WHITE PAPER

Citrix MetaFrame Access Suite: Access Infrastructure for the On Demand Enterprise

Sponsored by: Citrix Systems Inc.

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IDC OPINION

Organizations are increasingly looking for ways to reduce both the costs and the complexity of their IT infrastructure, especially as they relate to application software portfolios and enterprise data. The number and variety of distinct applications, software architectures, operating systems, and data assets in most large enterprises today translate into what IDC calls the "age of complexity." Primary research clearly shows that organizations are facing mounting pressure to reduce this complexity and the associated costs. Access infrastructure software — which IDC classifies as serverware software — such as the Citrix® MetaFrame™ Access Suite can help.

IN THIS IDC WHITE PAPER

IDC examines the market trends that we have identified through both demand- and supply-side research, how these trends cause organizations to change their technology adoption and investment plans, our view of the evolving fabric of distributed processing software called serverware, and, finally, how Citrix access infrastructure software can help organizations derive value from their IT investments.

SITUATION OVERVIEW

Organizations find themselves dealing with a number of challenging market trends simultaneously, including:

- ☑ Severe budgetary constraints

- ☑ Increasingly complex computing environments

- ☑ Supporting an increasing number of sophisticated remote and mobile workers

- ☑ Pressure to deliver consistently high-quality IT services

- ☑ Corresponding requirements to improve availability and reliability

- ☑ Heightened security requirements

- ☑ Growing support issues tied to a variety of small form-factor access devices

- ☑ Complicated business issues

Organizations are seeking ways to lower their costs of application and system administration, operations, and support. They are also increasingly concerned with obtaining the best possible levels of scalability, security, and performance while keeping their hardware acquisition costs in line.

BUDGETARY CONSTRAINTS: DOING MORE WITH LESS

The majority of organizations are either offering the same level of IT services with a smaller budget or offering more IT services with a static budget. What is clear is that organizations are increasingly relying on information-based services to enhance worker productivity. Unfortunately, IT staffs are constantly fighting to contain tactical problems at the same time that they are dealing with the lack of available expertise, especially in remote locations. Out of necessity, organizations are turning to technologies that offer relief.

If lowering administrative and operational costs is the driving factor, then organizations are centralizing designated application workloads from a large number of small systems to a fewer number of larger systems. The industry buzzword for this movement is *server consolidation*. It is evident that costs for system administration, product updates, and data backup and recovery will be lower for a smaller number of systems than for a large number of systems. If the workload cannot be consolidated onto a larger system, then virtual processing software is used to create a single domain, allowing many servers to be seen as a single computing resource.

If lowering hardware costs is the driving factor, organizations are hosting some functions on low-cost Intel architecture or Intel architecture–compatible systems to take advantage of the cost structure for systems, memory, and peripheral devices on these high-volume systems. Multisystem configurations, sometimes known as farms, clusters, or grids, are being deployed for enhanced performance, scalability, reliability, or availability. Another approach to lower overall software costs is to use a more compartmentalized, or object-oriented, development and deployment architecture. Applications are segmented into basic "services," each of which can be housed in the most appropriate system (or blade) somewhere in the network. This allows each component to be developed, tested, and deployed separately. Over time, several market catchphrases have been used to describe this trend. The most recent is *Web services architectures*. Multiple instances of a service can be deployed to increase levels of application availability, scalability, and/or performance. Other industry buzzwords for this trend include *utility computing*, *grid computing*, *on-demand computing*, *N1*, and *.NET*.

Most medium-sized and large organizations are adopting one or more of these approaches to lower their overall costs while successfully maintaining existing levels of IT service or broadening services to new functions.

ACCESS REQUIREMENTS

Non-PC access-point devices are increasingly found at all levels of an organization, making it important that any application be accessible by any authorized user using any type of device over any type of network (see Figure 1). Executives, analysts, point-of-service and support staff, as well as an array of other classes of global knowledge workers require secure access from mobile computers, personal digital assistants (PDAs), wireless devices, and traditional PCs. They are as likely to require access via rapidly evolving wireless GSM, GPRS, and CDMA networks as they are from the organization's LAN. Numerous applications running on a variety of back-end server operating environments, inconsistent delivery and management over disparate networks, and content sourced and proliferated from almost limitless sources make today's enterprise computing value chain

highly dynamic. People's roles, as well as their application and information access needs, are in a constant state of change. Virtual access software, also known as virtual user interface software, is at the heart of these configurations. Citrix calls this type of software *access infrastructure software* at the macro level and *presentation server software* at the micro level. IDC uses these terms throughout the paper.

Access infrastructure software, as shown in Figure 1, reduces the complexity for end users, allows organizations to increase levels of security through multifactor user authentication and full authorization, increases levels of application availability by having redundant application systems, and reduces costs of client system administration, software updates, and ongoing operational expenses.

