



# DevOps environment with OpenStack and NetApp

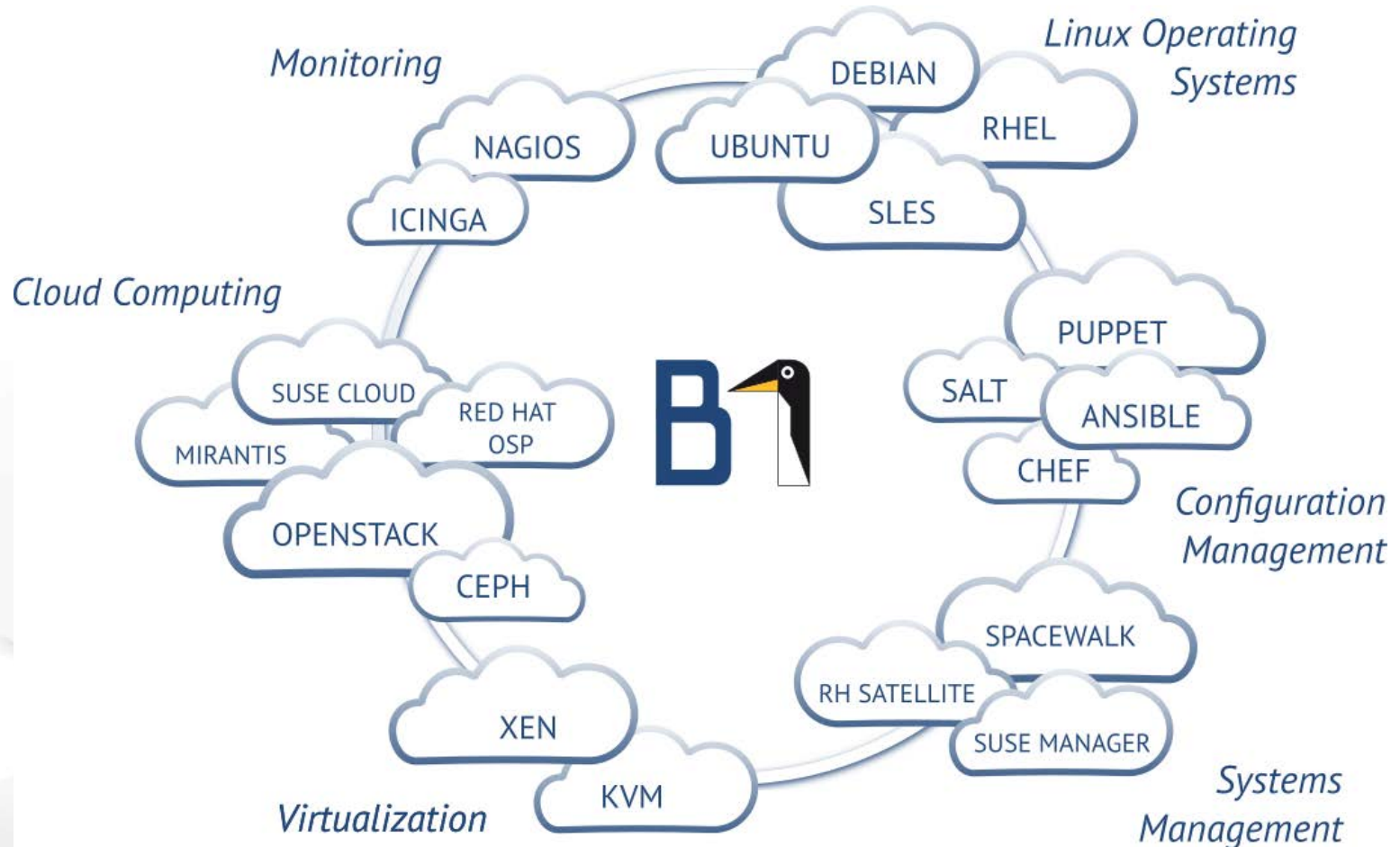
Christian Berendt  
Cloud Solution Architect

# Introducing B1 Systems GmbH



- Founded in 2014
- Operating both nationally and internationally
- Nearly 100 employees
- Vendor-independent (hardware & software)
- Focus:
  - Consulting
  - Support
  - Development
  - Training
  - Operations
  - Solutions

