Citrix: Liberating the Desktop Through Virtualization Innovation

An ENTERPRISE MANAGEMENT ASSOCIATES® (EMA™) White Paper
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Table of Contents

Executive Summary .......................................................................................................................... 1
The Business Challenges of the Distributed Desktop ........................................................................1
Citrix: Delivering IT as an On-Demand Service ............................................................................. 3
  Pioneer and Visionary .................................................................................................................... 3
  Going Virtual with Citrix: The Choice of More than 230,000 Customers Worldwide .................... 4
  Citrix XenDesktop: The Advantages of Hosted Desktop Virtualization ....................................... 5
  Deliver Applications as an On-Demand Service ......................................................................... 6
  Optimizing the Data Center ........................................................................................................... 7
  Security, Risk Management and Compliance Benefits .................................................................. 7
  Citrix and the Web: Better Together ............................................................................................. 9
  Going Virtual to Enable a Virtual Workforce .......................................................................... 10
EMA Perspective ............................................................................................................................ 11
Executive Summary

With the rise of distributed computing and the personal desktop, enterprise IT underwent a radical change; from a centralized model over which the business maintained tight control, to a ubiquitous computing model that enabled individuals to have much greater freedom and flexibility in a truly “personal” experience. Today, with the rise of global Internet connectivity, the consumerization of IT and the desire for a self-service environment, IT organizations are faced with an ever expanding list of worker preferences and devices, increasingly owned by the individual – from PCs to smartphones to netbooks – for which they must securely deliver corporate data on demand.

These widely distributed network of desktops and the proliferation of user devices often means significant burdens of both administration and cost, and a fear of a rapid and alarming acceleration of security threats. Many are finding new answers to these challenges in the emerging and dynamic field of desktop virtualization. With the right approach to virtualization, organizations continue to achieve greater levels of business agility and productivity by making enterprise data available to workers when and where they need it while simultaneously ensuring that corporate data is protected. Virtualization solutions help IT organizations reduce complexity and lower cost of infrastructure and operations, provide stronger protection for intellectual property and data privacy, ensure easier fulfillment of compliance requirements, and achieve improvements in scalability, performance and utilization of associated networks, systems and facilities. Businesses can now take advantage of virtual computing to deliver information resources on demand to any device, including those provided by employees or other personnel themselves. These capabilities support business initiatives such as facilitating branch office expansion, shrinking the time to value for mergers and acquisitions, attracting, on-boarding, re-assigning and retaining workers, reducing facility costs and ensuring workforce continuity.

Managing these requirements, however, can quickly spread available resources very thin. In this paper, ENTERPRISE MANAGEMENT ASSOCIATES® (EMA™) analysts examine how desktop virtualization delivers these values in light of the Citrix product portfolio. Long a pioneer in this field, Citrix continues to be a visionary force in desktop virtualization. Today, Citrix offers virtualization technologies that enable businesses to quickly and securely provide applications and desktops to workers anywhere, using any device, with granular access controls that help to maintain tight, centralized control over the user and distribution of sensitive data. Business and technology professionals will learn how desktop virtualization with Citrix has become a strongly competitive answer to costly and resource-intensive legacy approaches to desktop computing, and a solution to many of the most burdensome business and IT challenges of distributed desktop and application management.

The Business Challenges of the Distributed Desktop

The IT revolution introduced by the personal computer, the development of applications, the global Internet, and the introduction of mobile-based devices (including smartphones and netbooks) over the last two decades have made a high-performance IT experience accessible from virtually anywhere. As a result, businesses (and workers) today demand ubiquitous access to information in order to remain competitive—but these advantages have come at a cost.
To say that this revolution poses some of the biggest IT challenges and expense faced by businesses worldwide would be an understatement of the first order. Managing current environments poses no small challenge for the distributed organization, particularly one faced with limitations of resources and personnel for managing a large number of distributed systems spread throughout a wide range of geographies. This leaves many enterprises wondering: “given all the advances in computing technology over the past two decades, why does IT continue to be encumbered by the limitations of legacy technologies that keep it from falling short of its promise to meet business demands?”

