Any Device, Anywhere: The Next Phase for the Enterprise

Zeus Kerravala, Senior Vice President and Distinguished Research Fellow, zkerravala@yankeegroup.com

Highlights

▶ **When employees are empowered to work from anywhere using any device, a business' global reach is extended.** Forty-eight percent of respondents to our 2011 US Enterprise Mobility: IT Decision-Maker Survey, July, indicate that improving responsiveness to customers is a key driver for mobility solutions.

▶ **The network can also increase workforce productivity.** Forty-one percent of the respondents to the same IT decision-maker survey indicate that improving worker productivity is a key driver for mobility solutions.

▶ **Virtualization and cloud computing increase IT flexibility, enabling IT to say "yes" to more business initiatives.** It changes the unfortunate perception of IT as a cost center into a more strategic view of IT as a business enabler.

Enterprises Are on the Precipice of an Unprecedented Technology Shift

The history of network computing is characterized by an ongoing struggle between end-user/business requirements and IT capabilities/budgets. At times, IT has been ahead of the curve, with innovations in technology—deployed creatively—enabling new conveniences for users and new value for businesses. At other times, like today, end-user and business demands often exceed IT's capacity to fulfill them. IT needs to find ingenious ways to fill the gap between expectations and reality.

At least three major trends developing within the networking industry have the potential to drive traditional IT departments toward new operating models.

The first is the increasing influx of mobile consumer devices into the enterprise. Yankee Group's 2011 US Enterprise Mobility: IT Decision-Maker Survey, July, reveals the number of workers using smartphones currently exceeds the number of workers with laptops (see Exhibit 1 on the next page).

A consequence of this trend is that there is increasing pressure on IT departments to provide access to enterprise resources for these personally owned devices. Today's workers—wielding a smartphone or tablet—want to be able to work anywhere, anytime and on any device they choose. The days of IT-certified and standardized computers are slowly disappearing. The natural impulse for IT managers may be to hunker down and deny access to non-IT-controlled devices. While this certainly responds to IT budget and manpower limitations, does it serve the needs of the business?
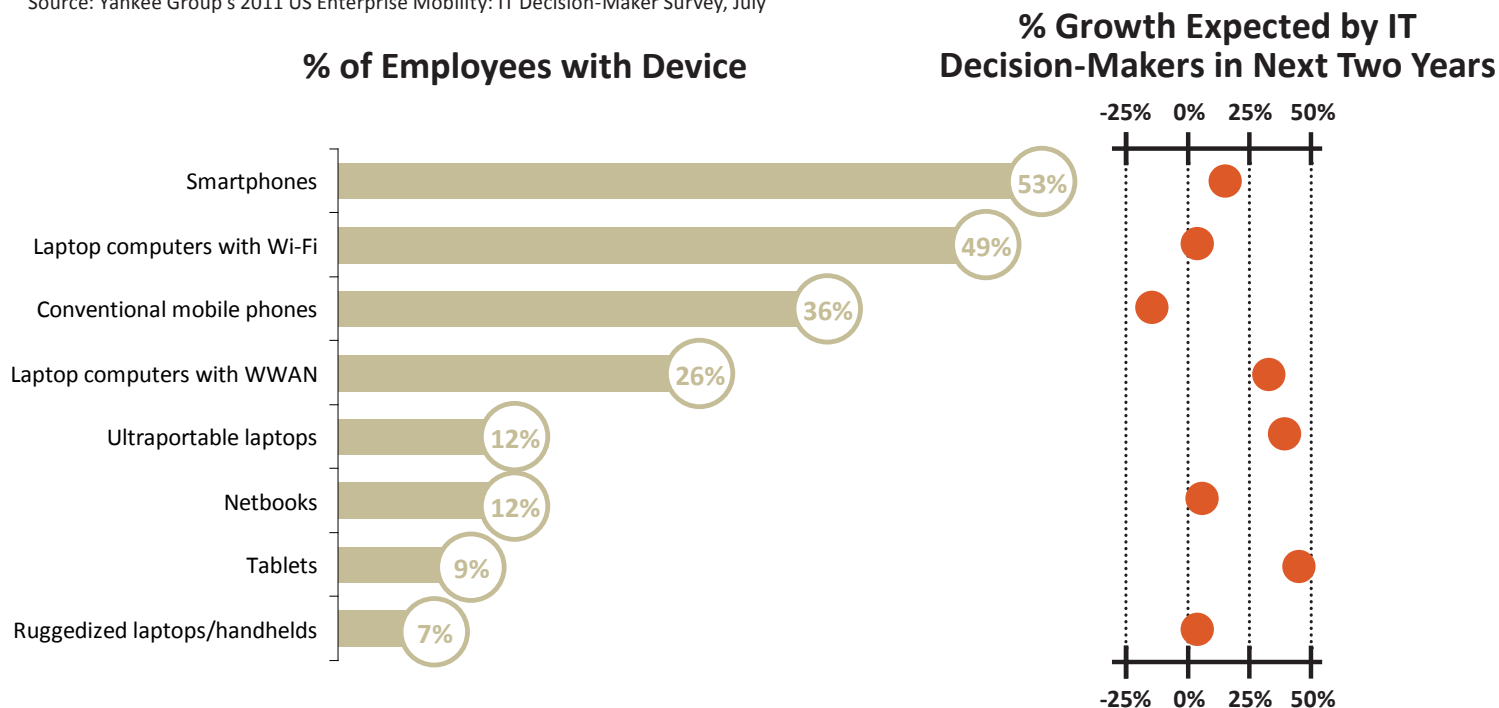
Exhibit 1: IT Decision-Makers Anticipate High Tablet Growth in the Enterprise
Source: Yankee Group's 2011 US Enterprise Mobility: IT Decision-Maker Survey, July

