

November 8-9 2011

Topic: IBM SmartCloud Provisioning

Name:

Title:

Email:



What Makes Cloud Different than Virtualization?

- Different Business Expectations – *apply my skills to growing my business, not maintaining my IT infrastructure*
 - Virtualization is designed to save capital (hardware) expense
 - Cloud is designed to save labor (human) expense (which is typically much larger)
 - Eliminate tickets
 - High degrees of standardization
 - Rapid ability to adapt to business decisions

No tickets	Standardize	Fast change
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- Different User Expectations – *want to do what I need to do now*
 - “Do it myself” – don’t want to have to ask or wait for someone to help
 - Always available – my job can’t wait for “system maintenance”
 - Instant gratification – if I can’t get what I need in a couple of minutes, I won’t bother

Do it myself	Always available	Get it fast
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- If you can’t meet the business expectations, your Cloud will fail.
- If your users aren’t happy with your service, they won’t use it, and your Cloud will fail.

- IBM Smart Cloud Provisioning was designed from the ground up to meet these expectations...

IBM Smart Cloud Provisioning uniquely addresses the needs of Cloud

- Through a rich set of interfaces – all functions available via web UI, command line, or web service API
 - Choose from a list of preconfigured images and how many to run
 - Optionally, attach more storage to your virtual servers
 - Optionally, attach a “public” IP address to your virtual servers
 - ...they will be **available for you to use in seconds, not hours**
 - **Works consistently across VMWare, KVM, and Xen hypervisors...** including the ability to mix and match

- Through our unique “High Scale, Low Touch” Architecture
 - High Scale (*starts simple, expands easily as large as you want*)
 - Fast access to virtual servers through copy-on-write approach
 - Multi-instances for all services for automatic load balancing
 - Peer-peer architecture to avoid traditional bottlenecks
 - Low Touch (*zero downtime, minimal admin responsibilities*)
 - Add capacity simply by plugging in a new system
 - Recover from failure scenarios without taking down the Cloud
 - “Live update” capability to patch or upgrade the Cloud

- Through highly standardized environments...with control
 - Pre-configured, pre-tested images for people to use
 - **Avoid “image sprawl”** – users creating hundreds of variations (4Q)
 - Ability to maintain compliance on running environments (4Q)

No tickets	Standardize	Fast change
Do it myself	Always available	Get it fast

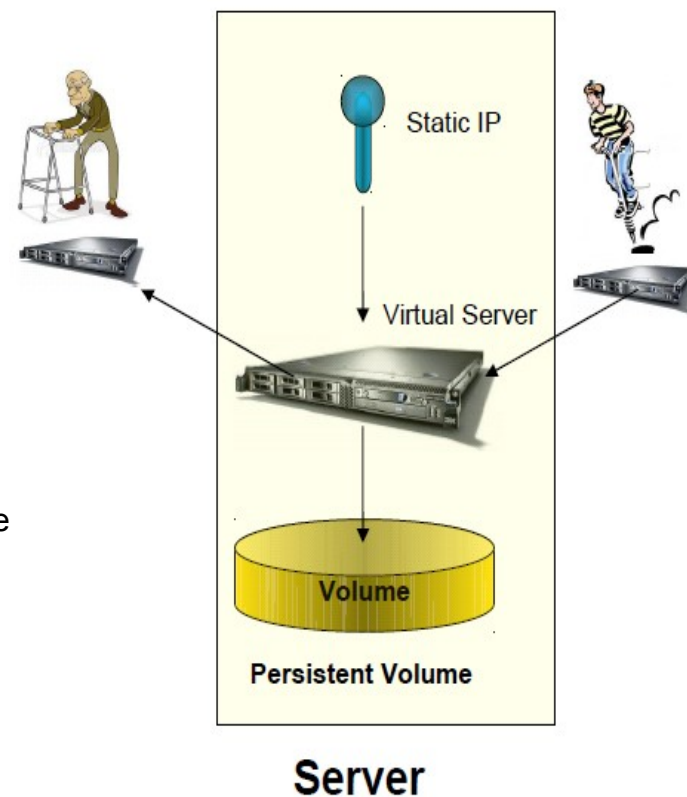
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First...an important concept

- IBM Smart Cloud Provisioning coordinates three independent ingredients:
 - Virtual Servers
 - Network addresses
 - Storage volumes
- When a request is made, a given virtual server is attached to one or more network addresses and one or more storage volumes
- This has several advantages:
 - Quickly recover from failures – cheaper to replace than to fix
 - Swap out old VM and replace with fresh new VM on different hardware
 - Dramatically simplifies patch, image and change management
 - New versions can be easily swapped in, and old versions can be easily put back if problems arise
 - Servers can be restarted and then reattached to their previous storage volumes and addresses to quickly restore their state



Typical Virtualization vendors mistakenly put the configurations inside the VM, making it either difficult or impossible to automate with scripts

Real life examples of the Self Service Interface Difference...

