



AUTOMATING SERVER SETUP WITH

ANSIBLE

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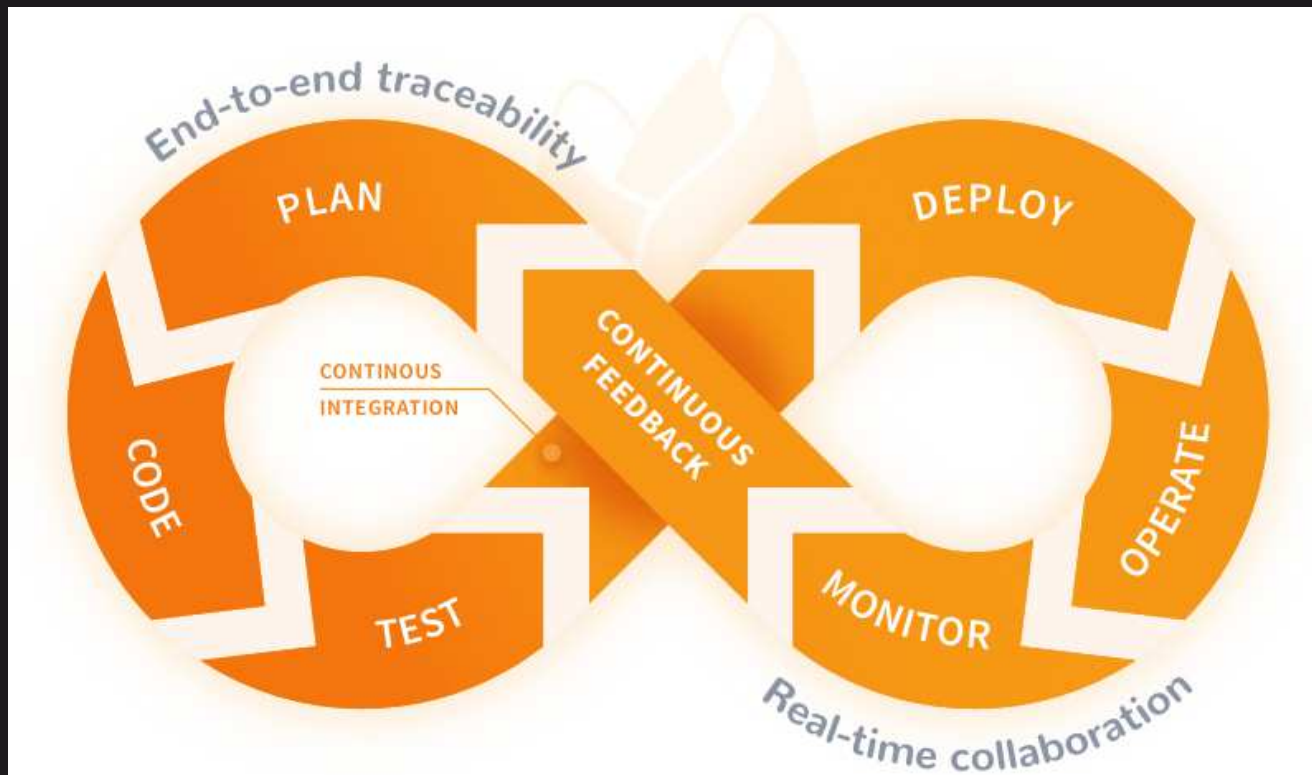
INTRODUCTION DEVOPS AND DEVSECOPS

WHAT IS DEVOPS?

IT'S NOT A TEAM OR TITLE ... IT'S A PROCESS.
BECAUSE CUSTOMER OF THE KINGS

INTRODUCTION DEVOPS AND DEVSECOPS

DevOps Lifecycle



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DevOps Timeline

Patrick Debois
start's assessing IT
Value Chain



Agile System
Administrators
Group is launched
on Google



Inaugural "DevOps
Days" are held in
Ghent, Belgium



Industry leading software
vendors increase market
presence with "Enterprise"
class DevOps tools



devX is born and
Xceed launches the
"12 days of DevOps"



2007

2008

2009

2010

2011

2012

2013

2014

2015



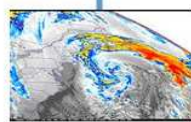
Andrew Clay Shafer
and Patrick Debois
meet at Agile
Conference 2008



Open Source toolsets
rip up the legacy
playbook.



John Allspaw and
Paul Hammond
present "10 Deploys
per day" at Velocity



The "Perfect Storm" of adjacent
methodologies occurs



Gene Kim
releases "The
Phoenix
Project"



Industry leading software
vendors increase market
presence with "Enterprise"
class DevOps tools

