IBM System x Hyper-V Private Cloud Solution

The comprehensive, usable cloud for midmarket clients from System x, Microsoft and Brocade

Highlights

- Robust and ready private cloud
  - Leading edge technology from IBM, Microsoft® and Brocade
- Modular for secure scalability
  - Seamlessly add resources to meet demand
- Designed for elasticity and flexibility
  - Service demand management is fully automated and can be securely reallocated
- Economies of scale enhances value
  - Pooled resources yield higher utilization and lower overall costs
- Automated web-based access
  - Powerful management tools and self-service portal

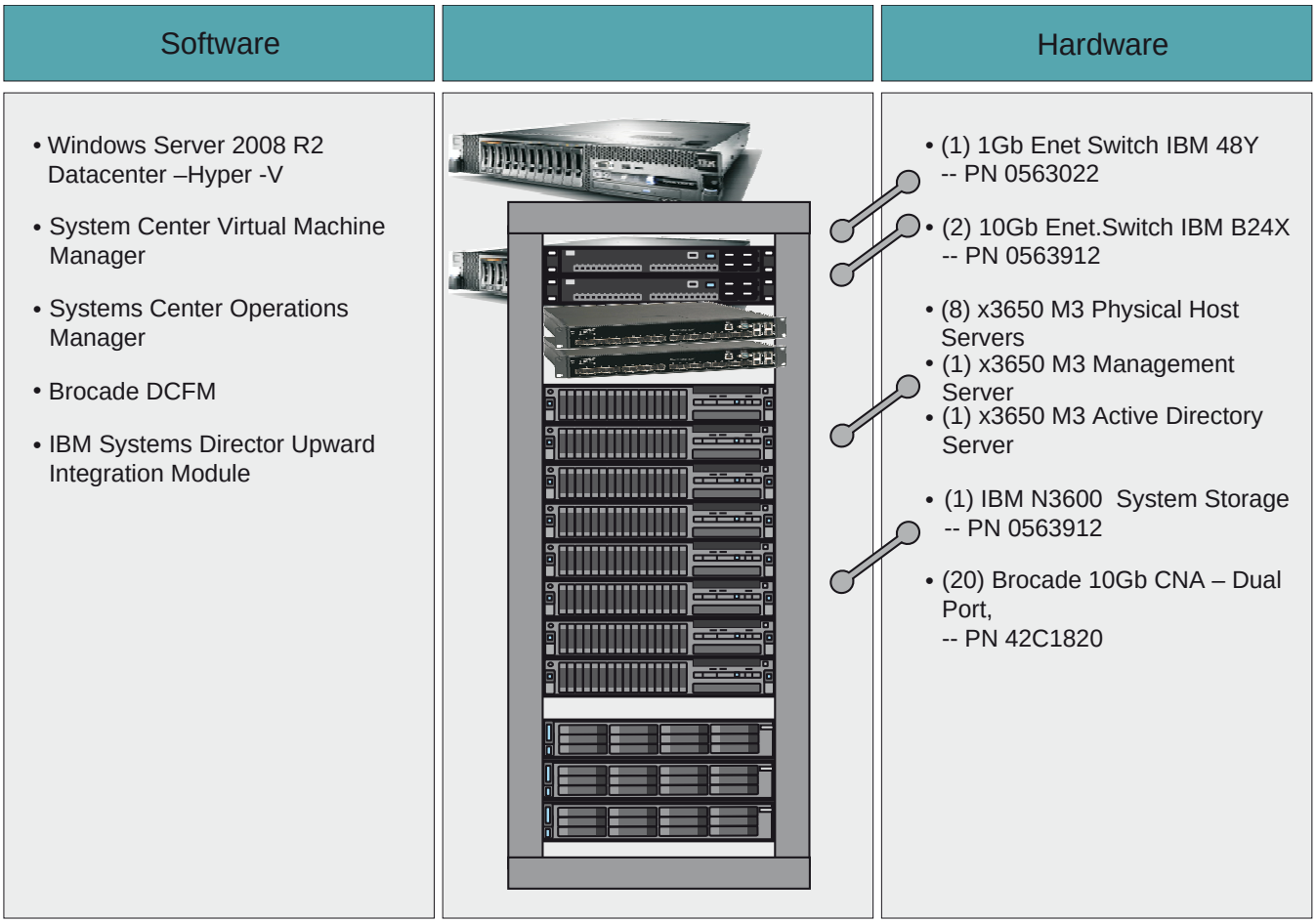
IBM® System x® Private Cloud offering (PCO) is the result of an evolution that brings a ready-to-use, high-performance, ultra-reliable datacenter to businesses looking to benefit from the promise that cloud computing offers. IBM brings a sophisticated, powerful platform that can be rapidly virtualized into multiple, secure, completely segregated environments so that each environment acts as if it has complete ownership of the entire platform and all its resources. The resources incorporated into IBM System x PCO solutions are leading edge—from 10 Gb Brocade® Network products to the latest Microsoft Self Service Portal. IBM System x, Microsoft and Brocade continue a tradition of delivering simple, easy-to-use solutions.

