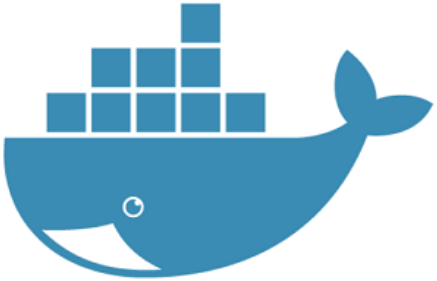

Docker for Beginners

- Lucas Albuquerque -
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Agenda

DAY 1

Technological Landscape

Container Concepts

Kernel Features (Namespaces, CGroups,)

DAY 2

Docker Installation

Managing Docker using CLI

DAY 3

Dockerfile

Docker Images

Docker Registry

DAY 4

Docker Volumes

Docker Networking

DAY 5

Docker Compose

Docker on Nutanix

Final Project - Flask App in LB mode

Resources

- **Powerpoint Slides**
- **Virtual Machines**
  - ✓ Available on Prolix
  - ✓ VMs CentOS 2 vCPU / 4GB RAM
  - ✓ IP Range: 10.66.41.203-213/24
  - ✓ User: root / Password: Nutanix/4u
- **GitHub Repository**
  - ✓ https://github.com/hutger/docker-training
  - ✓ LABs + Files
- **Etherpad**
  - ✓ https://etherpad.wikimedia.org/p/EMEA-Docker-Training
- **Slack Channel**

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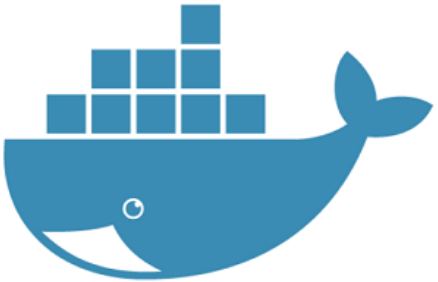

Docker for Beginners

Day 1 – Introduction

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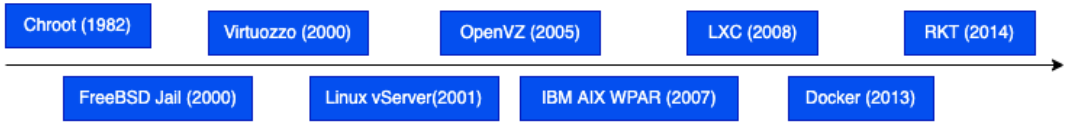
Technological Landscape

- Container concept is not new… it's being around for such a time!



- But why only in the most recent years it became a "trending topic"?
- Why some many companies are adopting container for delivering their apps?
- There are other tendencies which are taking advantage of containers?

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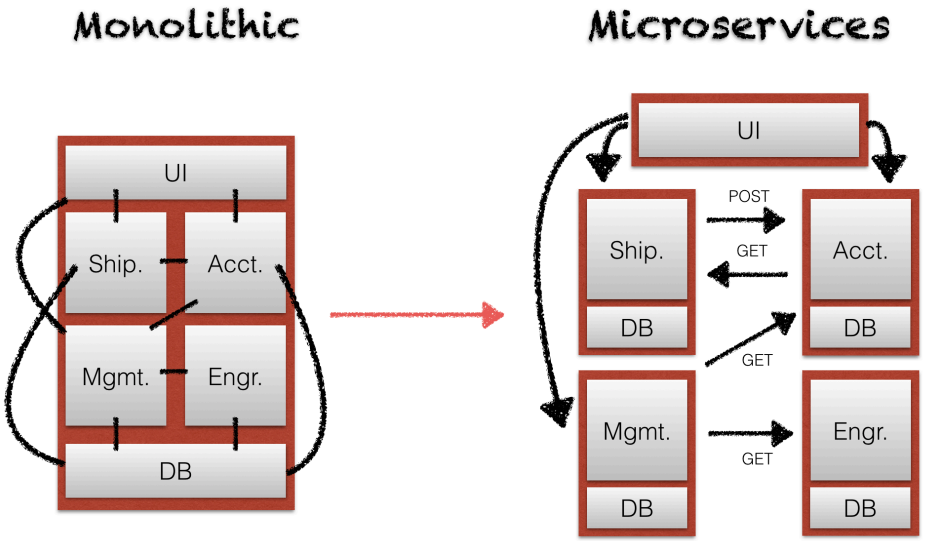
Technological Landscape

