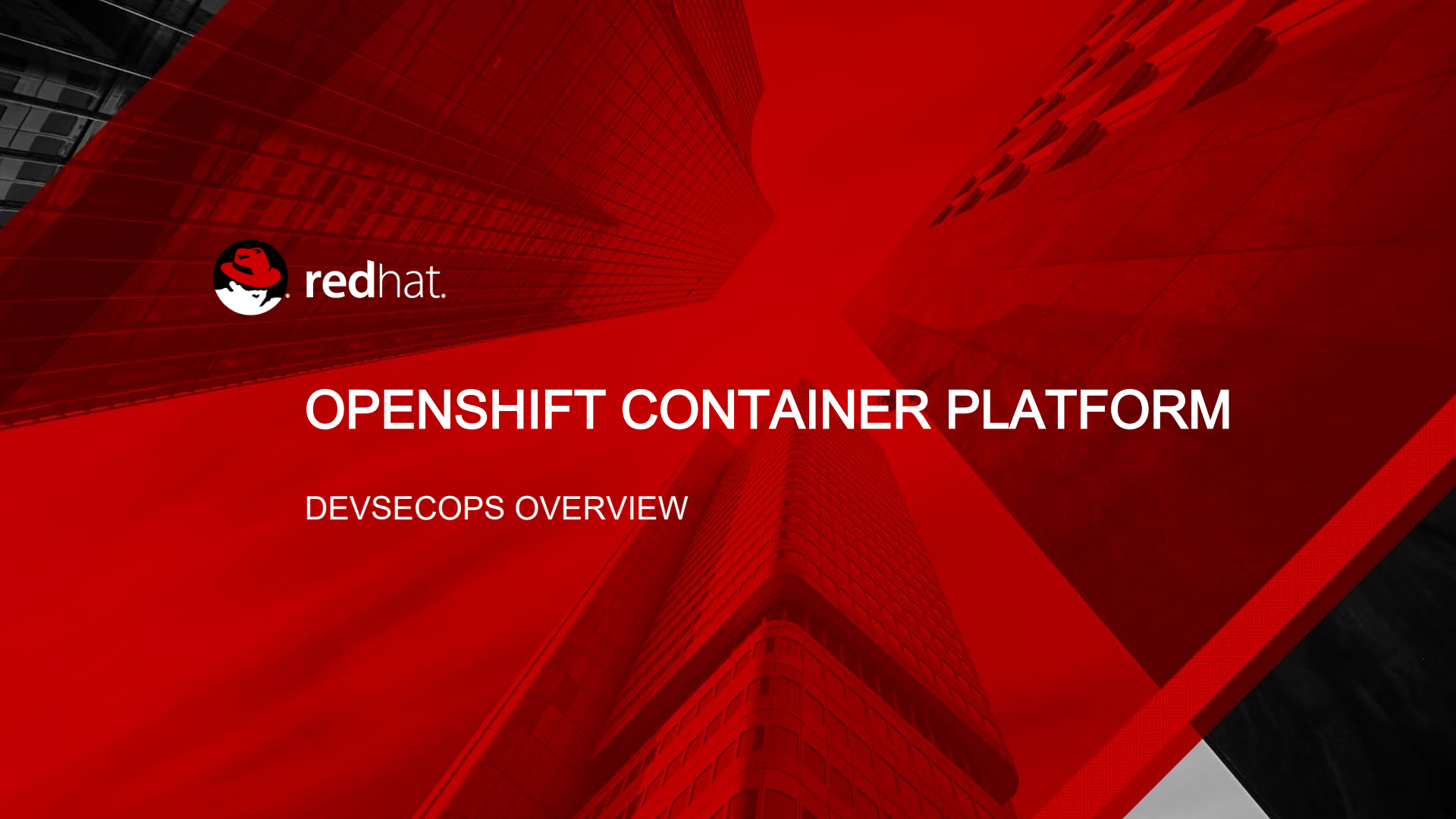

OPENSHIFT CONTAINER PLATFORM

DEVSECOPS OVERVIEW

AGENDA

INTRODUCTION	Today’s Business Need
KEY CONCEPTS	Digital Transformation, DevSecOps, etc.
HOLISTIC VIEW	Technology Solution
STARTER PACK	DevSecOps CI/CD Pipeline

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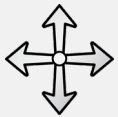
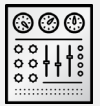
DIGITAL TRANSFORMATION NEEDS

Speed / Security

IT Optimization / App Modernization



Path to the Cloud / Cloud First



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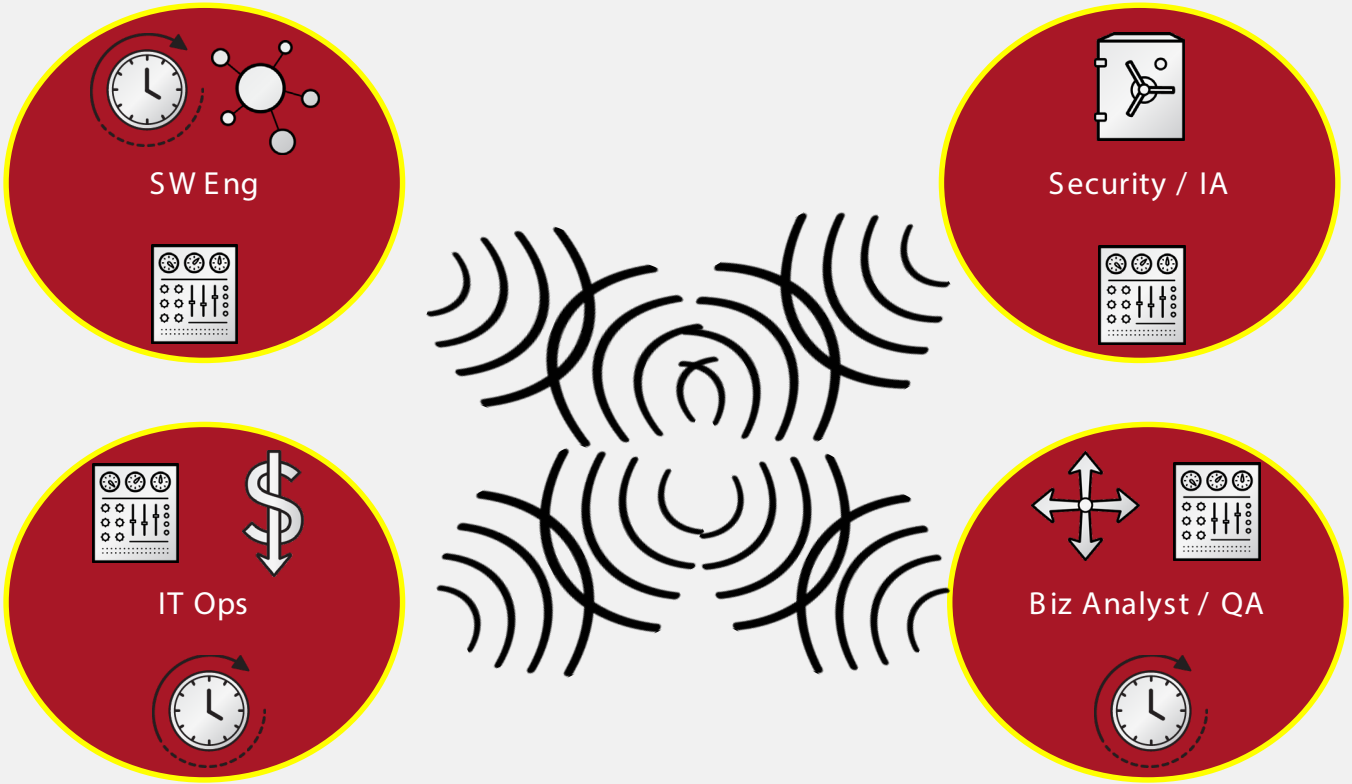
THE CULTURAL CHALLENGE



