

Creating a Cloud Computing Ecosystem: How IBM Helps ISVs and Developers Deploy SaaS Applications on the Cloud.

Sponsored by IBM

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Executive Summary

Cloud computing has rapidly emerged as the principal approach to reduce escalating operating costs, manage complexity, and drive business integration and alignment. Several key facets of cloud computing, for example, time sharing, virtualization, metering, secure hosting, etc. have been core IBM capabilities since the 1970s. More recently, in 2008, after over three years of partnering with several early cloud computing adopters through “in-market” experiments, IBM announced a significant company-wide cloud computing initiative, tying its systems, software, and services businesses.

As many companies implement cloud computing, Independent Software Vendors (ISVs) and Application Developers need to develop or adapt their solutions to the cloud to benefit from this growing market opportunity. But they need a trusted partner to plan, build, deliver, and scale their cloud application solutions with enterprise grade reliability, security, and flexibility to accommodate a range of business and delivery models.

IBM provides a robust portfolio of end-to-end cloud solutions (systems, software, and services) for ISVs and developers of all sizes. This cloud portfolio is built on fundamental IBM strengths in deploying enterprise grade systems, security, reliability, and a very mature fully supported middleware stack. ISVs and developers overcome challenges of cloud adoption and benefit from multiple tailored cloud workload-optimized partner paths. These paths support partners at every phase from development to deployment, minimize cloud migration risks, and include new flexible pricing models which align costs with revenue streams. IBM’s continuing investment, collaboration, and innovation throughout the cloud ecosystem ensures a clear roadmap and ongoing support. For partners and their customers, this means their investments are protected against changing market conditions.

Introduction

The current tough economic climate and escalating energy, software, and people costs for IT mean that companies must constantly find new ways to maximize their return on IT investments. One of the most powerful ways to do this is through cloud computing –that is, by sharing data, computing resources and applications on the Internet and accessing them on a usage basis. Cloud computing broadly covers four areas: Infrastructure as a Service (IaaS), Platform as a Service (PaaS), Software as a Service (SaaS), or even Business processes as a Service (BpaaS). In this paper, we focus on Software as a Service (SaaS). As more companies turn to cloud computing, Independent Software Vendors (ISVs) and application developers must prepare to deliver more and more of their solutions in the cloud. .

There are Multiple Cloud Computing Delivery Models

Cloud computing services are delivered in three modes: as a private cloud (within an enterprise), as a public cloud (accessible through the internet), or as a secure hybrid cloud (extended private).

While public clouds are popular, particularly among smaller businesses and individual developers, larger enterprises are increasingly turning to private and hybrid clouds to assuage concerns relating to security, regulatory compliance, governance, reliability and IP protection.

In the hosted-private, hybrid, or public cloud computing model, a cloud service provider manages routine IT needs and provides higher level cloud services to run business software solutions. These software solutions run in the service provider’s datacenter which is shared by multiple enterprises in a secure multi-tenant mode. Since cloud computing service providers manage multiple customers on their infrastructure and software, they can provide better economies of scale and amortize costs over a larger set of concurrent users and thus provide far better ROI on IT investments than what a typical enterprise can achieve in-house.

Driving Business Value through a Cloud Ecosystem

ISVs need to be aware of a few key attributes of the SaaS environment:

Multi-tenancy: There are three broad approaches to multi-tenancy: ASP, Virtualization, and Shared Middleware. In the ASP model, each tenant has a dedicated server. This is inefficient and expensive since each additional tenant will require an additional dedicated server. The second approach, Virtualization, creates multiple operating systems within a single server. This is more efficient than ASP but still means creating separate software stacks for each virtual machine and that has related costs. The most efficient approach is the Shared Middleware model where within a single server or virtual instance of a server, the OS and middleware is shared among tenants. The architecture of the application allows multiple tenant profiles to be customized and securely deployed. This is referred to as “multi-tenant / single instance” and should be the goal of all SaaS providers if they are to fully realize the cost benefits of cloud-computing.

