 6 – Why Do I Care?

Managed Services Opportunity

Real World Applications

Questions & Answers

Wi-Fi 6 – Why Do I Care

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Networks Are Being Asked to Do More Than Ever

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Video Conferencing

Internet of Things

Cloud Everything

Location Tracking

AR/VR

4K/8K Video

8K Ultra HD
4K Ultra HD
Full HD
SD

Wi-Fi 6 Clients Are Becoming Ubiquitous

Asus Chromebook Flip

Samsung Galaxy S10
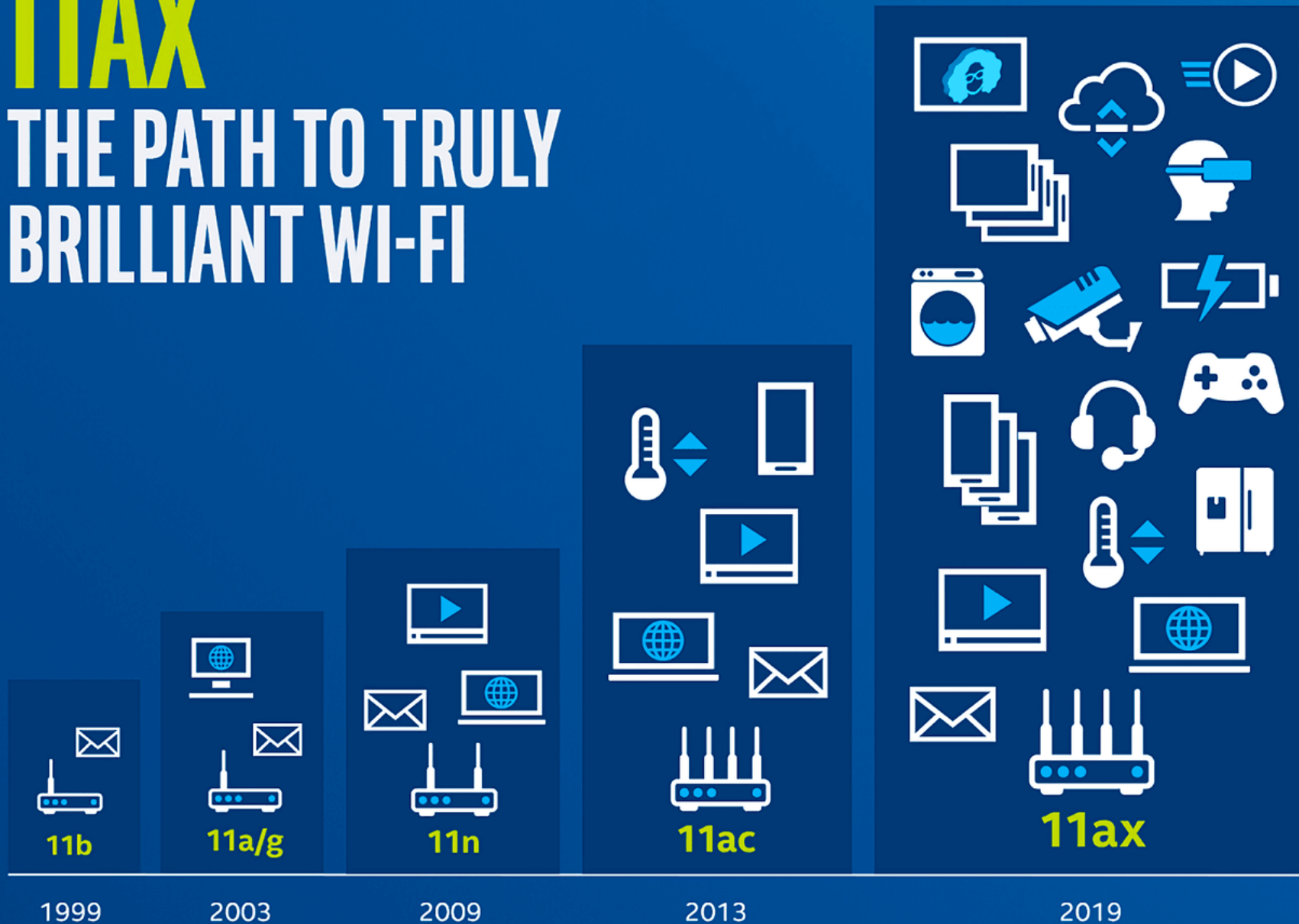
Surface Laptop Go

iPhone 11

iPad

Dell XPS 13

iPhone 12

Surface Pro 7

HP Elitebook x360

11AX
THE PATH TO TRULY BRILLIANT WI-FI

11b — 1999
11a/g — 2003
11n — 2009
11ac — 2013
11ax — 2019

4x BETTER IN DENSE ENVIRONMENTS
Improve average throughput per user by at least four times in dense or congested environments

