



Why Ruckus?

A quick review of our storytelling tools

Selling Ruckus

Key Takeaways

- true high performance
- ease of use
- intelligence **new**
- lowest total cost of ownership

Formats

- coffee shop conversation
- short pitch (most situations)
- long pitch (big customer, long meeting)
- technical v. not

Coffee shop conversation

Tools



this is different

- topless AP
- product guide

Story

- Ruckus company stats
- Criticality of performance
- BeamFlex difference
- Results (tests, customers)
- Product line
- Takeaways



Short Pitch



this is different

The Ruckus Difference

Two kinds of Wi-Fi in the industry:

Adaptive antennas and learning-based self-organizing technology (Ruckus)



Conventional reference-design implementations with zero IP in the radios (everyone else)



Flashlight

Dim light bulb

>20,000 customers + Syracuse U. say...

Test Conditions

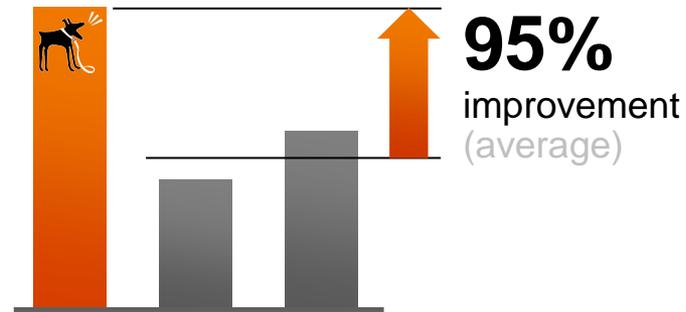
Results (Total TCP Throughput)

High Density

90 active clients per AP

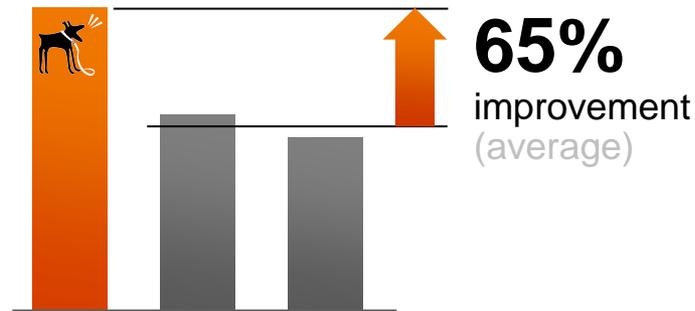
adaptive antennas +
learning-based SON
(BeamFlex & ChannelFly)

leading conventional reference
design implementations



Interference

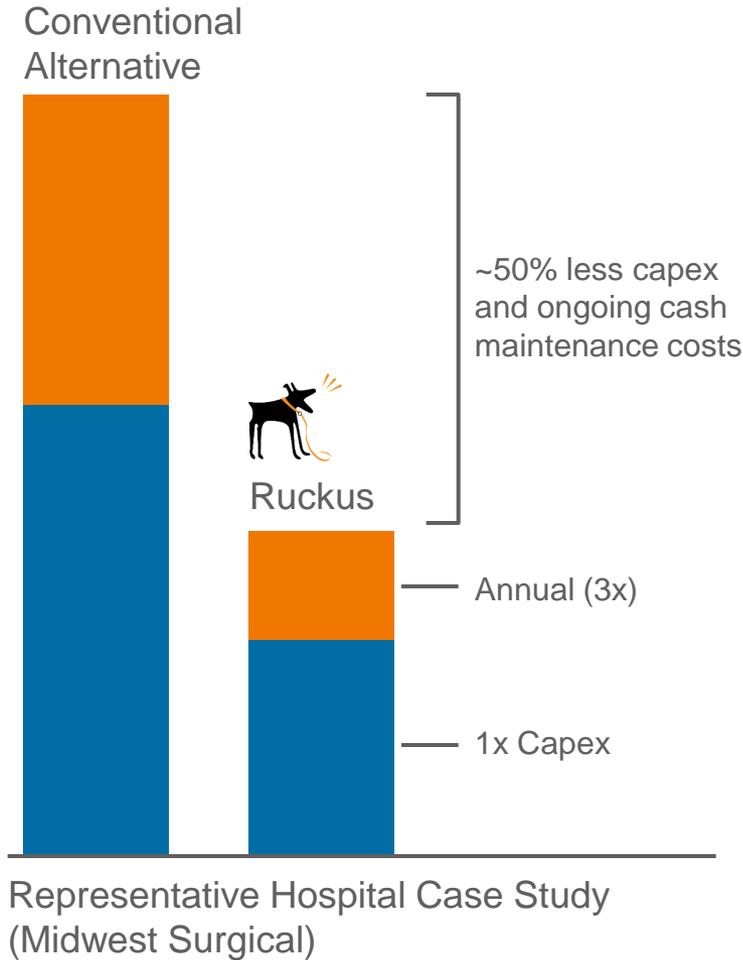
6 APs,
120 clients,
1 busy rogue AP



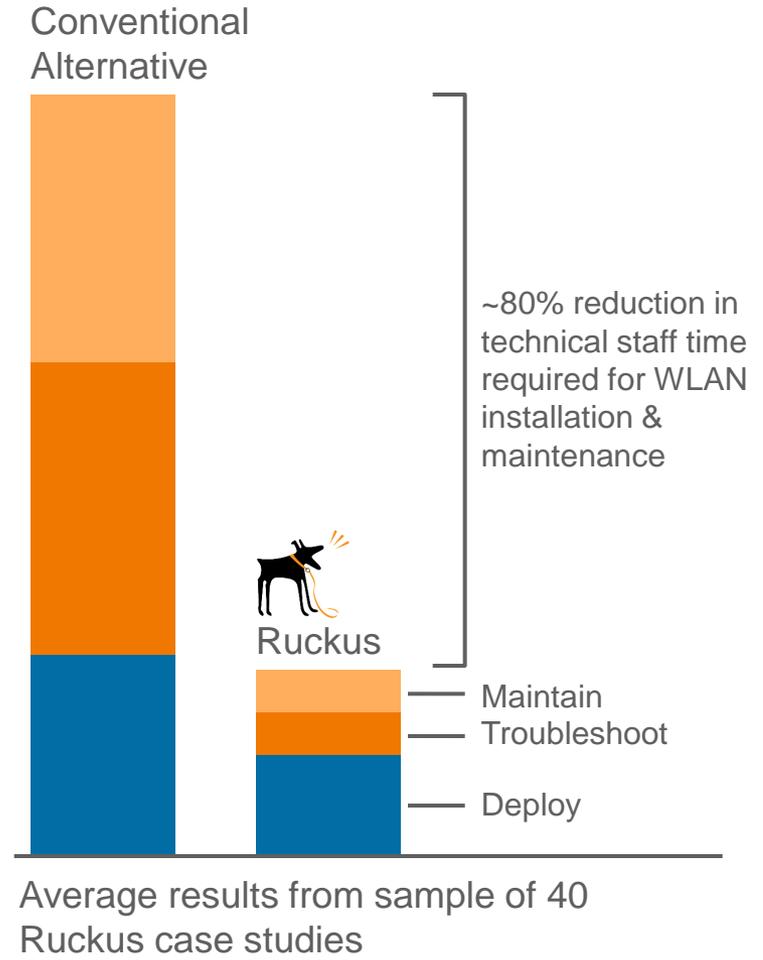
Source: Syracuse University comparative Wi-Fi testing, 2012.