PCO combines high-quality servers and networking hardware with the robust tools and software to create an innovative, comprehensive, usable cloud-computing offering. PCO maximizes client value and performance per square foot of datacenter space, lowering the barrier of entry for a cloud solution, so now midmarket businesses can reap cloud-computing benefits without a large IT staff or deep pockets. IBM System x rack servers form the reliable foundation, Microsoft software Hyper-V™ Cloud Fast Track provides the latest in virtualization and cloud management software and Brocade Top-of-Rack switches and adapters complete the datacenter connectivity. PCO is a pre-tested, end-to-end cloud solution that is ready to deploy and run.

PCO alleviates key IT private cloud deployment inhibitors by centralizing compute power, pooling resources, maximizing utilization and seamlessly responding to and measuring fluctuating demand for server features. Integrated virtualization with Windows® Server 2008 R2

Hyper-V Server virtualization promises cost savings by reducing hardware, power, cooling and space requirements, and increasing operational efficiencies. Capacity needs can be predefined within the integrated management tools simplifying planning of the private cloud and for virtual machine and infrastructure deployment. The self-service portal allows for rapid and automated VM deployment.

Hyper-V, the Microsoft hypervisor-based server virtualization technology, and flexible licensing policies make it easier than ever to take advantage of the cost savings of virtualization through Windows Server 2008 R2. Windows Server 2008 R2 with Hyper-V offers a complete, integrated virtualization solution that features Live Migration and Cluster Shared Volumes out-of-the-box. Key Microsoft software components are shown in the figure below:



Comprehensive, robust and ready design for rapid private cloud deployment

IBM System x offers an architecture that is sized to fit the small and midmarket business needs. Each configuration is a predefined, robust solution with out-of-the-box usability. PCO is a tested, end-to-end solution that comprises all parts of a future-ready data center in a modular, extensible, flexible and scalable rack server format. This format optimizes value both in terms of ease of deployment as well as administration, support and expansion.

Part and parcel of business agility is the ability to scale the delivery of services to match the demand. PCO does just that thanks to the hardware that powers this cloud architecture. IBM System x3550 M3 and x3650 M3 servers are optimized to meet the virtualization management and advanced workload demands of private cloud data centers. Brocade 10 Gb Ethernet components form the backbone for data and network connectivity. The combination of high-performance adapters and low latency, cut-through switches enables the high speed infrastructure that is critical for resource utilization and load balancing within the cloud. The IBM N series N3600 Storage System was selected to bring high-performance SAN and NAS features in a unified system with efficiency features like deduplication, thin replication and no-performance-impact snapshots.

