



E-Rate RFP Response

Prepared for:

Gull Lake Community Schools



Proposal Date: 1/7/2025

Prepared by: Vector Tech Group  
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USF SPIN#: 143049512

FCC 470#: 250006890



E-Rate RFP Response

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Gull Lake Community Schools

# Statement of Work

**Gull Lake Community Schools - 470#: 250006890**

*Prepared for Gull Lake Community Schools*

## ***Vector Tech Group***

USF SPIN#: 143049512

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*Sales Executive: jake baker*

*SOW Generated on December 3, 2024, Version 1*

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## *Client Contact Information*

<b>Client Name</b>	<b>Gull Lake Community Schools</b>
<b>Project Name</b>	Gull Lake Community Schools - 470#: 250006890
<b>Client Contact</b>	
<b>Client Contact Email</b>	

## *Locations in Scope*

**Gull Lake Community Schools:** 10100 E D Ave, Richland MI 49083

## *Executive Summary*

Vector Tech Group is providing a proposal for all requested Ruckus wired and wireless equipment. The proposal includes all necessary labor for installation and configuration of the Ruckus equipment. The proposal includes multiple different options for you to select from including the option to add Cloudpath to the Gull Lake wireless network via the MIBS program.

The access point hardware options that we have provided include:

- Ruckus R650 WIFI6 4X4(5Ghz) 2X2(2.4Ghz) access point
- Ruckus R560 WIFI6E 2X2(6Ghz) 2X2(5Ghz) 2X2(2.4Ghz)
- Ruckus R670 WIFI7 2X2(6Ghz) 4X4(5Ghz) 2X2(2.4Ghz)

If you have any questions at all regarding our proposal please do not hesitate to reach out.

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## Solution Summary

### **Wireless deployment - VectorFi**

VectorFi is a platform developed by Vector Tech Group that integrates AI-driven network assurance with business intelligence. It allows enterprises to manage converged networks, optimize network performance, and make data-driven decisions to ensure seamless connectivity, security, and performance optimization across an organization's network

#### Centralized Management:

VectorFi offers a unified platform for managing both wired and wireless devices. This centralized approach simplifies network monitoring and configuration from a single dashboard, regardless of the network's physical location.

#### Scalability and Flexibility:

Since the controller is hosted in the cloud, it allows for easy scaling. As your network grows (e.g., adding more access points or switches), the cloud platform can handle the increased workload without needing additional on-premise hardware.

#### Remote Access and Configuration:

Administrators can manage and configure the network from any location with internet access, reducing the need for on-site maintenance. This is particularly valuable for multi-site businesses or organizations with a distributed workforce.

#### Real-time Analytics and Monitoring:

VectorFi provides real-time data on network performance, device status, traffic patterns, and potential security threats. Advanced AI-driven analytics can also be integrated to automate troubleshooting and optimize network performance.

#### Automatic Updates and Maintenance:

VectorFi handles software updates, maintenance, and backups, ensuring the network stays up-to-date without manual intervention from IT staff. This helps avoid downtime and enhances security.

### **Physical Installation of Wireless Access Point**

This project involves the physical installation and testing of Wireless Access Points (WAPs) throughout the client's designated areas. The goal is to provide comprehensive wireless network coverage, improving connectivity and network performance. The scope includes mounting of WAPs as per the client's requirements.

### **Wired deployment - Complex Wired Network Installation**



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The purpose of this Scope of Work (SOW) is to define the responsibilities, tasks, deliverables, and exclusions for the installation of a complex wired network infrastructure. This project will involve the design, installation, testing, and documentation of the network infrastructure, including the deployment of wired network components such as switches, routers, firewalls, and cabling.

### **Hosted Deployment of Ruckus Cloudpath**

Ruckus Cloudpath is a cloud-managed security and policy management platform designed to provide secure network access for devices and users. It helps organizations implement secure wired and wireless network access by ensuring that only authorized users and devices can connect to the network. Here's what it does:

#### **Key Features of Ruckus Cloudpath:**

##### **Device Onboarding:**

Cloudpath automates the secure onboarding of various devices (BYOD, IoT, and guest devices) to the network. It simplifies the process for users while maintaining network security.

##### **Certificate-Based Authentication:**

Cloudpath uses digital certificates instead of traditional passwords for user authentication, improving security and removing the need to regularly change passwords.

##### **Role-Based Access:**

It allows administrators to create different security policies based on user roles. For instance, a student, staff, and guest may each receive different levels of network access based on the organization's security policies.

##### **BYOD and Guest Access:**

It provides a self-service portal for BYOD users and guests to securely connect to the network. This reduces the burden on IT staff while ensuring security compliance.

##### **Network Policy Management:**

Cloudpath integrates with RADIUS servers, firewalls, and other network infrastructure to enforce network access policies dynamically.

##### **Secure Wired and Wireless Access:**

It works for both wired and wireless connections, allowing for a unified security policy across the network.

##### **Compliance and Reporting:**

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The platform helps organizations meet regulatory compliance by providing detailed logs and reporting for network access.

Benefits of Ruckus Cloudpath:

Enhanced Security: By using certificate-based authentication and policy enforcement, it reduces the risk of unauthorized access.

User-Friendly: End users have a simpler, self-service process to securely access the network.

IT Efficiency: Automates device onboarding, reducing manual intervention by IT teams.

Scalability: Being cloud-based, it can easily scale to accommodate more users and devices.

In summary, Cloudpath is designed to simplify and secure network access for users and devices, while improving management efficiency and reducing security risks for organizations.

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## Scope of Work (SOW) per location proposed

The following information gives a detailed breakdown of the scope of work being performed.

### Location: Gull Lake Community Schools

#### *eRate Line of Business*

#### **Planning/Pre-Installation Planning - VectorFi Service**

- Conduct a site survey to determine optimal Access Point (AP) placement. Subservice
- Identify potential sources of interference (e.g., other wireless networks, physical obstructions). Subservice
- Document areas requiring coverage and their specific requirements (e.g., high-density areas). Subservice

#### **Planning/Requirements Gathering - VectorFi Service**

- Collect user requirements (number of users, types of devices, expected bandwidth). Subservice
- Determine network security needs (encryption, authentication methods). Subservice
- Plan for future scalability. Subservice

#### **Executing/Network Design - VectorFi Service**

- Design the network topology (placement of APs, switches, controllers). Subservice
- Plan for cabling and power requirements (PoE considerations). Subservice
- Define IP addressing scheme and VLAN requirements. Subservice

#### **Executing/Hardware Preparation - VectorFi Service**

- Ensure all equipment is available (APs, licensing, switches, cables). Subservice
- Verify firmware versions and compatibility. Subservice

#### **Executing/Staging and Configuration - VectorFi Service**

- Pre-configure APs and in a controlled environment. Subservice
- Update firmware on all devices to the latest stable version. Subservice
- Configure basic network settings (SSID, security protocols, VLANs). Subservice

#### **Executing/Controller Setup - VectorFi Service**

- Build client domain Subservice
- Apply defined security practices to user accounts Subservice
- Access the controller's web interface for configuration. Subservice

#### **Executing/Network Configuration - VectorFi Service**

- Define WLAN settings (SSID, security policies, VLAN tagging). Subservice
- Configure AP groups and profiles. Subservice

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- Set up user roles and access controls. Subservice

#### **Executing/AP Adoption - VectorFi Service**

- Adopt APs into the controller. Subservice
- Verify that all APs are detected and correctly configured. Subservice

#### **Monitoring and Controlling/Testing and Validation - VectorFi Service**

- Test wireless connectivity from various locations. Subservice
- Verify that clients can connect to the correct SSID and obtain IP addresses. Subservice

#### **Monitoring and Controlling/Security Testing - VectorFi Service**

- Verify encryption (WPA2/WPA3) and authentication methods. Subservice
- Test access controls and user roles. Subservice
- Perform vulnerability assessments. Subservice

#### **Monitoring and Controlling/Training - VectorFi Service**

- Train IT staff on managing the VectorFi controller. Subservice

#### **Closing/Post-Installation Review - VectorFi Service**

- Configure monitoring tools and alerts for network performance and security. Subservice

#### **Closing/Documentation - VectorFi Service**

- Document network design and configuration settings. Subservice
- Create a map of AP locations and coverage areas. Subservice
- Record test results and any troubleshooting steps taken. Subservice

#### **Planning/Site Survey and Preparation - physical installation of wireless access point (WAP) Service**

- Conduct a site survey to confirm installation locations for each WAP as per the project design Subservice
- Identify challenges or obstacles in installation areas. Subservice

#### **Planning/Equipment Preparation - physical installation of wireless access point (WAP) Service**

- Unbox and inspect WAPs and any related mounting hardware. Subservice
- Prepare any necessary tools and materials for installation (e.g., drills, screws, brackets). Subservice

#### **Executing/Physical Installation - physical installation of wireless access point (WAP) Service**

- Mount WAPs at designated locations, secure with appropriate hardware, connect to power sources and network. Subservice

#### **Monitoring and Controlling/Post-Installation Testing - physical installation of wireless access point (WAP) Service**

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- Power on WAPs, verify operational status. Subservice

#### **Closing/Documentation - physical installation of wireless access point (WAP) Service**

- Record WAP locations and installation notes, document any issues or deviations from the original plan. Subservice

#### **Planning/Preparation and Planning- Complex Wired Network Service**

- Define network size, number of devices, and performance expectations. Subservice
- Determine necessary redundancy and failover mechanisms. Subservice
- Identify specific network services needed (e.g., VLANs, QoS, Layer 3 routing). Subservice

#### **Planning/Site Survey- Complex Wired Network Service**

- Evaluate physical space for equipment placement. Subservice
- Identify cable routing paths. Subservice
- Verify power requirements and availability. Subservice
- Ensure adequate cooling and ventilation. Subservice

#### **Planning/Network Design - Complex Wired Network Service**

- Create a detailed network diagram including core and edge switch placement. Subservice
- Plan IP addressing scheme. Subservice
- Define VLAN configurations. Subservice
- Plan for routing protocols (e.g., OSPF, BGP). Subservice

#### **Planning/Pre-Installation Setup - Complex Wired Network Service**

- Unbox and inspect all hardware. Subservice
- Label all equipment and cables. Subservice
- Pre-configure switches with basic settings (hostname, management IP, etc.). Subservice

#### **Executing/Physical Installation - Complex Wired Network Service**

- Mount core and edge switches in designated rack spaces. Subservice
- Install patch panels and cable management systems. Subservice
- Connect power supplies to UPS units. Subservice
- Route and connect all necessary cables (power, network, and console). Subservice

#### **Executing/Core Switch Configuration - Complex Wired Network Service**

- Configure Layer 3 routing settings. Subservice
- Set up VLANs and inter-VLAN routing. Subservice
- Implement routing protocols (e.g., OSPF, BGP). Subservice
- Configure QoS settings. Subservice
- Set up redundant links and failover protocols. Subservice

#### **Executing/Edge Switch Configuration - Complex Wired Network Service**

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- Configure access VLANs. Subservice
  - Set up port security and access control lists (ACLs). Subservice
  - Ensure PoE settings if applicable. Subservice
  - Apply any necessary QoS settings. Subservice
  - Connect edge switches to the core switch. Subservice

#### **Monitoring and Controlling/Network Testing and Validation - Complex Wired Network Service**

- Verify physical connections and power status. Subservice
- Test network connectivity for all VLANs. Subservice
- Check routing table and protocol status. Subservice
- Perform end-to-end ping tests. Subservice
- Validate QoS configurations. Subservice
- Test failover and redundancy mechanisms. Subservice

#### **Monitoring and Controlling/Training and Handover- Complex Wired Network Service**

- Provide training for network administrators on the new setup. Subservice
- Hand over all documentation and configuration files. Subservice
- Explain maintenance procedures and troubleshooting steps. Subservice

#### **Monitoring and Controlling/Monitoring and Maintenance Setup - Complex Wired Network Service**

- Set up network monitoring tools (e.g., SNMP, Syslog). Subservice
- Configure alerts for critical events. Subservice
- Schedule regular maintenance checks. Subservice
- Update network diagrams with final configurations. Subservice

#### **Closing/Documentation - Complex Wired Network Service**

- Update network diagrams with final configurations. Subservice
- Document IP addressing and VLAN assignments. Subservice
- Record switch configurations and backup files. Subservice
- Create an inventory of all equipment and serial numbers. Subservice

#### **Planning/Network Assessment - Hosted Deployment of Ruckus Cloudpath Service**

- Assess the current network infrastructure. Subservice
- Identify the locations for deploying Cloudpath Enrollment System (ES). Subservice

#### **Planning/Gather Requirements - Hosted Deployment of Ruckus Cloudpath Service**

- Define use cases for Cloudpath (e.g., BYOD, guest access, certificate-based authentication). Subservice
- Determine user groups and access policies. Subservice
- Collect necessary certificates and credentials for integration. Subservice

#### **Executing/Initial Configuration - Hosted Deployment of Ruckus Cloudpath Service**

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- Configure basic settings Subservice
  - Set up admin accounts and configure initial security settings. Subservice

#### **Executing/Integration with Wireless Controller - Hosted Deployment of Ruckus Cloudpath Service**

- Navigate to the AAA servers section. Subservice
- Add Cloudpath ES as an external AAA server. Subservice

#### **Executing/SSID Configuration - Hosted Deployment of Ruckus Cloudpath Service**

- Create or modify SSIDs to use Cloudpath for authentication. Subservice
- Configure WLAN settings to redirect users to the Cloudpath portal for enrollment. Subservice
- Set up RADIUS attributes and policies to match Cloudpath requirements. Subservice

#### **Executing/Cloudpath Configuration - Hosted Deployment of Ruckus Cloudpath Service**

- Define the network configuration in Cloudpath (e.g., RADIUS, LDAP, Active Directory). Subservice
- Integrate Cloudpath with existing user directories. Subservice

#### **Executing/Enrollment Workflows - Hosted Deployment of Ruckus Cloudpath Service**

- Create enrollment workflows for different user groups (e.g., staff, students, guests). Subservice
- Configure device provisioning policies and certificate issuance. Subservice

#### **Executing/Access Policies - Hosted Deployment of Ruckus Cloudpath Service**

- Define access policies and roles in Cloudpath. Subservice
- Set up VLAN assignments and network restrictions based on user roles. Subservice

#### **Executing/Testing and Validation - Hosted Deployment of Ruckus Cloudpath Service**

- Verify that the Wireless controller can communicate with the Cloudpath server. Subservice
- Test SSID configuration by connecting devices and following the Cloudpath enrollment process. Subservice

#### **Monitoring and Controlling/Security Testing - Hosted Deployment of Ruckus Cloudpath Service**

- Ensure proper redirection to Cloudpath portal. Subservice
- Test certificate issuance and device provisioning. Subservice
- Validate that enrolled devices receive the correct network access based on policies. Subservice

#### **Monitoring and Controlling/Finalization and Documentation - Hosted Deployment of Ruckus Cloudpath Service**

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- Document all configuration settings in Controller and Cloudpath. Subservice
  - Record the network topology and integration points. Subservice

**Closing/Training and Handover - Hosted Deployment of Ruckus Cloudpath Service**

- Provide training to IT staff on managing and troubleshooting the Cloudpath integration. Subservice
- Ensure staff is familiar with the Cloudpath admin interface and workflows. Subservice

**Closing/Post-Deployment Support - Hosted Deployment of Ruckus Cloudpath Service**

- Schedule regular follow-up checks to ensure ongoing stability. Subservice
- Provide contact information for support and maintenance. Subservice



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## Out of Scope

Vector is responsible to perform only the Services described in this Statement of Work Agreement. Any additional services discussed or implied that are not defined explicitly by this SOW will be considered out of scope. All services requested outside of this SOW as detailed above will require a "Change Order" before any services are performed. "Change Order" must be agreed upon by all parties and signed. Specific examples from this project may be listed below.

- Creating building maps is out of scope
- This is not a site visit unless required at additional T&M
- The creation of DHCP scopes and vlans is not in this scope
- Network configuration, SSID setup, security settings, and firmware updates are not included.
- Any structural changes required to accommodate networking equipment.
- Installation and configuration of servers, applications, and databases.
- Dealing with ISP-related issues or installation of external connections.
- DNS entries are the responsibility of the end user to input
- Three work flows are included in this proposal. Additional configuration of flows will be build at T & M
- Two policy creations are included in this scope. Additional policies will be billed at T & M
- VLAN scope creation outside of the Cloudpath installation are not included in this scope.
- Any routing issues will be troubleshooted and billed at T & M
- This is basic vulnerability testing. If pin testing is desired it is available but not part of this scope.
- If additional training outside what was proposed is desired it is not in this scope of work and will be billed as T & M
- Ongoing maintenance will be billed at T&M
- If building maps are not provided this will be a best effort
- Integration of the WAPs into the existing network, including VLAN configuration, DHCP setup, and network monitoring, is out of scope.
- Ongoing support, maintenance, and troubleshooting after installation are not part of this SOW.
- A set number of hours will be used for training. Additional training and configuration will be billed at T & M
- Unless built into the proposal any additional configuration and or updates will be billed as T&M

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## *Client Responsibilities*

Client responsibilities for this project are:

- Client is responsible for ensuring all necessary permissions for mounting equipment are obtained prior to installation.
- Client will provide any additional hardware, such as switches or injectors, if PoE is not available.
- Any unforeseen changes in scope will require an amendment to this SOW, and additional costs may apply.

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## À la Carte Labor Rate Table

Any services requested beyond the scope outlined in the proposed agreement will be billed at the rates specified below. These additional services will be discussed and agreed upon prior to the commencement of any work outside the original scope.

<b>Resource</b>	<b>Hourly Price</b>
Cabling Services	\$100.00
Development - Custom App	\$195.00
Development - Web	\$195.00
Fiber Work	\$195.00
Field Technician	\$175.00
Project Management	\$195.00
Service Desk - Level 1 Support	\$175.00
Systems Engineer - Level 2 Support	\$195.00
Systems Engineer - Level 3 Support	\$195.00
Systems Engineer - Level 4 Support	\$225.00
Training	\$175.00
Virtual IT Director	\$225.00

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### Rate Adjustments for After-Hours and Holidays

- **Standard Rates** apply Monday through Friday, 8:00 AM to 5:00 PM EST.
- **Night and Weekend Rates** are 1.5 times the standard hourly rate.
- **Holiday Rates** are 2 times the standard hourly rate.

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## Terms & Conditions

### Limitation of Liability

The Company shall perform all services using the same level of care or better than that is expected in the industry. However, in no event shall Service Provider be held liable for indirect, special, incidental, or consequential damages arising out of service provided hereunder, including but not limited to loss of profits or revenue, loss of use of equipment, lost data, costs of substitute equipment, or other costs and damages.

### Confidentiality

The Company and its agents will not use or disclose any Client information, except as necessary for or consistent with providing the contracted services, and will use our best efforts to protect against unauthorized use.

The Client must designate which authorized employee(s) are allowed to make changes to the account, request password modification for themselves or other users.

### Out of Scope Work

Any work performed on items not expressly covered by this document will be billed on a separate invoice.

## Project Acceptance

IN WITNESS HEREOF, the parties hereto have caused this Statement of Work Agreement to be executed by their duly authorized representatives on the dates set forth below.

Accepted by:

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By: Gull Lake Community Schools

Name:

Title:

Date: December 3, 2024

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By: Vector Tech Group

Name:

Title:

Date: December 3, 2024



## Gull Lake Community Schools

Category	Materials	Labor	Total
Network Switches	\$ 326,068.00	\$ 20,300.00	\$ 346,368.00
Wireless Access Points	\$ 178,450.00	\$ 19,950.00	\$ 198,400.00
			\$ -
Sub Total	\$ 504,518.00	\$ 40,250.00	\$ 544,768.00
Performance Bond			\$ -
<b>Grand Total Base Bid</b>			<b>\$ 544,768.00</b>

Add/Alt #1		
Ruckus R560 WIFI6E in lieu of the Ruckus R650 WIFI6 access point		
	Deduct	-\$11,650.00
	Performance Bond	\$0.00
	Grand Total Add/Alt	-\$11,650.00

Add/Alt #2		
Ruckus R670 WIFI7 in lieu of the Ruckus R650 WIFI6 access point		
	Add	\$69,900.00
	Performance Bond	\$0.00
	Grand Total Add/Alt	\$69,900.00

Add/Alt #3		
Managed Internal Broadband Services		
	Add	\$17,650.00
	Performance Bond	\$0.00
	Grand Total Add/Alt	\$17,650.00

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## Network Switches

### Wired Infrastructure

Type	Qty	Part #	Description	Unit Price	Ext. Price	Unit Labor	Ext. Labor	Sub-Total
	32	ICX8200-48PF2-E	RUCKUS ICX 8200 Switch, 48x10/100/1000 Mbps PoE+ ports, 4x25 GbE SFP28 stacking/uplink-ports, 740 W PoE budget (with one PSU), hot swap power supplies and fans, one power supply and two fans included., three-year TAC support. Power cord not included.	\$3,168.00	\$101,376.00	\$0.00	\$0.00	\$101,376.00
	34	ICX8200-48ZP2-E	RUCKUS ICX 8200 Switch, 48x10/100/1000 Mbps PoE+ ports, 4x25 GbE SFP28 stacking/uplink-ports, 740 W PoE budget (with one PSU), hot swap power supplies and fans, one power supply and two fans included., three-year TAC support. Power cord not included.	\$4,100.00	\$139,400.00	\$0.00	\$0.00	\$139,400.00
	66	10G-SFPP-TWX-P-0101	10GbE Direct Attach SFP+ to SFP+ Passive copper cable, 1 m	\$230.00	\$15,180.00	\$0.00	\$0.00	\$15,180.00
	30	10G-SFPP-LRM	10GBASE-LRM SFP+ optic (LC), for up to 220m over MMF	\$740.00	\$22,200.00	\$0.00	\$0.00	\$22,200.00
	36	10G-SFPP-LR-S	10GBASE-LR, SFPP SMF (LC), for up to 10km over SMF, standard temperature (0°C to 70°C)	\$170.00	\$6,120.00	\$0.00	\$0.00	\$6,120.00
	22	11556	Cisco SFP-10G-LRM Compatible 10GBASE-LRM SFP+ 1310nm 220m DOM Duplex LC/UPC MMF/SMF Optical Transceiver Module	\$75.00	\$1,650.00	\$0.00	\$0.00	\$1,650.00
	10	11555	Cisco SFP-10G-LR Compatible 10GBASE-LR SFP+ 1310nm 10km DOM Duplex LC/UPC SMF Optical Transceiver Module	\$75.00	\$750.00	\$0.00	\$0.00	\$750.00
	28	F-NCDFC50LCSC01M	FIBER PATCH CABLE 50 MM OM2 LC/SC 1 METER (NCDFC50LCSC01M)	\$20.00	\$560.00	\$0.00	\$0.00	\$560.00
	150	HCJX05	Cat6 Patch Cables	\$5.00	\$750.00	\$0.00	\$0.00	\$750.00
	66	CLR-BNDL-ICX-EDU5	VectorFi eRate Wi-Fi 5 year subscription for 1 ICX switch. Switch RMT support is not included. Renewal	\$327.00	\$21,582.00	\$0.00	\$0.00	\$21,582.00
	32	LE9-8200-SGX5	8200 2 Year RMT Support Extension (5 years total)	\$250.00	\$8,000.00	\$0.00	\$0.00	\$8,000.00
	34	LE9-8200Z-SGX5	SZ ICX Mgt Lic w/SPT 8200Z 2YR EXT ERATE	\$250.00	\$8,500.00	\$0.00	\$0.00	\$8,500.00
	66	Englabor	Engineering labor for installation and configuration	\$0.00	\$0.00	\$300.00	\$19,800.00	\$19,800.00
	1	PM	Project management	\$0.00	\$0.00	\$500.00	\$500.00	\$500.00

<b>Total</b>	<b>\$346,368.00</b>
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## Wireless Access Points

### Wireless Infrastructure

Type	Qty	Part #	Description	Unit Price	Ext. Price	Unit Labor	Ext. Labor	Sub-Total
BASE	233	901-R650-US00	Ruckus R650 dual-band 802.11abgn/ac/ax Wireless Access Point with Multi-Gigabit Ethernet backhaul, 4x4:4 + 2x2:2 streams, OFDMA, MU-MIMO, BeamFlex+, dual ports, PoH/uPoE/802.3at PoE support. Does not include power adapter or PoE injector. Includes Limited Lifetime Warranty	\$550.00	\$128,150.00	\$0.00	\$0.00	\$128,150.00
	2	901-T750-US51	Ruckus T750SE 802.11ax Outdoor Wireless Access Point, 4x4:4 Stream, 120-Degree Sector antenna included and option to attach external antennae, 2.4GHz and 5GHz concurrent dual band, (1x) 2.5G Ethernet port, (1x) 10/100/1000 Ethernet port, 100-240 Vac, POE in and PSE out, Fiber SFP/SFP+, GPS, IP-67 Outdoor enclosure, -40 to 65C Operating Temperature.	\$1,650.00	\$3,300.00	\$0.00	\$0.00	\$3,300.00
	235	CLD-VEWF-5001	VectorFi eRate Wi-Fi 5 year subscription for 1 AP includes RUCKUS Analytics Subscription 5yr.	\$200.00	\$47,000.00	\$0.00	\$0.00	\$47,000.00
	6	Post Survey	Post Site Survey, Optimization and Tuning	\$0.00	\$0.00	\$500.00	\$3,000.00	\$3,000.00
	1	PM	Project Management	\$0.00	\$0.00	\$500.00	\$500.00	\$500.00
	235	Cabling Labor	AP Installation Labor	\$0.00	\$0.00	\$50.00	\$11,750.00	\$11,750.00
	235	Englabor	Engineering labor for controller configuration	\$0.00	\$0.00	\$20.00	\$4,700.00	\$4,700.00
<b>Total</b>								<b>\$198,400.00</b>



## ADD-ALTS

### Ruckus R560 WIFI6E in lieu of the Ruckus R650 WIFI6 access point

Type	Qty	Part #	Description	Unit Price	Ext. Price	Unit Labor	Ext. Labor	Sub-Total
	-233	901-R650-US00	Ruckus R650 dual-band 802.11abgn/ac/ax Wireless Access Point with Multi-Gigabit Ethernet backhaul, 4x4:4 + 2x2:2 streams, OFDMA, MU-MIMO, BeamFlex+, dual ports, PoH/uPoE/802.3at PoE support. Does not include power adapter or PoE injector. Includes Limited Lifetime Warranty	\$550.00	-\$128,150.00	\$0.00	\$0.00	-\$128,150.00
	233	901-R560-US00	Ruckus R560 tri band 802.11abgn/ac/ax Wireless Access Point with Tri-Radio (6GHz/5GHz/2.4GHz 2x2:2) with Multi-Gigabit Ethernet backhaul, PoH/uPoE/802.3bt PoE support. Concurrent Tri-Band operation in 6GHz, 5GHz and 2.4GHz bands. (1x) 5Gbps PoE In port, (1x) 1 GbE port, USB 2.0, OFDMA, MU-MIMO, BeamFlex+. Does not include power adapter or PoE injector. Includes Limited Lifetime Warranty.	\$500.00	\$116,500.00	\$0.00	\$0.00	\$116,500.00

**Deduct    -\$11,650.00**

### Ruckus R670 WIFI7 in lieu of the Ruckus R650 WIFI6 access point

Type	Qty	Part #	Description	Unit Price	Ext. Price	Unit Labor	Ext. Labor	Sub-Total
	-233	901-R650-US00	Ruckus R650 dual-band 802.11abgn/ac/ax Wireless Access Point with Multi-Gigabit Ethernet backhaul, 4x4:4 + 2x2:2 streams, OFDMA, MU-MIMO, BeamFlex+, dual ports, PoH/uPoE/802.3at PoE support. Does not include power adapter or PoE injector. Includes Limited Lifetime Warranty	\$550.00	-\$128,150.00	\$0.00	\$0.00	-\$128,150.00
	233	901-R670-US00	RUCKUS R670 Wi-Fi 7 tri-band concurrent wireless Access Point with 2x2:2 (2.4GHz) + 2x2:2 (5GHz) + 2x2:2 (6GHz). Wi-Fi 7 in all three bands. 6GHz LPI mode and SP mode support with AFC. Software configurable to 2x2 (2.4GHz) + 4x4 (5GHz) dual-band mode. BeamFlex+, one 5/2.5/1-Gigabit Ethernet backhaul, one 1-Gigabit port, PoH/uPoE/802.3bt PoE support, onboard BLE and Zigbee selectable IoT radio, USB 2.0, TPM 2.0, and Secure Boot. Adjustable acoustic drop ceiling bracket included. Power adapter not included. Includes Limited Lifetime Warranty.	\$850.00	\$198,050.00	\$0.00	\$0.00	\$198,050.00

**Add        \$69,900.00**

### Managed Internal Broadband Services

Type	Qty	Part #	Description	Unit Price	Ext. Price	Unit Labor	Ext. Labor	Sub-Total
BASE	1600	MIBS	Managed Internal Broadband Services of the wireless network (Cloudpath)(1 Year)	\$6.50	\$10,400.00	\$0.00	\$0.00	\$10,400.00
	1	Englabor	Engineering labor for MIBS setup	\$0.00	\$0.00	\$7,250.00	\$7,250.00	\$7,250.00

**Add        \$17,650.00**





# The Vector Team

The Vector Tech Group team has been designing and implementing Wi-Fi and LAN networks specifically in the education vertical since 2009. Our team consists of highly qualified experienced professionals.

## **Project Manager:**

Minimum of three years in role with similar responsibilities

Basic Overview/responsibilities:

- To act as the primary point of contact (POC)
- Develop, obtain agreement on, and execute the project according to the proposal
- Provide and present project status reports
- May assist with installation of network equipment for the project
- Conduct project status meetings as needed
- Identify, track, escalate, and resolve issues
- Communicate staffing needs and changes

## **Design Technician:**

Minimum certification level: AM-30 Airmagnet Survey Pro Certified and CWNA Certified

Basic Overview/responsibilities:

- Design and deploy wireless LAN's for optimal performance, security and compliance
- Understand 802.11b/g/n/ac/ax/6E and 4.9GHz site surveying
- Provide real world measurements to create an accurate deployment
- 802.11n, voice & spectrum surveys
- Verifying RF coverage
- Complete Wi-Fi weather map of all critical RF and end-user performance metrics
- Verify end-user network requirements and do detailed end-user capacity planning

## **Network Technician:**

Minimum certification level: Ruckus wireless certified integrator (RWCI), BICSI Certified, Hubbel Certified

Basic Overview/responsibilities:

- Performs installation of network equipment
- \* May also provide support and configuration of network equipment

## **Network Engineer:**

Minimum certification level: Wireless Solutions Engineer (WiSE), CWNA, Fortinet NSE7, Ruckus switch implementer (RICXI), JNCIA Mist AI, JNCIA-Junos

Basic Overview/responsibilities:

- Design, installation, and implementation of network resources
- Performs configuration of network equipment for the project
- Has a solid working knowledge of Wi-Fi and LAN networks and related issues
- Provides training and assists with technology transfer to the client



## Wired References

### **Holland Christian Schools**

Education

Contact: Charlie Piffer

(616)717-2875

[jcpiffer@hollandchristian.org](mailto:jcpiffer@hollandchristian.org)

Complete district-wide wired and wireless network upgrades in 2017

### **Mona Shores Public Schools**

Education

Contact: Chad Pranger

(231)767-7281

[prangerc@muskegonisd.org](mailto:prangerc@muskegonisd.org)

Complete wired and wireless upgrade from 2020 to 2023

### **Caro Community Schools**

Education

Contact: Scott Dwyer

(989) 673-3165 ext 1200

[sdwyer@carok12.org](mailto:sdwyer@carok12.org)

Complete district wide wired and wireless network upgrades in 2019

### **Midland Public Schools**

Education

Contact: David A. Dziedzic

(989) 923-5127

[dziedzicda@midlandps.org](mailto:dziedzicda@midlandps.org)

Complete district wide wired and wireless network upgrade in 2019

### **Kent ISD**

Education

Contact: Tim Lillis

(616) 447-3073

[TimLillis@kentisd.org](mailto:TimLillis@kentisd.org)

Wired and Wireless network upgrades across the ISD and all supported districts from 2018 to 2023



## Wireless References

### **Portage Public Schools** Education

Contact: Dan Vomastek  
(269)720-3148  
dvomastek@portageps.org

Complete district-wide wireless network upgrade in 2023

### **Muskegon Area ISD** Education

Contact: Myles Sylva  
(231)767-7237  
msylva@muskegonisd.org

Wireless network upgrade for the ISD and supported districts in 2023

### **Midland Public Schools** Education

Contact: David A. Dziedzic  
(989)923-5127  
dziedzicda@midlandps.org

Complete district wide wired and wireless network upgrades in 2019

### **National Heritage Academies** Education

Contact: Meghan Redder  
(877)223-6402  
mredder@nhaschools.com

Upgraded NHA supported wireless networks from 2017-2023

### **Gaylord Community Schools** Education

Contact: Todd Oostmeyer  
(989)705-3080  
oostmeyert@gaylord.k12.mi.us

Complete district wide wireless network upgrade in 2022





# Vector Education Services

## DESIGNING, BUILDING, AND DEPLOYING BEST PRACTICE NETWORK INFRASTRUCTURES

Today's educational institutions have increased demands on their network infrastructures, requiring higher levels of performance, availability, and scalability to take advantage of new IP-based technologies. To increase efficiency and reduce costs, these institutions need intelligent networks that effectively utilize available bandwidth capacity, manage data traffic flow, and ensure network security.

As a leading education network solutions provider, Vector has the experience to help schools deploy highly scalable, highly reliable, and high performance next-generation network infrastructures.

Vector offers end-end services that help schools:

- Design best-in-class network environments with flexibility for future growth
- Implement best practices to optimize network configuration and management for IT leadership
- Utilize leading edge technologies to provide a highly optimized learning environment
- Support their faculty and students as their technical demands increase
- Maximize limited budgets to effectively support their students and staff

## SURVEY/ASSESSMENT SERVICES

Schools interested in optimizing their current environments or implementing new networking solutions should first analyze their existing network and cable infrastructures, along with their current and future requirements. Vector Survey & Assessment Services can help schools identify any specific needs and potential problem areas.

These services utilize capacity and performance tests to identify potential problem areas. In addition, it also helps schools budget out projects for building a next-generation network capable of supporting increasing bandwidth demands. As part of these services, Vector Engineers will:

- Check network architecture and design for performance, availability, security, consistency, and manageability
- Evaluate network infrastructure, application delivery, interconnectivity, router and switch configurations, and performance
- Evaluate network infrastructure age and expected lifecycle
- Evaluate existing low voltage and fiber optic cable infrastructure age and compatibility
- Assess network security, including compliance issues and best practices
- Appraise network performance, including traffic patterns, bandwidth optimization, internet connectivity and network vulnerabilities
- Perform RF propagation site survey to provide insight into the wireless network and its coverage

At the conclusion of this service, Vector will provide a detailed Network Survey/Assessment Report, present the findings, and discuss recommendations and next steps.

## **DESIGN SERVICES**

Vector Design Services help schools develop practical design plans considering present and future business requirements that network requirements that best match their budgets, requirements, performance needs and schedules. These services offer several design options tailored to the school's specific needs, whether they need to introduce a partial technology refresh to leverage their existing network infrastructure or would like to perform a full technology refresh. As part of this service, Vector experts will:

- Review any IP network infrastructure survey/assessment results
- Analyze current network management tools
- Analyze current WIFI and LAN networks for any gaps in coverage
- Analyze power outputs for all IT closets
- Provide design options for leveraging existing infrastructure or refreshing all technology
- Identify and communicate resolution needs for any potential implementation gaps or risks
- Create a bill of materials and implementation plan
- Present the final network design plan
- Present bill of materials and documentation needed for RFP if required

## **ENGINEERING SERVICES**

Vector Engineering Services provide unmatched expertise in helping schools install, configure, and validate networking solutions including but not limited to Firewalls/Routers, Network Switches, UPS's, Wireless Access Points, Wireless Controllers, and NAC solutions. These services may include:

- Review design and validate with pre deployment walkthrough
- Document existing hardware and configurations
- Configure and validate new network equipment
- Identify and validate connection points
- Integrate new network equipment per the defined connections
- Configure and integrate any network monitoring and analytics tools
- Perform functionality validation
- Perform post site survey to validate connections and coverage
- Produce as-built and knowledge transfer documentation

## **CABLING SERVICES**

Vector Cabling Services operates as multiple cabling crews with each crew having its own Project Manager and all necessary tools to provide Low Voltage and Fiber Optic cabling services to schools across the state. Our crews are all BICSI and Hubbell certified and have decades worth of experience to provide unmatched quality of service to schools across the state. These service may include:

- Analyze and validate current cable infrastructure
- Test and tone existing fiber optic cabling
- Closet clean up services
- Install and terminate Cat6 and Cat6A low voltage cabling
- Install and terminate SM and MM Fiber Optic cabling
- Fusion splice and repair of existing Fiber Optic cabling

## **SUPPORT SERVICES**

An implementation being complete does not mean that Vector's services stop. Vector's Education Services team will continue to support your team throughout the years to continue maximizing network performance and reliability for your school. Our team is available 24/7/365 and there are a number of ways to reach them:

- <https://vectortechgroup.com/support/>
- [support@vectortechgroup.com](mailto:support@vectortechgroup.com)
- (866) 827-4886

In addition, there are also proactive ways to utilize our Educational Services team:

- Pre purchased block hours
- Purchasing block hours through E-Rate via the Basic Maintenance of Internal Connections (BMIC) category
- Purchasing managed services for your network through E-Rate via the Managed Internal Broadband Services (MIBS) category

## **TRANSFORM YOUR NETWORK WITH VECTOR EXPERTS**

For over 30 years Vector has been providing local expert services to educational networks and giving peace of mind and confidence to the schools we work with.

The Vector Education Services team has a vast knowledge base and the engineering expertise to Assess, Design, Implement and Support highly efficient and reliable educational networks. All Vector Education Service team members are industry certified and have many years of hands-on experience delivering network solutions. The valuable transfer of knowledge that our team brings to your staff can reduce risks and disruptions while optimizing network performance for your school.

## CERTIFICATE OF AUTHORIZATION

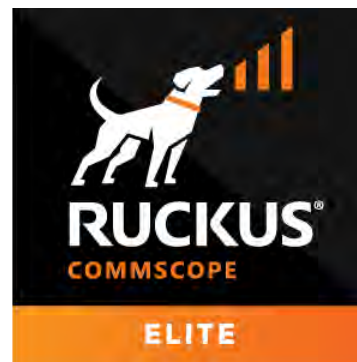
**RUCKUS PROUDLY RECOGNIZES**

**VECTOR TECH GROUP DBA SOLUTIONS PLUS**

as an Elite Solution Provider in the RUCKUS BIG DOGS Partner Program



Bart Giordano, SVP Ruckus Networks



Eric Law, SVP Ruckus Networks Worldwide Sales



# FOREST HILLS PUBLIC SCHOOL DISTRICT

Provides a secure and reliable network, Cloudpath® delivers BYOD security

Forest Hills Public School District (FH) is located in Grand Rapids, Michigan. FH is one of the largest geographic districts in Michigan, as it encompasses approximately 68 square miles. FH serves over 10,000 students in grades K through 12 and 1200 faculty and staff. Its legacy network could not keep up with the bandwidth requirements of an ever-increasing population of wireless devices so the need for a reliable, secure and fast network was a must.



Customer  
Forest Hills Public School District

Location  
Grand Rapids, Michigan

## REQUIREMENTS

- A secure and easy to manage network
- Ubiquitous Wi-Fi coverage and strong signal strength to deliver high data rates to thousands of concurrent clients
- Higher capacity client support per access point (AP)
- A future-proof network that could grow as the district's needs grow

## SOLUTION

- Deployed close to 1,000 indoor access points throughout the district, including wall-mounted APs
- Installed the RUCKUS virtual SmartZone™ (vSZ) for redundancy to deliver the high availability needed for online learning
- Installed Cloudpath for secure onboarding of BYOD devices

## BENEFITS

- Equipped FH students and staff with a reliable and secure infrastructure
- Increased the number of concurrent clients supported per AP while improving signal strength and wireless reliability
- Future-proof network to grow as their district grows





Digital learning is on the rise. Blended learning, flipped classrooms and digital curricula engage students and help instructors to be more effective. Textbooks are being digitized and open educational resources (OER) are available online for mobile devices to provide rich and interactive content. Bring your own device (BYOD) and 1:1 computing initiatives are replacing wired computer labs, as most students now have consistent access to a laptop, tablet or Chromebook computer. With this advancement, schools need to be prepared with a reliable network that ensures students and teachers have anytime, anywhere access for uninterrupted teaching and learning. Importantly, as schools transition to more screen-based learning, they also need to protect student data privacy through secure network access.

### The challenge

Forest Hills' legacy network could not keep up with the bandwidth requirements of an ever-increasing population of wireless devices. Built in 1956, the twenty-four buildings were built with "RF unfriendly" materials, such as cinder block and brick, making it difficult to deliver fast and reliable wireless service.

"With the expansion of Chromebooks into the schools, we were finding that once you introduced more than 25-30 wireless devices on an access point, it would start to bog down and become a point of contention," states Chris Alger, systems engineer at Forest Hills Public School District.

Having bandwidth constraints led to daily help desk tickets, and so the IT department was struggling to keep up with the ever-increasing demands.

The secondary schools were looking to launch a BYOD initiative, and Alger felt it was time to find a solution that could support the dense environment. The district needed Wi-Fi infrastructure that could support the demands of mobile devices in the hands of all students, and the bandwidth-hungry applications running on them. The network needed to ensure high performance and connectivity through high-capacity access points (APs) that were easy for IT to manage. Additionally, the district needed a way to securely onboard and secure BYOD computers in order to protect students from harmful content on the internet, unacceptable use in school and secure data privacy.

### The solution

Looking for the right solution to fit the district's needs, FH turned to partner Vector Tech Group for guidance. Looking at several requests for proposal (RFPs), FH started the vetting process. Vendors were put to the test to identify the solution that best met their requirements. Already having experience with RUCKUS from a previous district, Alger wasn't surprised when RUCKUS came out on top.

Building the wireless classroom requires reliable 802.11ac Wi-Fi to boost student achievement. The deployment consists of close to 1,000 indoor APs throughout the district. The RUCKUS R500 family of APs (2x2:2 802.11ac) were deployed in the secondary schools, the H500 family of APs (wall-mounted 802.11ac) were placed in smaller areas such as offices and the R700 family of APs (4x4:4 802.11ac) were placed across the elementary schools.

Managing these APs are two virtual SmartZone (vSZ) controllers for centralized management and redundancy to deliver the high availability needed for online learning. The vSZ platform future proofs the network to grow as demands increase across the school district.

FH chose RUCKUS Cloudpath® Enrollment System software for secure onboarding of BYOD devices. This secure network access management platform provides users with easy, self-service onboarding for student, faculty, and staff devices. The system automatically installs a digital certificate onto user devices when they connect for the first time using their existing network credentials. Users don't need to re-enter login credentials to connect again later, and this certificate-based approach secures every connection with WPA2-Enterprise encryption. Once a device is authenticated using Cloudpath, it automatically connects to the network regardless of which campus the student or faculty member visits.

"Cloudpath gives us an easy way to attach devices to our wireless network securely, without manual intervention by IT," stated Alger.

The right network infrastructure empowers teachers and students to leverage the latest technology in devices and applications for a rich digital learning experience. The new network has made a huge difference across the district. Students are no longer experiencing interrupted learning. The district has experienced solid coverage and reliability with very few IT tickets. The network provides fast Wi-Fi with increased concurrent client capacities per AP.

"Since the deployment, we have seen over 100 users on each access point, great reliability and no calls," claimed Alger. "We feel that RUCKUS just does wireless better."

"Since the deployment, we have seen over 100 users on each access point, great reliability and no calls," claimed Alger. "We feel that RUCKUS just does wireless better."

**Chris Alger**  
**Systems Engineer**  
**Forest Hills Public School District**

## About RUCKUS Networks

RUCKUS Networks builds and delivers purpose-driven networks that perform in the demanding environments of the industries we serve. Together with our network of trusted go-to-market partners, we empower our customers to deliver exceptional experiences to the guests, students, residents, citizens and employees who count on them.

[www.ruckusnetworks.com](http://www.ruckusnetworks.com)

Visit our website or contact your local RUCKUS representative for more information.

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CS-115864.1-EN (02/23)

**RUCKUS®**  
**COMMScope**

# Advantages of deploying Wi-Fi 7 APs today



With the new Wi-Fi 7 standards having officially kicked off, skipping Wi-Fi 6E and deploying Wi-Fi 7 access points (APs) seems to make the most sense. Wi-Fi 7 APs offer faster speeds, more capacity and better network reliability and stability and fully support existing Wi-Fi 6E clients. Not to mention, only Wi-Fi 7 APs will be able to support the 233 million Wi-Fi 7 devices expected to come online in 2024\*.

## Five reasons to deploy Wi-Fi 7 APs

### Blazing fast network speeds

By utilizing the full potential of the 6 GHz spectrum, Wi-Fi 7 can deliver more than four times the maximum throughput of Wi-Fi 6E. On its best day, Wi-Fi 6E could deliver as much as 9.6 Gbps, while Wi-Fi 7 is rated at 46.1 Gbps.

### No more network bottlenecks

Networks can often get bogged down by slow, legacy client devices. But Wi-Fi 7 APs use Multi-Link Operation (MLO) to avoid this. By being able to send transmissions between the 2.4, 5 and 6 GHz bands simultaneously, Wi-Fi 7 APs circumvent network congestion and actually reduce latency.

### Fully support existing Wi-Fi 6E clients today

Deploying Wi-Fi 7 APs today is the only future-proof option. Wi-Fi 7 is fully compatible with Wi-Fi 6E, so all the existing Wi-Fi 6E phones, tablets and laptops that have been shipping for the last couple years will be able to connect to Wi-Fi® at 6GHz (at Wi-Fi 6E speed) and as Wi-Fi 7 clients start shipping they will be able to take full advantage of Wi-Fi 7 massive performance improvement.

### More robust network reliability

In addition to MTO, Wi-Fi 7 APs can access mega-wide channels (320 MHz) that Wi-Fi 6E can't. Then can also employ Punctured Transmission technology, which mitigates interference by "puncturing out" that used portion of a channel spectrum and optimizes the remaining clean portion of the spectrum. This more efficient use of the wider channels contributes to a more stable and reliable network.

### Highest performance for all devices

Not only can Wi-Fi 7 APs allow devices using the 6 GHz band to maximize their performance, they can help legacy devices run more efficiently by clearing up channels through MTO. What's more, Wi-Fi 7 APs can reserve bandwidth for specific types of data transmission through Restricted Target Wake Time (rTWT), which can help extend the battery life of these devices.

