Stratecast

FROST & SULLIVAN

50 Years of Growth, Innovation and Leadership

Getting More Out of the Cloud with Platform as a Service

January 2012

GETTING MORE OUT OF THE CLOUD WITH PLATFORM AS A SERVICE

INTRODUCTION

If you ask a group of IT leaders about their strategic goals, their responses will likely address business growth. Today's IT leaders understand they have an unprecedented stake in corporate success, thanks to transformational IT-led business trends such as social networking and crowdsourcing, m-commerce and virtual teaming, analytics-driven decision making and "everything as a service." For these leaders, "innovation" and "agility" are not just words on a PowerPoint slide, but a mandate for corporate value and differentiation.

If you ask the same group of leaders about their challenges, most of the answers can be boiled down to *cost* and *complexity*. Like all business leaders, IT is being asked to do more with less, to upgrade legacy technologies and develop new applications in record time, with budgets that are flat or nearly so. At the same time, the IT environment is becoming increasingly complex. Today's IT leaders must develop and deploy applications that support a range of corporate and user-owned devices, that can be delivered locally and via the network with optimal performance, and that integrate valuable business functionality, such as analytics. The physical and logical complexity of the new IT environment does more than add cost and management resources. Of greater concern— it inhibits business agility. Every newly automated or upgraded business application requires an extended development and test timeline, with shortcut attempts resulting in quality compromises. No wonder Line of Business managers often consider IT a stumbling block to business growth.

Savvy IT leaders understand that they cannot succeed in the new, hypercompetitive business world using old-line processes for application development and deployment. They are looking to shorten the development timeline; foster innovative thinking and collaboration among stakeholders; increase functionality; improve quality and reduce launch-delaying bugs. And they want to deliver the data and analysis tools the business needs to measure its performance.

Increasingly, IT leaders are finding the solution they need in the cloud—specifically, in a robust Platform as a Service offer.

In this white paper, we look at how PaaS can streamline and enhance the development and delivery of corporate applications. With a focus on IBM SmartCloud solutions, we examine how the right platform can help a corporation build a solid foundation for corporate growth.

DEFINING PLATFORM AS A SERVICE (PAAS)

As shown in Figure 1, the standard industry definition for the cloud includes three service layers: Infrastructure as a Service, Platform as a Service, and Software as a Service.

Figure 1: Cloud Services Model
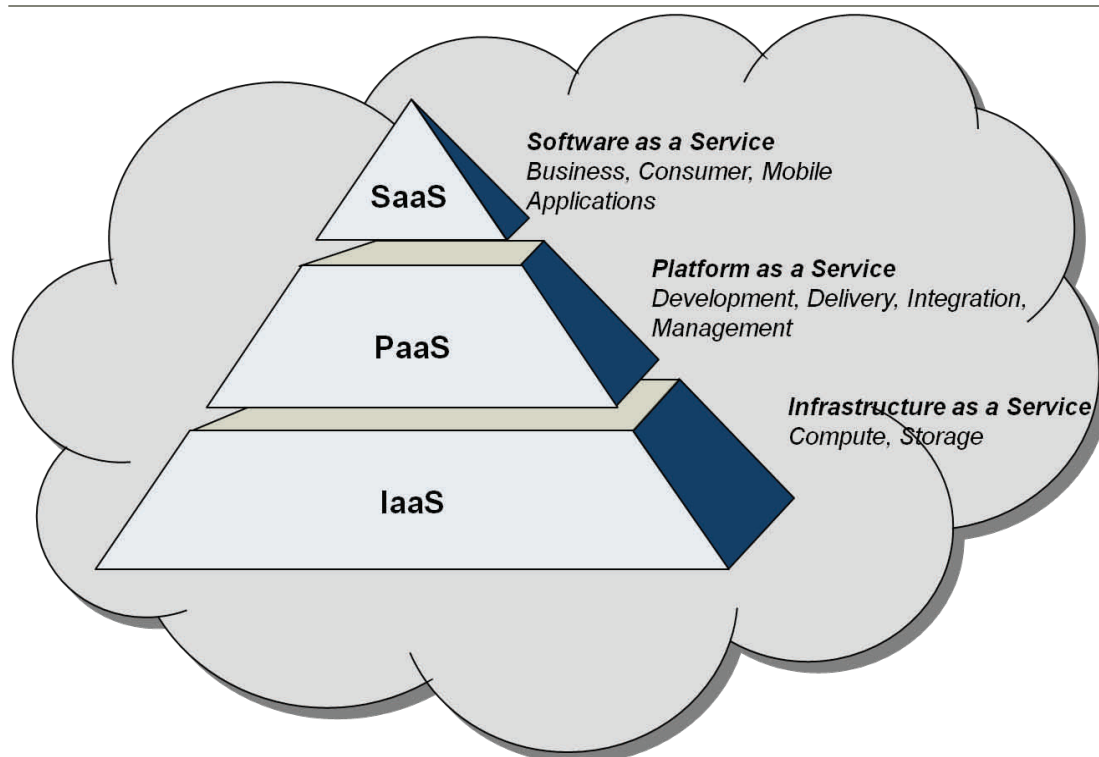
Source: Stratecast

