



The next logical evolution in WLAN architecture

THE VX 9000:

**THE WORLD'S FIRST SCALABLE, VIRTUALIZED
WLAN CONTROLLER BRINGS A NEW LEVEL
OF SCALABILITY, COST-EFFICIENCY AND
RELIABILITY TO THE WLAN**

Background:

THE EVOLUTION OF THE WLAN — AND THE ROLE OF VIRTUALIZATION

Zebra has been the driving force behind the creation and evolution of the wireless LAN (WLAN), from its inception through today's third generation architecture. As the many benefits of the WLAN became evident, businesses added more users and more wireless applications. In addition, applications became more sophisticated, evolving from data applications to voice and streaming video. The result was a substantial increase in traffic volume, which in turn pressured the various generations of WLAN architecture — impacting network performance and reliability. And every time, Zebra responded with a new architecture that addressed the issue.

THE FIRST GENERATION WLAN: THE BEGINNING

As the inventor of the first generation WLAN, Zebra is attributed with the virtual birth of the WLAN. In the first generation WLAN, individually managed independent access points that contained all the intelligence required to route Wi-Fi traffic were replicated throughout the enterprise. As a result, the high cost of duplicating this intelligence and hands-on management prevented many organizations from deploying a WLAN.

SECOND GENERATION WLAN: REDUCING COST WITH A CENTRALIZED APPROACH:

As the benefits of WLANs became evident, businesses were ready to embrace the technology for its ability to boost worker productivity, efficiency and customer service levels — but to enable pervasive adoption, the cost would need to come down. To address this issue, Zebra created the second generation of WLAN architecture — the birth of the centralized WLAN.

Now, instead of the high cost of replicating technology throughout the enterprise, a hub-and-spoke architecture allowed a centralized controller to distribute intelligence to “thin” low cost access points, and all traffic was routed from the “thin” access points to the controller, which selected the best pathway for each transmission. In addition, the access points could be managed remotely from a single centralized location. The result? A dramatic reduction in capital and operational costs, making the WLAN affordable for more businesses.

But while this architecture worked well for 802.11a/b/g, when 802.11n and 802.11ac appeared on the horizon, the major increase in bandwidth and traffic created an issue: since all transmissions were required to pass through the controller, the controller became a major bottleneck, eroding network performance. In addition, since all traffic passed through the controller, security could not be enforced at the network edge — packets containing viruses and attacks entered the network and travelled to the controller deep inside the network before the threats could be identified and eliminated, increasing the risk of security breaches and network downtime.

THE THIRD GENERATION WLAN: INCREASING CAPACITY, PERFORMANCE AND SECURITY WITH A DISTRIBUTED NETWORK:

To resolve these issues, Zebra married the best of the first and second generation WLAN architectures to create the third and current WLAN architecture — the distributed WLAN. A server still provides a central point of control for access points — however, all traffic is no longer backhauled to the controller. Instead, all wireless infrastructure — access points and controllers — is network aware and armed with the network-wide visibility required to work together to dynamically select the fastest and most efficient path for every transmission. The network bottlenecks that became prevalent in the second generation centralized WLAN architecture were eliminated.

In addition, access points now offer the best of both worlds: they can be adopted and centrally managed by a controller, but in the event the connection to the controller is lost, they can still continue to function, providing workers on site with the wireless connectivity they need to get the job done.

Last, third generation architecture delivers true security at the network edge. The access points at the edge of the network have the intelligence and security features to identify and prevent threats from entering your network — instead of stopping them only after they have reached a controller well inside your network. While this powerful third generation architecture is meeting the needs of today's WLANs, it is hardware-based in a world that is rapidly embracing the simplicity and cost-efficiencies of virtualization technology.

Virtualization:

THE NEXT LOGICAL EVOLUTION IN WLAN ARCHITECTURE

With virtualization, physical hardware servers are replaced with a virtual server, allowing one physical server to function as multiple servers. While virtualization is not new, it is rapidly gaining acceptance in the world of WLAN controllers. A 2013 Infonetics survey revealed that more than one third of all respondents anticipate deploying a software-based WLAN controller by 2015, and nearly half of all respondents envision shifting to a cloud-based subscription service for WLAN controller functionality — a service that is easily enabled by a virtual WLAN controller.