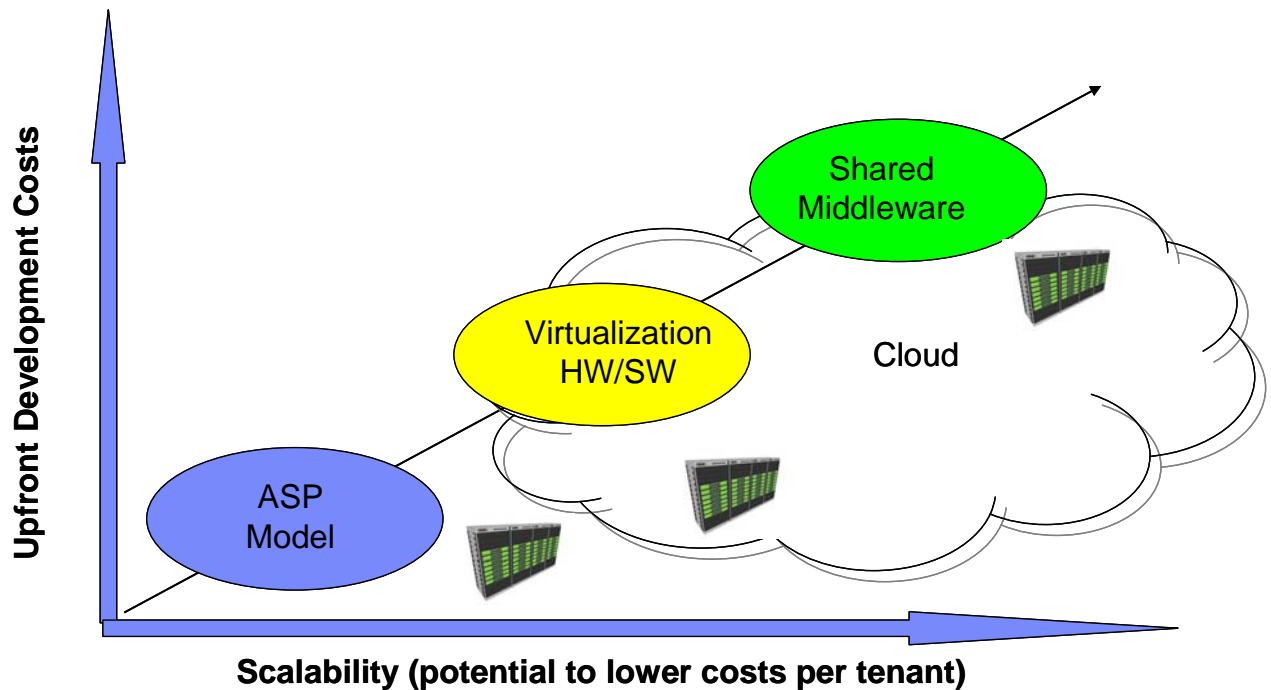


Figure 1: Multi-Tenancy Approaches: Up-front cost vs. Scalability & Administration Costs

Can reduce costs and complexity: Software as a Service (SaaS) helps shorten sales cycles. ISVs and their clients can now scale IT investment with revenues. This pay-as-you-go investment model helps both ISVs and their clients reduce escalating labor and infrastructure costs through an on-demand infrastructure. Developers can now rapidly, reliably, and efficiently set up and tear down development and test systems. Further, SaaS democratizes the playing field. It enables small ISVs to reach markets without having to invest significantly in a large sales force or expensive on-premise support. And through the pay per use business model, larger solution providers can now reach out to customers who otherwise could not have afforded expensive off-the-shelf applications.

But enterprise class security and reliability concerns remain: Web-based cloud services for e-mail, computer storage, personal productivity applications, and customer management software are now common. But enterprises have been traditionally wary of cloud computing citing traditional IT concerns like data security, reliability, and regulatory compliance. That is now changing as companies like IBM apply their fundamental strengths in deploying enterprise grade systems, security, reliability, and a mature fully supported middleware stack to provide robust end-to-end cloud solutions.

ISVs need a trusted partner for benefiting from SaaS: To realize the benefits of SaaS, ISVs and developers need long-term trusted partnerships with providers of cloud services. IBM drives business through a smart ecosystem that leverages over 40,000 ISVs in PartnerWorld, 8 million members in developerWorks with 400,000 in My developerWorks, 1.5 million students and 9,000 faculty in the academic initiative, and over 300 entrepreneurs mentored in the Venture Capital program. Now IBM is helping developers and ISVs deliver their applications/assets as a cloud service and sell more of their existing cloud services. IBM also provides go-to-market training and assistance for partners – including leveraging synergistic and complementary partners in the partner ecosystem - to ensure maximum effectiveness and profitability of joint marketing and sales activities.

IBM Delivers a Robust Portfolio of Workload Optimized Cloud Computing Offerings

IBM leads the industry with its robust portfolio of Cloud Offerings that addresses not only ISVs, developers and business partner requirements, but also other infrastructure players with global access to consumers. These include telecom providers who are actively partnering with IBM to create an ecosystem of ‘Cloud Service’ providers leveraging their carrier grade infrastructure.

IBM Smart Business Development and Test Cloud helps clients assess, plan, design and implement a flexible development and testing private cloud environment. This helps save capital and operating costs as well as reduce test cycle times, complexity and risks. A self-service test platform, which is designed for ease of use, combines service request management, automated provisioning and configuration management, providing users on-demand provisioning of physical and virtualized test resources-including IBM and non-IBM components such as operating systems, middleware, storage, network, images and data. This helps clients reduce capital expenses while gaining a dynamically scalable development and testing environment to meet changing business needs.

