AGENDA

About Delta

App Modernization at Delta

Modernization Program Initiatives

DOJO Program

PaaS Program
         Delta's PaaS Journey
         Path to PaaS
         Operating Model
         PaaS Program – Implemented Patterns
         PaaS Offerings & Benefits

Delta's Evaluation with other Red Hat Products

Delta Air Lines

App Modernization for Business Transformation

Delta has initiated the app modernization and digital transformation journey to enable its existing applications to move to a lean architecture, leading to improved customer experience and time-to-market

Business Agility — Creating modularized and business aligned components leading to accommodate business changes quickly.

Release Velocity — Establishing a DevOps culture and a tools foundation which will aide in the overall release velocity.

Technical Debt — Simplification and continuous assessment based on tools to ensure the application stays relevant to modern digital needs.

Scalable Architecture — Creating light weight deployment units which can lend itself to on-demand scaling needs.

Security Vulnerabilities — Standardization of security scans in CI/CD and legacy practices & Implement Standard code quality analysis and reporting

PROGRAM INITIATIVES

DOJO Program | PaaS Program | Technology Upgrade

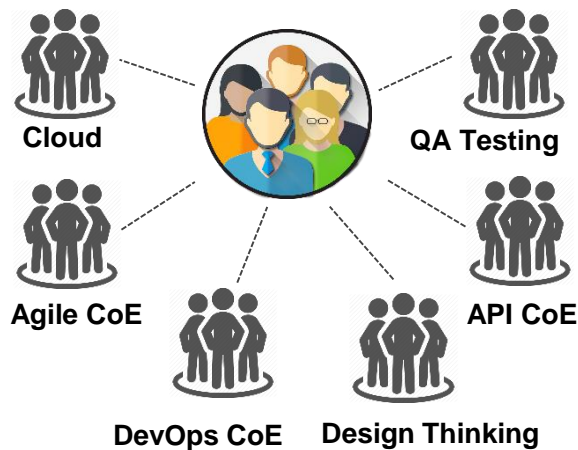# Dojo Program

The Dojo Program

Incubation for 'Being Agile'

OPERATING MODEL

OFFERINGS

- **8 week** Immersive Learning Program
- Customized learning offerings to address specific needs
- Dedicated Workspace in **ATL & MSP**
- Multiple CoEs with dedicated experts
- Expert **Coaching Community** for technical maturity & workflow needs
- Formal **Training Curriculum** specific to Delta
  - Direct Coaching
  - Instructor Led
  - Self Learning
- Architecture Vision & Framework Compliance

Cloud

QA Testing

Agile CoE

API CoE

DevOps CoE

Design Thinking

OTHER FEATURES

Ops Concierge Services
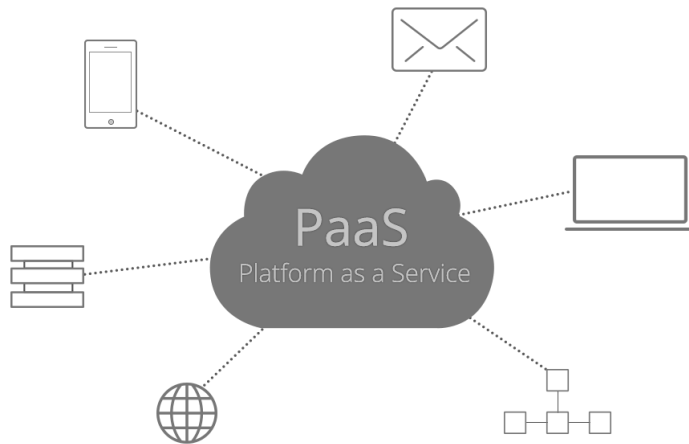- Expedited support for Operational needs

Access to IaaS & PaaS
- Curriculum designed to prepare teams to utilize Delta's Cloud Platform and OpenShift