Truly lower TCO in practice

50% Lower cash costs



80% Less technical staff time



Long Pitch



this is different

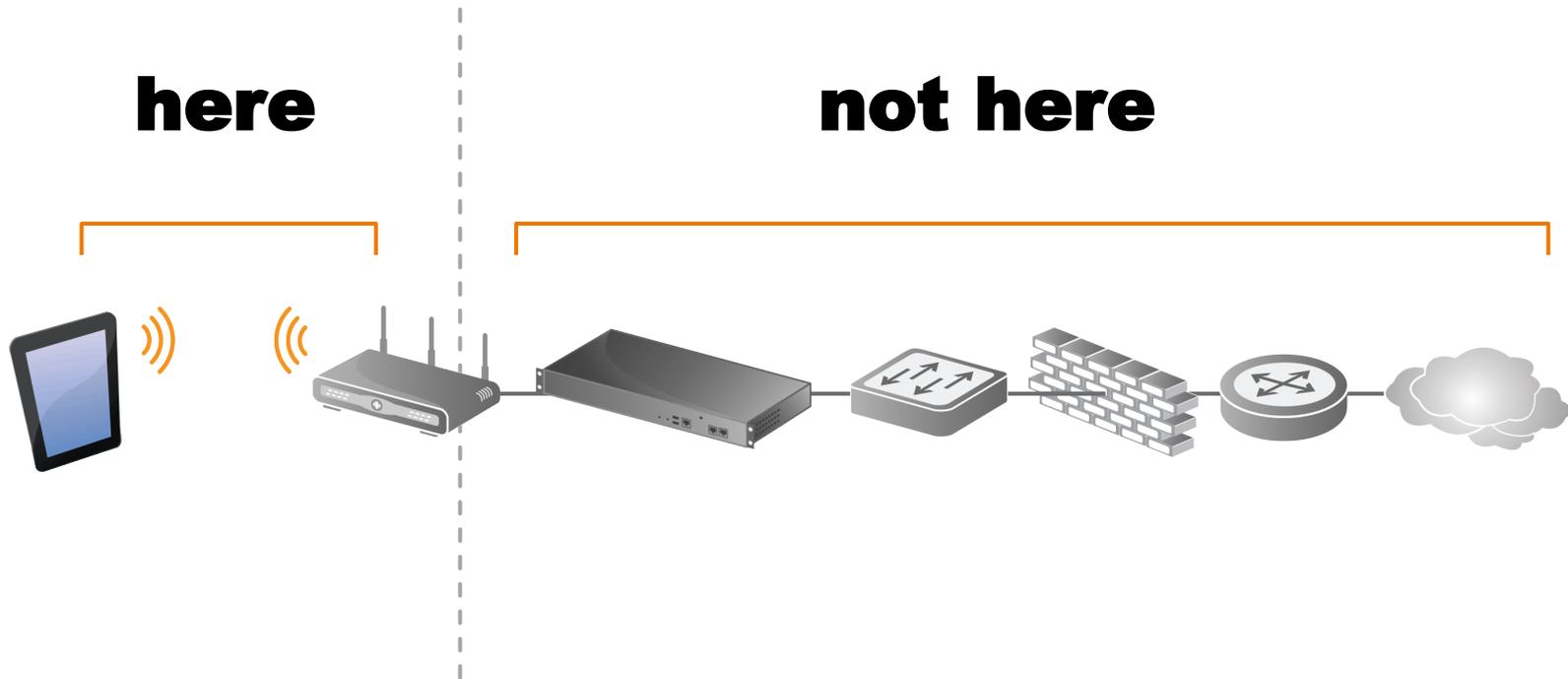
Performance matters more than ever

- Increasing mission-critical role for mobile applications
- More users, devices, and bandwidth demand per user
- High demand density
- Interference



How to deliver high performance

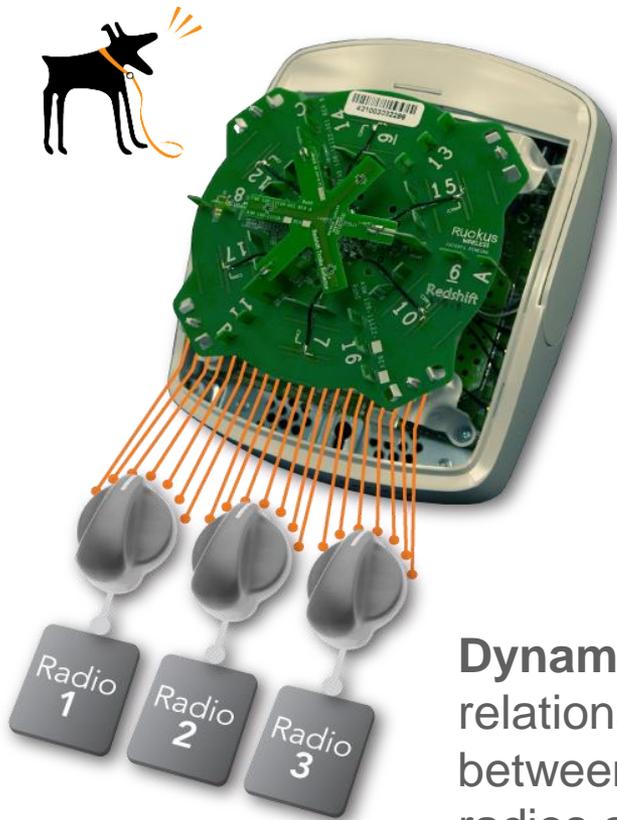
Apply engineering talent...