Most users interface with the cloud through the upper and lower layers. Consumers and business users use their Internet browser to interface with their favorite SaaS apps. Data center managers utilize IaaS services to augment the computing and storage capacity in their own data centers.

But what is going on in the middle layer of PaaS? The industry has yet to agree on a standard definition. As a result, platform providers use the term to cover any and every type of middleware, regardless of functionality or scope.

We define PaaS as network-based software used for building, running, integrating, delivering, and managing applications. PaaS solutions usually include tools, Application Programming Interfaces (APIs), and templates that make it easier for application developers, managers, and providers to build, run, and manage their software.

As with other cloud services, most PaaS services are available to users on demand, with the PaaS provider responsible for managing the hardware and software that support the PaaS functions.

PaaS Functionality

Commercial PaaS offers reflect a range of functionality levels, including middleware, automated services and fully managed services. Many PaaS services target the developer community, with templates designed to facilitate application development. Others were designed to help enterprises or third-party providers manage SaaS applications. Providers (and platforms) fall into one or more of several camps:

- *Development platforms* – The first PaaS services, and some of the best known, were launched by successful software and application vendors who opened their platforms to commercial and corporate developers. These include the Google App Engine, which enables software developers to create applications that complement or enhance Google's own applications. Salesforce.com opened its proprietary platform, called force.com, to commercial and corporate developers who wanted to build custom functionality into the popular CRM software. Microsoft Azure provides a platform for developing, scaling and running Web-based applications.

- *IaaS-based management platforms* – Under a broader definition of "platform," the basic tools offered by IaaS providers may be considered a middleware platform. Some IaaS providers, such as Amazon Beanstalk, have enhanced their IaaS services by layering on a limited set of infrastructure management tools and functionality, including load balancing, capacity scaling, and monitoring. When corporate developers upload their applications into the developer's IaaS, they can access the PaaS functionality to run their software. Actual functionality varies by provider, with the scope of functionality usually limited to workloads hosted on the IaaS provider's public cloud.

- *Aggregation platforms* – Some PaaS providers offer a platform that aggregates or integrates the provider's own software with users' applications and even commercial applications. One example is a marketplace or store for distribution of software developed via its PaaS. Corporate developers can upload their own custom apps into the provider's platform for distribution to employees via a portal. The provider may offer wrap-around application services, such as security or backup and recovery, as part of the integrated bundle. Similarly, providers of IT and telecom management systems have taken their licensed software to the cloud, offering platforms that automate billing and administrative functions for commercial or custom software, and sometimes enable limited customization. Some providers offer hosted versions of their software for enterprises; others sell their multi-tenant platforms to third-party communications or managed

services vendors, who, in turn, develop their own branded PaaS offers for enterprises. HP, Alcatel-Lucent, and Parallels are providers of management platforms.

PaaS Benefits

The best PaaS platforms facilitate development and delivery of corporate applications. Enterprises that select PaaS for development benefit from:

- *Decreased development time* – Easily replicable, preconfigured images enable developers to minimize routine coding, significantly cutting time-to-deployment. Additional application instances can be deployed immediately, for uses such as testing or a training environment. Where teaming tools are built into the development platform, stakeholders have the added benefit of real-time review and collaboration.

