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Accelerate your journey to the government cloud with EMC's roadmap to the virtual data center

A PARADIGM SHIFT FOR GOVERNMENT IT

Operate more efficiently. That's the order of the day for government organizations, but obstacles are everywhere. These include siloed information, outdated IT processes, and distributed IT budgets and staff—with no to little consistency in how information is managed across numerous agencies and systems. Storage is growing at more than 30 percent annually. Utilization rates are under 50 percent. Power and cooling costs account for 25 percent of the budget. Human errors cause network downtime, and new applications take two to six months to deploy. At least that was the case up until recently. Now we have the cloud.

Cloud computing represents a paradigm shift which enables IT to focus less on the physical assets it is managing and more on the services it is providing—services to citizens, contractors, and government staff at all levels across all departments. Providing services across the continuum of government entities will require the ability to scale application workloads, share information, and ensure that citizen information is protected, secured, and always available when needed. It also will mean changing the business cost model, streamlining administrative and case management workflows, automating processes, and consolidating IT assets. In fact, thanks to the promise of cloud computing, today's government IT departments can consider new, more connected government business models. These models will leverage the IT infrastructure to bring better citizen services at lower total cost.

A cloud-based public utility computing model will enable the transformation:

- The IT infrastructure will become the backbone of coordinated citizen services
- Automated workflows will boost productivity and reduce tax burden
- Web-based portals will facilitate new methods of delivering citizen services, including to mobile devices and the home
- Unified information repositories used across departments will reduce fraud, shorten the time to service completion, and optimize staff and citizen time
- Aggregated population data will enable trending, research, and more frequent governmental oversight and evaluation of new services

An opportune time

“The flexibility available today in private and even public clouds changes the question from why cloud to why not cloud?”

Todd Sander,
Deputy Director, Center for Digital
Government

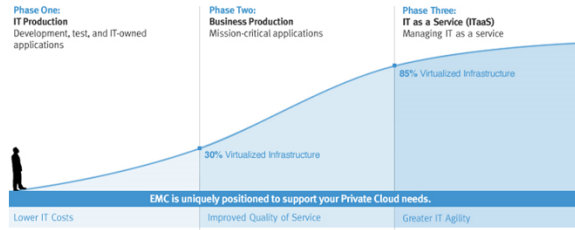
JOURNEY TO THE GOVERNMENT CLOUD

Cloud computing enables a more dynamic flow of information. Virtualization technology breaks the tie between the application and the physical infrastructure enabling IT to leverage pooled resources—compute, network, and storage—to achieve performance and availability requirements. Advanced automation, provisioning, and virtualization technologies enable users, via any device, to access the information and applications they need, while ensuring that compliance and governance is not compromised.

What we call the journey to the government cloud will be accomplished over time in phases. The benefits are accrued by and across government personnel, infrastructure, and applications. (Figure 1)

“At its core, cloud is a “value-driven” approach to supporting the business of government. IT becomes a utility with limitless elasticity to meet the demands of the business when and as they change.”

Bethann Pepoli,
Chief Technology Officer, EMC State and Local Government



	Lower IT Costs	Improved Quality of Service	Greater IT Agility
PEOPLE	New Technology Enablement	New Processes New Roles	New Relationships
INFRASTRUCTURE	Simplicity Efficiency	Availability Scalability Protection Rapid Deployment	Policy-Driven & Automated Dynamic Federation Transparent
APPLICATIONS	File, Print, IT Ops	Existing Enterprise Apps i.e. email, OLTP, DB, Enterprise Content Management, Other Production Applications	Next-generation Platforms DW/BI, Collaboration

FIGURE 1: PHASES IN THE JOURNEY TO THE GOVERNMENT CLOUD

The first phase focuses on efficiency and, primarily, yields substantial cost savings for IT. The primary activities of this phase are rationalization and consolidation. The applications portfolio is rationalized to simplify IT management. Lower tier applications are virtualized and consolidated onto fewer servers to improve resource utilization and to reduce cost and complexity.

The second phase, which involves the virtualization of mission-critical applications, improves the quality of services that IT can deliver to the business. The organization leverages new technology to improve application performance, security, dynamic scaling, and disaster recovery. The application owners benefit from faster test/development cycles and rapid implementation as well as from higher service-level agreements (SLAs).

The final phase transforms the IT organization into a strategic business asset as it improves agility and promotes new business initiatives. Self-service portals enable departments to provision their own resources supported by chargeback mechanisms based on SLAs. Policy-based automation frees IT staff for higher-value tasks.

A phased approach to cloud deployment enables IT to use cost savings from early phases to help fund needed strategic IT investments in later phases.

PHASE ONE: CONSOLIDATION & VIRTUALIZATION

Historically, nearly three-fourths of the typical IT budget has supported existing stove-piped capabilities with only a quarter remaining to support new initiatives. The operating costs for older infrastructure—including power, cooling, and data center space—often exceed the benefits of using these assets. In many cases, IT resources in one area are underutilized while those in another area are stretched to capacity.