## Benefits of RUCKUS® Wi-Fi 7 access points

The dawn of the Wi-Fi 7 era ushers in a new wave of possibilities. With its groundbreaking advancements in speed, capacity, latency, and reliability, Wi-Fi 7 has the potential to transform the way we connect and interact with the digital world.

Bandwidth-hungry ultra-high definition video, virtual reality (VR), the internet of things (IoT), and an explosion of new devices and content are all on the horizon. For businesses in industries where customer satisfaction is closely tied to the performance of your Wi-Fi network—like hospitality, education, healthcare, large public venues and multi-dwelling units—migrating to the RUCKUS R770 Wi-Fi 7 indoor AP today prepares your network for what's next.

## RUCKUS® R770 indoor access point



This new high-end Wi-Fi 7, tri-band concurrent AP delivers eight spatial streams and supports Wi-Fi 7 features such as Multi-Link Operation (MLO), Preamble Puncturing, 4K QAM Modulation, and 320 MHz channels. It delivers industry-leading performance with a combined data rate of 12.22 Gbps.

Furthermore, a 10 Gbps Ethernet port eliminates wired backhaul bottlenecks for full use of available Wi-Fi capacity. And the R770 features one built-in IoT radio offering onboard Bluetooth® Low Energy or Zigbee® capabilities.

The R770, with built-in RUCKUS exclusive technology, dramatically improves network performance through a combination of patented wireless innovations and learning algorithms that includes:

- Airtime decongestion: Increases average network throughput in heavily congested environments
- Transient client management: Reduces interference traffic from unconnected Wi-Fi devices
- BeamFlex+® adaptive antennas: Extended coverage range and optimized throughput with patented dynamic multi-directional antennas and radio patterns that work with any client.

With RUCKUS Networks being the only commercial vendor to have been selected by the Wi-Fi Alliance® to become part of the Wi-Fi CERTIFIED 7™ test bed, you can rest assured you can trust RUCKUS for all your Wi-Fi 7 needs. To learn more about migrating to RUCKUS Wi-Fi 7 APs, contact your RUCKUS representative today.

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\*Source: Wi-Fi Alliance <https://www.wi-fi.org/news-events/newsroom/wi-fi-alliance-introduces-wi-fi-certified-7>

CO-118566-EN (02/24)



# K-12 Education

Reliable school networks made simple and secure





# TRANSITION TO DIGITAL LEARNING

In many ways, the connectivity and access to the internet has transformed education at all levels. The ability for students to access learning materials on-line as well as for instructors to share lessons and collaborate has revolutionized teaching and learning. Where education used to be concentrated in school buildings, it can now be accessed by millions of people (almost) anywhere.



58%

Of schools say that they are in Phase 3



## LAB

CURRENT 1%  
DESIRED 0%

### ACCESS

- Lab-centric classrooms

### USAGE

- Small files/PDFs

### INFRASTRUCTURE

- Classroom switch
- 10/100Mbps edge
- 1Gbps backbone

PHASE  
1



## TEACHER

CURRENT 26%  
DESIRED 2%

### ACCESS

- Teacher-centric classrooms

### USAGE

- Interactive E-Books
- Google Docs / Office 365

### INFRASTRUCTURE

- Wi-Fi 5 (Cloud-managed)
- 1 Gbps edge with PoE
- 10 Gbps backbone

PHASE  
2



## STUDENT

CURRENT 58%  
DESIRED 32%

### ACCESS

- Student-centric classrooms
- Secure campus / remote access

### USAGE

- Courseware and denser files
- VR, video and gaming

### INFRASTRUCTURE

- 2.5 Gbps Wi-Fi 5
- 2.5 Gbps edge with 60W PoE
- 10/40 Gbps backbone

PHASE  
3



## COMMUNITY

CURRENT 11%  
DESIRED 40%

### ACCESS

- Community and industry (Smart Cities)
- Collaboration between schools and nations
- Outdoor Connectivity (School bus Wi-Fi)

### USAGE

- Video conferencing and streaming
- Synchronous and Asynchronous learning
- E-Sports

### INFRASTRUCTURE

- Wi-Fi 6 and CBRS (indoor & outdoor)
- 5 Gbps edge with 90W PoE+
- 40 Gbps backbone
- Cat 6A & Fiber

PHASE  
4



## GLOBAL

CURRENT 4%  
DESIRED 13%

### ACCESS

- Global / Internet of things

### USAGE

- Virtual classrooms
- Pervasive computing

### INFRASTRUCTURE

- Cloud Analytics
- Wi-Fi 6 + LTE + IoT
- 5/10 Gbps edge
- 100 Gbps backbone
- Cat 6A & Powered Fiber

PHASE  
5

9.4 Million

Households with school-aged children do not have access to the internet.

(NCES: National Center for Education Statistics)

96%

96% of IT Leaders consider digital equity a priority.

(CoSN: The State of Edtech Leadership in 2020)

49%

Only 49% of districts are meeting the FCC long-term goal of 1 Gbps per 1,000 students.

(CoSN's 2018-2019 Annual Infrastructure Report)

17%

17% of students can't finish their homework because they do not have reliable access to a computer or the internet.

(Pew Research Center Fact Tank)

# A FAST AND RELIABLE NETWORK IS NO LONGER OPTIONAL.

Don't let your campus network become a roadblock. Invest in a wired & wireless network that supports future ready technologies and delivers proven performance, reliability, and scale for K-12.

## THE DIGITAL CLASSROOM OF TOMORROW PROMISES AN OUTSTANDING EDUCATION. IS YOUR NETWORK READY?

The classroom of tomorrow promises an outstanding education. Blended learning, digital curriculum and other modern learning models can better engage students and help educators be more effective.

With this digital transformation, lesson plans now depend on consistent, reliable connectivity to the school Wi-Fi network. Instead of leaving tools locked in the classroom, students walk in the door with their Chromebooks, tablets or other devices every morning, and take them home with them each night.

As such, there are three major concerns that IT administrators in K-12 school districts are currently facing:

### NETWORK AND BROADBAND SCALING

THE TOP PRIORITY FOR IT IS BROADBAND AND NETWORK CAPACITY.

More devices are coming onto the network, stretching the limits of aging infrastructure. SETDA recommends 10Gbps per 1000 students by 2020-21. Plan for growth, not rip-and-replace.

### SECURITY AND STUDENT DATA PRIVACY

FACING THE TASK OF PROTECTING STUDENT DATA FROM MISUSE OR BREACH.

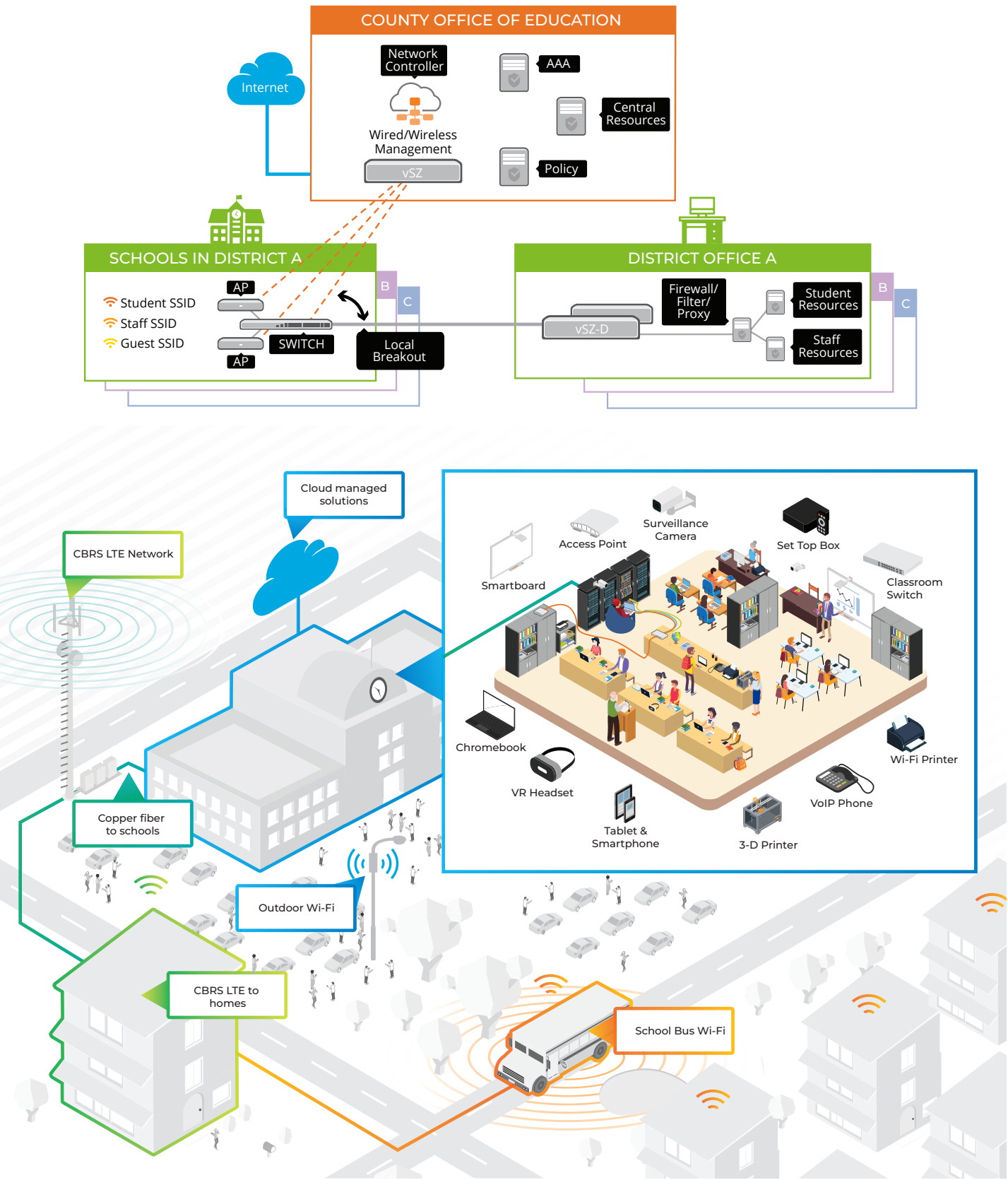
Buying or receiving 1:1 computers for digital learning will require schools to securely on-board devices for student data privacy.

### TRANSITION TO DIGITAL LEARNING

THE TRANSITION FROM TEXT-BASED CURRICULA TO BLENDED LEARNING.

Buying or receiving 1:1 computers for digital learning will require schools to securely on-board devices for student data privacy.

# HOW DOES THIS FIT IN MY SCHOOL



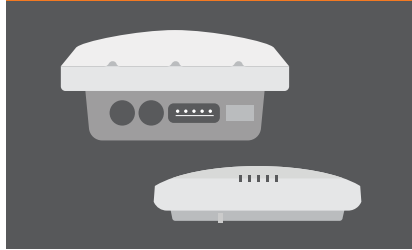


# WHY CHOOSE COMMSCOPE FOR YOUR SCHOOL PROJECT

As your school continues its digital transformation to 1:1 mobile learning, RUCKUS helps you address the top three challenges of school IT: network scaling, securing student data privacy, and network reliability for digital instruction. **Our goal is to help you provide a safe and reliable learning environment at an affordable price.**



## Reliable Wi-Fi (indoor & outdoor)



Our passion is highlighted by 100+ RF patents that provide the strongest wireless connections and enable our access points (APs) to automatically adapt to non-ideal placement or changing conditions. Moreover, it has been independently proven that only RUCKUS can sustain 60 HD video streams with just one AP. Supporting more students with fewer APs means significant savings for your school.

Combined with the outdoor APs, which provides not just connectivity outdoors, but also security when combined with solutions like Soter and AXIS.

School Bus Wi-Fi provides a mobile hotspot solution for students on and off the bus.

## Scalable Switching



Our switches support long distance stacking between closets, floors and buildings, while RUCKUS Campus Fabric allows up to 1,800 ports to be managed under a single IP address. In addition, entry-level switch uplinks can be upgraded from 1GbE to 10GbE with just a software license. Similarly, our high-performance access switch uplinks can be upgraded to 40GbE or 100GbE.

## Simple Security



We make securing every connection to your school network easy, with identity-based policies that facilitate rapid guest access on-boarding. This means an end to passwords and trouble tickets for Wi-Fi access.

## Easy Cloud



RUCKUS Wi-Fi and ICX switching are now in the cloud and easier than ever to manage. Plus, our intuitive smartphone app allows you to deploy, monitor and manage APs on the go. And even when your subscription expires, the APs are still able serve your clients.

## Optimal for Chromebooks



Our RUCKUS Cloudpath Chrome Extension enables simple network provisioning with a single click – and verifies which Chromebooks are school property. Moreover, only RUCKUS can sustain 60 HD video streams with just one AP. We also support CIPA compliance by allowing the restoration of content filtering for HTTPS traffic.

## Future Proof



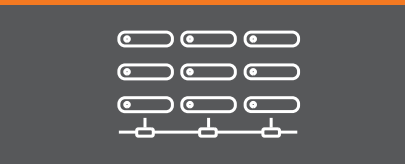
Our ICX access switch uplinks can be upgraded without replacing the switch. We also support stacking up to 12 switches, while Campus Fabric supports up to 36 switches with a single pane of glass. Our flexible switch deployment options include standalone, stacking and Campus Fabric (with the same switches). With RUCKUS Cloud Wi-Fi, you can easily add APs, as well as in-building LTE or Internet of Things (IoT) infrastructure. For the latter two, simply plug into pre-existing APs – without ripping and replacing!

## Affordable Multi-Gigabit



Our purpose-built multi-gigabit APs and switches are designed to work together. We offered the first entry-level multi-gigabit switch, with up to 16 multi-gigabit (2.5GbE) ports per 48-port switch, and up to 8 x 10GbE uplinks without over subscription. Our premium multi-gigabit access switch offers 24 x 1/2.5/5/10GbE ports with 40/100 GbE uplink ports. These multi-gigabit switches offer full PoE/PoE+ on all ports (up to 90W per port).

## High Performance Network Cabling



Foundational to high performance networks is the structured cabling to support your networks bandwidth, capacity and power requirements. CommScope Cat 6A copper cabling ensures your access layer foundation is ready and able with up to 10G speeds and support for High Power PoE. CommScope's fiber solutions provide the scalable bandwidth you need for your network backbone and for high performance applications like eSports, VR and Wi-Fi 6 APs.

## Fixed Wireless Access



CBRS networks for private LTE allows school districts to share broadband to nearby homes without monthly data charges.



# WAYNESBORO AREA SCHOOL DISTRICT

“The ICX switches were technically superior to anything else we evaluated. So, we ended up with the best of both worlds with RUCKUS APs and switches.”

**NICHOLAS ERICKSON**  
Director of Technology Services for the Waynesboro Area School District



Waynesboro Area School District in Pennsylvania educates about 4,400 K-12 students. The district views technology as an integral part of its instruction models. Every Wednesday, the IT team, administration and faculty leaders meet to discuss current and future educational initiatives that depend on technology. For over a decade, Waynesboro has used RUCKUS, now part of CommScope, to provide reliable, high-performance Wi-Fi across the district. But its switch vendor failed to live up to the same standard. After evaluating other vendors, IT chose RUCKUS ICX switches, which met all of its requirements for reliability, flexibility and redundancy.

## CHALLENGE

- IT, administration and faculty agreed that a reliable network infrastructure was vital for supporting a wide variety of digital curriculum projects
- The existing edge switches suffered from spotty performance and lacked redundancy
- Network management was too resource-intensive for a small IT teams

## SOLUTION

- 150 RUCKUS indoor APs
- 100 RUCKUS ICX switches
- 2 RUCKUS SmartZone network controllers

## BENEFITS

- The RUCKUS edge network supports cutting-edge programs, such as a mobile robot with telepresence and Kerbal Space Program flight simulator
- RUCKUS switches deliver flexible capacity to schools and redundancy across the district
- The IT team now has end-to-end visibility and unified management across APs and switches
- The district can investigate integrating operational and informational technology, such as running building automation systems over the RUCKUS edge network

# COMMSCOPE INDUSTRY RECOGNITION

CommScope has long been an active participant of leading standards committees and alliance organizations. Participating in these groups has allowed CommScope to develop solutions that drive benefits to our customers today while ensuring the same solutions are a sound investment for tomorrow. By upholding these values and commitments, CommScope’s portfolio of products and services have been recognized among the best in the industry.

2022	2022 CRN Awards CommScope receives 5-Star rating and Women of the Channel 2022 CommScope named operator’s “Supplier of the Year” and “Outstanding Technology Performance” awards at Vodafone Partner Awards Arch 2022
2020	2020 Technology and Engineering Emmy® Awards recognize CommScope’s IP Video Ad Insertion portfolio leadership (2020) CommScope is the IoT Sensor Company of the Year CommScope named a Wi-Fi Alliance 2020 Industry Impact Award Recipient
2019	(2019) 3rd consecutive year, CommScope achieved a Gold level Corporate Social Responsibility (CSR) rating from EcoVadis RUCKUS Wi-Fi 6 R730 AP scores WBA Award 2019 CommScope’s RUCKUS ICX 7850 switch wins CRN’s “2019 Product of the Year” award
2018	2018 Top 100 Global Tech Leader by Thomson Reuters
2017	CommScope receives AT&T 2017 Supplier Diversity Crystal Award
2016	RUCKUS Wireless recognized as a Best-in-Class Channel Provider on CRN’s 2016 Annual Report Card



# RELIABLE SCHOOL CONNECTIVITY: COMMSCOPE RUCKUS

The CommScope RUCKUS product portfolio of Wi-Fi, switching, IoT, LTE, powered fiber, Cat 6A solutions, software and SaaS lets you deliver a great end-user connectivity experience while reducing the amount of time you spend managing the network. And because CommScope RUCKUS packs more capability into every network element, you can build that network at a lower cost per connection.



## SMARTZONE NETWORK CONTROLLER



- Wired/Wireless management
- Visual connection diagnostics
- Powerful new mapping tool
- COE as service provider
- Customization with Open APIs

## CLOUDPATH SOFTWARE



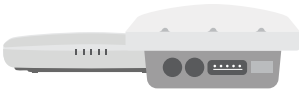
- Easy Chromebook on-boarding
- HTTPS inspection for CIPA
- Prevents password lockouts
- BYOD and 1:1 policies
- Dynamic PSK
- Granular policy guest access

## CLOUD SOLUTIONS



- Easy management saves time
- Scales with 1:1 deployments
- High reliability for digital learning
- Can manage from smartphone
- RUCKUS APs, now in the cloud
- Long distance stackable

## ACCESS POINTS (INDOOR & OUTDOOR)



- All students connect reliably
- Fewer APs needed per school
- Non-stop VR, gaming and video streaming Network
- Multi-gigabit (2.5GbE) uplink
- Outdoor AP stats

## ICX SWITCHES



- Silent classroom switches
- Leading power density (up to 90W)
- Uplink scaling 1/10/40/100GbE
- Hitless failover & ISSU
- Multi-gigabit (1/2.5/5/10 GbE)
- Long distance stackable

## CBRS SOLUTIONS



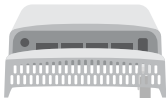
- Secure, wide-area, high-definition video surveillance
- More secure connectivity than Wi-Fi and at high speeds and quality of an LTE wireless network
- Utilizing the 3.5 GHz radio band, districts can bild a highly reliability wireless network that offers cost-effective fixed wireless access with low latency and delivers real-time communications to all their sensors, cameras, and industrial IoT

## COMMSCOPE STRUCTURED CABLING



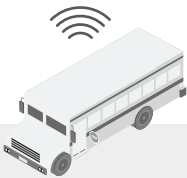
- Comprehensive Category 6A & Category 6 Solutions
- High performance Multimode and Singlemode fiber optic cables in various constructions
- Standard and high density fibre optic connecting hardware
- 25 Year Warranty
- Highly Skilled Certified Installer Network
- Powered Fiber with hybrid cabling

## RUCKUS IoT SUITE



- Add IoT during or after install
- Keep your AP investment
- Reduce IoT complexity and cost
- Great for STEM learning
- Go green, save green

## SCHOOL BUS WI-FI SOLUTIONS



- Superior in-bus or outdoor Wi-Fi performance up to 1,200 feet
- Centralized management to extend the school network
- LTE backhaul access point creates a mobile hotspot





# STUDENT SAFETY AND WELLNESS

Vaping Detection and IP Video Indexing on CommScope's RUCKUS WLAN Infrastructure

## Push back against the youth E-cigarette epidemic

Vaping is a difficult behavior to target. Its odor is easily overlooked, it's easy to conceal visually, and it's often done in private areas like bathrooms and locker rooms where human and electronic monitoring is weakest.



## Axis Communications networked cameras

This powerful, flexible, IoT-driven camera provides exceptional image quality, panoramic views, remote zoom, and low-light performance. Combined with FlySense sensors, they can capture actionable, time-stamped footage around vape detection locations.

## The Soter Technologies FlySense detector

This IoT device detects vaping mist in the air and also flags raised voices in a room without actually recording them—all in real time. It can quickly alert administrators and hall monitors with customized alerts sent to their mobile devices if illicit vaping or bully confrontations are detected where video surveillance is not used, such as bathrooms, locker rooms or anywhere else conditions prohibit video.

Riding on CommScope's RUCKUS portfolio of Wi-Fi solutions, it's a school's best defense against vaping by students.



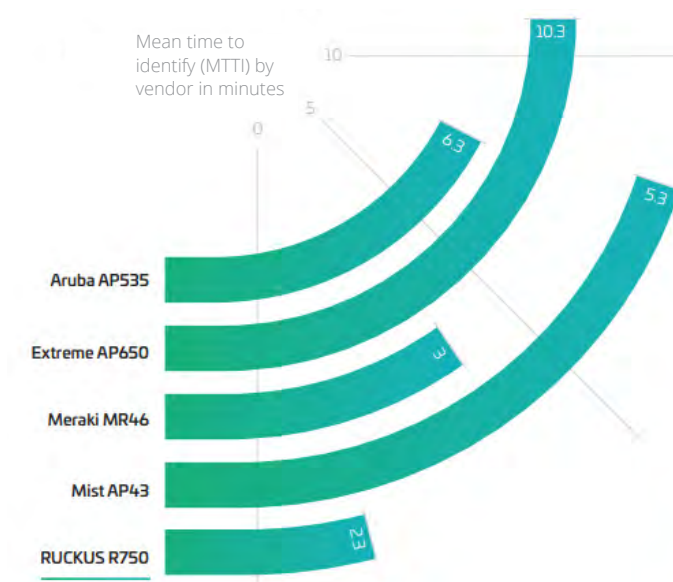
# RUCKUS ANALYTICS DELIVERS THE LOWEST MTTI

## Troubleshooting with network analytics tools

Mean time to identify (MTTI) is the time a network administrator needs to determine the root cause of a network issue or incident. A shorter average MTTI reduces the trouble-shooting burden on IT while improving user experience by allowing IT to more effectively limit incident duration and impact.

RUCKUS Analytics is a cloud service for network intelligence and service assurance. Powered by machine learning and artificial intelligence, it gives IT comprehensive visibility into network operations. If you are a current SmartZone customer, you can also opt for a free trial of RUCKUS Analytics.

Want to learn more? Send an email to [ruckuscloud@commscope.com](mailto:ruckuscloud@commscope.com) and someone will get back to you within one business day.



# A CLOUD WI-FI EXPERIENCE? IT'S AS EASY AS 1, 2, 3...

## LET'S GET YOUR TRIAL STARTED

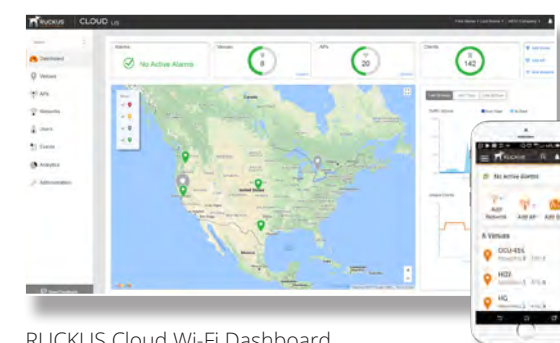
We told you that RUCKUS Cloud Wi-Fi simplifies WLAN management. Try it for yourself. No obligation, no credit card required. See how easy it is to set up, monitor and manage.



Free trial includes:

- Free RUCKUS 802.11ac Wi-Fi access point
- Up to 10 Wi-Fi AP management licenses for 60 days
- Up to 20 RUCKUS Analytics licenses for 60 days
- RUCKUS Cloud mobile app for anywhere management

**FREE TRIAL AND AP TERMS AND CONDITIONS APPLY.**  
[www.commscope.com/cloud-trial/](http://www.commscope.com/cloud-trial/)



RUCKUS Cloud Wi-Fi Dashboard



Application by traffic

CommScope RUCKUS is proud to be a contributing member of many associations serving the Education community. We are also working with leading technology and alliance partners that offer complete, proven solutions that complement the RUCKUS wired or wireless portfolio to help our customers meet critical business needs.



## About RUCKUS Networks

RUCKUS Networks builds and delivers purpose-driven networks that perform in the demanding environments of the industries we serve. Together with our network of trusted go-to-market partners, we empower our customers to deliver exceptional experiences to the guests, students, residents, citizens and employees who count on them.

[www.ruckusnetworks.com](http://www.ruckusnetworks.com)

Visit our website or contact your local RUCKUS representative for more information.

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**RUCKUS®**  
**COMMScope**





# Education Network Solutions Product Guide for E-Rate

Reliable school networks made simple

# Why choose RUCKUS for your school project?

As your school continues its digital transformation to 1:1 mobile learning, RUCKUS helps you address the top three challenges of school IT: network scaling, securing student data privacy, and network reliability for digital instruction.

## The digital classroom of tomorrow promises an outstanding education. Is your network ready?

The classroom of tomorrow promises an outstanding education. Blended learning, digital curriculum and other modern learning models can better engage students and help educators be more effective.

With this digital transformation, lesson plans now depend on consistent, reliable connectivity to the school's network. Instead of leaving tools locked in the classroom, students walk in the door with their laptops, tablets or other devices every morning, and take them home with them each night.

As such, there are three major concerns that school IT administrators are currently facing.

### NETWORK AND BROADBAND SCALING



#### THE TOP PRIORITY FOR IT IS BROADBAND AND NETWORK CAPACITY.

More devices are coming onto the network, stretching the limits of aging infrastructure. SETDA recommends 10Gbps per 1000 students by 2020-21. Plan for growth, not rip-and-replace.

### SECURITY AND STUDENT DATA PRIVACY



#### FACING THE TASK OF PROTECTING STUDENT DATA FROM MISUSE OR BREACH.

Buying or receiving 1:1 computers for digital learning will require schools to securely on-board devices for student data privacy.

### TRANSITION TO DIGITAL LEARNING



#### THE TRANSITION FROM TEXT-BASED CURRICULA TO BLENDED LEARNING.

Reliable connectivity is critical for classroom and distance learning. Cloud managed networks combined with network analytics can reduce digital downtime.

# Education Solutions for E-Rate

Expectations for your communications network have never been higher, as both students and teachers engage in new ways. To keep up with this demand, the communication infrastructure must be up to the task. That's where RUCKUS solutions can help your communications network do more—and do it better.

RUCKUS' communications infrastructure solutions are built to make your communications network simpler to deploy and manage, improve its reliability, and give it the adaptability to evolve as students and teachers' requirements change.

Our Education Network solutions portfolio for E-Rate covers every connection and cable, from copper and fiber structured cabling to the latest Wi-Fi 6 access points, high capacity switching and the best in control management using cloud or on-prem. CommScope is the only vendor who can fully support your entire communications network for your school, home, and community.

RUCKUS' portfolio of products will provide you with the most reliable networks made simple.



## FUTURE PROOF

Our ICX access switch uplinks can be upgraded without replacing the switch. We also support stacking up to 12 switches, while Campus Fabric supports up to 36 switches with a single point of management. Our flexible switch deployment options include standalone, stacking and Campus Fabric (with the same switches). With RUCKUS Cloud, you can easily add in RUCKUS Wi-Fi AP's and switches, or Internet of Things (IoT) infrastructure. For the latter two, simply plug into pre-existing RUCKUS Wi-Fi AP's – without having to rip and replace!



## WIRED AND WIRELESS NETWORK MANAGEMENT

With RUCKUS SmartZone Network Controllers, it is possible to manage both your wired and wireless network using a single network element. SmartZone network controllers simplify network set-up and management, enhance security, minimize troubleshooting and ease upgrades, and ensure provisioning consistency across networks built on RUCKUS access points and switches.

# Education Solutions for E-Rate



## Wireless Technology

Indoor and outdoor Wi-Fi (access points with Wi-Fi 6 that enables high device density, high-quality video, IoT sensors and cloud-managed control)

Mobile Hotspot (mobile-wireless access point is designed to leverage LTE networks as a backhaul and provide outdoor coverage)



## Fiber and Copper Cabling

Cat 6A and Powered Fiber (indoor and outdoor cabling to connect security cameras, sensors and small cells)



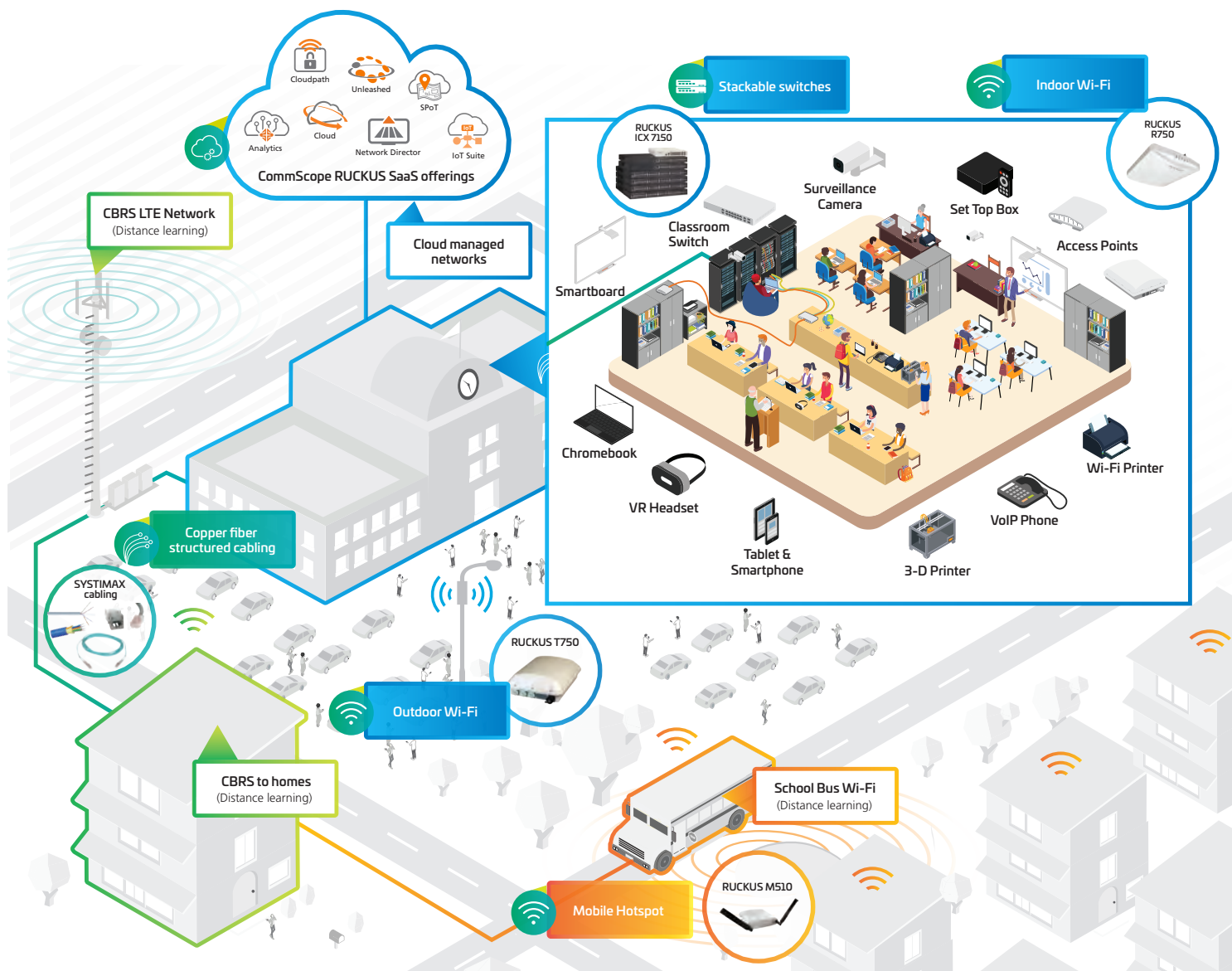
## Switching Technology

Multigigabit stackable switches with PoE (delivers high-end routing and security capabilities suitable for any school or district network)



## Cloud-Managed Solutions

SaaS offerings (Cloudpath ES, RUCKUS Cloud Network Monitoring, IoT Networking, RUCKUS SPoT, RUCKUS Analytics)





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# Access Points for E-Rate



## INDOOR ACCESS POINTS

Product Name	SKU/Part Number	Description	E-Rate Eligibility %	E-Rate Category
R850	9U1-R850-US00	RUCKUS Unleashed R850 dual-band 802.11abgn/ac/ax Wireless Access Point with Multi-Gigabit Ethernet backhaul, 8x8:8 streams (5GHz) 4x4:4 streams (2.4GHz), OFDMA, MU-MIMO, BeamFlex+, dual ports, PoH/uPoE/802.3at PoE support. Does not include power adapter or PoE injector. Includes Limited Lifetime Warranty.	100%	Cat 2 (IC, MIBS)
R770	901-R770-US00	RUCKUS R770 Wi-Fi 7 tri-band concurrent wireless Access Point with 2x2 (2.4GHz) + 4x4 (5GHz) + 2x2 (6GHz) RF configurations. Wi-Fi 7 support in all three frequency bands. 6GHz band supports LPI mode and SP mode with AFC. Fully backward compatible with Wi-Fi 6E. Can also be configured to 2x2 (2.4GHz) + 4x4 (5GHz) dual-band RF configurations through software, with Wi-Fi 7 support in both frequency bands. BeamFlex+, one 10-Gigabit Ethernet backhaul, one 1-Gigabit auxiliary port, 802.3bt PoE-in and 48V DC, onboard Bluetooth® Low Energy (BLE) and Zigbee® technology selectable IoT radio with "Matter" and "Thread" capable, USB 2.0, TPM 2.0, Secure Boot, and DPSK3. Includes adjustable acoustic drop ceiling bracket. Does not include power adapter or PoE injector. Includes Limited Lifetime Warranty		
R750	901-R750-US00	RUCKUS R750 dual-band 802.11abgn/ac/ax Wireless Access Point with Multi-Gigabit Ethernet backhaul and onboard BLE/Zigbee, 4x4:4 streams (5GHz) 4x4:4 streams (2.4GHz), OFDMA, MU-MIMO, BeamFlex+, dual ports, 802.3at PoE support. Does not include power adapter or PoE injector. Includes Limited Lifetime Warranty.		
R670	901-R670-US00	RUCKUS R760 tri band 802.11abgn/ac/ax Wireless Access Point with Tri-Radio (6GHz/5GHz/2.4GHz 4x4:4) with Multi-Gigabit Ethernet backhaul, PoH/uPoE/802.3bt PoE support. Concurrent Tri-Band operation in 6GHz, 5GHz and 2.4GHz bands. (1x) 10Gbps PoE In port, (1x) 1 GbE port, USB 2.0, OFDMA, MU-MIMO, BeamFlex+. Does not include power adapter or PoE injector. Includes Limited Lifetime Warranty.		
R650	901-R650-US00	RUCKUS R650 dual-band 802.11abgn/ac/ax Wireless Access Point with Multi-Gigabit Ethernet backhaul, 4x4:4 + 2x2:2 streams, OFDMA, MU-MIMO, BeamFlex+, dual ports, PoH/uPoE/802.3at PoE support. Does not include power adapter or PoE injector. Includes Limited Lifetime Warranty.		
	9U1-R650-US00	RUCKUS Unleashed R650 dual-band 802.11abgn/ac/ax Wireless Access Point with Multi-Gigabit Ethernet backhaul, 4x4:4 + 2x2:2 streams, OFDMA, MU-MIMO, BeamFlex+, dual ports, PoH/uPoE/802.3at PoE support. Does not include power adapter or PoE injector. Includes Limited Lifetime Warranty.		
R550	9U1-R550-US00	RUCKUS R550 dual-band 802.11abgn/ac/ax Wireless Access Point with Multi-Gigabit Ethernet backhaul and onboard BLE/Zigbee, 2x2:2 streams (2.4GHz/5GHz) OFDMA, MU-MIMO, BeamFlex+, dual ports, 802.3at PoE support. Does not include power adapter or PoE injector. Includes Limited Lifetime Warranty.		
	9U1-R550-US00	RUCKUS Unleashed R550 dual-band 802.11abgn/ac/ax Wireless Access Point with Multi-Gigabit Ethernet backhaul and onboard BLE/Zigbee, 2x2:2 streams (2.4GHz/5GHz) OFDMA, MU-MIMO, BeamFlex+, dual ports, 802.3at PoE support. Does not include power adapter or PoE injector. Includes Limited Lifetime Warranty.		
R350	901-R350-US02	RUCKUS R350 dual-band 802.11abgn/ac/ax Wireless Access Points, 2x2:2 streams (2.4GHz/5GHz) OFDMA, MU-MIMO, BeamFlex+, 802.3af PoE support. Does not include power adapter or PoE injector. Includes Limited Lifetime Warranty		

# Access Points for E-Rate



T750

## T750 OUTDOOR ACCESS POINTS

Product Name	SKU/Part Number	Description	E-Rate Eligibility %	E-Rate Category
T750	901-T750-US01	RUCKUS T750 802.11ax Outdoor Wireless Access Point, 4x4:4 Stream, Omnidirectional Beamflex+ coverage, 2.4GHz and 5GHz concurrent dual band, (1x) 2.5G Ethernet port, (1x) 10/100/1000 Ethernet port, 100-240 Vac, POE in and PSE out, Fiber SFP/SFP+, GPS, IP-67 Outdoor enclosure, -40 to 65C Operating Temperature.	100%	Cat 2 (IC, MIBS)
	901-T750-US51	RUCKUS T750SE 802.11ax Outdoor Wireless Access Point, 4x4:4 Stream, 120-Degree Sector antenna included and option to attach external antennae, 2.4GHz and 5GHz concurrent dual band, (1x) 2.5G Ethernet port, (1x) 10/100/1000 Ethernet port, 100-240 Vac, POE in and PSE out, Fiber SFP/SFP+, GPS, IP-67 Outdoor enclosure, -40 to 65C Operating Temperature.		
	9U1-T750-US01	RUCKUS Unleashed T750 802.11ax Outdoor Wireless Access Point, 4x4:4 Stream, Omnidirectional Beamflex+ coverage, 2.4GHz and 5GHz concurrent dual band, (1x) 2.5G Ethernet port, (1x) 10/100/1000 Ethernet port, 100-240 Vac, POE in and PSE out, Fiber SFP/SFP+, GPS, IP-67 Outdoor enclosure, -40 to 65C Operating Temperature.		
	9U1-T750-US51	RUCKUS Unleashed T750SE 802.11ax Outdoor Wireless Access Point, 4x4:4 Stream, 120-Degree Sector antenna included and option to attach external antennae, 2.4GHz and 5GHz concurrent dual band, (1x) 2.5G Ethernet port, (1x) 10/100/1000 Ethernet port, 100-240 Vac, POE in and PSE out, Fiber SFP/SFP+, GPS, IP-67 Outdoor enclosure, -40 to 65C Operating Temperature.		



T670

## T670 OUTDOOR ACCESS POINTS

Product Name	SKU/Part Number	Description	E-Rate Eligibility %	E-Rate Category
T670	901-T670-US01	RUCKUS T670 Wi-Fi 7 tri-band outdoor concurrent wireless access point with 2x2 (2.4GHz) + 2x2 (5GHz) + 2x2 (6GHz) RF configuration. Wi-Fi 7 in all three bands. 6GHz supports SP mode with AFC. T670 can be also software configurable to 2x2 (2.4GHz) + 4x4 (5GHz) dual-band mode with Wi-Fi 7 support in both frequency bands. BeamFlex+, one 5-Gigabit Ethernet backhaul, one 1- Gigabit auxiliary port, PoH/uPoE/802.3bt/802.3at PoE support, TPM 2.0, Secure Boot, and DPSK3. Mounting bracket included. Power adapter or PoE Injector not included. Includes limited one-year warranty.	100%	Cat 2 (IC, MIBS)



T350

T350 OUTDOOR ACCESS POINTS				
Product Name	SKU/Part Number	Description	E-Rate Eligibility %	E-Rate Category
T350	901-T350-XX20	RUCKUS T350c, omni, outdoor access point, 802.11ax 2x2:2 internal BeamFlex+, dual band concurrent. One Ethernet port, PoE input. -20°C to 65°C Operating Temperature. Includes mounting bracket. Does not include PoE injector.	100%	Cat 2 (IC, MIBS)
	901-T350-XX40	RUCKUS T350d, omni, outdoor access point, 802.11ax 2x2:2 internal BeamFlex+, dual band concurrent. One Ethernet port, PoE input, DC input, USB. -40°C to 65°C Operating Temperature. Includes mounting bracket. Does not include PoE injector.		

# ICX Switches for E-Rate



ICX 7150 – Compact

## ICX 7150 – COMPACT (ACCESS/EDGE SWITCH)

SKU/Part Number	Description	E-Rate Eligibility %	E-Rate Category
ICX7150-C10ZP-2X10GR	ICX 7150 Compact Switch, 2x 100/1000/2.5/5/10G PoH ports, 2x 100/1000/2.5G PoH ports, 6x 100/1000/2.5G PoE+ ports, 2x 10G SFP uplink-ports, 240W PoE budget, L3 features (OSPF, VRRP, PIM, PBR)	100%	Cat 2 (IC, MIBS)
ICX7150-C10ZP-2X10GR-RMT3	ICX 7150 Compact Switch, 2x 100/1000/2.5/5/10G PoH ports, 2x 100/1000/2.5G PoH ports, 6x 100/1000/2.5G PoE+ ports, 2x 10G SFP uplink-ports, 240W PoE budget, L3 features (OSPF, VRRP, PIM, PBR), 3 year remote support.		
ICX7150-C10ZP-2X10GR-A	ICX 7150 Compact Switch, 2x 100/1000/2.5/5/10G PoH ports, 2x 100/1000/2.5G PoH ports, 6x 100/1000/2.5G PoE+ ports, 2x 10G SFP uplink-ports, 240W PoE budget, L3 features (OSPF, VRRP, PIM, PBR), TAA		
ICX7150-C08P-2X1G-RMT3	ICX 7150 Compact Switch, 8x 10/100/1000 PoE+ ports, 2x 1G SFP uplink-ports, 62W PoE budget, L2 (switch image only), 3 year remote support.		
ICX7150-C08PT-2X1G-RMT3	ICX 7150 Compact Switch Extended Temp, 8x 10/100/1000 PoE+ ports, 2x 1G SFP uplink-ports, 62W PoE budget, L2 (switch image only), 3 year remote support. 13 month hardware warranty.		



ICX 7150

## ICX 7150 (ACCESS/EDGE SWITCH)

SKU/Part Number	Description	E-Rate Eligibility %	E-Rate Category
ICX7150-24-4X1G	ICX 7150 Switch, 24x 10/100/1000 ports, 2x 1G RJ45 uplink-ports, 4x 1G SFP uplink-ports upgradable to up to 4x 10G SFP+ with license, basic L3 (static routing and RIP)	100%	Cat 2 (IC, MIBS)
ICX7150-24-2X10G	ICX 7150 Switch, 24x 10/100/1000 ports, 2x 1G RJ45 uplink-ports, 2x 1G SFP and 2x 10G SFP+ uplink-ports upgradable to 4x 10G SFP+ with license, basic L3 (static routing and RIP)		
ICX7150-24-4X10GR-RMT3	ICX 7150 Switch, 24x 10/100/1000 ports, 2x 1G RJ45 uplink-ports, 4x 10G SFP+ uplink-ports, L3 features (OSPF, VRRP, PIM, PBR), 3 year remote support.		
ICX7150-24-4X10GR-A	ICX 7150 Switch, 24x 10/100/1000 ports, 2x 1G RJ45 uplink-ports, 4x 10G SFP+ uplink-ports, L3 features (OSPF, VRRP, PIM, PBR), TAA		
ICX7150-24P-4X1G	ICX 7150 Switch, 24x 10/100/1000 PoE+ ports, 2x 1G RJ45 uplink-ports, 4x 1G SFP uplink ports upgradable to up to 4x 10G SFP+ with license, 370W PoE budget, basic L3 (static routing and RIP)		
ICX7150-24P-2X10G	ICX 7150 Switch, 24x 10/100/1000 PoE+ ports, 2x 1G RJ45 uplink-ports, 2x 1G SFP and 2x 10G SFP+ uplink-ports upgradable to 4x 10G SFP+ with license 370W PoE budget, basic L3 (static routing and RIP)		
ICX7150-24P-4X10GR-RMT3	ICX 7150 Switch, 24x 10/100/1000 PoE+ ports, 2x 1G RJ45 uplink-ports, 4x 10G SFP+ uplink-ports, 370W PoE budget, L3 features (OSPF, VRRP, PIM, PBR), 3 year remote support.		

