access ON DEMAND

WHITE PAPER

IT Efficiency

DELIVERING BUSINESS BENEFITS, MEASURING BUSINESS IMPACT

CITRIX®

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Introduction

Decade after decade and across organizations throughout the world, each successive wave of computing, from mainframe to minicomputer to PC to client-server to the Web to Java to Web services, has been piled on top of its predecessor. Today, these technologies continue to provide organizations with best-of-breed capabilities, sound economic return, and strategic value — but the cost to maintain them drastically limits IT in its ability to support business growth.

In recent years, organizations and their key executives, along with industry experts from Gartner to Forrester to IDC, have come to recognize that IT groups must reduce the cost of owning and maintaining technology systems in order to re-deploy those funds to business-enabling IT projects. Driven by the diverse and far-reaching requirements that are shaping an organization's ability to effectively compete and succeed in today's business landscape, IT efficiency has become paramount: costs must be reduced, productivity must be increased. It is no longer acceptable to continue using most of the IT budget simply to support existing IT investments.

Improving IT efficiency, however, is not a simple matter. The IT infrastructure has become extremely complex. The user environment has changed completely, now characterized by its dynamic nature. The risks to security of information are vast, far exceeding the power of patches and passwords alone. As a result, if IT is to support the organization's ability to compete, grow, and prosper, IT groups need to focus on a new way to approach IT operations — instead of focusing on the status quo.

Together, the new and broad challenges of today's business landscape and the consequent implications for IT teams suggest that a strategic approach to improving IT efficiency will yield the best results, both immediately and in the flexibility to meet new challenges over time. This requires:

- **A foundation** that is secure by design, not by chance, to help eliminate the traditional compromise between security on the one hand and productivity and profitability on the other.
- **A platform** that delivers an integrated, end-to-end architecture, to close the gaps inherent in a fragmented approach to IT operations and to reduce their related costs and inefficiencies and the consequent inability to support business goals.
- **A solution** that will help an organization to improve IT efficiency, reducing the need for custom integration of individual products, accommodating legacy as well as future technologies — and everything in-between, and providing easy extensibility to meet an organization's requirements and priorities over time.

This white paper examines the business benefits and business impact delivered by such an approach when it is used to address some of the key concerns, challenges, and issues confronting the CTO and the IT group today.

Real Metrics of Business Impact

As the global leader and most trusted name in on-demand access, Citrix since 1989 has been helping organizations to tie together information resources, access devices, and networks — securely and cost-effectively — and to leverage the power of access for the success of their business initiatives. In fact, Citrix was the first company to understand how organizations use access to run their business, and to deliver an access platform with access solutions based on the customer's perspective. Citrix solutions help IT both to improve operating efficiencies and to directly support their organization's business goals.

Today, more than 180,000 organizations around the world use the Citrix Access Platform to drive IT efficiency and to transform the way their business grows through initiatives ranging from leveraging current IT investments to recovering from a disaster. This includes 100% of the *Fortune* 100 companies and 98% of the *Fortune* Global 500, as well as hundreds of thousands of small businesses and individuals.

On-Demand Access Holds the Key

These customers are using Citrix solutions to do more than simply "keep the lights on", reporting impressive results in improving IT efficiency with lower operational costs, higher productivity, and opportunities for innovation, thereby enabling them to better advance and support their organization's business goals and objectives. For example:

CZ

One of the largest independent health insurance organizations in the Netherlands, with 2,200 employees providing services to over two million people, uses Citrix Presentation Server™ to provide on-demand access for local, remote, mobile, and home-based employees to over 150 applications. The Citrix solution has enabled CZ to reduce IT staff for help desk and local support in two of its three headquarters, while at the same time increasing the level of IT service and flexibility, efficiency, and satisfaction of users.

"We expect to save about 600,000 euro every year over the next five years as a result of migrating to Citrix Presentation Server."

— Jeroen Kuijlen, Director, ICT & General and Technical Services, CZ

Frost Brown Todd LLC

This full-service business law firm, the largest group of legal professionals between Chicago and Atlanta, with seven offices in Ohio, Kentucky, Indiana, and Tennessee, uses Citrix® GoToMyPC® Corporate to provide more than half of the firm's 350 attorneys with on-demand remote access to their office desktops from anywhere. In addition to improved productivity, the Citrix solution saved Frost Brown Todd the costs of implementing a VPN, including hardware, software, and administration, and has enabled the firm to avoid the cost of purchasing about 110 laptops, a savings of over $500,000.

"We are getting over 1,000 hours a month in online attorney time. As a result, attorney productivity is up and we are doing a better job of servicing our clients. The ROI is easy [an attorney needs to work only one additional hour per year to cover the cost of a GoToMyPC Corporate license]. We think we are doing much better than that. We're getting a big-time payback and ROI on GoToMyPC Corporate. The other benefit is quality of life, and there is great ROI in keeping people happy. "

— Paul Bromwell, CIO, Frost Brown Todd

Gati Limited

This India-based pioneer in the express cargo industry and market leader in logistics, with more than 2,500 employees in 250 offices, and more than 100 franchisees, uses Citrix Presentation Server to provide on-demand access to the Gati Enterprise Management System (GEMS), a custom-developed ERP application that enables all Gati offices to carry out operations, from capturing pickup requests to tracking consignments. The Citrix solution has enabled Gati to reduce dial-up costs by 50%.

"Citrix architecture has helped connect branches across the country without line disconnection, thereby improving internal efficiencies and enabling better decision-making."

— G.S. Ravi Kumar, CIO, Gati Limited

Kronos Incorporated

Kronos Incorporated empowers organizations around the world to effectively manage their workforce. With the sole focus of delivering software and services that enable organizations to reduce costs, increase productivity, improve employee satisfaction, and ultimately enhance the level of service they provide, Kronos uses Citrix® GoToAssist™ to provide on-demand technical assistance for customers. The Citrix solution has helped Kronos decrease problem-resolution times by a half-hour, saving the company an estimated 11,000 support-engineer labor hours per year and increasing support capacity and first-incident resolution rates by 20%.

"GoToAssist is twice as fast, and that is key for us. Plus, our support engineers and customers have found GoToAssist extremely user friendly. It is a win-win for everyone."

— Mark Ellis, Director of Global Support, Kronos Incorporated

Operational Initiatives: Modernize the Business while Leveraging the Infrastructure

Consider this: typically 70% of today's IT budget is being spent just on *maintaining* the complex mix of information systems that most enterprises have built up over time.[1] As this dramatic statistic has gained increasing recognition in this century, there has come a consequent profound impact on the IT group and its key executives.

Organizations now are seeking IT cost savings through operational initiatives ranging from data center and server consolidation to centralization, with an eye to:

- **Reducing total cost of ownership** (TCO), such as costs for hardware depreciation, costs for organization moves and changes, or charges for remote data centers and business continuity requirements.
- **Reducing capital expenditures,** such as those associated with adding sites in diverse geographic locations.
- **Improving capacity planning and control,** such as leveraging centralized servers to efficiently use existing capacity and to scale to grow without additional investments at each incremental point of scaling.
- **Simplifying operational management of IT services,** such as centralizing functions such as deployment and maintenance of applications and thereby speeding up service delivery while reducing staffing requirements and increasing productivity.

This requires targeting the increasing complexity of the IT environment and successfully controlling its many moving parts, to relieve the pressure on IT and re-direct budget dollars where they really matter — toward growing the business. From the constant struggle to keep critically important business applications up-to-date, secure, and performing adequately, to meeting new requirements driven by such factors as today's mobile workforce or the escalating security requirements of today's regulatory environment, IT groups need a new approach to managing all of these moving parts — instead of the exhausting, frustrating, and expensive effort of trying to solve the challenges with only existing tools.

"Citrix technology has enabled us to remotely deploy enterprise-wide applications with ease, resulting in significant savings in project man-hours and costs."

— Mr. B.V. Dinesh, IT Consultant, Jyothi Laboratories Ltd.

Citrix streamlines IT operations and reduces costs in even the most complex infrastructure environments, extending the use of existing infrastructure. In fact, the more diverse the environment, the greater the value-add of Citrix solutions. For example: Citrix enables organizations to efficiently install, maintain, and support Windows®, UNIX®, Java™ and Web applications in the datacenter, and make them accessible over wired, wireless, Web, and satellite networks to users anywhere, securely and on demand. Plus, Citrix solutions are developed for virtually any platform, from Microsoft® Windows Server™ 2003 x64 Edition to Windows Server 2003, Windows 2000 Server, and UNIX, and for virtually any size of customer, from small businesses and individuals to enterprises ranked among the *Fortune* 100 and the *Fortune* Global 500.

[1] "Best Practices: IT for Growth and Innovation", Forrester Research, March 2005.

HERE'S WHAT CITRIX DELIVERS:

New value that's measurable, immediate and full of opportunity. When it comes to specific initiatives for client-server applications, such as server consolidation and data center consolidation which now are the focus of enterprises worldwide, Citrix delivers new high-value results, immediately — lower total cost of ownership (TCO) for new servers, higher return on investment (ROI) for installed servers, and increased productivity for your users and you, regardless. If your objective is cutting costs, you'll use Citrix to reduce the number of servers for the users and applications you now have, reducing your TCO. If your objective is growth, you'll use Citrix to expand the number of users and applications without adding more servers, expanding your ROI. Equally impressive, you'll be introducing a new opportunity to fuel IT efficiency, both helping the organization achieve goals for the business and increase IT productivity right away.

Consolidate resource requirements across the organization. Citrix enables IT administrators to manage application access for client-server applications from a single location via a consolidated management console that centralizes control and administration of many moving parts. This means IT can use Citrix Presentation Server to consolidate its resource requirements across the organization to improve resource utilization, delivering economies of scale and purchasing leverage across multiple branches and divisions.

Extend the life of PCs and other client devices. Because Citrix enables applications to be run on a central server instead of on PCs and other client devices, the life of these devices is extended by reducing the processing power needed on the client. The capability to run applications from a central location also enables organizations to reduce network bandwidth consumption, which increases application performance and further reduces IT costs. This rolls into a big plus for IT efficiency: it is far easier and more cost-effective for the IT group to install and manage both clients and application data on a central server than to try to manage separate clients and applications on every user's desktop.

Exploit the most efficient way for users to access *all* applications with a *single* password. Citrix fundamentally changes the typical approach for managing multiple passwords, delivering simplified user access and advanced password security to Windows, Web, and host-based applications, both as a standalone solution and as a seamless part of Citrix environments. Instead of forcing users to remember five passwords or 15 or 30, not to mention which application goes with which password, Citrix Password Manager™ requires users to authenticate only once, with a single password for all password-protected applications, and then it does the rest. Password Manager automatically logs into password-protected information resources, enforces password policies, monitors password-related events, and automates end-user tasks — even password changes. On top of everything else, Password Manager is easy to deploy — no scripting, no application-level integration, no changes to your infrastructure, and no additional hardware or software to buy. Plus, it integrates out-of-the-box with leading multifactor authentication devices.

