#Automate2Accelerate

Tech Mahindra

AUTOMATION FRIDAY WEBINAR
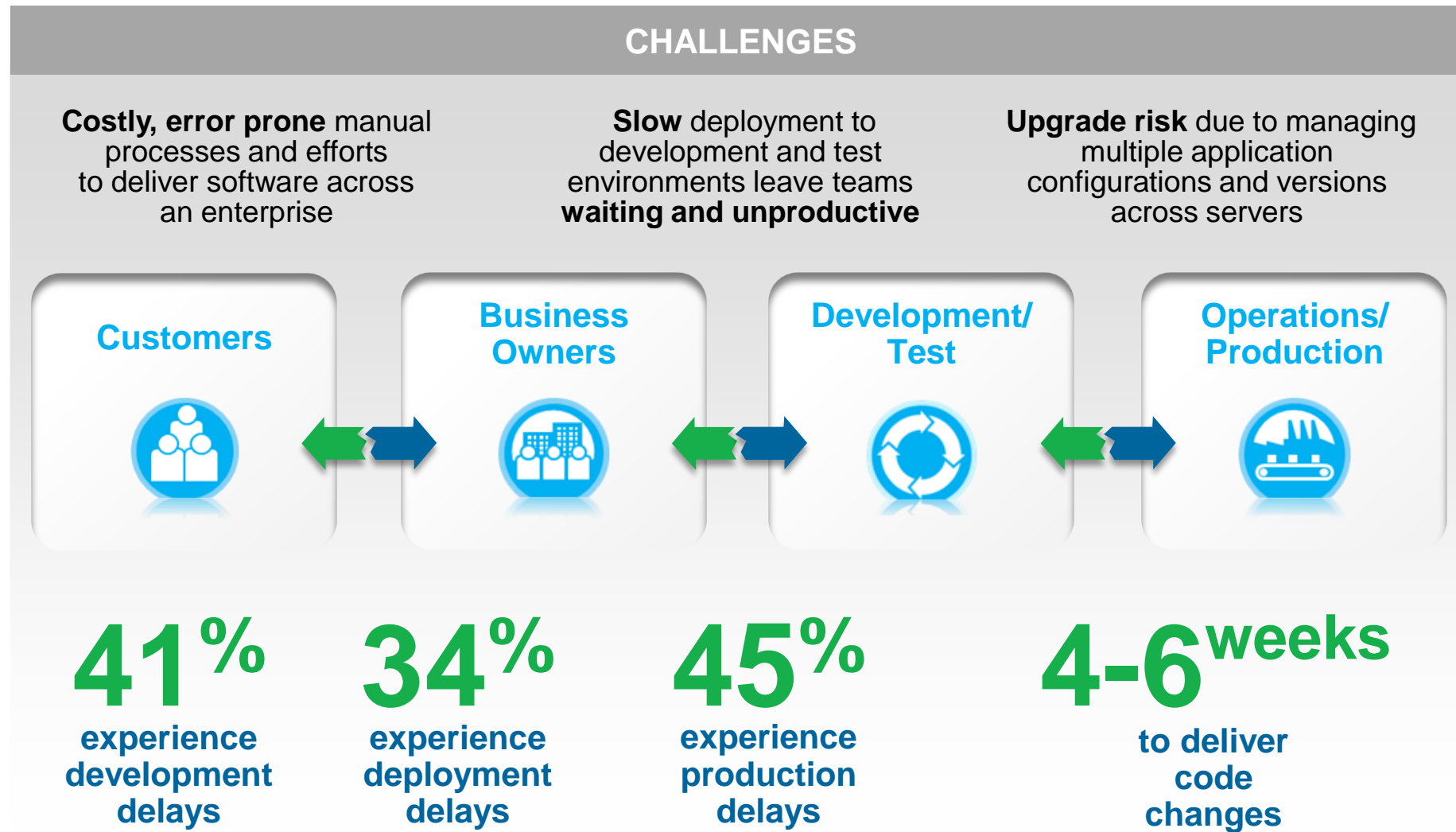
CI-CD-CT pipeline using IBM UrbanCode Deploy
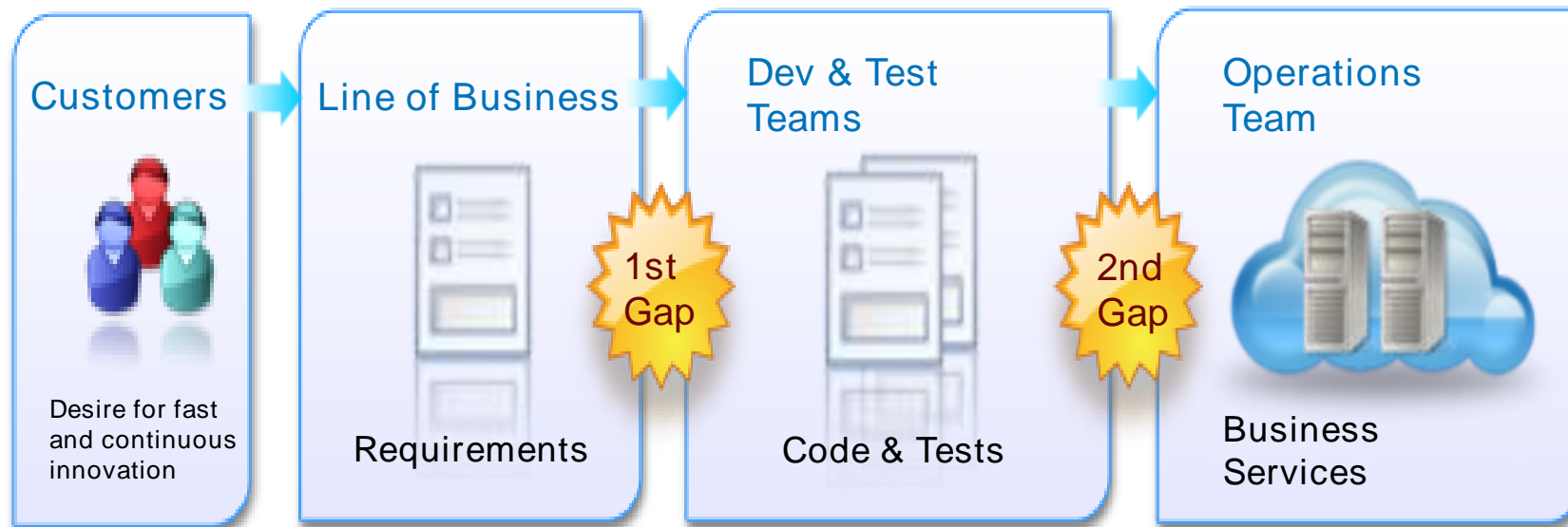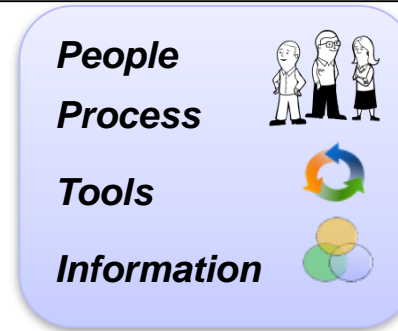
Sachin Chitrakoti
UnLeash the Labs
chitrakoti@in.ibm.com

