DEVSECOPS FOR HYBRID CLOUD

Automation, Security and IT Operations at Scale

Dave Sirrine
Principal Solution Architect

Red Hat

IN BUSINESS, DIFFERENTIATION DEPENDS ON YOUR ABILITY TO DELIVER INNOVATION FASTER

Connected Applications

Intelligent Recommendations

Better Use of Data

Globally Availability

Innovation In New Markets

IN IT, SUCCESS DEPENDS ON YOUR ABILITY TO DELIVER APPLICATIONS FASTER

Cloud-native Applications

AI & Machine Learning

Blockchain

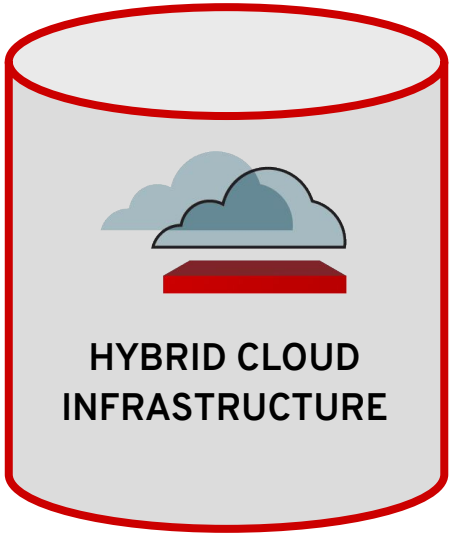
Internet of Things

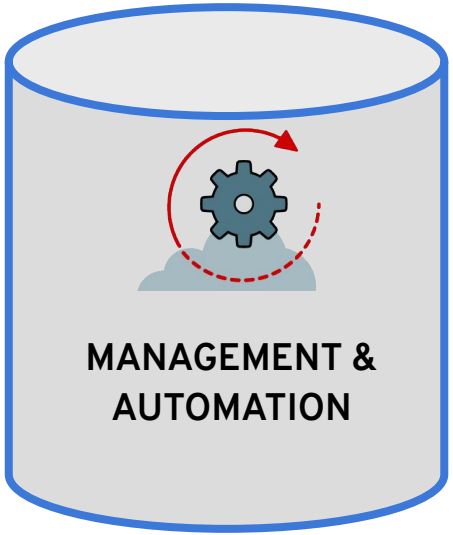
Innovation Culture

CONTAINERS, KUBERNETES, MICROSERVICES & DEVOPS ARE KEY INGREDIENTS

AGILITY CAN'T SUCCEED IN SILOS

MUST ENABLE COLLABORATION BETWEEN TECHNOLOGY & GROUPS





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What is DevOps?

DevOps is an approach to culture, process, and tools for delivering increased business value and responsiveness through automated, rapid, iterative, self-service, and high-quality IT service delivery. It applies open source principles and practices with:

- Culture of collaboration valuing openness and transparency
- Automation of process from development through ongoing operations
- Adoption of technology drawing from innovative development communities

TL;DR

DevOps is about getting things out the door to end users quickly and reliably.

DevSecOps TL;DR

DevSecOps is about getting things out the door to end users quickly and reliably and securely.

DEVOPS IS ABOUT CULTURE

CULTURE IS ABOUT PEOPLE

CHARACTERISTICS OF DEVOPS CULTURE

- Open Communication
- Respect
- Trust
- Incentive and Responsibility
- Embrace Experimentation and Failure
- Patience

EVERYONE HAS VALUABLE INPUT AND COMMUNICATES

SYSADMIN

OPERATIONS

BUSINESS

DEVELOPER

SECURITY ADMIN

CLOUD ADMIN

NETWORK ADMIN

GETTING STARTED

- Define Primary Business Objective & Set Goals
- Establish Executive Sponsorship
- Find Technical Leadership
- Select Pilot Projects
- Define Initial Processes
- Identify Key Tools
- Plot Timelines and Measure Progress
- Iterate

DevOps Team Syndrome

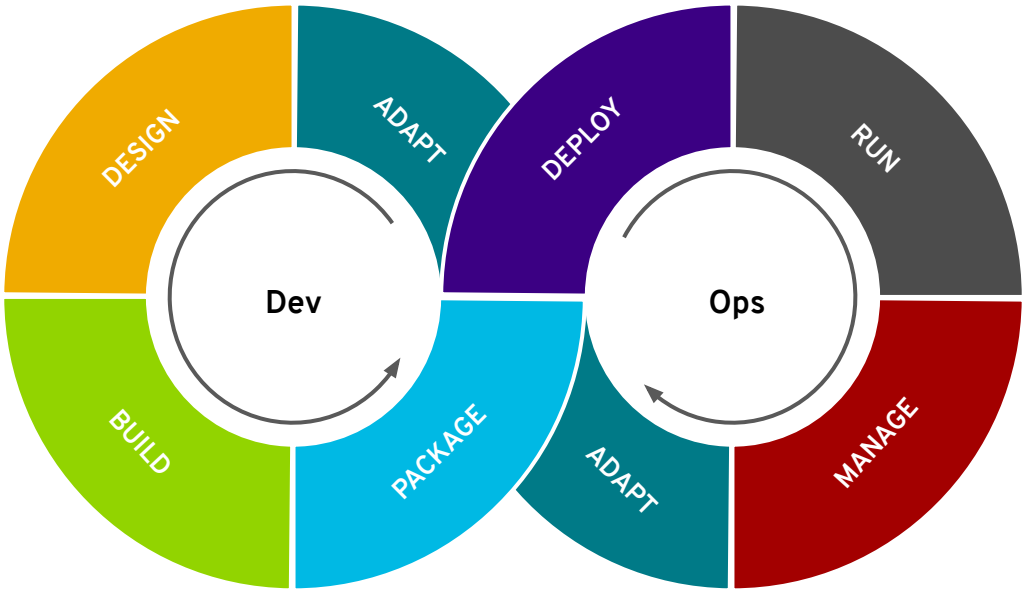
/dēvops/ /tēm/ /ˈsinˌdrōm/

technology disease

1. the unfortunate behavior in believing that a single team of engineers can solve an organization's technology problems alone by using some orchestration tool.

Source: Walter Bentley, Senior Manager, Automation Practice, Red Hat Consulting

THE DEVOPS MODEL



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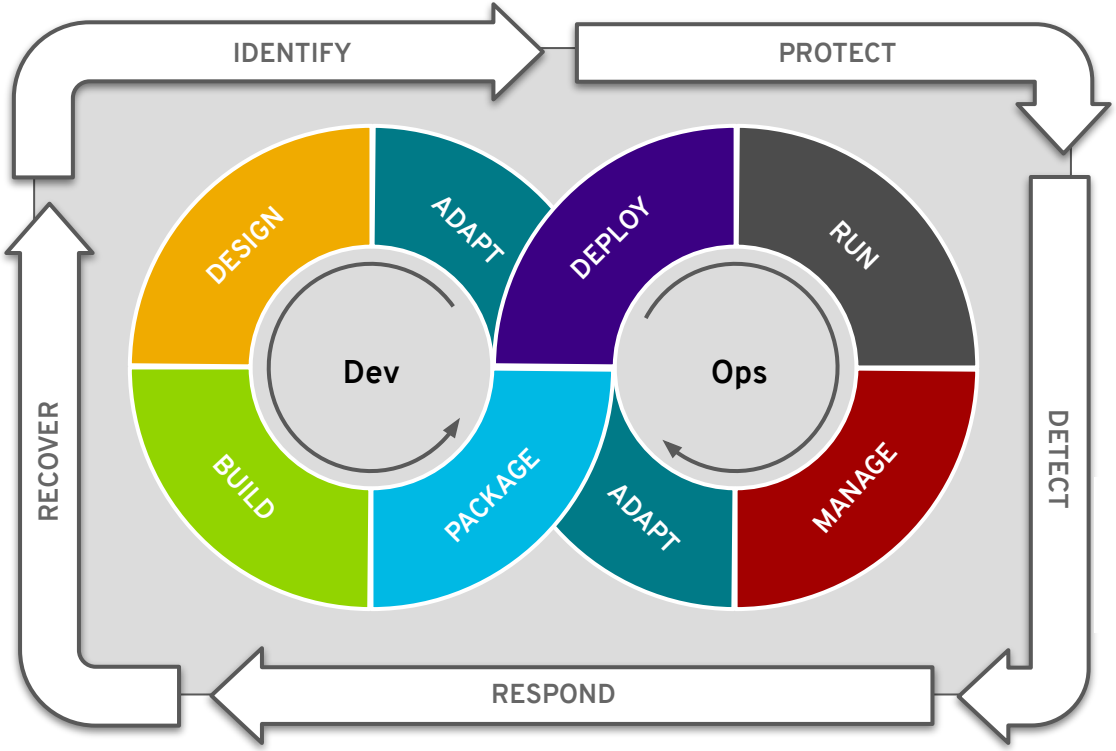
THE DEVSECOPS MODEL: CONTINUOUS SECURITY

Revise, update, remediate as the landscape changes

Identify security requirements & governance models

Built-in from the start; not bolted-on



Deploy to trusted platforms with enhanced security capabilities

Automate systems for security & compliance

Revise, update, remediate as the landscape changes

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DEVSECOPS

We created Dev and Ops and Security user stories and tackled them together.

DEVELOPER

I can break builds if security and compliance rules aren't followed…

SECURITY

We're empowering the developers and ideally empowering them straight to production.

