

Wireless Networks Change the Enterprise - again!

Nathan Rowe Senior Manager, Product and Planning, Motorola Solutions

Wireless networking changed the employee experience within enterprises several years ago. As an adjunct to the wired LAN, wireless networking assisted employees by adding connectivity on the fly. From there, a virtuous cycle rapidly evolved the user expectations and the networks themselves. Today, the wireless network is stepping forward as a business-critical system, evolving the very nature of the enterprise. We are only at the beginning of this transformative phase, but its implications hold great potential. To realize this potential, we must strive toward the ideal of a zero outage network.

Many of us can still remember the first staff meeting in which people were actively on the network. Today's common scene was brand new: notebook computers were located around the conference room table and seats next to electrical outlets were prized. Amidst the droning of staff reports, workers answered e-mail and created productivity out of what was previously considered administrative time.

In this early phase, WLAN quickly became a convenience in the enterprise, worthy of a "best effort" class of reliable engineering. However, business-critical undertakings were still reserved for the wired infrastructure.

At the same time, wireless networks started enabling new kinds of high-profile efficiencies in areas where a mobile workforce was important such as logistics or retail. Fundamental business goals like customer service and operational efficiency became associated with the collection and deployment of data. Wireless technologies connected people, places and equipment that coaxial wire could not.

In just the last few short years, virtually every enterprise is hard at work to transform operations and customer experiences by mobilizing data. WLAN is now business-critical in all kinds of enterprises.

Consider just a few examples:

- *Factories*: RFID sensors built into equipment allow machines to report their status to monitoring systems. Underutilized equipment can be identified and process flow rebalanced on the fly to maximize output and profitability. RFID also allows process managers to monitor inventory as it flows through the factory.
- *Retail*: Sales associates armed with the latest mobile devices are closing sales on the floor via wireless connections to back-office systems. New innovations are also empowering the consumer to use the store's WiFi network for convenience and to enhance customer service. Mobile data also makes the supply chain more responsive. The multi-channel shopper can buy an item online and pick it up in the brick and mortar store because transactions now flow wirelessly through the retail enterprise.

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- *Telecommunications*: Carriers are expanding from cellular technology to WiFi networks to offer new services to customers. WiFi is offloading cellular networks without compromising customer service or data plan pricing.

WLAN is now changing the very nature of enterprises. But, this massive shift from “convenience” wireless to “business-critical” wireless requires a change in our ideas of network design. When the business fundamentally relies on the network, “best effort” practices are simply not enough. Network outages are not mere inconveniences – they can be crippling events to the enterprise. Avoiding them requires new tools and processes along with a new mindset.

Network troubleshooting is a discipline that has grown up with networking in general and is applied to WLAN installations. But, as the name implies, troubleshooting presumes the presence of “trouble.” It is an after-the-fact remediation when a problem occurs. The zero outage network calls for a new approach: “network assurance.”

If network troubleshooting is about reactions to problems, network assurance is about proactive steps to guarantee the network is stable and providing a quality experience to all users. To implement such an approach, designers need new tools to monitor performance and to view the network as a user experiences it.

Proactive tools make up the real toolkit for network assurance. Network monitoring tools provide constant insights into the performance of the network as well as a historical record of performance. By monitoring anomalies or changes from a baseline in various metrics, small issues can be addressed before they become big issues. Think of it as an early warning system on various points such as:

- Changes in power levels
- Inaccessible Ports
- Coverage holes
- Noise sources
- Configuration changes
- Security Breaches & Vulnerabilities
- Troubled clients
- Critical Networking Infrastructure Outages (DHCP, DNS)
- Saturated channels

Additionally, performance monitoring is improved if it supports taking a detailed forensic view of the network. A best-in-class approach to monitoring operates in real

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time, but it also functions as a historical record. Network states can be rewound to see how issues affected the network or where a problem originated. This goes well beyond troubleshooting. Like a forensic scientist on a TV crime drama, network administrators can examine network anomalies to determine root causes and uncover vulnerabilities that can be addressed proactively.

The best proactive network assurance tools also test the network from the perspective of users on the network. By simulating clients, network administrators can gauge the quality of the user experience. Simulated clients provide the insights needed to see what network users' experience. This is especially useful in business-critical situations where customers are using the wireless network. Network assurance tools make it possible to resolve a problem before the first user experiences it.

In today's environments, the network clients might well be machines talking to other machines. Issues in those transactions can be much more subtle and harder to detect than bad human experiences. A proactive testing regimen can detect small deviations from baselines and alert network administrators to anomalies in machine-to-machine communication on the network. Proactive testing is the most robust form of network assurance.

The enterprise has evolved since the early days when wireless networking was a convenience item. While some enterprises pioneered a wireless business model, virtually all enterprises are evolving rapidly today because of wireless networks. Our approach to the networks themselves must evolve as well. Enterprises should set the goal of a zero outage network. Network assurance is a model for reaching boldly toward that ideal.

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