



## Continuous Release and Deployment to compress delivery cycles



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@Dave\_Does



# IBM DevOps Solution Series

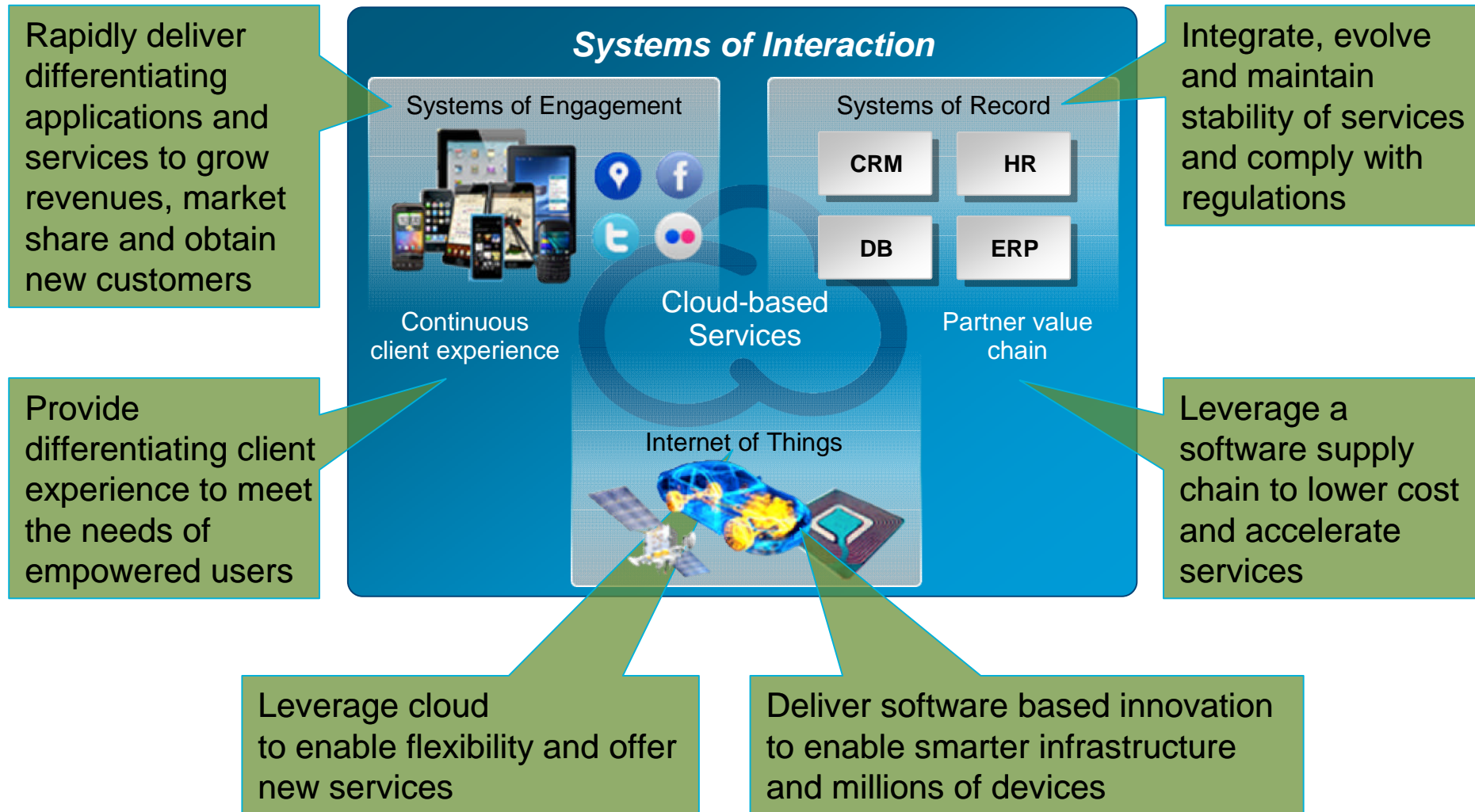
5-part webcast series with IBM DevOps experts

Learn more and register:  
[ibmsystemsmag.com/devops](http://ibmsystemsmag.com/devops)

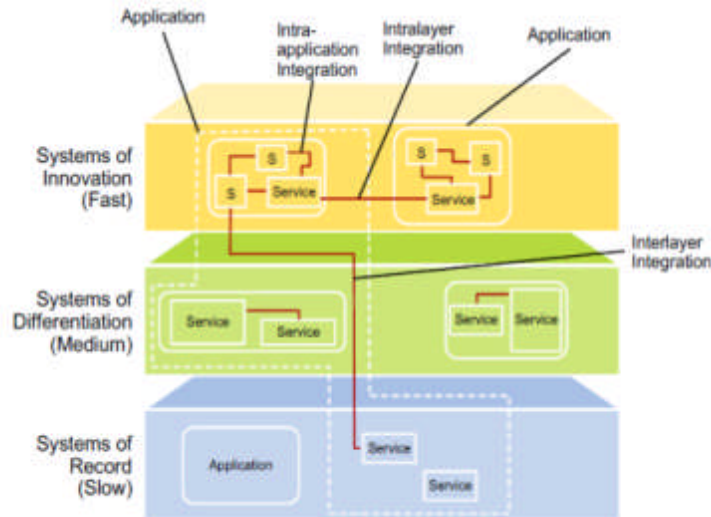
Presenters	Topics	Live On
  	<b>IBM DevOps solution: Accelerating the Delivery of Multiplatform Applications</b> <i>Presenters: Carmen DeArdo, Hayden Lindsey, Mike Perera</i>	Aug 7, 2013
 	<b>IBM DevOps solution: Continuous Business Planning to get cost out and agility in</b> <i>Presenters: Rick Slade, Richard Szulewski</i>	Aug 14, 2013
 	<b>IBM DevOps solution: Collaborative Development to Spark Innovation and Integration among Teams</b> <i>Presenters: Tim Hahn, Danny Mace</i>	Sep 4, 2013
 	<b>IBM DevOps solution: Continuous Testing to save costs and improve application quality</b> <i>Presenters: Rosalind Radcliffe, Marty Shelton</i>	Sep 11, 2013
 	<b>IBM DevOps solution: Continuous Release and Deployment to compress delivery cycles</b> <i>Presenters: David Myers, Mike Baskey</i>	Sep 18, 2013



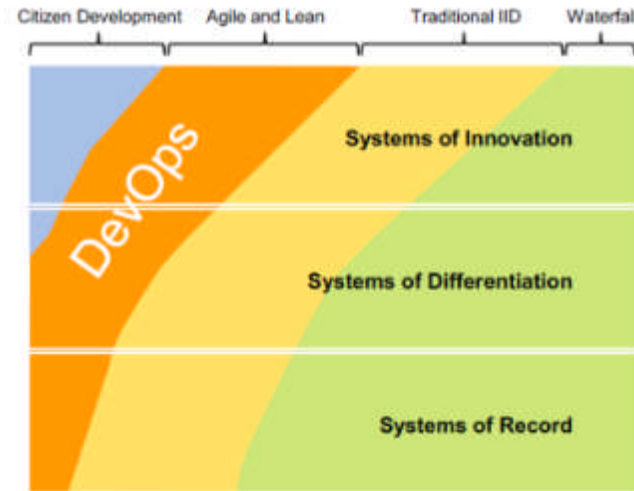
# Business innovations are increasingly driven by software



# Evolving customer and market expectations



Source: Gartner (October 2012)

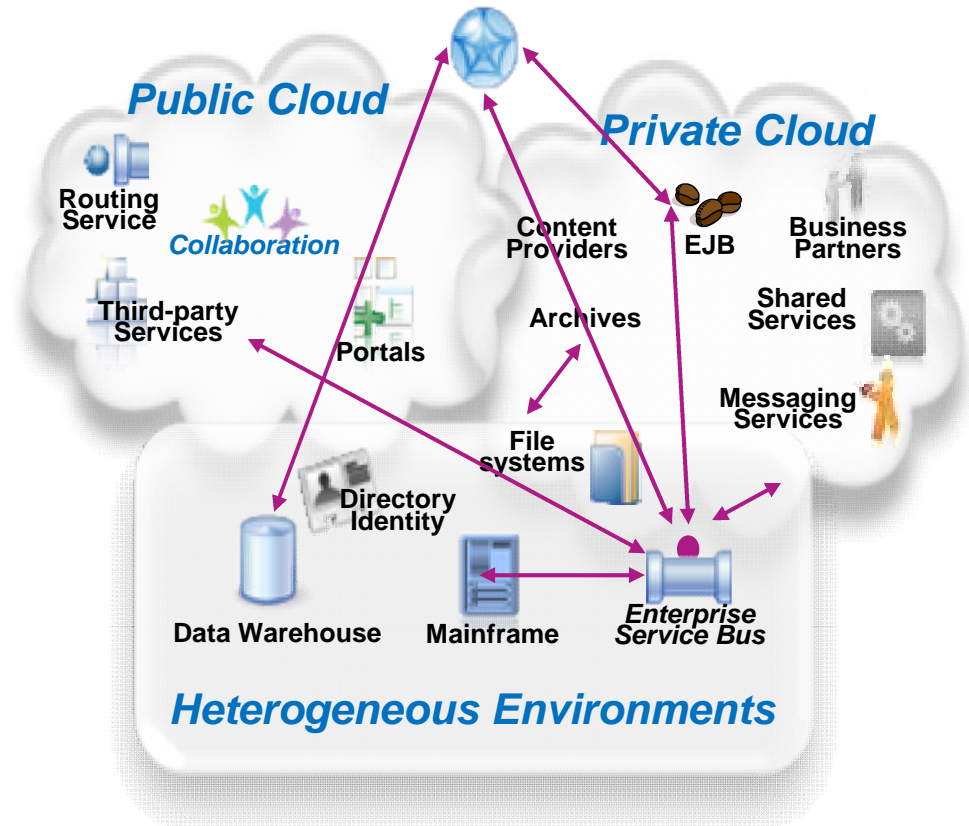


Source: Gartner (October 2012)

Capabilities and User Experience	Today	Emerging
Primary Workload Types	<b>Systems of Record</b> <i>Transactional</i>	<b>Systems of Interaction</b> <i>Big Data, Analytics, Mobile/Social Channels, Transactional</i>
Time to Value	Planned	Opportunistic
<b>Release Frequency</b>	<b>Months to Years</b>	<b>Hours to Days, based on business opportunity</b>
Integration Frequency	Weeks	Continuous
Service Sourcing	Develop	Consume and Assemble (Public and Private)
Operational Model	Systems Management	Built in to application, Recovery Oriented Computing, Continuous Availability
Infrastructure Deployment	Days	Minutes
Risk Profile	Big-Bang (High Risk)	Incremental