The answer lies in part in the paradox of the desktop system, whose most salient value is also one of its chiefest limitations—it is a self-contained environment where all execution is local. Accessibility to desktop application functionality typically requires access to the desktop itself. This means that each individual desktop system must be touched when the installation, maintenance and support of applications or underlying resources is required. For application management, obsolescence and backward compatibility, the coexistence and conflicts among multiple versions and security are just a few of the challenges with which IT must grapple today.

Note that the IT revolution has not been universal. Business desktops typically require shared or networked resources such as network filesystems and corporate storage, shared applications such as calendars and messaging, collaboration and enterprise or line-of-business applications, and print services. These, in turn, require the business to provide the necessary underlying IT infrastructure. In many cases, organizations end up with local “islands” of computing, isolated from the rest of the organization, just to support the wide variety of applications and application demands typical in today’s distributed business. Such islands may be local branch offices forced to maintain their own computing resources separate from a parent organization. They may also be mobile devices, designed to be highly portable as well as personal, yet just as disconnected from the enterprise.

The result of this situation is the complication of desktop management for distributed organizations, who become faced with serious (and often highly expensive) challenges for assuring a high degree of IT reliability and consistency throughout the enterprise, not to mention security for sensitive information. Enterprises have sought to circumvent these limitations through approaches such as client-server applications and delivering applications via the Web. Client-server approaches, however, typically require a client designed for a specific application. The Web solved many of these challenges with a ubiquitous and flexible client that could be adapted to a wide range of applications—but the Web does not always replace locally executing desktop programs, or does not always provide a suitable replacement.

Legacy approaches to desktop computing still do not solve the underlying challenges of managing the personal desktop system and its many different applications, particularly when the desktop or its supporting infrastructure is not as powerful or up-to-date as current technology.

Above all, these approaches still do not solve the underlying challenges of managing the personal desktop system and its many different applications, particularly when the desktop or its supporting infrastructure is not as powerful or up-to-date as current technology. Because of their limitations in delivering a suitable desktop experience, they often restrict the way users work. They may also
inhibit the adaptability of the organization to the fast-changing demands of business, and the need to tailor the user environment to requirements that may change daily. How does the business strike the right balance between flexibility and control? The increased advancement of more capable mobile and personal devices will only exacerbate these issues as they expand the reach of personal computing.

Citrix: Delivering IT as an On-Demand Service

Citrix believes that answers to these challenges can be found in its family of desktop virtualization products and enabling resources that help enterprises overcome these obstacles and truly deliver IT as an on-demand service to workers anywhere, using any device. The Citrix philosophy has been to take a strategic approach to the desktop and desktop applications, disconnecting the hard-wired logic from the desktop environment and application type in favor of a flexible architecture for desktop and application virtualization and delivery that is secure, scalable and mobile-enabled.

Today, Citrix is executing on that philosophy by offering desktop virtualization solutions that empower the business with choice, delivering an optimal desktop experience and offering workers self-service, on-demand desktops and applications delivered to any device.

Pioneer and Visionary

Citrix technology enables enterprises to virtualize individual desktop applications as well as deliver a complete Windows desktop experience, even for devices as constrained as mobile phones. It gives businesses the option of balancing local execution with virtualized applications while preserving centralized control for both, by “streaming” the physical delivery of selected applications as well as components of the desktop itself, for local execution on the desktop host.

The story of Citrix began with virtualization. Citrix was one of the first to abstract multiple instances of the Microsoft Windows environment from underlying physical resources on a centrally managed server and deliver each instance to an individual user—a pioneering approach to what is today known as Virtual Desktop Infrastructure (VDI). Client-side Citrix technology enabled this virtualized environment to run “on top” of a range of underlying systems, with no modification of the underlying host required aside from installation of the Citrix client.
This innovative technology brought a number of new values to the enterprise. By enabling the definition of the desktop environment on a centralized server, it allowed the business to exert consistent and direct control over each instance of a virtualized desktop or individual desktop application, while simultaneously isolating it safely from the underlying client-side system. At the same time, it provided for a measure of latitude given to individual users to customize their virtual desktop experience, allowing businesses to strike the right balance between centralized enterprise control and individual preference that best fit a specific organization.

