What we will cover today

- What challenges do we see in the field ?
- What is Infrastructure as Code (IaC) ?
- Principles, Practices and Goals
- Red Hat's Dynamic Infrastructure solutions
- How can Red Hat help in your journey to Infrastructure as code ?

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INFRA TEAM CHALLENGES

Challenges faced by IT

And some Sysadmin tales...

- Server Sprawl
- Configuration Drifts
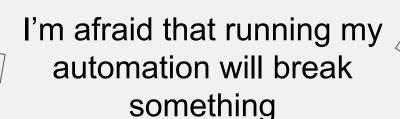- Snowflake Servers
- "Fragile Infrastructure"
- Erosion

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The Automation Fear Spiral

I make changes outside my automation tool
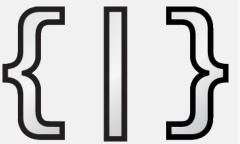
My servers are inconsistent

FEAR!

I'm afraid that running my automation will break something

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The WHAT and the WHY of Infrastructure as code

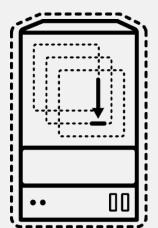redhat.

WHAT is Infrastructure as Code ?

- Infrastructure as Code = Approach to Infrastructure automation based on Practices from Software Development

- Emphasizes **consistent, repeatable routines for provisioning and changing systems** and their configuration.

- The premise is that <u>modern tooling can treat infrastructure as if it were software</u> and data.

WHY Infrastructure as Code ?

Virtualization, cloud, containers, server automation, and software-defined networking **should simplify IT operations work**.
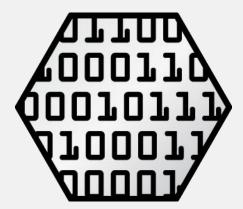
Adopting cloud and automation tools immediately lowers barriers for making changes to the infrastructure

Legacy change management processes are sometimes ignored, bypassed, or overruled by people who need to get things done and struggle to cope with the pace of change offered by cloud and automation.

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Infrastructure as Code - Principles

- Systems can be easily reproduced (with confidence)
- Systems are disposable
- Cattle, not pets
- Systems are consistent
- Processes are repeatable
- Design is always changing

Infrastructure as Code - Practices

- Use Definition files (json, yaml or xml)
- Self-documented Systems and processes (embedded in the code, captured in scripts, definition files and tools)
- Version all the things (with VCS): traceability, rollback, correlation, visibility, actionability)
- Continuously Test the systems and processes
- Small changes rather than batches
- Keep Services Available continuously

Infrastructure as Code - Goals

- IT infrastructure supports and enables change
- Changes to the system are routine
- IT staff spends their time on valuable things that engage their abilities
- Users can define, provision, manage resources they need
- Teams are able to easily and quickly recover from failures
- Improvements are made continuously
- Solutions to problems are proven through implementing, testing, and measuring them

Red Hat Dynamic Infrastructure Solutions
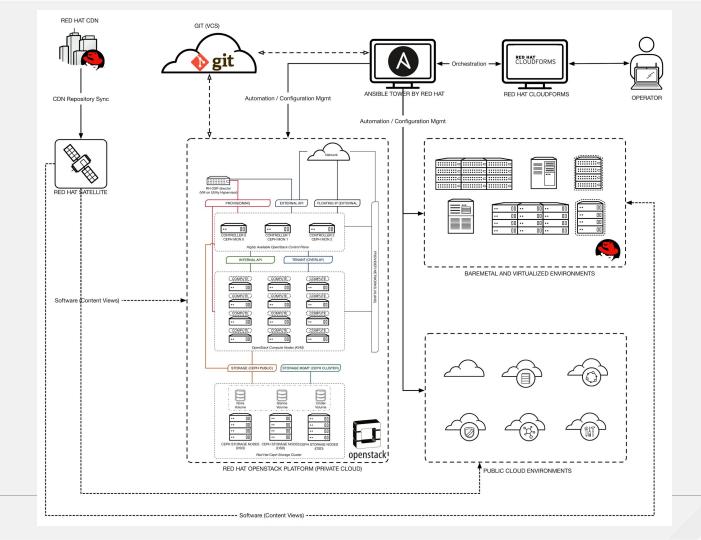
How Red Hat OpenStack Platform is addressed with IaC

- Red Hat OpenStack Platform director (RH OSP-d) is built on Triple-O project, which uses the IaC paradigm.
- The configuration for the Overcloud is defined in templates.
- All the templates are YAML files that defines how the OpenStack cloud will look.
- Any modifications to the OpenStack cloud should be done by modifying the templates and then running RH OSP-d to update the overcloud.
- The overcloud can be completely rebuilt just by using the configuration defined in the templates.