## Enterprise Applications are *complex*

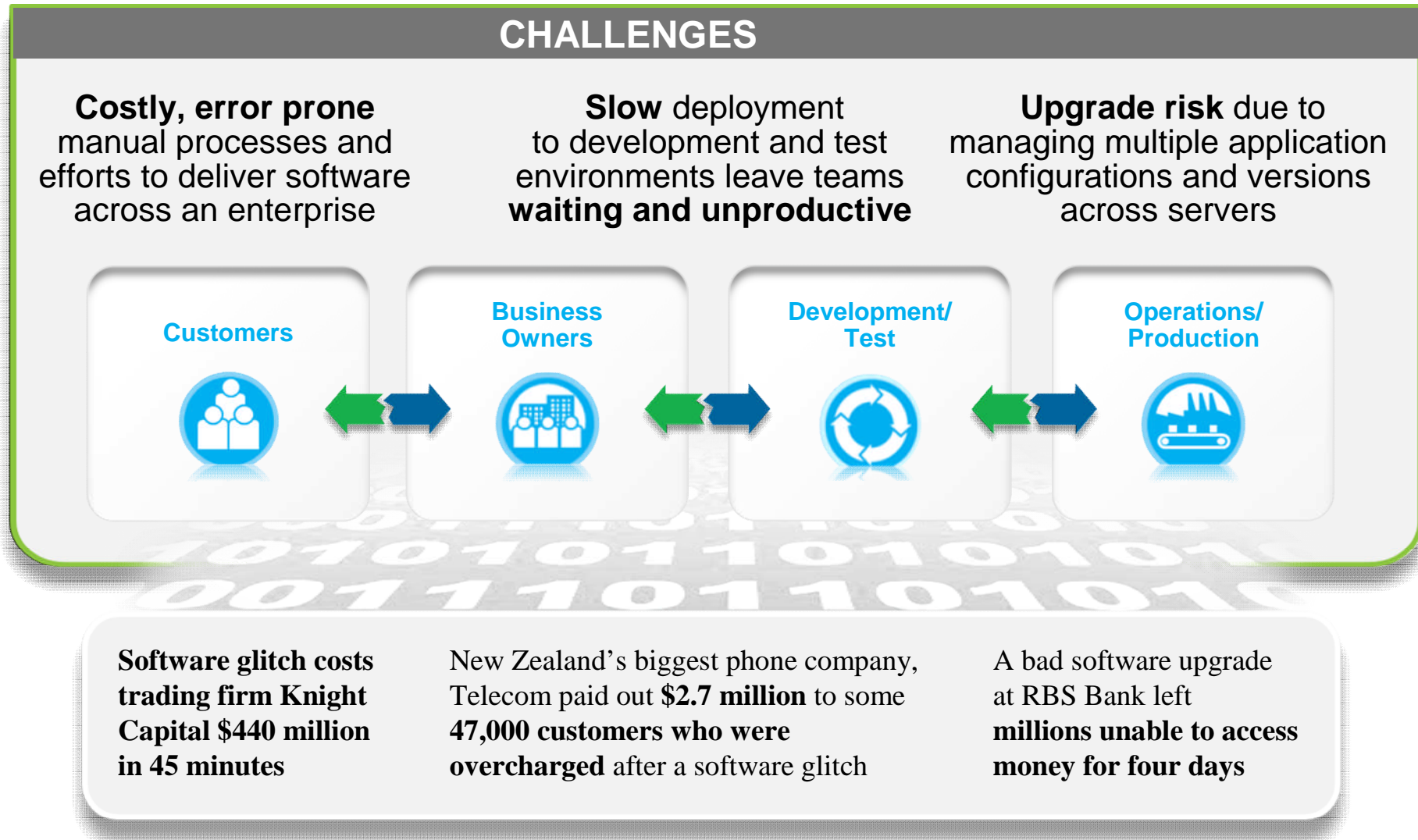
- Interdependent applications and services
- Multi-tier
- Multi-architecture
- Multi-team
- Insourced/outsourced/partners
- Compliance/audit processes
- ...



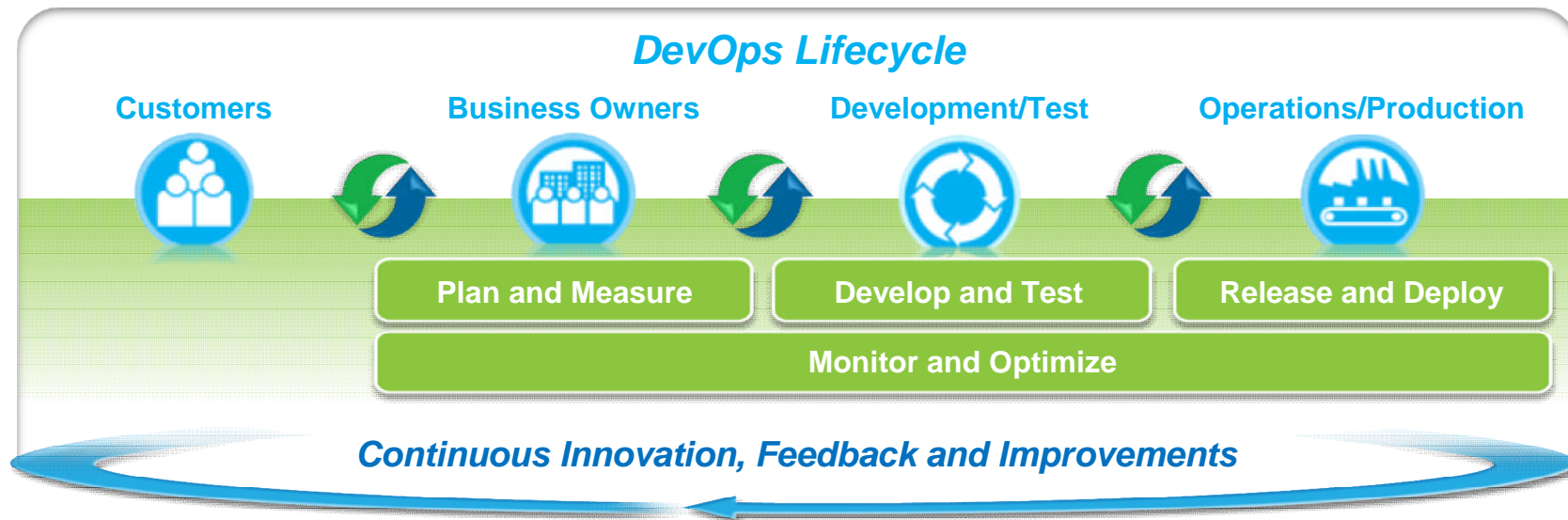




## A lack of continuous delivery impacts the entire business



*DevOps - Enterprise capability for continuous service delivery that enables clients to seize market opportunities and reduce time to customer feedback.*



### **Accelerate Service Delivery**

Expanding collaboration to include customers, LOB and others to eliminate organization silos

### **Balance speed, cost, quality and risk**

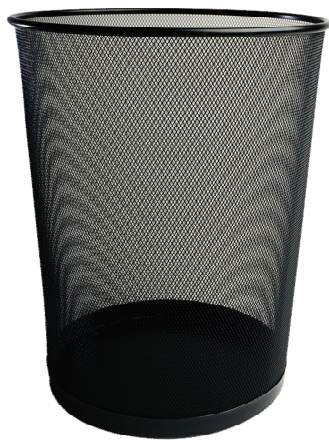
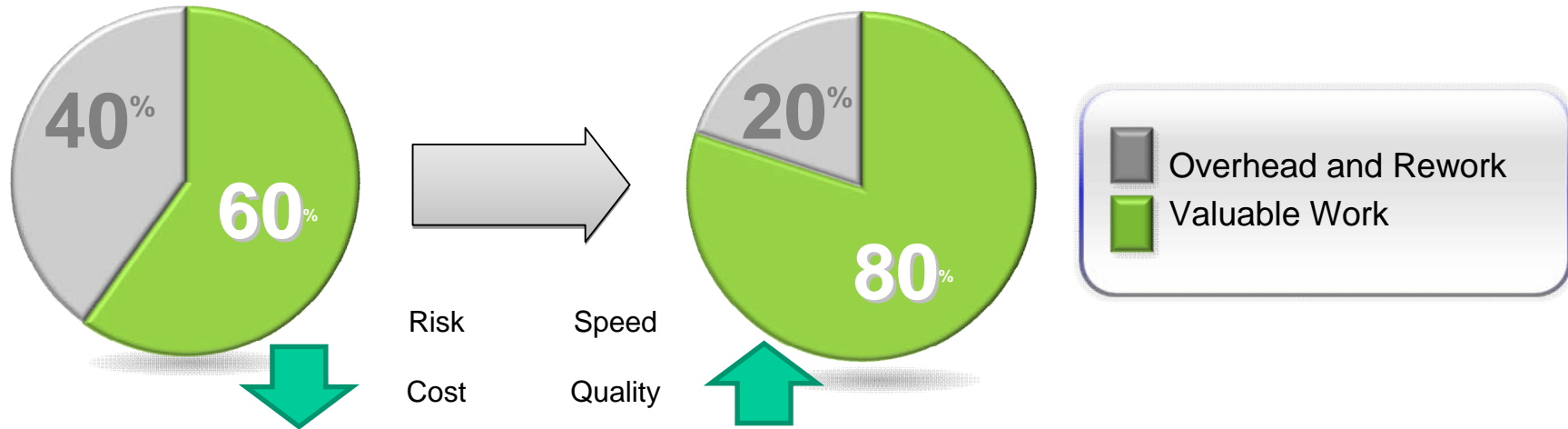
Automating manual processes across delivery lifecycle to eliminate waste/delays and compliance tracking

### **Reduce time to customer feedback**

Enabling a customer feedback loop for continuous improvement



## Removing waste is key to success



Waste of overproduction

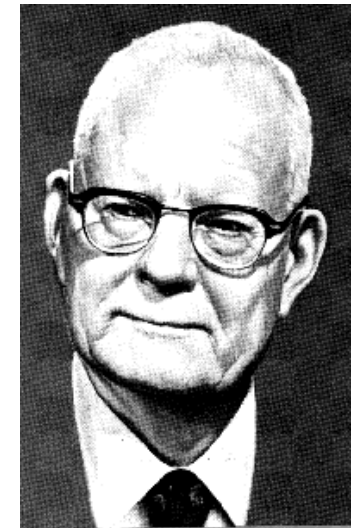
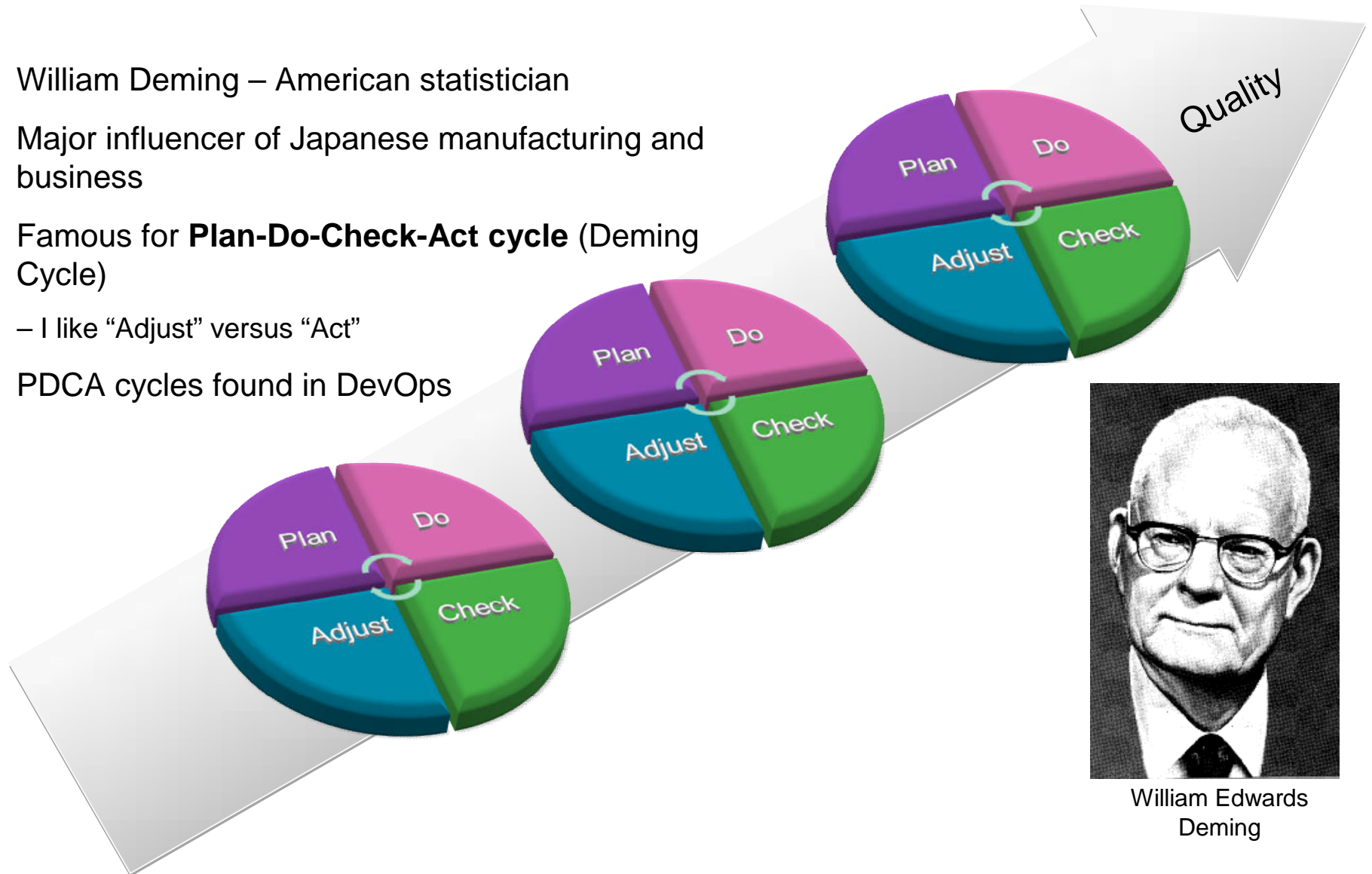
Waste of time and resources waiting