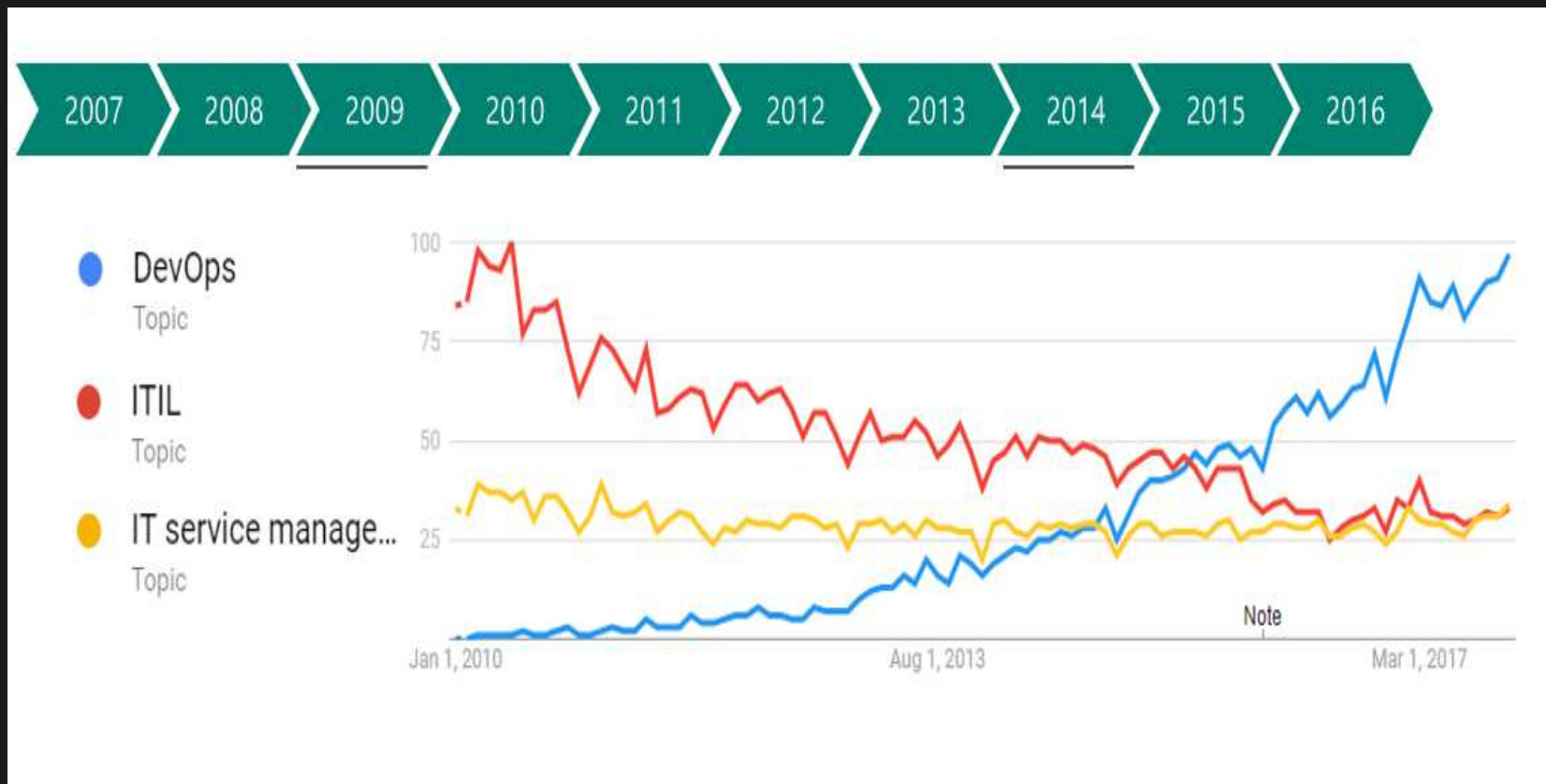


DevOps begins to
provide positive impact
to "Enterprise" IT



What does the future of
DevOps hold for your
organisation?

INTRODUCTION DEVOPS AND DEVSECOPS



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WHAT IS DEVSECOPS ?

IT IS SHORT FOR :

DEVELOPMENT

SECURITY

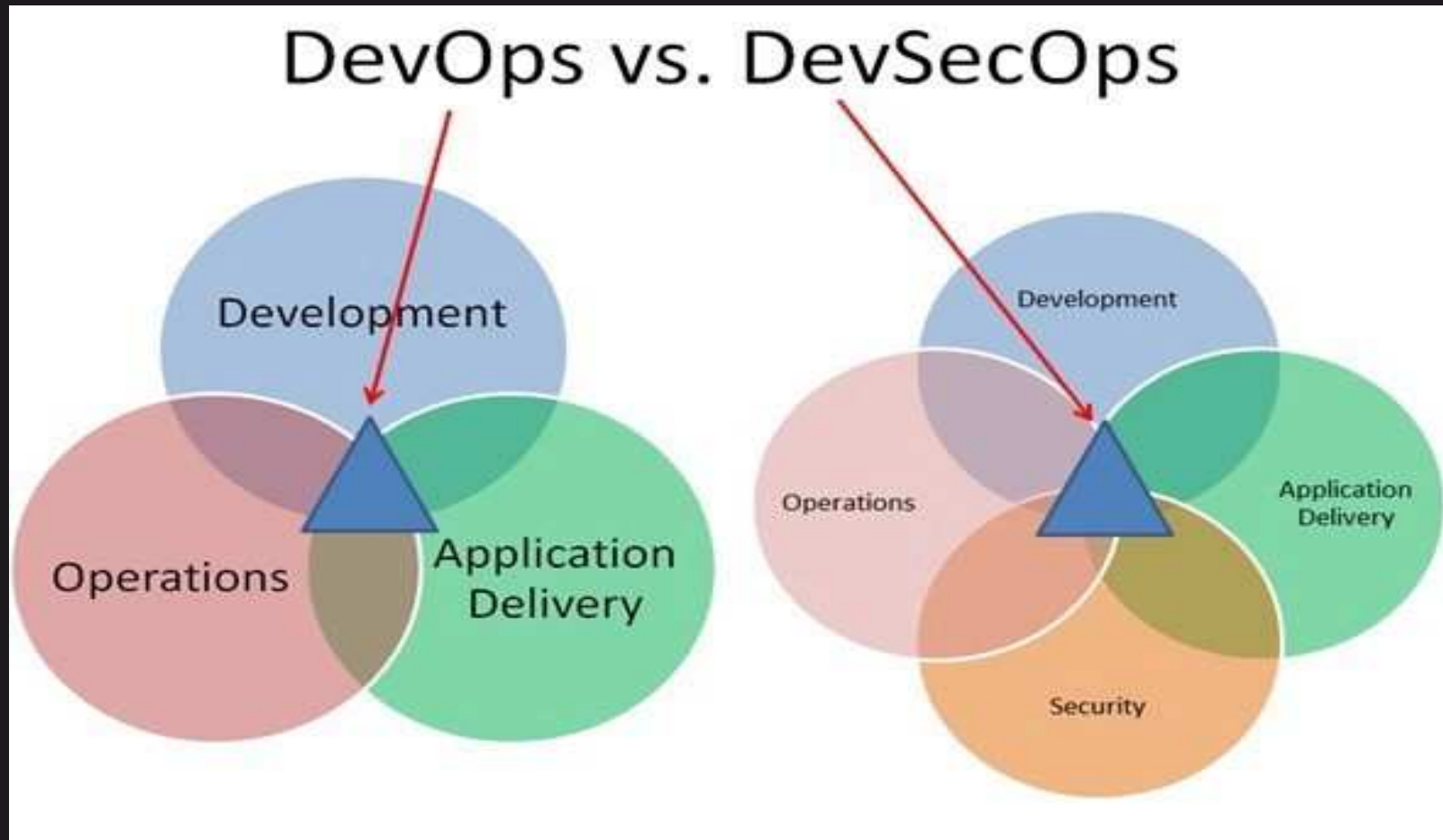
OPERATIONS

INTRODUCTION DEVOPS AND DEVSECOPS

DevSecOps: Integrate Security Into DevOps



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INTRODUCTION DEVOPS AND DEVSECOPS

TARGET :

New versions of the product, very **Quick** to final **Customers**
Improve Speed to Market

PROBLEM :