Reduce network complexity and operational costs for Web applications. Citrix® NetScaler® application delivery systems are an ideal replacement for aging load balancers and other traffic management devices. For example, replacing legacy devices with the Citrix® NetScaler® Application Switch reduces network complexity and operational costs, and streamlines the application delivery infrastructure with the industry's leading technologies.

"Citrix NetScaler delivered a 67 percent increase right off the bat. It clearly reinforced for us that our customers were having difficulty getting onto the system, and that we were doing the right thing purchasing the NetScaler system."

— Jay Winslow, Chief Information Officer, Security Service Federal Credit Union

Free server resources for more online users. Citrix NetScaler systems integrate hardware-based SSL acceleration to offload the compute-intensive processes of SSL connection setup and bulk encryption from Web servers. This reduces CPU utilization on servers, enhancing application response times and freeing server resources for more users.

Simplify remote access for everyone. Citrix's universal SSL VPN appliance provides a secure, always-on, single point-of-access to any information resource. The Citrix Access Gateway™ works through any firewall; supports all applications and protocols, including IP telephony; is fast, simple and cost-effective to deploy and maintain via its Web-deployed, auto-updating client; and ensures that devices meet company security standards with a worm-blocking client and integrated end-point scanning.

Deliver applications to the screens of IP phones and wireless devices. The Citrix Application Gateway™ is used by organizations to deliver applications, packaged and/or transformed, to the screens and speakers of IP phones and wireless devices. Citrix® Voice Office is a suite of packaged telephony applications that requires no development work whatsoever. These innovative access solutions complement the Citrix portfolio of products and services by extending on-demand access to both voice and data across virtually any screen size, device type and location.

Reduce help desk costs and invest in growing the business. With its automated password-change process, Citrix Password Manager zeroes in on one of the most surprising costs for the help desk: $200 per user on average for password problems and especially resets, according to Forrester Research. Password Manager automates password resets via user self-service, reducing this cost for your department. Converting password resets to an easy user self-service means reducing IT costs for password resets by up to 85% and that means more money to invest in growing the business.

Accelerate user migrations of desktops and operating systems. Because the client software is kept within the controlled environment of the datacenter, Citrix helps IT accelerate user migrations of desktops and operating systems by eliminating the need for IT groups to physically install and test applications on the end-point devices.

Quickly distribute patches for hundreds of servers and thousands of clients. With Citrix, all applications are located on centralized servers managed directly by the IT department. Instead of updating each of these applications individually, with the same patch distributed to each client and server, each patch only has to be installed once, on a single server which replicates the updates to all Citrix Presentation Servers. This makes it easy to manage patches for hundreds of servers and thousands of clients, including mobile devices that cannot easily be repatriated, eliminating the headache of testing patch programs before their deployment and the need to establish specific schedules for patch programs that are incompatible with the systems in use or those that need servers to be restarted.

Move password management under IT control. Citrix centralizes password management, improving IT efficiency by moving this important capability into the hands of the IT organization and out of the hands of users. This reduces vulnerability to the security lapses of users and to external attacks. In fact, when users leave the organization, there is only one door to shut to terminate their application access — the primary network logon — because IT controls all user passwords.

"With Citrix, our nurses don't have to remember any passwords except their Windows NT logon password. This speeds up and simplifies the roaming process, and supports compliance by eliminating generic logons. To enable our access strategy, we are standardizing on Citrix as the main platform to deliver information resources to users, while keeping total cost of ownership down."

— David Valcik, Vice President, Infrastructure Services, Beverly Enterprises

Easily update operating systems. Because Citrix centralizes client-server applications, the majority of business applications can be hosted on servers, which means the operating system can be shared among all business applications and updated easily. The same Citrix Presentation Server can run the ERP solution, the office suite, the intranet and even the Web browsers.

Efficiently update even problematic applications. With Citrix, updating client-server applications is greatly simplified, particularly in situations in which client software does not natively support automatic or remote updates. Presentation Server addresses this particular issue by allowing all clients, wherever they might be located, to benefit from the latest updated software every time they log on.

Improve IT services for the user. The advantages of Citrix extend to the user as well, enabling IT groups to offer everyone — from employees to partners, consultants, suppliers, and outsourcers — the ability to work from anywhere, with secure centralized information. Plus, with Citrix, user devices can be any form factor, run any operating system, and have low processing power, because both client and server software execute on a robust server.

"GoToAssist meets our support needs perfectly. It has increased our productivity and enabled us to offer a far more efficient support service to the sales team."

— Simon Winsall, IT Manager, Dermalogica UK

Help the business move fast. Citrix dramatically reduces the time and cost of delivering client-server applications — often from months to days or hours — to greatly improve the efficiency of product development, of integrating mergers and acquisitions, of getting branch offices up and running, and of any other business initiative. When it comes to Web applications, Citrix NetScaler application delivery systems can increase the speed of application delivery up to 15 times by leveraging multiple acceleration technologies, including data compression and content caching to speed application response times, and innovative TCP optimizations that enhance the efficiency of both client and server connections, while remaining entirely transparent to application users. Plus, Citrix makes it easy to scale to millions of simultaneous online users and hundreds of thousands of transactions per second with a high-end product line that processes application transactions up to 400 percent faster than the best high-end products available from other companies.

Money, resources, and your end-user community. In addition to developing product families that are built to work immediately and seamlessly with any IT infrastructure, no matter how distributed and diverse, and with each other, Citrix makes sure that any investments in its solutions are also protected over time. Citrix can help IT teams upgrade with the least possible impact on everybody — the users, the business, the IT team. And Citrix can help organizations understand how to overcome the challenges and obstacles of upgrading with a limited budget, or with limited resources, or with limited effects on productivity and revenue. For example: The underlying architecture of Citrix Presentation Server has been the same since it was first released — it is still IMA-based and all the subsystems are the same. What Citrix does with each release is extend the performance and stability of the system, while adding more functionality on top. As well, Citrix continually improves licensing of its software products, ranging from simplifying maintenance to increasing grace periods; makes it easy to manage new products, generally offering the flexibility to turn off new features, for instance; and enables gradual migrations so that organizations can move at their own pace and avoid and avoid any limiting effects on the productivity and revenue generation of the end-user community.

Industry Challenges: Maximize the Assets You Already Have

In many industries, there arise special requirements in order to provide the various services and products around which they are shaped, a factor that introduces distinct challenges for the IT group when focusing on improving efficiency and better supporting business objectives and goals for their organization. These challenges might center on volume, say, or on confidentiality and privacy, or on sensitive financial data.

From government and education to industries such as financial services, healthcare, retail, e-commerce, manufacturing, or telecommunications, IT groups face special challenges that require power and capabilities beyond "keeping the lights on". For example:

For financial services institutions, time is literally money. Applications need to be consistently available, with performance that doesn't waiver. Downtime and even poor response time can mean lost revenue, and lost customers. Security is likewise paramount. In many cases, confidentiality is not only expected, it's legally required to comply with laws, including the Gramm-Leach-Bliley Act, the Sarbanes-Oxley Act, the European Union Privacy Directive, and Basel II. At the same time, the mix of applications such firms must support, in order to service customers and employees alike, grows continually more complex.

Success in retail comes down to having what customers want, when they want it, at a competitive price. Achieving that comes down to getting maximum value out of the supply chain and internal employees, to keep costs under control and preserve margins. With that in mind, retailers are turning to the Web to help them more effectively manage their supply chains. Online inventory tracking systems integrate with order management tools to feed orders to partners up and down the chain. They also connect with internal systems that employees use to check stock data, order status, and other criteria. Similarly, corporate intranets keep employees up to speed on human resources information as well as policies and procedures. Still more online programs manage customer loyalty programs, along with supplier and customer self-help tools. And of course most retailers have an online counterpart that requires stellar performance.

Effective e-commerce Web sites come down to speed and availability; without that combination, customers will quite simply go elsewhere, whether they've just started browsing a site or even if they're at checkout. At the same time, providers know that they need to keep their sites secure against denial of service (DoS) and other attacks, both for the sake of availability and to protect personal customer data, including credit card data. Providing speed, availability and security can be a tall order when sites have a multitude of applications to support, including Web-based catalogs, custom online transaction processing programs, and customer self-help capabilities.

Patient confidentiality has always been a concern in the healthcare field, but since implementation of the Health Insurance Portability and Accountability Act (HIPAA), it's also a legal requirement in the U.S. Healthcare providers thus put a premium on application security and accountability when it comes to handling and maintaining patient records. Yet, to provide the best care, patient records and other data have to be available around the clock, wherever they might be required. Application response time must be optimized, as every second counts. That means providing fast, on-demand access to information to doctors and other providers, whether they are on site or in a remote office-and at low cost. Above all, these individuals must have uninterrupted access to applications and information at the point of care, while they roam from one device to another, and while roaming across multiple wired and wireless networks. At the same time, provider organizations need supply chain applications to handle the constant flow of drugs, equipment, supplies and other necessities, while also providing links to a maze of

insurance providers. Employee and customer resource management programs are required to keep track of workers and patients. Increasingly, patients are also demanding access to data and services via Web-based self-help programs.

For online media providers to be successful, their sites must not only offer valuable content, they must also provide superior performance. In such a competitive market, if the site is sluggish, viewers will quickly go elsewhere. Providing superior performance means having a site that is consistently available, which requires strong defenses against failures, as well as effective security measures, to prevent against DoS attacks. Systems must also be scalable, in order to effectively deal with traffic spikes that are common in the media world-and all without breaking the bank.

"Citrix software is a critical part of a groundbreaking project whose success will benefit the health of a nation, thanks to the collaborative research and teaching enhancements it makes possible. The progress made will allow others around the UK to build on the confidence that has been established within the NHS community to deliver more effective information systems and services — and potentially a more comprehensive approach to public sector information service provision in general."

— Tony Rucinski, Assistant Director and Head of the Strategy Group, Cardiff University Information Services Directorate

Citrix helps IT groups to address this range of requirements, providing reliable, secure, on-demand access to business-critical information resources, enabling organizations to deploy new services faster, improve customer service, control risk, and reduce costs. For example, from one location, IT can deploy new applications and information without touching a single desktop, and deliver legacy applications over the Web without rewriting a single line of code. Heterogeneous environments resulting from mergers and acquisitions can be integrated into a single cohesive enterprise, with all users enjoying reliable, high-speed performance, even over low-bandwidth connections. And Citrix can help organizations do all of this while typically decreasing bandwidth consumption and increasing the capacity of existing server resources — benefits that go directly to the bottom line.

"By the time we get an issue, it's very technical, very detailed and the call can last for hours. GoToAssist is saving us money because it makes our staff more productive. It's very robust, quick and easy to use."