FASTER THROUGHPUT
Deliver up to 40 percent higher peak data rates for a single client device
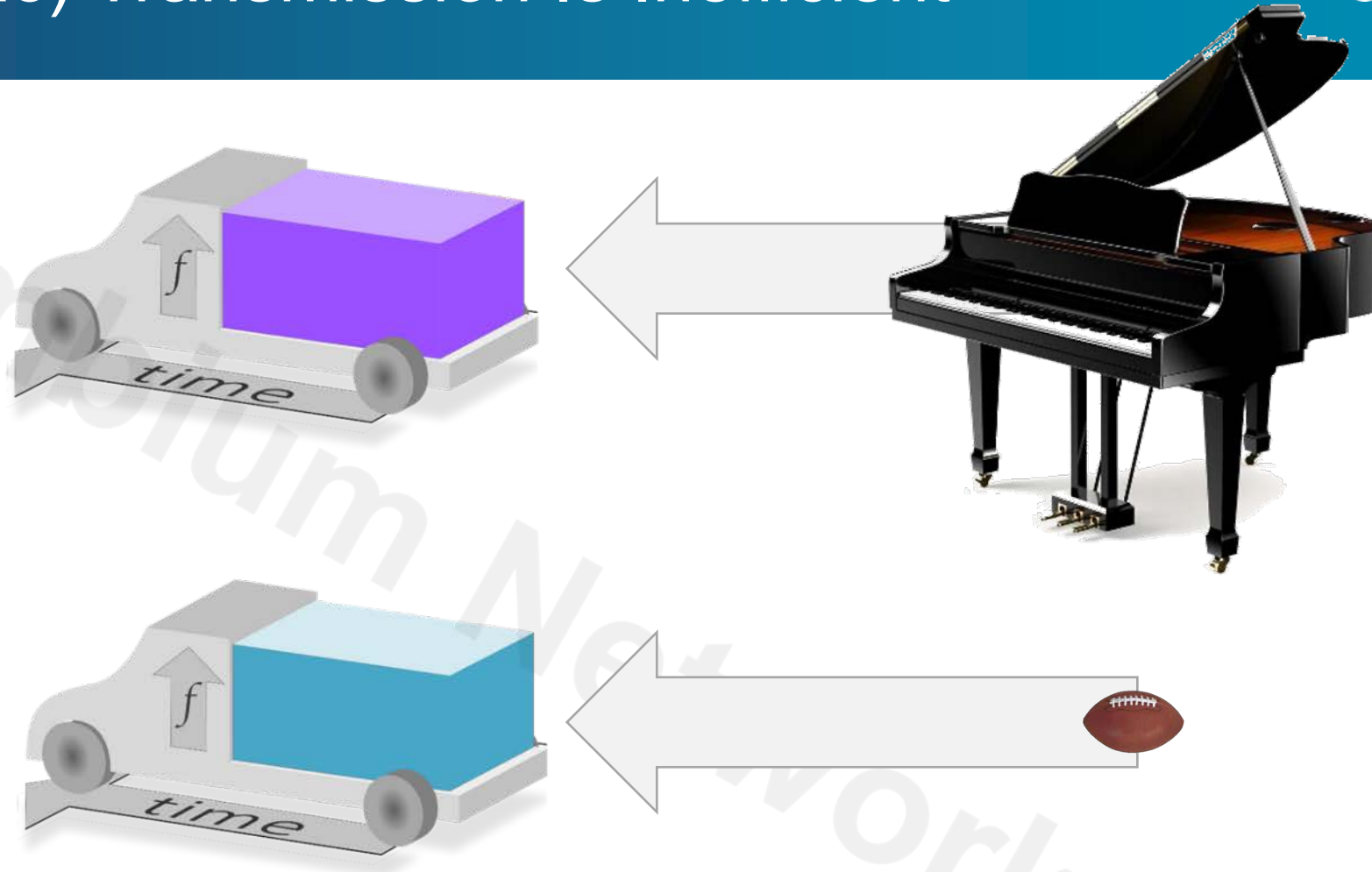
