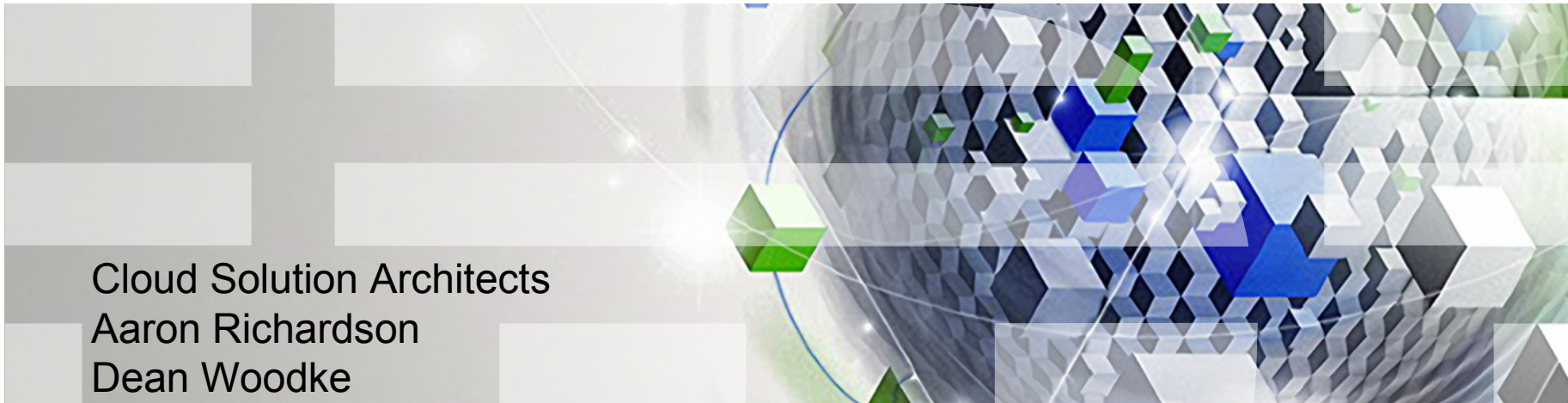


Power Systems Cloud Overview: *Solutions for every step in your Cloud Journey*



Cloud Solution Architects
Aaron Richardson
Dean Woodke

Power is performance redefined



Agenda

- IBM Cloud Overview
- Power Systems Cloud Solutions Overview
- Smart Cloud Entry Demonstration

“Cloud” is a **consumption and delivery model** inspired by consumer Internet services.

Cloud enables:

Self-service

Sourcing options

Economies-of-scale



Cloud represents:

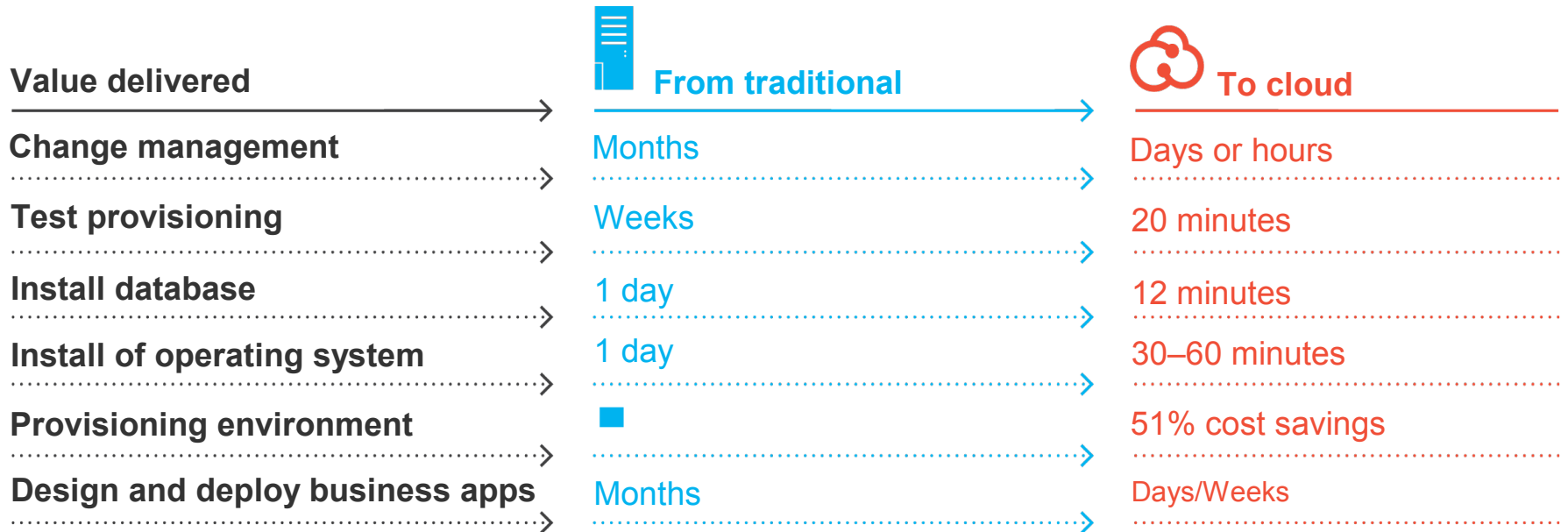
The **industrialization** of **delivery** for IT supported **services**

Multiple types of clouds will co-exist:

Private, Public, and **Hybrid**

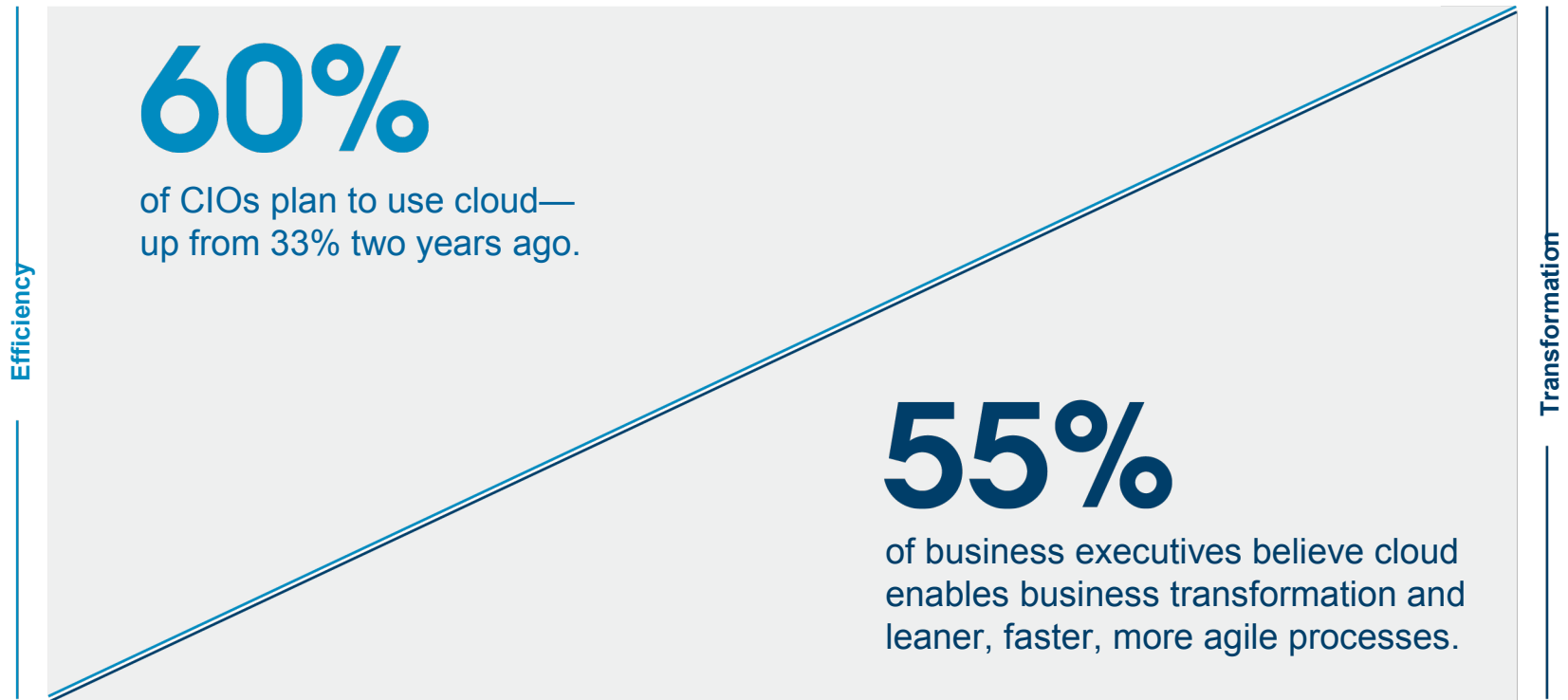
Workload and / or **Programming Model** Specific

Cloud is an increasingly attractive means of creating and delivering IT services.





IT is drawn to cloud's cost, efficiency and control...



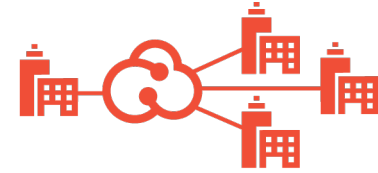
...while business users are drawn to cloud's simplified, self-service experience and new service capabilities.

Businesses are choosing a variety of cloud models to meet their unique needs and priorities.



Private cloud

On or off premises cloud infrastructure operated solely for an organization and managed by the organization or a third party



Public cloud

Available to the general public or a large industry group and owned by an organization selling cloud services.



Hybrid IT

Traditional IT and clouds (public and/or private) that remain separate but are bound together by technology that enables data and application portability



Traditional IT

Appliances, pre-integrated systems and standard hardware, software and networking.

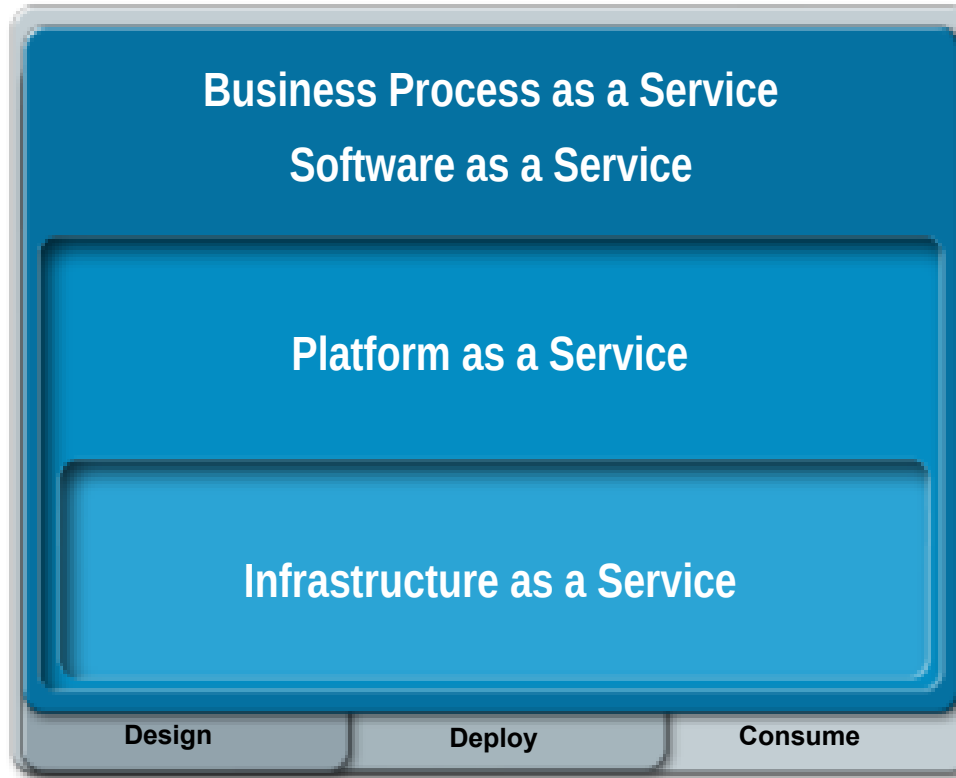


Adoption patterns are emerging for successfully beginning and progressing cloud initiatives

IBM Smart Cloud

PaaS: Accelerate time to market with cloud platform services

IaaS: Cut IT expense and complexity through a cloud enabled data center

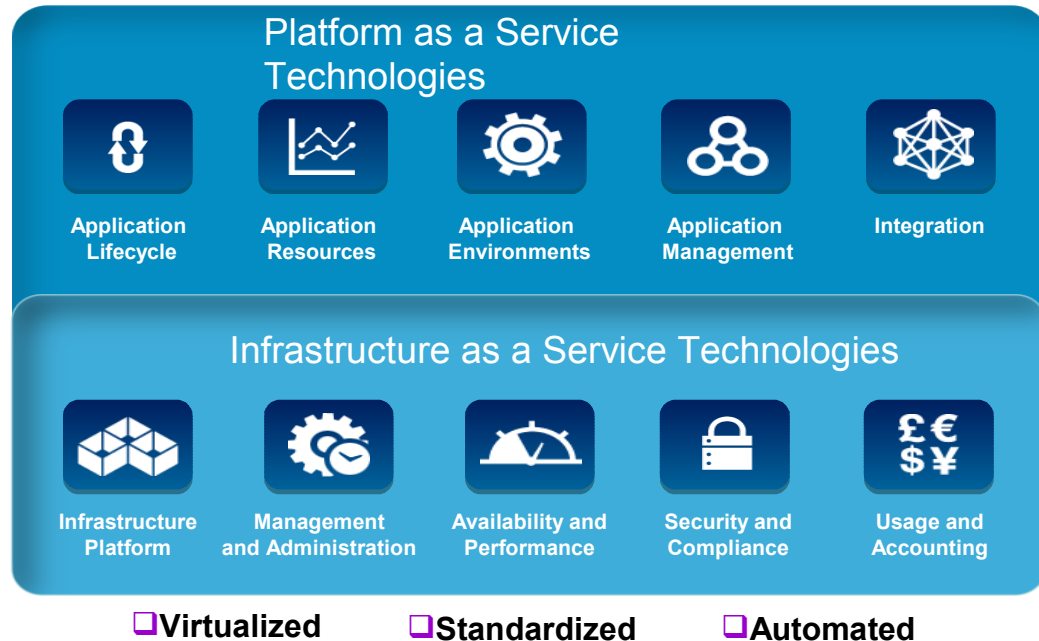


BPaaS: Innovate business models by becoming a cloud service provider

SaaS: Gain immediate access to business solutions on cloud

Easily build and rapidly scale private cloud environments with unparalleled time-to-market, integration and management