- *Deferral or avoidance of hardware purchases* – As a cloud-based service, PaaS offers scalable resources that can meet unpredictable and seasonal demand, eliminating the need to invest in hardware for peak usage. Furthermore, the service is budget-friendly, drawing from operating expenses rather than the capital budget.

- *Increased quality and control* – Development managers can ensure that preconfigured images align with corporate requirements for security. Furthermore, by using a clean, consistent image of the app for testing and debugging, developers can avoid inadvertently introducing errors and vulnerable code during multiple test iterations.

- *Test environments that closely mirror the delivery environment* – Because cloud is elastic, applications can be tested at the same scale as the production environment, eliminating a common cause of rollout problems.

- *Reduced risk in a cloud environment* – For all their cost and agility benefits, certain shared cloud services, such as Software as a Service and public Infrastructure as a Service, introduce more risk—including data loss and leakage, unauthorized access, and availability issues—than many enterprises are comfortable with. For these businesses, PaaS offers a more controlled environment, in which the enterprise IT department—not the SaaS provider or cloud provider—is able to establish, maintain, and monitor a consistent security profile and performance specifications. This enables enterprises to leverage the cloud with confidence.

- *An environment that fosters innovation* – Interestingly, some developers are fearful that the pre-set templates of most PaaS offers will stifle, rather than foster creativity. In fact, the opposite is true, provided the PaaS platform has an expansive library of images. Rather than restricting the creativity of developers,

the pre-configured images remove the repetitive "grunt work" from the development process, freeing developers to focus on innovative solutions.

Using PaaS to Optimize IT

The challenge with most of the PaaS offers available today is that they solve only pockets of IT problems—that is, they may only streamline automation of a new business process, or they may only enable management of a single cloud environment.

But that's not the environment most enterprises operate in. Enterprises devote considerable resources to managing mission-critical systems, like SAP and web applications, that long predated the cloud era. Furthermore, they manage multiple data center environments, which generally have separate administrative consoles. In this real-life IT environment, a PaaS solution may not be part of the solution—and in fact, may be part of the problem.

But suppose PaaS could solve real challenges faced by IT departments? Suppose PaaS could optimize not only pockets of cloud-based services, but all of IT? Suppose PaaS not only facilitated deployment of an application without dedicated hardware, but also made it easier to build, deploy and manage the app itself? To do all that, a PaaS must be built on a fully integrated cloud foundation, like IBM SmartCoud.

ABOUT IBM SMARTCLOUD

The IBM SmartCloud is a fully integrated portfolio of services that represents the entire cloud service stack. As shown in Figure 2, IBM SmartCloud consists of three "pillars" or service families.