INCREASE NETWORK EFFICIENCY
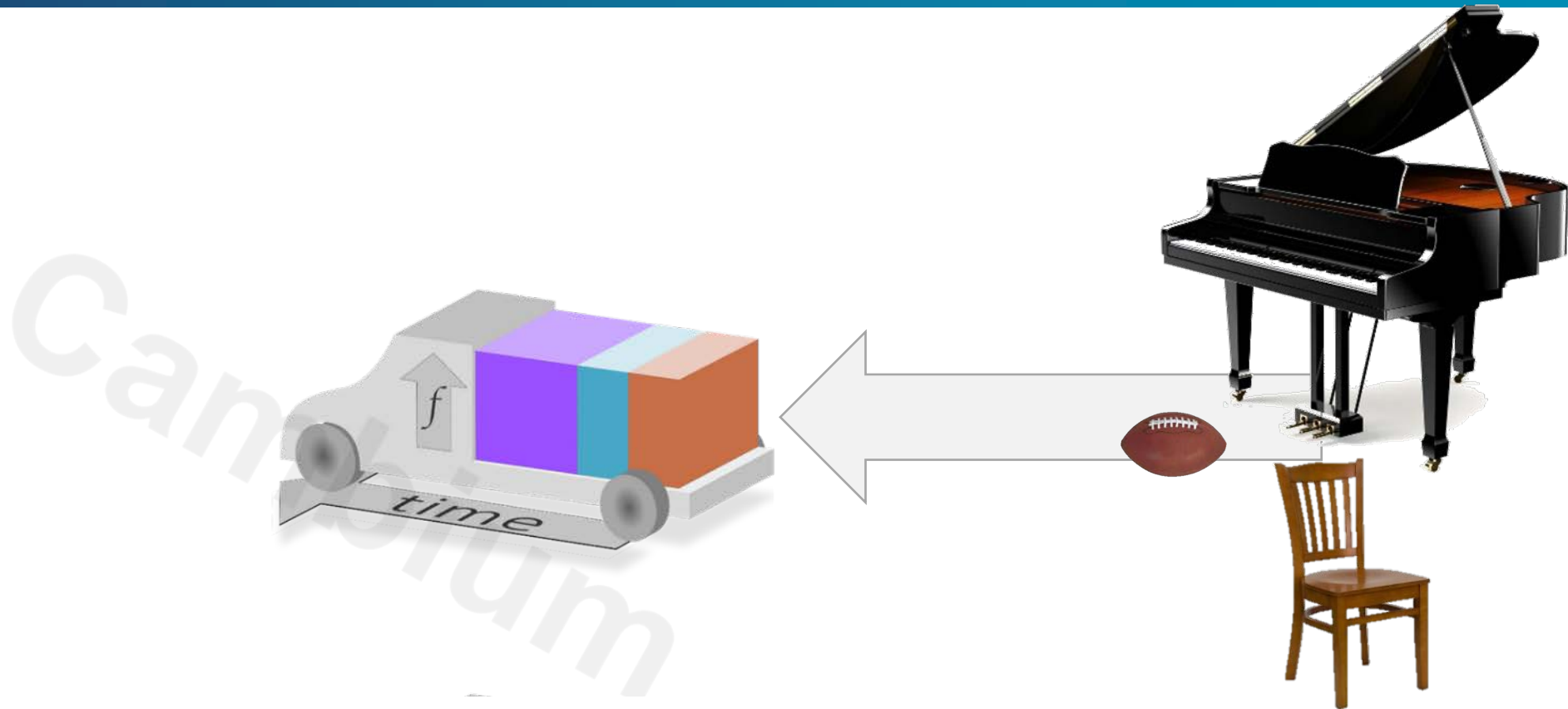By more than four times

