How IBM does Cloud

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Agenda

Introduction

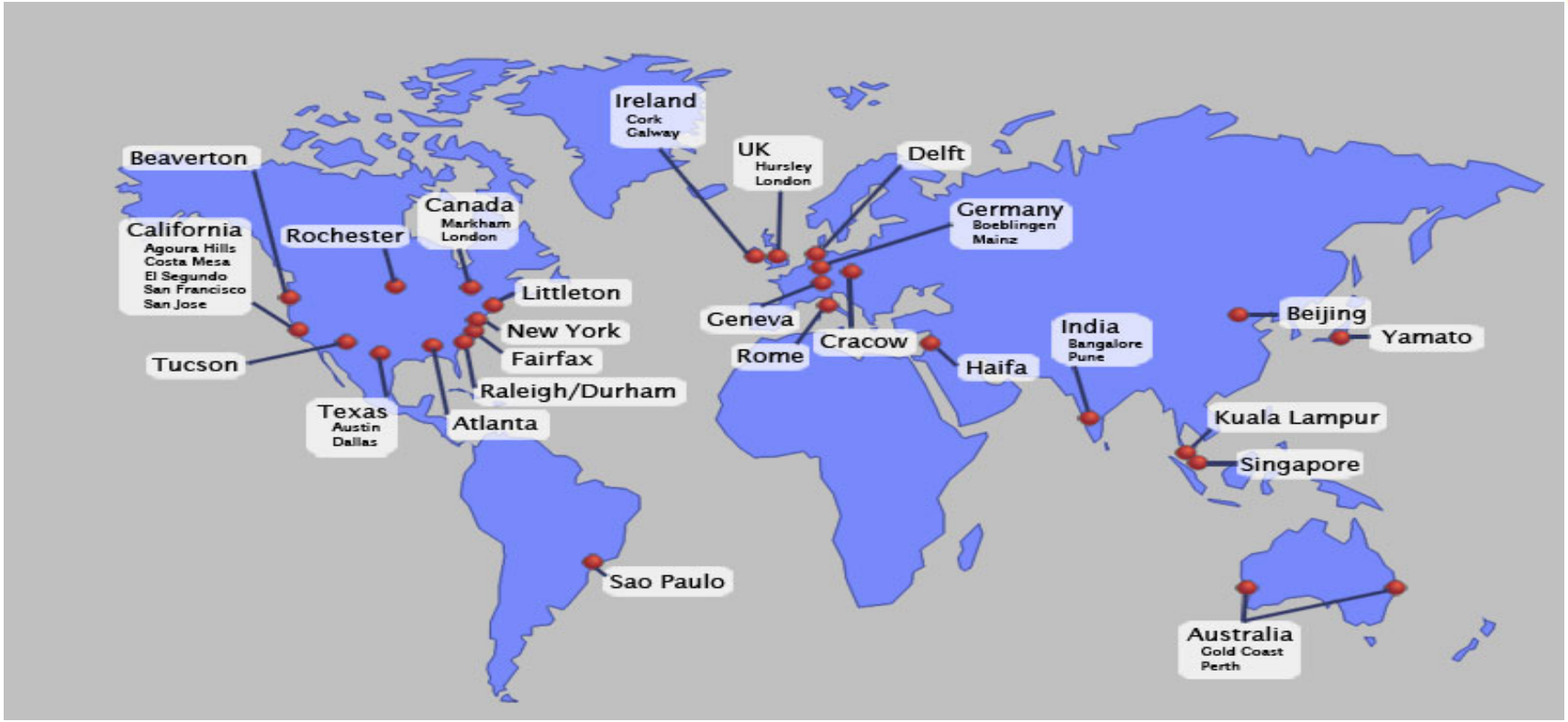
Approach

Lessons Learned

Driving Agile Development

Proving DevOps using Cloud

Tivoli Development & Test



➡ Geographically dispersed team of ~7000 team members

Tivoli's approach to delivering IT needed to become *smarter* … about delivering "services"

- IT footprint expanded to 38 labs through growth and acquisitions, creating inefficiencies, increased capital & operational expense
- The growing complexity of our IT systems demanded that sprawling processes become standardized services that are efficient, secure and easy to access
- A Service Management System to provide *visibility, control and automation* across IT and business services to ensure consistent delivery
- Deliver automated IT services to support dynamic needs of an agile focussed Development organization