Microservices

- Application is broken down into multiple component services
- So that each of these services can be deployed and then redeployed independently



- ✓ Better fault isolation;
- ✓ Multilanguage application
- ✓ Easier to scale and integrate
- ✓ Easier to upgrade
- ✓ Teams micromanagement

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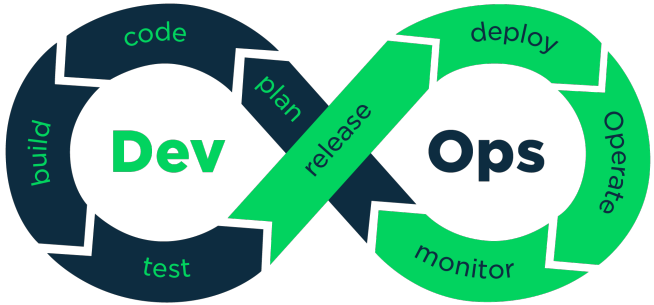
Technological Landscape

Agile and DevOps Practices

- **Agile** refers to a group of software development methodologies that evolve collaboration between self-organizing cross-functional teams.
- **DevOps** is the practice of operations and development teams working together in the entire service lifecycle
- Each team work on design and development process, but also on production support.



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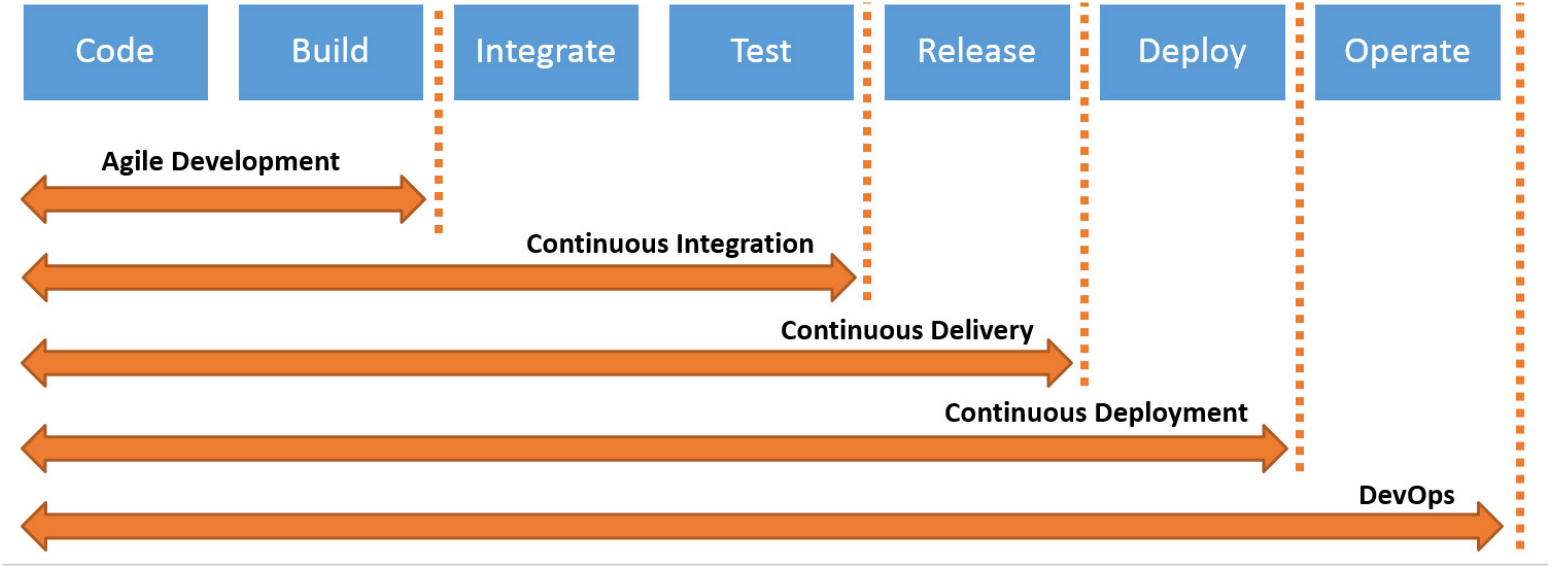
Technological Landscape