How we make it happen

Two kinds of Wi-Fi in the industry:

Adaptive antennas and learning-based self-organizing technology (Ruckus)



Dynamic 1:many relationship between Wi-Fi radios and antennas

Conventional reference-design implementations with zero IP in the radios (everyone else)



Fixed 1:1 relationship between Wi-Fi radios and antennas

How we make it happen

Two kinds of Wi-Fi in the industry:

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Flashlight

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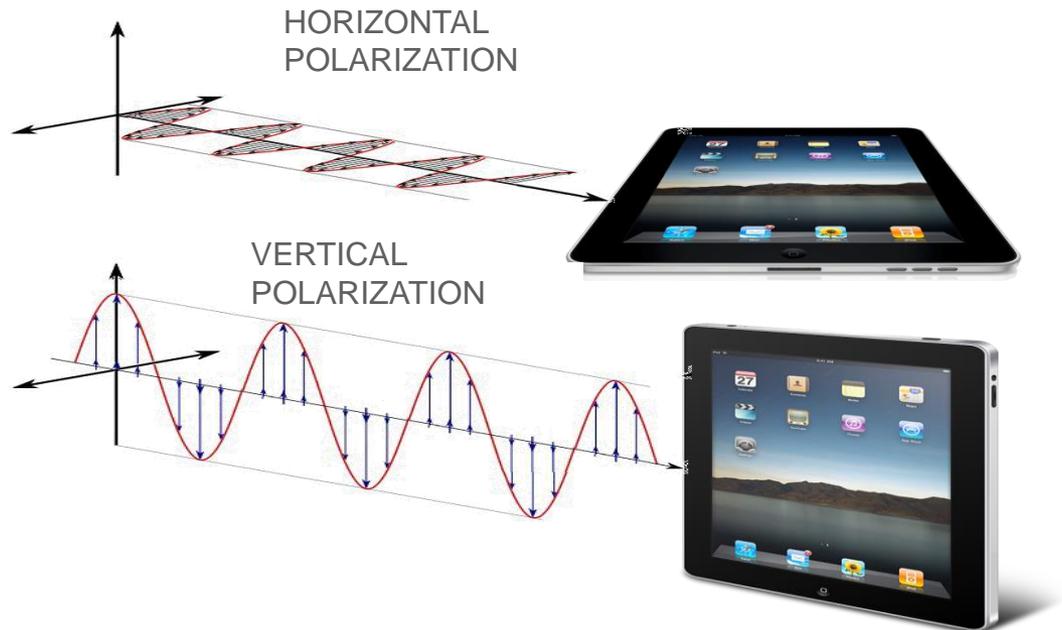


Dim light bulb

Adaptive Polarization Diversity

BeamFlex+

- Better reception for weak and “hard to hear” mobile devices
- Better transmission to devices constantly changing their orientation



On BeamFlex and beamforming (1)

In response to “beamforming is in the standard so you don’t need Ruckus”...

- BeamFlex technology = adaptive antennas
- Beamforming (calculated phase and gain manipulation) is not supported by clients today, so is only useful for meshing
- As client support emerges (in AC wave 2), BeamFlex will continue to deliver differentiating performance through the combination of adaptive antennas and beamforming

On BeamFlex and beamforming (2)

Ruckus
Simply Better Wireless

white paper

Using All the Tools You Can

GETTING THE BEST WI-FI PERFORMANCE POSSIBLE THROUGH BOTH BEAMFORMING AND ADAPTIVE ANTENNAS

INTRODUCTION

User demands on Wi-Fi networks continue to rise quickly across every segment of the industry, and as a direct result, great radio performance matters more than ever. Achieving that high performance is no small challenge in the face of high AP density, high client counts, and interference — requiring the use of every technology tool available to better control and improve radio behavior in the environment.

The latest generation of Wi-Fi chipsets are bringing a potentially useful new addition to the toolkit: transmit beamforming with explicit feedback (commonly referred to as “TxBF”). TxBF can offer gains under the right circumstances, but it has some inherent limitations that mean it cannot solve the performance challenges all by itself, despite some vigorous vendor marketing claims to the contrary.

Used in combination with adaptive antennas, though, TxBF can become an essential tool in a comprehensive approach to achieving maximum radio performance in today’s challenging environments.

Ruckus is continuing in its long tradition of pioneering work in the cost-effective application of smart antenna concepts to Wi-Fi, by enhancing our statistical optimization approach to radio performance with this combination of TxBF and adaptive antennas. As a result, APs equipped with our BeamFlex 2.0 technology, such as the recently launched ZoneFlex 7502 3x3:3 dual-band 802.11n AP, are setting new performance benchmarks for the industry.

This paper provides a thorough introduction to these smart antenna technologies, how they can be used together, and the results that combination makes possible in real-world WLAN networks.

Using All the Tools You Can

GETTING THE BEST WI-FI PERFORMANCE POSSIBLE THROUGH BOTH BEAMFORMING AND ADAPTIVE ANTENNAS

With an old-fashioned single-antenna access point, figure 1, with a common omni-directional antenna, when this device transmits, the antenna’s signal spreads in all directions in the plane (we’ll worry about what happens in the plane in section 4). While this approach has a certain simplicity, it has substantial performance limitations. The vast majority of this radio energy is wasted, since an access point can only talk to one client at a time. Beyond mere waste, this excess energy causes a form of more self-interference in the WLAN, known as co-channel interference (CCI), which is caused by neighboring APs and their clients and reducing the signal-to-noise ratio (SNR) at the client. The tiny fraction of signal that actually reaches the client yields a lower throughput than would be the case if the signal were more tightly focused on the client (higher available signal strength).

Another omni antenna to begin to explore the possibilities for better control of the radio environment is the combination of two copies of a signal, transmitted from two neighboring omni antennas. When these two signals combine, they can either yield a signal that is twice as strong as the original, or they can cancel each other out. In some locations, the peaks of the two signals line up in phase (‘Tx 1’, in the jargon) line up in phase with the peaks of Tx 2 — this is referred to as constructive combination. In other locations, the peaks of Tx 1’s signal are lined up with the troughs of signal from Tx 2, which yields destructive combination. If a receive (Rx) antenna is placed roughly twice the signal strength of a single Tx antenna’s output, without doing any intelligent work on its own — its analog receive electronics simply sum the signals received automatically, yielding a signal that is twice as strong as the original. In contrast, a zone of complete destructive combination would yield zero signal, a phenomenon useful in reducing intra-AP interference at the network level (more on this later). The repeating patterns in radio communication signals allow us to use the concept of phase to describe the peak or trough match-up relationship between two different signals.