Key Business Challenges

Reduce capital expense and maximise existing investment

- Initial footprint of 30K physical servers and unknown virtualised state Underutilized hardware: average of 5-9% utilization per server
- Duplication in the capital request and procurement process

Standardise & Automate end-user services and mitigate schedule risk

- Provide predictable, rapid access to reserve, provision and deploy servers
- Development and IT labs had a variety of tooling from homegrown to matured implementations
- Teams heavily leveraging hypervisor mgmt tools, images were everywhere!!
- Infrastructure and virtualization strategies not unified

Learn how to more to effectively manage resources and IT services in the cloud with Tivoli Service Management

- Our teams needed educating on Tivoli's solution capability
- Development, Test teams saw the face of IT as a 'ticket system'

Our approach to delivery…

- Consolidate underutilized IT resources into larger, denser, scalable clusters
- Pool resources
- Manage and control pooled resources

Consolidate

Lab Consolidation Plan

Centralize

Infrastructure Anchor Sites

- Establish an enterprise data center strategy that aligns with the business needs, continuity requirements and geopolitical considerations
- Implement strategy to all locations and geographies including site relocation, consolidation, and new construction

- Reserve resources for applications through standardized images
- Provision and de-provision resources based on reservations
- Manage workloads with advanced scheduling, integrated security and information virtualization

Virtualize

Utilize TSAM

Automate

Implement vCells

- Define virtual resources to separate physical IT resources from its use to deliver services
- Establish single management system for virtual resources
- Integrate security and workload management
- Schedule and control virtual resources based on application requirements and SLAs

Optimize

Leverage ISM Stack

- Optimize workloads to maximize performance and efficiency
- Prioritize workloads to attain SLAs
- Move workloads to appropriate virtualized infrastructures to reduce costs
- Define policies for workload management
- Schedule and orchestrate workloads based on policies

IBM Tivoli Development & Test Cloud Business Results

- **Lowered Costs** - Avoided $10.4M in capital expense and $11.5M in operational expense during a 2yr period through consolidation
- **Reduced Real Estate** - Reduced physical space by 15% while building capacity for 5500 virtual machines
- **Improved Efficiency** - Automated self service provisioning, reduced time to ~15mins, image re-use rather than procurement
- **Accelerated Innovation** – Transformed the role of IT staff to shift focus from administration to providing additional value to it's customers
- **Maximizing** - Virtualised infrastructure running an average of 60% utilization (cpu,mem,storage)
- **Boosted Productivity** - Ability to capture and rapidly share environments during development & testing phases in days/hours rather than months

Key Lessons Learned – Cloud Transformation

Architecture is key

- Delivering a cloud solution requires integration of multiple products with existing and new business processes and the consumability of that solution is the critical factor in success

Use cases must be clearly identified

- Cloud infrastructures have multiple dimensions with a broad set of roles
- Validate that you are addressing everyone's needs and not just a particular role
- Not everything can be tested/developed in a cloud environment*

Implementation should be phased

- Establishing a cloud is a true transformation of both IT and Development business processes
- The alignment of IT and Development operational strategies is key

Return on Investment

- Engage early and often on the topic of ROI – Trust but Verify!!!

Not all Testing/Development can be done in a cloud environment

Test objectives that are best suited for the Cloud are those focused on functionality:

- Agile development methodologies work exceptionally well
- Unit, functional and build verification testing
- Testing of integration/interoperability points between software products
- Install, upgrade, and migration testing
- Globalization, security, time-to-value, and serviceability testing

Physical machines are still needed:

- Many of our clients still use physical machines
- For large customer simulations (high load, long duration)
- For performance, scalability, and capacity planning studies
- In support of “persistent test configurations” which don't benefit from the flexibility of virtualization

It’s important to understand that not all testing can be achieved with virtualization

Tivoli IT has become *smarter* … about delivering "services"

Consolidate & Virtualize

- During 2yr period, avoided over 10.4m capital and 11.5m in expense through consolidation and virtualization
- Single Development, Test & IT infrastructure strategy
- Seven sites had IT consolidated, further 3 to be consolidated by the end of 2011
- Virtualised infrastructure running an average of 60% utilization from an original average of 5-9% utilization per server
- 2055 servers have been relocated, 280 'scrapped', and 474 virtualized

SMALLER. FLATTER. SMARTER.

