



IBM Power Systems Solutions for Cloud

Open, extensible virtualization and cloud delivery

Highlights

- IBM® Power Systems™ with POWER8™ technology provide a price for performance advantage through higher utilization, lower acquisition cost, better performance for data and analytics workloads, and the ability to flexibly add compute resources on demand
 - Open and extensible virtualization and cloud management solutions provide a scalable, adaptable and resilient foundation for public and private clouds
 - Power Systems are optimized to handle delivery of business-critical big data, analytics and cloud delivery services with exceptional performance and security
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As the world changes and IT plays an increasingly critical role, organizations are seeking to respond more quickly to changing business demands by transforming the way IT capabilities are consumed and delivered. Cloud computing can streamline service delivery, and improve IT economics through automation and higher utilization of resources.

IT organizations are looking to move to more agile methods but are facing challenges with:

- Management of rapid data growth, regulatory compliance, information integrity and security concerns—all while trying to control continuously rising IT costs
- Lack of agility in the face of rapid, unprecedented changes in markets, service demands and stakeholder expectations
- Static islands of computing resources which result in inefficiencies and underutilized asset

Organizations need a flexible infrastructure to enable growth and innovation while lowering overall IT costs.



Cloud service providers share similar challenges with unique pressures to deliver competitively priced services in a dynamically changing market, while ensuring high levels of client satisfaction and service levels. Service providers typically look for:

- Open source offerings that can adapt to changing technology trends
- Automation to speed deployment times, and improvements in efficiency and reliability
- Standards based solutions for interoperability, extensibility and investment protection
- A secure environment to support multi-tenancy
- Flexible purchase and lease options that match the infrastructure costs to the resources being used

A cloud computing environment built with IBM Power Systems helps organizations transform their data centers to meet these challenges.

Power Systems cloud solutions:

- Provide [superior cloud economics](#), the ability to scale out or scale up and security built into the foundation
- Address the big data and analytics challenge by delivering fast, flexible and secure access to critical information while meeting the highest standards for risk management and compliance mandates
- Utilize flexible delivery models to greatly simplify IT service delivery while providing enterprise qualities of service including continuous application availability, optimized performance, more scalability and enterprise-class security
- Are built on open source cloud management with OpenStack™ and can manage across all platforms including Power Systems, z Systems® and x86, and with a choice of hypervisor



Power is cloud optimized

IBM Power Systems cloud solutions can help customers quickly build a dynamic, open and efficient private or public cloud computing environment enabling them to reduce IT costs, improve service delivery, and foster business innovation.

Power Systems are optimized for Cloud

IBM Power Systems are uniquely suited for cloud environments with its industry-leading virtualization, enterprise-class security, elastic scalability and reliability, availability, and serviceability (RAS). Power Systems provide the necessary memory bandwidth and compute power to deliver the performance that big data, analytics and other compute intensive cloud services require. As organizations look to establish or expand their cloud deployments, they are seeking open solutions and choice for long term flexibility. Power Systems provide that flexibility with choice of operating systems, hypervisors, and cloud management solutions based on open standards and OpenStack.

Virtualization Foundation Solutions

Based on the POWER® processor, Power Systems servers are architected to achieve maximum performance and efficiency for both the system and its virtual machines. Intelligent workload based resource allocation with dynamic processor thread switching and logical memory expansion deliver optimal performance for critical cloud services.

Power Systems provide a choice of hypervisor with IBM's own PowerVM® or the open source PowerKVM. PowerVM makes efficient use of system resources and imposes a negligible impact on performance because PowerVM is built directly into the firmware of Power Systems, as opposed to x86-based virtualization products which are typically third-party software add-ons. Being part of the firmware also means PowerVM is secure by design, with zero reported Common Vulnerabilities Exposures for the PowerVM hypervisor (versus more than 200 reported for VMware) in the US Government NIST Database.¹

PowerKVM presents a choice for customers looking for an open source virtualization solution for Linux on Power Systems built on POWER8 technology. PowerKVM provides support for Red Hat® Enterprise Linux, SUSE® Linux Enterprise Server, and Ubuntu® guests and is optimized for the Power Systems platform with support for processor and memory sharing over-commit for higher utilization, dynamic addition and removal of virtual devices, and live VM migration.

Advanced virtualization management is available with PowerVC (Virtualization Center). Built on OpenStack, it allows Power Systems cloud infrastructure to plug into a broad array of management solutions. It also enables high utilization of Power Systems with its advanced placement algorithms for VMs and easy to use interface that helps administrators quickly react to changing business demands for IBM AIX®, IBM i, or Linux environments.

