CHAPTER 5

MULTI-GIGABIT ACCESS AND SWITCHING TO MAKE THE MOST OUT OF WI-FI 6

Communications networks are more complex than ever before. High-bandwidth, media-rich applications, bring-your-own-device (BYOD) culture and the IoT have hastened organizations toward 802.11ac Wave 2 Wi-Fi implementations, even as 802.11ax (Wi- Fi 6) begins to gain awareness.

While more apps are being migrated to the cloud, the edge has become increasingly wireless. Wireless APs have essentially become part of a converged access platform where multiple functions – ranging from IoT gateway to firewall – are performed. Access is established through radios operating over different air interfaces, from Wi-Fi to Blue-tooth Low-Energy (BLE) to Zigbee.

Regardless, Wi-Fi networks in particular will have to be more efficient, flexible and intelligent than ever before. The networks will utilize sensors and machine data combined with innovations such as artificial intelligence to automatically provision for added capacity and proactively solve potential problems before it impacts the user.

Concurrently, increased dependence on data-intensive wireless and cloud-based applications has driven demand for multi-gigabit connectivity between wireless APs and Ethernet switches at the edge.

built to handle more devices and bandwidth-hungry applications. But a single Wi-Fi 6 client can quickly overtax existing 1 GbE backhaul links on a typical AP. This has generated interest in multi-gigabit connections between APs and switches.

Bridging the performance gap between gigabit and multi-gigabit Wi-Fi is becoming necessary in demanding environments such as stadiums, exhibition halls, hotels and even primary and K-12 schools.

Most 802.11ac APs are equipped with two 1 GbE ports, with some featuring 2.5 GbE ports.

The new 802.11ax (Wi-Fi 6) APs can easily achieve 5 Gbps speeds in real-world operations, so these APs will be equipped with 5 GbE ports.

MULTI-GIGABIT CONNECTIVITY

With the 802.11ac (Wi-Fi 5) and now 802.11ax (Wi-Fi 6) standards, an AP has the potential of more than one-gigabit throughput. Wi-Fi 6 was

APS AND SWITCHES

Ruckus Networks, now part of CommScope, has been deploying Wi-Fi in challenging venues with unusually high capacity requirements, such as stadiums and arenas. CommScope RUCKUS offers multi-gigabit options that include APs and switches optimized for Wi-Fi 5 or Wi-Fi 6 with 2.5 GbE connections, or Wi-Fi 6 via APs or ICX Z-Series switches with 2.5/5/10 GbE ports.

These multi-gigabit solutions allow organizations to balance cost, performance and Wi-Fi client density. For example, the RUCKUS R750 802.11ax indoor AP for ultra-dense client environments is Wi-Fi CERTIFIED 6 from the Wi-Fi Alliance.

Meanwhile, the RUCKUS ICX 7150-C10ZP, ICX 7150-48ZP and ICX 7650-48ZP provide rich options for 2.5/5/10 GbE Ethernet switching fit for different deployment scenarios with the R750. Additionally, the RUCKUS ICX 7850 switch is designed to deliver 100 gigabit core switching capacity for large campus networks.

To maintain a consistent Wi-Fi 6 user experience, the combination of RUCKUS multi-gigabit switching, Wi-Fi technology and unified network controller, with CommScope's portfolio of structured cabling, provides a comprehensive end-to-end network solution.

