Securing Government Network Access While Reducing Costs in a Post 9/11 World

How Virtualization and Cloud Client Computing Enable Secure, Cost-Effective Network Access

A white paper by Wyse Technology Inc.

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Introduction and Challenges

Server virtualization, desktop virtualization, and cloud computing provide major opportunities, as well as some challenges, for public sector organizations around the world. For government agencies, virtualization is a concept whose time has come, a means of extending the availability of resources beyond a system or physical piece of hardware. Today's interest in cloud clients and virtual desktop infrastructure (VDI) is centered on moving computing and storage off the client and onto the servers. The drivers behind this in the public sector are the need for additional security and workstation lockdown, reduced environmental footprint, and lowering total cost of ownership (TCO) for both desktop hardware and ongoing maintenance overhead. Desktop virtualization also plays extremely well with remote disaster recovery processes by eliminating local storage of both the client data and applications on the desktop.

The twin pressures of reduced budgets and the need for greater efficiency have led the U.S. federal government to strongly promote desktop virtualization and cloud computing as a solution whenever possible. The U.S. Office of Management and Budget in December 2010 declared that government now operates under a cloud-first policy, meaning that agencies must first try to incorporate some type of cloud computing into projects. Agencies that choose not to use a cloud scenario must justify their decision. Going forward, when evaluating options for new IT deployments, OMB will require that agencies default to cloud-based solutions whenever a secure, reliable, cost-effective cloud option exists. In addition, an OMB directive encourages the use of virtualization by 2011, to help meet data center consolidation and energy reduction requirements.

Virtualization is now considered a stepping stone to, and a vital component of, cloud computing. And while only a subset, desktop virtualization is also considered a step in the right direction toward achieving federal regulatory compliance. As public sector organizations strive to grant employees access to internal information resources when and where they need it while simultaneously reducing costs, desktop virtualization is becoming a key component to help meet those goals, in addition to providing both greater control over desktop resources and stronger IT security. According to a survey released recently by the 1105 Government Information Group[1], cost reduction, fast access to data and applications, and simplifying IT infrastructure and management are the top three reasons that government agencies…at the national, state, and local levels… are moving to virtualization and the cloud.

Government Cloud and Virtualization Initiatives

One of the largest consumers of IT infrastructure and services in the world is the U.S. federal government. U.S. CIO Vivek Kundra has a vision for deploying virtualization across the federal IT landscape with the familiar goal of helping agencies do more with less. The federal government has a 2011 budget of nearly $80 billion and a mammoth infrastructure characterized by segregated silos and server glut. As a result, the task of transforming the public IT sector poses significant challenges, and will involve substantial change.

For example, U.S. government data centers reportedly grew from a mere 432 in 1998 to more than 2,100 in 2009. Those redundant infrastructure investments are costly – not just in terms of hardware and software, but also in energy consumption and even real estate. The federal government's implementation plan, currently underway in 2011, will reduce the number of federally run data centers from 2,100 to approximately 1,300, rectify or cancel one-third of troubled IT projects, and require federal agencies to adopt a "cloud first" strategy in which they will move at least one system to a hosted environment within a year.

Highlights of the implementation plan:

- Each agency will identify three "must move" services within three months, and move one of those services to the cloud within 12 months, and the remaining two within 18 months

- Ensure IT programs use a modular approach with usable functionality delivered every six months

- Turn around or terminate at least one-third of underperforming projects in the IT portfolio within the next 18 months

- Reduce the number of federal government data centers by at least 800 by 2015

- Reduce the energy and real estate footprint of federal data centers

- Cut data center hardware, software and operations costs

- Boost IT security

- Migrate federal IT investments to more efficient computing platforms and technologies

[1] Source: 1105 Government Information Group

Public Sector Agency Approaches in the U.S. and Globally

Many public sector agencies in the U.S. and around the world are already well along in the process of transforming their IT infrastructure to a cloud computing model complete with server and desktop virtualization.

