Cloud computing made simple with IBM BladeCenter

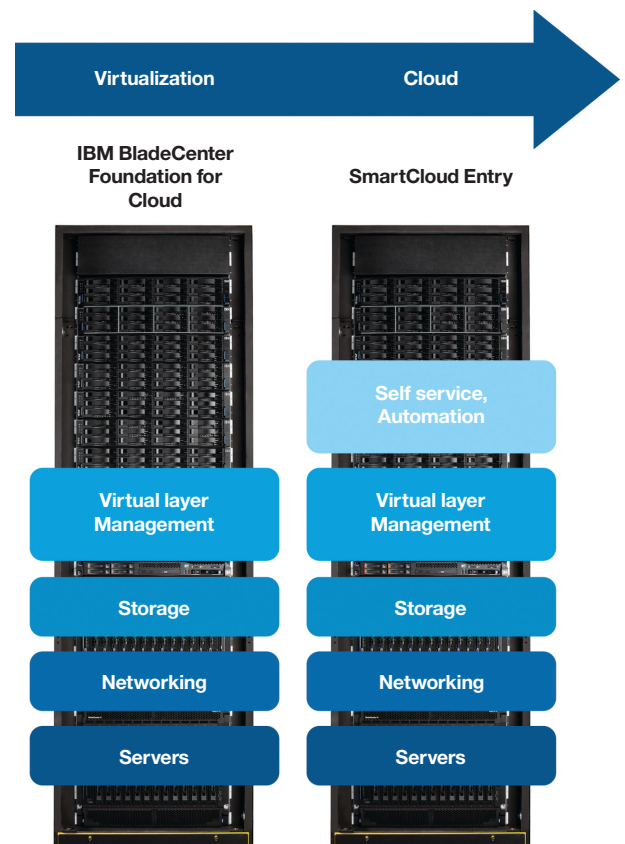*Converge your data center on your own terms*

IBM

Highlights

- IBM is a leader in cloud computing, with 80 percent of Fortune 500 companies using IBM cloud capabilities
- IBM BladeCenter Foundation for Cloud enables fast, complete virtualized platform deployment with network, servers, storage and management
- IBM SmartCloud Entry simplifies transition to a private cloud infrastructure with simple, intuitive cloud software that seamlessly integrates with BladeCenter Foundation for Cloud
- Fit-for-purpose portfolio from IBM can cut cost per workload with a workload optimized, energy efficient and resilient platform
- IBM System Networking helps reduce infrastructure administration with single point of management for virtual and physical resources: servers, storage and network
- Grow your business without rip-and-replace. Interoperable, best-of-breed portfolio delivers leadership, choice and flexibility
- 23x faster performance, 96 percent reduction in energy costs and 99 percent IT footprint reduction over older industry standard rack servers

Businesses today are under tremendous pressure driven by shifts like an increasingly mobile workforce and the need for greater productivity. Yet, companies are being asked to accommodate these increased demands without an increase in resources. As a result, many companies are considering cloud computing, using computing resources only when and where needed, as a way to reduce the cost and complexity of delivering traditional IT services. While cloud computing has raised expectations, industry buzz had made its implementation seem overly complex. Based on extensive client experience and easy to deploy solutions, IBM can simplify the implementation of cloud enabled data center for clients.

IBM offers a range of solutions that help clients simplify administration while increasing services to users—from easy to deploy and easy to manage virtualization platforms to full cloud infrastructures. There are several key components of successful virtualized or cloud deployment; and in each of these areas, IBM® BladeCenter® offers unique advantages:

- Easy to order and deploy: rapidly deliver a virtualized platform
- Scalability: proven enterprise platform that can easily scale to meet changing business demands
- Fits into existing infrastructure: seamless integration with no rip and replace
- Superior performance: application performance and availability to reduce solution costs

A converged virtualization platform that is easy to order and deploy

A converged virtualized system is a base of any cloud based solution. This solution is made up of servers, networking, storage and management in a tightly integrated stack. As virtualization becomes fundamental to deploying new workloads, you need such converged systems to simplify IT operations.

