How to Train your Jenkins?

• ... to Use Your Resources Effectively and Get More Value for Each Buck Spent on Resources

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CI Journey at PayPal

- Fusion - Single CI instance
  - April 1, 2014

- CIaaS
  - June 9, 2014
  - ECI released to overwhelming response
  - November 11, 2014
    - Open sourced CI monitoring/alerting code

- CI hits 800 CI milestone
  - Period of instability
    - November 4, 2014

- Recognised for Open Source Contributions
  - January 7, 2015

- Replaced Marathon with Aurora
  - February 15, 2015
Background - CI at PayPal

- One Ginormous Jenkins Instance, customized for PayPal
- 40,000 runnable jobs
- 12,000 builds are run each day
- Java, Node, Python, and C++ stacks, Fortify and Freestyle jobs too
- Unit test and deploy flows
- One Jenkins master with a pool of a hundred Jenkins slaves
- Specialized “Monster Machine” stages build 40,000,000 lines of code in a half hour
Overloaded Jenkins
Background - CI

- Individual VMs running Jenkins for each Application

- 2500+ VMs in use

- Each Jenkins would have 2 executor on master to perform builds
Dedicated Jenkins Instance Per VM
ClaaS Live

- Fusion - Single CI instance 4/1/2014
- ClaaS hits 800 CI milestone - Period of instability 11/4/2014
- Recognised for Open Source Contributions 1/7/2015
- Replaced Marathon with Aurora 2/15/2015
- ClaaS Live 6/9/2014
- ECI released to overwhelming response 11/11/2014
- Open sourced CI monitoring/alarming code 6/21/2015
Build slaves on Demand - Jenkins Mesos Plugin

- Jenkins Mesos plugin community is active
- We have contributed many enhancements/patches to the plugin
Optimized Resource Utilization
10X Savings

Before:

~ 24,000 CPU’s, 180 TB Disk, 54 TB RAM

After:

~2400 CPU’s, 18 TB, 7.2 TB RAM
Recovery was slow without Mesos...
Instant Recovery with Mesos...
Customers Felt It

Before:

“One common issue which blocks the CI (which blocks releases) is the Jenkins site becoming unavailable and you only get a to “Bad Gateway” message. When this bad gateway issue occurs all you can do is file a Jira ticket to bring it back up.”

Tim Craig (Millennium)

After:

“I talked to the people who monitored the CI the last two weeks and they both said they did not recall of any issues of the CI going down. So it looks like you guys have fixed 502 errors issues.”

Tim Craig (Millennium)
800 CI milestone

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  4/1/2014

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- Recognised for Open Source Contributions
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- Replaced Marathon with Aurora
  2/15/2015

- ECI released to overwhelming response
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- Open sourced CI monitoring/alarming code
  6/21/2015
CI workload – too much for Marathon
ClaaS Outages
A Step ahead of Customers

- Reporting/Alerting Dashboard
  - Data driven approach
  - One Step ahead of Customer
- Open Sourced Reporting/Alerting Plugin and Code.
- Email alerting
We Never Give Up

• ~20 Open Source contributions
  • Mani from ClaaS is a committer and led the last two releases of Mesos Jenkins Scheduler

• Replace Marathon with Aurora
  • Zero Outages and no customer impact.
Highly Available Setup

- Nginx
- ClaaS
- Aurora
- Mesos Master
- Mesos Cluster
- Jenkins Master
- Jenkins Slave
- Zookeeper
- MongoDB
- Swift / Object Storage
CD for Code and Config Management

- Ansible Based Configuration Management
- Ansible/Jenkins/GitHub for continuous deployment
H2 2015 and Beyond

- Fusion - Single CI instance
  - 4/1/2014

- ClaaS hits 800 CI milestone - Period of instability
  - 11/4/2014

- Replaced Marathon with Aurora
  - 2/15/2015

- Recognition for Open Source Contributions
  - 1/7/2015

- Marathon upgrade - Deluge of 502 errors
  - 1/14/2015

- Open sourced CI monitoring/alerting code
  - 6/21/2015

- ECI released to overwhelming response
  - 11/11/2014

- ClaaS Live
  - 6/9/2014

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Under the Hood

- Kubernetes
- Jenkins Scheduler
- Aurora

Diagram:
- Masters
- Slaves
- CI API
- MongoDB
- Managed Stages
- Docker