Software drives today's innovation for a smarter planet
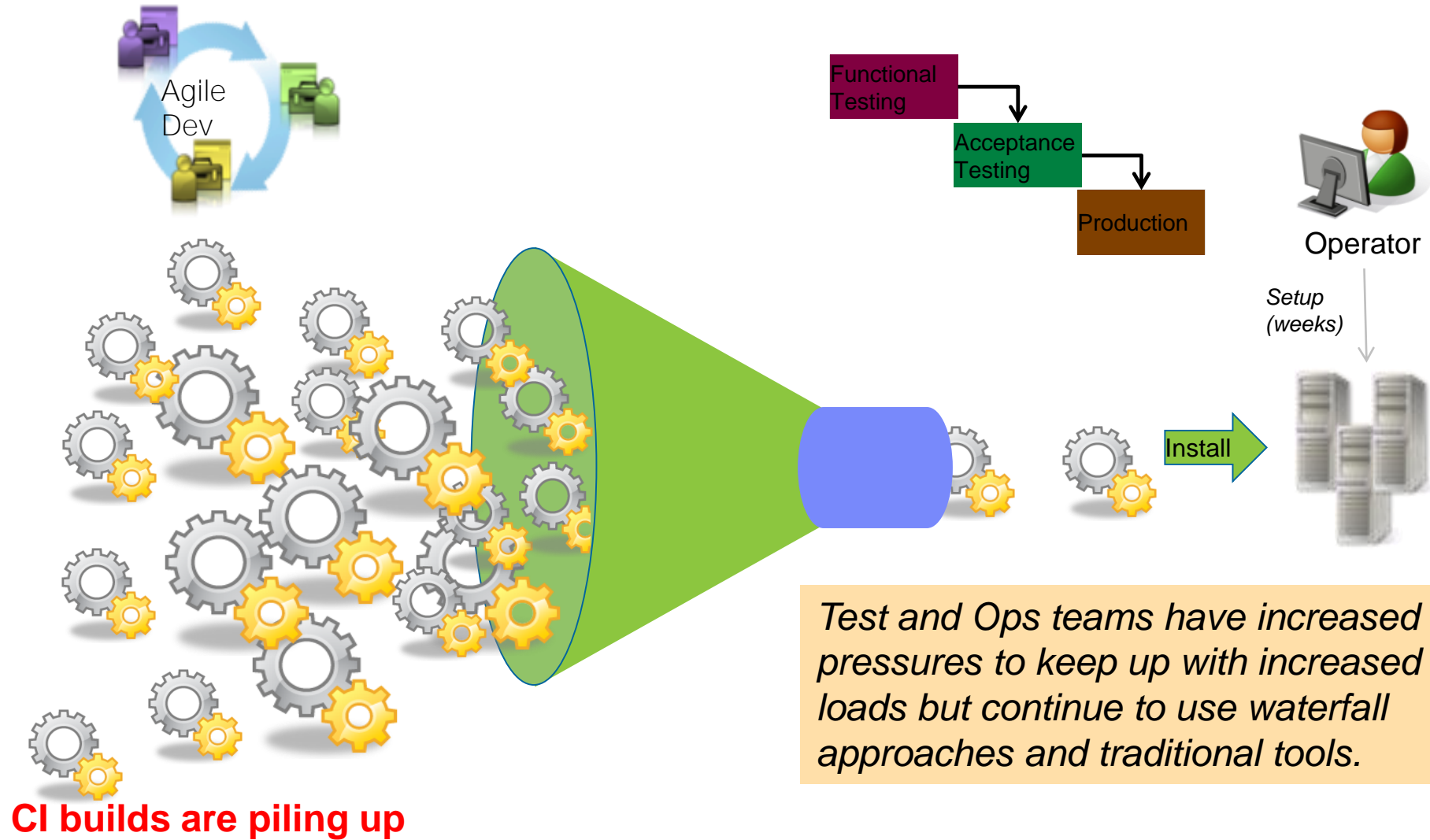*Transforming the way we live, work, and play*

But a lack of continuous delivery impacts the entire business

CHALLENGES

Costly, error prone manual processes and efforts to deliver software across an enterprise

Slow deployment to development and test environments leave teams **waiting and unproductive**

Upgrade risk due to managing multiple application configurations and versions across servers

Customers

Business Owners

Development/ Test

Operations/ Production

41% experience development delays

34% experience deployment delays

45% experience production delays

4-6 weeks to deliver code changes

Source: Five Ways To Streamline Release Management, Forrester Research, Inc.,

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

People
Process

Tools

Information

Customers

Desire for fast and continuous innovation

Line of Business

Requirements

1st Gap

Dev & Test Teams

Code & Tests

2nd Gap

Operations Team

Business Services

Agile Dev

Functional Testing

Acceptance Testing

Production

Operator

Setup (weeks)

Install

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

CI builds are piling up

Customers

Desire for fast and continuous innovation

Line of Business

Requirements

1st Gap

Dev & Test Teams

Code & Tests

2nd Gap

Operations Team

Business Services

Addressed by...

Addressed by...

Agile Dev

Dev Ops

The DevOps architecture

© 2013 IBM Corporation
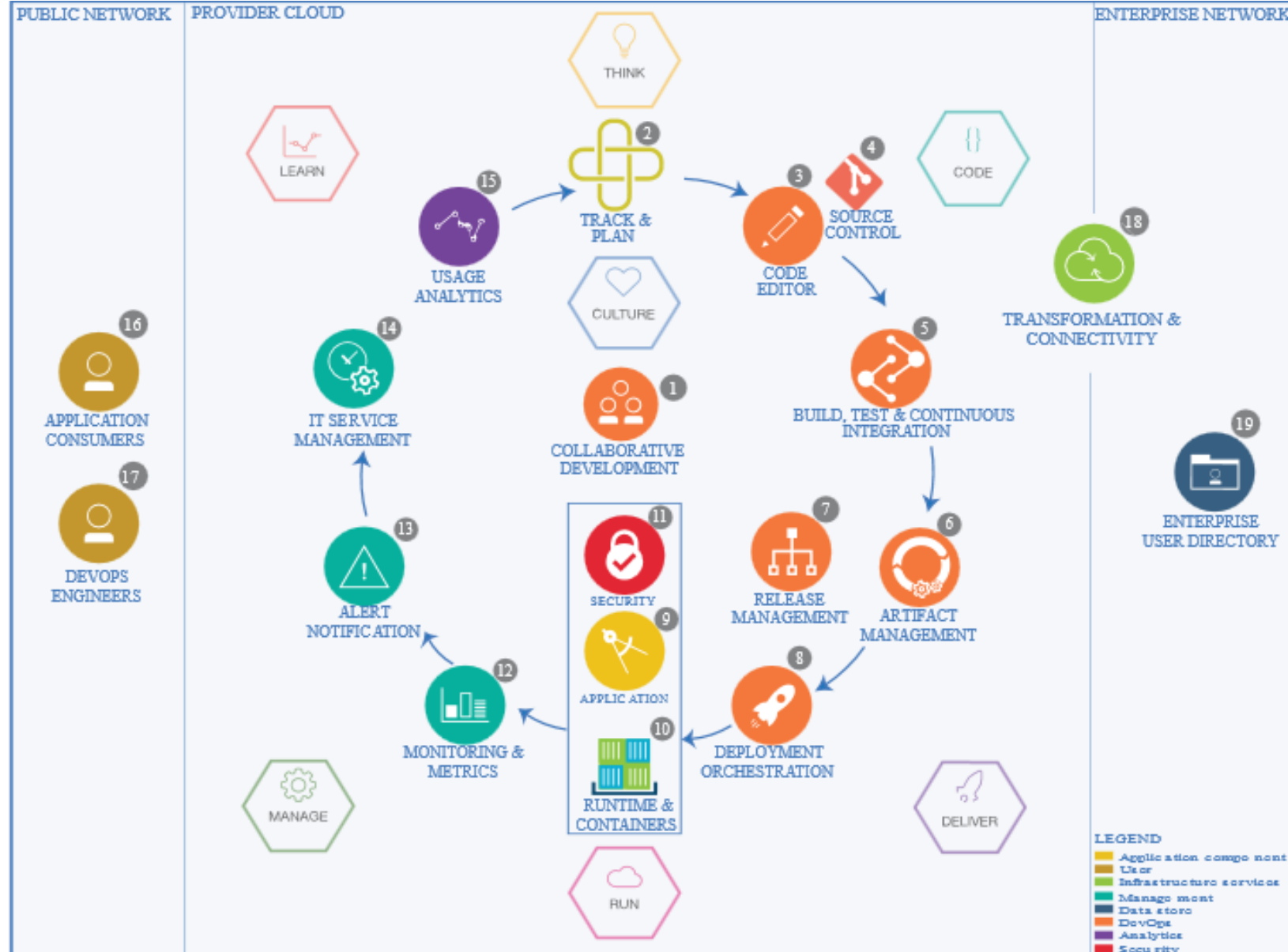
*Ensure applications are production-ready throughout the lifecycle
and can be released at any time without rollback due to quality issues*