Waste of processes themselves  
(overhead)

Waste of poor quality products

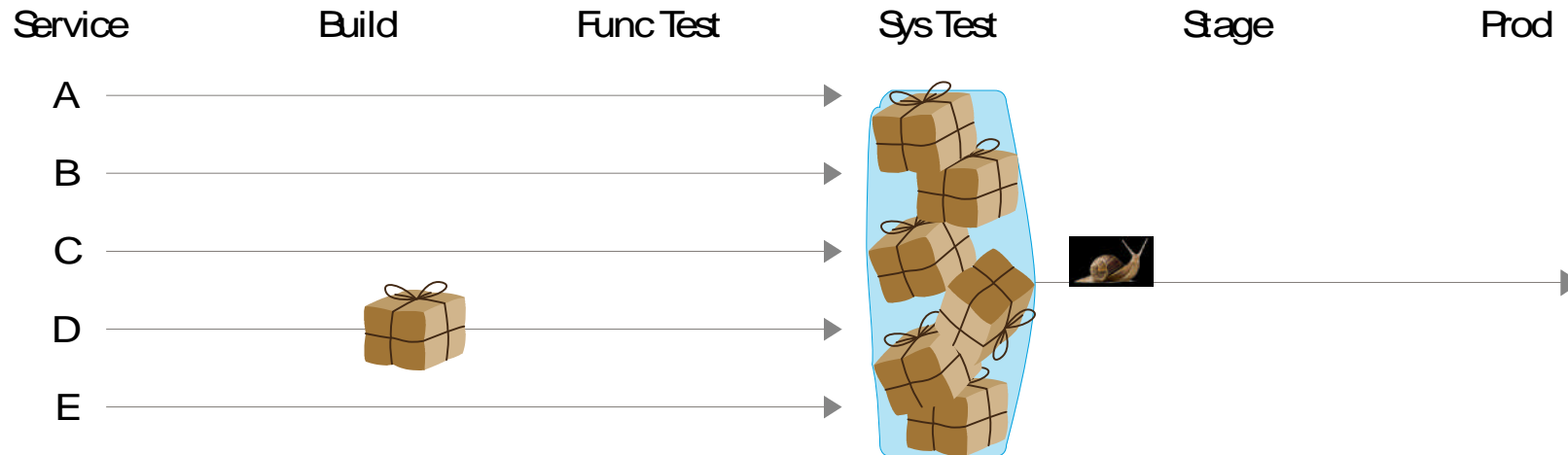
## Deming Cycles

- William Deming – American statistician
- Major influencer of Japanese manufacturing and business
- Famous for **Plan-Do-Check-Act cycle** (Deming Cycle)
  - I like “Adjust” versus “Act”
- PDCA cycles found in DevOps



William Edwards  
Deming

# Large Releases Increase Risk

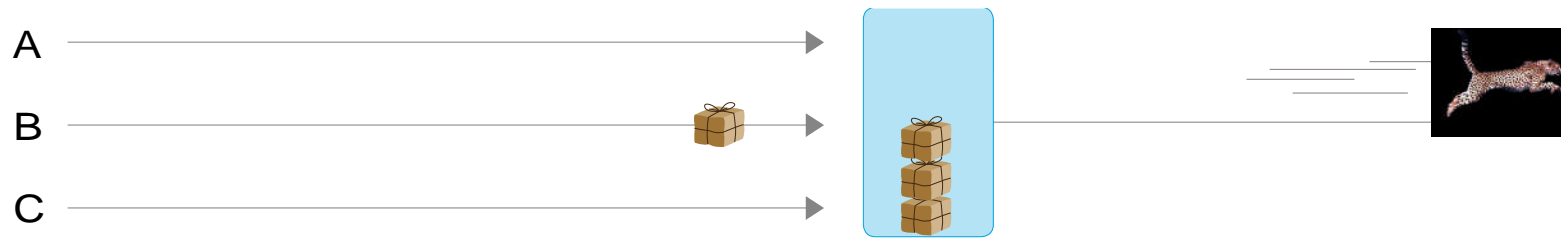


## Large Batch Sizes

- Services: Many
- Dependencies: Many
- Changes: Many
- Complexity: Large
- Impact of Failure: Large
- Failure Analysis: Difficult



# New Calculus for Release and Risk



## Small Batch Size

- Services: Few
- Dependencies: Few
- Changes: Few
- Complexity: Small
- Impact of Failure: Small
- Failure Analysis: Simple



## DevOps Principles and Values

Develop and test against a production-like environments

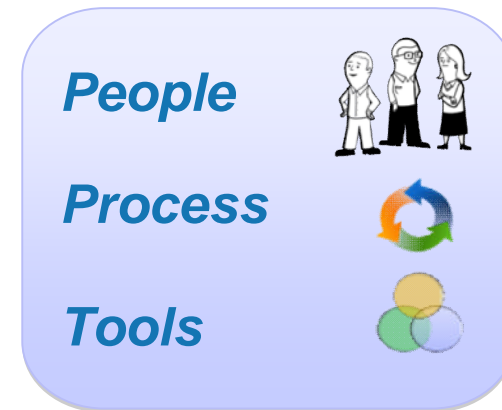


Iterative and frequent deployments using repeatable and reliable processes



Continuously monitor and validate operational quality characteristics in all environments

Monitor and improve

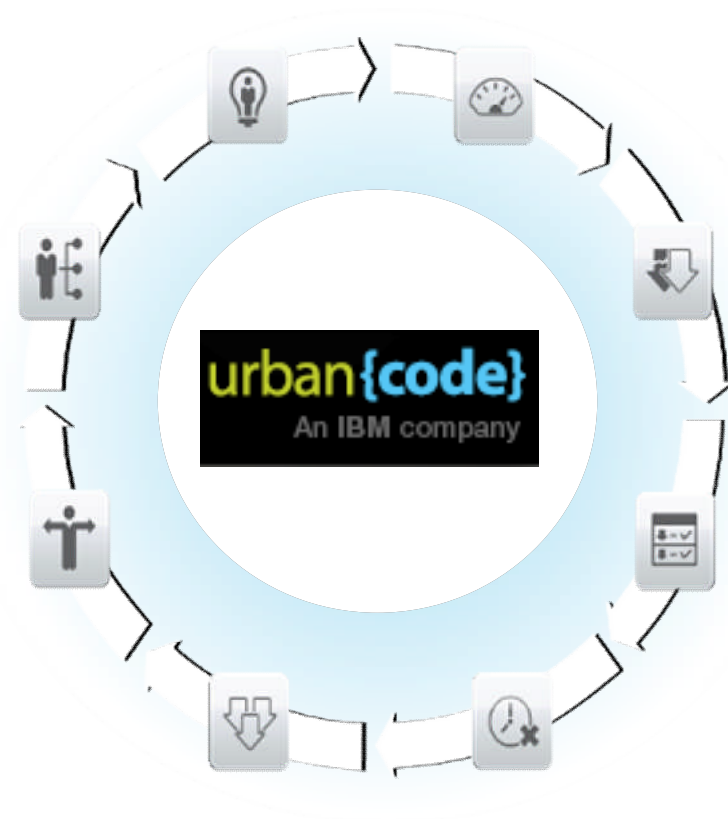




## IBM UrbanCode

*Enabling clients to more rapidly deliver mobile, cloud, big data analytics and traditional applications with complementary DevOps capabilities*

- **Drive down costs**
  - Reduce the amount of manual labor, resource wait-time, and rework
- **Speed time to market**
  - Increase frequency of software delivery
- **Reduce risk**
  - Deliver higher quality application releases with increased compliance



*“Mobile development moves more quickly than most enterprises are accustomed to. The coordination required, and the pace being driven by mobile, is a big factor driving DevOps in the enterprise.”*

- Eric Minick, **UrbanCode**.

# Application Deployment Automation

## Deployment of Applications across Environments

The screenshot shows the uDeploy web interface for managing the JPetStore application. The top navigation bar includes links for Dashboard, Components, Applications, Configuration, Resources, Deployment Calendar, Work Item, Reports, and Settings. The main content area is titled 'Application: JPetStore' and features a 'Description' section with tabs for Environments, Gates, History, Edit, Properties, Components, Snapshots, Processes, Calendar, Tasks, Changes, and Security. The 'Environments' section is active, displaying three environments: SIT (blue), UAT (orange), and PROD (yellow). Each environment has a table of 'Latest Desired Inventory' with columns for Component, Version, Snapshot, Properties, Status, and Compliance. The SIT and UAT environments show three components (JPetStore-APP, JPetStore-DB, JPetStore-WEB) with their respective versions and compliance status. The PROD environment shows no components installed.