Standardize & Automate

- Process for accessing provisioning and scheduling services with TSAM
- Process for managing IT services with ISM
- With automation reduced time to provision a server from 12 hrs to ~15mins
- Rapid deployment of image based configurations, reduction in debugging phases

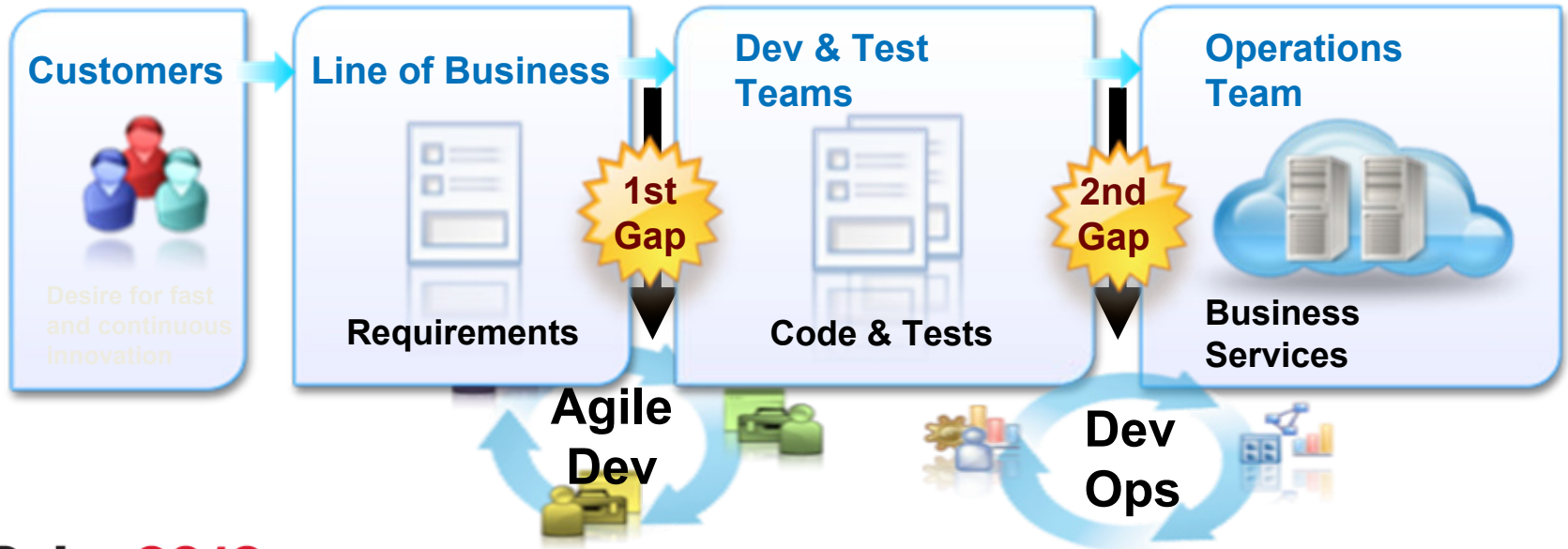
Optimization

- IT staff have bandwidth to focus on continued service improvements
- Over 3800 users, growing daily!
- Over 6000 VMs in use and growing as more servers are virtualized
- Management of the cloud globally whilst being serviced locally