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THE CULTURAL CHALLENGE (CONT.)

Developers

- Features
- Quality
- Attributes
- Efficiency
- Performance
- Users
- Authentication
- Authorization

IT Ops

- Deployment
- Maintenance
- Updates
- Change policy
- Failure
- Data loss
- Risk prevention
- Authentication
- Authorization

QA/BA

- Testable
- Issue tracking
- Bug Reports
- Usability
- Performance
- Load
- MOEs
- Help Desk

Security / IA

- Data Privacy
- Intrusion detection
- Threat vectors
- CWEs & CVEs
- Package/Artifact security
- Authentication
- Authorization
- Security Standards
- Compliance

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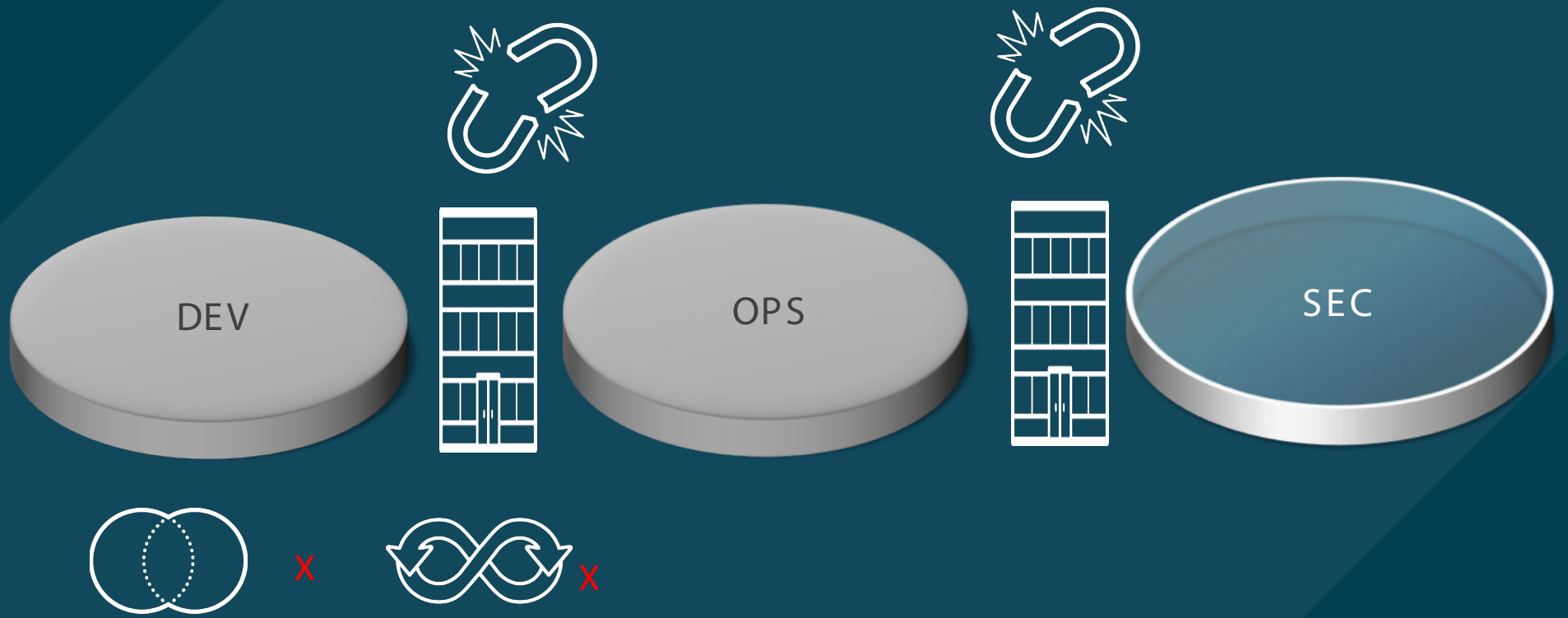
WHAT DOES THAT LOOK LIKE?



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MAYBE SOMETHING LIKE THIS?