U.S. Defense Information Systems Agency - The DISA is developing a number of Cloud Computing solutions available to US military, DoD government civilians and DoD contractors for Government authorized use. They include: Forge.mil, a system that currently enables the collaborative development and use of open source and DoD community source software; GCDS, a commercially owned, globally distributed computing platform that provides a reliable and secure content and application distribution services solution that delivers applications to dispersed user communities; and RACE, a quick-turn computing solution that uses cloud computing to deliver platforms that are quick, inexpensive and secure.

U.S. Department of energy - The DOE is exploring the cloud concept with its federal partners to identify opportunities to provide better service at lower cost through cloud services. The DOE National Laboratories are exploring the use of cloud services for scientific computing. They are also developing high bandwidth networking to transport the high volumes of data between DOE and cloud service providers required by scientific computing.

Japan - Ministry of Internal Affairs and Communications (MIC) – MIC released a report outlining the Digital Japan Creation Project (ICT Hatoyama Plan) which seeks to create new Information and Communications Technology (ICT) markets to help boost Japan's economy. Within this plan is an outline to create a nationwide Cloud Computing infrastructure tentatively called the Kasumigaseki Cloud.

Canada – Public Works & Government Services Canada (PWGSC) - The Canadian Government's CTO of PWGSC presented a paper on Cloud Computing and the Canadian Environment. This paper essentially outlines the Canadian Government's considerations of cloud computing by outlining the advantage of their cold landscape (among other things) as a prime location for the construction of large energy efficient Cloud Computing data centers.

European Union - The Seventh Framework Programme (FP7) – FP7 bundles all research-related EU initiatives together under a common roof, playing a crucial role in reaching the goals of growth, competitiveness and employment. The FP7 is funding several projects on cloud computing and has also compiled a group of experts to outline the future direction of cloud computing research.

The Positive Impact of Virtualization

Trends in cloud computing adoption are making a major impact on the adoption of desktop and server virtualization solutions. A recent survey of federal and IT industry professionals predicted that the virtualization market within the U.S. federal government alone will grow from $800 million in 2009 to $1.4 billion by 2014.[2] Mandates pre-dating the cloud-first strategy have driven adoption of virtualization technologies such as virtual desktop infrastructure and cloud clients to complement the cloud computing model. The U.S. Congress passed a law in 2006 - the Federal Funding Accountability and Transparency Act - to push government in that direction.

Deployment of technologies like virtualization and cloud computing can help federal agencies get their IT shops functioning more efficiently, and in compliance with regulatory statutes. The top-down mandates for transparency and open government are part of the business case for virtualization in federal agencies, with flexibility and efficiency as the key benefits. Desktop and server virtualization can help agencies easily deploy application infrastructures within minutes across a common physical infrastructure. This speeds time to market, and fuels more rapid change to business processes that otherwise would not be possible.

While it can be difficult to quantify the return on investment (ROI) for deploying virtualization in federal agencies, there are some benefits that can be readily observed, such as the reduction in hardware, support, and maintenance costs. Personnel costs may drop as well if a public sector agency finds it needs fewer people to manage a smaller infrastructure.

Government organizations at all levels are also challenged to make their agencies more energy efficient and to reduce skyrocketing costs. Virtualization can help them accomplish those goals of getting greener by consolidating lots of underutilized servers and replacing power-hungry PCs with more flexible virtual desktops and cloud clients which use significantly less energy, thus making government IT operations more environmentally friendly. A Gartner report estimated that "the effective use of virtualization can reduce server and desktop energy consumption by up to 82 percent and floor space by 85 percent". In the federal government, which is under a mandate to cut its overall energy consumption 28 percent by 2020, savings gained from virtualization of servers and desktops are low hanging fruit. As green computing moves forward in federal agencies, identifying the energy footprint of IT will become increasingly important.

Cloud Clients for Security and Compliance

Proper data and end-point security is a necessity in the public sector data environment. Cloud client solutions at end-points formerly occupied by PCs can increase data security, governance, and compliance through a centrally stored data base and managed infrastructure. Cloud clients can be configured to support the latest identity management and access control policies and best practices though the use of two-factor authentication. Cloud clients can also be centrally configured to restrict user access to specific resources, and access rights can be changed without having to service or modify the desktop in any way. By using cloud clients, end points and individual access can be completely locked down as needed by the IT administrator through centralized control of the virtual machines hosted by the servers.

