

The New 802.11n Wireless Standard

Bringing mobility to your business



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Bringing mobility to your business by Nadeem Ahmad

It might not have the catchiest of titles, but the new 802.11n draft wireless networking standard has had its fair share of press recently. Indeed, you'd be hard pushed to miss the industry stories on wireless, the new 802.11n standard and how essential they are to your organisation's plans to support its mobile workforce.

In this article, Nadeem Ahmad, Director of Global Technology at Dimension Data, investigates the reality behind the hype: what does the 802.11n standard actually bring to the table, what are its implications, how will it affect the wireless world and how might it be incorporated into a broader mobility strategy?

What is all the fuss about?

So what are the key elements of the 802.11n new wireless draft standard that have got the industry more than a little excited? The overwhelmingly positive implication of 802.11n is better end-user experience for data, voice and video. There are three key areas that deliver improvement on anything that has been before. First up is the increased throughput or connection speed which looks to be up to five times greater than existing networks. Increased reliability should also be realised due to lower latency or jitter, making the wireless solution increasingly viable. Likewise, more consistent coverage and throughput make for a more predictable wireless service.

The combined potential of these improvements goes a long way in justifying the hype; the wireless network now truly has the possibility of supporting real-time traffic and bandwidth intensive applications. Most multimedia services, and especially services like voice, require a more consistent signal coverage and lower latency or jitter to ensure the best end user experience. Annoyances, such as delays or echoes, that might previously have seemed a fair trade

off for the advantages of increased mobility, could now be significantly improved by the 802.11n draft standard.

Whilst the benefits of 802.11n are exciting for the industry and organisations which plan to implement the technology, it is also important to be aware of some of the challenges that may arise during deployment. In terms of controller capacity, the increased rate and traffic of 802.11n will have more impact on the wired network and could cause more bottlenecks on the WLAN controller than previous standards. Mitigation includes separating data traffic and control traffic within the centralised architecture. Power issues will become evident as the current Power over Ethernet (PoE) standard 802.3af will not be able to provide sufficient power to be able to use all the features of 802.11n. However, a new PoE standard (802.3at) is due for release soon and there are proprietary PoE solutions also available from WLAN System vendors.

There are also certain security implications that an organisation should be aware of before implementing the new technology. Appropriately, 802.11n will incorporate the same robust security standards we have today and our recommendation is for the use of WPA2 / 802.11i, which has 802.1 x authentication and AES encryption. Most 802.11n client devices will have hardware-based encryption acceleration. One issue to be aware of is that upgrades to existing Wireless Intrusion Detection Systems (WIDS) will be needed. Today's intrusion detection systems will interpret the legitimate 802.11n transmissions as noise or interference, leading to unnecessary alerts and mitigation requests. Access Points used as sensors will also need to be upgraded to be 802.11n capable.

Should I be installing a wireless network that supports the new draft standard?

An emerging trend in the space is that 802.11 is slowly becoming the preferred technology for network access and the throughput improvements of 802.11n alone will accelerate this trend. Whilst there is the potential for 802.11n networks to replace Ethernet wired networks, we don't believe that this is going to happen today, rather that the new standard could signal the beginning of the end for wired

networks as a mechanism for end-user network access. Today, Gigabit Ethernet will still offer better latency and better jitter performance than 802.11n.

Equally, we do not necessarily feel that all organisations require wireless networks using the new draft standard. However, mobility leaders, those organisations with a history of buying leading edge and retaining a high tolerance for draft standards, may find the benefits outweigh the challenge and risk of such emerging technology. It all depends on the rate of technology refresh within the organisation, the tolerance for risk and the desire to protect future investment. Regardless of whether you implement a wireless network with the new draft standard or a previous standard (802.11 b/g/a) it is critical to establish a wireless and mobility strategy for your organisation designed to meet the goals and requirements of your business.

What are the drivers for mobility and how will it benefit my organisation?