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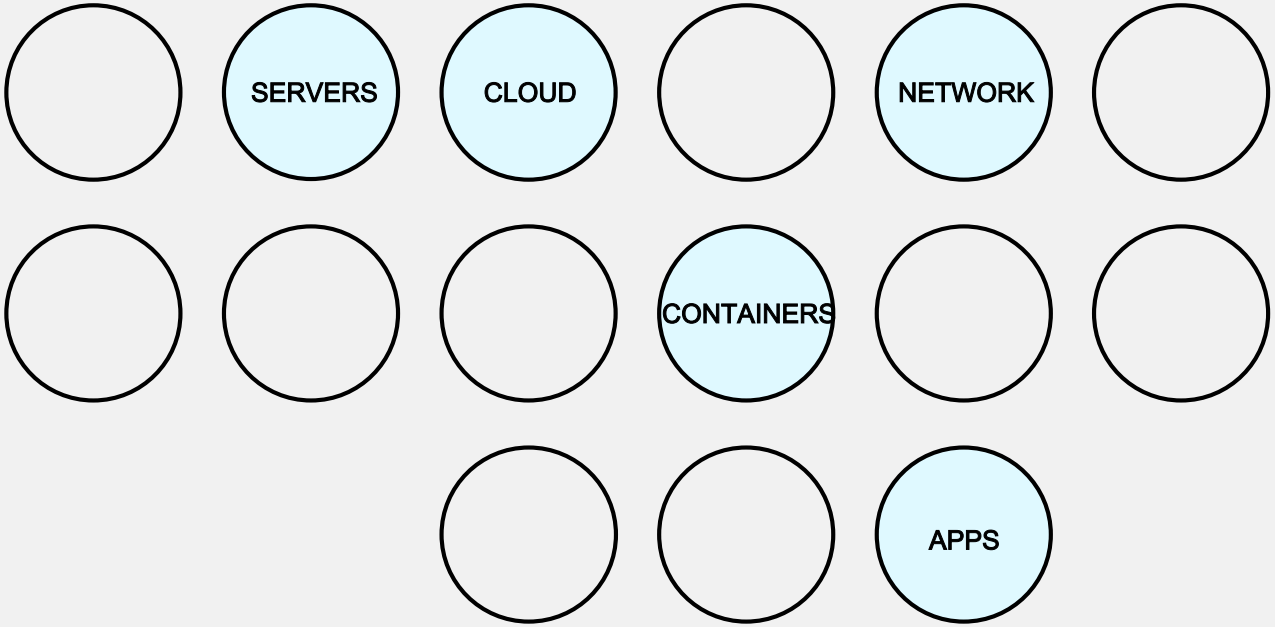
THE OPERATIONAL CHALLENGE



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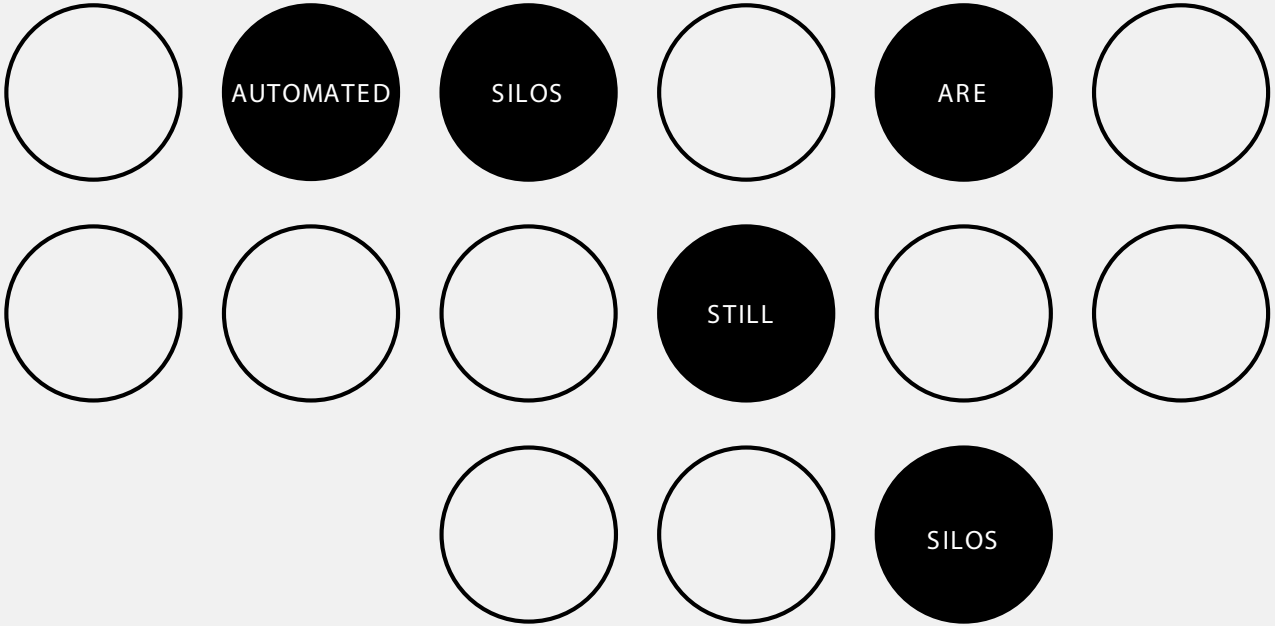
THE OPERATIONAL CHALLENGE (CONT.)



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THE OPERATIONAL CHALLENGE (CONT.)

1

PEOPLE PROBLEMS

Skills gaps & org charts get in the way

2

POINT TOOLS

Proliferation of point solutions and vendor-specific tools

3

PACE OF INNOVATION

Automation requires integration across domains

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THE TECHNICAL CHALLENGE

Applications require complicated installation, verification/validation and integration every time they are deployed.

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SOLUTION REQUIRES AN EVOLUTION IN…

Applications
New ways of developing, delivering, and integrating applications

Platform
Modernize existing and build new cloud-based infrastructure

Process
More agile process across Security, IT and Engineering

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IF YOU WANT SOMETHING NEW,
YOU HAVE TO STOP DOING SOMETHING OLD.

–Peter Drucker

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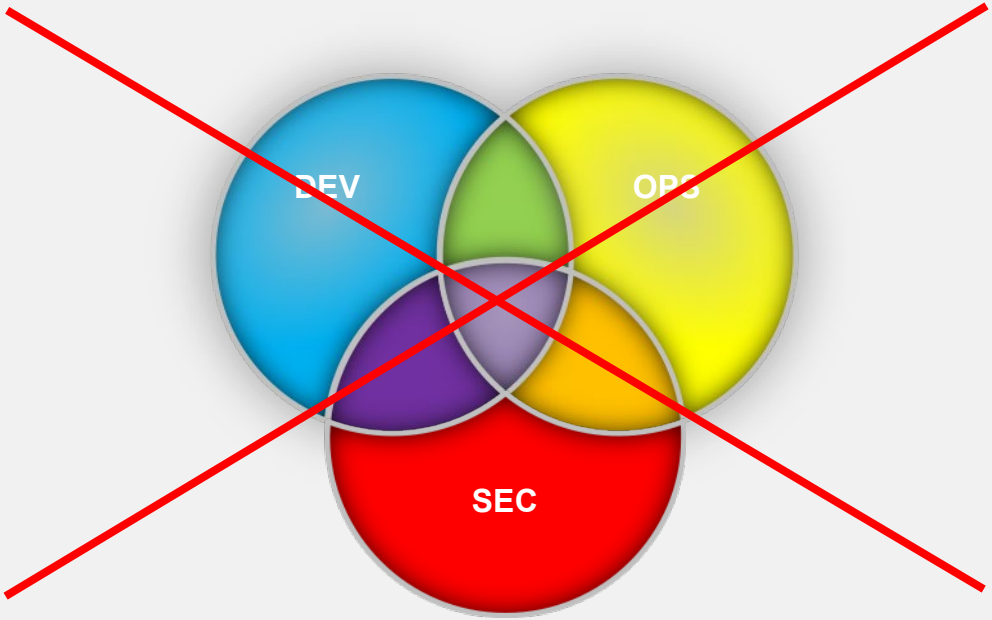
LETS FIRST DISPEL SOME MYTHS