Transformation Assessment & Measure
- Team & Product Health
- Delivery Planning and Management Priorities
- Technical Practices (including CI/CD and Automation)
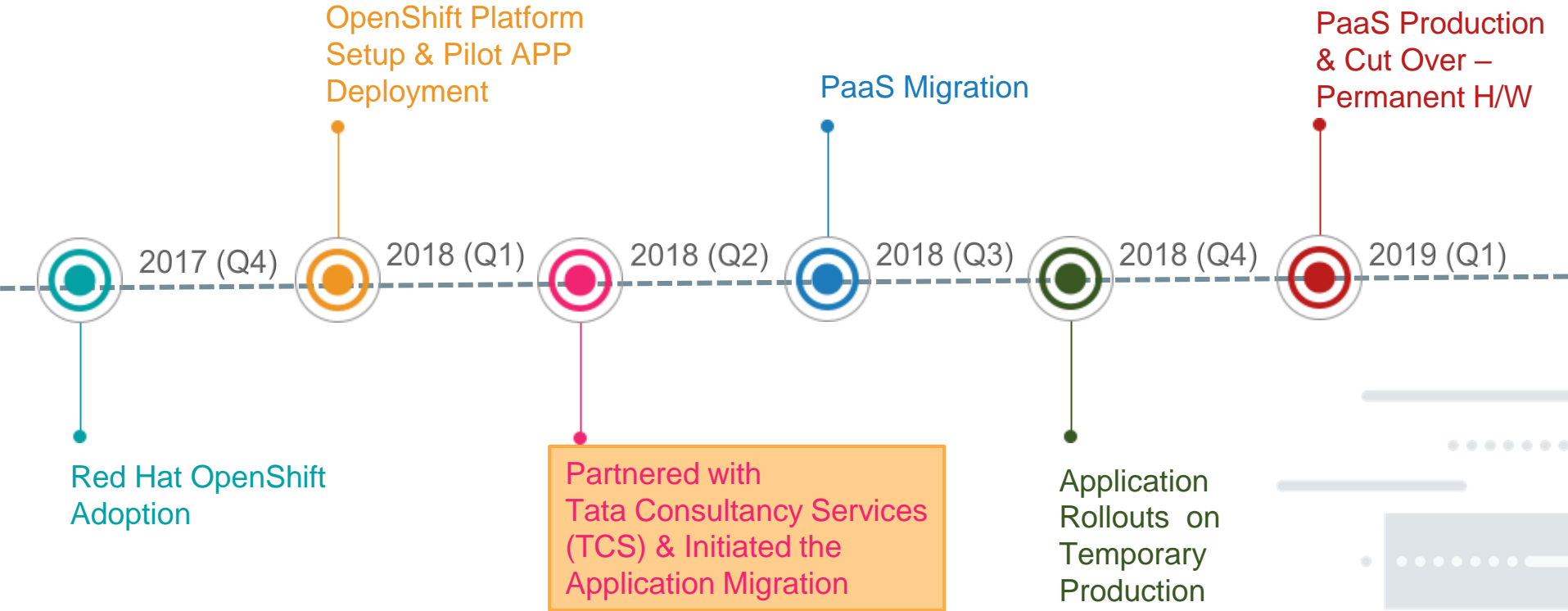- Learning Culture and Environment

PaaS Program

Platform as a Service (PaaS) Project

PaaS in Delta is a private cloud computing service that provides a platform allowing portfolio customers to develop, run, and manage applications. Also utilizing the CI/CD process on the OpenShift platform, without the complexity of building and maintaining the infrastructure typically associated with developing and launching an app.

App Mod PaaS team – Delta has partnered with **Tata Consultancy Services (TCS)** as the technology partner for migrating the legacy application to the PaaS (Red Hat OpenShift).

Delta's PaaS Journey

OpenShift Platform
Setup & Pilot APP
Deployment

PaaS Migration

PaaS Production
& Cut Over –
Permanent H/W

2017 (Q4)　　2018 (Q1)　　2018 (Q2)　　2018 (Q3)　　2018 (Q4)　　2019 (Q1)

Red Hat OpenShift
Adoption

Partnered with
Tata Consultancy Services
(TCS) & Initiated the
Application Migration