Multi-antenna processing for increased signal strength (technology often broadly categorized as ‘beamforming’)

page 2

Using All the Tools You Can

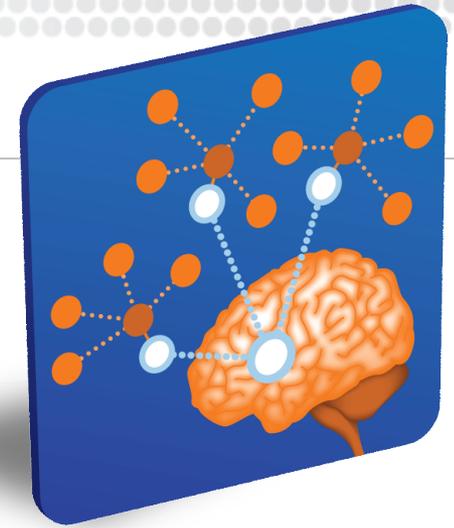
GETTING THE BEST WI-FI PERFORMANCE POSSIBLE THROUGH BOTH BEAMFORMING AND ADAPTIVE ANTENNAS

RF Technology Comparison
300 DL Throughput, Mbps

RF Technology Comparison
UL Throughput, Mbps

page 14

More than just good radios (1)



Smart meshing

- autonomously optimized, self-organizing networks, including hybrid meshing
- adapts to changes in environment

Dynamic channel management

- ongoing channel performance assessment
- adaptation based on realizable capacity (ChannelFly)

Client load balancing

- balances client load across APs by redirecting clients based on neighboring AP connection quality and relative loading

Band steering

- balances client load across bands by redirecting clients based on capabilities
- maximizes overall throughput

QoS at AP level

- application queues per client
- prioritization of voice, video, and data

Airtime fairness

- round-robin time allocation based on client capabilities
- prevents slower clients from throttling faster ones

More than just good radios (2)



- Identifying user, device, and app classes (e.g. staff, students, guests)
- Onboarding users and devices; managing class-based access
- Large client-count support (~500 per radio)
- Secure authentication for cellular and non-cellular devices
- Relevant context standards compliance (esp. PCI, emission, vibration specs)
- Rich feature sets for dynamic QoS, VLAN, security, and authentication integration with existing IT environment
- Interop with AD, RADIUS, LDAP, property management systems, subscriber gateways, UTM/firewalls, switching platforms
- Massive scale, high-availability, and highly-distributed configurations
- Guest access portal and control
- Vertical application interop (RTLS/LBS, VoIP phones, scanners, medical devices, UC platforms, classroom mgt. apps)
- Simplified web GUI interface for config/admin, rogue detection, spectrum analysis
- Detailed reporting for users, devices, applications, APs — associations, bandwidth consumption, time series, aggregates
- SNMP interfaces for management system integration, more advanced interfaces for big-data analytics feeds (e.g. JSON, XML, RESTful)

>20,000 customers + Syracuse U. say...

Test Conditions

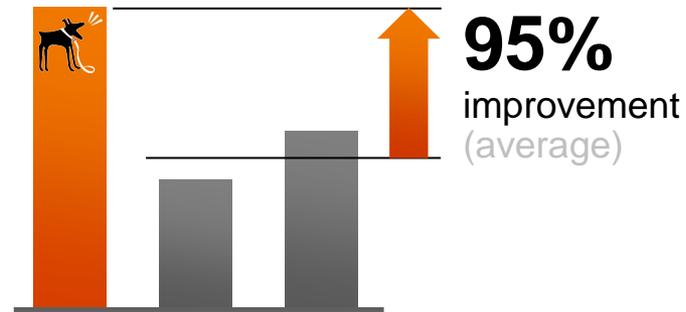
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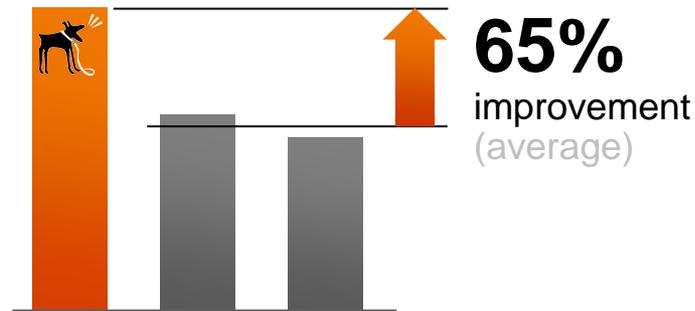
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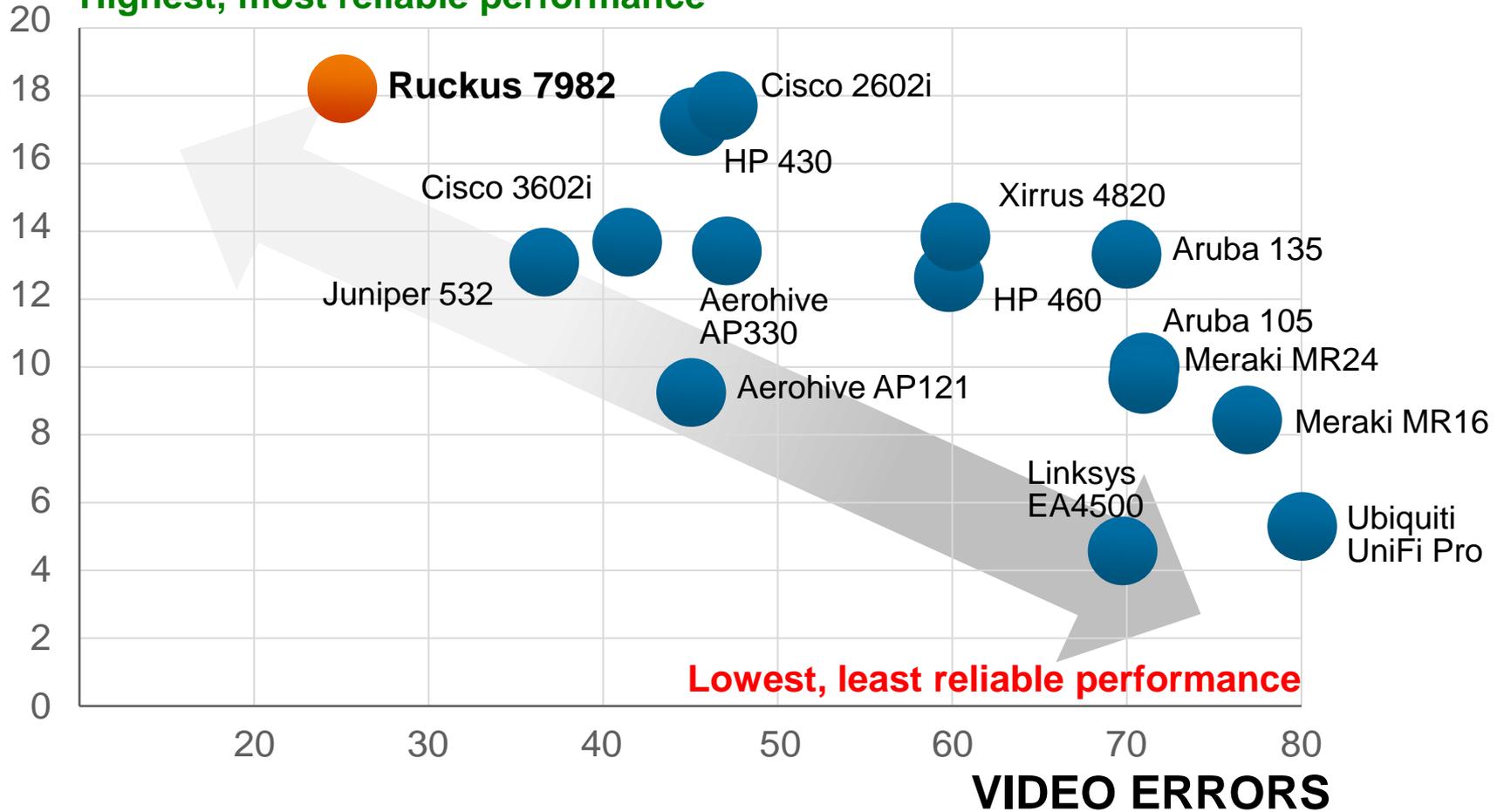
Source: Syracuse University comparative Wi-Fi testing, 2012.