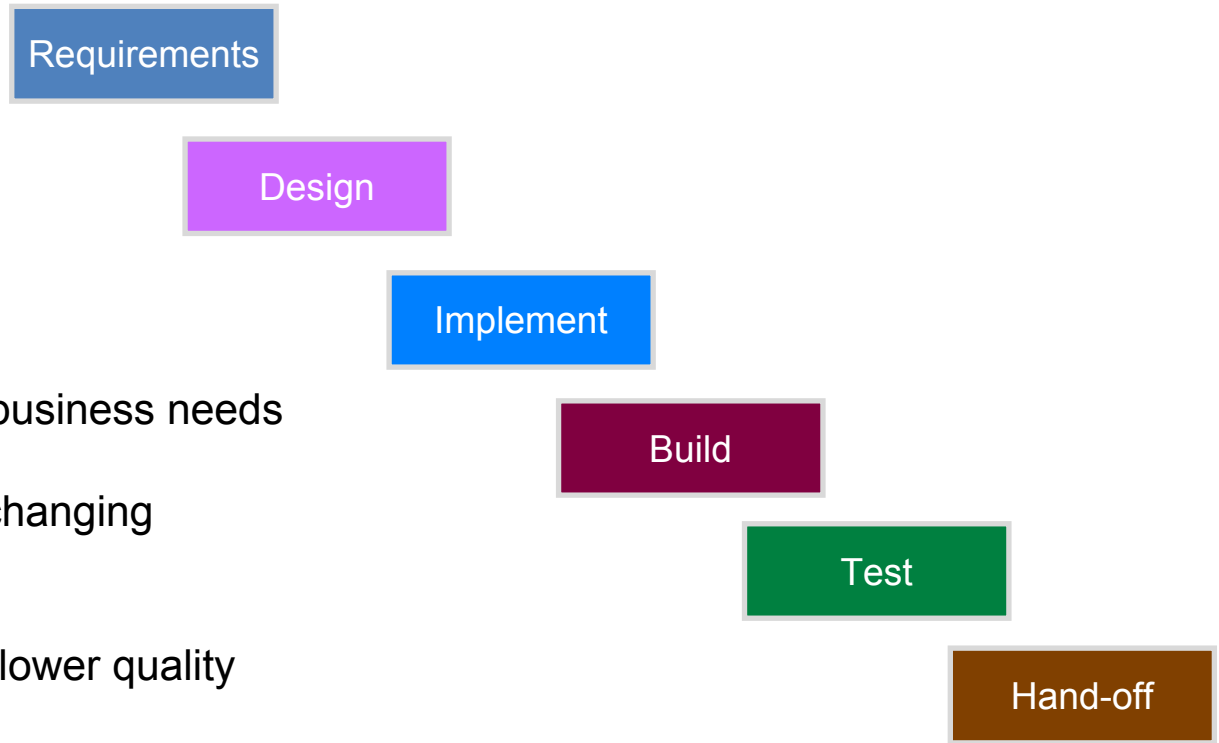
Driving Agile Development

Delivery Challenges

Today's business and technical needs are pushing traditional delivery approaches to the breaking point