IBM SmartCloud Foundation



- Simplified initialization and administration of cloud environments
- Image management to reduce cost and complexity of image sprawl
- Enterprise class rapid image provisioning and scaling across heterogeneous environments improves agility
- Enhanced visibility into performance of cloud infrastructure optimizing quality of service
- Analytics for capacity planning and workload placement improve utilization, lower capex
- Proactive monitoring/protection of cloud resources from attacks and breaches reduces expense, risk

What are customers asking IBM?



Infrastructure Teams

How can I improve my resource utilization, simplify administration and reduce cost ?



Line of Business Teams

How can I accelerate my application release cycle in an optimized , quality fashion?

Infrastructure as a Service Technologies

Infrastructure Platform	Management and Administration	Availability and Performance	Security and Compliance	Usage and Accounting



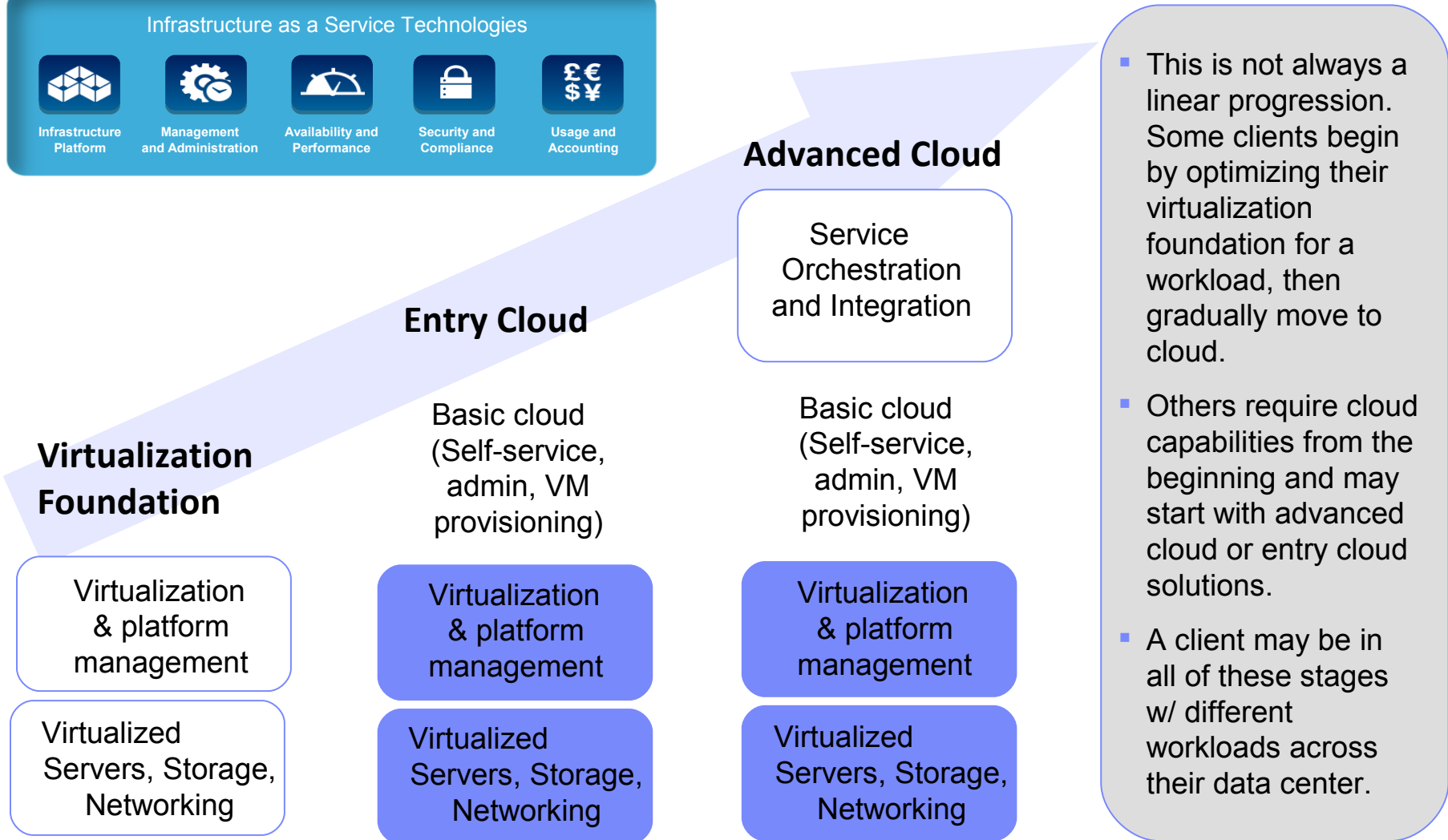
Operations Teams

How can I improve responsiveness and drive productivity and efficiency while maintaining stringent qualities of service?