Seeing any **Problem** in the operation
Each Team attributed it to the Other Team

SOLUTION :

Collaboration
Remove the wall between Operation and Developer
DevOps Engineering Tools

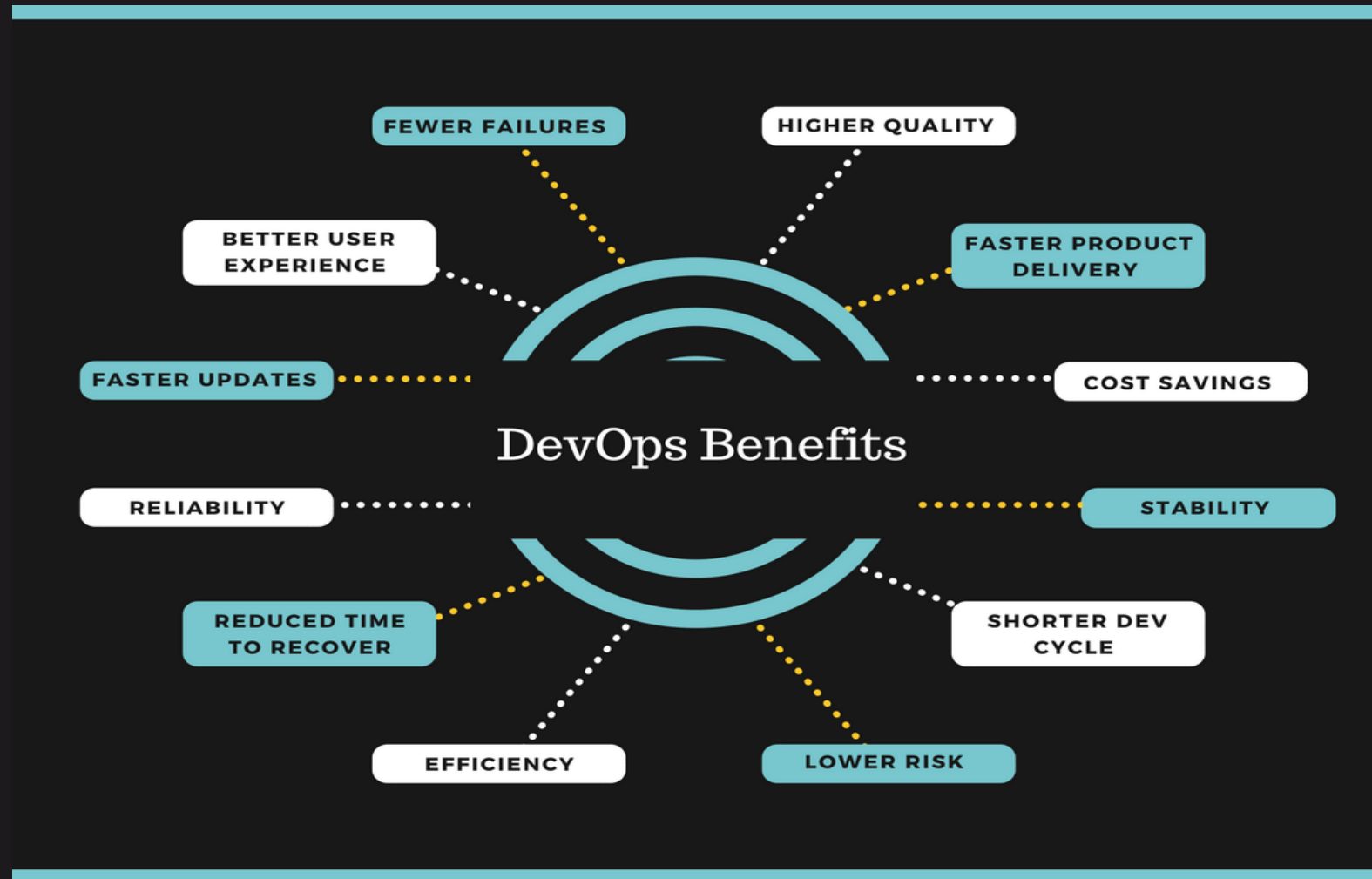
BENEFITS :

TrubleShooting Speed
Isolation Environment
Performance Tuning
Fail Over
Resource & Cost Reduction
Increased Performance
Job Satisfaction

RESULT :

The transformation of the IT industry

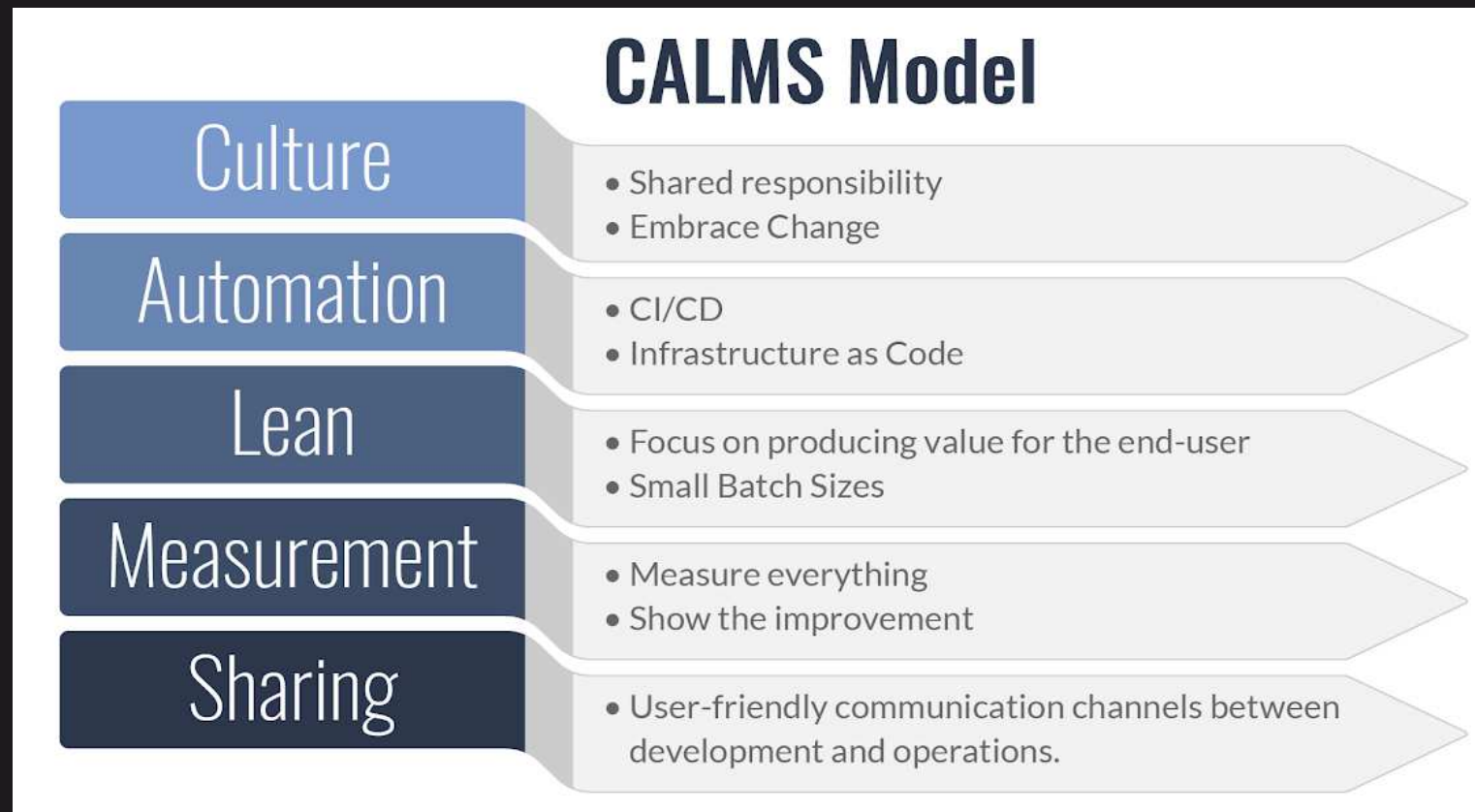
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INTRODUCTION DEVOPS AND DEVSECOPS