Today, these values continue to power the heart of Citrix desktop virtualization—but they have evolved far beyond their original concepts. The Citrix experience enables information resources to reach centralized office workers as well as the most highly distributed, mobile workforce, regardless of endpoint or constraints on network bandwidth. This enables businesses to extend enterprise computing into places that might otherwise be beyond reach. With innovations such as Citrix HDX Technology, today’s Citrix portfolio can also take full advantage of network and desktop system resources to deliver a “high definition” experience, powered by automated detection of available capability, and supplemented by Citrix assets that optimize the remote or branch office environment. These speak to the pioneering vision of desktop virtualization that remains strong at Citrix, and which will be extended into the future as concepts such as the client hypervisor take shape.

**Going Virtual with Citrix: The Choice of More than 230,000 Customers Worldwide**

In essence, hosted desktop virtualization executes the user’s desktop environment in the data center while maintaining the same local experience, with full use of local devices and printers. This approach allows enterprises to deliver multiple instances of a single defined desktop environment and applications to multiple users, without installing each individual application on the local system or device. The ability to deliver this experience across a wide range of network and infrastructure terrain enables a highly mobile, distributed workforce to access applications of any kind, from anywhere.

More recent innovations such as streaming enable the data center to deliver locally executing components of the desktop, including entire applications, or even different, independent versions of the same application, to the desktop system. Streaming enables the enterprise to centrally define and control the delivery of applications, even when executed locally, and can be used in concert with virtualization to deliver a more complete—yet still centrally managed—desktop experience.

In addition to the ability to extend any application to any user on any device, anywhere, desktop virtualization also offers benefits in the data center similar to those of server virtualization, through the value of consolidation and pooling of resources that virtualization enables. Individual desktop environments and applications can be managed much more cost-effectively in the data center rather than scattered throughout the business. Updating desktops and applications can be accomplished in hours rather than months, and with less manpower, freeing IT staff to work on more strategic initiatives. Security is improved because application data either never leaves the data center or can be encrypted at the endpoint, while the application itself is under more strict control, with more finely grained access control managed in the data center rather than on each individual desktop. This also makes backups much easier to accomplish and secure. Significantly expanded user mobility is also now possible, when users can gain access from any device—including personal devices provided by
the user—because the desktop and its applications are centralized. Business continuity is easier to address for the same reason: it is much easier to replicate the data center than large numbers of distributed desktops or desktop applications, and easier to provide access because users can access applications or their desktop environment from anywhere with any device. The list continues, from branch office management and expansion, to immediate time to value for mergers and acquisitions, and to teleworking initiatives. As these illustrations suggest, the power of virtualization, extended to applications and to the desktop itself, offers tremendous cost efficiencies and productivity enablers to businesses and IT organizations.

Citrix XenDesktop: The Advantages of Hosted Desktop Virtualization

As mobility continues to re-define the personal computing experience, virtualization technologies are re-defining enterprise IT. Together, these two trends are driving significant interest in desktop virtualization, as a primary technology for enabling today’s enterprise with ubiquitous mobility for even the most hard-to-reach device or location, as well as for the most demanding applications. For the user, desktop virtualization allows them to maintain consistency in their personal computing experience. Personnel that move frequently and freely throughout the workplace such as healthcare professionals, or highly mobile workers who need access to a consistent and reliable desktop experience from any location and device, will find it preferable for their desktop environment to follow them wherever they go, regardless which desktop system may be nearest.

Citrix desktop virtualization provides all these values to today’s enterprise, but today’s Citrix XenDesktop goes farther still. For applications that demand a high performance in real time, such as streaming video, teleconferencing, or graphically intensive applications, Citrix HDX Technology delivers such a “high definition” user experience. The automated detection capabilities of Citrix FlexCast determine how network and system resources can be optimized for the best performance, enabling Citrix HDX Technology to deliver optimal real-time performance for rich or complex applications.

