Edgewater Wireless

Rising to the interference and capacity challenge

EDGEWATER
wireless

Edgewater Wireless

Innovator in high-density WiFi solutions & technology

Pioneering development of interference mitigation

Over $60M invested in our patented technology

Born out of a defence industry R&D powerhouse

Global presence in USA, Canada and Europe

Publicly listed: YFI; TSX-V

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Multi-channel WiFi Access Points

- Simultaneous transmit and receive of 3 up to 12 channels (2.4 and 5 GHz)

- 802.11 standards compliant WiFi

- Revolutionary high-performance chipset, backed by over 20 industry leading patents

- Real-time onboard spectral surveillance monitoring technology

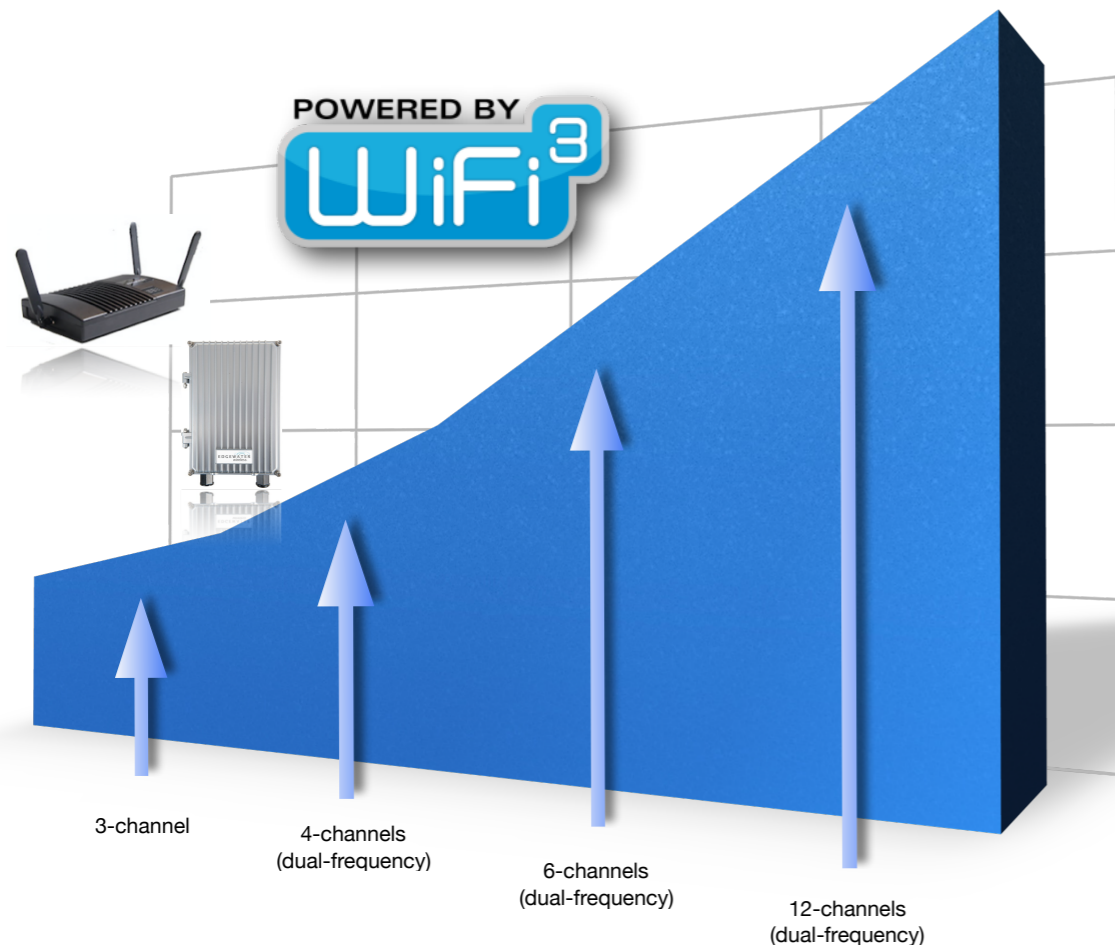- Controller or controller-less architecture deployment-ready

POWERED BY WiFi^3

☑	Multi-channel Air Interface	WiFi[3tm] offers the highest channel density in the industry, unlocking maximum frequency reuse and planning potential to deliver capacity where it matters most — to your users
☑	PowerZoning™	Patented multi-channel implementation to deliver the highest performance to the greatest number of simultaneous users
☑	Load Balancing	Dynamic balancing of network load to deliver the maximum performance to users
☑	Spectral Surveillance) (SSA™)	Edgewater's patented Spectral Surveillance Architecture (SSA[tm]), offers real-time RF monitoring to identify sources of interference, or rogue hackers, remotely — dramatically lowering ongoing network costs

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Comprehensive high-density WiFi solutions

Multi-channel Access Points

POWERED BY WiFi³

High-Density WiFi

3-channel

4-channels
(dual-frequency)

6-channels
(dual-frequency)

12-channels
(dual-frequency)

Controller Architecture

Controller-less mode

EdgeNET Controllers

Access Control

Access Gateway partners

NOMADIX®

Service Management partners

aptilo NETWORKS

Network Management

EdgeNET NMS
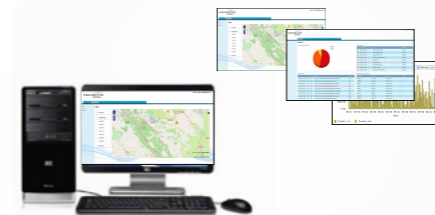
Infrastructure

WiFi3 over DAS

zinwave

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WiFi3 Benchmarking:

Overview

The evaluation scenario detailed in the following slides compared Edgewater Wireless' 3-channel access point against a top-ranked 802.11ac access point.
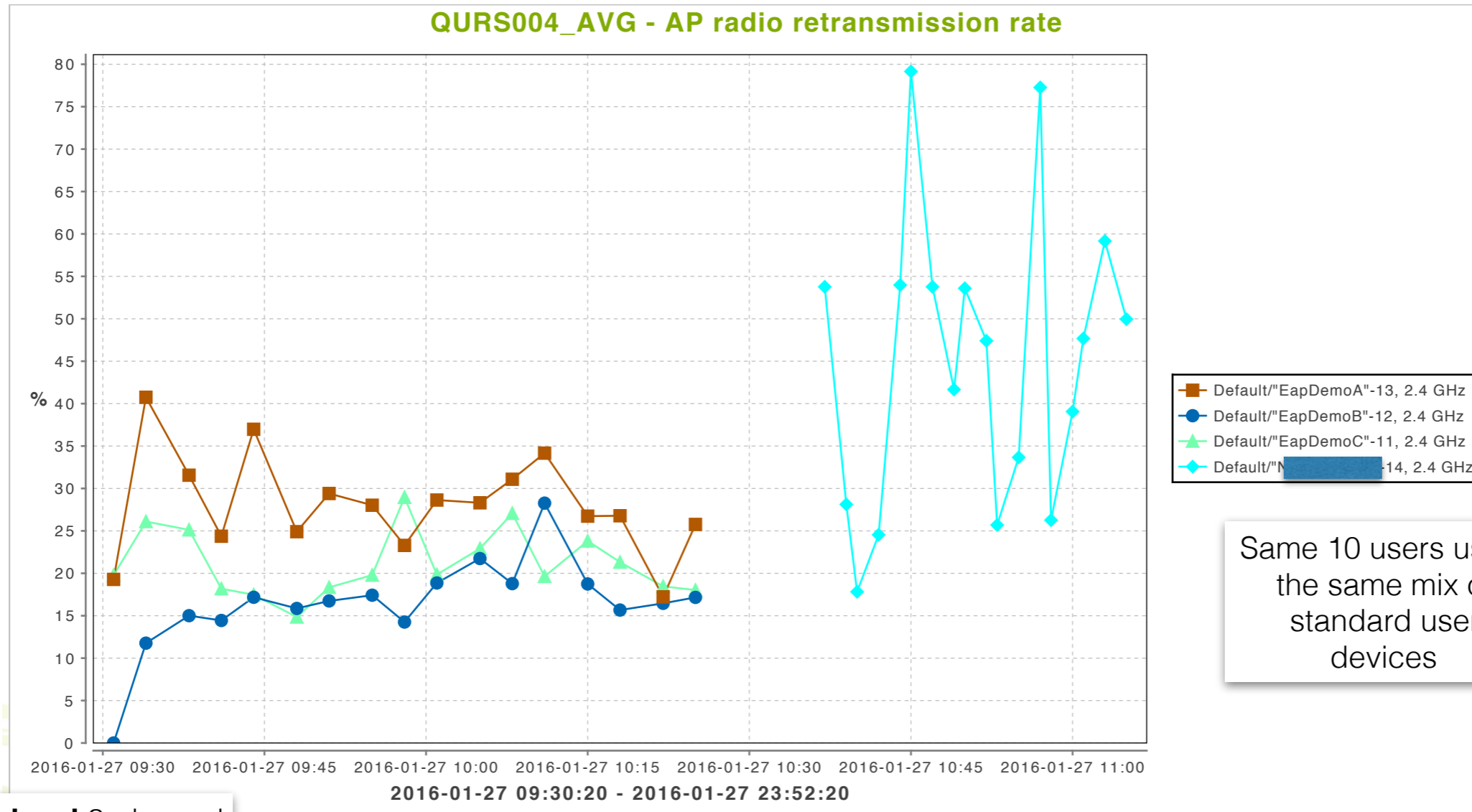
The evaluation utilized Edgewater Wireless <u>entry level</u>, multi-channel product variant to demonstrate the easily achievable gains that can be accomplished through a simple 3-channel AP operating in 2.4 GHz in a 'real-world', congested RF environment.

The testing utilized <u>10 off-the-shelf client devices</u> in the same configuration for each AP.

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WiFi3 Benchmarking:

Retransmission rate comparison

QURS004_AVG - AP radio retransmission rate

Legend:
- Default/"EapDemoA"-13, 2.4 GHz
- Default/"EapDemoB"-12, 2.4 GHz
- Default/"EapDemoC"-11, 2.4 GHz
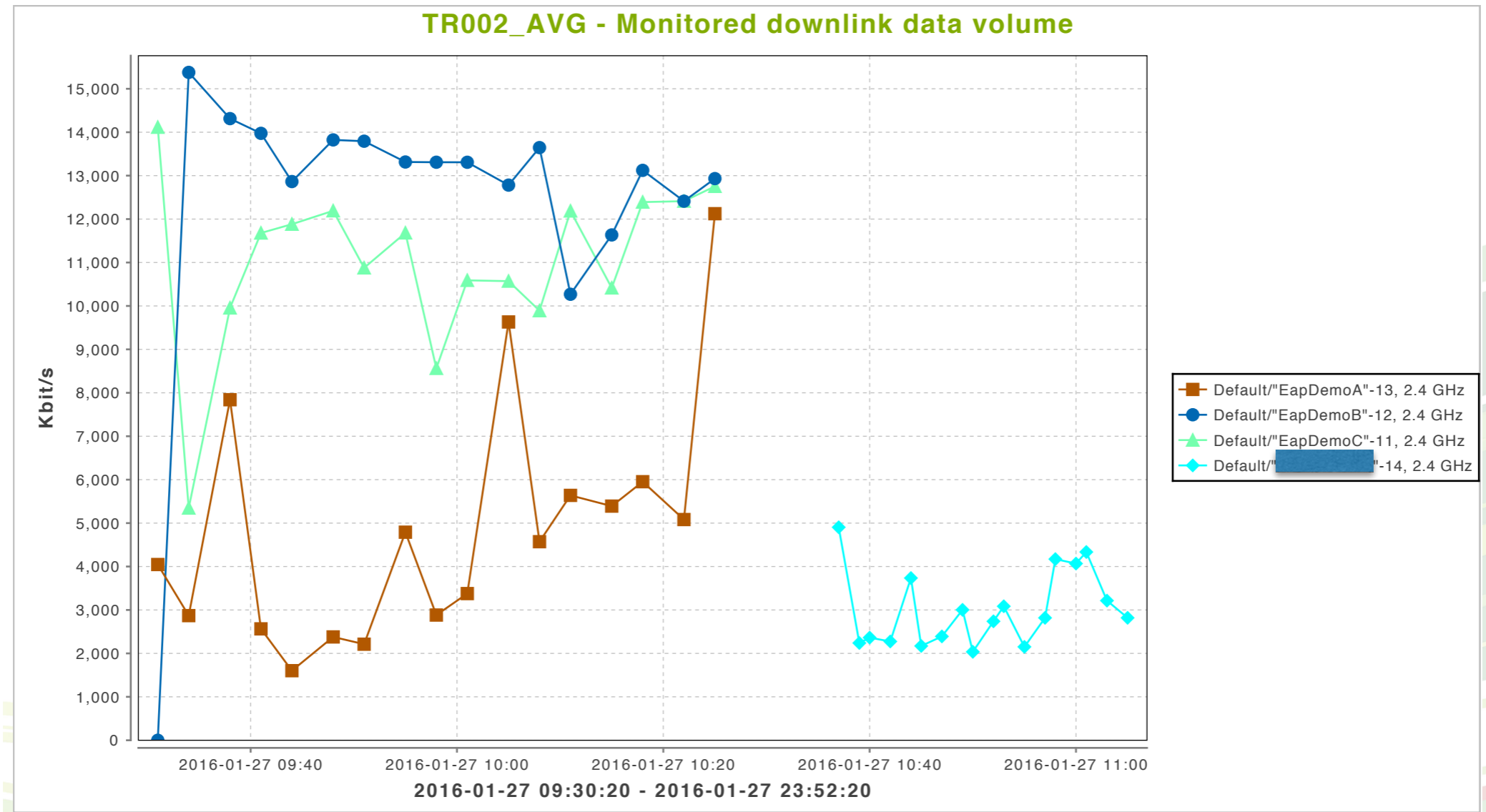- Default/"N███████-14, 2.4 GHz