Agile and DevOps Practices



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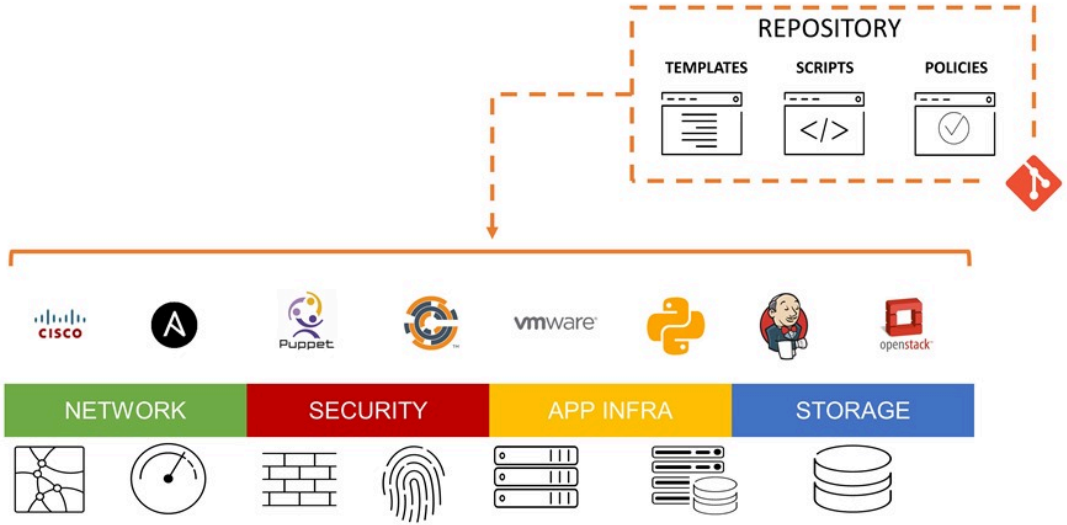
Technological Landscape

Infrastructure as Code

- Programmatically way to deliver the resources required by CI/CD development cycle;
- Automates the infrastructure delivery using API calls;



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Technological Landscape

VMs vs Containers (a tendentious comparison)

	VM	Container
Size		
Startup		
Disposability		
Integration		
Portability		

Containers seem to suit very well the needs of such new scenario!
Docker is at the right place at right time!

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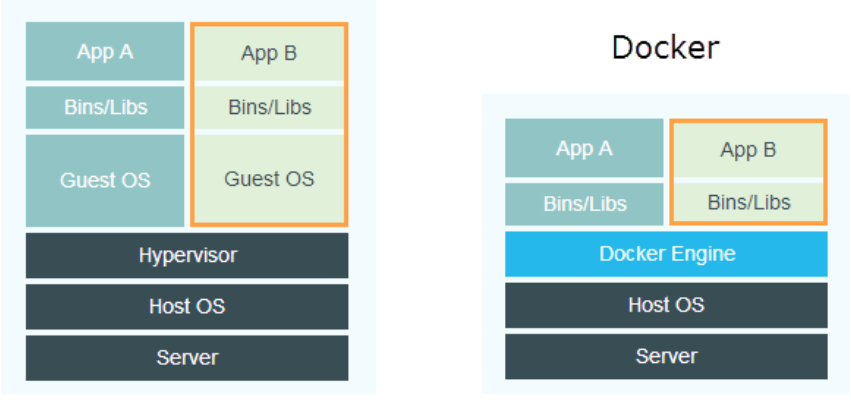
Docker

What is it?