— Robert Bell, Director of Product Support Services, Eclipsys Corporation

HERE'S WHAT CITRIX DELIVERS:

Fast time-to-value and ROI for client-server application deployments, upgrades, and migrations. With Citrix, application changes are made to centralized servers so they can be published and made accessible to an entire organization over LAN, WAN, or Internet — immediately. The key is application virtualization, which minimizes the amount of data that needs to travel over networks, while also enabling centralization over the organization's valuable data assets. Everyone is working with the same data resources, they can be assured that they are always getting the latest information, and their ability to collaborate productively improves significantly.

"All the implementation phases were glitch-free and in line with our timeframe expectations. Citrix Presentation Server not only delivered higher performance and reliability, but also scored high on manageability."

— Mr. C.N. Ram, Head I.T, HDFC Bank

Confidentiality for sensitive data when serving millions of customers online. Web applications provide direct access to some of the most sensitive and valuable data in any enterprise — including financial records, credit card numbers, and customer identity information. But delivering these applications securely is particularly challenging because Web vulnerabilities are generally easy to exploit, and attacks cannot be detected by traditional security products. Web applications require defenses against a wide range of application-layer threats, such as DoS and worm attacks. Citrix NetScaler application delivery systems, which include built-in SSL encryption, have been architected to forward valid client requests to servers and to block illegitimate requests. Plus, because Citrix NetScaler's single, unified device takes the place of a number of point solutions, overall network infrastructures are dramatically simplified, and overall operational costs are dramatically reduced.

One door to the Internet. The Citrix Access Gateway centralizes access control to all applications and data. The advantage is that only one network port needs to open to the Internet, and all traffic is secured by open standards-based SSL/TLS encryption. The result is that the Access Gateway becomes a single point of access, control, and management of remote access.

"The Citrix Access Gateway solution is really going to enable us to do things we could not do before. We could no longer give the level of support we desired with an IPSec VPN implementation based on scalability issues with our manpower. We could not really look at a mobile solution like wireless. We could no longer really look at anything like that if we didn't have an aggregation point that we were comfortable with to be able to support the numbers as the connectivity into our network continues to expand… This solution gets it right, and the Access Gateway has been able to respond to both the economic and technical situations as well as any customer could ask. You've got a baseline feature set here that kills pretty much anything that is out there. Plus, you add on the new innovation like remote control and host check and it's really a no-brainer."

— David O'Berry, Director of Information Technology Services, South Carolina Department of Probation, Parole and Pardon Services (SCDPPPS)

A big help with regulations on access and audits. With Citrix, the IT group can eliminate security breaches that infiltrate when users have more passwords than they can manage, instead of inefficiently and hopelessly trying to chase down sticky notes loaded with passwords. That means secure access to all business-critical information. And that means a big help with regulatory compliance. Citrix Password Manager adds great internal controls over access to information, helping the organization easily handle the vast number of regulatory requirements now sweeping across industries throughout the world. This minimizes the likelihood of severe penalties for security breaches under regulations such as the Sarbanes-Oxley Act in the United States or the European Union Data Protection Directive. In tracking information access, the underlying technology enforces strong password policies, automates password changes, and captures user access data for audits. And consider the increased security level when Password Manager keeps passwords hidden from end users.

Applications delivered to the screens of IP phones and wireless devices, securely. The Citrix Application Gateway is an appliance that is used by organizations to deliver packaged, custom, and transformed HTML-based applications to the screens and speakers of IP phones and wireless devices. Any organization that has an IP telephony system from Cisco, Nortel, Avaya, Mitel, Siemens, NEC, and Alcatel can increase data security with SSL encryption of the application traffic to and from its IP telephones. The Application Gateway is so secure that its software code base is used by the Access Gateway, which is deployed in an organization's DMZ.

End-user performance optimizations and reliable access for client-server applications. Responsive application performance for users is ensured through screen display optimizations, caching, and compression. On the server side, application-level load distribution, CPU management, and memory optimization ensure that users get a reliable, consistent access experience.

A more efficient underlying application delivery network. Citrix NetScaler application delivery systems can increase the speed of application delivery up to 15 times by leveraging multiple acceleration technologies, including data compression and content caching to speed application response times, and innovative TCP optimizations that enhance the efficiency of both client and server connections, while remaining entirely transparent to application users.

"The Citrix NetScaler Application Switch significantly outperformed the other solutions in terms of saving connections to servers, reducing load on servers, and increasing overall performance. It was the clear winner."

— Sean Means, Director of Operations and IT, Ingenio, Inc.

Scaling to millions of simultaneous online users and hundreds of thousands of transactions per second. The new high-end offering of Citrix's market-leading NetScaler application delivery product line raises the bar for Web application delivery with the ability to process application transactions up to 400 percent faster than the best high-end products available from other companies. Unlike traditional networking vendors that focus solely on network-layer performance and packet processing, Citrix delivers application-specific performance gains for the most complex and demanding Web applications and far outdistances competing offerings with the power to accelerate application transactions with more than 275,000 Web (HTTP) requests per second and 28,000 secure (SSL-based) transactions per second.

Comprehensive Web traffic management. The Citrix NetScaler Application Switch distributes traffic and directs client requests to the right application server based on layer 4 or application-layer request data. In addition, the Application Switch provides multiple methods to monitor the health of application servers to ensure continuous application availability.

Security for Web applications. Citrix's patented Request Switching technology enables forwarding of valid client requests and blocking of illegitimate requests. For example, the Application Switch includes built-in defenses against damaging attacks and content-inspection capabilities to identify and block application-based attacks, including DoS and distributed denial of server attacks such as TCP SYN flood attacks, connection layer attacks, SSL flood attacks, and HTTP GET flood attacks.

Ultra security against attacks which evade network firewalls and IPS devices. The Citrix Application Firewall further improves security of Web applications and infrastructure by preventing the theft of sensitive information that might be exchanged via a Web portal, such as credit card numbers, financial data, and personal

identity information. Such application-layer attacks, which target application vulnerabilities, account for nearly 75% of all attacks on the Internet today, according to Gartner, and range from buffer overflow exploits to SQL injection attempts, cross-site scripting attacks, and parameter manipulations attacks.

Remote Access: Doing Business Everywhere, with Everyone

Businesses have been providing remote access for many years, with the CTO and IT teams long contending with the need to provide a computing infrastructure that facilitates easy access to enterprise information, data, and applications. Regardless of whether the need is for access to email, say, or to financial or sales information, the challenge has been the same: easy access and use while providing a high degree of security — factors that are in direct conflict with each other.[2]

Early on, much of that remote access was from a remote site to a central location. However, the Internet has taken remote access and interactivity to new levels of sophistication, and now remote access is thought of as individual access rather than site-to-site access and on a vast scale: IDC estimates that the number of Internet users will double in five years and the level of Internet commerce will increase tenfold.[3]

As well, the need for easy and secure endpoint access to information resources is also being driven by a confluence of factors, fueling the conflict between the aggregated billions of dollars that organizations spend on network security while at the same time requiring that their IT managers and staff expose the IT infrastructure to more users — those who are company employees and those who are not — by providing access outside of the physical enterprise infrastructure. These factors include:

- **Worldwide growth in workforce mobility,** as both developed and undeveloped nations embrace its productivity enhancements and competitive benefits
- **Multi-site organizations,** as companies expand with branch offices, merge with other companies, and outsource a dazzling array of once-internal functions
- **A diverse and expanding set of computing endpoint technologies that is continually being introduced,** now requiring the capabilities to accommodate intelligent devices such as PCs, laptops, tablets, PDAs, kiosks, and smart phones[4]
- **Corporate environments that are facing tighter fiscal and regulatory compliance constraints,** requiring new infrastructure investments to mitigate security vulnerabilities that could be construed as compliance risks, such as augmenting authentication and authorization, centralizing security policy configuration and management, or integrating faster with future Web applications

Together, such factors are driving the need for IT infrastructures to keep pace with evolving remote access requirements and will increase remote access costs. For example, regulators require companies to identify their operating risks and identify the steps that are being — or have been — taken to limit or prevent these risks. One of these risks is that mobile employees are invisible until they need access to corporate information, and there is little way for the corporate network to know if the person at the other end is a trusted, policy-abiding employee. These factors also contribute to the current momentum of security infrastructure development, a cost that kicks in due to the deployment of new infrastructure to increase the level of authentication and authorization, centralize security policies and management, or migrate away from legacy solutions.

[2] "Worldwide SSL-VPN Appliance 2005-2009 Forecast and 2004 Vendor Shares: Delivering Secure Application Access", IDC, March 2005.

[3] "Worldwide SSL-VPN Appliance 2005-2009 Forecast and 2004 Vendor Shares: Delivering Secure Application Access", IDC, March 2005

[4] "Worldwide SSL-VPN Appliance 2005-2009 Forecast and 2004 Vendor Shares: Delivering Secure Application Access", IDC, March 2005

"Citrix has enabled us to maintain our high service quality without having to devote a lot of financial or staff resources to our IT systems. We can deploy all of our applications to any staff member at any location with ease and efficiency."

— Tom Chung, IT Manager, Society for the Prevention of Cruelty to Animals Hong Kong

From conceptual design to customer implementation, Citrix solutions allow IT teams to provide well-managed, secure access for any number of employees, partners, and customers. Citrix builds its products to improve the ease, speed, and security of access for end users, whether this involves a single individual working independently; collaborative teams that come together from many, many geographical locations and organizations, with the need to share information without risk to intellectual property or to productivity as they develop new products and services; learning opportunities for employees and customers, to improve employee productivity and customer service and to control costs; meetings on any scale at any time; or world-class technical support for all.

HERE'S WHAT CITRIX DELIVERS:

High performance over long distances and low bandwidth. By minimizing the need to transfer data and providing user experience enhancements that improve the responsiveness of virtualized applications, Citrix ensures that everyone — from remote workers to contractors, outsourcers, or telecommuters — can be productive, wherever they are.

Remote desktop access that's "like being there". For managers who need the highest level of security and control over remote workers, budget owners who need to manage the costs of implementing IT solutions, and network administrators who need to ensure compatibility with existing architecture, Citrix GoToMyPC is a managed service with fast performance that delivers a "like being there" access experience. GoToMyPC enables remote individuals to access from any Internet-connected computer all of the applications, email, files, and network resources hosted on their desktop, just as though they were sitting in front of their PC. The Web-based screen-sharing technology works with existing firewall and Internet infrastructures, without having to change or open ports, configure IP addresses, or deploy any extra hardware or software.

"GoToMyPC Corporate uses the same security standards we require for everything internally. Multiple levels of authentication, 128-bit data encryption, security time-outs and strong passwords are all important features of GoToMyPC Corporate that are required by our security policy. The security features are head and shoulders above other standalone remote-access products."

— Ross McKenzie, Director of Information Systems, Johns Hopkins Bloomberg School of Public Health

Customer win rates, lead generation, training without travel. With Citrix, the IT group can help the business increase productivity by optimizing customer presentations and meetings — regardless of location, reduce customer acquisition expenses and cost of sales by reducing travel and operational costs, boost sales by expanding geographic reach and accelerating the sales cycle, and keep customers happy with online training.