**Business
Owners**

Development   **Testing**   **Staging**   **Production**
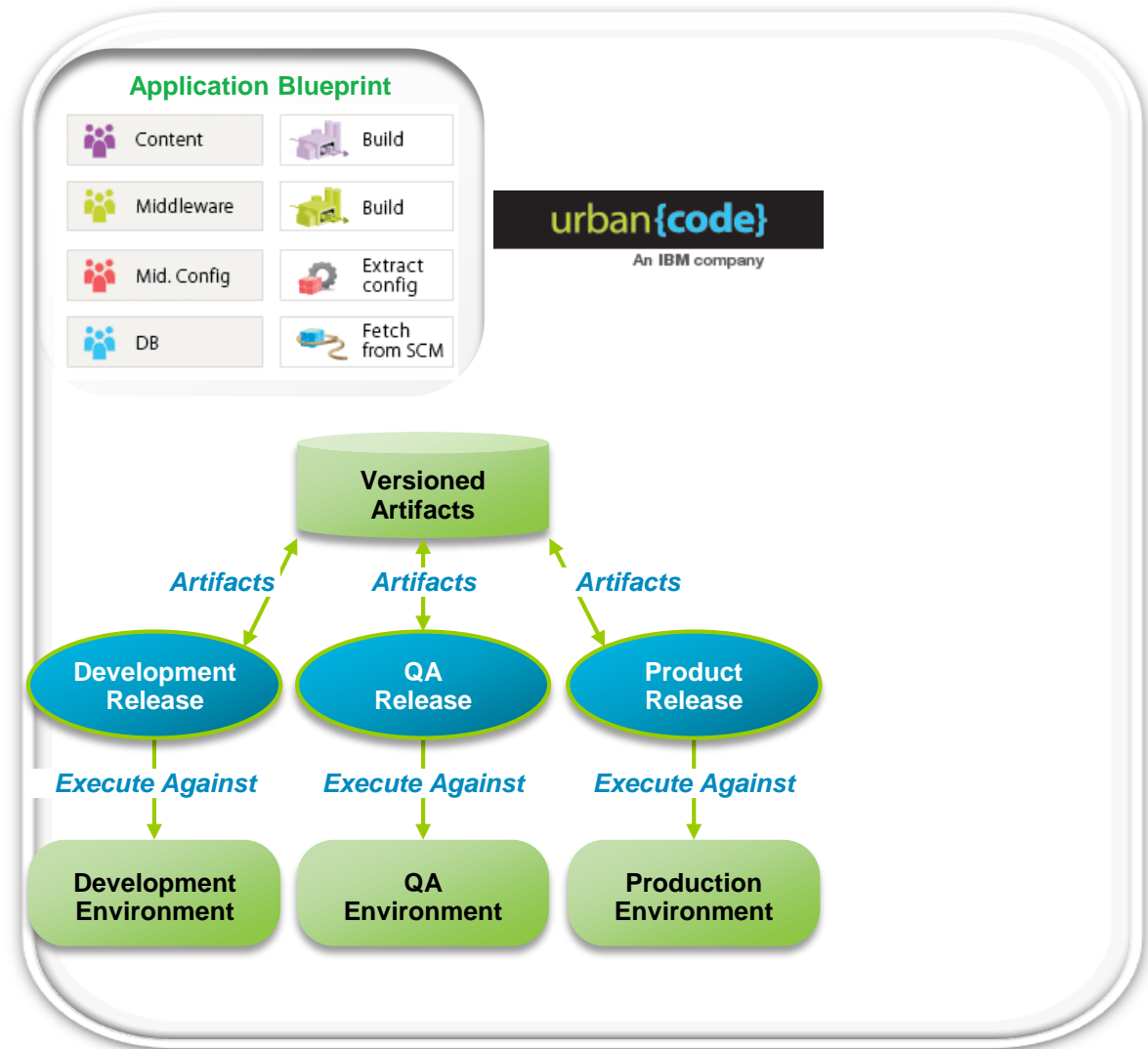
Customers
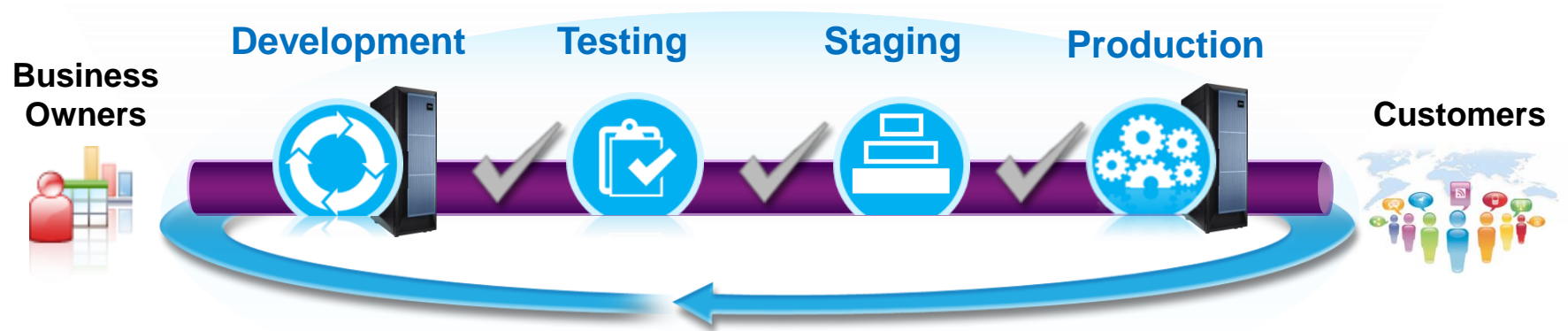
Continuous Delivery Pipeline:
An iterative set of quality checks and verifications that each piece of application
code must pass during lifecycle phases before being released to production.

IBM

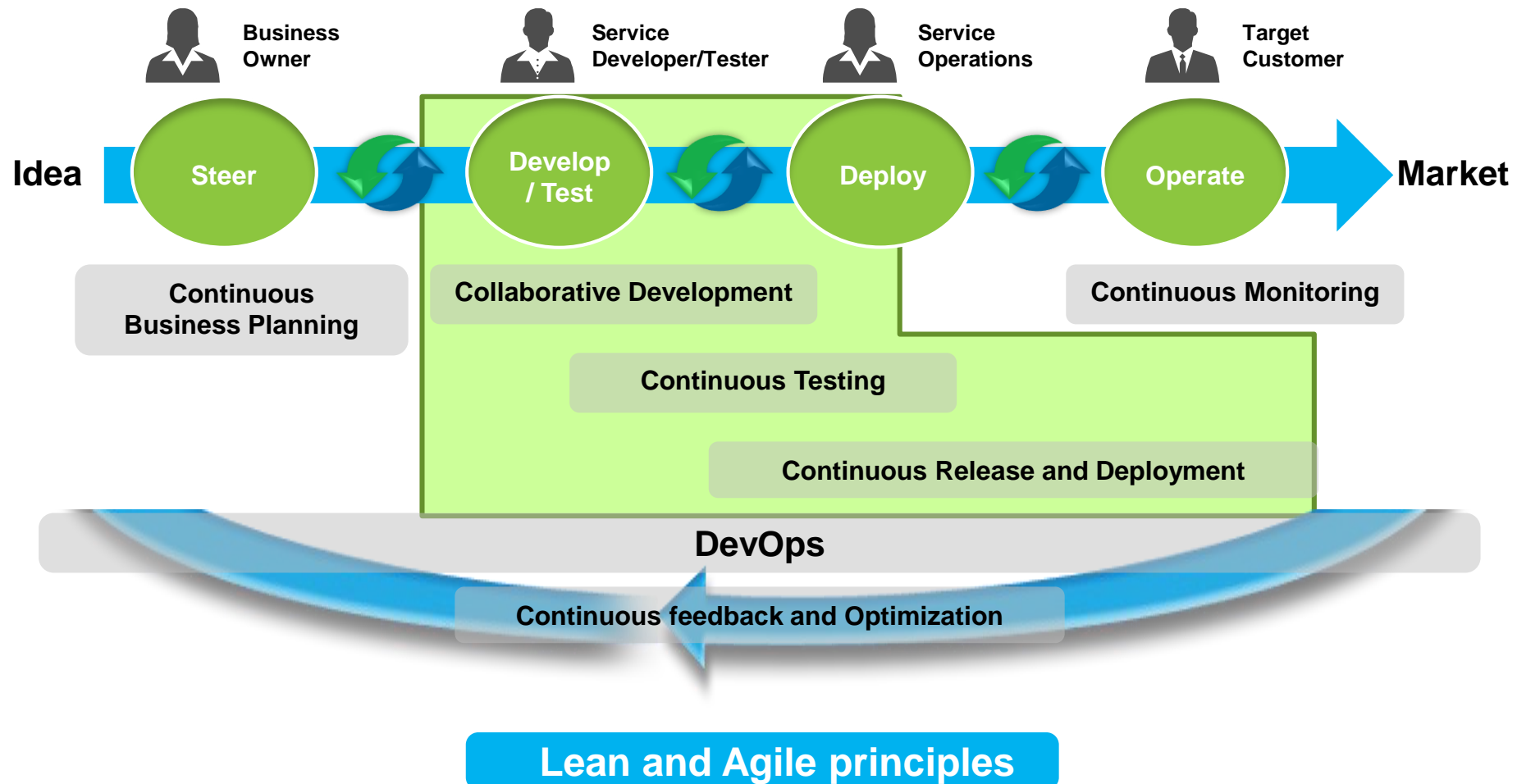| Complex manual processes for deploying infrastructure lack repeatability and speed	Failures due to inconsistent development and production environments	Long and complex lifecycle for managing infrastructure	Managing large number of configurations for deploying to Hybrid Cloud
Env. Request → Provision VM → Deploy Database → Deploy App Server	Dev → Prod	Application Changes / Infrastructure Changes	Public / Private — Develop Public, Deploy Private / Market test Workloads / Cloud Bursting

