White Paper

Virtualized Architecture Enables Choice, Efficiency, and Agility for Enterprise Mobility

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Introduction

Mobility, server virtualization, and cloud computing are major initiatives for IT departments across industries. Companies are applying these services and technologies to empower an agile and competitive workforce. These technologies engender a more dynamic IT infrastructure that achieves new cost efficiencies and enables IT staff to respond quickly to rapidly changing business needs and priorities.

Organizations are virtualizing datacenters to pool computing resources, reduce costs, accommodate business growth, simplify management, and create a more agile infrastructure. Virtualization allows enterprises to leverage shared computing infrastructure and scale business applications in response to changes in demand. In this way, IT managers can optimize their resource allocation and utilization and adapt to changes in network demand.

The many benefits of an agile and scalable infrastructure have led enterprise customers to actively embrace server virtualization. This trend will continue to grow exponentially as evidenced by Gartner’s 2011 Magic Quadrant for x86 Server Virtualization Infrastructure:

“As of mid-2011, at least 40% of x86 architecture workloads have been virtualized on servers; furthermore, the installed base is expected to grow five-fold from 2010 through 2015 [as both the number of workloads in the marketplace grow and as penetration grows to more than 75%].”

To allow customers to capitalize on the benefits of virtualization and cloud computing, Meru is introducing new virtual appliances to complement its portfolio of wireless LAN controllers and services appliances. Customers will have the flexibility of being able to deploy single-function, high-capacity appliances in high-density environments and virtualized products in low- to medium-density locations. This hybrid architecture allows customers to benefit from the high performance of Meru’s purpose-built controllers and appliances and the operational efficiencies and agility of Meru’s virtualized offerings.

Virtualization – Increased Choice, Operational Efficiency, and Network Flexibility

Traditional network designs required the customer to purchase and deploy single-purpose hardware with bundled software. There was little, if any, flexibility with regard to software portability or choice of hardware. Enterprise wireless LANs have been built around distributed access points connected to WLAN controllers—single-purpose hardware appliances with bundled wireless LAN management and security software. Additional network services such as routing and WAN optimization are typically on-premises and often require additional dedicated hardware. Although these solutions are positioned as “purpose-built” by their vendors, they do not effectively leverage datacenter virtualization and do not benefit from the flexibility and efficiencies of virtualized infrastructure.

Meru Networks is leveraging the power of datacenter virtualization to improve operational efficiency, reduce equipment costs, and enhance service reliability across the wireless enterprise network.
**Virtualized Wireless LAN Infrastructure**
Meru is introducing virtual wireless controllers to complement its line of hardware-based wireless controllers. The virtual wireless controllers are VMware-based virtual appliances that operate on x86 computing platforms in a VMware environment. A virtual controller can operate alongside other enterprise applications on the same physical x86 platform, allowing customers to benefit from consolidation within the datacenter.

Meru’s virtual controllers can be loaded onto stackable 1U rack servers or, if more scalability is required, modular blade servers. Blade servers enable customers to build scalable virtual chassis in which the server blades operate as independent virtual controller modules, achieving scale and performance comparable to that of purpose-built chassis solutions.

**Virtualized Application Services**
Meru is also virtualizing its E(z)RF™ suite of service assurance applications (E(z)RF VE) and its Identity Manager suite of policy-based network access applications (Identity Manager VE).

1. **E(z)RF Network Manager** – A comprehensive network management system for Meru’s 802.11 wireless networks. It supports AP and controller configuration and upgrades, user profiles, per-user firewall and security policies, quality of service, endpoint events, network replay, RF visualization, wireless performance dashboards, and fault management for enterprise wireless LANs.

2. **E(z)RF Spectrum Manager** – A comprehensive spectrum analysis solution that analyzes information from RF sensors to classify and identify sources of RF interference. Data is presented using easy-to-read graphical dashboards and is logged for replay and historical reporting.

3. **E(z)RF Service Assurance Manager** – Instead of passively monitoring the network, Service Assurance Manager creates virtual clients on existing access points that actively inject traffic over the air, using application profiles that match the requirements of real network services. Analysis of profile traffic details can characterize network behaviors and report on them before they become problems.

4. **Identity Manager Guest Manager** – Provides identity-based guest management using authenticated sponsor portals to facilitate guest provisioning and eliminate IT involvement.

5. **Identity Manager Smart Connect** – Automates 802.1X device configuration, applying device- and identity-based policy for wired and wireless clients.