All of the data in a cloud client/virtual server computing environment resides on the servers themselves...not at the cloud client end-points. Data is prevented from leaving the premises on USB memory sticks, CDs, or other portable media, for example, since no data resides on the cloud client desktop device. Storing all data in centralized data centers greatly improves security and can also help ensure compliance with data privacy regulations as required under the Gramm-Leach-Bliley Act and other federal and state regulations. Since all data resides in the data center, automatic information back-up can be deployed more easily across the IT infrastructure, ensuring business continuity and reducing the risk of loss through disaster, while also removing the uncertainty of relying on each user to archive the files stored on their personal device.

More Cloud Client Benefits

Research firm Gartner compared the Total Cost of Ownership (TCO) of personal computers versus what they term server-based computing (SBC). SBC is simply one implementation of cloud client computing. According to their findings, the "TCO of a SBC deployment used to deliver all applications to users is around 50% lower than that of an unmanaged desktop deployment, and 11% to 18% lower than that of a locked and well-managed PC deployment." In addition, the direct costs "of SBC are between 12% and 27% lower than those of traditional PCs."[3] The cloud client approach also delivers other benefits to financial services organizations.

Improved economic efficiencies for IT - Software and storage are hosted and supported on the centralized server infrastructure, so it is no longer necessary to buy software for each desktop or laptop device that only one person uses, invest in technologies that are quickly outdated, or spend hours and hours on technical support. On average, it costs more than twice as much to provision a PC vs. a cloud client. PCs typically incur significant annual maintenance costs associated with software maintenance and upgrades, hard drive failure, and troubleshooting, while cloud clients are essentially maintenance-free, and can be easily swapped out when necessary. The average lifespan of a cloud client is six to eight years, vs. the three to four year lifespan of a PC, thus extending the buying cycle and reducing costs over time. In addition,

[3] Total Cost of Ownership Comparison of PCs With Server-Based Computing, by Federica Troni, Mark A. Margevicius, Michael A. Silver.

cloud clients provide a greener solution from an energy perspective, consuming 10% or less of the wattage (under 7 watts versus 100 or more) required to operate a PC.

Greater reliability – Cloud clients do not have moving parts such as disk drives and fans, and require no native OS to be loaded on the machine, since they are completely dependent upon the centralized servers. With no PC OS to corrupt, cloud clients, and more secure 'zero clients', reduce or eliminate virus or vulnerability issues. Unlike a PC, it is impossible for unauthorized users to "customize" the cloud client with outside software which could potentially disrupt the workstation and the network.

Simplified desktop environment and ease of use – Since information and computing resources are resident on centralized servers, cloud clients are not cluttered with multiple applications, and can be re-purposed to meet changes in operating systems, application environment, or user community. A single cloud client can efficiently display any application and OS supported by the virtual server cluster.

Rapid deployment to meet business changes – The lower per-unit costs of cloud clients vs. PCs means that more cloud clients can be deployed rapidly, when and where needed, to address new service initiatives or manage expansions and mergers.

Example: Transforming Public Services through Desktop Virtualization

A major renewal of IT infrastructure is helping a local authority in the North of England to deliver much more effective and cost efficient information technology to its staff. North Tyneside Council, which represents a large metropolitan borough of over 190,000 people, has replaced traditional PCs and laptops with Wyse cloud clients that are easier to manage and maintain, and are contributing to a much more productive working environment. The council's review of information technology included exploring how IT systems could deliver better value for money and provide maximum support for staff doing vital work in the local community.

From an early stage its IT department became advocates for adopting a cloud computing and virtual desktop infrastructure for everyday computing requirements across the authority. Switching from desktop PCs to cloud client devices offered clear efficiency savings in maintenance and support with the same benefits of using a standard PC to access personal data and applications.