Environment	Component	Version	Snapshot	Properties	Status	Compliance	Actions
SIT	JPetStore-APP	1.0		Version 5	Active	Compliant (1/1)	View Request
	JPetStore-DB	1.1		Version 1	Active	Compliant (1/1)	View Request
	JPetStore-WEB	1.1		Version 3	Active	Compliant (1/1)	View Request
UAT	JPetStore-APP	1.0	Baseline	Version 8	Active	Compliant (1/1)	View Request
	JPetStore-DB	1.0	Baseline	Version 8	Active	Compliant (1/1)	View Request
	JPetStore-WEB	1.0	Baseline	Version 2	Active	Compliant (1/1)	View Request
PROD	No components have been installed to this environment. - Refresh						

- Manage application components and versions
- Manage environment configuration from dev/test through production
- Compliance: audit trails quality gates
- Easy to use process designer
- Inventory: what is where

# IBM UrbanCode Deploy configuration settings

uDeploy Hello admin | Help | Logout

Dashboard Components Applications **Configuration** Resources Deployment Calendar Work Items Settings

Home > Configuration

Application / Component / Environment

- [-] JPetStore
- [-] JPetStore-Jenkins
- [-] JPetStore-Jetty
- [-] PetShop
  - [-] IIS
    - SIT
    - UAT
    - Prod
  - [-] Net Framework
    - SIT
    - UAT
    - Prod
  - [-] PetShop-APP
    - SIT
    - UAT
    - Prod
  - [-] PetShop-DB
    - ...

### Component: PetShop-APP

Variables for this component regardless of environment.

#### Properties

[Add Property](#)

Name	Value	Description	Actions
appcmd.path	C:\Windows\System32\inetsrv		<a href="#">Edit</a> <a href="#">Delete</a>
code	78ecf0dfadfb6a38ea8f4bf8d8528950867a039c	trigger code for anthill	<a href="#">Edit</a> <a href="#">Delete</a>

10 per page 2 records - [Refresh](#)

[Add Property](#)

#### Environment Property Definitions

Define properties here to be given values on each environment the component is used in.

[Add Property](#)

Name	Label	Required	Default Value	Description	Actions
web.dir	web.dir	false	C:\Live		<a href="#">Edit</a> <a href="#">Delete</a>
db.server	db.server	true			<a href="#">Edit</a> <a href="#">Delete</a>
db.user	db.user	true			<a href="#">Edit</a> <a href="#">Delete</a>
db.password	db.password	true	****		<a href="#">Edit</a> <a href="#">Delete</a>
web.port	web.port	false			<a href="#">Edit</a> <a href="#">Delete</a>
web.url	web.url	false			<a href="#">Edit</a> <a href="#">Delete</a>

10 per page 6 records - [Refresh](#)

[Add Property](#)

#### Configuration Templates

Name	Actions
web.config	<a href="#">View</a> <a href="#">Edit</a>
applicationHost.config	<a href="#">View</a> <a href="#">Edit</a>

10 per page 2 records - [Refresh](#)

[Create New Configuration Template](#)

uDeploy is ready for lots of config.

This stuff changes across those environments

Secure stuff is secure.

You can even replace whole files with templated versions at deploy time.

Store app configuration in your deploy tool where it's safe from junior devs.

# IBM UrbanCode Deploy process designer

The screenshot displays the IBM UrbanCode Deploy process designer interface. At the top, there is a navigation bar with the 'uDeploy' logo and user information 'Hello admin | Help | Logout'. Below this is a breadcrumb trail: 'Home > Components > JPetStore-APP-Jenkins > Processes > Process: Install'. The main title is 'Process: Install', with a description 'Version 19 of 19'. A callout bubble points to the version information, stating 'These designs are versioned.' Below the title are tabs for 'Design', 'Edit', 'Properties', and 'Changelog'. On the left, there is a 'Tools' section with various icons and an 'Add Steps' section. Below that is a list of 'Available Plugin Steps' including Manual Task, Add Inventory Status, Remove Inventory Status, Artifacts, BI, Builders, Configuration Management, DB, Deploy, Installers, Integration, Scripting, SQL, and UrbanDeploy. A callout bubble points to this list, stating 'Hundreds of built-in steps. (and you can make your own with our open plugin system!)'. The central area shows a workflow diagram with steps: 'Stop Application', 'Undeploy Application', 'Erase Scratch Directory Shell', 'Download Artifacts By Label', 'Unwar Shell', 'Replace Tokens', 'Rewar Shell', and 'Deploy Application'. A callout bubble points to the 'Undeploy Application' step, stating 'Super easy drag-and-drop configuration. Click the pencil icon to do the detailed config of each step.' Another callout bubble points to the 'Download Artifacts By Label' step, stating 'Moving the artifacts/files/stuff for you to deploy is handled for you. No FTP, network file shares or other craziness required.' A small thumbnail of the workflow is visible in the top right corner of the design area.

# IBM UrbanCode Deploy Application environment inventory

uDeploy Hello admin | Help | Logout

Home » Applications » PetShop Information Resources Deployment Calendar Work Items Settings

**Application: PetShop**

Description

Environments **History** Edit Properties Components Snapshots Pro

**Environments**

Drag environments by their label boxes to order them.

**SIT**

Actions

Request Process

Compare Copy

Inactivate

**Latest Inventory**

Component	Version	Snapshot	Properties	Status	Compliance	Actions
PetShop-DB	2279		Version 2	Active	Compliant (1/1)	View Request
Net Framework	4.0	baseline - petshop	Version 1	Active	Compliant (1/1)	View Request
IIS	7.5	baseline - petshop	Version 1	Active	Compliant (1/1)	View Request
PetShop-APP	2306		Version 20			

10 per page 4 records - Refresh

**UAT**

Actions

Request Process

Compare Copy

Inactivate

**Latest Inventory**

Component	Version	Snapshot	Properties	Status	Compliance	Actions
PetShop-DB	2279	baseline - petshop	Version 1	Active	Compliant (1/1)	View Request
PetShop-APP	2299	baseline - petshop	Version 11	Active	Compliant (1/1)	View Request
Net Framework	4.0	baseline - petshop	Version 1	Active	Compliant (1/1)	View Request
IIS	7.5	baseline - petshop	Version 1	Active	Compliant (1/1)	View Request

10 per page 4 records - Refresh

**Prod**

Actions

Request Process

Compare Copy

Inactivate

**Latest Inventory**

Component	Version	Snapshot	Properties	Status	Compliance	Actions
No components have been installed to this environment. - Refresh						

Show Inactive Environments

Create New Environment Define your own environments

The "Petshop" is made of 4 deployable components and is deployed to 3 environments.

Inventory of correct versions of each component and full app in each environment. SIT has newer stuff.

Compliance  
How many of our machines actually have the right version?

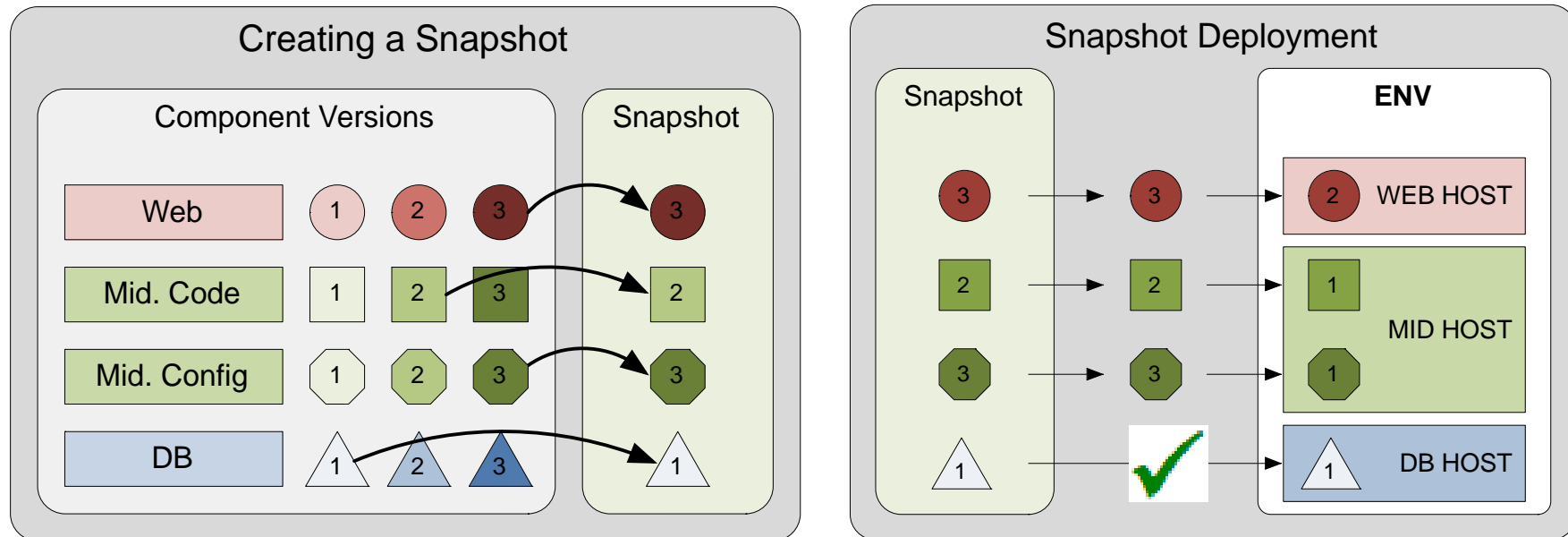
The variables used at deploy time are versioned and tracked along with the deployed binaries.

Compare one env.'s versions, settings and files to another. Super easy.

Easily see how this got there.



