Client: **Confidential**

Project: **“A mobile-first network” Is it your time?” e-book (excerpts)**

portfolio

The explosion of smartphones, tablets, cloud-based applications, and the Internet of Things has changed the nature of work. This new mobile-first environment is mostly a good thing for small and midsize businesses (SMBs).

Forbes reported SMBs that adopt mobile technologies see double the revenue growth and create up to eight times as many jobs as their less mobile-ready peers.[1] Small businesses alone save over $67 billion a year using mobile apps, tablets, and smartphones.[2]

This isn’t a great secret: 67% of the SMBs are using tablets for business purposes, and 93% are using employee-owned smartphones.[3]

But too often, networks—even networks just a few years old—simply aren’t robust or flexible enough to keep up with mobile-first demand.

For SMBs with these network issues, there is a simple, affordable option: an integrated network built around 802.11ac LAN technology, a secure and scalable switch, and simple cloud management. While wireless is the primary means by which employees will access the network, the best solution for SMBs is an end-to-end wireless and wired infrastructure that is easy to deploy and offers built-in security and tools to collect and analyze network performance data.

This eBook explores how an integrated network built around 802.11ac can provide SMBs with a higher-performing, secure network for the mobile-first approach needed in today’s business environment. And how simple—and profitable—setting up such a network really is.

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- Seven in 10 businesses get user complaints about poor Wi-Fi, but six in 10 SMBs don’t have on-staff networking expertise.[4]
- 67% of SMBs view mobile solutions and services as critical to their business.[5]

- 78% of U.S. small businesses will have fully adopted cloud computing by 2020.[5]

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Chapter 1: The benefits of a mobile-first network

No matter the size of your business, when you have a reliable network, productivity is increased. Why? Because employees don't have to wait for the network to get work done—and your limited IT team won't have to respond to as many helpdesk tickets, freeing them to focus on other IT innovations that help your business grow.

A robust network infrastructure allows you to prioritize and optimize business-critical applications so you can respond faster to customers and make smart decisions quickly.

A strong integrated solution provides the following benefits:

- An infrastructure that is easy to deploy and offers built-in security and the tools to collect and analyze network performance data
- More insight into users, devices, and apps running on the network to ensure the network runs smoothly
- A flexible and easy-to-use network management solution that can grow with the business
- Integrated and automated security controls and intrusion detection to help protect business data from malware and unauthorized users
- The intelligence to evolve with the business

Today, that solution should be built around an integrated solution of wired connection and 802.11ac wireless, which offers wireless access speeds three times faster than 802.11n (1.3 Gbps vs. 0.45 Gbps).[6] An 802.11ac access point has increased signal strength and data range, with 400 Mbsp at 75 feet, while 802.11n provides only 200 MBsp at the same distance. Thanks to its eight multi-input multi-output (MIMO) antennas or spatial streams at 80 MHz, 802.11ac allows for a significant increase in user bandwidth.[6]

But those are stats. Do they translate to the real world?

Yes, according to Yugendran Pillay, head of IT with North Sydney Boys High School in Crows Nest, South Wales. That school transitioned to an XXX 802.11ac network to support its modern technologies and electronic resources for students. Its network is now stable and strong enough to support more than 400 devices with no access issues.

“We now have 70 XXX 802.11ac XXX Instant Access Points distributed throughout the school,” Pillay says. “We are not aware of any areas on campus our wireless network does not reach. There is excellent coverage across the entire site, in and outside classrooms.”

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Students leveraging the internet are 20% more proficient.[7]

Digital textbooks result in annual savings of $1,000 per student.[7]

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For healthcare companies, Wi-Fi has become the foundation for more meaningful and positive interactions between providers and patients. 69% of hospitals allow physicians to use their personal devices at the point of care.[7]

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64% of retailers plan to implement mobile POS. Research shows 42% of shoppers search for product information while in the store—and if a store isn’t providing Wi-Fi, those customers might choose to leave rather than waste precious data.[7]

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Chapter 2: Dispelling modern network myths

Chapter 3: Convincing the doubters

A mobile-first mentality isn’t about written documents or lines of code; it’s an organization-wide attitude and approach where everything from infrastructure to

applications are designed around offering a consistently positive experience to every user.

But sometimes there is some hesitation to upgrade the network—especially from the financial folks who don't have deep interaction with it daily, but who do have to sign off on any purchase.

So it helps to show them the impact a mobile-first network strategy has on the following:[9]

- **Improving the customer experience**. According to a study conducted by consumer intelligence agency Walker, by the year 2020, customer experience will overtake price and product as the key brand differentiator.[10] A customer's communications with a business is a big part of this experience—and offers you an advantage over less-technical competition.