How do we ensure that we deploy
What we want, When we want, Where we want!

Continuous release and deployment

- **Drive down cost. Reduce the amount of manual labor, resource wait-time, and rework**
  - Push-button deployments improves productivity for developer and operations

- **Speed time to market. Increase frequency of software delivery**
  - Automated software release and deployment reduces errors
  - Built-in best practices

- **Reduce risk. Deliver higher quality application releases with increased compliance**
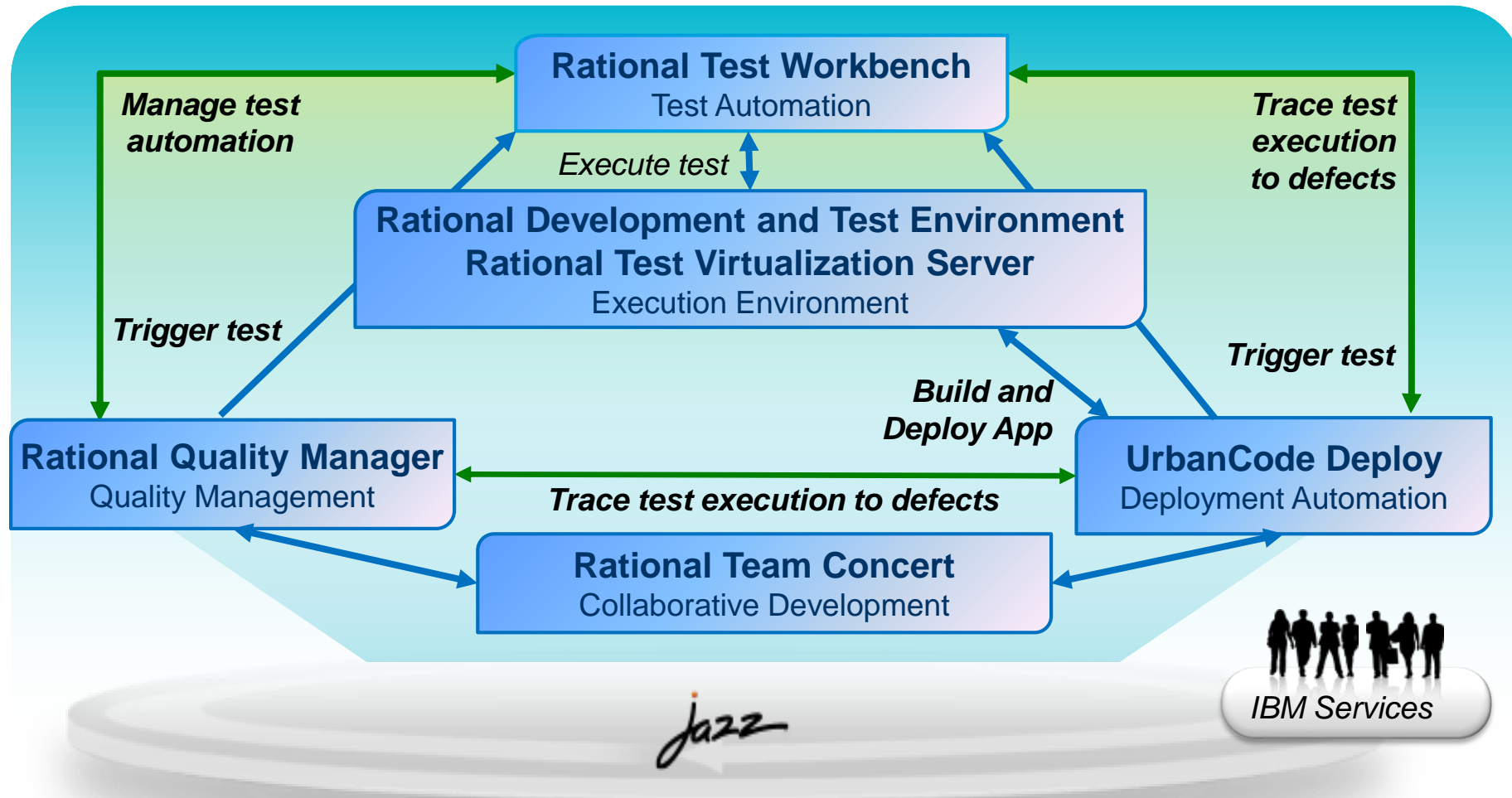 - End-to-end transparency, auditability and reduced time to feedback

Application Blueprint

Content	Build
Middleware	Build
Mid. Config	Extract config
DB	Fetch from SCM

urban{code}
An IBM company

Versioned Artifacts

Artifacts *Artifacts* *Artifacts*

Development Release **QA Release** **Product Release**

Execute Against *Execute Against* *Execute Against*

Development Environment **QA Environment** **Production Environment**

Effective continuous delivery requires a whole-team approach
Extends Lean and Agile practices across the entire software value chain