FIGURE 1

SIMPLIFYING AND SECURING USER ACCESS
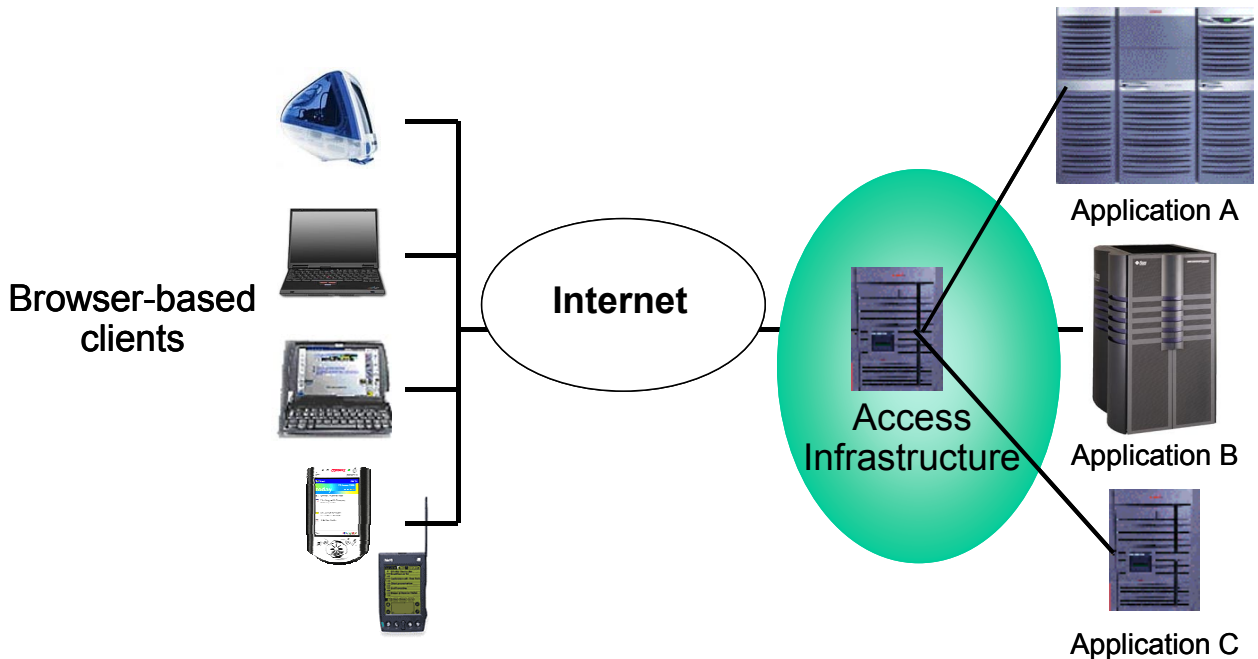
Source: IDC, 2003

Because employees are increasingly mobile — working in remote offices, hotels, or airports while traveling or onsite at their customers' offices — organizations find it necessary to make corporate applications available to them in a safe, secure, and reliable fashion.

Organizations are also increasingly considering wireless communications and new, smaller form-factor access-point devices, such as PDAs or intelligent mobile phones, for these distributed workers.

An access infrastructure software solution must include the following capabilities:

☐ Connect and interactively work with applications and information

- ☑ Organize and find important data based on profile and preference

- ☑ Control access securely and efficiently

- ☑ Support any hardware device over any network

It is clear that the mantra of access to "anything, anywhere, anytime, and anyone" must be part of today's enterprise belief system.

INTEGRATION OF EXISTING APPLICATION SYSTEMS IS A PRIORITY

Recent IDC research (*Worldwide IT Spending Forecast and Analysis by Vertical Market, 2002–2007: North America, Western Europe, Asia/Pacific, and Rest of World,* IDC #29648, July 2003) indicates that although there is some light at the end of the tunnel, the IT world still faces some belt tightening and resource optimization. Diverse economic, geopolitical, and health-related crises have negatively affected the high-tech climate over the past several years. These crises include the dot-com crash, Wall Street, global recession, war in Iraq, telecom winter, Middle East, September 11, oil prices, Enron, WorldCom, and SARS.

These crises have significantly impacted profits and undermined confidence levels. Profits have traditionally funded new projects, and confidence can help companies overcome the uncertainties and risks associated with new projects. However, because companies have neither profits nor an overabundance of confidence, many new projects have not left the starting blocks. Does this mean that work has ceased? No, but the trends are toward smaller, tactical projects that leverage existing applications and infrastructures. Organizations indicate that they are focused on quick projects with immediate return on investment (ROI) and limited operational impact on the end user.

IDC has identified the following key trends:

- ☑ **Hardware:** consolidation, price competition, commoditization, optimization

- ☑ **Software:** age of complexity, growth via modules and software that simplifies

- ☑ **Services:** smaller projects, enterprise application–related activity slowing as software slows, outsourcing growing but contracts being renegotiated, internal budgets still available for conversion

Some drivers of increased IT spending are cost savings, security, replacement of aging infrastructure, productivity, customer demand, customer acquisition, and competitive pressure.

Software is available that can help organizations mitigate the impact of the slow economy and lower corporate profits. This software can provide tactical cost effectiveness and sophisticated results without increasing complexity. In many cases, it can reduce the perception of complexity, optimize existing resources, and generally improve the IT staff's and users' experience with information-based solutions. When possible, most organizations look for ways that allow their IT expenditures to address both cost savings/efficiencies and improve the perception of their IT infrastructure. IDC believes that access infrastructure software, when properly implemented, can address those requirements.

Access infrastructure software will not address every issue or fit every trend, but it can and should play an important role.

CATEGORIES OF TOTAL COST OF OWNERSHIP

IDC has conducted a large number of total cost of ownership (TCO) studies that shed light on how technology costs vary depending on the computing model organizations adopt. This research includes a focus on the cost savings associated with adoption of an access infrastructure software model. These studies are based on interviews and surveys to determine actual ownership costs associated with the purchase of hardware, software, networking, and services as well as the retirement of systems. The research does not depend on theoretical modeling and other questionable cost factors. When the findings of these studies are combined, the data reveals that hardware and software are not the leading costs.

As Figure 2 shows, staffing costs, such as administration, operations, development, support, software installation, software updates, and training, significantly outweigh the costs of hardware and software acquisition combined. Organizations may be able to save millions of dollars using the appropriate technology to more effectively manage staff-related costs.