% of Employees with Device

% Growth Expected by IT Decision-Makers in Next Two Years

Device	% of Employees with Device	% Growth Expected
Smartphones	53%	
Laptop computers with Wi-Fi	49%	
Conventional mobile phones	36%	
Laptop computers with WWAN	26%	
Ultraportable laptops	12%	
Netbooks	12%	
Tablets	9%	
Ruggedized laptops/handhelds	7%	

The second trend impacting IT operating models is virtualization. Without virtualization, Yankee Group estimates that as many as 40 percent of data center facilities would run out of power, space or cooling in 2011-2012. But physical resource limitations are not the only factor driving enterprises to virtualization. Dedicating computing, bandwidth and storage to single-function infrastructure is simply inefficient because spare cycles, megabits and disk space could be better used to support other resource-hungry applications. In addition, there is an operations cost driver for virtualization. Virtual instances are faster to deploy (assuming the existing physical infrastructure is already in place) and easier to manage.

One variation on the virtualization trend is the increasing relevance of virtual desktop infrastructure (VDI), which does for the client what traditional virtualization did for servers in the data center. Separating the interface for desktop applications from the compute and storage resources required to run them helps applications scale better and be more easily accessible from anywhere and on any device. Further, because the applications and data now reside on virtual machines in the data center, it restores an element of control and data security to IT operations.

There are increasing levels of abstraction between where data is stored and the methods and devices on which it is accessed and manipulated. Which brings us to our third big trend: cloud computing. Cloud computing makes data more mobile so it can be accessed from anywhere. It also makes it more transferrable so that you get the same results no matter which device you use. Either the data is accessed from a common source, or your various devices are synchronized by procedures within the cloud. Cloud computing is very attractive for IT organizations because public clouds reduce the private infrastructure demands on IT to provide end-user services. At the same time, the security and control risks of cloud computing may cause many enterprises to look to private or hybrid cloud models as an interim step before fully embracing public cloud computing.

The Evolution of the Enterprise Network

These developments provide benefits to the enterprise, but they also present new challenges for the IT department. Indeed, these new trends so dramatically alter the ways in which networks are conceived, designed and built that an evolution to a new phase of networking—a next-generation network—is required. What would the network need to look like to support these new trends?

Security Comes to the Fore

Assuming the influx of consumer devices and the desire for employees to work anywhere are irreversible trends, then security is the chief concern. But security needs to be richer and more policy-driven than simple firewalls and intrusion detection. Security needs to not only know who and what is coming into the enterprise, but it must also take into account factors such as location and context. Business partners coming into the enterprise may need access to road maps for a project on which they are collaborating, but they also must be segmented away from private intellectual property. A doctor might be allowed to access patient records when connected to the in-hospital wireless network, but not when accessing the hospital over Wi-Fi from a coffee shop. Clearly, more sophisticated security and policy is needed to allow the network to make those decisions based on customized business rules.

Part of the problem could be solved by the selection of the access client. While IT may not have control over the devices accessing the network, it can still control access methods and glean additional security information via control of the access client. Ideally, the client should work for wired, wireless and VPN access, and be able to interact with security devices within the enterprise to provide meaningful information about identity, role-based access control, location and context.

