White Paper |

The Aruba Mobile Virtual Enterprise

The Next-Generation Network Access Architecture for the Post-Laptop Era

February 2011

ARUBA® networks

Executive Summary

2011 marks the beginning of the post-laptop era. Mobile devices – whether or not they were intended for corporate use – are making their way onto enterprise networks by the millions.

Enterprise mobility has come to the mainstream along with many other attributes of the socialized consumer Internet experience: multimedia content, heavy use of rich collaboration technologies and cloud-based applications.

Users are embracing these changes as an integral part of how work gets done. But for IT, the new realities are overwhelming a network budget whose foundation supports a legacy design that dates back to the client-server era:

- Siloed networks that duplicate functions and infrastructure at the access layer.
- Fragmented services at the edge of the network where applications meet users and devices.
- Multiple bolt-on technologies that fail to address the unique needs of user mobility.

As long as enterprises remain entangled in this legacy access infrastructure, IT will be forced to respond to users by saying no – to mobility, to mobile devices, and to accessing business-critical applications.

Aruba Networks® changes all this with the Mobile Virtual Enterprise (MOVE) architecture.

Aruba MOVE™ unifies disparate wired, wireless and remote access methods into one cohesive access solution – for traveling business professionals, remote office workers, corporate headquarters employees and guests. Access privileges are context aware, i.e. based on user, device, application and location, and this dictates the type of network resources each person is entitled to.

Consequently, the entire mobile enterprise workforce has consistent, secure access to the appropriate network resources based on who they are – no matter where they are, what device they're using or how they're connected.

Because MOVE securely unifies disparate networks and eliminates redundant services, it drives the capital and operational cost savings that free up budget so that IT can say yes to mobility, the influx of mobile devices, access to applications and other new business initiatives.

MOVE consists of a centralized set of network services that are managed in the data center, such as identity management and role-based policy enforcement. It also includes affordable access on-ramps – wireless, wired and VPN connectivity, for example – that utilize these services across all locations and access methods.

Collectively, these services and on-ramps deliver:

- An integrated access architecture costing up to 70% less than legacy network approaches
- Simpler access from remote locations.
- Faster campus additions, moves and changes.
- Stronger security.
- Lower end-user support costs and higher satisfaction.

The Mobile Enterprise has Arrived

Since Apple unveiled the iPad in 2010, it has sold almost 15 million units.[1] By 2012, eMarketer forecasts that nearly 41 million Americans will have a tablet device.[2] Combined, Apple and Research In Motion (RIM) sold more than 26 million smartphones in the third quarter of 2010.[3] IDC predicts that 330 million smartphones and over 42 million media tablets will be sold in 2011.[4]

Regardless of whether these mobile devices were intended for corporate use, they are making their way onto enterprise networks by the millions and are rapidly becoming an integral part of how work gets done across all types of organizations.

> IDC expects shipments of application-capable,non-PC mobile devices, such as smartphones and tables, to outnumber PC shipments within the next 18 months.
>
> *IDC news release, December 2010*

Tablets, smartphones, and other mobile devices are advancing the trend that laptops started: users' lives no longer revolve around an office or cubicle. 90 percent of users now work outside of the enterprise's headquarters office – increasingly in virtual office environments. Instead of working on a single desktop client, they have multiple personal computers and mobile devices, some of which are owned by users themselves rather than the organization for which they work.

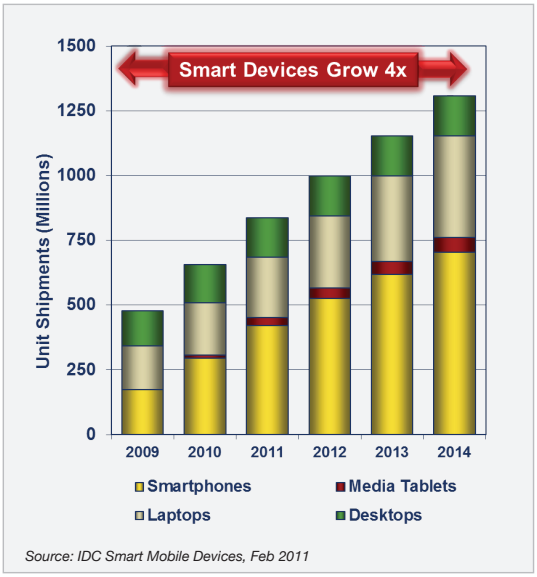

Figure 1: Rapid Growth of Mobile Devices.