Traditional Waterfall Development

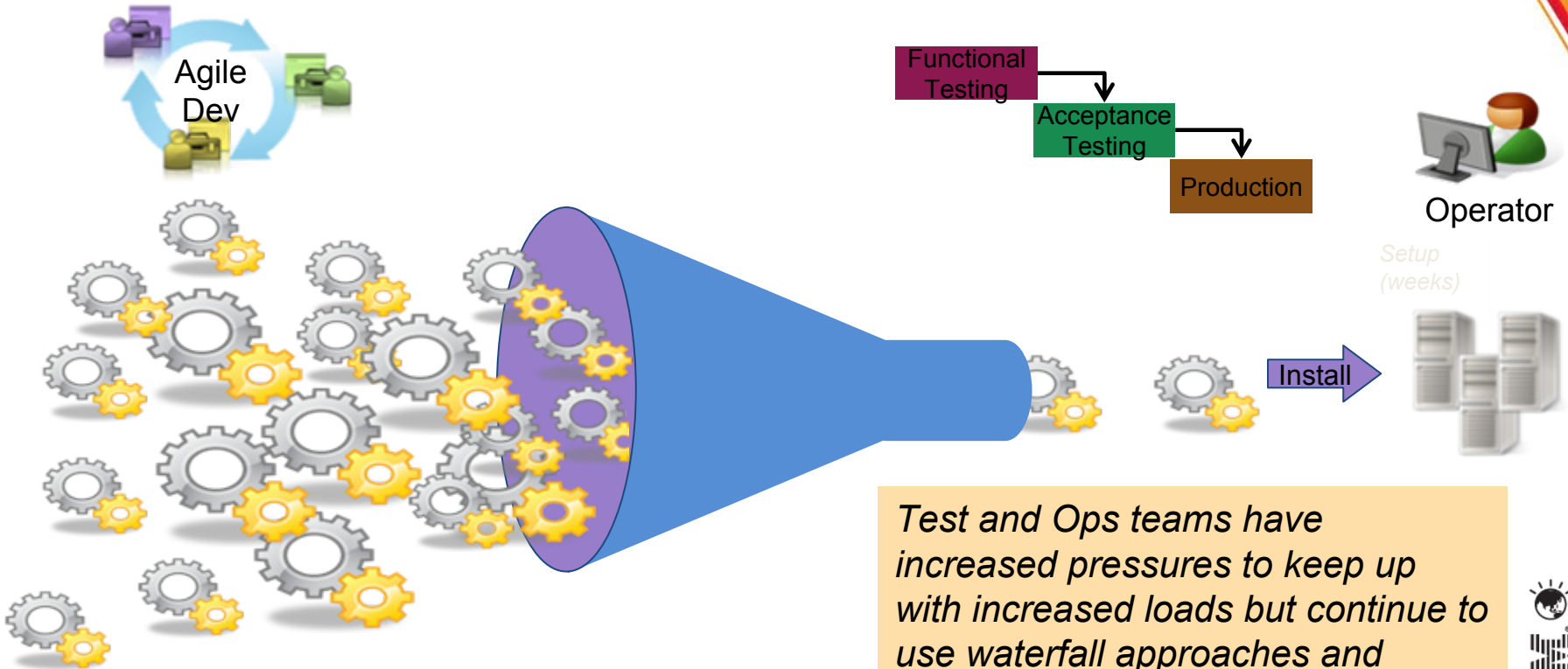


Slow to respond to business needs

Inability to react to changing requirements

Generally results in lower quality

With only Agile Development improvements…

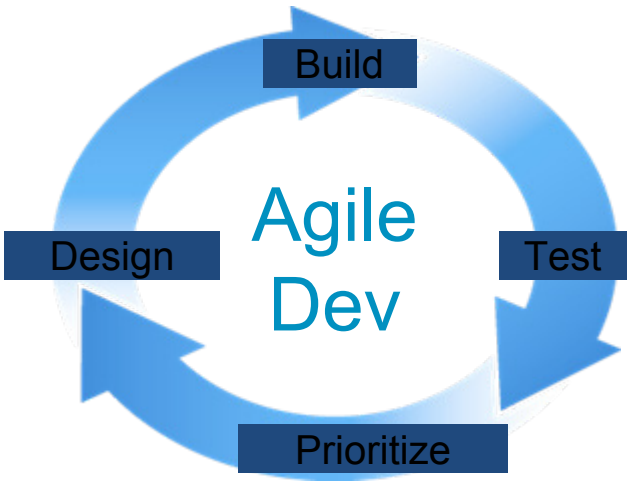


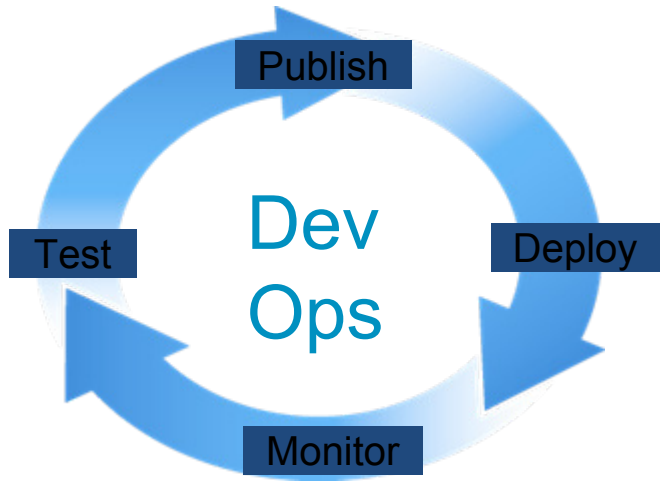
CI builds are piling up

Test and Ops teams have increased pressures to keep up with increased loads but continue to use waterfall approaches and traditional tools.

