Eliminating Developer Friction with Docker
TEXT WEROCKYOU TO 404040
FOR A CHANCE TO
WIN $100
TICKETMASTER® TICKET CASH®
Andy Chan

- 2.5 Years in Ticketmaster
- Principal Architect, Systems
- Cloud Enablement Team (CET)
- LinkedIn: https://www.linkedin.com/in/in/iceycake
- Twitter: @iceycake
ABOUT US

History

- 1976 - Founded at Arizona State University
- 1996 - Ticketmaster.com Launched
- 2010 - Live Nation and Ticketmaster Join Forces to Power Live Experiences

- Publicly Traded Company (LYV)
- $7.6B Revenue
- $25B in GTV (Gross Transaction Value) in 2015
- One of the World’s Top 10 eCommerce Sites
SOMEBWHERE IN THE WORLD
EVERY 20 MINUTES
IS A LIVE NATION EVENT
ticketmaster®
THE WORLD'S LEADING TICKETING COMPANY

530,000,000
TICKETS

12,500
CLIENTS

27
COUNTRIES
Onsales = Black Friday every day!

- Huge spikes / demand for tickets
- Global company = across time zones
- Limited inventory (Beyonce Tickets!)
- Multiple sales channels

0 to 150M transactions in minutes!

That’s a spike of >8 GBps !!!!!

Self Inflicted DDOS-as-a-Business
TECH COMPLEXITY
PRE-MODERN TECHNOLOGY

- Every era of software, many not ready for containers and cloud
- 1970s: Custom VMS OS on Emulated VAX (The Host)
- 2000s: Xen Cloud, Big-Iron Filers, NFS, custom built infrastructure
Our Infrastructure Today

- 22,000 Private Cloud VMs
- 60% VMs Growth in 2015
- 21 Ticketing Systems
- 250+ Products
- Different Technology Stacks
- More than 1,000 Databases
- 7 DCs Globally
Public Cloud Migration

Amazon Web Service (AWS) Preferred Public Cloud Provider
Public Cloud Migration

- Raise Tech Maturity
- Containerize and Retool Apps
- Migrating themselves to the cloud
Public Cloud Migration
Public Cloud Migration
Public Cloud Migration - Cloud Enablement Team
Public Cloud Migration - Cloud Enablement Team

- Small team (5) of experts dedicated to developing:
  - Future state architecture
  - Path to Public Cloud
  - Cloud Native Solution Patterns
  - Cure us of our on-prem addiction
    - (NFS, Always scaled, HW reliance, SW trees, etc)
Public Cloud Migration - Cloud Enablement Team

- Self Migration Toolkit
  - Online Documentation
  - General Guidelines
  - Common Software/System Design Patterns
  - Migration Solutions/Templates
  - Utilities and Tools
  - CICD Pipeline
Developers Challenges

- Multiple Steep Learning Curves
  - Cloud Native Software Development
  - Cloud System Design Patterns
  - AWS / AWS SDK
  - Self Migration Toolkit

- Time Constraints

- Business as Usual (Supporting Existing On-Prem Systems)
Self Migration Toolkit Requirements

- Command Line First (Automation)
- Cross Platform
  - Linux, Windows, Mac
- Easy to Distribute/Upgrade/Rollback
  - Change Frequently
- Easy to Use/Learn
“Write Once Run Everywhere”
3 Billion Devices Run Java
Computers, Printers, Routers, Cell Phones, BlackBerry, Kindle, Parking Meters, Public Transportation Passes, ATMs, Credit Cards, Home Security Systems, Cable Boxes, TVs...
To open “Eclipse.app,” you need a Java SE 6 runtime. Would you like to install one now?

Note: Use of this software is subject to the Software License Agreement applicable to the software you are downloading. A list of Apple SLAs may be found here: http://www.apple.com/legal/sla/

[Buttons: Not Now, Install]
Go
Docker

- Can run **ALMOST** anywhere
- Windows 7, 8 (Docker Toolbox)
- Windows 10 (native with Hyper-V, Docker for Windows)
- Mac OS (native with HyperKit, Docker for Mac)
- Linux Distros (dockerd)
$ docker pull myregistry/cet/terraformer:latest

$ docker pull myregistry/cet/jana:latest

$ docker pull myregistry/cet/credtools:latest

$ docker pull myregistry/cet/credtools:experiment

$ docker pull myregistry/cet/credtools:1.0.7
Docker

- Almost **ANY** Programming Languages
- On almost **ANY** modern Linux Distro
- Abstraction: **ZERO** Impact to Developers when Rewriting/Refactoring Tools
Docker

- Combining multiple open-sourced tools into a single tool
- Easy to extend functionality from existing distributed binaries.
- Multiple Docker based tools can chain together easily by developers
- Gitlab-CI (CI/CD pipeline)
Case Study
Hashicorp Terraform

- Open Source
- Supports AWS, Google Cloud Platform, Azure
- Better DSL vs Cloud Formation (JSON)
Hashicorp Terraform (< 0.9.0)
$ rm -rf .terraform/

$ terraform remote config \
  > -backend=s3 -backend-config="bucket=terraform.bucket" \
  > -backend-config="key=PRD99999999/dev1/terraform.tfstate" \
  > --profile tm-sandbox-Ops-Techops \
  > --region us-east-1

$ terraform apply -var-file=sandbox/andy/terraform.tfvars
Ticketmaster Terraformer (Docker Container)

State File Logic

Ubuntu
$ docker run --rm -it -v $(pwd):/cfg -v ~/.aws:/.aws/ \
   myregistry/cet/terraformer:latest tm-sandbox/dev1 apply

$ cat ~/.bash_profile
.
.
.
terraformer() {
  docker run --rm -it -v $(pwd):/cfg -v ~/.aws:/.aws/ myregistry/cet/terraformer:latest "$@";
}
.
.
$ terraformer tm-sandbox/dev1 apply
Ticketmaster Terraformer (Docker Container)
Ticketmaster Terraformer (Docker Container)

State File Logic (golang)

Pull Requests

Alpine
Ticketmaster Terraformer (Docker Container)

State File Logic (golang)

Ticketmaster Validation Logic

Pull Requests

Alpine
Ticketmaster Terraformer (Docker Container)

- Gruntwork Terragrunt
- Ticketmaster Validation Logic
- State File Logic (golang)
- Alpine
- Pull Requests
Ticketmaster Terraformer (Docker Container)
GitLab CI

- Community Edition Open Source
- Source Code Management (SCM)
- CI/CD Pipeline
- Runner Executor
  - Shell, SSH, PowerShell
  - Docker, Docker Machine
GitLab CI

[Diagram of the GitLab CI workflow with multiple slaves connected to a central hub, each labeled "Slave." The hub has a label "Plugins." Each slave also has a label "Plugins." The connections are indicated by arrows between the slaves and the hub.]
● Easy to upgrade (docker pull latest)
● Abstract from Developers/Users
● Almost Cross Platforms
  ○ Mac, Windows, Linux Desktop / Server Side
● Still Frictions with Windows
  ○ Bugs
    ■ Symlinks Not Quite Working
  ○ Difficult to Setup
    ■ Git BASH Profile to Work with Powershell
    ■ Local User Account for Setup Docker Volume
● Windows Container?
Questions?