

# Changing the Game: Monthly Technology Briefs

February 2011

**The Next Generation Data Center:  
Designed for Services via Clouds**

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## The Next Generation Data Center

The current data center could be defined as the physical co-location of a number of individual discrete systems to enable optimization of operations, and efficiency in sharing as many resources as possible. This definition is based on a legacy of application-driven development which in turn drove the choice of the operating system, and from this usually the hardware. The shift to small modular services supported from common resource pools in the cloud model literally turns this model upside down. The individuality of each application based on a business requirement led to the acceptance that other factors were secondary, and if this led to diversity in the choices of operating systems and hardware this was acceptable.

Virtualization in its first round of adoption has provided a rationalization for this model by enabling different operating systems to be clustered together more efficiently on a single server. Less servers, with better utilization of each, provides reductions in both direct, and indirect (air-con etc.), power consumption which is generally reckoned to be more than half of the overall data center operating costs. Extending this model to create a 'pool' of servers amongst which these applications on their operating systems can be still further optimized, or using a mainframe-based super server to achieve a similar effect, is often described as a private cloud especially if 'virtual machines' can be readily created for new user-driven purposes.

The key point that this approach may not address, and which is at the heart of the Next Generation Data Center, is that with the genuine 'services on a cloud' environment there is little or no need for an operating system at all. In conventional discrete application development on dedicated hardware the role of the operating system is to provide a set of interfacing capabilities to the hardware. In a genuine cloud environment 'services' are written to a set of simple standardized Application Programming Interfaces (APIs) that the cloud layer provides. Microsoft Azure is a good example of this, as are IBM Cloudburst, and HP Instant-On for internal private clouds, as well as external public cloud approaches by Google and Amazon. VMware and Cisco, with EMC, are introducing another approach with their Vblock offering.

Correctly done, these simple APIs provide a highly optimized use of the computational resources and avoid all the previous challenges of performance improvements for unique custom development. In addition, there are all the other benefits of 'services' in reducing development time, allowing reuse and dynamic orchestrations etc., all in a cloud model without the need for time consuming server builds, deployment and operational management. As a result, the data center can now be simplified and, instead of the previous co-location of different servers each virtualized to suit their unique workload, it becomes a standardized uniform single resource.

The Next Generation Data Center uses virtualization and cloud technology to resemble a single server, or storage system, or any other computational service, all addressed through a single set of standardized interfaces. Failover and resilience is addressed by the sheer number of Computer Processing Units (CPUs) running being able to cope with any individual failure by distributing the load across the remaining pool. In existing data centers that have adopted this approach, repair (led by Google and Amazon as first movers) and reboot are generally abandoned in favor of remove and junk on the basis that it is both cheaper and safer to do this than risk operational activity in the overall running cloud pool.

The principle operating and administration task moves from being machine-focused towards policy management of what, who and how users, and services, can make use of the resources. Simplicity in access, and use, coupled with the shift to user-driven provisioning, orchestration, etc. all make it essential to be able to strengthen the policy management capabilities. This is a point that IBM, HP,

and Dell are intent on addressing and positioning as the new value that their hardware provides. (Sun is in a somewhat different model developed by Oracle to suit their application-centric business model.) The shift to a new generation of software becomes the critical element in the virtualized cloud resource model that has introduced start-ups such as Joyent, which provides only the software and reduces the role of the hardware to 'cheapest' standardized units available.

Standardization plays a big part in Next Generation Data Centers for two reasons; the obvious one in terms of building blocks and flexibility, but the second aspect is in terms of the universal similarity of the resulting environment. All enterprises will be using a mixture of 'services' in the much more externalized activities that new business models are driving. Some will come from their internal private cloud, others will be shared with business partners and must therefore be running in easily accessible public clouds, and increasingly there will be vertical sector clouds providing new specialized business capabilities for these new markets.

The shift to 'X as a Service' is not necessarily about the current generation of Enterprise Applications managed by IT as part of the internal overheads budget, it is a direct requirement for the front office consumption of 'services' for Business Technology in such situations. The connectivity management between people, services, and resources is a new complex task that defines the difference between the 'free' and 'open' world of Web 2.0 and the business world of the cloud. Cisco believes the management of this connectivity and the network of people, services and resources calls for their version of the Next Generation Data Center which focuses on these aspects rather than on the physical data center, or its hardware.

In all of these aspects the need for Next Generation Data Centers to provide commonly understood interfacing and service levels is paramount to the ongoing development of clouds in the fully developed business model. For this reason some seventy companies have established the Open Data Center Alliance with five Working Groups using 19 use case models to develop Roadmap 1.0. The five core focus areas are: Infrastructure; Management, Security, Services, and Government & Ecosystems. An initial set of drafts termed Roadmap 0.5 will be delivered in the first half of 2011.