Figure 2: IBM SmartCloud
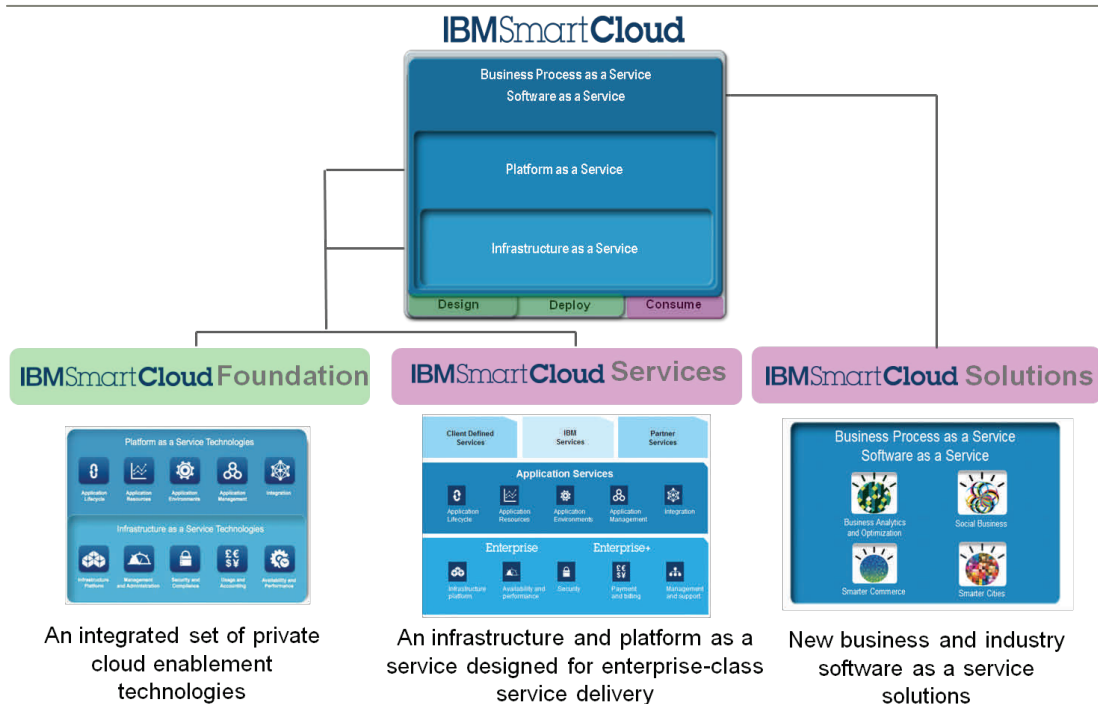
Source: IBM

SmartCloud Foundation comprises hardware and software that enterprises can use to deploy on-premises private clouds and/or to connect their private clouds with hosted clouds in a hybrid configuration.

SmartCloud Services includes the SmartCloud Enterprise public (shared) cloud offer, a secure, virtual machine-based Infrastructure service, as well as SmartCloud Enterprise+— a hosted, managed private cloud service.

Both the SmartCloud Foundation and the SmartCloud Services offer fully integrated infrastructure and platform, enabling enterprises to not only deploy their apps in whichever cloud environment they choose, but also to build and manage them.

The third component of the SmartCloud family is IBM *SmartCloud Solutions*, SaaS-based services from IBM's rich legacy of enterprise software.

With its SmartCloud family of services, IBM differentiates itself from other cloud providers in two important ways:

- Not only is IBM one of few companies that provides solutions for each part of the cloud stack—infrastructure, platform, and software—but the company has fully integrated its infrastructure and platform layers. This increases the value of the cloud for enterprises, which can do more than simply deploy their applications; they can also build and manage their applications in the cloud.

- Furthermore, IBM is unique in enabling enterprises to build on-premises private clouds and hybrid clouds that are fully interoperable with the public and hosted private cloud offers. This flexibility in deployment reduces the complexity of IT management, enabling applications and workloads to be moved across cloud environments and managed via a single console.