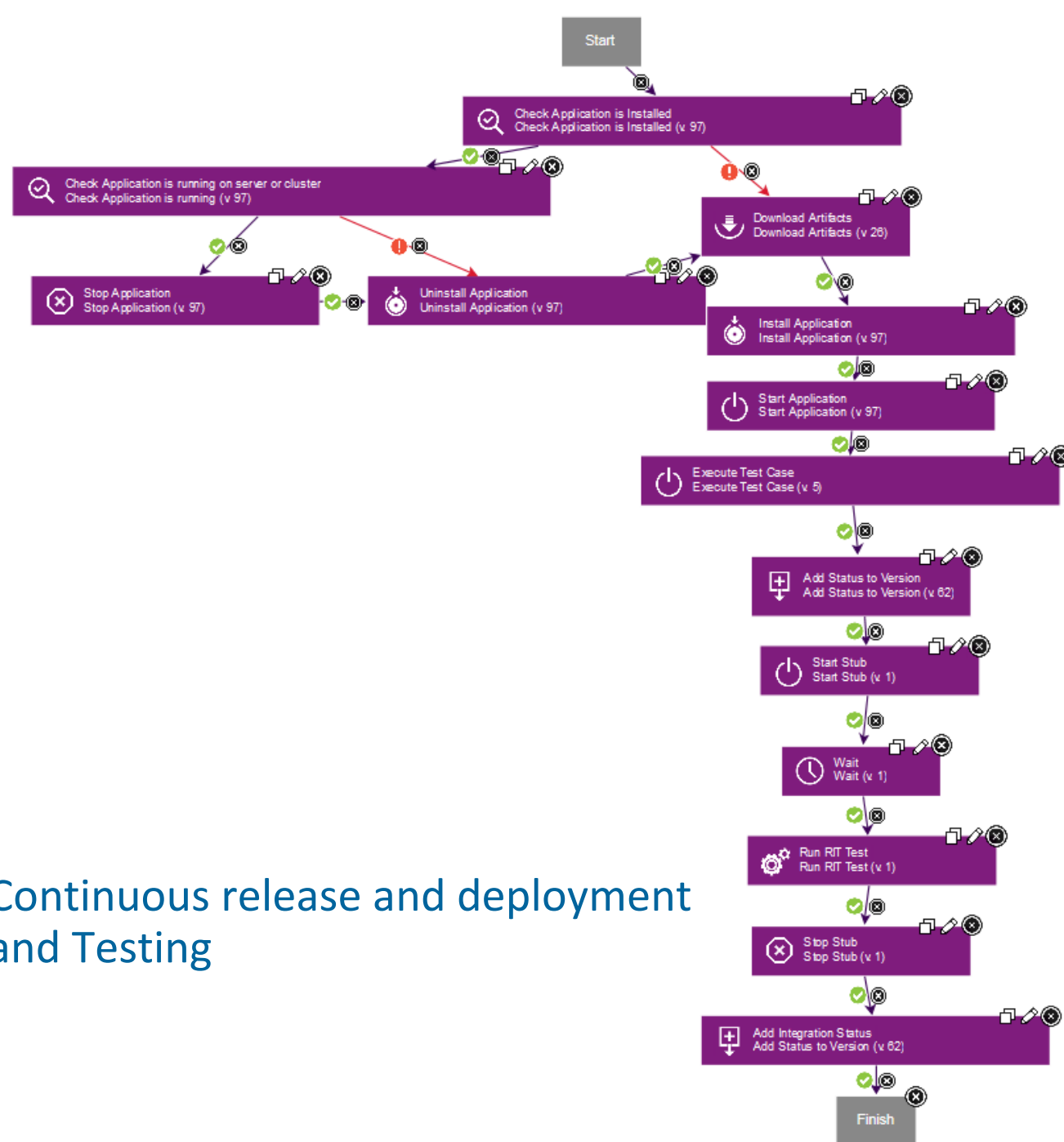**Business Owner**

Service Developer/Tester

Service Operations

Target Customer

Idea

Steer

Develop / Test

Deploy

Operate

Market

Continuous Business Planning

Collaborative Development

Continuous Monitoring

Continuous Testing

Continuous Release and Deployment

DevOps

Continuous feedback and Optimization

Lean and Agile principles

IBM CI-CD-CT Solution
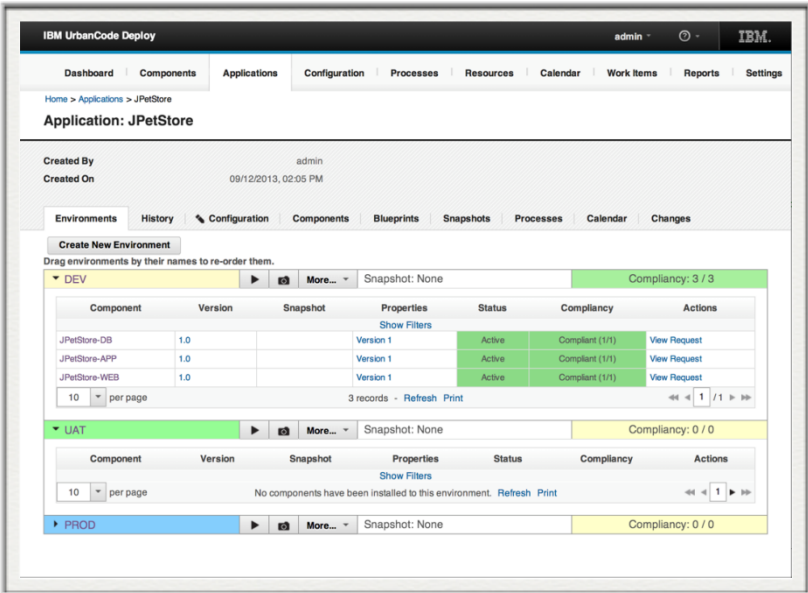## Reduced delivery time, end-to-end visibility of test activities

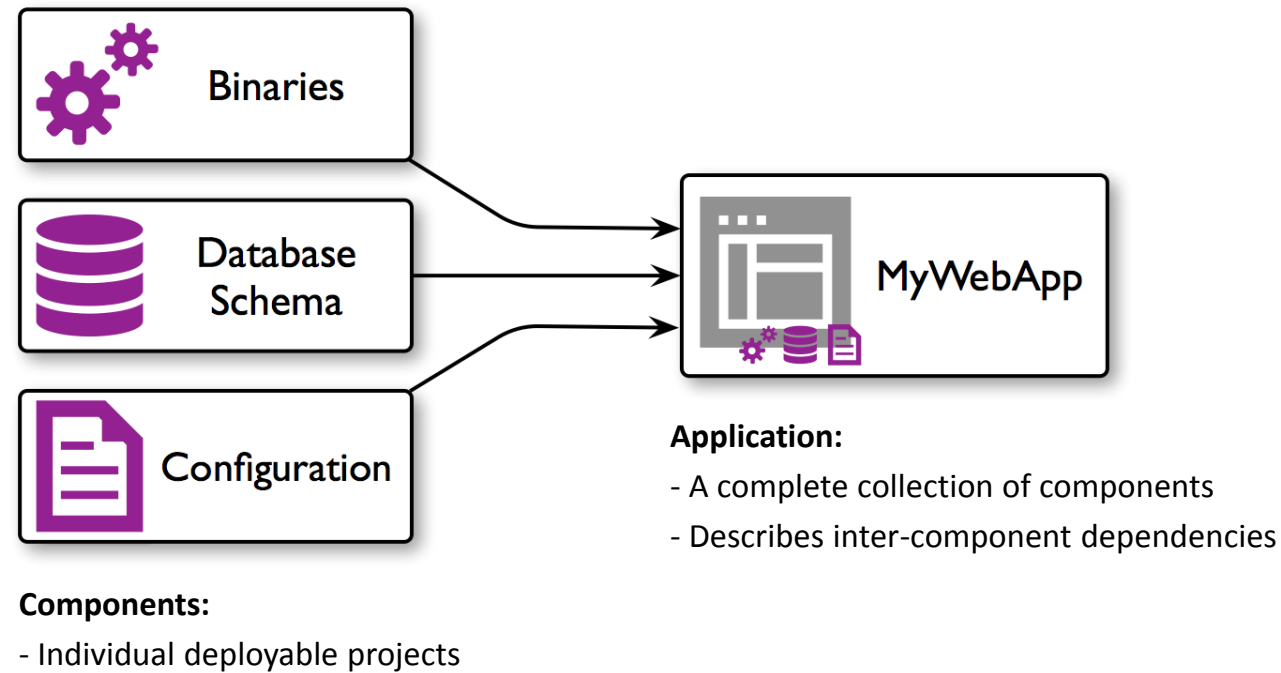**Rational Test Workbench**
Test Automation

Manage test automation

Execute test

Trace test execution to defects

Rational Development and Test Environment
Rational Test Virtualization Server
Execution Environment

Trigger test

Trigger test

Build and Deploy App

Rational Quality Manager
Quality Management

Trace test execution to defects

UrbanCode Deploy
Deployment Automation

Rational Team Concert
Collaborative Development

jazz

IBM Services

Continuous release and deployment and Testing

Continuous release and deployment

Intuitive Deployment Model

Environment Configuration Management

Rich Drag-and-Drop Workflow Designer

Distributed Deployment Automation

Deployment Inventory

Binaries

Database Schema

Configuration

MyWebApp

Application:

- A complete collection of components

- Describes inter-component dependencies

Components:
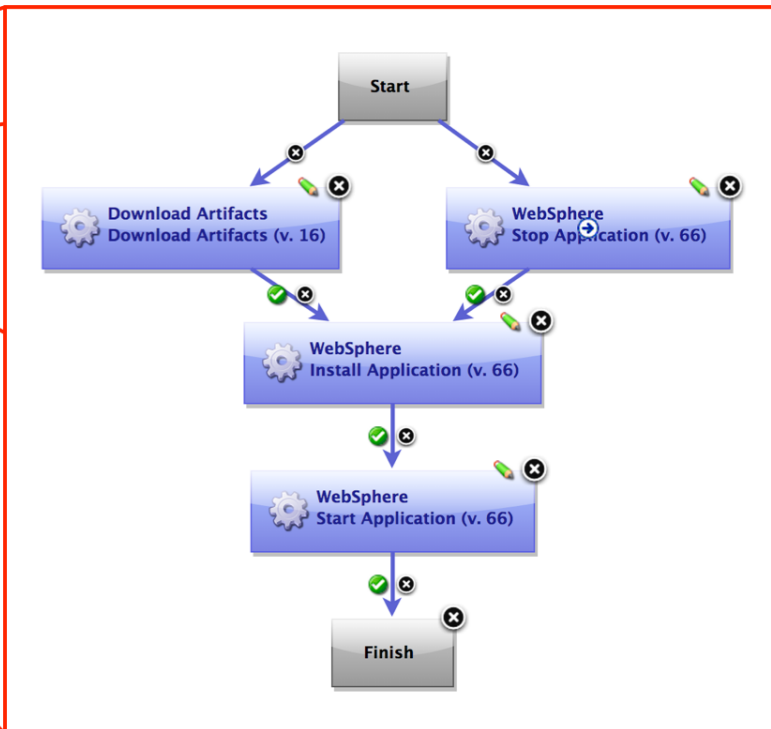
- Individual deployable projects
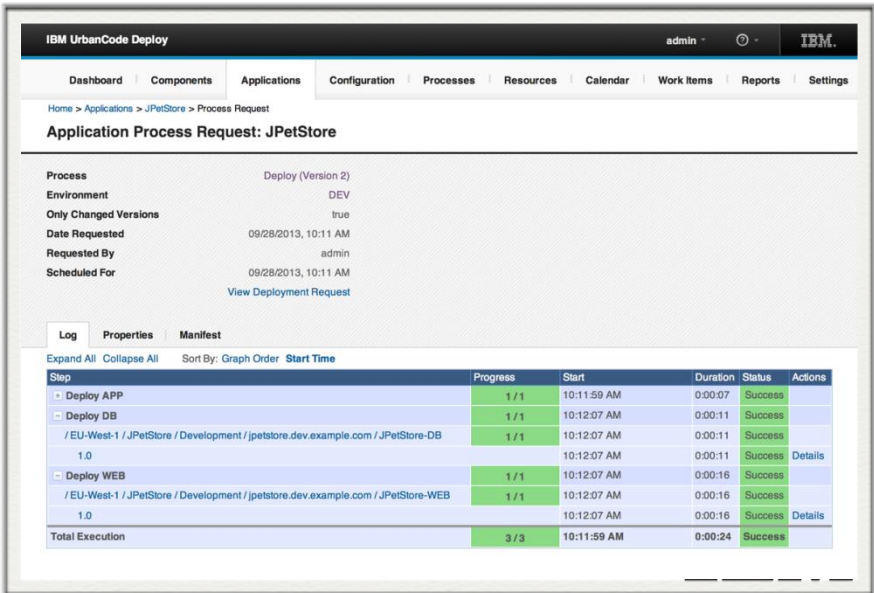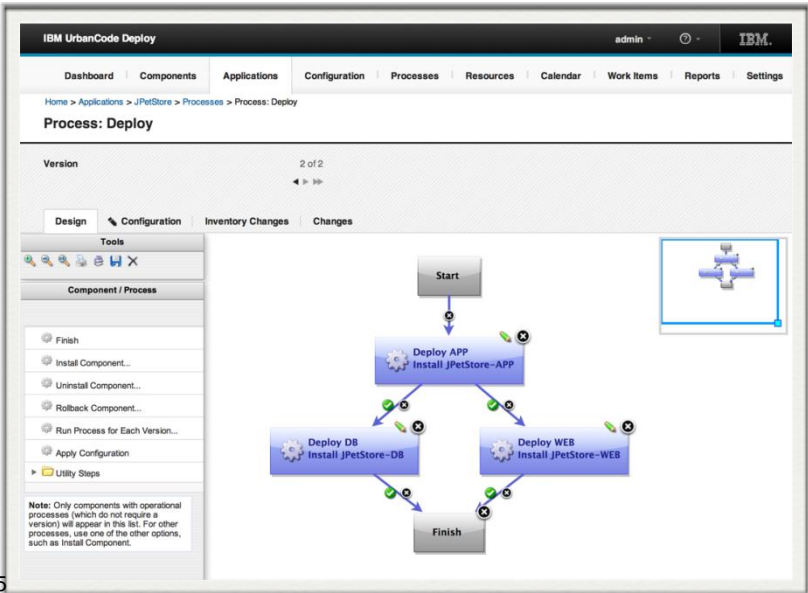
Deploy Application

