

Maximizing Mobile Worker Productivity



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by Sandra Palumbo and Nathan Dyer | January 2008

Executive Summary

At over 30 million strong, mobile workers such as service technicians, salespeople, physicians, construction workers and public safety personnel represent a large and growing segment of US workers. When looking beyond mobile e-mail for the next killer mobile application, these mobile workers present the largest addressable market for solution providers.

E-mail is an important collaboration tool for mobile professionals such as senior executives, managers and knowledge workers. However, mobile fieldforce workers and specialty workers (see Exhibit 1) are more process driven and rely heavily on access to key applications, databases and information. Mobility is naturally engrained into daily business processes because these mobile workers spend most of their day traveling within a local area interfacing with clients, customers, patients, partners and distributors.

The right mobile and wireless technologies not only address the unique computing challenges mobile workers face such as wireless coverage gaps and interruptions, internetwork roaming and performance issues, but also help automate and streamline processes, providing significant ROI by:

- Yielding higher efficiencies in completing tasks
- Increasing visibility into customers and clients
- Decreasing operational costs
- Reducing data error and loss
- Improving client retention through better customer service

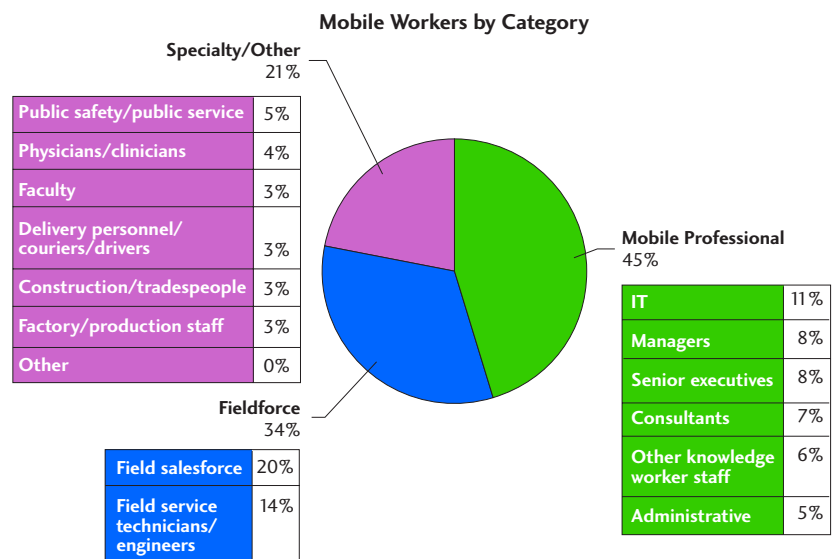
Unlike selecting mobility solutions for consumer use, corporate mobility cannot be solely limited to end-user preference; nor can it be limited to IT's typical policies. What really needs to occur is the appropriate blending of the needs of the business, the end user and the specific job function to truly leverage the benefits of mobility. As such, the primary mobile computing challenges to maximize ROI of mobility implementations can be segmented into the following key areas:

- Increasing application reliability
- Protecting against network coverage gaps and interruptions
- Enabling internetwork roaming
- Optimizing mobile network and application performance
- Enforcing device and network management
- Implementing bandwidth prioritization
- Making mobility easier for less technically savvy mobile workers

Exhibit 1

Looking Beyond the Mobile Professional

Source: Yankee Group Anywhere Enterprise—Large: 2007 US Mobility and Business Applications Survey



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I. Introduction

As organizations strive to grow their businesses and increase productivity and performance, they must find the right tools and solutions to achieve these goals. How large of a workforce are we trying to make more productive through mobility? More than 50 million US workers are considered mobile, which Yankee Group defines as being away from their primary workspace at least 20% of the time. Field workers and mobile specialty workers constitute approximately 55% of mobile workers today (see Exhibit 1 on previous page). Field workers are defined as individuals such as traveling salespeople whose primary job is conducted on the road or by moving between various locations and not having a formal primary workspace. Specialty workers are those who have a specific function or training in a specialized area such as healthcare workers and public utility workers.

To support this massive and still growing mobile workforce, enterprises and government agencies must deploy solutions that provide these mobile employees with access to back-end resources beyond e-mail, such as databases and applications. Companies and agencies are just beginning to completely understand remote access solutions for laptop computers. Now, with the rise of smart phones and other handheld devices, organizations are largely unaware of the similar technologies available to these edge endpoints and their ability to significantly improve mobile workforce efficiency and productivity.