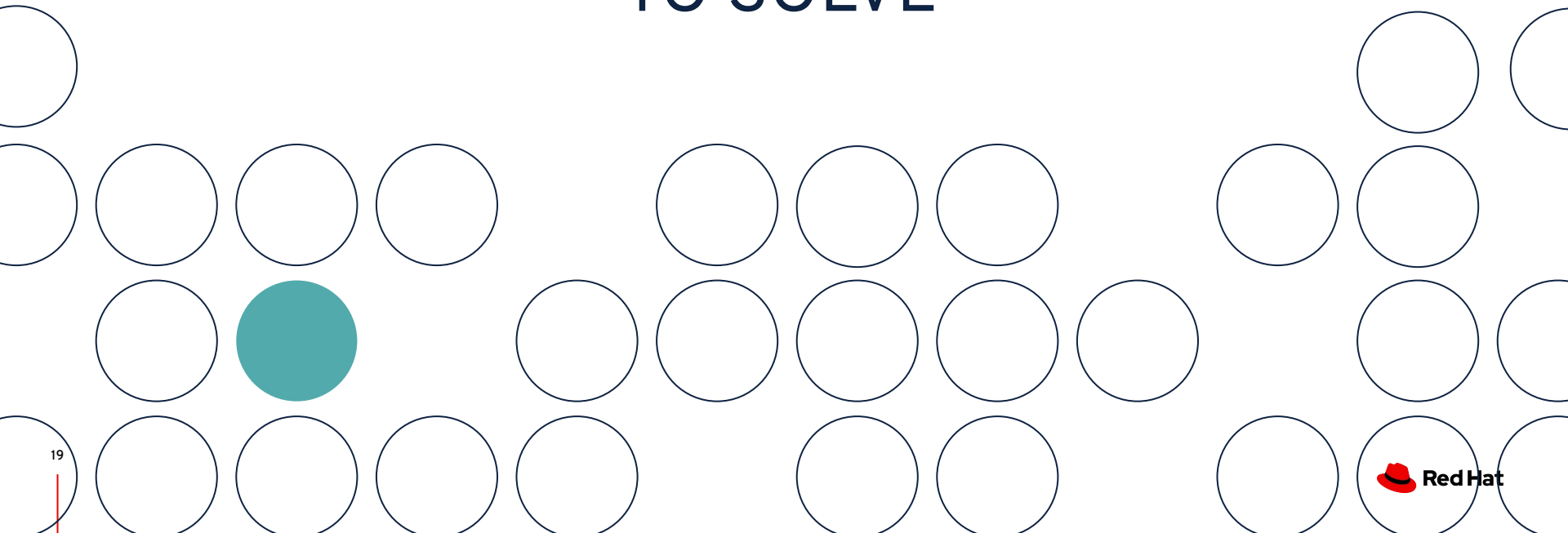
OPERATIONS

[DevNation Federal 2017 - The Journey to DevSecOps]

AUTOMATION IS KEY

Automation happens when **one person** meets
a problem they never want to solve again

WE ALL HAVE
MORE THAN ONE PROBLEM
TO SOLVE



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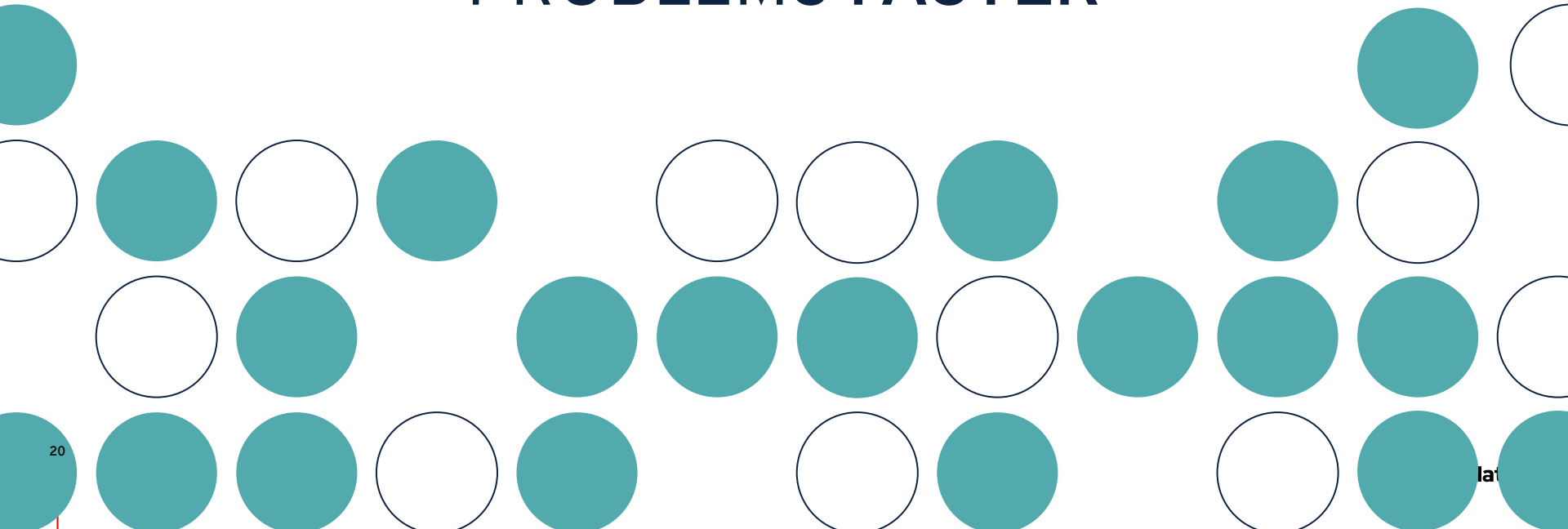
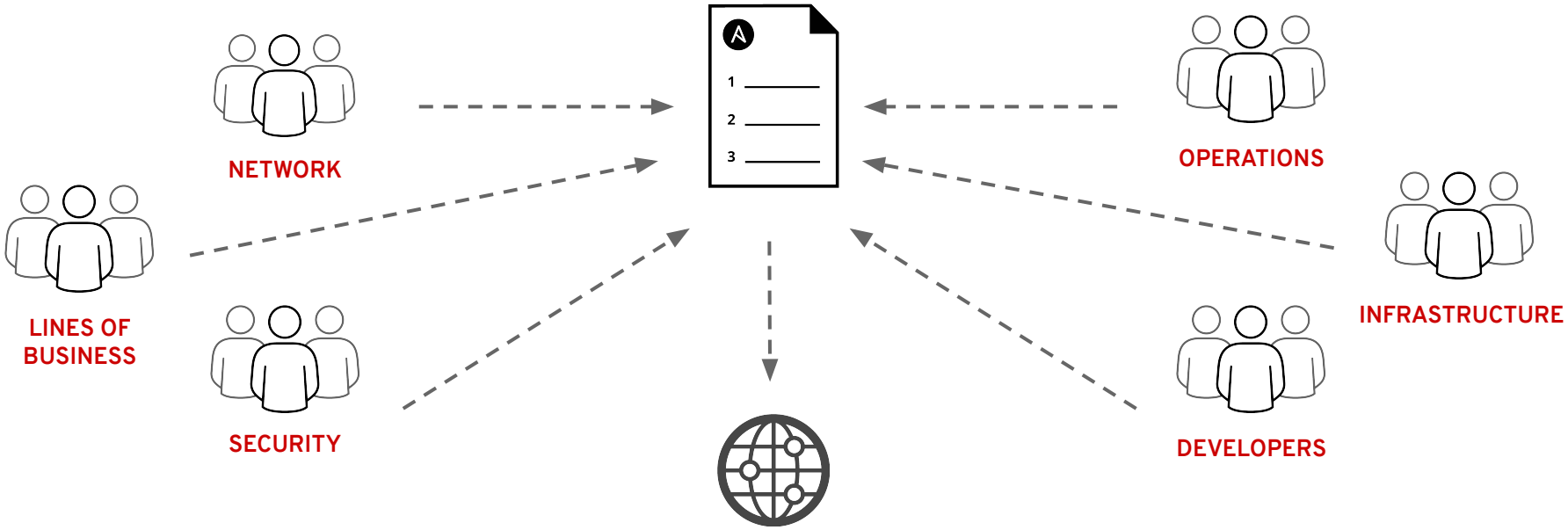
HELPING TEAMS AUTOMATE TO SOLVE PROBLEMS **FASTER**



AUTOMATION BRINGS TEAMS TOGETHER



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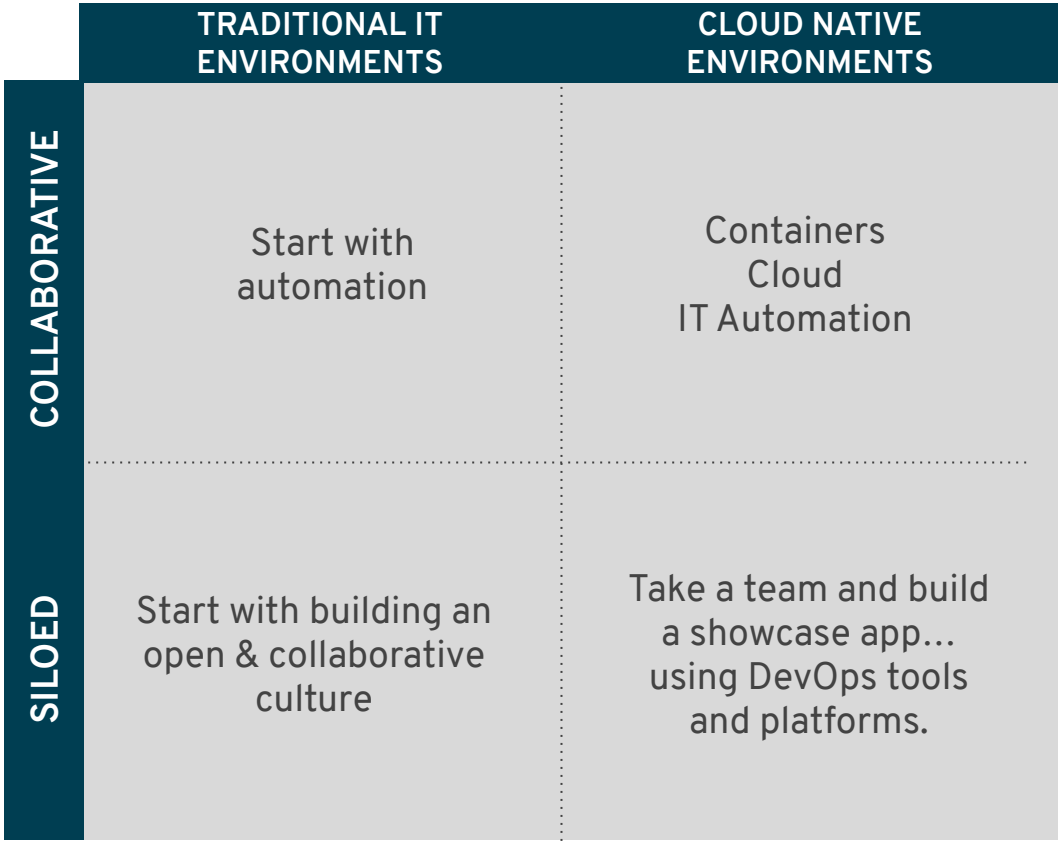
Where are you looking for DevOps benefits?