FIGURE 2

FACTORS OF TOTAL COST OF OWNERSHIP
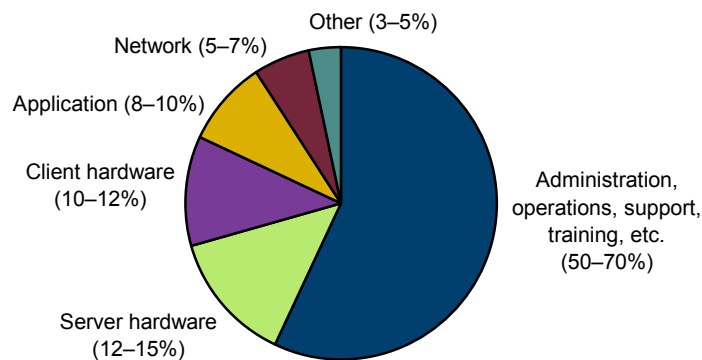
Source: IDC, 2003

PRICING AND LICENSING PARADIGM SHIFT

Organizations are increasingly demanding that hardware and software suppliers address the complexity issue by offering pricing and licensing models that help them do the following:

☑ **Simplify** pricing and licensing models

☑ Provide **equitable** pricing and licensing

☑ Make product licensing **manageable**

EVOLUTION TO DISTRIBUTED ARCHITECTURES

Organizations facing these pricing and licensing requirements often turn to entirely new approaches — a paradigm shift — including the following:

☑ Companies are increasingly looking to the deployment of serverware (which includes access infrastructure software and presentation server software), along with the more traditional approach of deploying fault-tolerant systems, to provide a resilient environment.

☑ IT executives are thinking about application performance, reliability, security, availability, scalability, and manageability rather than focusing on single-system performance.

☑ Intel architecture (IA) systems are being selected for functions previously hosted only on single-vendor platforms.

☑ Linux and other open source software products are increasingly considered mainstream and as platforms for critical applications or IT services.

☑ Packaged solutions are being deployed whenever possible to avoid the costs of development and ongoing support of custom projects.

SERVERWARE: DISTRIBUTED COMPUTING SOFTWARE

Serverware is independent system software that extends, coordinates, or "virtualizes" the resources provided by interconnected servers or nodes, regardless of their underlying processor architecture or operating system. It is often sold separately from the operating system on which it runs. IDC has also used the term *virtual environment software* to describe this fabric of software. Serverware is a secondary market of the system infrastructure software market.

GENERATIONS OF DISTRIBUTED PROCESSING

On-demand computing and *grid computing* are industry catchphrases that have emerged recently to describe the adoption of available distributed processing technologies for anywhere, anytime access; automated workload management; parallel processing/grid computing/clustered computing technologies for processing; and distributed storage systems (network attached storage and storage area networks). Although the catchphrases might be new, the technology behind them has evolved from distributed processing architectures, which date back to the late 1970s and early 1980s. IDC has observed the following generations of distributed technology:

☑ **Pre–Distributed Computing.** Applications were monolithic and host based. The application's interface, rules processing, data management, and storage management functions were typically linked together into a single image that was hosted on a single system.

☑ **First Generation: Remote Access to Distributed Processing.** Networking technology was inserted to allow remote batch job support and interactive access to host-based processing. Catchphrases used for the first generation included *remote job entry*, *remote batch*, and *distributed access*.

- ☑ **Second Generation: Client/Server Computing.** As client devices became more powerful and networking technologies improved, more application components — user interface, rules processing, and data management — migrated down to the client system. The host continued to support critical application processing, data management, and storage management tasks. The catchphrase for the second generation was *client/server computing*.

- ☑ **Third Generation: Multitier Computing.** As networking technology offered increasing levels of performance, applications were often segmented into several tiers, each hosted on a different system: The user interface and local processing were hosted on PCs; application services were hosted on application servers; data management was hosted on database servers; and storage was hosted on dedicated storage servers. After this approach established itself, the Web emerged as a distribution mechanism. Catchphrases for the third generation included *Web-enabled applications*, *n-tier applications*, and *Web-centric applications*.

- ☑ **Fourth Generation: Web Services Architectures.** With advances in processing power, memory, and storage and the availability of broadband networking media, the third generation approach to distributed computing was further refined. Application processing was broken down into a series of "services" accessible over the Internet. Application services could be hosted in several places on the network for greater scalability, performance, and reliability. Catchphrases for the fourth generation included *on-demand computing*, *Web services architectures*, *grid computing*, and even *blade computing*.

As usual with an evolving market, organizations adopt technology in stages. Older technology is deployed alongside newer technology. Older technology is only replaced when it is obsolete or organizations no longer need the functions it offers. IDC expects this will be the case as the fourth generation of distributed processing evolves. New applications are likely to be constructed on the foundation of fourth-generation technology. Older applications will continue to be utilized as they are architected today.

ACCESS INFRASTRUCTURE SOFTWARE

Access infrastructure software, as defined by Citrix, is a category of enterprise software that consolidates previously separate types of access technologies in the areas of device and network services, aggregation and personalization, security and identity management, and presentation and conferencing. The result is a single, integrated and consistent access infrastructure for the enterprise. The benefits of this infrastructure extend across the company from IT staffs stationed in corporate headquarters to remote and mobile workers roving far beyond the company firewall.

IDC believes that organizations are likely to use access infrastructure software to "wrap" their inventory of first-, second-, and third-generation applications to gain many of the benefits offered by the fourth generation without also having to redesign and rewrite established applications. Some of the benefits they are likely to receive fall into the following categories:

- ☑ Rapid application access and deployment

- ☑ Better support for remote workers

- ☑ Secure access

- ☑ Lower acquisition costs for desktop hardware and software

- ☑ Lower staffing costs, which can be attributed to desktop application administration, support, and license management

- ☑ Optimized management of heterogeneous applications and information

- ☑ Centralization of applications and information

- ☑ Increased flexibility and productivity

- ☑ Increased resilience in the event of business and technical disruptions

- ☑ Lower networking costs

Access infrastructure software's principal objective is to provide workers with secure, easy, and instant access to enterprise applications, information, processes, and people, from anywhere, at anytime, using nearly any device, and over any connection.