These capabilities are vital to a truly comprehensive desktop experience. Users expect their desktop environment to provide the same experience, regardless how delivered—no small demand, considering the range of endpoint functionality available today. Citrix HDX and FlexCast technologies enable desktop virtualization to meet these expectations, making XenDesktop a choice for desktop computing that fulfills user expectations while easing burdens of desktop management across the mobile, distributed enterprise.

One of the biggest challenges of endpoint management is the extreme variability in the endpoint itself. Organizations must often support multiple vendors and models of devices, from desktop PCs to newer, more capable mobile form factors such as Apple’s iPad. These end-user platforms may vary widely in system capabilities, types, age and performance. By delivering a consistent, centrally managed and delivered desktop experience regardless of endpoint device, XenDesktop can significantly reduce the
impact of managing a wide variety of endpoints, regardless of capabilities, types, age and performance. This approach also offers substantial security and compliance benefits, by reducing the variability of the endpoint and providing more effective control over endpoint changes that can directly introduce security or compliance risks.

Another example of how desktop virtualization enables today’s enterprise is the organization that seeks to give its personnel greater latitude in the type of personal system or device they bring into the workplace. Many would prefer to be able to bring in a system of their choosing, but enterprise constraints over the type of platform needed for business-critical applications often limits this freedom of choice. This limitation would not be necessary, if the enterprise desktop environment itself could be virtualized in a way that would enable it to be abstracted from any underlying device. Such an approach would also give the enterprise greater and more direct control over issues such as the security of business applications and data.

Citrix XenDesktop enables businesses to deliver a “high definition” desktop experience as a centrally hosted service. XenDesktop allows the enterprise to define a consistent desktop for each individual, group, or role within the organization, with the proper complement of applications for each. It relieves concerns over desktop use that may negatively impact the availability of critical resources and lead to increased service desk calls. It enables the business to control access to sensitive information resources, keeping important applications and their data within the data center, and relieving many other concerns of distributed desktop computing, while delivering a highly responsive desktop experience that satisfies user expectations.

**Deliver Applications as an On-Demand Service**

Virtualization can be used to empower the “all-terrain” delivery of applications as well as the full desktop experience, and in this realm as well, Citrix has capitalized on its pioneering expertise with expanded capabilities for delivering any kind of application—including desktop and traditional client-server applications—to any device, anywhere, as an on-demand service.

Today’s Citrix offers major new enhancements such as HDX technology that delivers a “high definition” experience for applications of all kinds, including those that embrace demanding content such as streaming video or graphically intense applications such as computer-aided design (CAD) systems. Enhanced scalability and improved ease of centralized management have high appeal for the enterprise, as does integration with Microsoft technologies such as App-V and Windows Server 2008 R2. Citrix also supports self-service application provisioning through an application “storefront” concept and provides a means for distributing these virtualized applications to multiple personal devices including PCs, Apple Macintosh computers, smartphone, netbooks, and even the popular Apple iPad with Citrix Receiver.

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One of the primary virtues of Citrix is the performance benefit it delivers to users, especially users accessing applications remotely. With a small footprint on the client system and its lightweight impact on network resources made possible by patented compression technologies, Citrix delivers excellent user performance even over low speed access connections. This helps IT to make the most of scarce resources, with an impact typically far less than many desktop or client-server applications themselves. This aspect of virtualization has proven to be a key enabler for business initiatives such as branch office expansion, on-demand access from anywhere, and workforce mobility where high latency and low bandwidth must be overcome—a not-uncommon challenge facing the truly global enterprise.

Citrix leverages this wide range of capability to deliver the application delivery approach that best meets their needs. When seeking to extend distributed IT more manageably into challenging environments such as new markets or remote territory where IT resources may be scarce, Citrix may be the option of choice for consistently delivering business applications throughout the enterprise, and getting control over the challenges of distributed desktop application management. When the emphasis is application performance balanced with centralized control, Citrix can deliver an application experience that compares favorably to local execution, even for the most demanding applications, enabled by technologies such as Citrix HDX.