⌘ Applying a major upgrade to a workload

- Keep workload running as-is and deploy new version in parallel
- when the new deployment is successful:
 - Point static address to point to "in maintenance" page
 - Quiesce the old application (e.g. graceful shutdown)
 - Snapshot the data volumes
 - Attach data volumes into new environment
 - Run migration code (if any)
 - Verify upgrade is successful
 - Flip static address to point to the new environment - upgrade successful
- If you need to roll back to the old version:
 - Point static address to "in maintenance" page
 - Create data volumes from previous snapshots
 - Attach data volumes to old environment
 - Verify application
 - With new environment need to capture any transactions that need to be re-applied
 - Flip static address to point to the old environment

⌘ Separate Test and Production Instances

- Use Regions to separate and promote images

⌘ Security patches (since reboots are typically required)

- Consolidate your images to a small number by decoupling data into separate volumes
- Query image lib for images requiring patching
- Patch images, recapture and check in new version to image library
- Query image lib for all instances requiring patching
- for each instance
 - Create new instance of new version of image
 - Quiesce any application state from running instance
 - Attach data volumes to new instance
 - Terminate old instance

⌘ Application/server falls over (hardware or software fault)

- Create new instance
- Attach data volume

⌘ Application gets corrupt (software bug)

- Determine last snapshot prior to corruption
- Create volume from snapshot
- Create new instance
- Attach data volume
- Keep old volume for forensic investigation, data loss etc.

Simple to connect servers, addresses and storage together – automates new, simpler, faster IT “best practices”!

Organizations are implementing proven, repeatable Cloud solutions in a project fashion, based on their most pressing business needs

Cloud Enabled Data Center

Cloud Platform Services

Business Solutions on Cloud

Cloud Service Provider

Audience

IT Operations, DC Manager, Service Delivery Manager, Security Manager, CTO, LOB

Application Developer, IT Operations, Security Manager, Software Architects, VP of Apps, LOB

LOB, IT Manager, CIO

CIO, CTO, IT Executive, LOB Executive

- Create a Cloud Strategy and Roadmap
- Consolidate and Virtualize your Infrastructure
- Image and Virtual Environment Management
- Implement an Entry Cloud Infrastructure
- Implement an Advanced Cloud Infrastructure
- Access Compute and Storage as a Service

- Applications on Private Cloud
- Develop and Deploy Cloud Applications
- Delivering Dev and Test Environments

- Social Business
- Reducing total cost of ownership of B2B Integration
- Enable Global Supply Chain and Inventory
- Digital Marketing Optimization
- Business Process Redesign
- ~~Monitoring as a Service~~
- Desktop Cloud

- Build the Cloud Infrastructure
- Enable Applications in the Cloud
- Extend Applications in the Cloud