What's the **culture** of your organization?



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AUTOMATION WITH ANSIBLE
Traditional IT

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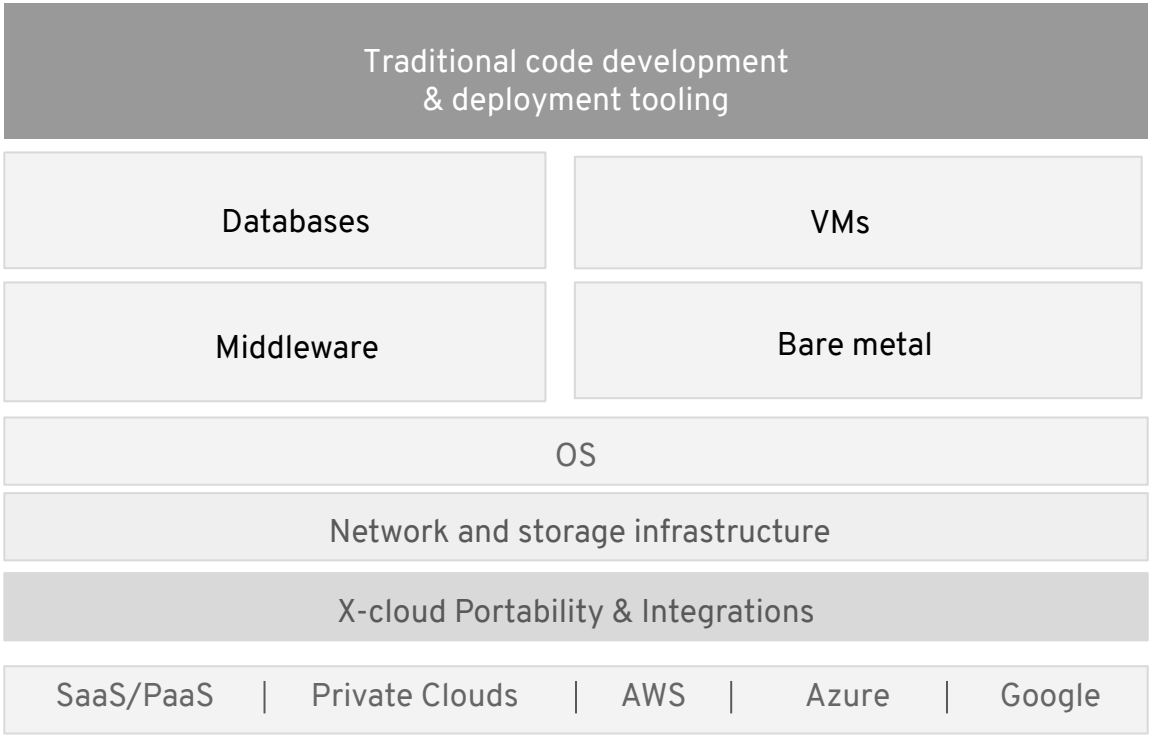
AUTOMATION FOR TRADITIONAL IT



- Service catalogs & governance
- Full stack monitoring
- Root cause Analytics
- Capacity Optimization
- Security & Compliance
- Config & Provision
- Patch & Remediate
- ITSM & CMDB Integration

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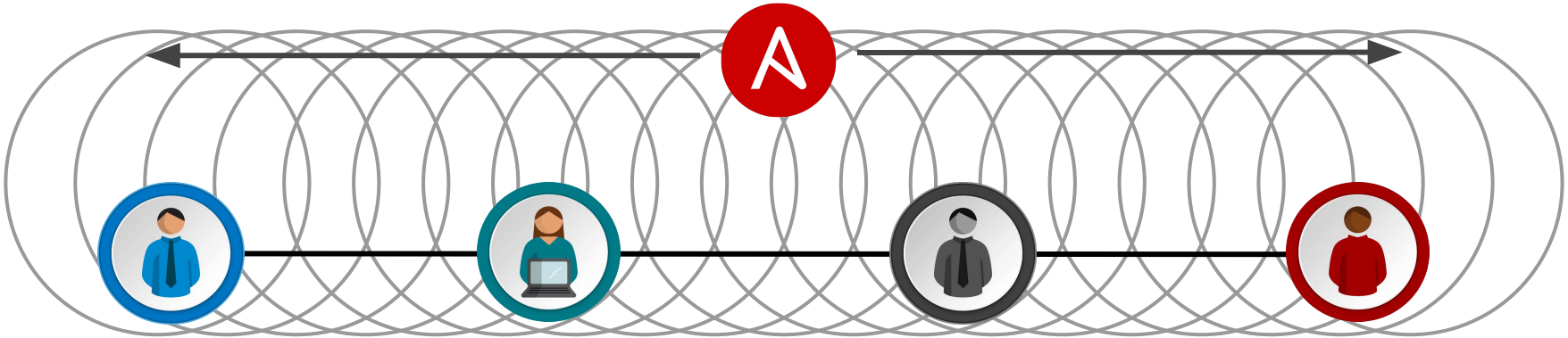
ANSIBLE IS THE UNIVERSAL LANGUAGE



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RED HAT ANSIBLE AUTOMATION

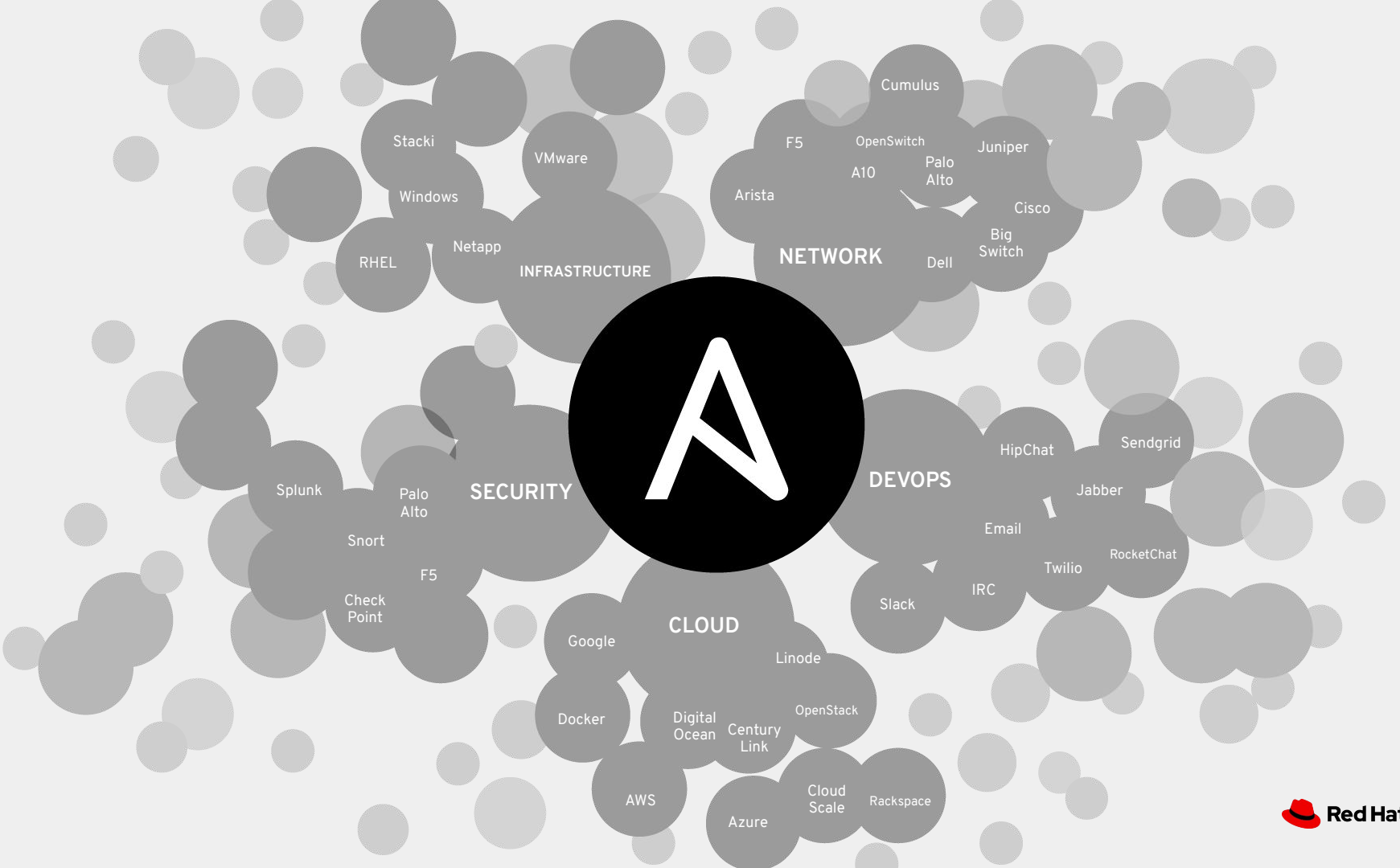
Effective automation in the container era requires
IT Operations to be as agile as software developers

Programmatic, reusable, open

Human readable

Consistent across technologies and multiple clouds

Self-documenting


Stacki
VMware
Windows
RHEL
Netapp
INFRASTRUCTURE
Cumulus
F5
OpenSwitch
Juniper
A10
Palo Alto
Arista
Cisco
NETWORK
Big Switch
Dell
Splunk
Palo Alto
SECURITY
Snort
F5
Check Point
HipChat
Sendgrid
DEVOPS
Jabber
Email
RocketChat
Twilio
IRC
Slack
Google
CLOUD
Linode
Docker
Digital Ocean
Century Link
OpenStack
AWS
Azure
Cloud Scale
Rackspace

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ANSIBLE NETWORK AUTOMATION

Configure, validate, & ensure continuous compliance for physical network devices

BUILD
with Red Hat Ansible Engine

- Get automating quickly.
- Integrate configs from Cisco, Juniper, Arista, F5, and more.
- Ideal for both existing and greenfield.

