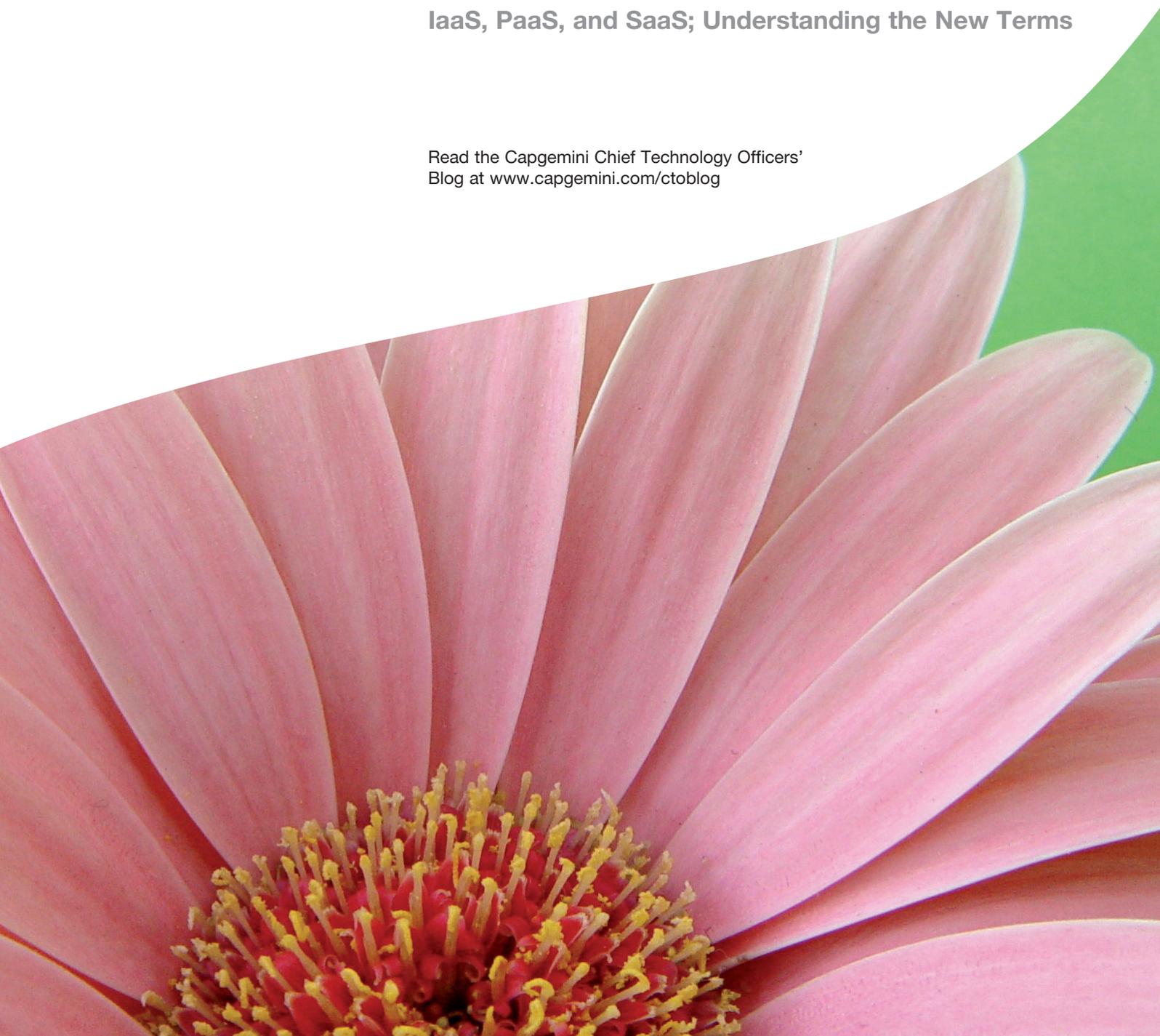


# Changing the Game: Monthly Technology Briefs

January 2010

**IaaS, PaaS, and SaaS; Understanding the New Terms**

Read the Capgemini Chief Technology Officers'  
Blog at [www.capgemini.com/ctoblog](http://www.capgemini.com/ctoblog)



