Do You See What I See?
The Wi-Fi Client's Perspective

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CWNP Wi-Fi Trek 2016

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eWEEK

Microsoft Ditches Ethernet at Its Campuses

By Pedro Hernandez | Posted 2016-08-18 Print

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If you plan to visit Microsoft in the future, it may be near-impossible to find an Ethernet port to plug into.

Soon, finding a physical network connection may be nearly impossible at Microsoft's offices. The Redmond, Wash., technology giant is currently in the midst of moving from a traditional infrastructure to a fully wireless network.

Today, "What's the WiFi password?" is a common question to ask when visiting a new office, attending a conference or replying to emails at the local coffee shop. For a fee, it's

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Something's wrong
with the Wi-Fi!

GUILTY
UNTIL PROVEN INNOCENT

Focus on MTTR instead of MTTI

And no! The solution is not to take a packet trace!

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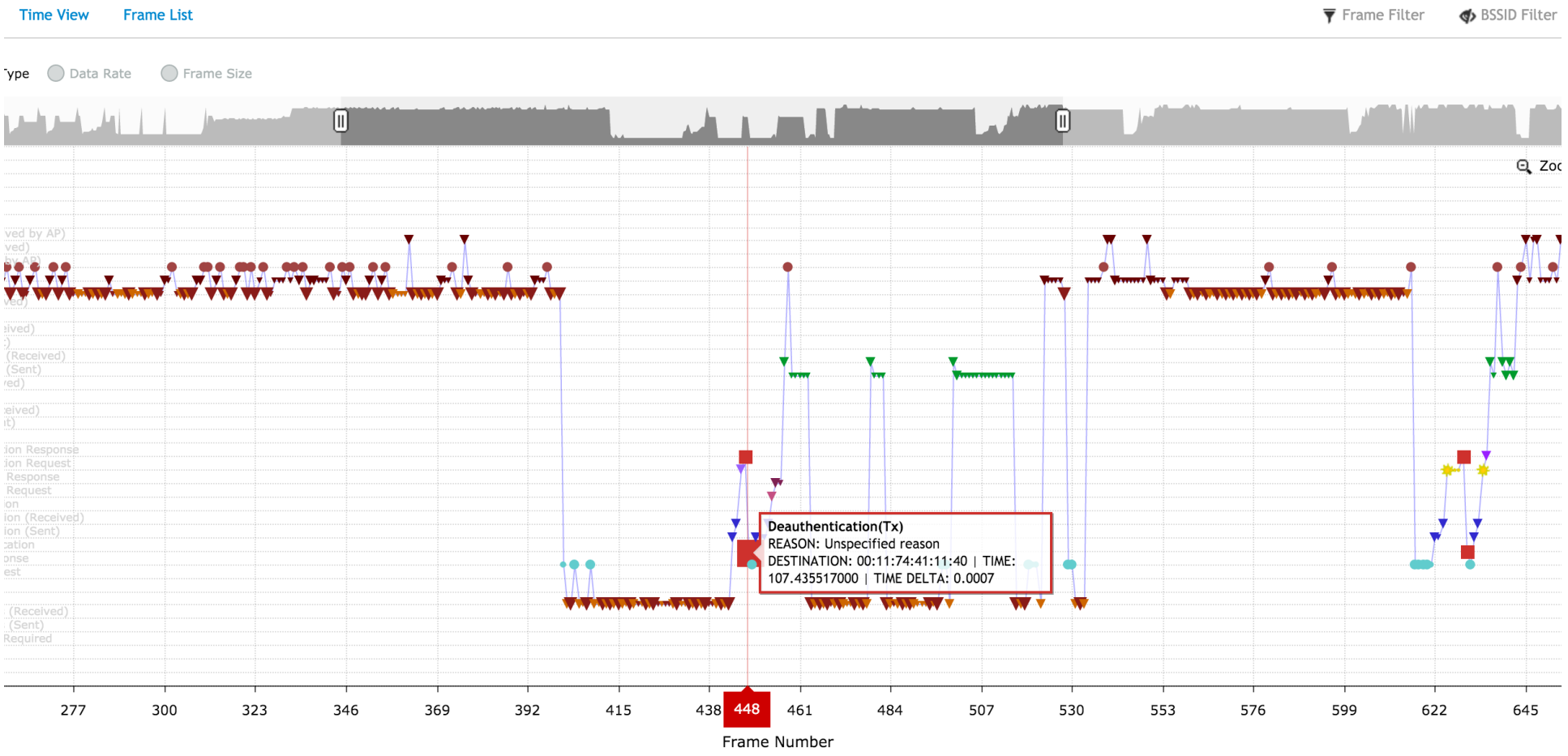
Mojo Packets: Visual Wi-Fi Troubleshooting