Citrix® GoToMeeting™ is a Web-based, managed service for conducting online meetings, training sessions, and collaborative gatherings that is easy to use, secure, cost-effective, and fast. This makes it easy for the Sales group to increase win rates and reduce the sales cycle, qualifying prospects before travel and strengthening relationships; for the Marketing team to generate more sales leads, more cost effectively, and to deliver more impactful presentations; and for those teams that train individuals or large groups to minimize travel time and costs and to record and make training events available at any time, to anyone.

Remote technical support as a competitive advantage. Citrix gives organizations the power to provide fast, easy, and secure remote-support services, resulting in a superior customer experience every time. Citrix GoToAssist is an industry-leading, remote technical-support solution that enables organizations to provide best-in-class support over the Internet, on demand and securely. This means:

- **External customer support contact centers** rapidly improve incident-handling time, first-call resolution rates and customer-loyalty metrics. As remote support becomes increasingly adopted by support centers, GoToAssist provides a competitive edge
- **Internal IT help desks** use one solution to remotely support all of their end users, regardless of their location, rapidly resolving complex and mission-critical support incidents and handling increasing call volume without increasing budgets
- **Consultants, system integrators, and value-added resellers** shorten implementation times, extend geographic reach, and win in today's competitive environment with world-class remote support
- **Support outsourcers** cost-effectively provide remote support to small and medium-size businesses

End-user device and system independence. Citrix's broad support for devices and operating systems greatly reduces the complexities of deploying applications to both internal and third-party users.

Maximized accelerated performance, clientless secure remote access. The Citrix® NetScaler® Application Accelerator is a cost-effective solution for enterprises looking to maximize the performance of their Web applications while providing secure anytime, anywhere access to them. The Application Accelerator combines application optimization technologies to speed applications and its flexible

AppCache™ technology supports both static and dynamic content, including a range of time- and event-based invalidation schemes which reduce the number of server resources needed for page re-generations, significantly increasing the performance of applications while decreasing related server costs.

Well-managed, secure endpoint access for client-server applications. Among the greatest benefits that Citrix delivers is the ability to prevent data from leaving the data center, ever, with application virtualization. This is the best delivery method for client-server applications and Citrix set the industry standard with Citrix Presentation Server, which protects information by

- Keeping applications, information, and servers in the data center, eliminating the need to install an application on the user device and minimizing loss of information and the risk of theft
- Controlling, and even eliminating when appropriate, the ability to print, copy, and save to the local device
- Avoiding the transmittal of text over the network, using instead vector graphic updates (partial screen updates), transmitting only screen pixels, keystrokes and mouse movements

- Mitigating the spread of viruses through unprotected client devices
- Building-in policy-based controls that allow IT groups to easily restrict who gets access to what information and when, including limiting system administrators to "restricted / permitted" for a particular range of tasks and responsibilities

"Citrix architecture has helped connect branches across the country without line disconnection, thereby improving internal efficiencies and enabling better decision-making."

— G.S. Ravi Kumar, CIO, Gati Limited

Secure managed services for remote desktop access, meetings, support. Similarly, the security of screen-sharing technology delivers comparable benefits for organizations using any of the diverse managed services of the Citrix Access Platform: Citrix GoToMyPC for remote access to PC desktops, Citrix® GoToMeeting™ for easy online meetings, and Citrix GoToAssist for support staff of external contact centers and internal help desks to provide best-in-class support over the Internet.

Enhanced password security and reduced password support costs. Citrix Password Manager™ provides centralized Enterprise Single Sign-on (ESSO) access for multiple resources, reducing user exposure to multiple passwords and logins and enhancing security while also reducing support costs. It can also enforce password policy requirements, such as strong passwords or password rotation. The value of Password Manager has been recognized by enterprise-class identity management vendors such as Hewlett-Packard, which has partnered with Citrix to make Password Manager the ESSO option for the HP OpenView Select Identity portfolio. Strong authentication is enhanced in the Citrix approach through cooperation with partners such as RSA Security and Secure Computing. These partners enable the integration of measures such as two-factor authentication using tokens, smartcards, and industry identity-linked encryption.

One access point. Citrix provides a secure, always-on, single point-of-access to any information resource via a universal SSL VPN appliance that works through any firewall; supports all applications and protocols, including IP telephony; is fast, simple and cost-effective to deploy and maintain via its Web-deployed, auto-updating client; and ensures that devices meet company security standards with a worm-blocking client and integrated end-point scanning.

"We use about 250 laptops for field sales employees that needed to be updated at six regional offices using a slow WAN connection and a software distribution application. About 20 percent of these remote installations would simply fail and had to be fixed by hand. You can see the enormous impact a Citrix access infrastructure has on our business efficiency."

— Fred Overduin, IT Operations Manager, Gouden Gids Netherlands

Strong encryption for applications. Citrix encrypts traffic from end to end, regardless of the application requested, via an SSL / TLS tunnel from the client machine to the Access Gateway. Any application — Windows applications, Citrix Presentation Server-hosted applications, Web applications, company intranets, shared files —

thus becomes immediately accessible via the Internet. All of this is achieved without having to modify the existing firewall configuration, as data streams use the same single port. Citrix Presentation Server itself provides SSL / TLS encryption between a secure Internet gateway server and an SSL-enabled client, combined with encryption of the HTTP communication between the Web browser and the Web server. This Secure Gateway for Citrix® Presentation Server feature makes firewall traversal easier and provides heightened security via a single point of entry and secure access to an organization's server farms.

Special encryption for managed services. When anyone from an organization is in-session using any of Citrix's managed services, all end-to-end communications are protected using secure key establishment protocols and 128-bit AES encryption. Given the additional security issues that arise during collaborative exchanges, Citrix went even further for GoToMeeting. First, all endpoint-to-infrastructure links are encrypted with SSL. Then, a standard that was developed at the renowned Stanford University in California, called SRP, is used to do an authenticated group key agreement and establish a session encryption key shared only by the authorized meeting attendees. This is important because it provides extra assurance that a meeting is protected from eavesdropping and it means that at no time does unencrypted confidential customer information flow through the Citrix Online communications servers.

Security for IP telephony systems. Any organization that has an IP telephony system from Cisco, Nortel, Avaya, Mitel, Siemens, NEC, and Alcatel can increase data security with SSL encryption of the application traffic to and from its IP telephones. The Citrix Application Gateway™, an appliance which that is used to deliver packaged, custom, and transformed HTML-based applications to the screens and speakers of IP phones, is so secure that its software code base is used by the Access Gateway, which is deployed in an organization's DMZ.

Transparent implementation of WiFi networks. Whereas the Ethernet socket of a wired network is securely located within the business premises, a Wireless Fidelity access point can be used by anyone, even from an organization's parking lot. Of course, good network architecture allows WiFi-related risks to be controlled, and effective protection methods exist, such as WPA, authentication via 802.1X, and the long awaited 801.1i. However, these solutions have only recently been standardized and their implementation or even their integration to the existing architecture can sometimes be cumbersome. Citrix allows a WiFi network to be implemented transparently, without any additional effort from the IT department or any change of habits for users who are familiar with the LAN access infrastructure. The security that will be applied to it will be exactly the same as that applied to any other connection: no matter where users access the network, including a non-secure WiFi base station, their session and data will travel through an encrypted tunnel which guarantees confidential exchanges.

A browser that keeps the door closed. From trapped ActiveX or JavaScript controls to cross-site scripting attacks to the common iFrame flaws or illegal downloads, the Web browser is often an open door to a system. And when the victim is a company employee, then the knock-on effect on the whole information system can be very serious. Accordingly, many operational teams deploy browsers in their most restrictive configuration and require a particularly strict implementation of security patches. This, however, is not always effective: in addition to the increased workload for IT, users sometimes modify the configuration of their browser if it seems too restrictive for them or simply install the browser of their choice if a configuration is too difficult for them to modify. With Citrix, all clients access the same browser and use it exactly as if it were working only for them, on their PC. But in reality, the browser remains protected, out of their reach and controlled by IT. Users cannot modify the configuration themselves and IT has great flexibility in configuring browsers: the IT staff changes the parameters only once and all modifications become effective on all clients. Plus, the business firewalls can be configured to authorize only outgoing Web traffic that comes from the Citrix server so any other browser that is installed on a PC will be unable

to access the Internet. When the nature of the business demands greater confidentiality for data accessed via the browser, Citrix provides another great benefit: the cache which usually stores visited Web pages and cookies on the client is located on the application server and therefore it is beyond the reach of any malicious hacker who might attempt to take control of the client.

Unlimited Sites: Agility to Expand, Merge, Outsource

Ultimately, remote offices, regardless of the type of facility or location of the site, are at the heart of business agility: an organization's ability to move fast and sustain its pace in today's increasingly competitive business environment. That means relentless demands on the IT group, to move with corresponding speed to provision, maintain, and integrate the capabilities and services on which the organization runs, improving time-to-value for business expansion with accelerated delivery of line-of-business applications such as Enterprise Resource Planning (ERP), Customer Relationship Management (CRM), or Sales Force Automation (SFA), while also reducing the cost of provisioning multiple facilities and locations.

With their diverse set of networks and devices, supporting and maintaining applications and information for remote offices and locations can be overwhelming, yet providing a high level of support to every individual at each site is critical to keep employee productivity and satisfaction high and the revenue stream uninterrupted. Plus, with the pressure on IT to continually enhance efficiency, both improving productivity and reducing costs while better supporting business initiatives, it becomes imperative to eliminate as many cost factors as possible, such as IT travel to these offices simply to install new application or operating system software or to upgrade desktop devices which typically is required when deploying new applications. And how to measure the impact on customer satisfaction when technology suddenly hinders customers' ability to do what they have been doing?

Consequently, corporate incentives to overhaul remote office management are strong. Drivers include the increasing numbers of remote offices, with estimates ranging between 1 million and 2 million; the increasing pressure to reduce IT costs while improving management; and security and regulatory compliance concerns.[5] Interestingly, with the direct link between agility and fast action, there has surfaced the need for quick but secure remote access, a factor that in turn has led to an increasing use of technology that leverages the Secure Sockets Layer (SSL) built into standard Internet browsers to create a virtual private network (VPN). In fact, IDC estimates that organizations will spend nearly $900 million on standalone SSL-VPN appliances by 2009 compared to ~$201.5 million in 2004.[6]

"Because of Citrix, we have an access strategy and were able to easily prepare for the deployment of our SAP system to the new organization with minimal impact. In fact, interconnectivity between the Integris system and the Ryerson system is being accomplished using Citrix Presentation Server. Overall, our cost of integrating an acquired company is substantially decreased as a result of efficient, centralized deployment and support."

— Jim Chorosevic, Director of Information Technology, Ryerson, Inc.