Agile development and delivery

Continuous Integration extends to Continuous Delivery





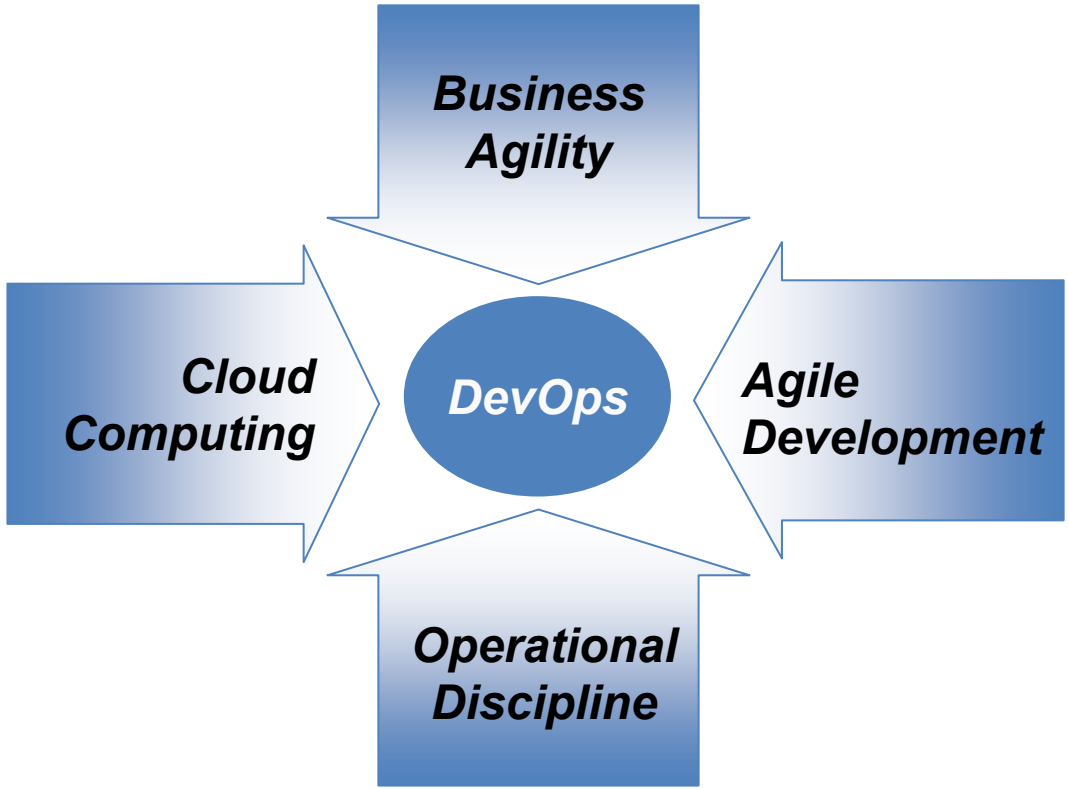
Continuous Feedback

DevOps Principles & Values

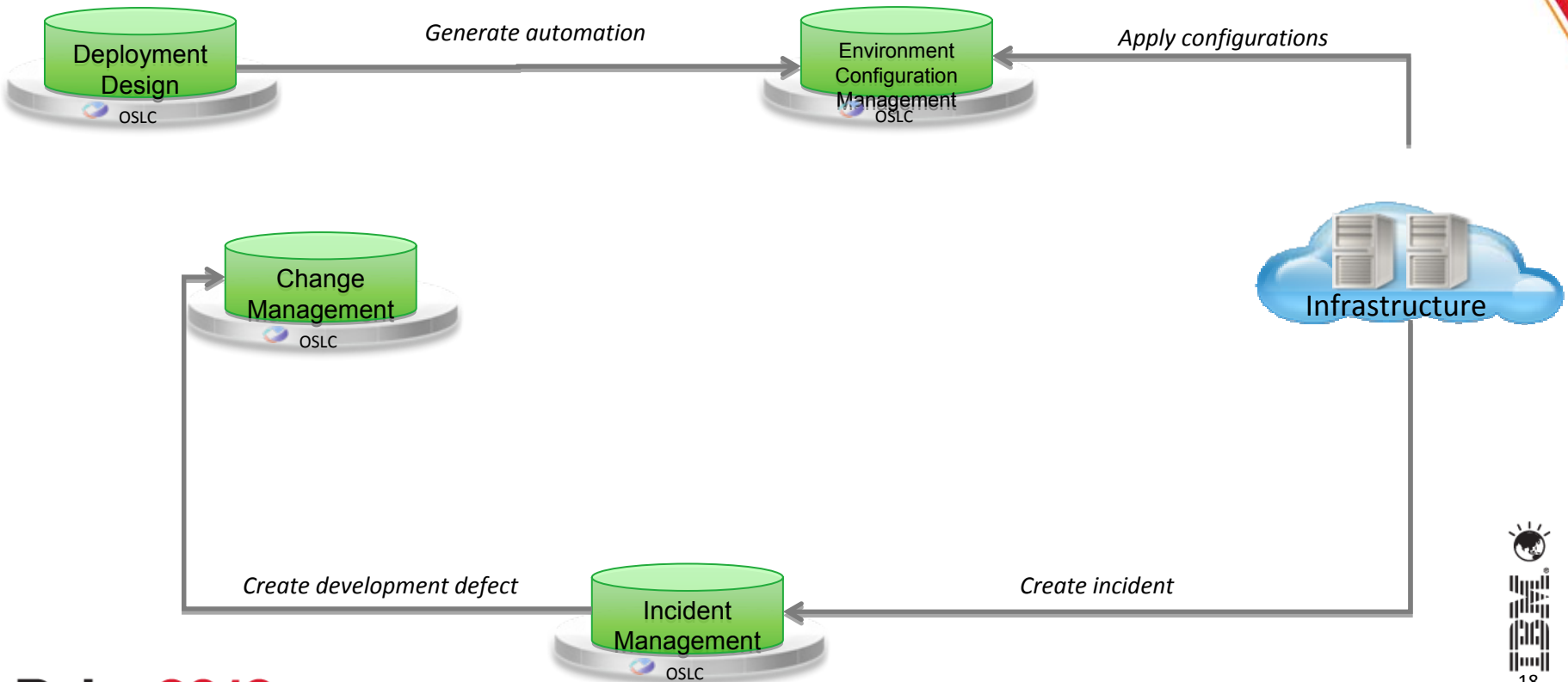
- Collaborate across disciplines
- Develop and test against a production-like system
- Deploy frequently
- Continuously validate operational quality characteristics