Today, you have to sort through a myriad of options and build such a solution yourself with trial and error. This leads to increased complexity and long sales cycles.
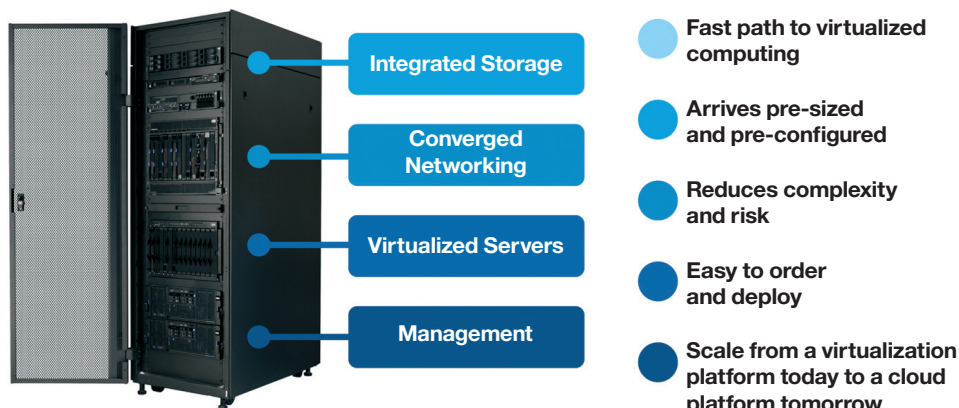
With BladeCenter Foundation for Cloud, we have combined the best elements from BladeCenter portfolio and made it easier for you to build a tightly integrated system that is ready for virtualization and can scale easily. Additionally, you retain configuration flexibility to support a wide range of datacenter requirements, including interoperable I/O technologies.

BladeCenter Foundation for Cloud can easily grow from a virtualization platform today to a cloud platform tomorrow by addition of SmartCloud Entry offering.

The BladeCenter platform is ideal for virtualization, which is the key foundation for IT infrastructure convergence:

- Reduce infrastructure administration cost with a single point of management for virtual and physical resources, such as servers, storage and networking.
- Get a fit-for-purpose portfolio that can cut cost per workload with a workload optimized, energy efficient and resilient platform.
- Grow your business without a rip-and-replace. The interoperable, best-of-breed networking portfolio delivers leadership, choice and flexibility.
- Provide 23x faster performance, 96 percent reduction in energy costs and 99 percent IT footprint reduction over older industry standard rack servers.[1]

IBM BladeCenter Foundation for Cloud

Integrated Storage

Converged Networking

Virtualized Servers

Management

Fast path to virtualized computing

Arrives pre-sized and pre-configured

Reduces complexity and risk

Easy to order and deploy

Scale from a virtualization platform today to a cloud platform tomorrow

Easily grow to cloud

Manual provisioning of hardware and software is a time-consuming and cumbersome process. It takes many people acting serially to get a new environment up and running, which can often take months. This repetitive manual interaction is error prone and can cause inconsistent configurations. Users tend to keep their environments even past the time needed because the combination of lead time and the difficulty of getting an identical new environment can often result in an inefficient data center.

As a result, many companies are considering cloud computing, using computing resources only when and where needed, as a way to reduce the cost and complexity of delivering traditional IT services. Simplify transition from virtualized computing to cloud infrastructure with IBM SmartCloud™ Entry. It is simple, intuitive cloud software that seamlessly integrates with BladeCenter Foundation for Cloud to enable a private cloud. Some notable features of SmartCloud Entry are:

- An intuitive, web based self service portal where users can select an IT service from an administrator defined catalog.
- Virtual image tools and catalog.
- Usage metering.