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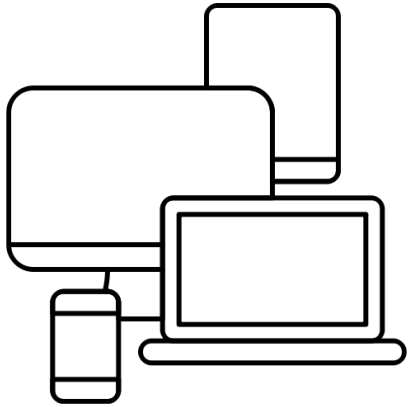
Client-first approach

Client experience (QoE) is the ultimate reflection of the health of the Wi-Fi network

Connectivity



Performance

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Client connectivity

- Association limit
- Capability mismatch
- Unauthorized client

- Incorrect PSK
- RADIUS auth failure
- RADIUS server not responding
- EAPOL failure
- Fast roaming failure

- DHCP failure
- DNS failure
- Portal failure

- Application failure
- WAN failure

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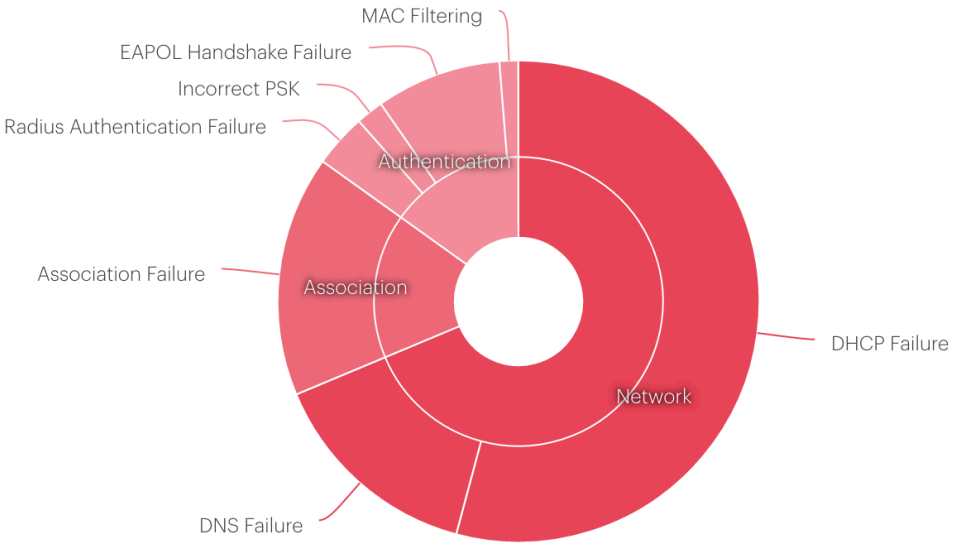
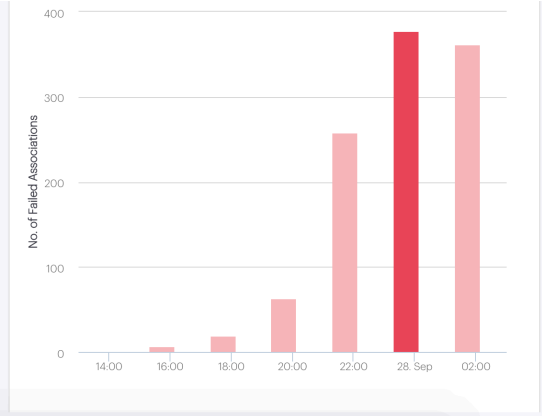
Analysis of connection failures



Auto-classification
(Real-time)

Historical view



Most affected clients

Clients by Most Failed Connections SSID 12 hours

lap-256	**45**	BM416	17
Tinno_Mobile_Tech...	25	HemantC-89EG	10
Android-54690E	25	Laptop-test-80	10
iPhone-7872	25	Motorola-80c	9
Lu Macbook Pro	19	Lenovo-7890	9

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Analysis of connection failures

