

# Wi-Fi Performance Monitoring as a Design Tool

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# Wi-Fi Performance Monitoring Systems

- Hardware sensors
  - Active tests
  - Passive tests
- Software agents
  - Client data
- Network-as-a-sensor
  - Infrastructure metrics

# WLAN Design

- Follow best practices
- Always do site surveys
- Wi-Fi performance monitoring systems can help

# Gather Requirements

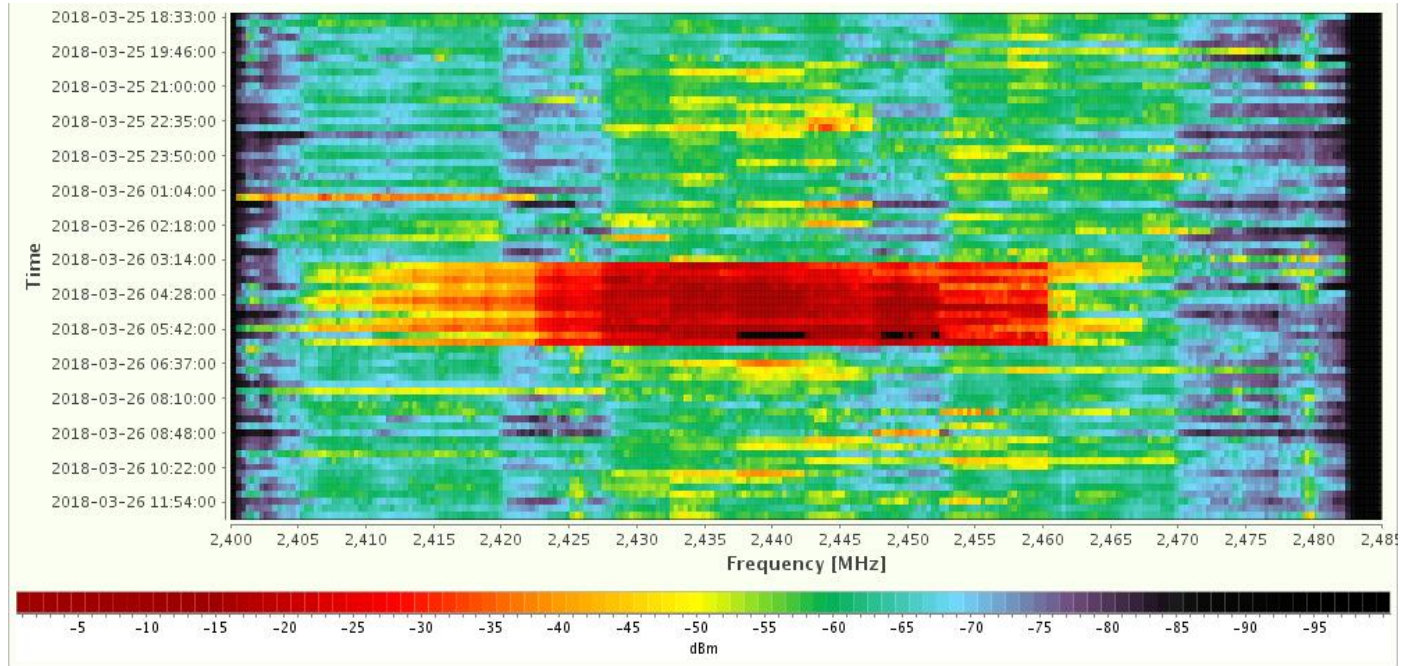
- Existing WLAN upgrade/redesign
  - What are the clients?
  - What is there performance?
- Greenfield
  - What is operating in the RF now?
    - Neighboring WLAN's
    - Long term spectrum analysis
- AP Performance
- Applications in use