- An open source software platform to create, deploy and manage virtualized application containers on a common OS;
- Uses host kernel, hence there is no custom or additional kernel inside container;
- Relies on cgroups, namespaces and LXC which are features of Linux kernel to isolate groups of processes;



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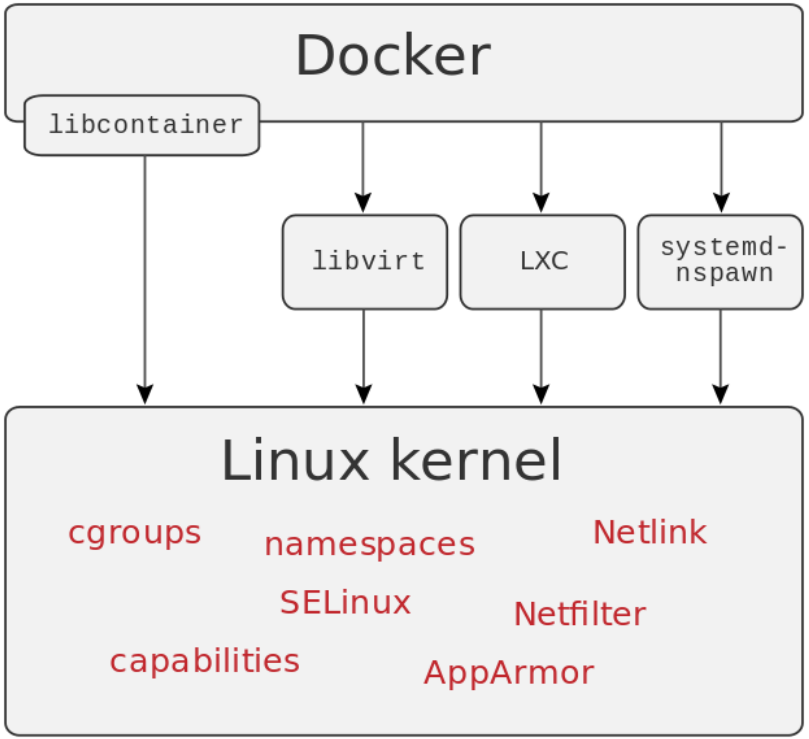
Docker

Kernel Components



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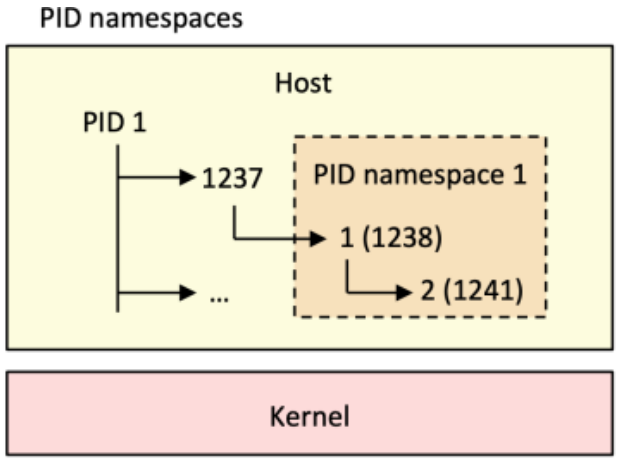
Docker

Namespaces

- Partitions kernel resources isolating processes in order to gives access to create virtual subsystem;
- Wraps a global resource such that it appears to processes in that namespace have their own isolated instance of the said resource.