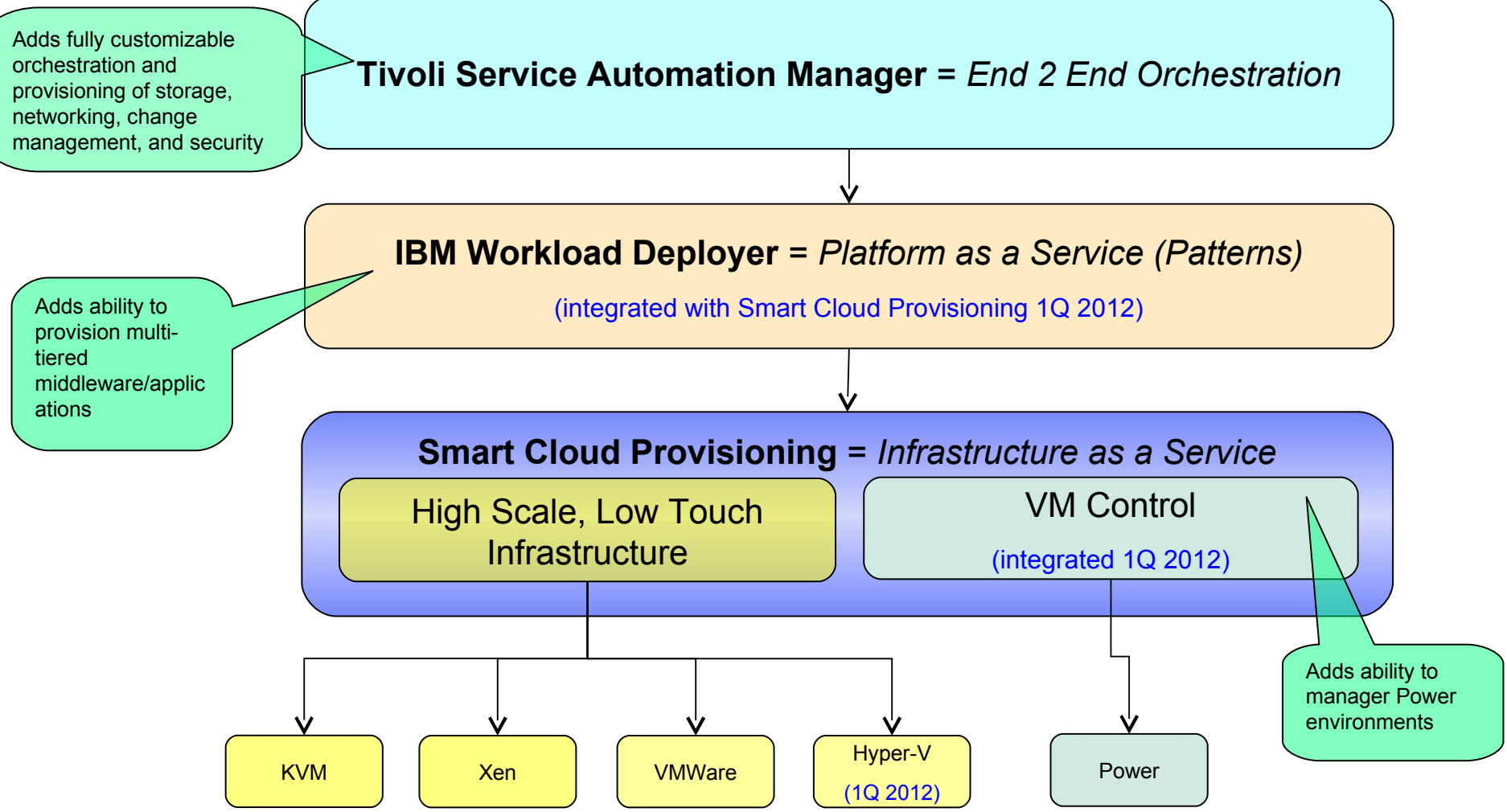
Cloud Service Management and Integration

Cloud Service Security

Cloud Assurance: Performance, Resilience, and Backup

Integrate and manage a hybrid cloud

How will IBM Smart Cloud Provisioning fit into IBM's Cloud Provisioning Family?