EXTEND BATTERY LIFE
Of client devices

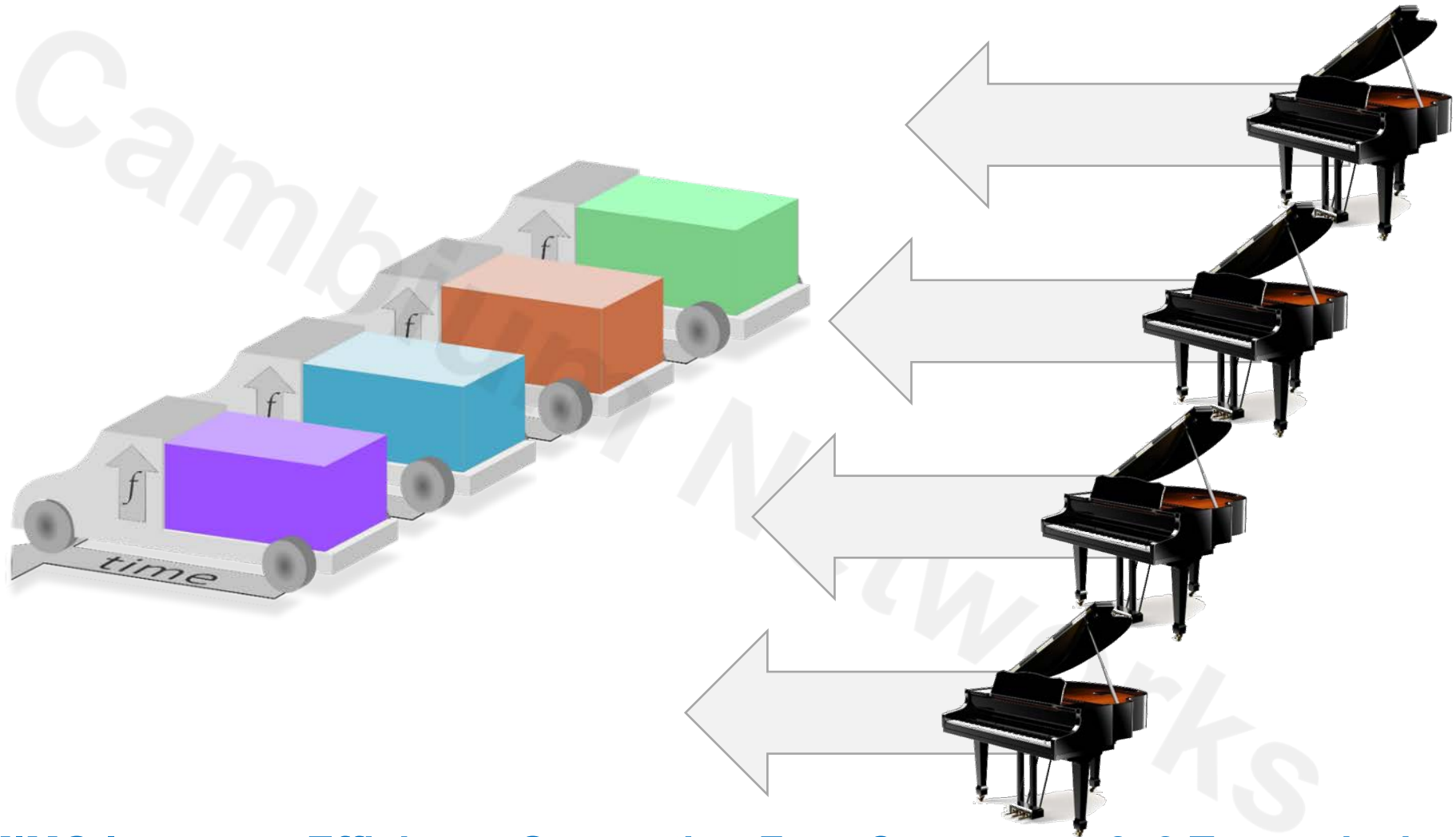# Wi-Fi 5 (11ac) Transmission Is Inefficient

With Wi-Fi 5, one device transmits at a time – regardless of the size of the package