Optimizing the Data Center

As a pioneer of virtualization, Citrix has grown to embrace a truly all-encompassing portfolio of solutions for server, desktop and application virtualization and optimization. In the data center, Citrix XenServer provides the resource consolidation and IT optimization advantages of server virtualization, a technology embraced by organizations for improving the efficiency and agility of IT. Server virtualization offers substantial cost advantages by helping to assure more complete resource utilization—a technology of high value in the current economic climate while enabling IT to be more responsive in serving the business. What in the past may have taken days or weeks if not months to provision in the physical realm, server virtualization can make available to IT's customers within hours, or even minutes, through the advantages of server virtualization.

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Security, Risk Management and Compliance Benefits

In recent years, the alarming growth and increased sophistication of security threats as well as expanded regulatory compliance requirements worldwide have increased demands for better IT risk control. Organizations worldwide are under increased pressure to protect sensitive information such
as personally identifiable data and intellectual property. Adding to these concerns today are the security pressures arising from an increasingly mobile workforce and a profusion of highly capable personal devices. These factors have accentuated the security and risk mitigation values inherent in Citrix desktop virtualization.

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When desktop environments and applications—both client and server components—can be run in the data center, they can be maintained and defended with much greater reliability than depending on the best efforts of individual users. This also supports not only regulatory compliance, but compliance with internal security policy as well. With Citrix XenDesktop, data never leaves the data center. Desktop virtualization allows data itself to be kept off endpoints where it may be exposed to lost control. When data must be accessed directly on the endpoint device, Citrix also supports data encryption on the endpoint to support a more comprehensive approach to data security. Together, these features help safeguard confidential information such as personal identities and corporate intellectual property—a high-value capability in an era of sharply increased sensitivity to the security of information itself.

These values have played a significant role in the wide adoption of Citrix in risk- and compliance-sensitive environments such as financial services, healthcare and government, where a high premium is placed not only on security for sensitive information resources, but on cost efficiency as well. Business services such as legal organizations and real estate companies may also see value in such an approach, particularly when supporting a highly mobile and distributed workforce. Manufacturing concerns stand to benefit as well, when desktop and application virtualization eases the delivery of vital information resources throughout highly demanding physical environments such as the manufacturing floor, or in geographically dispersed plants, warehouses and business locations. These Citrix XenDesktop values can help enterprises to address a wide scope of regulations, standards and industry practices having a direct impact on risk management and compliance in IT worldwide.

Finely grained Citrix access control capabilities are another key enabler of these values. When accessing enterprise functionality remotely, through desktop virtualization as well as through the Web, organizations will want to assure a highly granular level of control over access to critical resources. Enterprises may want to consider factors such as the device and/or context of access—from a coffee shop rather than from the office, for example, before delivering sensitive information remotely. Citrix offers more granular access control in assuring that access to the right applications and data are delivered to the right users under the right conditions, with comprehensive auditing and tracking of activity enabled to support compliance and risk priorities.

As a result of these security and risk management benefits, businesses are identifying several strategic opportunities to leverage virtualized desktops for a broader segment of their workers and business operations. For example, having centralized, consolidated control over data can be a key enabler for business process outsourcing, where organizations can give outsourcing providers secured and
monitored access to the resources they need to complete their work, but without ever letting corporate data assets leave immediate enterprise control. Another example is business continuity planning. By enabling the organization to work from a variety of locations, devices and connections, the business is made inherently more resilient to interruptions of any sort. In the case of a health pandemic, severe weather emergency, facility outage (due to air conditioner failure, for example), or transportation outage (due to a strike, for example) affecting critical numbers of staff, remote working could be vital to the organization enabling productivity during sustained workforce displacement.

Together, these factors make Citrix XenDesktop the preferred resource of many enterprises for secure hosted virtualization of the desktop itself and a high-impact solution for securely delivering applications. Citrix desktop virtualization enables resources ordinarily chained to a highly distributed, support-intensive model to be delivered essentially any time, anywhere, across a wide range of form factors, while minimizing the risk exposure of sensitive data and computing resources.