2016-01-27 09:30:20 - 2016-01-27 23:52:20

Same 10 users using the same mix of standard user devices

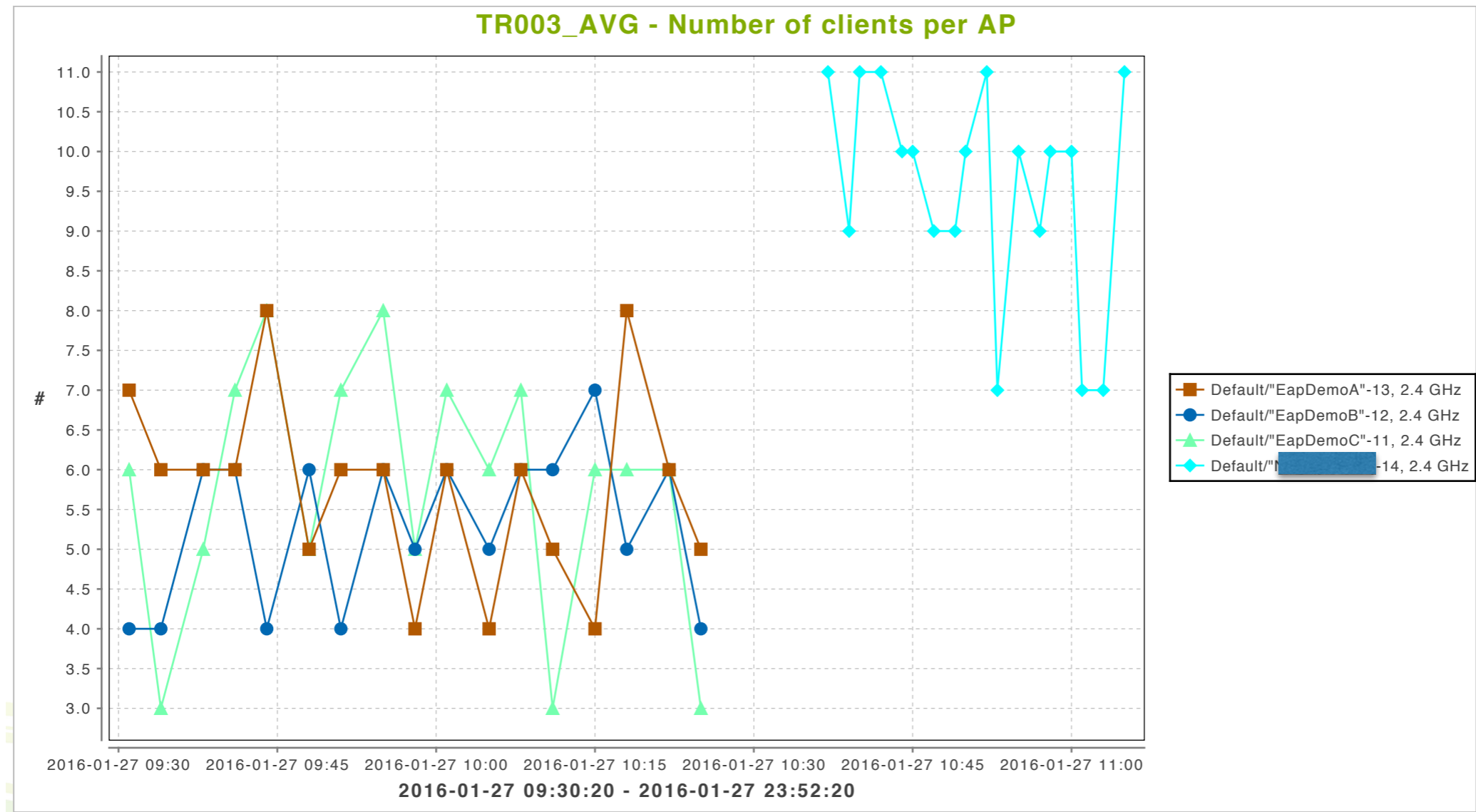**Entry level** 3-channel (2.4Ghz) AP **without optimization**

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WiFi3 Benchmarking:

Downlink date rate comparison

TR002_AVG - Monitored downlink data volume

WiFi3 Benchmarking:

Number of clients per Access Point

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Let's look at a real-world example

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High-Density Venue:
2000 Seat Modern Exposition Hall

Large, ultra-modern 2,000-seat facility

State-of-the-art facility includes a modern amphitheatre with full concert capabilities, as well as studio quality television production and recording, and has up to 1,500 to 2,000 simultaneous users

The venue required a high quality of service WiFi network to meet the intense and growing user demand.