The intent of this Yankee Group Report is to identify the secure mobile solutions available in the market, and how these technologies map back to the requirements of today's mobile enterprise, specifically focusing on the needs of mobile field workers. In addition, we:

- Look at productivity as the hallmark of successful mobile deployments
- Provide enterprise ROI examples
- Discuss the impact of key challenges and possible solutions to overcome them

Although there is a segment of mobile workers who primarily roam within the office or at a remote location, the typical mobile worker routinely travels beyond the four walls of the enterprise to serve customers or to drive sales. Underlying wireless wide-area and wired network technologies have evolved in the past 5 years to help connect the executive road warrior, the field service or sales representative and the teleworker, providing access to corporate databases and applications. These networks often suffer from bandwidth constraints, long network delays (latency), weak signals, coverage gaps and the typical security challenges of the internet, which presents unique challenges that we address later.

Enterprises largely are embracing mobility initiatives to support their distributed mobile workforces. The business benefits of going mobile can be summarized in three main categories:

- **Increase revenue:** Mobility solutions can enhance worker productivity by leveraging real-time information and line-of-business applications to make better informed decisions and to process orders more rapidly.
- **Decrease costs:** Mobile applications can reduce workflow volumes through automation utilization and can often reduce overhead costs by upgrading antiquated paper-based business processes.
- **Improve services:** Mobility can provide higher quality care for public safety, healthcare, utilities, telecom, transportation and other organizations that rely on real-time access to network resources for rapid response, and that provide differentiated services with location and presence information.

Businesses recognize the potential benefits they can realize through mobility and will continue to deploy more of these solutions throughout their organizations. In the next section, we look more closely at one specific type of mobile worker—the field worker—to get a better view of the benefits and ROI that mobility solutions can bring to the worker and the business.

II. Understanding the Mobile Worker

Field and specialty mobile workers represent a large and growing segment of US workers (see Exhibit 1 on first page). Mobility is engrained into daily processes because these mobile workers generally spend most of their day traveling within a local area interfacing with clients, customers, partners and distributors.

Field sales and service isn't a standalone industry vertical (such as healthcare, transportation) and it isn't quite a horizontal segment (such as executive, account manager). It's a combination of both horizontal and vertical—more like a diagonal approach—where several industry verticals have a significant number of field workers to manage. Industries such as insurance, transportation, construction, telecommunications and utilities rely heavily on field workers in the business process.

Specialty mobile workers in industries such as healthcare, public administration, construction and manufacturing represent about 21% (see Exhibit 1) of the mobile workforce. For this segment of workers, wireless network connectivity can be mission-critical. Clinicians, physicians and other medical personnel are tasked with caring for patients at the point of care. Public administration roles vary greatly from police officers to home and building inspectors.

The ROI Story

Mobility has a critical impact on a business's top and bottom lines. What was once thought of as a corporate perk to key employees has evolved into a real IT platform that drives productivity, differentiation and convenience. Mobile e-mail was an early example of this paradigm change, as executives and high-profile workers demanded a more efficient and practical collaborative process while away from their workspace. Mobility has since trickled down further within organizations, both horizontally (e.g., managers using mobile e-mail) and vertically (e.g., lines of business).

When looking beyond mobile e-mail for the next killer mobile application, mobile workers including field service, field sales and specialty workers present the largest addressable market for solution providers.

There are compelling drivers to mobilize and automate the business processes of mobile workers. Early mobile implementations have revealed real and verifiable ROIs:

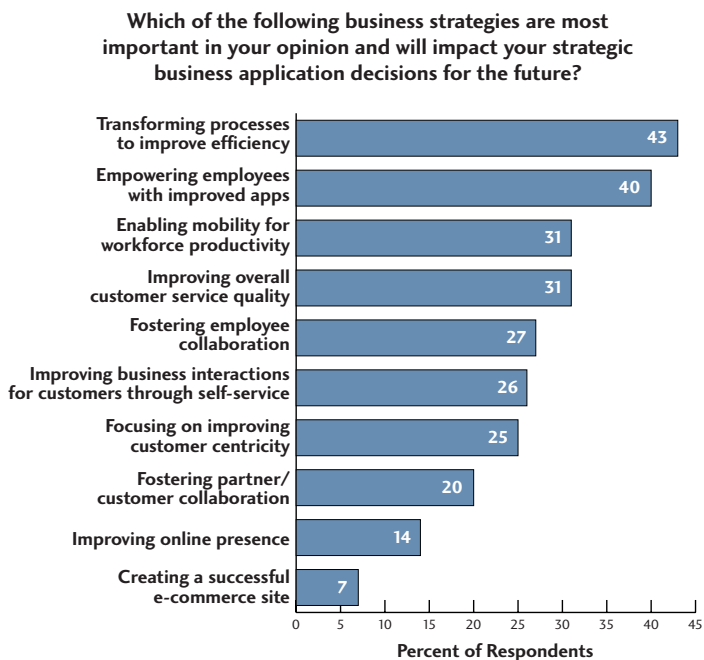
- **Higher efficiency in completing tasks:** In most cases, mobile solutions automate legacy pen and paper processes. This eliminates process redundancy (i.e., database entry of field information) and optimizes processes and tasks (i.e., efficient route management) without adding complexity (which is particularly important for less technical mobile workers). ROI due to efficiency gain alone is huge and can take as little as 6 months.
- **Increased visibility into customers and clients:** Mobile devices provide on-the-go and real-time customer information access that otherwise would be buried in forms or stuck on a desktop. One telecommunications company is arming its field technicians with mobile handsets so they are aware of current service promotions and can identify up-sell opportunities. Also, the availability of real-time customer data ensures better forecasting of sales, which reduces inventory cost.
- **Decrease operational costs:** Mobile solutions enable automated asset management to reduce operational costs. Mobile applications can record vehicle diagnostics such as fuel usage, engine fault codes and GPS location. One courier trucking firm expects to shift the fleet break-fix to preventive maintenance ratio from 90:10 to 75:25 in 3 years.
- **Reduction of data error and loss:** By automating discrete processes, businesses can eliminate pen and paper tasks that tend to be error prone. One restaurant chain reported an 18% reduction in order mistakes by implementing a mobilized order-taking solution.

- Client retention through better customer service:** Mobile solutions give field workers tools that help them spend more time in the field. For example, sales representatives can support more customers more quickly, without dropping productivity in other tasks. Process automation can enable 20% faster call resolution for service technicians.

With more success stories around mobile fieldforce implementations, the decision to mobilize becomes a matter of *when*, not *if*. Yankee Group research shows that mobilizing business applications encapsulate the top business strategies of companies today (see Exhibit 2). It becomes a competitive disadvantage to not have a mobility strategy on the table today, especially after examining the ROI impact on existing business processes.

Exhibit 2

Process and Anytime Access Drives Strategic Business Decisions
 Source: Yankee Group Anywhere Enterprise—Large: 2007 US Mobility and Business Applications Survey



Mobile Worker Fragmentation

No two mobile workforces are the same. Field workers are very diverse in terms of role and industry sector, and specialty workers are highly specialized by definition. Although they share the requirement for mobility, mobile workers differ on:

- Business processes:** Field workers are very process-driven. Their work consists of following a specific procedure to accomplish discrete tasks, and the procedure tends to be highly customized. For example, technicians rely heavily on dispatch and scheduling applications while insurance agents use forms to process claims and adjustments.
- Mobile applications:** As business processes vary, so too do suitable mobile applications. Applications range from dispatch, timesheet and work-order management services to report generation, CRM database connector and medical point-of-care solutions.
- Mobile device requirements:** Mobile workers use many types of mobile computing devices today, which are tailored to the needs of the user and the business process. The size and ruggedness of the device are largely determined by who, where and how the device will be used in the field. For data entry within a client’s premises, a handheld device (i.e., smart phone) would be the device of choice for field sales teams. For monitoring dispatch and scheduling data while delivering supplies to customers, a laptop could be deployed and mounted in a vehicle. Tablets are most commonly used in healthcare environments.

This fragmentation makes it difficult for solution providers to target field workers as one holistic segment. Despite differences in processes, applications and devices used by field workers, the requirement for a robust wireless network to facilitate the exchange of information and communication is universally demanded. Without optimal mobile connectivity, the usability and effectiveness of the mobile solution rapidly break down.

Connectivity Pain Points

There are many success stories about organizations deploying mobile solutions that empower their fieldforce. Businesses and solution providers are quick to quantify ROI from mobilizing and automating business processes. But mobility is complex from an implementation standpoint and organizations must solve many nuts-and-bolts challenges to prevent the initiative from turning into a lemon.