Evolving Enterprise Applications Change the Face of the Enterprise Network

Mobile users and mobile devices are not the only agents of change in enterprise networks. Applications are changing as well.

The continuous upsurge in multimedia traffic – including audio, streaming live content, and high-definition video on-demand – has inspired enterprise users to demand the same rich, interactive media experience they get from Facebook and YouTube.

Enterprise users are also employing collaborative and social applications that offer increased context awareness – smartphone apps that let you chat with an expert on another continent, virtual whiteboard sessions with remote colleagues and videoconferencing.

The dynamic social networking experience that originated on the consumer Internet has unleashed a massive wave of business-critical apps across the enterprise. The volume and diversity of these applications has compelled IT to prioritize different types of traffic to optimize quality of service (QoS) while usage continues is rapid ascent.

Finally, applications no longer reside on users' desktops; they run in the cloud from data centers hundreds or even thousands of miles away. While this change has significantly reduced the resources required to support end-user desktops and local servers, it has increased the importance of managing QoS across the network.

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[1] *Apple earnings releases.*
[2] *http://www.emarketer.com/Article.aspx?R=1008098*
[3] *Apple earnings release for the fourth quarter of fiscal year 2010, http://www.apple.com/pr/library/2010/10/18results.html*
[4] *"IDC Predicts 2011," IDC, December 2010*
[5] *Gartner press release, 11/10/10, http://www.gartner.com/it/page.jsp?id=1466313*
[6] *Needs citation*

In healthcare, mission-critical biophysical signals are given priority over voice communication, which has precedence over the electronic medical records system, which is given preferential treatment over patient Internet access. In the background, the network is transmitting bulk EKG data and performing other data transfer tasks.

In retail, secure cardholder data environments (CDE) are running alongside inventory system updates and high-definition video surveillance traffic. Now, the vice president of retail field operations wants to arm sales associates with iPads and offer guest wireless LAN (WLAN) access to shoppers. How can IT possibly keep up?

The New Realities have Created a Culture of No

From the users' perspective, the IT mandate is simple: Deliver consistent, reliable, and secure network access from any location, regardless of the mobile devices or applications they are using. But behind the scenes, every new user, mobile device and application adds a great deal of complexity to an already complex infrastructure. And too often, the only way that IT can respond to a request is to say no.

Why has the culture of no arisen? Because most businesses funnel a majority of their IT dollars to support an aging, inflexible and unscalable infrastructure whose design is nearly two decades old.

Yesterday's Network is Woefully Mismatched for Today's Users

Conceived when access was confined to corporate campuses, legacy infrastructure designs are obsessed with devices and nodes in order to protect physical assets within the walls of the enterprise. This approach made sense when the same person connected to the same port and used the same client device and accessed the same applications. But that assumption is no longer true.

Siloed Networks Duplicate Functions

Today's IT organizations support three distinct networks:

- The traditional wired network.
- The rapidly growing WLAN, functioning as an overlay to the wired network.
- VPNs for secure connectivity from branch and home offices.

These networks have separate infra-structures, technologies, management platforms, and security devices. Despite employing different methods to address tasks common to network operations staff and end users, IT remains burdened with ensuring that security, management and performance are consistent across networks.