Automate discrete tasks

MANAGE
with Red Hat Ansible Engine

- Methodically track configuration drift.
- Make changes across any set of network devices.
- Validate that changes were successful.

Automate business processes

SCALE
with Red Hat Ansible Tower

- Ensure ongoing steadystate on a schedule.
- Use role-based access controls with specific teams.
- Integrate external third-party solutions with RESTful API.

Orchestrate & operationalize automation

RED HAT® ANSIBLE® Engine

RED HAT® ANSIBLE® Engine

RED HAT® ANSIBLE® Tower

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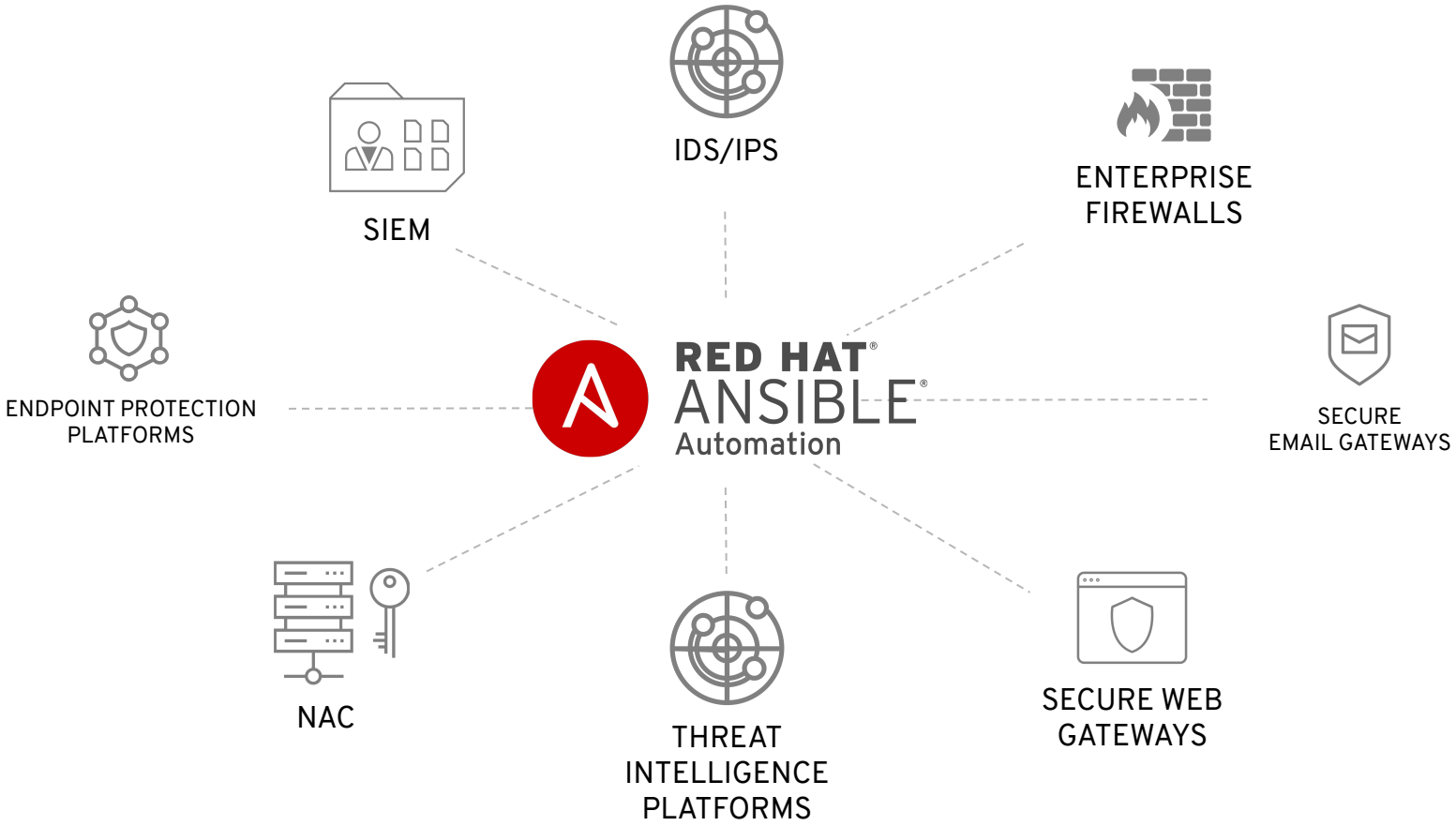
IDS/IPS
SIEM
ENTERPRISE FIREWALLS
ENDPOINT PROTECTION PLATFORMS
RED HAT
ANSIBLE
Automation
SECURE EMAIL GATEWAYS
NAC
THREAT INTELLIGENCE PLATFORMS
SECURE WEB GATEWAYS

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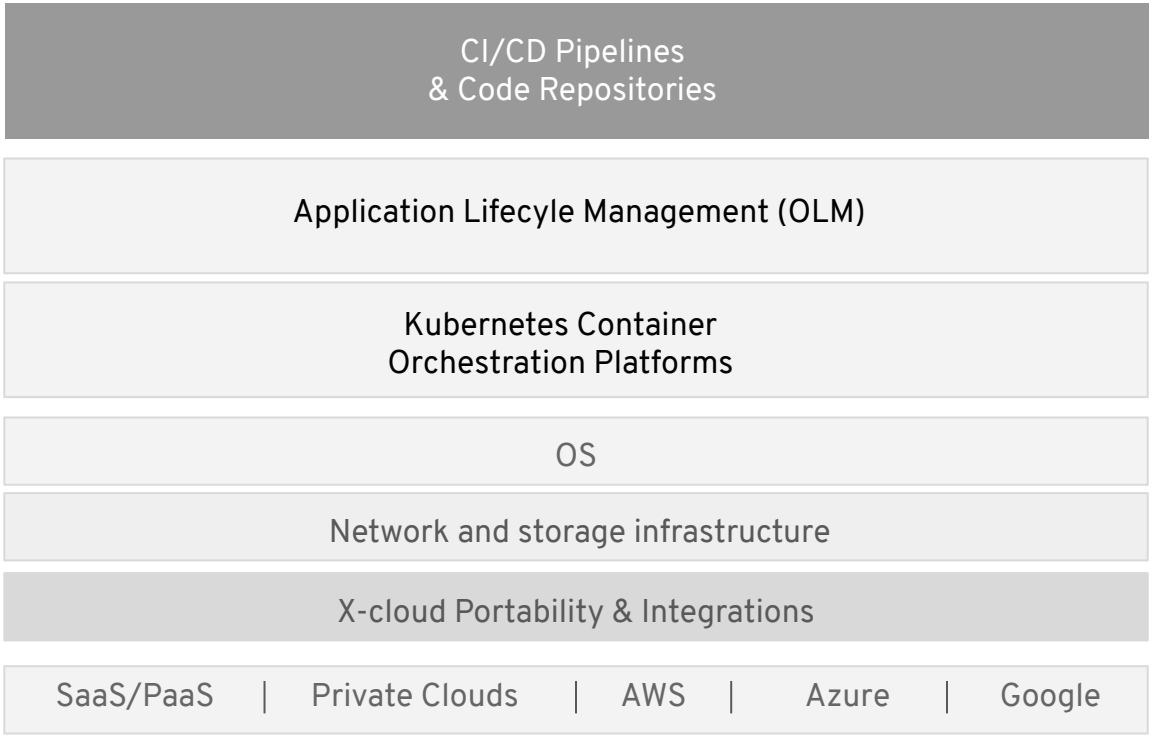
CI / CD FOR CLOUD NATIVE