DevOps is Process

Approach to reach DevOps with **CALMS**



INTRODUCTION DEVOPS AND DEVSECOPS

DevOps is Process

Approach to reach DevOps with **CALMS**

Culture : Delete Wall between Developers Team and Operations Team

Automation : Continuous Delivery – Continuous Integration – Continuous Deployment
Use tools (Configuration Management and Virtualization , ...)

Lean : Delete Redundant work and Useless

Measurement : Unless we know where we are, we will not know where we want to go

Infrastructure Monitoring

Log Management

Application and Performance Management

→ TPS and Response Time , ...

Sharing : Share Information and Result with Coworker

DevOps Use cases :

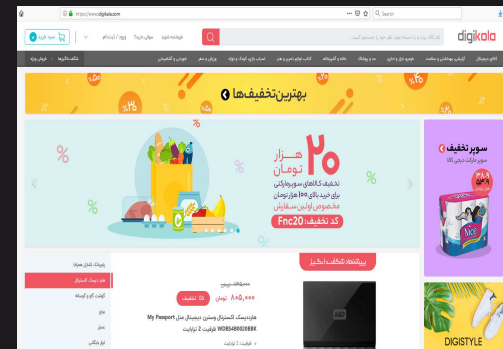
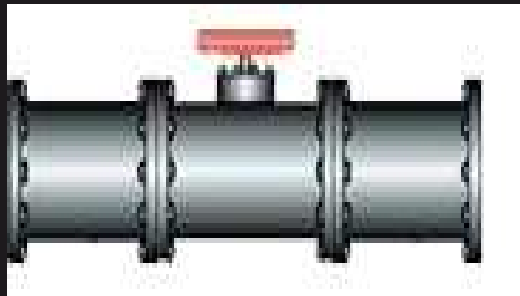
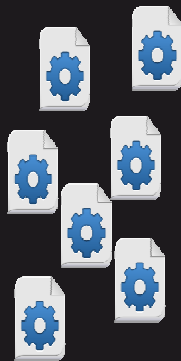
High changes in product

Add More Features

Competitive products

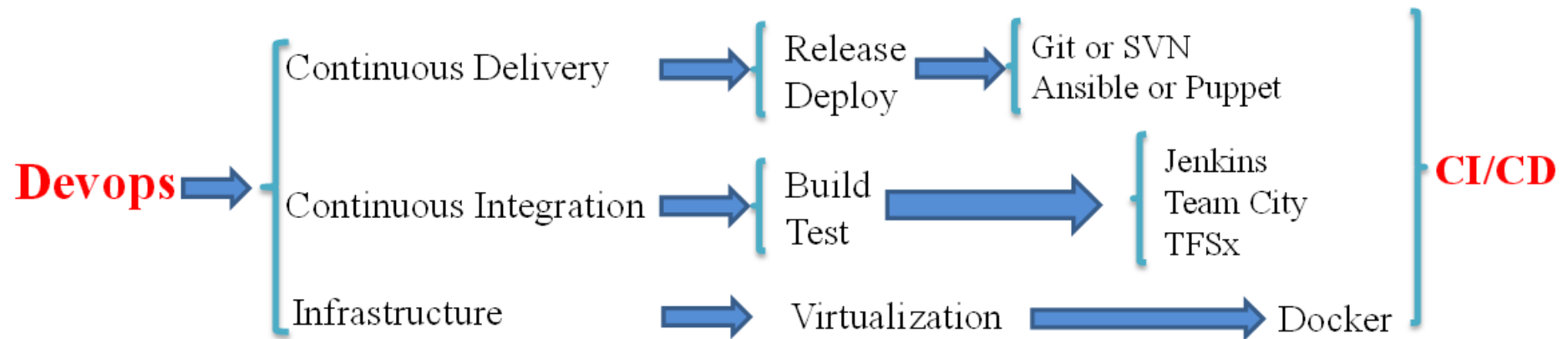
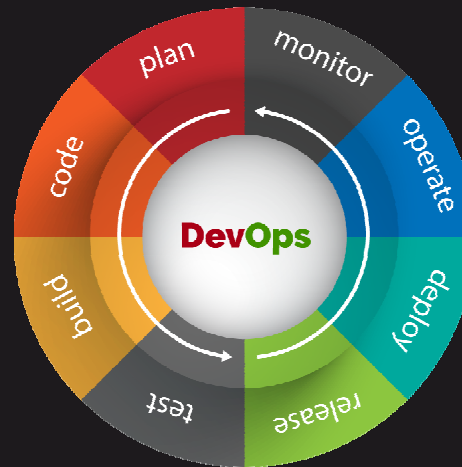
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DevOps Pipeline