Citrix helps IT teams rapidly and seamlessly integrate the various sites of an acquired company, say, or to open new facilities, avoiding the risk that the competitive advantage which was sought could be undermined, possibly irreparably. This makes it easy for IT teams to cost-effectively and productively support the organization in its quest to:

- **Immediately, easily expand product portfolios, partner/expert participation, and geographic reach,** creating combined teams that can share information productively yet securely

[5] "Remote Offices: Critical Links in Enterprise Architecture", Forrester, March 24, 2005

[6] "Worldwide SSL-VPN Appliance 2005-2009 Forecast and 2004 Vendor Shares: Delivering Secure Application Access", IDC, March 2005

- **Reach more customers** by easily opening and supporting branch locations and remote offices, optimizing remote office operations along with large data centers
- **Reduce capital and labor costs** through outsourcing by assuring performance of applications and security of access and data

HERE'S WHAT CITRIX DELIVERS:

Let everyone work anywhere. Among the advantages that Citrix delivers is enabling IT groups to offer everyone — from employees to partners, consultants, suppliers, and outsourcers — the ability to work from anywhere, with secure centralized information. Plus, with Citrix, user devices can be any form factor, run any operating system, and have low processing power, because both client and server software execute on a robust server.

Keep everyone productive. With Citrix, IT simply creates new user accounts for mergers and acquisitions, partners or outsourcers to give them role-based access to client-server applications. This is the beauty of Citrix Presentation Server: instant application availability.

"Our remotely deployed applications are showing a performance improvement of more than 50 percent since our Citrix implementation. This greatly facilitates expansion of our overseas business and has improved the satisfaction of overseas customers."

— Mr. Fu Yilin, Director of IT Application Development, Huawei Technologies (HQ)

Bring everyone together and improve collaboration among employees and with partners and outsourcers — with less travel and operational costs. With Citrix, the IT group can help the Human Resources team to remove the physical barriers for remote offices and employees and empower functional teams to collaborate effectively, securely and easily, regardless of their size, geographic spread, or composition. Citrix® GoToMeeting™ is a is a new breed of online-meeting technology that enables desktop and application sharing, as well as virtual workgroup conferencing. Citrix patented technology enables attendees to view any application running on the desktop, to share keyboard and mouse control, to chat online with any participant, to instantly change presenters, and to use existing email and instant-messaging applications to start or join GoToMeeting sessions. Meeting organizers start a meeting with a mouse click; co-workers, customers, and prospects join just as simply; and presenters instantly share any file or application on their desktop. Its robust feature set provides all features necessary to conduct successful online meetings, training sessions, and collaborative gatherings.

Provide superior remote technical support to every site and every employee, on demand and securely. Citrix gives organizations the power to provide fast, easy, and secure remote-support services, resulting in a superior customer experience every time. Citrix GoToAssist is an industry-leading, remote technical-support solution that enables organizations to provide best-in-class support over the Internet, on demand and securely. This means the help desk will use one solution to remotely support all end users, regardless of their location, rapidly resolving complex and mission-critical support incidents and handling increasing call volume without increasing budgets.

Help the business move fast. Citrix dramatically reduces the time and cost of delivering client-server applications — often from months to days or hours — to greatly improve the efficiency of product development, of integrating mergers and acquisitions, of getting branch offices up and running, and of any other business initiative.

"The complete Citrix suite of solutions has provided both real-dollar and soft-dollar cost savings. The technology has provided efficiencies to the organization, allowing us to focus on the services we provide to our members."

— Tamara Hudson, MIS Director, Community Resource Credit Union

Maximize the IP telephony investment. The Citrix Application Gateway™ is used by organizations to deliver applications, packaged and/or transformed, to the screens and speakers of IP phones and wireless devices. Citrix® Voice Office is a suite of packaged telephony applications that requires no development work whatsoever. These innovative access solutions complement the Citrix portfolio of products and services by extending on-demand access to both voice and data across virtually any screen size, device type and location.

Reduce help desk costs and invest in growing the business. With its automated password-change process, Citrix Password Manager zeroes in on one of the most surprising costs for the help desk: $200 per user on average for password problems and especially resets, according to Forrester Research. Password Manager automates password resets via user self-service, reducing this cost for your department. Converting password resets to an easy user self-service means reducing IT costs for password resets by up to 85% and that means more money to invest in growing the business.

Accelerate user migrations of desktops and operating systems. Because the client software is kept within the controlled environment of the datacenter, Citrix helps IT accelerate user migrations of desktops and operating systems by eliminating the need for IT groups to physically install and test applications on the end-point devices.

"If a customer has a question, the salesperson can find the answer right in our system, then and there. Fast, reliable access to our business applications and data from anywhere makes us look more professional in the eyes of customers."

— Jack Schacht, President, Illinois Trade Association

Quickly distribute patches for hundreds of servers and thousands of clients. With Citrix, all applications are located on centralized servers managed directly by the IT department. Instead of updating each of these applications individually, with the same patch distributed to each client and server, each patch only has to be installed once, on a single server which replicates the updates to all Citrix Presentation Servers. This makes it easy to manage patches for hundreds of servers and thousands of clients, including mobile devices that cannot easily be repatriated, eliminating the headache of testing patch programs before their deployment and the need to establish specific schedules for patch programs that are incompatible with the systems in use or those that need servers to be restarted.

Centralize data security with policy-driven access. Citrix gives IT groups the power to provide access to applications but to retain control over the data, including how the data are used and where they are stored. This means IT can prevent any data from leaving the data center — without impacting the productivity of any employee at any site.

Accelerate performance from data center Web applications. Using Citrix solutions, IT groups can reduce cost of operation by maximizing performance for Web applications, reducing server workload with integrated static and dynamic caching, assuring continuous service during DDoS attacks with end-to-end security, and providing anytime, anywhere access to applications and content for thousands of concurrent users. Citrix NetScaler application delivery systems decrease bandwidth usage with high-throughput compression and increase server capacity with integrated caching.

Take control of password management. Citrix Password Manager™ provides centralized Enterprise Single Sign-on (ESSO) access to multiple resources, reducing user exposure to multiple passwords and logins and enhancing security while also reducing support costs. It can also enforce password policy requirements, such as strong passwords or password rotation. The value of Password Manager has been recognized by enterprise-class identity management vendors such as Hewlett-Packard, which has partnered with Citrix to make Password Manager the ESSO option for the HP OpenView Select Identity portfolio. Strong authentication is enhanced in the Citrix approach through cooperation with partners such as RSA Security and Secure Computing. These partners enable the integration of measures such as two-factor authentication using tokens, smartcards, and industry identity-linked encryption.

Assure secure WiFi access at any site. With Citrix, a Wireless Fidelity network can be implemented transparently. The security that will be applied to it will be exactly the same as that applied to any other connection. No matter where users access the network, including a non-secure WiFi base station, their session and data will travel through an encrypted tunnel which guarantees confidential exchanges. Moreover, this does not require any additional effort from the IT department or any change of habits for users who are familiar with the LAN access infrastructure. This is good news for administrators who, as a result, now only have to worry about user rights, and not their access methods.

Switch to a published browser for fast action and high productivity. With Citrix, the Web browser can be centrally hosted as a published application. This means there will be only one browser, installed and configured by the IT staff. All clients access the same browser and use it exactly as if it were working only for them, on their PC, but in reality, the browser remains protected and out of their reach. In addition to obvious security benefits, this also brings great efficiency: to configure the browser for any number and type of devices, the IT staff changes the parameters only once for all modifications to become effective on all clients. The result: fast action, high productivity. Plus, the business firewalls can be configured to authorize only outgoing Web traffic that comes from the Citrix server, eliminating the ability of any other browser that is installed on a PC to access the Internet.

When there are special requirements for browser security. When the nature of the business demands greater confidentiality for data accessed via the browser, Citrix provides another great benefit: the cache which usually stores visited Web pages and cookies on the client is located on the application server and therefore it is beyond the reach of any malicious hacker who might attempt to take control of the client.

"We wanted to make it easier for our small IT staff to push applications out to employees in our locations worldwide. In addition, we wanted to provide our users with personalized access to applications and information via the Web."

— Todd Sanford, Director of Networking Systems, Central Parking

Centralize client-server applications. Citrix allows the majority of business applications to be hosted on servers, which means the operating system can be shared among all business applications. As a result, the same Citrix Presentation Server can run the ERP solution, the office suite, the intranet and even the Web browsers. All of these applications are located on centralized servers managed directly by the IT department. Instead of updating each of these applications individually, say with the same patch distributed to each client and server, each patch only has to be installed once, on a single server which replicates the updates to all of the Presentation Servers.

Centralize updates. Not only can the operating system be updated easily, but also updating applications is greatly simplified with Citrix, particularly in situations in which client software does not natively support automatic or remote updates. Citrix Presentation Server addresses this particular issue by allowing all clients, wherever they might be located, to receive the latest updated software every time they log on.

Workforce Mobility: Productivity Gains for Strategic Employees

From a long-time role as a niche employee, the mobile worker now is perhaps one of the most strategic employees of an organization, able to deliver significant productivity gains across organizations and industries. According to IDC, the worldwide mobile worker population is set to increase from 676.0 million in 2004, accounting for 23.1% of the worldwide workforce, to 878.2 million in 2009, accounting for 27.3% of the workforce.[7]

Both local and federal governments are starting to consider office mobility and flex time as options, with notably increased interest in Europe and the U.S. Mobile enterprise deployments are growing and becoming more strategic as corporations seek to spend in key components of the mobile ecosystem — software, mobile devices, professional services, and mobile operator services — to arm this critical worker population. For example, in 2005, almost 50% of all U.S. enterprises had a wireless local area network (WLAN) in some form, and jobs such as sales, IT, transportation/logistics and other key verticals that have a strong potential to become mobile are expected to have an average growth rate of 8%. India provides technology services around the world and is expected to be a significant leader of the growth of the mobile workforce in the region. China is poised to join India as a country with a high percentage of mobile workers; as the host of the upcoming Olympic Games in 2008, the country needs to quickly develop a stronger technology infrastructure that would include mobile capabilities. The Japanese corporate culture has appreciation for productivity, efficiency, and constant improvement, fueling an ongoing interest in finding ways to minimize long commuting hours to work and in finding alternatives to growing office/business rental expenses. As well, with the growing importance of attracting and retaining good employees everywhere, an ability to provide flexible working environments is paramount.

