

# WLAN Deployment Trends

## *Networks, Devices, Security*

### Introduction and Summary

This report, the second in a series, discusses enterprise deployment trends pertaining to Wi-Fi networks, devices and security. The trends reflect partial results of the fifth annual wireless LAN (WLAN) survey conducted by the Webtorials Editorial/Analyst Division. Responses were gathered in August 2008 from several hundred members of the Webtorials subscriber base who said they currently played a role in their organizations' WLAN implementations.

The results showed that WLANs of some flavor have been deployed throughout the common areas of many respondents' organizations (83%). Like last year, fewer companies (55%) have covered individual workspaces with Wi-Fi infrastructure. Virtually all respondents said that some number of their employees carried at least one Wi-Fi-enabled device; in fact, 47% of respondents said that at least half of their organization's employee population had one or more Wi-Fi devices, up from just 34% last year.

Among the other noteworthy developments:

- Next-generation 802.11n products, though still in pre-standard form, are gaining respect as enterprise requirements grow and the IEEE standards ratification process continues to languish.
- WLAN deployments currently outpace broadband/3G cellular adoption and, according to user plans, will continue to do so.
- Data-only client devices such as laptops remain far and away the most largely deployed Wi-Fi access devices. However, dual-mode smartphones are poised for growth and will outpace deployment of single-mode Wi-Fi voice handsets by nearly two times.
- Centralized management of Wi-Fi networks has grown dominant, though some pockets of independent, individually managed wireless access points (APs) remain active and mesh is attracting new interest.
- Security remains enterprises' biggest concern when scaling their Wi-Fi deployments, even though organizations are growing sophisticated in their own security measures and don't seem to fear noncompliance with governance mandates.

The remainder of this report examines each of these trends in more detail. This is the second document in the 2008 Wireless LAN Series, with other publications including additional documents, demographics, and background information available at <http://webtorials.com/abstracts/2008-WLAN.htm>.