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High-Density Venue:
The Engineering Challenge

The existing WiFi network was failing to deliver performance required by a growing number of smart phone and tablet users:

- Poor Quality of Service

- Users unable to connect / dropping

- Increasing complaints to IT

What did the network look like?

Existing solution:

- Multiple single channel 802.11 n (MIMO) access points deployed in close proximity with cloud based management system

Result:

- Poor quality of service due to intense interference

- Inability of network to support growing user demand

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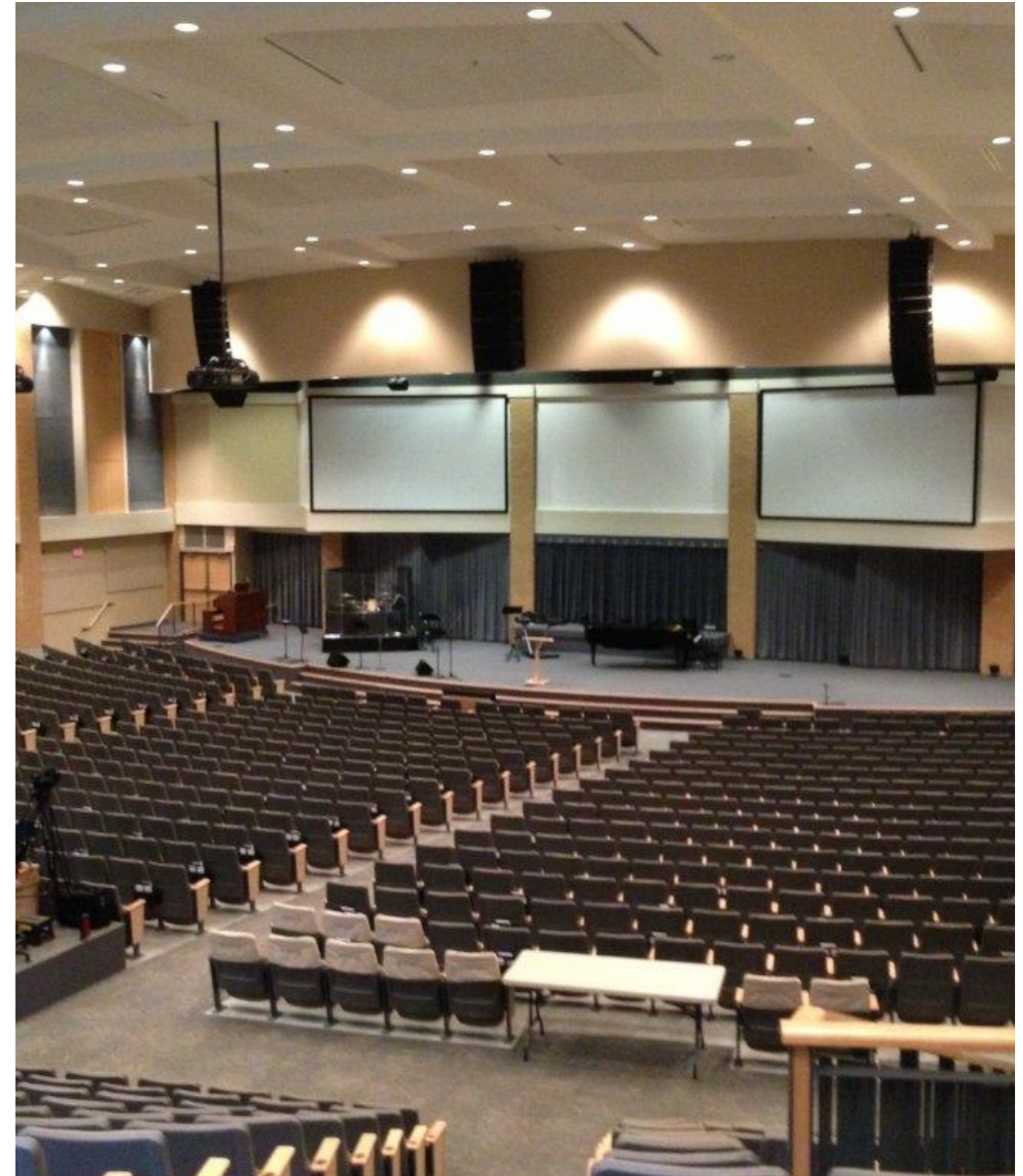
High-Density Venue:
The WiFi3 Solution

Deploy multi-channel WiFi solution:

- Multiple channels of Transmit and Receive from a single radio

- Dramatically reduce interference (ACI)

- Enable PowerZoning(tm) to reduce CCI

- Increase network performance by 20-30x

- Reduce equipment and services costs (fewer AP's)

- Add Spectral Surveillance Architecture for real-time, remote monitoring (interference and security)