Before racing off to install new technology that supports the new draft standard, it's advisable to spend some time considering the implications of mobility as a whole and particularly how it could drive and enable your organisation's success:

- Employees are able to obtain secure access to company information and applications regardless of both time and location. This in itself allows more frequent and less restricted communication and collaboration between employees and their associates
- Internet access can be easily provided to visitors, be they contractors or partners, without compromising corporate network security access
- Hospitals can provide an effective means of tracking or locating key staff and equipment with literally lifesaving consequences
- Data connectivity can be provided over large areas of space, say in warehouses.
- Voice connectivity, an area particularly benefited by the new 802.11n standard, can be provided over the network and would reduce the unnecessary phone charges incurred by employees making calls from a cell phone

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- A fundamental benefit is employee productivity. Mr J. Soap can't get into the office because his car has broken down? No problem, the office can come to him
- Customers will benefit from improved employee response times, increased accessibility and their ability to access and retrieve relevant company data regardless of whether they're at their desk or not

These advantages not only facilitate more streamlined business processes and improve workflow, but also allow your organisation to enjoy a competitive business and technological position. The fiscal benefits of wireless networks include a reduction of the cabling infrastructure costs associated with Ethernet wired networks, as well as those incurred by IT configuring and providing support of guest access. Employee travel expenses and, as previously mentioned, employee cellular and roaming charges can be significantly reduced.

Mobility facts and figures

2007 has seen more laptops than desktops in the enterprise, and an increasingly mobile workforce now has expectations of accessibility to data and business applications. The proliferation of mobile devices is widespread; 200 million 802.11 chipsets were sold in 2006 and it's now mainstream to have said chip embedded in the newer laptops. Today, there are a staggering three billion mobile phone users worldwide and by 2009 the Wireless LAN phone market is estimated to be worth \$4 billion.

In the context of such increased mobility worldwide, it's not hard to acknowledge certain fundamental advantages of 'on the go' access when examining responsiveness between co-workers, partners and customers.

Create a mobility and wireless roadmap for your organisation

Your wireless and mobility roadmap will be dictated by the business requirements related to your organisation's strategic initiatives and objectives. What should you consider when putting together this roadmap? It is critical to understand your wireless coverage requirements for data services. Your capacity requirements must be understood; where are your employees located and how are they organised? Any environmental or technical factors that have an effect on, or impact, your wireless or radio frequency and spectrum must be analysed, and any issues identified and mitigated before deploying a wireless network.

A Radio Frequency (RF) assessment can accomplish all of the above and much more. It is a critical step in any wireless and mobility roadmap as it maximises cost reduction and productivity benefits of wireless network technology. By identifying optimal access and placement of wireless devices and components, the wireless architecture to be designed will ensure the most effective and most secure implementation. If Voice services are a part of your roadmap make sure your telephony infrastructure is migrated to IP. Voice readiness assessments will identify whether your quality of service (QoS), network latency and jitter are at acceptable levels. Whilst the 802.11n standard provides improvements in reliability and predictability of coverage, analysis is still a necessary starting point.

There are four elements of a mobility strategy that you should consider on a more tactical level

Consider your mobility platform

Firstly the platform for your client devices and network infrastructure should be addressed. This can include standard operating systems and application platform support requirements from your IT organisation.

Define your connectivity protocols

Next, the connectivity protocols you will need should be defined. 'Wireless' consists of many types of technologies from 802.11 to GPRS, 3G to 802.16 (Wimax). How all these varieties of wireless mechanisms will, or won't, be incorporated into your strategy should be outlined.

Determine your security strategy

Thirdly, security is an extremely critical component to any mobility roadmap. In addition to perimeter security, there is security of devices, identity management and access to sensitive data over the network.

Plan your mobility applications

The fourth element is applications. These range from application servers and portal software to database systems and business specific applications. Your choices here will be driven by specific business requirements which may or may not be a pre-requisite to benefiting from wireless and mobility for your organisation.

A final component of your roadmap should address the management of your Wireless LAN and mobility services and applications. Whether your network runs on 802.11n or another standard, the ability, through both personnel and technology, to support, troubleshoot, monitor and manage all aspects of your wireless infrastructure is critical to the wireless network's continued success in meeting your organisation's goals and objectives, and will ensure future growth and evolution of said network in a more seamless manner. Improvement and innovation must always be considered in any wireless and mobility roadmap or strategy.

Look at the bigger picture and assess how mobility would support your organisation's goals. Consider the services, devices and applications that would benefit your mobile staff, your clients and your business as a whole. Think about the technical and logistical context of your wireless and mobility ambitions and finally strategise and devise a mobile roadmap that best meets your organisation's strategic initiatives and objectives. Mobility is movement, and more importantly, movement forward. Ensure you're not left behind.

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