# Introducing B1 Systems GmbH



# AGENDA

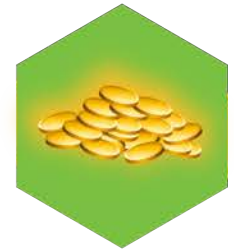
1. Software development
2. Dev(&/vs.)Ops
3. Toolchain
4. Cloud environment



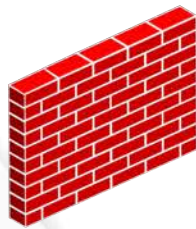
**In short, software is eating the world.**

**Marc Andreessen**

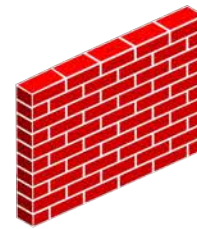
# Software development



business



development



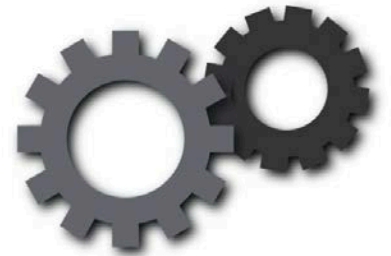
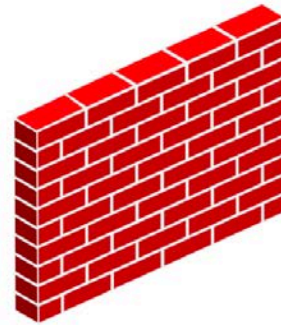
operations



# Walls of confusion



business



development



# Business vs. Development

## How Projects Really Work (version 1.5)

Create your own cartoon at [www.projectcartoon.com](http://www.projectcartoon.com)