# ICX Switches for E-Rate



ICX 7150 (ACCESS/EDGE SWITCH)			
SKU/Part Number	Description	E-Rate Eligibility %	E-Rate Category
ICX7150-24P-4X10GR-A	ICX 7150 Switch, 24x 10/100/1000 PoE+ ports, 2x 1G RJ45 uplink-ports, 4x 10G SFP+ uplink-ports, 370W PoE budget, L3 features (OSPF, VRRP, PIM, PBR), TAA	100%	Cat 2 (IC, MIBS)
ICX7150-48-2X10G	ICX 7150 Switch, 48x 10/100/1000 ports, 2x 1G RJ45 uplink-ports, 2x 1G SFP and 2x 10G SFP+ uplink-ports upgradable to 4x 10G SFP+ with license, basic L3 (static routing and RIP)		
ICX7150-48-4X10GR-RMT3	ICX 7150 Switch, 48x 10/100/1000 ports, 2x 1G RJ45 uplink-ports, 4x 10G SFP+ uplink-ports, L3 features (OSPF, VRRP, PIM, PBR), 3 year remote support.		
ICX7150-48-4X10GR-A	ICX 7150 Switch, 48x 10/100/1000 ports, 2x 1G RJ45 uplink-ports, 4x 10G SFP+ uplink-ports, L3 features (OSPF, VRRP, PIM, PBR), TAA		
ICX7150-48P-4X1G	ICX 7150 Switch, 48x 10/100/1000 PoE+ ports, 2x 1G RJ45 uplink-ports, 4x 1G SFP uplink ports upgradable to up to 4x 10G SFP+ with license, 370W PoE budget, basic L3 (static routing and RIP)		
ICX7150-48P-2X10G	ICX 7150 Switch, 48x 10/100/1000 PoE+ ports, 2x 1G RJ45 uplink-ports, 2x 1G SFP and 2x 10G SFP+ uplink-ports upgradable to 4x 10G SFP+ with license, 370W PoE budget, basic L3 (static routing and RIP)		
ICX7150-48P-4X10GR-RMT3	ICX 7150 Switch, 48x 10/100/1000 PoE+ ports, 2x 1G RJ45 uplink-ports, 4x 10G SFP+ uplink-ports, 370W PoE budget, L3 features (OSPF, VRRP, PIM, PBR), 3 year remote support.		
ICX7150-48P-4X10GR-A	ICX 7150 Switch, 48x 10/100/1000 PoE+ ports, 2x 1G RJ45 uplink-ports, 4x 10G SFP+ uplink-ports, 370W PoE budget, L3 features (OSPF, VRRP, PIM, PBR), TAA		
ICX7150-48PF-4X1G	ICX 7150 Switch, 48x 10/100/1000 PoE+ ports, 2x 1G RJ45 uplink-ports, 4x 1G SFP uplink ports upgradable to up to 4x 10G SFP+ with license, 740W PoE budget, basic L3 (static routing and RIP)		
ICX7150-48PF-2X10G	ICX 7150 Switch, 48x 10/100/1000 PoE+ ports, 2x 1G RJ45 uplink-ports, 2x 1G SFP and 2x 10G SFP+ uplink-ports upgradable to 4x 10G SFP+ with license, 740W PoE budget, basic L3 (static routing and RIP)		
ICX7150-48PF-4X10GR-RMT3	ICX 7150 Switch, 48x 10/100/1000 PoE+ ports, 2x 1G RJ45 uplink-ports, 4x 10G SFP+ uplink-ports, 740W PoE budget, L3 features (OSPF, VRRP, PIM, PBR), 3 year remote support.		
BR-ICX-7150-210U410R-P-01	CoE certificate license to upgrade any ICX 7150 24-port or 48-port model from 2x 1G SFP & 2x 10G SFP+ to 4x 10G SFP+ uplink ports. Also includes L3 features (OSPF, VRRP, PIM, PBR)		
BR-ICX-7150-41U210-P-01	CoE certificate license to upgrade any ICX 7150 24-port or 48-port model from 4x 1G SFP to 2x 1G SFP & 2x 10G SFP+ uplink ports.		
BR-ICX-7150-41U410R-P-01	CoE certificate license to upgrade any ICX 7150 24-port or 48-port model from 4x 1G SFP to 4x 10G SFP+ uplink ports. Also includes L3 features (OSPF, VRRP, PIM, PBR)		
BR-ICX-7150C-21U210R-P-01	CoE certificate license to upgrade the ICX 7150-C12P compact switch from 2x 1G SFP to 2x 10G SFP+ uplink ports. Also includes L3 features (OSPF, VRRP, PIM, PBR)		
BR-ICX-7150Z210U810R-P-01	CoE certificate license to upgrade the ICX 7150-48ZP, Z-Series switch from 2x 10G SFP+ to 8x 10G SFP+ uplink ports. Also includes L3 features (OSPF, VRRP, PIM, PBR)		

# ICX Switches for E-Rate



ICX 7150 Z-series

## ICX 7150 Z-SERIES (ACCESS/EDGE SWITCH)

SKU/Part Number	Description	E-Rate Eligibility %	E-Rate Category
ICX7150-48ZP-E2X10G	ICX 7150-48ZP Switch Z-Series, 16x 100/1000/2.5G PoH ports, 32x 10/100/1000 PoE+ ports, 2x 10G SFP+ and 6x 1G SFP uplink-ports upgradable to 8x 10G SFP+ with license. Basic L3 (static routing and RIP). 1 RPS20-E Power Supply, 1 Fan tray.	100%	Cat 2 (IC, MIBS)
ICX7150-48ZP-E8X10GR-RMT3	ICX 7150-48ZP Switch Z-Series, 16x 100/1000/2.5G PoH ports, 32x 10/100/1000 PoE+ ports, 8x 10G SFP+, L3 features (OSPF, VRRP, PIM, PBR). 1 RPS20-E Power Supply, 1 Fan tray. 3 years remote support		
ICX7150-48ZP-E8X10GR2-A	ICX 7150-48ZP Switch Z-Series, 16x 100/1000/2.5G PoH ports, 32x 10/100/1000 PoE+ ports, 8x 10G SFP+, L3 features (OSPF, VRRP, PIM, PBR). 2 RPS20-E Power Supplies, 2 Fan trays. TAA		



ICX 7550

## ICX 7550 (AGGREGATION/CORE SWITCH)

SKU/Part Number	Description	E-Rate Eligibility %	E-Rate Category
ICX7550-24	ICX 7550 24-port 10/100/1000 Mbps with 2-ports 40 Gbps Uplink/Stack QSFP+, module slot, no fans, no power supplies installed. Transceivers sold separately	100%	Cat 2 (IC, MIBS)
ICX7550-24-E2	ICX 7550 24-port 10/100/1000 Mbps with 2-ports 40 Gbps Uplink/Stack QSFP+, module slot, three fans, two AC power supplies with exhaust airflow installed. Transceivers sold separately		
ICX7550-48	ICX 7550 48-port 10/100/1000 Mbps with 2-ports 40 Gbps Uplink/Stack QSFP+, module slot, no fans, no power supplies installed. Transceivers sold separately		
ICX7550-48-E2	ICX 7550 48-port 10/100/1000 Mbps with 2-ports 40 Gbps Uplink/Stack QSFP+, module slot, three fans, two AC power supplies with exhaust airflow installed. Transceivers sold separately		
ICX7550-24P	ICX 7550 24-port 10/100/1000 Mbps 802.3at POE+ with 2-ports 40 Gbps Uplink/Stack QSFP+, module slot, no fans, no power supplies installed. Transceivers sold separately		
ICX7550-24P-E2-R3	ICX 7550 24-port 10/100/1000 Mbps 802.3at POE+ with 2-ports 40 Gbps Uplink/Stack QSFP+, module slot, three fans, two AC power supplies with exhaust airflow installed. 3-years TAC support. Transceivers sold separately		
ICX7550-48P	ICX 7550 48-port 10/100/1000 Mbps 802.3at POE+ with 2-ports 40 Gbps Uplink/Stack QSFP+, module slot, no fans, no power supplies installed. Transceivers sold separately		
ICX7550-48P-E2-R3	ICX 7550 48-port 10/100/1000 Mbps 802.3at POE+ with 2-ports 40 Gbps Uplink/Stack QSFP+, module slot, three fans, two AC power supplies with exhaust airflow installed. 3-years TAC support. Transceivers sold separately		
ICX7550-24ZP	ICX 7550 12-port 10/100/1000/2500 Mbps 802.3bt POE, 12-port 100/1000/2500/50000/10000 Mbps 802.3bt POE with 2-ports 40/100 Gbps Uplink/Stack QSFP28, module slot, no fans, no power supplies installed. Transceivers sold separately		

# ICX Switches for E-Rate



ICX 7550 (AGGREGATION/CORE SWITCH)			
SKU/Part Number	Description	E-Rate Eligibility %	E-Rate Category
ICX7550-48F-E2-R3	ICX 7550 36-port 100/1000 Mbps SFP, 12-port 1/10 Gbps SFP+ with 2-ports 40/100 Gbps Uplink/Stack QSFP28, two AC power supplies, three fans exhaust airflow with exhaust airflow installed, 3-years TAC support. Transceivers sold separately	100%	Cat 2 (IC, MIBS)
ICX-MACSEC-LIC	ICX MACSEC LICENSE		
ICX7550-PREM-LIC	ICX 7550 LAYER 3 PREMIUM LICENSE		
ICX7550-24ZP-E2	ICX 7550 12-port 10/100/1000/2500 Mbps 802.3bt POE, 12-port 100/1000/2500/50000/10000 Mbps 802.3bt POE with 2-ports 40/100 Gbps Uplink/Stack QSFP28, module slot, three fans, two AC power supplies with exhaust airflow installed. Transceivers sold separately		
ICX7550-24ZP-E2-R3	ICX 7550 12-port 10/100/1000/2500 Mbps 802.3bt POE, 12-port 100/1000/2500/50000/10000 Mbps 802.3bt POE with 2-ports 40/100 Gbps Uplink/Stack QSFP28, module slot, three fans, two AC power supplies with exhaust airflow installed. 3-years TAC support. Transceivers sold separately		
ICX7550-48ZP-E2-R3	ICX 7550 36-port 10/100/1000/2500 Mbps 802.3bt POE, 12-port 100/1000/2500/50000/10000 Mbps 802.3bt POE with 2-ports 40/100 Gbps Uplink/Stack QSFP28, module slot, three fans, two AC power supplies with exhaust airflow installed. 3-years TAC support. Transceivers sold separately		
ICX7550-24F	ICX 7550 24-port 1/10 Gbps with 2-ports 40/100 Gbps Uplink/Stack QSFP28, module slot, no fans, no power supplies installed. Transceivers sold separately		
ICX7550-24F-E2-R3	ICX 7550 24-port 1/10 Gbps with 2-ports 40/100 Gbps Uplink/Stack QSFP28, module slot, two AC power supplies, three fans exhaust airflow with exhaust airflow installed, 3-years TAC support. Transceivers sold separately		
ICX7550-48F	ICX 7550 36-port 100/1000 Mbps SFP, 12-port 1/10 Gbps SFP+ with 2-ports 40/100 Gbps Uplink/Stack QSFP28, module slot, no fans, no power supplies installed. Transceivers sold separately		
ICX7550-48F-E2-R3	ICX 7550 36-port 100/1000 Mbps SFP, 12-port 1/10 Gbps SFP+ with 2-ports 40/100 Gbps Uplink/Stack QSFP28, two AC power supplies, three fans exhaust airflow with exhaust airflow installed, 3-years TAC support. Transceivers sold separately		
ICX-MACSEC-LIC	ICX MACSEC LICENSE		
ICX7550-PREM-LIC	ICX 7550 LAYER 3 PREMIUM LICENSE		



# ICX Switches for E-Rate



ICX 7850

ICX 7850 (AGGREGATION/CORE SWITCH)			
SKU/Part Number	Description	E-Rate Eligibility %	E-Rate Category
ICX7850-32Q-E2	ICX 7850 32-port QSFP28 supports native 40GE or 100GE, or breakout 4x10GE or 4x25GE, bundle includes two AC PS and six fans, PS side exhaust airflow, transceivers sold separately.	100%	Cat 2 (IC, MIBS)
ICX7850-48F-E2	ICX 7850 48-port SFP28 1/10/25GE, 8x-port QSFP28 supports native 40GE or 100GE or breakout 4x10GE or 4x25GE, bundle includes two AC PS and five fans, PS side exhaust airflow, transceivers sold separately.		
ICX7850-48FS-E2-RMT3	ICX 7850 48-port SFP+ 1/10GE, 8x-port QSFP28 supports native 40GE or 100GE or breakout 4x10GE or 4x25GE, bundle includes two AC PS and five fans, PS side exhaust airflow, transceivers sold separately, with 3-year remote support.		
ICX7850-32Q	ICX 7850 32-port QSFP28 supports native 40GE or 100GE, or breakout 4x10GE or 4x25GE, bundle includes two AC PS and six fans, PS side exhaust airflow, transceivers sold separately.		
ICX7850-48F	ICX 7850 48-port SFP28 1/10/25GE, 8x-port QSFP28 supports native 40GE or 100GE or breakout 4x10GE or 4x25GE, bundle includes two AC PS and five fans, PS side exhaust airflow, transceivers sold separately.		
ICX7850-48FS	ICX 7850 48-port SFP+ 1/10GE, 8x-port QSFP28 supports native 40GE or 100GE or breakout 4x10GE or 4x25GE, bundle includes two AC PS and five fans, PS side exhaust airflow, transceivers sold separately.		
ICX-MACSEC-LIC	ICX MACSEC LICENSE		
ICX7850-PREM-LIC	ICX7850 Premium feature license		

# ICX Switches for E-Rate



ICX 8200

ICX 8200 (AGGREGATION/CORE SWITCH)			
SKU/Part Number	Description	E-Rate Eligibility %	E-Rate Category
ICX8200-24	RUCKUS ICX 8200 Switch, 24×10/100/1000 Mbps ports, 4×25 GbE SFP28 stacking/uplink-ports, three-year remote TAC support. Power cord not included. TAA	100%	Cat 2 (IC, MIBS)
ICX8200-24P	RUCKUS ICX 8200 Switch, 24×10/100/1000 Mbps PoE+ ports, 4×25 GbE SFP28 stacking/uplink-ports, 370W PoE budget, three-year remote TAC support. Power cord not included. TAA		
ICX8200-48	RUCKUS ICX 8200 Switch, 48×10/100/1000 Mbps ports, 4×25 GbE SFP28 stacking/uplink-ports, three-year remote TAC support. Power cord not included. TAA		
ICX8200-48P	RUCKUS ICX 8200 Switch, 48×10/100/1000 Mbps PoE+ ports, 4×25 GbE SFP28 stacking/uplink-ports, 370 W PoE budget, three-year remote TAC support. Power cord not included. TAA		
ICX8200-48PF	RUCKUS ICX 8200 Switch, 48×10/100/1000 Mbps PoE+ ports, 4×25 GbE SFP28 stacking/uplink-ports, 740 W PoE budget, three-year remote TAC support. Power cord not included. TAA		
ICX8200-48PF2-E	RUCKUS ICX 8200 Switch, 48×10/100/1000 Mbps PoE+ ports, 4×25 GbE SFP28 stacking/uplink-ports, 840 W PoE budget (with one PSU), hot swap power supplies and fans, one power supply and one fan included., three-year remote TAC support. Power cord not included. TAA		
ICX8200-48PF2-E2	RUCKUS ICX 8200 Switch, 48×10/100/1000 Mbps PoE+ ports, 4×25 GbE SFP28 stacking/uplink-ports 1480 W PoE budget, hot swap power supplies and fans, two power supplies and two fans included, three-year remote TAC support. Power cords not included. TAA		
ICX8200-C08PF	RUCKUS ICX 8200 Compact Switch, 8×10/100/1000 Mbps PoE+ ports, 2×10 GbE SFP+ stacking/uplink-ports, 124W PoE budget, three-year remote TAC support. Power cord not included. TAA		
ICX8200-C08ZP	RUCKUS ICX 8200 Compact Switch, 4×100/1000/2500 Mbps PoE++ ports, 4×1/2.5/5/10Mbps PoE++ ports, 2×25 GbE SFP28 stacking/uplink-ports, 240 W PoE budget, three-year remote TAC support. Must use Power Cord High Temperature C15 connector. Power cord not included. TAA		
ICX8200-24ZP	RUCKUS ICX 8200 Switch, 24×100/1000/2500 Mbps PoE++ ports, 4×25 GbE SFP28 stacking/uplink-ports, 740 W PoE budget, three-year remote TAC support. Power cord not included. TAA		
ICX8200-48ZP2-E	RUCKUS ICX 8200 Switch, 32×10/100/1000 Mbps PoE+ ports, 16×100/1000/2500 Mbps RJ-45 PoE++ ports, 4×25 GbE SFP28 stacking/uplink-ports, 800 W PoE budget (with one PSU), hot swap power supplies and fans, one power supply and one fan included, three-year remote TAC support. Power cord not included. TAA		
ICX8200-48ZP2-E2	RUCKUS ICX 8200 Switch, 32×10/100/1000 Mbps PoE+ ports, 16×100/1000/2500 Mbps RJ-45 PoE++ ports, 4×25 GbE SFP28 stacking/uplink-ports, 1480 W PoE budget, hot swap power supplies and fans, two power supplies and two fans included, three-year remote TAC support. Power cords not included. TAA		

# ICX Switches for E-Rate



ICX 8200 (AGGREGATION/CORE SWITCH)			
SKU/Part Number	Description	E-Rate Eligibility %	E-Rate Category
ICX8200-24F	RUCKUS ICX 8200 Switch, 24x10/100/1000 Mbps SFP ports, 4x25 GbE SFP28 stacking/uplink-ports, three-year remote TAC support. Power cord not included. TAA	100%	Cat 2 (IC, MIBS)
ICX8200-48F	RUCKUS ICX 8200 Switch, 48x10/100/1000 Mbps SFP ports, 4x25 GbE SFP28 stacking/uplink-ports, three-year remote TAC support. Power cord not included. TAA		
ICX8200-24FX	RUCKUS ICX 8200 Switch, 16x1/10GbE SFP+ ports, 8x25 GbE SFP28 stacking/uplink-ports, three-year remote TAC support. Power cord not included. TAA		
S41-0001-1LSG	SLED Premium WatchDog Support for SZ/vSZ AP management license, 1 Yr		
S41-0001-3LSG	SLED Premium WatchDog Support for SZ/vSZ AP management license, 3 Yr		
S41-0001-5LSG	SLED Premium WatchDog Support for SZ/vSZ AP management license, 5 Yr		
L09-0001-SGCX	Switch management license for SZ-100/vSZ 5.X/SZ300, 1 RUCKUS ICX switch. Order this when you intend to run software version from 5.0 onwards.		
CLD-PROF-APSW-REC5	RUCKUS One Professional 5-Yr Subscription for 1 network device (AP or Switch) for REC (License owned by Ruckus End Customer). Switch RMT support is not included and is required to be purchased separately.		
CLD-PROF-APSW-REC7	RUCKUS One Single-tenant Professional cloud 1 x license of Device Networking for 7-Yr Subscription for REC. License owned by Ruckus End Customer. Device Networking of AP or Switch use 1 x license each. Switch RMT support is not included and is required to be purchased separately.		
CLD-BNDL-SZWA-EDU5	RUCKUS WIRELESS:E-RATE SZ AP Mgmt License for SZ144/vSZ, includes AP 5yr Warranty, includes RUCKUS Analytics 5yr.		

# Accessories for E-Rate



## ACCESSORIES (OPTICS, CABLES, CONNECTORS, AND POWER CORDS)

SKU/Part Number	Description	E-Rate Eligibility %	E-Rate Category
E1MG-100FX-IR-OM	100BASE-FX IR SFP optic for SMF with LC connector, optical monitoring capable. For distances, up to 15Km	100%	Cat 2 (IC, MIBS)
E1MG-100FX-OM	100BASE-FX SFP optic MMF, LC connector, optical monitoring capable		
E1MG-100FX-OM-8	100BASE-FX SFP optic MMF 8 pack, LC connector, optical monitoring capable, 8-pack		
E1MG-BXD	1000BASE-BXD SFP optic SMF, transmits at 1490nm and receives at 1310nm, LC connector, single strand SMF fiber. This optic should only be connected to an E1MG-BXU at the far end.		
E1MG-BXU	1000BASE-BXU SFP optic SMF, transmits at 1310nm and receives at 1490nm, LC connector, single strand SMF fiber. This optic should only be connected to an E1MG-BXD at the far end		
E1MG-LHA-OM	1000BASE-LHA SFP optic, SMF, LC connector, optical monitoring capable		
E1MG-LHA-OM-T	1000BASE-LHA SFP optic, SMF, LC connector, optical monitoring capable, industrial temperature (-40°C to 85°C)		
E1MG-LX-OM	1000Base-LX SFP optic, SMF, LC connector, Optical Monitoring Capable		
E1MG-LX-OM-8	1000BASE-LX SFP optic, SMF, LC connector, optical monitoring capable, 8-pack		
E1MG-LX-OM-T	1000Base-LX SFP optic, SMF, LC connector, Optical Monitoring Capable, Industrial Temperature		
E1MG-SX-OM	1000Base-SX SFP optic, MMF, LC connector, Optical Monitoring Capable		
E1MG-SX-OM-8	1000BASE-SX SFP optic MMF, LC connector, optical monitoring capable, 8-pack		
E1MG-SX-OM-T	1000Base-SX SFP optic, MMF, LC connector, Optical Monitoring Capable, Industrial Temperature		
E1MG-TX	1000BASE-TX SFP Copper, RJ-45 Connector		
E1MG-LX-A	1000BASE-LX SFP Optic, SMF, LC connector, Optical Monitoring Capable, TAA compliant		
E1MG-LX-A8	1000BASE-LX SFP Optic, SMF, LC connector, Optical Monitoring Capable, TAA compliant, 8-pack		
E1MG-100FX-A	100BASE-FX SFP optic MMF, LC connector, optical monitoring capable, TAA compliant		
E1MG-100FX-A8	100BASE-FX SFP optic MMF, LC connector, optical monitoring capable, TAA compliant, 8-pack		
E1MG-SX-A	1000BASE-SX SFP Optic, MMF, (LC), Optical Monitoring Capable, TAA compliant		
E1MG-SX-A8	1000BASE-SX SFP Optic, MMF, (LC), Optical Monitoring Capable, TAA compliant, 8-pack		
E1MG-TX-A	1000BASE-TX SFP Copper, RJ-45, TAA compliant		
E1MG-TX-A8	1000BASE-TX SFP Copper, RJ-45, TAA compliant, 8-pack		
PC15USA	Power Cord, USA 125V 20A		
PCUSA	Power Cord EPS, USA, 250V 13A		
PCUSA-3M	Power Cord, USA version, NEMA 5-15P Plug (15amp), 3m		
PCUSA-C19C20	Power Cord for IEC 60320-C19 to IEC 60320-C20, 250V, 20A		
PCUSA-C19L620P	Power Cord for IEC 60320-C19 to locking Nema L6-20P, 250V, 20A		
PCUSA-C15	Power Cord High Temperature C15, USA, 125V 13A, 1.83m		

# Accessories for E-Rate



## ACCESSORIES (OPTICS, CABLES, CONNECTORS)

SKU/Part Number	Description	E-Rate Eligibility %	E-Rate Category
E100G-QSFP-ESR4	100GBASE-ESR4 QSFP+ optic (MTP 1x8 or 1x12), 300m over MMF, 1-pack	100%	Cat 2 (IC, MIBS)
E100G-QSFP-QSFP-AOC-1001	100GbE QSFP28 to QSFP28 Direct Attached, Active Optical Cable, 10m		
E100G-QSFP28-CWDM4-2KM	100GBASE-CWDM4 QSFP28 optic (LC), for distances up to 2 km over SMF		
E100G-QSFP28-LR4-10KM	100GBASE-LR4 QSFP28 optic (LC), for distances up to 10 km over SMF		
E100G-QSFP28-LR4-LP-10KM	100GBASE-LR4 Low Power, QSFP28 optic (LC), for distances up to 10 km over SMF		
E100G-QSFP28-LR4L-2KM	100 GbE QSFP28 optic (LC), LR4-Lite, for distances up to 2 km over SMF		
E100G-QSFP28-SR4	100GBASE-SR4 QSFP28 optic (MTP 1x12), for up to 100 m over MMF		
E40G-QSFP-ER4	40GBASE-ER4 QSFP+ optic (LC), for up to 40km over SMF		
E40G-QSFP-ESR4-8	40GBASE-ESR4 QSFP+ optic (MTP 1x8 or 1x12), 300m over MMF, 8-pack		
E40G-QSFP-LM4	40GBASE-LM4 QSFP+, 1310nm, 160m over duplex LC OM4 MMF		
E40G-QSFP-LR4	40GBASE-LR4 QSFP+ optic (LC), for up to 10km over SMF, 1-pack		
E40G-QSFP-LR4-8	40GBASE-LR4 QSFP+ optic (LC), for up to 10km over SMF 8-PACK		
E40G-QSFP-LR4-INT	40GBASE-LR4 QSFP+ to 4 SFP+ optic (LC), for up to 10 km over SMF		
E40G-QSFP-QSFP-AOC-1001	40GE Direct Attach QSFP+ to QSFP+ Active Optical Cable, 10m, 1-pack		
E40G-QSFP-SR4	40GBASE-SR4 QSFP+ optic (MTP 1x8 or 1x12), 100m over MMF, 1-pack		
E40G-QSFP-SR4-8	40GBASE-SR4 QSFP+ optic (MTP 1x8 or 1x12), 100m over MMF, 8-pack		
10G-SFPP-ER	10GBASE-ER SFP+ optic (LC), for up to 40km over SMF		
10G-SFPP-ER-2	10GBASE-ER SFP+ optic (LC), for up to 40km over SMF 2-pack		
10G-SFPP-LR-8	10GBASE-LR, SFPP SMF (LC), for up to 10km over SMF, 8-pack		
10G-SFPP-LRM-8	10GBASE-LRM SFP+ optic (LC), for up to 220m over MMF, 8-pack		
10G-SFPP-TWX-0308	10GbE Direct Attach SFP+ to SFP+ Active copper cable, 3 m, 8-pack		
10G-SFPP-TWX-0508	10GbE Direct Attach SFP+ to SFP+ Active copper cable, 5 m, 8-pack		
10G-SFPP-ZR	10GBASE-ZR SFP+ optic (LC), for up to 80km over SMF		
10G-SFPP-ZR-2	10GBASE-ZR SFP+ Optic (LC), for up to 80km over SMF, 2-pack		
10G-SFPP-TWX-P-0308	10GbE Direct Attach SFP+ to SFP+ Passive copper cable, 3 m, 8-pack		
10G-SFPP-TWX-P-0508	10GbE Direct Attach SFP+ to SFP+ Passive copper cable, 5 m, 8-pack		
10G-SFPP-SR-SA8	10GBASE-SR, SFP+ optic (LC), target range 300m over MMF, standard temperature (0°C to 70°C),TAA compliant, 8 pack		
10G-SFPP-SR-S8	10GBASE-SR,SFPP MMF LC CONNECTOR 8-PACK (No TAA)		
10G-SFPP-LR-SA	10GBASE-LR, SFP+ optic (LC), for up to 10km over SMF, standard temperature (0°C to 70°C), TAA compliant		
10G-SFPP-LR-SA8	10GBASE-LR, SFP+ optic (LC), for up to 10km over SMF, -standard temperature (0°C to 70°C), TAA compliant, - 8 pack		
10G-SFPP-LR-S8	10GBASE-LR,SFPP SMF LC CONNECTOR 8-PACK (No TAA)		

# Software, Licenses, and Services for E-Rate



SmartZone 100 & 144

## PHYSICAL SMARTZONE

SKU/Part Number	Description	E-Rate Eligibility %	E-Rate Category
LE9-0001-SG00	E-Rate AP management license for SZ-100/vSZ 3.X, 1 RUCKUS AP access point with 1 year E-Rate Warranty.	100%	Cat 2 (IC, MIBS)
LE9-0001-SG03	E-Rate AP management license for SZ-100/vSZ 3.X, 1 RUCKUS AP access point with 3 year E-Rate Warranty.		
LE9-0001-SG05	E-Rate AP management license for SZ-100/vSZ 3.X, 1 RUCKUS AP access point with 5 years E-Rate Warranty.		
PE1-S124-US01	E-Rate SmartZone 100 with 2x10GE ports and 4x1GE ports, 1 Y E-Rate Warranty E-Rate SZ100 2x10GE, 4x1GE 1 yr wrnty		
PE1-S124-US03	E-Rate SmartZone 100 with 2x10GigE and 4 GigE ports with 3 years E-Rate Warranty. E-Rate SZ100 2x10GE, 4x1GE 3 yr wrnty		
PE1-S144-US01	E-Rate SmartZone 144 - (4x) 1GbE & (4x) 10GbE ports, 1 Yr E-Rate Warranty	100%	
PE1-S144-US03	E-Rate SmartZone 144 - (4x) 1GbE & (4x) 10GbE ports, 3 Yr E-Rate Warranty	33%	
PE1-S144-US05	E-Rate SmartZone 144 - (4x) 1GbE & (4x) 10GbE ports, 5 Yr E-Rate Warranty	20%	



sZV-E

## VIRTUAL SMARTZONE

SKU/Part Number	Description	E-Rate Eligibility %	E-Rate Category
L09-0001-SG00	AP management license for SZ-100/vSZ 3.X/SCG200/SZ300, 1 RUCKUS AP Access point. Order this when you intend to run software version from 3.2 onwards.	100%	Cat 2 (IC, MIBS)
S41-0001-1LSG 3LSG 5LSG	L09-0001-SGCX (switch license)		
L09-VRND-WW00	Virtual Ruckus Network Director, 1 Instance (no device management licenses included)		
L09-0001-SGHA	AP management license for High Availability. Supported products (Standby mode only): SZ-300, vSZ-H. 1x Ruckus AP on Standby Cluster only		
L09-0001-ND00	Ruckus Device management license for virtual RND, 1 Ruckus Network Device		
LE9-VSCG-WW01	E-Rate Virtual SmartZone 3.0 or newer software virtual appliance, 1 Instance, includes 1 AP license with 1 year E-Rate Warranty.		
LE9-VSCG-WW03	E-Rate Virtual SmartZone 3.0 or newer software virtual appliance, 1 Instance, includes 1 AP license with 5 year E-Rate Warranty.		
LE9-VSCG-WW05	E-Rate Virtual SmartZone 3.0 or newer software virtual appliance, 1 Instance, includes 1 AP license with 5 year E-Rate Warranty.		
S01-URL1-1LSZ	SmartZone URL Filtering 1 year subscription for 1 AP		
S01-URL1-3LSZ	SmartZone URL Filtering 3 year subscription for 1 AP		
S01-URL1-5LSZ	SmartZone URL Filtering 5 year subscription for 1 AP		

# Software, Licenses, and Services for E-Rate



SmartZone Data Plane

## SMARTZONE DATA PLANE AND VIRTUAL DATA PLANE

SKU/Part Number	Description	E-Rate Eligibility %	E-Rate Category
PE1-D144-US01	E-Rate SZ Dataplane 144 1 Yr E-Rate Warranty	100%	Cat 2 (BMIC)
PE1-D144-US03	E-Rate SZ Dataplane 144 3 Yr E-Rate Warranty	33%	Cat 2 (BMIC)
PE1-D144-US05	E-Rate SZ Dataplane 144 5 Yr E-Rate Warranty	20%	Cat 2 (BMIC)
S01-S144-1000	End User WatchDog Support for SmartZone 144 Controller Appliance, 1 Year	100%	Cat 2 (BMIC)
S01-S144-3000	End User WatchDog Support for SmartZone 144 Controller Appliance, 3 Year	33%	Cat 2 (BMIC)
S01-S144-5000	End User WatchDog Support for SmartZone 144 Controller Appliance, 5 Year	20%	Cat 2 (BMIC)
S01-D144-1000	WatchDog End User Support Smart Zone 144 Data Plane, 1Yr	100%	Cat 2 (BMIC)
S01-D144-3000	WatchDog End User Support Smart Zone 144 Data Plane, 3Yr	33%	Cat 2 (BMIC)
S01-D144-5000	WatchDog End User Support Smart Zone 144 Data Plane, 5Yr	20%	Cat 2 (BMIC)
S41-0001-1LER	E-Rate K-12 WatchDog Support for SZ/vSZ AP management license, 1 Yr	100%	Cat 2 (BMIC)
S41-0001-3LER	E-Rate K-12 WatchDog Support for SZ/vSZ AP management license, 3 Yr	33%	Cat 2 (BMIC)
S41-0001-5LER	E-Rate K-12 WatchDog Support for SZ/vSZ AP management license, 5 Yr	20%	Cat 2 (BMIC)
L09-vSZD-WW00	Virtual Data Plane 3.2 or newer software virtual appliance, 1 instance (includes throughput upto 1 Gbps)	100%	Cat 2 (BMIC)
L09-vSZD-BW10	Virtual Data Plane Bandwidth Upgrade - 1 instance ADD ON (throughput upto 10 Gbps)		
L09-vSZD-BWUL	Virtual Data Plane Bandwidth Upgrade - 1 instance ADD ON (No throughput cap)		
L09-vSZD-SVCM	Virtual Data Plane – Services (CALEA Mirroring) – 1 instance ADD ON		
L09-vSZD-SVL3	Virtual Data Plane – Services (L3 Roaming) – ADD ON – Needs minimum 2 vDP/DP instances		
L09-vSZD-SNAT	Virtual Data Plane – Services (NAT) – 100K Sessions - 1 instance ADD ON		
L09-vSZD-SDHP	Virtual Data Plane – Services (DHCP Server) – 1K IP Leases - 1 instance ADD ON		



# Software, Licenses, and Services for E-Rate



ZoneDirector 1200

ZONEDIRECTOR			
SKU/Part Number	Description	E-Rate Eligibility %	E-Rate Category
9E9-0001-ZD12	E-Rate ZoneDirector 1200 Single AP License Upgrade SKU with 1 year E-Rate Warranty. Max orderable upgrade license quantity is 145.	100%	Cat 2 (BMIC)
9E9-3001-ZD12	E-Rate ZoneDirector 1200 Single AP License Upgrade SKU with 3 years E-Rate Warranty. Max orderable upgrade license quantity is 145.		
9E9-5001-ZD12	E-Rate ZoneDirector 1200 Single AP License Upgrade SKU with 5 years E-Rate Warranty. Max orderable upgrade license quantity is 145.		



RUCKUS ONE			
SKU/Part Number	Description	E-Rate Eligibility %	E-Rate Category
CLD-ESNT-APSW-REC1	RUCKUS One Essentials 1-Yr Subscription for 1 network device (AP or Switch) for REC - Renewal.*	100%	IC/MIBS

RUCKUS ONE BUNDLE			
SKU/Part Number	Description	E-Rate Eligibility %	E-Rate Category
CLD-PROF-APSW-REC1	RUCKUS One Professional 1-Yr Subscription for 1 network device (AP or Switch) for REC - Renewal.	90% / 100%	IC/MIBS
CLD-PROF-APSW-REC3	RUCKUS One Professional 3-Yr Subscription for 1 network device (AP or Switch) for REC - Renewal.		
CLD-PROF-APSW-MSP1	RUCKUS One Professional 1-Yr Subscription for 1 network device (AP or Switch) for MSP - Renewal.		
CLD-PROF-APSW-MSP3	RUCKUS One Professional 3-Yr Subscription for 1 network device (AP or Switch) for MSP - Renewal.		

\* Switch RMT support is not included and is required to be purchased separately.

# Software, Licenses, and Services for E-Rate



## SWITCH MANAGEMENT BUNDLE

SKU/Part Number	Description	E-Rate Eligibility %	E-Rate Category
LE9-712P-SGX3	SZ ICX Mgt Lic RMT Spp 712P 3yr ERATE	100%	Cat 2 (IC, MIBS)
LE9-712P-SGX5	SZ ICX Mgt Lic RMT Spp 712P 5yr ERATE		
LE9-7150-SGX3	SZ ICX Mgt Lic RMT Spp 7150 3yr ERATE		
LE9-7150-SGX5	SZ ICX Mgt Lic RMT Spp 7150 5yr ERATE		
LE9-7550-SGX3	SZ ICX Mgt Lic RMT Spp 7550 3yr ERATE		
LE9-7550-SGX5	SZ ICX Mgt Lic RMT Spp 7550 5yr ERATE		
LE9-75ZF-SGX3	SZ ICX Mgt Lic RMT Spp 75ZF 3yr ERATE		
LE9-75ZF-SGX5	SZ ICX Mgt Lic RMT Spp 75ZF 5yr ERATE		
LE9-7850-SGX3	SZ ICX Mgt Lic RMT Spp 7850 3yr ERATE		
LE9-7850-SGX5	SZ ICX Mgt Lic RMT Spp 7850 5yr ERATE		

## SUBSCRIPTION BUNDLES OF RUCKUS ANALYTICS AND SMARTZONE

SKU/Part Number	Description	E-Rate Eligibility %	E-Rate Category
CLD-BNDL-SZWA-REC1	SZ AP Mgmt License for SZ144/vSZ, includes Support for AP 1yr, includes RUCKUS Analytics Subscription 1yr.	100%	Cat 2 (IC, MIBS)
CLD-BNDL-SZWA-REC3	SZ AP Mgmt License for SZ144/vSZ, includes Support for AP 3yr, includes RUCKUS Analytics Subscription 3yr.	33%	
CLD-BNDL-SZWA-REC5	SZ AP Mgmt License for SZ144/vSZ, includes Support for AP 5yr, includes RUCKUS Analytics Subscription 5yr.	20%	
CLD-BNDL-SZSA- EDU3	E-RATE SmartZone RA support bundle for SZ144/vSZ, includes 5yr Warranty for 1xAP, includes basic RUCKUS Analytics Subscription 5yr.	25%	
CLD-BNDL-SZSA-EDU5	E-RATE SmartZone RA support bundle for SZ144/vSZ, includes 5yr Warranty for 1xAP, includes basic RUCKUS Analytics Subscription 5yr..	25%	

# Software, Licenses, and Services for E-Rate



RUCKUS Analytics

## RUCKUS ANALYTICS

SKU/Part Number	Description	E-Rate Eligibility %	E-Rate Category
CLD-ANAP-1001	RUCKUS Analytics 1 year subscription for 1 Cloud or SZ managed AP or ICX switch	0%	Cat 2 (MIBS)
CLD-ANAP-3001	RUCKUS Analytics 3 year subscription for 1 Cloud or SZ managed AP or ICX switch		
CLD-ANAP-5001	RUCKUS Analytics 5 year subscription for 1 Cloud or SZ managed AP or ICX switch		

## WATCHDOG REMOTE SUPPORT FOR ICX

SKU/Part Number	Description	E-Rate Eligibility %	E-Rate Category
ICX7150-SVL-RMT-1	WatchDog REMOTE SUPPORT, ICX7150-24, 24P ,48, 48P, 48PF, C12P, C10ZP & -24F	100%	Cat 2 (BMIC/ MIBS)
ICX7150-SVL-RMT-3	WatchDog REMOTE SUPPORT, ICX7150-24, 24P ,48, 48P, 48PF, C12P, C10ZP & -24F	33%	Cat 2 (BMIC/ MIBS)
ICX7150-SVL-RMT-5	WatchDog REMOTE SUPPORT, ICX7150-24, 24P ,48, 48P, 48PF, C12P, C10ZP & -24F	20%	Cat 2 (BMIC/ MIBS)
ICX7150-C08P-SVL-RMT-1	Watchdog Remote Support, ICX7150-C08P SKUs Only; 1Yr duration	100%	Cat 2 (BMIC/ MIBS)
ICX7150-C08P-SVL-RMT-3	Watchdog Remote Support, ICX7150-C08P SKUs Only; 3Yr duration	33%	Cat 2 (BMIC/ MIBS)
ICX7150-C08P-SVL-RMT-5	Watchdog Remote Support, ICX7150-C08P SKUs Only; 5Yr duration	20%	Cat 2 (BMIC/ MIBS)
ICX7150-48ZP-SVL-RMT-1	WatchDog REMOTE SUPPORT, ICX 7150-48ZP SKUs only	100%	Cat 2 (BMIC/ MIBS)
ICX7150-48ZP-SVL-RMT-3	WatchDog REMOTE SUPPORT, ICX 7150-48ZP SKUs only	33%	Cat 2 (BMIC/ MIBS)
ICX7150-48ZP-SVL-RMT-5	WatchDog REMOTE SUPPORT, ICX 7150-48ZP SKUs only	20%	Cat 2 (BMIC/ MIBS)
ICX7850-SVL-RMT-1	WatchDog REMOTE SUPPORT, ICX 7850, 1 YR	100%	Cat 2 (BMIC/ MIBS)
ICX7850-SVL-RMT-3	WatchDog REMOTE SUPPORT, ICX 7850, 3 YR	33%	Cat 2 (BMIC/ MIBS)
ICX7850-SVL-RMT-5	WatchDog REMOTE SUPPORT, ICX 7850, 5 YR	20%	Cat 2 (BMIC/ MIBS)
ICX7550-S-RMT-1	Watchdog Remote Support, ICX7550-24,-48; -24P; -48P SKUs Only; 1 Yr duration	100%	Cat 2 (BMIC/ MIBS)
ICX7550-S-RMT-3	Watchdog Remote Support, ICX7550-24,-48; -24P; -48P SKUs Only; 3 Yr duration	33%	Cat 2 (BMIC/ MIBS)
ICX7550-S-RMT-5	Watchdog Remote Support, ICX7550-24,-48; -24P; -48P SKUs Only; 5 Yr duration	20%	Cat 2 (BMIC/ MIBS)

# Software, Licenses, and Services for E-Rate

## WATCHDOG SUPPORT FOR SMARTZONE

SKU/Part Number	Description	E-Rate Eligibility %	E-Rate Category
S41-S144-10ER	E-Rate K-12 Education WatchDog Support for SZ 144, 1 Yr	100%	Cat 2 (BMIC/ MIBS)
S41-S144-30ER	E-Rate K-12 Education WatchDog Support for SZ 144, 3 Yr	33%	
S41-S144-50ER	E-Rate K-12 Education WatchDog Support for SZ 144, 5 Yr	20%	
S41-D144-10ER	E-Rate K-12 Education WatchDog Support for SZD 144, 1 Yr	100%	
S41-D144-30ER	E-Rate K-12 Education WatchDog Support for SZD 144, 3 Yr	33%	
S41-D144-50ER	E-Rate K-12 Education WatchDog Support for SZD 144, 5 Yr	20%	

## WATCHDOG SUPPORT FOR UNLEASHED ACCESS POINTS

SKU/Part Number	Description	E-Rate Eligibility %	E-Rate Category
841-ULAP-1UER	E-Rate support for Unleashed APs, no Adv HW replacement, 1 Yr	100%	Cat 2 (BMIC)
841-ULAP-3UER	E-Rate support for Unleashed APs, no Adv HW replacement, 3 Yr	33%	
841-ULAP-5UER	E-Rate support for Unleashed APs, no Adv HW replacement, 5 Yr	20%	

## EDUCATION WATCHDOG SUPPORT FOR ZONEDIRECTOR 1205

SKU/Part Number	Description	E-Rate Eligibility %	E-Rate Category
841-1201-1LER	E-Rate K-12 Education WatchDog Support for ZoneDirector AP management license, 1 Year	100%	Cat 2 (BMIC)
841-1201-3LER	E-Rate K-12 Education WatchDog Support for ZoneDirector AP management license, 3 Year	33%	
841-1201-5LER	E-Rate K-12 Education WatchDog Support for ZoneDirector AP management license, 5 Year	20%	

## About RUCKUS Networks

RUCKUS Networks builds and delivers purpose-driven networks that perform in the demanding environments of the industries we serve. Together with our network of trusted go-to-market partners, we empower our customers to deliver exceptional experiences to the guests, students, residents, citizens and employees who count on them.

[www.ruckusnetworks.com](http://www.ruckusnetworks.com)

Visit our website or contact your local RUCKUS representative for more information.

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CO-115185.6-EN (08/24)


**RUCKUS**<sup>®</sup>  
**COMMScope**


# Enterprise

*VectorFi Enterprise* is a topnotch WiFi solution comprised of a suite of hardware, software, and online data storage.

 Secure Cloud-Based Data Storage


 Customizable WiFi Names

 Optimized Network Designs

 One Time Setup Fee

 Access Point Installation

 Eye Catching Landing Pages

 99.99% Service Uptime

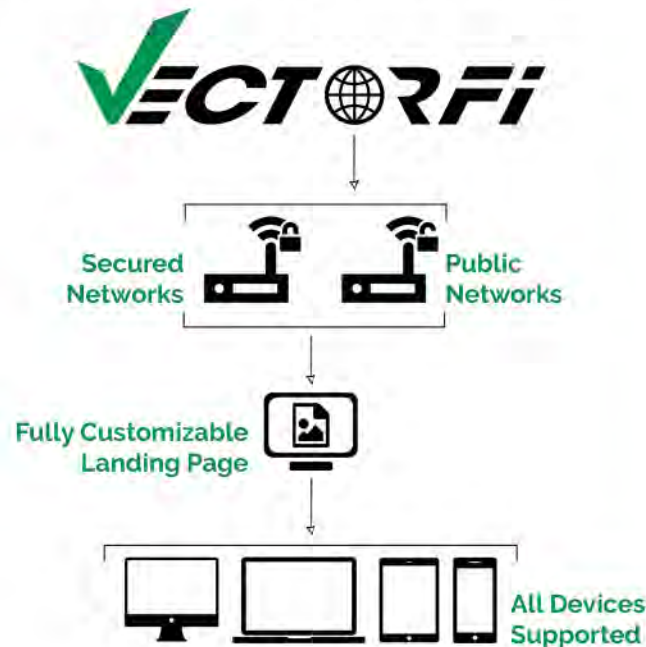
*VectorFi Enterprise* is rugged and grows with your business needs.



Reliable. Simple. Fast.

Why just have WiFi, when you can have *VectorFi*?

***VectorFi* is an all-inclusive wireless service for companies who want to spend more time partnering with their customers and NO time dealing with the WiFi technical details.**





**Created and Invented  
by VTG Experts**


   
Simple. Straightforward. Honest.

# White Glove

*VectorFi White Glove* is a blazing fast WiFi solution for businesses who need coverage in every corner, whether it's in the same building or across the country!

 Secure Cloud-Based Data Storage

 Customizable WiFi Names

 Optimized Network Designs

 Monthly Fee

 Multi-Point Installation

 Flexible Leasing Options

 Free Ongoing Upgrades

*VectorFi White Glove* is the WiFi partnership that will set up, manage, store, and report your data - so you don't have to.



# RUCKUS® R560

Indoor Wi-Fi 6E (802.11ax) Access Point with 4.7 Gbps Data Rate



## Benefits

### Connect more devices simultaneously

Improve device performance, by enabling more simultaneous device connections with built-in 6 spatial streams (2x2:2 concurrent in 2.4GHz, 5GHz, and 6GHz), MU-MIMO and OFDMA technology.

### High client density and performance

Provides exceptional end-user experience within large meeting halls, general enterprise spaces, and large classrooms with a combined data rate of 4.7 Gbps.

### BeamFlex+ Adaptive Antenna Technology

For greater speed, fewer errors, and instant bandwidth delivery, RUCKUS BeamFlex+ patented technology offers first-of-its-kind smart antenna technology that maximizes signal coverage, throughput, and network capacity and work with any client. It further increases MIMO diversity gain and maximize spatial multiplexing potential.

### Converged Access Point

Allows customers to eliminate siloed networks and unify WiFi and non-WiFi wireless technologies into one single network by using built-in BLE and Zigbee, and also expanding to any future wireless technologies through the USB port.

### 5 GbE eliminates bottleneck

Optimized multi-gigabit Wi-Fi performance delivered using the built-in 1/2.5/5GbE port to connect to multigigabit switches.

### Multiple management options

Manage the R560 with on premise physical/ virtual appliances and control auto-provisioning for faster deployment and seamless firmware upgrades.