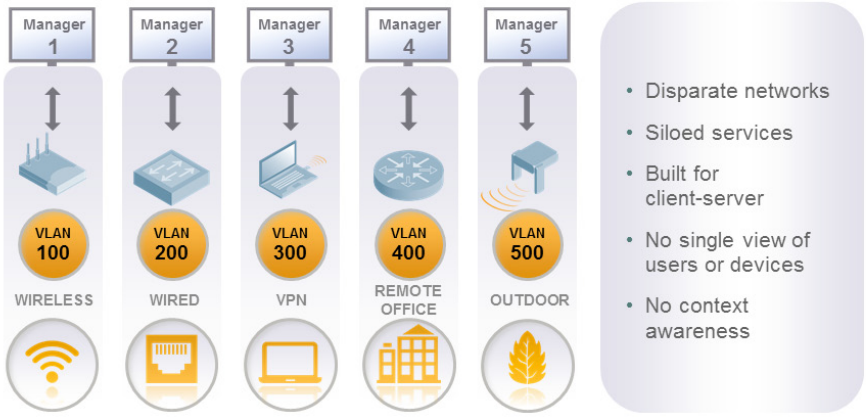

Figure 2: Legacy Siloed Networks

Fragmented Services at the Network Edge

Consider the process of identifying a user and determining if that user should have access to a particular application. How does this process change based on that user's location?

- If the user connects to a port in a conference room, a network access control (NAC) solution and VLAN might control access.
- On the wireless LAN, a separate access control system and VLANs might be required.
- From a home office, a user will require a VPN connection.

Now what happens if a security policy changes? Or a new app comes online? Or an employee with a personal smartphone that's configured to access the WLAN quits?

Most IT organizations use a plethora of different management tools in the data center and interfacing directly with hundreds of devices in individual wiring closets. They must understand the underlying technologies for a multitude of devices and resolve the inevitable interoperability problems that arise.

MOVE: A User-centric, Role-based Access Architecture for the Post-laptop Era

Aruba MOVE offers a way for IT organizations to say yes. It unifies yesterday's disparate networks and services in order to cut costs and reallocate budgets that align with initiatives that matter most to your business.

Aruba knows that the next generation of access networks must focus squarely on users, their devices and their applications – not on infrastructure or ports. Users should have simple, secure network access regardless of where they work or roam, which devices and applications they are using, or how they want to connect.

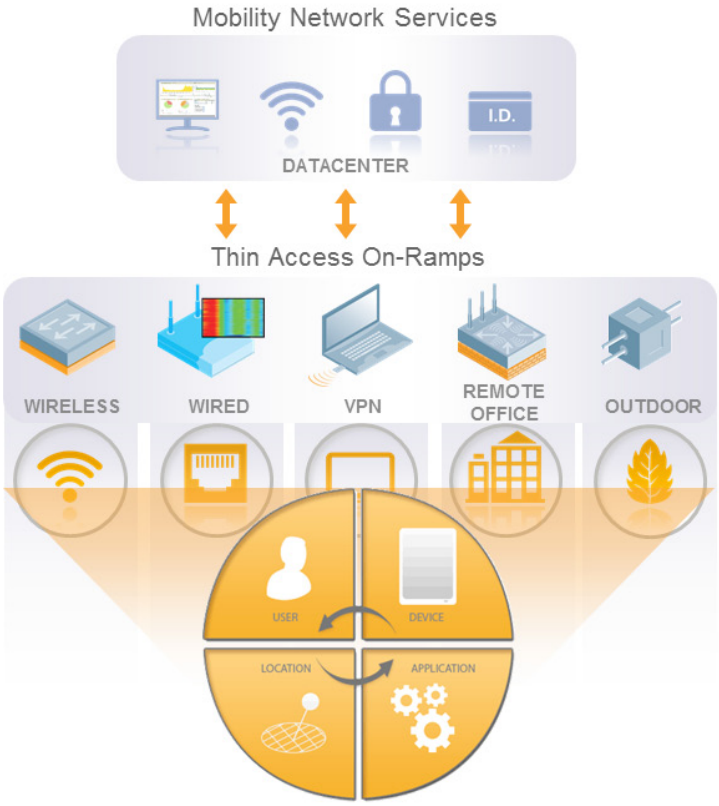

Figure 3: MOVE-Centralized Network Mobility Services

MOVE provides a common set of network services that manage security, policy, and network performance for every user and device on the network, regardless of method of access. These services include:

- Identity management
- Guest access
- Role-based policy enforcement
- Application traffic management
- Content security
- Device and network configuration
- RF and spectrum management
- Compliance

With Aruba MOVE, services are defined once via a centralized Aruba Mobility Controller in the data center. This eliminates the need to keep up with a profusion of wiring closets, firewalls, NAC solutions, management systems and reporting tools that operate in separate domains.