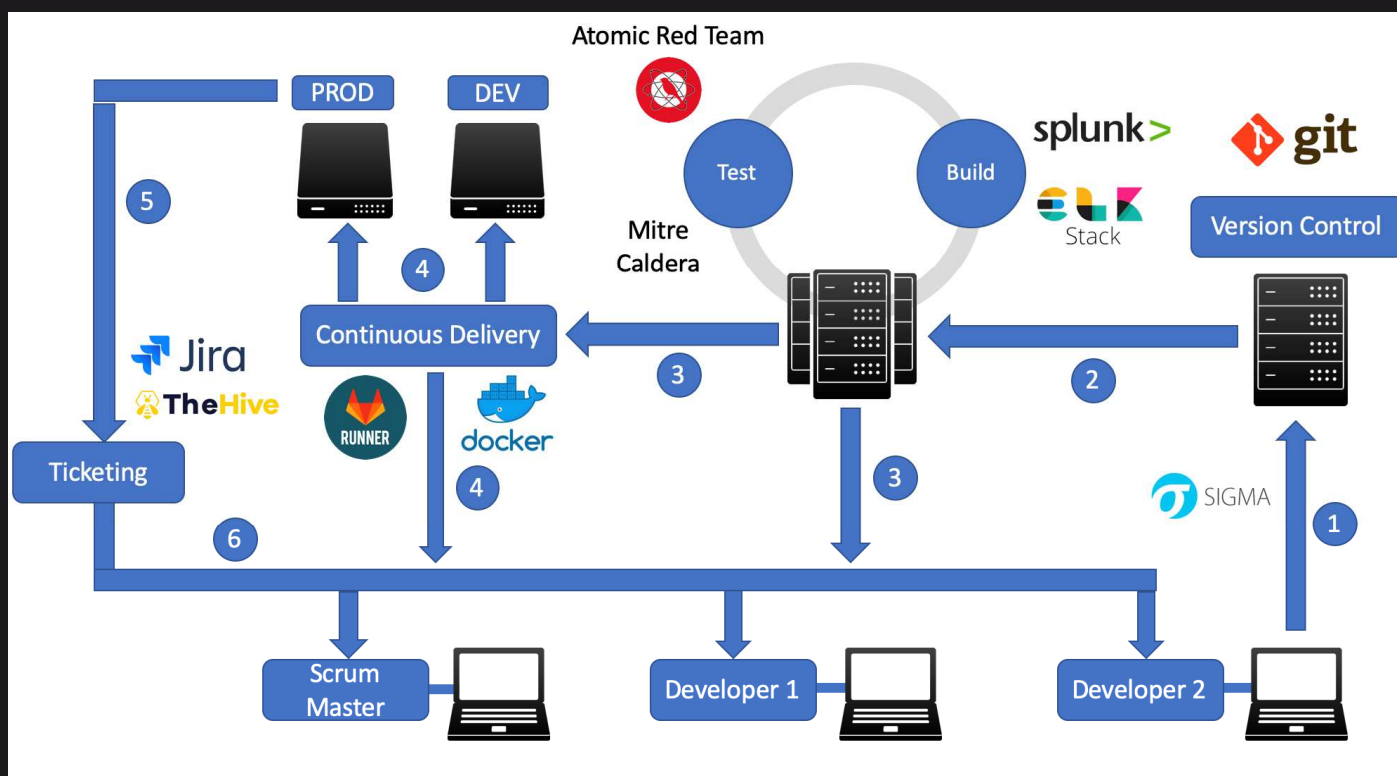
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DevOps Pipeline



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DEVSECOPS PIPELINE IS COMPLETED