Real-time and historical logs for individual clients

Status	BSSID	Failure	AP Name	SSID	Channel	Timestamp ▾
	00:11:74:86:0C:61		C130_Beta_86:0C:8F	Spectrum-a	64	Sep 28 2016 1:34:14 AM
	00:11:74:F2:22:21		C120_Gamma_F2:22:3F	Spectrum-a	56	Sep 28 2016 12:22:01 AM
	00:11:74:F2:1B:E1		C120_Beta_F2:1B:FF	Spectrum-a	149	Sep 28 2016 12:13:34 AM
	00:11:74:86:0C:61		C130_Beta_86:0C:8F	Spectrum-a	153	Sep 27 2016 11:21:27 PM
	00:11:74:F2:22:20	DHCP Failure	C120_Gamma_F2:22:3F	Spectrum	56	Sep 27 2016 11:16:01 PM
	00:11:74:86:0C:70	DHCP Failure	C130_Beta_86:0C:8F	Spectrum	13	Sep 27 2016 11:11:18 PM

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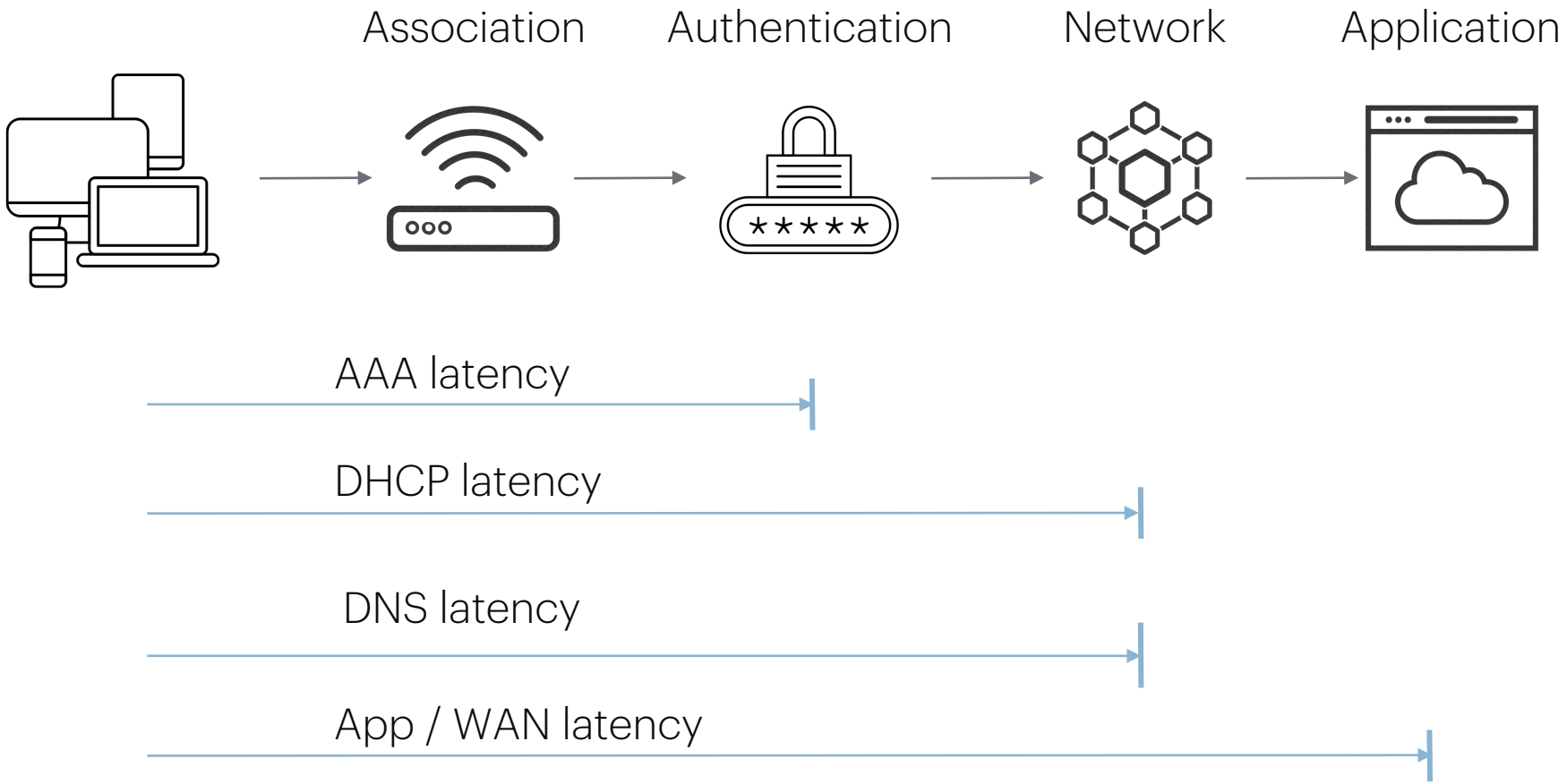
Client performance