The first step is to take an inventory of all physical assets and then consolidate existing IT infrastructure. Virtualization should also begin as soon as possible, so IT can begin to dynamically allocate pooled resources when they are needed by an application. Virtualization combined with consolidation of server, network, and storage resources improves utilization and frees resources for higher value initiatives.

Analysts report that we are still in the beginning stages of virtualization with only 15-20 percent of organizations worldwide having virtualized their servers. Yet, those government agencies which have virtualized their IT environments report substantial savings from consolidating servers as a first step in their evolution to a cloud computing model.

State of Michigan

Faced with exponential data growth, citizen demands for improved service, and pressure to reduce infrastructure costs, the State of Michigan leveraged its long-time strategic partnership with EMC to begin its move to the cloud. Specifically, through consolidation, virtualization, and chargeback, they now support multiple agencies including police, corrections, health records, human services, education, treasury, and civil service agency applications on an EMC® infrastructure. The result: storage chargeback rates were reduced by 68 percent, storage grew by 4x without adding any new FTEs, more than \$1M in annual maintenance costs was saved, and asset utilization was provisioned and improved.

In some cases, there's an opportunity to standardize policies and practices across agencies. This provides an opportunity to eliminate redundant applications and standardize on one platform. It will also simplify IT system and network management and improve overall operational efficiencies.

Cloud computing opens a new conversation between government IT and the departments it serves. An important part of that conversation is the validation of requirements in a service catalogue. This catalogue can serve as a contract between IT and its customers (e.g., tax, welfare, social services, intelligence, border patrol, and other departments for examples)—a contract which evolves as requirements change.

The service catalogue should include explicit conditions for information security and compliance. In this way, IT can develop an architecture that is appropriate for sharing and protecting information in the connected government delivery model of the future. The costs associated with providing various tiers of service should be made explicit in the service catalog. This sets the stage for chargeback schemes in later phases.

This stage also presents an opportunity for standardizing policies across IT operations if this has not been done in the past. The increasing scale and complexity of environments coupled with the high rate of change make manual approaches to operations less and less viable over time. Process rationalization during Phase 1 ensures consistent adherence to best practices and sets the stage for automation which further improves efficiency.

While beginning the journey, it is important to look ahead to the needs of the mission-critical agency applications which will become the focus of Phase 2. Virtualization offers many benefits; but before jumping in with both feet, it's important to understand that virtualization carries with it implications for how IT organizations conceptualize, design, architect, deploy, and manage the infrastructure.

Virtualization solutions will offer varying degrees of performance and reliability as well as differing management tools and disaster recovery options. Because many virtual machines will run on a single server, deficiencies may seem to be compounded in a virtualized environment. That's why it's so important to plan ahead. Unless longer-term business needs are matched with the functionality and scale offered by various vendors, costly migration from one platform to another may be required.

To get started, the IT architect will look at the entire environment: the servers, network, storage, and virtualization platform. The components need to be balanced so that improved utilization in one area does not introduce a bottleneck in another.

PHASE TWO: APPLICATION MIGRATION

In the second phase, the emphasis is on improving the service-level agreements (SLAs) of government applications. While many application vendors may have been slow to support virtualization in the past, the picture has been changing as more organizations—at the state and federal and central government levels—are mandating that new applications run on a virtualized infrastructure.

Virtualization touches every domain—server, network, storage, and application—and can complicate root-cause analysis, service availability, and performance troubleshooting. These typically labor-intensive processes must be automated in order to achieve efficiencies in a virtualized setting. Phase two presents an opportunity to automate operational processes as well as a chance to revisit backup methods and implement advanced security technologies.

New management techniques and skills will be required as provisioning is no longer performed at the system, network, or application level, but rather across the entire cloud stack.

Virtualization helps contain expenditures, lower facility costs, and reduce ongoing management costs. In addition, employing management technologies to automate operations helps government IT enforce policy and best practices across the organization. This phase presents

Hong Kong Admin Region

The Central Information Office was tasked to implement a shared-resource pool to pave the way for building a government cloud. They had early virtualization experience but lacked the knowledge or methodology to scale their infrastructure in an integrated and proven approach. EMC Infrastructure Consulting, in partnership with VMware® and Cisco, conducted a virtualization and cloud study to satisfy the need. The office is now in the process of systematically migrating applications to the cloud.

government IT with an opportunity to rein in information growth with deduplication technology and to meet personally identifiable information (PII) regulatory requirements.

With the ability to move applications as easily as files across a network, virtualization technologies offer improved availability and ensure disaster recovery. Additional capacity can be provisioned quickly and easily as departments grow. In many cases, secondary virtualized data centers help balance workloads and serve as failover sites for primary centers.

Of course, government IT must develop a road map for virtualizing applications as it may be better to leave some applications in a physical environment. Business process owners and constituent end-users alike need to be involved to develop a plan that balances the impact to process workflow with the capabilities of technology and the limitations of funding models. Phase two is all about creating an environment that improves quality of service—one that's scalable, available, protected, and secure.