IBM has also collaborated with Amazon Web Services to give developers and ISVs access to [IBM software products](#) in the EC2 virtual environment as ready-to-deploy product level Amazon Machine Images (AMIs) for DB2, WebSphere Application Server, Informix Dynamic Server, Lotus Domino Enterprise Server, Tivoli Monitoring and IBM Mashup Center and other IBM products.



IBM’s Cloud environment provides two options with virtual IT infrastructure support: one is the standard level of security for sharing physical IT resources among many tenants and the second is a dedicated computing environment for extra level of protection through private cloud deployments. IBM Business Partners benefit through this delivery flexibility backed by IBM’s holistic cloud offerings spanning systems, software, and services geared for enterprises, small and medium businesses.

IBM's SaaS cloud computing offerings are available both in the form of a public cloud or in a private cloud. Several IBM software solutions are now available for installation behind the corporate firewall in a private cloud environment. Alternatively, users can use IBM software via the IBM Cloud, which is essentially the same technology but running on IBM's public cloud infrastructure where these software solutions are provisioned and deployed in a pay per use model. IBM collaborates with Amazon Web Services (AWS) EC2 public cloud infrastructure offering whereby users could use the same IBM software deployed on the EC2 server instances. IBM also allows users to integrate their private cloud with the public cloud in a hybrid model.¹ These SaaS cloud solutions enable ISVs, developers, and other business partners to expand their total addressable market by reducing the entry barrier of price to reach out to many new potential customers.

IBM Cloud Computing Solutions: Enabling ISVs, Developers, and Business Partners

IBM drives business through a smart, global, extensive ecosystem of partners via the PartnerWorld program and developerWorks by:

Offering a comprehensive cloud offerings portfolio to plan, build, and deliver cloud applications:

IBM delivers a robust portfolio of cloud computing offerings with the objective of helping cloud service providers, ISVs, developers and business partners to plan, build, and deliver cloud computing solutions. IBM is also working on providing partners with a single, easy to navigate centralized cloud web resource (www.ibm.com/cloud) that allows them to identify which set of IBM cloud solutions work best to address their needs while exposing them to the breadth of partnering options with IBM.

Extending IBM PartnerWorld and developerWorks programs to cloud computing: IBM plans to leverage and complement existing incentive programs (SVP, Solution Select), skills training initiatives, education vehicles (Dynamic Infrastructure Certifications, Cloud Certifications) by developing roadmaps and guidance for partner types such as *Cloud Application providers*, Cloud Infrastructure providers, Cloud Builders, Cloud Technology providers, Cloud Services resellers, and Cloud Aggregators. Further, these programs are designed to address the needs of ISVs and developers who are cloud enabling their applications through scalability, multi-tenancy, rapid infrastructure deployment, and error free configuration.

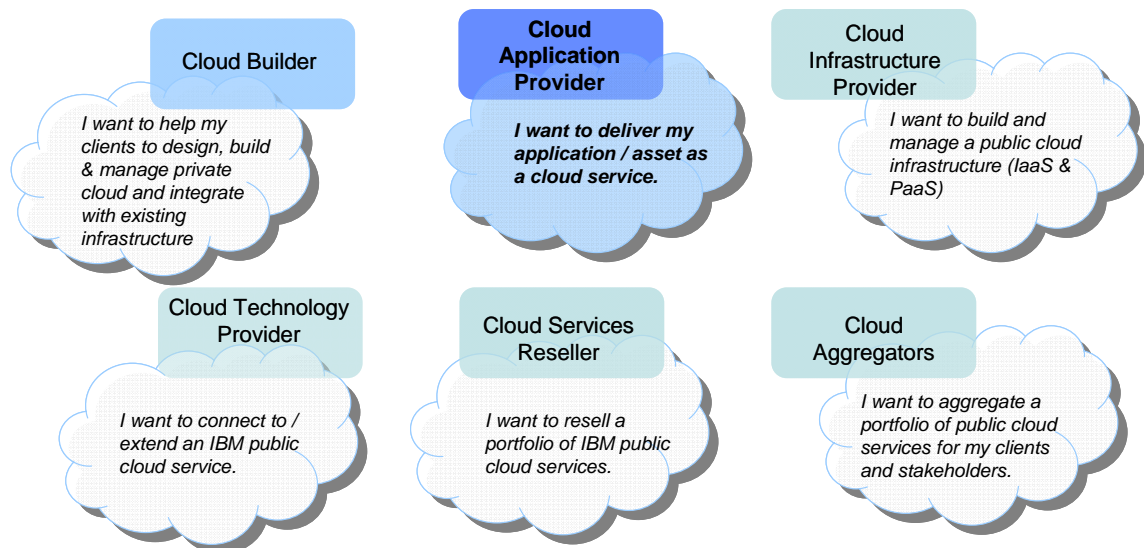


Figure 2: IBM Cloud Partners and their Requirements – Focus on Cloud Application Developer

¹ IBM's public private cloud integration solutions to <http://www-935.ibm.com/services/us/igs/cloud-development/>

Addressing ISV and Developer challenges with cloud adoption: The table below summarizes key benefits that IBM provides through its cloud offerings to address cloud requirements and adoption challenges in a holistic manner.