Application
Rollouts on
Temporary
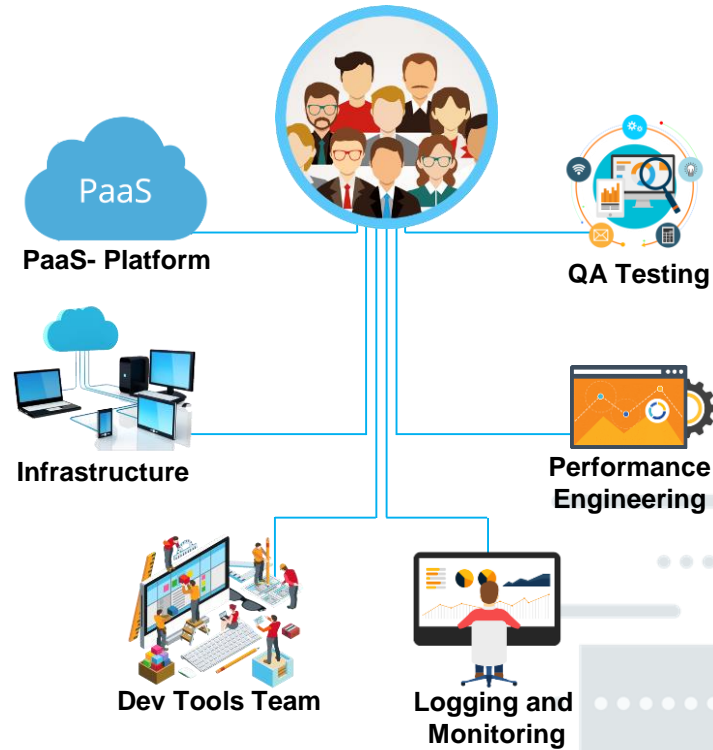Production

Operating Model

Feature offerings

- Accelerate application delivery with agile and DevOps methodologies
- Modernize Delta apps to Cloud Friendly mode
- Expert Knowledge and technical expertise in OpenShift & DevOps migration
- Establish Partnership with application portfolio teams for app migration
- Utilize established and proven processes for migration
- Ensure application teams are ready for Day2 Support
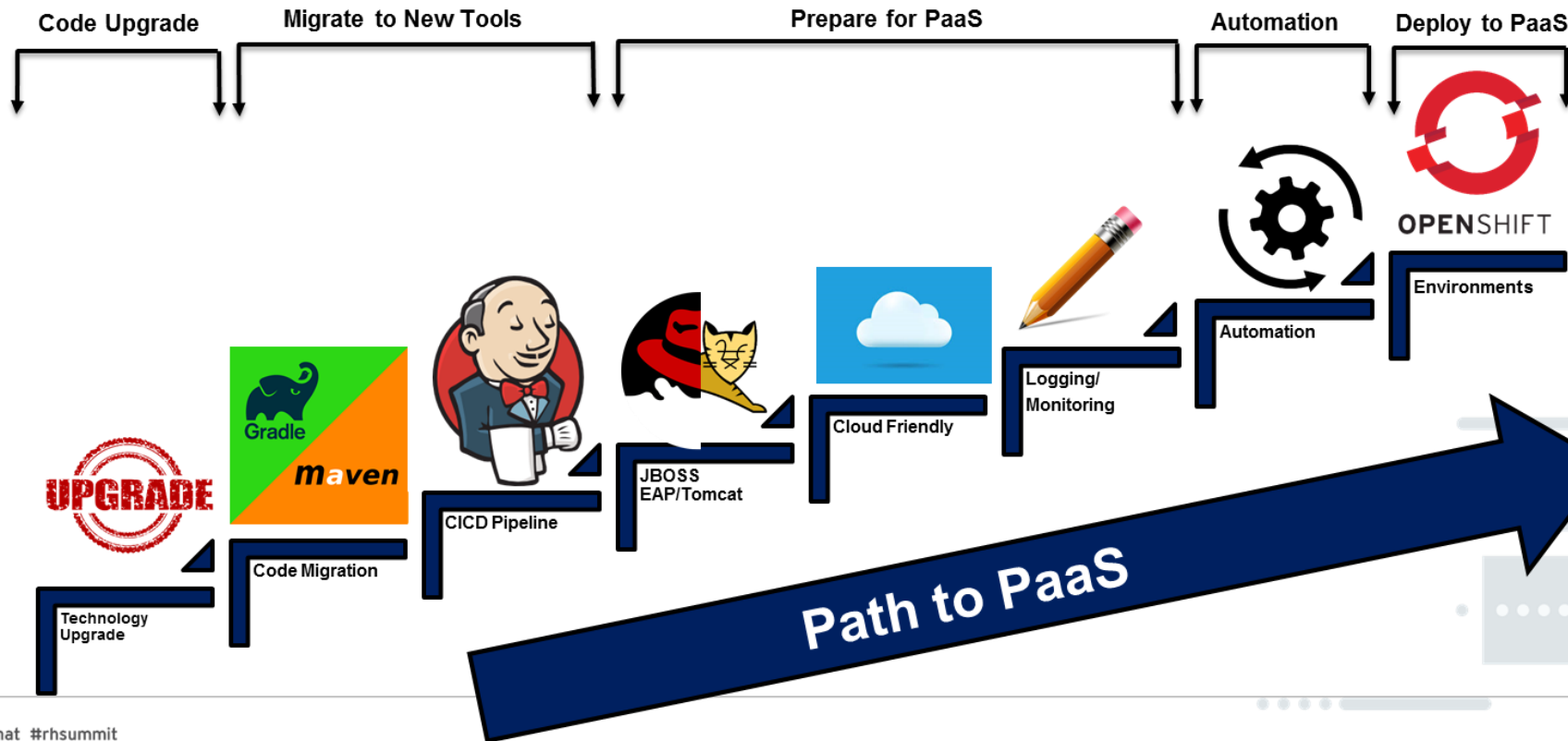
Paired Programming