### Enhanced Security

The latest Wi-Fi security standard with WPA3 and receive enhanced protection from man-in-the-middle attacks. Adds the power of RUCKUS DPSK to WPA3/SAE combining enhanced security with the flexibility and ease of use of dynamic passphrase to secure network access.

### More Than Wi-Fi

Support solutions beyond Wi-Fi with RUCKUS IoT Suite, RUCKUS Analytics, RUCKUS Cloudpath Enrollment System and onboarding software

Bandwidth-hungry ultra-high definition video, virtual reality, Internet of Things (IoT). An explosion of new devices and content. With these kinds of demands, organizations in every industry need more from their Wi-Fi. But with hundreds of devices and nonstop wireless noise and interference, busy indoor spaces can make challenging wireless environments.

The RUCKUS R560 is a mid-range Wi-Fi 6E tri-radio, tri-band concurrent indoor AP that delivers 6 spatial streams (2x2:2 concurrent in 2.4GHz, 5GHz, and 6GHz) and supports OFDMA, TWT and MU-MIMO capabilities. It delivers industry-leading performance and reliability in demanding high-density environments with a combined data rate of 4.7 Gbps and efficiently managing up to 1536 clients. Furthermore, a 5 Gbps Ethernet port ensures the backhaul is not a bottleneck for full use of available Wi-Fi capacity.

Also, wireless requirements within enterprises are expanding beyond Wi-Fi. The R560 has built-in IoT radios with onboard BLE and Zigbee capabilities. In addition, the R560 is a converged access point that allows customers to seamlessly integrate any new wireless technologies with our USB port.

The R560 addresses the increasing client demands in transit hubs, auditoriums, conference centers, and other high traffic indoor spaces. It is the perfect choice for data-intensive streaming multimedia applications like 4K video transmissions, while supporting latency sensitive voice and data applications with stringent quality-of-service requirements.

The R560, with built-in RUCKUS exclusive technology, dramatically improves network performance through a combination of patented wireless innovations and learning algorithms that includes:

- **Airtime Decongestion:** Increases average network throughput in heavily congested environments
- **Transient Client management:** Reduces interference traffic from unconnected Wi-Fi devices
- **BeamFlex® + Adaptive Antennas:** Extended coverage range and optimized throughput with patented dynamic multi-directional antennas and radio patterns and work with any client.

Whether you are deploying ten or ten thousand APs, the R560 is also easy to manage through RUCKUS multiple management options including cloud based and on premises controllers.

# RUCKUS<sup>®</sup> R560

Indoor Wi-Fi 6E (802.11ax) Access Point with 4.7 Gbps Data Rate





# RUCKUS® R560

Indoor Wi-Fi 6E (802.11ax) Access Point with 4.7 Gbps Data Rate

## Access Point Antenna Pattern

RUCKUS' BeamFlex+ adaptive antennas allow the R560 AP to dynamically choose among a host of antenna patterns (over 4,000 possible combinations) in real-time to establish the best possible connection with every device. This leads to:

- Better Wi-Fi coverage
- Reduced RF interference

Traditional omni-directional antennas, found in generic access points, oversaturate the environment by needlessly radiating RF signals in all directions. In contrast, the RUCKUS BeamFlex+ adaptive antenna directs the radio signals per-device on a packet by-packet basis to optimize Wi-Fi coverage and capacity in real-time to support high device density environments. BeamFlex+ operates without the need for device feedback and hence can benefit even devices using legacy standards.

Figure 1. Example of BeamFlex+ pattern

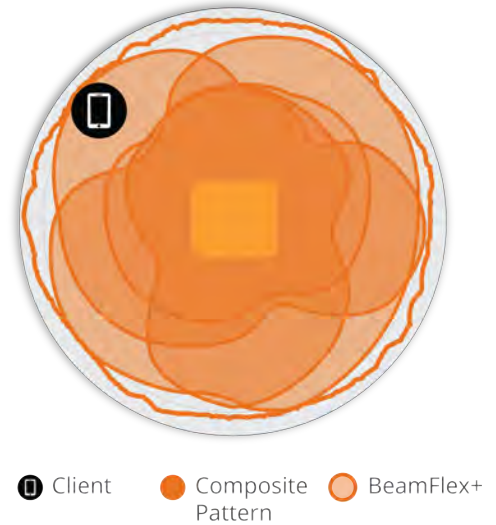


Figure 2. R560 2.4GHz Azimuth Antenna Pattern



Figure 3. R560 5GHz Azimuth Antenna Pattern



Figure 4. R560 6GHz Azimuth Antenna Pattern



Figure 5. R560 2.4GHz Elevation Antenna Pattern



Figure 6. R560 5GHz Elevation Antenna Pattern



Figure 7. R560 6GHz Elevation Antenna Pattern



Note: The outer trace represents the composite RF footprint of all possible BeamFlex+ antenna patterns, while the inner trace represents one BeamFlex+ antenna pattern within the composite outer trace.

# RUCKUS® R560

Indoor Wi-Fi 6E (802.11ax) Access Point with 4.7 Gbps Data Rate

Wi-Fi	
Wi-Fi Standards	<ul style="list-style-type: none"><li>IEEE 802/11a/b/g/n/ac/ax, WiFi-6E</li></ul>
Supported Rates	<ul style="list-style-type: none"><li>802.11ax: 4 to 2402 Mbps</li><li>802.11ac: 6.5 to 866 Mbps</li><li>802.11n: 6.5 to 300 Mbps</li><li>802.11a/g: 6 to 54 Mbps</li><li>802.11b: 1 to 11 Mbps</li></ul>
Supported Channels	<ul style="list-style-type: none"><li>2.4GHz: 1-13</li><li>5GHz: 36-64, 100-144, 149-165</li><li>6GHz: 1-233</li></ul>
MIMO	<ul style="list-style-type: none"><li>2x2 SU-MIMO</li><li>2x2 MU-MIMO</li></ul>
Spatial Streams	<ul style="list-style-type: none"><li>2 for both SU-MIMO &amp; MU-MIMO</li></ul>
Radio Chains and Streams	<ul style="list-style-type: none"><li>2x2:2</li></ul>
Channelization	<ul style="list-style-type: none"><li>20, 40, 80, 160 MHz</li></ul>
Security	<ul style="list-style-type: none"><li>WEP, WPA, WPA-PSK, WPA2, WPA2-PSK, WPA3, WPA3-SAE, OWE, PMF (802.11w), Dynamic PSK</li><li>WIPS/WIDS</li></ul>
Other Wi-Fi Features	<ul style="list-style-type: none"><li>WMM, Power Save, Tx Beamforming, LDPC, STBC, 802.11r/k/v</li><li>MBO</li><li>Web Authentication and Guest Access</li><li>Hotspot, Hotspot 2.0</li><li>Captive Portal</li><li>WISPr</li></ul>

RF	
Antenna Type	<ul style="list-style-type: none"><li>BeamFlex+ adaptive antennas with polarization diversity</li><li>Adaptive antenna that provides 4,000+ unique antenna patterns per band</li></ul>
Antenna Gain (max)	<ul style="list-style-type: none"><li>Up to 4dBi</li></ul>
Peak Transmit Power (Tx port/ chain + Combining gain)	<ul style="list-style-type: none"><li>2.4GHz: 26dBm</li><li>5GHz: 25dBm</li><li>6GHz: 22dBm</li></ul>
Frequency Bands	<ul style="list-style-type: none"><li>ISM (2.4-2.484GHz)</li><li>U-NII-1 (5.15-5.25GHz)</li><li>U-NII-2A (5.25-5.35GHz)</li><li>U-NII-2C (5.47-5.725GHz)</li><li>U-NII-3 (5.725-5.85GHz)</li><li>U-NII-5 (5.925-6.425GHz)</li><li>U-NII-6 (6.425-6.525GHz)</li><li>U-NII-7 (6.525-6.875GHz)</li><li>U-NII-8 (6.875-7.125GHz)</li></ul>

2.4GHZ RECEIVE SENSITIVITY (dBm)							
HT20		HT40		VHT20		VHT40	
MCS0	MCS7	MCS0	MCS7	MCS0	MCS7	MCS0	MCS7
-94	-75	-91	-72	-94	-75	-91	-72
HE 20				HE40			
MCS0	MCS7	MCS9	MCS11	MCS0	MCS7	MCS9	MCS11
-94	-75	-70	-64	-91	-72	-67	-61

5GHZ RECEIVE SENSITIVITY (dBm)											
VHT20				VHT40				VHT80			
MCS0	MCS7	MCS8	MCS9	MCS0	MCS7	MCS8	MCS9	MCS0	MCS7	MCS8	MCS9
-94	-75	-72	-69	-91	-72	-69	-66	-88	-69	-66	-63
HE20				HE40				HE80			
MCS0	MCS7	MCS9	MCS11	MCS0	MCS7	MCS9	MCS11	MCS0	MCS7	MCS9	MCS11
-94	-75	-69	-64	-91	-72	-66	-61	-88	-69	-63	-58

6GHZ RECEIVE SENSITIVITY (dBm)							
HE20				HE40			
MCS0	MCS7	MCS9	MCS11	MCS0	MCS7	MCS9	MCS11
-94	-75	-70	-64	-91	-72	-67	-61
HE80				HE160			
MCS0	MCS7	MCS9	MCS11	MCS0	MCS7	MCS9	MCS11
-88	-69	-64	-58	-85	-66	-61	-55

2.4GHZ TX POWER TARGET (PER CHAIN)	
Rate	Pout (dBm)
MCS0 HT20	22
MCS7 HT20	17.5
MCS8 VHT20	17
MCS9 VHT40	16
MCS11 HE40	14

5GHZ TX POWER TARGET (PER CHAIN)	
Rate	Pout (dBm)
MCS0, VHT20	22
MCS7, VHT40, VHT80	18
MCS9, VHT40, VHT80	16
MCS11, HE20, HE40, HE80	14

6GHZ TX POWER TARGET (PER CHAIN)	
Rate	Pout (dBm)
MCS0, HE160	22
MCS7, HE160	17.5
MCS9, HE160	16
MCS11, HE160	14

# RUCKUS® R560

Indoor Wi-Fi 6E (802.11ax) Access Point with 4.7 Gbps Data Rate

POWER CONSUMPTION			
Mode	Power Consumption	System Configuration	Wi-Fi Radios
DC Power	32.4W	<ul style="list-style-type: none"><li>5Gbps Ethernet Enabled</li><li>1Gbps Ethernet Enabled</li><li>USB Enabled (3W)</li><li>IoT Enabled (selectable)</li></ul>	2.4GHz (2x2) Tx 23dBm 5GHz (2x2) Tx 22dBm 6GHz (2x2) Tx 22dBm
802.3bt5 PoH, uPoE	31W	<ul style="list-style-type: none"><li>5Gbps Ethernet Enabled</li><li>1Gbps Ethernet Enabled</li><li>USB Enabled (3W)</li><li>IoT Enabled (selectable)</li></ul>	2.4GHz (2x2) Tx 23dBm 5GHz (2x2) Tx 22dBm 6GHz (2x2) Tx 22dBm
802.3at	25.0W	<ul style="list-style-type: none"><li>5Gbps Ethernet Enabled</li><li>1Gbps Ethernet Disabled</li><li>USB Disabled (0W)</li><li>IoT Enabled (selectable)</li></ul>	2.4GHz (2x2) Tx 23 dBm 5GHz (2x2) Tx 22dBm 6GHz (2x2) Tx 19dBm

PERFORMANCE AND CAPACITY	
Peak PHY Rates	<ul style="list-style-type: none"><li>2.4GHz: 591 Mbps</li><li>5GHz: 1237.5 Mbps</li><li>6GHz: 2882 Mbps (MCS13), 2402 Mbps (MCS11)</li></ul>
Client Capacity	<ul style="list-style-type: none"><li>Up to 1536 clients per AP</li></ul>
SSID	<ul style="list-style-type: none"><li>Up to 33 per AP</li></ul>

RUCKUS RADIO MANAGEMENT	
Antenna Optimization	<ul style="list-style-type: none"><li>BeamFlex+</li><li>Polarization Diversity with Maximal Ratio Combining (PD-MRC)</li></ul>
Wi-Fi Channel Management	<ul style="list-style-type: none"><li>ChannelFly</li><li>Background Scan Based</li></ul>
Client Density Management	<ul style="list-style-type: none"><li>Adaptive Band Balancing</li><li>Client Load Balancing</li><li>Airtime Fairness</li><li>Airtime-based WLAN Prioritization</li></ul>
SmartCast Quality of Service	<ul style="list-style-type: none"><li>QoS-based scheduling</li><li>Directed Multicast</li><li>L2/L3/L4 ACLs</li></ul>
Mobility	<ul style="list-style-type: none"><li>SmartRoam</li></ul>
Diagnostic Tools	<ul style="list-style-type: none"><li>Spectrum Analysis</li><li>SpeedFlex</li></ul>

NETWORKING	
Controller Platform Support	<ul style="list-style-type: none"><li>SmartZone</li><li>Standalone</li><li>Cloud (Future support)</li></ul>
Mesh	<ul style="list-style-type: none"><li>SmartMesh™ wireless meshing technology. Self-healing Mesh in 2.4 GHz, 5GHz, and 6GHz</li></ul>
IP	<ul style="list-style-type: none"><li>IPv4, IPv6, dual-stack</li></ul>
VLAN	<ul style="list-style-type: none"><li>802.1Q (1 per BSSID or dynamic per user based on RADIUS)</li><li>VLAN Pooling</li><li>Port-based</li></ul>
802.1x	<ul style="list-style-type: none"><li>Authenticator &amp; Supplicant</li></ul>
Tunnel	<ul style="list-style-type: none"><li>GRE, Soft-GRE</li></ul>
Policy Management Tools	<ul style="list-style-type: none"><li>Application Recognition and Control</li><li>Access Control Lists</li><li>Device Fingerprinting</li><li>Rate Limiting</li><li>URL Filtering</li></ul>
IoT Capable	<ul style="list-style-type: none"><li>Intelgrated BLE and Zigbee (1 radio, selectable)</li></ul>

PHYSICAL INTERFACES	
Ethernet	<ul style="list-style-type: none"><li>One 100M/1/2.5/5G Ethernet (PoE) port and one 10M/100M/1G Ethernet port</li><li>Power over Ethernet (802.3af/at/bt) with Category 5e (or better) cable</li><li>LLDP support</li></ul>
USB	<ul style="list-style-type: none"><li>1 USB 2.0 port, Type A</li></ul>

PHYSICAL CHARACTERISTICS	
Physical Size	<ul style="list-style-type: none"><li>23.3cm (L), 23.3cm (W), 4.8cm (H)</li><li>9.2in (L) x 9.2in (W) x 1.9in (H)</li></ul>
Weight	<ul style="list-style-type: none"><li>1.09kg</li><li>2.40lbs</li></ul>
Mounting	<ul style="list-style-type: none"><li>Wall, acoustic ceiling, desk</li><li>Bracket (902-0120-0000)</li></ul>
Physical Security	<ul style="list-style-type: none"><li>Hidden latching mechanism</li><li>Secure bracket (sold separately) (902-0120-0000)</li></ul>
Operating Temperature	<ul style="list-style-type: none"><li>0°C (32°F) to 50°C (122°F)</li></ul>
Operating Humidity	<ul style="list-style-type: none"><li>Up to 95%, non-condensing</li></ul>

# RUCKUS® R560

Indoor Wi-Fi 6E (802.11ax) Access Point with 4.7 Gbps Data Rate

CERTIFICATIONS AND COMPLIANCE	
Wi-Fi Alliance <sup>1</sup>	<ul style="list-style-type: none"><li>Wi-Fi CERTIFIED™ a, b, g, n, ac, 6, 6E</li><li>Passpoint®, Vantage</li></ul>
Standards Compliance <sup>2</sup>	<ul style="list-style-type: none"><li>IEC/EN/UL 60950-1 Safety</li><li>IEC/EN/UL 62368-1 Safety</li><li>EN 60601-1-2 Medical</li><li>EN 61000-4-2/3/5 Immunity</li><li>EN 50121-1 Railway EMC</li><li>EN 50121-4 Railway Immunity</li><li>IEC 61373 Railway Shock &amp; Vibration</li><li>UL 2043 Plenum</li><li>EN 62311 Human Safety/RF Exposure</li><li>WEEE &amp; RoHS</li><li>ISTA 2A Transportation</li></ul>

SOFTWARE AND SERVICES	
Location Based Services	<ul style="list-style-type: none"><li>SPoT</li></ul>
Network Analytics	<ul style="list-style-type: none"><li>SmartCell Insight (SCI), RUCKUS Analytics</li></ul>
Security and Policy	<ul style="list-style-type: none"><li>Cloudpath</li></ul>

ORDERING INFORMATION	
901-R560-XX00	<ul style="list-style-type: none"><li>R560 tri-band (6GHz, 5GHz, and 2.4GHz concurrent), tri-radio Wi-Fi 6E wireless access point, 2x2:2 streams, adaptive antennas, dual ports, onboard BLE and Zigbee, PoE support. Includes adjustable acoustic drop ceiling bracket. One Ethernet port is 5GbE. Does not include power adaptor.</li></ul>

See RUCKUS price list for country-specific ordering information.

Warranty: Sold with a limited lifetime warranty.

For details see: <http://support.ruckuswireless.com/warranty>.

OPTIONAL ACCESSORIES	
902-1180-XX00	<ul style="list-style-type: none"><li>Multigigabit PoE injector (2.5/5/10)-BaseT PoE port, 60W</li></ul>
902-0120-0000	<ul style="list-style-type: none"><li>Spare, Accessory Mounting Bracket</li></ul>
902-1170-XX00	<ul style="list-style-type: none"><li>Power Supply (48V, 0.75A, 36W)</li></ul>

PLEASE NOTE: When ordering Indoor APs, you must specify the destination region by indicating -US, -WW, or -Z2 instead of XX. When ordering PoE injectors or power supplies, you must specify the destination region by indicating -US, -EU, -AU, -BR, -CN, -IN, -JP, -KR, -SA, -UK, or -UN instead of -XX. For access points, -Z2 applies to the following countries: Algeria, Egypt, Israel, Morocco, Tunisia, and Vietnam.

<sup>1</sup> For complete list of WFA certifications, please see Wi-Fi Alliance website.

<sup>2</sup> For current certification status, please see price list.

## About RUCKUS Networks

RUCKUS Networks builds and delivers purpose-driven networks that perform in the demanding environments of the industries we serve. Together with our network of trusted go-to-market partners, we empower our customers to deliver exceptional experiences to the guests, students, residents, citizens and employees who count on them.

[www.ruckusnetworks.com](http://www.ruckusnetworks.com)

Visit our website or contact your local RUCKUS representative for more information.

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# RUCKUS® R650

Indoor Wi-Fi 6 (802.11ax) 4x4:4 Wi-Fi Access Point with 2.5Gbps backhaul and 6 spatial streams



## Benefits

### Stunning Wi-Fi performance

Mitigate interference and extend coverage with patented BeamFlex® + adaptive antenna technology utilizing several directional antenna patterns.

### Serve more devices

Connect more devices simultaneously with six MU-MIMO spatial streams and concurrent dual-band 2.4/5GHz radios while enhancing device performance.

### Converged access point

Allow customers to eliminate siloed networks and unify Wi-Fi and non-Wi-Fi wireless technologies into one single network by using built-in BLE and Zigbee, and also expanding to any future wireless technologies.

### Automate optimal throughput

ChannelFly® dynamic channel technology uses machine learning to automatically find the least congested channels. You always get the highest throughput the band can support.

### Multiple management options

Manage the R650 from the cloud, with on-premises physical/virtual appliances, or without a controller.

### Better mesh networking

Reduce expensive cabling, and complex mesh configurations by checking a box with SmartMesh wireless meshing technology to dynamically create self-forming, self-healing mesh networks.

### More than Wi-Fi

Support services beyond Wi-Fi with [Ruckus IoT Suite](#), [Cloudpath](#)® security and onboarding software, [SPoT](#) Wi-Fi locationing engine, and [SCI](#) network analytics.

**Wi-Fi capacity requirements in office buildings, classrooms, and retail venues are rapidly raising due to increase in Wi-Fi connected devices, non-Wi-Fi IoT devices and bandwidth-hungry applications.**

The RUCKUS® R650 access point (AP) with the latest Wi-Fi 6 (802.11 ax) technology delivers increased capacity, improved coverage and performance in dense environments. The R650 is our mid-range dual-band, dual-concurrent AP that supports six spatial streams (4x4:4 in 5GHz, 2x2:2 in 2.4GHz). The R650 supports peak data rates of up to 2974 Mbps and efficiently manages up to 512 clients connections. Furthermore, 2.5GbE Ethernet ensures the backhaul will not be a bottleneck for full use of available Wi-Fi capacity.

Also, wireless requirements within enterprises are expanding beyond Wi-Fi with BLE, Zigbee and many other non-Wi-Fi wireless technologies resulting in creation of network silos. Enterprises need a unified platform to eliminate network silos. The RUCKUS AP portfolio is equipped to solve these challenges.

The R650 has built-in IoT radios with onboard BLE and Zigbee capabilities. In addition, the R650 is a converged access point that allows customers to seamlessly integrate any new wireless technologies with the pluggable IoT module.

The R650 is packed with Ruckus patented technologies in addition to Wi-Fi 6 features such as OFDMA, MU-MIMO and TWT. The R650 is ideal for medium-density deployments such as office buildings, K-12 classrooms, libraries and retail venues.

The R650 Wi-Fi 6 AP incorporates patented technologies found only in the Ruckus Wi-Fi portfolio.

- **BeamFlex+ Antennas:** Extended coverage and optimized throughput with patented multi-directional antennas and radio patterns
- **ChannelFly:** Improved throughput with dynamically changing the channels to use least congested channel
- **Ruckus Ultra-High-Density Technology Suite:** Dramatically improved network performance with technologies such as Airtime Decongestion, Transient Client Management etc.

Whether you are deploying ten or ten thousand APs, the R650 is also easy to manage through Ruckus' physical and virtual management options.

# RUCKUS® R650

Indoor Wi-Fi 6 (802.11ax) 4x4:4 Wi-Fi Access Point with 2.5Gbps backhaul and 6 spatial streams

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Front view



# RUCKUS® R650

Indoor Wi-Fi 6 (802.11ax) 4x4:4 Wi-Fi Access Point with 2.5Gbps backhaul and 6 spatial streams

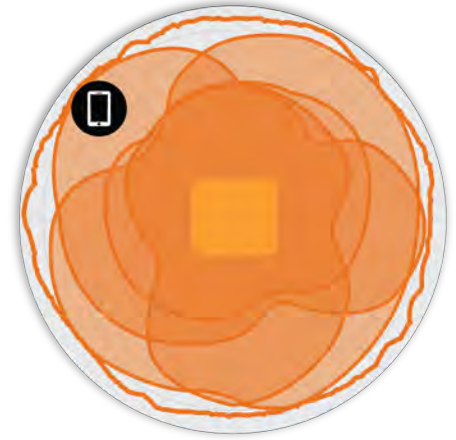
## Access Point Antenna Pattern

Ruckus' BeamFlex+ adaptive antennas allow the R650 AP to dynamically choose among a host of antenna patterns in real-time to establish the best possible connection with every device. This leads to:

- Better Wi-Fi coverage
- Reduced RF interference

Traditional omni-directional antennas, found in generic access points, oversaturate the environment by needlessly radiating RF signals in all directions. In contrast, the Ruckus BeamFlex+ adaptive antenna directs the radio signals per- device on a packet by-packet basis to optimize Wi-Fi coverage and capacity in real- time to support high device density environments. BeamFlex+ operates without the need for device feedback and hence can benefit even devices using legacy standards.

Figure 1. Example of BeamFlex+ pattern



Client Composite Pattern BeamFlex+ Pattern

Figure 2. R650 2.4GHz Azimuth Antenna Patterns



Figure 3. R650 5GHz Azimuth Antenna Patterns



Figure 4. R650 2.4GHz Elevation Antenna Patterns



Figure 5. R650 5GHz Elevation Antenna Patterns



Note: The outer trace represents the composite RF footprint of all possible BeamFlex+ antenna patterns, while the inner trace represents one BeamFlex+ antenna pattern within the composite outer trace.



# RUCKUS® R650

Indoor Wi-Fi 6 (802.11ax) 4x4:4 Wi-Fi Access Point with 2.5Gbps backhaul and 6 spatial streams

Wi-Fi	
Wi-Fi Standards	<ul style="list-style-type: none"><li>IEEE 802.11a/b/g/n/ac/ax</li></ul>
Supported Rates	<ul style="list-style-type: none"><li>802.11ax: 4 to 2400 Mbps</li><li>802.11ac: 6.5 to 1732 Mbps</li><li>802.11n: 6.5 to 600 Mbps</li><li>802.11a/g: 6 to 54 Mbps</li><li>802.11b: 1 to 11 Mbps</li></ul>
Supported Channels	<ul style="list-style-type: none"><li>2.4GHz: 1-13</li><li>5GHz: 36-64, 100-144, 149-165</li></ul>
MIMO	<ul style="list-style-type: none"><li>4x4 SU-MIMO</li><li>4x4 MU-MIMO</li></ul>
Spatial Streams	<ul style="list-style-type: none"><li>4 streams SU/MU MIMO 5GHz</li><li>2 streams SU/MU MIMO 2.4GHz</li></ul>
Radio Chains and Streams	<ul style="list-style-type: none"><li>4x4:4 (5GHz)</li><li>2x2:2 (2.4GHz)</li></ul>
Channelization	<ul style="list-style-type: none"><li>20, 40, 80, 160/80+80MHz</li></ul>
Security	<ul style="list-style-type: none"><li>WPA-PSK, WPA-TKIP, WPA2 AES, WPA3, 802.11i, Dynamic PSK, OWE</li><li>WIPS/WIDS</li></ul>
Other Wi-Fi Features	<ul style="list-style-type: none"><li>WMM, Power Save, Tx Beamforming, LDPC, STBC, 802.11r/k/v</li><li>Hotspot</li><li>Hotspot 2.0</li><li>Captive Portal</li><li>WISPr</li></ul>

RF	
Antenna Type	<ul style="list-style-type: none"><li>BeamFlex+ adaptive antennas with polarization diversity</li><li>Adaptive antenna that provides unique antenna patterns per band</li></ul>
Antenna Gain (max)	<ul style="list-style-type: none"><li>Up to 3dBi</li></ul>
Peak Transmit Power (Tx port/chain + Combining gain)	<ul style="list-style-type: none"><li>2.4GHz: 26dBm</li><li>5GHz: 28 dBm</li></ul>
Frequency Bands	<ul style="list-style-type: none"><li>ISM (2.4-2.484GHz)</li><li>U-NII-1 (5.15-5.25GHz)</li><li>U-NII-2A (5.25-5.35GHz)</li><li>U-NII-2C (5.47-5.725GHz)</li><li>U-NII-3 (5.725-5.85GHz)</li></ul>

2.4GHZ RECEIVE SENSITIVITY (dBm)							
HT20		HT40		VHT20		VHT40	
MCS0	MCS7	MCS0	MCS7	MCS0	MCS7	MCS0	MCS7
-93	-75	-90	-72	-93	-75	-90	-72
HE 20				HE40			
MCS0	MCS7	MCS9	MCS11	MCS0	MCS7	MCS9	MCS11
-93	-75	-70	-64	-90	-72	-67	-61

5GHZ RECEIVE SENSITIVITY (dBm)											
VHT20				VHT40				VHT80			
MCS0	MCS7	MCS8	MCS9	MCS0	MCS7	MCS8	MCS9	MCS0	MCS7	MCS8	MCS9
-98	-80	-77	-	-95	-77	-	-72	-92	-74	-	-69
HE20				HE40				HE80			
MCS0	MCS7	MCS9	MCS11	MCS0	MCS7	MCS9	MCS11	MCS0	MCS7	MCS9	MCS11
-98	-80	-75	-70	-95	-77	-72	-67	-92	-74	-69	-64

2.4GHZ TX POWER TARGET (PER CHAIN)	
Rate	Pout (dBm)
MCS0 HT20	22
MCS7 HT20	19
MCS8 VHT20	18
MCS9 VHT40	17
MCS11 HE40	15

5GHZ TX POWER TARGET (PER CHAIN)	
Rate	Pout (dBm)
MCS0, VHT20	22
MCS7, VHT40, VHT80	16.5
MCS9, VHT40, VHT80	15
MCS11, HE20, HE40, HE80	12.5

PERFORMANCE AND CAPACITY	
Peak PHY Rates	<ul style="list-style-type: none"><li>2.4GHz: 574 Mbps</li><li>5GHz: 2400 Mbps</li></ul>
Client Capacity	<ul style="list-style-type: none"><li>Up to 512 clients per AP</li></ul>
SSID	<ul style="list-style-type: none"><li>Up to 31 per AP</li></ul>

RUCKUS RADIO MANAGEMENT	
Antenna Optimization	<ul style="list-style-type: none"><li>BeamFlex+</li><li>Polarization Diversity with Maximal Ratio Combining (PD-MRC)</li></ul>
Wi-Fi Channel Management	<ul style="list-style-type: none"><li>ChannelFly</li><li>Background Scan Based</li></ul>
Client Density Management	<ul style="list-style-type: none"><li>Adaptive Band Balancing</li><li>Client Load Balancing</li><li>Airtime Fairness</li><li>Airtime-based WLAN Prioritization</li></ul>
SmartCast Quality of Service	<ul style="list-style-type: none"><li>QoS-based scheduling</li><li>Directed Multicast</li><li>L2/L3/L4 ACLs</li></ul>
Mobility	<ul style="list-style-type: none"><li>SmartRoam</li></ul>
Diagnostic Tools	<ul style="list-style-type: none"><li>Spectrum Analysis</li><li>SpeedFlex</li></ul>



# RUCKUS® R650

Indoor Wi-Fi 6 (802.11ax) 4x4:4 Wi-Fi Access Point with 2.5Gbps backhaul and 6 spatial streams

NETWORKING	
Controller Platform Support	<ul style="list-style-type: none"><li>SmartZone</li><li>ZoneDirector</li><li>Standalone</li><li>Unleashed</li></ul>
Mesh	<ul style="list-style-type: none"><li>SmartMesh™ wireless meshing technology. Self-healing Mesh</li></ul>
IP	<ul style="list-style-type: none"><li>IPv4, IPv6, dual-stack</li></ul>
VLAN	<ul style="list-style-type: none"><li>802.1Q (1 per BSSID or dynamic per user based on RADIUS)</li><li>VLAN Pooling</li><li>Port-based</li></ul>
802.1x	<ul style="list-style-type: none"><li>Authenticator &amp; Supplicant</li></ul>
Tunnel	<ul style="list-style-type: none"><li>L2TP, GRE, Soft-GRE</li></ul>
Policy Management Tools	<ul style="list-style-type: none"><li>Application Recognition and Control</li><li>Access Control Lists</li><li>Device Fingerprinting</li><li>Rate Limiting</li></ul>
IoT Capable	<ul style="list-style-type: none"><li>Yes</li></ul>

PHYSICAL INTERFACES	
Ethernet	<ul style="list-style-type: none"><li>One 2.5Gbps Ethernet port and one 1Gbps Ethernet port</li><li>Power over Ethernet (802.3af/at) with Category 5/5e/6 cable</li><li>LLDP</li></ul>
USB	<ul style="list-style-type: none"><li>1 USB 2.0 port, Type A</li></ul>

PHYSICAL CHARACTERISTICS	
Physical Size	<ul style="list-style-type: none"><li>22.4cm (L), 19.4cm (W), 4.7cm (H)</li><li>8.8in (L) x 7.6in (W) x 1.9in (H)</li></ul>
Weight	<ul style="list-style-type: none"><li>0.854 kg</li><li>1.88 lbs</li></ul>
Mounting	<ul style="list-style-type: none"><li>Wall, acoustic ceiling, desk</li><li>Secure bracket (sold separately)</li></ul>
Physical Security	<ul style="list-style-type: none"><li>Hidden latching mechanism</li><li>T-bar Torx</li><li>Bracket (902-0120-0000) Torx screw &amp; padlock (sold separately)</li></ul>
Operating Temperature	<ul style="list-style-type: none"><li>0°C (32°F) - 50°C (122°F)</li></ul>
Operating Humidity	<ul style="list-style-type: none"><li>Up to 95%, non-condensing</li></ul>

POWER <sup>1</sup>		
Power Supply	Operating Characteristics	Max Power Consumption
802.3af PoE	<ul style="list-style-type: none"><li>2.4GHz radio: 2x2, 19dBm per chain</li><li>5GHz radio: 2x4, 20dBm per chain</li><li>2nd Ethernet port, onboard IoT &amp; USB disabled</li></ul>	12.25W
802.3at PoE+	<ul style="list-style-type: none"><li>Full Functionality</li><li>2.4GHz radio: 2x2, 23 dBm per chain</li><li>5GHz radio: 4x4, 22 dBm per chain</li><li>2nd Ethernet Port, onboard IoT &amp; USB Enabled (3W)</li></ul>	PoE+ : 21.59W DC Power: 21.46W

CERTIFICATIONS AND COMPLIANCE	
Wi-Fi Alliance <sup>2</sup>	<ul style="list-style-type: none"><li>Wi-Fi CERTIFIED™ a, b, g, n, ac, ax</li><li>Passpoint®, Vantage</li></ul>
Standards Compliance <sup>3</sup>	<ul style="list-style-type: none"><li>EN 60950-1 Safety</li><li>EN 60601-1-2 Medical</li><li>EN 61000-4-2/3/5 Immunity</li><li>EN 50121-1 Railway EMC</li><li>EN 50121-4 Railway Immunity</li><li>IEC 61373 Railway Shock &amp; Vibration</li><li>UL 2043 Plenum</li><li>EN 62311 Human Safety/RF Exposure</li><li>WEEE &amp; RoHS</li><li>ISTA 2A Transportation</li></ul>

SOFTWARE AND SERVICES	
Location Based Services	<ul style="list-style-type: none"><li>SPoT</li></ul>
Network Analytics	<ul style="list-style-type: none"><li>SmartCell Insight (SCI)</li></ul>
Security and Policy	<ul style="list-style-type: none"><li>Cloudpath</li></ul>

ORDERING INFORMATION	
901-R650-XX00	<ul style="list-style-type: none"><li>R650 dual-band (5GHz and 2.4GHz concurrent) 802.11ax wireless access point, 4x4:4 + 2x2:2 streams, adaptive antennas, dual ports, onboard BLE and Zigbee, PoE support. Includes adjustable acoustic drop ceiling bracket. One Ethernet port is 2.5GbE. Does not include power adaptor.</li></ul>

See Ruckus price list for country-specific ordering information.

Warranty: Sold with a limited lifetime warranty.

For details see: <http://support.ruckuswireless.com/warranty>.

<sup>1</sup> Max power varies by country setting, band, and MCS rate.

<sup>2</sup> For complete list of WFA certifications, please see Wi-Fi Alliance website.

<sup>3</sup> For current certification status, please see price list.

# RUCKUS<sup>®</sup> R650

Indoor Wi-Fi 6 (802.11ax) 4x4:4 Wi-Fi Access Point with 2.5Gbps backhaul and 6 spatial streams

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OPTIONAL ACCESSORIES	
902-0180-XX00	• PoE Injector (60W)
902-1170-XX00	• Power Supply (48V, 0.75A, 36W)
902-1180-XX00	• Multigigabit PoE injector (2.5/5/10)-BaseT PoE port, 60W
902-0120-0000	• Spare, Accessory Mounting Bracket
902-0195-0000	• Spare, T-bar ceiling mount kit for mounting to flush frame ceiling

PLEASE NOTE: When ordering Indoor APs, you must specify the destination region by indicating -US, -WW, or -Z2 instead of XX. When ordering PoE injectors or power supplies, you must specify the destination region by indicating -US, -EU, -AU, -BR, -CN, -IN, -JP, -KR, -SA, -UK, or -UN instead of -XX. For access points, -Z2 applies to the following countries: Algeria, Egypt, Israel, Morocco, Tunisia, and Vietnam.

## About RUCKUS Networks

RUCKUS Networks builds and delivers purpose-driven networks that perform in the demanding environments of the industries we serve. Together with our network of trusted go-to-market partners, we empower our customers to deliver exceptional experiences to the guests, students, residents, citizens and employees who count on them.

[www.ruckusnetworks.com](http://www.ruckusnetworks.com)

Visit our website or contact your local RUCKUS representative for more information.

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PA-114143.5-EN (10/22)

**RUCKUS<sup>®</sup>**  
**COMMScope**

# RUCKUS® R670

Indoor Wi-Fi 7 (802.11be) Access Point with 9.34 Gbps Data Rate



## Benefits

### Connect more devices simultaneously

Improve device performance, by enabling more simultaneous device connections with built-in 6 spatial streams (2x2:2 in 2.4GHz, 2x2:2 in 5GHz, 2x2:2 in 6GHz) technology. 9.34 Gbps Combined data rate.

### Wi-Fi 7 for mainstream deployment

Provides exceptional end-user experience expanding the range of use cases for Wi-Fi 7 including guest rooms, classrooms, meeting rooms.

### BeamFlex+ Adaptive Antenna Technology

For greater speed, fewer errors, and instant bandwidth delivery, RUCKUS BeamFlex+ patented technology offers first-of-its-kind smart antenna technology that maximizes signal coverage, throughput, and network capacity and work with any client. It further increases MIMO diversity gain and maximizes spatial multiplexing potential.

### Converged Access Point

Allows customers to eliminate siloed networks and unify Wi-Fi and non Wi-Fi wireless technologies into one single network by using built-in BLE or Zigbee with support for Matter and Thread\*. Expandable to future wireless technologies through USB port.

### 5 GbE eliminates bottleneck

Optimized multi-gigabit Wi-Fi performance delivered using the built-in 1/2.5/5GbE port to connect to multi-gigabit switches.

### Multiple management options

Manage the R670 with on premise physical/ virtual appliances and control auto-provisioning for faster deployment and seamless firmware upgrades.

### Enhanced Security

The latest Wi-Fi security standard with WPA3 and receive enhanced protection from man-in-the-middle attacks. Adds the power of RUCKUS DPSK3 to WPA3/SAE combining enhanced security with the flexibility and ease of use of dynamic passphrase to secure network access.

### More Than Wi-Fi

Support solutions beyond Wi-Fi with RUCKUS IoT Suite, RUCKUS AI, RUCKUS One, RUCKUS Cloudpath Enrollment System and onboarding software

Bandwidth-hungry ultra-high definition video, virtual reality, Internet of Things (IoT), an explosion of new devices and content. With these kinds of demands, organizations in every industry need more from their Wi-Fi. But with hundreds of devices and nonstop wireless noise and interference, busy indoor spaces can make challenging wireless environments.

The dawn of the Wi-Fi 7 era ushers in a new wave of possibilities. With its groundbreaking advancements in speed, capacity, latency, and reliability, Wi-Fi 7 will transform the way we connect and interact with the digital world.

From seamless streaming of ultra-high-definition content to immersive virtual and augmented reality experiences, Wi-Fi 7 enables applications that were previously unimaginable. Real-time social gaming can reach new heights, allowing for lag-free, competitive multiplayer experiences with unparalleled responsiveness.

The Internet of Things (IoT) also receive a significant boost, as Wi-Fi 7 supports a massive number of connected devices simultaneously, facilitating smart homes, smart cities, and intelligent automation on a grand scale.

Moreover, industries such as hospitality and education can benefit immensely from Wi-Fi 7 low latency and high reliability. Other verticals like, MDUs, large public venues and service providers gain greatly from Wi-Fi 7 unprecedented advancements in speed and capacity.

The RUCKUS R670 is a mid-range Wi-Fi 7, tri-band concurrent indoor AP that delivers 6 spatial streams (2x2:2 in 2.4GHz, 5GHz and 6GHz or 2x2:2 in 2.4GHz and 4x4:4 in 5GHz in dual band mode) With Multi-Link-Operation (MLO), Preamble Puncturing, 4K QAM Modulation and 320MHz channels. It delivers industry-leading performance environments with a combined data rate of 9.34 Gbps. Furthermore, a 5 Gbps Ethernet port eliminates wired backhaul bottleneck for full use of available Wi-Fi capacity.

Wireless requirements within enterprises are expanding beyond Wi-Fi. The R670 has one built-in IoT radio offering onboard BLE or Zigbee capabilities. The R670 is a converged access point that allows customers to seamlessly integrate any new wireless technologies with the USB port.

The R670 expands the reach of Wi-Fi 7 and addresses the needs of every day deployments, in guest rooms, classrooms, hotel rooms and lobby. It supports data intensive streaming applications like 4K/8K video transmissions, while supporting latency sensitive voice and data applications with stringent quality-of-service requirements.

The R670, with built-in RUCKUS exclusive technology, dramatically improves network performance through a combination of patented wireless innovations and learning algorithms that includes:

- **Airtime Decongestion:** Increases average network throughput in heavily congested environments
- **Transient Client management:** Reduces interference traffic from unconnected Wi-Fi devices
- **BeamFlex® + Adaptive Antennas:** Extended coverage range and optimized throughput with patented dynamic multi-directional antennas and radio patterns and work with any client.

Whether you are deploying ten or ten thousand APs, the R670 is also easy to manage through RUCKUS multiple management options including cloud based and on premises controllers.

# RUCKUS® R670

Indoor Wi-Fi 7 (802.11be) Access Point with 9.34 Gbps Data Rate

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RUCKUS BeamFlex® Smart Adaptive Antenna



# RUCKUS® R670

Indoor Wi-Fi 7 (802.11be) Access Point with 9.34 Gbps Data Rate

## Access Point BeamFlex Antenna Pattern

RUCKUS' BeamFlex+ adaptive antennas allow the R670 AP to dynamically choose among a host of antenna patterns (over 4,000 possible combinations) in real-time to establish the best possible connection with every device. This leads to:

- Better Wi-Fi coverage
- Reduced RF interference

Traditional omni-directional antennas, found in generic access points, oversaturate the environment by needlessly radiating RF signals in all directions. In contrast, the RUCKUS BeamFlex+ adaptive antenna directs the radio signals per-device on a packet by-packet basis to optimize Wi-Fi coverage and capacity in real-time to support high device density environments. BeamFlex+ operates without the need for device feedback and hence can benefit even devices using legacy standards.

Figure 1. Example of BeamFlex+ pattern

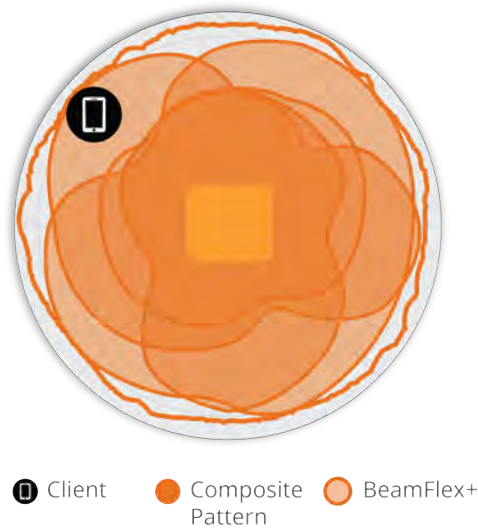


Figure 2. R670 2.4GHz Azimuth Antenna Patterns



Figure 3. R670 5GHz Azimuth Antenna Patterns



Figure 4. R670 6GHz Azimuth Antenna Patterns



Figure 5. R670 2.4GHz Elevation Antenna Patterns



Figure 6. R670 5GHz Elevation Antenna Patterns



Figure 7. R670 6GHz Elevation Antenna Patterns



Note: The outer trace represents the composite RF footprint of all possible BeamFlex+ antenna patterns, while the inner trace represents one BeamFlex+ antenna pattern within the composite outer trace.