# Client Inventory

Platform	Make	Model	Adapter	Driver	Download / Upload Throughput	Sample Count	Unique Devices
Windows					99.6 / 111.3 Mbps	14,398	57
	HP	HP Spectre x360 Convertible	Intel - Intel(R) Dual Band Wireless-AC 7265	19.51.12.3	130 / 161.8 Mbps	483	1
	Dell Inc.				97 / 106.1 Mbps	2,683	7
		Latitude E7470	Intel - Intel(R) Dual Band Wireless-AC 8260		123 / 122.1 Mbps	680	2
				20.20.1.1	162.1 / 171.7 Mbps	483	1
				18.40.0.9	29.9 / 3.8 Mbps	197	1
		Latitude E7240	Microsoft - Intel(R) Dual Band Wireless-AC 7260	17.15.0.5	111.9 / 136.9 Mbps	1,245	1
		XPS 13 9360	Qualcomm Atheros Communications Inc. - Killer Wireless-n/a/ac 1535 Wireless Network Adapter	12.0.0.720		88	1

Old drivers

# Long Term Spectrum Analysis

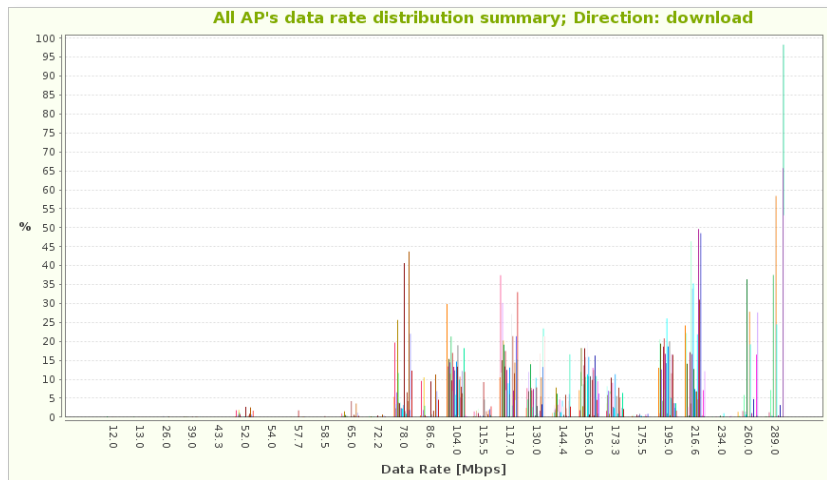


# Capacity Planning

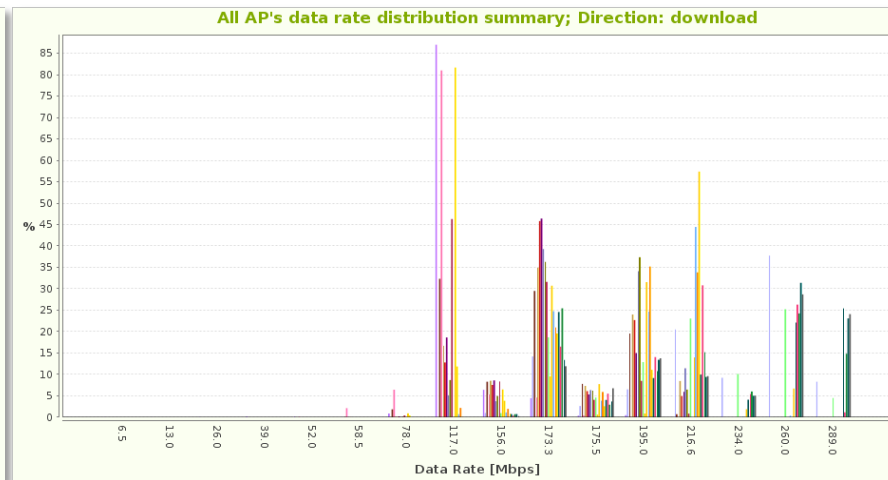
- AP Tx data rates
- Client Tx data rates
- Throughput
- Retry rates
- Airtime