There is a disconnect between the perceived technology challenges of corporate decision-makers who plan the mobile solution and the actual fieldforce workers who use the technology. The top usability concerns of decision-makers include security risks, integration complexity, insufficient network speeds and cost of ownership. Geographic coverage falls near the bottom of the barrier spectrum. Mobile workers have a different perspective because they're not concerned about security, cost or back-end integration (see Exhibit 3). They state unavailable network coverage as the top mobile frustration while connecting mobile devices, even more than unreliable

throughput speeds. This poses extremely high risk to the fieldforce because the more time spent in the field, the higher the likelihood that unreliable coverage becomes a bottleneck in the business process.

Unreliable network access can be the result of many culprits. In addition to wireless coverage gaps, other network issues such as latency, jitter, roaming and bandwidth limitations wreak havoc on field workers completing tasks. The next section looks at solutions to addressing the five key challenges of mobile computing.

III. Addressing the Challenges of Mobile Computing Deployments

Despite the incredible potential productivity gains, increased employee satisfaction and potential ROI benefits, enterprise mobility solutions are not without their challenges. Enterprises name a variety of challenges and pain points when it comes to supporting mobile workers (see Exhibit 4).

Exhibit 3

Coverage Remains a Critical Bottleneck for Mobile Workers

Source: Yankee Group Anywhere Enterprise—Large: 2007 US Mobile Professional Blended Lifestyle Survey

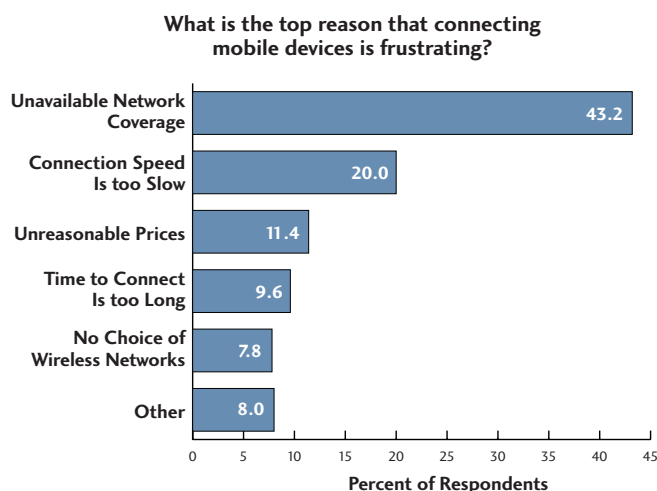
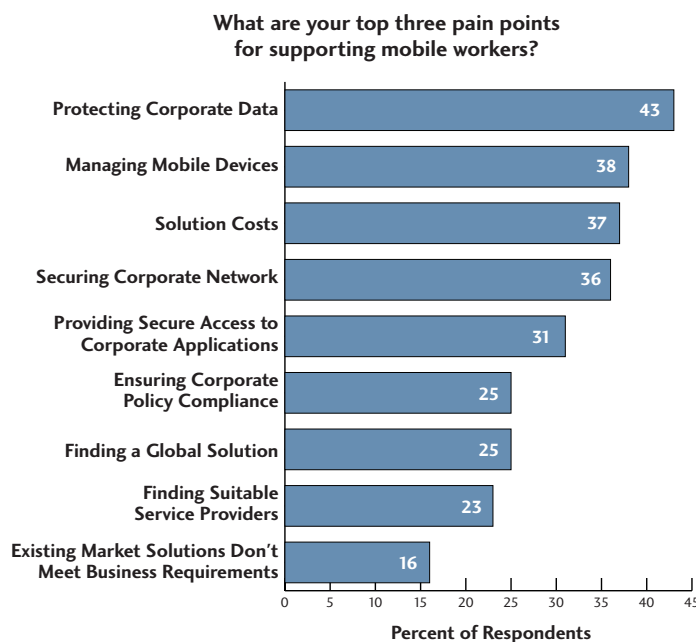


Exhibit 4

Top Pain Points of Supporting Mobile Workers

Source: Yankee Group Anywhere Enterprise—Large: 2007 US Fixed-Mobile Convergence Survey



Unlike selecting mobility solutions for consumer use, corporate mobility cannot be solely limited to end-user preference; nor can it be limited to just IT's typical policies. To truly leverage the benefits of mobility, the appropriate blending of the needs of the business, the end user and the specific job function must occur.