As a result, IT teams must recognize the increasing importance of the mobile worker and the critical need for mobility to become a fundamental capability across a growing population of their organization's workforce. This, in turn, requires an understanding both of clear-cut issues, such as the type or types of mobility within any given organization, and of subtle issues such as work/life balance, as mobile workers seek the benefits of mobility without the need to be available 24x7.[8]

Pivotal in the endeavor to improve IT efficiency are the various patterns of mobility that might touch the organization, as each brings different challenges:

- **Office-based mobile workers,** such as mobile professionals whose primary workplace is the office but who conduct business in airports, in hotels, at customer sites
- **Non-office-based mobile workers,** who might be: 1) mobile on location, roaming within a facility, campus, or similar specific area such as indoors in a hospital, restaurant, or warehouse or outdoors at a construction site; and/or 2) mobile in the field, moving among varying remote locations such as field-service employees who collect data on regularly traveled routes or routes that vary from day to day. Notably, these employees increasingly are delivering enhanced services beyond data collection, such as sales functions, to better serve clients' needs and provide an upsell opportunity for their company.
- **Home-based mobile workers,** who use their home as a workplace all or part of the time, such as telecommuters who work at home all or part of the time and who also might travel away from the home or corporate office

[7] "Worldwide Mobile Worker Population 2005-2009 Forecast and Analysis", IDC, October 2005

[8] "Worldwide Mobile Worker Population 2005-2009 Forecast and Analysis", IDC, October 2005

A solutions-based approach is recommended, to address the many requirements of an organization seeking to enroll mobile workers, from back-end technology and integration to a valuable user interface and role-based mobile worker experience.[9]

"We needed a solution which would enable access to business applications for our employees any time and anywhere, while reducing the costs of manpower, hardware and communication. Citrix has not only helped us in making important information available to all users irrespective of location and time, but its software has also aided in eliminating delays in updates and inter-office communication, thereby making it real-time information."

— Mr. Manoj Gautam, Senior Manager, Technology Solutions, Eicher Group

As the share of employees with laptops and other mobile devices continues to increase, Citrix makes it easy for organizations to enable their people to better utilize their time by working with whatever device they choose, wherever and whenever they want, via any network available — wired or wireless, private or public, dedicated or dial-up. Citrix solutions enable IT groups to provide on-demand access to business-critical information, technical support, and collaboration — without compromising security, instantaneously extending access to a company's networked resources beyond the traditional office environment.

HERE'S WHAT CITRIX DELIVERS:

Mobility without limits: the data always stay in the safest place. Among the greatest benefits that Citrix delivers is the ability to prevent data from leaving the data center, ever, with application virtualization. This is the best delivery method for client-server applications and Citrix set the industry standard with Citrix Presentation Server, which protects information by

- Keeping applications, information, and servers in the data center, eliminating the need to install an application on the user device and minimizing loss of information and the risk of theft
- Controlling, and even eliminating when appropriate, the ability to print, copy, and save to the local device
- Avoiding the transmittal of text over the network, using instead vector graphic updates (partial screen updates), transmitting only screen pixels, keystrokes and mouse movements
- Mitigating the spread of viruses through unprotected client devices
- Building-in policy-based controls that allow IT groups to easily restrict who gets access to what information and when, including limiting system administrators to "restricted / permitted" for a particular range of tasks and responsibilities

End-user device and system independence for client-server and Web applications. Application virtualization enables mobile workers to access client-server applications and data where ever they are, with the same usability and performance, including secure access to business-critical information even from non-corporate-owned devices. Citrix Presentation Server is the standard for application virtualization, proven by customers worldwide to deliver the best TCO, security and performance for every client-server application. For Web applications, Citrix solutions

[9] "Worldwide Mobile Worker Population 2005-2009 Forecast and Analysis", IDC, October 2005

integrate SSL VPN capabilities to maintain corporate privacy with secure clientless remote access. For example, the Citrix NetScaler Application Accelerator requires no additional client or server software, allowing end users to connect to a data center from any browser at any time. The Application Accelerator provides real-time compression for application data, including the ability to compress encrypted and unencrypted data for Web applications. The NetScaler system's integrated AppCompress™ technology provides real-time, high-throughput compression capabilities, eliminating bandwidth bottlenecks and dramatically reducing last-mile transmission times, while dramatically improving user response times.

"Our social workers are dedicated people who would devote every hour of the day to their job if they could. Remote access has given them the flexibility to balance their work and their home lives. They have the flexibility to work outside normal office hours to respond to clients' needs. Citrix has changed the way of life of our social workers."

— David Titcombe, ICT Strategy Manager, Social Services, Swindon Borough Council

Access to desktops without making the drive to the office. Citrix GoToMyPC is a managed service with fast performance that delivers a "like being there" access experience. GoToMyPC enables remote individuals to access from any Internet-connected computer all of the applications, email, files, and network resources hosted on their desktop just as though they were sitting in front of their PC. The Web-based screen-sharing technology works with existing firewall and Internet infrastructures, without having to change or open ports, configure IP addresses, or deploy any extra hardware or software.

Ad hoc meetings with the office, customer win rates, lead generation, training without travel. With Citrix, the IT group can help the business increase productivity by enabling employees to reduce the cost of trips to the office by collaborating on the fly, optimizing customer presentations and meetings — regardless of location, reduce customer acquisition expenses and cost of sales by reducing travel and operational costs, boost sales by expanding geographic reach and accelerating the sales cycle, and keep customers happy with online training. Citrix GoToMeeting is a Web-based, managed service for conducting online meetings, training sessions, and collaborative gatherings that is easy to use, secure, cost-effective, and fast. This makes it easy for employees to increase their productivity, the Sales group to increase win rates and reduce the sales cycle, qualifying prospects before travel and strengthening relationships, for the Marketing team to generate more sales leads more cost effectively and deliver more impactful presentations, and for anyone training individual or large groups to minimize travel time and costs and to record and make training events available at any time.

"Collaboration is critical, but our partners are often spread all over the country, so it's difficult and costly to get them together in the same room to look at the same set of plans. Because our teams work with AutoCAD® files and other documents that can often require megabytes of storage, emailing the files to participants is impractical. We've tried other solutions, but the first time we used GoToMeeting Corporate, we were convinced that it's the best tool for collaborating quickly and simply."

— John Leeper, CIO, Ryan Companies, Inc.

Superior remote technical support for every employee, on demand and securely. Citrix gives organizations the power to provide fast, easy, and secure remote-support services, resulting in a superior customer experience every time. Citrix GoToAssist is an industry-leading, remote technical-support solution that enables organizations to provide best-in-class support over the Internet, on demand and securely. This means the help desk will use one solution to remotely support all end users, regardless of their location, rapidly resolving complex and mission-critical support incidents and handling increasing call volume without increasing budgets.

SmoothRoaming and SmartAccess integration. Citrix's innovative technologies enable mobile workers to work efficiently and well as they move from location to location and device to device. Citrix SmoothRoaming™ ensures that their work environment travels with them and they get a consistent experience, no matter the access scenario. Based on Citrix® SmartAccess policies, the type of applications and data and the actions that mobile workers can take are automatically adjusted depending on the device, location, and network.

Award-winning application firewalls. The Citrix Application Firewall delivers the industry's highest performing Web application security solution, capable of protecting Web servers without degrading throughput or application response times. The Application Firewall delivers best-fit performance for any enterprise or data center installation, with security technology that implements a positive security model based on HTTP industry standards and best coding practices for HTML. Web application behavior that deviates from the positive security model is treated as potentially malicious and is blocked. Because it understands good application behavior, the positive security model does not require attack signatures or pattern matching techniques to detect and block attacks. It is the only proven approach delivering zero day protection against unpublished exploits.

"Simplified password management is important for physicians, to save them time and frustration. If they have to get on the phone with the help desk, it takes time away from patient care. We were getting, on average, 100 phone calls a month from physicians who had forgotten their passwords. We needed to do something, so we decided to implement Password Manager along with fingerprint scanners and so far it's been a great success."

— Tim Kruse, Supervisor of IT Development, Saint Anthony's Health Center

Whether broadband or dial-up, a better user experience — securely. Citrix's patented technology tracks changes to the screen without installing a device driver and intelligent caching is used to only transmit changed screen images. These data security dimensions are delivered in concert with motion and mixed pixel compression that allows Citrix to achieve better screen compression rates — 5x better than GIF and 6x better than JPEG without JPEG artifacts. Being bandwidth adaptive allows Citrix to match the experience to the available session bandwidth, which equates to a better overall experience for end users, whether they are on broadband or running over a dial-up connection.

- GoToMyPC — the data never leave the office PC. All information is accessed remotely, eliminating the security risk of having the data themselves leave the premises on an employee's laptop, for example.
- GoToMeeting — the data are not posted on a hosting site. Screens are shared but the data are not passed from one attendee to another.
- GoToAssist — instead of requiring remote employees to send in their system when they need technical support, which represents yet another security risk, the repair takes place remotely.

IP telephony access that's simple for users and adaptable to almost any access scenario. In addition to delivering applications to IP phones and wireless devices, Citrix also provides the ability to transform existing Web-based applications to wireless devices and the screens of IP phones. This encompasses time clocks, email, sales force automation, school attendance, inventory look-up, and patient records, for example. Transformed applications appear as though they were custom-developed for the IP telephone or wireless device — without a single change to any of the underlying Web-based applications. Plus, Citrix enables enterprises to further leverage their IP telephony investments and increase workforce productivity with a range of applications, from voicemail that's visual to clicking on a phone number instead of dialing the phone.

One door to the Internet. The Citrix Access Gateway centralizes access control to all applications and data. The advantage is that only one network port needs to open to the Internet, and all traffic is secured by open standards-based SSL/TLS encryption. The result is that the Access Gateway becomes a single point of access, control, and management of remote access.

"Role-based access to information and applications through a Web browser means employees can work almost anywhere with the tools they need at their fingertips."

— Hugh Jones, Head of IT, Kingfisher

Strong encryption for applications. Citrix encrypts traffic end to end, regardless of the application requested, via an SSL / TLS tunnel from the client machine to the Access Gateway. Any application — Windows applications, Citrix Presentation Server-hosted applications, Web applications, company intranets, shared files — thus becomes immediately accessible via the Internet. All of this is achieved without having to modify the existing firewall configuration, as data streams use the same single port. Citrix Presentation Server itself provides SSL / TLS encryption between a secure Internet gateway server and an SSL-enabled client, combined with encryption of the HTTP communication between the Web browser and the Web server. This feature — Secure Gateway for Citrix® Presentation Server — makes firewall traversal easier and provides heightened security via a single point of entry and secure access to an organization's server farms.

Special encryption for managed services. When anyone from an organization is in-session using any of Citrix's managed services, all end-to-end communications are protected using secure key establishment protocols and 128-bit AES encryption. Given the additional security issues that arise during collaborative exchanges, Citrix went even further for GoToMeeting. First, all endpoint-to-infrastructure links are encrypted with SSL. Then, a standard that was developed at the renowned Stanford University in California, called SRP, is used to do an authenticated group key agreement and establish a session encryption key shared only by the authorized meeting attendees. This is important because it provides extra assurance that a meeting is protected from eavesdropping and it means that at no time does unencrypted confidential customer information flow through the Citrix Online communications servers.