For truly elastic, pay-per-use cloud like capabilities, Power Systems provide Capacity on Demand which enables additional memory and compute resources to handle temporary spikes in system usage.

With platform management technologies on Power Systems, businesses have the tools to automatically deploy, optimize, and maintain these systems at maximum effectiveness, energy efficiency, and cost control.

IaaS Cloud Solutions

IBM Cloud Manager with OpenStack is a highly flexible and easy-to-use solution designed to deliver cloud services for private, public and hybrid clouds, across a choice of heterogeneous infrastructure including Power Systems, z Systems and x86.

The IBM Cloud Manager with OpenStack solution can reduce manual administrative tasks, improve productivity and decrease errors with automated process management and provisioning of standardized images. Cloud administration is simplified through an intuitive interface for managing projects, users, and VMs as well as monitoring heterogeneous workloads and cloud resources. Optional approval policy capabilities enable oversight, while workload metering capabilities support a transition to pay-per-use business models. IBM Cloud Manager with OpenStack provides an on-ramp to more advanced IBM cloud offerings in support of evolving business needs.

IBM Power Systems Solution Edition for Cloud is a customizable, factory configured system, with pre-built network, compute, storage, and software, so you can get your cloud up and running and adding value quickly. Customers can choose from a variety of system configurations to suit their business and workload needs: from entry to enterprise, the Solution Edition for Cloud make it easy to order just the right size and scale for any PowerVM based cloud and helps customers achieve cloud service deployments with the enterprise system qualities of service, highest scale, and superior IT economics.

IBM Power Systems and Storage Solution Edition for Scale Out Cloud is a one or two socket system built on IBM's latest POWER8 processor technology and the exceptional storage virtualization of the Storwize v7000 with superior performance-for-price advantages compared to x86 systems. With the PowerKVM hypervisor and OpenStack cloud management tools and application program interfaces (APIs),

the Solution Edition for Scale Out Cloud allows open infrastructures to scale out intelligently, requiring less hardware, power and cooling, and with over twice the bandwidth from previous generations for those cloud services that demand exceptional compute power and memory bandwidth such as big data and analytics.

For SAP customers who have virtualized with the Landscape Virtualization Manager (LVM), IBM entry cloud configuration for SAP solutions on Power Systems is a Reference Configuration which provides a proven and prescriptive software configuration and hardware architecture that enables customers to integrate and automate management of their virtualized SAP Landscape Virtualization Management environments with IBM Cloud Manager with OpenStack.

PaaS and SaaS Cloud Solutions

IBM offers advanced cloud capabilities such as rapid and scalable provisioning optimized for service providers, robust workflow orchestration, virtualization lifecycle management and sophisticated billing/chargeback with IBM Cloud Orchestrator. This solution is built on open source solutions and standards including OpenStack, and is designed to reduce the risk associated with software integration and accelerate delivery of advanced cloud computing capabilities.

Customers can also choose open source tools to manage automation and delivery of workloads for their Power Clouds including Chef server, Canonical JuJu Charms and OpenStack HEAT.

The Bluemix rapid application development environment makes available Cloud Integration Services to easily and securely connect applications “born on the cloud” with applications and databases running on highly available Systems of Record such as Power Systems and z Systems. Cloud Integration Services support connecting to DB2, SAP and Oracle.

Power Systems cloud solutions

Power Systems cloud solutions help organizations to reduce IT costs, improve service delivery and encourage business innovation, with an effective, efficient cloud computing environment which is:

- *Scalable* for your smallest to largest workloads
- *Dynamic* for automated, optimum resource allocation and superior economics
- *Reliable* for high qualities of service across the cloud
- *Flexible* with open source based tools and APIs for maximum customizability

For more information

To learn more about the IBM Power Systems cloud solutions, please contact your IBM representative or IBM Business Partner, or visit the following website:

ibm.com/systems/power/solutions/cloud/

To learn more about Power Systems, visit:

ibm.com/systems/power/hardware

To learn more about virtualization, visit:

ibm.com/systems/power/software/virtualization/

To learn more about automated management, visit:

ibm.com/systems/power/software/management/enterprise.html

To learn more about IBM Cloud Manager with OpenStack for Power, visit:

ibm.com/systems/power/solutions/cloud/smartcloudentry/

To learn more about IBM Cloud Orchestrator visit:

ibm.com/software/products/en/smartcloud-orchestrator

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¹ Source: Is your platform secure? Really?; Solitaire Interglobal Ltd (All rights reserved); January 2013



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