Volatile Environments with Virtualization Technologies

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About Me

- PhD in N-Version Execution
- GRID, IT and CMS
- OpenStack
- Kubernetes Project
Outline

- Problems during developing, testing and setup
- Vagrant + Demos!
- Docker + Demos too!
This is going to be a technical session with a lot of examples!
Motivation (aka problems)

Three kinds of problems (IMHO):
- Project switching
- Project transferring
- Project testing
Project switching

- **Dependencies**
  - make sure they don’t conflict with something you have

- **Requirements**
  - Sorry your platform is not supported!

- **Interlinking components**
  - Start the DB and Server (plz no port conflicts!)
Project transferring

- Sharing with a friend
- Sharing with a team
- Sharing with the world
- Deploy in production
Project testing

- Various configurations
  - This option and this option and this option should fail

- Different components
  - MySQL + MariaDB + Postgresql

- Different topologies
  - M-M, M-S, what about this ActiveMQ…
Local VM lifecycle

- Download a VM image
- Configure resources: RAM, CPUs, network connections, and shared folders
- Boot the VM and install OS
- Install additional software
- User’s configuration
History of Vagrant

- Initial release: March 8, 2010, 5 years ago
- Mitchell Hashimoto and John Bender
- HashiCorp
- https://www.vagrantup.com
What Is Vagrant?

- **Simplifies the workflow necessary to run VMs locally**
  - Offers a very simple CLI
  - Supports: VirtualBox, VMWare, and Hyper-V…
  - Supports: Ansible, Chef, Puppet, and Salt
  - Distribute and share virtual environments
Demo 1

- Basic commands
- `vagrant init && vagrant up`
- Shared folders
- `nginx server`
- `vagrant share`
Demo 2

- Various web projects
- Port forwarding
Demo 3

- Multiple VMs
- Private networking
- Redis Server-Client Benchmark!
Further Reading

- Provisioners!
- https://www.vagrantup.com/docs/
- https://atlas.hashicorp.com
- https://github.com/mitchellh/vagrant/wiki/Available-Vagrant-Plugins
Enter Docker
History of Docker

- Initial release: 13 March 2013, 2 years ago
- Solomon Hykes
- dotCloud, now: Docker, Inc.
- www.docker.com
Extra features from VMs

- Fast
- Small memory footprint
- It’s disposable
Demo 1

- LXC example
- chroot on steroids
Demo 2

- Redis
- docker tunnels
Further Reading

- https://www.docker.com
- https://docs.docker.com
- Vagrant Docker Provisioner
Recap

- Use the virtualization!
- Helps you to keep track of development
- Helps you to share your work
- Keeps complexity and overhead low
- Enforces good practices
- Special treatment == You done something wrong (usually)
Some Personal Thoughts

- Dockfile/Vagrantfile vs the build?
  - Users vs Developers ???

- Think about Reproducibility?

- Open source code + Open source environment?

- This topic should become a course

- Question?