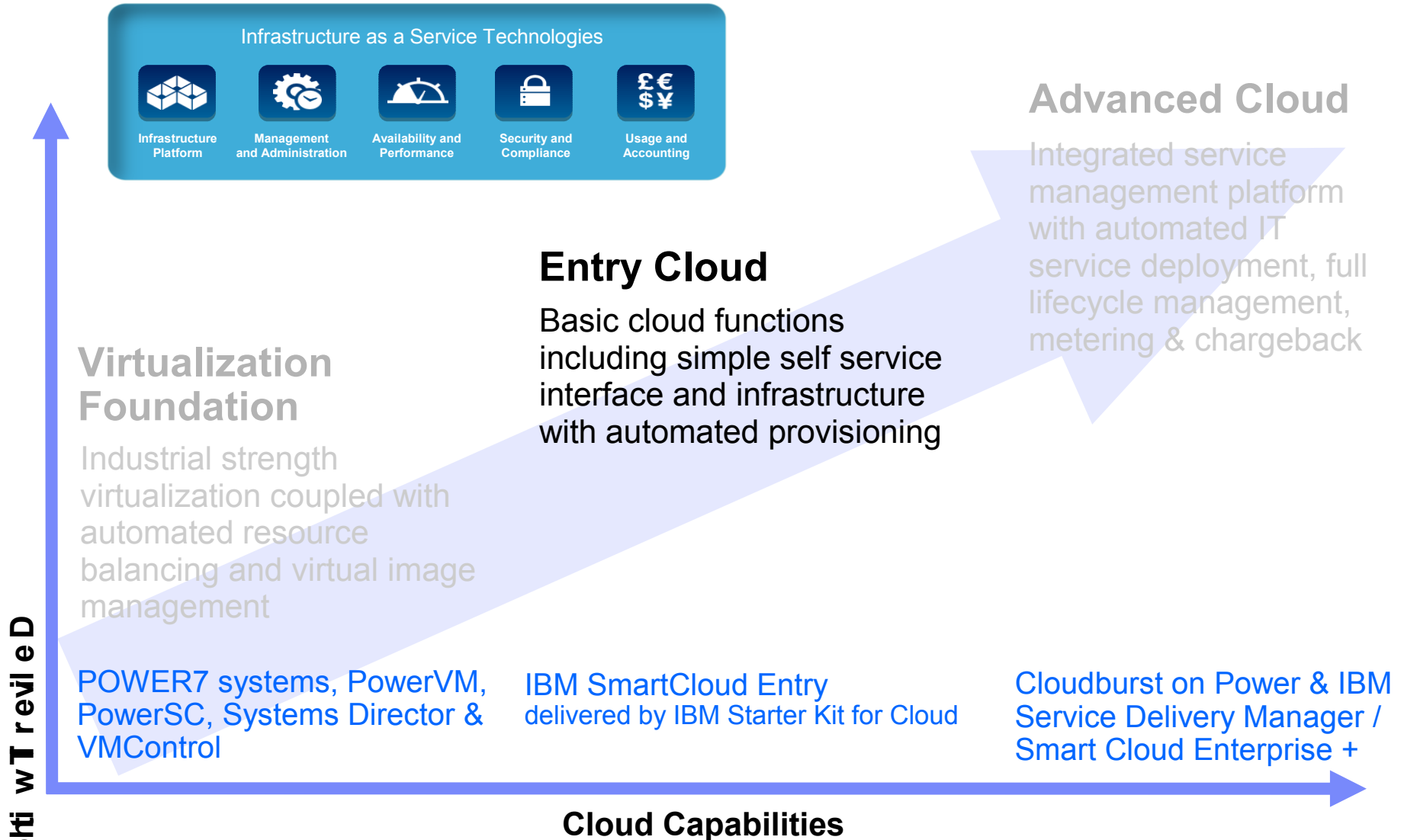
Private clouds can help address these business problems but clients are not sure where to start on the journey

Infrastructure as a Service Technologies

Infrastructure Platform	Management and Administration	Availability and Performance	Security and Compliance	Usage and Accounting



Power Systems Cloud Solutions – Entry points at any level



t uohti wT r e i l e d



IBM SmartCloud Entry delivered by IBM Starter Kit for Cloud

Entry level cloud solution built on top of the virtualization foundation



Entry cloud solution that provides affordable, easy-to-install and easy-to-use capabilities to allow clients to **more rapidly move to a cloud model**

- ✓ **Fast time to value** with a solution that is simple to deploy, easy to use and works with existing infrastructure
- ✓ Accelerate infrastructure delivery and speed service deployment to **quickly respond to changing business needs**
- ✓ **Dramatically increase IT efficiency** with standardization and lower operations cost
- ✓ Scale as needed to **improve quality and meet demand** with continuous availability
- ✓ **Enable self service** with a simple interface that provides oversight
- ✓ **Expandable** to advanced Cloud offerings

More information: <http://www.ibm.com/systems/power/solutions/cloud/onpower/starterkit.html>

Starter Kit for Cloud Capabilities

Create Images

- **Easily create** new golden master images and software “appliances” using corporate standard OS
- **Convert images** from physical systems or between various x86 hypervisors to use cheaper tooling
- **Reliably track** images to ensure compliance and minimize security risks
- **Conserve resources**, reducing both the number of images and the storage required for them

Simplify storage of thousands of images

Deploy VMs

- **Deployment** of application images across compute and storage resources
- **End user self service** for improved responsiveness
- **Ensure security** through resource and VM isolation, project-level user access controls
- **Easy to use** - no need to know all the details of the infrastructure
- **Protect your investment** through full support of your current virtualization environment
- **Optimize performance** on IBM systems with dynamic scaling, expansive capacity and continuous operation

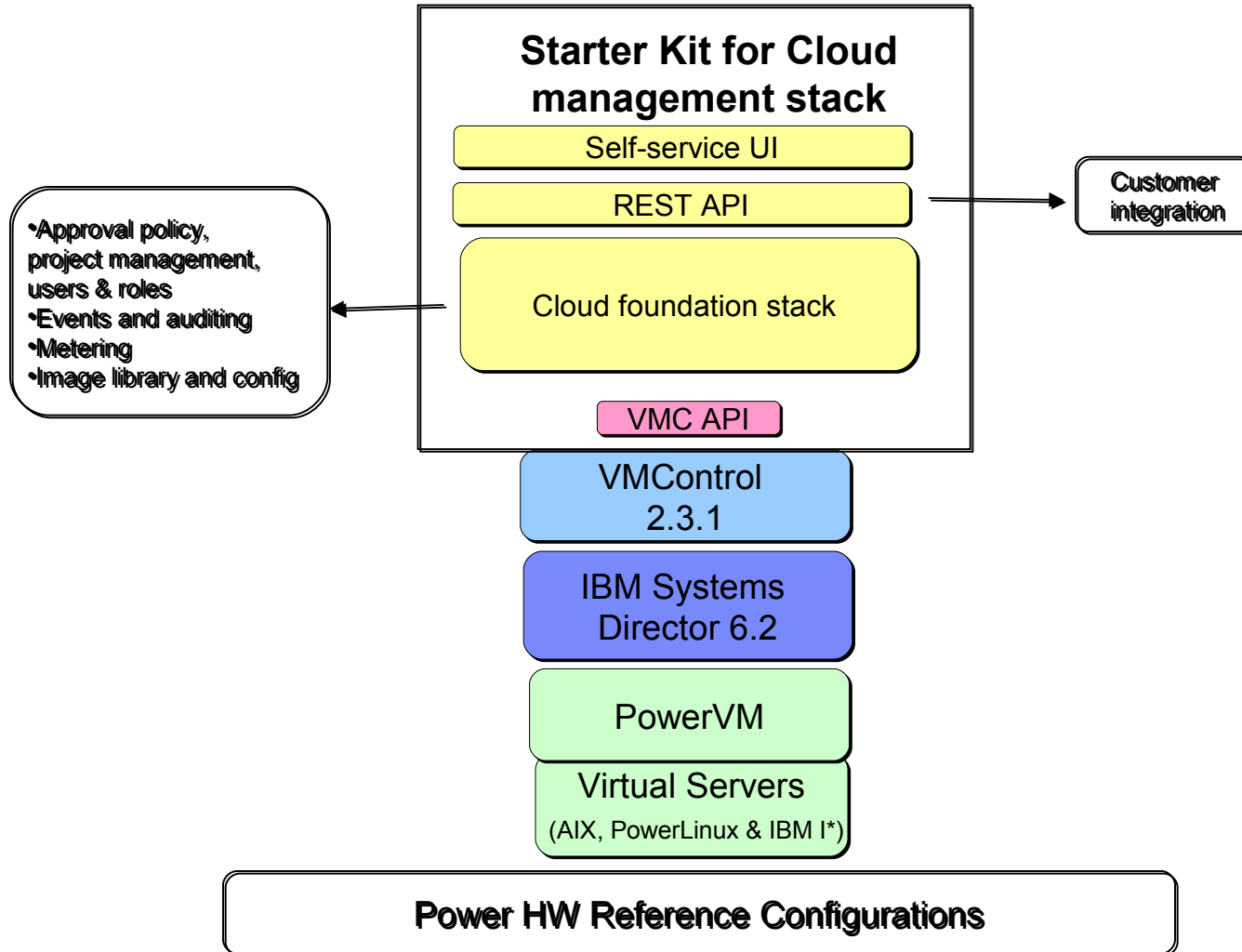
35:1 *Slash time to market for new apps from four months to just two or three days*