- Orchestrate deployment of many components
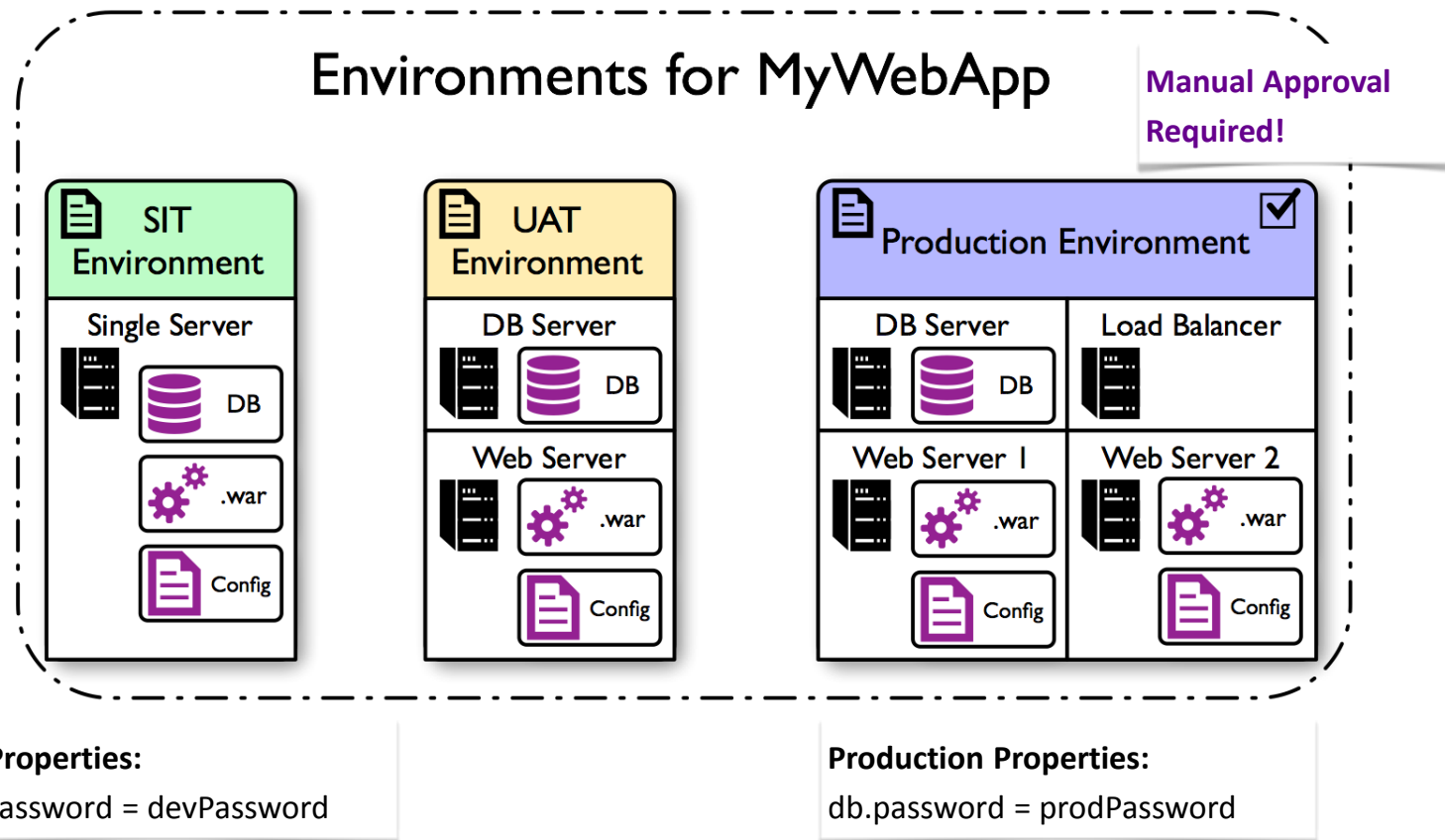
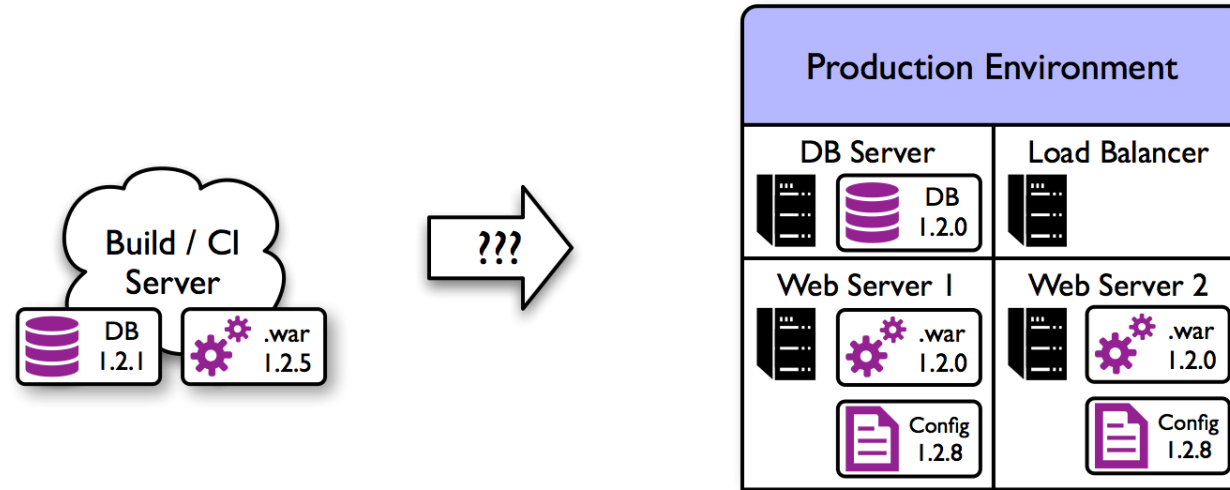- Represents deploy-time dependencies
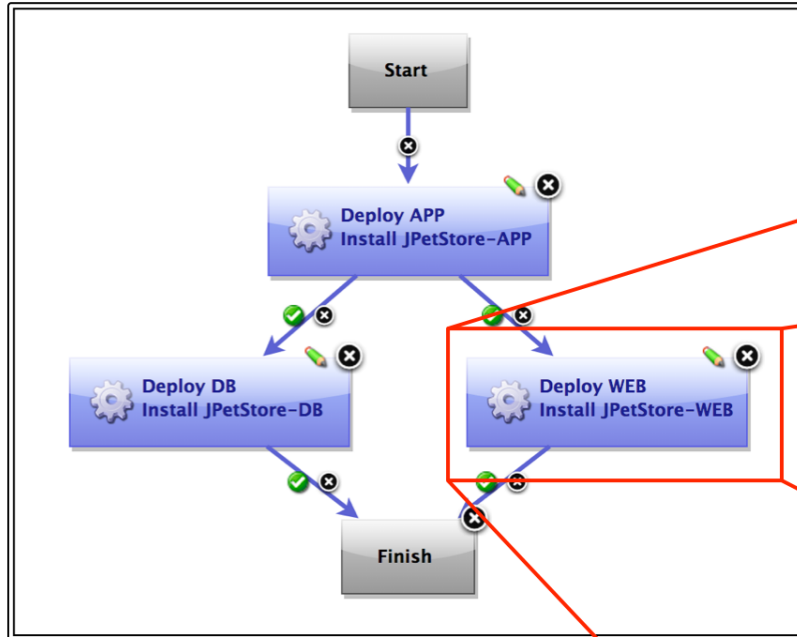
Deploy Component

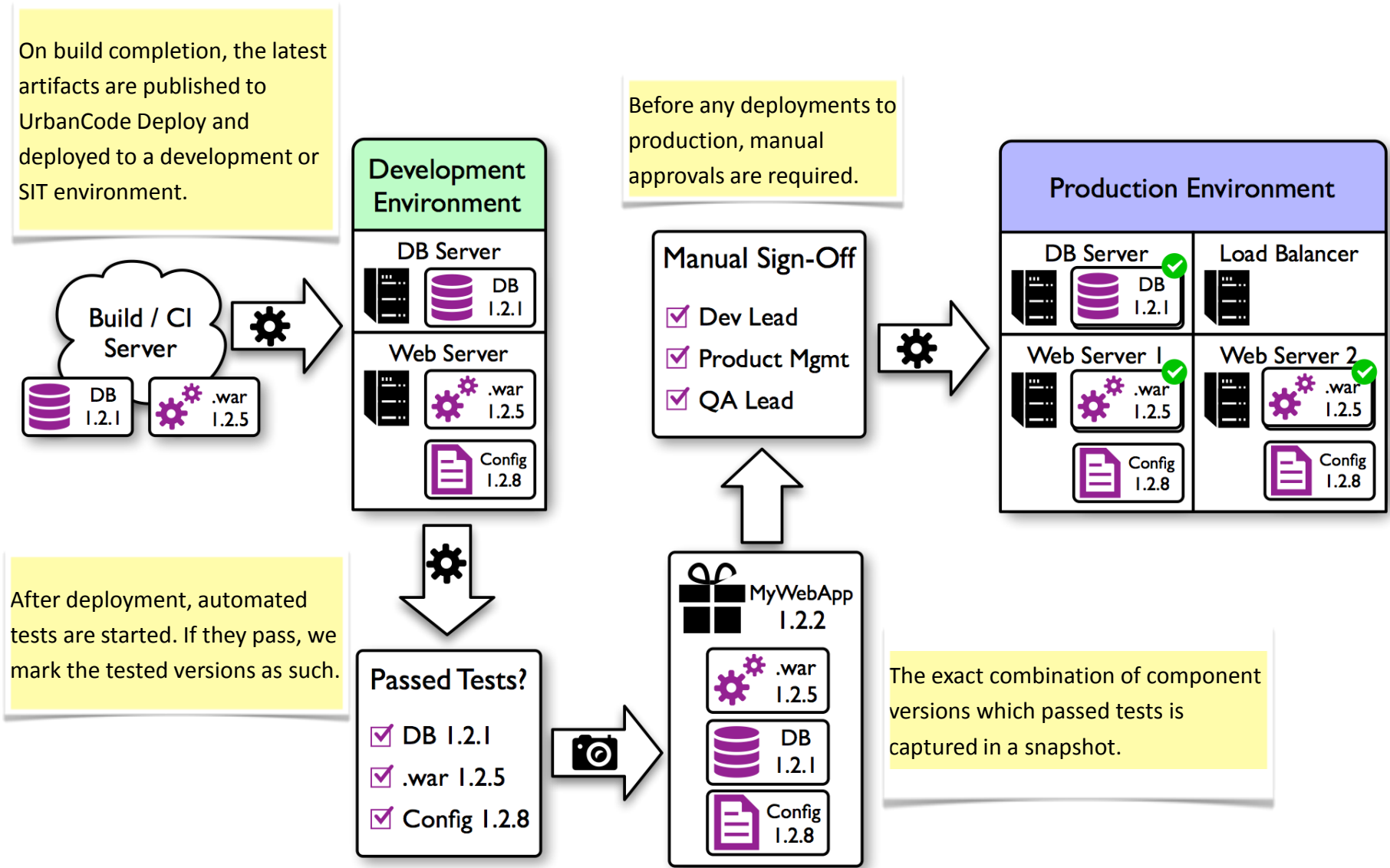- Create a fully automated workflow to be executed

  on target servers

☑ Drag-and-Drop Workflow Designer

☑ Precise Control of Execution Flow

☑ Hundreds of Integration Steps Provided

☑ Create Custom Steps

- Model different topologies for the same application
- Set environment-specific configuration
- Environments may require manual approvals for deployments

Environments for MyWebApp

Manual Approval Required!