## Snapshots – A Version of the App



Contents of environments that pass tests

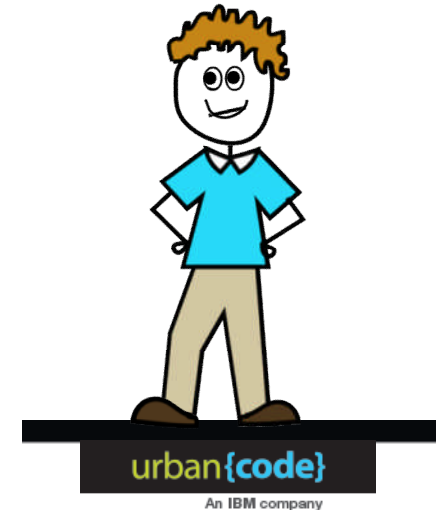
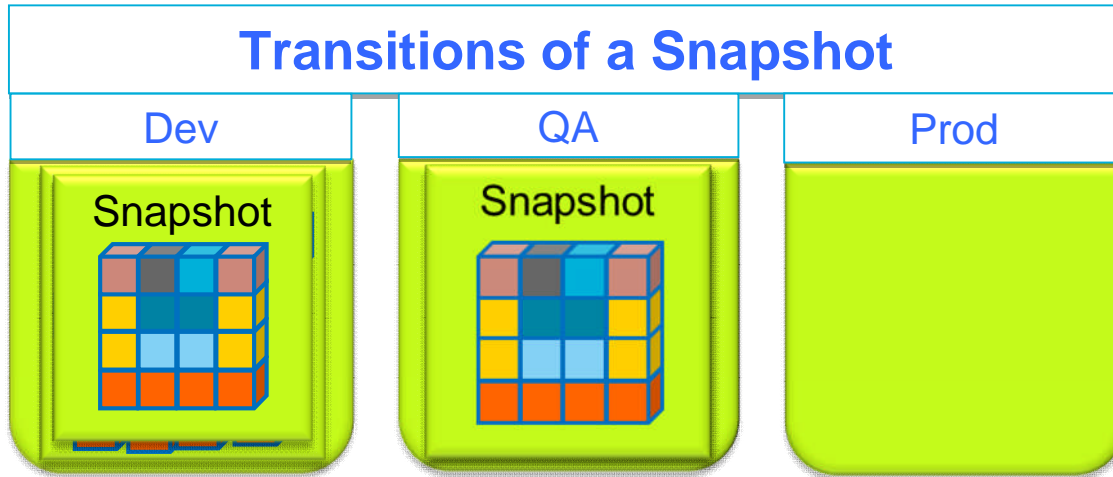
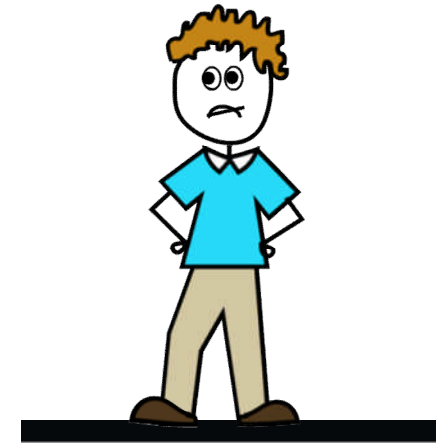
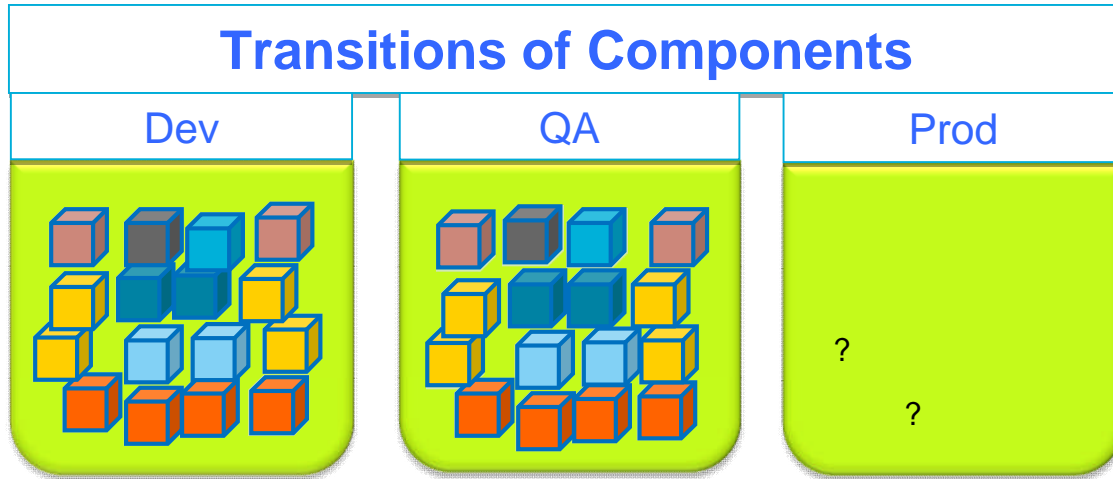
- contain deployable version and configuration

Deployments are based on deltas

They help with:

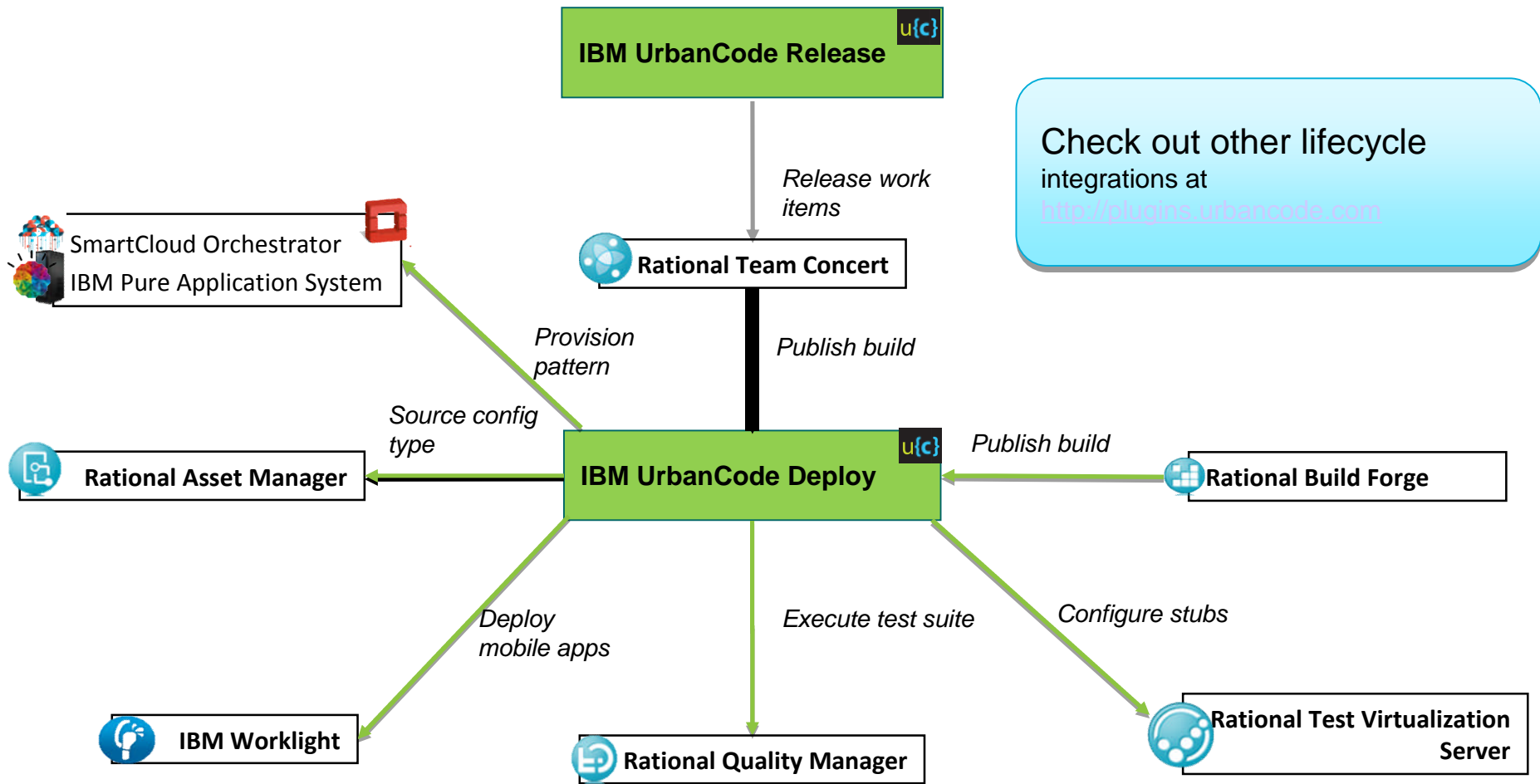
- ✓ Automation, Audit, and Visibility

# Snapshots



# New Application Lifecycle Integrations

Providing richer linked data integrations across the entire application lifecycle



# Release and Deployment solutions

*Deliver measurable business results*

## **International Investment Firm**

### *Driving Down Costs*



Release process required considerable effort and delayed by manually-introduced errors

- Solution: Automated release process
- Results: Cost avoidance of over \$2.3M/year, reduced release time from 2-3 days to 1-2 hours and virtually eliminated test team “down-time”

## **Online Retailer**

### *Speeding Time-to-Market*



Significant delays getting application changes to production

- Solution: Scaled up continuous deployment
- Results: Deployment time reduced by over 95% with easy scale and deploying to over 250 servers within 2 months of implementation

## **Higher Education**

### *Speeding Time-to-Market*



Agile development teams constrained by slow deployment to dev. and test environments

- Solution: Accelerate deployment by enabling development teams to self deploy with automation
- Results: Deployments cut from hours to minutes and a greater number of servers with fewer resources

## **SaaS Software Provider**

### *Reducing Risk*



Difficulty managing multiple customer configurations and versions of software deployed across servers

- Solution: Automate managing configuration and version deployment
- Results: Execute customer specific releases, reduced deployment outages by over 90%

Our experience tells us that Enterprise Clouds need to be **Workload Optimized** to maximize business outcomes



- Workloads have unique requirements
- Successful cloud deployments:
  - ✓ Build requirements **awareness** into the workloads
  - ✓ Provide **intelligence** to manage service levels
  - ✓ Leverage **patterns** for workload optimization

**1 in 5 data centers can allocate more than 50% of their IT budget to delivering new capabilities**

**Most Efficient Data Centers**

**Least Efficient Data Centers**

**83%**

Move VMs to Perform Maintenance

**25%**

**58%**

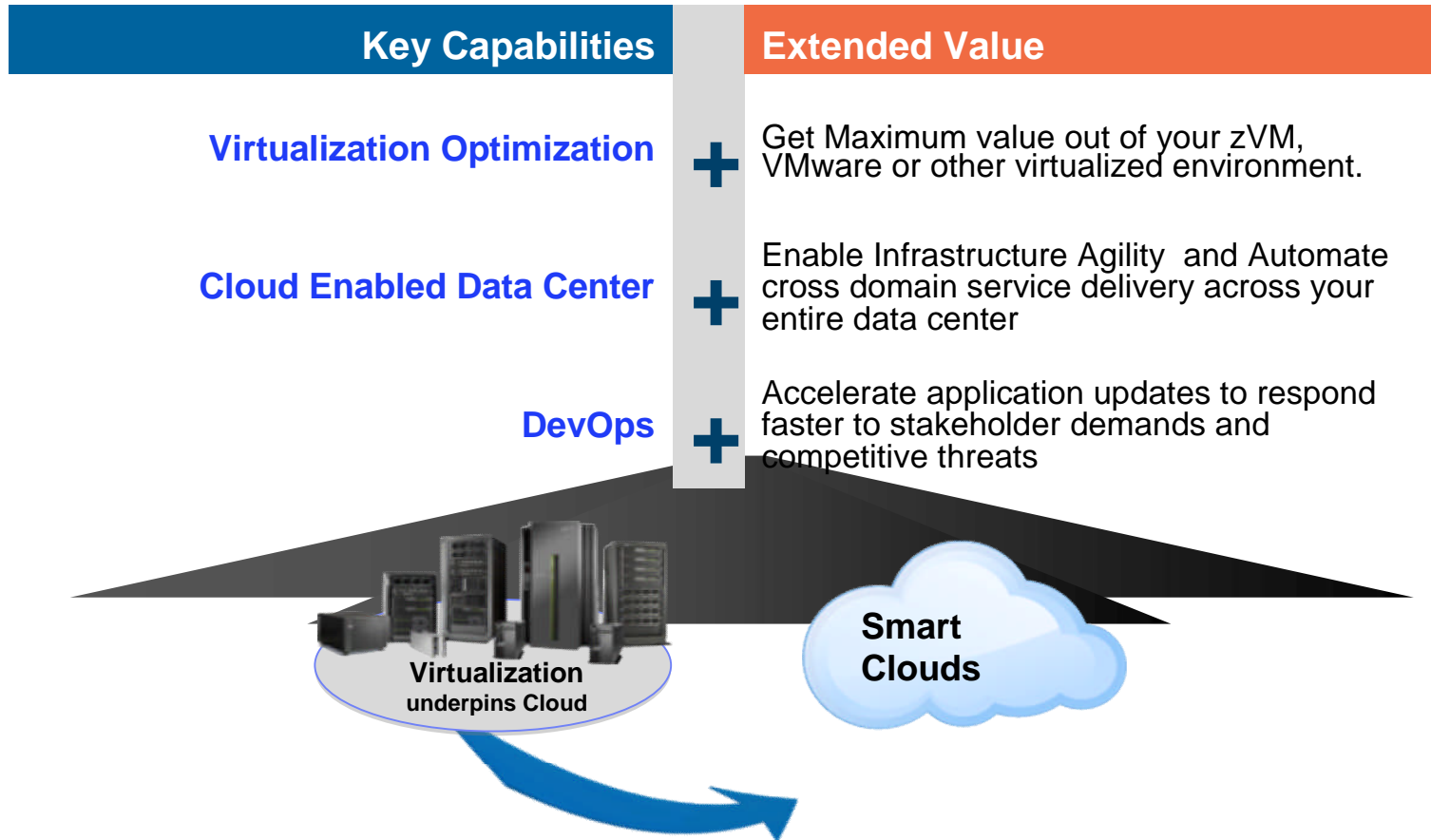
Meet SLAs

**1%**

Source: 2012 IBM Data Center Study



As enterprises move beyond virtualization to higher value stages of Cloud, having Cloud Management is critical to their success.