Operate Your Cloud

- **Delegate provisioning** to authorized ‘users’ to improve productivity
- **Maintain full oversight** to ensure an optimally running and safe Cloud through automated approval / rejection
- **Standardize deployment** and configuration to improve compliance and reduce errors by setting policies, defaults and templates
- **Simplify administration** with an intuitive interface for managing projects, users, workloads, resources, budgeting, approvals & metering

Cut costs with efficient operation

IBM Starter Kit for Cloud solution architecture and components



*All statements regarding IBM's future direction and intent are subject to change or withdrawal without notice, and represent goals and objectives only. Some features require the purchase of additional software components.



IBM Starter Kit for Cloud Power Reference Configurations

IBM Starter Kit for Cloud HW Reference Power 740 Rack Based Configuration

p740 Management node, 16 cores,
128GB (8 cores Mgmt, 8 cores Comp)
p740, Compute node 16 cores, 128GB
(1 core Mgmt, 15 cores comp)
Storwize v7000 storage controller with
24 drives - 7TB Min.
Infrastructure System x
2 - F/C SAN Switch 40 ports
2 - 1 Gb Ethernet Switch
Flat panel with keyboard console and
console switch
T42 Rack with 4 PDUs
SKC / SD / VMC / AIX / Power VM

IBM Starter Kit for Cloud HW Reference PS703 BCH Blade Configuration

PS703 Management node, 16 cores,
128GB (8 cores Mgmt 8 cores Comp)
PS703 Compute node, 16 cores,
128GB (1 core Mgmt, and 15 cores
comp)
HS22 x86 infrastructure blade
BCH Chassis
Storwize v7000 storage controller with
24 drives - 7TB Min
Flat panel with keyboard
B42 Rack with 4 PDUs
SKC / SD / VMC / AIX / Power VM

Power Systems Cloud Solutions – Entry points at any level

Infrastructure as a Service Technologies

- Infrastructure Platform
- Management and Administration
- Availability and Performance
- Security and Compliance
- Usage and Accounting

Advanced Cloud - Private

Integrated service management platform with automated IT service deployment, full lifecycle management, metering & chargeback

Entry Cloud

Basic cloud functions including simple self service interface and infrastructure with automated provisioning

Virtualization Foundation

Industrial strength virtualization coupled with automated resource balancing and virtual image management

POWER7 systems, PowerVM, PowerSC, Systems Director & VMControl

IBM SmartCloud Entry delivered by IBM Starter Kit for Cloud

Cloudburst on Power & IBM Service Delivery Manager / Smart Cloud Enterprise +

Cloud Capabilities

Virtualization

IBM Service Delivery Manager for Power Systems

Pre-integrated software solution for advanced cloud solutions

Pre-integrated service management software stack that **automates IT service deployment** and provides **resource monitoring, cost management, and availability of services** in a cloud environment

- ✓ Self service portal, standardization and automation help to **reduce complexity and simplify use**
- ✓ **Leverage your existing IT investments** by deploying on your existing Power infrastructure and integrating your existing IT assets as part of your cloud environment
- ✓ Software stack delivered as virtual images and pre-integrated to **improve time to value**
- ✓ **Accelerate deployment** with automated image deployment and activation of components

More information: <http://www.ibm.com/software/tivoli/products/service-delivery-manager/>

Tivoli software

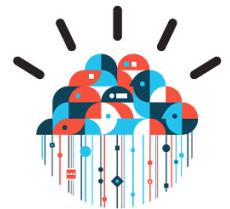


IBM CloudBurst on Power Systems

Completely integrated advanced cloud solution for the fastest time to value

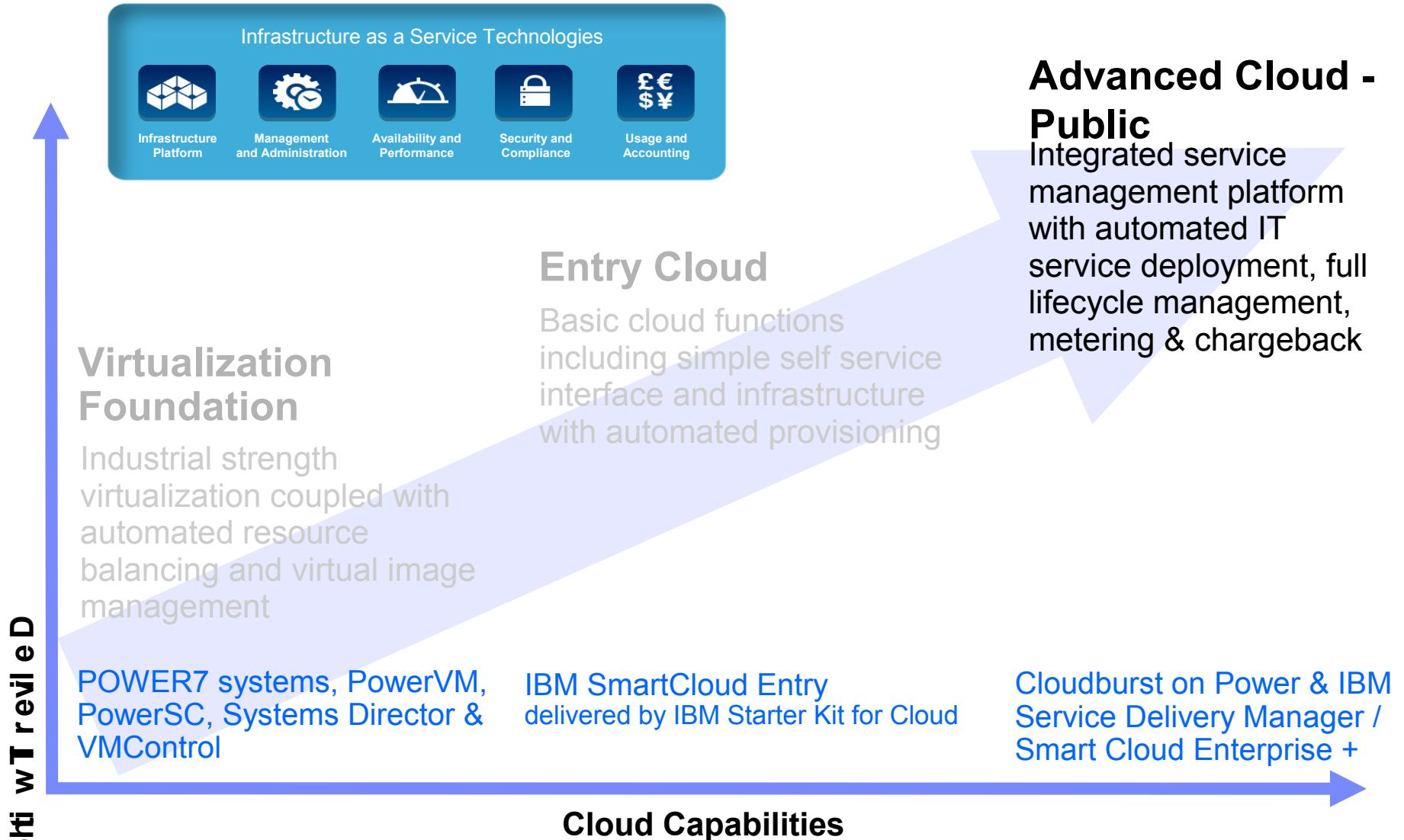
Completely integrated service management platform with network, servers, storage, software and quickstart services that enable the **fastest time to value**