MARKET DATA

The worldwide market for software can be segmented into applications, application development and deployment tools, and system infrastructure software (see Figure 3). Citrix continues to rise in IDC's annual vendor rankings, which are based on software licensing revenue. In 2002, the company emerged as the number 44 supplier of software in the world.

FIGURE 3

WORLDWIDE SOFTWARE MARKET, 2002

System infrastructure software (29.0%)

Applications (48.9%)

Application development and deployment tools (22.1%)
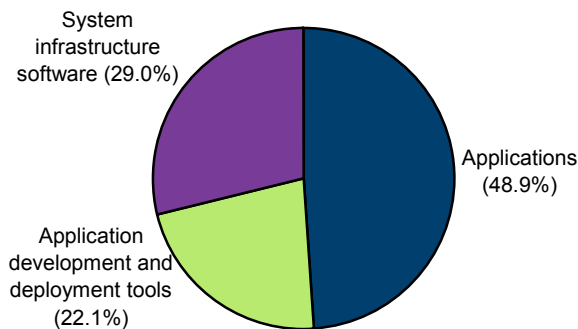
Total = $169.8 billion

Source: IDC, 2003

System infrastructure software can be further divided into system management tools, security, storage software, serverware, mobile infrastructure, operating environments, and other system infrastructure software (see Figure 4). According to IDC's 2002 rankings, Citrix is the number 15 supplier of system infrastructure software worldwide.

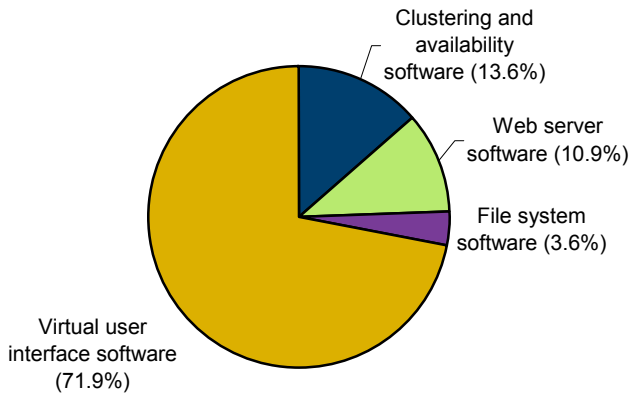WORLDWIDE SYSTEM INFRASTRUCTURE SOFTWARE MARKET, 2002
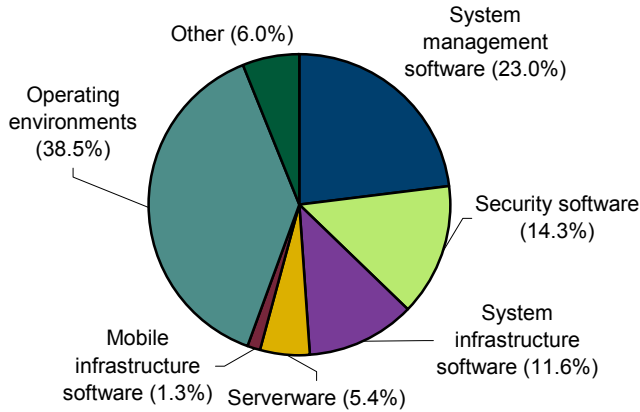
Total = $49.2 billion

Source: IDC, 2003

Serverware can be divided into clustering and availability software, Web server software, file system software, and virtual user interface software, which Citrix refers to as presentation server software (see Figure 5). According to IDC's 2002 rankings, Citrix is the number 3 supplier of serverware worldwide and holds 16.3% share of this segment. Only Microsoft and Sun are ranked higher than Citrix.

WORLDWIDE SERVERWARE SOFTWARE MARKET, 2002

Total = $2.6 billion

Source: IDC, 2003

WHO IS CITRIX SYSTEMS?

Citrix Systems, a worldwide supplier of access infrastructure software and services, enjoyed total revenue of $527.4 million in 2002. Software contributed approximately $468.8 million. Virtual access software, which Citrix refers to as presentation server software, is the largest contributor to Citrix's software revenue. Citrix also supplies software that is categorized as system management software.

Citrix's strong showing in the serverware market is largely based upon the fact that it is the leading software provider in the area of virtual access software. Its products provide access to applications, information, processes, and people on a broad array of access-point devices and over nearly all major networking technology. Citrix offers a comprehensive suite of software, the Citrix MetaFrame Access Suite, which provides a platform for remote access solutions.

The Citrix MetaFrame Access Suite portfolio includes the following products, which provide a single point of access to an organization's applications and information:

☐ **Citrix® MetaFrame XP™ Presentation Server.** Access infrastructure software that allows applications hosted on systems running Windows 2000 Server and Windows Server 2003 to be accessed from nearly any type of networked access-point devices over just about any type of media while still allowing them to be centrally managed.

☐ **Citrix® MetaFrame® Presentation Server for UNIX.** Access infrastructure software that allows UNIX and Java™ applications to be accessed from nearly any type of networked access-point device over just about any type of media while still allowing them to be centrally managed.

☐ **Citrix® MetaFrame® Conferencing Manager.** Access infrastructure software that allows teams, regardless of their individual locations, to work concurrently and enable application conferencing on the same applications and documents.

☐ **Citrix® MetaFrame® Password Manager.** Access infrastructure software that provides a single sign-on solution for accessing password-protected applications running in the Citrix MetaFrame Access Suite environment.

☐ **Citrix® MetaFrame® Secure Access Manager.** Access infrastructure software that provides a cost-effective way for organizations to provide secure, personalized access over the Web to applications and information.