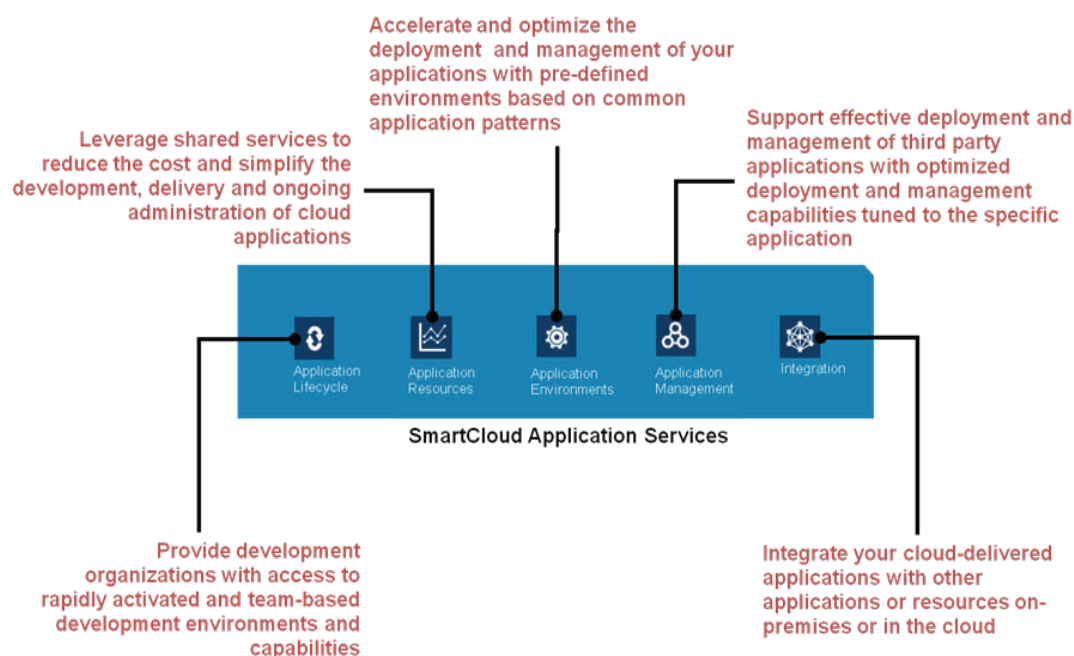## IBM SMARTCLOUD APPLICATION SERVICES: GETTING THE MOST FROM THE CLOUD

IBM introduced SmartCloud Application Services as part of the SmartCloud portfolio, and a logical extension of the SmartCloud Enterprise and Enterprise+ cloud infrastructure services. SmartCloud Application Services is an integrated PaaS offer that enables enterprises to maximize the benefits of the cloud across applications and environments.

While most PaaS services are limited in scope and functionality, IBM's SmartCloud Application Services offers a comprehensive array of tools for developing, deploying, managing and integrating corporate applications. With support for the full range of IT environments (including private and public clouds, on-premises and hosted), the services simplify installation, setup, and configuration of applications and management tools, regardless of the underlying infrastructure environment. As such, SmartCloud Application Services can simplify and strengthen the entire IT environment, offering a consistent and flexible set of capabilities that enable enterprises to respond more quickly to changing market needs.

As shown in Figure 3 below, the service comprises five capability areas, which enterprises can adopt independently or collectively. The modular approach allows enterprises to choose the elements they need, depending on where they are in their cloud deployment, and add or subtract later, as their needs change.

Figure 3: IBM SmartCloud Application Services

Leverage shared services to reduce the cost and simplify the development, delivery and ongoing administration of cloud applications

Accelerate and optimize the deployment and management of your applications with pre-defined environments based on common application patterns

Support effective deployment and management of third party applications with optimized deployment and management capabilities tuned to the specific application

Provide development organizations with access to rapidly activated and team-based development environments and capabilities

Integrate your cloud-delivered applications with other applications or resources on-premises or in the cloud

Source: IBM

The five categories of capabilities include:

- *Application Lifecycle* – This set of capabilities, based on IBM Rational technology, includes not only development tools (e.g., templates and APIs) but also collaboration tools. The development tools improve speed-to-market by allowing developers to reduce repetitive coding tasks, replacing them with packaged templates. More importantly, the toolset includes integrated "teaming" tools that facilitate collaboration among developers. This includes the shared ability to review code and track results, even among non-technical stakeholders. The application lifecycle tools foster business agility and innovation, while improving quality of software and reducing errors.

- *Application Resources* – The cloud era has brought with it an acknowledgement that IT doesn't have to be homegrown; that enterprises can benefit from shared facilities and services without losing a competitive edge. IBM's Application Resources allow enterprises to reduce costs and simplify deployment of common application resources, such as database and backup services.

- *Application Environments* – Deploying self-contained applications is a common usage for cloud services. The Application Environments capability automates and facilitates the deployment of apps through a simple interface. The

user selects a pre-configured pattern for the type of app to be deployed (e.g., Web applications, database apps) and selects appropriate performance-related configurations (e.g., throughput). IBM's PaaS creates and deploys the virtual machine, allocating appropriate resources (e.g., load balancing). Integrated monitoring agents track performance, automatically increasing resources as needed to maintain specified performance levels. For enterprises, this capability hastens time to deploy applications—as well as deployment of duplicate instances for testing or training—and ensures more consistent performance of the deployed apps.