# RUCKUS® R670

Indoor Wi-Fi 7 (802.11be) Access Point with 9.34 Gbps Data Rate

Wi-Fi	
Wi-Fi Standards	<ul style="list-style-type: none"><li>IEEE 802/11a/b/g/n/ac/ax/be, Wi-Fi 7</li></ul>
Supported Rates	<ul style="list-style-type: none"><li>802.11be: 4 to 5765 Mbps</li><li>802.11ax: 4 to 4804 Mbps</li><li>802.11ac: 6.5 to 866 Mbps</li><li>802.11n: 6.5 to 300 Mbps</li><li>802.11a/g: 6 to 54 Mbps</li><li>802.11b: 1 to 11 Mbps</li></ul>
Supported Channels	<ul style="list-style-type: none"><li>2.4GHz: 1-13</li><li>5GHz: 36-64, 100-144, 149-165</li><li>6GHz: 1-233</li></ul>
MIMO	<ul style="list-style-type: none"><li>2x2 SU-MIMO in tri-band mode. 4x4(5GHz) in dual-band</li><li>2x2 MU-MIMO in tri-band mode. 4x4(5GHz) in dual-band</li></ul>
Spatial Streams	<ul style="list-style-type: none"><li>2 in tri-band mode or 4 in dual-band mode at 5GHz</li></ul>
Radio Chains and Streams	<ul style="list-style-type: none"><li>2x2:2 in all 3 bands. 4x4:4(5GHz) in dual-band mode</li></ul>
Channelization	<ul style="list-style-type: none"><li>20, 40, 80, 160, 320 MHz</li></ul>
Security	<ul style="list-style-type: none"><li>WEP, WPA, WPA-PSK, WPA2, WPA2-PSK, WPA3, WPA3-SAE, OWE, PMF (802.11w), Dynamic PSK, DPSK3</li><li>WIPS/WIDS. TPM 2.0, Secure Boot</li></ul>
Other Wi-Fi Features	<ul style="list-style-type: none"><li>WMM, Power Save, Tx Beamforming, LDPC, STBC, 802.11r/k/v, MBO</li><li>MLO (Multi-link operation), Preamble Puncturing</li><li>Web Authentication and Guest Access</li><li>Hotspot, Hotspot 2.0</li><li>Captive Portal</li><li>WISPr</li></ul>

RF	
Antenna Type	<ul style="list-style-type: none"><li>BeamFlex+ adaptive antennas with polarization diversity</li><li>Adaptive antenna that provides 4,000+ unique antenna patterns per band</li></ul>
Antenna Gain (max)	<ul style="list-style-type: none"><li>Up to 4dBi</li></ul>
Peak Transmit Power (Tx port/chain + Combining gain)	<ul style="list-style-type: none"><li>2.4GHz: 26dBm</li><li>5GHz: 25dBm(2x2). 28dBm(4x4)</li><li>6GHz: 25dBm</li></ul>
Frequency Bands	<ul style="list-style-type: none"><li>ISM (2.4-2.484GHz)</li><li>U-NII-1 (5.15-5.25GHz)</li><li>U-NII-2A (5.25-5.35GHz)</li><li>U-NII-2C (5.47-5.725GHz)</li><li>U-NII-3 (5.725-5.85GHz)</li><li>U-NII-5 (5.925-6.425GHz)</li><li>U-NII-6 (6.425-6.525GHz)</li><li>U-NII-7 (6.525-6.875GHz)</li><li>U-NII-8 (6.875-7.125GHz)</li></ul>

2.4GHZ RECEIVE SENSITIVITY (dBm)							
HT20		HT40		VHT20		VHT40	
MCS0	MCS7	MCS0	MCS7	MCS0	MCS7	MCS0	MCS7
-97	-79	-94	-76	-97	-79	-94	-76
HE20/EHT20				HE40/EHT40			
MCS0	MCS7	MCS9	MCS11	MCS0	MCS7	MCS9	MCS11
-97	-79	-74	-68	-94	-76	-71	-65

5GHZ RECEIVE SENSITIVITY (dBm) in 2x2 tri-band mode											
HT20/VHT20				HT40/VHT40				VHT80			
MCS0	MCS7	MCS8	MCS9	MCS0	MCS7	MCS8	MCS9	MCS0	MCS7	MCS8	MCS9
-96	-79	-76	-73	-93	-75	-73	-70	-90	-72	-70	-67
HE20/EHT20			HE40/EHT40			HE80/EHT80			HE160/EHT160		
MCS0	MCS9	MCS13	MCS0	MCS9	MCS13	MCS0	MCS9	MCS13	MCS0	MCS9	MCS13
-96	-73	-61	-93	-70	-58	-90	-67	-55	-87	-64	-52

5GHZ RECEIVE SENSITIVITY (dBm) in 4x4 dual-band mode											
HT20/VHT20				HT40/VHT40				VHT80			
MCS0	MCS7	MCS8	MCS9	MCS0	MCS7	MCS8	MCS9	MCS0	MCS7	MCS8	MCS9
-100	-82	-79	-76	-97	-79	-76	-73	-94	-76	-73	-70
HE20/EHT20			HE40/EHT40			HE80/EHT80			HE160/EHT160		
MCS0	MCS9	MCS13	MCS0	MCS9	MCS13	MCS0	MCS9	MCS13	MCS0	MCS9	MCS13
-100	-76	-64	-97	-73	-61	-94	-70	-58	-91	-67	-55

6GHZ RECEIVE SENSITIVITY (dBm)								
HE20/EHT20			HE40/EHT40			HE80/EHT80		
MCS0	MCS9	MCS13	MCS0	MCS9	MCS13	MCS0	MCS9	MCS13
-96	-73	-61	-93	-70	-58	-90	-67	-55
HE160/EHT160					EHT320			
MCS0	MCS9	MCS11	MCS13	MCS0	MCS9	MCS11	MCS13	
-87	-64	-58	-52	-84	-61	-55	-49	

2.4GHZ TX POWER TARGET (PER CHAIN)	
Rate	Pout (dBm)
MCS0, HT20	22
MCS7, HT20	19
MCS9, VHT20	18
MCS11, HE40	16
MCS13, EHT40	14

5GHZ TX POWER TARGET (PER CHAIN)	
Rate	Pout (dBm)
MCS0, HT40	22
MCS7, HT40	19
MCS9, VHT80	17.5
MCS11, HE160	16
MCS13, EHT160	14

6GHZ TX POWER TARGET (PER CHAIN)	
Rate	Pout (dBm)
MCS0, HT40	22
MCS7, HT40	17.5
MCS9, VHT80	16.5
MCS11, HE160	15
MCS13, EHT320	13



# RUCKUS® R670

Indoor Wi-Fi 7 (802.11be) Access Point with 9.34 Gbps Data Rate

POWER CONSUMPTION			
Mode	Power Consumption	System Configuration	Wi-Fi Radios
DC Power	36W	<ul style="list-style-type: none"><li>5Gbps Ethernet Enabled</li><li>1Gbps Ethernet Enabled</li><li>USB Enabled (3W)</li><li>IoT Enabled (selectable)</li></ul>	2.4GHz (2x2) Tx 22dBm 5GHz (2x2) Tx 22dBm 6GHz (2x2) Tx 22dBm
802.3bt5 PoH, uPoE	36W	<ul style="list-style-type: none"><li>5Gbps Ethernet Enabled</li><li>1Gbps Ethernet Enabled</li><li>USB Enabled (3W)</li><li>IoT Enabled (selectable)</li></ul>	2.4GHz (2x2) Tx 22dBm 5GHz (2x2) Tx 22dBm 6Ghz (2x2) Tx 22dBm
802.3at	25.5W	<ul style="list-style-type: none"><li>5Gbps Ethernet Enabled</li><li>1Gbps Ethernet Disabled</li><li>USB Disabled (0W)</li><li>IoT Disabled</li></ul>	2.4GHz (2x2) Tx 17dBm 5GHz (2x2) Tx 17dBm 6Ghz (2x2) Tx 17dBm

PERFORMANCE AND CAPACITY	
Peak PHY Rates	<ul style="list-style-type: none"><li>2.4GHz: 689 Mbps</li><li>5GHz: 5765 Mbps (4x4:4) or 2882 Mbps (2x2:2)</li><li>6GHz: 5765 Mbps</li></ul>
Client Capacity	<ul style="list-style-type: none"><li>Up to 768 clients per AP</li></ul>
SSID	<ul style="list-style-type: none"><li>Up to 36 per AP</li></ul>

RUCKUS RADIO MANAGEMENT	
Antenna Optimization	<ul style="list-style-type: none"><li>BeamFlex+</li><li>Polarization Diversity with Maximal Ratio Combining (PD-MRC)</li></ul>
Wi-Fi Channel Management	<ul style="list-style-type: none"><li>ChannelFly</li><li>Background Scan Based</li></ul>
Client Density Management	<ul style="list-style-type: none"><li>Adaptive Band Balancing</li><li>Client Load Balancing</li><li>Airtime Fairness</li><li>Airtime-based WLAN Prioritization</li></ul>
SmartCast Quality of Service	<ul style="list-style-type: none"><li>QoS-based scheduling, QoS Mirroring</li><li>Directed Multicast</li><li>L2/L3/L4 ACLs</li></ul>
Mobility	<ul style="list-style-type: none"><li>SmartRoam</li></ul>
Diagnostic Tools	<ul style="list-style-type: none"><li>Spectrum Analysis</li><li>SpeedFlex</li></ul>

NETWORKING	
Controller Platform Support	<ul style="list-style-type: none"><li>SmartZone</li><li>RUCKUS Unleashed</li><li>RUCKUS One</li></ul>
Mesh	<ul style="list-style-type: none"><li>SmartMesh™ wireless meshing technology. Self-healing Mesh in 2.4 GHz, 5GHz, and 6GHz</li></ul>
IP	<ul style="list-style-type: none"><li>IPv4, IPv6, dual-stack</li></ul>
VLAN	<ul style="list-style-type: none"><li>802.1Q (1 per BSSID or dynamic per user based on RADIUS)</li><li>VLAN Pooling</li><li>Port-based</li></ul>
802.1x	<ul style="list-style-type: none"><li>Authenticator &amp; Supplicant</li></ul>
Tunnel	<ul style="list-style-type: none"><li>GRE, Soft-GRE</li></ul>
Policy Management Tools	<ul style="list-style-type: none"><li>Application Recognition and Control</li><li>Access Control Lists</li><li>Device Fingerprinting</li><li>Rate Limiting</li><li>URL Filtering</li></ul>
IoT Onboard	<ul style="list-style-type: none"><li>Integrated BLE or Zigbee (one IoT radio)</li><li>Matter &amp; Thread capable</li></ul>

PHYSICAL INTERFACES	
Ethernet	<ul style="list-style-type: none"><li>One 100M/1/2.5/5GbE (PoE) port and one 10M/100M/1GbE port</li><li>Power over Ethernet (802.3af/at/bt) with Category 5e (or better) cable</li><li>LLDP support</li></ul>
USB	<ul style="list-style-type: none"><li>1 USB 2.0 port, Type A</li></ul>
DC Power	<ul style="list-style-type: none"><li>48V DC Power Jack</li></ul>

PHYSICAL CHARACTERISTICS	
Physical Size	<ul style="list-style-type: none"><li>22cm (L), 22cm (W), 4.9cm (H)</li><li>8.66in (L) x 8.66in (W) x 1.93in (H)</li></ul>
Weight	<ul style="list-style-type: none"><li>1.02kg</li><li>2.25lbs</li></ul>
Mounting	<ul style="list-style-type: none"><li>Wall, acoustic ceiling, desk</li><li>Bracket (902-0120-0000)</li></ul>
Physical Security	<ul style="list-style-type: none"><li>Secure bracket (sold separately) (902-0120-0000)</li></ul>
Operating Temperature	<ul style="list-style-type: none"><li>0°C (32°F) to 50°C (122°F)</li></ul>
Operating Humidity	<ul style="list-style-type: none"><li>Up to 95%, non-condensing</li></ul>

Product owner is responsible to abide by the country of deployment spectrum regulations when configuring and deploying this product/device.

The 6GHz band is enabled in countries where it is authorized by the local regulations. AP operates as per local regulations via country regulatory domain, otherwise 6GHz radio is disabled. Once this product is certified to operate in a particular country the 6GHz band may be enabled with a future software release..

\* Expected in a future software release

# RUCKUS® R670

Indoor Wi-Fi 7 (802.11be) Access Point with 9.34 Gbps Data Rate

CERTIFICATIONS AND COMPLIANCE	
Wi-Fi Alliance <sup>1</sup>	<ul style="list-style-type: none"><li>Wi-Fi CERTIFIED™ a, b, g, n, ac, ax, be (Wi-Fi 6, Wi-Fi 7)</li><li>Passpoint®, Vantage</li></ul>
Standards Compliance <sup>2</sup>	<ul style="list-style-type: none"><li>IEC/EN/UL 60950-1 Safety</li><li>IEC/EN/UL 62368-1 Safety</li><li>EN 60601-1-2 Medical</li><li>EN 61000-4-2/3/5 Immunity</li><li>EN 50121-1 Railway EMC</li><li>EN 50121-4 Railway Immunity</li><li>IEC 61373 Railway Shock &amp; Vibration</li><li>UL 2043 Plenum</li><li>EN 62311 Human Safety/RF Exposure</li><li>WEEE &amp; RoHS</li><li>ISTA 2A Transportation</li></ul>

SOFTWARE AND SERVICES	
Cloud Based Services	<ul style="list-style-type: none"><li>RUCKUS One</li></ul>
Network Analytics	<ul style="list-style-type: none"><li>RUCKUS AI (Formerly known as RUCKUS Analytics)</li></ul>
Security and Policy	<ul style="list-style-type: none"><li>Cloudpath</li></ul>

ORDERING INFORMATION	
901-R670-XX00	<ul style="list-style-type: none"><li>RUCKUS R670 Wi-Fi 7 tri-band concurrent wireless Access Point with 2x2:2 (2.4GHz) + 2x2:2 (5GHz) + 2x2:2 (6GHz). Wi-Fi 7 in all three bands. 6GHz LPI mode and SP mode support with AFC. Software configurable to 2x2 (2.4GHz) + 4x4 (5GHz) dual-band mode. BeamFlex+, one 5/2.5/1-Gigabit Ethernet backhaul, one 1-Gigabit port, PoH/uPoE/802.3bt PoE support, onboard BLE and Zigbee selectable IoT radio, USB 2.0, TPM 2.0, and Secure Boot. Adjustable acoustic drop ceiling bracket included. Power adapter not included. Includes Limited Lifetime Warranty.</li></ul>

See RUCKUS price list for country-specific ordering information.  
Warranty: Sold with a limited lifetime warranty.  
For details see: <http://support.ruckuswireless.com/warranty>.

OPTIONAL ACCESSORIES	
902-1180-XX00	<ul style="list-style-type: none"><li>Multigigabit PoE injector (2.5/5/10)-BaseT PoE port, 60W</li></ul>
902-0120-0000	<ul style="list-style-type: none"><li>Spare, Accessory Mounting Bracket</li></ul>
902-1170-XX00	<ul style="list-style-type: none"><li>Power Supply (48V, 0.75A, 36W)</li></ul>
902-0196-0000	<ul style="list-style-type: none"><li>T-bar Bracket</li></ul>

PLEASE NOTE: When ordering Indoor APs, you must specify the destination region by indicating -US, -WW, or -Z2 instead of XX. When ordering PoE injectors or power supplies, you must specify the destination region by indicating -US, -EU, -AU, -BR, -CN, -IN, -JP, -KR, -SA, -UK, or -UN instead of -XX. For access points, -Z2 applies to the following countries: Algeria, Egypt, Israel, Morocco, Tunisia, and Vietnam.

<sup>1</sup> For complete list of WFA certifications, please see Wi-Fi Alliance website.  
<sup>2</sup> For current certification status, please see price list.

**About RUCKUS Networks**  
RUCKUS Networks builds and delivers purpose-driven networks that perform in the demanding environments of the industries we serve. Together with our network of trusted go-to-market partners, we empower our customers to deliver exceptional experiences to the guests, students, residents, citizens and employees who count on them.

# RUCKUS® T750

Outdoor 4x4:4 Wi-Fi 6 Access Point with 2.5Gbps Backhaul



## Benefits

### Great Outdoor Wi-Fi

Experience high performance outdoor Wi-Fi 6 with IP-67 weather proofing and dual backhaul options with SFP and multi-gigabit 2.5 GbE ethernet port.

### Connect More Devices Simultaneously

Improve device performance, by enabling more simultaneous device connections with built-in 8 spatial streams (dual-concurrent, 4x4:4 in 5GHz, 4x4:4 in 2.4GHz), MU-MIMO and OFDMA technology while enhancing non-Wi-Fi 6 client performance. Support for up to 1,024 clients.

### High Density Performance

Provide exceptional end-user experience within high density public venues such as airports, amusement parks, stadiums, outdoor arenas, and other dense outdoor urban environments with the RUCKUS Ultra-High-Density Technology Suite.

### Converged Access Point

Allow customers to eliminate siloed networks and unify Wi-Fi and IoT wireless technologies into one single network by using built-in BLE and Zigbee, and also expand to any future wireless technologies through the pluggable IoT module.

### Power Other Devices

Daisy chain and power other devices like an IP camera, or another AP directly from the 1 GbE PoE output port.

### Multiple Management Options

Manage the T750 from the cloud, with on-premises physical/virtual appliances, or without a controller.

### Enhanced Security

Reinforce security with WPA3, the latest Wi-Fi security standard and receive enhanced protection from man-in-the-middle attacks.

**Outdoor locations such as stadiums, arenas can have the most demanding wireless requirements due to high client density. The RUCKUS® T750 access point (AP), based on the latest Wi-Fi 6 standard, brings in multi-gigabit Wi-Fi to support the ever raising expectation for highest quality of service from the users. T750 is IP-67 rated to withstand the rigors of outdoor deployments.**

The RUCKUS T750 is our high-end dual-band, dual-concurrent Wi-Fi 6 AP that supports eight spatial streams (4x4:4 in 5GHz, 4x4:4 in 2.4GHz). The T750, with OFDMA and MU-MIMO capabilities, efficiently manages up to 1,024 client connections with increased capacity, improved coverage and performance in ultra-high dense environments. Furthermore, the 2.5 GbE ethernet ensures that the backhaul will not be a bottleneck for full use of available Wi-Fi capacity.

The T750 addresses the increasing client demands in public venues such as airports, convention centers, plazas, malls, and other dense urban environments. It is the perfect choice for data-intensive streaming multimedia applications like 4K video transmissions, while supporting latency sensitive voice and data applications with stringent quality-of-service requirements.

The T750 is also easy to manage through physical, virtual and cloud management options.

The T750 is also designed with a small form factor pluggable (SFP) fiber interface that enable seamless connectivity to a fiber backhaul. The T750 boasts a built-in GPS. Furthermore, 1GbE PoE output port can power a variety of devices like an IP-based camera or even another AP.

In addition, organizations are increasingly leveraging IoT-based sensors to serve their customers better. These sensors run on non-Wi-Fi wireless technologies such as Wi-Fi , BLE or Zigbee. Organizations need a unified platform to eliminate network silos. The RUCKUS AP portfolio is equipped to solve these challenges.

The T750 has built-in IoT radios with onboard BLE and Zigbee capabilities. In addition, the T750 is a converged access point that allows customers to seamlessly integrate any new wireless technologies with pluggable IoT module.

The T750 when paired with the RUCKUS Ultra-High-Density Technology Suite found only in the RUCKUS Wi-Fi portfolio, dramatically improves network performance through a combination of patented wireless innovations and learning algorithms that includes:

- **Airtime Decongestion:** Increases average network throughput in heavily congested environments
- **Transient Client management:** Reduces interference traffic from unconnected Wi-Fi devices
- **BeamFlex® + Antennas:** Extended coverage and optimized throughput with patented multi-directional antennas and radio patterns

Whether you are deploying ten or ten thousand APs, the T750 is also easy to manage through RUCKUS' physical and virtual management options.

# RUCKUS® T750

Outdoor 4x4:4 Wi-Fi 6 Access Point with 2.5Gbps Backhaul

## Access Point Antenna Pattern

RUCKUS' BeamFlex+ adaptive antennas allow the T750 AP to dynamically choose among a host of antenna patterns (over 4,000 possible combinations) in real-time to establish the best possible connection with every device. This leads to:

- Better Wi-Fi coverage
- Reduced RF interference

Traditional omni-directional antennas, found in generic access points, oversaturate the environment by needlessly radiating RF signals in all directions. In contrast, the RUCKUS BeamFlex+ adaptive antenna directs the radio signals per-device on a packet by-packet basis to optimize Wi-Fi coverage and capacity in real-time to support high device density environments. BeamFlex+ operates without the need for device feedback and hence can benefit even devices using legacy standards.

Figure 1. Example of BeamFlex+ pattern

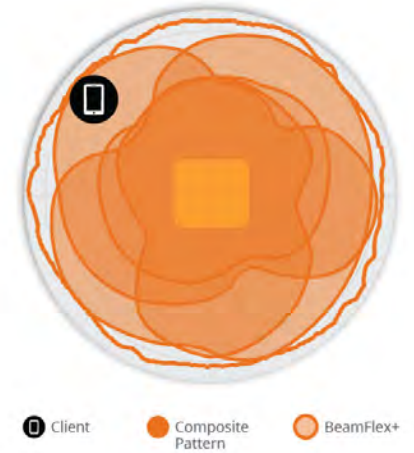


Figure 2. T750 2.4GHz Azimuth Antenna Patterns



Figure 3. T750 5GHz Azimuth Antenna Patterns



Figure 4. T750 2.4GHz Elevation Antenna Patterns



Figure 5. T750 5GHz Elevation Antenna Patterns



Note: The outer trace represents the composite RF footprint of all possible BeamFlex+ antenna patterns, while the inner trace represents one BeamFlex+ antenna pattern within the composite outer trace.

# RUCKUS® T750

Outdoor 4x4:4 Wi-Fi 6 Access Point with 2.5Gbps Backhaul

Wi-Fi	
Wi-Fi Standards	<ul style="list-style-type: none"><li>IEEE 802.11a/b/g/n/ac/ax</li></ul>
Supported Rates	<ul style="list-style-type: none"><li>802.11ax: 4 to 2400 Mbps</li><li>802.11ac: 6.5 to 1732 Mbps</li><li>802.11n: 6.5 to 600 Mbps</li><li>802.11a/g: 6 to 54 Mbps</li><li>802.11b: 1 to 11 Mbps</li></ul>
Supported Channels	<ul style="list-style-type: none"><li>2.4GHz: 1-13</li><li>5GHz: 36-64, 100-144, 149-165</li></ul>
MIMO	<ul style="list-style-type: none"><li>4x4 SU-MIMO</li><li>4x4 MU-MIMO</li></ul>
Spatial Streams	<ul style="list-style-type: none"><li>4 for both SU-MIMO &amp; MU-MIMO</li></ul>
Radio Chains and Streams	<ul style="list-style-type: none"><li>4x4:4</li></ul>
Channelization	<ul style="list-style-type: none"><li>20, 40, 80, 160MHz</li></ul>
Security	<ul style="list-style-type: none"><li>WPA-PSK, WPA-TKIP, WPA2-Personal, WPA2-Enterprise, WPA3-Personal, WPA3-Enterprise, AES, 802.11i, Dynamic PSK, OWE</li><li>WIPS/WIDS</li></ul>
Other Wi-Fi Features	<ul style="list-style-type: none"><li>WMM, Power Save, Tx Beamforming, LDPC, STBC, 802.11r/k/v</li><li>Hotspot</li><li>Hotspot 2.0</li><li>Captive Portal</li><li>WISPr</li></ul>

RF		
	T750	T750SE
Antenna Type	<ul style="list-style-type: none"><li>BeamFlex+ adaptive antennas with polarization diversity</li><li>Adaptive antenna that provides 4,000+ unique antenna patterns per band</li><li>T750 provides internal omni-directional antenna; and T750se provides internal 120-degree sectorized antenna with option to attach an external antenna</li></ul>	
Antenna Gain (max)	<ul style="list-style-type: none"><li>2.4GHz: 1.6dBi</li><li>5GHz: 3.4dBi</li></ul>	<ul style="list-style-type: none"><li>2.4GHz: 6.0dBi</li><li>5GHz: 8.0dBi</li></ul>
Peak Transmit Power (Tx port/chain + Combining gain)	<ul style="list-style-type: none"><li>2.4GHz: 28dBm</li><li>5GHz: 28dBm</li></ul>	
Frequency Bands	<ul style="list-style-type: none"><li>ISM (2.4-2.484GHz)</li><li>U-NII-1 (5.15-5.25GHz)</li><li>U-NII-2A (5.25-5.35GHz)</li><li>U-NII-2C (5.47-5.725GHz)</li><li>U-NII-3 (5.725-5.85GHz)</li></ul>	

2.4GHZ RECEIVE SENSITIVITY (dBm)							
HT20				HT40			
MCS0		MCS7		MCS0		MCS7	
-98		-79		-95		-76	
HE20				HE40			
MCS0	MCS7	MCS9	MCS11	MCS0	MCS7	MCS9	MCS11
-98	-79	-76	-70	-95	-76	-73	-67

5GHZ RECEIVE SENSITIVITY (dBm)											
VHT20				VHT40				VHT80			
MCS0	MCS7	MCS8	MCS9	MCS0	MCS7	MCS8	MCS9	MCS0	MCS7	MCS8	MCS9
-98	-80	-77	-	-95	-77	-	-72	-92	-74	-	-69
HE20				HE40				HE80			
MCS0	MCS7	MCS9	MCS11	MCS0	MCS7	MCS9	MCS11	MCS0	MCS7	MCS9	MCS11
-98	-80	-75	-70	-95	-77	-72	-67	-92	-74	-69	-64

2.4GHZ TX POWER TARGET (PER CHAIN)	
Rate	Pout (dBm)
MCS0, HT20	22
MCS7, HT20	19.5
MCS8, HE20	19
MCS9, HE40	18.5
MCS11, HE40	17

5GHZ TX POWER TARGET (PER CHAIN)	
Rate	Pout (dBm)
MCS0, VHT20	22
MCS7, VHT40, VHT80	20
MCS9, VHT40, VHT80	18.5
MCS11, HE20, HE40, HE80	17

PERFORMANCE AND CAPACITY	
Peak PHY Rates	<ul style="list-style-type: none"><li>2.4 GHz: 1148 Mbps</li><li>5 GHz: 2400 Mbps</li></ul>
Client Capacity	<ul style="list-style-type: none"><li>Up to 1024 clients per AP</li></ul>
SSID	<ul style="list-style-type: none"><li>Up to 31 per AP</li></ul>

RUCKUS RADIO MANAGEMENT	
Antenna Optimization	<ul style="list-style-type: none"><li>BeamFlex+</li><li>Polarization Diversity with Maximal Ratio Combining (PD-MRC)</li></ul>
Wi-Fi Channel Management	<ul style="list-style-type: none"><li>ChannelFly</li><li>Background Scan Based</li></ul>
Client Density Management	<ul style="list-style-type: none"><li>Adaptive Band Balancing</li><li>Client Load Balancing</li><li>Airtime Fairness</li><li>Airtime-based WLAN Prioritization</li></ul>
SmartCast Quality of Service	<ul style="list-style-type: none"><li>QoS-based scheduling</li><li>Directed Multicast</li><li>L2/L3/L4 ACLs</li></ul>
Mobility	<ul style="list-style-type: none"><li>SmartRoam</li></ul>
Diagnostic tools	<ul style="list-style-type: none"><li>Spectrum Analysis</li><li>SpeedFlex</li></ul>

# RUCKUS® T750

## Outdoor 4x4:4 Wi-Fi 6 Access Point with 2.5Gbps Backhaul

NETWORKING	
Controller Platform Support	<ul style="list-style-type: none"><li>SmartZone</li><li>ZoneDirector</li><li>Cloud</li><li>Standalone</li><li>Unleashed</li></ul>
Mesh	<ul style="list-style-type: none"><li>SmartMesh™ wireless meshing technology. Selfhealing Mesh</li></ul>
IP	<ul style="list-style-type: none"><li>IPv4, IPv6, dual-stack</li></ul>
VLAN	<ul style="list-style-type: none"><li>802.1Q (1 per BSSID or dynamic per user based on RADIUS)</li><li>VLAN Pooling</li><li>Port-based</li></ul>
802.1x	<ul style="list-style-type: none"><li>Authenticator &amp; Supplicant</li></ul>
Tunnel	<ul style="list-style-type: none"><li>L2TP, GRE, Soft-GRE</li></ul>
Policy Management Tools	<ul style="list-style-type: none"><li>Application Recognition and Control</li><li>Access Control Lists</li><li>Device Fingerprinting</li><li>Rate Limiting</li></ul>
IoT Capable	<ul style="list-style-type: none"><li>Yes</li></ul>

OTHER RADIO TECHNOLOGIES	
GPS	<ul style="list-style-type: none"><li>Types GLONAS...etc</li></ul>

PHYSICAL INTERFACES		
	T750	T750SE
Ethernet	<ul style="list-style-type: none"><li>1x2.5 Gbps, 1 x 10/100/1000 Mbps ports, RJ-45</li><li>LACP</li></ul>	
Fiber	<ul style="list-style-type: none"><li>SFP, 1Gbps, SFP+ 10 Gbps</li></ul>	
USB	<ul style="list-style-type: none"><li>1 USB 2.0 port, Type A</li></ul>	—
External Antenna Connectors	—	<ul style="list-style-type: none"><li>4x N-type female connectors</li></ul>

PHYSICAL CHARACTERISTICS		
	T750	T750SE
Physical Size	<ul style="list-style-type: none"><li>34.64cm (L), 24.06cm (W), 10.17cm (H)</li><li>13.64in (L) x 9.47in (W) x 4.0in (H)</li></ul>	<ul style="list-style-type: none"><li>34.08cm (L), 24.06cm (W), 11.17cm (H)</li><li>13.42in (L) x 9.47in (W) x 4.4in (H)</li></ul>
Weight	<ul style="list-style-type: none"><li>2.84kg</li><li>6.27lbs</li></ul>	<ul style="list-style-type: none"><li>3.31kg</li><li>7.3lbs</li></ul>
Mounting	<ul style="list-style-type: none"><li>Pole Mount</li><li>Wall Mount</li><li>Flat Surface</li><li>Bracket included in the box</li></ul>	
Operating Temperature	<ul style="list-style-type: none"><li>-40°C (-40°F) to 65°C (145°F)</li></ul>	
Operating Humidity	<ul style="list-style-type: none"><li>Up to 95%, non-condensing</li></ul>	
Wind Survivability	<ul style="list-style-type: none"><li>Up to 266km/h (165mph)</li></ul>	

POWER		
Mode	Power Consumption	System Configuration
AC Power	63.7W (SFP+ Backhaul) 64.6W (Ethernet Backhaul)	<ul style="list-style-type: none"><li>Full Functionality</li><li>2nd Ethernet Port enabled</li><li>PSE Out (26W) available</li><li>Onboard IoT enabled</li><li>USB enabled (3W) - omni SKU</li></ul>
802.3bt Class 7 (Maximum Functionality With PSE Out)	57W	<ul style="list-style-type: none"><li>Full Functionality</li><li>2nd Ethernet Port enabled</li><li>PSE Out (26W) available</li><li>Onboard IoT enabled</li><li>USB enabled (3W) - omni SKU</li></ul>
802.3at (Reduced Functionality Without PSE)	24.2W	<ul style="list-style-type: none"><li>2nd Ethernet Port enabled</li><li>PSE Out disabled</li><li>Onboard IoT enabled</li><li>USB enabled (3W) - omni SKU</li></ul>
Idle	10.75W	<ul style="list-style-type: none"><li>2nd Ethernet Port enabled</li><li>PSE Out disabled</li><li>Onboard IoT disabled</li><li>USB disabled</li></ul>

Certifications and Compliance	
Wi-Fi Alliance*	<ul style="list-style-type: none"><li>Wi-Fi CERTIFIED™ a, b, g, n, ac</li><li>Wi-Fi CERTIFIED™ 6</li><li>Wi-Fi Enhanced Open™</li><li>WPA2™ - Personal</li><li>WPA2™ - Enterprise</li><li>WPA3™ - Personal</li><li>WPA3™ - Enterprise</li><li>Wi-Fi Agile Multiband™</li><li>Wi-Fi Optimized Connectivity™</li><li>Wi-Fi Vantage™</li><li>WMM®</li><li>Passpoint®</li></ul>
Standards Compliance**	<ul style="list-style-type: none"><li>EN 60950-1 Safety</li><li>EN 60601-1-2 Medical</li><li>EN 61000-4-2/3/5 Immunity</li><li>EN 50121-1 Railway EMC</li><li>EN 50121-4 Railway Immunity</li><li>IEC 61373 Railway Shock &amp; Vibration</li><li>EN 62311 Human Safety/RF Exposure</li><li>WEEE &amp; RoHS</li><li>ISTA 2A Transportation</li></ul>

\*For complete list of WFA certifications, please see the Wi-Fi Alliance website.

\*\*For current certification status, please see the price list.

Software and Services	
Location based services	<ul style="list-style-type: none"><li>SPoT</li></ul>
Network Analytics	<ul style="list-style-type: none"><li>SmartCell Insight (SCI)</li><li>RUCKUS Analytics</li></ul>
Security and Policy	<ul style="list-style-type: none"><li>Cloudpath</li></ul>



# RUCKUS® T750

## Outdoor 4x4:4 Wi-Fi 6 Access Point with 2.5Gbps Backhaul

ORDERING INFORMATION	
901-T750-XX01	<ul style="list-style-type: none"><li>RUCKUS T750 Wi-Fi 6 Outdoor Wireless Access Point, 4x4:4 Stream, Omnidirectional Beamflex+ coverage, 2.4GHz and 5GHz concurrent dual band, (1x) 2.5G Ethernet port, (1x) 10/100/1000 Ethernet port, 100-240 Vac, POE in and PSE out, Fiber SFP/SFP+, GPS, IP-67 Outdoor enclosure, -40 to 65C Operating Temperature. Mounting bracket included. Does not include power adapter.</li></ul>
901-T750-XX02	<ul style="list-style-type: none"><li>RUCKUS T750 Wi-Fi 6 Outdoor Wireless Access Point, 4x4:4 Stream, Omnidirectional Beamflex+ coverage, 2.4GHz and 5GHz concurrent dual band, (1x) 2.5G Ethernet port, (1x) 10/100/1000 Ethernet port, 100-240 Vac, POE in and PSE out, Fiber SFP/SFP+, IP-67 Outdoor enclosure, -40 to 65C Operating Temperature. <b>No GPS functionality.</b> Mounting bracket included. Does not include power adapter.</li></ul>
901-T750-XX51	<ul style="list-style-type: none"><li>RUCKUS T750SE Wi-Fi 6 Outdoor Wireless Access Point, 4x4:4 Stream, 120-Degree Sector antenna included and option to attach external antennae, 2.4GHz and 5GHz concurrent dual band, (1x) 2.5G Ethernet port, (1x) 10/100/1000 Ethernet ports, 100-240 Vac, POE in and PSE out, Fiber SFP/SFP+, GPS, IP-67 Outdoor enclosure, -40 to 65C Operating Temperature. Mounting bracket included. Does not include power adapter.</li></ul>
901-T750-XX52	<ul style="list-style-type: none"><li>RUCKUS T750SE Wi-Fi 6 Outdoor Wireless Access Point, 4x4:4 Stream, 120-Degree Sector antenna included and option to attach external antennae, 2.4GHz and 5GHz concurrent dual band, (1x) 2.5G Ethernet port, (1x) 10/100/1000 Ethernet ports, 100-240 Vac, POE in and PSE out, Fiber SFP/SFP+, IP-67 Outdoor enclosure, -40 to 65C Operating Temperature. <b>No GPS functionality.</b> Mounting bracket included. Does not include power adapter.</li></ul>

See RUCKUS price list for country-specific ordering information. PLEASE NOTE: When ordering APs, you must specify the destination region by indicating -US, -WW, -JP or -Z2 instead of XX. For access points, -Z2 applies to the following countries: Algeria, Egypt, Israel, Morocco, Tunisia, and Vietnam. Warranty: Sold with a limited 1-year warranty. For details see: <http://support.ruckuswireless.com/warranty>.

OPTIONAL ACCESSORIES	
902-0180-XX00	<ul style="list-style-type: none"><li>PoE Injector (60W)</li></ul>
902-0125-0000	<ul style="list-style-type: none"><li>Secure articulating mounting bracket</li></ul>
902-0134-0000	<ul style="list-style-type: none"><li>Outdoor AP mounting bracket (weatherized aluminum), 180-degree adjustment range in both azimuth and elevation. Mounting support for solid wall or ceiling, vertical or horizontal pole 1" to 4" in diameter using enclosed mounting hardware. Pole diameter greater than 4" can be supported with user-supplied clamps.</li></ul>
902-1180-XX00	<ul style="list-style-type: none"><li>Multigigabit PoE injector (2.5/5/10)-BaseT PoE port, 60W</li></ul>
911-2120-0000	<ul style="list-style-type: none"><li>2.4GHz &amp; 5GHz 14/14.5dBi 4-port directional H/V high gain antenna; with 30 degrees 3dBm beam width and 4 N-type female connectors</li></ul>
E1MG-LX-OM	<ul style="list-style-type: none"><li>1000Base-LX SFP optic, SMF, LC connector, Optical Monitoring Capable</li></ul>
E1MG-SX-OM	<ul style="list-style-type: none"><li>1000Base-SX SFP optic, MMF, LC connector, Optical Monitoring Capable</li></ul>
E1MG-SX-OM-8	<ul style="list-style-type: none"><li>1000BASE-SX SFP optic MMF, LC connector, optical monitoring capable, 8-pack</li></ul>
10G-SFPP-SR	<ul style="list-style-type: none"><li>10GBASE-SR, SFP+ optic (LC), target range 300m over MMF</li></ul>
10G-SFPP-LR	<ul style="list-style-type: none"><li>10GBASE-LR, SFP+ optic (LC), for up to 10km over SMF</li></ul>
10G-SFPP-USR	<ul style="list-style-type: none"><li>10GBASE-USR, SFP+ optic (LC), target range 100m over MMF</li></ul>
10G-SFPP-ER	<ul style="list-style-type: none"><li>10GBASE-ER SFP+ optic (LC), for up to 40km over SMF</li></ul>

PLEASE NOTE: When ordering PoE injectors or power supplies, you must specify the destination region by indicating -US, -EU, -AU, -BR, -CN, -IN, -JP, -KR, -SA, -UK, or -UN instead of -XX.

## About RUCKUS Networks

RUCKUS Networks builds and delivers purpose-driven networks that perform in the demanding environments of the industries we serve. Together with our network of trusted go-to-market partners, we empower our customers to deliver exceptional experiences to the guests, students, residents, citizens and employees who count on them.

[www.ruckusnetworks.com](http://www.ruckusnetworks.com)

Visit our website or contact your local RUCKUS representative for more information.

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# RUCKUS® ICX 8200

Enterprise-class stackable access switch with future-proof expandability

The RUCKUS ICX 8200 Switch series is purposely designed to handle next generation wireless first and IoT campus networks. These intelligent, scalable edge switches deliver enterprise-class functionality at an affordable price without compromising performance and reliability.

The RUCKUS ICX 8200 raises the bar with up to 8× 25 GbE ports for uplinks or stacking, PoE++ (802.3bt), VXLAN, advanced L2/L3 features and market-leading stacking density with up to 12 switches per stack. In addition, the RUCKUS ICX 8200 combines enterprise-class features, manageability, performance, and reliability with the flexibility, cost-effectiveness, and “pay as you grow” scalability of stackable solution.



## Benefits

### Maximum flexibility: Gigabit, Multigigabit edge ports and Fiber to the Room

- Optimized for latest generation Wi-Fi 6/6E/7 AP deployments with multigigabit ports.
- 8, 24 and 48 Gigabit Ethernet ports
- Up to 24x 1/2.5G Multigigabit RJ45 ports
- Up to 4x 1/2.5/5/10 Gbps Multigigabit RJ-45 ports
- Up to 48x 1G SFP fiber ports
- Up to 24x 10G SFP+ fiber ports

### Power next generation APs and PoE devices

- PoE+ 802.3at, 30W per port on all ports
- PoE++ 802.3bt, 60/90W on multigigabit ports
- Up to 1480W PoE budget with two power supplies

### 25 GbE uplinks/stacking for maximum performance and future-proofing

- Stacking comes standard with all ICX 8200
- Up to 8x 1/10/25GbE SFP28 fiber ports for uplink and/or stacking

### Enhanced Security and data privacy

- VXLAN\* support for advanced network segmentation and data confidentiality

### Advanced L3 routing delivers network design flexibility

- IPv4 and IPv6 L3 routing
- Static routes, RIP, OSPF, VRRP, VRF, GRE, PIM, PBR

### Broad range of unified management options for maximum flexibility

- On Premises: SmartZone
- Cloud Based: RUCKUS Cloud\*
- Controllerless: RUCKUS Unleashed\*
- RUCKUS Analytics

### Enhanced availability







- Redundant, load-sharing power supplies and fans on specific models

### Services and Support Included

- 3 Years remote TAC support included with every ICX 8200 model
- Limited lifetime warranty



## RUCKUS ICX 8200 with RJ45 Copper ports and fixed power supply and fans

These stackable RUCKUS ICX 8200 models offer a single integrated power supply, one RJ-45 Ethernet port for out-of-band network management, one USB Type-C port for console management, one RJ-45 port for serial console management, and one USB port for external file storage.

	<b>ICX 8200-24</b> <ul style="list-style-type: none"> <li>• 24× 10/100/1000 Mbps RJ-45 ports</li> <li>• 4× 1/10/25 GbE uplink/stacking SFP28 ports</li> </ul>
	<b>ICX 8200-24P PoE</b> <ul style="list-style-type: none"> <li>• 24× 10/100/1000 Mbps RJ-45 PoE+ ports</li> <li>• 4× 1/10/25 GbE uplink/stacking SFP28 ports</li> <li>• 370 W PoE budget. PoE+ 802.3at</li> </ul>
	<b>ICX 8200-24ZP Multigigabit PoE</b> <ul style="list-style-type: none"> <li>• 24× 100/1000/2500 Mbps RJ-45 PoE++ 90W ports</li> <li>• 4× 1/10/25 GbE uplink/stacking SFP28 ports</li> <li>• 740 W PoE budget.</li> </ul>
	<b>ICX 8200-48</b> <ul style="list-style-type: none"> <li>• 48× 10/100/1000 Mbps RJ-45 ports</li> <li>• 4× 1/10/25 GbE uplink/stacking SFP28 ports</li> </ul>
	<b>ICX 8200-48P PoE</b> <ul style="list-style-type: none"> <li>• 48× 10/100/1000 Mbps RJ-45 PoE+ ports</li> <li>• 4× 1/10/25 GbE uplink/stacking SFP28 ports</li> <li>• 370 W PoE budget. PoE+ 802.3at</li> </ul>
	<b>ICX 8200-48PF PoE</b> <ul style="list-style-type: none"> <li>• 48× 10/100/1000 Mbps RJ-45 PoE+ ports</li> <li>• 4× 1/10/25 GbE uplink/stacking SFP28 ports</li> <li>• 740 W PoE budget. PoE+ 802.3at</li> </ul>

## RUCKUS ICX 8200 with hot-swap power supplies and fans

These stackable RUCKUS ICX 8200 models offers 2 slots for redundant hot swappable load sharing power supplies, 2 slots for hot swappable fans, one RJ-45 Ethernet port for out-of-band network management, one USB Type-C port for console management, one RJ-45 port for serial console management, and one USB port for external file storage.

	<b>ICX 8200-48PF2 PoE</b> <ul style="list-style-type: none"> <li>• 48× 10/100/1000 Mbps RJ-45 PoE+ ports</li> <li>• 4× 1/10/25 GbE uplink/stacking SFP28 ports</li> <li>• 1440 W PoE budget with two PSUs (740W with one PSU)</li> <li>• Dual hot swappable power supplies and fans</li> </ul>
	<b>ICX 8200-48ZP2 Multigigabit PoE</b> <ul style="list-style-type: none"> <li>• 32× 10/100/1000 Mbps RJ-45 PoE+ ports</li> <li>• 16× 100/1000/2500 Mbps RJ-45 PoE++ 90W ports</li> <li>• 4× 1/10/25 GbE uplink/stacking SFP28 ports</li> <li>• 1480 W PoE budget with two PSUs (740W with one PSU)</li> <li>• Dual hot swappable power supplies and fans</li> </ul>

## RUCKUS ICX 8200 Compact

These RUCKUS ICX 8200 compact switches offer a single integrated power supply, one USB Type-C port for console management, one RJ-45 Ethernet port for out-of-band network management, one RJ-45 port for serial console management, and one USB port for external file storage.



### ICX 8200-C08P PoE

- 8× 10/100/1000 Mbps RJ-45 PoE+ ports
- 2× 1/10GbE uplink/stacking SFP+ ports
- 124 W PoE budget PoE+ 802.3at



### ICX 8200-C08ZP Multigigabit PoE

- 4× 100/1000/2500 Mbps RJ-45 PoE++ 90W ports
- 4× 1/2.5/5/10 Gbps RJ-45 PoE++ 90W ports
- 2× 1/10/25 GbE uplink/stacking SFP28 ports
- 240 W PoE budget

## RUCKUS ICX 8200 Fiber

These stackable RUCKUS ICX 8200 models offer a single integrated power supply, one RJ-45 Ethernet port for out-of-band network management, one USB Type-C port for console management, one RJ-45 port for serial console management, and one USB port for external file storage



### ICX 8200-24F Fiber

- 24× 1GbE SFP ports
- 4× 1/10/25 GbE uplink/stacking SFP28 ports



### ICX 8200-48F Fiber

- 48× 1GbE SFP ports
- 4× 1/10/25 GbE uplink/stacking SFP28 ports



### ICX 8200-24FX 10G Fiber

- 16× 1/10GbE SFP+ ports
- 8× 1/10/25 GbE uplink/stacking SFP28 ports

## RUCKUS ICX 8200 Feature/Model Comparison

	Gigabit Compact	Gigabit Non-PoE		Gigabit PoE			
	RUCKUS ICX 8200-C08PF	RUCKUS ICX 8200-24	RUCKUS ICX 8200-48	RUCKUS ICX 8200-24P	RUCKUS ICX 8200-48P	RUCKUS ICX 8200-48PF	RUCKUS ICX 8200-48PF2
Feature							
Switching capacity (data rate, full duplex)	56 Gbps	248 Gbps	296 Gbps	248 Gbps	296 Gbps	296 Gbps	296 Gbps
Forwarding capacity (data rate, full duplex)	42 Mpps	184 Mpps	220 Mpps	184 Mpps	220 Mpps	220 Mpps	220 Mpps
10/100/1000 Mbps RJ45	8	24	48	24	48	48	48
1 Gbps SFP uplinks							
1/10 Gbps SFP/SFP+ uplinks	2						
1/10/25 Gbps SFP/SFP+/SFP28 uplinks		4	4	4	4	4	4
PoE/PoE+ 802.3at ports	8			24	48	48	48
Dual hot-swap power supplies and fan modules							Yes
Max PoE Class 3 ports (15.4 W per port)	8			24	48	48	48
Max PoE+ Class 4 ports (30 W per port)	4			12	12	24	48 (2 PSU)
Energy Efficient Ethernet (802.3az)	Yes						
Base IPv4/v6 Layer 3 routing (static routing, RIP)	Yes						
Advanced IPv4/v6 Layer 3 (OSPF, VRRP, VRF, GRE, PIM, PBR)	With License						
Aggregated stacking bandwidth (data rate, full duplex)	240 Gbps	1.2 Tbps					
Stacking density (maximum switches in a stack)	12						
Stacking ports (maximum ports usable for stacking)	Up to 2×10 GbE SFP+	Up to 4×25 GbE SFP28					
Maximum stacking distance (distance between stacked switches)	10 km						



## RUCKUS ICX 8200 Feature/Model Comparison

	Gigabit Compact	Gigabit Non-PoE		Gigabit PoE			
	RUCKUS ICX 8200-C08PF	RUCKUS ICX 8200-24	RUCKUS ICX 8200-48	RUCKUS ICX 8200-24P	RUCKUS ICX 8200-48P	RUCKUS ICX 8200-48PF	RUCKUS ICX 8200-48PF2
POWER							
Features							
Power inlet (AC)	C14						
Input voltage/frequency	AC: 100 to 240 VAC @ 50 to 60 Hz						
Power Supply Hold Time	10ms	10ms	10ms	20ms	20ms	10ms	10ms
Power supply rated max (AC)	240 W	65 W	100 W	525 W	525 W	880 W	920W x 2
PoE power budget (AC)	124 W			370 W	370 W	740 W	740W (1 PSU) 1440W (2 PSU)
Switch power usage (25°C) 10% traffic* (no PoE load) 100% traffic** (full PoE load)	18 W 150 W	31 W 38 W	47 W 54 W	36 W 445 W	49 W 451 W	51W 854 W	86 W 1667 W
Airflow	Fanless	Fanless Mode. Front to side & back		Fanless Mode. Front to side & back			Front to Back
Switch power dissipation (25°C) 10% traffic* (no PoE load) 100% traffic** (full PoE load)	61 BTU/hr 514 BTU/hr	106 BTU/hr 132 BTU/hr	160 BTU/hr. 184 BTU/hr	124 BTU/hr 1518 BTU/hr	167 BTU/hr 1539 BTU/hr	174 BTU/hr 2914 BTU/hr	294 BTU/hr 5692 BTU/hr
Features							
Net Weight	2.27 kg 5.00 lb	3.74 kg 8.24 lb	4.96 kg 10.93 lb	4.34 kg 9.57 lb	5.57 kg 12.28 lb	5.51kg 12.15 lb	6.39 kg 14.08 lb
Dimensions							
Height	4.40 cm 1.73 Inches	4.40 cm 1.73 Inches	4.40 cm 1.73 inches	4.40 cm 1.73 inches	4.40 cm 1.73 inches	4.40 cm 1.73 inches	4.40 cm 1.73 inches
Width	27.00 cm 10.63 inches	44.00 cm 17.32 inches	44.00 cm 17.32 inches	44.00 cm 17.32 inches	44.00 cm 17.32 inches	44.00 cm 17.32 inches	44.00 cm 17.32 inches
Depth	21.40 cm 8.42 inches	28.00 cm 11.02 inches	37.00 cm 14.57 inches	28.00 cm 11.02 inches	37.00 cm 14.57 inches	37.00 cm 14.57 inches	37.00 cm 14.57 inches
Acoustics (25°C, min fan speed)	Fanless	40.0 dBA	40.0 dBA	41.0 dBA	41.0 dBA	41.0 dBA	51.0 dBA
MTBF (25°C)	2,007,096hr	1,543,328hr	1,136,723hr	1,550,360hr	1,297,288hr	1,070,987hr	561,966hr
MANAGEMENT PORTS							
USB Type-C port (For console management)	Yes						
RJ45 serial port (For serial console management)	Yes						
USB Type-A port (For external file storage)	Yes						
RJ45 Ethernet port (For out of band network management)	Yes						

\* All downlink ports, stacking ports, and uplink ports are linked up with 10% traffic rate. No PoE load on PoE models. Fans are at nominal speed.