As a result, network operations are consistent across the entire enterprise, regardless of user location, access method, mobile device or applications. Aruba MOVE easily accommodates users with multiple devices, whether enterprise-owned or user-owned.

Why Aruba?

Aruba customer BAA, one of the world's largest commercial airport operators, deployed a single, unified network infrastructure at Heathrow Airport's Terminal 5 to provide public Wi-Fi access for 80,000 people every day, support key staff functions like baggage recomciliation, and run point-of-sale and other applications for airport retailers. "In our view, Aruba had the only architecture that could guarantee the level of security we required," said Kevin Fallon, commercial leader of Terminal 5 systems at BAA.

This user-centric approach to network access makes it easier for IT organizations to accommodate the deluge of smartphones, tablets and other personal mobile devices that employees are bringing to work. Aruba MOVE also eliminates the need to maintain VLAN at the edge and manually configure user additions and changes.

Access From a Wide Range of Network on-Ramps

Aruba MOVE offers a wide range of network on-ramps that leverage a common set of network services to deliver consistent, reliable and secure access to users:

- ***Wireless access points (APs).*** Aruba 802.11n APs support distributed and centralized traffic forwarding modes, while providing best-in-class RF management through Adaptive Radio Management (ARM) technology

  All Aruba APs offer RF management and monitoring capabilities without requiring dedicated modes of operation. For example, the Aruba AP-134 and AP-135 set the standard for Wi-Fi coverage in business environments with extremely high concentrations of mobile devices.
- ***Wired APs.*** Aruba has extended the user-centric, services-based approach of the MOVE architecture to a new class of wired APs. Designed to provide network access in wiring closets, Aruba S3500 Mobility Access Switches connect wired Ethernet devices such as virtual desktops, IP phones, videophones, video surveillance cameras and 802.11 APs.
- ***Remote APs:*** Aruba Remote APs (RAPs) automatically extend corporate enterprise resources to branch and home office networks using site-to-site VPN tunnels to the central data center. Using zero-touch configuration, employees at branch and home offices can easily set up their own RAPs with no IT assistance.
- ***Outdoor:*** Aruba wireless mesh routers combine a unique multi-radio, multi-frequency architecture and adaptive Layer 3 routing to bring high-performance networking to outdoor environments. They deliver unparalleled speed, scale, and reliability as well as low latency and seamless handoffs for voice, video and other latency-sensitive applications across multiple hops in the wireless mesh network.