Wi-Fi 6 (11ax) OFDMA Is Much More Efficient

With Wi-Fi 6, each device assigned RESOURCE UNITs as small as 2MHz up to the full band
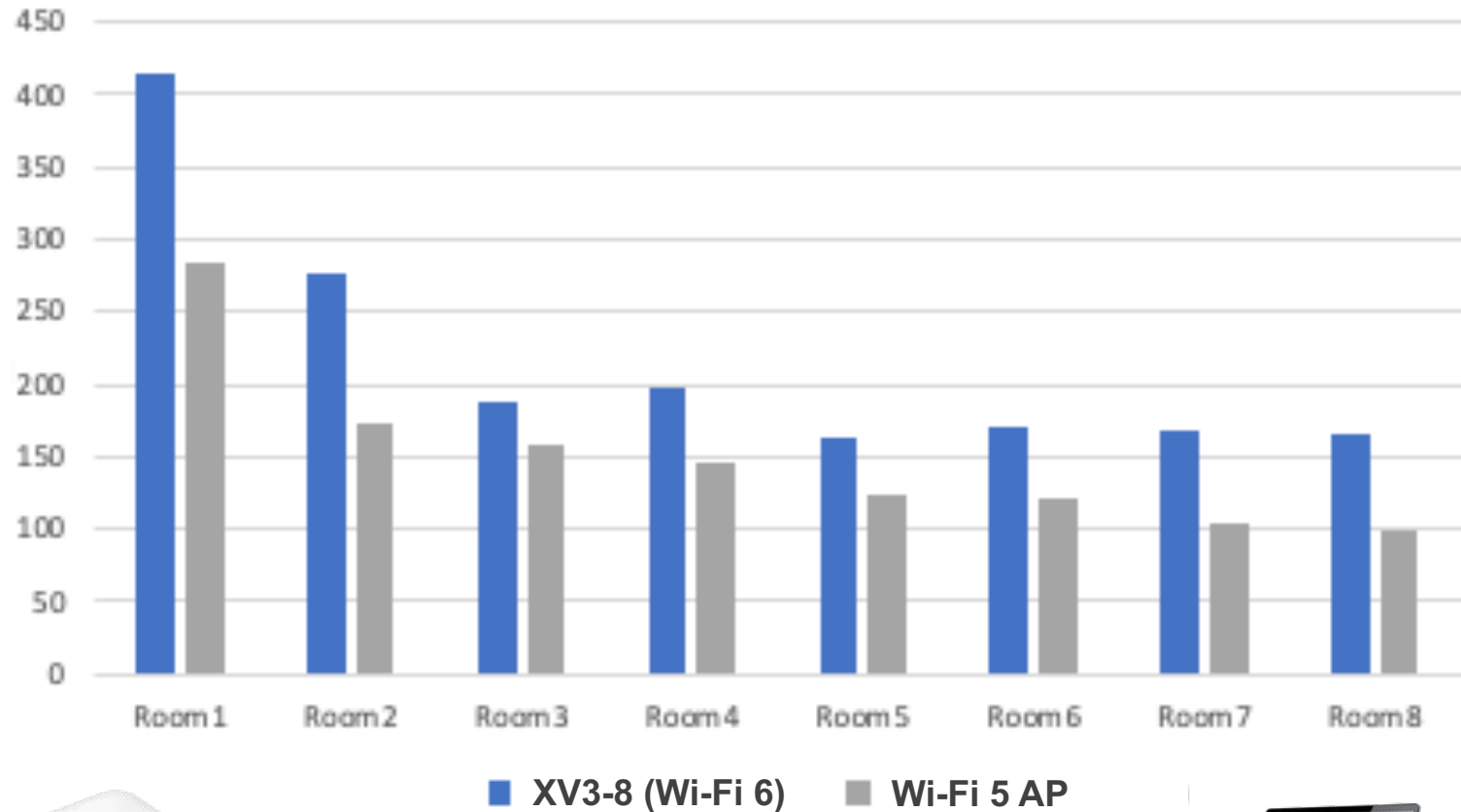**Benefit:** Reduced Latency, more efficient use of time and frequency

Wi-Fi 6 MU-MIMO Supports Concurrent Transmission

Wi-Fi 6 MU-MIMO Improves Efficiency Supporting Four Concurrent 2x2 Transmissions
Benefit: high capacity with high bitrate

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Wi-Fi 6 Improves Performance of Existing Clients

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5GHz Throughput vs Room (Mbps)