# Real AP Tx Data Rates, not Assumptions

## Last generation 3SS 11ac AP's 5 GHz

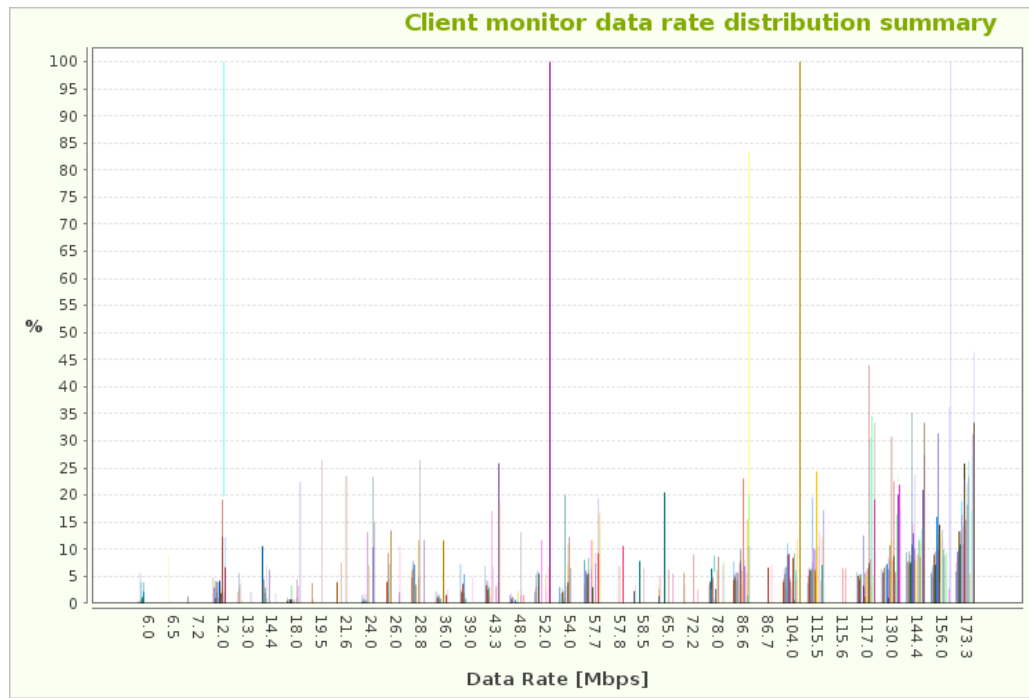


## Current generation 3SS 11ac AP's 5 GHz





# Real Client Tx Data Rates



- 3SS 11ac AP
- All 2SS 11ac clients from the same chipset vendor

# Design

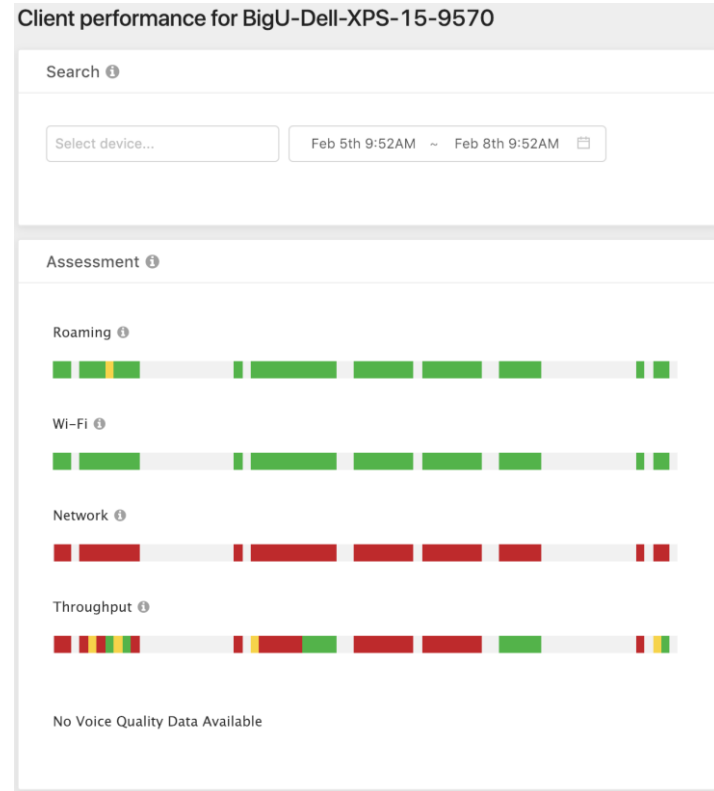
- Add real-world inputs to normal design process
- Predictive designs
- Survey-less designs 😞
  - Can't get budget for site surveys, doesn't scale well
  - Can't travel onsite
  - WPMS can provide some validation and help with the increased need for support