- **Increasing workforce performance.** Employees who can work from anywhere put in an average of extra two hours a day and send out 20 more emails per day than the traditional office employee.[11]

- **Increasing workforce pride.** Workers who consider their employers "mobile pioneers" are typically more productive, creative, satisfied, and loyal.[11]

- **Increasing revenue. Modern technologies have made us less patient, and businesses are judged by how** quickly calls, emails, and texts are returned. Just a few minutes can be the difference between a sale and a loss; businesses that respond to a web inquiry within five minutes are **nine times** more likely to convert the lead to a sale.[12]

Chapter 4: Implementing the network

Building a mobile-first network relies on a foundation of switches and routers. Switches connect multiple devices on the same network within a building and enables connected devices to share information and talk to each other. Routers tie multiple networks together and connect your networked computers to the internet through a single connection. A router acts as a dispatcher, choosing the best route for your information to travel. It connects your business to the world, protects information from security threats, and can even decide which computers get priority over others.

On top of that foundation will be your management system. A cloud management tool can save you money and increase flexibility and scalability. Managing theses services can be complex, requiring management and cost evaluation for multiple services running across multiple cloud platforms, resource consumption details, integration with other enterprise tools, and other factors, so a simple tool is best.

Some implementation tips:

- Invest in business-grade switches and routers for reliable communications. Enterprise-grade routers include the standard features of consumer routers and include intrusion detection, anti-spam and anti-virus features, more control over the firewall, and the option to filter or classify network traffic. Enterprise-class routers also typically allow you to set up a virtual private network (VPN) server, which enables secure remote access to your network and is essential if you or your employees plan to work from home or while traveling.
- Invest in a network that can grow over time, so you can add features and functionality as needed.
- Make sure your switches and routers are easy to install, use, and manage.
- Keep in mind reliability and redundancy when designing your network.
- Remember that the speed of your network will be dependent on client devices and on the distance from which they are operating. The closer your 802.11ac devices are to the router, the better the speeds will be. This means that you shouldn’t set up your router too far from your main devices, if you can help it.

Chapter 5: Tips, how-tos and questions to ask

Before diving into network migration, you should lay the groundwork to establish the best plan.

Of course, the most efficient method might be bringing in a trusted, experienced consultant to lead your migration. But, if you want to do some or all of it on your own, here are a few crucial steps you should complete to make your transition as smooth and successful as possible.

Consider: Wired or wireless? Or a mix of both?

Wired (or Ethernet) networks do have some advantages, including greater reliability and faster speeds. But, 802.11ac wireless nearly matches the speed and reliability of wired networks with added flexibility. But many businesses choose to incorporate both wired and wireless access with cloud management, a robust and solution that provides flexible access and reliable connect for your critical critical devices and peripherals.

Complete a wireless site survey

A new wireless site survey conducted specifically for 802.11ac will help point out the adjustments that have to be made. For example, migrating to the new standard means transitioning to a 5 GHz network, which has less ability to penetrate walls and other building materials.

A proper wireless site survey will allow you to optimize your new network to take advantage of the higher throughput and increased number of channels that 802.11ac has to offer.

Ask yourself:

- How many computers and peripherals need to connect to the network?
- What kinds of data and files are you storing and sharing?
- What applications will you be using?
- Will employees need or want to access the network from remote locations or using mobile devices?

Make accommodations for 802.11ac wave 2

Wave 2 is faster, more reliable, and has more capacity than wave 1. Even if you decide wave 1 is best for now, be mindful of the future. Although wave 2 is fairly new, some vendors are already offering wave 2 APs or APs that support wave 2 technology.

Allocate budget for upgrades

The capital investment for 802.11ac equipment is not much different from when you upgraded to 802.11n, although wave 2 compatibility may increase the cost

and you might need higher density of APs. The price tag on your last deployment should give you a good idea of the upgrade cost, though.

Many times, businesses and organizations upgrade to 802.11ac in phases, concentrating on their highest priority areas first and completing the entire migration over time. It all comes down to your specific environment, who and what you're trying to support, and what sorts of IT goals you have going forward.

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Wave 1 vs. wave 2

802.11ac features will come in waves: wave 1 and wave 2.

Wave 1 refers to the first-generation of 802.11ac products, which use 20, 40, and 80 MHz channels all in the 5 GHz bandwidth. In some cases, this is combined with the older 802.11n in the 2.4 GHz bandwidth. This increase in bandwidth means those who use the 5 GHz bandwidth get a "less crowded highway" and faster communication speeds; those who still have the 2.4 GHz bandwidth have fewer people crowding the channels and slowing traffic.

The performance speeds of wave 1 can reach 750 MBps for a single three-stream client and 250 MBps for single stream such as a smartphone. Data rates for wave 1 products are capable of supporting up to 1.3 GBps with three spatial streams.

Wave 2 is the second generation of 802.11ac products. The PHY (physical) rate, which affects the throughput rate of data transfer, maxes out at 2.34 GBps.[8] For SMBs, wave 2 offers greater density by supporting multi-user, multiple input, multiple output—meaning the spectrum is used more efficiently for multiple connected devices, and devices can more easily get on and off the network.

Wave 2 supports additional 5 GHz channels. If these channels are designated for Wi-Fi use, it could help support more users and devices overall. And the wave 2 standard adds a fourth spatial stream, which should mean better overall performance.

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