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## **Virtualization Storms Ahead: Plan for Clouds on the Horizon**

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*The IT sector is in the midst of reinventing itself to adjust to changes in the business climate faster and at a lower cost. There is a transition away from the legacy days of static IT capacity that is inefficiently allocated for business demands – demands that are nothing but static. The shift is toward a cloud model where IT resources are served only as need dictates and at a cost that declines with lower usage. The hype and conflicting definitions, however, have confused what is a simple model. To cut through the noise — and to help Canadian organizations build successful IT plans that incorporate cloud — IDC analyst David Senf addressed important questions on the topic.*

**Q.    What do you mean by cloud computing?**

A.    At its root, cloud computing is the abstraction of demand (business) from supply (IT). IT departments struggle to provide the appropriate supply of services — too little supply results in annoyed employees and customers frustrated by IT's inability to deliver on their needs, while too much aggravates executives forced into shelling out more budget than they care to. Cloud allows IT to quickly meet quality of service objectives without supporting the cost of excess capacity. Sound familiar? Utility computing, ASPs, and timesharing promised the same thing. What is new and game changing this time around is virtualization. Myriad other factors play a role in cloud too. But the explosive growth in virtualization of all forms (e.g., server, storage, and desktop) is the catalyst and underlying technology of cloud success.

Cloud comes in (what appears now as) two distinct flavours: public and private. In fact, public and private models represent two ends of a deployment continuum, which IDC expects will frame a variety of models that mix aspects of both. Whether public or private, cloud is built on the elements of virtualization: commodity priced hardware, standardization, and automation. Other important ingredients include self-service provisioning and administration, elastic scaling, usage metering, and open Web/Web services standards.

The most widely recognized side of cloud is its public face. Online software-as-a-service (SaaS) offerings such as CRM, email, and Web offerings are getting the most publicity at the moment. Online storage, security, server, and development platforms fall under the public cloud banner too as infrastructure as a service (IaaS) and platform as a service (PaaS), but don't yet share the level of uptake as SaaS.

Not well understood or receiving the same level of attention, "private clouds" also called "enterprise" or "internal" cloud mirrors public cloud but is managed in-house. Private cloud isn't new or "all of a sudden." It is an evolutionary next step in CIOs' decades-long efforts to transform IT resources and applications from static to shared, elastic, and service-oriented.

**Q. Why is virtualization being equated with cloud?**

A. Virtualization does not equal cloud — but cloud computing couldn't happen without it. Put simply, virtualization breaks apart the bind between an application or data and the hardware that accesses it, computes it, routes it, or stores it. In a cloud model, IT still only has a certain number of physical desktops, servers, networking gear, and storage devices. Through virtualization internal IT resources, although finite, aren't linked to any particular application — and are therefore available to be shared as what is coming to be called private cloud. Moreover, as the model evolves the amount of internal IT physical capacity is expanded as needed through Web-based public cloud services. Virtualization technology makes it possible for applications and data to be moved from device to device irrespective of whether it is sent to an in-house resource in Vancouver or to a service provider in Halifax.

**Q. How active are Canadian organizations in the cloud? Why?**

A. Canadian organizations are getting underway with cloud but we are a long way from having achieved fully services-oriented applications, compute power, storage, network, and other IT resources. Public cloud uptake varies depending on the application. Only 6% of organizations in this country connect to online storage, whereas online CRM usage is in the low double digits. Private cloud is far more heavily utilized — despite the fact that it is not being identified as such. Server virtualization, which is one aspect of cloud, is used by over 60% of firms with more than 100 employees (midmarket and large companies). When speaking with large organizations, I find it common these days that over 50% of their servers are virtualized. Further, a recent IDC study found that over 80% of virtualized workloads (ranging from Web to ERP to email) are in production, as opposed to just three years ago when virtualization was used mostly for test/development.

Canadian organizations participate, with varying degrees, in both private and/or public cloud computing. There is no typical rollout pattern for cloud, and the mix of public and private is unique for each firm. A smaller IT shop may be less able to engage in private cloud, so it will tend towards adopting public cloud. An organization, particularly in sectors such health or finance, which has highly classified data, on the other hand, might be reticent to use public cloud at this time. IDC expects that organizations will employ a mix of public and private clouds to support IT and business objectives. For example, a computationally intensive, sales analysis workload could be executed partly in the private cloud with support from the public cloud.