- ✓ **Deliver services faster via a self service portal** by offering a standardized service catalog and automatically provisioning requested resources
- ✓ **Reduce complexity and risk** through standardization and automation which help to reduce human errors
- ✓ **Lower IT costs** by leveraging automation workflows to provision assets based on business approved policies
- ✓ **Decrease capital expenses** by ensuring optimal utilization of all resources
- ✓ **Scales to the enterprise** with the ability to expand the solution to manage additional platforms and workloads
- ✓ **Enterprise quality of service** by leveraging the Power systems hardware, virtualization and software components



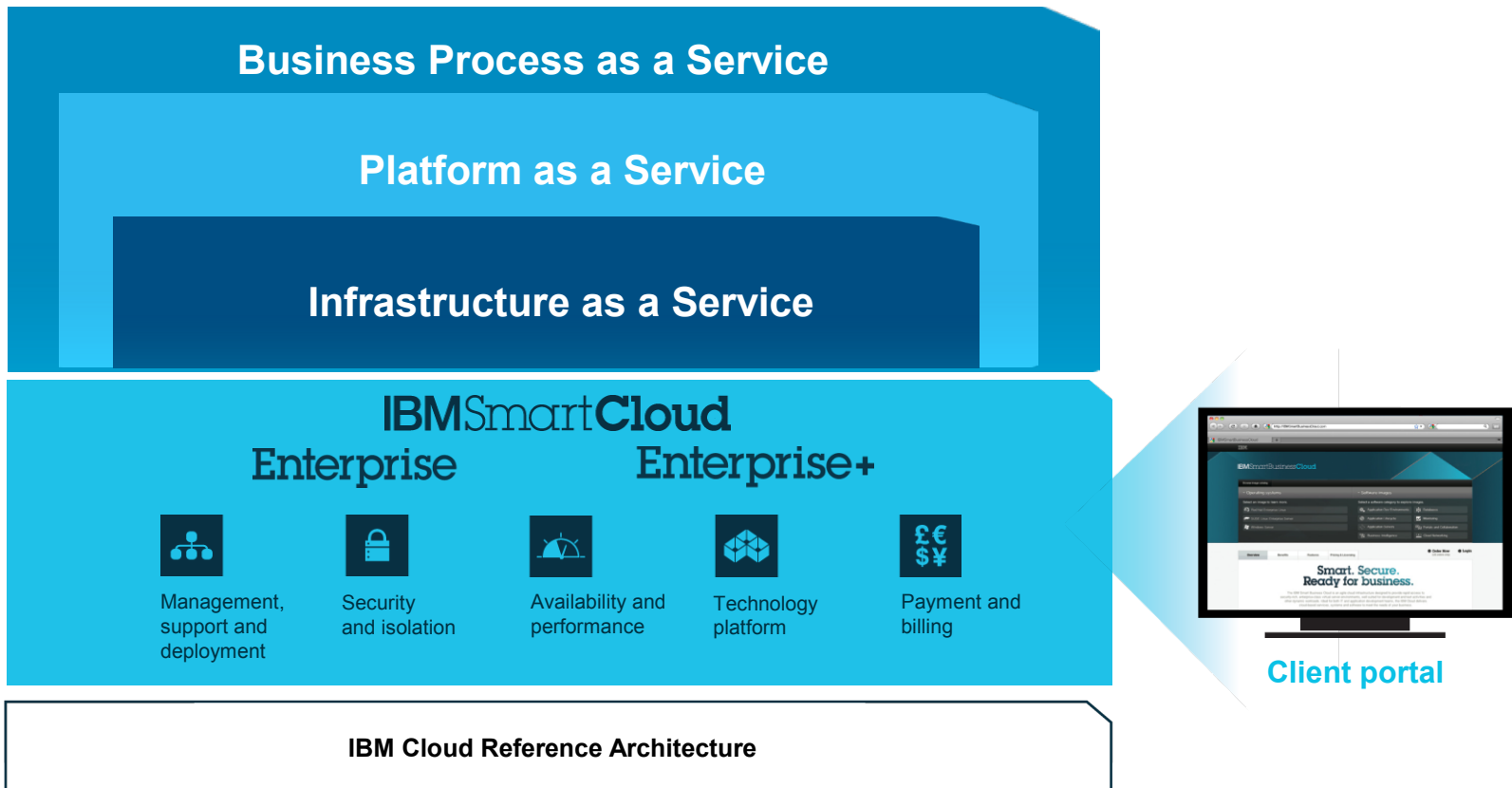
More information: <http://www.ibm.com/systems/power/solutions/cloud/cloudburst/>