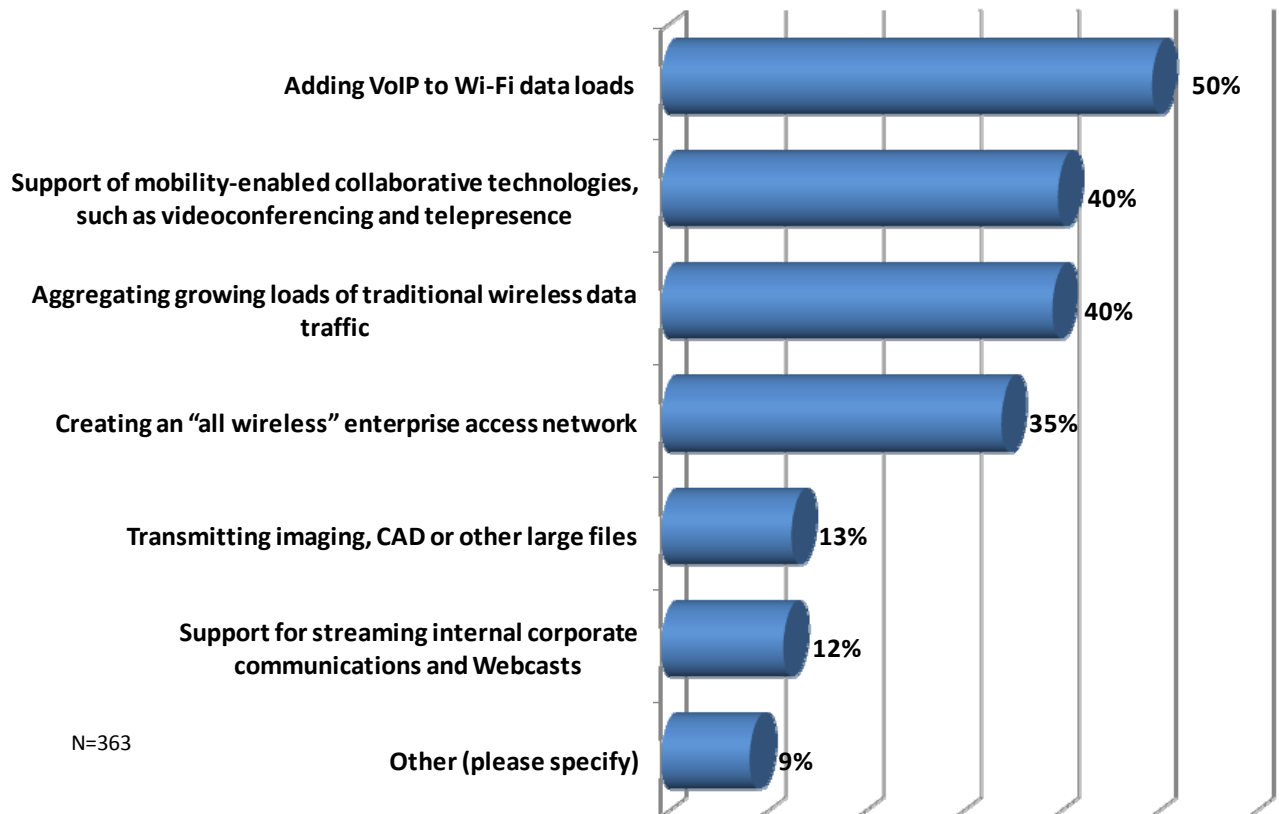
## Pre-Standard 802.11n Gains Respect

Pre-standard, or “Draft N,” 802.11n networks are being more largely embraced in their current form than they were last year. More than a third of respondents (38%) now say they intend to deploy 802.11n ahead of standards ratification in some form, compared to 17% in 2007.

Last year, the number of respondents currently needing the bandwidth afforded by 802.11n (100Mbps+ throughput) and planning to deploy it ahead of formal standards ratification was just 1%. That figure jumped to 16% this year. Similarly, in 2007, 15% of respondents said they would tinker with Draft N deployments in controlled pilots or in limited areas of the company. That percentage grew to 22% in 2008.

The reasons for the attitude shift? The standards process continues to experience delays while data loads in general continue to grow, as do enterprise plans for adding VoIP traffic to their wireless networks (Figure 1).

**Figure 1. Most Important 802.11n Applications**



*Increasing volumes of traditional data traffic and adding VoIP to the mix will drive 802.11n deployments, but plans for new applications and going “all wireless” also add fuel to the business justification.*

The figure also shows that support for collaborative applications such as videoconferencing and telepresence are making strong contributions toward driving 11n deployments (40%). So is enterprise anticipation of eventually using 802.11n to create an all-wireless enterprise access network (35%), though 61% had no plans to build an all-wireless network right away.

Despite the 11n excitement, a limited volume of 802.11n has actually been deployed. Nearly two thirds of respondents (62%) said none of their users currently use 11n and just 22% said that between 1% and 10% of their users were 11n-enabled.

But the formal IEEE standards process delays with the 802.11n standard are forcing enterprises to consider products not strictly defined as standard but that the Wi-Fi Alliance industry consortium has certified as interoperable. As of late September 2008, the Alliance had Wi-Fi-certified 415 products, both consumer and enterprise class, as interoperable based on the 802.11n Draft 2.0 set of specifications, adding a margin of comfort as to the utility and investment protection of early products. The Alliance began Draft N certification in June 2007, shortly after last year's Webtorials WLAN State-of-the-Market survey was completed. According to the official IEEE 802.11 working group project timelines as of late September 2008, the IEEE 802.11 Working Group approval for 802.11n is expected in January 2010<sup>1</sup>.