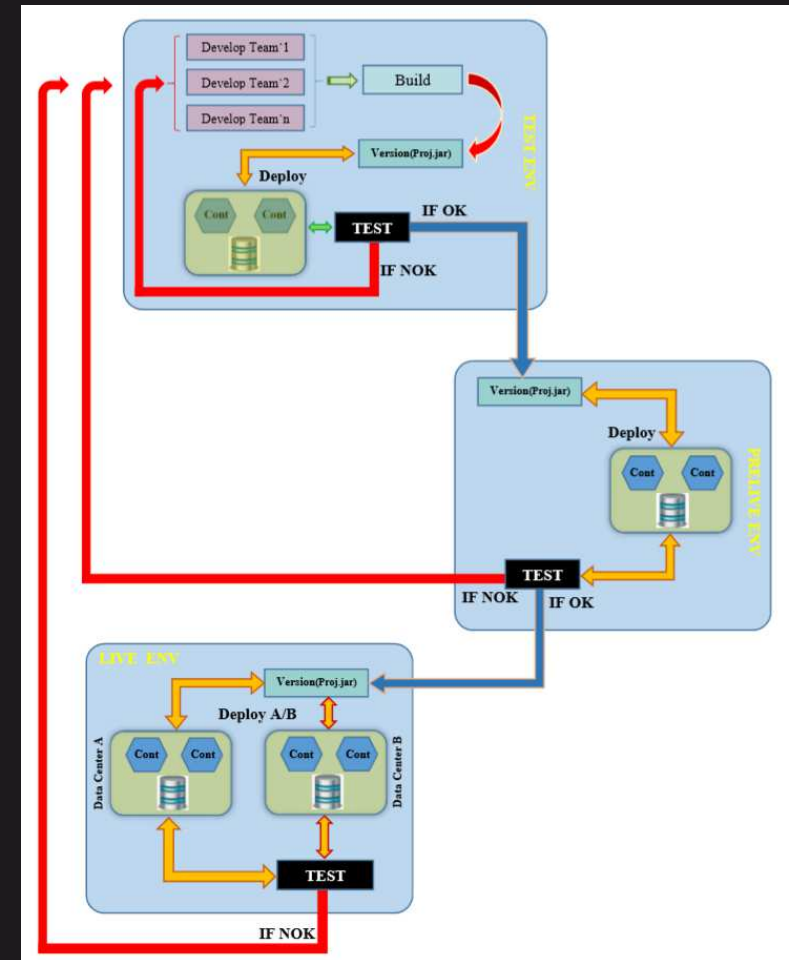


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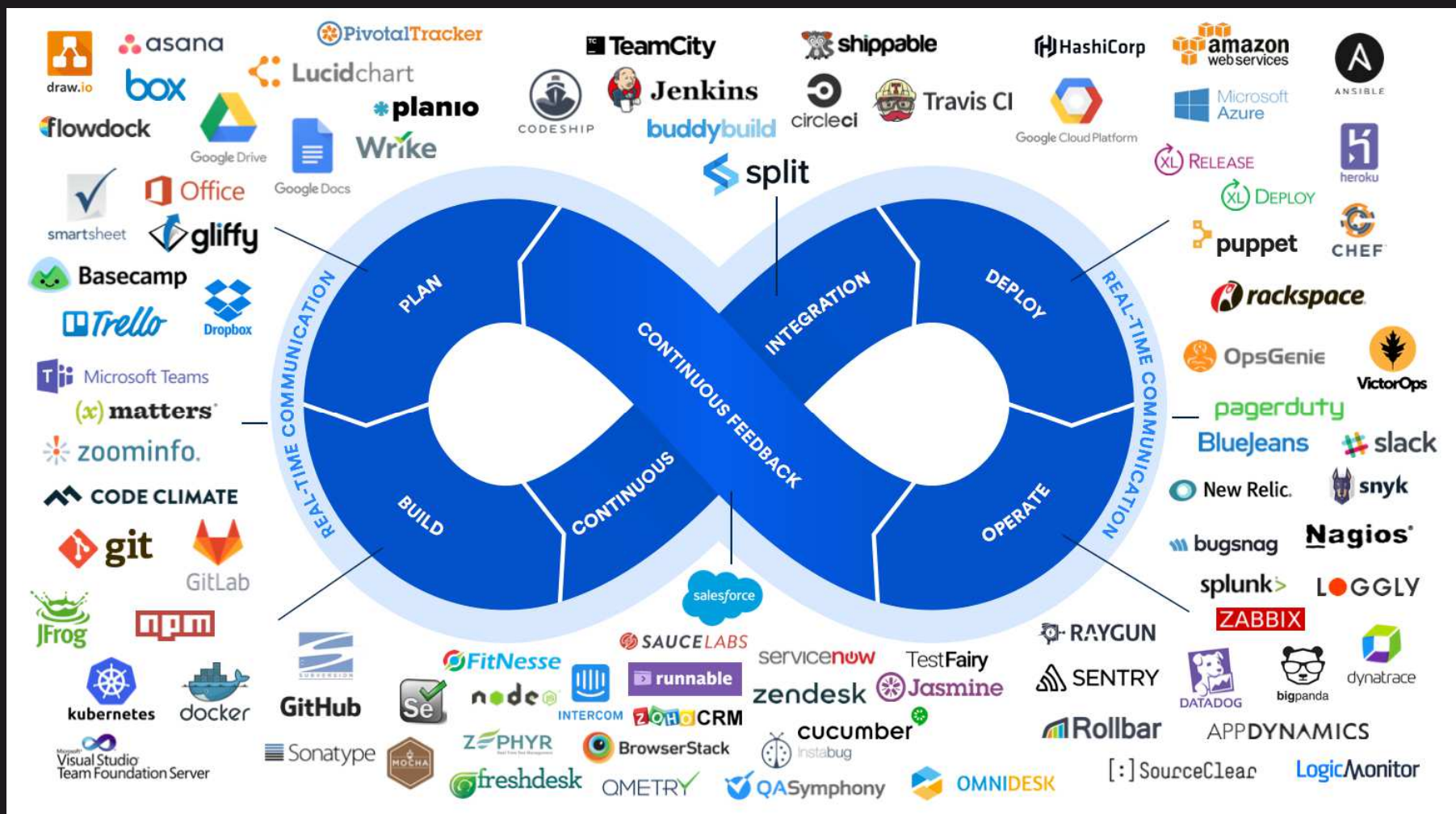
Building Application Deployment Pipelines and Environments

Environment :

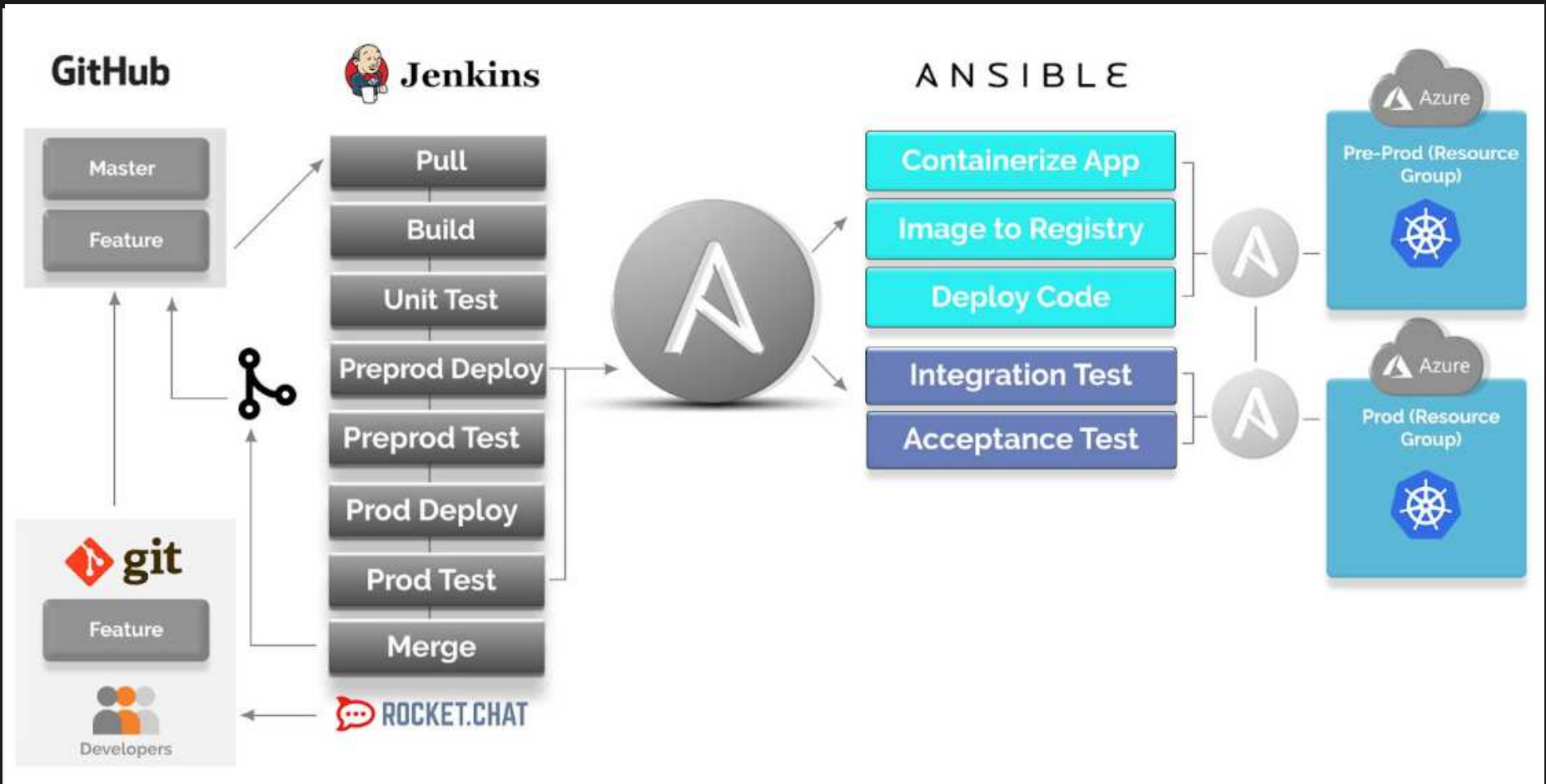
- ❖ Test Env
- ❖ Prelive Env
- ❖ Live Env