Power Systems Cloud Solutions – Entry points at any level

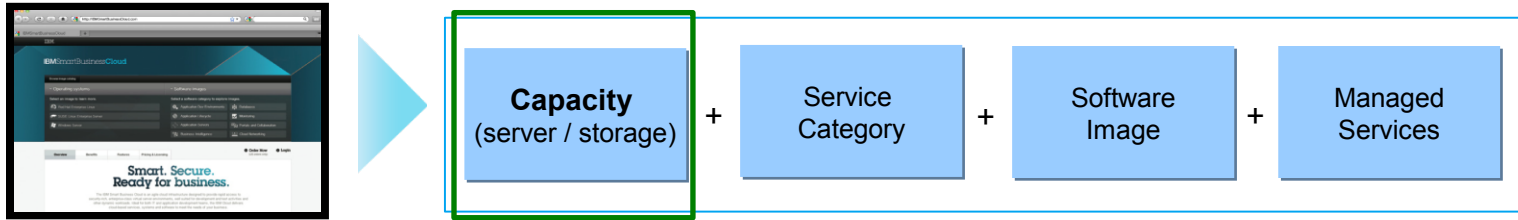


IBM SmartCloud : IBM's next generation service delivery platform

Enabling Enterprise IT and Business Process Transformation



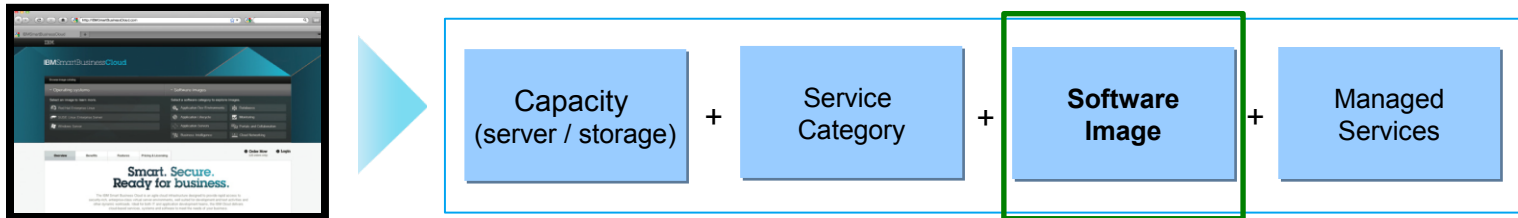
Virtual Machine Capacity Options



x86 Options	32-bit configurations			64-bit configurations			
	Small	Med	Large	Small	Med	Large	XL
Virtual CPUs	1	2	4	2	2	4	8
Virtual Memory (Gigabytes)	1	2	4	4	4	8	16
Instance Storage (Gigabytes)	64	128	192	64	128	192	384

pSeries Options	64-bit configurations				
	Small	Med	Large	XL	Jumbo
Virtual CPUs	1	2	4	8	16
Virtual Memory (Gigabytes)	2	4	8	16	32
Instance Storage (Gigabytes)	64	128	196	384	512

Operating System and Software Images



- Operating System

- x86 (VMware ESXi 4.1)

- Red Hat Enterprise Linux 5.4 & 5.6 (32 and 64-bit)
 - Windows Server 2003 R2 Standard Edition (32 and 64 bit)
 - Windows Server 2008 R2 Standard Edition (64-bit)

- pSeries (IBM PowerVM) - IBM AIX Standard Edition Version 6.1

- IBM and non-IBM software:

- | | |
|--|---|
| <ul style="list-style-type: none"> • MS SQL Server • Oracle 10.2 • Oracle DB 11g EE • IBM DB2 EE V9.7 • IBM Websphere MQ V7.0 • MS Internet Information Server | <ul style="list-style-type: none"> • Apache Tomcat V5.5 • Oracle Weblogic V10.3 • Apache HTTP V2.2 • Microsoft .Net 3.5 |
|--|---|

Comparison of IaaS Platform Functionality

	SmartCloud Enterprise	SmartCloud Enterprise+
Core Technology	KVM, x86 only	VMWare, AIX (x86 and Power Platform)
Application Applicability	Emerging application architectures that build resiliency into the application. Dev and test environments	Production, with full stack enablement for existing application designs
Service Scope	Unmanaged, cost optimized to compete with public IaaS providers	Managed Hosting service scope, 30%+ more efficient than traditional managed hosting deployments
Service Activation Performance	Self-service, ungoverned	~ 1 day, including full service activation. Shorter than hosted BAU today (2-4 weeks)
Guest Management	Client responsibility	Complete ITIL process support
Client ITSM Integration	Client responsibility	Integrated across client's non-cloud and cloud environments
Compliance	IBM internal security standards	ISEC above hypervisor, IBM internal below
SLA	99.5% for portal or VMs	98.5-99.9% for VM availability;
Service management	Below hypervisor	Above and below the hypervisor
Backup and recovery	Client Responsibility	IBM Provides as Integrated Service