# Validation

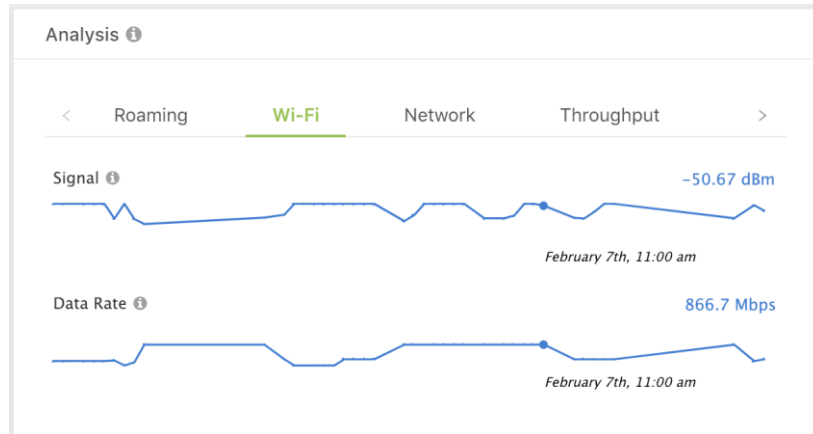
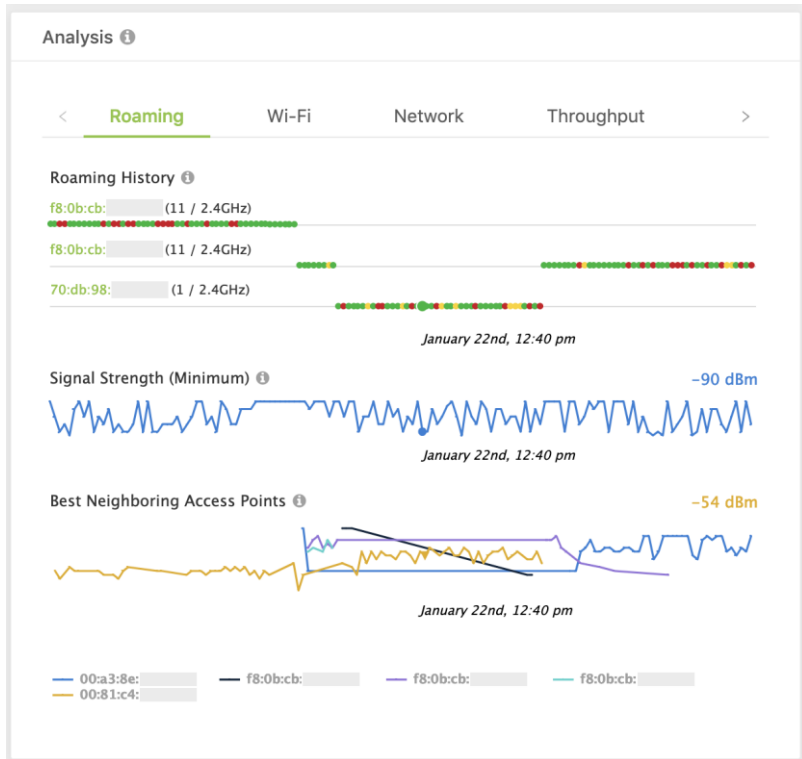
- Deploy portable hardware sensors to iffy areas
  - On-site staff can move them as needed
  - Your toolset, available remotely
- Software agents on local clients can tell you a lot
  - RSSI for coverage, and client differences from survey
  - Client roaming
  - Scan results for co-channel interference
  - Real client throughput
  - Application reachability and performance