Virtualization Requires a Re-Think

Virtualization also has implications for IT. While virtualization is almost a necessity to combat data center sprawl, deciding what to virtualize and determining what effect it will have on application performance is as much an art as it is a science. In general, extremely low-latency applications where nanoseconds count—such as financial trading applications—are poor candidates for virtualization. More traditional business applications such as those from Oracle or SAP fare very well in virtualized environments and, in many cases, see response-time improvements.

A second consideration for virtualization is how services will be handled. Virtualization should not be about a series of trade-offs. IT should ensure traditional network services including security, application acceleration, load-balancing, management and analytics have virtualization-aware solutions available before making the leap to virtualization.

If your plan extends to virtualizing desktops via VDI, you need to be aware of limitations in some current VDI implementations and the efforts being made to resolve them. The biggest issue is IP telephony, video and other collaboration tools that are latency- and jitter-sensitive. Not only must the VDI solution deal with the overhead of encapsulation, compression and encryption, but VDI itself can lead to sub-optimal forwarding of packets. Direct video or audio will always pass through the VDI server in the data center, even if there is a more direct path from peer to peer. This points us to another requirement for the next-generation network. It must not only be media-aware; it must be media- and virtualization-aware simultaneously.

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Cloud Computing Offers Risks/Rewards

Cloud computing is the other trend with major implications for IT. Security is an issue for the cloud, but not an insurmountable one. The key is providing access control to the data and data security. Data security could be enforced by policy, combined with automation, requiring that any data that is sent to, retrieved from or residing on a cloud service provider's infrastructure be encrypted. Access control is also becoming a shared responsibility between the enterprise and the provider. For infrastructure-as-a-service (IaaS) providers to be successful, they must interface with enterprise customers' identity and access management systems. In turn, enterprise IT must ensure its security systems can adapt to the dynamic nature of cloud services. For example, the security system should be able to interact with HR databases to ensure that terminated employees cannot access proprietary information from within the company—or from without—via the cloud.

The Business Value of the Next-Generation Network

Change is difficult, but it is usually driven by a tipping point when benefits outweigh the costs. For a next-generation network, the benefits are significant:

- **When the employee is empowered to work from anywhere using any device, the business' global reach is extended.** Forty-eight percent of respondents to

our IT decision-maker survey indicate that improving responsiveness to customers is a key driver for mobility solutions (see Exhibit 2). The "virtual expert" concept scales the knowledge within the enterprise and makes it more broadly available globally.

- **The network can also increase workforce productivity.** Forty-one percent of the respondents to the same IT decision-maker survey indicate that improving worker productivity is a key driver for mobility solutions.

- **Virtualization and cloud computing increase IT flexibility, enabling IT to say "yes" to more business initiatives.** This changes the unfortunate perception of IT as a cost center into a more strategic view of IT as a business enabler.

A next-generation network increases business agility by enabling faster time to market for new applications and services.
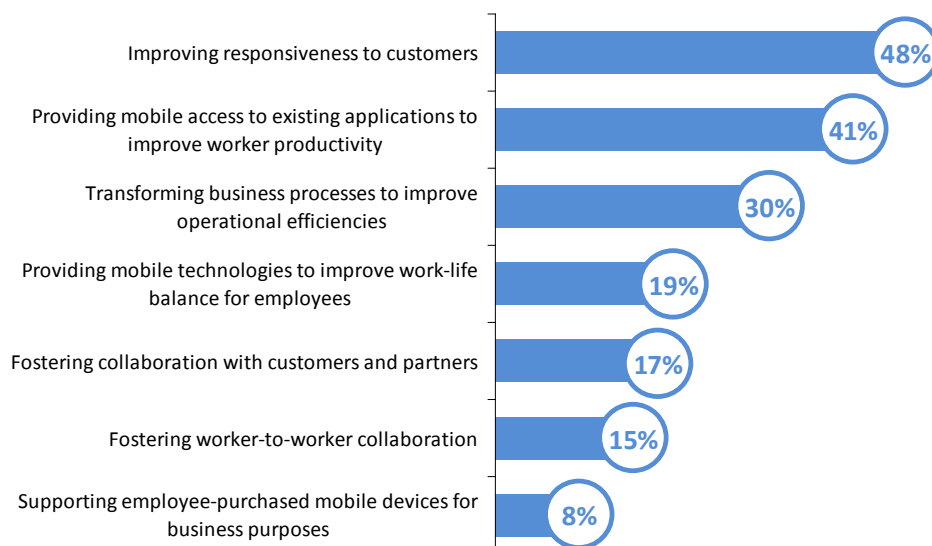
A Next-Generation Network Case Study

The problems presented by these new trends in the enterprise are complex but not insoluble. Getting to the next-generation network is a process of evolution, not revolution. In many cases, it is about migration and enabling services in the network that exist currently but are not yet turned on.