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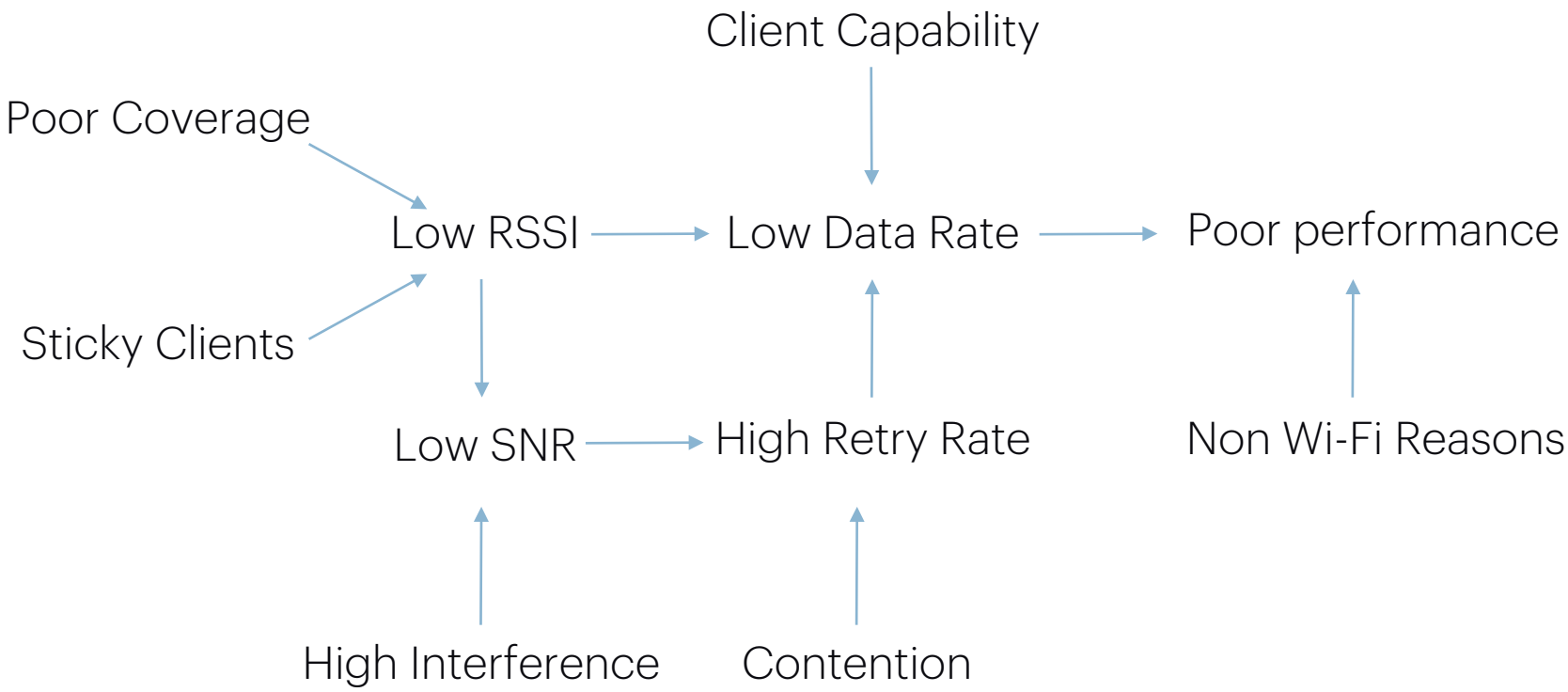
Client performance problems