The radical change that all of this brings may not be welcomed by the current operators of data centers who will rightfully argue the need to continue to support their current enterprise applications, and point to operating improvements that virtualization is bringing. But the Next Generation Data Center is not about operational improvement and is not driven from resources up as in the past. Instead it is being driven by a shift in business's use of technology, creating the need for a wholly different set of resources, supplied, charged for, and managed in a new way. The steering committee of the Open Data Center Alliance makes this very clear, being comprised totally of non IT vendors or service providers, but representing some of the largest business market makers; BMW, China Life, Deutsche Bank, Lockheed Martin, JPMorgan Chase, Marriot International, National Australia Bank, Shell, UBS, and Terremark.

The impact of this and other technologies is discussed in the [Capgemini CTO Blog](#).

## Leading Company Results (Revenues)

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Full Year	SAP ↑ 27% @ \$4.0bn	Intel ↑ 24% @ \$43.6bn	AMD ↑ 20% @ \$6.5bn
	IBM ↑ 4% @ \$99.9bn		
Q4	SAP ↑ 34% @ \$1.2bn	Intel ↑ 8% @ \$11.5bn	IBM ↑ 7% @ \$29bn
Q1	Apple ↑ 42% @ \$26.7bn		

### Movements by Industry Leaders

**Cisco Videoscape is an entirely new platform** aimed at providing high grade multi-media services to the home through the television. **Catalyst 3560-C and 2960-C Ethernet Switches** offer pass through power over Ethernet to remove the need for additional power cabling to end devices. [www.cisco.com](http://www.cisco.com)

**Oracle Financial Analytics for SAP** provides integration between SAP Financials and Oracle BI. **Oracle Transportation Management and Oracle Global Trade Management** have both been updated. [www.oracle.com](http://www.oracle.com)

**HP has revised its business laptops** to include the new generation Intel Core chipsets to boost performance and lower energy consumption. **Jointly with Microsoft, HP is introducing a 'new category** of converged application appliances that fuses applications, infrastructure and productivity tools into a single system' based on a shift to embrace cloud technology. [www.hp.com](http://www.hp.com)

**Intel's second generation ore processor family** (called Sandy Bridge) is a completely new architecture claimed to double the performance over current chipsets and adding on the chip graphics, energy management and multi-media capabilities. Intel has paid **NVIDIA a settlement sum to use its graphics technology** and to settle an intellectual property dispute through a mutual cross licensing agreement. [www.intel.com](http://www.intel.com)

**Microsoft's CEO demonstrated that Windows 8** will be able to run on ARM (the smart phone chip supplier) processors as a means of demonstrating how Microsoft will support a shift into the wide range of devices that are now in use. **Microsoft WebMatrix is a free lightweight set of web development tools** to enable straightforward web sites to be developed and deployed with minimal skills. **Microsoft Dynamics CRM 2011** update also includes both on-premise and 'as a service' cloud versions both with the same capabilities. **Jointly with HP, Microsoft is introducing a 'new category** of converged application appliances that fuses applications, infrastructure and productivity tools into a single system' based on a shift to embrace cloud technology. **Microsoft Attack Surface Analyzer** monitors applications, when implemented, to check for system based vulnerabilities. **Microsoft OneNote is now available for the Apple iPhone** in a similar format as on the Microsoft Windows Phone 7. [www.microsoft.com](http://www.microsoft.com)

**SAP is to acquire Secude**, a vendor of a cohesive set of ID and Authentication Services, which will be incorporated into NetWeaver. **SAP Billing for Telecommunications Package** is a fully integrated set of capabilities for Communication Services Providers combining for the first time previously separate functions. [www.sap.com](http://www.sap.com)

**Google Android 3.0 is aimed at tablets** under the codename of Honeycomb according to a preview at CES, Consumer Electronics Show. **Google Apps Service Contracts** are amended to remove the need for any scheduled downtime. [www.google.com](http://www.google.com)

**Apple Mac App Store** now provides the same capabilities for users to select and download as iPhones App Store after a free download of an update for those running Mac OSx v 10.6.6. [www.apple.com](http://www.apple.com)

**Amazon Web Services Elastic Beanstalk** service provides an even easier capability for developers by covering even more of the implementation elements requiring only the application coding itself to be uploaded. [www.amazon.com](http://www.amazon.com)

#### Open Source Update

**Mozilla Firefox 4 beta 9**, thought to be the final beta before the final fixed code, is now available with further improvements in speed etc. [www.firefox.com](http://www.firefox.com)

#### Standards Watch

**World IPv6 Test Day on June 8** will allow users to test their IPv6 implementations against trial sites running by Google, Yahoo and Facebook as a full load stress test. [www.bsigroup.com](http://www.bsigroup.com)

**LTE (Long Term Evolution)**, managed by the Common Platform Technology Forum, reports that chip makers are on track for mass adoption in 2014 to create a new high speed alternative to WiMax for both internal and external connectivity of devices. [www.commonplatform.com](http://www.commonplatform.com)

**The Storage Networking Industry Association, SNIA, and training specialists CompTIA** have partnered to introduce a professional certification for IT workers specializing in storage management. [www.comptia.org](http://www.comptia.org)

**OASIS Privacy Management Reference Model, PMRM**, is a new technical committee established by OASIS to determine if a framework that would enable 'privacy by design' can be established. [www.oasis-open.org](http://www.oasis-open.org)