\*\* All downlink ports, stacking ports, and uplink ports are linked up with 100% traffic rate. 100% PoE load on PoE models. Fans are at high speed.

## RUCKUS ICX 8200 Feature/Model Comparison

	Multigigabit Ethernet PoE++			Fiber Ethernet		
	RUCKUS ICX 8200-C08ZP	RUCKUS ICX 8200-24ZP	RUCKUS ICX 8200-48ZP2	RUCKUS ICX 8200-24F	RUCKUS ICX 8200-24FX	RUCKUS ICX 8200-48F
Features						
Switching capacity <i>(data rate, full duplex)</i>	200 Gbps	320 Gbps	344 Gbps	248 Gbps	720 Gbps	296 Gbps
Forwarding capacity <i>(data rate, full duplex)</i>	148 Mpps	237 Mpps	254 Mpps	184 Mpps	533 Mpps	219 Mpps
10/100/1000 Mbps RJ45			32			
100/1000 Mbps/2.5 Gbps RJ45 downlinks <i>(full duplex only)</i>	4	24	16			
100Mbps/1/2.5/5/10 Gbps RJ45 downlinks	4					
1 Gbps SFP				24		48
1/10 Gbps SFP+					16	
1/10/25 Gbps SFP/SFP+/SFP28 uplinks	2	4	4	4	8	4
PoE/PoE+ 802.3at ports			32			
PoH / PoE / PoE+ / PoE++ 802.3bt ports	8	24	16			
Dual hot-swap power supplies and fan modules			Yes			
Maximum PoE Class 3 ports <i>(15.4 W per port)</i>	8	24	48			
Maximum PoE+ Class 4 ports <i>(30 W per port)</i>	8	24	24 (1 PSU) 48 (2 PSU)			
Maximum PoE++ Class 6 ports <i>(60 W per port)</i>	4	12	12 (1PSU) 16 (2 PSU)			
Energy Efficient Ethernet (802.3az)	Yes					
Base IPv4/v6 Layer 3 routing <i>(static routing, RIP)</i>	Yes					
Advanced IPv4/v6 Layer 3 routing <i>(OSPF, VRRP, VRF, GRE, PIM, PBR)</i>	With License					
Aggregated stacking bandwidth <i>(data rate, full duplex)</i>	600 Gbps	1.2 Tbps				
Stacking density <i>(maximum switches in a stack)</i>	12					
Stacking ports <i>(maximum ports usable for stacking)</i>	Up to 2×25 GbE SFP28	Up to 4×25 GbE SFP28				
Maximum stacking distance <i>(distance between stacked switches)</i>	10 km					

RUCKUS ICX 8200 Feature/Model Comparison

	Multigigabit Ethernet PoE++			Fiber Ethernet		
	RUCKUS ICX 8200-C08ZP	RUCKUS ICX 8200-24ZP	RUCKUS ICX 8200-48ZP2	RUCKUS ICX 8200-24F	RUCKUS ICX 8200-24FX	RUCKUS ICX 8200-48F
Features						
Power inlet (AC)	C14					
Input voltage/frequency	AC: 100 to 240 VAC @ 50 to 60 Hz					
Power supply hold time	20ms	10ms	10ms	10ms	10ms	10ms
Power supply rated max (AC)	305W	950W	920W x 2	100W	150W	180W
PoE power budget (AC)	240W	740W	800W (1 PSU) 1480W (2 PSU)			
Switch power usage (25°C) 10% traffic* (no PoE load) 100% traffic** (full PoE load)	41W 300W	69W 920W	90W 1839W	65W 78W	82W 93W	106W 118W
Airflow	Fanless	Front to side & back		Front to side & back		
Switch power dissipation (25°C) 10% traffic* (no PoE load) 100% traffic** (full PoE load)	140 BTU/hr. 1023 BTU/hr.	235 BTU/hr. 3139 BTU/hr.	305 BTU/hr. 6275 BTU/hr.	223 BTU/hr. 264 BTU/hr.	279 BTU/hr. 316 BTU/hr.	362 BTU/hr. 402 BTU/hr.
Features						
Net Weight	3.23 Kg	5.22 Kg	6.64 Kg (2 PSUs)	3.77 Kg	3.81 Kg	4.30 Kg
Dimensions						
Height	4.40 cm 1.73 Inches	4.40 cm 1.73 inches	4.40 cm 1.73 inches	4.40 cm 1.73 inches	4.40 cm 1.73 inches	4.40 cm 1.73 inches
Width	27.00 cm 10.63 inches	44.00 cm 17.32 inches	44.00 cm 17.32 inches	44.00 cm 17.32 inches	44.00 cm 17.32 inches	44.00 cm 17.32 inches
Depth	26.00 cm 10.24 inches	28.00 cm 11.02 inches	37.00 cm 14.57 inches	28.00 cm 11.02 inches	28.00 cm 11.02 inches	28.00 cm 11.02 inches
Acoustics (25°C, min fan speed)	Fanless	41.0 dBA	51.0 dBA	41.0 dBA	41.0 dBA	41.0 dBA
MTBF (25°C)	539,091hr	936,765hr	536,710hr	1,190,512hr	890,716hr	1,699,974hr
Features						
USB Type-C port (For console management)	Yes					
RJ45 serial port (For serial console management)	Yes					
USB Type-A port (For external file storage)	Yes					
RJ45 Ethernet port (For out of band network management)	Yes					

\* All downlink ports, stacking ports, and uplink ports are linked up with 10% traffic rate. No PoE load on PoE models. Fans are at nominal speed.

\*\* All downlink ports, stacking ports, and uplink ports are linked up with 100% traffic rate. 100% PoE load on PoE models. Fans are at high speed.

# RUCKUS ICX 8200 Specifications

Features	SPECIFICATIONS	
Connector options	<ul style="list-style-type: none"> <li>10/100/1000 Mbps RJ-45</li> <li>1/2.5 Gbps RJ-45</li> <li>1/2.5/5/10 Gbps RJ-45</li> <li>1 Gbps SFP ports</li> <li>1/10 Gbps SFP+ ports</li> <li>1/10/25 Gbps SFP28 ports</li> </ul>	<ul style="list-style-type: none"> <li>Out-of-band Ethernet management: 10/100/1000 Mbps RJ-45</li> <li>Console management: RJ45 serial port and USB Type-C port with serial communication device class support</li> <li>File transfer: USB port, standard-A plug</li> </ul> <p>For the latest information about supported optics, please visit <a href="http://www.commscope.com/ruckus">www.commscope.com/ruckus</a>.</p>
DRAM NVRAM (eMMC) Packet buffer size	<ul style="list-style-type: none"> <li>4 GB</li> <li>8 GB</li> <li>4 MB</li> </ul>	
Maximum MAC addresses	<ul style="list-style-type: none"> <li>32K</li> </ul>	
Maximum VLANs Maximum PVLANS	<ul style="list-style-type: none"> <li>4,095</li> <li>32</li> </ul>	
Maximum STP (spanning trees instances)	<ul style="list-style-type: none"> <li>253</li> </ul>	
Maximum VEs	<ul style="list-style-type: none"> <li>512</li> </ul>	
Maximum ARP entries	<ul style="list-style-type: none"> <li>8192</li> </ul>	
Maximum routes (in hardware)	<ul style="list-style-type: none"> <li>16k IPv4, 4k IPv6</li> <li>Next hop address: 8k</li> </ul>	
Trunking	<ul style="list-style-type: none"> <li>Maximum ports per LAG : 8</li> <li>Maximum Link Aggregation Groups : 128</li> </ul>	
Maximum jumbo frame size	<ul style="list-style-type: none"> <li>9,216 bytes</li> </ul>	
QoS priority queues	<ul style="list-style-type: none"> <li>8 per port</li> </ul>	
Multicast groups	<ul style="list-style-type: none"> <li>4096 (Layer2 IGMP) 512 (Layer2 MLD)</li> <li>4096 (IPv4 PIM) 512 (IPv6 PIM)</li> </ul>	
Quality of Service (QoS)	<ul style="list-style-type: none"> <li>ACL Mapping and Marking of ToS/DSCP (CoS)</li> <li>ACL Mapping and Marking of 802.1p</li> <li>ACL Mapping to Priority Queue</li> <li>Classifying and Limiting Flows Based on TCP Flags</li> <li>DiffServ Support</li> </ul>	<ul style="list-style-type: none"> <li>Honoring DSCP and 802.1p (CoS)</li> <li>MAC Address Mapping to Priority Queue</li> <li>Priority Queue Management using Weighted Round Robin (WRR), Strict Priority (SP), and a combination of WRR and SP</li> </ul>
Traffic management	<ul style="list-style-type: none"> <li>ACL-based inbound rate limiting and traffic policies</li> <li>Broadcast, multicast, and unknown unicast rate limiting</li> <li>Inbound rate limiting per port</li> <li>Outbound rate limiting per port and per queue</li> </ul>	
Security	<ul style="list-style-type: none"> <li>802.1X authentication</li> <li>MAC authentication</li> <li>Flexible authentication</li> <li>Web authentication</li> <li>DHCP snooping</li> <li>Dynamic ARP inspection</li> <li>Neighbor Discovery (ND) Inspection</li> <li>Bi-level Access Mode (Standard and EXEC Level)</li> <li>EAP pass-through support</li> <li>IEEE 802.1X username export in sFlow</li> <li>Protection against Denial of Service (DoS) attacks</li> <li>Authentication, Authorization, and Accounting (AAA)</li> </ul>	<ul style="list-style-type: none"> <li>MAC Address Locking MAC Port Security</li> <li>Advanced Encryption Standard (AES) with SSHv2</li> <li>RADIUS/TACACS/TACACS+</li> <li>Secure Copy (SCP)</li> <li>Secure Shell (SSHv2)</li> <li>Protected Ports</li> <li>Local Username/Password</li> <li>Change of Authorization (CoA) RFC 5176</li> <li>Trusted Platform Module</li> <li>RADSEC (RFC 6614)</li> <li>Encrypted Syslog (RFC 5425)</li> </ul>
SDN features	<ul style="list-style-type: none"> <li>OpenFlow1 v1.0 and v1.3</li> <li>Operates with OpenDayLight Controller</li> <li>OpenFlow hybrid port mode (Supports both OpenFlow traffic forwarding and regular traffic forwarding on the same port)</li> </ul>	

# RUCKUS ICX 8200 Specifications

Features	SPECIFICATIONS	
High availability	<ul style="list-style-type: none"> <li>• Layer 3 VRRP/VRRP-E protocol redundancy</li> <li>• Real-time state synchronization across the stack</li> <li>• Hitless failover and switchover from master to standby stack controller</li> <li>• Hot insertion and removal of stacked units</li> <li>• Layer 2 VSRP switch redundancy</li> <li>• In Service Software Update (ISSU)</li> </ul>	
Layer 2 feature set	<ul style="list-style-type: none"> <li>• 802.1s Multiple Spanning Tree</li> <li>• 802.1x Authentication</li> <li>• Auto MDI/MDIX</li> <li>• BPDU Guard, Root Guard</li> <li>• Dual-Mode VLANs</li> <li>• MAC-based VLANs, Dynamic MAC-based VLAN activation</li> <li>• Dynamic VLAN Assignment</li> <li>• Dynamic Voice VLAN Assignment</li> <li>• Fast Port Span</li> <li>• GVRP : GARP VLAN Registration Protocol</li> <li>• IGMP Snooping (v1/v2/v3)</li> <li>• IGMP Proxy for Static Groups</li> <li>• IGMP v2/v3 Fast Leave</li> <li>• Inter-Packet Gap (IPG) adjustment</li> <li>• Link Fault Signaling (LFS)</li> <li>• MAC Address Filtering</li> <li>• MAC Learning Disable</li> </ul>	<ul style="list-style-type: none"> <li>• MLD Snooping (v1/v2)</li> <li>• Multi-device Authentication</li> <li>• Per-VLAN Spanning Tree (PVST/PVST+/PRST)</li> <li>• Mirroring: Port-based, ACL-based, MAC Filter-based, and VLAN-based</li> <li>• PIM-SM v2 Snooping</li> <li>• Port Loop Detection</li> <li>• Private VLAN</li> <li>• Remote Fault Notification (RFN)</li> <li>• Single-instance Spanning Tree</li> <li>• Trunk Groups (static, LACP)</li> <li>• Uni-Directional Link Detection (UDLD)</li> <li>• Metro-Ring Protocol (MRP) (v1, v2)</li> <li>• Virtual Switch Redundancy Protocol (VSRP)</li> <li>• Q-in-Q and selective Q-in-Q</li> <li>• VLAN Mapping</li> <li>• Topology Groups</li> </ul>
Base Layer 3 IP routing feature set	<ul style="list-style-type: none"> <li>• IPv4 and IPv6 static routes</li> <li>• RIP v1/v2, RIPv6</li> <li>• ECMP</li> <li>• Port-based Access Control Lists</li> <li>• Layer 3/Layer 4 ACLs</li> </ul>	<ul style="list-style-type: none"> <li>• Host routes</li> <li>• Virtual Interfaces</li> <li>• Routed Interfaces</li> <li>• Route-only Support</li> <li>• Routing Between Directly Connected Subnets</li> </ul>
Premium Layer 3 IP routing feature set with software license	<ul style="list-style-type: none"> <li>• IPv4 and IPv6 dynamic routes</li> <li>• OSPF v2, v3</li> <li>• PIM-SM, PIM-SSM, PIM-DM, PIM passive (IPv4, IPv6)</li> <li>• PBR</li> </ul>	<ul style="list-style-type: none"> <li>• Virtual Route Redundancy Protocol VRRP (IPv4)</li> <li>• VRRP v3 (IPv6)</li> <li>• VRRP-E(IPv4/IPv6)</li> <li>• VRF (IPv4 and IPv6)</li> <li>• GRE</li> </ul>

Features	STANDARD COMPLIANCE	
IEEE standards compliance	<ul style="list-style-type: none"> <li>• 802.1AB LLDP/ LLDP-MED</li> <li>• 802.1D MAC Bridging</li> <li>• 802.1p Mapping to Priority Queue</li> <li>• 802.1s Multiple Spanning Tree (MST)</li> <li>• 802.1w Rapid Reconfiguration of Spanning Tree (RSTP)</li> <li>• 802.1x Port-based Network Access Control (PNAC)</li> <li>• 802.3 Carrier Sense Multiple Access/Collision Detection (CSMA/CD)</li> <li>• 802.3ab 1000BASE-T</li> <li>• 802.3 10Base-T</li> <li>• 802.3ad Link Aggregation (Dynamic and Static)</li> <li>• 802.1 AX-2008 Link Aggregation</li> </ul>	<ul style="list-style-type: none"> <li>• 802.3ae 10 Gigabit Ethernet</li> <li>• 802.3af Power over Ethernet</li> <li>• 802.3at Power over Ethernet Plus</li> <li>• 802.3bz Multigigabit Ethernet</li> <li>• 802.3u 100Base-TX</li> <li>• 802.3x Flow Control</li> <li>• 802.3z 1000Base-SX/LX</li> <li>• 802.3 MAU MIB (RFC 2239)</li> <li>• 802.1Q VLAN Tagging</li> <li>• 802.1BR Bridge Port Extension</li> <li>• 802.3az Energy Efficient Ethernet</li> <li>• 802.3bt PoE++</li> </ul>
RFC standards compliance	For a complete list of RFCs supported by the ICX 8200 product family, please visit <a href="http://www.commscope.com/ruckus">www.commscope.com/ruckus</a> .	



# RUCKUS ICX 8200 Specifications

Features	FEATURE SETS
<b>Management</b>	<ul style="list-style-type: none"> <li>DHCP Auto-Configuration</li> <li>Configuration Logging</li> <li>Digital Optical Monitoring</li> <li>Display Log Messages on Multiple Terminals</li> <li>Embedded Web Management (HTTP/HTTPS)</li> <li>Embedded DHCP Server</li> <li>Industry-standard Command Line Interface (CLI)</li> <li>RUCKUS SmartZone, RUCKUS Cloud*, RUCKUS Unleashed*</li> <li>CLI activation of optional software features</li> <li>USB file management and storage</li> <li>Macro for batch execution</li> <li>Out-of-band Ethernet Management</li> <li>RSPAN</li> <li>TFTP</li> <li>TELNET Client and Server</li> <li>SSH / SSH V2</li> <li>Bootp</li> <li>SNMPv1/v2c</li> <li>DHCP Server and DHCP Relay</li> <li>SNMPv3 Intro to Framework</li> <li>Architecture for Describing SNMP Framework</li> <li>SNMP Message Processing and Dispatching</li> <li>SNMPv3 Applications</li> <li>SNMPv3 User-based Security Model</li> <li>SNMP View-based Access Control Model SNMP</li> <li>sFlow</li> <li>Network Time Protocol (NTP)</li> <li>Multiple Syslog Servers</li> <li>SCP</li> <li>Virtual Cable Tester (VCT)</li> <li>From management MIB, please see the ICX technical documentation at <a href="http://www.commscope.com/ruckus">www.commscope.com/ruckus</a></li> </ul>

Features	ENVIRONMENT
<b>Ambient Temperature</b>	<ul style="list-style-type: none"> <li>Operational: 0°C to 45°C (32°F to 113°F) at sea level</li> <li>Non-operational: 40°C to 70°C (-40°F to 158°F)</li> </ul>
<b>Relative Humidity (non-condensing)</b>	<ul style="list-style-type: none"> <li>Operational: 10% to 90% at 50°C (122°F)</li> <li>Non-operational: 10% to 90% at 70°C (158°F)</li> </ul>
<b>Altitude (above sea level)</b>	<ul style="list-style-type: none"> <li>Operational 0 to 3,048 m (10,000 ft)</li> <li>Non-operational: 0 to 12,000 m (39,370 ft)</li> </ul>

Features	COMPLIANCE/CERTIFICATION
<b>Electromagnetic emissions</b>	<ul style="list-style-type: none"> <li>FCC Part 15, Subpart B (Class A)</li> <li>EN 55032 (CE mark) (Class A)</li> <li>EN 55035 (CE mark) (Immunity) for Information Technology Equipment</li> <li>EN 55024 (CE mark) (Immunity) for Information Technology Equipment</li> <li>ICES-003 (Canada) (Class A)</li> <li>AS/NZ 55032 (Australia/New Zealand) (Class A)</li> <li>VCCI (Japan) (Class A)</li> <li>EN 300 386</li> <li>CNS 15936-1 (BSMI) (Taiwan) (Class A)</li> <li>KN 32 (South Korea) (Class A)</li> <li>KN 35 (South Korea) (Class A)</li> <li>TCVN 7189 / TCVN 7317 (Vietnam) (Class A)</li> <li>EN 61000-3-2</li> <li>EN 61000-3-3</li> </ul>
<b>Safety</b>	<ul style="list-style-type: none"> <li>CAN/CSA-C22.2 No. 62368-1/UL 62368-1 - Safety of Information Technology Equipment</li> <li>EN 60825 Safety of Laser Products - Part 1: Equipment Classification, Requirements and User's Guide</li> <li>EN 60950-1/IEC 60950-1/EN 62368-1/EC 62368-1 Safety of Information Technology Equipment</li> <li>CNS 15598-1 (BSMI) (Taiwan)</li> </ul>
<b>Environmental regulatory compliance</b>	<ul style="list-style-type: none"> <li>2014/35/EU and 2014/30/EU</li> <li>2011/65/EU – Restriction of the use of certain hazardous substance in electrical and electronic equipment (EU RoHS)</li> <li>2012/19/EU – Waste electrical and electronic equipment (EU WEEE)</li> <li>94/62/EC – packaging and packaging waste (EU)</li> <li>2006/66/EC – batteries and accumulators and waste batteries and accumulators (EU battery directive)</li> <li>1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (EU REACH)</li> <li>Section 1502 of the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010 – U.S. Conflict Minerals</li> <li>30/2011/TT-BCT – Vietnam circular</li> <li>SJ/T 11363-2006 Requirements for Concentration Limits for Certain Hazardous Substances in EIPs (China)</li> <li>SJ/T 11364-2006 Marking for the Control of Pollution Caused by EIPs (China)</li> <li>CNS 15663 (BSMI) (Taiwan)</li> </ul>
<b>Vibration</b>	<ul style="list-style-type: none"> <li>IEC 68-2-36, IEC 68-2-6</li> </ul>
<b>Shock and drop</b>	<ul style="list-style-type: none"> <li>IEC 68-2-27, IEC 68-2-32</li> </ul>
<b>TAA (Trade Agreement Act)</b>	<ul style="list-style-type: none"> <li>All ICX 8200 SKUs are TAA compliant</li> </ul>

## RUCKUS ICX 8200 Ordering Information

Part Number	RUCKUS ICX 8200 Switches with Three-Year Remote TAC support TAA-Compliant
ICX8200-C08PF	RUCKUS ICX 8200 Compact Switch, 8×10/100/1000 Mbps PoE+ ports, 2×10 GbE SFP+ stacking/uplink-ports, 124 W PoE budget, three-year remote TAC support. Power cord not included.
ICX8200-C08ZP	RUCKUS ICX 8200 Compact Switch, 4×100/1000/2500 Mbps PoE++ ports, 4× 1/2.5/5/10Mbps PoE++ ports, 2×25 GbE SFP28 stacking/uplink-ports, 240 W PoE budget, three-year remote TAC support. Power cord not included.
ICX8200-24	RUCKUS ICX 8200 Switch, 24×10/100/1000 Mbps ports, 4×25 GbE SFP28 stacking/uplink-ports, three-year remote TAC support. Power cord not included.
ICX8200-24P	RUCKUS ICX 8200 Switch, 24×10/100/1000 Mbps PoE+ ports, 4×25 GbE SFP28 stacking/uplink-ports, 370 W PoE budget, three-year remote TAC support. Power cord not included.
ICX8200-24ZP	RUCKUS ICX 8200 Switch, 24×100/1000/2500 Mbps PoE++ ports, 4×25 GbE SFP28 stacking/uplink-ports, 740 W PoE budget, three-year remote TAC support. Power cord not included.
ICX8200-48	RUCKUS ICX 8200 Switch, 48×10/100/1000 Mbps ports, 4×25 GbE SFP28 stacking/uplink-ports, three-year remote TAC support. Power cord not included.
ICX8200-48P	RUCKUS ICX 8200 Switch, 48×10/100/1000 Mbps PoE+ ports, 4×25 GbE SFP28 stacking/uplink-ports, 370 W PoE budget, three-year remote TAC support. Power cord not included.
ICX8200-48PF	RUCKUS ICX 8200 Switch, 48×10/100/1000 Mbps PoE+ ports, 4×25 GbE SFP28 stacking/uplink-ports, 740 W PoE budget, three-year remote TAC support. Power cord not included.
ICX8200-48PF2-E	RUCKUS ICX 8200 Switch, 48×10/100/1000 Mbps PoE+ ports, 4×25 GbE SFP28 stacking/uplink-ports, 740 W PoE budget (with one PSU), hot swap power supplies and fans, one power supply and one fan included, three-year remote TAC support. Power cord not included.
ICX8200-48PF2-E2	RUCKUS ICX 8200 Switch, 48×10/100/1000 Mbps PoE+ ports, 4×25 GbE SFP28 stacking/uplink-ports, 1440 W PoE budget, hot swap power supplies and fans, two power supplies and two fans included, three-year remote TAC support. Power cords not included.
ICX8200-48ZP2-E	RUCKUS ICX 8200 Switch, 32×10/100/1000 Mbps PoE+ ports, 16×100/1000/2500 Mbps RJ-45 PoE++ ports, 4×25 GbE SFP28 stacking/uplink-ports, 740 W PoE budget (with one PSU), hot swap power supplies and fans, one power supply and one fan included, three-year remote TAC support. Power cord not included.
ICX8200-48ZP2-E2	RUCKUS ICX 8200 Switch, 32×10/100/1000 Mbps PoE+ ports, 16×100/1000/2500 Mbps RJ-45 PoE++ ports, 4×25 GbE SFP28 stacking/uplink-ports, 1480 W PoE budget, hot swap power supplies and fans, two power supplies and two fans included, three-year remote TAC support. Power cords not included.
ICX8200-24F	RUCKUS ICX 8200 Switch, 24×10/100/1000 Mbps SFP ports, 4×25 GbE SFP28 stacking/uplink-ports, three-year remote TAC support. Power cord not included.
ICX8200-48F	RUCKUS ICX 8200 Switch, 48×10/100/1000 Mbps SFP ports, 4×25 GbE SFP28 stacking/uplink-ports, three-year remote TAC support. Power cord not included.
ICX8200-24FX	RUCKUS ICX 8200 Switch, 16×1/10GbE SFP+ ports, 8×25 GbE SFP28 stacking/uplink-ports, three-year remote TAC support. Power cord not included.

Part Number	RUCKUS ICX 8200 Power Supplies, Fans and Accessories
ICX8200-PREM-LIC	ICX 8200 Layer 3 premium license. Enables advanced layer 3 features (OSPF, VRRP, PIM, PBR, VRF, GRE)
RPS23-E	Hot-swap 920 W AC PoE power supply, front to back airflow. Only applicable to the ICX8200 models with hot swap power supplies (up to 2 per switch) Power cord not included
ICX-FAN13-E	Hot-swap fan tray front to back airflow. Only applicable to the ICX8200 models with hot swap fans (up to 2 per switch)
XBR-R000295	1U, 1.5U, and 2U Universal Kit for Four-Post Racks
ICX7000-RMK	Two-post fixed rack mount kit
ICX7000-C12-RMK	Rack mount kit for compact switches
ICX7000-C12-WMK	Wall Mount Bracket Kit for compact switches
ICX-DIN-MNT	DIN rail mount kit
CC-USBC-USBA	USB 2.0 Cable, Type-C to Type-A, 1 meter (for USB Type-C console port)
CC-RJ45-DB9	Console cable RJ45-RJ45 with RJ-45-DB9 Adapter (for RJ-45 console port)

## RUCKUS ICX 8200 Ordering Information

Part Number	Power Cords
PCUSA2	C13 POWER CORD for USA, NEMA5-15/C13, 13A, 125V
PCEURO	C13 Power Cord for Europe
PCAU5	C13 POWER CORD FOR AUSTRALIA
PCCHINA2-IEC309	C13 Power Cord for China, 250V 10A
PCINDIA	C13 6 FOOT AC POWER CORD FOR INDIA
PCJAPAN	C13 Power Cord for Japan version
PCSWISS-C1312G-HF	C13 POWER CORD for Switzerland, SEV1011 TO C13, 10A, 250V, HALOGEN-FREE
PCUK	C13 Power Cord for United Kingdom
PC-C13C14	C13/C14 15A Power Cord

### Warranty

RUCKUS ICX 8200 Switches are covered by the RUCKUS Assurance Limited Lifetime Warranty. For details, visit [www.ruckusnetworks.com/warranty](http://www.ruckusnetworks.com/warranty).

### Best-in-Class Support

RUCKUS ICX 8200 switches are supported by next-business-day advance replacement where available, as well as software defect repairs and maintenance updates. 3 years remote TAC support is included with the product purchase. Many on-site and TAC support options are available and can be purchased bundled with the product or separately.

### Legal Disclaimer

Product features, functionality and specifications may change or be discontinued without notice. Nothing in this document shall be deemed to create a warranty of any kind, either express or implied,

statutory or otherwise, including but not limited to, any implied warranties of merchantability, fitness for a particular purpose, non-infringement of third-party rights or availability with respect to any products and services.

Refer to [www.commscope.com/ruckus](http://www.commscope.com/ruckus) for the latest version of this document.

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### About RUCKUS Networks

RUCKUS Networks builds and delivers purpose-driven networks that perform in the demanding environments of the industries we serve. Together with our network of trusted go-to-market partners, we empower our customers to deliver exceptional experiences to the guests, students, residents, citizens and employees who count on them.

[www.ruckusnetworks.com](http://www.ruckusnetworks.com)

Visit our website or contact your local RUCKUS representative for more information.

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PA-117001.1-EN (01/23)

**RUCKUS**<sup>®</sup>  
**COMMScope**

# RUCKUS® Cloudpath® Enrollment System

Secure network access for BYOD, guest users and IT-owned devices



## COMPOSED OF:

- All-inclusive user-based license or subscription

## DEPLOYMENT OPTIONS:

- Cloud-based
- Virtualized on-premises (VMware®, Hyper-V®)

## BENEFITS

- Increases security for the network, devices, users and data
- Streamlines network onboarding for BYOD users, guests and IT-owned devices
- Gives you the power to define and manage policies for role-based access
- Delivers visibility and control over what devices are on the network
- Dramatically reduces helpdesk tickets related to network access

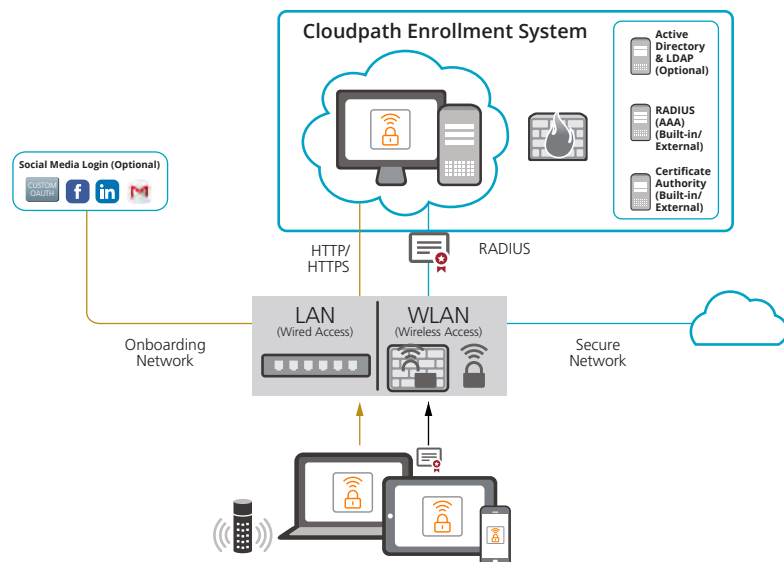
## FEATURES

- Secure network access
- Digital certificates and Dynamic PSKs
- Self-service onboarding and device enablement
- Policy management
- Third-party product integration via APIs

RUCKUS® Cloudpath® Enrollment System is a cloud service (or on-premises software) that delivers secure network access for any user, and any device, on any network.

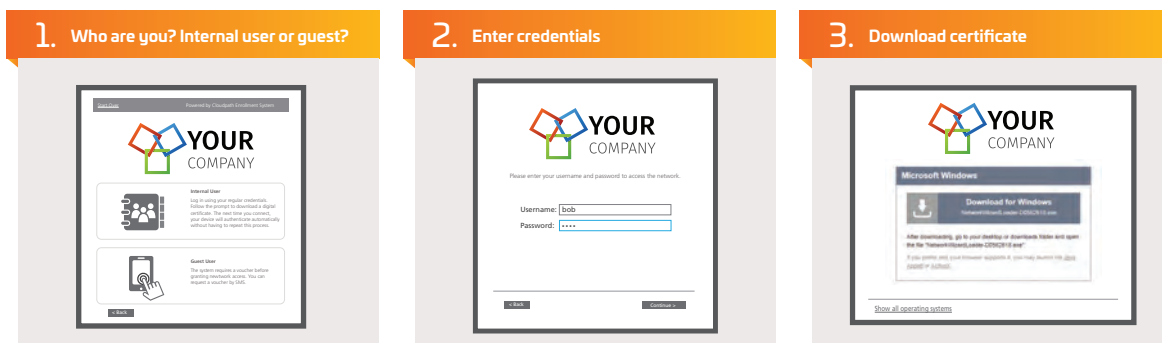
Cloudpath secures every connection with WPA2/WPA3-Enterprise, protecting data in transit between the device and the access point with powerful encryption. You gain visibility and control over which devices are on the network, and can define and manage policies so every user sees only the network resources they should see. The Cloudpath service checks the security posture of devices during onboarding to ensure they comply with your organization's security policies. The system redirects users with noncompliant devices to remediate them before granting access. It associates every device with a user, and you can easily revoke access at any time—for example, when a BYOD user leaves the organization. The service supports any Wi-Fi enabled device, including headless and IoT devices.

Intuitive self-service workflows streamline network onboarding—users gain network access simply and securely without IT intervention. The service lets you deliver a great onboarding experience while dramatically reducing helpdesk tickets related to network access. Internal users can easily self-provision any device for network access using their existing login credentials. Cloudpath installs a digital certificate for network authentication so that, after the initial connection, users don't need to re-enter credentials when they connect again. Guest users access a self-service login portal and receive credentials in the form of a CommScope-patented Dynamic PSK™ via email or SMS. Dynamic PSKs remove the need to install a certificate on the device, and offer similar security benefits. They are intuitive for users and much more secure than conventional PSKs because every user/device gets a unique key.



Cloudpath Enrollment System delivers secure network access for any device and any user on any network.

## Secure network onboarding workflow



BYOD and guest users can easily onboard their devices for secure network access with intuitive self-service workflows—without IT intervention.

The Cloudpath service interoperates via its APIs with third-party products to further enhance security and improve user experience. It works flawlessly with any vendor's wired and wireless infrastructure. Unlike leading competitors, the Cloudpath service offers a unique combination of cloud-based or virtualized on-premises deployment, built-in multi-tenancy, cost-effective per-user licensing, and superior ease of use.

### Secure multi-vendor network access

The Cloudpath service delivers secure network access for every user, and every device, on any vendor's network.

- Secure connections with WPA2/WPA3-Enterprise via 802.1X authentication
- Powerful encryption for data in transit over the air
- Support for BYOD, guest and IT-owned devices—including headless and IoT devices
- Up-front-posture check with remediation
- Visibility and control over devices on the network—with the power to revoke access

### Digital certificates and Dynamic Pre-Shared Keys

The Cloudpath service includes a built-in, comprehensive certificate authority (CA) that lets you create and manage your own public key infrastructure (PKI). Dynamic PSKs are a great alternative for guest users and devices that don't support certificates. They provide similar security benefits to digital certificates without the need to install a certificate on the device.

- Built-in RADIUS server and user database
- Integration with external certificate authorities and user database infrastructures
- Certificate-based authentication, authorization and accounting (AAA)

- CommScope patented Dynamic PSKs improve security because, unlike conventional PSKs, each user gets a unique key—revoke a user's access at any time without affecting other users

### Self-service onboarding and device enablement

Easy self-service onboarding ensures that users gain network access quickly and securely—without helpdesk involvement.

- Customizable workflows—entirely self-service or with internal sponsors—to tailor the user experience
- Optional pre-boarding lets users set up their devices for secure access before arriving at a given location
- Device provisioning capability can prompt users to install specific software during onboarding
- Customizable onboarding portal for guest access—including optional social login with Google, Facebook, LinkedIn and other popular identity providers
- Guest credentials via email, SMS or printed voucher
- Management portal and resident portal for multi-dwelling units help residents and their guests connect quickly, easily and securely
- Automated IT-managed onboarding via integration with third-party endpoint management products

### Policy management

The Cloudpath service lets you define and manage policies that govern network access for all users. It works with your network infrastructure to enforce policies for role-based access.

- Granular per-user, per-device policies, including bandwidth management and application-based access
- Role-based access—users get only the appropriate level of access
- Private per-user networks via VLANs, VXLANs or access policies—users see only their devices and traffic

### Third-party product integration via API

The Cloudpath service integrates via its APIs with third-party products to enhance security and user experience. It works with any product that can consume its APIs.

- Web content filters—lets these products filter encrypted content and apply role-based filtering rules (technology partnerships: iBoss® and Lightspeed Systems®)
- Next-generation firewalls—enables per-user and per-device policies (technology partnership: Palo Alto Networks®)

- Mobile device management—works with MDM products to support both managed and unmanaged devices with appropriate policies (technology partnership: AirWatch®)
- eduroam®—facilitates inter-campus roaming
- Google Chromebooks™—IT can onboard devices directly through the Google console, eliminating the need for users to onboard their own devices

## Specifications

<b>Deployment options</b>	<ul style="list-style-type: none"><li>• Cloud-based deployment</li></ul>	<ul style="list-style-type: none"><li>• On-premises virtualized deployment (VMware or Hyper-V)</li></ul>
<b>Redundancy and multi-tenancy</b>	<ul style="list-style-type: none"><li>• VM-based Cloudpath Enrollment System can be deployed as a standalone server or as a cluster in both active-active mode or as a star-hub for data replication and redundancy</li></ul>	<ul style="list-style-type: none"><li>• Multi-tenant mode enables MSPs to host multiple tenants within a single instance</li></ul>
<b>Certificate infrastructure (PKI)</b>	<ul style="list-style-type: none"><li>• Built-in certificate management system</li><li>• Unique CA for every tenant within the multi-tenant mode</li><li>• Ability to connect to external PKI</li><li>• Standalone or subordinate to integrate with existing PKI</li></ul>	<ul style="list-style-type: none"><li>• Certificate templates that integrate with policy</li><li>• Supports OSCP with automatic revocation</li><li>• Automatic deployment of certificates and secure networks using Group Policy Objects, MSI and SCEP calls</li></ul>
<b>RADIUS</b>	<ul style="list-style-type: none"><li>• Support for dynamic VLANs, ACLs and more</li><li>• Streamlined support for EAP-TLS and MAC filtering</li><li>• Client-based support for PEAP</li></ul>	<ul style="list-style-type: none"><li>• Built-in RADIUS server</li><li>• Ability to connect to an external RADIUS infrastructure</li><li>• RADIUS accounting</li></ul>
<b>Onboarding</b>	<ul style="list-style-type: none"><li>• Self-service onboarding with customizable workflows</li><li>• Support for wired/wireless infrastructure from any standards-based vendor</li></ul>	<ul style="list-style-type: none"><li>• Unified wired or wireless access</li></ul>
<b>Visibility and reporting</b>	<ul style="list-style-type: none"><li>• Per-device and per-user visibility and control</li><li>• Association between user, device, certificate and policy</li></ul>	<ul style="list-style-type: none"><li>• RADIUS accounting</li></ul>
<b>Authentication protocols</b>	<ul style="list-style-type: none"><li>• 802.1X (EAP methods: EAP-TLS, PEAP/MSCHAPv2, EAP-SIM, EAP-AKA, EAP-AKA')</li><li>• Dynamic PSK</li><li>• Web authentication</li><li>• Non-802.1X (MAC authentication)</li></ul>	<ul style="list-style-type: none"><li>• Support for Passpoint 2.0 R1 and HS2.0 R2 via OSU (online signup server)</li><li>• RADIUS CoA</li><li>• DPSK configuration for RUCKUS WLAN</li></ul>
<b>User identity support</b>	<ul style="list-style-type: none"><li>• Microsoft® Active Directory®</li><li>• RADIUS via PAP</li><li>• Any LDAP-compliant directory</li><li>• LDAP/S</li><li>• Novell®</li></ul>	<ul style="list-style-type: none"><li>• Google</li><li>• Azure</li><li>• OAuth2.0</li><li>• SAML</li><li>• Internal user database</li></ul>
<b>Device support</b>	<ul style="list-style-type: none"><li>• Android™ 6.0 and higher</li><li>• iOS® 9 and higher</li><li>• Chromebook™</li><li>• Windows® 7 and higher</li><li>• Mac OS X 10.7 and higher</li></ul>	<ul style="list-style-type: none"><li>• Linux Ubuntu® 16.04 and higher</li><li>• Fedora® 18 and higher</li><li>• Windows Phone® 8.1</li><li>• BlackBerry®</li></ul>
<b>SMS and email</b>	<ul style="list-style-type: none"><li>• Native integration with Twilio® and CDYNE®</li><li>• Ability to configure any custom SMS gateway</li></ul>	<ul style="list-style-type: none"><li>• Built-in SMTP server or configure SMTP server</li></ul>
<b>Third-party integrations via API</b>	<ul style="list-style-type: none"><li>• Next-generation firewalls</li><li>• Web content filters</li><li>• Mobile device management</li></ul>	<ul style="list-style-type: none"><li>• eduroam</li><li>• Google Chromebooks</li><li>• Any platform that can consume APIs</li></ul>



# Licensing overview

## Subscription

(Support included)

Cloud			
Step 1	Choose number of users		
<1K	1K–5K	5K–10K	10K+

Step 2	Choose subscription duration		
<1K	1 year	3 years	5 years

On-premises			
Step 1	Choose number of users		
<1K	1K–5K	5K–10K	10K+

Step 2	Choose subscription duration		
<1K	1 year	3 years	5 years

Step 3	Choose server license quantity
1 license per 20K users	

- Licensed by user, not device
- User count determines volume discount
- Separate list price for education customers

## Perpetual license

Step 1	Choose number of users		
<1K	1K–5K	5K–10K	10K+

Step 2	Choose server license quantity
1 license per 20K users	

Step 3	Choose support duration		
<1K	1 year	3 years	5 years

- Licensed by user, not device
- User count determines volume discount
- Separate list price for education customers

## Ordering guidance

1. Select from cloud or on-premises deployment model.
2. If you select on-premises, choose from subscription or perpetual licensing model.
3. Cloud deployment requires subscription model.
4. Determine the number of users in your environment, including guests.
5. Choose the appropriate SKU based upon subscription duration and user count.
6. Add optional white glove service for remotely assisted deployment.



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# RUCKUS AI™

## AI-Driven Service Assurance and Business Intelligence for RUCKUS enterprise networks



### BENEFITS

- AI powered network incident identification, prioritization, and resolution AI Operations.
- AI powered RRM to optimize network by reducing interference links
- AI driven AppInsights for visibility into wired, wireless and application server performance over time.
- Accelerates network and client troubleshooting
- Helps IT teams improve the user experience
- Service Assurance works with your RUCKUS network to automatically validate service levels

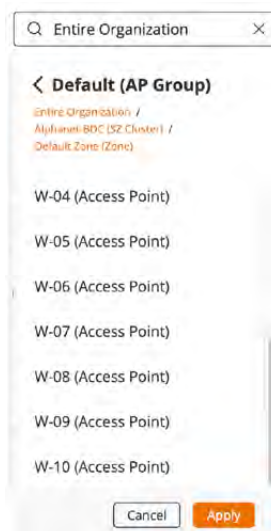
IT teams often lack the tools to ensure required network service levels in an environment of ever-increasing user connectivity demands and network complexity. Helpdesk tickets from user connectivity issues pile up while IT struggles to glean insight from network data. When service issues affect user experience, IT often lacks a way to identify root causes and define a course of action to fix the problem.

RUCKUS AI™ from CommScope is a cloud service for network intelligence and service assurance. Powered by machine learning (ML) and artificial intelligence (AI), it helps you get the most from your RUCKUS® network. The service gives IT comprehensive visibility into network operations. It accelerates troubleshooting and helps IT teams meet their network service level agreements (SLAs).

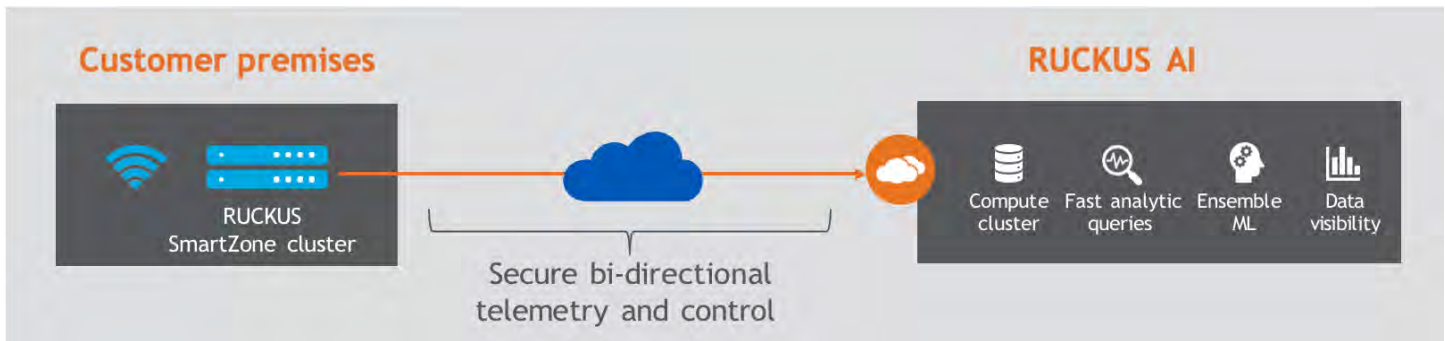
The service identifies network assurance incidents, classifies them by severity, traces root causes and makes specific AI recommendations for remediation. It automatically monitors network health relative to configurable thresholds.

Advanced client troubleshooting and AI incident intelligence give IT teams the power to address service issues for individual users and devices. RUCKUS AI works with your RUCKUS network to allow it to self-validate—without the need for overlay sensors. You can identify and address many service issues before they even affect users.

The service also delivers robust reporting and informative dashboards. Create custom dashboards and data visualizations with the Data Studio tool—and flexibly explore your network data warehouse with drag-and-drop ease.



This network navigation widget present in the dashboard and other pages enables you to browse across your entire network organization. It enables you to drilldown and filter parts of the network hierarchy. Levels to browse include overall network, domain, zone, AP group, AP. You can also search for a specific network element in the search box above the navigation.



RUCKUS AI aggregates raw data and automatically transforms it into deep insight into network operations. This ML- and AI-powered service frees you from a wide variety of manual tasks associated with network assurance. Comprehensive network intelligence helps you deliver on network SLAs in support of users, devices and applications.