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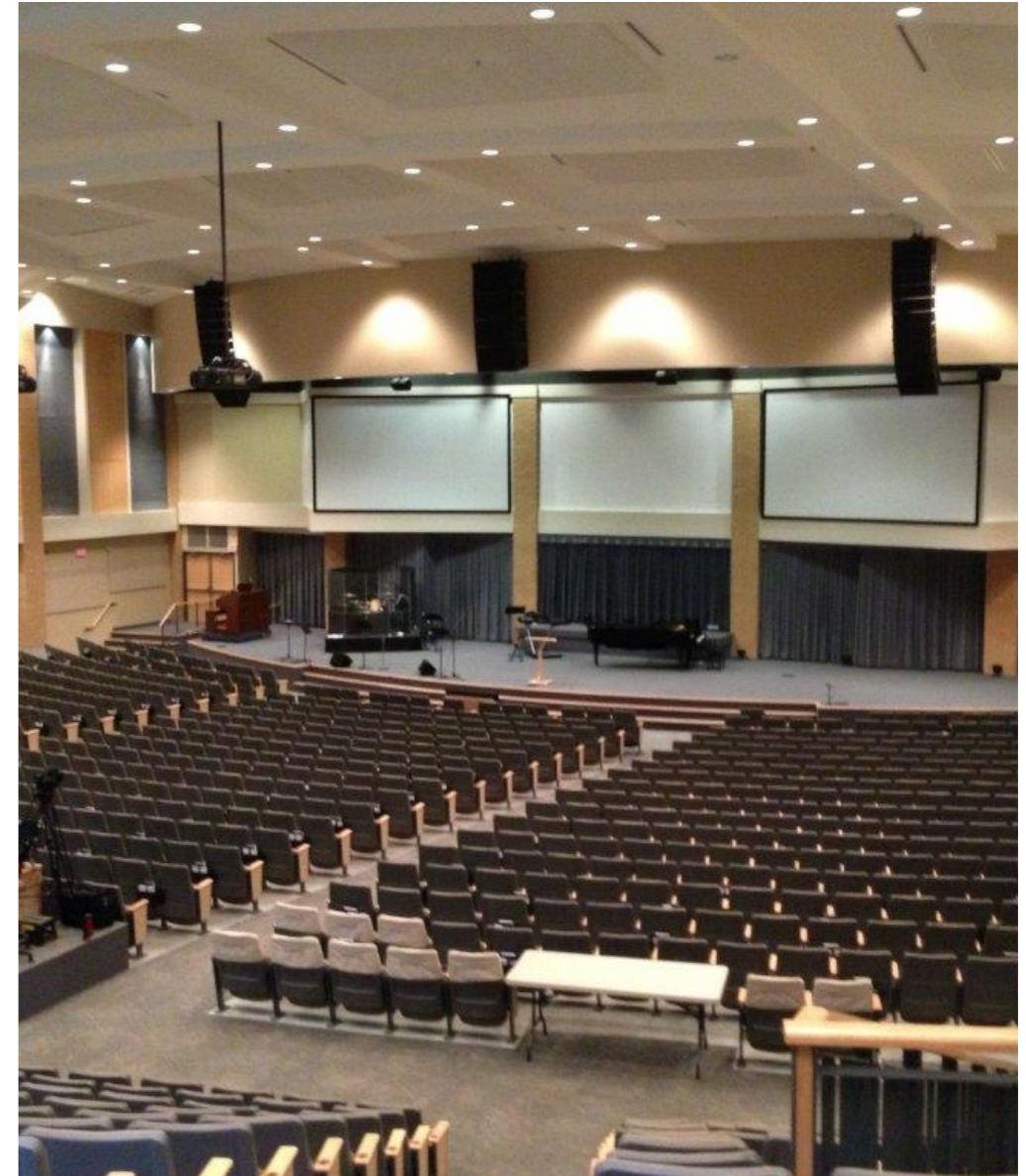
High-Density Venue:
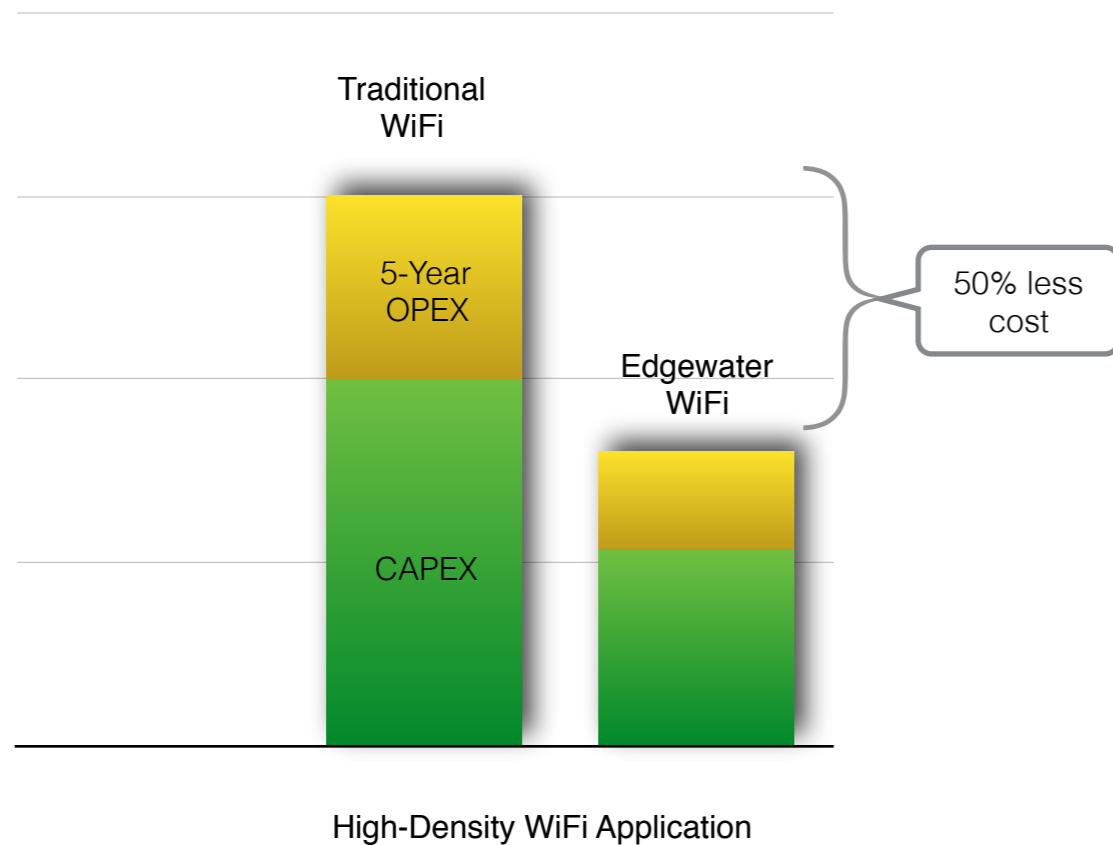## Real world benefits of WiFi3