Exhibit 2: Mobility Can Improve Customer Service and Raise Productivity
Source: Yankee Group's 2011 US Enterprise Mobility: IT Decision-Maker Survey, July

Which of the following activities are most important when you consider your company's investments in mobility solutions?
(Please select up to two) (n=989)

Activity	Percent
Improving responsiveness to customers	48%
Providing mobile access to existing applications to improve worker productivity	41%
Transforming business processes to improve operational efficiencies	30%
Providing mobile technologies to improve work-life balance for employees	19%
Fostering collaboration with customers and partners	17%
Fostering worker-to-worker collaboration	15%
Supporting employee-purchased mobile devices for business purposes	8%

The following is an example of the above trends:

The organization: A U.S.-based professional services firm with 75 employees.

The problem: The organization has a high percentage of workers (almost 50 percent) who are mobile (defined as workers that spend more than 50 percent of their time away from their desk). The company wants to implement a program that allows workers to use whatever device they want, not just corporate-issued devices.

The primary communications tools for the organization, like most small to midsize companies, are e-mail and instant messaging (IM). The corporate platform used for these applications is a market leader and was deployed as follows:

- The data and application resides on a server in a hosting center off the company's premises.

- All employees use a locally installed client to access the application.

- Every employee has a mail store limit of 500 MB to 1 GB, depending on title and role. Since this amounts to just a few months of e-mail, workers also have a local archive file to save any e-mail older than three months.

- E-mail and chat is handled by corporate-issued BlackBerrys tied to a BlackBerry Enterprise Server (BES), allowing workers to access their messages and messaging functionality when mobile.

This implementation provides the portability the workers require, in that every worker can use the applications wherever they are as long as they have their corporate-issued laptop and BlackBerry. However, the implementation has the following limitations:
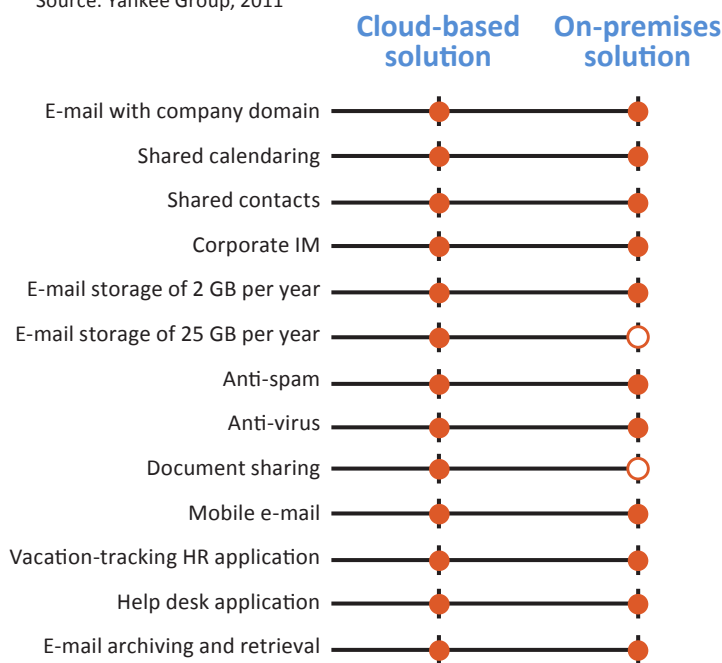
- **Lack of user choice on laptops and PCs.** The e-mail client runs only on Windows laptops so the only method of access for non-Windows laptops and PCs is the Web interface, which has only limited functionality compared to the local client.

- **Lack of user choice with mobile devices.** Since all e-mail must be pushed through a BES, every worker must carry a corporate-issued BlackBerry for mobile e-mail. The increased popularity of iPhones and Android phones makes this an increasingly larger problem. In the end, most mobile employees carry two smartphones: a corporate BlackBerry and a personal smartphone.

- **No support for tablets.** At the time of migration, no tablet client was available for the e-mail and IM applications.

- **Long IT provisioning times.** When a worker needs to switch laptops for upgrade or maintenance purposes, the local information must be copied from the old laptop to the new one. Longer-tenured employees tend to have local archive files in the several-gigabyte range, causing long lead times for provisioning new laptops.

- **High corporate risk with lost or stolen devices.** If users' devices are lost or stolen, all their locally archived e-mail is permanently lost. This creates a large amount of risk, since workers may have important information saved in the local archive.