RUCKUS AI automatically measures the impact of the RUCKUS SmartZone™ software configuration changes on network performance. You can observe the effects of each change on a portion of the network before rolling it out more broadly. This helps to avoid fully rolling out changes that might have an adverse effect on network performance.

It scales to support the largest deployments—expanding capacity transparently to meet your requirements. RUCKUS AI supports two control and management architectures: RUCKUS SmartZone software\* for on-premises and private cloud/data center deployments, and RUCKUS Cloud™ for cloud-managed deployments.

RUCKUS AI has an industry-unique combination of attributes:

- Automated data baselining and insights driven by ML and AI
- Health and SLA monitoring
- Powerful, holistic troubleshooting
- Automatic classification of incident severity
- Service validation without the need for an on-site data collector or overlay sensors
- Granular access to raw data with deep exploration and custom dashboards
- 12 months of storage with flexible data reporting

\* RUCKUS SmartZone 5.1.2 or higher is required.

### Streaming telemetry with a modern data stack for advanced service assurance

RUCKUS AI is designed for the unique data profile generated by network devices. On-premises controllers securely connect to the cloud and stream lightweight health KPIs and telemetry. The high-performance data stack ingests and processes the data to serve as the basis for queries, reports and baseline metrics.

### Comprehensive visibility into network operations

“Health” page provides users visibility to monitor network health,, with an overview tab that provides a high-level summary view. Select other health monitoring tabs to view metrics in specific health categories: connection, performance, and infrastructure. Network health monitoring gives you instant visibility into metrics like AP service uptime, time to connect, connection success rate, client throughput and more. You define the service levels you want to measure against. For example, you might want to set the “time to connect” goal at five seconds—RUCKUS AI will tell you what percentage of the time the network meets that goal. The service lets you readily demonstrate to others in your organization performance to SLAs. You can also setup custom SLA and measure compliance of network values with custom thresholds.

### Network Incident creation powered by machine learning and artificial intelligence.

RUCKUS AI enables machine-assisted proactive networking for your RUCKUS deployment. It automatically establishes a normal range of behavior for each network element, without requiring any input from IT. Then it uses machine learning to automatically identify service incidents related to connectivity, performance and infrastructure that affect user experience.

It uses artificial intelligence to classify service incidents by severity—so you can address the highest-priority issues first.

The system provides details for each incident, including:

- Root cause and recommended action
- Affected areas (client operating system types, access point models, firmware versions, WLANs and more)
- Other impact details, including severity, client impact and duration.
- List of impacted clients
- Presentation of the underlying data that drives the incident.

RUCKUS AI dramatically reduces mean time to resolution for service incidents. It can eliminate some helpdesk tickets by letting you address issues before they affect users. By addressing the root cause for one incident, you can avoid other incidents that might arise from that cause. Service providers can realize instant business value when level 1/2 helpdesk personnel can remediate complex network problems using RUCKUS AI.

## AI driven Cloud RRM

With compute intensive AI capabilities such as RRM, RUCKUS AI can drive optimization to each zone of your network by recommending ideal channel plan and channel bandwidth along with changes to AP transmit power to reduce interfering links and bring about improved speed throughput for your users. You will visually be presented with a prediction of this optimization and reduction of interference. RUCKUS AI runs simulations every 24 hours to get the best possible solution of driving down to zero interference. You also have an ability to schedule applying the recommended setting and to revert if the need arises.

## AI Operations

RUCKUS AI also helps automate solutions and task sequences to the customer by simplifying action as a single click and taking away manual search, operations management and helps remove chances of manual error. Like AI driven Cloud RRM, the user can view the prediction, schedule the recommendation and revert if the need arises.

## AppInsights – Application Quality of Experience

RUCKUS AI also provides the user insights linked to application outcomes by scoring an application quality of experience. This is especially useful to monitor collaboration application traffic over the network and drive to administrators - incident notifications and corrective action steps within their network infrastructure in order to improve the end user experience with various applications.

## Powerful client troubleshooting

With simple and flexible search and a holistic client troubleshooting page, RUCKUS AI gives you a complete picture of client experience for easy connectivity and user experience diagnostics, including:

- Successful, slow, and failed connections
- Disconnect events.
- Roaming events and failed roams
- Connection quality (RSSI, MCS, client throughput)
- Network incidents affecting users, with links to see incident details.
- Network pcap download for all failure events for detailed packet analysis.

Client troubleshooting is a powerful tool that helps you understand and address issues affecting specific clients on the network.

## Automatic service validation

RUCKUS AI works with your RUCKUS network to automatically validate service levels without the need for overlay sensors. Access points act as virtual clients to identify possible service disruptions, often before they affect users. The system can perform a variety of tests, including:

- WLAN, LAN and WAN connectivity
- EAP, RADIUS, DHCP and DNS
- Ping, traceroute and speed test (upload/download)

## Melissa™ Virtual Assistant infused with chatGPT—your own AI-powered virtual network assistant.

RUCKUS AI includes a powerful AI-powered virtual network assistant called Melissa™ which has also been infused with chatGPT capabilities. Combining an intuitive interface with advanced natural language processing, Melissa determines the administrator's intent in posing a wide variety of inquiries and delivers highly insightful responses. IT teams save valuable time with ready access to information that helps them manage network operations—without the need for any coding.

### Health

RUCKUS AI includes a feature to view 15 metrics over time categorized amongst Connection, Performance, Infrastructure, Application such as connection success ratio, time to connect, client throughput, AP capacity, and many more. You can also setup custom SLA and measure compliance of network values with custom thresholds.

### Config change

RUCKUS AI includes a feature as a method to quantify impact of making config changes to network and these can be measured across 15 different SLA points.

### AI Driven Probe suppression

RUCKUS AI can intelligently help reduce channel congestion linked to excessive probes in high density venues with transient devices or large number of Wi-Fi clients and ultimately improve network performance.

### Occupancy Analytics

The Occupancy page provides insights into space utilization within a facility, such as the most heavily used area or the predominantly least used area within the facility along with network metrics. It includes Utilization rate, total In-Site visitors, average dwell time for each site along with the set of clients.

### IT service management integration

RUCKUS AI integrates closely with leading IT service management (ITSM) products from ServiceNow and Salesforce

to initiate helpdesk tickets automatically and let IT get a head start in resolving them. This ensures that, when a service issue occurs, it is flagged for the helpdesk to address. Without such a system in place many issues that affect user experience go unreported.

### Business Insights

RUCKUS AI also delivers valuable insights for business decisions with features such as Brand 360 that enables hospitality properties to monitor brand compliance scores. They can share the scores with ecosystem partners to help identify issues and make improvements quickly. With custom service level agreements, hotel operators can ensure that networks are available, reliable, and performing at their best for the end customer guests.

### Prepackaged reports and dashboards

A wide variety of standardized reports provides visibility into network performance, traffic patterns, application usage and more. Summary views provide high-level information, and you can drill down to the level of individual network components and devices. Examples of standardized reports include:

- **Network**—traffic and client trends, top devices, top SSIDs, traffic distribution and more
- **Client**—reports by OS and device manufacturer, top clients by usage, client trends, session details and more
- **Inventory**—AP, switch and controller count, models, firmware, status and more
- **Application**—top apps and their usage trends, top app groups and usage, top ports and more
- **Device-specific reports**—complete visibility and usage reports for clients, APs, and switches

The service lets you download reports as raw data, a PDF file, or a CSV file. Forward the results to stakeholders inside or outside the organization.

### Data Studio—custom dashboards, data visualizations and more

The RUCKUS AI Data Studio tool lets you create custom dashboards with multiple charts to dissect and analyze data

from your network ecosystem. Drag-and-drop dashboard creation makes it easy to design views tailored to your needs. You can easily position and reposition dashboard tiles, edit tiles at will and toggle between different views.

Analyze and filter data by dozens of data sets (AP Hardware, AP, Applications, Client, Client Connection, Client Sessions, Controller and Switch Inventory). Data Studio puts your full network data warehouse at your fingertips so you can answer any number of network questions.

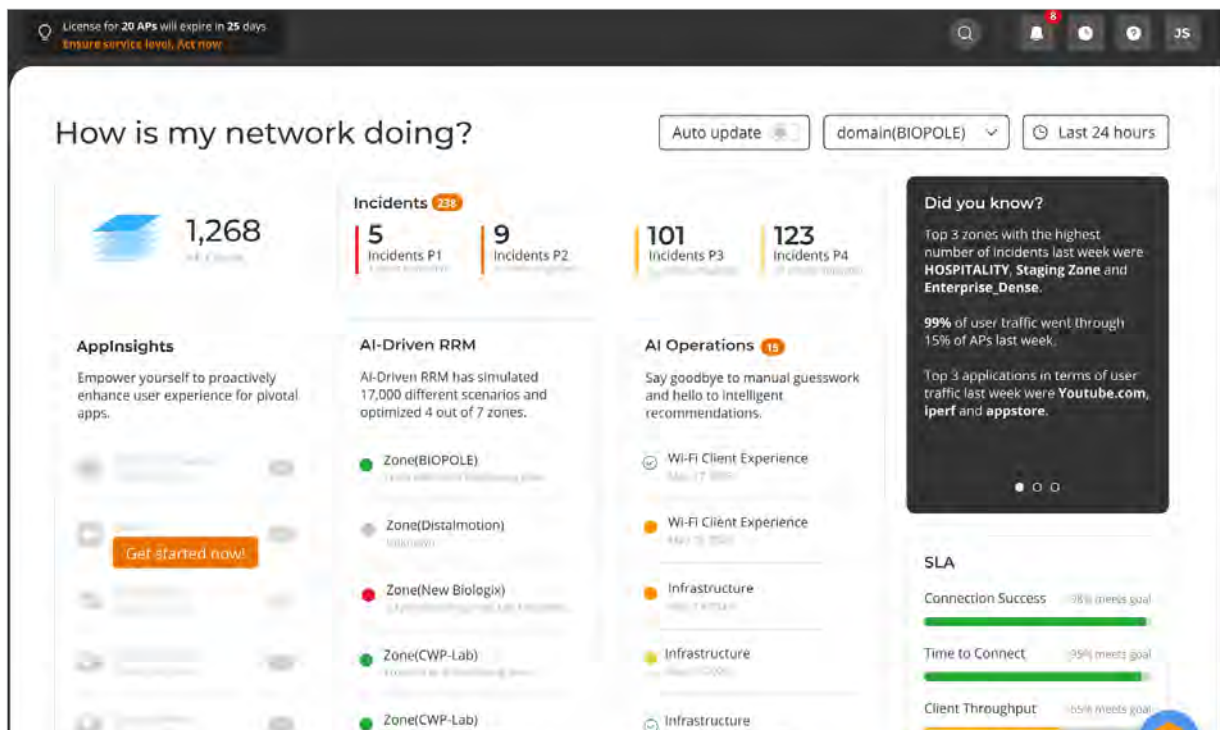
## Cloud deployment for scalability and expandability

As a completely hosted service, without the need for any on-site data collectors, RUCKUS AI relieves you of the burden of managing an in-house network intelligence platform. Leveraging on the latest software technologies in scalable cloud microservices, databases and real-time data pipelines, RUCKUS AI constantly learns and improves its AI models to provide maximum insights and optimization for your network.

Customers can designate a third party—such as a RUCKUS networking solution provider—to administer their account. Managed service providers (MSPs) can manage multiple end- customer RUCKUS AI accounts from within their own account.

## New Dashboard

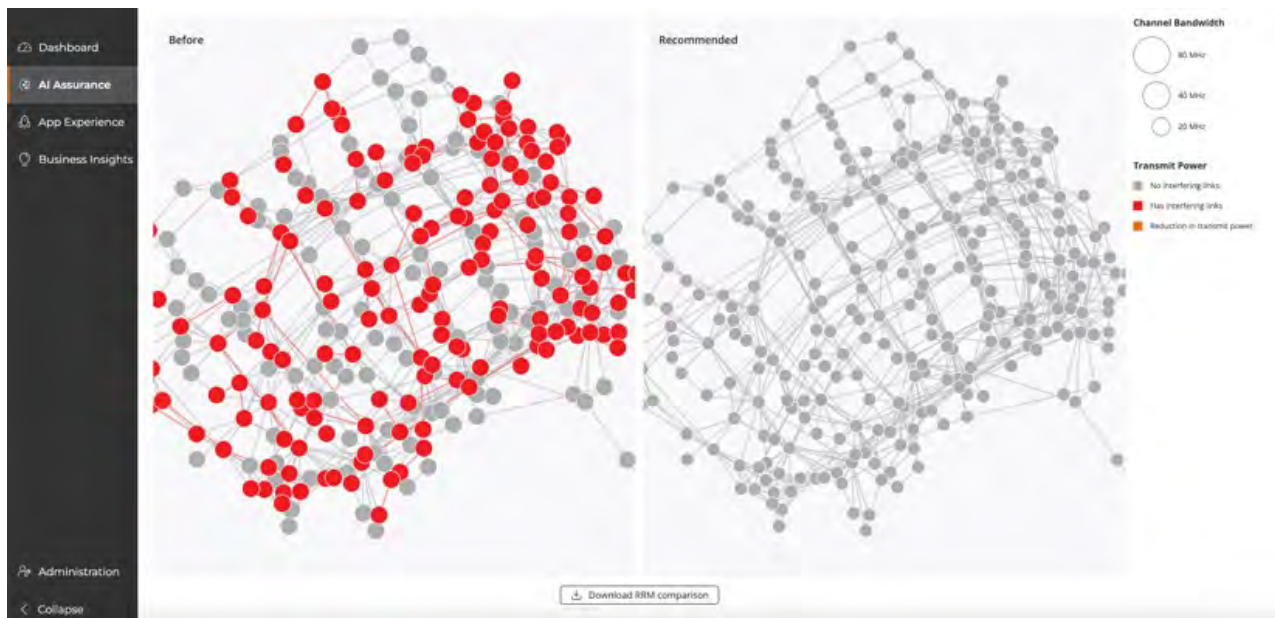
New Dashboard | RUCKUS AI includes a dashboard with all your network summarized for AI Incidents, AI Operations, AI driven RRM, AppInsights and Melissa infused with chatGPT capabilities.





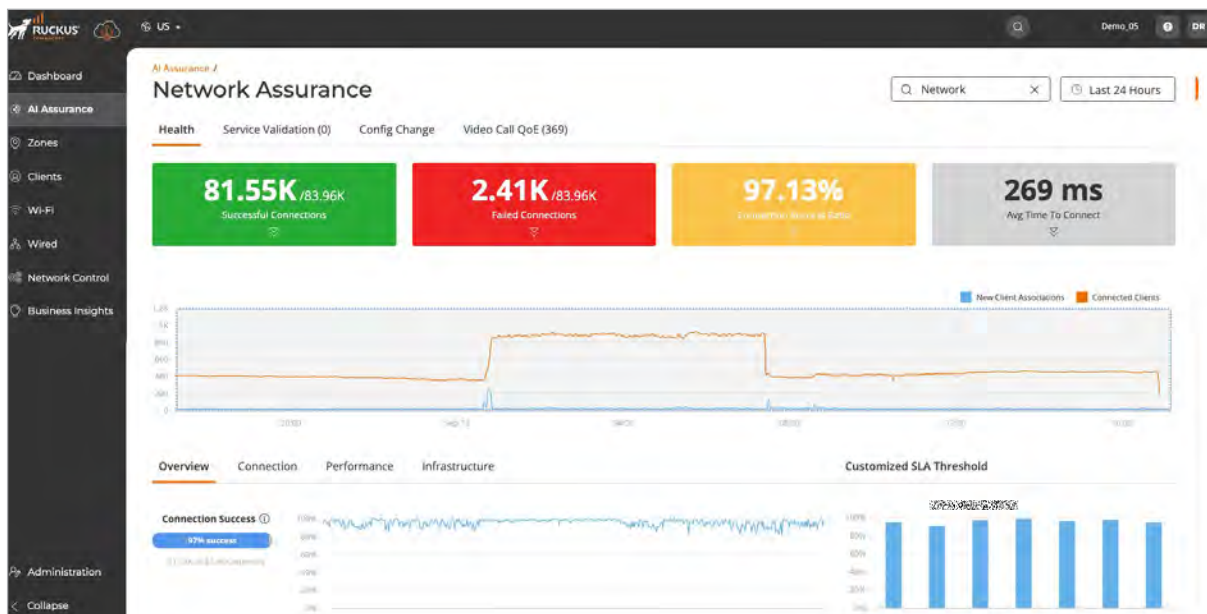
## AI Driven Cloud RRM

AI-Driven RRM | RUCKUS AI drives network optimizations in reduction in co channel interference links by adjusting channel plan, bandwidth and AP transmit power through large number of simulations and linking with a single click apply



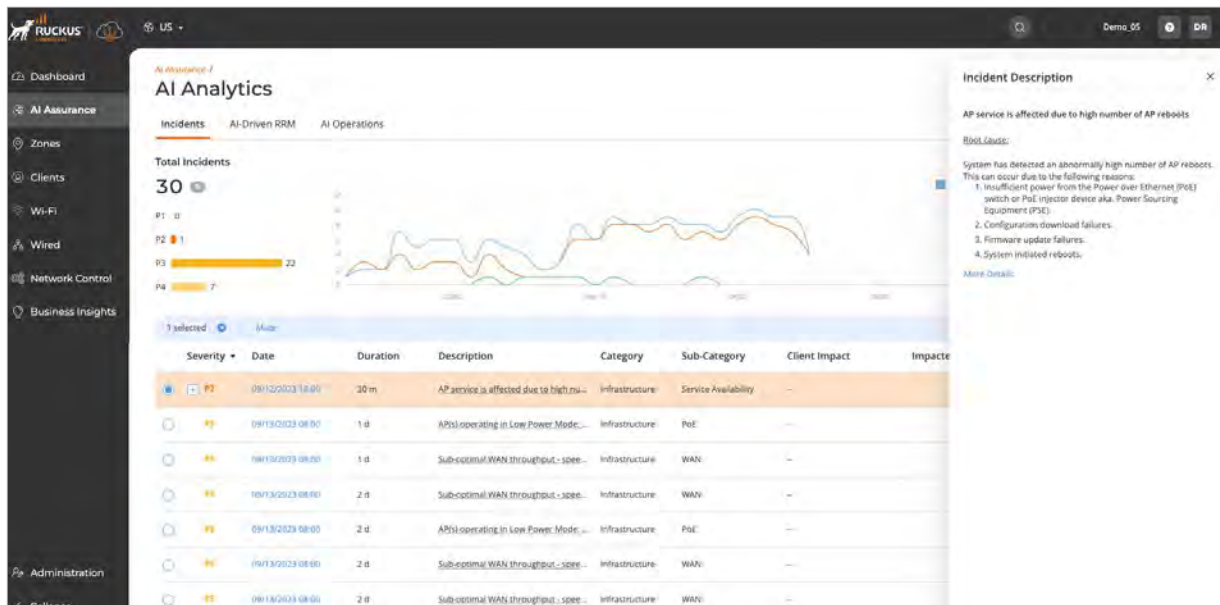
## Network Assurance

Network Assurance | Health | RUCKUS AI automatically monitors network health across a variety of metrics in three areas: connection, performance, and infrastructure.



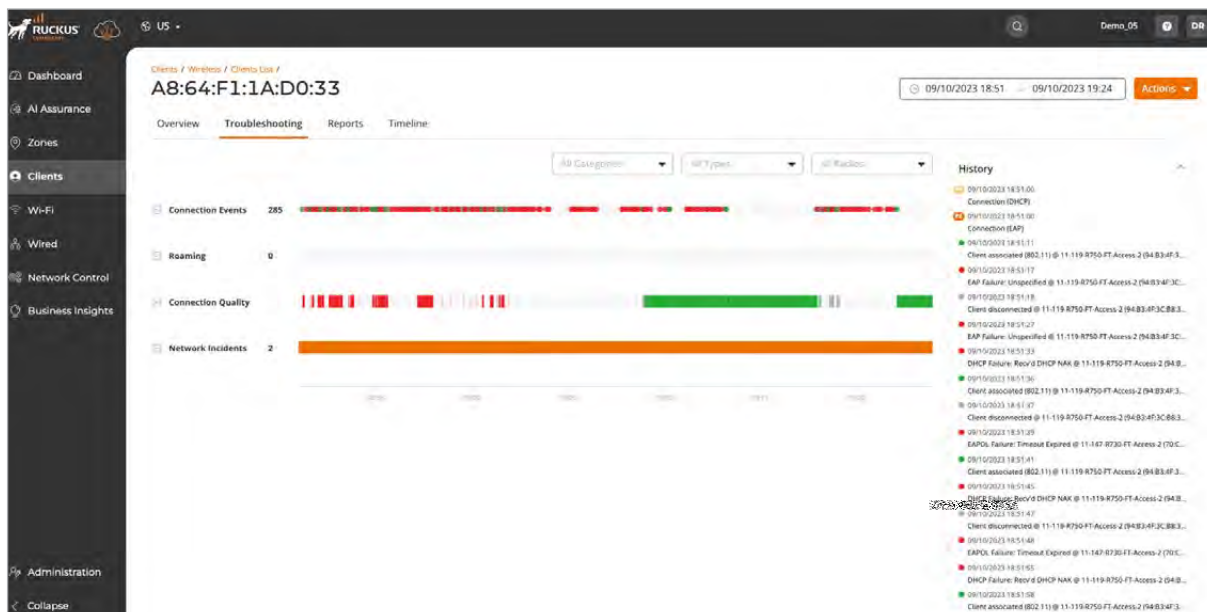
## AI Incidents

AI Incidents | RUCKUS AI provides a root cause analysis of each service incident with specific recommendations for how to resolve the issue.



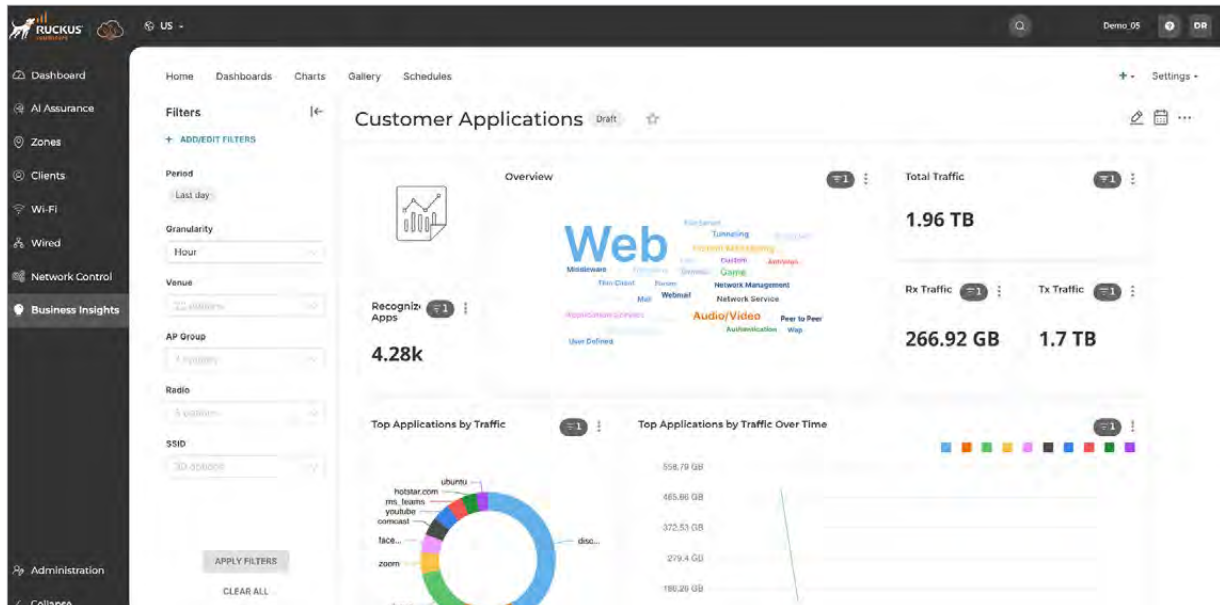
## Advanced Client Troubleshooting

Advanced Client Troubleshooting | Lets you investigate and resolve issues that have impacted a specific client on the network.



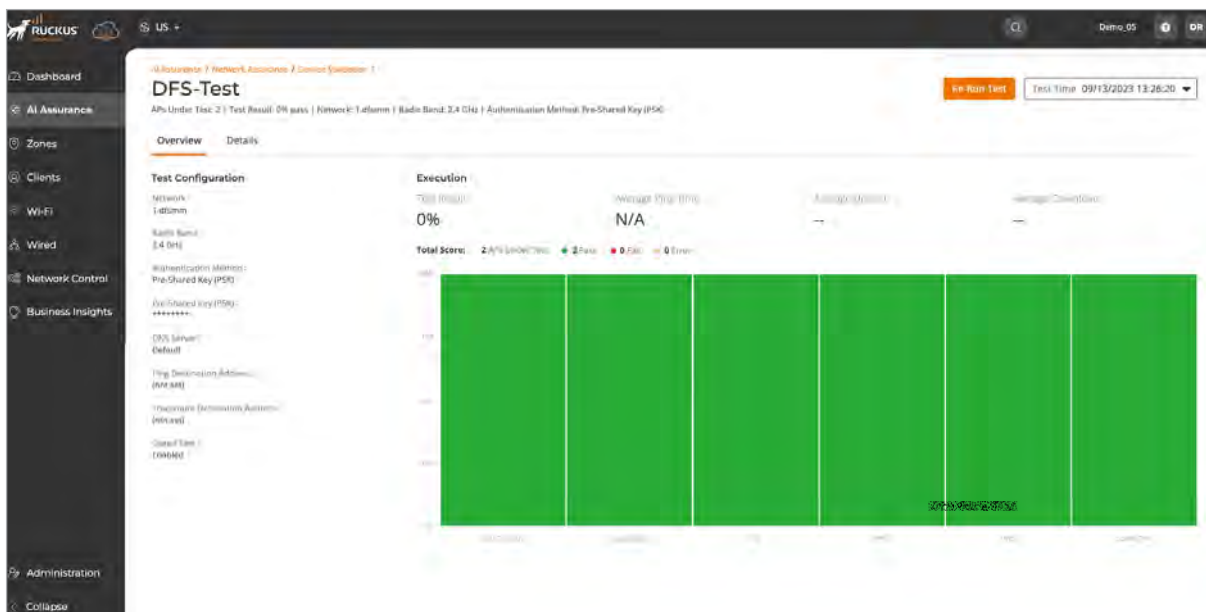
## Data Studio

Data Studio | The Data Studio tool in RUCKUS AI lets you create custom dashboards with drag-and-drop ease.



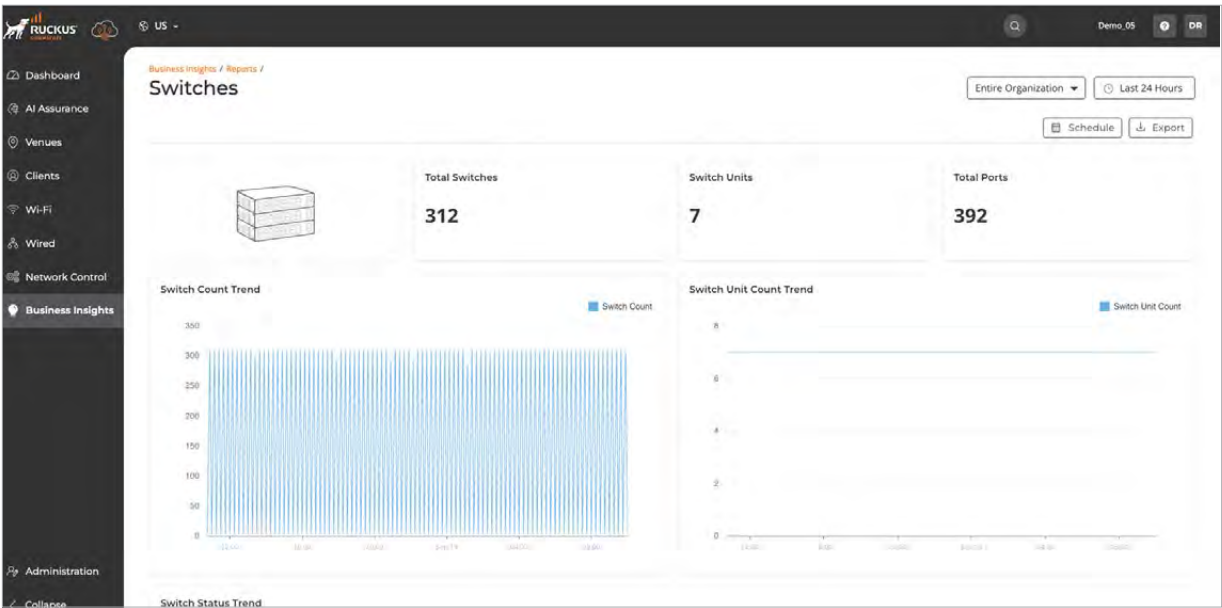
## AI Assurance

AI Assurance | Service Validation | RUCKUS AI works with your RUCKUS network to allow the network to automatically validate network service levels.



Reporting

Reporting | RUCKUS AI includes a wide variety of pre-packaged reports. This report shows metrics related to the RUCKUS switches in the network.



Specifications

<b>Security, privacy and data protection</b>	<ul style="list-style-type: none"><li>• All traffic to and from the cloud is encrypted.</li><li>• Only AP, switch, and client management traffic are sent to the cloud.</li><li>• Client data traffic stays local (broken out to local LAN and sent through existing firewall)</li><li>• All data stored in RUCKUS AI is encrypted at rest.</li><li>• RUCKUS offers EU-located data centers for European customers.</li><li>• Latest security patches are automatically updated.</li><li>• Role-based access control is provided for administrative privileges</li></ul>	Admin can grant and revoke access to partners and RUCKUS support  View RUCKUS Cloud <a href="#">privacy policy</a>
<b>Cloud data center</b>	<ul style="list-style-type: none"><li>• Hosted in USA, Europe and Asia on world-class IAAS provider with:<ul style="list-style-type: none"><li>– ISO 27001 information security certification</li><li>– SSAE-16, SOC 1, SOC 2 and SOC 3 certifications</li><li>– Stringent physical, data access and data disposal security measures</li><li>– Per-tenant migration capabilities</li><li>– Green carbon-neutral facilities</li><li>– Dedicated inter-DC fiber connectivity</li></ul></li></ul>	Ability to choose the hosting region for your service (USA, EU or Asia)
<b>SLA</b>	<ul style="list-style-type: none"><li>• 99.9 percent network availability (does not include planned maintenance, including periodic software upgrades and other pre-announced activities)</li></ul>	

<b>Support</b>	<ul style="list-style-type: none"> <li>• 24x7 chat/web/phone support included for the term of the subscription</li> </ul>	
<b>Part numbers</b>	<ul style="list-style-type: none"> <li>• CLD-ANAP-1001 <ul style="list-style-type: none"> <li>– RUCKUS AI one-year subscription for RUCKUS Cloud or AP managed by SmartZone controllers or ICX® switch</li> </ul> </li> <li>• CLD-ANAP-3001 <ul style="list-style-type: none"> <li>– RUCKUS AI three-year subscription for RUCKUS Cloud or AP managed by SmartZone controller or ICX® switch</li> </ul> </li> <li>• CLD-ANAP-5001 <ul style="list-style-type: none"> <li>– RUCKUS AI five-year subscription for RUCKUS Cloud or AP managed by SmartZone controller or ICX® switch</li> </ul> </li> <li>• CLR-ANAP-1001 <ul style="list-style-type: none"> <li>– RUCKUS AI one-year renewal for RUCKUS Cloud or AP managed by SmartZone controller or ICX® switch</li> </ul> </li> <li>• CLR-ANAP-3001 <ul style="list-style-type: none"> <li>– RUCKUS AI three-year renewal for RUCKUS Cloud or AP managed by SmartZone controller or ICX® switch</li> </ul> </li> <li>• CLR-ANAP-5001 <ul style="list-style-type: none"> <li>– RUCKUS AI five-year renewal for RUCKUS Cloud or AP managed by SmartZone controller or ICX® switch</li> </ul> </li> </ul>	

## About Ruckus Networks

Ruckus Networks builds and delivers purpose-driven networks that perform in the demanding environments of the industries we serve. Together with our network of trusted go-to-market partners, we empower our customers to deliver exceptional experiences to the guests, students, residents, citizens and employees who count on them.

[www.ruckusnetworks.com](http://www.ruckusnetworks.com)

Visit our website or contact your local RUCKUS representative for more information.

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**RUCKUS**<sup>®</sup>  
COMMScope



# A day in the life of a Network Administrator

Before and after CommScope RUCKUS network with RUCKUS Analytics

## Meet Jim, a network administrator.

Jim's job is to keep the organization's wired and wireless network running smoothly; that means supporting the increasingly high expectations of users, especially as new devices and applications proliferate.

Until recently, Jim—like most network admins—used numerous tools, consoles and management systems to manage and troubleshoot the network. Then, he and his team migrated to a RUCKUS network from CommScope, including the RUCKUS Analytics cloud service. It works with their RUCKUS wired and wireless access network to provide unified network analytics and assurance. Now Jim can focus on what's important—take a look.



Before RUCKUS Analytics

Jim comes into the office and immediately starts reviewing the previous night's activities. Using multiple systems and five different monitors, he reviews logs, warnings, and alarms to search for any service-disrupting incidents and determine the health of the network.



After RUCKUS Analytics

Jim stops off at his favorite coffee shop before work. At the office, he catches up on emails and video-chats the kids good morning. Then Jim logs into the RUCKUS Analytics top-level dashboard to check the status of the network. Noticing a few issues, he drills down for more detail before starting his day.



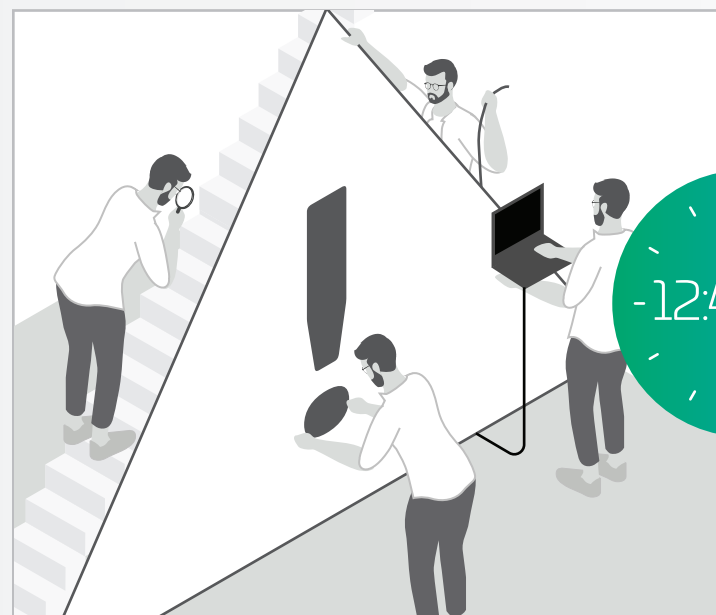
Before RUCKUS Analytics

Jim spends the next three hours playing detective, just to understand what incidents have occurred, how severe they are and how to troubleshoot them. He tries to piece it all together using helpdesk tickets, emails and phone calls.



After RUCKUS Analytics

Having already checked the incident analytics tab in RUCKUS Analytics for prioritized incidents, Jim has used the recommended remediation steps to resolve many before anyone notices. He's got some time now to work on that special project for the CIO.



Before RUCKUS Analytics

No time for lunch today. Jim has to reverse engineer every service issue, one-by-one, to determine the root cause. The process could take another couple of hours. He uses wireless capture programs, wired PCAP, and custom scripts to identify and fix various problems.



After RUCKUS Analytics

At lunch, Jim and his team unwind, talking sports and the latest binge-worthy TV. Back at the office, he makes good progress on the CIO's project, then checks his schedule. Quarterly reports are due by the end of the day.



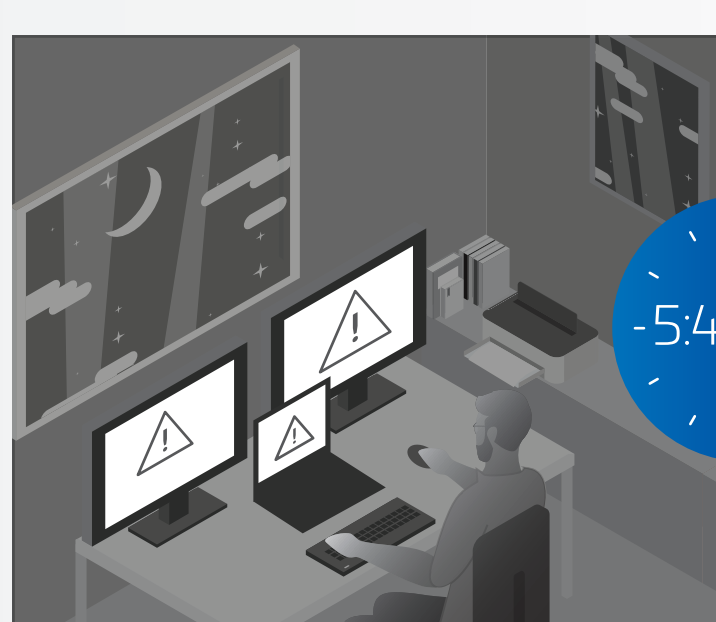
Before RUCKUS Analytics

Still playing catch-up, Jim has to cancel a vendor call on SLA metrics for his quarterly report. He spends the afternoon consolidating network data from various tools and combing through log files just to come up with something usable. He feels pretty confident about network uptime, but the rest are no more than best guesses.



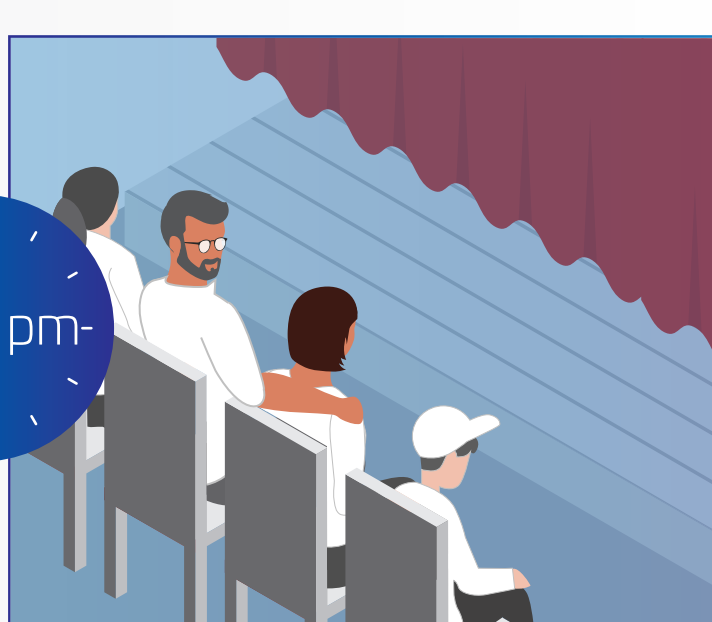
After RUCKUS Analytics

Jim logs onto RUCKUS Analytics. He starts with SLA metrics by checking the network health monitor module. All the info is there, automatically generated, including detailed metrics comparing network performance to pre-defined SLA thresholds he and the team have established. SLA performance is looking good. Helpdesk tickets and user complaints are way down, too.



Before RUCKUS Analytics

The SLA metrics are finally done. Next up, the network operations report. No shortage of data points, but they're in multiple databases—network traffic, connected devices, client throughput and more. Manually pulling it all together to get an accurate assessment of network operations is like herding squirrels. Jim calls his wife, "It's gonna be another late night." Someone just turned out the lights... again.



After RUCKUS Analytics

Jim left the office 20 minutes ago. Using the reporting and Data Explorer functions in RUCKUS Analytics, Jim was able to finish up his quarterly report with time to spare. He even threw in some never-before-seen application usage trends that are going to raise some eyebrows. But that doesn't matter right now. Jim sits next to his wife as they nervously wait together for their daughter's dance recital to start.

Ready for a network that's easier to see and manage?

Download the RUCKUS Analytics data sheet. Then let CommScope help you prepare for tomorrow, make your users happier and reclaim your time.

[RUCKUS Analytics data sheet](#)



# RUCKUS<sup>®</sup> PRODUCT GUIDE

[THE RUCKUS ADVANTAGE](#)

[INDOOR ACCESS POINTS](#)

[OUTDOOR ACCESS POINTS AND BRIDGES](#)

[CONTROL AND MANAGEMENT](#)

[ICX SWITCHES](#)

[MONITORING AND SOFTWARE](#)



# THE RUCKUS ADVANTAGE



## QUICK REFERENCE GUIDE

RUCKUS® delivers purpose-driven networks that offer the best possible performance in the most challenging environments of the industries we serve. With enterprise-wide automation—and network assurance driven by artificial intelligence (AI) and machine learning (ML)—our partners and customers deliver an exceptional connectivity experience for every user and device. When “good enough” networking just isn’t good enough, organizations turn to RUCKUS Networks.

### OUR OFFERING

#### WIRELESS ACCESS POINTS



The RUCKUS wireless product line offers a broad range of indoor and outdoor access points (APs) with embedded internet of things (IoT) connectivity to fit any budget, performance requirement or deployment scenario.

#### SWITCHES



RUCKUS ICX® stackable switches are designed to excel in a wide range of deployment scenarios: from access to core, 1 GbE to 100 GbE, copper or fiber, with or without PoE, and with multigigabit and high PoE support.

#### CONTROL AND MANAGEMENT



The RUCKUS network management portfolio addresses the needs of organizations of all types and sizes.

Choose between an on-premises physical or virtual controller (SmartZone™), a cloud-managed controller (RUCKUS One™), or a controller-less architecture (RUCKUS Unleashed™).

#### NETWORK ANALYTICS AND ASSURANCE



Powered by AI and ML, RUCKUS Analytics™ delivers network analytics, business intelligence and service assurance.

#### SECURE NETWORK SERVICES



RUCKUS Cloudpath® Enrollment System enables authentication against multiple identity providers, enforcement of policies and role-based access control (RBAC) across multi-access networks to deliver secure network access for any user, and any device, on any network.

RUCKUS WAN Gateway delivers a robust set of network and security services at the edge via a single unified platform.

#### IoT CONNECTIVITY



RUCKUS IoT Platform simplifies IoT networking by connecting Wi-Fi and non-Wi-Fi IoT endpoints with a single multi-standards wireless access network. Customers gain operational efficiency with a converged IT/OT network.

### WHAT SETS RUCKUS APART

#### PERFORMANCE



A RUCKUS network consistently delivers amazing network performance to every end user, no matter how challenging the environment.

RUCKUS patented and proprietary technologies yield a demonstrably better end-user experience than other vendors.

See the latest third-party report at [ruckusnetworks.com/wi-fi-stress-test](https://ruckusnetworks.com/wi-fi-stress-test)

#### SIMPLICITY



RUCKUS solutions are designed to be simple to deploy and manage.

With zero touch provisioning (ZTP), any new RUCKUS device that is connected will be automatically provisioned with proper software and policies—saving time and minimizing configuration errors.

The exact same process is used for APs and switches thanks to controller-based management of wired and wireless devices.

#### ADAPTABILITY



A single RUCKUS network can support LAN, WLAN and IoT users and devices—eliminating the need to deploy new networks to support emerging operations/IoT initiatives.

RUCKUS offers multiple interchangeable deployment options for management with easy capacity expansion without any hardware swap, for future flexibility and investment protection.

RUCKUS integrates with third-party IoT products to support a variety of smart building, asset tracking, physical safety and user experience applications.

#### INNOVATION



A RUCKUS network features a variety of patented RF technologies such as BeamFlex+ and AI-driven radio resource management to ensure the best Wi-Fi performance.

RUCKUS deploys state-of-the-art AI/ML and automation technologies to ensure network assurance.

We offer Dynamic PSK™ technology, extending into WPA3 to support 6 GHz operation, to deliver secure access to a converged IT/OT network to any user, any device, and any application.

RUCKUS WAN Gateway enables enterprises to easily deploy zero-trust network access (ZTNA) spanning multiple access networks.

#### INTEROPERABILITY



Open standards support, Open APIs, and enterprise-wide automation enable RUCKUS products to integrate seamlessly with third-party and homegrown applications to fit the requirements of enterprises and service providers.