## IaaS, PaaS, and SaaS; Understanding the New Terms

The whole concept and language used for Clouds along with shifting to supplying “Everything as a Service,” XaaS, is thoroughly confusing. Part of this confusion arises from the apparently little agreement on standard definitions while much of it lies in the sheer diversity of possibilities that the new technologies bring to building and delivering various forms of solutions. The most widely used definitions are those of the US Government-sponsored National Institute of Standards and Technology (NIST) and they define;

- Five characteristics; On-demand self services, broad network access, resource pooling, rapid elasticity, and measured services.
- Three delivery models; Software-as-a-Service (SaaS), Platform-as-a-Service (PaaS), and Infrastructure-as-a-Service (IaaS).
- Four deployment models; Private cloud, community cloud, public cloud, and hybrid cloud

This is not surprising. If we define the entire IT model in the same way, it would be equally wide in its characteristics, delivery models, and deployment possibilities; just consider the variations of the client-server delivery model alone - thick or thin client, ‘n’, or single tier. But just as client-server represents a definable group of delivery elements, so does focusing on the three delivery models of SaaS, PaaS, and IaaS. It provides a similar definable delivery model that will always be present.

**Infrastructure as a Service, IaaS**, is the base level provisioning of pure technology elements, most commonly meaning a hosting service provider such as Google or Amazon that provides so-called “virtual machines” on demand for developers to use as instantly available resources, with payment geared to the amount of usage. Put simply this means that the time and cost of procuring and building actual physical machines at the clients’ premises is avoided and what behaves as a single physical machine is made available across the Internet. The term “virtual machine” means that a portion of a bigger server is made available like a separate machine to the user even though it is part of the resources of a bigger machine. IaaS can be used to set up a simple requirement rapidly; each increase in the requirement is matched by an increase in the capacity made available, whereas the scale of capacity is wound down when it is not required. Payment is charged only for the amount of resources consumed, and may cover any combinations of CPU hours, million instructions per second (Mips), bandwidth, or storage.

**Platform as a Service, PaaS**, introduces the next level of sophistication by moving beyond simple technology elements, or building blocks, that need to be built into operational systems or platforms. It provides a capability to have “services” (as opposed to applications) loaded directly on to the platform. Such platforms will be pre-configured to support a particular programming language in a “standard” hosting environment, though they can be built for specific use by an industry, or an enterprise, complete with management and governance capabilities. However, the most common type of PaaS that is growing rapidly is the type that provides a central core set of services to which a wide range of additional services can be added that can then leverage the core services. An example of this is the Force.com platform offering Salesforce.com client relationship management (CRM) as a core set of services to which various enterprises, or developers, can add additional specialized services for various purposes that extend the original core set of services.

**Software as a Service, SaaS**, is the delivery of actual end-user functionality, either as genuine granular “services” grouped together as orchestrations to perform the required functionality or as a conventional monolithic application. It is in this layer that the really important differentiations are found. IT management will be looking for ways to run existing applications for less cost using a hosting model that decreases the cost of providing technology structure, and this usually

means running on IaaS. There is a great deal of debate about what applications can be safely moved outside the Firewall to remote hosting services. Increasingly, small and medium enterprises (SME) are driving towards this change but larger enterprises with existing in-house IT teams are more reluctant, and would take a cost route around traditional data center and operational outsourcing rather than risk shared hosted environments.