Cloud services, both delivered from inside an organization or from an outside provider, are adopted first and foremost because of lower upfront costs and faster deployment time. Canadian firms report an overall annual saving of 25% from server virtualization, stemming from returns on hardware consolidation (30% per year) and power and cooling savings (18% per year).

**Q. Where should we start?**

A. Cloud is an evolution that starts with virtualization at the infrastructure layer. Server, storage, and desktop/client virtualization all factor in to the path forward — but as adoption increases complexity grows, and planning, architecture and process become critical. To some, "plan" is a four letter word, but it is sorely needed to avoid pitfalls, a few of which are addressed in the next question. Plan by considering questions such as:

- Where does virtualization fit now? How does a wider cloud rollout look in the coming years from a cost-benefit or from an enterprise architecture point of view?
- Where do storage and desktop virtualization add value?
- How will desktop, server, network and storage capacity, energy consumption, staff admin time, and security posture change in the shift from physical to logical? Do these changes impact compliance with health, finance or cardholder data regulations and legislation?
- For which applications and data should you plug into public cloud as an extension of private cloud?
- Who has authority to provision virtual machines on which parts of the network internally or to move them externally?
- Which are the most appropriate tools and processes for monitoring performance, backup/recovery, patch management, configuration management, and so forth?
- How will change in contract and performance SLAs be handled? Much as with outsourcing, SLAs and T&Cs become critical.

Don't overlook change management processes. Virtual machines are provisioned, deprovisioned, taken offline, and put back online with a frequency not possible with physical servers. Portability of virtual machines is unlike anything seen in the physical world. Although by many considered a cure for insomnia, better IT processes through IT infrastructure library (ITIL) is indispensable in larger virtual deployments. Change and configuration management are most common ITIL starting points for processes surrounding virtualization. But service delivery and service support processes such as capacity management and release management are gaining ground too. Our research finds that Canada is coming onboard with ITIL quickly — virtualization being a primary driver.

The best laid plans still do require a check along the way. This is particularly true with the move from a traditional form of IT delivery that is married to physical hardware to one that is virtual and may or may not be served in-house. Put bluntly, do proof of concepts along the way to justify returns and ferret out problems; look at TCO, application compatibility, security, capacity, and I/O performance. For example, server-hosted clients is a hot topic, but not all desktops should make it to the datacentre or be served from a public cloud.

**Q. What pitfalls lie ahead?**

A. Cloud has a number of cost and time saving advantages, but nothing comes for free. IT doesn't have to say "no" nearly as often in a cloud model — but that can be a double-edged sword. Having applications, storage, or compute power available as needed means more happy faces on employees, executives, and customers. But on the flipside prepare for many more moving parts to orchestrate — and the potential for new problems that creates. Security (e.g., larger attack surface), manageability (e.g., deviation from known good state), integration (e.g., multivendor environment), and capacity (e.g., available storage) are the

biggest problems facing cloud adopters.

The temptation to lead with technology has caught most off guard who avoid critical process questions — and exacerbate the drawbacks. A small virtual footprint is easily managed and secured. But a scaled move to cloud needs process to manage and secure scale in multiple directions: more physical servers, more VMs per server, more storage, more desktops and critical applications in the cloud.

Focusing on a top issue – security – the essentials are done as in the physical world with the added concerns for network segmentation in a virtual world, intrusion detection between virtual machines, and authority to provision into and management of the cloud. As noted, look at change management to watch for/avoid myriad problems including virtual servers coming back online that don't support current security policies or recent patches and updates. Understanding and negotiating how a public cloud provider will handle confidentiality, integrity, and availability of data and applications is paramount. Moreover, update business continuity and disaster recovery plans for cloud to proactively minimize any unexpected downtime.

In the past three years private cloud has been about virtualization rollout. The next three will be about cloud management. Companies that understand virtualization and have completed the foundational work required to cloud-enable their business critical/core infrastructure will be in the best position to capitalize on cloud.

#### ABOUT THIS ANALYST

*David Senf is director of IDC's Infrastructure Solutions Group. He engages with vendors, their channel partners, and end-user IT customers to gain a complete picture of his markets. Senf delivers research results through speaking engagements, in consulting, monthly reports, and in the media. He is based in IDC's Toronto office.*

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