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## The Integrated Enterprise Infrastructure: A More Efficient and Cost-Effective Model for IT

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*Most of today's datacenters — those with a combination of physical infrastructure and virtual servers — need a new approach to managing their IT assets. One such approach is enabled by integrated enterprise infrastructure platforms, which vendors are now offering in the marketplace. An integrated enterprise infrastructure platform enables the IT department to treat server, storage, and network infrastructure resources as pools to be assigned as needed to business services.*

*Typically, organizations deploy an integrated enterprise infrastructure in three phases. The first phase involves the integration of traditional hardware functionality — for example, combining servers and network equipment. In the second phase, organizations tightly integrate systems management and control software into hardware functionality. The third phase on the path to deploying an integrated enterprise infrastructure requires integrating various IT services such as outsourcing, software as a service (SaaS), platform as a service (PaaS), and cloud computing into a unified computing framework.*

*The advantage of an integrated enterprise infrastructure is that all the physical elements that are virtualized — whether they are storage or compute resources — don't have to reside in a physical building or even be a part of a physical process. As a result, an integrated enterprise infrastructure can lead to simplified management, increased flexibility, better availability, and higher utilization.*

The following questions were posed by EMC to Vernon Turner, IDC's senior vice president, Enterprise Infrastructure, Consumer and Telecom research, on behalf of EMC's customers.

**Q. We are hearing a lot about IT transformation and cloud computing. What do you see as the future for IT?**

A. Business will change how it consumes IT resources. In effect, we're going to move away from delivering applications for a fixed cost and toward delivering IT services using a consumption-based or subscription model. This is really the driving force behind cloud computing: The ability to take IT assets and deliver them to customers as services hosted internally or externally. The real key is the ability to scale demand up and down at will.

The ability to scale demand up or down will require a server infrastructure to be flexible and scalable. In the future, there will be opportunities for new architectures and business models in the datacenter.

Some fundamental changes will take place in terms of IT and cloud computing. First, there's SaaS — delivering pieces of an application or a workload on demand as a service to a customer. Underneath SaaS are two other components: infrastructure as a service (IaaS) — in which the hardware, the servers, the storage, and the network are delivered as a service — and PaaS — or the middleware in which the requirements of hardware are divided into discrete components and managed accordingly, and then put on the SaaS arena.

As the infrastructure changes, IT needs to have a better understanding of its cost structure to improve chargeback to the business. IT has to change its chargeback processes to focus on services rather than assets. This will require transparency and visibility into what end users are consuming. An integrated enterprise infrastructure can provide transparency by allowing IT to configure and provision services for the business. In this way, IT has the opportunity to dramatically change its chargeback mechanisms from asset based to service based, using a billing process for different types of services — something like a telephone bill.

**Q. We are hearing a lot about integrated enterprise architectures in the context of cloud computing. What is driving these developments?**

- A. Large-scale datacenters — particularly those with a combination of physical infrastructure and a proliferation of virtual servers — require new approaches to delivering and managing IT resources.

Over a relatively short period of time, an integrated enterprise infrastructure will improve asset management and return on investments. IT assets will become more utilized and better managed and will typically pay for themselves over a shorter period of time. As a rule of thumb, current hardware assets that are over four years old should be replaced prior to starting implementation of the new infrastructure model. These older assets will generally underperform and typically require more maintenance than the latest offering.

Integrated enterprise architectures, particularly in the hardware space, can enable IT to deliver services quickly and manage services efficiently. Storage servers and networks will work very closely together and in some cases will be part of the same device. I wouldn't go as far as to say that we're rebuilding mainframes, but I do see us gaining some of the integration benefits that mainframes offered — benefits such as simplified management, increased availability, flexibility, higher utilization, and higher resiliency inside the infrastructure — because the integrated enterprise infrastructure can scale on demand in a way that is safe and consistent.

**Q. What are the pros and cons of deploying these platforms as part of a private cloud strategy?**

- A. It is fundamentally important for IT to support business in a way that responds to business needs in real time. One of the advantages of an integrated enterprise infrastructure in a private cloud is that there will be little or no lag between application development and deployment once you get through the development and QA phase. Once the applications are in a production environment and there are swings in business demand, you'll be able to ratchet that demand up or down in a fairly quick and seamless fashion. The ability to do that represents a tremendous cost savings because the ROI for those applications and the infrastructure now becomes very short.