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Citrix and the Web: Better Together

Increasingly, businesses turn to the Web as the preferred means of application delivery. As a universal client, the browser can also serve as a universal endpoint for desktop virtualization. Citrix NetScaler helps optimize the delivery of Web applications, improving performance and reducing latency for Web applications that helps businesses deliver a more complete range of functionality via the Web, including desktop virtualization when delivered via the browser.

Conversely, the Web browser delivered via Citrix can also optimize management of the browser itself, giving greater control over end-to-end Web resources. The browser is also a desktop application, and Citrix enables the enterprise to virtualize the Web browser and its plug-ins just as effectively as other important applications. The Citrix client executes locally on the end-user system, accessing the Web browser and its plug-ins running within the virtualized environment in the data center. End users experience significantly improved response times due to the more powerful execution resources of the data center coupled with proven Citrix bandwidth efficiencies. Browser plug-ins can be more effectively managed when the browser itself is centralized in the data center, rather than the need to support tens, hundreds or thousands of browsers distributed throughout the enterprise.

Perhaps most importantly, in light of increased security threats that target the browser and its plug-ins, security and compliance can be enhanced when browser and plug-in risks can be more directly controlled in the data center by professionals rather than by end users. Here again, the use of virtualization means that no application data need ever leave the data center. It also enables the ability to encrypt data at the endpoint if needed. Either way, virtualization gives organizations choice while further limiting data security risks common with Web applications.
These are just a few ways in which the combination of Citrix virtualization solutions gives businesses a wide range of opportunities to make the most of its application choices.

**Going Virtual to Enable a Virtual Workforce**

With the increasing mobility of the workforce, and the increasing capability of personal devices supporting that mobility, desktop virtualization continues to extend the horizons of the possible in IT. No longer need organizations be hamstrung by legacy approaches to IT that depend directly on the inflexibility of physical resources and network constraints. With a portfolio of solutions that enable businesses to readily extend both existing application and desktop environments as well as new application technologies to any endpoint, Citrix helps businesses worldwide take advantage of the IT revolution brought about by “smart” personal devices and the ability to network from anywhere.

As desktop virtualization continues to play a leading role in expanding these horizons, Citrix continues to extend its leadership in this increasingly valuable domain. Already, Citrix has expanded its reach to consumer and mobile devices, with technologies such as the Citrix Receiver enabling virtualization to reach to popular devices such as the Apple iPhone and iPod, BlackBerry, Windows Mobile and Android devices along with any laptop, desktop, Mac and netbook including Apple iPad. Tools such as Citrix Dazzle enable enterprise personnel to select specific applications from an easy-to-use “menu” of choices, regardless whether virtualized in the data center or streamed locally to the physical desktop or personal device. This helps further reduce the administrative overhead of desktop application management and gives individuals greater latitude over the personalization of their desktop environment.

Organizations benefit from the fact that Citrix virtualization enables the delivery of IT as an on-demand service. Citrix virtualization products and technologies ensure the availability of an organization’s information infrastructure, and guarantee that essential data, application and desktop resources are securely accessible on-demand by users operating at any location with any device. As a result, the investment made in Citrix will pay dividends in many ways through increased business agility, improved user satisfaction, greater adaptability to changing business conditions and ensuring business continuity. New offices can be brought online in hours, greatly facilitating branch office expansion initiatives and significantly shrinking the time to value for mergers and acquisitions. On-boarding workers can happen quickly and outsourcing projects can be managed with greater control. Further benefits include reduced complexity and lower cost of infrastructure and operations, stronger protection for intellectual property and data privacy, easier fulfillment of compliance requirements, and improvements in scalability, performance and utilization of associated networks, systems and facilities. According to Citrix, the company’s products are in use at 98% of Fortune 500 companies and over 230,000 customers worldwide, making it a preferred choice for many of the world’s most demanding organizations.
EMA Perspective