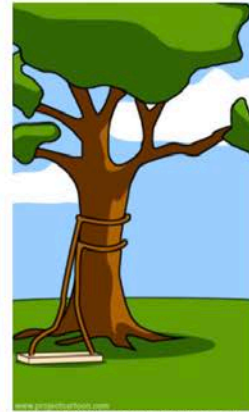
How the customer explained it



How the project leader understood it



How the analyst designed it



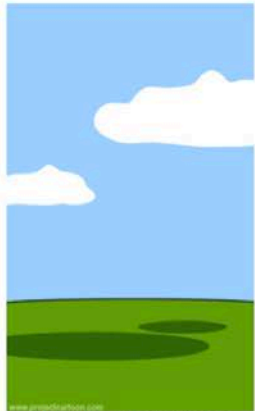
How the programmer wrote it



What the beta testers received



How the business consultant described it



How the project was documented



What operations installed



How the customer was billed



How it was supported



iSwing

What marketing advertised

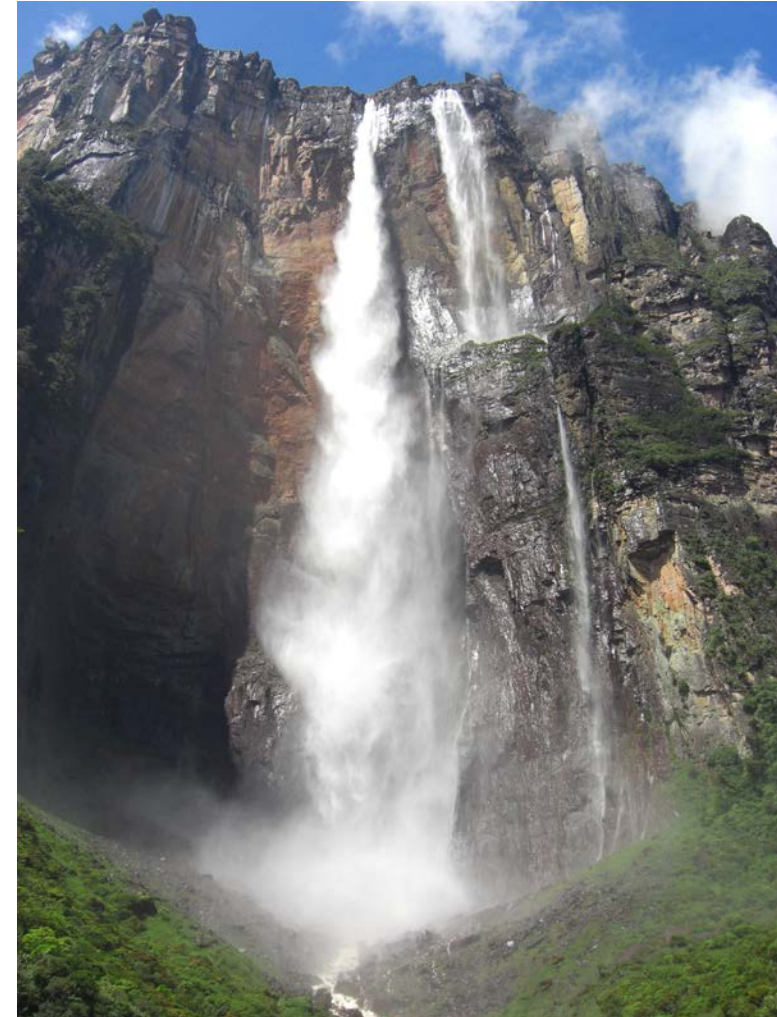


What the customer really needed



# Waterfall model

- Requirements
- Analysis
- Design
- Implementation
- Verification
- Operations



# Agile software development

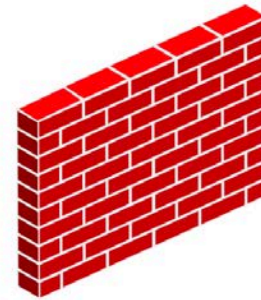
- Agile principles
- Agile methods
- Agile practices



# Walls of confusion



development



operations



# AGENDA

1. Software development
2. Dev(&/vs.)Ops
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# Dev vs. Ops

- Fear of change
  - Never touch a running system
- Risky deployments
  - Pray that it works
- Developer mindset
  - Works for me
- Isolated/splitted teams
  - “them“, “us“
  - Worked fine in Dev, Ops problem now



# Tearing down the walls of confusion



# Collaboration

- **Dev** needs to understand parts of **Ops**
- **Ops** needs to understand parts of **Dev**



# Communication

- **Ops** has to **communicate** (better) with **Dev**
- **Dev** has to **communicate** (better) with **Ops**





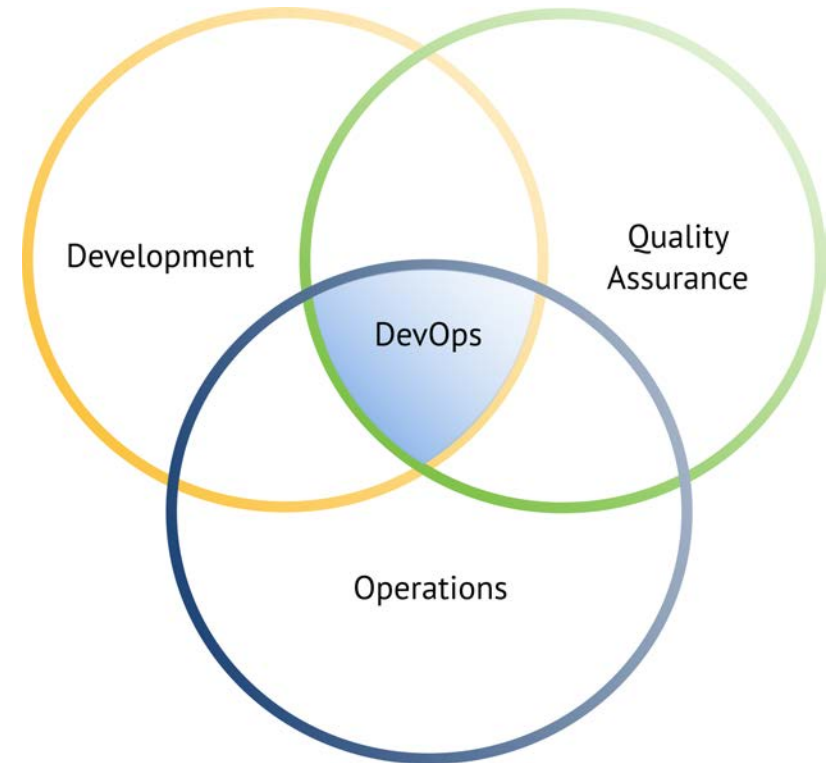
# Cultural changes

- Collaboration
- Communication



# Integration

- **Ops** has to be integrated in parts of **Dev**
- **Dev** has to be integrated in parts of **Ops**

