Containers Demo – Alisson Sol – July/2016

- “It was the best of times, it was the worst of times, it was the age of wisdom, it was the age of foolishness, it was the epoch of belief, it was the epoch of incredulity, it was the season of Light, it was the season of Darkness, it was the spring of hope, it was the winter of despair, we had everything before us, we had nothing before us, we were all going direct to Heaven, we were all going direct the other way - in short, the period was so far like the present period, that some of its noisiest authorities insisted on its being received, for good or for evil, in the superlative degree of comparison only”

The Long Voyage

- A while long: CORBA, SOM/DSOM, COM/DCOM, JavaBeans, CLI, …
- A little ago, in a little different way: apt, rpm, yum, Nix, …
- From code to running: Jenkins, Chef, Puppet, Ansible, Salt, …
- Live: Hyper-V live migration, VMware vMotion, OpenStack Glance, …
- Then: LXC, runC, Docker, Flockport, CoreOS Rocket (rkt), …
- Show must go on: Swarm, Fleet, Kubernetes, Mesos, …

The Old Curiosity Shop

Physical Machine	Virtual Machine	Containers
Any OS, 1 at a time	Hypervisor + Several VMs	VM + containers
~16GB RAM, ~TBs of persistent disk	~4GB RAM, ~256GB persistent disk	~2GB RAM, ~128MB persisted
Maximum performance	Great performance	Good to great performance
Misconfigure: reinstall image	Misconfigure: back to checkpoint	Misconfigure: restart
Latency (refresh): hours	Latency (refresh): minutes	Latency (refresh): seconds

Exceptioners: please drive against traffic!

Bleak House

- Some families have problems...
  - Dependency hell…
  - Threads, multi-threads, dammed threads...
  - Binary redistribution
  - DevOps

David Copperfield: Images and Containers

- docker --help
- docker images
- docker run ubuntu:14.04
- docker ps
- docker run ubuntu:14.04 /bin/echo "Hello docker!"
- docker run -t -i ubuntu:14.04 /bin/bash
  - -i, --interactive Keep SDIN open even if not attached
  - -t, --terminal Allocate a pseudo-TTY
  - cat > myFile
  - exit

David Copperfield: Host and Container

- docker cp index.html [container]:/index.html
- docker cp [container]:/index.html other.html

David Copperfield: Build Your Own Image

- myDockerImage
  - FROM nginx
    COPY myHtml /usr/share/nginx/html
- docker build -f myDockerImage -t my-website .
  (don’t forget final “.”)
- docker images

David Copperfield: Microservices

- docker run -d -p 8081:80 --name ng-original nginx
- docker run -d -p 8082:80 --name ng-my-website my-website
  - -d, --detach Run container in background and print container ID
  - -p, --publish value Publish a container’s port(s) to the host
- docker ps
- http://localhost:808?
- docker stop ng-original
- docker stop ng-my-website

David Copperfield: Volumes

- docker volume --help
- docker volume create --name my-data
- docker volume ls
- docker run -t -i -v my-data:/mnt/my-data ubuntu:14.04 /bin/bash
    - -v, --volume value

Great Expectations: Kitematic

- New, Search: nginx
- Create
- Start
- docker ps
- http://localhost:[port]
- docker exec -it [id] bash
- exit
- cd /usr/share/nginx/html
- docker cp index.html nginx:/usr/share/nginx/html/index.html

Great Expectations: node

- Search: node
- docker volume create --name my-app-node
- docker run -t -i -v my-app-node:/mnt/my-app-node node /bin/bash
- docker cp appNode [container]:/mnt/my-app-node
- npm install
- exit
- docker run -it --rm --name my-running-node
  -p 8888:8888
  -v my-app-node:/mnt/my-app-node
  -w /mnt/my-app-node/appNode
  node
  node server.js

Great Expectations: dotnet

- Search: dotnet
- docker volume create --name my-app-dotnet
- docker run -t -i -v my-app-dotnet:/mnt/my-app-dotnet microsoft/dotnet /bin/bash
- docker cp appDotnet [container]:/mnt/my-app-dotnet
- dotnet restore
- dotnet build
- dotnet run

Hard Times: For These Times

- docker push
- docker-compose
- configuration and security

Our Mutual Friend

- Presentation links
  - Docker security docs: https://docs.docker.com/engine/security/
  - Docker Security Deep Dive - https://www.youtube.com/watch?v=tL4IYSKu7ZU
  - The golden ticket – Docker and High Security Microservices: https://www.youtube.com/watch?v=346WmxQ5xtk
- Other
  - https://square.github.io/keywhiz/
  - https://www.vaultproject.io/
  - https://hub.docker.com/_/node
  - https://hub.docker.com/r/microsoft/dotnet