UNIVERSITY OF REGINA

High-Energy Campus Life Requires High-Reliability Wi-Fi

CASE STUDY

OVERVIEW

The University of Regina is a public research university located in Regina, the provincial capital of Saskatchewan in western Canada. The old Wi-Fi network stumbled constantly, trying to support high-density or high-interference environments. The Ruckus network, with the same number of APs, easily supports all environments across the 2.7m square foot campus—15,000 students, over 20,000 unique devices and 7,000 simultaneous clients, as well as big outdoor and indoor community events.

CHALLENGES

- Unreliable Wi-Fi in high-density areas, including the main food court and large lecture halls, generated daily complaints from students and faculty
- The Wi-Fi network required a lot of tuning to support community events on campus
- Even upgrading to the latest AP technology didn't solve any of the reliability problems

SOLUTION

- Approximately 1,100 indoor and outdoor Ruckus APs
- SmartCell Gateway wireless controllers
- SmartCell Insight reporting and predictive analytics

BENEFITS

- Student and faculty complaints have dropped from at least a dozen a week to less than a dozen a semester, and most of those are user errors
- Ruckus APs provided instant reliability over previous Wi-Fi in high-density, high-interference and outdoor environments
- The University now hosts large events (2,000+ people) without making any network adjustments
- The entire Wi-Fi network is managed by two people, who spend a minimum amount of time supporting the highly reliable Ruckus network

VIBRANT CAMPUS LIFE CREATES HIGH-DENSITY WI-FI CHALLENGES

The University of Regina is a comprehensive university located in Regina, the provincial capital of Saskatchewan in western Canada. Serving more than 15,000 undergraduate and graduate students, the University of Regina has a three-part mission of teaching, research and service to community. The University's Information Services (IS) department has a supporting strategy: to create a world-class information technology infrastructure.

The strategy was flagging in one particular area: wireless. "Many academic institutions struggle with Wi-Fi. We were in the same situation. I would hear concerns daily about the poor performance of our former Wi-Fi network," says Art Exner, Associate Vice-President (Information Services) at University of Regina. "We weren't planning to overhaul the whole network, but there were some problem areas that we absolutely had to address."

First was the popular campus food court, a favorite meeting place for students—lots and lots of students. It was known for great food but awful Wi-Fi. The concentration of students on their mobile devices was a high-density nightmare for the existing network. "It was almost unusable from a reliability standpoint," says Drew Baldock, Communications Support Supervisor. "We received daily student complaints about dropped connections or an inability to connect at all."

Baldock's team first tried to give that section of the network a boost. "We brought in the former supplier's engineer who spent two days analyzing just the food court. We upgraded to their latest technology. We moved some access points (APs) to enable better coverage. We added another AP. We tuned and optimized. But the complaints kept rolling in." Baldock also notes that, at this stage, students were using devices that were mostly 2.4GHz, not even 5.0GHz. Improvements were necessary.

So IS undertook an evaluation of three new vendors: Xirrus, Meru and Ruckus. They tested them one at a time in the food court on a production network at peak times. The evaluation produced a clear winner: Ruckus. "We took out six APs and installed six Ruckus APs. It was like night and day. At the busiest time when you could barely walk through the crowds of students in the food court, the Ruckus Wi-Fi was rock solid. The connections were reliable. The performance was fantastic."

In truth, IS had no plans to transform its entire wireless network across the 2.7 million square foot campus. But next came the problem of the large lecture halls, which hold up to 250 students. Professors tried using a wireless voting software, but that timed out constantly when all of the students tried

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ART EXNER
Associate Vice-President (Information Services)
University of Regina

to vote. "Now the complaints came from faculty members," says Baldock. "The University of Regina encourages innovative teaching models. Teachers were using modern tools to teach, and the Wi-Fi wasn't supporting them. That wasn't acceptable to us."

So IS replaced six additional APs with four Ruckus APs in each of two lecture theaters. "Again, overnight, Ruckus solved the coverage issue and concerns drastically dropped."

NEXT WI-FI STOP: INTERFERENCE WAS LITERALLY STOPPING WI-FI SIGNALS

There was another problem affecting Wi-Fi performance in other parts of the campus: high-interference environments. The Administration Humanities building has an open atrium through the center of the building that caused channel overlaps between the existing APs. This, in turn, caused roaming problems for users. Thick concrete walls also blocked RF signals. Similar problems affected wireless connectivity in the library, where the APs signals were attenuated by steel bookshelves. Ruckus APs replaced the existing APs in both buildings. Signal strength: perfect.