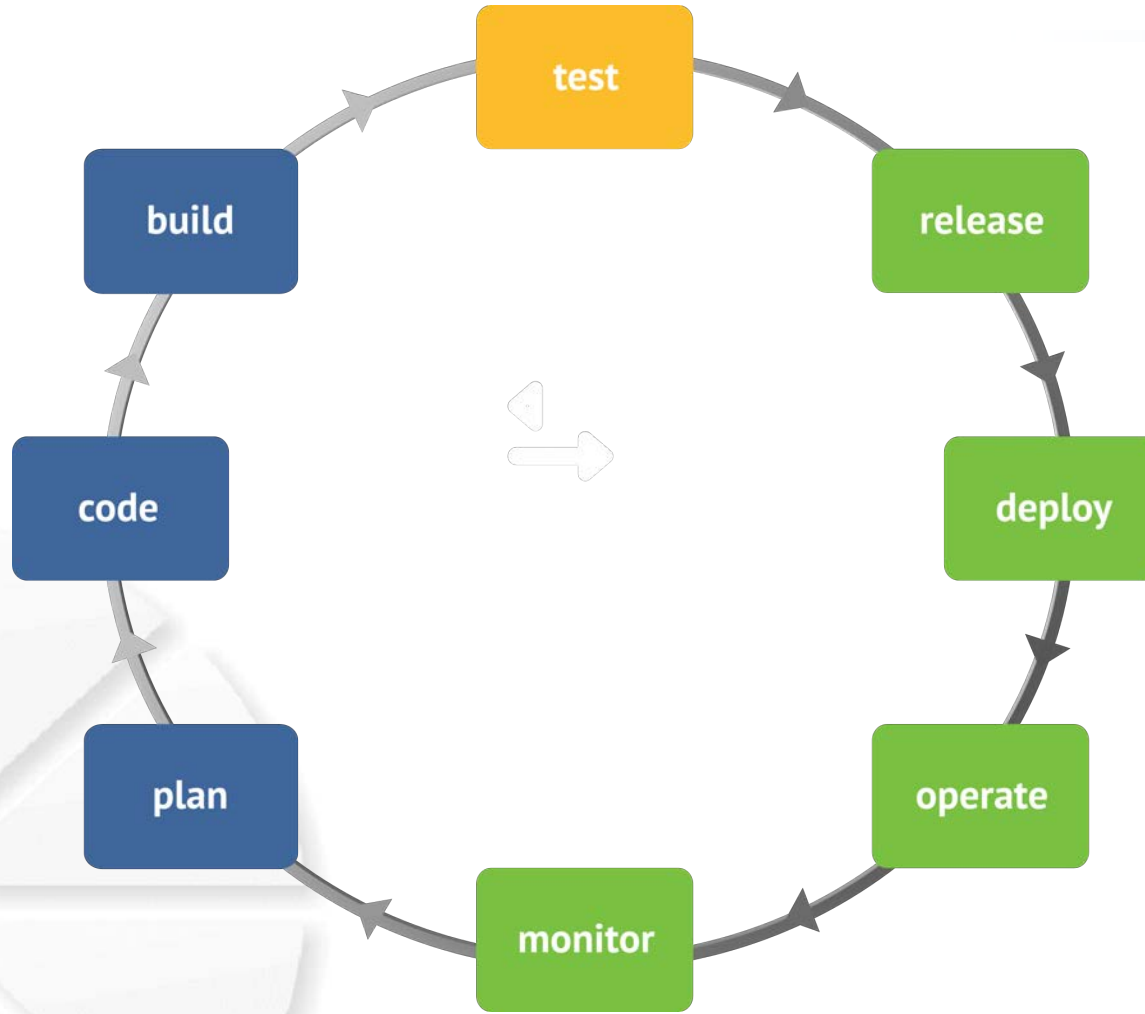


# AGENDA

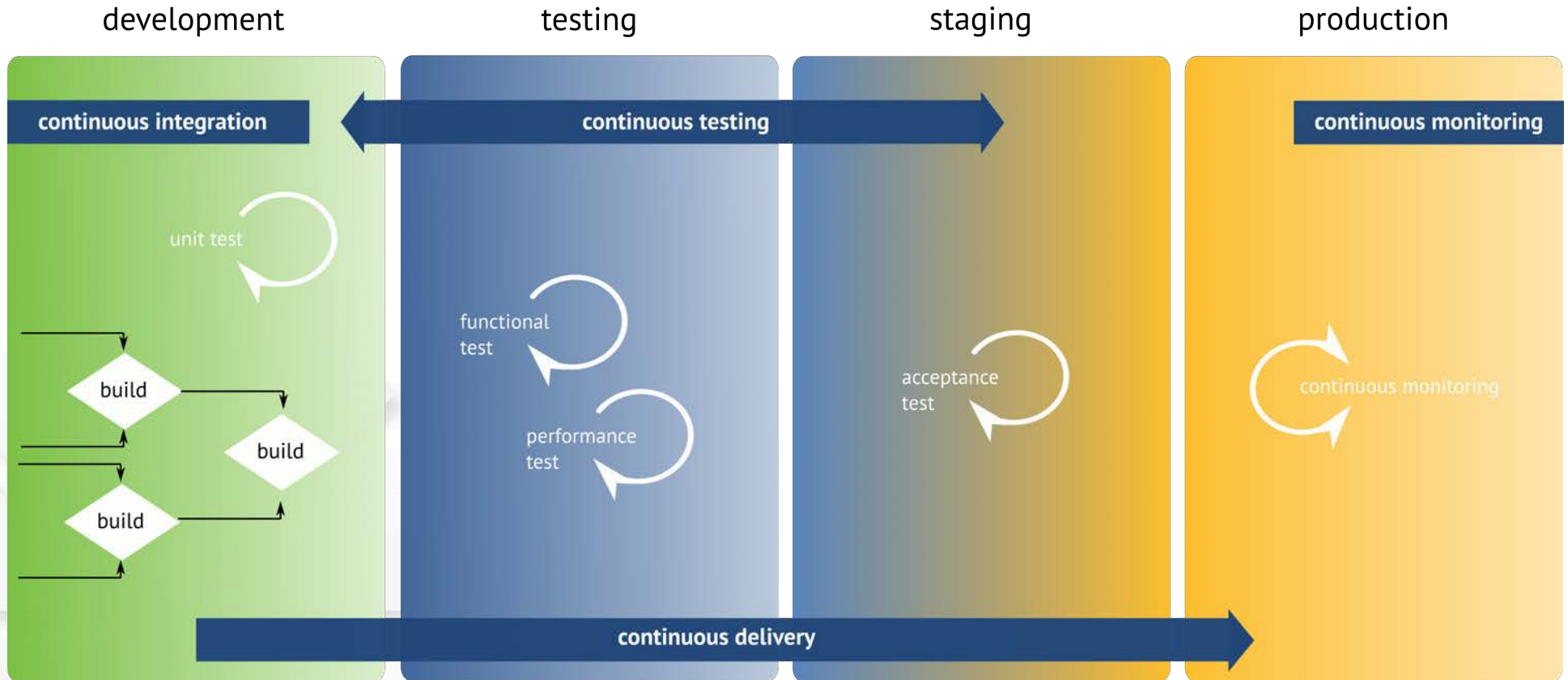
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# Lifecycle