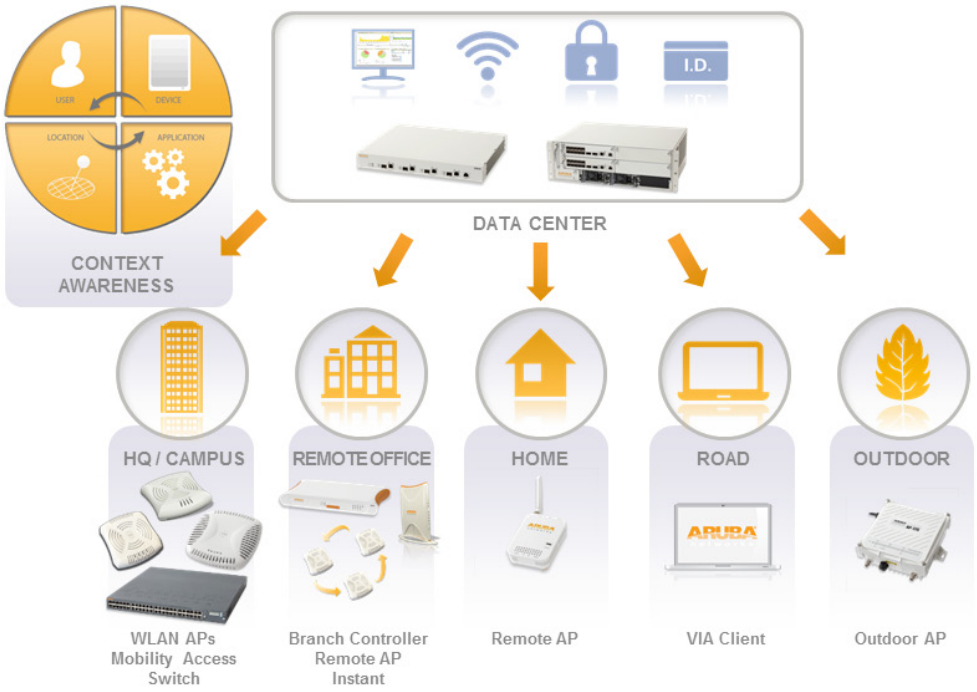

Figure 4: Aruba MOVE Architecture

Manage the Users Instead of the Network

Aruba MOVE represents a fundamental shift from the 20+ years of port-centric network architectures. Instead of focusing on physical devices – the core of network access – it places network services at the edge of the network, where a user's mobile device first encounters enterprise applications.

In a world where users are always on the move and utilizing more than one mobile device, it makes perfect sense to manage and secure network access based on who you are, rather than where you are or the device you are using.

This user-centric approach enables stronger security and simplifies user administration across wired, wireless, remote and outdoor networks. As pointed out previously, it also eliminates the need for VLANs because network services are centralized. Additionally, granular user, device and application visibility enables QoS and accelerates troubleshooting across the network.

Network Rightsizing with Mobility

By rightsizing its network with the Aruba mobility solution, KPMG reduced its wired infrastructure costs by 50%—realizing $2 million in build-out savings and an estimated $760,000 reduction in annual operating expenses.

Rightsize, Don't Supersize

At a time when network traffic is increasing faster than budgets, Aruba MOVE leverages mobility to rightsize the network. This is achieved by eliminating equipment from data centers and wiring closets, thereby reducing capital and operational expenses.

Aruba MOVE network services consolidate the functions of multiple independent management tools, configuration servers, location servers, NAC systems, VPNs, spectrum analyzers, and wireless intrusion detection systems. In legacy networks, this complex maze of functions require separate devices to install, manage, maintain and troubleshoot.

Rightsizing the Branch Office Network

With over eight hundred restaurants, Checkers needed to securely connect each store to the headquarters network to upload sales data upload and provide real-time credit card processing. By replacing a legacy router with the Aruba Virtual Branch Network (VBN), Checkers eliminated 60 days of lead time and two site visits from specialized consultants.

Aruba makes is simple. The restaurant manager plugs in the power cord, connects to the USB modem, and attaches a network cable to the in-store network. Injust a few minutes, the network is operational. Each restaurant saves about $600 in one-time costs and $120 per month in recurring costs.

In addition, Aruba MOVE lets you choose the right on-ramps based on specific access needs – without sacrificing consistency, security, reliability or performance. For example, Aruba can save branch offices thousands of dollars of capital and operating costs by eliminating the need for expensive branch routers.

Finally, MOVE makes it easier to rightsize over-built wired networks by replacing infrequently used ports with Wi-Fi access. Ideal for refresh projects and new builds, network rightsizing can save millions of dollars in one-time and ongoing expenses.

Define Once, Deploy Everywhere

Supermarkets have become the dominant way of buying groceries because of their efficiency: you can buy everything you need in one place. Similarly, MOVE provides network engineering and operations staff with a one-stop shop for:

- User administration
- Device configuration and upgrades
- Day-to-day management
- Troubleshooting
- Security

Think about the traditional checklist for deploying network access: configure VLANs, setup spanning trees on every edge switch and modify hardware settings using different protocols on a platform by platform basis. IT organizations might be conditioned to think that this complexity is normal, but the time adds up. In most cases, it takes 20-25 minutes to set up a switch at the edge. Multiply this by the number of devices in every wiring closet, and it's easy to see where a lion's share of the IT budget goes.

Instead of configuring a host of devices in the network core and wiring closet, Aruba MOVE automates common tasks and requires little or no direct touch. Aruba Mobility Access Switches and wireless APs are self-installing and self-configuring via predefined parameters created in the Aruba Mobility Controller. This zero-touch approach eliminates hundreds of hours of manual work and makes it easier to support remote locations without onsite IT staff.