- *Application Management* – For many enterprises, the lifeblood of their businesses is a powerful enterprise resource planning system such as SAP. Despite the potential benefits that could be derived, they often hesitate to move such critical systems into the cloud, fearing disruption of operations. For these businesses, IBM has launched Application Management services focused on specific third-party enterprise applications. Initially supporting SAP, the service offers application-specific patterns and configurations that enable users to deploy their critical SAP workloads in the cloud. The capability leverages IBM's expertise in SAP deployments, while enabling enterprises to take full advantage of cloud efficiencies.

- *Integration* – To maximize productivity and efficiency, employees need to access common applications from within other applications, which requires broad deployment of application service interfaces. Unfortunately, such integration usually means time- and resource-intense custom coding. That's where IBM SmartCloud Application Services can make a big difference. The Integration capability enables enterprises to integrate new and legacy applications without requiring coding. The capability includes standard "connectors" for off-the-shelf software, as well as "builder" templates that utilize a graphical interface to facilitate integration into custom applications. As a result, businesses can quickly and easily integrate a SugarCRM application into SAP, for example. The Integration capability not only facilitates development and deployment; it also enables businesses to improve productivity—allowing them to "connect the dots" between disparate business functions more easily, and providing the visibility and analysis tools they need to make smart business decisions.

IBM SmartCloud Application Services offer enterprises the following unique benefits:

- *Cross-platform support* – IBM's PaaS supports the full range of corporate IT environments, providing visibility and management tools for corporate cloud applications, whether they are hosted in private, public, or hybrid clouds. Because IBM's PaaS technologies and IaaS technologies are fully integrated, the service offers an unprecedented degree of visibility into IaaS-based virtual machines.

- *Robust library* – IBM SmartCloud users have access to a robust and continually updated library of templates and APIs to facilitate development.

- *SAP management* – IBM SmartCloud Application Services enable enterprises to streamline management and maintenance of their current mission critical applications, with SAP as the first application being supported. This valuable capability enables enterprises to leverage the benefits of the cloud—including ease of management and avoidance of hardware maintenance—for commercial applications, without giving up control or customization that is a by-product of SaaS deployments. By placing SAP in the IBM cloud, enterprises experience reduced time and cost associated with SAP maintenance tasks, including cloning, testing, patching, and refreshing. Because the deployments are managed by IBM SAP experts, enterprises can minimize risk associated with migration.

- *Common Core Technology* – IBM uses the same underlying technology for its private and public cloud solutions, including IBM SmartCloud Foundation for deploying on-premises private clouds, as well as IBM Enterprise and Enterprise+ infrastructure services, and the SmartCloud Application Services platform. The technologies include robust capabilities such as IBM Workload Deployer, Cast Iron, DB2 and Rational tools, which are fully integrated into the platform. This helps ensure seamless application portability across the full spectrum of cloud delivery models.

WHY IBM?

Leveraging its reputation as a technology leader serving the world's largest enterprises, IBM is executing a cloud strategy that well positions the company as the leading cloud provider for enterprises. As enterprises increasingly seek to deploy cloud services, not just for trials but for their production environments, they can turn to IBM for solutions that address their concerns and meet their future needs.

Among the advantages offered by IBM are:

- *Leadership in enterprise cloud services* – With over 20 years of experience managing mission-critical applications for enterprises, it's not surprising that IBM launched the industry's first set of enterprise-grade cloud services. Today, its cloud services portfolio is second to none. IBM continues to invest in its enterprise cloud vision, with tightly integrated services that span infrastructure, platform, and software layers, and support private, public, and hybrid cloud environments. Furthermore, IBM's expertise in managed and professional services allows the company to provide expert guidance to the large number of companies that are seeking assistance in developing a cloud strategy. Professional services

include cloud strategy and roadmap development, risk assessments, and cloud implementation services.

- *Unmatched Service Level Agreements (SLAs)* – At a time when most cloud providers are unsure whether and how to develop service level agreements, IBM continues to lead the way. As with other IBM cloud services, the company has adopted meaningful SLAs based on workload performance within its SmartCloud Application Services.

- *Leader in security solutions* – In our networked and collaborative world, with anytime-anywhere access to applications, security is no longer an afterthought, but a critical element to be built into every workload, application, and toolset. IBM's Security Framework ensures that robust and flexible security components are built into each solution.