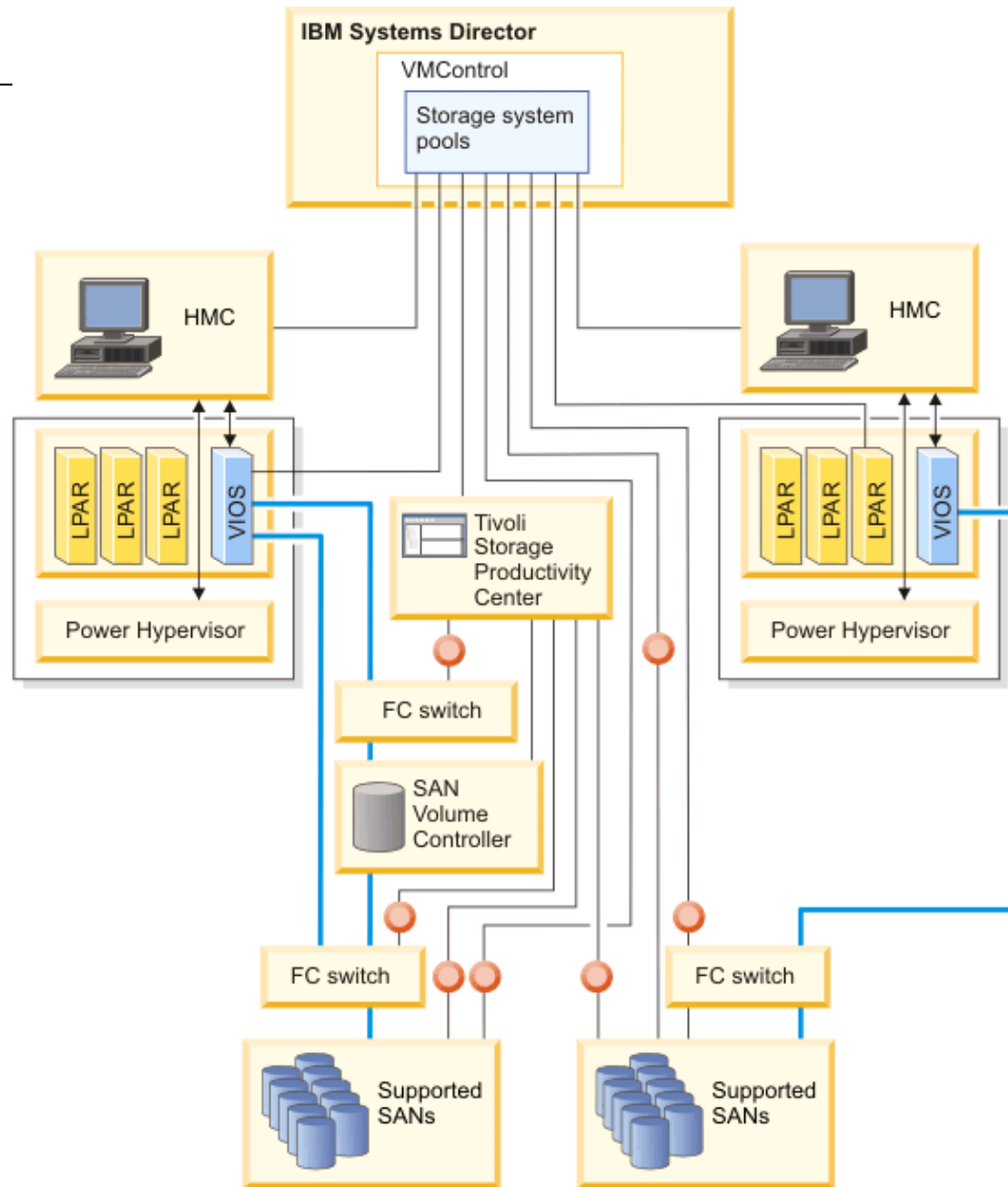
Power is performance redefined






Deliver new services faster, with higher quality, and superior economics

Demonstration of IBM SmartCloud Entry For





-  = SMI-S provider
-  = data path
-  = management control path

FSD0520-2

Special notices

This document was developed for IBM offerings in the United States as of the date of publication. IBM may not make these offerings available in other countries, and the information is subject to change without notice. Consult your local IBM business contact for information on the IBM offerings available in your area.

Information in this document concerning non-IBM products was obtained from the suppliers of these products or other public sources. Questions on the capabilities of non-IBM products should be addressed to the suppliers of those products.

IBM may have patents or pending patent applications covering subject matter in this document. The furnishing of this document does not give you any license to these patents. Send license inquires, in writing, to IBM Director of Licensing, IBM Corporation, New Castle Drive, Armonk, NY 10504-1785 USA.

All statements regarding IBM future direction and intent are subject to change or withdrawal without notice, and represent goals and objectives only.

The information contained in this document has not been submitted to any formal IBM test and is provided "AS IS" with no warranties or guarantees either expressed or implied.

All examples cited or described in this document are presented as illustrations of the manner in which some IBM products can be used and the results that may be achieved. Actual environmental costs and performance characteristics will vary depending on individual client configurations and conditions.

IBM Global Financing offerings are provided through IBM Credit Corporation in the United States and other IBM subsidiaries and divisions worldwide to qualified commercial and government clients. Rates are based on a client's credit rating, financing terms, offering type, equipment type and options, and may vary by country. Other restrictions may apply. Rates and offerings are subject to change, extension or withdrawal without notice.

IBM is not responsible for printing errors in this document that result in pricing or information inaccuracies.

All prices shown are IBM's United States suggested list prices and are subject to change without notice; reseller prices may vary.

IBM hardware products are manufactured from new parts, or new and serviceable used parts. Regardless, our warranty terms apply.

Any performance data contained in this document was determined in a controlled environment. Actual results may vary significantly and are dependent on many factors including system hardware configuration and software design and configuration. Some measurements quoted in this document may have been made on development-level systems. There is no guarantee these measurements will be the same on generally-available systems. Some measurements quoted in this document may have been estimated through extrapolation. Users of this document should verify the applicable data for their specific environment.

Revised September 26, 2006



Special notices (cont.)

IBM, the IBM logo, ibm.com AIX, AIX (logo), AIX 5L, AIX 6 (logo), AS/400, BladeCenter, Blue Gene, ClusterProven, DB2, ESCON, i5/OS, i5/OS (logo), IBM Business Partner (logo), IntelliStation, LoadLeveler, Lotus, Lotus Notes, Notes, Operating System/400, OS/400, PartnerLink, PartnerWorld, PowerPC, pSeries, Rational, RISC System/6000, RS/6000, THINK, Tivoli, Tivoli (logo), Tivoli Management Environment, WebSphere, xSeries, z/OS, zSeries, Active Memory, Balanced Warehouse, CacheFlow, Cool Blue, IBM Systems Director VMControl, pureScale, TurboCore, Chiphopper, Cloudscape, DB2 Universal Database, DS4000, DS6000, DS8000, EnergyScale, Enterprise Workload Manager, General Parallel File System, , GPFS, HACMP, HACMP/6000, HASM, IBM Systems Director Active Energy Manager, iSeries, Micro-Partitioning, POWER, PowerExecutive, PowerVM, PowerVM (logo), PowerHA, Power Architecture, Power Everywhere, Power Family, POWER Hypervisor, Power Systems, Power Systems (logo), Power Systems Software, Power Systems Software (logo), POWER2, POWER3, POWER4, POWER4+, POWER5, POWER5+, POWER6, POWER6+, POWER7, System i, System p, System p5, System Storage, System z, TME 10, Workload Partitions Manager and X-Architecture are trademarks or registered trademarks of International Business Machines Corporation in the United States, other countries, or both. If these and other IBM trademarked terms are marked on their first occurrence in this information with a trademark symbol (® or ™), these symbols indicate U.S. registered or common law trademarks owned by IBM at the time this information was published. Such trademarks may also be registered or common law trademarks in other countries.

A full list of U.S. trademarks owned by IBM may be found at: <http://www.ibm.com/legal/copytrade.shtml>.

Adobe, the Adobe logo, PostScript, and the PostScript logo are either registered trademarks or trademarks of Adobe Systems Incorporated in the United States, and/or other countries.

AltiVec is a trademark of Freescale Semiconductor, Inc.

AMD Opteron is a trademark of Advanced Micro Devices, Inc.

InfiniBand, InfiniBand Trade Association and the InfiniBand design marks are trademarks and/or service marks of the InfiniBand Trade Association.

Intel, Intel logo, Intel Inside, Intel Inside logo, Intel Centrino, Intel Centrino logo, Celeron, Intel Xeon, Intel SpeedStep, Itanium, and Pentium are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries.

IT Infrastructure Library is a registered trademark of the Central Computer and Telecommunications Agency which is now part of the Office of Government Commerce.

Java and all Java-based trademarks and logos are trademarks or registered trademarks of Oracle and/or its affiliates.

Linear Tape-Open, LTO, the LTO Logo, Ultrium, and the Ultrium logo are trademarks of HP, IBM Corp. and Quantum in the U.S. and other countries.

Linux is a registered trademark of Linus Torvalds in the United States, other countries or both.

Microsoft, Windows and the Windows logo are registered trademarks of Microsoft Corporation in the United States, other countries or both.

NetBench is a registered trademark of Ziff Davis Media in the United States, other countries or both.

SPECint, SPECfp, SPECjbb, SPECweb, SPECjAppServer, SPEC OMP, SPECviewperf, SPECcapc, SPECchpc, SPECjvm, SPECmail, SPECimap and SPECsfs are trademarks of the Standard Performance Evaluation Corp (SPEC).

The Power Architecture and Power.org wordmarks and the Power and Power.org logos and related marks are trademarks and service marks licensed by Power.org.

TPC-C and TPC-H are trademarks of the Transaction Performance Processing Council (TPPC).

UNIX is a registered trademark of The Open Group in the United States, other countries or both.

Other company, product and service names may be trademarks or service marks of others.

Revised December 2, 2010