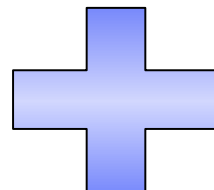


Manage Beyond the Provisioning – Add Capabilities to the Solution

Tivoli Service Automation Manager

Hybrid Cloud Integration

IBM Workload Deployer



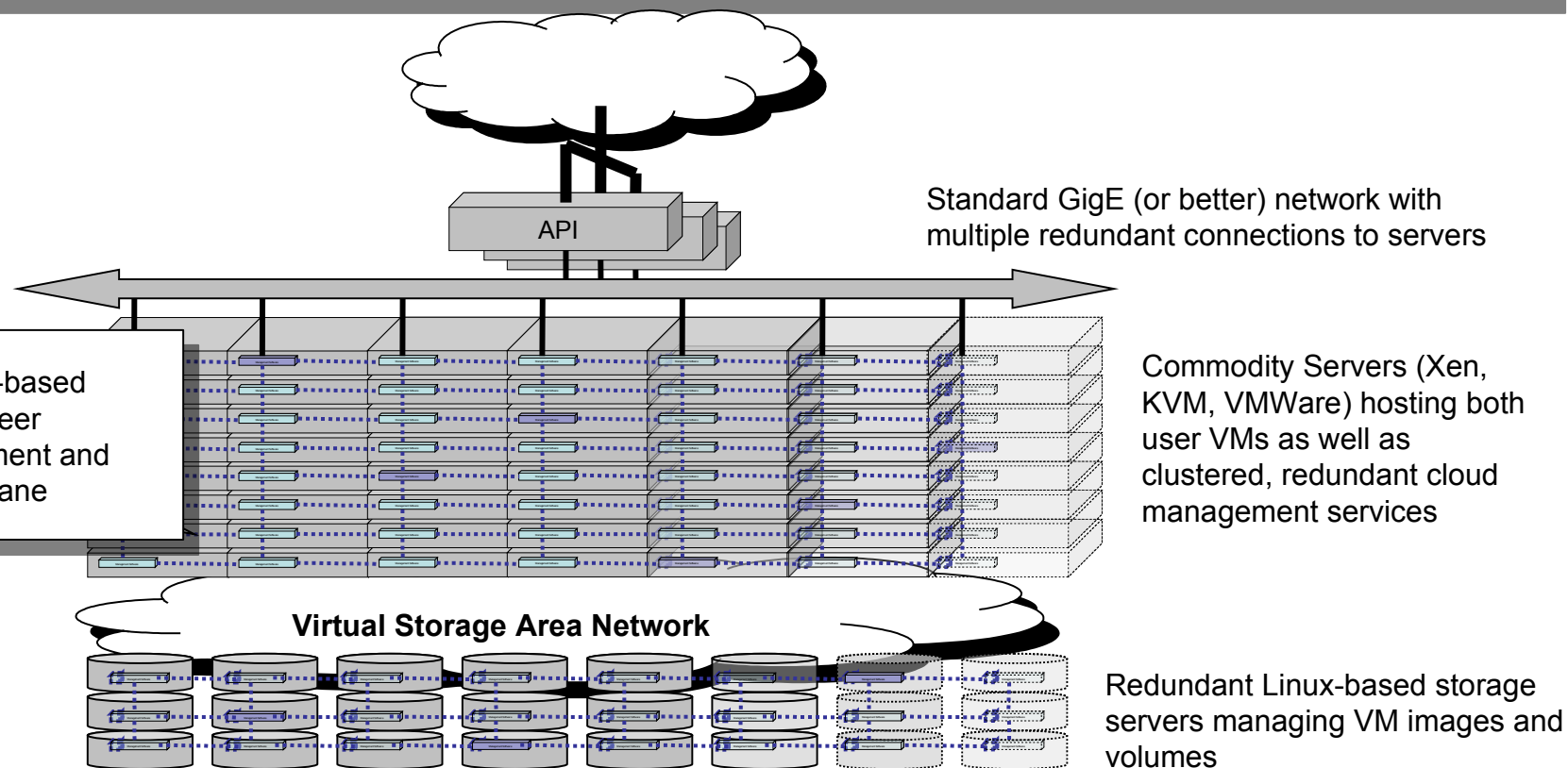
Cloud Health

Smart Cloud Provisioning

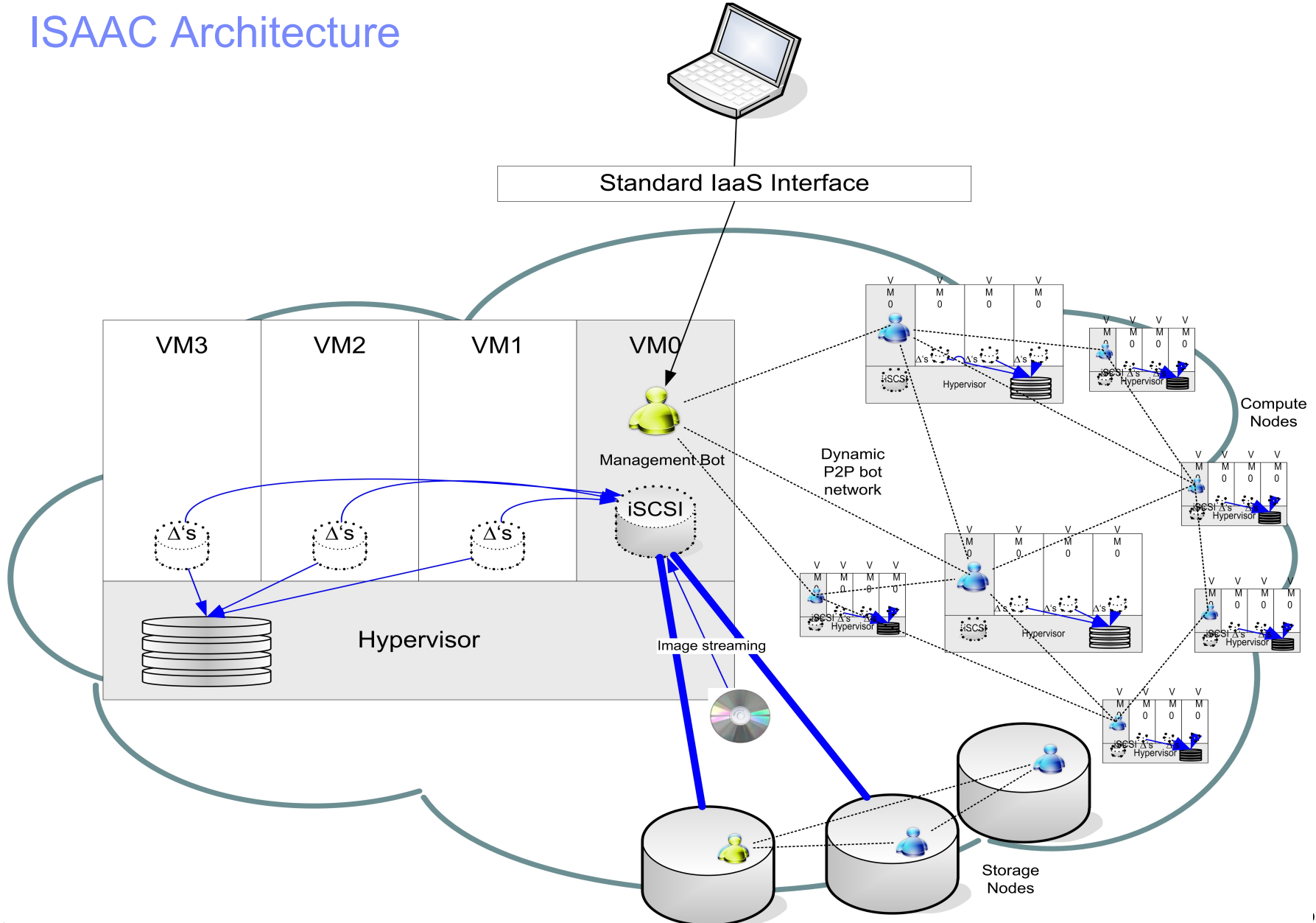
Cloud Resiliency...