AUTOMATION FOR HYBRID CLOUD



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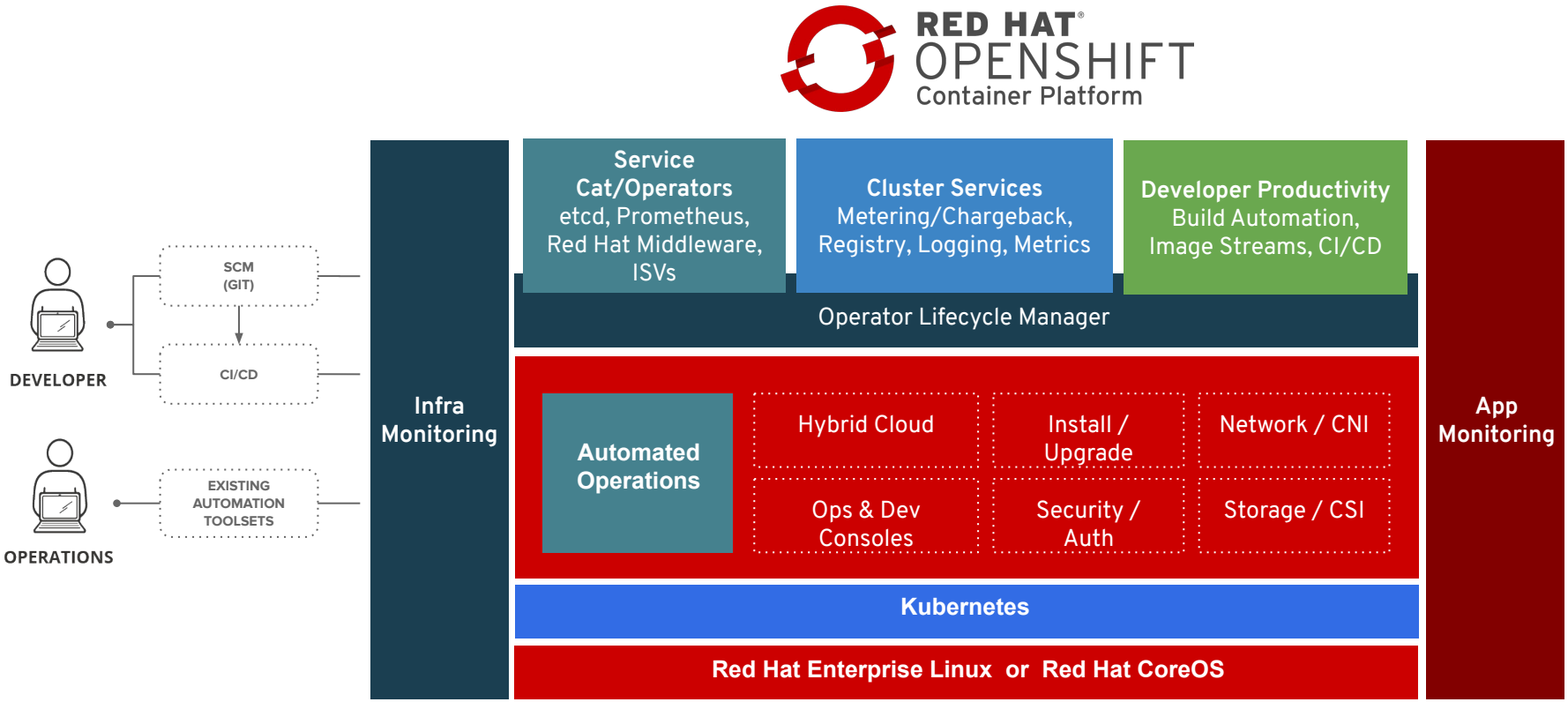
A PLATFORM FOR DEVOPS & HYBRID CLOUD



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OPENSHIFT 4 DEPLOYMENT OPTIONS

	Full Stack Automation	Pre-existing Infra
Build Network	Installer	User
Setup Load Balancers	Installer	User
Configure DNS	Installer	User
Hardware/VM Provisioning	Installer	User
OS Installation	Installer	User
Generate Ignition Configs	Installer	Installer
OS Support	Installer: RHEL CoreOS	User: RHEL CoreOS + RHEL 7
Node Provisioning / Autoscaling	Yes	Supported for IPI providers
Customization & Provider Support	Limited: AWS *only*	Yes: AWS, Bare Metal, & VMware

amazon web services
Microsoft Azure
Google Cloud Platform
vmware vSphere
Baremetal
RED HAT OPENSTACK PLATFORM
RED HAT VIRTUALIZATION
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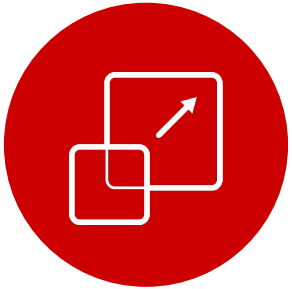
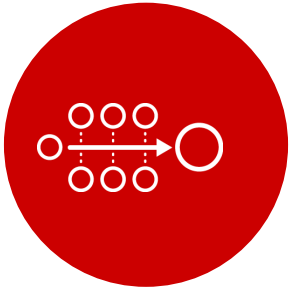
OPENSHIFT LOVES CI/CD

JENKINS-AS-A SERVICE ON OPENSHIFT

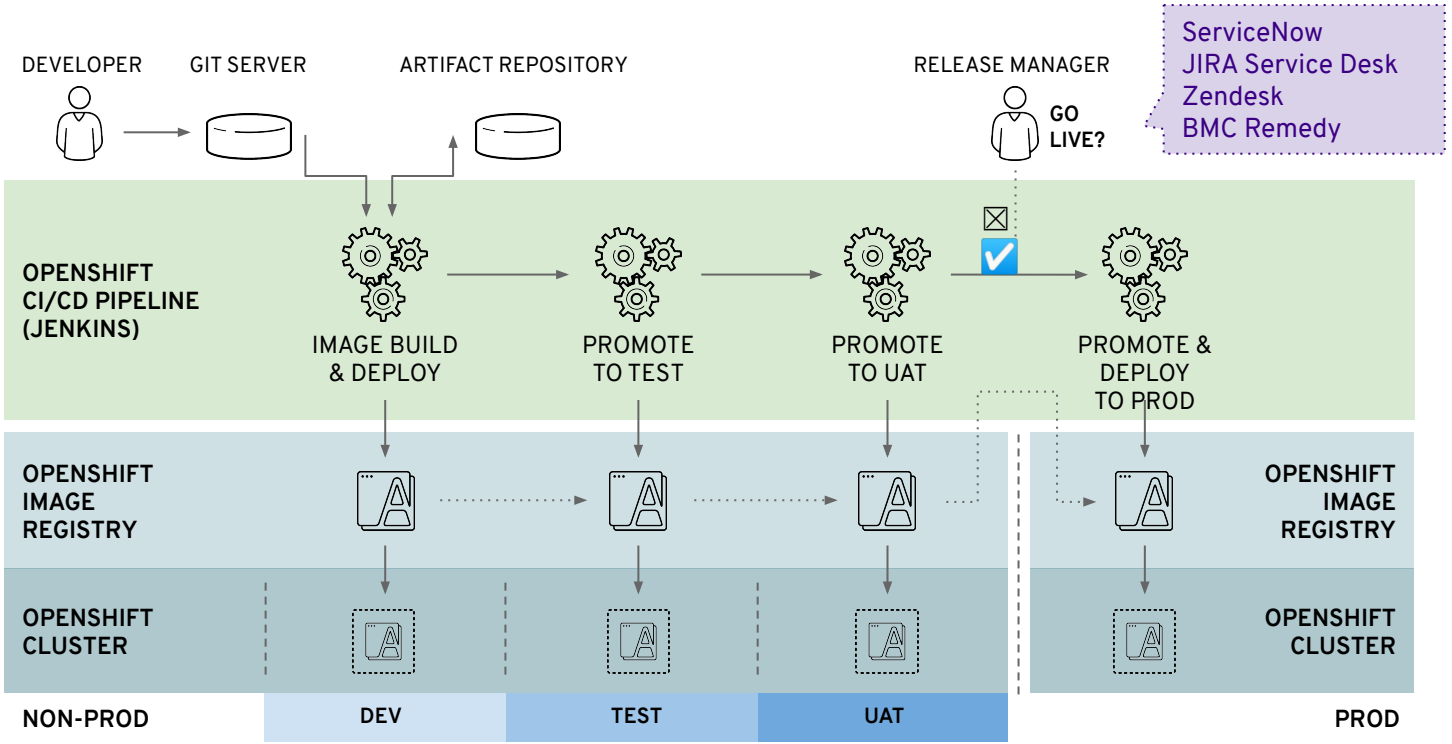


HYBRID JENKINS INFRA WITH OPENSHIFT



EXISTING CI/CD DEPLOY TO OPENSHIFT

USE THE OPENSHIFT PIPELINE



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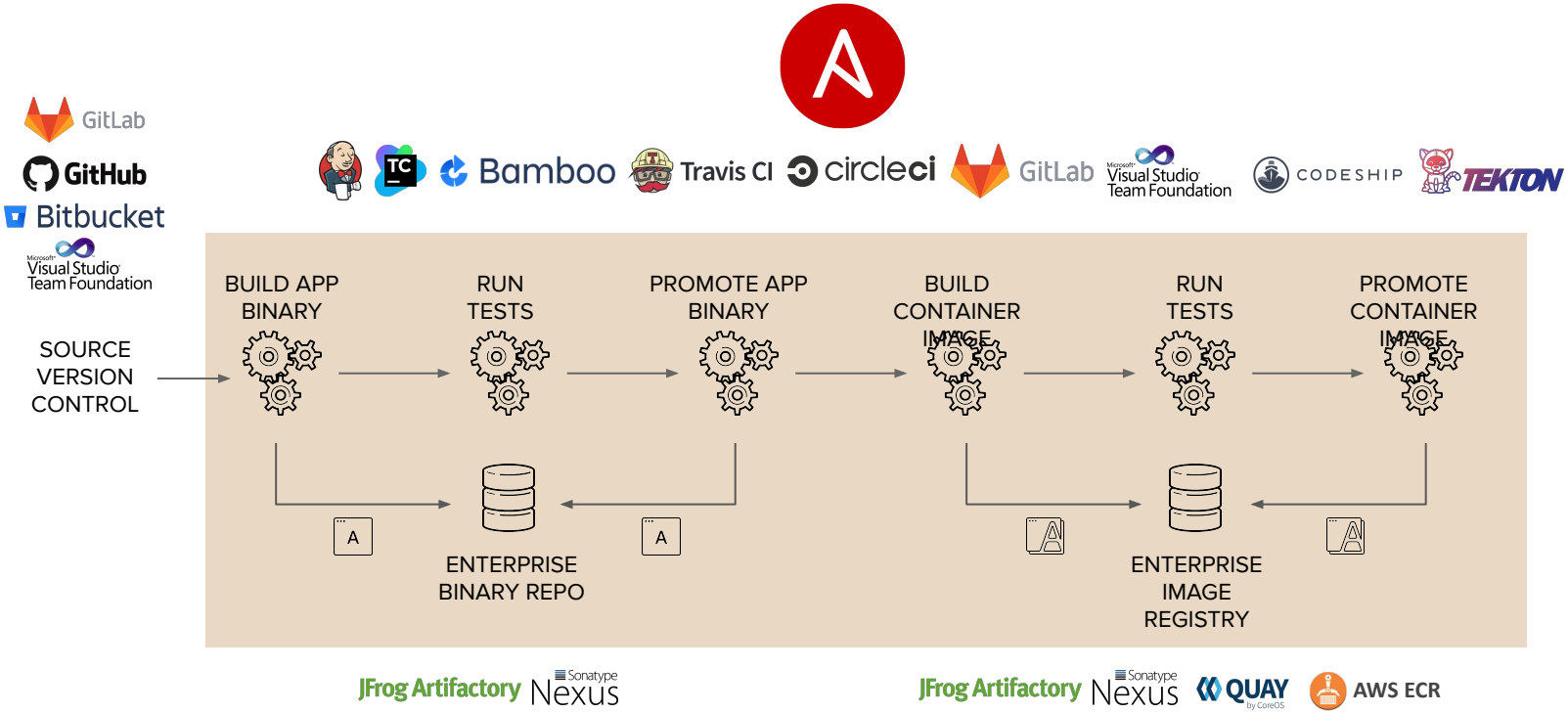
WHAT IF THERE ARE EXISTING DELIVERY PROCESSES?