WLAN Architecture with the VX 9000 software-based virtual controller

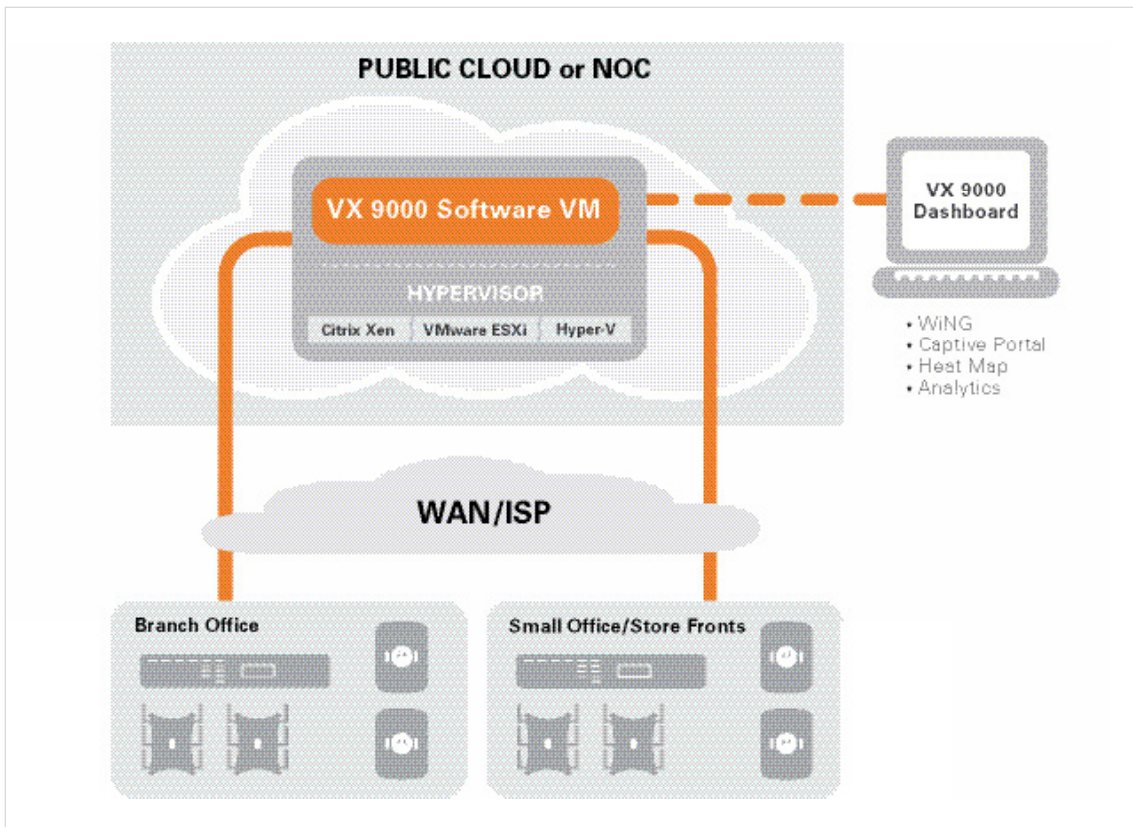


FIGURE 1

Recognizing this new trend and the many benefits that virtualization could bring to the WLAN, Zebra continued its long history as a leader in driving the evolution of WLAN infrastructure by creating the first virtualized, scalable wireless controller — the VX 9000.

Introducing the VX 9000:

THE NEXT EVOLUTION OF THE THIRD GENERATION WLAN — THE WORLD'S FIRST SCALABLE, VIRTUALIZED SOFTWARE BASED WLAN CONTROLLER

Zebra once again leads the way in advancing WLAN architecture by marrying the latest trend in server technology (virtualization) with its third generation WLAN controller. Completely hardware independent, the VX 9000 supports all the leading, commercially available Hypervisors and can be installed on any server. The unique benefits of virtualization bring compelling benefits to the WLAN, allowing enterprises to deploy a high-performance, high availability WLAN faster, easier and more cost-effectively than ever before.

THE VX 9000: BRINGING ALL THE BENEFITS OF VIRTUALIZATION TO THE WLAN

The VX 9000 makes it possible for any size enterprise to cost-effectively deploy a true enterprise-class WLAN — regardless of whether your business has a handful of employees or hundreds of thousand of employees all around the world.