Facilities staff requested coverage in tunnels for maintenance audits. So Ruckus APs went subterranean to cover 100m of tunnels. Signal strength: perfect.

At this point, the IS team was wrestling with the problems associated with managing two different wireless networks. "The operational overhead was starting to become its own issue. It made no sense for a bustling university with a small IS staff to be running two different Wi-Fi networks. We decided it was time to standardize on Ruckus."

A QUIET HELP DESK MEANS A HAPPY CAMPUS

To date, IS has deployed about 1,100 Ruckus APs across 20 buildings and five residence halls. Outdoor APs cover bus stop areas and the famous oval green at the center of the campus where events are often held. "We're using the mesh technology that's integrated into the Ruckus APs to provide coverage for the two sports fields, so we don't have the expense of running cables out to those fields."

Without adding more APs than they had before, IS discovered they have more capacity. "In the residence halls in the evenings we're using every possible channel on the APs. Students are streaming movies and watching videos without any problems at all. They love it," says Baldock. "I would say about 95% of our students are 5 GHz-enabled, so we've also gained tremendously in throughput—another benefit on top of reliability and capacity.

Even during welcome week, when all the new students show up on campus and log onto the network, it is a seamless process. Students sign onto the guest network and learn about eduroam, the preferred wireless network for students, faculty and staff. Students who have SaskTel-enabled phones can select the SaskTel Select Wi-Fi SSID. There's also a guest network and another SSID for students who live on campus whose devices aren't compatible with eduroam. "We have everyone covered with those four SSIDs," says Baldock. "We've been able to simplify network access to an amazing degree. The few problems we have are usually because of user errors, and those are easy enough for us to diagnose and correct with the Ruckus management tools."

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DREW BALDOCK
Communications Support Supervisor
University of Regina

EVEN MANAGEMENT IS EASY

IS started with Ruckus ZoneDirector controllers. They've now moved to Ruckus SmartCell Gateway which they manage with Ruckus SmartZone controller software. When it comes to identifying the root of a problem, Baldock can't say enough about Ruckus' new Visual Connection Diagnostics tool that's part of SmartZone 3.5 or higher. "It's fantastic. I don't know why everyone doesn't have this. If a student can't connect or connection is intermittent, we throw in their MAC address and trace the problem back to exactly where the process is failing. Is it a DHCP or a RADIUS timeout or something else? The coverage and capacity is so good that we really don't have many congestion problems. Usually it's a password or certificate issue. If it were a case of multiple users having a problem, then we'd have to do more detective work with the diagnostic tools. But it hasn't happened yet, which is a testament to how reliable the Ruckus APs are. They just work."

Baldock also uses Ruckus SmartCell Insight for reporting and predictive analytics. He finds it useful for tracking usage patterns and planning for the future.

Given how many users the Ruckus infrastructure is supporting, you'd think that a lot of management time goes into keep the network humming along. "There are basically two of us managing the Wi-Fi infrastructure, and I use the term 'managing' loosely," says Baldock. "I'm the controller guy, and I spend maybe 20 minutes a day checking the reports, more out of curiosity than anything. I have an engineer whose job is managing the device side. But we get so few trouble tickets—maybe one a week—that we have him on other projects most of the time. The Ruckus network pretty much manages itself. It's exactly what a small IS staff supporting a vibrant, highly mobile, growing academic institution should strive for. We've done it, so we know it's possible."

SUPPORTING MORE COMMUNITY EVENTS WITH NO EXTRA EFFORT

In the past, community events held on campus required a lot of support from IS, including adding APs on a temporary basis to try to bolster coverage.

In the past few months, the University of Regina has hosted major community events: the U SPORTS Women's Basketball Championship and the Canada-Wide Science Fair, each of which drew over 2,000 guests. It also hosted Congress of the Humanities and Social Sciences—a conference that brought more than 5,000 attendees to campus. "We did absolutely nothing special to the Ruckus network—no extra APs. The performance was flawless." "We have more than enough capacity with our existing Ruckus network," says Baldock.

"Back in the day, the complaints were frequent. Now they're almost non-existent," says Exner. "Today, I hear great comments about our wireless network on a regular basis. Our Ruckus network is high performance and high customer satisfaction. That's the combination we want for our students, faculty and staff, and the community we serve."

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