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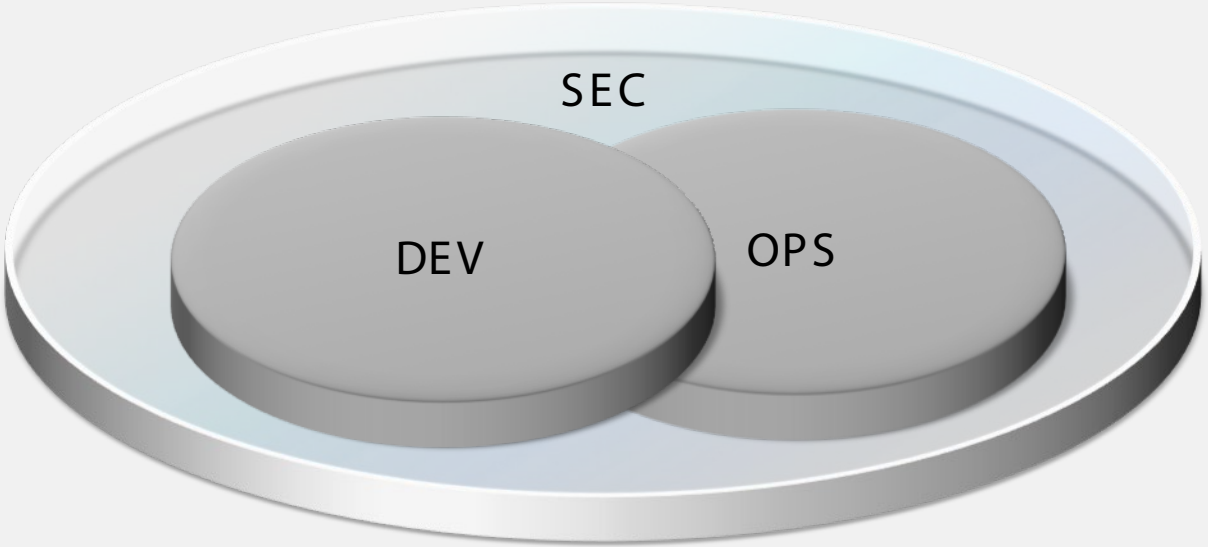
SECURITY ENCOMPASSES NOT INTERSECTS



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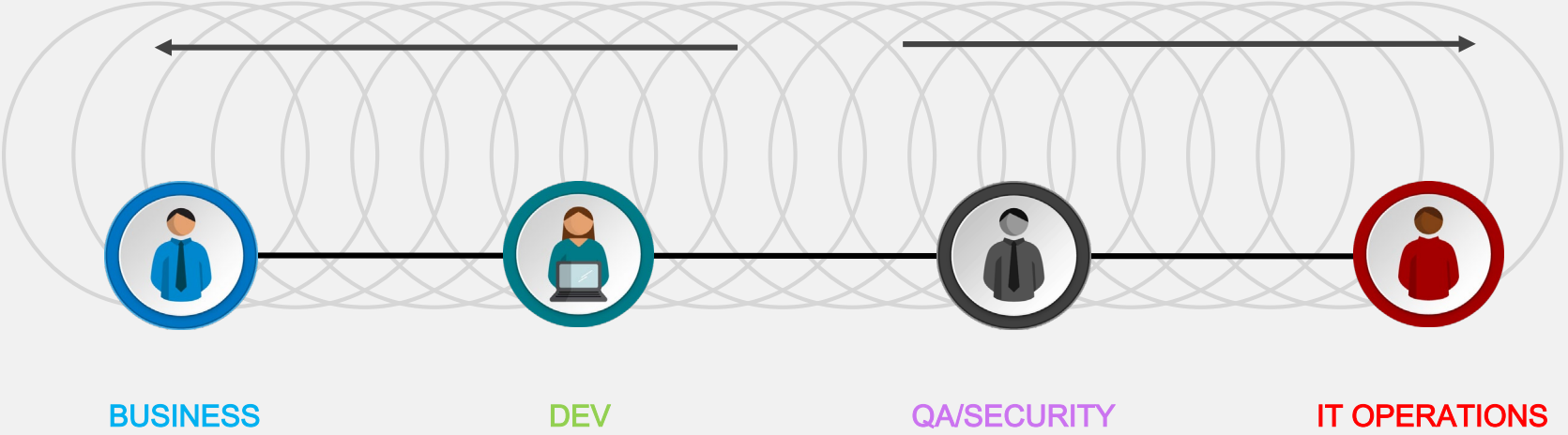
ADDRESSING THE OPERATIONAL CHALLENGE



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ADDRESSING THE TECHNICAL CHALLENGE

Adopting a container platform strategy will allow applications to be easily shared, managed, secured and deployed.

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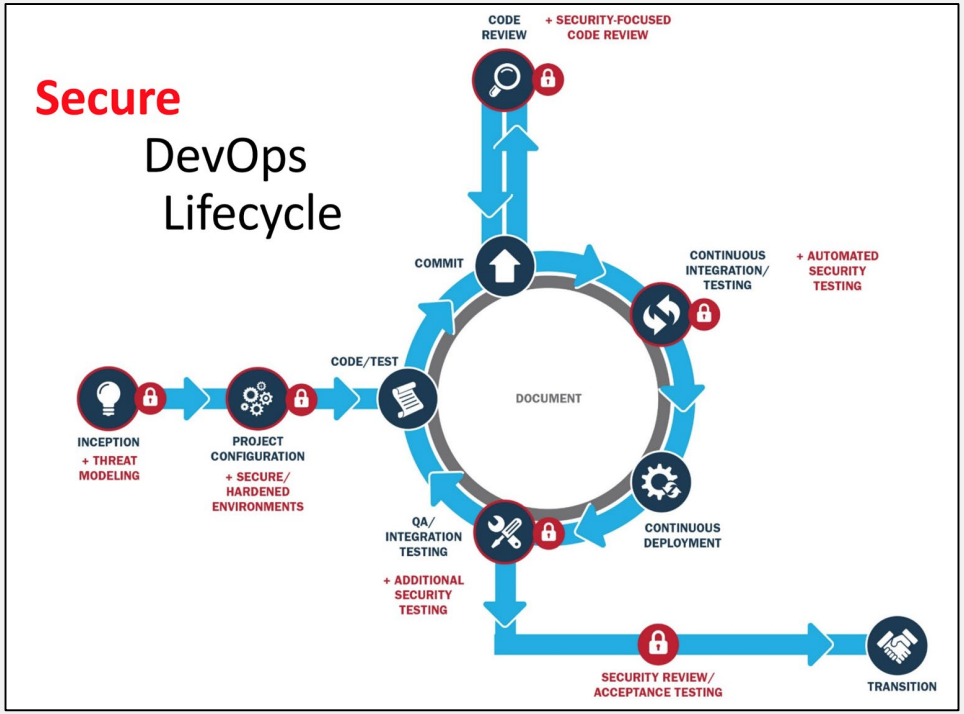
SO WHAT DOES THAT LOOK LIKE?