Stress-test results

AVG. TCP THROUGHPUT

Single AP, up to 25 iPads with video, no interference

Highest, most reliable performance



Lowest, least reliable performance

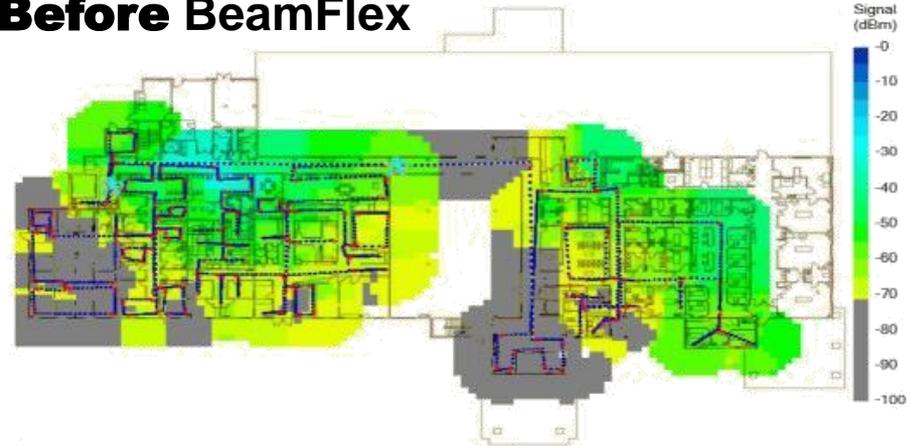
Making a BIG Difference

Measurements based on real-world customer Wi-Fi network

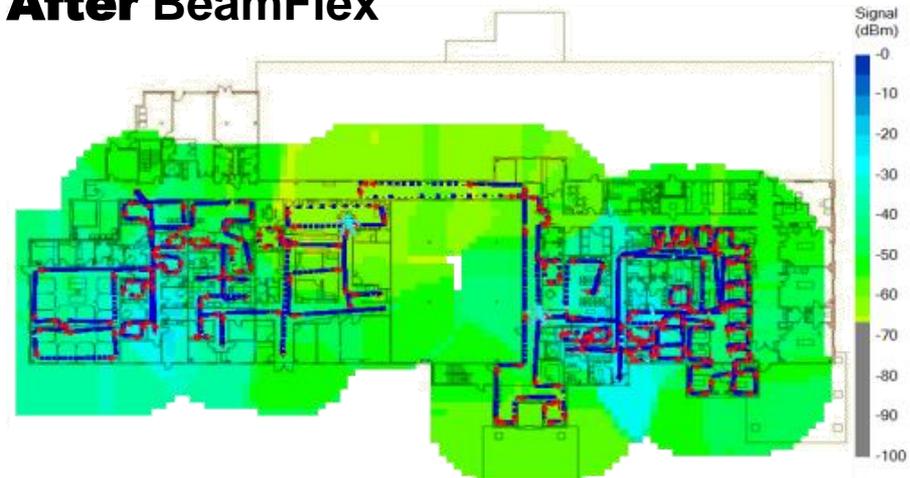


4x CRD APs

Before BeamFlex



After BeamFlex



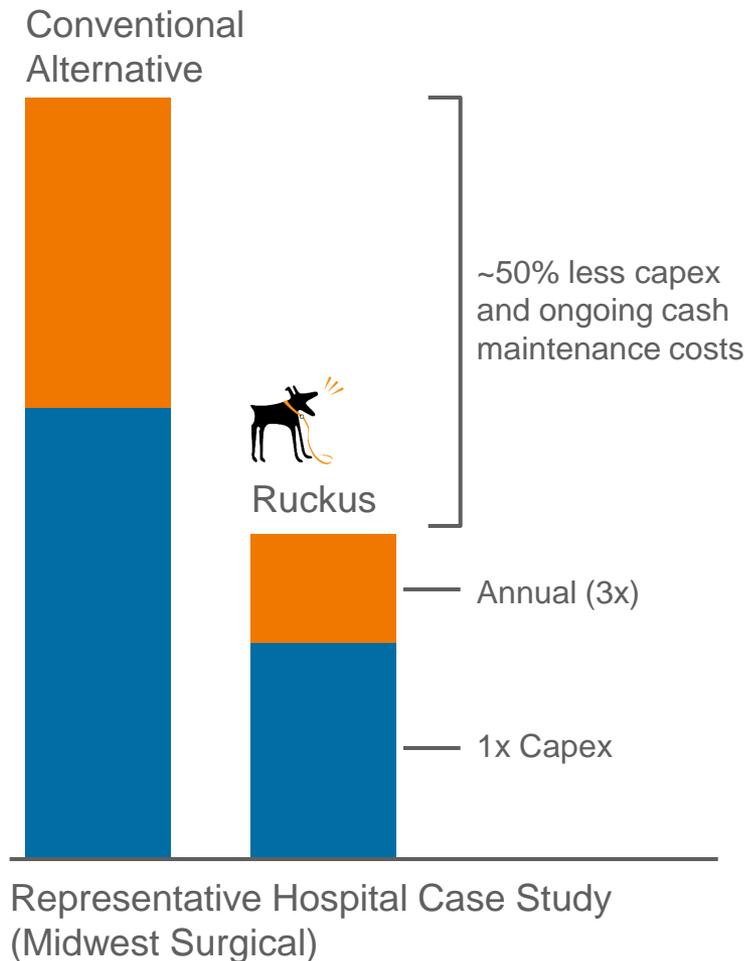
Green is good, grey is bad



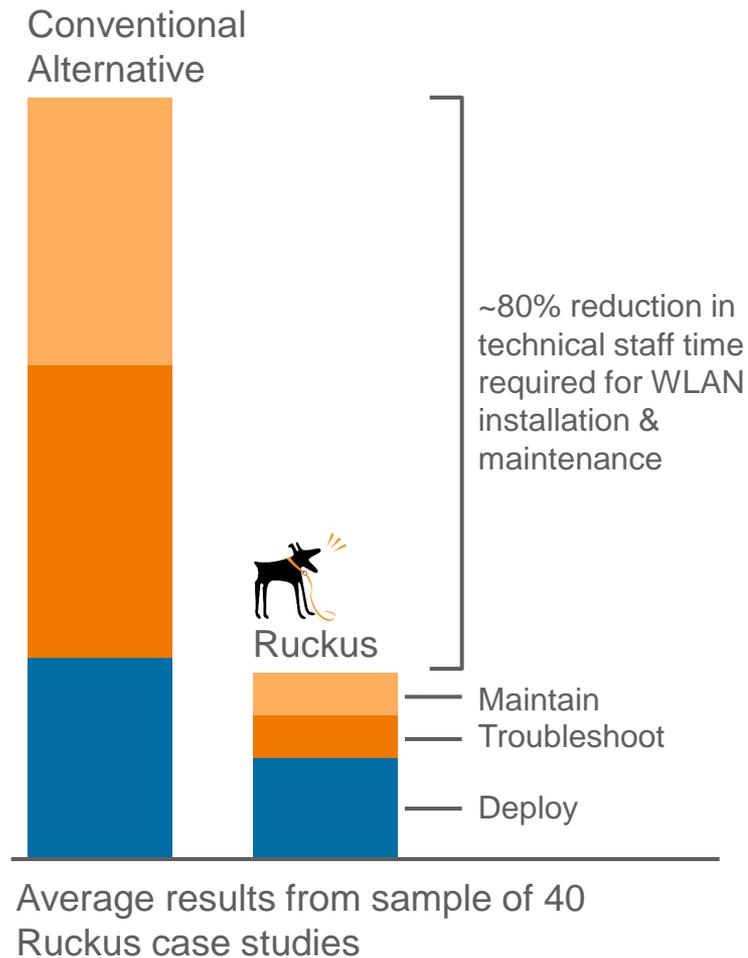
2x Ruckus 7363 APs

Truly lower TCO in practice

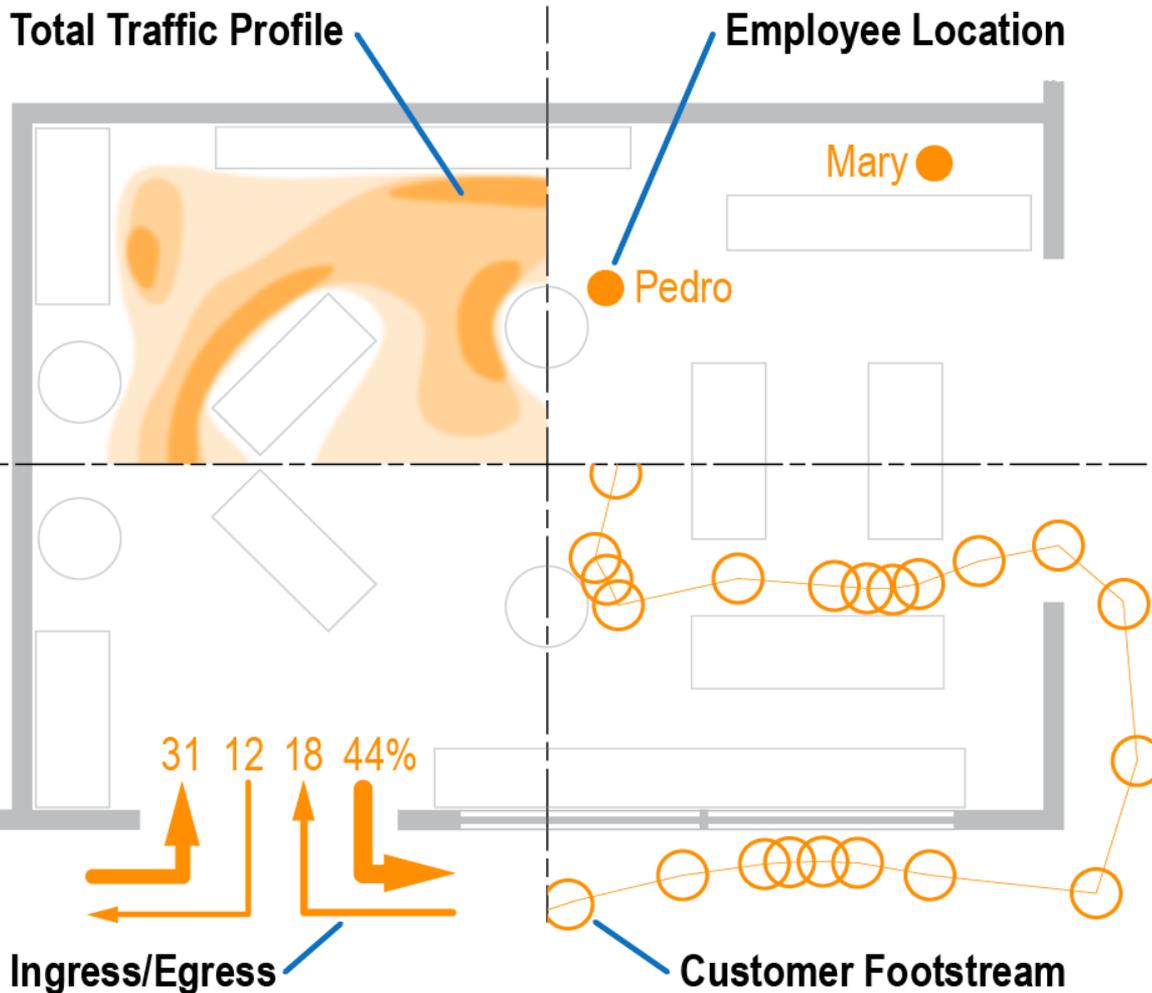
50% Lower cash costs



80% Less technical staff time



Enabling context-aware apps indoors

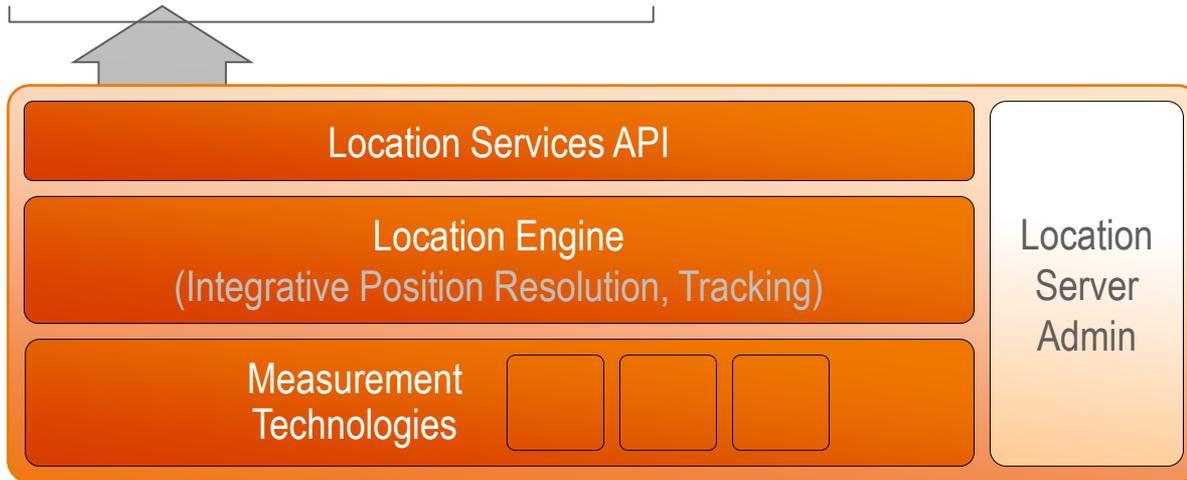


- Personalized information delivery
- Advanced loyalty programs
- Catalyzing impulse buys
- Friend- and staff-finder apps