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What is Tekton Pipeline

A Kubernetes-native pipeline resource

“The Tekton Pipelines project provides Kubernetes-style resources for declaring **CI/CD**-style pipelines.”

CD.FOUNDATION

“A Neutral Home for the Next Generation of Continuous Delivery Collaboration”

Contributors:

Google

Red Hat

CloudBees

IBM

…

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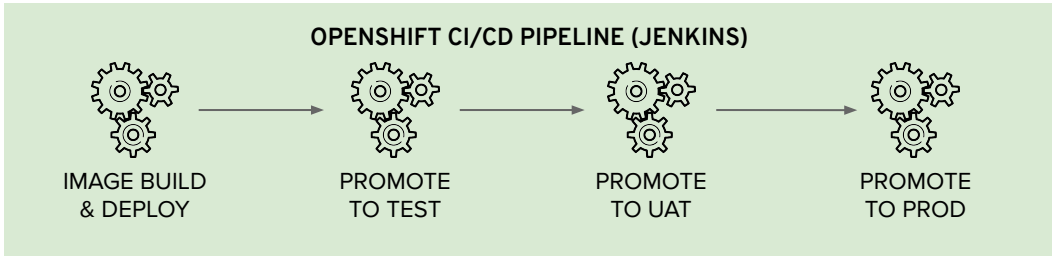
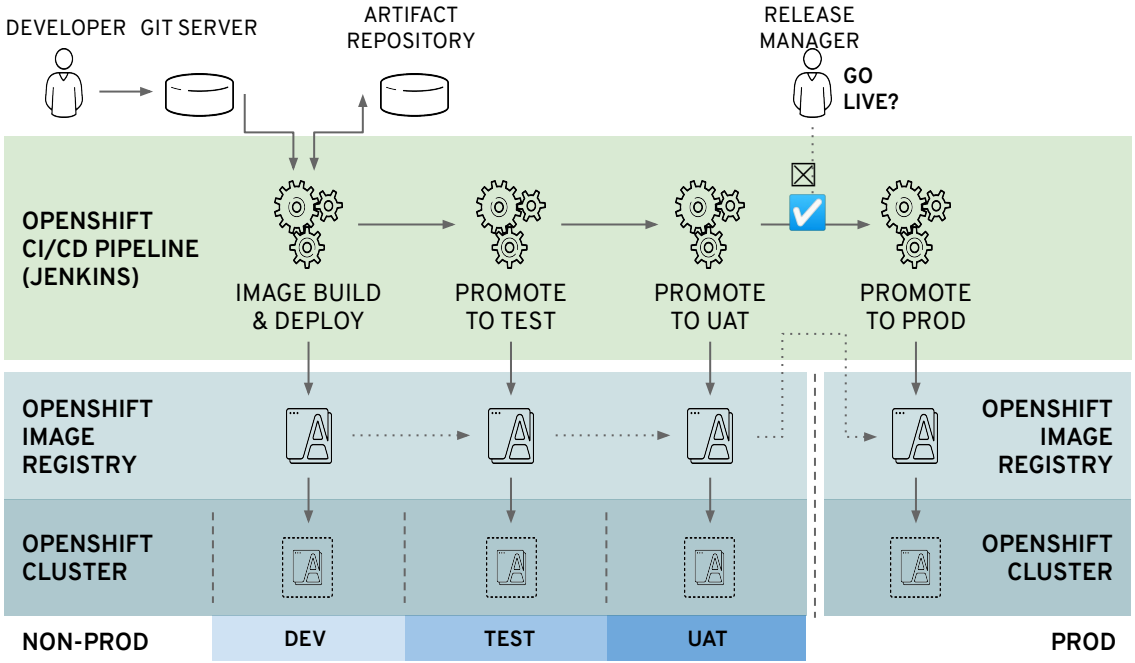
PIPELINE MUST INCLUDE SECURITY GATES



- Integrate security testing into your build / CI process
- Use automated policies to flag builds with issues
- Sign your custom container images

SECURITY FOR CONTAINER DEPLOYMENT
Trust is Temporal - Rebuild & Redeploy



- Operators: app config & lifecycle as code
- Whitelist / blacklist external repos
- Apply runtime security policies
- Validate image signatures
- Monitor for new vulnerabilities

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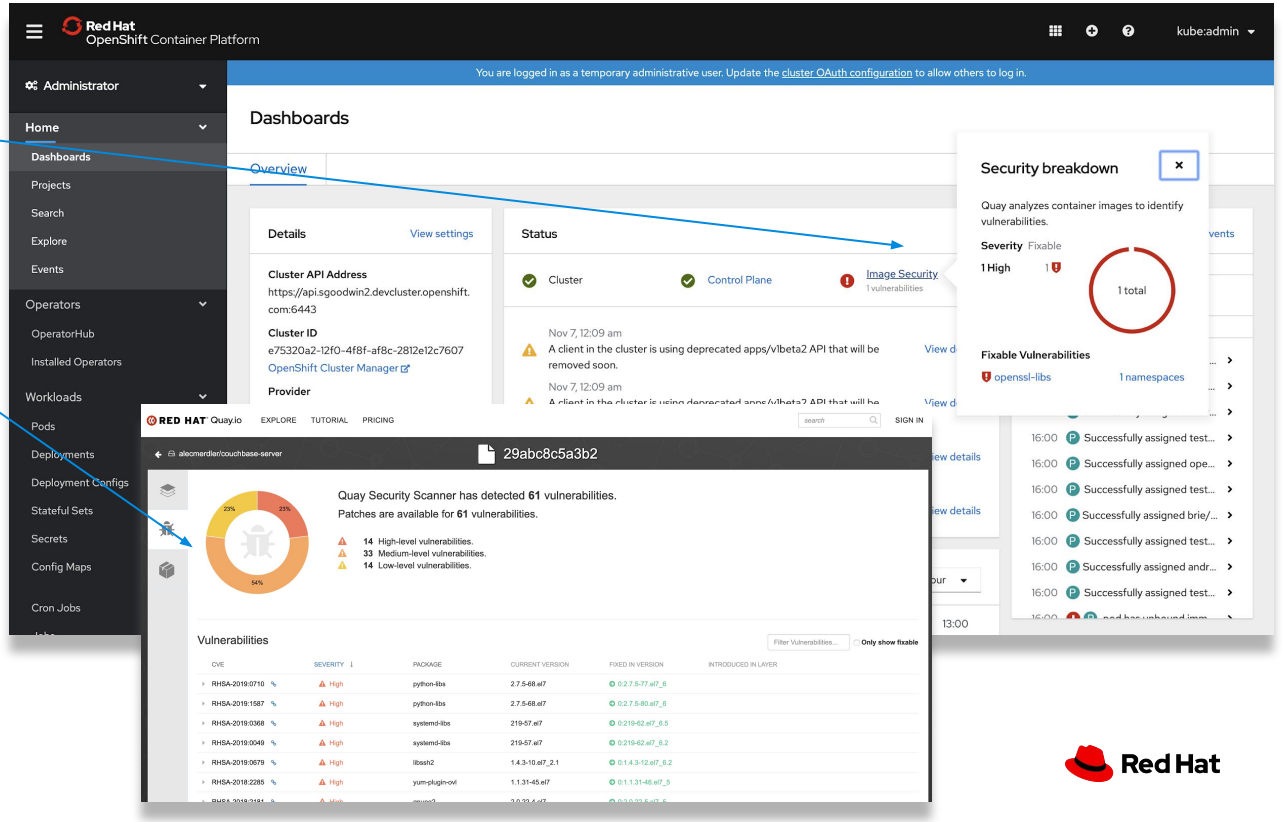
MONITOR SECURITY VULNERABILITIES

See all your Container Vulnerabilities right from the Console Dashboard

- Link out to **Red Hat Quay** for more in depth information
- The Quay Operator supports both **On-premise and External** Quay Registries
- Currently uses **Clair for Security Scan**; Planning to expand to other Vendors(TwistLock, Aqua, e.g.)
- *Only works for images managed by Quay*



