A DevOps State of Mind

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“In short, software is eating the world.”

- Marc Andreessen, Wall Street Journal, August 2011
UBER, LYFT FALLOUT: TAXI RIDES PLUNGE 65% IN SAN FRANCISCO
BUT DEMANDS ON IT INCREASING AS BUSINESSES ARE REIMAGINED

Online, Mobile

Software Defined Networks

Desktop to Cloud

Online, Mobile
CREATE AN IT INNOVATION GAP

- Business wants agility, more efficiency, new capabilities
- IT struggling with existing legacy infrastructure architecture and cost model
- IT needs to adopt cloud architectures and technologies to close innovation gap
## DELIVERING SOFTWARE TODAY: THE REALITY VS. THE GOAL

<table>
<thead>
<tr>
<th>BUDGET</th>
<th>TIME</th>
<th>VALUE</th>
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<tbody>
<tr>
<td>45% OVER</td>
<td>7% OVER</td>
<td>56% LESS</td>
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Source: Delivering large-scale IT projects on time, on budget, and on value
McKinsey & Company, October 2012
DEVELOPMENT LIFECYCLE TRENDS

More time spent on Development
WHAT CAN I.T. DO?

I.T. CAN TURN OPS AND DEV INTO **DEVOPS**

“DevOps is a software development method that stresses communication, collaboration and integration between software developers and information technology (IT) professionals.”[1]
WHAT CAN I.T. DO?

I.T. CAN TURN OPS AND DEV INTO DEVOPS

“DevOps is a software development method that stresses communication, collaboration and integration between software developers and information technology (IT) professionals.” [1]

Gene Kim’s THREE “WAYS” OF DEVOPS [2]

HOW DO THE THREE WAYS TRANSLATE?

✓ STANDARDIZED ENVIRONMENTS
✓ AUTOMATED PROVISIONING
HOW DO THE THREE WAYS TRANSLATE?

✓ CONTINUOUS INTEGRATION
✓ CONTINUOUS DELIVERY
HOW DO THE THREE WAYS TRANSLATE?

✓ DEVELOPER SELF-SERVICE
✓ RAPID PROTOTYPING
ORGANIZATIONS IMPLEMENTING DEVOPS

Better deployment quality 63%
Faster release frequency 63%
Improved process visibility 61%

DEVOPS VALUE IN ACTION: VELOCITY AT AMAZON AWS

10,000
11.6
.001%

MAX DEPLOYMENTS/HOUR
MEAN TIME BETWEEN DEPLOYMENTS (SECONDS)
SOFTWARE DEPLOYMENTS CAUSING AN OUTAGE

Puppet Labs, IT Revolution Press, ThoughtWorks
ORGANIZATIONS IMPLEMENTING DEVOPS

“30 innovations to the website deployed each day, … sometimes adding millions of dollars in sales”
Forbes, Apr’14

“Taking a system that required a full month to release new features and turning it into one that pushes out updates multiple times per day.”
Wired
THREE KEY QUESTIONS FOR I.T. AND BUSINESS

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<td>3</td>
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<tr>
<td>How to quickly and reliably deliver new capabilities?</td>
<td>What kinds of new apps and services to deliver and support?</td>
<td>Where to create and run new apps and services?</td>
</tr>
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</table>
DEVOPS IS PART OF A LARGER SHIFT

HOW? | WHAT? | WHERE?
---|---|---
DEVOPS | CLOUD APPS | OPEN HYBRID CLOUDS
DEVOPS + CLOUD = INDUSTRIALIZE
THE NEED FOR SPEED
THE ACCELERATION OF APPLICATION DELIVERY FOR THE BUSINESS

HOW
- Waterfall
- Agile
- DevOps

WHAT
- Monoithic Apps
- N-Tier Apps w/ Appservers
- Microservices w/ APIs

WHERE
- Physical Servers
- VMs
- Containers

FASTER AND HIGHER QUALITY
DEVOPS WORKFLOW

OPS

- Create containerized IaaS or PaaS development environment

DEV

- Provision environment locally or at OpenShift by Red Hat
- Write app as containerized microservices cluster and commit changes
- Push changes through CICD and automated testing system to containerized staging

DEVOPS

- Scheduler orchestrates and deploys app
- Monitor and operate app
USE DEVOPS TO CREATE CLOUD-NATIVE APPS

- Monolithic app container
- Scale up by adding hardware resources
- Limited scale out through clustering

- Distributed, networked, containerized services
- Scale out by orchestrating services
- *Faster iteration and release*
- *More robust*
OS EVOLUTION: MULTI-HOST APPS NEED AN ORCHESTRATOR AND A SCHEDULER

Orchestrator (Kubernetes): Model the app across multiple hosts/containers

Scheduler (Mesos): Provide service and APIs for placing the app onto resources

Container pool (Red Hat Enterprise Linux/Docker): Provide resources to run app
A CLOUD PLATFORM FOR MICROSERVICE CLOUD APPS

Provision apps from service catalog

Orchestrate and place apps

Run composed microservices in containers

Provide dynamic, programmable infrastructure

OPS MANAGEMENT AND SERVICE CATALOG
(Red Hat CloudForms)