The solution: To address these issues, the company chose to migrate to a cloud-based e-mail platform. The cloud-based solution provides both e-mail and IM functionality. The back-end server migration was very simple because the cloud mail provider uses a migration process developed for the company's specific messaging application. The front-end client migration took a few hours to copy all the mail from the local client to the cloud, but it was non-disruptive to the workforce. The cloud-based e-mail solution actually has more features than the old client solution. Each user received 25 GB of storage space for e-mail, an order of magnitude or even two larger than the premises-based solution. Exhibit 3 compares and contrasts the cloud-based solution and the on-premises solution.

Exhibit 3: Cloud vs. On-Premises
Source: Yankee Group, 2011

	Cloud-based solution	On-premises solution
E-mail with company domain	●	●
Shared calendaring	●	●
Shared contacts	●	●
Corporate IM	●	●
E-mail storage of 2 GB per year	●	●
E-mail storage of 25 GB per year	●	○
Anti-spam	●	●
Anti-virus	●	●
Document sharing	●	○
Mobile e-mail	●	●
Vacation-tracking HR application	●	●
Help desk application	●	●
E-mail archiving and retrieval	●	●

From a cost perspective, the cloud-based solution proved to be less expensive; the company saw a cost savings of $64,000 in the first year and $207,000 in three years. In the first year alone, this amounted to a little over $5,000 per employee. Additionally, the up-front migration cost was minimal—under $6,000. Exhibit 4 shows a total cost comparison of the premises-based solution and the cloud-based solution.

Exhibit 4: One-Year Cost Comparison of Premises- vs. Cloud-Based E-Mail
Source: Yankee Group, 2011

On-Premises Solution		Cloud-Based Solution
$0	Deployment cost	$5,607
$6,000	License/maintenance	$3,750
$60,000	Support costs	$0
$2,500	Security	$0
$5,000	Mobility	$0
$2,000	Backup	$1,500
$1,000	Associated applications	$1,500
$0	Training	$615
$76,500	**TOTAL COST**	**$12,972**

Overall, the company realized an 83 percent cost savings in the first year of deployment alone. In addition to the cost savings, the company also gained the following benefits:

• **Device freedom for workers.** The cloud solution offers a mobile-optimized client for all the major smartphone platforms. This means the BES could be removed from the implementation, allowing workers to use whatever mobile device they choose. Many employees have now consolidated down to a single smartphone. Additionally, workers can now use Macintosh-based laptops in addition to Windows-based PCs.

• **The ability to move to a cloud-based CRM solution.** The company's legacy CRM solution was integrated into its legacy e-mail/messaging platform. Since the mail migration, the company has moved to a cloud-based CRM solution as well.

This shift to cloud is allowing the company to move closer to the ultimate worker vision of any application on any device over any network. Users are free to switch devices whenever they want, with little to no IT support. And the company got all of this with a savings of 83 percent in the first year. It gained better user choice, more productive users and a significantly lower cost.

There are other ways to achieve the same results, but the network approach gives IT more control, allows for a more graceful migration and provides the least amount of risk compared to solutions that require device, cloud or OS-based control. The alternative approaches are viable, but they tend to be more labor- and cost-intensive over a longer period of time.

The Next-Generation Network: Recommendations

Shifting to a next-generation network can help transform a business. However, knowing where to start can be a challenge. Yankee Group offers the following recommendations:

- **Look to solutions and architecture, instead of boxes and technologies.** The challenges the next-generation network is trying to address are multi-dimensional, cutting across security, mobility, virtualization, collaboration and many other areas. There is the potential for prohibitive integration costs if you try to construct it yourself. Look to vendors that have already performed that integration for you.

- **Look to ROI and TCO when making networking investments.** While constructing a next-generation network isn't free of cost, neither does it require a "rip and replace" of old infrastructure. Look to incremental investment in your existing infrastructure, backed by a solid ROI model for new investments.

- **Embrace the future.** The business landscape is littered with defunct or struggling companies that failed to act on technology transitions. While it makes sense to balance cost and opportunity, be careful not to underestimate the opportunity in your calculation. You know your competitors are running the same equations.

About the Author

Zeus Kerravala

Senior Vice President and Distinguished Research Fellow

Zeus Kerravala, senior vice president and distinguished research fellow, leads the Research Council and is chartered with the responsibility of providing thought leadership to the research organization. Comprising senior research leaders, the Research Council provides outreach to clients and the broader Yankee Group community, as well as ensures that the company's research agenda addresses the needs of business leaders. Kerravala drives the strategic thinking of the research organization and helps shape the research direction. Much of Kerravala's expertise involves working with customers to solve their business issues through the deployment of infrastructure technology.

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