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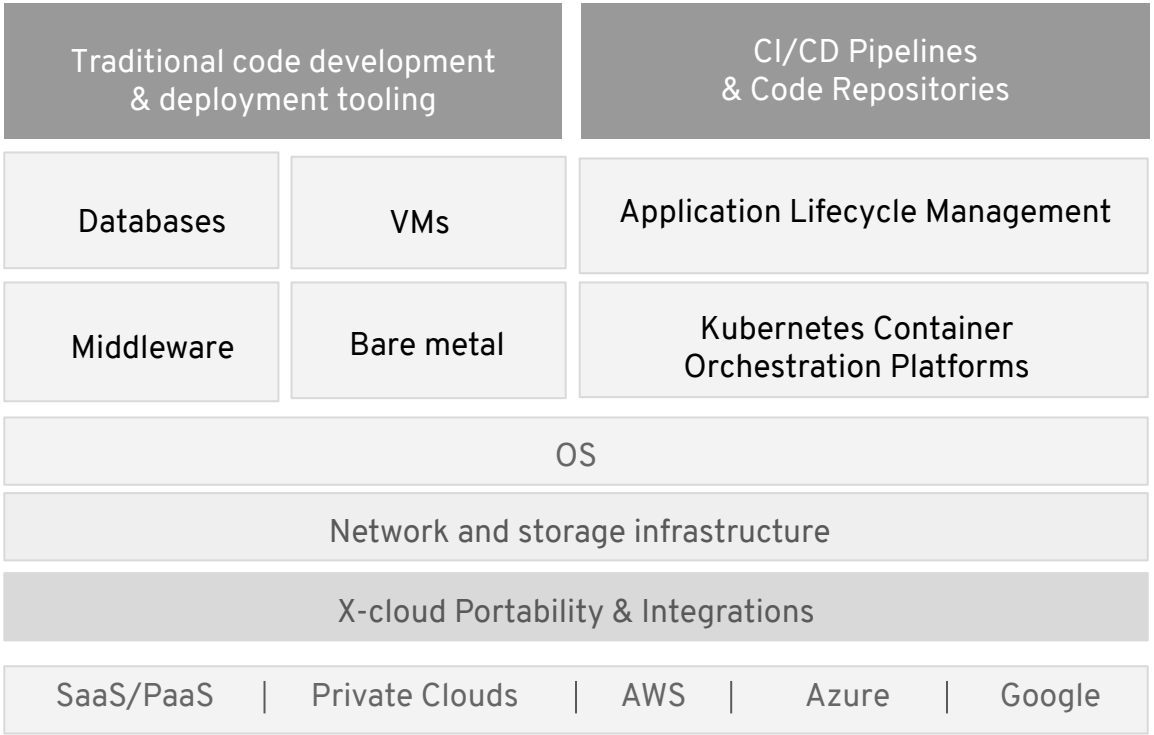
INTEGRATED IT

INTEGRATED ENTERPRISE IT AUTOMATION



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HYBRID APPLICATION AUTOMATION WITH OPENSHIFT AND ANSIBLE

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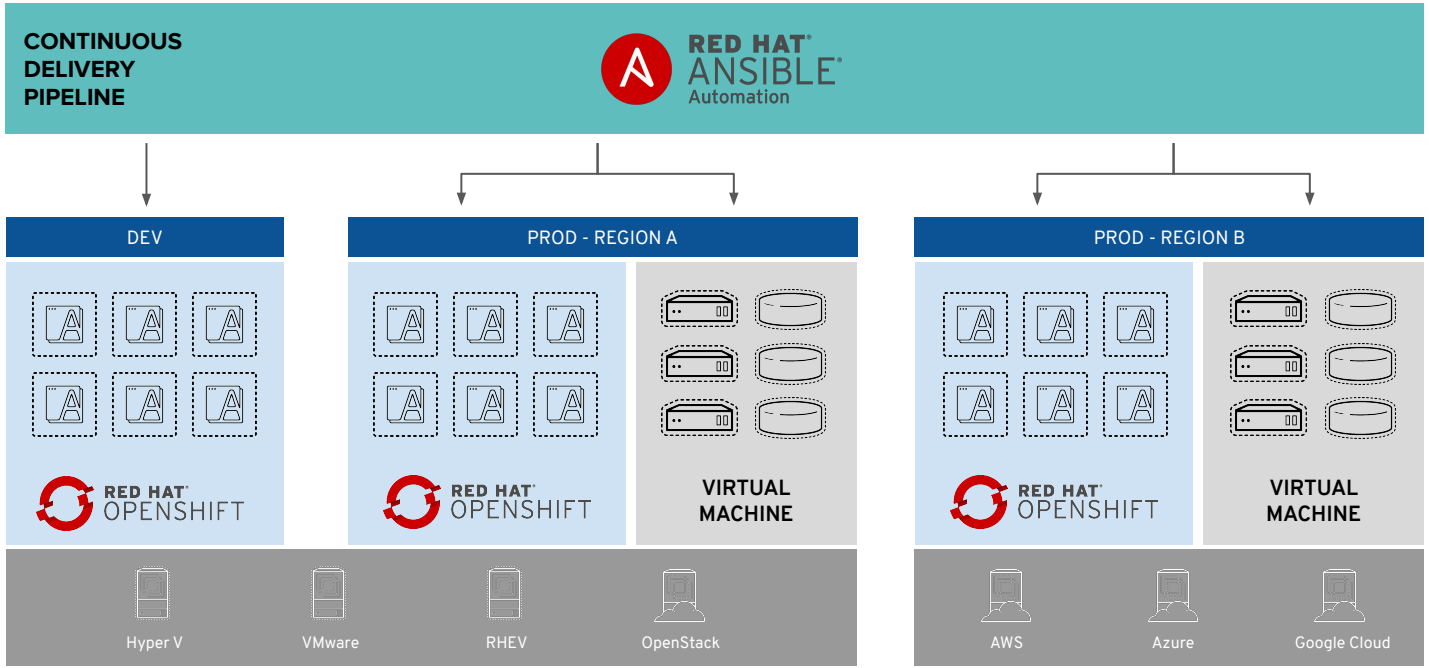

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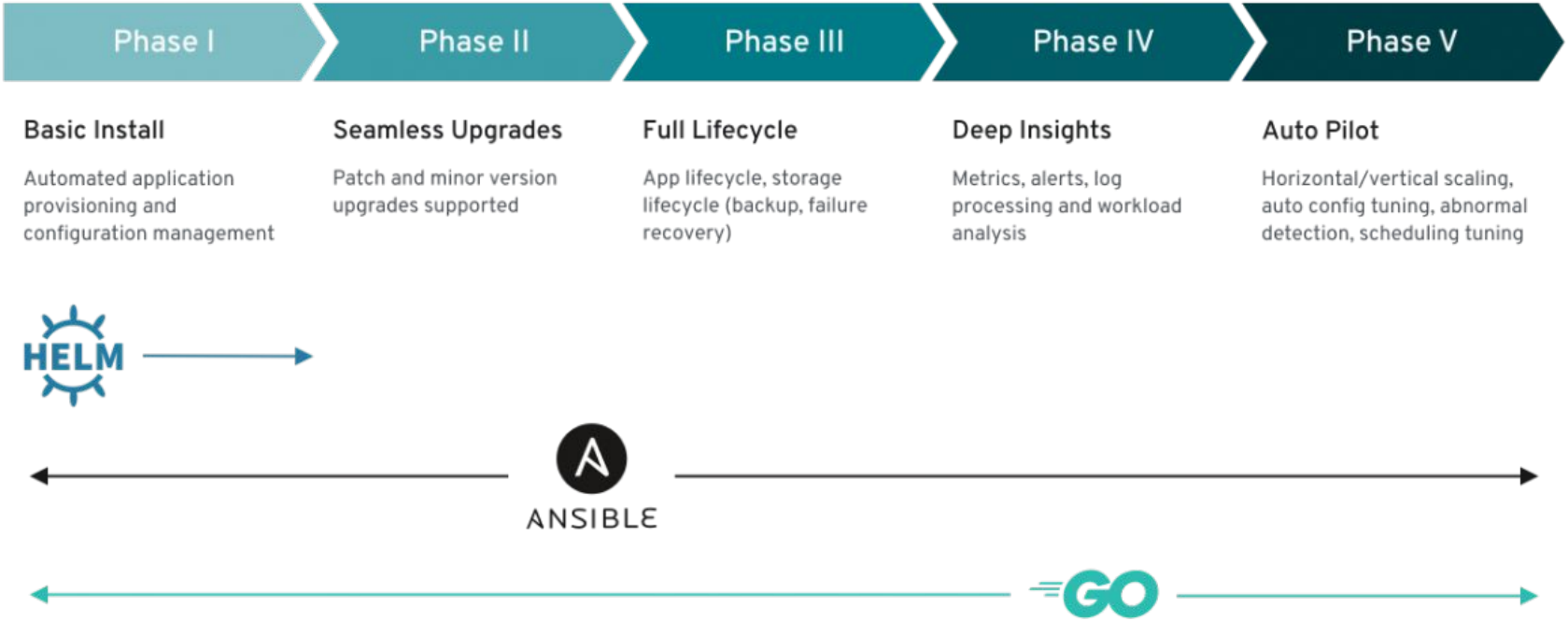
OPERATOR CAPABILITY LEVEL



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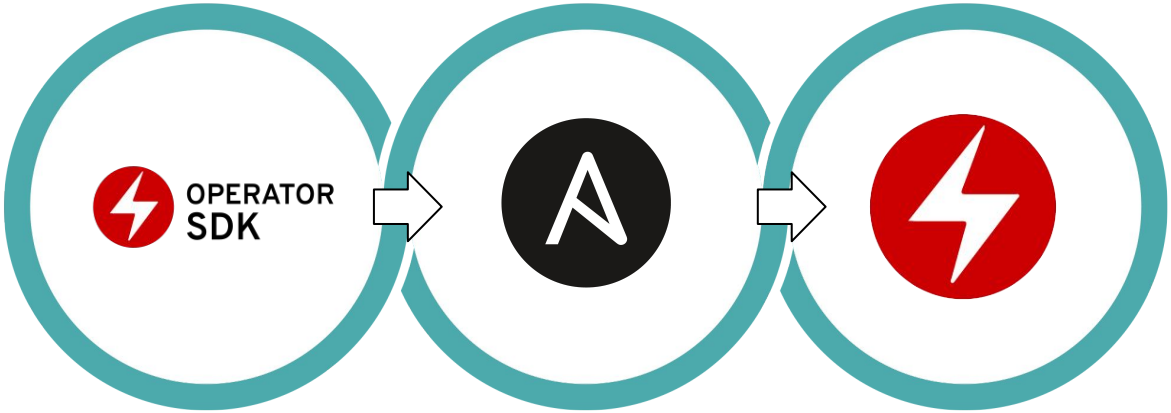
ANSIBLE AND OPENSHIFT