With an integrated enterprise infrastructure platform, IT can deliver a standard package and layer virtualization and systems management software upon it. As a result, IT doesn't have to manage more and more devices and instead can provide more value-oriented functions such as business analytics, data mining, and better customer support.

While the shift to a value-oriented, holistic focus has advantages, implementing an integrated enterprise infrastructure can present organizational challenges for the IT department. To successfully implement an integrated enterprise infrastructure, IT can no longer operate in silos; behind the scenes there has to be an end-to-end dashboard that shows each of the handoffs, such as from the data facilities to power management, compute storage, and application deployment. It is almost like a supply chain for IT.

To make sure service-level agreements are not jeopardized by the workload of any one department or individual, policy-based automation facilitates the handoffs between groups. If you think about all the devices that make up the infrastructure, you're going to have to deploy as much automation as you can across the whole infrastructure. As I mentioned earlier, handoffs across and between platforms have to happen as seamlessly as possible, and therefore manual or human intervention is simply too cumbersome to make that happen. Automation will also create and deliver an increased level of virtualization.

The traditional stovepipes among IT groups — those responsible for servers, systems, programming, applications, and so forth — have to be replaced by a very transparent organization. That means that, in this case, automation does not reduce headcount. Rather, IT staff will expand roles and skill sets into new, broader areas. However, this can be disruptive for many IT organizations, and some staff may resist these changes.

**Q. What are the things we should be looking for in an integrated enterprise infrastructure platform?**

A. Organizations looking to implement an integrated enterprise infrastructure require technology that supports sophisticated service-oriented automation and workload management, provisioning, and end-to-end performance optimization. An integrated enterprise infrastructure includes integrated network, storage, and server components. For large-scale organizations, an integrated enterprise platform should be capable of supporting several thousand VMs. Organizations with existing infrastructure also may want to deploy integrated enterprise infrastructure technology and components from vendors that maintain a large ecosystem of partners comprising global systems integrators, service providers, and channel partners.

As for specific functions, an integrated enterprise platform should provide automated IT management across a unified infrastructure of storage, compute, network, and virtualization resources to allow customers to accelerate their transition from a physical datacenter to a virtualized datacenter, and then to private clouds.

Ideally, an integrated enterprise platform will allow customers to manage their infrastructure in a unified manner because it will deliver significant operating expense benefits. An integrated enterprise platform with a unified element manager can provide IT with a single interface to manage and automate configuration, discovery, provisioning, and compliance monitoring across the infrastructure, including network, server, and storage components as well as virtualized applications and OS components.

For various services to be managed effectively in an integrated enterprise infrastructure, some intelligence has to be layered in. That intelligence forces us to do things in a standard, repeatable manner. We then start to see ITIL standards set at a business application layer so that repeatable services — such as patch management and upgrades — can be delivered over and over again in a consistent manner.

**Q. What are the benefits to business applications in an integrated enterprise infrastructure?**

A. Earlier I mentioned service levels and service-level agreements. The nice thing about an integrated enterprise infrastructure is that business units can negotiate with IT for the level of service in a genuine fashion. If you have a business unit that has to run in a mission-critical environment 24 x 7 and needs full business continuity and is willing to pay for it, you can differentiate that service from those provided to customers who don't require that level of availability. IT can create granular pricing; therefore, if you're an internal provider, the cost and cost recovery models become very attractive to you. You can manage costs really well. Service providers should be able to develop a profit model in which you target a broader range of customer segments. An integrated enterprise infrastructure is based on efficiencies. All the assets are being run in a more efficient manner with automation and virtualization and better utilization overall. The standards of service and customer satisfaction increase due to the speed with which you can deploy new applications.

An integrated enterprise infrastructure does lay the foundation for building a virtual environment across the infrastructure.

**ABOUT THIS ANALYST**

*Vernon Turner, senior vice president of IDC's Enterprise Infrastructure, Consumer and Telecom research, is responsible for worldwide enterprise research in the areas of technical computing, enterprise platforms, system infrastructure software, network infrastructure, security, storage, enabling technologies (including semiconductors), document solutions, and valuation (pricing/leasing). He also oversees the small/medium-sized business and hardware channels/alliances practices as well as IDC's wide-ranging consumer and telecommunications research. Mr. Turner advises IDC clients on the competitive, managerial, technological, integration, and implementation issues for complete systems environments.*

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