Security for IP telephony systems. Any organization that has an IP telephony system from Cisco, Nortel, Avaya, Mitel, Siemens, NEC, and Alcatel can increase data security with SSL encryption of the application traffic to and from its IP telephones. The Citrix Application Gateway, an appliance which is used to deliver packaged, custom, and transformed HTML-based applications to the screens and speakers of IP phones, is so secure that its software code base is used by the Access Gateway, which is deployed in an organization's DMZ.

Taking control of WiFi. With Citrix, a Wireless Fidelity network can be implemented transparently. The security that will be applied to it will be exactly the same as that applied to any other connection. No matter where users access the network, including a non-secure WiFi base station, their session and data will travel through an encrypted tunnel which guarantees confidential exchanges. Moreover, this does not require any additional effort from the IT department or any change of habits for users who are familiar with the LAN access infrastructure. This is good news for administrators who, as a result, now only have to worry about user rights, and not their access methods.

"By going wireless with Citrix, we have created a solution that other clubs are envious of. Remote access is helping us enhance performance, whether it is improving how we do inventory to boost beverage sales, or being able to proactively reach out to members."

— Steven Leviton, Food & Beverage Director and Head Chef, Briarwood Country Club

Centralized client-server applications. Citrix allows the majority of business applications to be hosted on servers, which means the operating system can be shared among all business applications. As a result, the same Citrix Presentation Server can run the ERP solution, the office suite, the intranet and even the Web browsers. All of these applications are located on centralized servers managed directly by the IT department. Instead of updating each of these applications individually, say with the same patch distributed to each client and server, each patch only has to be installed once, on a single server which replicates the updates to all of the Presentation Servers.

Centralized updates. Not only can the operating system be updated easily, but also updating applications is greatly simplified with Citrix, particularly in situations in which client software does not natively support automatic or remote updates. Citrix Presentation Server addresses this particular issue by allowing all clients, wherever they might be located, to receive the latest updated software every time they log on.

Data Security: No Delays for New Services and Applications, No Drops in Legacy Security and Productivity

Beyond the recent overarching focus of data security on defending the corporate network against threats from the Internet, and shaped by fundamental far-reaching changes in the business landscape, implementing information security today brings with it a new and broad set of challenges for the IT team and especially for key executives such as the CIO and Chief Security Officer.

Attacks on computer security infrastructure used to be little more than indiscriminate acts of vandalism by hackers who wanted to boast. Now, security intelligence experts have detected signs of organized crime and government espionage in attacks, and of hackers who are motivated more by financial gain than by personal or political fulfillment. In fact, according to the Computer Security Institute "2005 CSI/FBI Computer Crime and Security Survey", for 46% of companies, one out of every five security breaches originates from inside of the corporate walls.[10] The stakes are too high for companies to ignore security threats from within their own networks. They now need to step up security throughout their environments,[11] as those who have authorized access to internal resources often are far more dangerous than those who need to breach a perimeter firewall to get inside of the network.

At the same time, remote access and business partner connectivity mean the perimeter is disappearing, making it harder and harder to define, let alone defend. Now, corporate networks extend outside of the physical bounds of corporate facilities, blurring the line between internal and external networks and between "inside" and "outside" of the firewall. This requires a new way of thinking about data security and network security, and has triggered the formation of the Jericho Forum, a powerful and vocal security user group that includes organizations such as BP, Procter & Gamble, and the UK's Royal Mail. The group has introduced the concept of "de-perimeterization" and encourages organizations to look at securing the data rather than the infrastructure that supports the data.[12] Along these lines, Gartner, Inc. predicts that by 2007, 40% of new enterprise security spending will be directed toward data security issues, not perimeter security.[13]

"Although it provides full network connectivity, the Citrix client hides the IP addresses of the remote network. This helps prevent worms, Trojan horses, and other threats from discovering a path to additional network resources."

— Jon Prall, Vice President of Operations, Postini, Inc.

Citrix makes it possible for organizations to take advantage of a range of options for delivering integrated data security with strong measures. As a result, it is easy to launch new applications and new services successfully, guaranteeing information system security without delaying projects, and to ensure that the integration of security tools into the legacy infrastructure does not cause any drop in existing levels of security or of productivity.

[10] "Securing the Network from the Inside Out", Forrester Research, Inc., 2005

[11] "Securing the Network from the Inside Out", Forrester Research, Inc., 2005

[12] "The State of Security in SMBs and Enterprises", Forrester Research, Inc., 2005

[13] "Organizations Must Employ Effective Data Security Strategies", Gartner, Inc., 2005

HERE'S WHAT CITRIX DELIVERS:

Make sure the data stay in the safest place. Citrix prevents data from leaving the data center, ever, with application virtualization. This is the best delivery method for client-server applications and Citrix set the industry standard. Similarly, the security of screen-sharing technology delivers comparable benefits for Citrix's diverse group of innovative managed services.

Keep sensitive data confidential when serving millions of customers online. Web applications provide direct access to some of the most sensitive and valuable data in any organization. Citrix systems have been architected to forward valid client requests to servers and to block illegitimate requests via a single, unified device. This includes built-in defenses against DoS attacks and preventing the theft of sensitive information that might be exchanged via a Web portal.

Take a pass on the password problem. Citrix provides centralized Enterprise Single Sign-on (ESSO) access to multiple resources, reducing user exposure to multiple passwords and logins, enhancing security while also reducing support costs, and even enforcing password policy requirements.

"Working with independent agents means we have many users logging in from devices we don't own, over connections we don't control, and that raises security concerns. Citrix provides a number of security measures that help us protect corporate information. The products deliver secure, single sign-on and standards-based encryption of data over the network, and allow us to provide access based on user roles, so we can control who sees which information."

— Charlton Monsanto, Chief Information Officer, Prudential Fox & Roach REALTORS

Simplify DMZ management. Managing a DMZ is a permanent trade-off between security and user-friendliness. Citrix offers a better alternative: one access point and one door to the Internet with a universal SSL VPN appliance that provides a secure, always-on, single point-of-access to any information resource.

Strong encryption for applications. Citrix encrypts traffic end to end, regardless of the application requested, via an SSL / TLS tunnel from the client machine to the universal SSL VPN. Citrix also provides SSL / TLS encryption between a secure Internet gateway server and an SSL-enabled client, combined with encryption of the HTTP communication between the Web browser and the Web server.

Special encryption for managed services. When anyone from an organization is in-session using Citrix's managed services, all end-to-end communications are protected with secure key establishment protocols and 128-bit AES encryption. Citrix also protect every meeting from eavesdropping and assures that unencrypted confidential customer information never flows through the Citrix Online communications servers.

"Implementing Citrix will help us save 780,000 euro within a period of five years and has enabled access to a uniform and secure desktop from any location."

— Jos van Roosbroeck, Director ICT, LeasePlan Belgium

Security for IP telephony systems. Any organization with an IP telephony system from Cisco, Nortel, Avaya, Mitel, Siemens, NEC, and Alcatel can increase data security with SSL encryption of the application traffic to and from its IP telephones.

Taking control of WiFi. Wireless Fidelity networks are very practical, inexpensive, and extremely simple to deploy, but also demand particular attention in terms of security. Citrix allows a WiFi network to be implemented transparently, with the same security that is applied to any other connection and with no additional effort from the IT group and no change of habits for users who are familiar with the LAN.

Browser lock-down. Attacks against Internet users often come down to the victim's Internet browser being badly configured. With Citrix, the Web browser is centrally hosted as a published application, installed and configured by IT staff, and the cache which usually stores visited Web pages and cookies on the client is located on the application server instead, beyond the reach of hackers. The business firewalls can be configured to authorize only outgoing Web traffic that comes from the Citrix server.

Easy patch management. Managing patches is a difficult art to master. Citrix allows the majority of business applications to be hosted on servers, so the operating system can be shared among them, each patch only has to be installed once on a single server, and updating applications is greatly simplified, particularly when client software does not natively support automatic or remote updates.

Regulatory Compliance: Secure Data, Productive People, Cost-Efficiency

Increased regulation worldwide, both by governments and within industries, has resulted in greater accountability for corporate officers when it comes to managing risk in their organization. The stringent audit requirements of the many and diverse regulations have increased the need for control, visibility, and accountability, directly linking information security to risk management and, in fact, driving its implementation.

In this environment, the CIO, CSO, Chief Information Security Officer, Chief Privacy Officer, and other key executives must demonstrate that they are protecting corporate information effectively — to regulatory authorities, to business partners, to their own boards of directors. This requires that measures be in place to protect internal resources, and, in turn, has created pressure to adopt a comprehensive approach to risk management. As a result, IT has become an enabler for enterprise risk management by leveraging technology to proactively monitor and manage regulatory compliance and other business risks.[14] This, of course, is not a simple matter. Industry experts believe that implementation of security today depends on establishing strong security policies and procedures, not merely turning-on auditing features or deploying encryption in a solution. End-to-end security implementation should be the goal for enterprises, according to these experts, combining database security with application-, network-, and infrastructure-level security.

"Our Citrix solution has given us a world-class access infrastructure for our representatives and their clients. It has also helped us meet all government regulations, such as the Patriot Act and the Anti-Money Laundering Act."
— Christopher Grant McDaniel, Senior Vice President and Chief Information Officer, Mutual Service Corporation

Citrix combines benefits that deliver a very high degree of control and can be leveraged throughout an organization, from the data center to the endpoint, whatever the endpoint might be and wherever it might be found. This level of control corresponds to significant compliance requirements for internal IT controls and business processes. As a result, organizations can balance information security with business productivity and cost-efficiency, optimizing controls with exceptional granularity but also great flexibility.

Here's what Citrix Delivers:

Application control, reporting, logging, and monitoring to reduce compliance costs. Citrix makes it easy and cost-effective to centralize and consolidate applications, delivering the power to observe, monitor, and measure resources with robust business reporting, delegated administration, a common management infrastructure, and integration with third-party network- and systems-management tools. For example, much of regulatory compliance involves reporting, logging, monitoring, and alerting. Citrix provides this functionality with a unified management console and reporting center.

Information containment. One of the distinctive Citrix innovations is the power to intelligently automate security and compliance measures based on the access context, providing a high degree of control over sensitive

[14] "Securing the Network from the Inside Out", Forrester Research, Inc., 2005

information. Citrix technology determines who is requesting access, where they are, when access is requested, and how it is requested. If compliant, then and only then will access be enabled according to policy.

Granular security zones. Compliance might require the segregation of resources among specific users and groups. Citrix centralizes isolation of controls on application management and ownership, even when the same application is available to different user or ownership groups on the same server environment. Finely grained access management includes features that support content redirection, restricting access to specific resources as administratively defined.

Although THLP does not currently have regulatory compliance issues, the firm expects that it will have to deal with regulations at some future date. "Right now, we feel secure with our Citrix implementation, which enables us to provide role-based access to information without opening up the network to vulnerability. When compliance issues arise, we are in a solid position to address them with this Citrix solution."

— Hoby Cook, Vice President of IT, Thomas H. Lee Partners, L.P.