SIT Environment

Single Server

DB

.war

Config

UAT Environment

DB Server

DB

Web Server

.war

Config

Production Environment ☑

DB Server

DB

Load Balancer

Web Server 1

.war

Config

Web Server 2

.war

Config

SIT Properties:

db.password = devPassword

Production Properties:

db.password = prodPassword

IBM

Build / CI
Server

DB
1.2.1

.war
1.2.5

???

Production Environment

DB Server

DB
1.2.0

Load Balancer

Web Server 1

.war
1.2.0

Config
1.2.8

Web Server 2

.war
1.2.0

Config
1.2.8

On build completion, the latest artifacts are published to UrbanCode Deploy and deployed to a development or SIT environment.

Before any deployments to production, manual approvals are required.

Development Environment

DB Server
DB 1.2.1

Web Server
.war 1.2.5
Config 1.2.8

Build / CI Server
DB 1.2.1
.war 1.2.5

Manual Sign-Off

☑ Dev Lead
☑ Product Mgmt
☑ QA Lead

Production Environment

DB Server
DB 1.2.1

Load Balancer

Web Server 1
.war 1.2.5
Config 1.2.8

Web Server 2
.war 1.2.5
Config 1.2.8

After deployment, automated tests are started. If they pass, we mark the tested versions as such.

Passed Tests?

☑ DB 1.2.1
☑ .war 1.2.5
☑ Config 1.2.8

MyWebApp 1.2.2
.war 1.2.5
DB 1.2.1
Config 1.2.8

The exact combination of component versions which passed tests is captured in a snapshot.

IBM

Cloud
Provisioning

Mobile
Deployments

OS
Configuration

Middleware

QA/Testing

Infrastructure

Issue
Tracking

Database
Deployments

- Thousands of steps out-of-the-box

- Open plugin architecture

https://developer.ibm.com/urbancode/plugin

Mobile to Mainframe Application Deployment

IBM UrbanCode Deploy

Develop → SCM → Build → Deploy

Develop
IDE
— Deliver →

SCM
CI Tool
— Request Build →

Build
— Built Artifacts →

Deploy
IBM UrbanCode Deploy

System of Engagement

System of Record

Mobile Device

Cloud

Traditional

Mainframe

- **Deploy** complex applications: multi-platform, multi-technology
- Applications in different layers develop and deploy at different **velocities**
- **Hybrid environments**: Public and Private Cloud, Distributed physical or virtualized servers, Mainframe, Mobile Devices, and also Smart devices

Multi-platform deployments with UrbanCode Deploy with Patterns

SCM

Pull changes

Build Automation

Publish artifacts

IBM UrbanCode Deploy with Patterns

Application Deployment

Manage on and off prem application deployments with a single system spanning multiple platforms

IBM Bluemix

CLOUD FOUNDRY

PaaS systems on/off prem

Microsoft Azure

SOFTLAYER an IBM Company

amazon web services

Off-prem IaaS

IBM PureApplication System

IBM Cloud Orchestrator

IBM Cloud Manager with OpenStack

openstack

On-prem IaaS

- On-prem Traditional Physical x86, POWER, & Mainframe
- Virtual (VMware® vCenter Server™)

Continuous Integration extends to
Continuous Delivery and Continuous Testing

Agile Dev

Build

Test

Prioritize

Design

Dev Ops

Publish

Deploy

Monitor

Test

Continuous Feedback

Customer Benefiting from Release and Deploy

Fidelity WORLDWIDE INVESTMENT — *Achieved cost avoidance of more than USD2.3 million per year.*

Copyright Clearance Center — *83% decrease in release times by automating deployments.*

Amica AUTO HOME LIFE — *Decreased non-code related build failures from 20 percent to less than 1 percent*

HISCOX — *17.5 man days of effort reduced to around 10 minutes*

When Deployment Time Matters Speeding Time to Market		
Fidelity	2-3 days →	1-2 hours
Copyright Clearance Center	1.5 days →	2 hours
	2 days →	Minutes
	Hours →	Minutes
IBM	Weeks to months →	Minutes

Fidelity Worldwide Investments
Achieves predictable release schedules and simplifies regulatory compliance

Achieved

cost avoidance of more than USD2.3 million per year

Gained

more predictable release schedules for stakeholders

Improved

the ability to demonstrate compliance with regulations

Solution components

Software

- IBM® UrbanCode™ Deploy

The transformation: As it prepared to launch a critical new application, Fidelity Worldwide Investment wanted to replace its manual release processes with an automated release solution. The solution helped reduce the time required for software releases by 99 percent, from 2 - 3 days to just 1 - 2 hours. The company also achieved cost avoidance of more than USD2.3 million per year.

"Applications that took days to release now take just an hour."

— *Tony Green, Technology, Architecture and Engineering, Fidelity Worldwide Investment*

F Fidelity ™
WORLDWIDE INVESTMENT

Copyright Clearance Center – Automates application release and deployment using DevOps methods

Saves 4,800 hours
of work within the first year by eliminating the need for numerous release planning meetings

83% decrease
in release times by automating deployments

50% reduction
in number of staff needed for each software release

The transformation: Copyright Clearance Center's developers were using an agile software development process. However, the deployment procedure was becoming a bottleneck. The company automated the release and deployment of its software and database components using IBM® UrbanCode™ software, eliminating the need for release planning sessions.

"We evaluated numerous tools and determined that IBM UrbanCode software was the closest to meeting all of our criteria."

—Alexander Carr, lead software configuration management engineer

Solution components
Software
• IBM® UrbanCode™ Deploy
• IBM UrbanCode Release

Global 500 Banking Company uses IBM UrbanCode Deploy and IBM UrbanCode Release for WebSphere Application Server (WAS)

Challenges

- Error prone manual tasks and deployment processes to WAS

- Risk of instability due to managing multiple WAS configurations and versions

- Slow deployment to development and test environments

- Lack of centralized deployment processes across WAS environments

Benefits

- Deployments are 50-75% faster

- Realized value of their investment in UrbanCode in 2 weeks-1month

- Reduced cost

"UrbanCode tools have allowed us to successfully begin implementation of an enterprise level solution in a very large organization full of customized one-off processes. The ease of use, numerous supported integration plugins, and templates within the tools have proven invaluable in allowing my organization to move at a rapid pace while seeing almost immediate results in terms of speed, reliability and audit traceability/transparency."

Insurer has success incorporating DevOps and best practices into their development cycle.

Amica
AUTO HOME LIFE

Pain Points:

➤ Manual deployments very inefficient

➤ Compliance with auditing requirements hard to prove

➤ Very heterogeneous environment with little integration between tools

Goals:

➤ Build once, deploy everywhere

➤ Understand environment & conformance to a spec

➤ Notification of success and failure scenarios

➤ Glue together a disjointed development tool chain

➤ Automate as much as possible post code check-in

Timelines:
➤ Initial product demo and RFP – Jan 2013, POC – January 2013
➤ Implementation – 6 months

Results:
➤ Reduced deployment of new web services from days to hours
➤ Enabled separation of duties and met auditing requirements
➤ Created quality gates and metrics
➤ Provided for artifact retention

Click here to read their own testimonial!!

How Hiscox is adopting DevOps and IBM UrbanCode Deploy

Pain Points:

- Dev Team wanting to do more, and make more frequent changes
- Operations needing greater control with more standards in place

Goals / Business Drivers:

- Reduce friction between Development and Operations and break down silos.
- Business growth placing greater demands on IT for newer, and better ways to do things
- Work smarter not harder

Results:

- Ability to execute 47 releases in one week for one application
- 17.5 man-days of effort reduced to around 10 minutes
- Expand release knowledge from 1 person to dozens of people

HISCOX

About HISCOX
Hiscox is a leading specialist insurer with a diverse portfolio of personal and commercial risks. With 100 years of underwriting heritage, they have more than 1,400 staff, with offices in 11 countries.

Read how IBM Business Ranger4 helped Hiscox with their DevOpsjourney

ranger4

www.ibm.com/software