DevOps: The time is now

Four key drivers are making DevOps a 2012 imperative for all organizations.

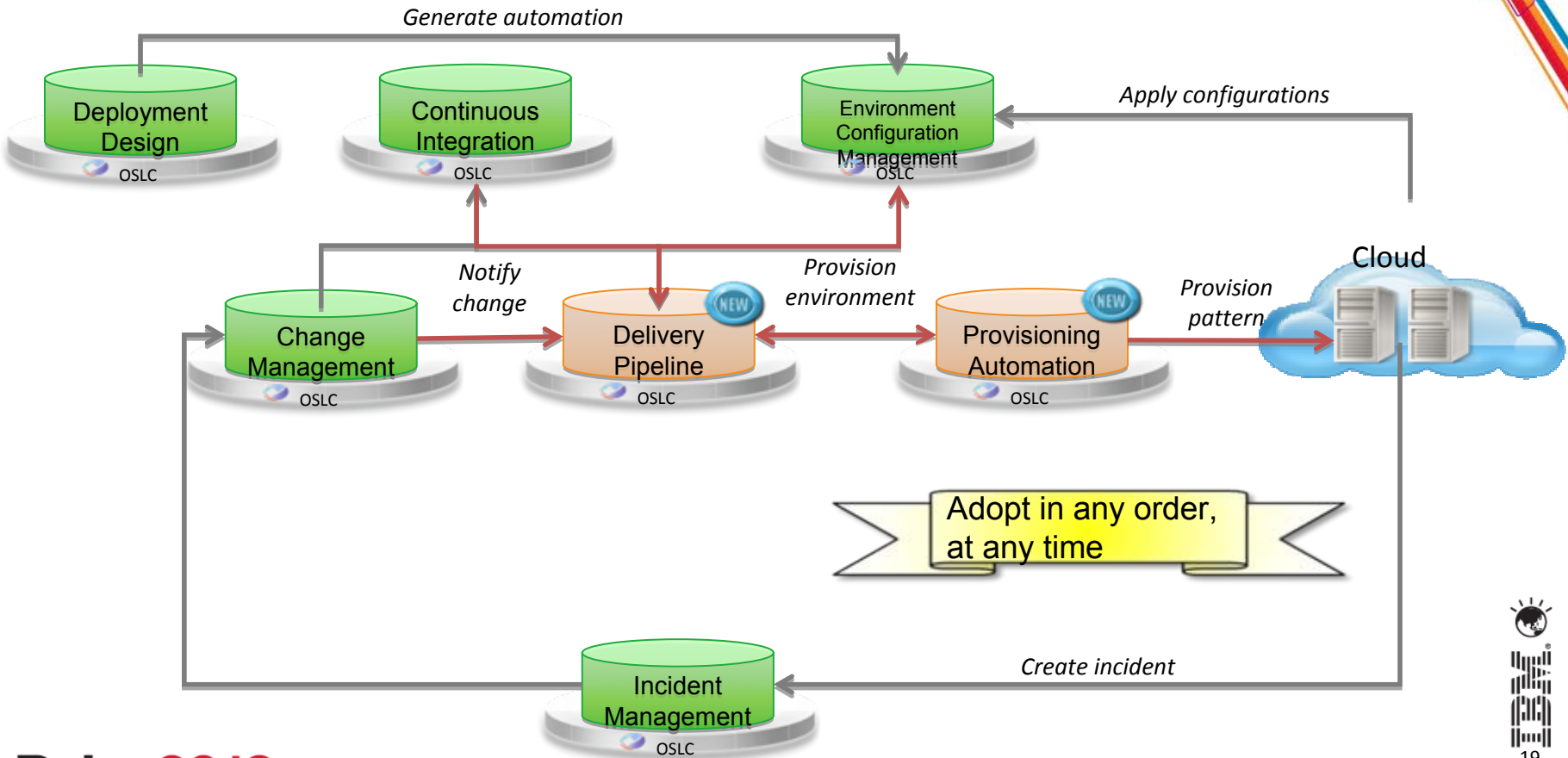


IBM's DevOps Capabilities Today



Integrated capabilities for DevOps

Using open services to drive continuous lifecycle management



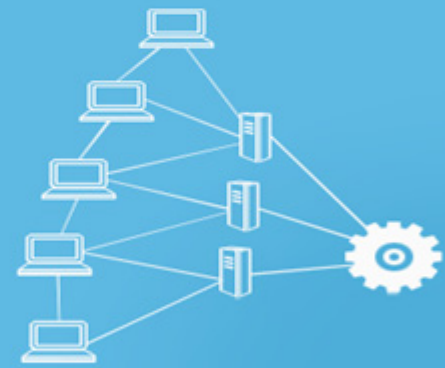
IBM SmartCloud Provisioning

Build a low-touch, highly scalable cloud

IBM SmartCloud Provisioning is a true Infrastructure-as-a-Service cloud, reducing cost and providing a highly scalable, rapid-deployment environment with near- zero downtime and automated recovery across heterogeneous platforms.

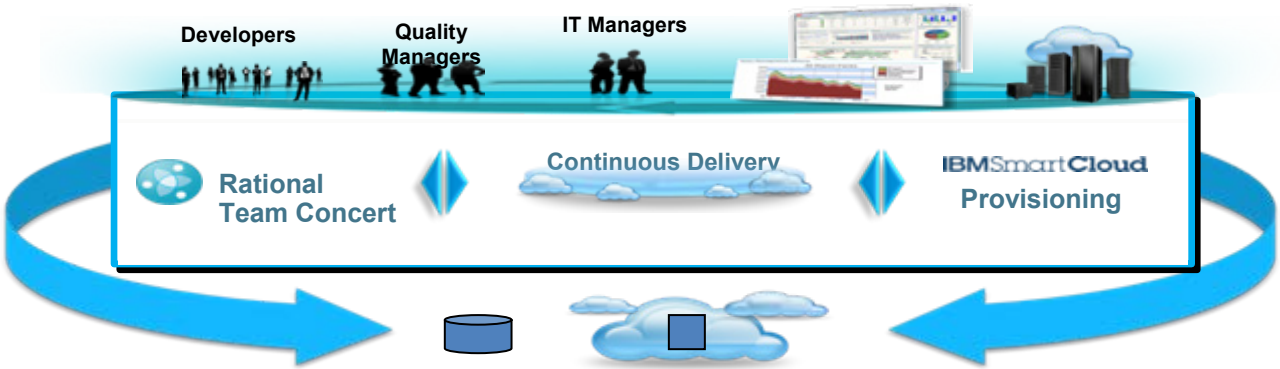
Key benefits:

- **Rapid scalable deployment**
- **Control image sprawl**
- **Image construction and composition tool**
- **Reliable, non-stop**
- **Save IT labor resources at scale**
- **Reduce complexity**



Introducing Continuous Delivery

A simple approach to bringing agility across the lifecycle (beta 2Q2012)



Client Value

- Reduce risk, improve quality; manage change from development to deployment
- Improve efficiency, accelerate delivery; automated handover between processes
- Optimize resources; workload pattern composition delivery

Targeted Entry

- Development team extending Agile into rapid workload deployment in the cloud
- Operation teams delivering scalable, continuous delivery services to the development organization

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