- Merchandizing optimization
- Traffic-based monetization
- Tying web and POS to physical activity (price comparisons, conversion)
- Time and motion studies for operations re-engineering
- Productivity management à la call centers

Ruckus Smart Location: future of Wi-Fi



Third-party mobile apps
Ruckus SmartCell Insight for
data warehousing and analytics feed



**Ruckus
Smart Location
Server**

Module on SCG,
VMWare Server,
or in Cloud



Ruckus Smart Wi-Fi Network



Mobile Devices

- Software addition to Wi-Fi network
- 1 to 3m resolution
- Device independent (no client SW)
- Under venue/operator control

How Ruckus Wi-Fi helps you make more \$

- Truly superior performance in practice
- Easier to deploy and use
- Lowest total cost of ownership
- Breaking ground for new opportunities
- 100% channel focus and strong partner support

which all mean...

- You win more deals
- You keep more of the margin you earn
- Customer references are stronger
- You can expand your business more easily into new growth areas



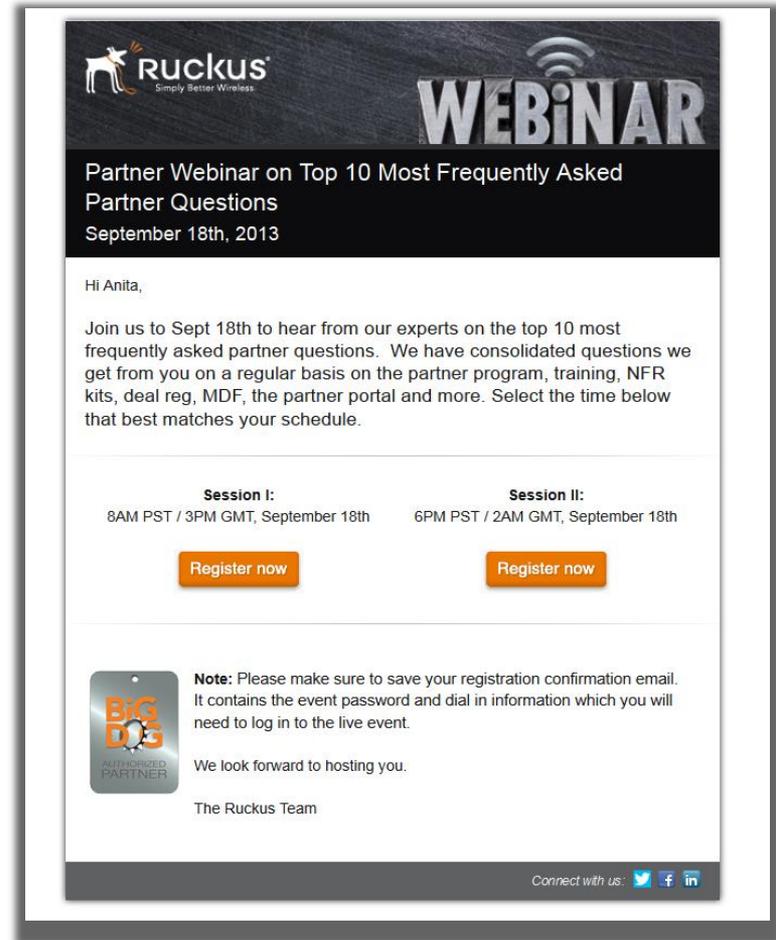
Channel Marketing Update

September 2013

Anita Pandey & Kelly Liu

Channel Marketing Update

- Reseller Webinar , Sept 18th –
“**Partnership Top 10 Most Frequently Asked Questions**”
 - Partner Program Requirements & Benefits
 - Training & Educational Events
 - NFR Kits
 - Deal Registration
 - MDF & Marketing Tools
 - Partner Portal Top 3 Tips
 - Key Sales Contacts
 - Partner Survey – what else would you like to see us cover?
- **Registration Links**
 - 8am PST
 - <https://ruckus.webex.com/ruckus/onstage/g.php?t=a&d=802898916>
 - 6pm PST
 - <https://ruckus.webex.com/ruckus/onstage/g.php?t=a&d=804264404>