IBM System x rack servers are built for virtualization performance

IBM is a leader in technology and innovation and has a deep understanding of virtual environments. With substantial investments in green initiatives and energy-smart designs, IBM can not only provide high-performing, easy-to-manage servers, but can also help minimize costs on power and cooling. The IBM System x3650 M3 and x3550 M3 rack servers address current business requirements while delivering the scalability to manage future requirements. Key capabilities of these servers include performance, reliability, and simplified management. System x servers provide a robust, reliable platform that clients can trust to run their business.

Brocade networking components

The Brocade 10 Gb Network Adapter and B24X 10 Gb Ethernet switches team together to create the comprehensive network fabric that interconnect the PCO for storage, data and management traffic flows. Low Latency and high performance tied to a non-blocking architecture yield a design that supports rapid movement of Virtual Machines with minimum delay. The use of an iSCSI SAN solution and the 10 GbE Brocade adapters provide a high-performance, lower-cost solution.

Built on the latest six-core Intel® Xeon® processor 5600 series, IBM System x3650 M3 2U, two-socket servers offer a highly available, high-performance platform for Windows Server 2008 R2 with Hyper-V. With integrated 6 Gbps RAID adapters and double the I/O performance, the x3650 M3 provides a resilient architecture ideal for virtualization environments.

Innovative, energy-smart 2U design helps to lower operational costs

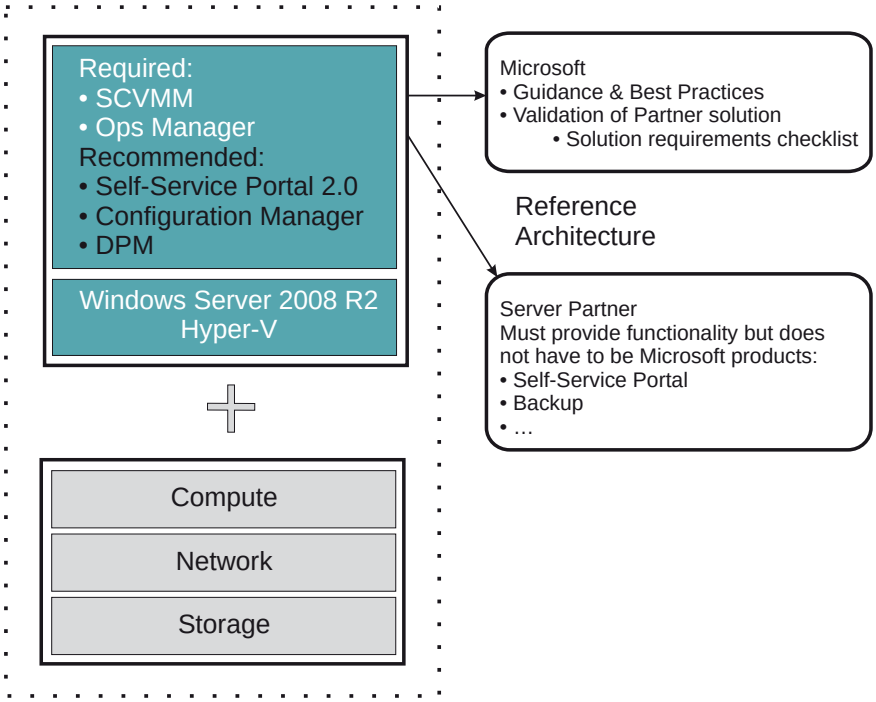
Eighteen DIMMs of ultra-fast registered 1333 MHz DDR3 memory with Chipkill ECC protection provide speed, high availability, and memory capacity of up to 192 GB.