#### More Noteworthy News

**Net Applications announced browser market shares for 2010** showing Google Chrome to be the big winner shifting up from 5% at the beginning of the year to 10% by December at the expense of Microsoft IE down by 4.5% and Firefox down by 1.5%, leaving Microsoft IE at 66% and Firefox at 18.5%. [www.netapplications.com](http://www.netapplications.com)  
At the same time Statcounter provides a regional breakdown that shows that **Firefox is the most popular browser in Europe** at 38.11% just beating Microsoft IE at 37.52%, possibly due to the European Union (EU) requirement that Microsoft opens up their product line to support non Microsoft browsers. However, both are lower than a year ago as **Google Chrome continues to make gains**. [www.statcounter.com](http://www.statcounter.com)

**EMC has announced 40 new products for 2011**, all covering various aspects of storage and data management focused on the VNXe name, adding a large and comprehensive range of products providing a cohesive set of capabilities for the small to medium-sized enterprise (SME) market. EMC's CEO made a statement that the company's **partnership with Dell** will become 'less strategic and more tactical' in future. [www.emc.com](http://www.emc.com)

**Amazon Web Services has new support options** which cut the cost of existing support and offer new higher levels of support options. <http://aws.amazon.com/>  
**Amazon is planning an App Store for Android** to offer an additional market to the existing Android App Store that Google operates. [www.amazon.com](http://www.amazon.com)

**AMD Fusion chips, called Accelerated Processing Units, APUs**, bring onboard Graphic Processor Units and much reduced power usage to a new AMD family of chips which are the first all new AMD designs since 2003. **AMD is extending their Fusion Chips** to cover the embedded market place under the designation G-Series with bundling of Graphics Processor with the CPU. [www.amd.com](http://www.amd.com)

**Salesforce.com is acquiring Dimdim**, a hosted service for collaboration tools, for a variety of purposes from online meetings, eLearning, webinars etc. to add to the ChatterBox suite. [www.salesforce.com](http://www.salesforce.com)

**Lenovo ThinkPad range** gains new high end performance business laptops using the new generation Intel and AMD chipsets. **Lenovo is to create a new business unit** for its consumer-focused products containing tablet and SmartPhone together with Digital Home products such as Web TV. [www.lenovo.com](http://www.lenovo.com)

**Opera multi-touch browser for tablets** is designed to bring smooth scrolling and other user experiences suitable for tablets to their mobile browser. [www.opera.com](http://www.opera.com)

**Dell acquires SecureWorks**, a provider of managed security services, as a further part of its move to offering various aspects of Cloud-based services. **Dell has consolidated its Public and Large Enterprise Business Units** from its acquisition of Perot Systems into a single unit amalgamated with existing Dell units and containing its own services division. [www.dell.com](http://www.dell.com)

**Consumer Electronic Show, CES, in the USA** is notable for the number of companies entering the tablet market place from well known players such as Lenovo, Motorola, BlackBerry, and Samsung to new entrants such as Motion, Asus, Vizio and Archos, attempting to build on Windows Tablet and/or Google Android operating systems. [www.cesweb.org](http://www.cesweb.org)

**LG Optimus 2x dual core smart phone** is claimed to be first to run dual cores and using Android 2.2 (with 2.3 upgrade capability), and can act as a hub to other devices using the Digital Living Network Alliance, DLNA, specifications. [www.lg.com](http://www.lg.com)

**Qualcomm is to acquire Atheros**, a specialized chip maker, to help it enter new hardware markets such as tablets. [www.qualcomm.com](http://www.qualcomm.com)

**Skype plans Video Conferencing** to create an equivalent to Apple FaceTime and using the technology gained from its acquisition of Qik. [www.skype.com](http://www.skype.com)

**Nimbula, a specialist cloud start-up** famous for executives from Amazon Web Services and VMware, is about to launch a private cloud version that resembles the Amazon model to allow internal abilities for business users and developers to set up virtual machines in a simple manner. [www.nimbula.com](http://www.nimbula.com)

**RIM BlackBerry WebWorks Developers kit** for the new BlackBerry Tablet is now available as a beta download for interested development professionals. [www.blackberry.com](http://www.blackberry.com)

**Symantec NetBackup 5200 and FileStore N8300** provide data backup management and data storage in a combo of appliances aimed at simplifying the operation. [www.symantec.com](http://www.symantec.com)

**FrontRange introduces SaaSIT** to bring all its service management capabilities into a single cohesive brand for supporting SaaS and Cloud offerings. [www.frontrange.com](http://www.frontrange.com)

**Micro Focus Visual Cobol Development Hub** provides tools to allow a Cobol application to be placed on a Microsoft Azure Cloud without needing to be reworked. [www.microfocus.com](http://www.microfocus.com)





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called Rightshore®, which aims to get the right balance of the best talent from multiple locations, working as one team to create and deliver the optimum solution for clients. Present in more than 35 countries, Capgemini reported 2009 global revenues of EUR 8.4 billion and employs over 100,000 people worldwide.

More information is available at [www.capgemini.com](http://www.capgemini.com)

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