Proven Enterprise class performance	Innovative SaaS Extensions	Cloud Integration	Flexible / Hybrid deployment options
IBM's platform for SaaS comprises WebSphere and DB2 - the same technology used to run mission-critical, SOA applications. IBM is the market leader for middleware.	IBM offers value added services including Collaboration, Analytics and Integration which enable ISVs to address customer concerns and differentiate their service.	3 of the top 10 reasons customers don't buy SaaS solutions relate to integration. IBM has the market leader in SaaS-to-SaaS and SaaS-to-on-premise integration in Cast Iron. IBM, MicroSoft and Salesforce.com partners have leveraged Cast Iron for their integration needs.	ISVs will need to support enterprise clients who will continue to have complex IT environments comprised of on- and off-premise clouds as well as traditional behind the firewall deployments. IBM provides the flexibility to build on their platform and then host on a public or private cloud. In a scalable, secure, and functional manner.
Flexible pricing models	Go to Market Support	No charge Development & Test Software	Open Standards vs. Proprietary
A flexible monthly pricing model specifically for ISVs looking to deliver SaaS solutions	ISVs that partner with IBM receive go to market support from IBM including the SaaS Specialty today and ongoing new support for ISVs in the future.	ISVs can start developing their SaaS apps on the IBM Cloud immediately Development Use Only images are available for ISVs and the ISV only pays for the compute usage and can also take advantage of the new Cloud Lab.	ISVs selecting a cloud platform should consider the openness of the platform on which they are going to develop and deploy their application. IBM has a strong track record with open standards

With IBM's cloud offerings, ISVs, developers and business partners get ready-to-run IBM software products such as WebSphere as cloud services that are ideal for prototypes, proof-of-concepts, development and test of other third party solutions in the cloud computing paradigm. These lower entry barriers for all partners and allow them to get started quickly on a cloud enablement path.

Providing multiple tailored cloud workload optimized paths: Cloud computing provides a service oriented approach to on-board the cloud. ISVs and developers must determine whether:

- Their applications or service workloads lend themselves well to cloud based models, or
- To develop new cloud solutions.

Then they must cloud enable their existing applications or develop new solutions on the cloud by:

- Identifying applications and workloads that have stringent security requirements or are performance sensitive or I/O intensive as these may not yet work best in clouds
- Determining if they need to:
 - use cloud based services and information (SaaS), or
 - develop and build applications (PaaS), or
 - host software and databases (IaaS) either on:
 - someone else's data centre (public or hosted cloud model), or
 - their own data centre (private cloud), or
 - a mix of both options (hybrid).

Once they identify their cloud consumption and solution pattern, they can work with IBM business and technical experts to identify which of IBM's robust portfolio of cloud offerings best suit their requirements for provisioning or deploying the application on the cloud, scaling, collaboration, reliability, security, data storage, billing, and monitoring.

Minimizing risk and supporting partners at every phase from development to deployment: IBM plans to proactively support existing IBM Business Partners that use IBM's middleware (Cognos, WebSphere, Tivoli, Rational, DB2, etc.) and systems (System z, iDataplex, Power, etc.). As these partners embark and continue their journey to leverage the cloud, they will continue to benefit from their deep and strategic relationships with IBM. In addition, new partners will be able to leverage and build robust and reliable cloud solutions with proactive support and guidance from IBM technical and domain experts as they deploy their specific solutions leveraging IBM cloud offerings. IBM is also building and expanding its cloud solutions portfolio with newer offerings including but not limited to IBM CloudBurst, IBM Desktop Cloud, IBM PaaS and other vertical industry frameworks, IBM Business Analytics etc. Through a staged and risk mitigated enablement strategy, IBM offerings can be used for several cloud service model and deployment models as shown in Figure 3.

Public Cloud Entry Point: Infrastructure Workloads

- Audio/Video Web Conferencing
- Service Helpdesk
- Infrastructure for training and demonstration
- WAN capacity
- VoIP Infrastructure
- Desktop
- Test environment Infrastructure
- Storage
- Data Center Network Capacity
- Server

Private Cloud Entry Point: Database & Application Workloads

- Data mining, text mining ,or other analytics
- Security
- Data warehouses or data marts
- Business continuity and Disaster Recovery
- Test environment Infrastructure
- Long-term data archiving/preservation
- Transactional databases
- Industry-specific applications
- ERP applications

Figure 3: Some IBM Cloud Workload Recommendations with Lowest Risk & Highest Potential

Including new SaaS pricing models which align costs with revenue streams²: As flexibility is critical for cloud business partners, IBM currently provides ISVs and developers with three ways to license the software required to run their services -- hourly, monthly, and perpetual pricing terms provided for ISVs and business partners. On a restricted and occasional basis, IBM also provides ISVs and developers access to its software on the IBM cloud at no charge primarily for development and testing.