Higher channel density with reduced interference

- ☑ A dramatic increase in network performance and coverage using <u>fewer</u> access points

- ☑ Deliver new applications and advanced user capabilities - video & voice

- ☑ Exponential increase in user adoption

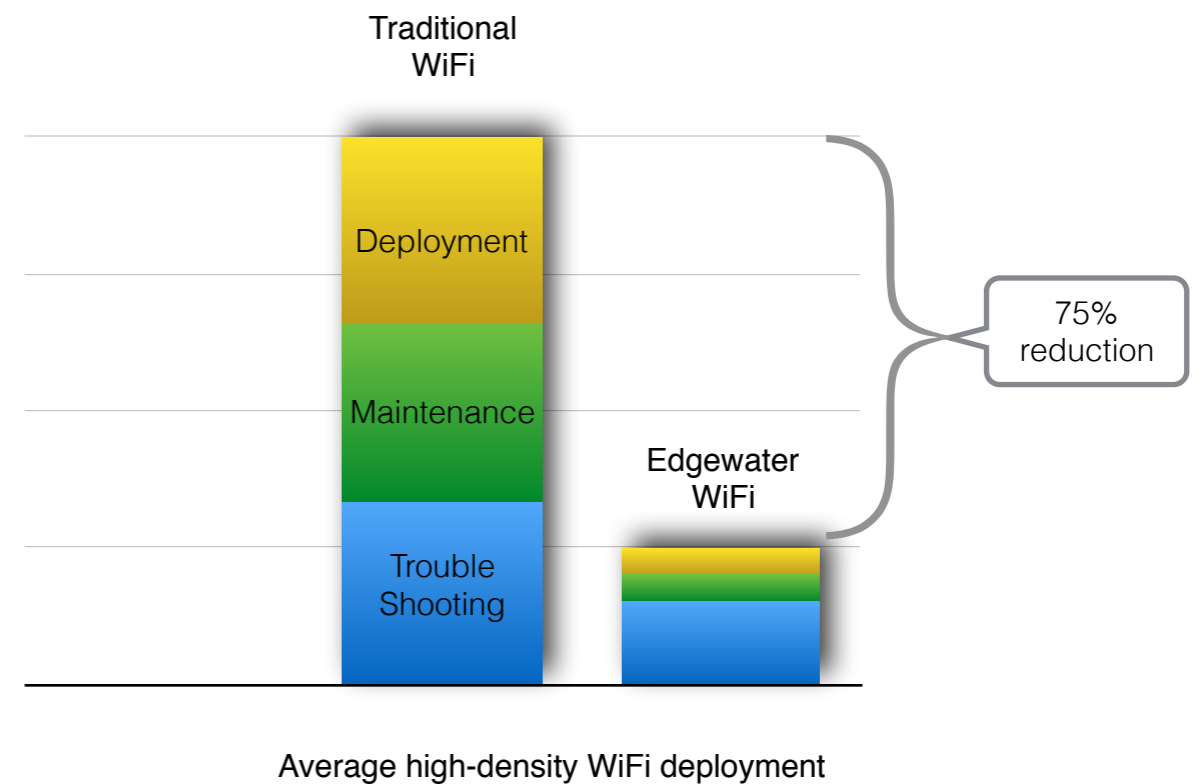- ☑ Improved throughput, QoS and user satisfaction

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High-Density Venue:
Financial value proposition

50% Lower cash cost

Traditional WiFi

5-Year OPEX

CAPEX

Edgewater WiFi

50% less cost

High-Density WiFi Application

75% Lower staff cost

Traditional WiFi

Deployment

Maintenance

Trouble Shooting

Edgewater WiFi

75% reduction

Average high-density WiFi deployment

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Let's talk about the engineering problem

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Why doesn't my access point from Vendor X do the job? It's got the latest 802.11 n/ac, a controller and is supposed to be the greatest!?

Increasing user density

Happy Home User   **Grumpy Enterprise User**   **Angry Mob**

Declining performance
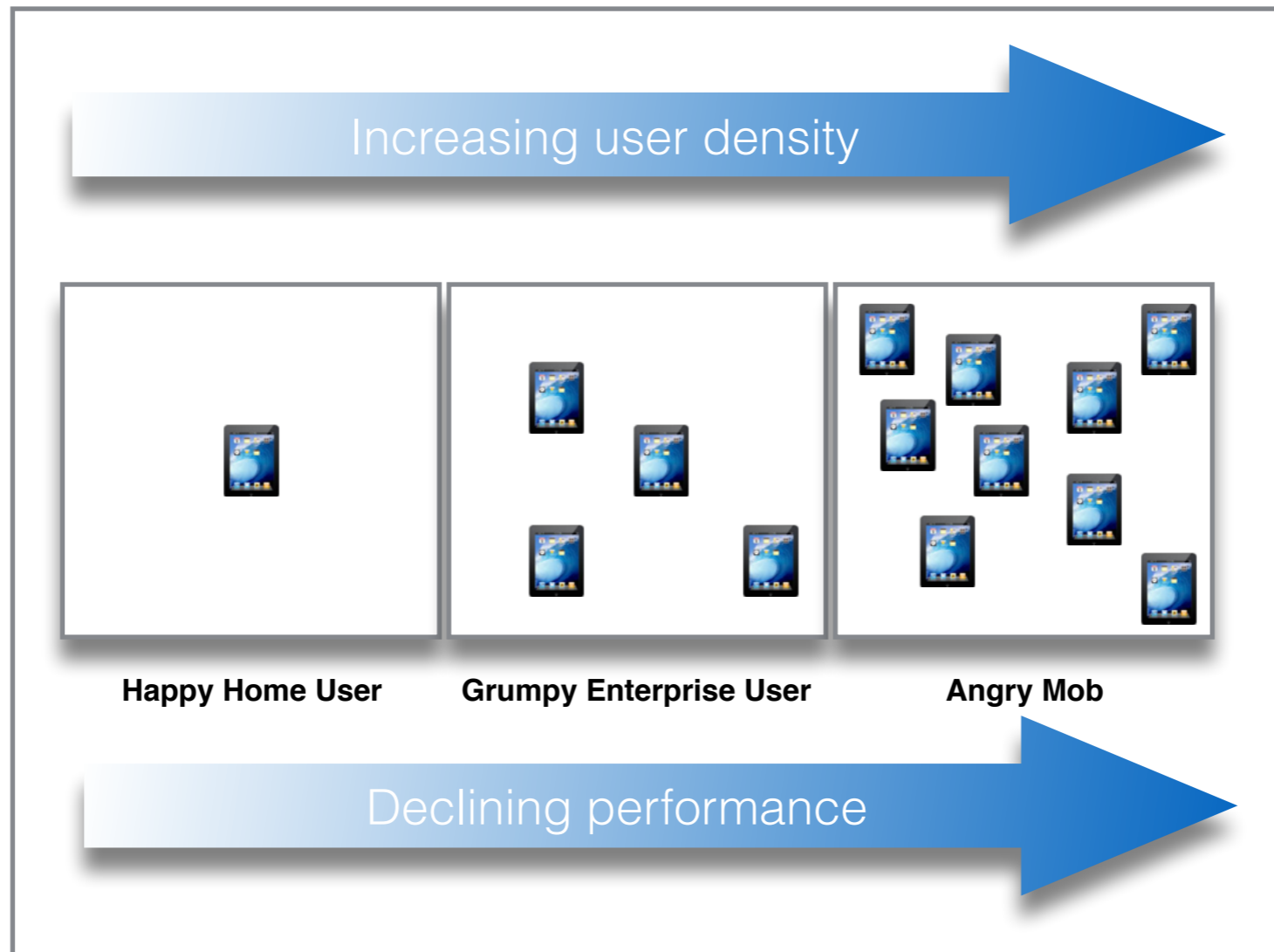
High-Density Application:

What's really happening?

Traditional, single channel WiFi solutions were designed for the home market

- Easy deployment
- Few users
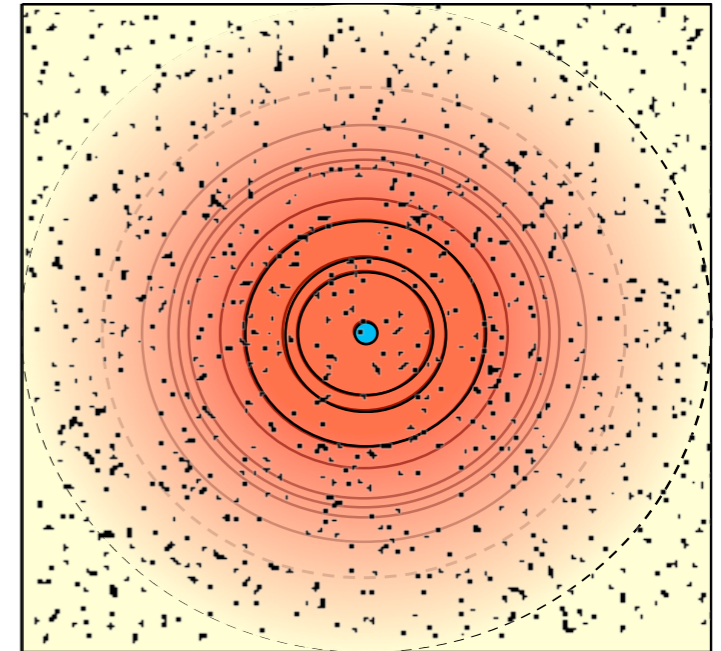- Little interference
- Close proximity to the access points

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High-Density Application:

It's not your home...

High-density WiFi applications are very different

- ☑ Large number of simultaneous users

- ☑ Varying distance from access points

Traditional WiFi approach not designed with high density in mind — results in declining data rates
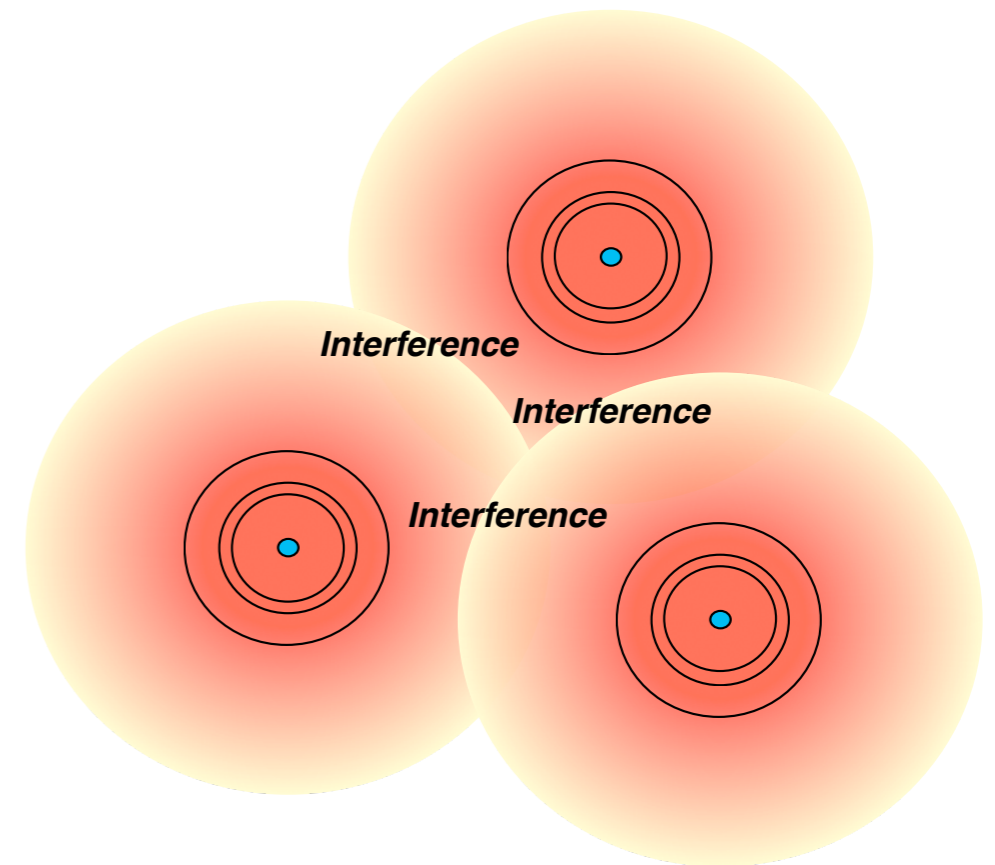