The primary mobile computing challenges can be segmented into five key areas:

- **Network coverage gaps and interruptions:** This refers to the lack of complete mobile network coverage such as in rural areas, parking garages and elevators, and inside large manufacturing, healthcare or other facilities. These dead spots interrupt service and connectivity, often causing performance issues for the device and applications.
- **Internetwork roaming:** Although roaming from one network to another can help improve overall network coverage, it can cause performance and latency issues as a device switches between networks, especially if re-authentication needs to occur. Applications may also crash as users change networks, forcing users to re-enter lost or corrupt data.
- **Mobile network and application performance:** The user experience and the ability to be productive when out of the office depend upon connectivity as well as network performance and its impact on the performance of applications. Many applications were not designed for wireless use and may suffer from performance issues or might not work at all when used in certain environments or with certain technologies.
- **Device and network management:** Like any endpoints being used for corporate functions, devices as well as the connection back to the corporate network need to be managed and secured. With the disparity of possible endpoint devices, it can be a huge challenge for IT to overcome.
- **Bandwidth management:** With an increasing number of mobile workers and applications being used by these workers, there is a lot of traffic fighting for a limited amount of bandwidth. Companies can achieve additional benefits if they shape and prioritize the traffic from critical applications.

Given the continuously evolving mobile landscape, finding solutions to these challenges can seem difficult and nearly impossible. Many businesses fear having to cobble together a bunch of additional tools and systems to address several of these challenges and then still being left with incomplete solutions. Usability from the end-user perspective and manageability from IT's perspective can also cause friction in the search for an adequate solution.

But enterprise mobility providers are trying to address many of these five pain points with solutions that not only solve the problems at hand, but do so without causing additional concerns for either IT or end users. Today, solutions such as mobile VPNs that address the connectivity and performance challenges unique to mobile endpoints are available from a limited number of providers. This technology helps increase mobile productivity by enabling connections to appear to be maintained from an application and authentication perspective, even when roaming between networks or moving in and out of coverage areas.

Designed for wireless access, mobile VPNs offer solid performance over wireless networks—especially across slower wireless WAN links. Wireless transmissions are far less predictable, and the packet sizes and timing parameters used for wired transmissions are far less efficient when applied to a wireless environment. Advanced mobile VPNs use link optimizations to reduce the number of retransmitted packets, excess control information and other network chatter. Mobile VPNs can also apply data compression to traffic sent over lower speed links. Adjustable thresholds enable the most efficient trade-off between the CPU overhead introduced by compression and the speed gained by transmitting less data. Additionally, advanced mobile VPNs optimize specific applications and protocols for use on wireless networks, such as by compressing large web images (e.g., JPEG or GIF) and using forward error correction on VoIP and video, which is particularly useful over slower long latency wireless WAN networks.

Application session persistence is a key benefit that a mobile VPN offers to an on-the-go worker. Because the mobile VPN uses virtual IP addresses instead of physical ones, users can continue TCP and application sessions without dropping the VPN connection, crashing applications or losing data—even when they roam among available wired and wireless networks or move in and out of wireless coverage areas. This also means that application authentication remains intact and does not need to be re-established every time a new connection is made or a device goes into a suspend/resume cycle. Aside from persistent network connections, mobile VPNs have also been designed to address the application needs of employees. Mobile VPNs support most business applications (even homegrown applications), require little configuration and support handheld devices as well as laptops.

Given that these VPN solutions are designed with the smaller form-factor handheld device in mind, the issues of battery life, performance, usability and small footprint are taken into account in the design and development of the technology.

At the very least, businesses should consider the use of these types of solutions for specific field workers or certain job functions where the device and application performance due to the mobility of the individual can cause productivity declines.

IV. Case Studies: Maximizing Fieldforce ROI

More companies are turning to connectivity solutions that enhance and protect their mobile fieldforce solution investment. Mobile VPNs are one such solution and have been deployed by numerous organizations where mobile connectivity is considered mission-critical. Exhibits 5, 6 and 7 provide some examples of businesses implementing mobile VPN services on top of their mobile solution.