CONTENT, ENTITLEMENT, AND LIFECYCLE
(Red Hat Satellite)

SERVICE SCHEDULER/ORCHESTRATOR
(Kubernetes, Mesos)

Red Hat CloudForms Monitoring Docker Image
Red Hat CloudForms Orchestration Docker Image
Red Hat Satellite Content Docker Image
Red Hat JBoss AMQ Docker Image
App DB Docker Image
Red Hat JBoss BRMS Docker Image
Red Hat Enterprise Linux Guest

RED HAT ENTERPRISE LINUX OPENSTACK PLATFORM
COMPUTE STORAGE NETWORK
(Red Hat Enterprise Linux OpenStack Platform, Red Hat Storage, Open Daylight)
OPEN HYBRID CLOUD FOR MICROSERVICE CLOUD APPS

OPS MANAGEMENT AND SERVICE CATALOG
(RED HAT CLOUDFORMS)

CONTENT, ENTITLEMENT, AND LIFECYCLE
(RED HAT SATELLITE)

SERVICE SCHEDULER/ORCHESTRATOR
(KUBERNETES, MESOS)

AMAZON SCHEDULER

OPENSHIFT
BY RED HAT

PRIVATE CLOUD

PHYSICAL

VIRTUAL

PUBLIC CLOUD
DEVOPS SPANS I.T. APPROACHES

INTEGRATE DEV, OPS, AND I.T. SERVICES WITH RED HAT

BROWNFIELD: TRADITIONAL I.T.  GREENFIELD: FAST I.T.
DEVOPS SPANS I.T. APPROACHES

INTEGRATE DEV, OPS, AND I.T. SERVICES WITH RED HAT

BROWNFIELD: TRADITIONAL I.T.

GREENFIELD: FAST I.T.
FINANCIAL SERVICES COMPANY
BUSINESS CHALLENGES

- Growth
- Competition
- Agility
- Predictability
- Recruiting
It could take 6 weeks to get a single word changed on the Web site.

It took 2 years after a competitive startup launch to get a competing product to market.

When developers work in Node.js, they can change the code they’re working on, direct it to run, and see whether it works — in the blink of an eye.

The environment, while stable, didn’t use the sexiest technologies, which made recruiting difficult.
DEVOPS SOLUTION

Leverage Automation Technologies Combined with Cloud Architecture
DEVELOPMENT TO PRODUCTION in <30 minutes

- Source Code Repository Service
  - Jenkins
  - Nexus "Release"
- Continuous Integration
- Repository Manager
  - Nexus "Production"
- OpenShift Deployment Tool
  - Eclipse IDE Web Console CLI
  - rsync
- Auto Scale... Up & Down
- Node
  - Binaries
  - Partitioning
  - Multi-version
  - Rollback
DEVOPS ROI

IMPROVE BUSINESS AGILITY

- Shorten time to market of new capabilities and stay ahead of increasing competitive threats
- Reduce app provisioning from 4 weeks to < 30 minutes

IMPROVE BUSINESS PREDICTABILITY

- Reduce wide variances of time to build and deploy, enabling improved alignment of launch events
DEVOPS ROI

IMPROVE DEVELOPER PRODUCTIVITY

- Provide developers with self-service capabilities
- Continuous integration and deployment
- Reduce dev/QA iteration on bugs from hours to minutes
- Test multiple versions of application in parallel
- Consistent set of tooling in dev, QA, and production
- Distributed Jenkins to improve build performance

IMPROVE OPERATIONAL EFFICIENCY AND COSTS

- Increase resource use, move from 1 app per VM to containers
- Automate scaling of applications
CASE STUDIES
# Entertainment and Media Giant

## Business Challenge
- The move to new lines of business is forcing the need for agility
- Need to provision and scale environments on demand
- Each new movie property has multiple unique app development requirements that must be met

## Why OpenShift?
- OpenShift allows them to move towards DevOps
- Development teams can create and destroy environments at a moment's notice
- No longer need to wait on operations

## Results
- Mobile Gaming Apps quickly created and running in Production
- Developers more innovative
- Operations more efficient
# Fortune 100 Global Technology Provider

## Business Challenge
- Large virtualization farm
- 5000 Developers
- 15,000 JVMs
- Want to add more automation, self service and improve productivity

## Why OpenShift?
- Standardized Dev provisioning workflows
- Standardized stacks
- It just worked
- Technical depth and support from team
- Evaluated Cloud Foundry and OpenShift

## Results
- Standardized on OpenShift for Internal IT
- Deploying to all Developers
- Early benefits from Rapid Prototyping
- Faster provisioning, lower TCO

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[Source: Cisco IT GIS—August 2013]
Financial Services Analytics ISV

Business Challenge
- ISV with traditional on-premise offerings
- They are building a cloud offering too
- Want to improve their ability to innovate their cloud offering and manage their on-prem offerings
- See OpenShift as a platform to build on

Why OpenShift?
- Known Enterprise OS
- Feature-set
- Extensibility
- API Interfaces
- Ease of integration
- Red Hat "knew what they were doing"
- Evaluated Cloud Foundry and OpenShift

Results
- 70% faster application development
- 90% faster app deployment
- Already serving new markets
- Handling Production workloads
THANK YOU