DEVOPS ENGINEER TOOLS



CONFIGURATION MANAGEMENT ROLE IN CI/CD ARCHITECTURE



CONFIGURATION MANAGEMENT AND ORCHESTRATION ROLES IN DEVOPS

Configuration Management in DevOps is

coined as "comprehensive configuration management" and is made up of

1- Source Code Repository : only Development phase

the source code repository is a database of source code which developers use.

This database serves as :

- A container for all the working code

- Source code aside

- It stores a number of useful components including various scripts and configuration files.

2- Artifact Repository : Development and Operation phase

An artifact repository is meant to store machine files.

This can include :

- binaries files

- test data files

- libraries files . Effectively, it's a database for files that people don't generally use.

3- Configuration Management Database : Development and Operation phase

configuration management database or (CMDB) is a relational database multiple systems and applications related to configuration management

including services, servers, applications, and databases to name a few.



INFRASTRUCTURE ENVIRONMENT AS A CODE TO MARKET

Results of Properly Managed Configurations

1- Infrastructure-as-a-Code : (Install)

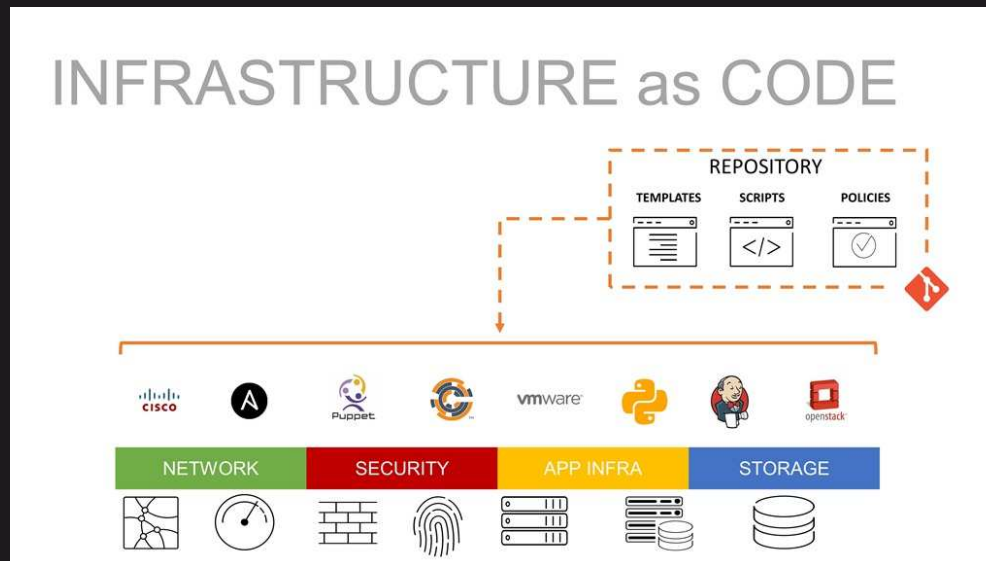
Automatically Create Environments and Infrastructures

Include :

servers , networks of configurations and other resources.

For Example :

Install and Configure Kubernetes Cluster with Configuration Management



INFRASTRUCTURE ENVIRONMENT AS A CODE TO MARKET

Results of Properly Managed Configurations

2- Configuration-as-a-Code : (Change and Deployment Configuration)

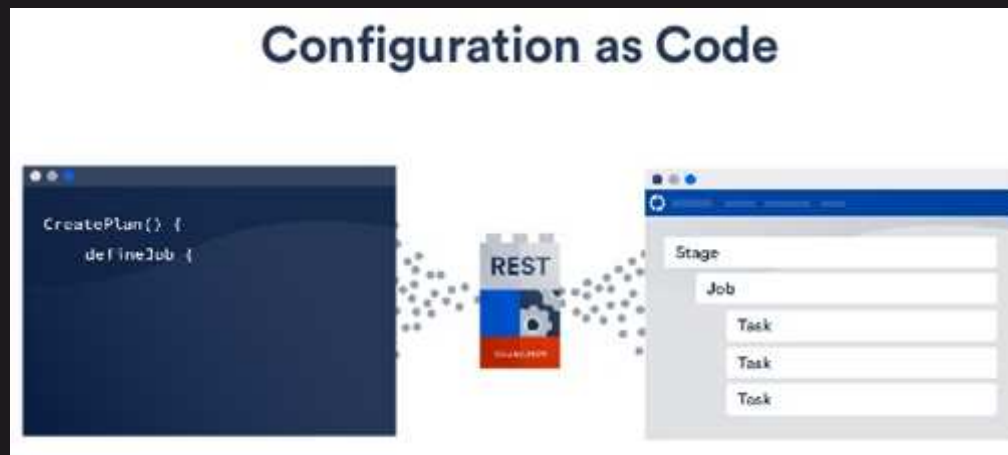
Automatically Change management and Central Configuration and Deployment Application

Include :

servers , networks of configurations and other resources.

For Example :

CI/CD



INFRASTRUCTURE ENVIRONMENT AS A CODE TO MARKET

Results of Properly Managed Configurations

3- Benefits of IaaC and CaaC

- Automation of the infrastructure environment provides standardization
- Setups are free of human error
- Collaboration is enhanced between operations and development
- Makes infrastructure more flexible, ready to scale
- Each step is consistent across all resources
- Version control is a given

INTRODUCTION TO ANSIBLE

ANSIBLE IS IT AUTOMATION PLATFORM THAT MAKES YOUR APPLICATIONS AND SYSTEMS EASIER TO DEPLOY.

IT SUPPORT CONFIGURATION MANAGEMENT WITH EXAMPLES AS BELOW.