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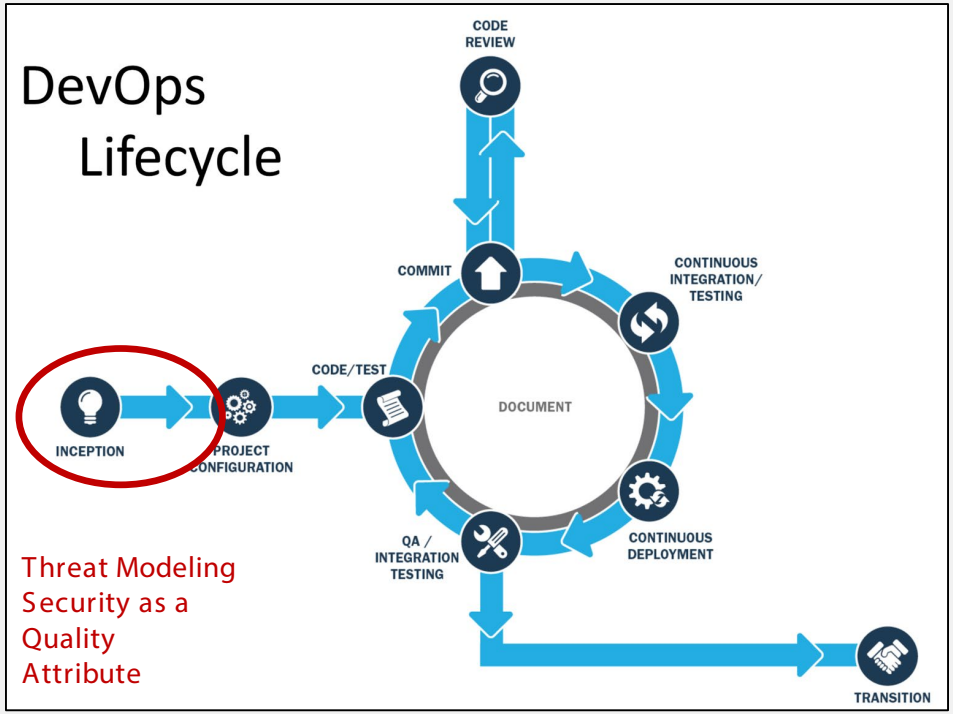
“SHIFT LEFT” WITH SECURITY/IA



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WHAT DOES SECURE MEAN TO YOU?

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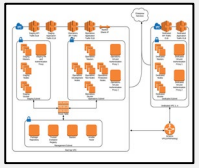
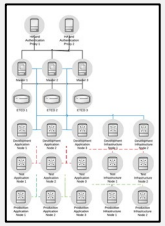
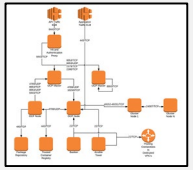
DON'T START FROM SCRATCH



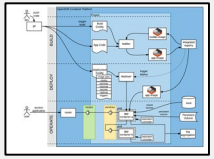
LOGICAL COMPONENT BLOCK DIAGRAM



CONTROLLED INTERFACE DIAGRAM

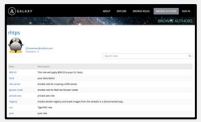


PHYSICAL CONNECTIVITY DIAGRAM



ROLE BASED ACTIVITY DIAGRAM

ROLE TO COMPONENT ALLOCATION



CUSTOM ANSIBLE ROLES

CENTRALIZED ARTIFACTS

Generic published reference architectures at https://goo.gl/Hz1gEJ

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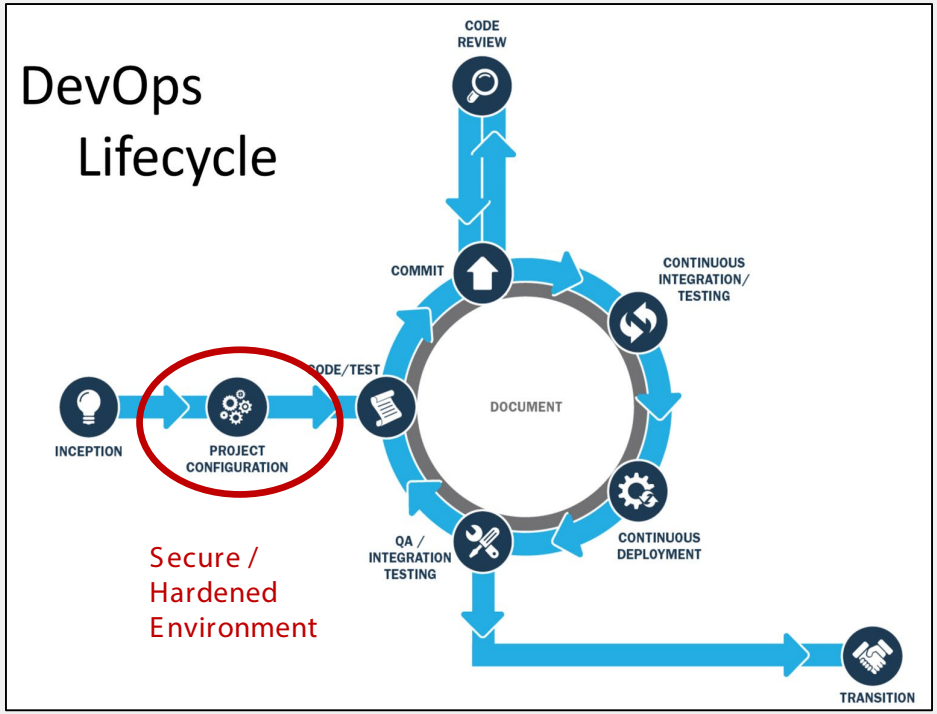
ADOPT A SECURITY INHERITANCE MODEL