E(z)RF VE (virtual edition) supports Network Manager, Spectrum Manager, and Service Assurance Manager in a single virtual appliance with each application licensed separately. Identity Manager VE supports Guest Manager and Smart Connect in the same manner.

These virtual appliances can operate either on-premises in an enterprise datacenter or off-premises, leveraging cloud-based offerings from commercial cloud operators such as Amazon Web Services (AWS), Verizon’s Terremark, and Rackspace. Meru’s virtual appliances may be installed on off-the-shelf computing platforms and share the common hardware resources with other virtualized enterprise applications.
Cloud-based Subscription Services to Broaden Services Architecture

Meru also plans to offer the E(z)RF application services as a suite of subscription-based, cloud-hosted private application services. Customers will be able to subscribe to the E(z)RF cloud service to manage their wireless LAN infrastructure across all locations. Similarly, Meru plans to offer Identity Manager as a subscription-based, cloud-hosted private application service. Customers will be able to subscribe to the Identity Manager cloud service for device- and user-based network authentication and policy control for wired and wireless endpoints in multi-vendor networks.

These cloud services will be deployed as private (i.e., single-tenant) application services by Meru and its partners. They will provide enterprise customers with an attractive, cost-effective option for supporting their mobility management needs. Identity Manager and E(z)RF cloud services effectively deliver outsourced applications to the customer, eliminating the customer’s need to manage the underlying infrastructure or the costs associated with deploying and administering the applications themselves (field upgrades, monitoring application performance, maintenance). These services will leverage the reliability, security, and ubiquity of the cloud infrastructure to provide enterprise-class network and device management across all enterprise locations.

Benefits of Virtualized and Cloud-based Mobility Solutions

Meru’s breadth of hardware, virtual appliances, and planned cloud services provide enterprises with a flexible solution for enterprise mobility.

Meru’s virtual controllers and virtual appliances allow customers to lower deployment costs by enabling a more cost-effective datacenter design. The virtualized solution allows the IT manager to reuse existing servers, consolidate applications onto common platforms, and take advantage of the cost-effectiveness of off-the-shelf x86 systems. Costs associated with dedicated, single-function hardware are eliminated.

Large enterprise customers may choose to deploy the entire solution—virtual controllers, E(z)RF VE, and Identity Manager VE—on-premises within their virtualized datacenter. Mid-size enterprises with multiple branches may implement the virtual controllers as applications on their network servers and deploy E(z)RF VE and Identity Manager VE in the cloud, using infrastructure as a service (IaaS) cloud services.

The emerging architecture is based on a solution that decouples mobility networking intelligence and services from the network’s underlying switches and appliances. As described above, this model provides much greater flexibility and choice, allowing IT managers to implement best-of-breed solutions and achieve new levels of cost and operational efficiencies. In the virtualized architecture, the performance, scale, and flexibility of the enterprise wireless LAN ride the rapid evolutionary advancements in datacenter computing power and are not constrained by the more slowly evolving wired switching platforms.

Certified for the Virtualized Datacenter

As a VMware Technology Alliance Partner, Meru Networks will have its virtual appliance products certified as VMware Ready. VMware Ready solutions interoperate seamlessly with a VMware-based virtual infrastructure and meet VMware integration and interoperability standards.
Conclusion

The rapidly growing number of mobile users and devices and the increasing importance of wireless in the enterprise are causing IT managers to rethink how best to support their companies’ mobility initiatives. Virtualized datacenters and cloud services are providing attractive tools for enterprises to use in their wireless network designs. Wireless networks based on legacy switches and single-function appliances do not provide the flexibility or achieve the cost and operational efficiencies that IT managers are seeking.

Enterprise organizations are looking for solutions that reduce costs, simplify and facilitate wireless deployment and management, and leverage a common set of tools and services. Meru’s virtual controllers, virtual appliances, and cloud services [planned] provide such a solution. Customers can deploy hybrid wireless networks that blend the benefits of virtualized, cloud services, and appliance-based network design. By offering this flexibility, Meru allows customers to select the best way to address their mobility needs using a mix of hardware, virtual appliances, and cloud-based subscription services.

Meru’s virtualized hybrid architecture enables IT managers to build a best-of-breed network that applies virtualization and cloud services to simplify network deployment, ease network operations, reduce equipment and operating costs, and deliver reliable, managed mobility services throughout the enterprise.