SmartCloud Entry is delivered as a software-only offering, with reference configurations or as an integrated hardware and software offering—giving you flexibility to customize or use the offering as delivered.

End-to-end management

Through the unique integration of IBM Systems Director and SmartCloud Entry, IBM provides a centralized platform for consolidated data center administration and self-service cloud deployment to help clients significantly reduce OpEx.

IBM Systems Director offers a single-point-of-control to simplify day-to-day administrative tasks, helping to reduce IT management complexity and cost. With IBM Systems Director, IT personnel are able to optimize compute and network resources with streamlined management of server, storage and networking, both physical and virtual. IBM Systems Director is designed to:

- Automate day-to-day administrative tasks:
    - Visualize data center infrastructure.
    - Deploy firmware updates.
    - Monitor system health and provide alerts.
- Maximize application availability by tightly linking physical and virtual environments.
- Improve capacity planning with smart energy management, monitor actual power consumption and resolve hot-spots.
- Ease LAN/SAN configuration and automated failover.
- Manage x86 and non-x86 environments.
- Support multiple hypervisors including VMWare, KVM and Hyper-V.

Seamless interoperability

IBM has a customer-centric networking strategy. In contrast, many other systems take a narrow view of networking, requiring you to rip and replace your existing network infrastructure to match their standards. The IBM approach is to foster an ecosystem of partners and use industry innovation to provide best-of-breed solutions that are interoperable. This flexibility and choice means that you can choose the solution that works best for your infrastructure today and grows with your data. More, it can save you up to 40 percent on networking costs versus competitive offerings.[2]

With IBM System Networking and the acquisition of Blade Network Technologies®, we are investing in the networking space. Concurrently, we stay committed to work closely with our ecosystem of partners to deliver complete end-to-end networking solutions including Ethernet, Fibre Channel, InfiniBand, FCoE, SAS and iSCSI. Working closely with our partners, IBM aims to offer innovation that matters.

Choice that matters

BladeCenter delivers the broadest I/O portfolio in the industry with a wide variety of solutions and a choice of industry-leading vendors, designed to allow clients to build solutions customized to their needs.

Virtual Fabric: Virtual NIC technology offers up to eight virtual Ethernet ports from a single adapter, delivering performance, flexibility and security.

10 Gb Ethernet: High performance network connectivity to support the increasing demands of virtualization and cloud infrastructures.

1 Gb Ethernet: Low cost and legacy connectivity.

Fibre Channel: 8 Gbps and 4 Gbps options for SAN connectivity.

FCoE: Consolidates the data and storage networks into a single, high performance, super-network using 10 Gb Ethernet.

InfiniBand: High performance with low latency ideal for High Performance Computing (HPC) environments.

iSCSI: Lower cost option to consolidate data and storage networks using 10 Gb Ethernet.

SAS/RAID: Affordable, yet powerful 3 Gbps for direct storage connectivity.

This means that if you have already standardized on a specific technology or vendor, you don't have to rip and replace to implement a BladeCenter solution. If you haven't standardized on a technology or vendor, you have the flexibility to mix-and-match as needed. Leadership innovation with choice means that you can grow your data center on your terms.

Superior performance with leadership server portfolio

On your path towards convergence, blade servers provide an ideal platform for server and network virtualization and consolidation. With their modular design optimized for efficient use of physical space and energy, blades can support extraordinary performance while reducing your ongoing costs.

The BladeCenter portfolio of blade servers support a wide range of workloads on Microsoft Windows, Linux and UNIX operating systems. This capability gives you the flexibility to consolidate many workloads into one system, while offering extraordinary energy efficiency, floor space savings and ease of management. The portfolio also features Intel Xeon series processors designed for industry-leading performance and maximum energy efficiency that are ideally suited for virtualization and cloud based workloads. With BladeCenter server technology, you can greatly increase server density versus rack servers, simplify cabling, lower power and cooling costs, ease server expansion and simplify datacenter management.