How ISVs and Developers Can Overcome Challenges using IBM SaaS Cloud Offerings

Details on key components of IBM SaaS cloud offerings are in the Appendix. Here we illustrate through specific examples how these offerings help ISVs, developers, and other IBM Business Partners overcome business and technical challenges.

Challenges faced by ISVs: Many IT buyers today are considering SaaS based solutions to achieve reduced costs, improved service, ease of scalability on demand, access to latest software updates with affordable pricing, simple on-boarding, and minimal infrastructure investment. For ISVs, this could result in a decline in sales of traditional on-premise packaged software and several business and technical challenges since:

² <http://www-935.ibm.com/services/us/igs/cloud-development/pricing.html>

- ISVs are under pressure to adopt a SaaS model for their offerings to compete and create newer models of revenue generation through their current software offerings
- Enterprise client CFOs increasingly favor a Capex to Opex switch for IT investments
- Sales cycles for application software reduce as solution consumption models become variable
- End user clients demand low investment cloud based demonstrations and evaluations of solutions
- Clients need cloud based beta for rapid evaluations, and additional functionality for billing, metering, monitoring, rapid resource provisioning, and integration of business solutions
- Database/Metadata customization for multi-tenancy is needed, and
- Security and self-service aspects of a cloud solution must be addressed at all levels.

In fact, a recent IBM survey of over 90 ISVs indicated that 80% of ISVs were not ready for a pure public cloud due to security and performance reasons; yet over 60% were interested in harnessing cloud computing.

How IBM cloud solutions benefit ISVs: IBM helps ISVs plan, build, and deliver cloud based solutions through its cloud computing offerings portfolio, consulting, and educational services. ISVs can:

- Build and deploy applications for the cloud
- Exploit new channels to deliver their applications
- Leverage as-a-service delivery and business models
- Partner with other complementary solution providers in the IBM cloud ecosystem.

To support these ISVs over the long haul, IBM

- Provides cloud services as SaaS application middleware
- Plans to deliver PaaS offerings and a continuing roadmap of high-value cloud solutions
- Offers a flexible licensing model for its cloud enablement and offerings
- Addresses security concerns - IBM's Cloud Offerings are available for public, private and hybrid cloud deployment models
- Provides access either on the IBM Public Cloud or Amazon EC2 in SaaS mode for rapid development and test setup and evaluations.

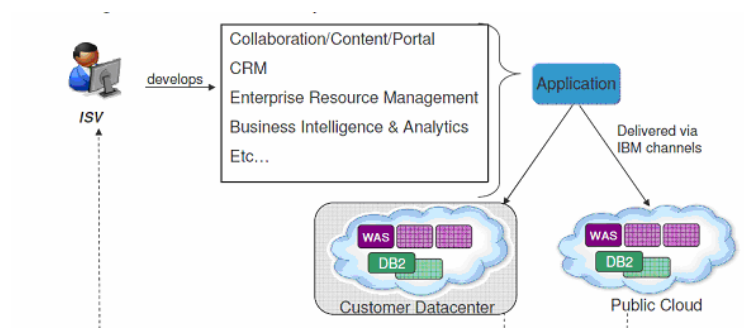


Figure 4: How ISVs Benefit from the IBM Cloud Computing Portfolio

IBM is a one stop shop to help ISVs on-board the cloud with the help of its full application life cycle offerings that help in planning, development, testing, collaboration, go-to-market, and deployment of their solutions with the help of IBM Smart Cloud Services.

Challenges faced by developers: These include:

- Procuring, configuring, setting up and maintaining an IT infrastructure for application development and testing requirements for a multitude of configurations

- Manual setup tasks run the risk of generating testing errors
- High upfront capital and operational expenses with low average resource utilization both in terms of software and hardware.
- Absence of integration with community tools and collaboration offerings
- Linear application scaling
 - Bottlenecks in data access, logging and application state management prevent applications from scaling
 - Dynamic Infrastructure Services provide ‘Auto-Scaling’ features for applications and traditional applications are not geared up to take advantage of such features