The council decided to standardize on Wyse technology, and the IT team began to roll out the Wyse cloud clients replacing PCs across a wide range of departments including housing, social services, revenues and benefits. The North Tyneside Council is well on its way to achieving the eventual goal to have 80 percent of its 4,000 PCs replaced by cloud clients. The migration will be completed as residual PCs reach the end of their operational life. Wyse contributed to the success of the implementation program by easing the introduction of the new client hardware by providing training sessions and efficiently resolving any deployment issues.

The mainstay of the deployment are Wyse cloud clients running an embedded version of Microsoft Windows, which delivers a rich desktop environment for running the latest desktop application software with support for any future peripherals requirements. The project has involved many major changes to the background technical environment. Alongside this the Wyse cloud clients have contributed to the transformation of the customer experience, changing the way in which applications are used and how data is accessed while maintaining the same familiar interaction with applications with which users have grown accustomed.

PCs had created significant challenges for ICT support. End users were customizing their PCs and installing additional applications and utilities. This had potential for serious problems such as risk of virus contamination, and also meant that maintenance and support of PCs was becoming more time consuming and expensive. With the new cloud clients, the IT team is able to make sure the systems are optimized for individual users. Each desktop is pre-configured for the end user before the cloud client is supplied and installed.

End users have easy access to exactly the data and applications that they need to do their job. With no hard disk, applications cannot be downloaded onto the cloud client and the set-up is standardized, making it simpler to support and maintain. There are obvious benefits for the council. All applications and data are managed centrally and presented onto the cloud clients via Citrix Presentation Manager running in the council's data centre. What were previously time-consuming tasks are now much simpler to complete. For example, setting up access to personal data and applications for a new hire takes minutes because all of the complex work is done centrally. And once the cloud client is active, the units tend to be much more reliable than the PCs that they are replacing. According to the IT team, hardware failures are now rare. Interruption to full service delivery is now also extremely rare, usually caused by external network disruption or power failure.

Another direct benefit of the more streamlined computing infrastructure is the ability to disable the USB ports centrally on the Wyse cloud clients, which do not contain disk drives. This makes it impossible to upload and download data, helping to protect private data from inadvertent or deliberate loss. In addition, agency staff is no longer tied to only working on their personal computer. They can access their own data and applications on any cloud client wherever they are within the council offices as well as from home using secure Internet connections.

Transforming the council's IT infrastructure has gone hand-in-hand with a wider project to enhance the quality of the working environment for all staff. The council is determined to make much better use of its real estate, selling off under-used buildings and consolidating its staff into new central offices. Cloud clients suit these new working environments, as they can be set up in minutes and require a smaller desktop footprint. They also offer the council more sustainable and "green" virtual desktop infrastructure that requires a fraction of the electricity to run compared with a PC, and generates less heat and noise, reducing the load on air conditioning for cooling large populations of PCs.

Summary

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This example illustrates the value of deploying cloud clients and a Virtualized Desktop Infrastructure in demanding public sector environments. Not only does the cloud client computing platform from Wyse Technology deliver better virtual desktop infrastructure with clear and compelling operational benefits to government organizations, it also enables the more efficient adoption of the complex regulatory mandates and security requirements that government organizations are being required to implement around the world. Wyse Technology continues to deliver ground-breaking software and hardware solutions in virtual computing environments which enhance data security, support regulatory compliance requirements, reduce IT overhead, and ensure greater operational reliability to meet the unique requirements of the public sector around the globe.

Wyse Technology is the global leader in Cloud Client Computing. The Wyse portfolio includes industry-leading thin, zero and cloud PC client solutions with advanced management, desktop virtualization and cloud software supporting desktops, laptops and next generation mobile devices. Cloud client computing replaces the outdated computing model of the unsecure, unreliable, energy-intensive and expensive PC, all while delivering lower TCO and a superior user experience. Wyse has shipped more than 20 million units and has over 200 million people interacting with their products each day, enabling the leading private, public, hybrid and government cloud implementations worldwide. Wyse partners with industry-leading IT vendors, including Cisco®, Citrix®, IBM®, Microsoft®, and VMware® as well as globally-recognized distribution and service partners. Wyse is headquartered in San Jose, California, U.S.A., with offices worldwide.

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THE GLOBAL LEADER IN
CLOUD CLIENT COMPUTING

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