Most energy efficient chassis platform

BladeCenter H	HS22: versatile 2-socket blade	HX5: leadership scalable blade
BladeCenter H: 12% greater performance per watt over HP*	• Ideal for general purpose applications • 23x faster than older industry standard rack servers • 96% reduction in energy costs alone • 99% IT footprint reduction	• Ideal for database and virtualization • Scalable from 2-socket to 4-socket • Independent memory expansion with MAX5, for 25% more memory per core • Reduce cost per workload for database and virtualization

With mission-critical workloads moving to x86, systems need to keep up and application availability is critical. You can confidently deploy business-critical workloads on the BladeCenter platform, which has rock-solid availability due to multiple layers of redundancy:

• The mainframe-inspired BladeCenter architecture has redundant power and I/O connections to the blades and switches, redundant hot-swap power supplies, blowers and management modules—even automated failover of blades and switches—for no single point of failure.

• BladeCenter memory architecture incorporates multiple layers of memory correction and redundancy, including Chipkill error correction, Memory ProteXion, mirroring, memory rank sparing and memory scrubbing (model-specific).

• BladeCenter servers and chassis monitor vital system components for maximum availability. IBM Predictive Failure Analysis warns in advance of potential hardware failure of key components to trigger preemptive action, and IBM light path diagnostics leads a servicer directly to a failing component so it can be replaced quickly, with little or no workload downtime.

BladeCenter - complete RAS
- Redundant connectors from the blade to the midplane for power and IO
- Two N+N power domains in chassis
- Two AC and DC chassis power buses
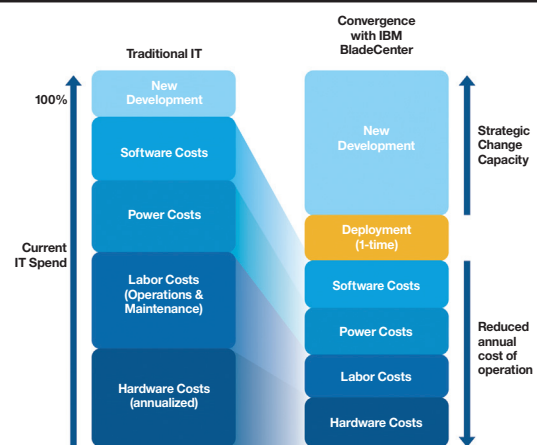- No single point of failure

Predictive failure
- Only IBM System x® monitors vital system components for maximum availability
- Warns ahead of potential hardware failures
- Triggers preemptive action
- Maintains application availability

PFA	Cisco	DELL	HP	IBM
Blade:				
HDD & SDD	No	Yes	Yes	Yes
Memory	No	Yes	Yes	Yes
CPU	No	No	Yes	Yes
VRM	No	No	No	Yes
Chassis:				
Fan	No	No	No	Yes
Power supply	No	No	No	Yes

TCO analysis available

We can do an assessment of your business—based on an interview with your staff—and create a view representing the savings you could achieve by deploying infrastructure convergence with BladeCenter.

For more information

To learn more about the IBM BladeCenter solutions, please contact your IBM marketing representative or IBM Business Partner, or visit the following website: **ibm.com**/bladecenter

Additionally, financing solutions from IBM Global Financing can enable effective cash management, protection from technology obsolescence, improved total cost of ownership and return on investment. Also, our Global Asset Recovery Services help address environmental concerns with new, more energy-efficient solutions. For more information on IBM Global Financing, visit: **ibm.com**/financing

[1] http://www.ibm.com/systems/info/x86servers/blades/servers/index.html?lnk=tabl, accessed 1/3/2012

[2] http://www-03.ibm.com/systems/info/x86servers/blades/networking/, accessed 1/3/12

* "IBM BladeCenter vs. HP Blade System: Energy Efficiency Comparison Study," Edison Group, May 2010