The image shows a screenshot of an email registration page for a Ruckus webinar. At the top, the Ruckus logo is on the left and the word 'WEBiNAR' is on the right. Below this, the text reads 'Partner Webinar on Top 10 Most Frequently Asked Partner Questions' and 'September 18th, 2013'. The email is addressed to 'Hi Anita,' and invites her to join on Sept 18th to hear from experts on the top 10 most frequently asked partner questions. It lists two sessions: Session I (8AM PST / 3PM GMT, September 18th) and Session II (6PM PST / 2AM GMT, September 18th), each with a 'Register now' button. A note mentions saving the registration confirmation email for login information. The email is signed 'The Ruckus Team' and includes social media icons for Twitter, Facebook, and LinkedIn at the bottom right.

NEW Highly Improved Deal Reg is Live!

- **Launched today**
 - Greatly improved UI
 - Step-by-step submissions workflow
 - More intuitive & flexible options for adding products

- **Product Code**

- Hardware/License/Software etc.

- Support

Search

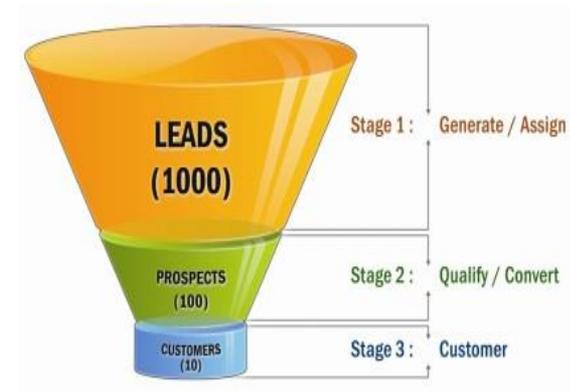


The screenshot shows a web interface with a header titled "Categories" in green. Below the header is a table with three rows: "New Partner Portal", "Deal Registration", and "Market Development Funds". To the right of the table are two blue links: "Register a Deal" and "View Deals".



Lead Generation Update

- **Weekly Prospect Webinars**
 - Generate ~ 50% of the warm leads!
 - Provide continuous education for VARs & customers
 - **What we need from YOU to boost lead quality**
 - **Consistent lead status updates** – feedback on our classifications of warm leads
 - Would you benefit from **Regionally focused prospect webinars?**
- **Automated email nurturing campaign:** multiple email touches to help accelerate buying cycle
 - Acquisition of sizeable global W & L & Assisted Living customer lists. Campaign in planning.
 - **What we need from YOU to increase campaign relevance**
 - **Case Study volunteers?**



Ruckus Led-Lead Generation for Partners

Direct your customers to visit our webinar calendar:

www.ruckuswireless.com/press/webinars

Upcoming Prospect Webinars

- September 12: 11ac
- September 19: BYOD
- September 25: BYOD in partnership with Infonetics and Fluke Networks.

Archived, On-Demand Webinars

- Securing Public Hotspots
- 11ac
- Complete solution for education

Webinars

Make your learning easy. Join our interactive live webinar series or sign up the on-demand webinars for easy access anytime and anywhere. Have suggestions for future webinar topics or comments? Just email us at ruckusteam@ruckuswireless.com.

Live Webinar Series

What you need to know about 11ac

Jointly brought to you with Spiceworks

We will take a deep dive on the topic of 802.11ac with GT Hill, who is a geek at heart with deep knowledge of networking, specifically Wi-F protocol behavior, network architecture, and is an in-house guru on Ruckus patented technology.

Session 1:
Wednesday, Sept. 3 at 11AM PT

[Register now](#)

Session 2:
Thursday, Sept. 12 at 6PM PT

[Register now](#)

Architecting Wireless LANs for BYOD

This webinar will provide practical advice for coping with the growth in new devices and examine how network managers can best integrate these devices into IT and network resources.

Hosted by the Ruckus Team:
Thursday, Sept. 19 at 6PM PT

[Register now](#)

Jointly brought to you with Infonetics and Fluke Networks:
Wednesday, Sept. 25 at 8AM PT

[Register now](#)

On-Demand Webinar Series

BYOD Meets Smarter Wi-Fi

Jointly hosted with NetworkWorld

BYOD is a way of life for IT managers these days. This webinar focuses on cutting through the BOYD bull, and suggests a practical way to use what you have to solve new capacity and management problems.

LMS – Portal Intro Page Being Simplified for Relevancy

I'm a Partner

I'm a Customer

I'm an Employee

Big Dog Partner Training

Audience: Value-Added Resellers (VARs) and Distributors

Ruckus Wireless approved Big Dog Partners are required to successfully complete the certifications for Ruckus Sales Expert (REx) and WiSE Guy. We recommend that courses are completed prior to certification exam enrollment. There are some resellers and integrators that may have the requisite knowledge to pass the exam. The WiSE Guy certification has a duration of 2 years. The REx certification is perpetual.

All online supporting courses and online Ruckus Sales Expert Certification Exam is available to you for free. The WiSE Guy Certification Exam is \$150.



Certifications:	Big Dog	Top Dog	**Expected Completion	Certificate period
WiSE Guy	*1	*2	3 months	2 years
Ruckus Sales Expert (REx)	*1	*3	3 months	Perpetual

*number of people with certification

**Expected completion time is from the date you are approved as a partner



REx Certification Exam Enrollment

Ruckus Sales Expert (REx) Courses:

- Introduction to Ruckus Products (75 minutes)
- Sales Essentials (2 hours)
- REx Exam (30 minutes)

New Page Launches Sept 18th!



WiSE Guy Certification Exam Enrollment

WiSE Guy Exam Courses:

- Wi-Fi Essentials (3 hours)
- ZoneDirector Installation and Management 9.3 (8.5 hours)
- Basic Wi-Fi Survey (90 minutes)
- Upcoming **WiSE Bootcamp** instructor lead classes