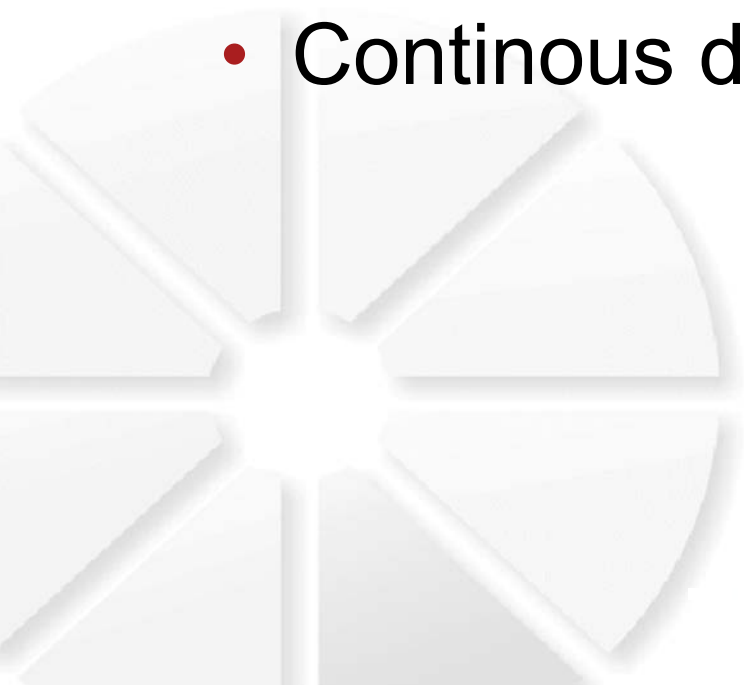


# Continuous Processes



# Delivery or Deployment?

- Manual deployment to production
  - Continuous delivery
- Automated deployment to production
  - Continuous deployment





**Automate all the things!!!**

# Automatization

- Jenkins
- Ansible
- CFEngine
- Chef
- Otter
- Puppet
- Salt Open

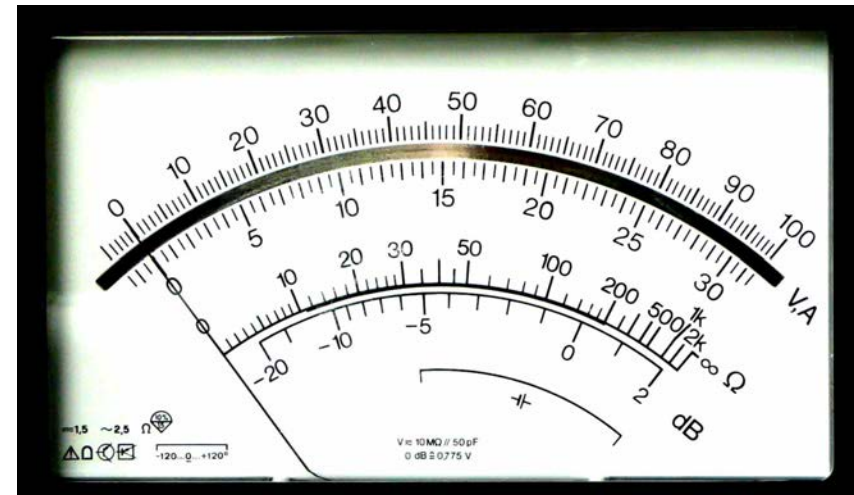


# Standardization

- Topology and Orchestration Specification for Cloud Applications (TOSCA)
- Amazon AWS CloudFormation templates
- OpenStack Heat Orchestration Template (HOT)

# Measurements

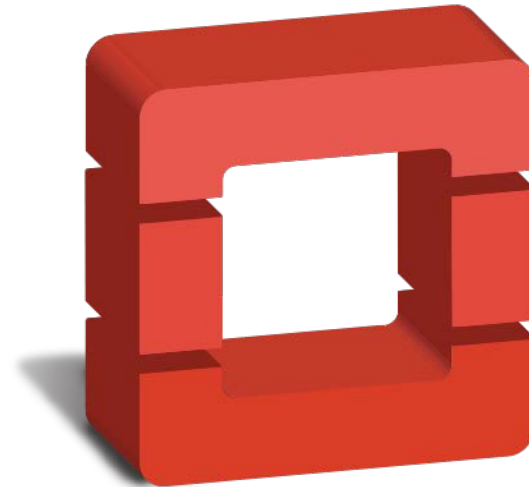
- **Stability**
  - Change failure rate
  - Mean time to recover (MTTR)
- **Throughput**
  - Deployment frequency
  - Lead time for changes