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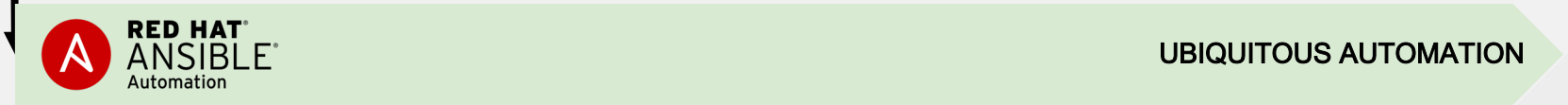
DEPLOYING A SECURE SOFTWARE FACTORY



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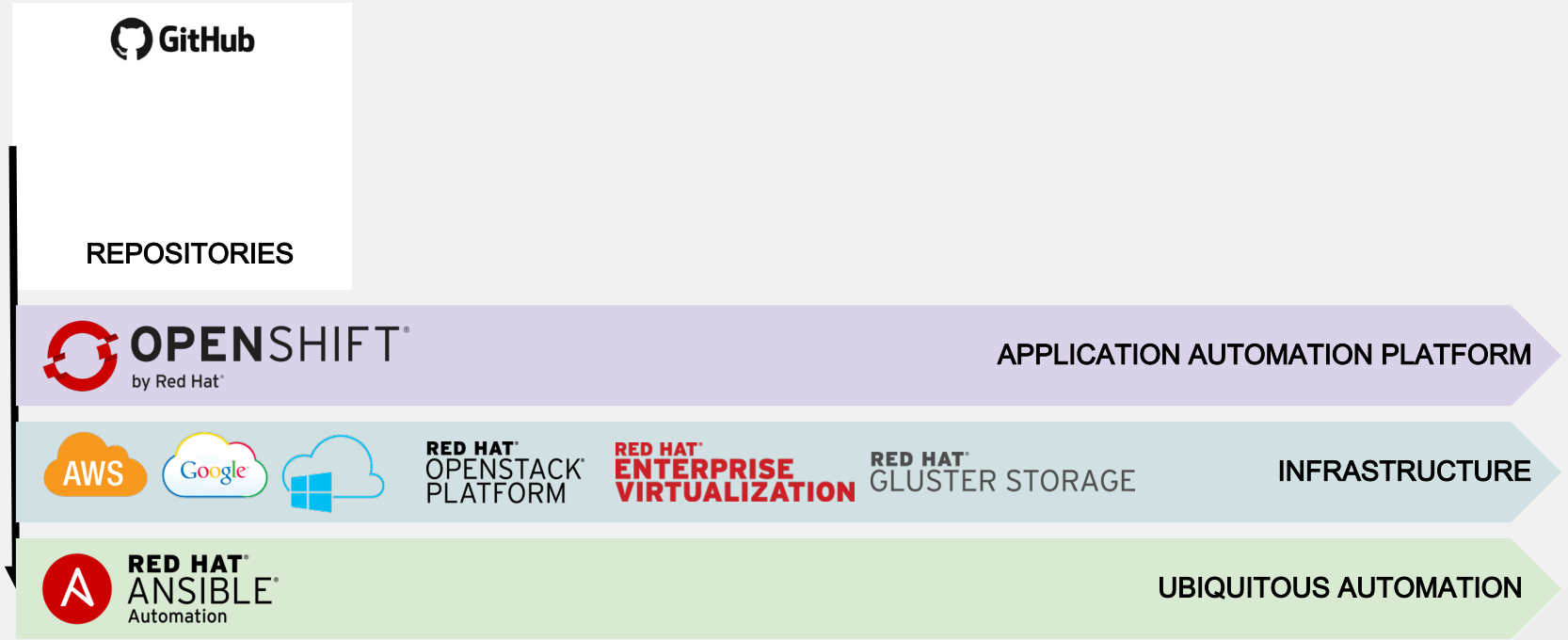
DEPLOYING A SECURE SOFTWARE FACTORY

GENERAL DISTRIBUTION

DEPLOYING A SECURE SOFTWARE FACTORY



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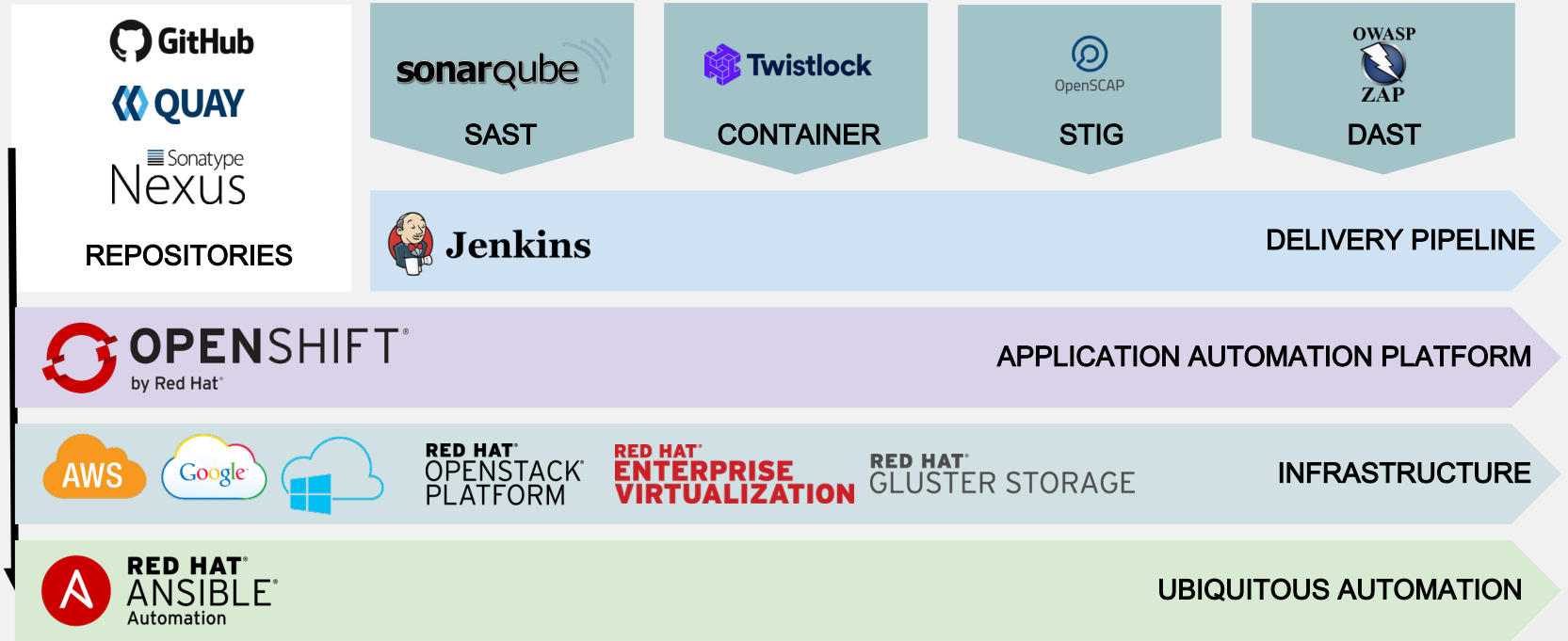
DEPLOYING A SECURE SOFTWARE FACTORY