Exhibit 5

Case Study: Leading Cable Company

Source: Netmotion and Yankee Group, 2008

Company	Leading Cable Company
Solution	Mobile VPN on 5,000 field service technicians' laptops
Connectivity Challenges	<ul style="list-style-type: none"> • Cellular coverage gaps caused interruptions to critical applications • Each interruption required a reboot of the application and re-entering lost data • High user frustration because network roaming was cumbersome and required user intervention • Inefficiencies due to poor application performance on low-bandwidth networks
Benefits	<ul style="list-style-type: none"> • Seamless roaming between various networks with network persistence • No network connectivity interruptions—eliminates application re-boots and lost customer data • Automatic and transparent wireless network selection • Optimized application performance from bandwidth prioritization • Real-time visibility of device activity, such as application usage, device connectivity and battery life performance • Custom policy creation around lost or stolen devices (quarantine) and bandwidth prioritization standards (critical transmissions and applications)
Results	<ul style="list-style-type: none"> • Reduced support calls to corporate help desk and IT • Greater customer satisfaction from quicker resolution time for customer service and support • Higher productivity in the field • High field service technician acceptance and higher workforce morale

Exhibit 6**Case Study: Food Service Distributor**

Source: Netmotion and Yankee Group, 2008

Company	Leading Food Service Distributor
Solution	Mobile VPN on 5,000 field sales managers' laptops
Connectivity Challenges	<ul style="list-style-type: none"> • Required field sales managers to have access to existing applications without any customization • Cellular coverage gaps caused interruptions to critical applications • Each interruption required a re-boot of the application and re-entering lost data • Extremely critical that real-time inventory access and order status be maintained • Requirement for a seamless user experience without complicated logins and network configurations • Deployment could not add new processes to the system
Benefits	<ul style="list-style-type: none"> • Application session persists through multiple wireless network coverage gaps and suspend/resume device cycles • Field sales managers can access their databases and applications without complex logins • Policy management module enables IT to push software updates and patches (OS, anti-virus, etc.) on devices during non-peak business hours only
Results	<ul style="list-style-type: none"> • Higher productivity in the field • Achieved 100% ROI within 7 months after deployment

Exhibit 7**Case Study: Healthcare Provider**

Source: Netmotion and Yankee Group, 2008

Company	Leading Healthcare Provider
Solution	Mobile VPN on 750 clinician mobile handhelds, tablets, laptops, bar code scanners and medical devices (soon to be 1,000)
Connectivity Challenges	<ul style="list-style-type: none"> • Wi-Fi coverage gaps caused interruptions to critical applications • Each interruption required a re-login, application restart and re-entering lost data • High HIPAA compliance standards, which required VPN and data protection tools • High user frustration because network roaming was cumbersome and required user intervention • Unable to connect hospital assets to the wireless network because of wireless coverage gaps and static IP address requirements
Benefits	<ul style="list-style-type: none"> • Seamless roaming among various networks using network persistence • No network connectivity interruptions—eliminates application re-boots and lost customer data • HIPAA compliance standards met to ensure uncompromised patient data (AES 128-bit encryption; lost devices are automatically quarantined from the corporate network) • Real-time visibility of device activity, such as application usage, device connectivity and battery life performance • Creation of static virtual IP address, which enables hospital equipment to mobilize to any location within the hospital while retaining network connectivity
Results	<ul style="list-style-type: none"> • Faster patient diagnosis and treatment • Optimized medical asset management by keeping devices in service for longer periods of time • Provided real-time patient information to speed room preparations • Reduced time to receive X-ray results from 45 minutes to 90 seconds • Better reliability of connected devices

V. Conclusions and Recommendations

To manage and secure a mobile workforce, enterprises must adopt a comprehensive solution designed to address both the current and the anticipated needs of their users and organizational business objectives. Despite a variety of challenges to mobility adoption, solutions exist that enable organizations to overcome these issues while ensuring the productivity and effectiveness of their mobile workforces.

Recommendations

- **Understand the endpoint and the end user.** The various types of remote access solutions offer specific strengths and weaknesses. It is critical to select the right solution for the endpoint, the end user and the functions performed when that endpoint is mobile. At the same time, the solution needs to balance the needs of the business (manageability, security, etc.) with the needs of the end user.
- **Recognize manageability as critical.** Policy control and management capabilities need to be key evaluation criteria for any remote access solution. If corporate policies cannot be enforced and the solution and the endpoint cannot be managed, the actual level of security and user productivity provided will be limited.
- **Work with solution providers to address the needs of specific workforce segments.** Businesses shouldn't necessarily look for a one-size-fits-all solution when it comes to addressing enterprise mobility. Different workers will have different needs. A business can still realize a solid ROI and productivity gain by addressing specific worker segments, such as fieldforce or executives, without breaking the bank.



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