- *Leader in developer community initiatives* – IBM is building a broad ecosystem of partners who are building their solutions on the IBM SmartCloud platform and extending the IBM SmartCloud platform with additional capabilities and services. In addition, IBM's developerWorks program offers tools and resources for commercial and in-house developers.

Stratecast
The Last Word

For forward-looking IT leaders, the cloud is not a technology to be pursued for its own sake; instead, the cloud represents a means to grow and differentiate the business. Unfortunately, most cloud infrastructure and software services on the market today make it difficult to achieve that lofty goal. In fact, they may have the opposite effect, merely adding yet another development or delivery environment to be managed by the already-overburdened IT staff.

However, a new view of a flexible, integrated cloud is being introduced by IBM, one that enables enterprises to enter the cloud with confidence. Through its new PaaS offer, SmartCloud Application Services, IBM offers enterprises the capability to develop, deploy, manage and integrate corporate applications—regardless of operating system or environment.

SmartCloud Application Services facilitate application development, with unique collaboration tools that enable even non-technical stakeholders to participate in quality reviews. To maximize performance of applications, the PaaS includes management and monitoring tools that offer high levels of visibility and control over multiple environments. Furthermore, because enterprises expend considerable time and employee resources in managing mission-critical legacy apps, SmartCloud Application Services includes prepackaged application environments for commercial business applications, beginning with SAP.

SmartCloud Application Services helps enterprises get the most from the cloud, allowing them to realize the benefits of cost containment and rapid deployment of applications, while minimizing risk. Even more important to IT leaders, the IBM PaaS solution enables them to achieve business goals: to respond more quickly to the changing marketplace, to rapidly deploy innovative ways to connect with customers, and to foster collaboration among partners and employees.

With SmartCloud Application Services, IBM has shown that a robust PaaS can provide more than a set of development tools. In the hands of a savvy IT leader, it can become the platform that optimizes IT in the cloud.

Lynda Stadtmueller

Program Manager - Cloud Computing Services
Stratecast | Frost & Sullivan
lstadtmueller@stratecast.com

ABOUT STRATECAST

Stratecast assists clients in achieving their strategic and growth objectives by providing critical, objective and accurate strategic insight on the global communications industry. As a division of Frost & Sullivan, Stratecast's strategic consulting and analysis services complement Frost & Sullivan's Market Engineering and Growth Partnership services. Stratecast's product line includes subscription-based recurring analysis programs focused on Analytics, Customer Experience and Marketing (ACEM), Business Communication Services (BCS), Cloud Computing (CC), Connected Home (CH), Consumer Communication Services (CCS), Mobility and Wireless (M&W), OSS and BSS Global Competitive Strategies (OSSCS), Secure Networking (SN); and our weekly opinion editorial, Stratecast Perspectives and Insight for Executives (SPIE). Custom consulting engagements are available. Contact your Stratecast Account Executive for advice on the best collection of services for your growth needs.

ABOUT FROST & SULLIVAN

Frost & Sullivan, the Growth Partnership Company, partners with clients to accelerate their growth. The company's TEAM Research, Growth Consulting, and Growth Team Membership™ empower clients to create a growth-focused culture that generates, evaluates, and implements effective growth strategies. Frost & Sullivan employs over 50 years of experience in partnering with Global 1000 companies, emerging businesses, and the investment community from more than 40 offices on six continents. For more information about Frost & Sullivan's Growth Partnership Services, visit http://www.frost.com.

Auckland
Bangkok
Beijing
Bengaluru
Bogotá
Buenos Aires
Cape Town
Chennai
Colombo
Delhi / NCR
Dhaka

Dubai
Frankfurt
Hong Kong
Istanbul
Jakarta
Kolkata
Kuala Lumpur
London
Mexico City
Milan
Moscow

Mumbai
Manhattan
Oxford
Paris
Rockville Centre
San Antonio
São Paulo
Seoul
Shanghai
Silicon Valley
Singapore

Sophia Antipolis
Sydney
Taipei
Tel Aviv
Tokyo
Toronto
Warsaw
Washington, DC