## Network Preferences

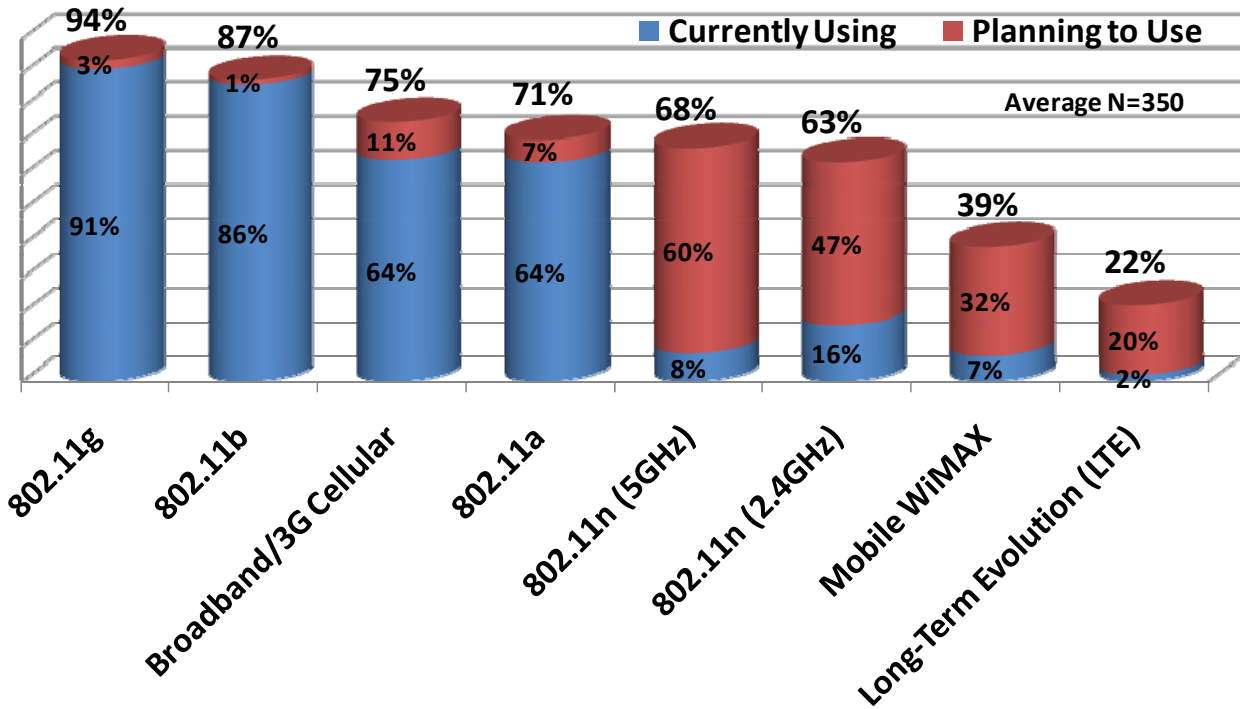
Most enterprises surveyed (91%) were using 802.11g, the 2.4GHz, 54Mbps standard WLAN that is backward compatible with 11Mbps 802.11b networks. 802.11b was in use by 86% of respondents. Use of the 5GHz frequency band, however, is rising. This year, 64% of respondents reported having 802.11a networks in use, up from 48% last year. 802.11a and cellular data network usage has been about even: Last year, 45% said they were using traditional cellular data networks, a percentage that also grew to 64% this year.

Going forward, however, plans change. Enterprises intend to largely halt deploying 802.11a/b/g networks and begin using 802.11n in the 5GHz range (60%), which affords more channels for network design flexibility and is currently less crowded, as well as in the 2.4GHz range (47%). These numbers dwarf traditional mobile WAN use (**Figure 2**), though nearly a third (32%) plan to use newer mobile WiMAX services. Another 20% expressed plans to use Long-Term Evolution (LTE), a nascent platform not yet commercialized that will move today's CDMA-based networks to GSM-based broadband technology, which is standard around the world.

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<sup>1</sup> Official IEEE 802.11 Working Group Project Timelines can be found at [http://grouper.ieee.org/groups/802/11/Reports/802.11\\_Timelines.htm](http://grouper.ieee.org/groups/802/11/Reports/802.11_Timelines.htm)

Figure 2. Which Wireless Networks?