ISAAC Highlights

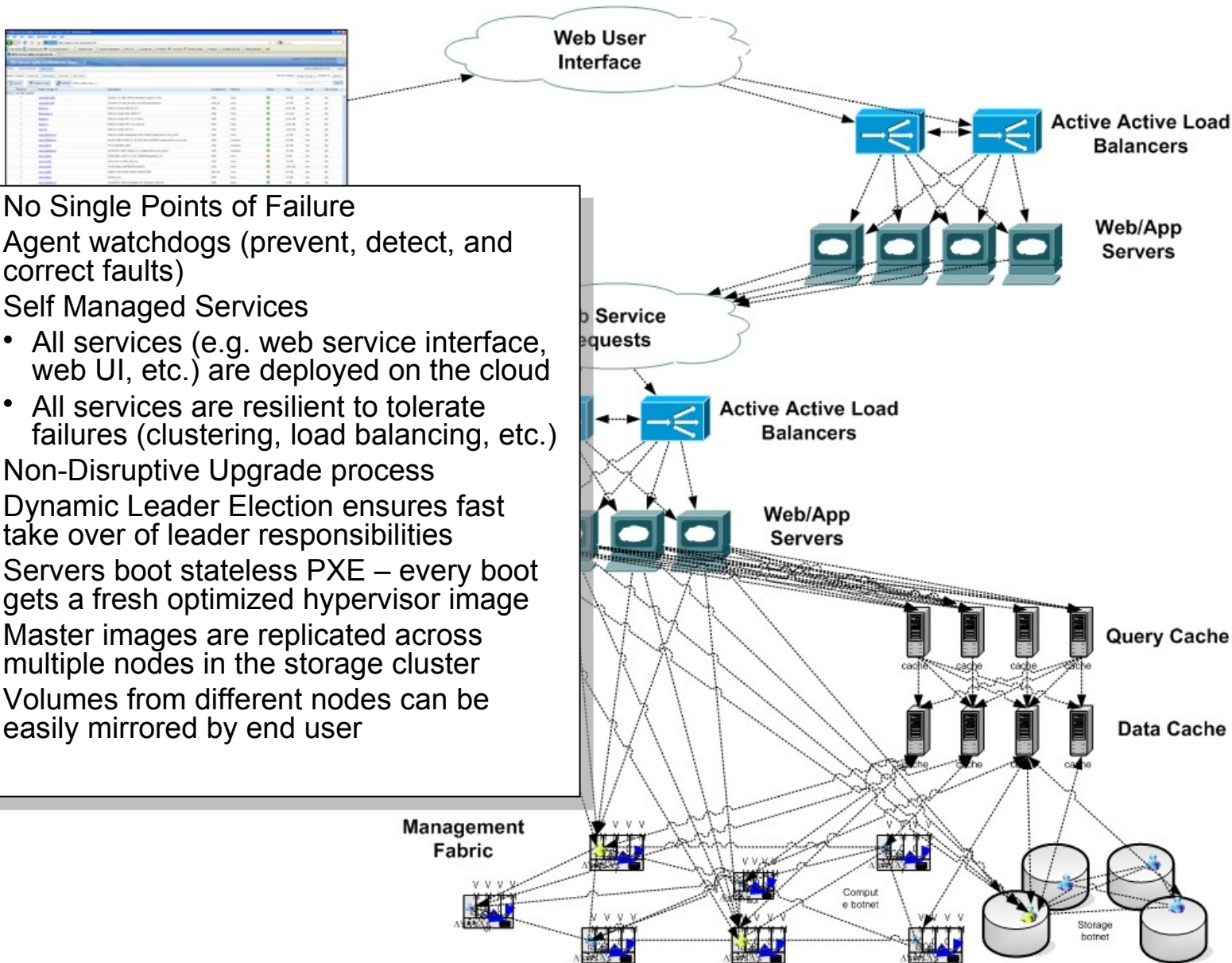
- Can provision & boot **100 VMs in ~1 minute** (1 VM in **20-30 seconds**)
- **>100,000 VMs** provisioned to date on an internal cloud (88 servers running for **12 months**)
- Tested provisioning throughput **> 10,000 VMs/Hour** (80 compute 3 storage)
- Sustained production usage 1600 Vms/Hour for over 100 minutes
- Can tolerate multiple failures by dynamically working around failed elements
- **Near 0 downtime** due to faults, hypervisor/management software upgrades, addition/removal of hardware



ISAAC Architecture



ISAAC 1.1 Architecture



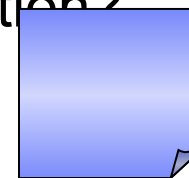
- No Single Points of Failure
- Agent watchdogs (prevent, detect, and correct faults)
- Self Managed Services
 - All services (e.g. web service interface, web UI, etc.) are deployed on the cloud
 - All services are resilient to tolerate failures (clustering, load balancing, etc.)
- Non-Disruptive Upgrade process
- Dynamic Leader Election ensures fast take over of leader responsibilities
- Servers boot stateless PXE – every boot gets a fresh optimized hypervisor image
- Master images are replicated across multiple nodes in the storage cluster
- Volumes from different nodes can be easily mirrored by end user



the problem with Virtualization and Standardization?

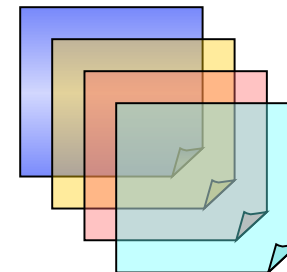
1

In the beginning, there was the perfect image...



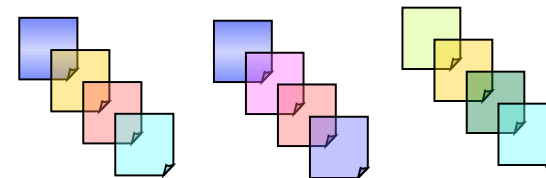
2

Then users starting making changes and “snapshots”...
...and what they put in the images is unknown...