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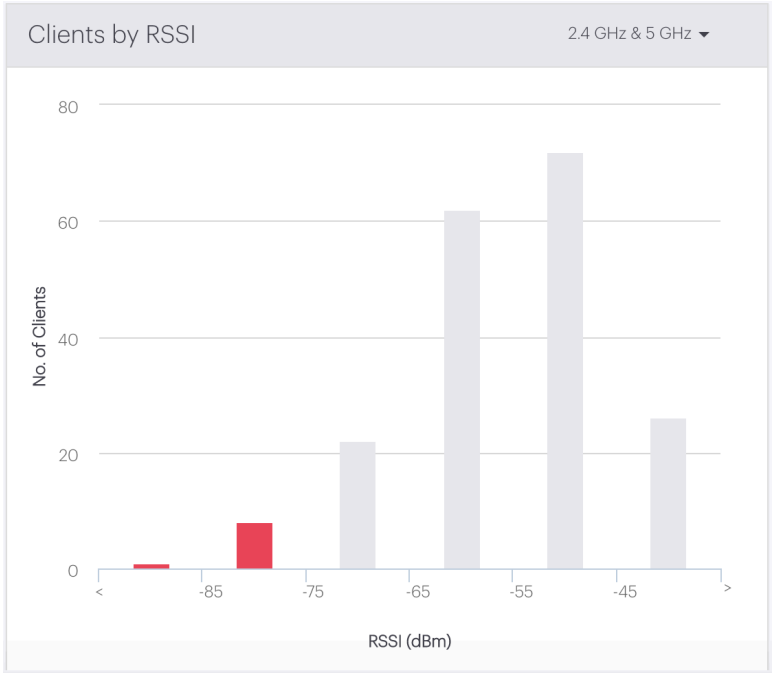
Client performance – RSSI and Data Rate



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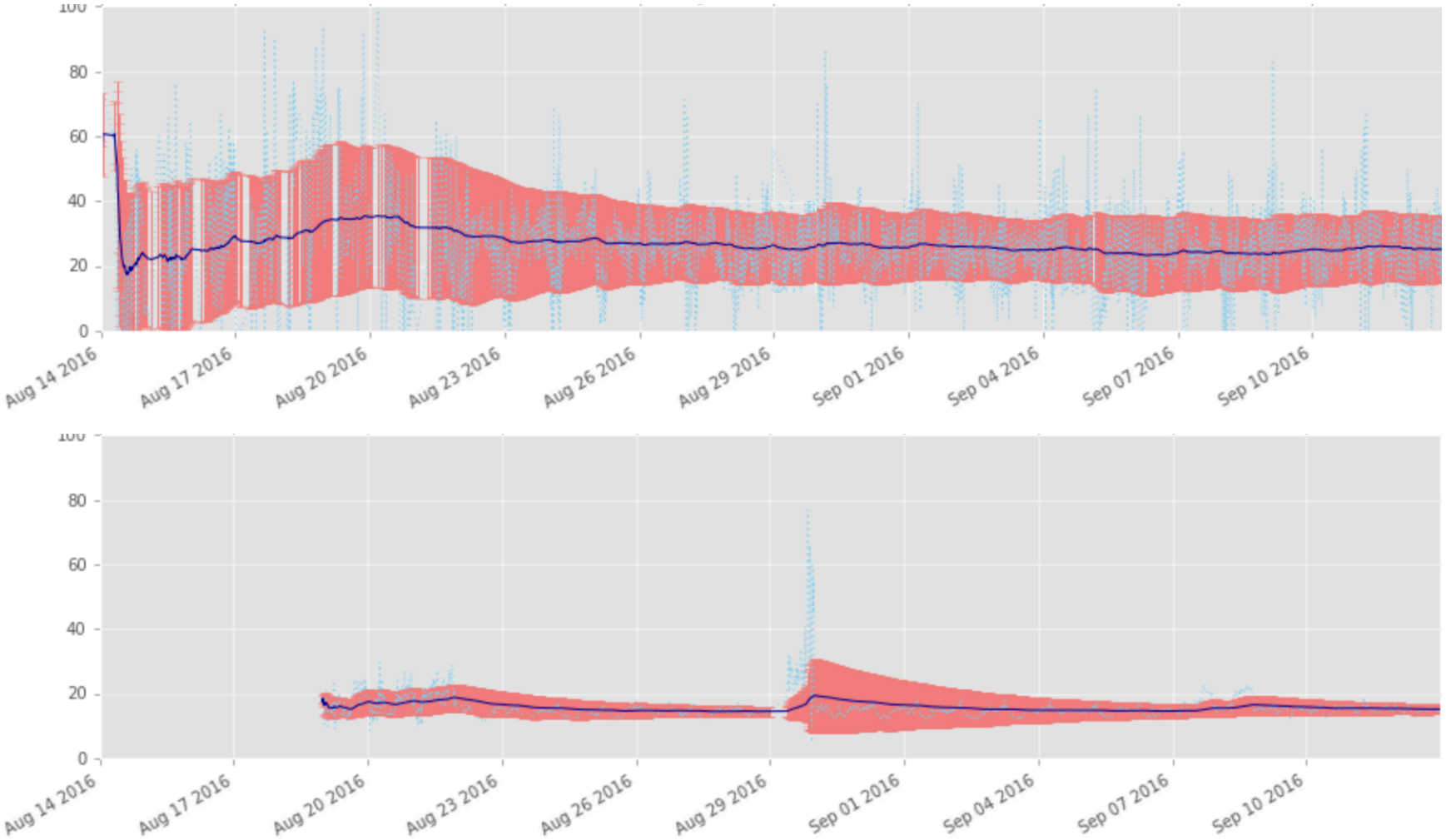
Baselining – Retry Rate