■ XV3-8 (Wi-Fi 6)   ■ Wi-Fi 5 AP

Wi-Fi 6 Advantage:
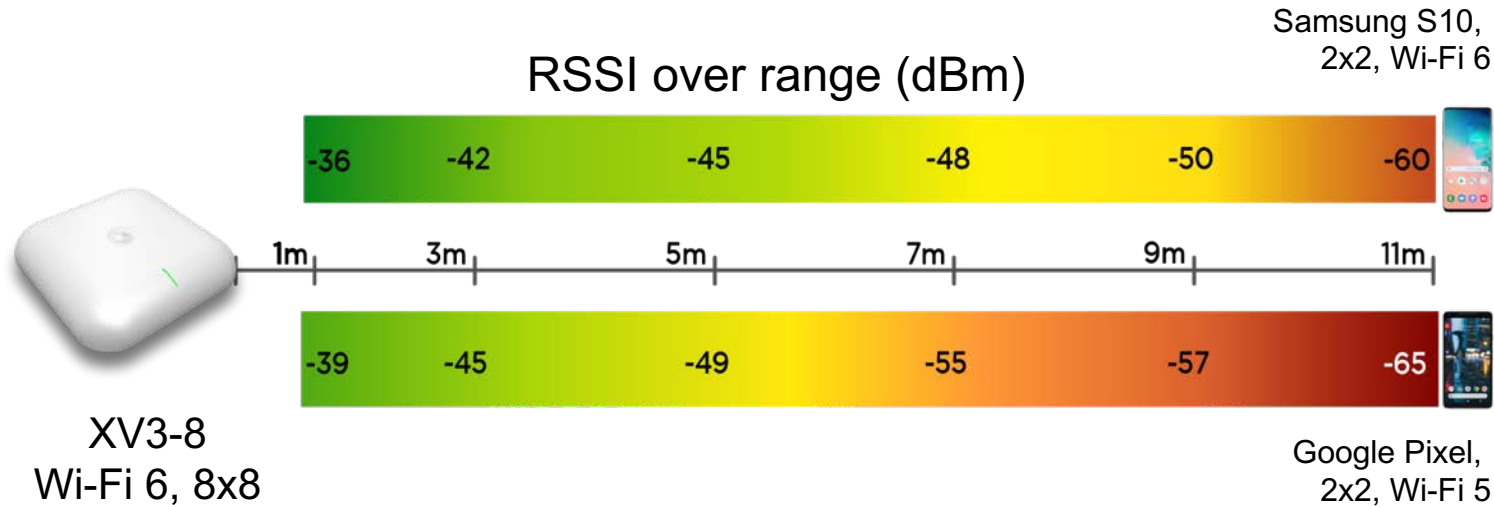Up to **40%** Higher Performance vs. Wi-Fi 5

What is happening?

- 8x8 antennas provide better receive sensitivity and signal integrity

- Improved radio driver and offload

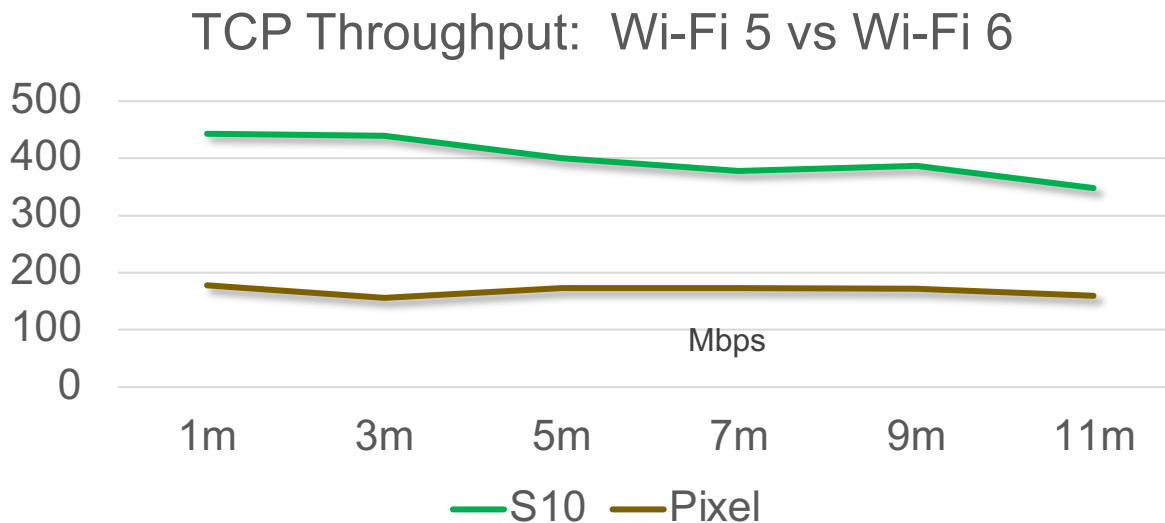- 1024QAM is 25% more bits/Hz

Test Details
AP located outside of Room 1
Increasing distance from AP to Rooms on the right of graph
Throughput measured to single Macbook 3x3 11ac client

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Wi-Fi 6 Performance with New Clients Is Even Better

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RSSI over range (dBm)

Samsung S10,
2x2, Wi-Fi 6

| -36 | -42 | -45 | -48 | -50 | -60 |

1m   3m   5m   7m   9m   11m

| -39 | -45 | -49 | -55 | -57 | -65 |

XV3-8
Wi-Fi 6, 8x8

Google Pixel,
2x2, Wi-Fi 5

TCP Throughput: Wi-Fi 5 vs Wi-Fi 6

500
400
300
200
100
0

Mbps

1m   3m   5m   7m   9m   11m

—— S10   —— Pixel

Wi-Fi 6 Advantage:
Average **135%** Improvement vs. Wi-Fi 5

What is happening?