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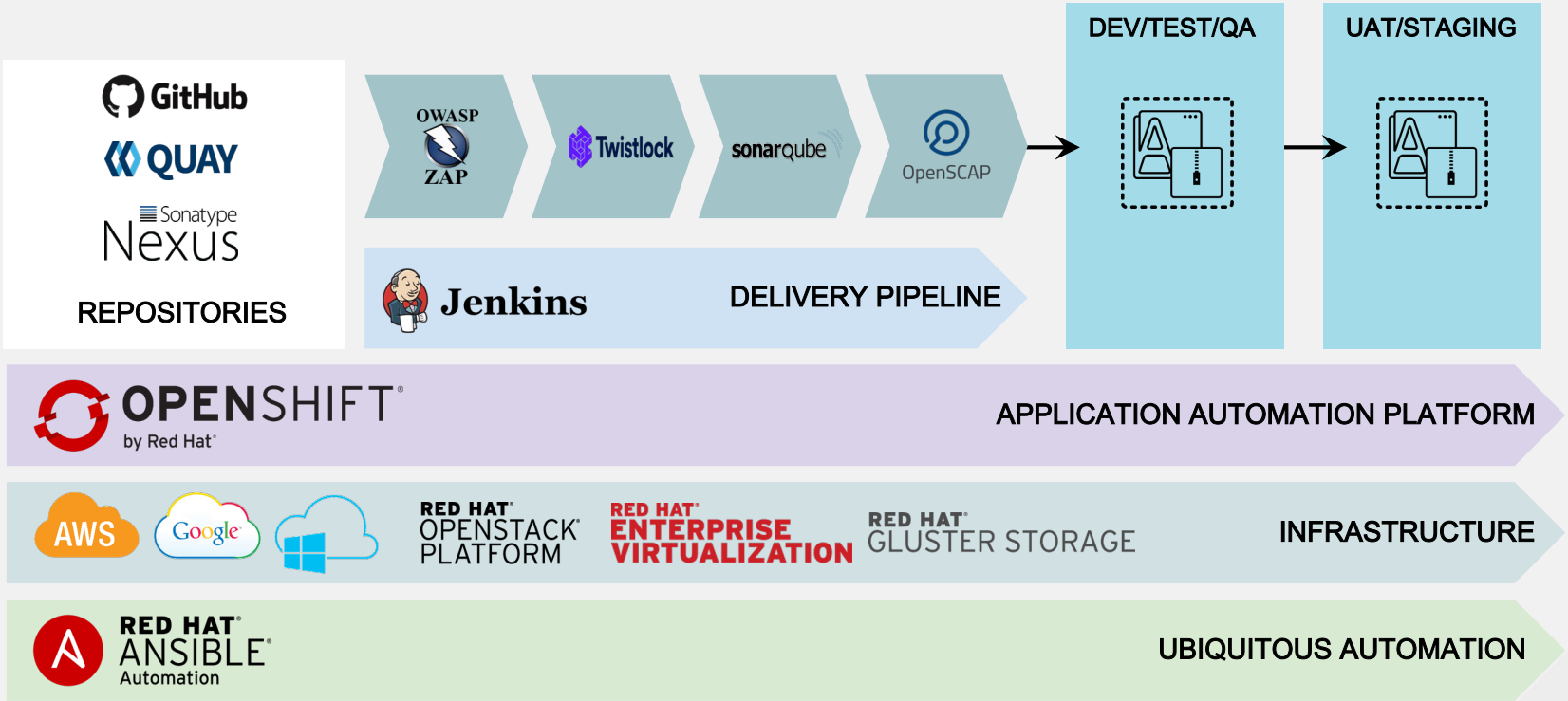
EXERCISING A SECURE SOFTWARE FACTORY



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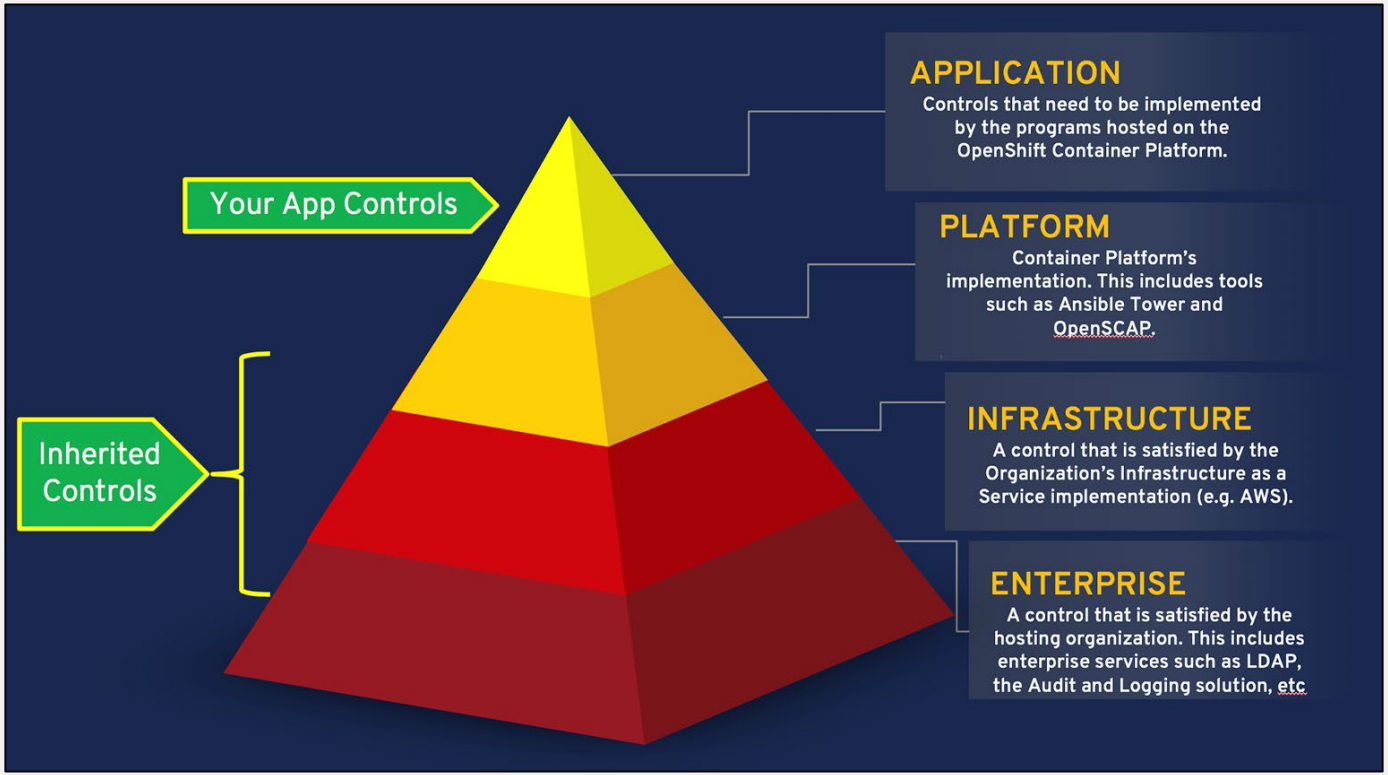
SECURITY INHERITANCE MODEL