The Citrix MetaFrame Access Suite offers a comprehensive approach enabling people to easily and securely access the organization's IT assets on demand while still providing IT organizations the ability to manage heterogeneity. This allows IT teams to centrally deploy, manage, and support secure access to Windows, Web, and UNIX applications across the Internet, intranets, extranets, WANs, LANs, and wireless networks to remote and mobile employees, partners, customers, and suppliers.

By presenting its products as a suite, Citrix can address a large number of organizational application and information access requirements, including device and network services, aggregation and personalization services, security and identity management services, and presentation and conferencing services (see Figure 6). Citrix believes that an integrated solution will be easier to deploy, use, and manage than independent, unrelated products.

CITRIX ACCESS INFRASTRUCTURE
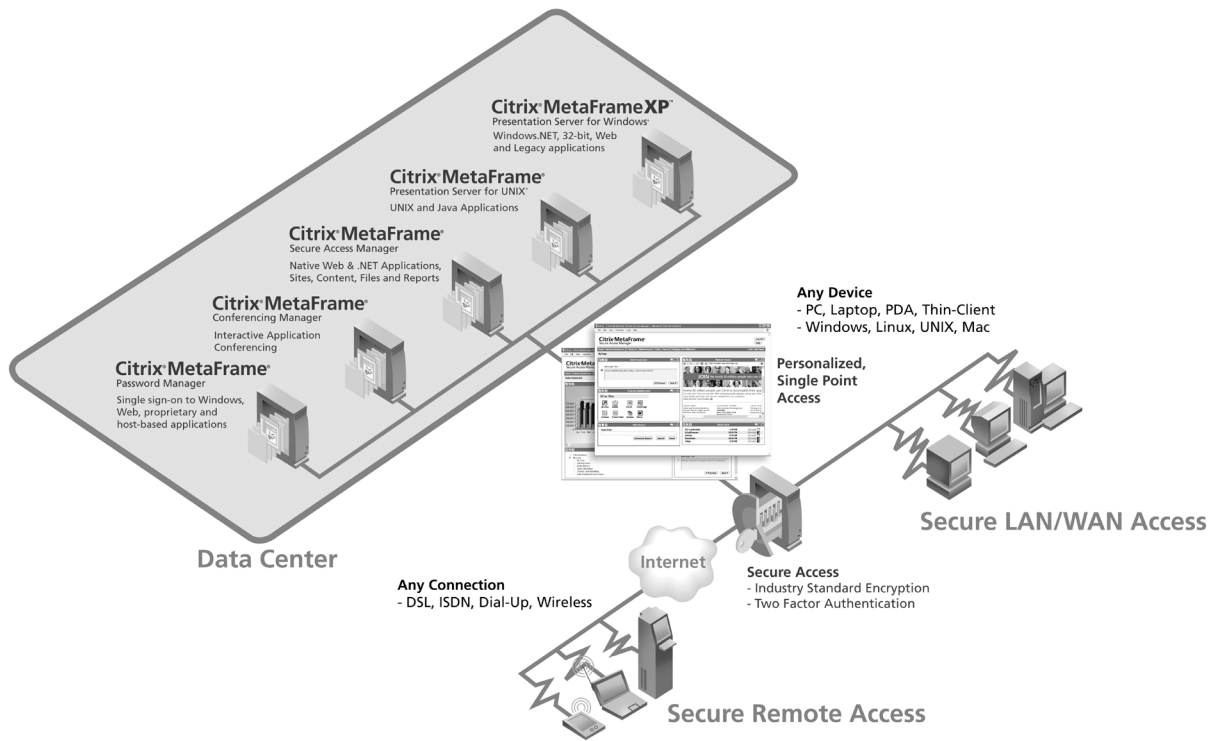
Source: IDC and Citrix, 2003

W H A T   P R O B L E M S   I S   C I T R I X   S O L V I N G ?

Citrix is addressing the need for highly efficient, safe, reliable access to applications running on any system within an organization's IT infrastructure from any device and over any network without also requiring that those applications be rewritten.

Citrix is also focused on providing secure access to organizations' Web-enabled or Web-centric applications in today's burgeoning distributed computing environments.

Heterogeneous environments of Web, Windows, Unix, Solaris, AIX, HP-UX, and others can be woven into homogeneous solutions for real-world applications. These solutions can be put in place to serve the client with cost effectiveness, cost savings, current hardware and software optimization, limited or often reduced complexity, and reasonable implementation and ROI time frames.

The Citrix MetaFrame Access Suite is an integrated solution that can provide capabilities which, if deployed properly, can result in a rapid payback and can be used to position an organization's IT assets for strategic advantage. As a gateway to the long-term advantages of On Demand computing, the Citrix MetaFrame Access Suite should be part of any prudent evaluation of companies with the needs described in this IDC White Paper.

FUTURE OUTLOOK

IDC's view is that serverware, also defined as access infrastructure and presentation server software, and other forms of virtualization software will increasingly be where the value is in the system infrastructure software market. IDC's research indicates that server operating environments are a declining source of revenue, while there has been rapid growth in various types of virtualization software, excluding Web services. Currently, the combined worldwide vendor revenue of virtualization products is roughly two-thirds of the revenue of server operating environments. IDC expects the positions to be reversed by 2007. One should note that most of these virtualization products barely existed in 1998; therefore, the 880% growth between 1998 and 2007 is very sizable.