Making it easy to deploy and manage Kubernetes apps with native Ansible support via the Operator SDK



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Thank You

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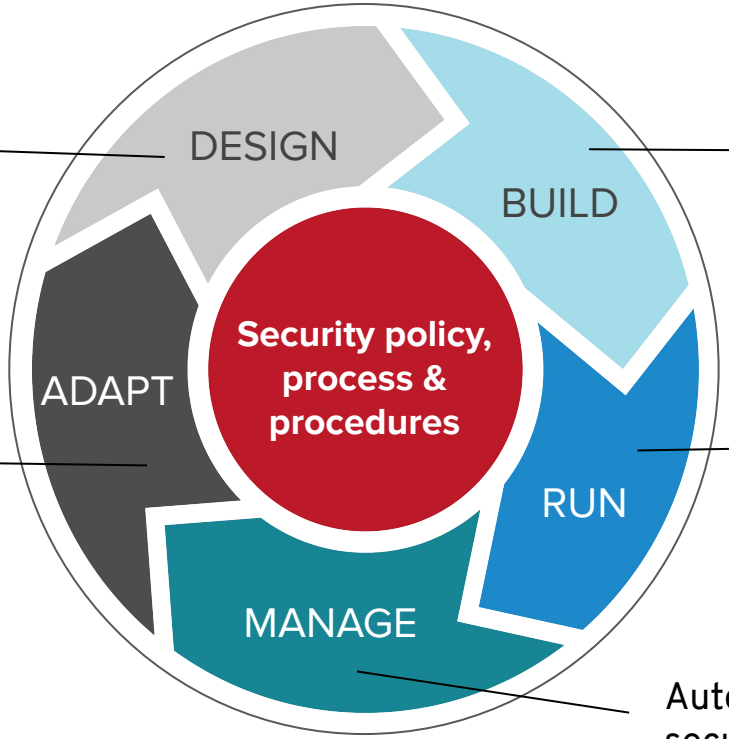
DEVSECOPS

SECURITY MUST BE CONTINUOUS

And integrated throughout the IT lifecycle



Identify security requirements & governance models

Built-in from the start; not bolted-on

Deploy to trusted platforms with enhanced security capabilities

Automate systems for security & compliance

Revise, update, remediate as the landscape changes

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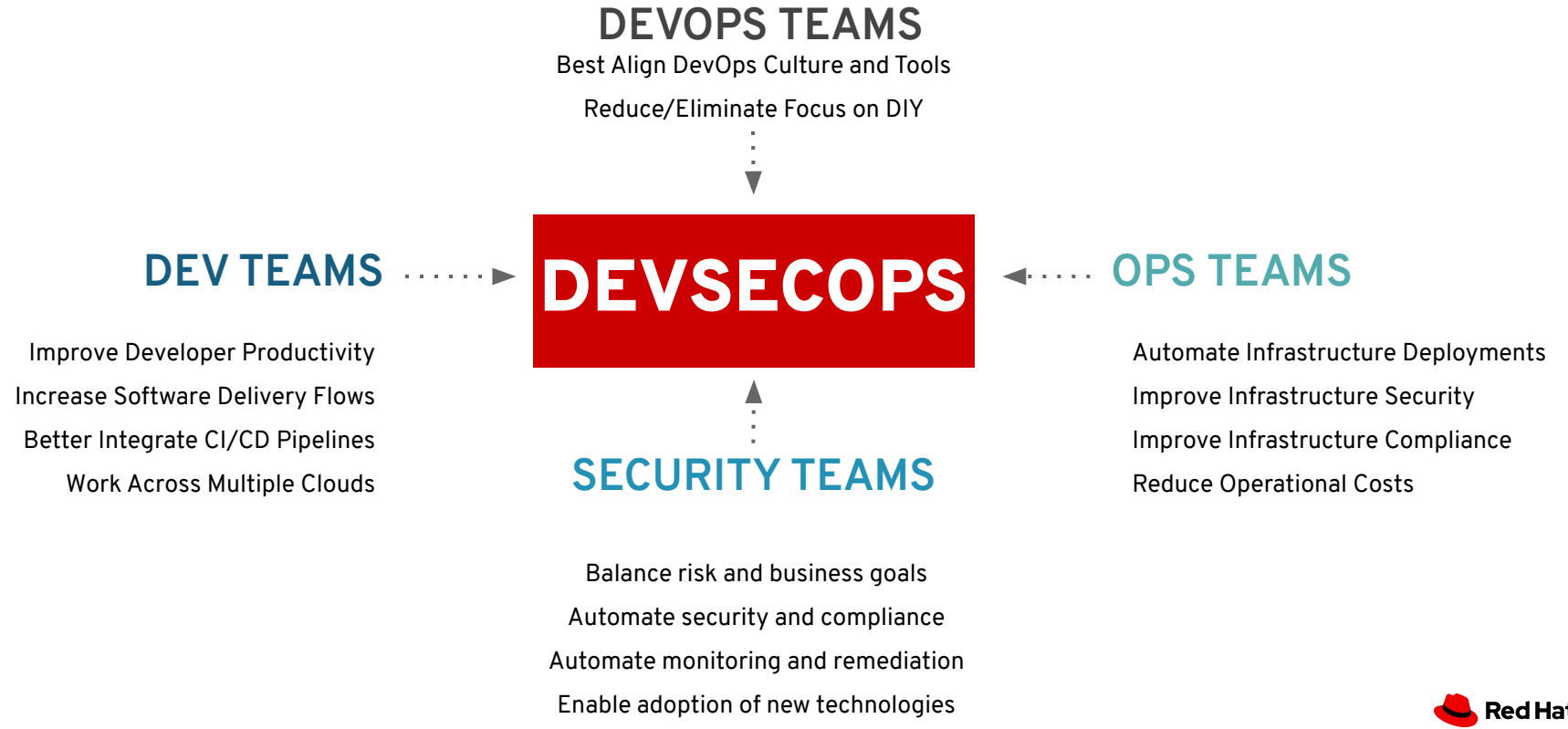
DevOps Defined:

DevOps is a culture, movement or practice that emphasizes the collaboration and communication of both **software developers** and **IT operations professionals** while automating the process of software delivery and infrastructure changes.

FROM WIKIPEDIA

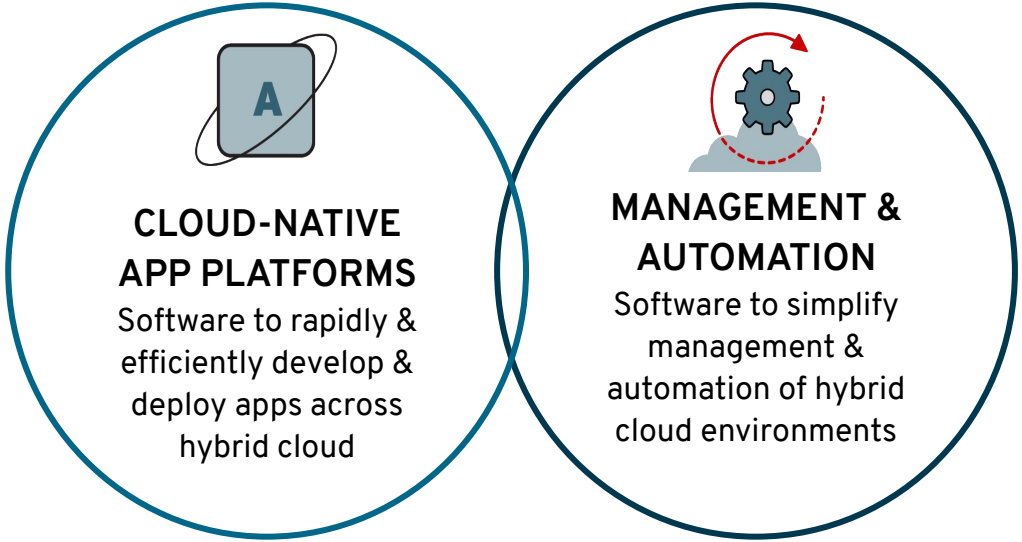
DIMENSIONS OF DEVSECOPS ACROSS THE ORGANIZATION



CUSTOMERS ARE LOOKING FOR BETTER DEVOPS AUTOMATION SOLUTIONS

79%

Enterprise IT organizations will need to deploy new management and automation software between now and 2020



Source: (n=1,171 IT operations decision makers) IDC InfoBrief sponsored by Red Hat, *DevOps Agility Demands Advanced Management and Automation,* Dec 2017. https://www.redhat.com/en/resources/devops-agility-management-automation-idc-infobrief

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ANSIBLE ENABLES DEVOPS

USER ACTION

9

Jira commit

Git commit

Commit code to master if approved

Jira

ISSUE/BUG/ ENHANCEMENT

GitHub

1

VERSION CONTROL SYSTEM

Jenkins hook

Jenkins

2

BUILD/TEST

Build docs

Confluence

5

DOCUMENTATION

Push build to repo

JFrog ARTIFACTORY

4

BINARY/PACKAGE REPO

Get Playbooks & Roles

Run Ansible Tower job

RED HAT OPENSHIFT

3

Infoblox

IP Address Management (IPAM)

Get/Assign IP

Container Build

IoT

Deploy/ manage

splunk>

ELK STACK

8

Log aggregation

RED HAT ANSIBLE Tower

6

Deploy VM

VIRTUAL MACHINE

7

Google Cloud

Red Hat

vmware