- 1024QAM is 25% more bits/Hz
- More efficient signaling protocols
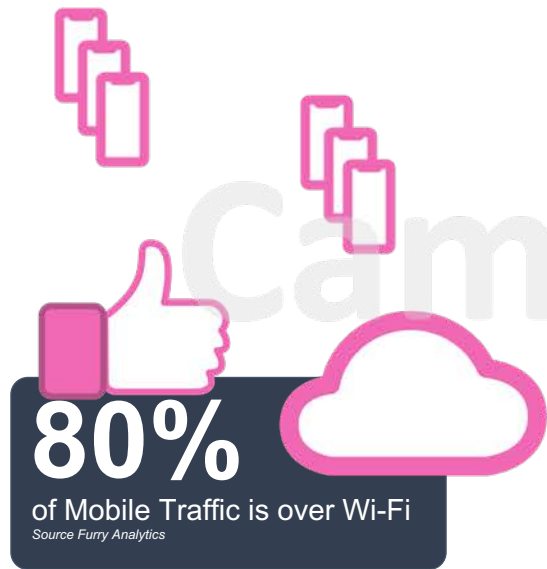- Client-side CPU speed increase

Test Details
*iPerf3 client on Windows 10 PC
iPerf3 server on smart phone
iperf3 –c <ip> -i 10 –t 10 –P 6
40Mhz channel, 44/48, short guard*

Wi-Fi Is a Platform for Delivering Business Services

Voice Over Wi-Fi	Video	IoT	Entertainment	Location	Guest Services	BYOD

Always connected social media, mobile media, connected lifestyle

2019: VoWIFI passes VoLTE

IoT at home, school, enterprise, hospitals, hospitality

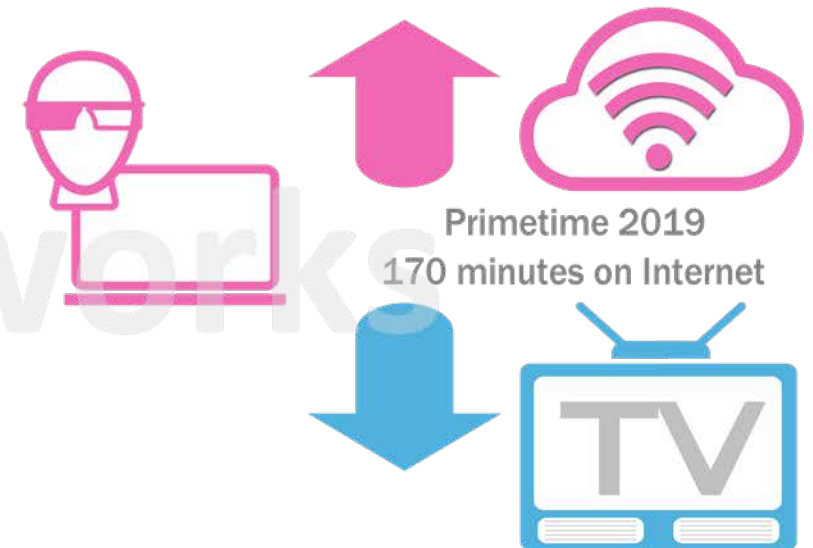Personal IoT works best when it interfaces with people, not just things

Massive streaming media at higher bitrates

4K Live TV: 36x growth from 2016-2021

Source: Cisco VNI

80%
of Mobile Traffic is over Wi-Fi
Source Furry Analytics

IOT

Google Home, Alexa

Primetime 2019
170 minutes on Internet

TV

Wi-Fi Designer

- Free online Wi-Fi design tool
- Access from Cambium web site
  - Products -> Software -> Wi-Fi Designer
- Place APs to visualize coverage
- Supports all Cambium Wi-Fi APs
  - Wi-Fi 6
  - cnPilot
  - Xirrus

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Managed Service Opportunity

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Managed Services for Wi-Fi

- Turnkey service that changes CAPEX outlay to OPEX

- MSP provides Level 1/Level 2 support

- Types of models:
  - CAPEX + OPEX: Customer owns equipment, MSP provides services
  - OPEX: MSP owns equipment, MSP provides services