Cloud Benefits for the Developer/Tester

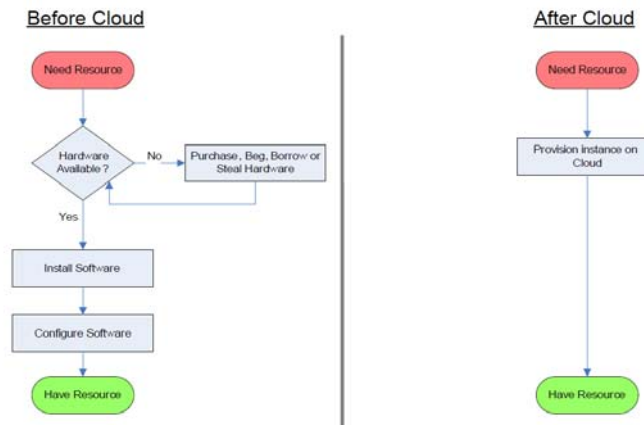


Figure 5: How Developers Benefit from IBM Cloud Computing Solutions

IBMs Solution for developers: Rapid, Elastic and Efficient resource deployment: IBM’s Smart Business Development and Test Offerings helps developers reduce costs and eliminate the need for own infrastructure with an enterprise-ready IBM Cloud environment. Developers gain by faster setup and shorter cycle times for development and testing process. They can achieve better collaboration and teamwork with IBM tools such as Rational and standardized configurations available as part of these offerings. IBM cloud offerings such as the IBM Smart Development and Test Cloud helps developers in developing and integrating web based applications and services rapidly without spending up-front capital expenses and eliminating manual tasks involved in setting up and maintaining IT infrastructure for test and dev. Services such as IBM’s LotusLive help in better teamwork and collaboration among developers through their integration with third party services for collaboration such as Skype.

Challenges faced by IBM Business Partners: IBM Business Partners are challenged to:

- Automate business processes in a fast, efficient, cost effective and innovative manner
- Deal with the complexity involved in setting up and deployment of BPM solutions
- Discover, map, document and collaborate on business process
- Integrate business process solutions that help other partners, suppliers and customers collaborate and communicate efficiently for inter-enterprise commerce

IBMs Solution for Business Partners: Go from Zero to Process in 90 seconds: IBM BlueWorks Live enables every business person to improve processes currently run over email. It provides process control to the team, improves visibility and productivity. This solution is offered in the form of SaaS based offering which is easy to use and provides Process Blueprints across team members using a social approach.

IBM Solutions for Business Partners: Simplify daily business interactions with customers, partners and colleagues. IBM LotusLive provides cloud based integrated e-mail, web conferencing, and social networking and collaboration services in a secure, reliable and integrated manner. It is integrated with Ariba's Commerce Cloud and helps customers work together across company boundaries in a cost effective manner.