Up to sixteen 2.5-inch hot-swap SAS/SATA hard disk drives offer high performance with high availability—SSDs offer even higher availability, with extremely high IOPS rates

Better serviceability with a highly scalable, flexible design that is easy to deploy, integrate, service, and manage

What we offer

The PCO reference architecture for the components currently defined is as follows:



Management and infrastructure servers

Offering a single management platform with integrated management of both virtual and physical servers, Microsoft System Center Virtual Machine Manager (SCVMM) enables increased physical server utilization, centralized management of virtual infrastructure and rapid provisioning of new virtual machines. Plus, there's no need to rip-and-replace current VMware investments. SCVMM allows you to manage your Hyper-V environments as well as your Virtual Server and VMware environments—all from a centralized platform

Management Server	Quantity
IBM System x 3650 M3	1
16 GB RAM	4 x 4 GB
ServeRAID M5014 SAS/SATA Controller (Battery not included)	1
IBM 73 GB 15K 6 Gbps SAS 2.5" SFF Slim-HS HDD	2
IBM 146 GB 15K 6 Gbps SAS 2.5" SFF Slim-HS HDD	4
Intel Xeon Processor X5650 6C 2.66 GHz 12 MB Cache 1333 MHz	2

System Center Virtual Machine Manager 2008 R2:

- Live migration
- Clustered shared volumes
- Hot addition/removal of storage
- Maintenance mode
- Expanded support for iSCSI SANs
- SAN migrations in and out of clustered hosts
- Support for third-party CFS
- Support for quick storage migration

Active Directory Server	Quantity
IBM System x 3550 M3	1
4 GB RAM	2 x 2 GB
ServeRAID M5014 SAS/SATA Controller (Battery not included)	1
IBM 73 GB 15K 6 Gbps SAS 2.5" SFF Slim-HS HDD	2
Intel Xeon Processor X5650 6C 2.66 GHz 12 MB Cache 1333 MHz	2

Compute node (host) servers

Achieve outstanding mission-critical performance and reliability and reduce operational costs with innovative 2U design Centralize and streamline management of the virtual environment with Microsoft System Center Virtual Machine Manager

IBM System x3650 M3 servers with Intel Xeon processors 5600 series deliver a high-performance platform for Microsoft Windows Server® 2008 R2 with Hyper-V virtual environments

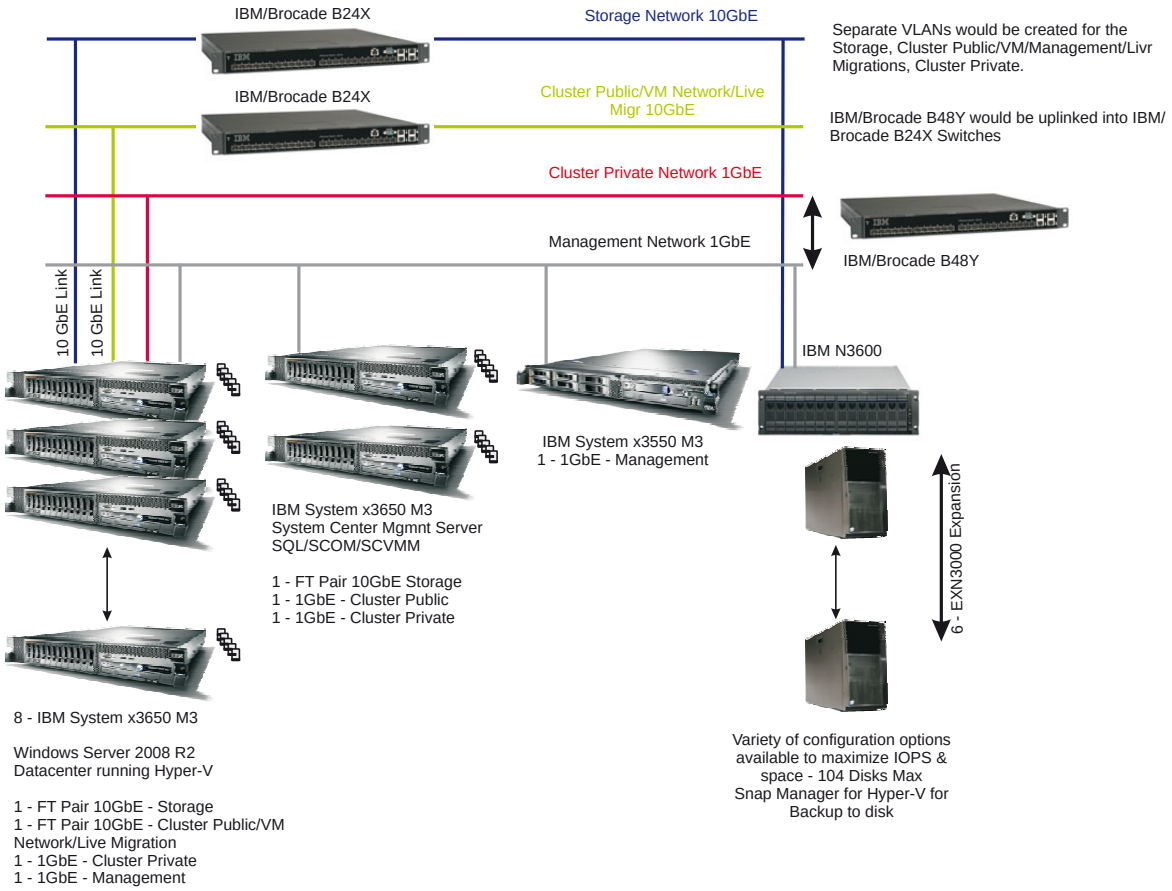
Host Server (8 Node Cluster)	Quantity
IBM System x 3650 M3	1
96 GB RAM	12 x 8 GB
ServeRAID M5014 SAS/SATA Controller (Battery not included)	1
IBM 73 GB 15K 6 Gbps SAS 2.5" SFF Slim-HS HDD	2
Brocade DP 10 Gb CNA for IBM System x	2
Intel Xeon Processor X5670 6C 2.93 GHz 12 MB Cache 1333 MHz 95w	2