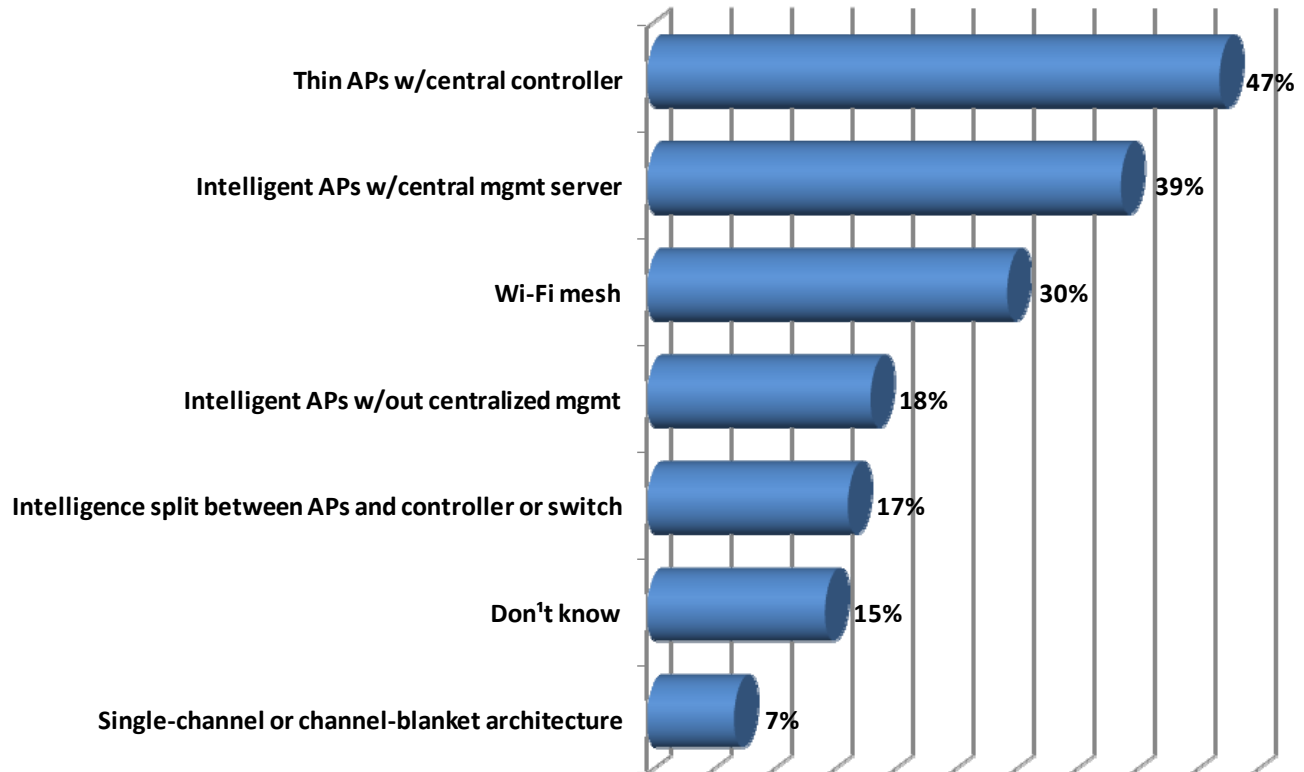
Dominant networks in use today are 802.11g and 802.11b networks, though enterprises plan to move to 802.11n, particularly in the less cluttered 5GHz band, and to broadband mobile WAN services as they become available.

## Management and Architectural Attitudes

About the same percentage of respondents continue to migrate to thin APs with a centralized controller architecture as last year (47% are using or planning to use). A healthy number are also going the route of controller-less intelligent APs albeit with a centralized management and security provisioning system (39%). Standalone intelligent APs that are individually managed, rather than centrally managed, continue to persevere in 18% of respondents' organizations, down from 27% last year.

Fewer respondents than last year indicated an intention to move to newer "split" or "hybrid" architectures that move some latency-sensitive capabilities out of the controller to the AP or Ethernet switch (17% in 2008 compared with 23% in 2007). Meanwhile, respondents have grown more interested in mesh networking; 30% indicated current or planned use of Wi-Fi mesh this year compared with 23% last year (Figure 3).

Figure 3. Wi-Fi Architectures



*Respondents specified the WLAN architectures they are currently using or plan to use in the next 6 months.*