# Client Experience for Validation

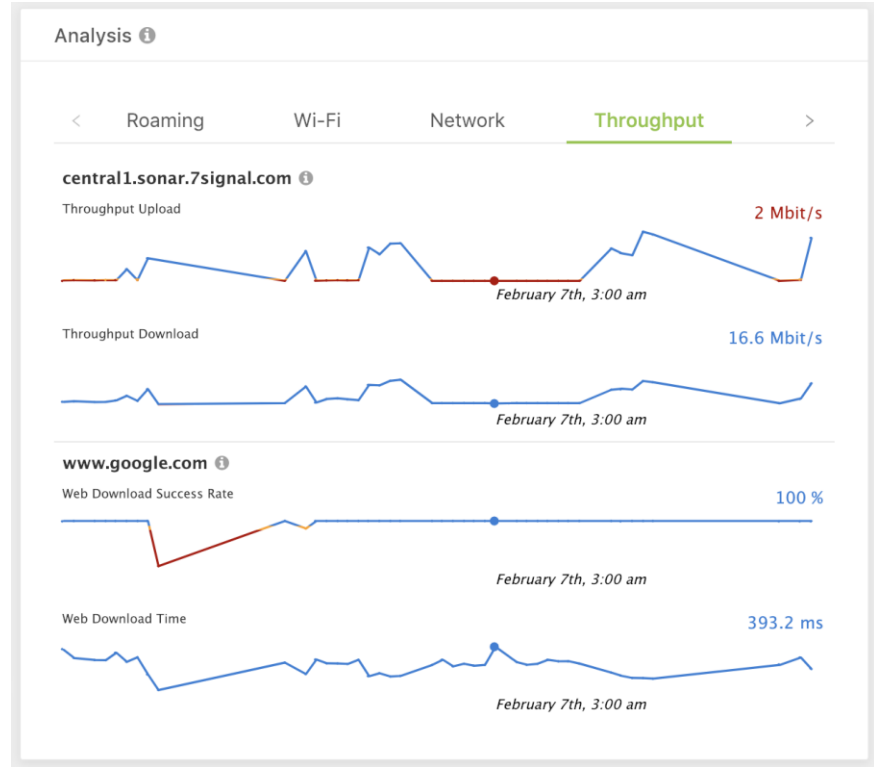
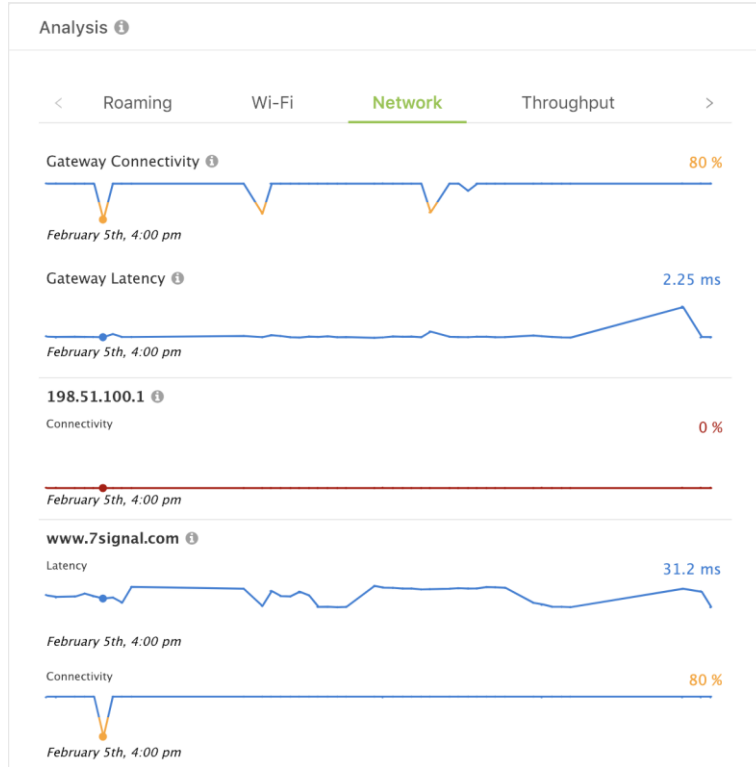
- Remote, scalable visibility into the client experience
- Is everything working?
  - Clients
  - WLAN
  - Network
  - Applications



# Client Experience for Validation



# Client Experience for Validation



# Is Keith Glaring at Me Yet?

- Portable sensors can be moved by local staff to problem areas
  - 24/7 visibility
  - Proactive alarms
  - The Wi-Fi engineer's toolset, available remotely
- Software agents for help desk/client visibility
- Network-as-a-sensor for end-to-end visibility

**Thank You**

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