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RED HAT CDN

GIT (VCS)

git

ANSIBLE TOWER BY RED HAT

Orchestration

RED HAT CLOUDFORMS

RED HAT CLOUDFORMS

OPERATOR

CDN Repository Sync

Automation / Configuration Mgmt

Automation / Configuration Mgmt

RED HAT SATELLITE

Software (Content Views)

RH OSP director
(VM on Utility Hypervisor)

PROVISIONING

EXTERNAL API

FLOATING IP (EXTERNAL

Network

CONTROLLER 0
CEPH MON 0

CONTROLLER 1
CEPH MON 1

CONTROLLER 2
CEPH MON 2

Highly Available OpenStack Control Plane

INTERNAL API

TENANT (OVERLAY)

PROVIDER NETWORKS (VLANS)

COMPUTE   COMPUTE   COMPUTE
COMPUTE   COMPUTE   COMPUTE
COMPUTE   COMPUTE   COMPUTE
COMPUTE   COMPUTE   COMPUTE

OpenStack Compute Nodes (KVM)

STORAGE (CEPH PUBLIC)

STORAGE MGMT (CEPH CLUSTER)

Nova
Volume

Glance
Volume

Cinder
Volume

CEPH STORAGE NODES
(OSD)

CEPH STORAGE NODES
(OSD)

CEPH STORAGE NODES
(OSD)

Red Hat Ceph Storage Cluster

openstack

RED HAT OPENSTACK PLATFORM (PRIVATE CLOUD)

BAREMETAL AND VIRTUALIZED ENVIRONMENTS

PUBLIC CLOUD ENVIRONMENTS
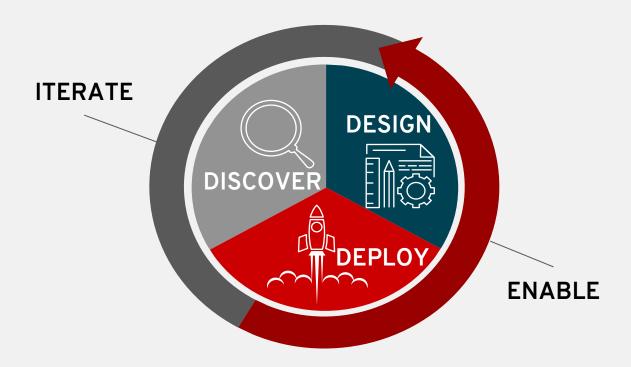
Software (Content Views)

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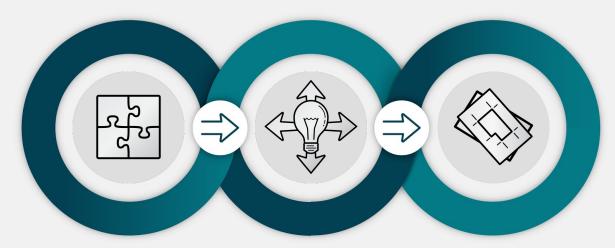# How can Red Hat Consulting help ?

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Red Hat's Consulting Methodology

Let's schedule a Discovery workshop...

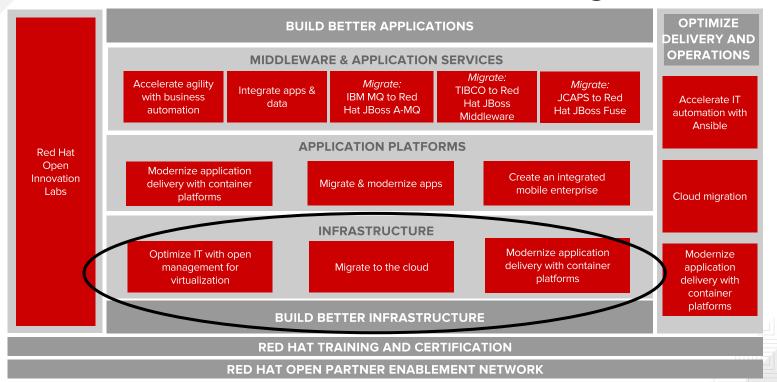With your Business, Technology and Operations stakeholders and a white-board...

Objectives:

Identify your business drivers, use cases, and challenges

Articulate what solutions can help solve your Business needs

Establish an action plan and an iterative roadmap...

Red Hat Services Solutions Program

BUILD BETTER APPLICATIONS

OPTIMIZE DELIVERY AND OPERATIONS

MIDDLEWARE & APPLICATION SERVICES

Accelerate agility with business automation	Integrate apps & data	*Migrate:* IBM MQ to Red Hat JBoss A-MQ	*Migrate:* TIBCO to Red Hat JBoss Middleware	*Migrate:* JCAPS to Red Hat JBoss Fuse

Red Hat Open Innovation Labs

APPLICATION PLATFORMS

Modernize application delivery with container platforms

Migrate & modernize apps

Create an integrated mobile enterprise

INFRASTRUCTURE

Optimize IT with open management for virtualization

Migrate to the cloud

Modernize application delivery with container platforms

BUILD BETTER INFRASTRUCTURE

Accelerate IT automation with Ansible

Cloud migration

Modernize application delivery with container platforms

RED HAT TRAINING AND CERTIFICATION

RED HAT OPEN PARTNER ENABLEMENT NETWORK

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QUESTIONS?

RED HAT SUMMIT

LEARN. NETWORK.
EXPERIENCE
OPEN SOURCE.

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