Regardless of the size of your business or your industry, with the VX 9000 you can count on:

Deployment flexibility

The virtualization of the WLAN takes deployment flexibility to a new level, offering enterprises three choices that fit different budgets and existing networking strategies:

- **The private network data center.** Large IT organizations that may be utilizing 10 to 15 or more hardware WLAN controllers can now deploy virtual instances of those WLAN controllers on a single server.
- **The hosted server.** Smaller businesses that do not have a data center or strong IT support can simply lease a server in the cloud for a monthly fee. There is no server to purchase and manage — the server is managed for you. You simply install the VX 9000 on the leased server and you're ready to go — and since you manage the VX 9000, you're in complete control of your WLAN.
- **Wi-Fi as a Service.** Zebra partners can utilize the VX 9000 to offer customers a completely new WLAN model — a monthly service fee for a completely managed WLAN. There is no server to purchase or manage. Instead, this low cost model allows you to simply pay-as-you-go for a low monthly fee — ideal for small businesses that do not have IT support.

Management simplicity — and increased IT staff productivity

Built-in hierarchical management allows you to automatically discover and deploy access points and branch-level controllers, creating a truly plug-and-play WLAN. And server consolidation allows an IT worker to manage more servers. The result? IT management time requirements are greatly reduced, allowing you to either reduce IT staff or re-deploy IT staff to more crucial projects.

Better and more flexible disaster recovery

The VX 9000 supports live migration — in the event that the host server fails, the VX 9000 will automatically move to a different server, eliminating WLAN downtime and any associated impact on user productivity.

In addition, the three modes of deployment discussed above can be used in any combination for very cost-efficient and highly effective redundancy, without the

typical high cost associated with the purchase of multiple servers. For example, a large enterprise with the VX 9000 installed on a server in the data center might choose a hosted server in the cloud for redundancy, ensuring seamless connectivity even if there is an epic failure in the main data center due to a natural disaster. Alternatively, a small or mid-size organization might choose to lease a server in a server farm to offload server management yet still maintain direct hands-on WLAN management, with cost-effective “Wi-Fi as a Service” as a failsafe.

Reduced IT capital costs

Instead of purchasing a wireless controller that may have more capacity and features than you need today, the highly scalable VX 9000 provides the same enterprise-class feature set in our NOC wireless controllers, but allows you to pay-as-you-grow, with a single instance supporting up to 25,000 access points. In addition, large distributed enterprises can replace multiple hardware controllers with a single server running multiple instances of the VX 9000, reducing the number of appliances and networking hardware costs.

Reduced IT operational costs

Operational costs are substantially reduced:

- There is less hardware to manage, reducing IT management time requirements. IT is now free to focus on more strategic business initiatives.
- There is less hardware to power, reducing the monthly energy bill and enabling a very “green” wireless network initiative.

- There is less space required in the IT cabinet, reducing overhead and freeing valuable office space for other more crucial business initiatives.

Infinite cost-effective scalability and management simplicity

Perhaps one of the most powerful benefits of the virtualized VX 9000 is its infinite scalability. Coupled with the lack of hardware requirements and flexible deployment models, the VX 9000 brings a new level of cost efficiency to any size WLAN — from the smallest of Wi-Fi networks to the largest network with offices all around the world. For example, a very large global retailer can replace multiple networks in different regions (such as the East, South, North and West) with a single network that has a single centralized point of management and a single failover back-up plan, greatly simplifying WLAN network management. And cellular service providers who are blanketing cities with hot spots to reduce costs and improve services can simplify and centralize hot spot management by deploying multiple instances of the VX 9000 on one server.

Maintenance flexibility

When a server is due for maintenance, the VX 9000 can be easily moved to another server in a matter of seconds, ensuring timely maintenance without any disruption in wireless services.

Take cost-efficiency, management simplicity, network availability and scalability to the next level in your WLAN with the VX 9000 — the world’s first scalable, virtualized WLAN controller.

For more information, please visit www.zebra.com/wlan or locate your local Zebra representative in our global contacts directory at www.zebra.com/contact

TECHNICAL BRIEF

VIRTUALIZATION: VX 9000

1. Wireless LAN Strategies and Vendor Leadership: North American Enterprise Survey; October 22, 2013; Infonetics Research; Page 13.

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