# The IT challenges

## Infrastructure

We have lots of tools, to manage **isolated automation tasks**

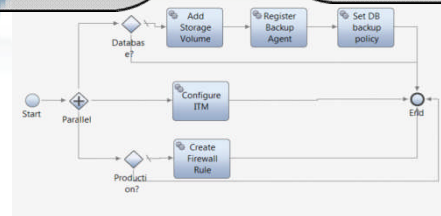
But getting everything coordinated is challenging and **takes a lot of time**

## Operations

Releasing a new application in production **is a lot more than creating a virtual machine.**

And after deployment, I need to manage its **entire lifecycle.**

I need to link different tools, people, departments. **It takes weeks.**



## Development

I need to **accelerate delivery** and improve feedback between development and production.

## Business

I need to **react quickly to market demand.** IT is not fast enough to support my strategy and is slowing down innovation



# Why do clients need an Orchestrator ?

**Automated**

Customers are looking for end to end automation of cloud service delivery  
Provisioning play a key role, but is just one of many steps that must be automated

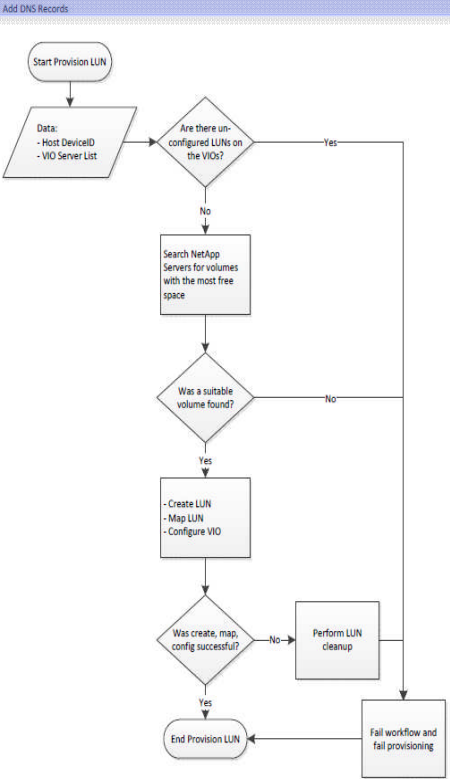
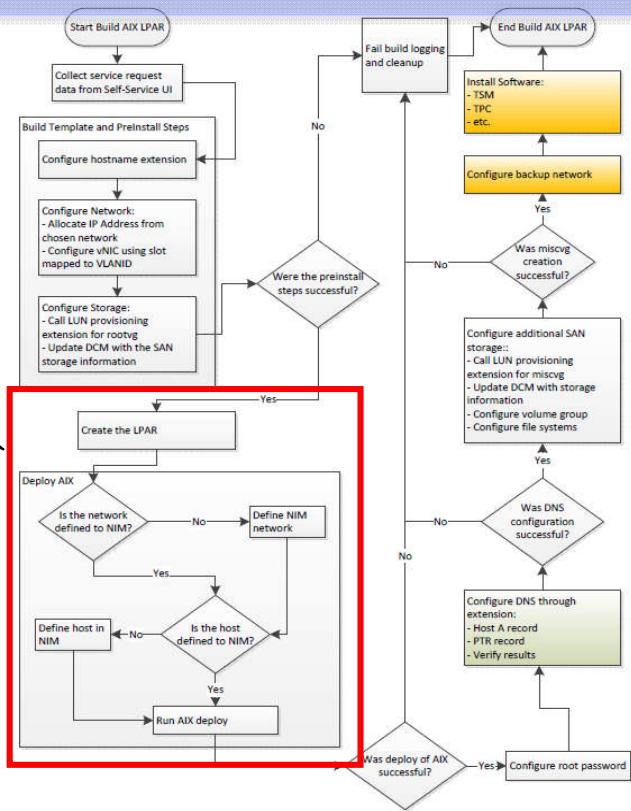
**Standardized**

Deliver “services”: repeatable and controlled process, simplified consumption, auditable

**Flexible**

Each customer has unique requirements to integrate with existing data center processes and tools.

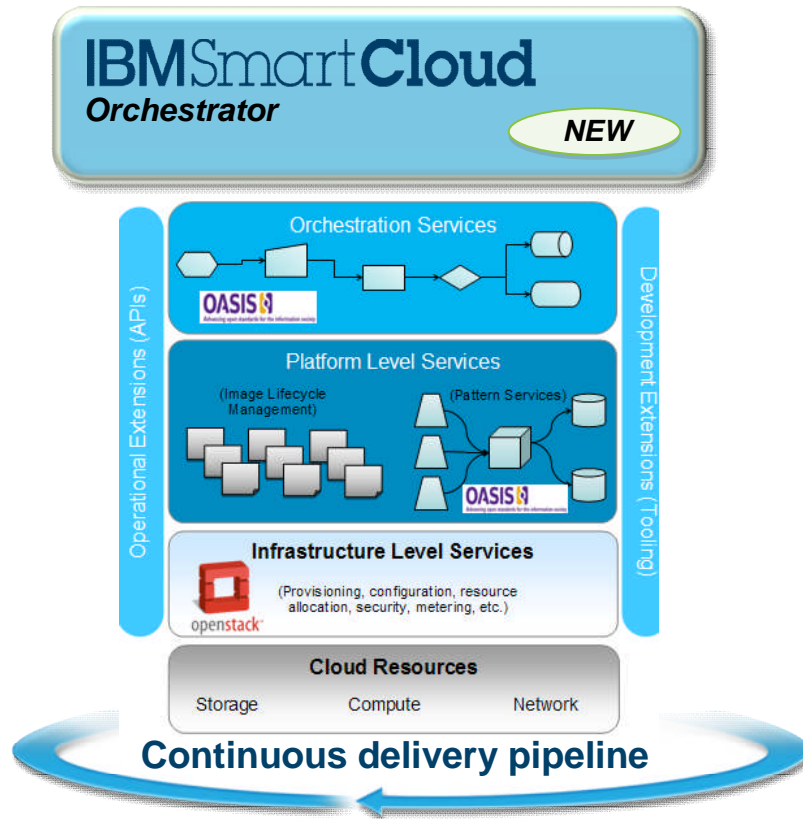
VM Provisioning



Real customer example

# SmartCloud Orchestrator

*Open, dynamic orchestration of resources, workloads and services*



- Fully automates the deployment and lifecycle management of cloud services across resources, workloads and services
- Built on a foundation of open standards – TOSCA, OpenStack, OSLC
- Accelerated deployments with reusable workload patterns and Chef recipes
- Unified management of heterogeneous environments
- Both all IBM servers and 3<sup>rd</sup> party resources
- Supports deployment of hybrid & public clouds
- Works with SmartCloud Continuous Delivery to provide extended DevOps platform

Reduce time-to-market to deliver new business services

Improve administrator productivity





# SCO Service Catalog – an Overview

IBM SmartCloud Orchestrator Administrator | Help | About | Logout

Welcome **Service Catalog** Service Requests Instances

Service Catalog >> All Categories Search for a Service...

**My Favorites**  
The service offerings which you marked with the label **favorites**.

**Network Services**  
These service offerings allow you to manage network services.

**Storage and Backup Services**  
These service offerings allow you to manage storage and backup services.

**Customer Onboarding Services**  
These service offerings allow you to manage customer onboarding services.

**Development and Test Services**  
These service offerings allow you to define new development and test services.

**New Servers**  
These service offerings allow you to add additional server such as Windows 7 Server, or Linux RH Server.

**Database Servers**  
These service offerings allow you to add additional database in an existing environment.

**Software Installation**  
These service offerings allow you to install software on a server.

**My Service Requests** 83

Today | [Since Yesterday](#) | [Last Week](#)

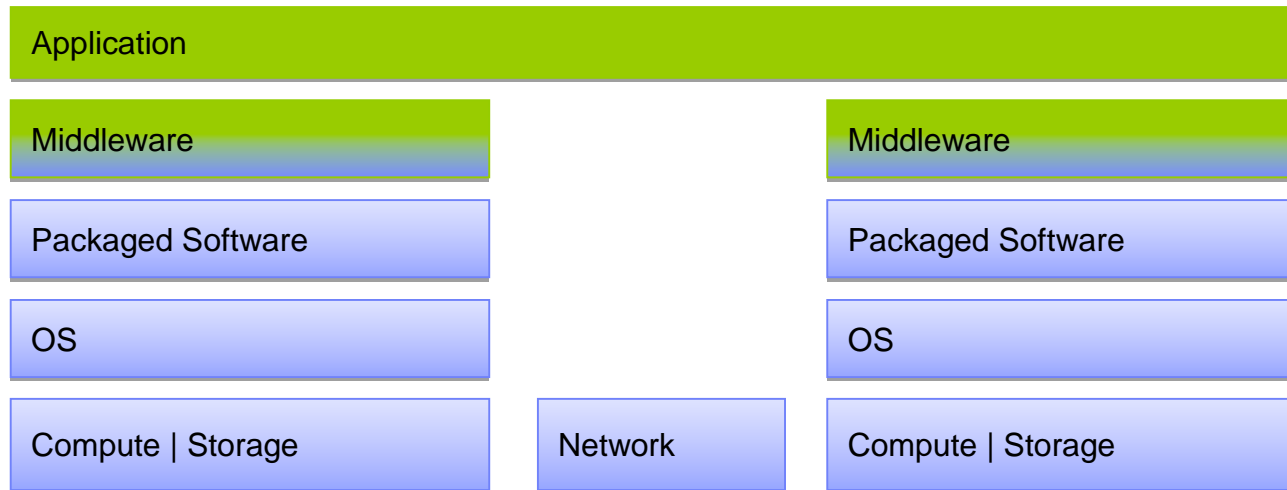
3 in progress	
5 pending	
7 successful	
2 failed	

**Recent Activity**

- Server Provisioning Request (1067397)
- Storage Request (1067396)
- Network Request (1067395)
- Backup Request (1067394)
- Customer Onboard Request (1067393)
- Customer Onboard Request (1067392)
- Customer Onboard Request (1067391)
- Database Request (1067390)
- Windows 7 Server Request (1067389)
- LDAP Server Request (1067387)

[Manage My Service Requests...](#)