The real driver for SaaS is not traditional IT Applications; it is the “edge of the enterprise” business users requiring a flexible model to deploy new technologies and to improve front office trading activities with the market. The key significance is that whereas IT is about enterprise-wide back office transactional processing based on annual budgets and overhead recovery, these new requirements are directly associated with “go-to-market” activities and will be subject to constant change, the need to be made available very quickly for competitive purposes, likely to endure for only a few months, and require to be direct cost-attributing to the business unit consuming the “services”. The flexibility of “services” as a granular medium that can be rapidly changed, the availability of PaaS on which to base them, and the charge model - all contribute to the creation of the SaaS market, which in turn drives the PaaS and IaaS markets. In the case of the latter, it also supports the hosting of traditional IT applications.

**The term “Clouds”** was coined originally to describe the SaaS over PaaS environment, with the understanding that the users would need to have no knowledge of how technology was supporting the business services that they were using, and be able to re-orchestrate it at will; instead the complex technology layers would be represented by the symbol of the cloud.

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

## Leading Company Results (Revenues)

Leading Company Results (Revenues)		
Q4:	<b>HP</b> ↓ 8% @ \$30.8bn	<b>Novell</b> ↓ 9% @ \$862mn
Q3:	<b>RedHat</b> ↑ 18% @ \$194.3mn	
Q2:	<b>Oracle</b> ↑ 4% @ \$5.9bn	
Q1:	<b>Accenture</b> ↓ 11% @ \$5.38bn	

## Movements by Industry Leaders

**Oracle Sun has introduced a new Solaris Cluster V3.2 capability** that supports super virtualization by running a number of Oracle Applications including eBusiness Suite and Oracle DataBase direct from the Solaris container and also fully supports Oracle Automatic Storage Management and Real Application Clusters. **Oracle Advanced Electronic Data Capture Application 4.6 for Health** now scales to larger volumes and improves speed. **Oracle Enterprise Governance Risk and Compliance Manager, GRC Manager**, is claimed to be the most complete and integrated package for closed loop analysis of the issues involved. **Oracle Communications Marketing and Advertising** is a new application to help manage target campaigns on mobile devices. **Oracle PeopleSoft Enterprise CRM for Higher Education R9.1** manages continued relationships through students to alumni. **Oracle Enterprise Manager has the added functionality of Oracle Real User Experience Insight** to provide real-time monitoring of the performance a user experiences in business applications that combine business intelligence. [www.oracle.com](http://www.oracle.com)

**HP Total Care portfolio of products and services for SMEs** is being extended with new products designed for minimal maintenance or support needs as well as a new bundle of software including HP thin client and Microsoft Small Business Server designed to cover all business needs. The new **HP Compaq 8000 Elite desktop PC range** with bundled ProtectTools and Stable Image Platform Program supports improved speeds and energy use. HP has added **three new products to manage using clouds**; HP Operations Orchestration; HP Cloud Assure; and HP Communications as a Service. [www.hp.com](http://www.hp.com)

**Intel plans a 'cloud on a chip' that will 'revolutionize' server farms** consisting of a lattice of 48 cores with routing that allows each core to function independently. A beta SDK kit is now available for **the Intel Atom platform** and uses Intel's Open Source Moblin and Windows C and C++ software. Intel's project Larrabee graphics platform for 3D graphics on x86 is to be released as technology for others to develop, in a change of direction from the original intention to build completed products. **Three important new chips** have been added to the ATOM range covering Netbooks and desktop PCs with significant improvements in size and power consumption. [www.intel.com](http://www.intel.com)

**IBM is acquiring Guardium, a database security tools vendor** for management of sensitive data and compliance requirements. Also being acquired is **Lombardi, a provider of software and services for Business Process Outsourcing, BPO**. **IBM Tivoli Live Monitoring Service** can monitor up to 500 individual resources of almost any type from devices, operating systems, applications, etc. [www.ibm.com](http://www.ibm.com)

**Microsoft has completed the deal with Yahoo** that sees Microsoft Bing becoming the search engine for Yahoo and links their respective advertising and marketing activities in the online market place. A new **partnership with NetApp aims at developing new cloud and virtualized storage capabilities** integrated with Windows products. A **reorganization sees the Azure Cloud Computing**