CABLING, POE TO OPTIMIZE WI-FI

The cabling infrastructure needed to support the latest Wi-Fi APs must be
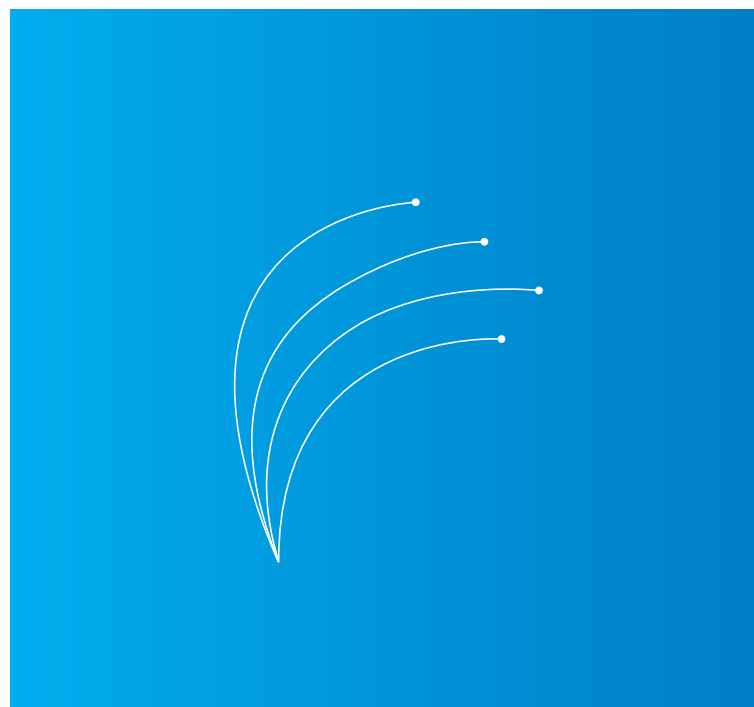
upgraded to handle bandwidth-hungry devices and applications such as virtual reality, 4K video streaming and wearables. Critical connectivity is also needed to support operational use cases like IoT devices, video surveillance, asset tracking, climate control systems, smart locks and point-of-sale.

Generally, multi-gigabit technology leverages commonly deployed Cat 5e (for 2.5 Gbps) or Cat 6A (for 5 Gbps) cabling. Hence, enterprises can maximize the performance of their Wi-Fi networks and obtain multi-gigabit access capacity over an existing cable plant.

To ensure optimal performance of these APs, Category 6A cabling infrastructure and multi-gigabit switches that support the 802.3bt PoE standard to its full 90W should be installed. RUCKUS multi-gigabit switches already offer up to 90W per port and up to 1500W of total PoE budget along with uplinks of up to 100 Gbps to future-proof the network.

SUCCESS STORY: RICHARDSON INTERNATIONAL, WINNIPEG, CANADA

AGRIBUSINESS STREAMLINES SWITCHING NETWORK FOR BIG EFFICIENCY GAINS

Richardson International is Canada's leading agribusiness. Its food products – grains, oilseeds, canola and oats – are sold to customers worldwide. During a period of extraordinary growth in its history along with expansion through strategic acquisitions in North America and Europe, the organization's IT team decided to replace its unreliable switching network to help gain the trust of acquired organizations and make standardization of technology easier for them.

Technology recommendations must improve the operations of their business and plants. The small IT team required switches to be efficiently managed from the corporate data center in Winnipeg. Downtime required to standardize switches had to be minimized.

With agility and efficiency in mind, the switching infrastructure had to be easily scalable and offer low cost of ownership, high performance and rock-solid reliability. Other key considerations included ease of deployment and seamless transitions toward standardization.

SOLUTION

As Richardson International's network grew to support more remote locations, the organization deployed more than 500 RUCKUS ICX switches across Canada, the U.S. and the U.K. while actually decreasing the cost of that support.

The multi-gigabit RUCKUS ICX fixed form-factor or stackable switches enhance security, minimize troubleshooting, and make upgrades easy. This is critical because reliable Wi-Fi requires a well-matched wired infrastructure that provides high performance and high reliability. The infrastructure must be easily managed, and can scale to meet ever-increasing Wi-Fi demands.

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Hence, ICX switches work seamlessly with RUCKUS Wi-Fi APs, RUCKUS SmartZone network controllers and RUCKUS Cloud to improve responsiveness to organizational needs while reducing IT overhead.

Additionally, the advent of Wi-Fi 6/6E APs is playing a major role in driving the de-mand for multi-gigabit connectivity.

BENEFITS

Post-deployment, three network engineers based at Richardson International's head-quarters in Winnipeg are responsible for managing the 500 RUCKUS ICX switches deployed across 140 farflung locations. For the team, network performance entails not just bandwidth and throughput but also simplified management.

Management simplicity is integral to the RUCKUS high-performance switches. Unnecessary steps associated with configuring and monitoring a large network of distributed switches are reduced. Documentation is clear and thorough to ease deployments.

RUCKUS Cloud has further extended this advantage to enable management of single-site or geographically distributed multi-site wired and wireless network from anywhere using an intuitive web interface or a mobile app. Administrators get a unified view of all venues, as well as connected APs, switches and clients.