EMC Embraces Cloud

EMC is leading the way with its own cloud journey. In 2006, having experienced dramatic and clear efficiencies of Phase one through consolidation and virtualization, EMC's CIO quickly gained the business' support to move applications into the cloud for Phase two. By the end of 2010, up to 75 percent of the applications were moved to the cloud and the quality of service to the business was predictable and improved. Now in Phase three, EMC continues to gain business agility by offering IT services. Software as a service, platforms as a service, and even user interface as a service are now on the menu. This means EMC employees can go with their access device of choice, be it a PC, Macintosh, iPad, or any other mobile device. As Sanjay Mirchandani, EMC CIO, said recently, "It's no longer a question of 'Am I going to build a cloud?' it's just how fast?"

PHASE THREE: SHARED SERVICE INFRASTRUCTURE

Cloud computing is the realization of the National Institute of Standards and Technology (NIST) vision of IT as a service-oriented organization, dynamically allocating resources to meet the changing needs of the business. The third phase is a transition to service-centric government IT. In this phase, resources are pooled based on usage patterns. Especially for distributed government departments and agencies, IT-as-a-Service can minimize the challenges associated with locally installed, legacy client/server systems. Chargebacks are based on tiered levels of service, associated with applications and users. Governance becomes policy-based so that data residing anywhere in the cloud is subject to appropriate controls.

An agile infrastructure enables dynamic scaling of resources as the needs of the organization change. What this means for government IT is that organizational resources are freed to undertake more critical initiatives. New systems are implemented in shorter time frames, with cost models well understood, and decisions can be made about moving additional services to a cloud strategy as deemed appropriate to the business. Individual departments are no longer waiting for IT to provision additional resources, but rather can self-provision as the needs of the department change. Privacy and security of citizen data is incorporated as encryption and access controls are leveraged across the cloud to host electronic record applications.

In addition, cloud implementation enables the government IT organization to offer services to an extended community of satellite government agencies and partners. It becomes the infrastructure for truly connected government. Individual social services, tax, and education departments will no longer build their own IT capabilities, but rather they'll consume the cloud services that are offered. In this "community cloud" model, federal, central, and state-wide governments will present citizen service applications along with traditional IT services (e.g., user authentication, archiving services) to offer a wide range of technology services to affiliated cities and towns and other smaller, geographically distributed government bodies.

This third and arrival stage is all about improving government IT's agility. Government IT delivery is policy-based and automated with customizable chargeback and cost transparency.

Security's Different in the Cloud

Despite common perception, the cloud presents an opportunity to make security stronger—not weaker. It can be faster, cheaper, and more efficient to deploy security measures in the cloud. This is because cloud platforms are still developing, so information security processes and technologies can be built in from the start. Security protocols can be embedded in the virtualization layer instead of being bolted on later in the process. Virtual machines can be moved throughout the cloud, to wherever they're needed, and always take their policies and security features with them. And don't forget multi-tenancy. With new features from RSA®, The Security Division of EMC, you can manage and customize attributes of service delivery for each business client, all from the same platform.

GETTING STARTED

Cloud computing acts as a technology enabler of connected government. It presents government IT with an opportunity to integrate, streamline, and innovate—to enable flexible IT efficiencies at lower cost. Because cloud-based IT environments are easier to manage than physical ones, IT staffs are freed to consult with their business counterparts on new ways of serving information. Governments of all sizes can focus on improved processes and workflow instead of the continued justification, acquisition, and maintenance of onsite technology. Initially, government agencies deploy cloud computing for data storage and archiving—decreasing the cost and maintenance of a physical hardware environment. As the virtualization journey progresses, pooled IT resources and intelligent automation provide the means to further reduce the resources spent on operating and maintaining systems.

As a result, attention will focus on new initiatives addressing online appointment scheduling, registration, bill payment, and licensing modules to improve citizen access. Citizen services gets even better when water, sewer, and property tax collectors can join forces to deliver consistent, more predictable billing.

On a worldwide scale, public sector will be transformed as new technology models emerge. Cloud computing is a paradigm shift for delivering IT services to government. Each organization will determine its own model, one that balances risk and cost while serving its mission and the needs of all its constituents. Choosing the right architecture and partnering with the right set of vendors will enable government IT to build the foundation for the citizen service delivery network of the future.

ABOUT EMC IN GOVERNMENT

EMC is the world's leading developer and provider of information infrastructure solutions. We provide government customers—of all sizes—the products, services, and solutions they need to manage data growth and get the most value from their information. With more than 30 years of serving the public sector and a satisfied customer base across the nation, EMC helps governments save money, serve citizens better, and transform government.

Information about EMC's solutions, products, and services for government can be found at www.EMC.com/publicsector. Or contact an EMC representative directly at 866-438-3622. Follow EMC on twitter at <http://www.twitter.com/emcpublicsector>.

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