CHALLENGES/OPPORTUNITIES

Although Citrix is the leading virtual access supplier, it faces a number of challenges in gaining mass acceptance for its solutions. For example, Citrix's solutions depend upon the availability of network connections. While this doesn't sound like much of a barrier to the adoption of virtual environment technologies, it may mean that some mobile employees benefit from the virtual environment only when they are in the office, a hotel, an airport, or some other fixed location. If they are working in motion — say, on a transcontinental flight — they are likely to also need standalone mobile PCs. Citrix and its partners can lessen the inconvenience posed by non-networked devices by ensuring that the files on mobile computers are periodically synchronized with those on a server. Furthermore, the growing adoption of wireless communications will further increase workers' independence from traditional communications media.

Increasingly, Citrix faces competition directly from Microsoft and Unix suppliers, as they add virtual access technology to their basic operating environments. If organizations need access to applications running on many operating environments rather than those offered by a single vendor, which IDC believes to be the case in most medium-sized to large organizations, Citrix has the opportunity to continue as the leading player in that portion of the serverware software market.

CONCLUSION

The Citrix MetaFrame Access Suite offers organizations opportunities to realize savings in a number of hardware, software, and staff-related categories.

Citrix's support of heterogeneous environments makes it a good choice for most organizations. Citrix software also clearly honors the "if it ain't broke, don't fix it" rule that most IT organizations follow. It can also facilitate integration of the newest technology into an existing environment without supplanting existing solutions.

IDC believes that Citrix's products and solutions should be on the short list for organizations seeking centralized, secure access to heterogeneous applications and information from anywhere, anytime, using any device over any connection.

RELATED RESEARCH

The fit of Citrix access infrastructure software has proven to be ubiquitous across industries. IDC conducted industry-focused research and presents that research in a series of IDC White Papers.

These IDC White Papers can be found on the Citrix Web site (www.citrix.com) within the Documents section of each Industry Solutions area (see Table 1). They describe how Citrix fits the particular industry's needs and how organizations are using Citrix access infrastructure software to good effect.

TABLE 1

CITRIX ACCESS INFRASTRUCTURE SOFTWARE USE BY INDUSTRY

Industry	IDC White Paper
Education	Simplifying Education in Complicated Times: The Technology Challenge in K–12 and Higher Education
Financial Services	Finding Financial Freedom: Using Technology to Address Business Challenges Within Financial Services
Government	Achieving E^2 Government: Using Technology to Help U.S. Government Agencies Gain Efficiency and Effectiveness
Healthcare	Rx for Change: Using Technology to Address Challenges Facing the Healthcare Industry
Manufacturing	Building a World-Class Manufacturing Operation with Just-in-Time Technology

Source: IDC, 2003

CITRIX METAFRAME ACCESS SUITE CASE STUDIES

Technology providers such as Citrix have proven their worth across a wide variety of industries. The following case studies tell more about how three organizations are working with Citrix to meet their needs.

AIR LIQUIDE AMERICA

AIR LIQUIDE AMERICA EXTENDS THE ENTERPRISE WITH CITRIX VIRTUAL ACCESS SOLUTIONS

Air Liquide America is part of Air Liquide Group, a global leader in industrial and medical gases and related services. The company has more than 220 locations across North America.

DEPLOYING A BUSINESS-CRITICAL ERP APPLICATION INTERNALLY AND EXTERNALLY

Air Liquide America decided to deploy an Oracle 10.7 SmartClient enterprise resource planning (ERP) application across all of its North America locations. Employees needed to access core data such as financials, procurement information, inventory management, and project accounting. The company also wanted to give selected business partners, such as customs brokers, real-time access to key information, such as purchase orders, taxes, and duties. Deploying the new application in a widely diverse computing environment containing a mix of hardware and software platforms inside and outside the company would be a major initiative with the potential for significant disruptions to the business.

One option was to install the ERP application on more than 3,000 company computers scattered across North America as well as the computers of the customs brokers. However, this option would have required the upgrading of more than 2,000 devices, and the time and travel to visit all 220+ locations would have consumed significant resources.

$1.5 MILLION IN INITIAL SAVINGS AND LOWER COSTS GOING FORWARD

Air Liquide felt that there had to be a way of bringing the ERP application to its user base without incurring such large costs. The company was already using Citrix to deploy applications at a remote location in Canada, and Louis Gilbert, director of datacenter operations, felt that this could serve as a model for the larger deployment. As Gilbert explained, "We decided to see if we could host the Oracle ERP application on a Citrix server farm. This would eliminate desktop application issues and also allow us to avoid the cost of upgrading thousands of desktops."

Air Liquide implemented Citrix® MetaFrame XP™e application server software, Citrix MetaFrame® for AIX, Citrix NFuse® Classic and Citrix Secure Gateway. With the Citrix solution in place, nearly 5,000 users across North America and key customs brokers have secure Internet access to Air Liquide's ERP Oracle application, from any Web browser, in any location.

Productivity has improved along with the manageability of the IT infrastructure. Using Citrix enabled Air Liquide to lower the cost of computing by centralizing administration, operations, support, and software upgrades. Other benefits include better reliability, security, and more convenience for users by allowing them to continue using their older systems. The company was able to save $1.5 million of the amount estimated for the deployment, and it will avoid significant costs on an ongoing basis due to the centralized management and version control that Citrix offers. Gilbert has high praise for Citrix: "Our team can easily manage entire load-balanced server farms. Delivering the Oracle 10.7 SmartClient ERP application to our geographically dispersed user base across the U.S. and Canada would have been impossible without Citrix solutions."

CREDIT SUISSE

Credit Suisse (CS) has seen great benefits from the security, reliability, and manageability provided by Citrix's access infrastructure software. Rapid application deployment and improved total cost of ownership (TCO) are also results of Credit Suisse's use of Citrix technology.

IDC interviewed Chris Demuth, vice president of Credit Suisse, to gain a clear understanding of how CS is using the Citrix® MetaFrame® Access Suite, what benefits the organization has realized from using Citrix software, and what recommendations CS has for others considering this technology.