- Git lab, Jenkins pipeline, Maven/Gradle, Sonarqube, Nexus
- JBOSS 7.1 EAP / Spring Boot
- Red Hat Application Migration Tool Kit
- Deployment on Red Hat OpenShift

PaaS Acceleration Team (TCS)

PaaS- Platform

QA Testing

Infrastructure

Performance Engineering

Dev Tools Team

Logging and Monitoring

Path To PaaS

Below is Delta's approach for migrating existing legacy applications to OpenShift

Code Upgrade

Migrate to New Tools

Prepare for PaaS

Automation

Deploy to PaaS

Technology Upgrade

Code Migration

CICD Pipeline

JBOSS EAP/Tomcat

Cloud Friendly

Logging/ Monitoring

Automation

Environments

OPENSHIFT

Path to PaaS

Implemented Patterns

PaaS Features & Benefits for Delta

PaaS Features

- Consistent Environment – app build, development, non-prod, prod

- Resiliency – Most resilient platform at Delta Airlines

- Easily Attained Resiliency:
  - Pod level
  - Compute node level
  - ESX level
  - Data Center level (with a little more effort from App Dev Team)

- Blue-Green\Canary Deployment Capability

- Easily portable

- Secure certificate handling

Self-Service Elastic infrastructure in less than 24 hours

Highly responsive, highly available, consistent infrastructure environments

Infrastructure & Reliability Benefits

- Automated Recovery
- Elasticity
- Leverage CI Pipeline
- Greater App Density

Developer & Application Benefits

- Quick and Efficient Patching
- Pipeline Application Deployment
- Accelerate release cycles
- Platform designed for 12 factor apps
- Strengthen Security
- Agile in Delivery

What this Means for Delta

- Maximum uptime – Active/Active/Active
- Ability to Innovate Faster
- Reduced lead time
- Improved Application Support
- Improved Business Operations

Other Red Hat Products in Delta

Ansible

- Limits configuration drift
- Decreases deployment time
- Allows for self-service
- Standardizes application deployments
- Orchestrates tasks on multiple systems

RHEL

- History of stability
- Live kernel patching without the need to reboot
- Specialize Features like SE Linux and Cockpit

Satellite

- Used as key part of RHEL server build automation
- Delta patching team utilizes Satellite for RHEL patching instead of local repositories

Learnings During the PaaS Journey

- ➢ Cross-Functional Teams established on process, tools, and platform

- ➢ Enterprise application pre-assessment and repeatable pattern identification

- ➢ OpenShift product catalog feature exploration and availability on Delta's Marketplace

- ➢ Gain commitment, knowledge, transition, mindshift and platform adoption from teams

- ➢ Platform upgrade, patching, tool integration and maintenance

- ➢ Spread knowledge and create community to share best practices across the enterprise with proactive inputs