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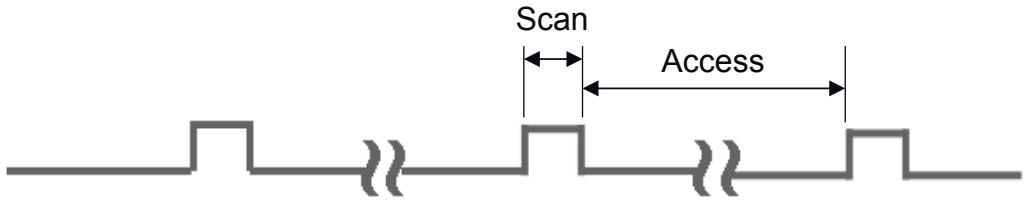
Background vs. Dedicated Scanning



Time taken for one cycle

	Channels	Background scanning	Dedicated scanning
2.4 GHz scan	14	~2 minutes	1.4 seconds
5 GHz scan	36	~ 5.5 minutes	3.6 seconds

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Background vs. Dedicated Scanning

Detection	Scan cycles	AP in background scanning mode	AP with 3rd radio
Access Point	1	~5.5 minutes	~4.5 seconds
Client associations	3+	~15-20 minutes Possible to miss	~10-15 seconds
Tx power adjustments	10+	~ 1 hr	~40 seconds
Data rate adjustments	10+	~ 1 hr	~40 seconds
Interference detection	3	~15-20 minutes Possible to miss	~10-15 seconds

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Benefits of the 3rd radio

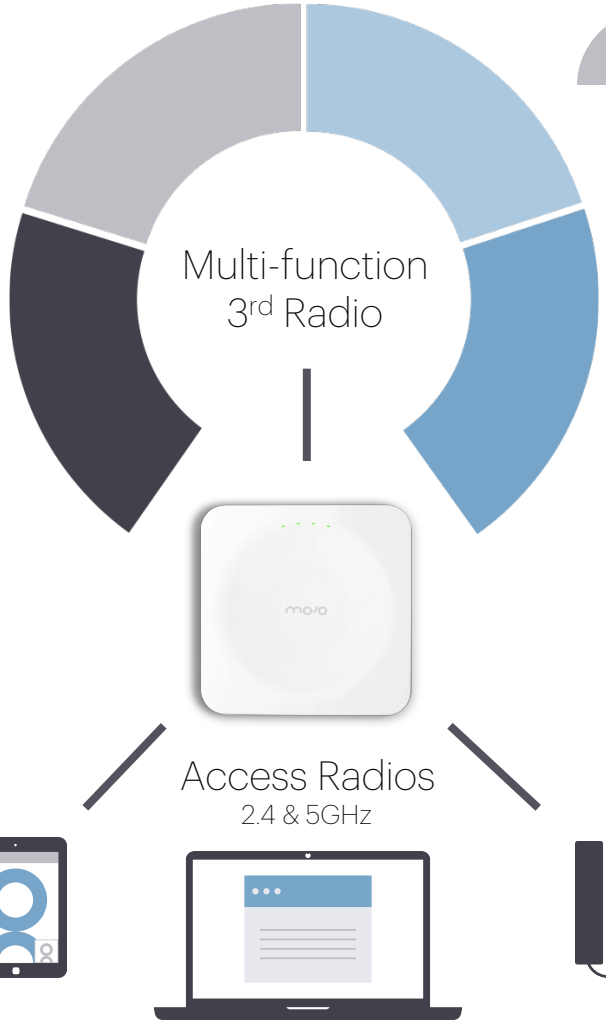
Increased Visibility | **Increased Functionality**

Improved Troubleshooting

Spectrum analysis and over-the-air packet capture increases effectiveness

Radio Resource Management

Persistent scans feed more and better information to support RRM functions



Application Performance

No impact on voice and video applications by persistent third radio scans

Dedicated Security

Free to perform automatic over-the-air prevention without impacting access clients

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