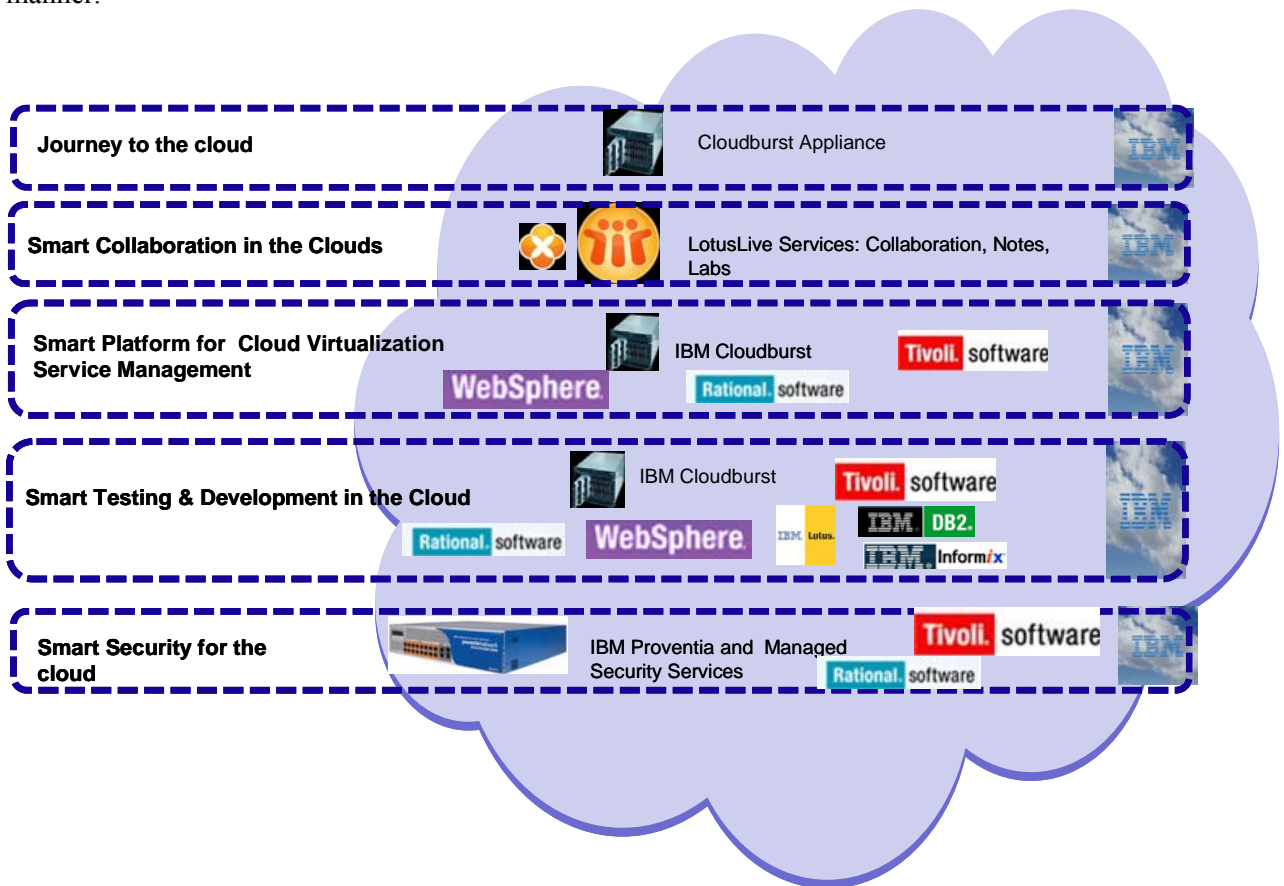


Figure 6: IBM Software Solutions in the Cloud

Real World Examples Highlighting the Business Benefits of IBM Cloud Offerings

IBM has extensive experience in working with ISVs, developers, and enterprise customers to set up, optimize, or to migrate their workloads and applications from almost any computing environment to a cloud environment. ISVs, developers, and enterprise customers looking to migrate their applications or workloads using IBM cloud offerings can draw inspiration from the following real-world cases.

An internal innovation cloud implemented by the IBM CIO's office - 84 percent reduction in TCO

Goal was an internal transformation of IBM's IT services provided by the CIO's office to consolidate the number of systems and applications used globally. And to streamline and standardize these IT services.

Challenges included the ability to support many system images and to customize end-user access through self-service portals while reducing the total number of systems and applications deployed to support varying needs of globally distributed users.

Solution was based on the internal implementation of the IBM Development and Test cloud which has now gone into full-scale production. This cloud consists of an Innovation Portal, Cloud Catalog with many self-service system images consisting of Linux and Windows bundled with IBM software and middleware

products to enable the rapid customization of cloud environments to deliver capacity provisioning of resources efficiently.

Benefits include consolidation and virtualization through of 400 servers to 55 servers for 120 projects. The TCO (costs for hardware, labor, facilities, energy, etc.) was reduced from \$3.9M to \$.6M annually – an 84 percent reduction in TCO.

A leading South African bank – reduced deployment time for new business services

Goals were to automate business process deployments, reduce cost, accelerate core banking transformation, and time to market.

Challenges included skills shortage, long time to deploy new business services - took ten weeks to setup and deploy test environments, multiple teams needed for each build of the software stack: Tivoli, WebSphere, DB2 support, application, and AIX.

Solution implemented consisted of IBM CloudBurst bundled with WebSphere Process Server 6.0 (Cluster), WebSphere MQ 6.0.2.2 (HACMP), ITCAM for SOA 6.1, and DB2 7.2 (HACMP), and Power Systems p570 and p595 bundled with WebSphere Application Server 6.0 (Cluster), IBM HTTP Server 6.0 (Load Balanced), WebSphere Edge Server 6.0, and WebSphere Message Broker 6.1 (HACMP).

Benefits realized with the IBM cloud include reduced deployment time for new business services by 10x to less than one week, optimized resource utilization – equipment and people, and accelerated business transformation. The IBM cloud solution also provided consistency of processes and consolidation of resources. This enabled this bank to deliver differentiated new customer services faster.

How to Engage IBM

IBM provides a large number of educational, planning, consulting, reference and developer resources for its business partners, ISVs and developers. The table below summarizes some of these.

Category	Web Links	Description
Education (Suggested BP roadmap)	Cloud for BP	IBM cloud computing overview for BP, BP roles, BP ready offerings, etc
	KYI Module	Know Your IBM module on IBM cloud computing
	Cloud Whiteboard Module	Cloud computing study guide for whiteboard selling technique
	SWG Cloud 101/201/301	SWG cloud overview, business benefits, and technical attributes
	Systems College Web Lecture	Dynamic Infrastructure for Cloud
	SWG Cloud Certification	SWG cloud architecture certification testing
PartnerWorld Portals	Middleware	Cloud portal for all IBM software
	Services	Cloud portal for IBM services
	Developers	Cloud portal for application developers
Other Assets	Economics Whitepaper	ROI of cloud computing
	Benefits Whitepaper	Benefits of cloud computing
	Cloud Adoption Whitepaper	Dispelling the Vapor around cloud computing
	Service Management	Service management portal for cloud computing