**division merged** with the Server Group to form the Server and Cloud Division. Microsoft has reached an agreement with the **European Union (EU) over unbundling browsers** offering a choice from within Windows of a number of competitive options. Microsoft **Bing Search is now available as an Apple iPhone app**, complete with the voice search function that is especially suited for mobile use. [www.microsoft.com](http://www.microsoft.com)

**SAP will not be implementing its planned maintenance pricing increases till 2010** after concerted customer opposition to the increase program that raised costs from 17 to 22 percent. SAP Influencer Summit introduced a **five-year strategic plan** to focus on using clouds and in-memory technology to boost value of analytics and business performance management as well as extend support to new devices and mobility middleware. A new **Business Objects Sustainability performance monitoring application** aims to measure and monitor key performance indicators (KPI) connected with carbon trading, etc. An updated version of **SAP Banking Services software** aims to improve competitive capabilities as well as linking more effectively to new regulatory requirements. **SAP for Retail** gains a new Prize Optimization for retail capability. [www.sap.com](http://www.sap.com)

**Google is acquiring online advertising specialist Teracent** to offer improvements in tracking effectiveness of advertising. A new addition to the Google **WebMaster Suite is Site Performance** to analyze traffic levels and response quality. Google is offering a **public Domain Name System (DNS) service** through which users can link their domain names and physical IP addresses, a function previously performed separately as a prime value of internet service providers (ISP). Google is to acquire **AppJet, the vendor of EtherPad** in real time web collaboration on text tool set, to add the capability to Google Wave. **Mac and Linux versions of the Chrome browser** are now available as beta versions for download and are claimed to be entirely new developments and not merely ports of the Windows version. **Google Android Market Apps** has now reached the availability of 20,000 Apps with more than 60 percent free. [www.google.com](http://www.google.com)

**Amazon is introducing EC2 'spot instances'** to create a tradable market in availability of resources. The scheme works by buyers making forward bids of the specifications for their requirement and the price they would pay. Amazon then matches bidders to any spare capability they have at a given time. **Amazon Virtual Private Cloud**, which enables enterprises to work on the Amazon EC2 cloud through secure encrypted links and sessions, is now moving into a public beta. [www.amazon.com](http://www.amazon.com)

#### Open Source Update

**Mandriva Flash 2010 delivers Mandriva Linux on an 8Gbit flash drive** though it leaves 6Gbits free for user files and documents. [www.mandriva.com](http://www.mandriva.com)

**Opera Mobile 10 is released to original equipment manufacturers (OEM)** delivering on Windows Mobile, Android, and Symbian S60 platforms and is claimed to provide a consistent interface for users on any of these platforms as well as on desktop PCs. [www.opera.com](http://www.opera.com)

**Firefox Browser 3.6 is available for mobiles** with the release candidate available for download but currently it will only work on a Nokia Linux based N900. [www.firefox.com](http://www.firefox.com)

### Standards Watch

**The EU Telecoms Package Reform text agreed** for a reformation of the existing 2002 rules, with particular emphasis on Net Neutrality allowing operators to restrict broadband access at their discretion from abusers, and on the right to restrict individual access after a 'fair and impartial hearing'.

[http://ec.europa.eu/news/science/071113\\_1\\_en.htm](http://ec.europa.eu/news/science/071113_1_en.htm)

**The EU has announced a single common patent office and court** for adjudication of patent disputes together with a simple package for lodging a patent at less cost. [www.epo.org](http://www.epo.org)

**Wireless Gigabit Alliance, WiGig, has completed specifications** for data speeds up to 7Gbits and backwards compliant capabilities with the existing 802.11 WiFi standard. [www.wirelessgigabitalliance.org](http://www.wirelessgigabitalliance.org)

### More Noteworthy News

**The EU Malmo Declaration aims to set out a clear ambition for the use of clouds and Web 2.0**, to integrate the citizen services offered across the EU into a single citizen portal that provides access to all services that the citizen is entitled to, regardless of their location inside the EU and their country of origin that provides the benefits and services.