3

Then they get copied to multiple locations...
...and some change again...



4

Then you need to apply a critical security patch...how? ... where?



Image Library Brings a Proven Approach to Managing Images

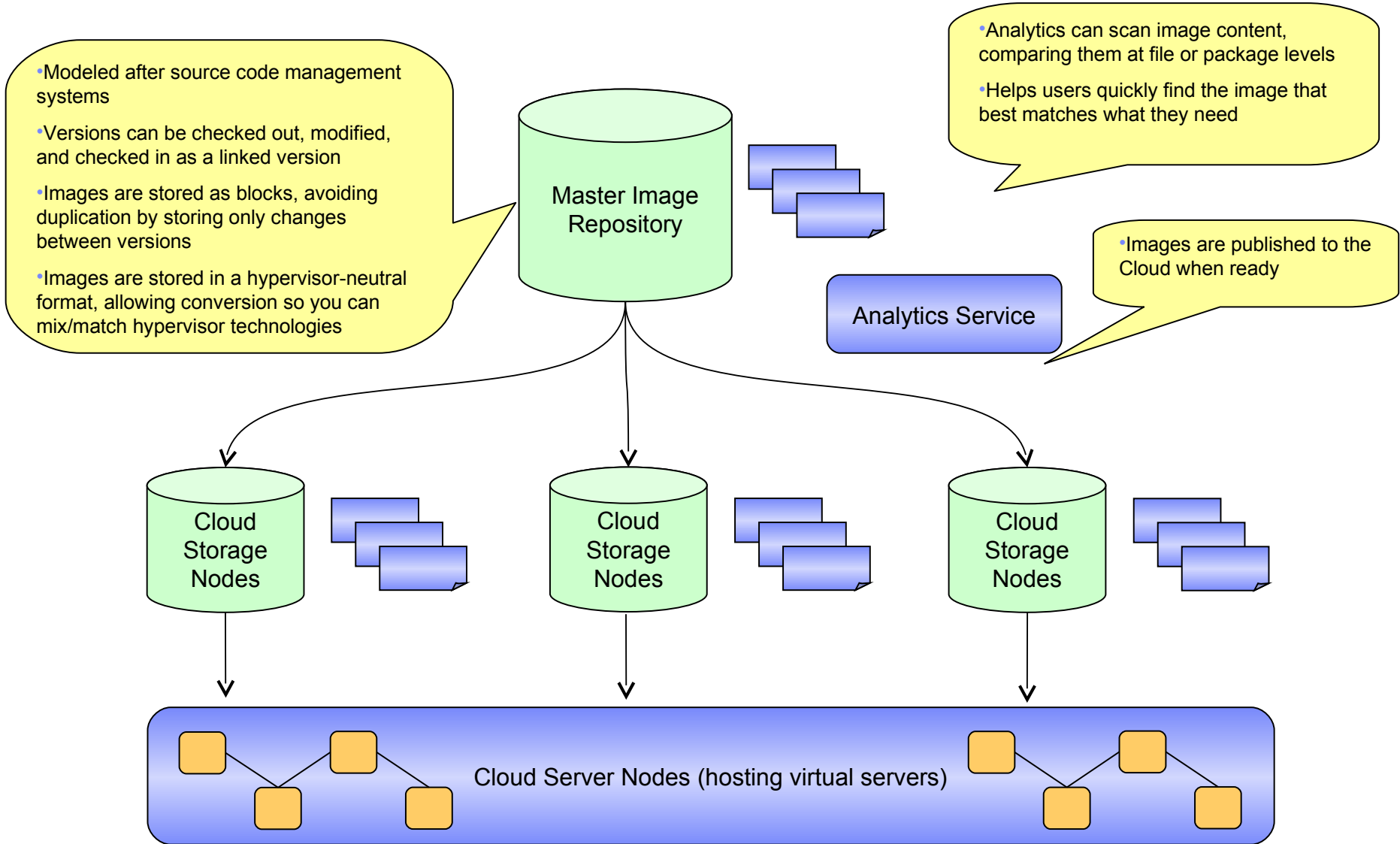
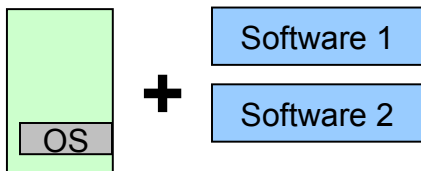