Management Server	Quantity
IBM System x 3650 M3	2
24GB RAM	6x4GB
ServeRAID M5014 SAS/SATA Controller (Battery not included)	1
IBM 73GB 15K 6Gbps SAS 2.5" SFF Slims-HS HDD	2
Brocade 10Gb Dual Port Converged Network Adapter for IBM System x	2
Intel Xeon Processor X5650 6C 2.66GHz 12MB Cache	2

Active Directory Server	Quantity
IBM System x 3550 M3	1
4GB RAM	2x2GB
ServeRAID M5014 SAS/SATA Controller (Battery not included)	1
IBM 73GB 15K 6Gbps SAS 2.5" SFF Slims-HS HDD	2
Intel Xeon Processor X5650 6C 2.66GHz 12MB Cache 1333MHz	2

Host Server (8 Node Cluster)	Per Server
IBM System x 3650 M3	1
96GB RAM	12x8GB
ServeRAID M5014 SAS/SATA Controller (Battery not included)	1
IBM 73GB 15K 6Gbps SAS 2.5" SFF Slims-HS HDD	2
Brocade DP 10Gb CNA for IBM System x	2
Intel Xeon Processor X5650 6C 2.66GHz 12MB Cache	2

IBM System x Virtual Private Cloud Topology



The modular design provides extensibility and scale out features that enhance performance and security with a well-designed network architecture that includes:

- A 1U, high-density top-of-rack data center switch for 10 GbE server access and aggregation with twenty-four 10 GbE/1 GbE dual-speed SFP+ ports
- Flexibility to mix 10 GbE and 1 GbE servers, protecting investments and streamlining migration to 10 GbE capable server farms
- Wire-speed performance with an ultra-low-latency, cut-through, non-blocking architecture ideal for VM migration and scale-out expansion
- Highly efficient power and cooling with front-to-back airflow and automatic fan speed adjustment

Notes

For more information

To learn more about the IBM System x Private Cloud offering, please contact your IBM marketing representative or IBM Business Partner, or visit the following website: **ibm.com**/systems/x/os/windows/

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RTP, NC 27709

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