IBM developerWorks provides demonstrations to show the benefits of using IBM technology from DB2, Lotus, Rational, Tivoli and WebSphere products for delivering secure and customizable multi-tenant applications http://www-304.ibm.com/isv/marketing/saas/demo_series.html

Additional References

1. IBM Managed Security Services http://www-01.ibm.com/common/ssi/rep_ca/3/897/ENUS610-063/ENUS610-063.PDF
2. IBM Development & Test on the IBM Cloud getting started guide http://www-10.lotus.com/ldd/portalwiki.nsf/dx/IBM_Smart_Business_Cloud_A_getting_started_guide
3. LotusLive integration with skype and Ariba <http://www.ucstrategies.com/unified-communications-newsroom/ariba-commerce-cloud-and-ibm-lotuslive-combine-for-improved-commerce.aspx>
4. IBM Cloud blogs and notes <https://www.ibm.com/developerworks/mydeveloperworks/blogs/c2028fdc-41fe-4493-8257-33a59069fa04/tags/cloud?lang=en>
5. Cloud computing for developers community <https://www.ibm.com/developerworks/mydeveloperworks/groups/service/html/communityview?communityUuid=82fea6f2-2b51-447c-a118-88711258a502>
6. For a complete and current listing of what all is available from IBM software solutions portfolio for ISVs and developers, refer to <http://www.ibm.com/developerworks/cloud/>

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Appendix 1

Appendix: Purpose and Benefits of IBM SaaS Cloud Offerings in Detail

IBM Offering	Purpose	Key Benefits
Information Protection Services³	Managed Backup Cloud Offering provides onsite or offsite data backup for enterprises	<ul style="list-style-type: none"> • Enables security-rich, managed protection of critical data on site or off site for increased availability
IBM Managed Security Services⁴	<p>Enforces security in a SaaS application</p> <p>Provides hosted security event and log management in the cloud.</p> <p>Designed to consolidate the security event and log data of diverse applications and technologies.</p>	<ul style="list-style-type: none"> • Rapid deployment • Minimal software and hardware investment (IBM Tivoli Directory Server, WebSphere Portal Member Manager) • Low upfront and long term maintenance fees
IBM Smart Business Development & Test on the IBM Cloud	<p>Provides cloud based enterprise class development and test environment with IBM tools such as Rational, Lotus, WebSphere, DB2, Informix, Tivoli provisioned on IBM's cloud or Amazon's EC2 infrastructure</p> <p>Developers can bring their own licenses into cloud infrastructure or pay per hour of IBM software use.</p>	<ul style="list-style-type: none"> • Rapid application development and reduced costs by eliminating the need to own an infrastructure or software licenses • Collaboration across firewalls • Functional and regression testing and verification • Frees up enterprise resources for production use
IBM Smart Business Cloud for Compute	Enables users create, access, build, stop server images based on WebSphere Portal and Lotus Web Content Management software from IBM, DB2 database.	<ul style="list-style-type: none"> • Rapid web server deployment without significant investment in software or hardware • Security enabled • Consistent, highly available software stack for developers and testers
IBM Applications on Amazon EC2	Allows use of IBM's software on Amazon EC2 server instances through the IBM development AMIs. These can only be used for demonstrations, evaluation, education, development and testing of commercially available SaaS applications but not for developing internal packaged applications or software.	<ul style="list-style-type: none"> • Fast deployment of IBM software such as DB2, Informix, Lotus, Mashup, WebSphere, Tivoli Monitoring and InfoSphere Information Server. • IT optimization, cost savings and faster time to market
LotusLive	Cloud based collaboration and messaging software	<ul style="list-style-type: none"> • Provides Bundled Messaging and Collaboration at affordable pricing • Community integrated, allows external guests into a conversation or collaboration space • Enables reverse integration, users

³ IBM Information Protection Services [link](#)

⁴ IBM Managed Security Services [link](#)

		can access Lotus Live collaboration environment from within Salesforce.com and Ariba. It pre-integrates with Skype and UPS
Blueworks Live	Business Process Management with IBM Blueprint in a SaaS based offering.	<ul style="list-style-type: none"> • Better connectivity with business partners, higher productivity and collaboration among teams
Tivoli Live Monitoring Services	<p>Enables businesses to monitor, predict, and prevent IT outages</p> <p>Provides performance and capacity reporting as well as automatic alerts and —self-healing□ for certain issues. This service is available as a monthly subscription service through the IBM Cloud</p>	<ul style="list-style-type: none"> • Better systems utilization • Lower management costs • Lower quality assurance/testing costs • Immediate scalability as-needed basis
Smart Business Expense Reporting	Helps businesses and employees manage business expense and spend management through a hosted, reliable, secure, monitored application hosted on IBM	<ul style="list-style-type: none"> • Eases complexity and compliance efforts through a simpler employee spend management • Intelligent expense reporting and analytics • Easy to use, enhances employee productivity • Infrastructure minimizing investment on application setup and maintenance.