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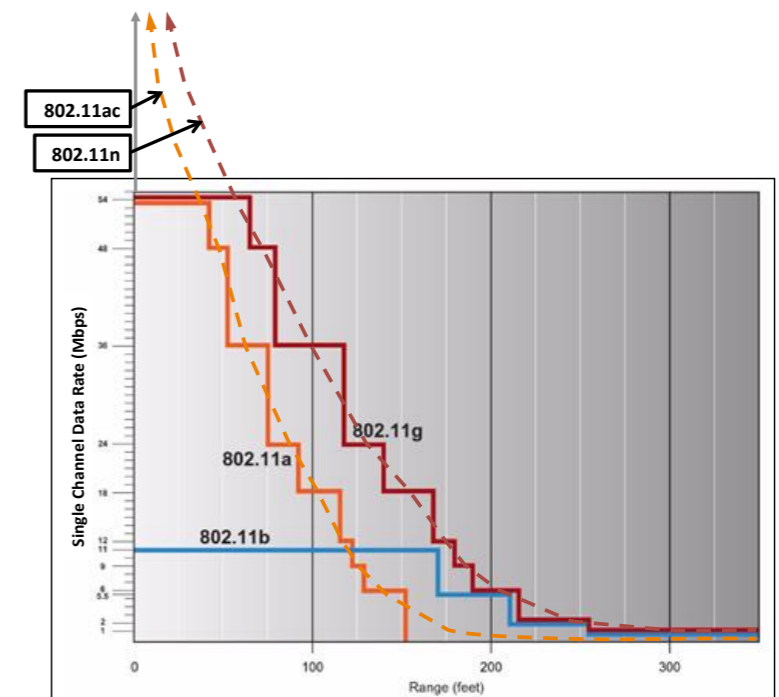
High-Density Application:

It's not your home…

More users require more access points — right? Why is the QoS so poor?

- More access points result increased interference

Traditional single-channel WiFi approach results in declining performance

Interference

Interference

Interference
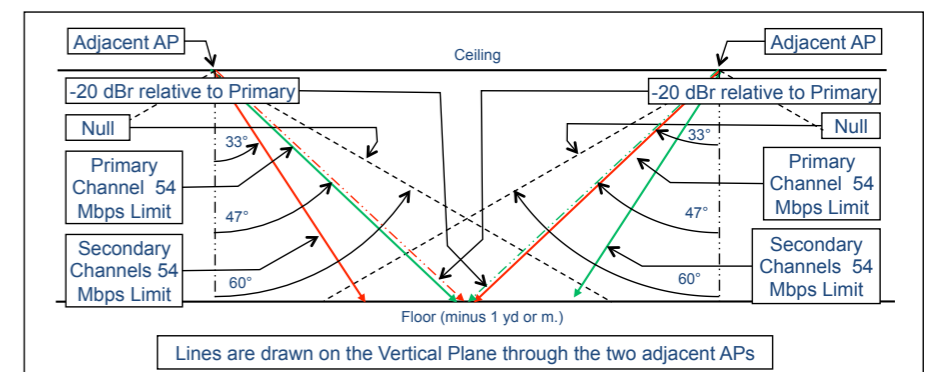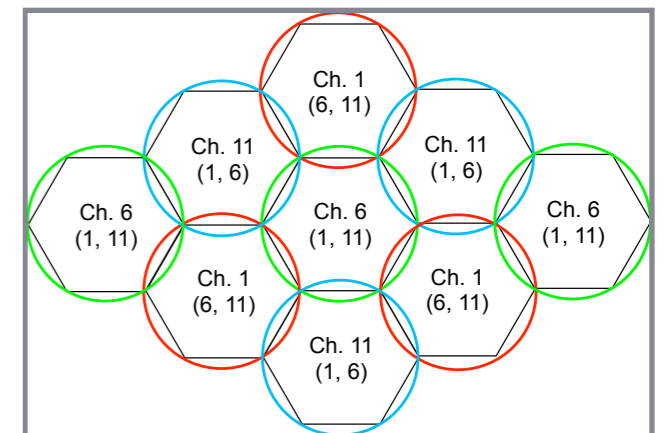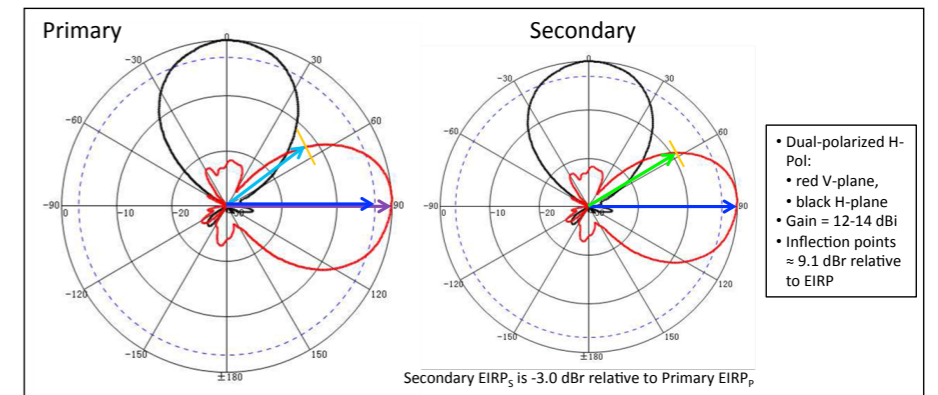
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High-Density Application:

What's the solution?

Address the root cause of the issue:

- Increase the channel density to support a greater number of users

- Mitigate interference

- Maximize channel re-use

Engineer the superior solution to address the high-density WiFi challenge

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