Comprehensive audits, automated reporting. The best security tools are useless without a clear view of how the information system is used: by whom, how, under what conditions. Citrix provides administrators with the tools to monitor and analyze the use of the information system. From a single console, an administrator can find out who connected from where and what applications were used for how long. This logging applies to all clients, no matter where they come from and regardless of their authentication method, without requiring a third-party logging tool.

Centralized authentication. Implementing an adequate password-management solution is not simple, mainly due to of the lack of authentication standardization. Citrix's Enterprise Single Sign-on (ESSO) solution takes care of all authentication requests that are required by Windows, Web, and host-based applications. Integrating a new application within a company's infrastructure does not affect its operating mode in any way, including authentication. By entering passwords on behalf of the user, Citrix also simplifies password management and reinforces security at critical points.

"The Citrix solution supports our key Health Insurance Portability and Accountability Act goal — giving people access to only the information they need. Recently a HIPAA security risk assessment was conducted and the consulting firm found no security holes or problems with our Citrix system. That was great news."

— Tim Kruse, Supervisor of IT Development, Saint Anthony's Health Center

Integrating strong authentication to the legacy. With Citrix, there is no ripping and replacing of the existing infrastructure. The authentication procedures implemented use the standard Microsoft and Novell GINA libraries, as well as UNIX authentication procedures, and the Citrix architecture uses the existing user base, so log-in procedures do not need to be modified. What is more, the Citrix solution can integrate with most two-factor authentication solutions that are currently available, including token, biometric, and proximity security systems.

Remote access to PCs in compliance with HIPAA and Gramm-Leach-Bliley. The Health Insurance Portability and Accountability Act (HIPAA) calls for privacy and security standards that protect the confidentiality

and integrity of patient health information, including electronic health information. Citrix is a HIPAA-compliant remote-access solution for desktop PCs that can help an organization or an office to meet these guidelines. The Gramm-Leach-Bliley Act of 1999 establishes standards for financial institutions relating to administrative, technical, and physical safeguards regarding customer records and information. The security architecture of managed services for remote access to desktop PCs offered by Citrix includes policy definition and enforcement mechanisms consistent with the best-practice guidance given for user management and remote access with the act.

Disaster Recovery: A Comprehensive Information Infrastructure and Virtual Workplace for Business as Usual

Sometimes called disaster recovery, and also referred to as business continuity, the ability to continue to do business — no matter what — has shifted from a safeguard in transaction-oriented industries, such as financial services, to an important concern for organizations in every industry. This stems from the dramatic increase in magnitude and number of potentially catastrophic events — man-made, natural, and accidental. Consider the span of terrorist activities, from Madrid and London to New York City and Bali… Of hurricanes, earthquakes, even an unprecedented tsunami… Of massive power losses, fires, and chemical spills… A severe incident, such as the Sept. 11 disaster in the United States, would cause crippling damage to businesses, and some might never recover, according to Gartner, Inc.[15]

An organization's response to a disaster introduces diverse opportunity to reduce the impact on the business and to speed disaster recovery. For example, voice over IP and IP telephony can change call center recovery, and work-at-home programs can be used effectively for production and recovery. However, although technical and management techniques can help companies be more resilient after catastrophic events,[16] disaster recovery plans must be individualized. Each organization must identify its own requirements, such as its recovery-time objective for how quickly information systems, services, and processes must be operational after an incident, including recovery of applications and data and end-user access to those applications. This, in turn, requires identifying and implementing an array of best practices for physical system backup and information security and IT systems, a natural convergence of physical and logical security that brings together many enterprise resources as a team.

"I chose to evacuate my family to North Carolina just prior to the storm (Hurricane Frances, when state officials ordered the largest evacuation in Florida's history). Through the powerful combination of Citrix capabilities and high-speed wireless connectivity, I was able to maintain continuous access to email and other critical applications both during the trip and once I reached the destination."

— Dave Lauer, Chief Information Officer, City of Jacksonville, Florida

Citrix enables displaced workers to serve customers and access the company information and people that they need, from anywhere, securely. This vital component of a complete disaster recovery solution reduces the impact of natural, accidental, and man-made business interruptions by enabling organizations to recover the comprehensive information infrastructure, from the data center to the endpoint user environment, quickly, securely, and with minimal business impact, and to create a virtual workplace that preserves employees' sense of corporate community and their ability to conduct business as usual.

HERE'S WHAT CITRIX DELIVERS:

Quickly re-route employees to backup systems. Citrix enables administrators to configure zone preference using a policy rule to direct user connections to particular zones in the server farm and to configure failover when a zone is not available, sending connections to the server with the highest zone preference and smallest load.

[15] "Management Alert: Effective Disaster Recovery Management Could Save Your Business, Gartner, Inc., 2003

[16] "Use Good Business Continuity Management to Prepare for a Disaster", Gartner, Inc. 2005

Make any PC anywhere an operational workstation. Citrix differentiates applications, their format, and their users, and does not require that these factors be in the same geographical location. This greatly facilitates staff relocation, as any PC can immediately become an operational workstation with only a simple Internet browser or Citrix client software.

When the office is okay, but the employees can't get there. From train strikes to mud slides and health hazards, if employees can't get to the office, an organization's ability to conduct business as usual can be impacted. Citrix allows employees to access their usual work environment, if their office PC is up and running.

Redeploy workstations and capture employees' usual work environment. By remotely connecting via a browser or a Citrix client, users regain exactly the same work environment — including their files, their business applications, their office suite, and their interfaces — regardless of where they actually are working.

Preserve users' stored credentials and their easy, secure access to applications. Citrix deployments can be implemented to take advantage of redundant sites for continuing to provide users with single sign-on access to applications and preserving their stored credentials securely. As well, if users cannot connect to a datacenter, they will be able to achieve single-sign-on offline if they have Citrix installed locally.

Re-establish the corporate community, online. Fostering employees' sense of corporate community is challenging when everyone is scattered, working at home, perhaps, or in temporary facilities. Citrix helps organizations bring everyone together, to instantly and easily meet online, regardless of their geographic dispersion.

Remote technical support that remains world class. Citrix enables the support staff of external contact centers and internal help desks to continue providing best-in-class support over the Internet via a managed service, maintaining the infrastructure that supports the service.

An interchangeable application infrastructure. When a primary facility has been affected by a disaster, Citrix enables users to be automatically redirected towards a new entity in failover mode and continue to work as if nothing had happened.

Simplify back-ups. By centralizing business applications on a limited number of servers and by removing the need for information-rich clients, Citrix enables organization to avoid scattering sensitive data across hundreds of servers and thousands of clients. This simplifies backups and also allows the information system to be rebuilt much more quickly and, above all, much more easily.

Leverage IP telephony for fast action. Because it is easier and faster to get an IP network up and running than it is the regular telephone system, IP telephony call centers can be operating quickly and use Citrix to securely deliver applications to the IP phones. Citrix also enables IP phones to replace overhead speakers for delivering audio messages and to serve as information kiosks for receiving priority messages.

Keep servicing online client requests by the millions. On any given day, organizations throughout the world service the client requests of many, many millions of Internet users, often via multi-site application environments. When there is a data center outage, Citrix transparently redirects user traffic to the closest surviving data centers, either geographic or network in proximity.

Secure by Design: Underpinning IT Efficiency

Underpinning Citrix's ability to help organizations improve IT efficiency is the Citrix Access Platform, which provides a consistent, integrated, end-to-end infrastructure that can accommodate every access variable that's required to seamlessly and securely connect users, devices, and networks to business-critical resources. It is the broadest portfolio of software solutions for secure, on-demand access to information, applications, and people that's offered by any company in the access-infrastructure industry today.

All Citrix product families are built to work immediately and seamlessly with any IT infrastructure, no matter how distributed and diverse, and with each other. Collectively, Citrix's access products and services deliver business benefits that help organizations to improve IT efficiency for some of their most important initiatives and challenges.

HERE'S WHAT CITRIX DELIVERS:

As a company and through the Citrix Access Platform with its many product families, Citrix's foundational approach to security provides the right degree of protection for extending access anywhere, anytime — without compromising security. We call it secure by design, because it enables organizations of any size to treat security as an integral part of their architecture, not as an afterthought.

Application delivery. Citrix is the only company that offers a service-oriented architectural approach for delivering all classes of applications with the highest security, lowest cost, and fastest performance: virtualization for client-server applications, optimization for Web applications, streaming for desktop applications. Enabling secure use of public networks, this combination offers unique opportunities for control of the endpoint environment, application execution, and information containment.

Access security and control. To deliver access security and control across IT and business initiatives, Citrix combines the power of two key security capabilities — SSL VPN and enterprise single sign-on. Both of these product families were the fastest-growing in their respective industries at the end of 2005.

Policy-based controls. Administrators can set end-to-end access policies that dictate what can be accessed from each specific access scenario. These access policies can take into account users, groups, device types, network locations, and end-point security.

Advanced authentication. In cooperation with partners, Citrix offers authentication to access resources with strong measures such as two-factor authentication, using tokens, smart cards and biometrics. Citrix is committed to ensuring that customers have the widest range of authentication options available, from leading authentication providers.

Industry partnerships. Citrix works closely with industry security leaders, to create certified tight integration with our products and services. Customers can be confident that Citrix has established the partnerships needed to tightly integrate secure-by-design capability with the security ecosystem, in areas such as authentication, identity management, and encryption.

Industry certification. Citrix is continually evaluating industry and government certification programs, and ensuring that products are submitted and certified where appropriate. These programs include FIPS 140-2, Common Criteria, and Section 508 accessibility.

Industry standards. Citrix is committed to both using and developing open, robust, secure standards for infrastructure security. We make use of established industry standards, such as Secure Sockets Layer (SSL)

encryption, and are involved in the development of emerging standards, such as the Security Assertion Markup Language (SAML).

End-point security. In partnership with industry leaders ranging from Microsoft to WholeSecurity, the Citrix Access Platform leverages new and innovative end-point compliance-enforcement solutions, centralizing the assurance that end-points are secure and compliant before access is delivered.

Comprehensive reporting and auditing. A compliance audit could require reporting that encompasses the entire information lifecycle, including interaction with end-points as well as with the data center. Citrix's product families encompass both environments, able to provide comprehensive, auditable reporting that includes the user environment as well as the data center.

CITRIX®

Best Access Experience. Anytime. Anywhere.

About Citrix: Citrix Systems, Inc. (Nasdaq:CTXS) is the global leader and most trusted name in on-demand access. More than 180,000 organizations around the world rely on Citrix to provide the best possible access experience to any application for any user. Citrix customers include 100% of the *Fortune* 100 companies and 98% of the *Fortune* Global 500, as well as hundreds of thousands of small businesses and individuals. Citrix has approximately 6,200 channel and alliance partners in more than 100 countries. Citrix annual revenues in 2005 were $909 million. Learn more at www.citrix.com.

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