INTRODUCTION TO CREDIT SUISSE

Credit Suisse Group is a leading global financial services company headquartered in Zurich. The business unit Credit Suisse Financial Services provides private clients and small and medium-sized companies with private banking and financial advisory services, banking products, and pension and insurance solutions from Winterthur. The business unit Credit Suisse First Boston, an investment bank, serves global institutional, corporate, government, and individual clients in its role as a financial intermediary. Credit Suisse Group's registered shares (CSGN) are listed in Switzerland and Frankfurt and in the form of American Depositary Shares (CSR) in New York. The Group employs approximately 64,000 staff worldwide. As of June 30, 2003, it reported assets under management of CHF 1,234.2 billion.

Credit Suisse Private Banking is one of the world's largest providers of private banking services. It is strongly represented in both the Swiss and international markets and serves a total of approximately 640,000 clients. Credit Suisse Private Banking specializes in providing personal investment advice and professional asset management for discerning private clients. It has assets under management amounting to CHF 493.8 billion (at the end of the second quarter of 2003). Clients may choose from a broad spectrum of investment products and services, as well as the full range of basic and credit products, offered by 70 offices in Switzerland and more than 50 offices in the rest of the world. In addition, Credit Suisse Private Banking offers comprehensive financial advice in matters relating to tax, inheritance, trusts, pensions, and real estate.

The ability to provide the highest levels of services and security is part of Credit Suisse Private Banking's value proposition to its clients. These levels of service require choosing the right products and vendors to assure the correct systems to provide the highest quality to clients.

HOW CS IS USING ACCESS INFRASTRUCTURE SOFTWARE

Both return on investment (ROI) and TCO are very important metrics for a financial services provider. This has been increasingly true as the market for IT has changed dramatically during a very short period of time. CS is also highly focused on providing integrated information services to its clients. "Credit Suisse's information services must be secure," said Demuth. "Secure Web sites have always been one of the top issues in online banking. This has not changed."

Credit Suisse is serving the needs of a demanding external customer group, consisting of asset managers, which requires both dedication and professionalism. Credit Suisse provides an online tool that gives access to account information and helps this group manage its assets. This requirement was important in the design and implementation of the system, and that led CS to use Citrix as the means of giving its clients access. CS used the Citrix products to distribute the application to these remote access users and leverage the Internet to assure efficiency and ubiquitous access.

The following bullets describe the benefits CS has received from deploying Citrix access infrastructure technology:

☑ Fast implementation

☑ Cost efficiency, including lower costs for maintenance and support

☑ Unchanged staffing levels (CS would have had to increase staffing levels to achieve service levels without Citrix.)

☑ Support for wide range of clients (e.g., normal standard clients, standard PC standalone, notebooks, computer desktops)

☑ Fewer support visits to remote sites

☑ Easily support different operating systems on customers' systems

☑ Secure Internet access from anywhere at anytime

These benefits of deploying Citrix's access infrastructure software were largely due to the change in the application delivery model. Customers are no longer required to install special software to access applications on CS' network. Instead, users can access CS' information products using the Internet and a Web browser. This has allowed CS to reduce the support-intensive maintenance tasks associated with the locally installed hardware and software. "We delivered the application described along with a Web portal, which offered custom integrated information, financial news, and financial quotes," Demuth said.

CURRENT ACCESS INFRASTRUCTURE CONFIGURATION

Credit Suisse started out with MetaFrame 1.8 but has since upgraded to Citrix MetaFrame XP for increased stability and enhanced printing support. Security is achieved by using Citrix's Secure Gateway and 128-bit security keys as well as RSA Security ID Cards.

CS' customers use a broad collection of desktop operating environments, including Windows 95, 98, 98 SE, NT Workstation, 2000 Professional, and XP.

ACCESS INFRASTRUCTURE SOFTWARE BENEFITS

Credit Suisse has realized benefits in the following areas since deploying Citrix access infrastructure software:

☑ **Application deployment.** Citrix software has simplified application deployment — a significant factor for CS, which updates applications several times a year.

☑ **Flexibility.** Customer needs and requirements change rapidly. To maintain customer loyalty, CS must rapidly respond to those needs.

☑ **Manageability.** CS has been able to provide a well-managed environment without having to increase the size of its IT staff.

☑ **Security.** Security is undoubtedly a critical issue to a financial services provider. Customers require that both their personal information and their financial transactions be safe, private, and secure. Therefore, security is always an important component of any financial system.

Credit Suisse recommends that IT decision makers try the following approach when considering Citrix as a technology provider:

☑ Have a clear picture of why you would like to work with Citrix. Know the answer to questions such as the following:

  ❑ Is it a security issue for which Citrix's ability to deliver encrypted information access without stored data on the remote client would be helpful?

  ❑ Is it an application access issue for which Citrix's ability to simplify application deployment and/or make established applications available to your users would be helpful?

  ❑ Is it the desire to offer remote or portal access to corporate applications and information?

☑ Determine if "this is really the right way" to provide your applications/information by analyzing your possible solutions. If your organization is just deploying simple Web applications, for example, then Citrix may not be the appropriate option. If, on the other hand, you're trying to deploy an existing application centrally instead of rewriting it for the Web, then Citrix is a good choice.

☑ Establish a good working relationship with Citrix — solid communication will provide you with an active, listening vendor! The company has the resources and the will to help you solve your issues. Citrix will also listen to your suggestions for product and business process improvements.

NATIONAL SEMICONDUCTOR

National Semiconductor Corporation (NSC) has moved beyond trying to prove the total cost of ownership (TCO) and return on investment (ROI) benefits of Citrix Systems' access infrastructure software.