As the early leader in the category of server-based computing for the Windows environment, Citrix was also an early thought leader in desktop virtualization. Through the careful cultivation of its strategy and portfolio, Citrix has not relinquished this lead. Indeed, it has expanded the scope of its virtualization portfolio, and extended its leadership through acquisition as well as organic development. Today, Citrix continues to be a dominant force in the field of desktop virtualization. It continues to break new ground in virtualization for mobile devices such as Apple iPhone and iPad, Android, Blackberry, Windows Mobile and other personal devices, and in expanding both the quality and capability of virtualization through techniques such as HDX technology. Recently, the company announced the development of the XenClient desktop hypervisor for Type 1 desktop virtualization, which could have an equally significant impact on the endpoint experience. Citrix’s commitment to the organic development of technologies such as application streaming and Citrix SmartAccess™ technologies for advanced access control, and Citrix SmoothRoaming™ for seamless mobility that enables a consistent desktop experience to follow the user regardless of desktop device or location, provide ongoing evidence of the Citrix dedication to expanding the frontiers of desktop virtualization.

One of the most significant reflections of Citrix’s long-running success in grasping the direction of desktop virtualization is the competition the company has inspired. If imitation is the sincerest form of flattery, Citrix has been flattered by some of the most potent competitors in the industry, some of whose offerings are directly derivative of Citrix innovations. EMA expects that the Citrix answer to this competition can be found in the remarkable loyalty of its customer base. This loyalty is the result of innovation as well as strategic vision and market execution, and has been successfully sustained for more than a decade. This success is well supported by the leadership exhibited by the more recent additions to the Citrix portfolio.

Looking to the future, EMA sees Citrix as being in an excellent position to continue its leadership in helping the enterprise to solve its desktop and application delivery, access and management challenges, particularly for the virtual and highly mobile workforce. Streaming technologies that support centralized definition, control and delivery of desktop applications and components are a precursor of approaches to virtualization that promise ultimate mobility for the end-user device. With the emergence of the “bare metal” client hypervisor, enterprises will be able to assure more direct control over the desktop environment itself, when it can be deployed in a virtual space owned by the enterprise, alongside any other environment useful to the user. The challenges of administration for such endpoints can be more directly controlled by the enterprise as well, when it has strongly controlled access to underlying management capabilities embedded on the end user device itself. For environments that include a
growing range of mobile devices and new definitions of personal systems such as the Apple iPad, virtualization offers the potential to allow users to retain high latitude over device capabilities—including the ability to bring their own preferred systems and devices into the workplace—while enabling the enterprise to define, control and secure the resources it requires on each.

These forward-looking capabilities hold great promise for the business seeking to expand its frontiers into new territories or markets. The ability to centrally deliver, define and control the desktop and mobile environment has high value in reducing many of the high costs of breaking new business ground, while simultaneously assuring a higher degree of control over security, regulatory compliance, and other risk management priorities faced by the expanding business. Most importantly, it enables the growing business to maintain a high standard of performance and availability as well as control over a wide range of risks for enterprise IT resources throughout its organization, no matter how widely distributed, or how difficult the IT environment may be in the field.

This ability to free the business from many of its most aggravating desktop computing constraints has enabled Citrix to be a preferred solution provider along multiple fronts, and has done much to assure that Citrix leads the short list of preferred suppliers for solving difficult desktop management challenges for businesses in many fields. In Enterprise Management Associates’ view, this success means that Citrix will continue to define—and re-define—its various markets, extending the boundaries of desktops and freeing them from their constraints well into the future.

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About Enterprise Management Associates, Inc.

Founded in 1996, Enterprise Management Associates (EMA) is a leading industry analyst firm that provides deep insight across the full spectrum of IT and data management technologies. EMA analysts leverage a unique combination of practical experience, insight into industry best practices, and in-depth knowledge of current and planned vendor solutions to help its clients achieve their goals. Learn more about EMA research, analysis, and consulting services for enterprise IT professionals, lines of business users, and IT vendors at www.enterprisemanagement.com or follow EMA on Twitter.

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Corporate Headquarters:
5777 Central Avenue, Suite 105
Boulder, CO 80301
Phone: +1 303.543.9500
Fax: +1 303.543.7687
www.enterprisemanagement.com