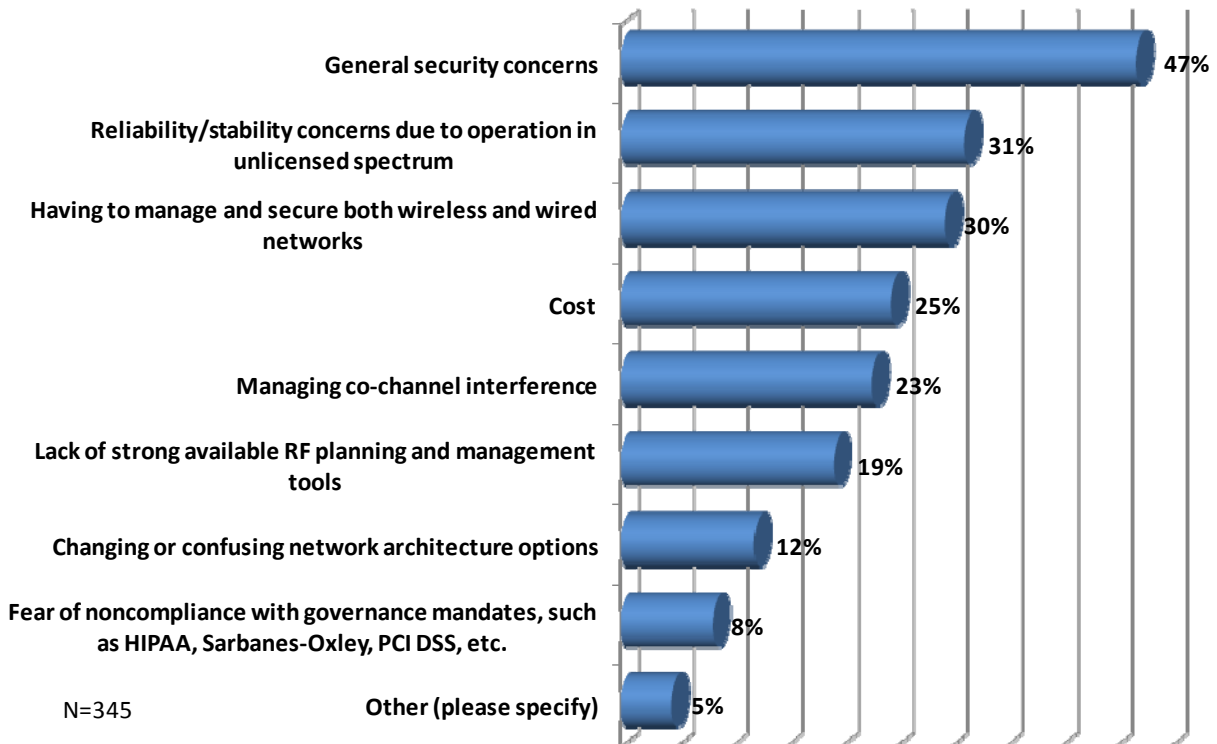
The increased interest in mesh is likely being fueled by a couple of factors. For one, most of the Draft 802.11n products that have hit the market support mesh transmission, whereby APs communicate over the air to one another directly, as in a wired router network, without each AP having to be cabled back to a LAN switch. Combining 802.11n speeds with mesh creates an effective backhaul technology for lower-speed WLAN access networks and contributes to enterprises' stated intentions to strive toward all-wireless networking by "uncabbling" a significant portion of the enterprise network.

## Nagging Security Challenges

Webtorials WLAN survey respondents consistently have cited security concerns relating to several aspects of Wi-Fi deployment, despite both industry and enterprise implementation progress with the latest security mechanisms. For example, 47% of respondents cited “general security concerns” as the one of the two biggest challenges to scaling Wi-Fi deployments throughout most or all of their organizations. In a fairly distant second place were reliability and stability concerns related to Wi-Fi’s operation in unlicensed spectrum (31%).

Still, a mere 8% cited fear of noncompliance with governance mandates such as HIPAA, SOX, PCI DSS and others as a challenge to scaling their Wi-Fi deployments, which are security related (**Figure 4**).

**Figure 4. Scalability Challenges**



*General concerns about RF security and management accounted for the lion’s share of perceived challenges to scaling Wi-Fi deployments enterprise-wide.*

And the sophistication of enterprise deployment of the many layers of security required is growing rapidly. This year, a very respectable 47% of respondents said they had deployed WPA2/802.11i, the tightest form of WLAN authentication security, compared to 41% last year. Use of wireless VLANs, IPsec or SSL VPNs over their WLANs, and wireless intrusion detection/prevention systems either from a third party or their primary WLAN supplier stayed about the same as last year, each falling between a respectable 36% and 40%.

### Conclusion

From an infrastructure perspective, 802.11g and b networks have become pervasive, at work in nearly all the respondents' organizations. Forward-thinking enterprises are now looking more closely at pre-standard 802.11n networks, in part because their bandwidth and coverage needs are rising while ratification dates for the standard keep getting delayed.

VoIP promises to play a large role in Wi-Fi growth: Webtorials members cite VoIP as one of the key drivers of their need for 802.11n bandwidth, yet deployments have been somewhat delayed because key standards that contribute to quality of service, 802.11r and 802.11k, have only just been ratified. Use of VoIP-enabled Wi-Fi handsets will likely further pick up next year, once the Wi-Fi Alliance's Voice-Enterprise certification program gets going in mid 2009.

Given that management and security rank high on respondents' list of scalability concerns, it's no wonder that the popularity of centralized Wi-Fi management and security has picked up. Still, old habits die hard, and pockets of standalone, unmanaged APs remain and will likely linger into the foreseeable future.

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