



CYBERINFRASTRUCTURE INTEGRATION RESEARCH CENTER

PERVASIVE TECHNOLOGY INSTITUTE

Infrastructure as Code

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Why do we need to code the infrastructure?

- A Case study:
- <https://www.henricodolfing.com/2019/06/project-failure-case-study-knight-capital.html>
- “how to lose \$172,222 per second for 45 minutes”

The \$440 Million Loss

- One of 8 servers at Knight Capital had gone “rogue” and sent out erroneous trades causing a huge stock market disruption
- Some 150 stocks saw spectacularly wild swings as much as 30% volatility
- Other market makers and traders compounded the problem by following suit and trading these stocks
- Lost \$440 Million within 45 minutes

The Computer Glitch That Wasn't

- Initially, Knight Capital blamed a software glitch associated with a system upgrade in order to accompany a new NYSE program called Retail Liquidity Program
- One of 8 servers did not receive software upgrade
- Recycled an old switch of the “Power Peg Code”
- Obsolete “Power Peg Code” was not deleted as been planned

Ansible

- Ansible is a radically simple automation platform.
- Ansible can be used as a configuration management Tool
- Use it for your project 3 for:
 - All Open Stack Provisioning with API interactions
 - Configuration of Instances
 - Application deployment
 - Continuous testing of already install application
 - Orchestration
- Pretty much Automation of any tasks

Again why “Infrastructure as a code”

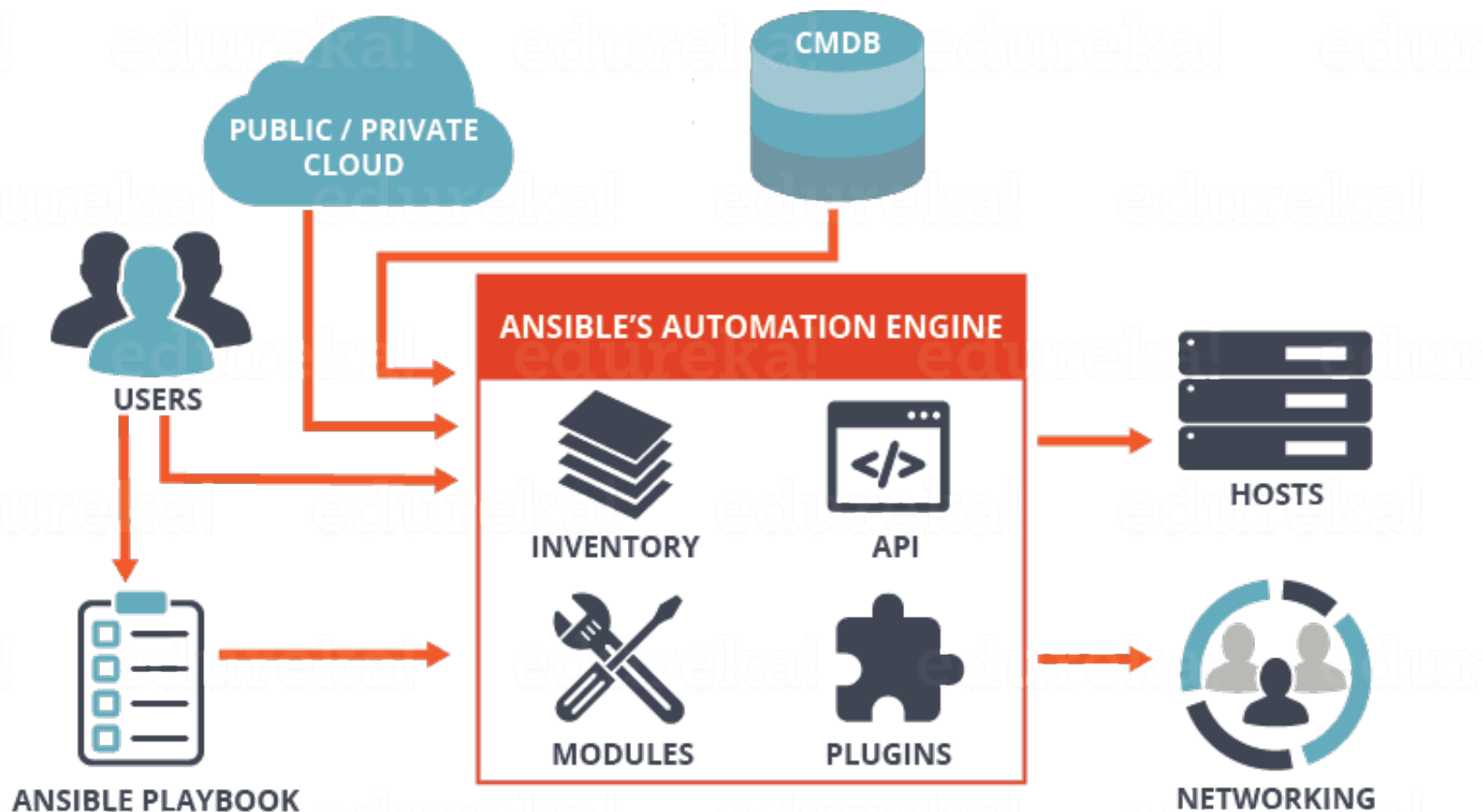
- Tasks in code
- Collaboration
- Eliminate errors
- Write once
- Can help you be Lazy after some initial effort

Ansible vs other tools

- It is a free open source application
- Agent-less
- Highly flexible and configuration management of systems.
- Large number of ready to use modules for system management
- Custom modules can be added if needed
- Configuration roll-back in case of error
- Simple and human readable
- **Self documenting**

ANSIBLE ARCHITECTURE

edureka!



Ansible – Kubernetes Kubespray

<https://kubernetes.io/docs/setup/production-environment/tools/kubespray/>

Rancher

Rancher & Kubernetes

Open source container manager used to run Kubernetes in production

- ✓ Easy-to-use interface for k8s configuration and deployment
- ✓ Infrastructure management across multiple clusters and clouds
- ✓ Automated deployment of the latest k8s release
- ✓ Workload, RBAC, policy, and project management
- ✓ 24x7 enterprise-grade support

Rancher Kubernetes Distribution

Certified and supported distribution that closely follows the upstream Kubernetes project

Rancher Infrastructure Services

Storage, networking, load balancing, security, etc.





COMPLETE
CONTAINER
MANAGEMENT
PLATFORM

Application Management
User Interface • App Catalog • CI/CD • Monitoring • Logging

Unified Kubernetes Management
Provisioning • Upgrades • RBAC • Policy • Security • Capacity • Cost

CLOUD NATIVE COMPUTING FOUNDATION  **kubernetes**



RANCHER
RKE



amazon
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Cloud Platform
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Microsoft
Azure
AKS



ubuntu®
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