CI/CD FOR THE ENTERPRISE: TEACHING AN OLD DOG NEW TRICKS

Open Infrastructure Summit 2019

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THE SQUAD

WHO WE ARE

- 22 people (managers, developers, SREs, quality engineers, BAs)
- Distributed across 3 states in the US and 3 continents

WHAT WE DO

- Build and maintain applications to help Red Hat customers manage their subscriptions and access content
WHERE WE BEGIN

- Early stages of adopting DevOps practices, but still very siloed
- IT Operations group performs majority of releases
- Good use of Configuration Management, though it was complex
- Averaged 2 releases/mo for our flagship application
THE TERRIBLE, HORRIBLE, NO GOOD, VERY BAD RELEASE PROCESS

PHASE
- Dev
- QA
- Stage
- Prod
THE TERRIBLE, HORRIBLE, NO GOOD, VERY BAD RELEASE PROCESS
OPPORTUNITIES FOR IMPROVEMENT

- Releases were a significant source of toil
- Infrequent releases led to long cycle times
- Confusing process
PAAS TO THE RESCUE?

- Red Hat IT launched new PaaS offering based on OpenShift 3
- Application teams given access to their apps in production
- Automated build and release jobs “for free”
KUBERNETES

IS THIS DEVOPS?
CI/CD

Commit Code
- Unit Testing
- Code Quality Checking
- Merge MR
- Package Release

Create CHG Record
- Deploy to QA
  - Update Portfolio Management
  - Test Suite
  - QA Signoff

Deploy to Stage
- Update Portfolio Management
- Test Suite
- QA Signoff

BA Signoff
- Deploy to Prod
  - Update Portfolio Management
  - Close CHG Record
  - Profit!
SCALING OUT

- So far we’ve only migrated a few low-touch apps
- Migrated our flagship app: access.redhat.com/management
- Started a greenfield app: api.access.redhat.com/management
SOLVING CONSTRAINTS
DEV-ON-DEMAND

- A single dev environment was no longer sufficient
- Moved to short-lived instances following Merge Requests
- Shifted left: code quality scans, unit tests
- Quick feedback for QEs and BAs
OPERATION “GO GREEN”

- Many automated tests flickered and became unstable over time
- Manual triage required by Quality Engineers
- Conscious choice to allocate time for fixing tests instead of developing new ones
MODERNIZING CHANGE MANAGEMENT

● Better risk categorization
● Removed arbitrary lead time requirement and change freezes
● Used “Standard Change” type that is pre-approved
● Used ServiceNow API to open/close changes
USER STORIES, NOT FAKE NEWS

● Up-to-date Kanban board is important
  ○ WIP Limits
  ○ Current Status
● Integrated pipeline with Rally APIs to move stories and create milestones
IT’S BEGINNING TO LOOK A LOT LIKE CI/CD
MEASURING UP
## DELIVERY PERFORMANCE

<table>
<thead>
<tr>
<th></th>
<th>ELITE</th>
<th>HIGH</th>
<th>MEDIUM</th>
<th>LOW</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Deployment Frequency</strong></td>
<td>on-demand</td>
<td>hourly-daily</td>
<td>weekly-monthly</td>
<td>weekly-monthly</td>
</tr>
<tr>
<td><strong>Change Lead Time</strong></td>
<td>&lt;1h</td>
<td>1d - 1w</td>
<td>1w - 1m</td>
<td>1m - 6m</td>
</tr>
<tr>
<td><strong>MTTR</strong></td>
<td>&lt;1h</td>
<td>&lt;1d</td>
<td>&lt;1d</td>
<td>1w - 1m</td>
</tr>
<tr>
<td><strong>Change Failure Rate</strong></td>
<td>0-15%</td>
<td>0-15%</td>
<td>0-15%</td>
<td>46-60%</td>
</tr>
</tbody>
</table>

From DORA’s 2018 State of DevOps report
RHSM WEB CHANGE RATE

Change Requests per Month

LEAD TIME

Lead Time to Accepted (days) vs. Date - Lower is better

- Lead Time to Accepted (days)
- Lead Time to Ready for Release (days)
- Lead Time Dev to Ready for Release (days)

Date:
- 7/1/2017
- 1/1/2018
- 7/1/2018
- 1/1/2019
THE HUMAN FACTOR

“Our release process used to feel more like filing taxes, but now it’s more like sending money with Venmo”
THE HUMAN FACTOR

“My favorite part of our CI/CD adoption has been the freedom to experiment: having disposable merge instances for giving early feedback, feature flags that let us try things with a targeted audience and fine-tune before turning on new functionality for the entire customer base, and even the experimentation that comes with every member of the team feeling empowered to try automating some piece of our process.”
THE HE-MAN FACTOR

“I am basically He-Man. By the power of CI/CD, I have the power*!”

*To push changes to production myself when an appropriate threshold of quality and organizational preparedness, much of which is built into our pipelines, is met.
Q+A
THANK YOU

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