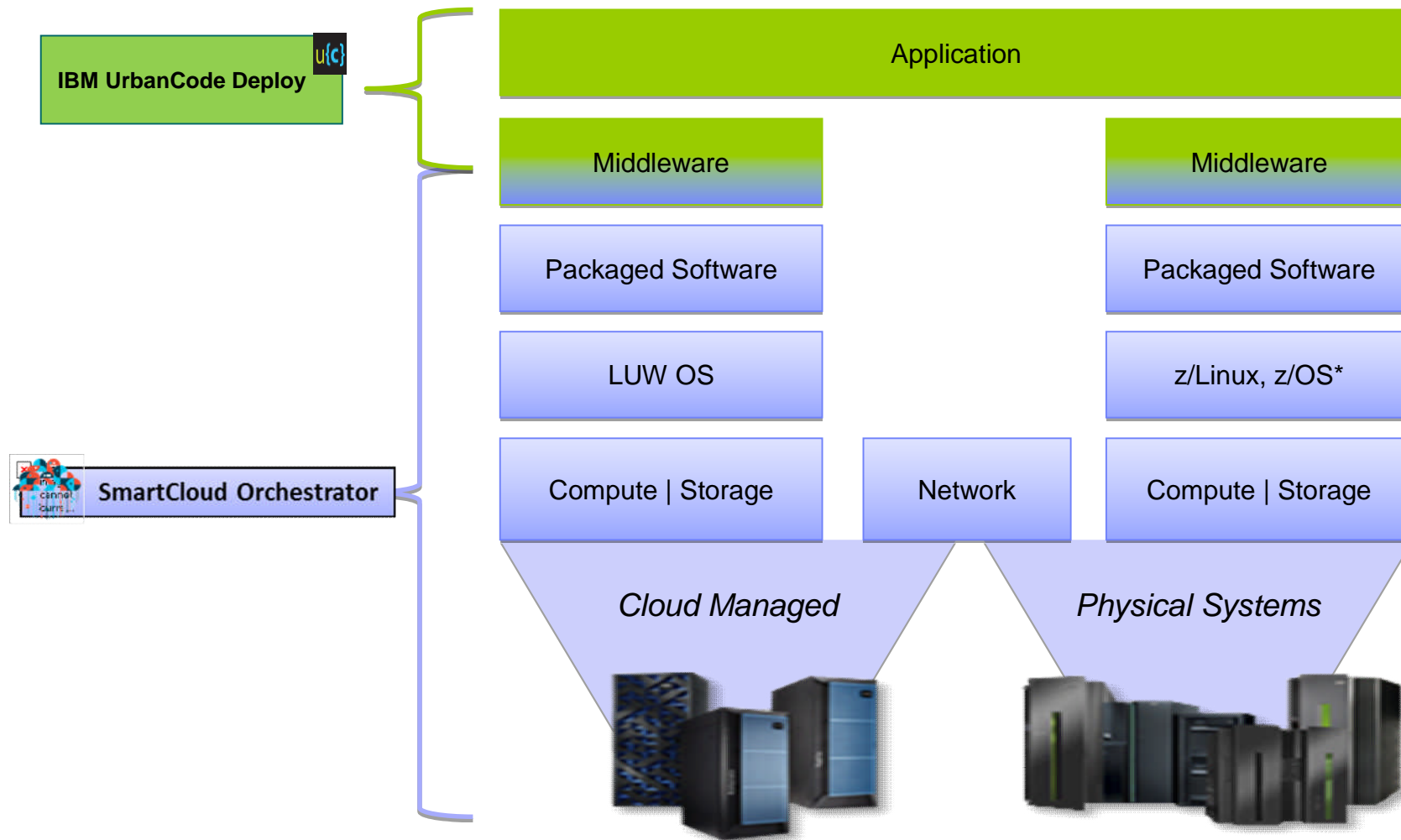
## Deployment Requirements Vary



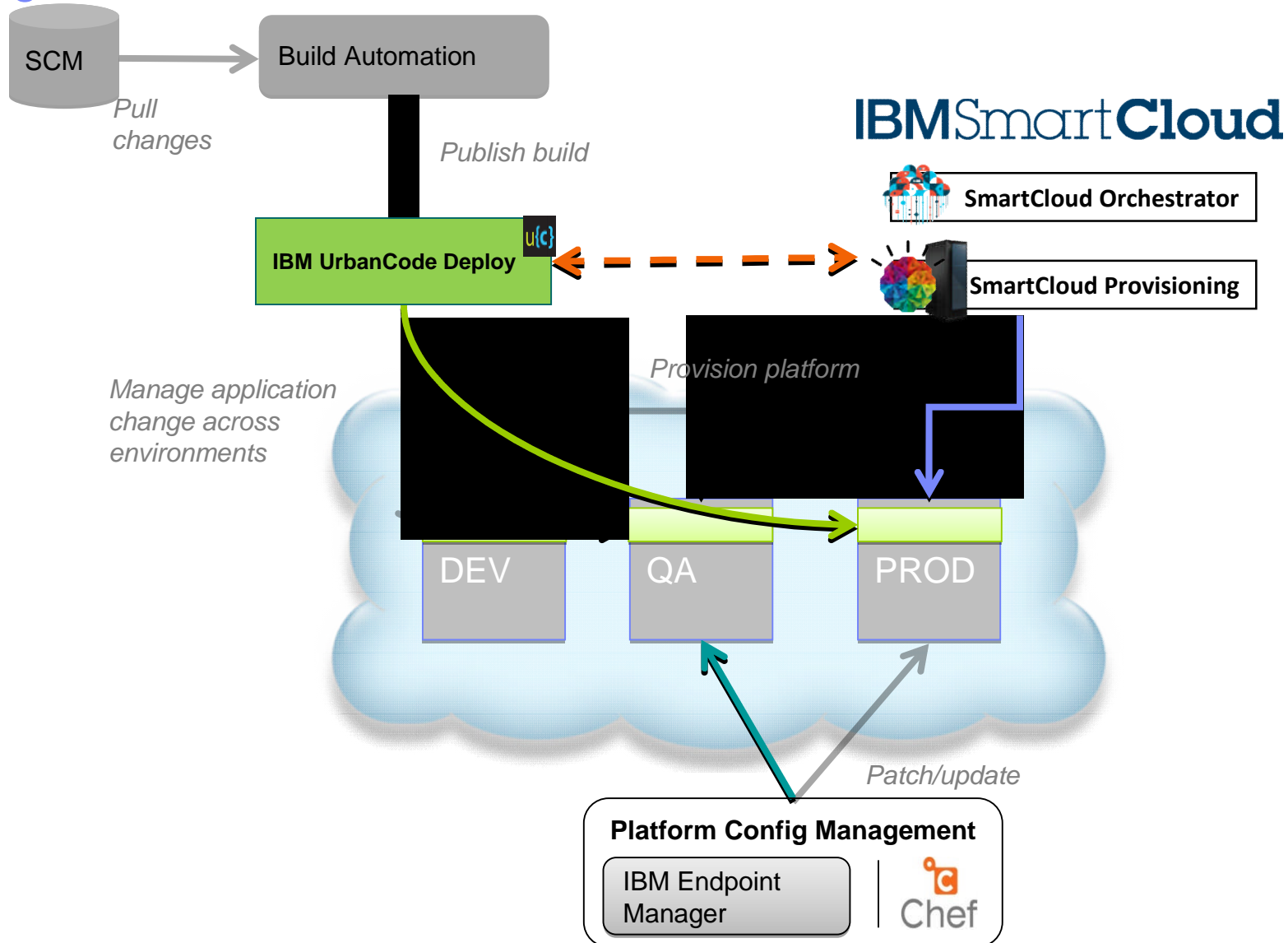
Quantity	Chg Frequency	Devt >> Prod	Lifetime needs
Fewer, standard, (1 to many)	Low rate of change	Topology complexity increases	Longer-lived, patching required
Many	High rate of change	Consistent processes with config changes	Shorter lived versions