Image Construction Ensures your Images are Compliant

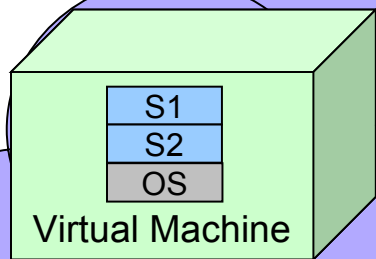
1. Design the image



- Images often have predefined versions of software that don't match corporate policies for security or licensing
 - eg Operating System service pack level, Apache web server build level

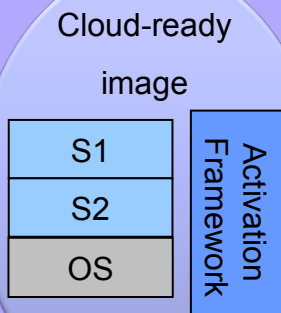
- The Image Construction Tool allows you build an “image recipe”, using your company’s approved OS and software as ingredients, and then “cook” an image that delivers what the users want and keeps you out of audit jail

2. Build the image



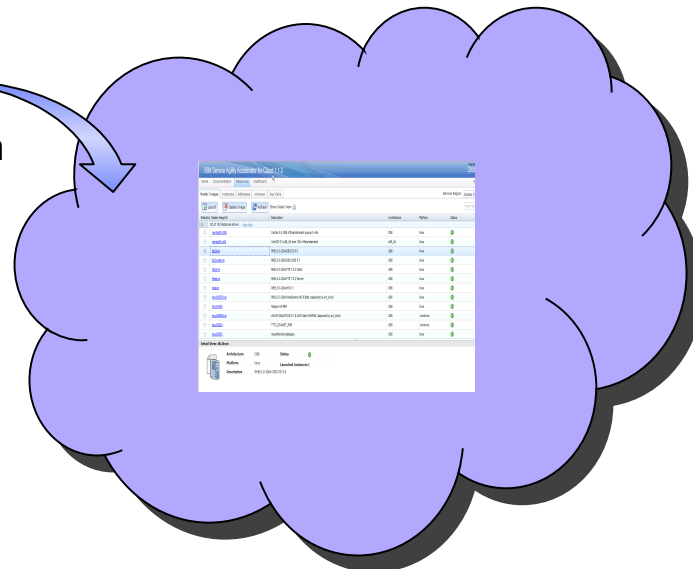
a. Synchronize (creates instance, installs software, sets up configuration)

b. Capture (Captures instance as master image)



Publish

3. Use image



Summary – IBM Smart Cloud Provisioning

- ✂ Only IBM Smart Cloud Provisioning can meet the expectations the business and your users have on an Infrastructure Cloud service:
 - ✂ *Reduced labor costs, standardization, and business agility*
 - ✂ *User-driven, always available, very fast access*
 - through...
- ✂ **Self-service**...for users who click and users who script
- ✂ **A very smart infrastructure**...that keeps you “live” all the time
- ✂ **Highly standardized delivery**...that can change fast but avoid chaos

Collaborating with us

- If you would like to:
- Hear the latest news on *IBM Smart Cloud Provisioning*
- Familiarise yourself with the product functionalities
- Help IBM to improve product functionality and usability
- Get in touch with our Subject Matter Experts

- *You can participate in any of our Customer Interaction Program activities, which can include:*
- **Design Validation**, collective group calls to review main design points
- **Usability sessions**, individual sessions that we will set up in accordance with you, on a one on one basis
- See the product working, with development **Demos**
- Work with a preconfigured **Virtual Beta** environment. Explore the product, either with our direct support or in an unattended mode, without the effort of installation and configuration.
- Download and try the **Beta** Code, and influence its development.
- For more details go to **Service Management Connect*** at <https://www.ibm.com/developerworks/servicemanagement/cvm/index.html>, or contact valory_batchellor@uk.ibm.com, our **Customer Interaction focal point**

- ***Service Management Connect:** *You can connect, learn, and share with Integrated Service Management (ISM) professionals in Service Management Connect. Get access to developers and technical experts who provide their perspectives and expertise to help you implement ISM solutions.*



ibm.com/smartcloud