[http://ec.europa.eu/information\\_society/activities/egovernment/index\\_en.htm](http://ec.europa.eu/information_society/activities/egovernment/index_en.htm)

**EMC is introducing Fully Automated Storage Tiering, FAST**, on its Symmetrix, CLARiiON, and Celerra product lines to automatically and dynamically place data in the optimized place for fast access on the basis of degree of use. [www.emc.com](http://www.emc.com)

**Fujitsu unveils the new offering Infrastructure as a Service, IaaS**, aiming to replace on-premise hardware systems with off-premise hosted services as a cost saving move. [www.fujitsu.com](http://www.fujitsu.com)

**Dell claims the world's fastest color printer** for its new Dell 5130cdn model that can handle up to A3 size documents. Dell is also laying claim to introducing the **world's smallest desktop PC** for confined footprints in workspaces. A new global **Business Unit focused on mobile devices** will handle phones, web books, and other crossover products. Dell will build its **Unified Data Center offering** of servers and storage around 10Gbit Ethernet standards, claiming this would maximize connectivity to other equipment. [www.dell.com](http://www.dell.com)

**Lenovo is planning to buy back the mobile phone business it sold two years ago** based on the extent to which mobile phones and PCs are converging. [www.lenovo.com](http://www.lenovo.com)

**Nokia Siemens Networks will move into the smart energy sector** in a new phase when the company plans to focus on growing revenues and markets through new business units, applying their core technology towards providing 'smart' elements to other markets. [www.nokiasiemensnetworks.com](http://www.nokiasiemensnetworks.com)

**Gartner is acquiring AMR Research** who are a niche specialist in a number of areas including SAP and Supply Chain. [www.amrresearch.com](http://www.amrresearch.com)  
[www.gartner.com](http://www.gartner.com)

**Amazon Kindle is repeating last Christmas' 'must have' status** as the wider range of models and features seems to have made it both a consumer and business item. [www.amazon.com](http://www.amazon.com)

**Skype SIP beta is now open** and allows enterprises to connect Skype to their unified communications platforms via a Skype Business Control Platform, which covers centralized management for tasks such as billing allocation, etc. [www.skype.com](http://www.skype.com)

**Social sites Facebook and Twitter are now integrated with Google and Yahoo social tools** as the industry recognizes the need and value in providing cross connections and services. [www.facebook.com](http://www.facebook.com) [www.twitter.com](http://www.twitter.com)

**Twitter Contributors is the first paying business service** and will support controlled groups in closed and user authenticated 'business to business' conversations. [www.twitter.com](http://www.twitter.com)

**Siemens IT Solutions and Services business will be sold or floated** to separate it from the mainstream manufacturing activities by mid-2010 as part of an overall restructuring plan following poor Q4 results. [www.it-solutions.siemens.com](http://www.it-solutions.siemens.com)

**Apple is acquiring Lala, a provider of streaming music services**, especially to Google and Facebook. [www.apple.com](http://www.apple.com)

**McAfee Artemis Security Program has been extended to cover 'clouds'** by offering protection between the cloud users and services to prevent hijacking of content transmissions. [www.mcafee.com](http://www.mcafee.com)



## About Capgemini and the Collaborative Business Experience

Capgemini, one of the world's foremost providers of consulting, technology and outsourcing services, enables its clients to transform and perform through technologies. Capgemini provides its clients with insights and capabilities that boost their freedom to achieve superior results through a unique way of working, the Collaborative Business Experience™. The Group relies on its global delivery

model 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 30 countries, Capgemini reported 2008 global revenues of EUR 8.7 billion and employs 90,000 people worldwide.

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

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