## Aligning Deployment Automation with Environment Provisioning

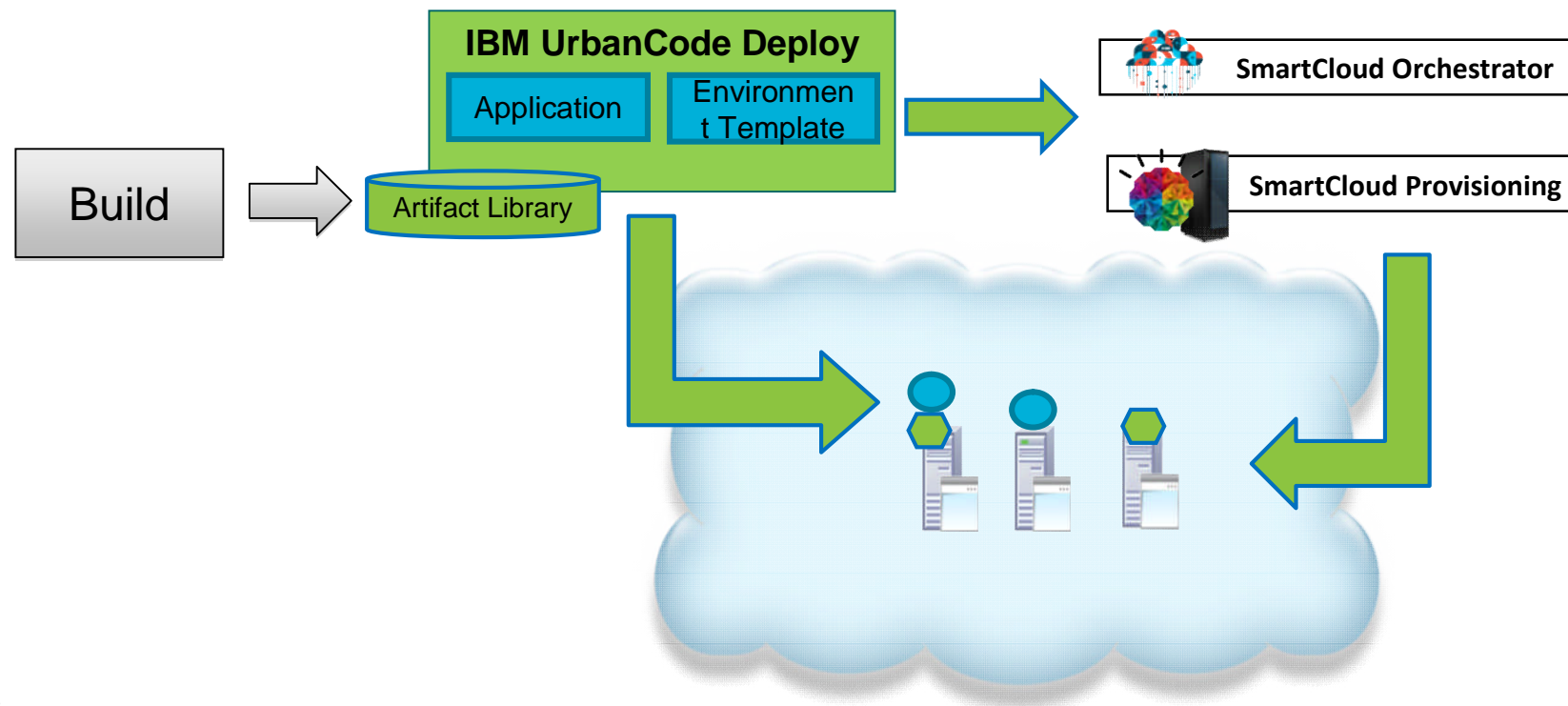


## Integrated Tools



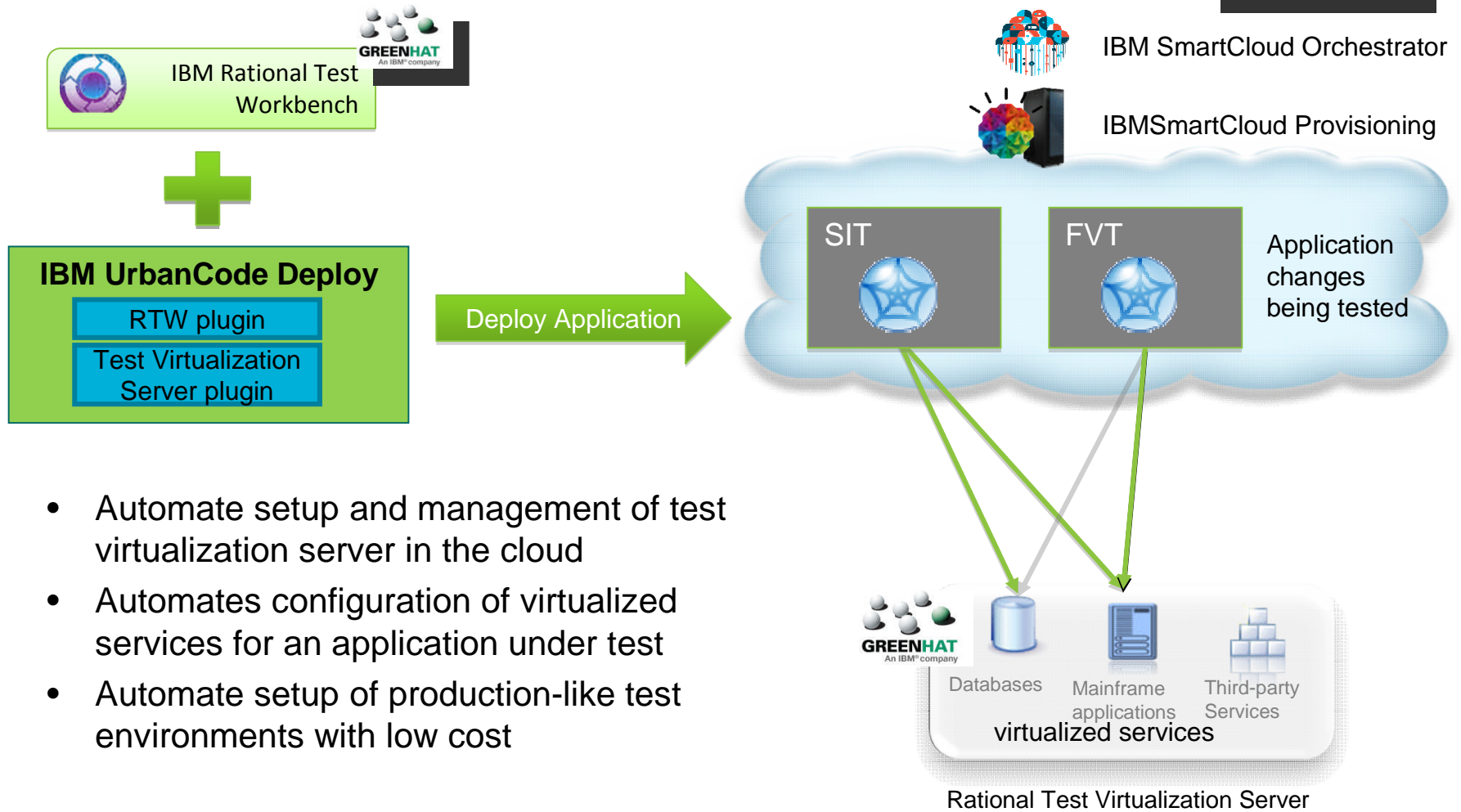
## Continuous Delivery to Cloud

- Extend UrbanCode Deploy to capture **Environment Templates**
  - Describe desired environment infrastructure/platform
  - Define Application processes to run in scope of Environment Template
- Seamless process flow for incremental, full stack provisioning and application deployment automation
- Track and version artifacts to know what is deployed where



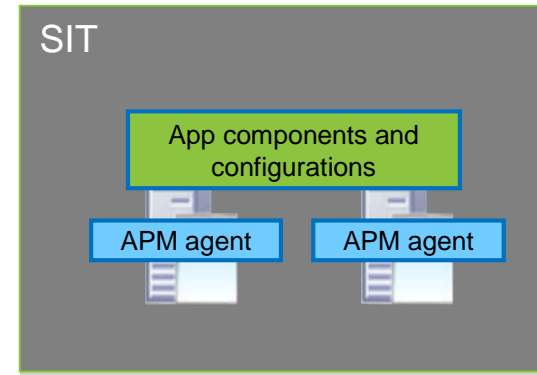
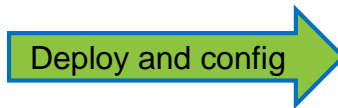
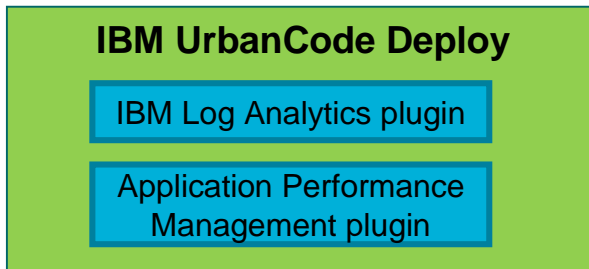
# Continuous testing with virtualized services

*Avoid testing bottlenecks due to dependencies on external services*

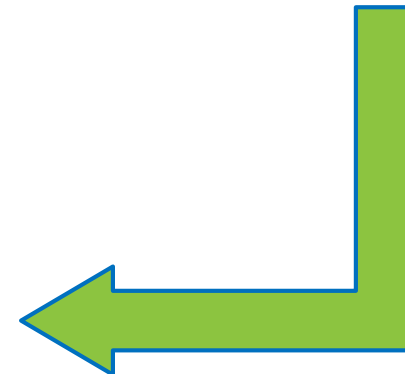


- Automate setup and management of test virtualization server in the cloud
- Automates configuration of virtualized services for an application under test
- Automate setup of production-like test environments with low cost

# Application Lifecycle Integration – Monitoring & Log Analytics

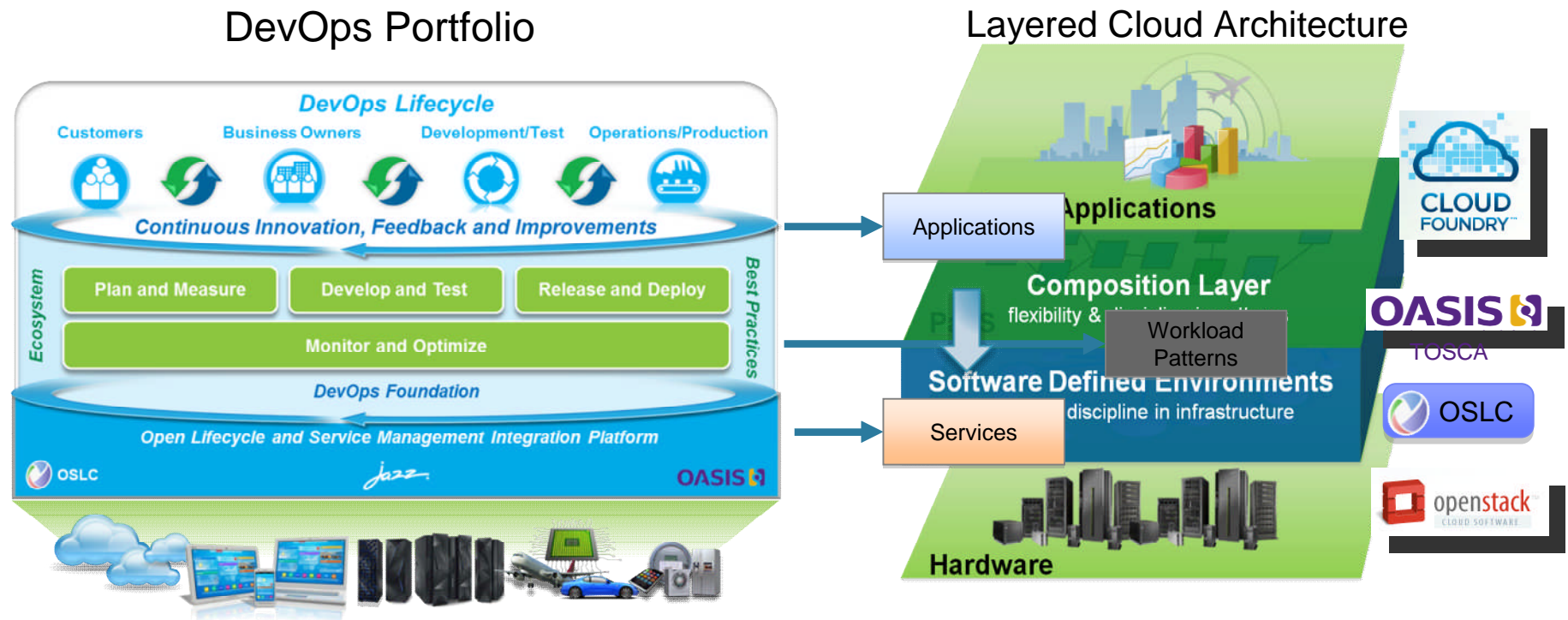


**Application Dashboard**



## DevOps - Enables Rapid Delivery of Differentiated Services

- Capability for continuous software delivery that enables clients to seize market opportunities and reduce time to customer feedback
- Flexible integration with Cloud APIs for lifecycle management enabled by the Jazz Platform and OSLC
- Portfolio of integrated tools to enable a service provider to deliver new capabilities and manage changes across whatever server platform they choose – Z, Unix or x86







[www.ibm.com/ibm/devops/us/en](http://www.ibm.com/ibm/devops/us/en)



## For more information

### Websites:

IBM DevOps solution overview: [www.ibm.com/devops](http://www.ibm.com/devops)

IBM UrbanCode Deploy: <http://www.urbancode.com/html/products/deploy/>

IBM UrbanCode Release: <http://www.urbancode.com/html/products/release/>

IBM UrbanCode v6.0 Announcement [http://www-01.ibm.com/common/ssi/ShowDoc.wss?docURL=/common/ssi/rep\\_ca/7/897/ENUS213-337/index.html&lang=en&request\\_locale=en&lc&lc](http://www-01.ibm.com/common/ssi/ShowDoc.wss?docURL=/common/ssi/rep_ca/7/897/ENUS213-337/index.html&lang=en&request_locale=en&lc&lc)

Enterprise Cloud Computing: <http://www-03.ibm.com/systems/z/solutions/cloud/index.html>

Provisioning and Orchestration: <http://www-03.ibm.com/software/products/us/en/category/SWU20>

Scheduling and Systems Automation: <http://www-03.ibm.com/software/products/us/en/subcategory/SWU10>

### Other resources:

Short Video: IBM DevOps – Continuous delivery of software-driven innovation

<http://www.youtube.com/watch?v=v5omfd2E5eQ&feature=youtu.be>

Article: Making DevOps Real for System z:

<http://public.dhe.ibm.com/common/ssi/ecm/en/ra112346usen/RA112346USEN.PDF?ce=ISM0056&ct=swg&cmp=ibm-social&cm=h&cr=crossbrand&ccy=us>

White Paper: Achieve end-to-end visibility for IBM System z and IBM zEnterprise cloud infrastructures

<http://public.dhe.ibm.com/common/ssi/ecm/en/tiw14157usen/TIW14157USEN.PDF>



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