# AGENDA

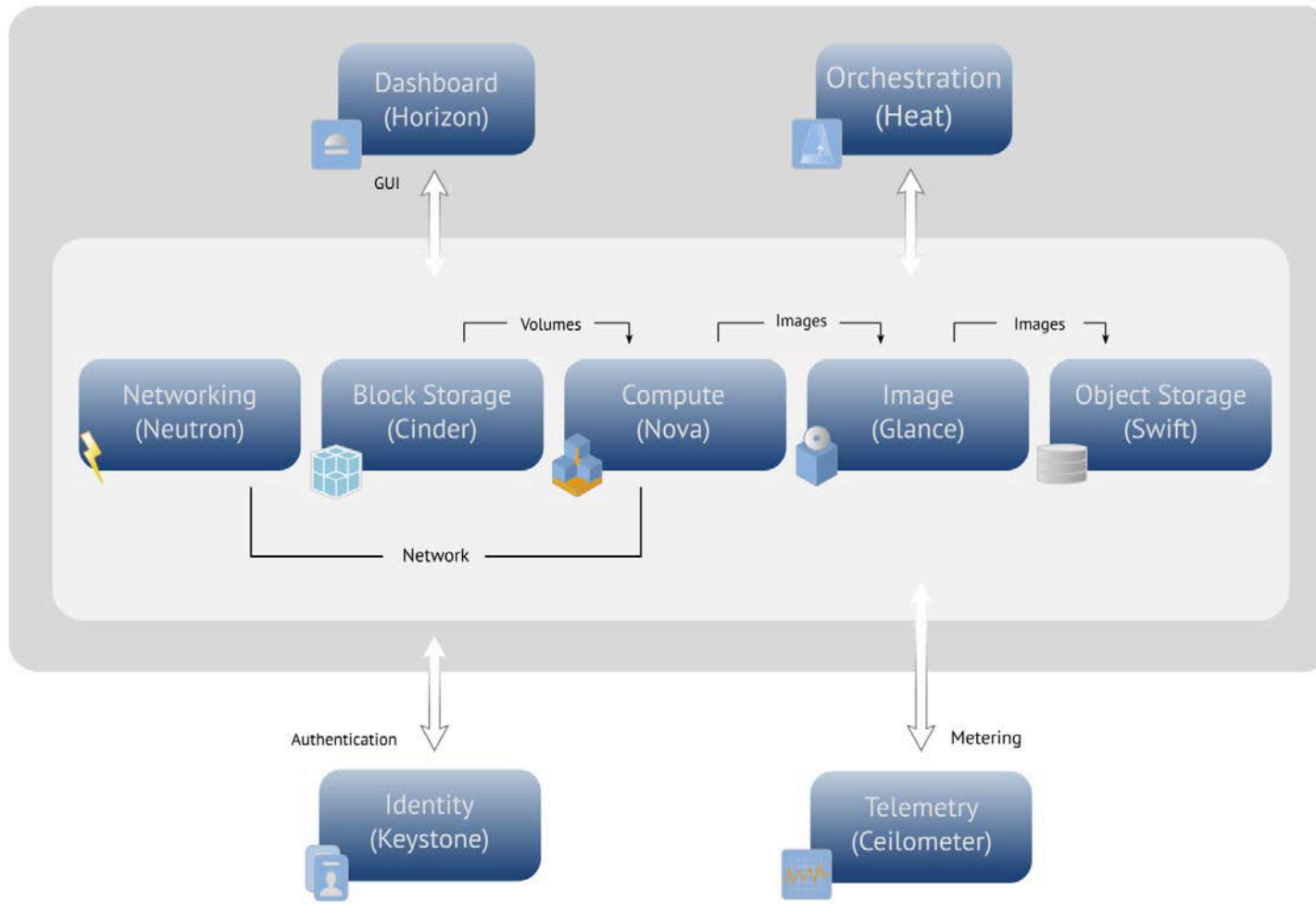
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- Open Source
- Open Design
- Open Development
- Open Community



**openstack**<sup>®</sup>  
CLOUD SOFTWARE

# High level overview



# Hardware integration

- OpenStack supports pluggable 3rd party drivers
- Storage related services
  - Cinder (Block Storage)
  - Manila (Shared File Storage)

# Hardware integration

- NetApp Unified Driver for Cinder
  - Clustered Data ONTAP
    - pNFS, NFS, iSCSI, Fibre Channel
  - 7-Mode
    - NFS, iSCSI, Fibre Channel
  - E-Series, EF-Series
    - iSCSI, Fibre Channel

# Hardware integration

- NetApp Unified Driver for Manila
  - Clustered Data ONTAP
    - NFS, CIFS





Questions?



# Contacts



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Thank you!