The Compelling Business Case to MOVE

With enterprise mobility at a critical juncture, the Aruba MOVE architecture presents a very compelling business case:

1. **An integrated access architecture costing up to 50 percent less to deploy and as much as 70 percent less to operate than legacy architectures.**[7]

   Aruba's MOVE architecture helps our customers get their entire access network ready for mobility. In the process, customers can realize up to a 70% reduction in TCO compared to legacy fixed network approaches from other vendors. The savings come from:

   - Unifying the number of network, security and management services required for different network on-ramps
   - Accelerating the move from wired to near-gigagbit 802.11n, thereby reducing the number of Ethernet Switches needed in favor of more cost-effective Wi-Fi access
   - Moving to thin on-ramps at the edge

2. **Simpler access from remote locations.**

   By taking advantage of centrally managed services, Aruba MOVE dramatically simplifies the process of providing network access to remote locations. Instead of employing well over a dozen steps to configure network access using a legacy approach, non-technical employees can configure the Aruba solution in just three simple steps.[8]

3. **Faster campus additions, moves and changes.**

   The Aruba MOVE architecture eliminates traditional tasks that IT departments must perform to complete additions, moves and changes. Instead of spending a half hour to configure every device, Aruba requires only one change to the Mobility Controller. The Mobility Controller then does the rest, pushing out configurations to all local devices.

   Based on joint estimates with customers across a number of industries, companies can save as much as two person-days per week by adopting the Aruba MOVE architecture.[9] That's 40% of a network engineer's time that is now available for new projects, such supporting the deployment of iPads, tablets and other mobile devices..

4. **Stronger security.**

   The Aruba MOVE architecture provides concurrent visibility into the identity of all users, their devices and their locations on both wired and wireless networks. Consequently, it is easier for IT organizations to quickly identify and mitigate potential threats.

   For example, an Aruba retail customer with stores located in busy shopping areas captures 20,000 potential rogue APs each day. If the retailer had to investigate each individual event, it would be unable to find any actual rogues until after damage had been done. Aruba's ability to correlate wired and wireless events enables IT security teams to prioritize its threat-mitigation effort.

5. **Lower end-user support costs and higher satisfaction.**

   Aruba MOVE gives the extended enterprise workforce – employees, business partners, contractors and guests – a single, consistent way to access the appropriate corporate resources. Role-based access policies allow IT to control users and devices, so that employees can switch effortlessly between desktops, laptops, tablets, smartphones and other mobile devices.

   Furthermore, users are never required to decrypt the mysteries of VPNs or VLANs in order to work in a new location. By cutting down on the confusion and saving time for users, MOVE reduces IT service desk calls and increases user satisfaction.

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[7] *Aruba Networks calculations. Please contact us for details.*
[8] *Aruba Networks calculations. Please contact us for details.*
[9] *Aruba Networks calculations. Please contact us for details.*

Conclusion

The Aruba MOVE architecture transforms IT organizations from a culture of no to a culture of yes. It does so by unifying disparate wired and wireless infrastructures into one seamless network access solution – for traveling business professionals, remote workers, corporate headquarters employees and guests.

With Aruba MOVE, access privileges are linked to a user's identity. That means your enterprise workforce has consistent, secure access to network resources based on who they are – no matter where they are, what devices they're using or how they're connected.

It's an architecture that's driven by mobility and the proliferation of Wi-Fi-enabled mobile devices. These devices – which have no Ethernet port – are connecting to enterprise networks in unprecedented numbers and will quickly surpass desktop connections.

MOVE eliminates the cost and complexity of managing separate wired and wireless access policies and VLANs at the edge. In fact, with Aruba you'll need fewer ports and consequently less equipment in the wiring closet – effectively rightsizing your access infrastructure.

About Aruba Networks

Aruba is the global leader in distributed enterprise networks. Its award-winning portfolio of campus, branch/teleworker, and mobile solutions simplify operations and secure access to all corporate applications and services – regardless of the user's device, location, or network. This dramatically improves productivity and lowers capital and operational costs.

Listed on the NASDAQ and Russell 2000® Index, Aruba is based in Sunnyvale, California, and has operations throughout the Americas, Europe, Middle East, and Asia Pacific regions. To learn more, visit Aruba at www.arubanetworks.com. For real- time news updates follow Aruba on Twitter, Facebook, or the Green Island News Blog.

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