- **INSTALL AND CONFIGURATION** OF SERVERS
- APPLICATION DEPLOYMENT
- CONTINUOUS TESTING OF ALREADY INSTALL APPLICATION
- ORCHESTRATION
- AUTOMATION OF TASKS

WHY ANSIBLE

Ansible Configuration Management For Automation :

- It is a free open source application
- Agent-less – No need for agent installation and management
- Python/yaml based
- 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

WHY AUTOMATION?

- Tasks in code
- Collaboration
- Eliminate errors
- Write once
- Laziness
- Etc....

ANSIBLE VS. OTHER CM TOOLS

The Best DevOps tools for 2019

✓ Configuration Management Tools :

- ☐ CFEngine
- ☐ Puppet : master-slave architecture.
- ☐ CHEF
- ☒ **Ansible**
- ☐ Salt

LPI Exam 701: DevOps Tools Engineer

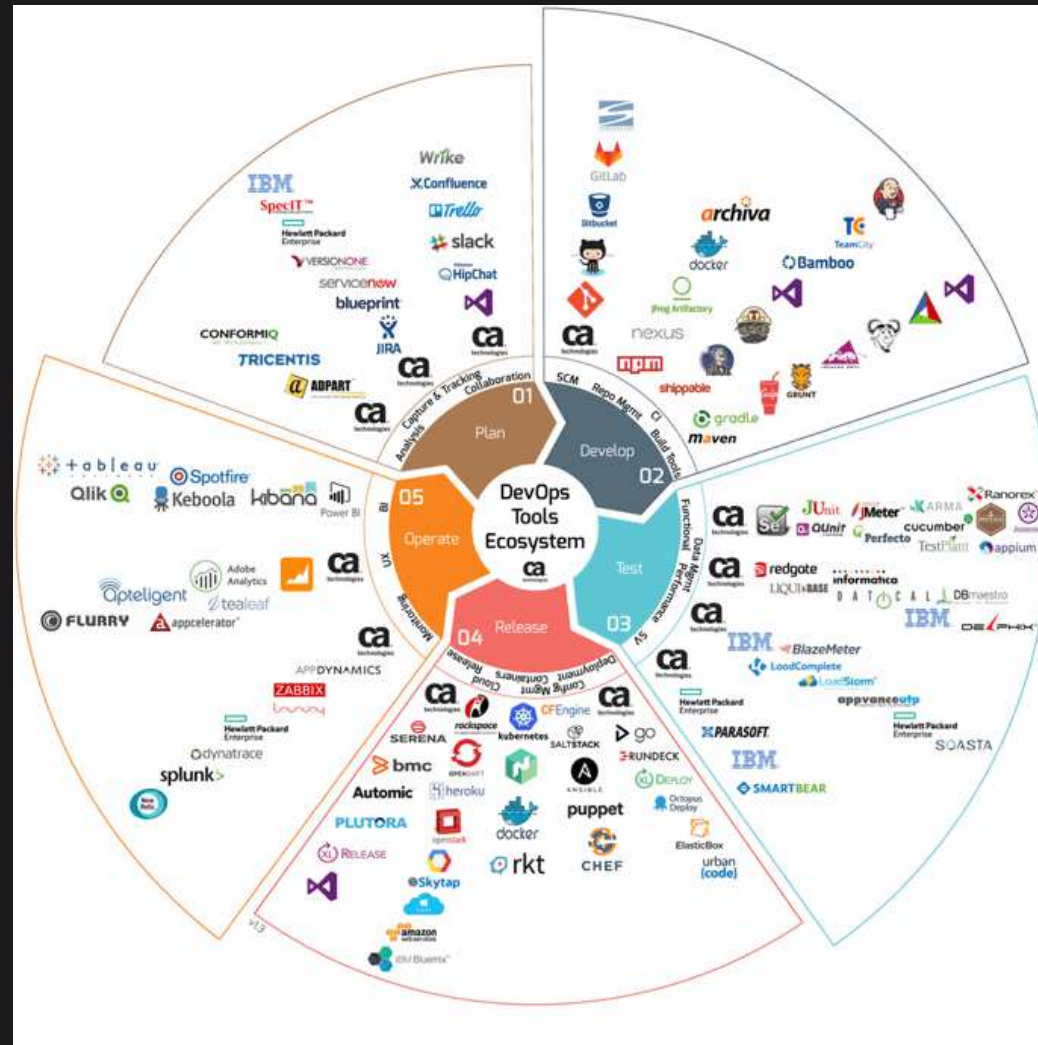
Topic 704: Configuration Management

Ansible : ansible.cfg , ansible-playbook , ansible-vault ,
ansible-galaxy , ansible-doc

Other Configuration Management Tools :
CHEF , Puppet

↕	Language	License	Mutual auth	Encrypts	Verify mode	Agent-less	Have a GUI	First release	Latest stable release
Ansible	Python	GPLv3+	Yes ^[1]	Yes ^[2]	Yes	Yes	Yes ^[3]	2012-03-08	2018-12-13 2.7.5 ^{[4][5][6]}
Chef	Ruby, Erlang	Apache 2.0	Yes ^[14]	Yes ^[15]	Yes ^{[16][17]}	No	Yes	2009-01-15 0.5.0	2019-01-28 14.10.9 (client), ^[18] 2018-02-13 12.17.33 (server) ^[19]
CFEngine	C ^[20]	GPLv3 ^[21]	Yes ^[1]	Yes ^[22]	Yes ^{[23][24]}	No	Yes ^[25]	1993	2019-07-01 3.14.0, ^[26] 2019-05-20 3.12.2, ^[27] 2019-05-10 3.10.6 ^[28]
Puppet	C++ & Clojure from 4.0, ^[45] Ruby before then	Apache from 2.7.0, GPL before then	Yes ^[46]	Yes ^[9]	Yes ^{[47][48]}	No	Yes ^[49]	2005-08-30 ^[50]	2019-01-15 6.0.5 ^[51]
Salt ^[72]	Python ^[73]	Apache 2.0 ^[74]	Yes ^[75]	Yes ^[75]	Yes	Both ^{[76][77]}	Yes ^{[78][79]}	2011-03-17 0.6.0 ^[80]	2019-02-25 v2019.2.0 ^[81]

ANSIBLE IN DEVOPS



INTRODUCTION TO YAML

YAML includes a markup language with important construct

The Design Goals and features of YAML are given below :

- Matches native data structures languages such as Perl, Python, PHP, Ruby and JavaScript
- YAML data is portable between programming languages
- Includes data consistent data model
- Easily readable by humans
- Supports one-direction processing
- Ease of implementation and usage