The company is realizing TCO/ROI benefits, but it is really leveraging Citrix technology for competitive advantage in the global market in which it competes. NSC's top priorities are supporting the increasing number of mobile workers and providing security and offline access for them. Whole populations of workers who were never mobile before are now working remotely or in front of customers. Citrix® MetaFrame XP™ Access Suite is an important tool in that effort.

IDC interviewed NSC's Director of Thin-Client Technology, Bob Neuberger, to better understand how the company is using the Citrix MetaFrame Access Suite, what benefits the organization has realized, and what suggestions NSC has for others considering this technology.

National Semiconductor is a supplier of information-age products that combine analog and state-of-the-art digital technology. The company focuses on the markets for wireless handsets, information infrastructure, and display and imaging technologies. NSC's chips power mobile and cordless phones; wired and wireless LANs; advanced

displays and imaging applications; desktop, portable, and thin-client computers; and a host of other electronic devices.

NSC's base of analog, mixed analog, and digital technologies enables it to provide system solutions by evolving and integrating its basic building-block circuits into standard chipsets tailored for specific applications to highly integrated, full-system solutions.

NSC has manufacturing sites around the globe. Its wafer fabrication facilities are located in Arlington, Texas; South Portland, Maine; and Greenock, Scotland. Test and assembly sites are in Melaka, Malaysia, and Singapore. As Neuberger said, "National Semiconductor is a high-technology company with locations all around the world. It is not decentralized, but it has a lot of legs."

HOW NSC IS USING ACCESS INFRASTRUCTURE SOFTWARE

NSC has transitioned from a "desktop paradigm" to a server-centric computing model to provide access to productivity tools, such as email, Microsoft Office, and a variety of corporate packaged software.

At first, demonstrating ROI and TCO of using access infrastructure software was the primary concern. After using this software for a period of time, NSC has progressed to a point where it now consistently benchmarks itself to ensure that it is maximizing the benefits that have the highest ROI. Tighter integration of its current information services was an early benefit. Rapid application deployment is another key area of benefit. Now, NSC has focused on developing and deploying Web Services Architecture[SM] (WSA)-based applications. An important goal for NSC is bringing nonmainframe environments up to the same standards of robustness, security, and availability as those of mainframes.

NSC's top priorities, as mentioned earlier, are properly supporting the increasing number of mobile workers and providing security and offline access for them. Neuburger said, "Whole populations of workers who were never mobile before are now working remotely or in front of customers."

DEPLOYING CITRIX AT NSC

NSC initially planned a limited deployment of Citrix® MetaFrame XP™ as a way to provide users a remote desktop environment. The goal was to take everything off of the desktop system by deploying a thin-client model. The first environment targeted was the manufacturing clean room floor. Bringing in a thin-client device that had fewer moving parts and had the potential of being a point of failure seemed a good choice because it would take many hours to decontaminate a system when a PC failed. The fact that these desktop systems had neither a fan nor a hard disk drive was a big advantage in this environment. This deployment was considered a success. Over time, that model was replicated in other departments and eventually was used throughout the company.

CURRENT ACCESS INFRASTRUCTURE CONFIGURATION

NSC is currently hosting MetaFrame XP™e on Windows NT 4 Terminal Server Edition and is just beginning a migration to Windows 2000. It expects to complete the migration by the end of 2003.

NSC will consider Windows 2003 a year from now. The company believes that the value proposition of this new release is not yet clear enough. It also believes that it would be better served by dealing with the architectural issues in a Windows NT 4 Terminal Server Edition to Windows 2000 Server migration before considering a generation beyond that.

NSC has a broad collection of desktop operating environments supporting Citrix's ICA software, including Windows 95, 98, 98 SE, NT Workstation, and 2000 Professional. Furthermore a Web browser is installed on the local device. At this point, NSC is not deploying applications to PDAs or mobile telephones.

ACCESS INFRASTRUCTURE SOFTWARE BENEFITS

NSC has realized a number of benefits from its deployment of Citrix access infrastructure software, including the following:

☑ **Application deployment.** In some cases, application deployment projects that would have taken months in the past were completed in hours.

☑ **Flexibility.** NSC believes that it can respond to changing events much more rapidly by deploying a server-centric approach.

☑ **Manageability.** NSC believes that the Citrix MetaFrame Access Suite has provided significant benefits in the area of desktop administration and license management.

☑ **Security.** NSC has experienced the benefits of a more centralized application environment. Viruses and worms, which created difficulties in other parts of NSC, did not affect the environments running the Citrix MetaFrame Access Suite. In some cases, NSC spent thousands of dollars eradicating some viruses on non-Citrix systems.

☑ **Connectivity.** NSC sees connectivity as a huge factor. The organization is really using the anytime, anywhere aspects of the MetaFrame Access Suite. In the past, the organization was forced to use expensive dial-up facilities for remote workers. Now, these workers can use inexpensive Web access from anywhere in the world. NSC anticipates that it will save a little more than $100,000 a year on this one item.

☑ **Cost reduction.** NSC has realized savings, which it states are at least in the seven figure range, because it has not had to update remote Windows 9x systems hardware or software.

☑ **Competitive advantage.** NSC is in the position of being able to move much faster to respond to the changing business environment. The company pointed out that savings in this area will allow it to invest elsewhere in its IT infrastructure or address other organizational requirements.

RECOMMENDATIONS FOR OTHERS CONSIDERING THIS TECHNOLOGY

NSC offers IT decision makers the following recommendations:

☑ Consider both the political and sociological aspects of an access infrastructure deployment as well as its technical feasibility.

☑ Remove the word *personal* from the discussion of personal computer–based desktop solutions and focus on the fact that these systems are merely tools that allow an organization to move toward its goals.

☑ Understand the true value of this move. Establish a comprehensive and complete set of metrics and how to measure success before starting a deployment.

☑ Prove the real savings in one area and move on from there. It is not wise to attempt to convert every desktop solution right at the start.