Namespaces:
- cgroup
- ipc
- mnt
- net
- pid
- user
- uts



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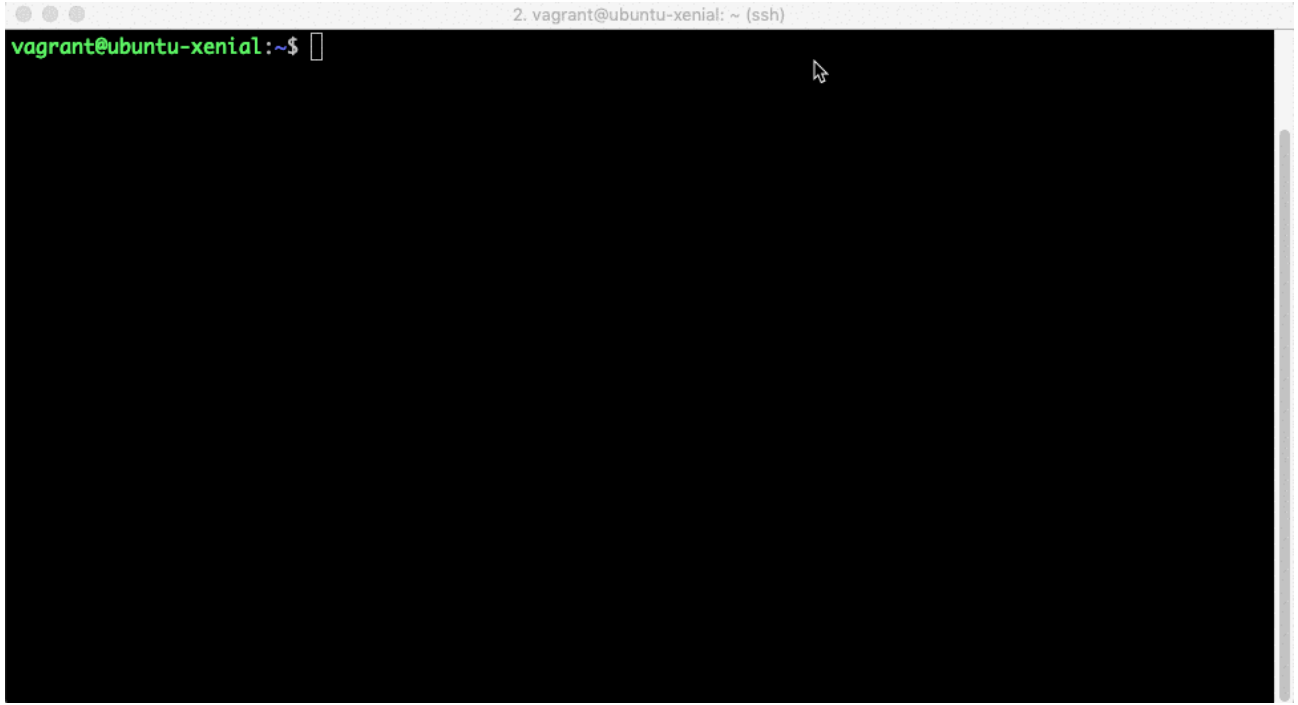
Docker

PID Namespace



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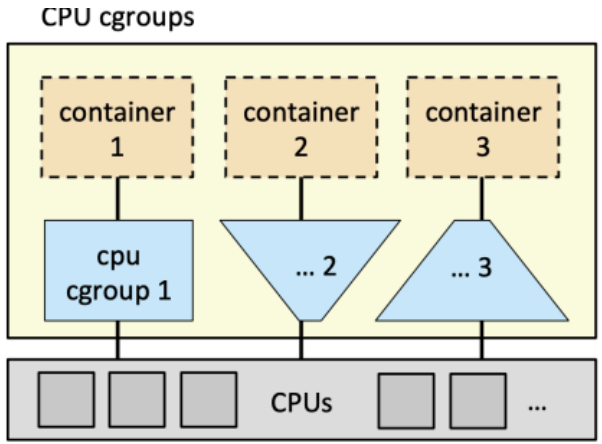
CGroups

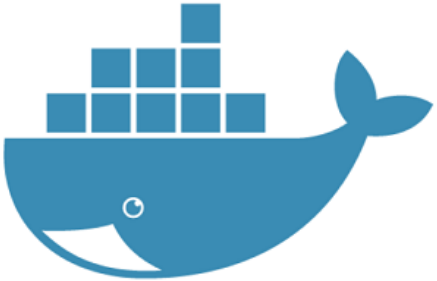
- Linux kernel feature which limits, isolates and measures resource usage of a group of processes.
- Resources quotas for memory, CPU, network and IO can be set.

cgroups:

- blkio
- **cpu,cpuacct**
- cpuset
- devices
- hugetlb
- **memory**
- net_cls,net_prio
- pids
- …



See you tomorrow…



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Thank You