The Wi-Fi 6 Managed Service Opportunity
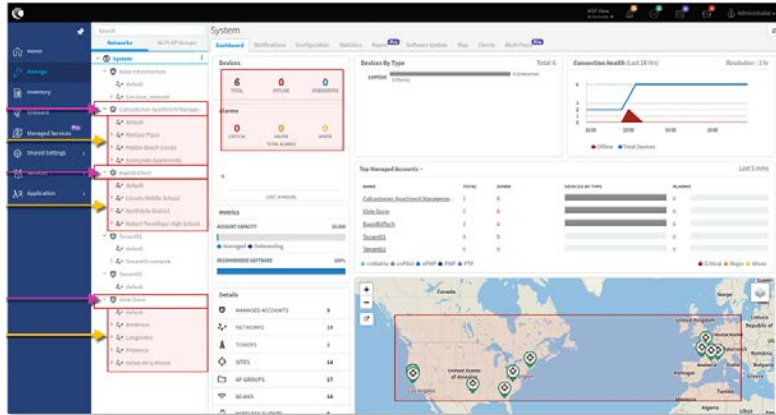
- **What**
  - ❑ Sell Wi-Fi 6 as a managed service offering

- **Why**
  - ❑ Wi-Fi 6 tech is better suited to address challenging environments
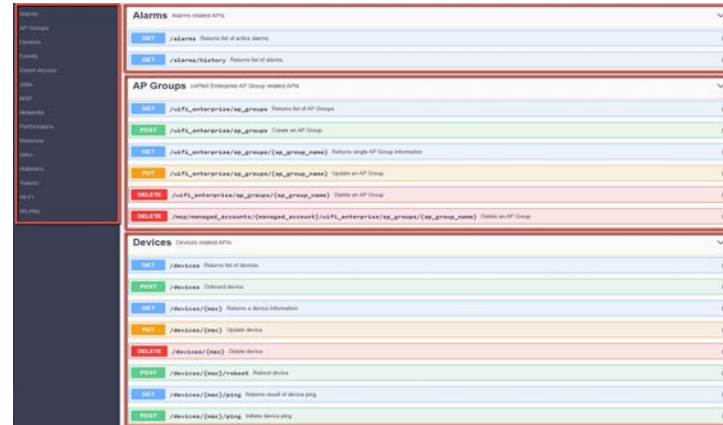 - ❑ Premium solution more likely sold as a service

- **Key Benefits**
  - ❑ Potential to dramatically increase cash flow
  - ❑ Increase margins
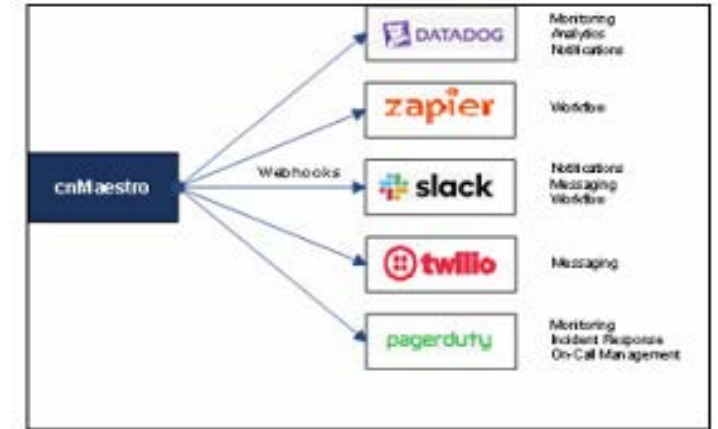 - ❑ Close deals faster by making it easier for the customer to say 'Yes'

Turnkey MSP Management Platform: cnMaestro

Multi-tenant:
Multi-level customer accounts

➢ Single pane of glass for all managed accounts

➢ Branded service pages for each account

➢ User roles for the Managed Accounts / Tenants

RESTful APIs:
Workflow automation

➢ Option to for reading and configuring features programmatically

➢ Swagger documentation makes it easy, you don't need to be a programmer

Webhooks:
Integration to backend systems

➢ Real time alarm streaming to external services

➢ Easy integration with Slack, Microsoft, Twilio, Pager Duty, Datadog, Zapier

➢ Separate alarms for managed accounts

Call to Action

Interested in offering Wi-Fi services with an OPEX model with regular payments vs. CAPEX outlay?

Contact your Cambium sales rep for more info on our pilot programs.

Thank You

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