### TARGET INDUSTRIES



Education



Hospitality



Multi-dwelling  
units



Enterprise



Government



Large public  
venues



Manufacturing



Service  
providers







Don't just take  
our word for it.  
**GIVE US A TRY!**

[Back to TOC page](#)

# RUCKUS PRODUCT GUIDE

## INDOOR ACCESS POINTS






	R760	R850	R750	R560	R650	R550
						
Feature/Description	High-end 802.11ax 4x4 tri-concurrent AP with MU-MIMO, BeamFlex+ and 10Gbps backhaul	High-end 802.11ax 8x8 dual-concurrent AP with MU-MIMO, BeamFlex+ and 5Gbps backhaul	High-end 802.11ax 4x4 dual-concurrent AP with MU-MIMO, BeamFlex+ and 2.5Gbps backhaul	Mid-range 802.11ax 2x2 tri-concurrent AP with MU-MIMO, BeamFlex+ and 5Gbps backhaul	Mid-range Wi-Fi 6 (802.11ax) dual-concurrent AP with MU-MIMO and BeamFlex+	Mid-range Wi-Fi 6 (802.11ax) dual-concurrent AP with MU-MIMO and BeamFlex+
Maximum PHY rate	4800 Mbps (6GHz) 2400 Mbps (5GHz) 1148 Mbps (2.4GHz)	4800 Mbps (5GHz) 1148 Mbps (2.4GHz)	2400 Mbps (5GHz) 1148 Mbps (2.4GHz)	2882 Mbps (6GHz) 1237 Mbps (5GHz) 591 Mbps (2.4GHz)	2400 Mbps (5GHz) 574 (2.4GHz)	1200 Mbps (5GHz) 574 Mbps (2.4GHz)
Wi-Fi technology	802.11ax (2.4GHz, 5GHz, 6GHz) Wi-Fi CERTIFIED 6E™	802.11ax (2.4GHz, 5GHz) Wi-Fi CERTIFIED 6™	802.11ax (2.4GHz, 5GHz) Wi-Fi CERTIFIED 6™	802.11ax (2.4GHz, 5GHz, 6GHz) Wi-Fi CERTIFIED 6E™	802.11ax (2.4GHz, 5GHz) Wi-Fi CERTIFIED 6™	802.11ax (2.4GHz, 5GHz) Wi-Fi CERTIFIED 6™
Concurrent users	1536	1024	1024	1536	512	512
Radio chains:streams (MU-MIMO)	6GHz: 4x4:4 5GHz: 4x4:4 2.4GHz: 4x4:4	5GHz: 8x8:8 2.4GHz: 4x4:4	4x4:4	6GHz: 2x2:2 5GHz: 2x2:2 2.4GHz: 2x2:2	5GHz: 4x4:4 2.4GHz: 2x2:2	2x2:2
Antenna patterns (per band)	4,000+	4,000+	4,000+	4,000+	128	64
Antenna gain	Up to 4dbi	Up to 2dbi	Up to 3dbi	Up to 4dBi	Up to 3dBi	Up to 3dBi
PD-MRC	✓	✓	✓	✓	✓	✓
Rx sensitivity (2.4/5GHz/6GHz)	-98/-96/-97dBm	-101dBm	-102dBm	-94dBm	-101dBm	-103dBm
ChannelFly	✓	✓	✓	✓	✓	✓
SmartMesh	✓ *	✓	✓	✓	✓	✓
USB (IoT Ready)	✓	✓	✓	✓	✓	✓
Ethernet ports	1x 1/2.5/5/10 Gbps 1x 10/100/1000 Mbps	1x 1/2.5/5 Gbps 1x 10/100/1000 Mbps	1x1 GbE 1x2.5 GbE	1x 1/2.5/5 Gbps 1x 10/100/1000 Mbps	1 x 1 GbE 1 x 2.5 GbE	2 x 1 GbE
Integrated BLE/ZigBee	✓	✓	✓	✓	✓	✓
WLAN Control and Management	<ul style="list-style-type: none"> <li>• SmartZone</li> <li>• RUCKUS Cloud*</li> </ul>	<ul style="list-style-type: none"> <li>• SmartZone</li> <li>• Unleashed</li> <li>• RUCKUS Cloud</li> </ul>	<ul style="list-style-type: none"> <li>• SmartZone</li> <li>• Unleashed</li> <li>• RUCKUS Cloud</li> </ul>	<ul style="list-style-type: none"> <li>• SmartZone</li> <li>• RUCKUS Cloud</li> </ul>	<ul style="list-style-type: none"> <li>• SmartZone</li> <li>• Unleashed</li> <li>• RUCKUS Cloud</li> </ul>	<ul style="list-style-type: none"> <li>• SmartZone</li> <li>• Unleashed</li> <li>• RUCKUS Cloud</li> </ul>

# RUCKUS PRODUCT GUIDE

## INDOOR ACCESS POINTS



	R350	H550	H350
			
Feature/Description	Entry level Wi-Fi 6 (802.11ax) dual-concurrent AP with BeamFlex+	Wall-mount Wi-Fi 6 (802.11ax) AP dual-concurrent, five GbE ports, IoT gateway, BeamFlex+	Wall-mount Wi-Fi 6 (802.11ax) AP dual-concurrent, three GbE ports, IoT gateway, BeamFlex+
Maximum PHY rate	1200 Mbps (5GHz) 574 Mbps (2.4GHz)	1200 Mbps (5GHz) 574 Mbps (2.4GHz)	1200 Mbps (5GHz) 574 Mbps (2.4GHz)
Wi-Fi technology	802.11ax (2.4GHz, 5GHz) Wi-Fi CERTIFIED 6™	802.11ax (2.4GHz, 5GHz) Wi-Fi CERTIFIED 6™	802.11ax (2.4GHz, 5GHz) Wi-Fi CERTIFIED 6™
Concurrent users	256	512	512
Radio chains:streams (MU-MIMO)	2x2:2	2x2:2	2x2:2
Antenna patterns (per band)	64	16	16
Antenna gain	Up to 3dBi	Up to 1dBi	Up to 1dBi
PD-MRC	✓	✓	✓
Rx sensitivity (2.4/5GHz)	-101dBm	-100dBm	-100dBm
ChannelFly	✓	✓	✓
SmartMesh	✓	✓	✓
USB (IoT Ready)	✓	✓	—
Ethernet ports	1 x 1GbE	5 x 1GbE	3 x 1GbE
Integrated BLE/ZigBee	—	✓ (concurrent)	✓
WLAN Control and Management	<ul style="list-style-type: none"> <li>SmartZone</li> <li>Unleashed</li> <li>RUCKUS Cloud</li> </ul>	<ul style="list-style-type: none"> <li>SmartZone</li> <li>Unleashed</li> <li>RUCKUS Cloud</li> </ul>	<ul style="list-style-type: none"> <li>SmartZone</li> <li>Unleashed</li> <li>RUCKUS Cloud</li> </ul>









### RUCKUS IoT Modules

i100	
Protocol	<ul style="list-style-type: none"> <li>Zigbee 3.0, BLE, iBeacon, Eddystone (software configurable)</li> </ul>
Device Capacity	<ul style="list-style-type: none"> <li>25 (Zigbee)</li> <li>12 (BLE)</li> </ul>
Interfaces	<ul style="list-style-type: none"> <li>USB 2.0, Type A</li> </ul>
Memory	<ul style="list-style-type: none"> <li>RAM: 256KB</li> <li>Flash: 1MB</li> </ul>
Output Power	<ul style="list-style-type: none"> <li>16.5dBm (max)</li> </ul>
Power Consumption	<ul style="list-style-type: none"> <li>500mW (max)</li> </ul>
Current Draw	<ul style="list-style-type: none"> <li>~100mA on 5V (max)</li> </ul>
Mechanical	<ul style="list-style-type: none"> <li>Dimensions: 47.83 x 18 x 8.25mm</li> <li>Max weight: 85 grams</li> </ul>
Temperature	<ul style="list-style-type: none"> <li>-40 to 70°C</li> </ul>
Certifications	<ul style="list-style-type: none"> <li>FCC and ETSI</li> </ul>

# RUCKUS PRODUCT GUIDE

## OUTDOOR ACCESS POINTS AND BRIDGES



	T750	T750se	T350c	T350d	T350se	T811-CM
						
Feature/Description	High-end Wi-Fi 6 (802.11ax) dual-concurrent AP with MU-MIMO and BeamFlex+	High-end Wi-Fi 6 (802.11ax) dual-concurrent AP with MU-MIMO and BeamFlex+ and internal sectorized antenna	High-density outdoor AP series 2x2:2 (5GHz) + 2x2:2 (2.4GHz) Wi-Fi 6 with integrated BeamFlex+ adaptive internal antennas with polarization diversity	High-density outdoor AP series 2x2:2 (5GHz) + 2x2:2 (2.4GHz) Wi-Fi 6 with integrated BeamFlex+ adaptive internal antennas with polarization diversity	High-density outdoor AP series 2x2:2 (5GHz) + 2x2:2 (2.4GHz) Wi-Fi 6 with integrated BeamFlex+ adaptive internal sectorized antennas with polarization diversity	Outdoor 4x4:4 2.4/5GHz 802.11ac Wave 2 Wi-Fi access point with DOCSIS 3.1 backhaul
Maximum PHY rate	2400 Mbps (5GHz) 1148 Mbps (2.4GHz)	2400 Mbps (5GHz) 1148 Mbps (2.4GHz)	2.4GHz: 574 Mbps 5GHz: 1200Mbps	2.4GHz: 574 Mbps 5GHz: 1200Mbps	2.4GHz: 574 Mbps 5GHz: 1200Mbps	1733 Mbps (5GHz) 600 Mbps (2.4GHz)
Wi-Fi technology	802.11ax (2.4GHz, 5GHz) Wi-Fi CERTIFIED 6™	802.11ax (2.4GHz, 5GHz) Wi-Fi CERTIFIED 6™	802.11ax (2.4GHz, 5GHz) Wi-Fi CERTIFIED 6™	802.11ax (2.4GHz, 5GHz) Wi-Fi CERTIFIED 6™	802.11ax (2.4GHz, 5GHz) Wi-Fi CERTIFIED 6™	802.11ac (5GHz) 802.11n (2.4GHz)
Concurrent users	1024	1024	512	512	512	512
Radio chains:streams (MU-MIMO)	4x4:4	4x4:4	2x2:2 (5GHz) + 2x2:2 (2.4GHz)	2x2:2 (5GHz) + 2x2:2 (2.4GHz)	2x2:2 (5GHz) + 2x2:2 (2.4GHz)	4x4:4
Antenna patterns (per band)	4,000+	4,000+	64	64	64	4,000+
Antenna gain	Up to 3dBi	2.4GHz: 6dBi 5GHz: 8dBi	Up to 3dBi	Up to 3dBi	2.4GHz: 6dBi 5GHz: 8dBi	Up to 3dBi
PD-MRC	✓	✓	✓	✓	✓	✓
Rx sensitivity (2.4/5GHz)	-103dBm	-103dBm	-101dBm	-101dBm	-101dBm	-98/-97
ChannelFly	✓	✓	✓	✓	✓	✓
SmartMesh	✓	✓	✓	✓	✓	✓
Ethernet interface	1 x 1 GbE 1 x 2.5 GbE	1 x 1 GbE 1 x 2.5 GbE	1x 1GbE	1x 1GbE	1x 1GbE	1 x 1GbE
USB (IoT Ready)	✓	n/a	n/a	✓	✓	✓
Fiber interface	✓	✓	n/a	n/a	n/a	✓
GPS	✓	✓	n/a	n/a	n/a	✓
Integrated BLE/ZigBee	✓	✓	n/a	✓	n/a	n/a
WLAN Control and Management	<ul style="list-style-type: none"> <li>• SmartZone</li> <li>• Unleashed</li> <li>• RUCKUS Cloud</li> </ul>	<ul style="list-style-type: none"> <li>• SmartZone</li> <li>• Unleashed</li> <li>• RUCKUS Cloud</li> </ul>	<ul style="list-style-type: none"> <li>• SmartZone</li> <li>• Unleashed</li> <li>• RUCKUS Cloud</li> </ul>	<ul style="list-style-type: none"> <li>• SmartZone</li> <li>• Unleashed</li> <li>• RUCKUS Cloud</li> </ul>	<ul style="list-style-type: none"> <li>• SmartZone</li> <li>• Unleashed</li> <li>• RUCKUS Cloud</li> </ul>	<ul style="list-style-type: none"> <li>• SmartZone</li> </ul>

# RUCKUS PRODUCT GUIDE

## CONTROL AND MANAGEMENT



SmartZone				
				
Feature	SmartZone 144	SmartZone 300	Virtual SmartZone-E	Virtual SmartZone-H
Number of APs supported	Up to 2,000 / 6,000 per cluster	Up to 10,000 / 30,000 per cluster	Up to 1,024 / 3,000 per cluster	Up to 10,000 / 30,000 per cluster
Number of switches supported	Up to 400 / 1,200 per cluster	Up to 2,000 / 6,000 per cluster	Up to 200 / 600 per cluster	Up to 2,000 / 6,000 per cluster
Number of clients supported	Up to 40,000 / 120,000 per cluster	Up to 100,000 / 450,000 per cluster	Up to 25,000 / 60,000 per cluster	Up to 100,000 / 300,000 per cluster
Ethernet ports	4 x GbE ports 4 x 10 GbE ports (SFP+)	6 x 1GbE ports 4 x 10GbE ports (SFP+)	1 vNIC	1 or 3 vNIC
Authentication support	802.1X, MAC address	802.1X, Local database, Active Directory, RADIUS, LDAP	802.1X, Local database, Active Directory, RADIUS, LDAP	802.1X, Local database, Active Directory, RADIUS, LDAP
Guest networking/captive portal	✓	✓	✓	✓
DHCP server	External or Assigned	External or Assigned	External or vSZ-D assigned	External or vSZ-D assigned
AP discovery and control	L2 / L3	L2 / L3	L2 / L3	L2 / L3
WLANs	Up to 2,048 per cluster	Up to 2,048 per zone Up to 65,534 per cluster	Up to 2,048 per cluster	Up to 2,048 per zone Up to 65,534 per cluster
Management Interface	Web GUI, CLI	Web GUI, CLI	Web GUI, CLI	Web GUI, CLI
Remote Management	Yes	Yes	Yes	Yes
Management protocol(s)	SNMP v3, RESTful JSON	SNMP v3, RESTful JSON	SNMP v3	SNMP v3
VLAN support	Dynamic VLANs	Dynamic VLANs	Dynamic VLANs	Dynamic VLANs
Data Plane	Tunneling or local breakout	Tunneling or local breakout	Tunneling or local breakout	Tunneling or local breakout
Power supply	AC, Field Replaceable	DC or AC, Field Replaceable	N/A	N/A
Fans	Field Replaceable	Six redundant, field swappable fans in three sets	N/A	N/A
SKU/Part number	P01-S144-XX00	901-S300-WW10/00	L09-VSCG-WW00	L09-VSCG-WW00



# RUCKUS PRODUCT GUIDE

## CONTROL AND MANAGEMENT






	SmartZone
	SmartZone Data Plane
Secured data plane tunneling	Enables forwarding of user data traffic through secure tunnels on RUCKUS APs when managed by Virtual SmartZone controllers.
Multiple hypervisor support	Supports the most widely deployed VMware and KVM hypervisors
NFV flexible architecture	Complete separation of Control+Management plane (vSZ) and data plane functions (SmartZone Data Plane) via separate VMs that support distributed and centralized deployments providing compelling architecture flexibility.
Works seamlessly with virtual SmartZone	vSZ acts as the controller for RUCKUS APs as well as SmartZone Data Plane providing seamless configuration and management capabilities.
Up to 10 SmartZone Data Planes per vSZ and up to 40 SmartZone Data Planes per cluster	The vSZ controller runs in Active/Active (3+1) mode for extremely high availability. Each SmartZone Data Plane runs as an independent virtual machine instance that is managed by the vSZ controller.
vSZ Zone affinity for SmartZone Data Plane	This feature enables RUCKUS APs in a particular zone establish tunnels with the SmartZone Data Plane in that particular zone. Provides flexibility for distributed and managed services deployments where the SmartZone Data Planes can be co-located on-premise with RUCKUS APs (vSZ Zones) on medium/large high density sites that need tunneling. With up to 40 SmartZone Data Planes per cluster, the SZ 3.5 release can potentially support a large number of such distributed deployments.
DHCP server and NAT	This feature enables a high scale DHCP Server on the SmartZone Data Plane. The DHCP Server is a high-scale server specifically designed and architected for Wi-Fi deployments that provide near-real time IP address assignment combined with NAT this provides tremendous value to the operator since it avoids mac-address scaling limits and high costs on the network infrastructure (switches).
Legal Intercept	This feature is useful from a Legal Intercept requirements perspective and enables the ability to mirror packets in both uplink and downlink directions for Wi-Fi clients that have a CALEA warrant.
Support for northbound tunnels L2oGRE	This feature enables SmartZone Data Plane to forward WiFi client traffic to a specified 3rd party WAG (Wireless Access Gateway) over L2oGRE protocol standard.
IPv6 support	Supports IPv6 addressing for the SmartZone Data Plane interfaces as well as support forwarding of IPv6 client traffic
L3 Roaming (inter SmartZone Data Plane tunnels)	This feature enables L3 Roaming when traffic is tunneled to the SmartZone Data Plane. The feature relies on inter SmartZone Data Plane flexi-vpn tunnels that are dynamically created with minimal user intervention. L3 Roaming can be enabled based on VLANs or subnets.

	Controller-Less	Cloud
Feature	Unleashed	RUCKUS Cloud
Number of APs supported	Up to 128	Virtually unlimited number of APs supported
Number of switches supported	Up to 8 switches	Virtually unlimited number of switches supported
Clients	up to 2,048	Clients per AP: refer to AP data sheet
Ethernet ports	Refer to selected AP data sheet	N/A
Authentication support	802/1x, local database, Active Directory, RADIUS, LDAPr	PSK, 802.1x, Active Directory, RADIUS, LDAP, SMS, social login, open
Guest networking/captive portal	✓	✓
DHCP server	✓	External or assigned
AP discovery and control	L2	L2
SSID/WLAN support	16	15/Venue
Management Interface	Web GUI, CLI, Unleashed Multi-Site Manager	Web GUI and native mobile application
Remote Management	Yes	Yes
Management protocol(s)	SNMP v3	N/A
VLAN support	Yes	Dynamic VLANs
Data Plane	Local breakout	Local breakout
Power supply	PoE	APs powered using PoE or optional power supply
Fans	N/A	N/A
SKU/Part number	Refer to Unleashed data sheet for supported devices	Refer to RUCKUS Cloud data sheet for supported devices

# RUCKUS PRODUCT GUIDE

## ICX SWITCHES










	Access		Access / Aggregation			Aggregation / Core	
							
Feature	ICX 7150	ICX 8200	ICX 7450	ICX 7550	ICX 7650	ICX 7750	ICX 7850
Switching Capacity (max)	304Gbps	720Gbps	336Gbps	1,020Gbps	1.128Tbps	2.56Tbps	6.4Tbps
1GbE RJ-45 ports	10, 12, 24 or 48 (+ 2)	8, 24 or 48	24 or 48	24 or 48	48	48	48
1GbE SFP ports (max)	8	48	48	48	48	48	48
1/2.5GbE RJ-45 ports (max)	16	16		12 or 36			
1/2.5/5/10GbE RJ-45 ports (max)	2	4		12	24		
10GbE SFP+ ports (max)	8	24	12	24	24 +4	96 <sup>1</sup>	128 <sup>1</sup>
10GbE RJ-45 ports (max)	2	4	12		24	48	48
25GbE SFP28 ports		8					48
40GbE QSFP+ ports (max)			3	4	2	32	
100GbE QSFP28 ports (max)				3	2		32
PoE Power Budget (max)	1480W	1480W	1480W	2000W	1500W		
Switches per stack (max)	12	12	12	12	12	12	12
Aggregate stack bandwidth	480Gbps	1.2Tbps	960Gbps	2.4Tbps	2.4Tbps	5.76Tbps	9.6Tbps

<sup>1</sup> Requires QSFP+ splitter cables

# RUCKUS PRODUCT GUIDE

## ICX SWITCHES



	Access		Access / Aggregation			Aggregation / Core	
							
Feature	ICX 7150	ICX 8200	ICX 7450	ICX 7550	ICX 7650	ICX 7750	ICX 7850
PoE/PoE+	✓	✓	✓	✓	✓		
Long-Distance Stacking	✓	✓	✓	✓	✓	✓	✓
sFlow	✓	✓	✓	✓	✓	✓	✓
Layer 3 (STATIC, RIP, OSPF)	✓	✓	✓	✓	✓	✓	✓
OpenFlow with Hybrid Port Mode	✓	✓	✓	✓	✓	✓	✓
RUCKUS Campus Fabric	✓		✓		✓	✓	✓
Redundant Power Option	✓	✓	✓	✓	✓	✓	✓
PoH (90W PoE power per port)	✓	✓	✓	✓	✓		
Hot Swap Internal power supplies and fans	✓	✓	✓	✓	✓	✓	✓
EEE (Energy Efficient Ethernet)	✓	✓	✓	✓	✓		
VRF		✓	✓	✓	✓	✓	✓
IPsec VPN (with service module)			✓				
MACsec			✓	✓	✓		✓
BGP			✓	✓	✓	✓	✓
Reversible airflow option			✓	✓	✓	✓	✓
VxLAN		✓ <sup>1</sup>		✓	✓	✓	✓
Multi Chassis Trunking (MCT)					✓	✓	✓
Unified network management options	<ul style="list-style-type: none"> <li>• SmartZone</li> <li>• Unleashed</li> <li>• RUCKUS Cloud</li> </ul>	<ul style="list-style-type: none"> <li>• SmartZone</li> <li>• Unleashed</li> <li>• RUCKUS Cloud</li> </ul>	<ul style="list-style-type: none"> <li>• SmartZone</li> <li>• Unleashed</li> </ul>	<ul style="list-style-type: none"> <li>• SmartZone</li> <li>• Unleashed</li> <li>• RUCKUS Cloud</li> </ul>	<ul style="list-style-type: none"> <li>• SmartZone</li> <li>• Unleashed</li> <li>• RUCKUS Cloud</li> </ul>	<ul style="list-style-type: none"> <li>• SmartZone</li> <li>• Unleashed</li> </ul>	<ul style="list-style-type: none"> <li>• SmartZone</li> <li>• Unleashed</li> <li>• RUCKUS Cloud</li> </ul>

<sup>1</sup> Available in a future software release.

# RUCKUS PRODUCT GUIDE

## MONITORING AND SOFTWARE



Network Monitoring		
Network Director (Centralized Inventory Management software)		Network Director provides a robust single-pane-of-glass view of your entire converged RUCKUS Wi-Fi and switch network. Network Director provides multi-cluster inventory control and management of all SmartZone network controllers for improved tracking and manageability.
RUCKUS Unleashed Multi-Site Manager		Unleashed Multi-Site Manager provides a single-pane-of-glass view of Unleashed networks deployed across multiple locations. It simplifies deployment, monitoring and management of Unleashed access points and ICX switches.
Software		
IoT Suite (Internet of Things Management server)		RUCKUS IoT Suite is a software controller that support IoT devices from the RUCKUS IoT Ecosystem. Our IoT Ecosystem partners offer panic buttons, door locks, thermostats, etc. running BLE, Zigbee, Bluetooth, LoRA, etc. wireless interfaces.
RUCKUS Analytics (Service Assurance)		RUCKUS Analytics is a cloud service for network analytics and assurance. Powered by machine learning and artificial intelligence, it gives IT comprehensive visibility into network operations and accelerates troubleshooting. RUCKUS analytics delivers powerful incident analytics and automated health monitoring among other things to enable IT to meet their network service level agreements (SLAs).
SmartCell Insight (SCI) (Reporting and Dashboards)		RUCKUS SmartCell Insight is software that delivers detailed reporting and informative dashboards for your RUCKUS network. It aggregates data from applications, users, devices, access points, controllers and switches to provide visibility into network operations. The software helps you to manage the network more effectively and improve user experience.
Cloudpath Enrollment System (Secure Network Access)		RUCKUS Cloudpath Enrollment System is a cloud service (or on-premises software) that delivers secure network access for any user, and any device, on any network. It streamlines network onboarding and authentication for BYOD, guest users and IT-owned devices—including IoT devices. The service increases security and reduces IT workload while providing a great end-user connectivity experience.
Smart Positioning Technology SPoT (Location engine and analytics software)		The RUCKUS real-time location engine and analytics software enables retailers, stadiums, and transportation hubs to enhance the way they interact with customers based on precise location. Deployed on top of RUCKUS Smart Wi-Fi, the RUCKUS SPoT does not require any additional hardware and has unlimited scalability in the cloud. Send real-time travel updates, targeted promotions, and even classroom notes through footfall traffic and proximity analytics to enrich customer relationships.

[www.ruckusnetworks.com](http://www.ruckusnetworks.com)

Visit our website or contact your local RUCKUS representative for more information.

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# VectorFi Premium Support

## END USER VECTORFI PREMIUM SUPPORT: SIMPLY BETTER SUPPORT

The VectorFi controller offers a cloud hosted Ruckus SmartZone solution that is managed and maintained by Vector and its team of high-quality, knowledgeable, and local engineers. With your purchased VectorFi licenses you also receive unlimited support from those same local engineers for the duration of the contract

### END USER VECTORFI PREMIUM SUPPORT DELIVERABLES

End user VectorFi premium support provides the following to ensure the reliability and functionality of your system:

- 24x7x365 access to Vector technical support professionals via web, phone and email.
- Software updates and upgrades, including bug fixes and maintenance releases, as available, for controllers and AP's
- Advanced Hardware Replacement on controllers and access points

For coverage, customers must buy a single VectorFi license per access point or switch. Customers should purchase the same term support (1, 3, 5, 7 or 10 years) for all products.

### CONTACTING SUPPORT

- <https://vectortechgroup.com/support/>
- [support@vectortechgroup.com](mailto:support@vectortechgroup.com)
- 866-827-4886

### SOFTWARE UPDATES AND UPGRADES

Ruckus software products are covered by a 90-Day Warranty. During the first 90 days following shipment of the hardware product from Ruckus, customers are entitled to upgrade to the latest software release which may include bug fixes that enable the product to perform as stated in the then-current documentation. After 90 days, VectorFi Premium Support customers will receive software upgrades, as available, for the applicable hardware for the term of the support contract.

### ADVANCED HARDWARE REPLACEMENT

VectorFi Premium Support customers are entitled to advanced hardware replacement for a failed controller or access point unit in advance of return shipment. Once notified of the failed unit Vector will deploy a local technician to replace the unit with either a refurbished or new equivalent from our stock.

Vector will then handle the RMA process through Ruckus and either return the repaired unit to the customer or return the unit to our stock for RMA purposes in the future.

### WARRANTY GUIDELINES

The most updated Ruckus Warranty terms can be found at <http://support.ruckuswireless.com/warranty> or on the following warranty document in our proposal.



## LIMITED WARRANTY



1. **Definitions.** For purposes of this Warranty, (i) "Buyer" shall mean the individual or entity identified on the applicable purchase order or supply agreement (or, if different, on Seller's quotation, order acknowledgement or statement of work ), (ii) "Seller" shall mean the Commscope entity identified on such entity's quotation, order acknowledgement, statement of work or supply agreement, (iii) "Hardware" means equipment designed and manufactured by or on behalf of Seller, or any third-party manufacturer's equipment offered for sale by Seller to Buyer, (iv) "Product" shall mean a product manufactured by or on behalf of Seller pursuant to the applicable supply agreement, quotation or order acknowledgement, and includes any combination of Hardware and Software, (v) "Services" means site engineering, system integration, product installation, implementation, training, maintenance and technical support services for Products, or other professional services provided by Seller to Buyer. Services exclude managed services and hosted cloud services provided by Seller, (vi) "Software" means Seller-licensed software, either embedded or standalone, including any updates provided, and any other enhancements, modifications, and bug fixes provided thereto, in object code form only (unless otherwise specified), and any full or partial copies thereof. Software does not include software created or owned by third parties, including but not limited to MediaKind Software, Google's Android Software or any third party application software, and (vii) "Warranty Period" means, unless a different time period is set forth in **Exhibit A**, (a) for Hardware, one year from date of original shipment from Seller's facility, (b) for Software-only Products, ninety (90) days from the date such Software is first made available to Buyer, or for Software embedded in a Hardware Product, ninety (90) days from date of original shipment of the Product from Seller's facility, and (c) for Services, thirty (30) days from the date the performance of such Services has been rendered.

2. **Limited Warranty.** Seller warrants that, as of the date of delivery, Seller has good title to the Product, free from any lawful security interest or other lien or encumbrance unknown to Buyer. In addition, during the Warranty Period, the Product and Services will be free from defects in materials or workmanship arising under proper and normal use. This Warranty shall apply only to the Products and Services and shall not apply to any other goods or materials, parts or components of a system or any system as a whole. This Warranty does not cover ordinary wear and tear. Seller does not warrant (i) Products not purchased from Seller or its authorized resellers; (ii) that the operation of the Product will be uninterrupted or error-free; (iii) that the Product will operate in combination with other third-party products selected by Buyer; or (iv) any products manufactured by third parties; provided that Seller will, to the extent permitted by the manufacturer, assign third-party warranties to Buyer. Seller gives no warranty for, and shall have no liability with respect to, any defects arising from any software (other than the Software), including, but not limited to MediaKind Software, Android Software or any third-party application software, downloaded to or otherwise used in conjunction with the Product. Seller further warrants to Buyer that during the Warranty Period, all Services performed by Seller for Buyer will be provided in a workmanlike manner.

3. **Disclaimers.** EXCEPT AS EXPRESSLY SET FORTH IN THIS LIMITED WARRANTY OR IN A SEPARATE, APPLICABLE SOFTWARE LICENSE AGREEMENT, ALL SOFTWARE IS LICENSED ON AN "AS IS" BASIS WITHOUT WARRANTY.

4. **Inspection and Return Authorization.** Buyer must promptly notify Seller of any claimed defect in the Product and/or Services. If Buyer claims that a Product is defective in materials or workmanship, Seller shall have the right to either examine the Product where it is located or, in its sole discretion, issue shipping instructions for return of the Product. Seller's inspection in response to a warranty claim shall not constitute acceptance or acknowledgment of the claim's validity. Except as otherwise agreed to in writing, Products may not be returned to Seller without prior authorization. Buyer must contact Seller to obtain an authorization number and return the Products to the location designated by Seller. Any Products returned to Seller without proper authorization will be returned to Buyer at Buyer's expense. Risk of loss, damage and insurance responsibilities for the Products shall not pass from Buyer to Seller until delivery of the Products to Seller's designated location. Buyer shall prepay all transportation charges for such return.

5. **Remedies.** Seller's sole and exclusive obligation and Buyer's exclusive remedy under this Warranty is Seller's repair or replacement of the defective Product or re-performance of Services or issuance of a credit for the net book value of the purchase price of the defective Product. Seller shall have sole discretion as to which of these remedies Seller will provide. Seller is not liable for any repair or maintenance costs incurred by Buyer, unless Seller authorizes such charges in writing in advance of the commencement of the work. If Seller elects to replace or repair the defective Product, the replaced or repaired Product will be warranted for the remainder of the Warranty Period applicable to the originally shipped Product, but the Warranty shall not be extended beyond the original Warranty Period. Replacement Products may be new, refurbished or contain refurbished materials.

6. **Notice and Waiver.** If Buyer discovers any defect in the Product, Buyer must provide prompt (and in no case later than thirty (30) days after discovery) written notice to Seller of the claimed defect. Such notice shall describe, in reasonable detail, the symptoms of such defect. The notice must be received by Seller during the Warranty Period for such Product. Failure to give timely notice of a claim shall result in Buyer's waiver of such claim.

7. **Transfer of Ownership.** This Warranty is not transferable unless Buyer is expressly authorized by Seller in writing to resell the Product. In addition, Buyer must notify Seller on or before the fifteenth (15<sup>th</sup>) day after the date on which it transfers ownership of the warranted Product. Any transfers in violation of this Section shall invalidate this Warranty. Notice of the transfer of ownership must be in writing and shall include the name and address of the new owner.

8. **Exclusions from Warranty.** This Warranty shall not apply to problems attributable to, or as a result of:

- (a) improper installation or misapplication of parts;
- (b) chain or system failures induced by other products or components;
- (c) lack of proper inspection or maintenance or failure to provide a suitable operating environment;
- (d) any consumables provided with the Product, including but not limited to batteries and other accessories, and any other materials, components or products manufactured by a third party;
- (e) power surges, fire, unusual mechanical, physical or electrical stress, severe weather conditions or acts of nature, including but not limited to, lightning or floods;
- (f) usage or operation not in accordance with published ratings, specifications or instructions, including but not limited to environmental specifications identified by Seller;
- (g) any adjustment, modification, alteration, removal or repair of any part of the Product, including but not limited to removal or alteration of serial numbers or other identifying marks not expressly authorized by Seller in writing;
- (h) accidental damage, misuse, abuse, neglect or unauthorized access of the Product or of any system of which the warranted Product is a part;
- (i) any type of aesthetic changes due to oxidation or corrosion occurring on stainless steel or galvanized steel parts installed in unusually corrosive marine and industrial atmospheres (in which case Seller's only obligation shall be to ensure that Product complies with Seller's published material specifications);
- (j) use of the Product for purposes other than that for which it was designed; or
- (k) mishandling during shipment of the Product.



## LIMITED WARRANTY

This Warranty is for Products installed and used in accordance with Seller's design, installation and operating parameters. Buyer's failure to ensure conformity with such parameters will void all warranties. Under no circumstance shall Seller have any liability or obligation with respect to expenses, liabilities or losses associated with the installation or removal of any Product or the installation or removal of any components for inspection, testing or redesign occasioned by any defect or by any repair or replacement of a Product.

9. **Limitation on Liability.** THE WARRANTIES SET FORTH IN SECTION 2 HEREOF ARE EXCLUSIVE AND ARE MADE ONLY TO BUYER. SELLER MAKES NO OTHER REPRESENTATIONS OR WARRANTIES, EXPRESS OR IMPLIED, AND SPECIFICALLY DISCLAIMS AND EXCLUDES ANY REPRESENTATION OR WARRANTY OF MERCHANTABILITY, NONINFRINGEMENT OR FITNESS FOR A PARTICULAR PURPOSE AND ANY REPRESENTATION OR WARRANTY ARISING BY USAGE OF TRADE, COURSE OF DEALING OR COURSE OR PERFORMANCE. No person is authorized to give any additional warranties on Seller's behalf or to assume for Seller any other liability, except in a writing signed by an authorized officer of Seller. SELLER'S TOTAL LIABILITY FOR ANY CLAIM OR DAMAGE ARISING OUT OF AND/OR IN CONNECTION WITH THE MANUFACTURE, SALE, DELIVERY OR USE OF THE PRODUCTS OR SERVICES WILL BE LIMITED TO PROVEN DIRECT DAMAGES, NOT TO EXCEED (I) FOR PRODUCTS, THE DEPRECIATED VALUE OF THE PURCHASE PRICE OF SUCH PRODUCTS OR (II) FOR SERVICES, THE ACTUAL AMOUNT PAID TO SELLER FOR SERVICES DURING THE 12 MONTH PERIOD IMMEDIATELY PRIOR TO THE EVENT (OR SERIES OF EVENTS) GIVING RISE TO THE LIABILITY. IN NO EVENT WILL SELLER BE LIABLE FOR ANY INDIRECT, SPECIAL, INCIDENTAL, CONSEQUENTIAL OR PUNITIVE DAMAGES, INCLUDING, WITHOUT LIMITATION, ANY CLAIM FOR LOSS OF ACTUAL OR ANTICIPATED DATA, USE, REVENUES OR PROFITS. The Products are not specifically designed, tested, manufactured or intended for operation or use in any inherently dangerous, life endangering or life support applications where any failure of the Products could lead to death, personal injury or significant physical or environmental damage (High Risk Activities). If Buyer uses the Products in High Risk Activities, including but not limited to nuclear facilities or the flight, navigation or communication of aircraft, Buyer agrees that neither Seller nor its third party licensors are liable in whole or in part, for any claims or damages arising from such use, and that Buyer shall indemnify and hold Seller and its third party licensors harmless from any and all claims for loss, cost, damage, expense or liability arising out of or in connection with any use of the Products in High Risk Activities. These limitations on liability will apply regardless of the form of action, whether in contract, tort, strict liability or otherwise, and whether damages were foreseeable and will survive failure of any exclusive remedies provided in Section 4 hereof.

10. **Choice of Law.** The terms and conditions contained herein and the rights of the parties to any transaction to which they relate shall be governed by and construed in accordance with the laws of the State of North Carolina, U.S.A. The United Nations Convention on Contracts for the International Sale of Goods shall not apply.

# LIMITED WARRANTY

## Exhibit A

Product Categories	Warranty Period from Original Shipment Date*
<b>Category A Products</b> E6000® Converged Edge Router (CER); E6000n™ Remote PHY Devices (RPDs); E6000r™ Remote PHY Shelves; E6000n™ Remote MACPHY Devices (RMDs); vManager; Remote OLT (R-OLT); associated power supplies and accessories. FLX PON OLT portfolio including vOLT. CherryPicker products, Encoder products including ME-7000, SE-6000; DSR-4xxx, DSR-6xxx and DSR-7xxx series IRD products, and Uplink systems including TME-2020, VDP-1000, BNC, DEM, and SEM; All APEX Universal EQAM including APEX1000 and APEX3000; All Aloha interactive products including OM2000, ARPD, ADM4000 and NC1500 4.0. All SDM products. All VUE and VTM Software Products. All STDC products.	Hardware One (1) Year Software Ninety (90) Days
<b>Category B Products</b> All Cable Modems, Gateway and Extenders HomeAssure™ All M-Card Mediapher Multi-Stream Cablecards All High and Standard Definition Transport Adapter MS4000™ Media Streamer All HomeSight™ connected healthcare products (Smart Camera / Personal Health Gateways): HC200 Environmental Multi-Sensors: EM200 LTE Module: LTE200	Hardware One (1) Year Software Ninety (90) days ** For certain CPE, option for 1% overship in lieu of Hardware warranty is standard
<b>Category C Products</b> All EMTA Batteries, PSUs and Telco IF Package for Multiline EMTAs and other home networking accessories	Hardware One (1) Year Software Ninety (90) days
<b>Category D Products</b> All Third Party OEM Products: power meters; All VUE and VTM hardware platforms; NC1500 4.0 hardware platform; LQA256 Legacy QAM Adapter; Elemental Products including Live, Server, Delta, Conductor and StatMux; DC2180 Cabinet Node.	Pass Through from OEM: Hardware One (1) Year Software Ninety (90) Days
<b>Category E Products</b> Intentionally left blank	
<b>Category F Products</b> All CHP Headend Optical (HEO) Elements and Optical Passives. All OM and SG optical node platforms, Flex Max® and Starline® amplifier platforms, RF Taps & Passives, and Optical Field Passives	Five (5) Years within the United States and Canada Three (3) Years outside United States and Canada
<b>Category G1 Products</b> All CH3 Headend Optical (HEO) Elements and Optical Passives, including OP/NP/DP/DC models. All NC optical node platforms and Optical Field Passives, including OP/NP/DP/DC models.	Five (5) Years
<b>Category G2 Products</b> All Legacy Optical Passives, including DCM/HAD/HIT/HW/HLS/WDM and DCM/NAD/NW/NSC models.	One (1) year
<b>Category G3 Products</b> All EPON and GPON ONUs, RFoG/HPON R-ONUs, including, CP8 models and associated power supplies and accessories	One (1) year
<b>Category H Products</b> All ConvergeMedia™ Distribution Platforms and Management Suite, AdManager™ including SkyVision Ad Management and EMP solutions CVEx™, SVA, all Vertasent products including SVOM, SVM and ERM, AdEdge™ COM and AdEdge APS,VMS, Manifest Delivery Controller (MDC), ARRIS Video Content Manager (AVCM) and Next Generation Insertion (NGI) and Multicast ABR.	Hardware One (1) Year Software Ninety (90) Days
<b>Category I Products</b> ECO Solutions, ServAssure® Advanced, ServAssure® NXT - Alarm Central, ServAssure® NXT - Analyze, ServAssure Domain Manager and EventAssure™. WorkAssure™® Workforce Management, Mobile TV, SecureMedia and Titanium	Hardware One (1) Year Software Ninety (90) Days

## LIMITED WARRANTY

<b>Category J Products</b> Intentionally left blank	
<b>Category K Products</b> Intentionally left blank.	
<b>Category L Products</b> Intentionally left blank	
<b>Category M Products</b> All Hybrid QAM/IP High-definition Set-Top Boxes	Hardware Two (2) Years Software Ninety (90) Days
<b>Category N Products</b> All Hybrid QAM/IP High-definition Set-Top Boxes with DVR	Hardware Two (2) Years Software Ninety (90) Days
<b>Category O Products</b> All CAS Products including DAC, CASMR (and associated plug-ins), CAST, Advisor, CSS, OLL, CSS-Lite, KLS, DKS, CPMS	DAC, CASMR, CAST, Advisor, CSS Hardware Three (3) Years OLL, CSS-Lite, KLS, DKS, OLES, CPMS Hardware One (1) Year Software Ninety (90) Days
<b>Category P Products</b> VIP Mediaroom Set-Top Boxes	Hardware One (1) Year  Software Ninety (90) Days ** For certain CPE, option for 1% overship in lieu of Hardware warranty is standard
<b>Category P1 Products</b> Intentionally left blank	
<b>Category Q Products</b> VIP Open Solutions Set-Top Boxes	Hardware One (1) Year Software Ninety (90) Days  ** For certain CPE, option for 1% overship in lieu of Hardware warranty is standard
<b>Category R Products</b> NVG CPE and Non-RUCKUS Wi-Fi Extenders including VAP	One (1%) percent overship in lieu of Hardware Warranty Software Ninety (90) Days
<b>Category R1 Products</b> Intentionally left blank	
<b>Category S Products</b> DVB-S/DVB-C/DVB-T Set-Top Boxes with or without DVR	Hardware One (1) Year Software Ninety (90) Days ** For certain CPE, option for 1% overship in lieu of Hardware warranty is standard
<b>Category S1 Products</b> Intentionally left blank	
<b>Category T Products</b> RUCKUS Wi-Fi Wireless	Hardware: - Indoor Access Points – Limited Lifetime Warranty** - Outdoor Access Points – One (1) Year - Controllers – One (1) Year, except ZoneDirector controllers are covered by the Limited Lifetime Warranty** Software Ninety (90) Days
<b>Category T1 Products</b> RUCKUS ICX Switches	- ICX Switches (excluding removable optics and LEDs) – Limited Lifetime Warranty,** except for ICX 7150-C08PT, for which the HW warranty period is 13 months. - Removable optics and LEDs – 13 months  Software: Limited lifetime access to defect repairs, and software maintenance updates through end of support date of product

## LIMITED WARRANTY

<b>Category T2 Products</b> RUCKUS CBRS LTE Access Points (subscription license required)	Hardware One (1) Year Software Ninety (90) Days
<b>Category U Products</b>  Other OSP Cable Products (P3®, Drop Coax, Fiber Cable, Fiber Drop Cable, CIC)  NovuX Products  Prodigy Products  FDH Products  Multiservice terminals (MST), Open Terminals (OTE) and Hardened Drop Cable Assemblies  OSP “Box” Products  Mini-RDTs and RDTs  FOSC™, FIST™ and Tenio™  OSP Copper Connect and Closure Products  HELIAX® FiberFeed® Products, including FiberFeed® hybrid and fiber cables and assemblies, power cables and junction boxes  Fiber Optic Panels, including Accessories, Mounting Hardware, Modules  Fiber Optic Field Terminated Connectors, Kits, Tools, Consumables, Accessories  Indoor Fiber Cable, Patch Cords, Cable Assemblies, Fiber Trunks  Passive Optical Components and Value Added Modules (VAMs)  Fiber Guide Fiber Management System (FGS)  Optical Distribution Frames, including Modules, Blocks, Accessories and Hardware  Cabinets Cable and Apparatus Products  Alifabs™ Cabinets & Ancillary Products  Alifabs™ Telecommunications Towers and Accessories  Metro Cell Products, including Enclosures; Integrated Pole; Standard Poles; Accessories; and Wood Pole Brackets	One (1) year
<b>Category V Products</b> ValuDAS® Passive Products, including Air Directional Couplers, Hybrid Couplers, High Power Splitters, and Cell-Max™ Antennas  Standard Tower Mounted Amplifier, Bias Tee and Power Distribution Unit Products  Standard Filter, Diplexer and Triplexer Products  Electronic Enclosure Products (Cabinets)  Alifabs™ Free Cooling Products and Accessories and Spare Parts, including Monitor	Two (2) years
<b>Category W Products</b> ValuSite® Products  I-Line Accessory Products  Steel Products and Rapid Deployment Monopoles  Microwave Antennas  Terrestrial Microwave System Products (including Microwave System Flex-Twist, Coupler, Filter and Diplexer Products)	Three (3) years

## LIMITED WARRANTY

<b>Category X Products</b> Broadband RF Connectivity Products  Premium Passive Products, including In-Building Directional Couplers, Hybrid Matrices, Tappers, Power Splitters, Terminations, Attenuators and CMAX Antenna Products	Five (5) years
<b>Category Y Products</b> QR® Coaxial Cable	Five (5) years
<b>Category Z Products</b> Standard RADIAX® Cable, Connector, Accessory and Cable Assembly* Products  * RADIAX® Cable Assembly Product means any RADIAX® coaxial cable that has been fitted with Seller's connectors in accordance with the installation instructions.	One (1) year
<b>Category AA Products</b> Standard CNT® Cable, Connector, Accessory and Cable Assembly* Products  * CNT® Cable Assembly Product means any CNT® coaxial cable that has been fitted with Seller's connectors by Seller or its certified distributor	Five (5) years; except that the Warranty Period for Products purchased for resale purposes shall be one (1) year.
<b>Category BB Products</b> Standard HELIAX® Cable, Connector, Accessory and Cable Assembly* Products  * HELIAX® Cable Assembly Product means any HELIAX® coaxial cable or elliptical waveguide that has been fitted with Seller's connectors by Seller or its certified distributor.	Ten (10) years; except for the following: (i) three (3) years for weatherproofing kits (including SureGuard boots); (ii) one (1) year for cable preparation tools (excluding blades); (iii) one year for single click-on hanger kits; and (iv) two (2) years for surge arrestors.
<b>Category CC Products</b> Standard ERA/ION-E®, ION-M®, ION-U®, MR, CMR, i-POI®, e-POI™, and Node Repeater Products	Hardware, the earlier of: (i) one (1) year from the date of installation; or (ii) fifteen (15) months from the date of shipment. Software Ninety (90) Days
<b>Category DD Products</b> In- Building and Fixed Subscriber Antennas	The earlier of: (i) three (3) years from the date of installation or (ii) thirty-nine (39) months from the date of original shipment
<b>Category EE Products</b> OneCell®  Powered Fiber Cable Solution: Hybrid Copper and Fiber Cables, Class 2 Power Supplies, Indoor/Outdoor POE Extenders, Field Terminated Outlets, Consolidation Boxes and Related Passive Components	Hardware, the earlier of: (i) one (1) year from the date of installation; or (ii) fifteen (15) months from the date of original shipment Software Ninety (90) Days
<b>Category FF Products</b> Small Cell Device Management System (DMS) Software DAS Device Management System (AIMOS) Software	Ninety (90) days
<b>Category GG Products</b> Base Station Antenna Products	Two (2) years for all base station antennas except base station antennas incorporating N-type connectors, which shall have a warranty of one (1) year
<b>Category HH Products</b> DryLine® Dehydrator Systems and Line Monitoring Systems	Three (3) years or 3,000 hours of actual run time, whichever occurs first; except the Warranty Period for the compressor is only one (1) year or 1,000 hours of actual run time, whichever occurs first. This Warranty Period does not apply to Factory Reconditioned Dehydrators, which are warranted for only one (1) year from the date of original shipment
<b>Category II Products</b> SiteRise™ Solutions	One (1) year on workmanship for the Solution.
<b>Category JJ Products</b> Copper Structured Cabling Products  Other Enterprise Products (Coax, Automotive Cables, Enterprise Enclosures and miscellaneous items) (excluding software)	One (1) year from the date of Installation

## LIMITED WARRANTY

<b>Category KK Products</b> Alifabs™ Services (power upgrades, enablements, installation and decommission work, rigging, and fault management)	One (1) year from the date of completion of the work.
<b>Category LL Products</b> imVision Overlays and Controllers	Three (3) years

*\* For Category H and Category I Products only, if Seller is engaged by Buyer to provide Services for the implementation of the purchased Products, warranty period for such Products shall commence upon Buyer's acceptance of the Products and Services.*

*\*\* For Category T Products only, "Limited Lifetime Warranty" means the period beginning on the Product shipment date and continuing for as long as the original end user of the Product continues to own and use the Product. For Category T1 Products only, "Limited Lifetime Warranty" means the period beginning on the Product shipment date and continuing (i) for as long as the original end user of the Product continues to own and use the Product or (ii) through the End of Support date, as defined in the RUCKUS End of Life Policy, whichever is earlier.*