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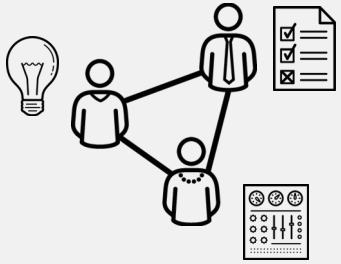
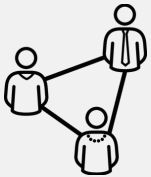


PULL OR CREATE

SCM

BUILD LOAD SCAN SIGN



DEV INSPECT BUILD SCAN TEST DEPLOY MONITOR

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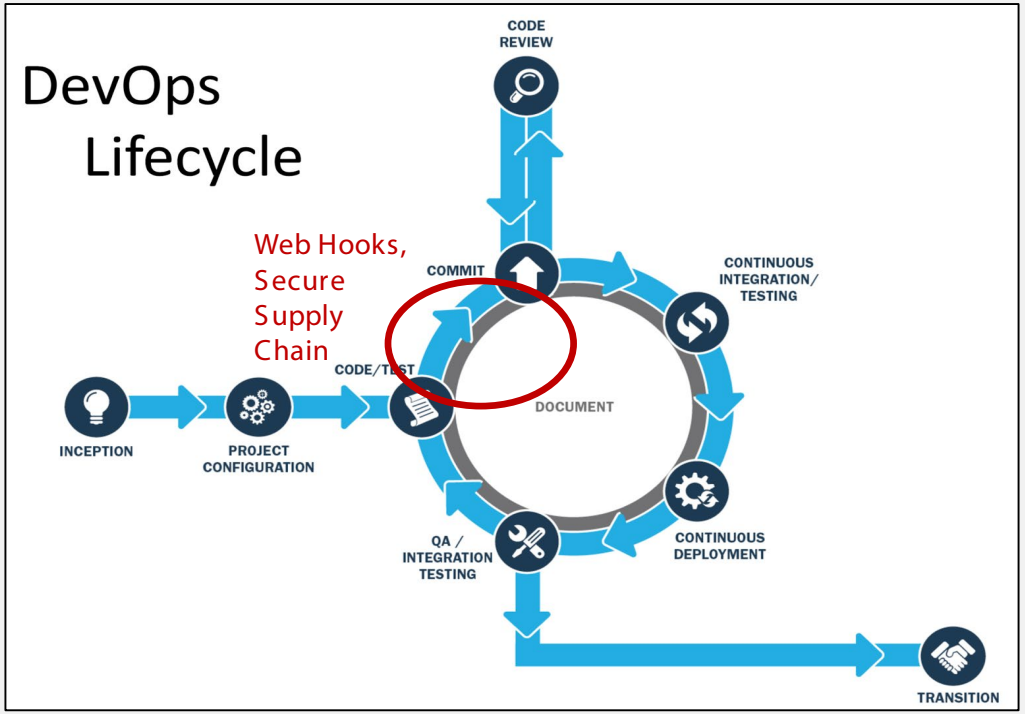
ONLY INTRODUCE "APPROVED" ELEMENTS



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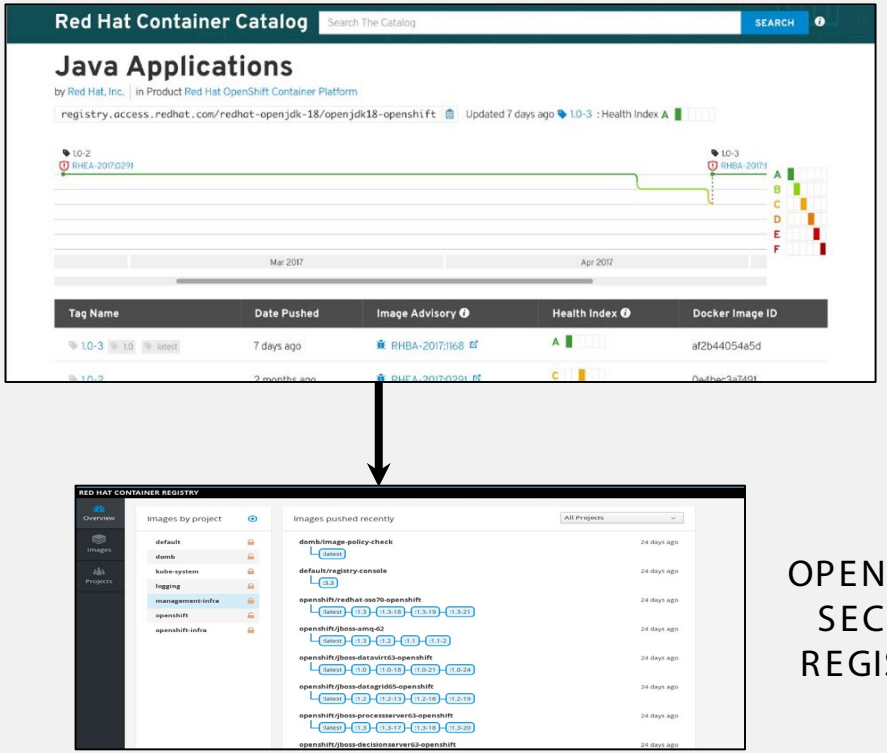
CONTAINERS START WITH QUALITY PARTS

What goes into your secure software supply chain? Red Hat provides:

- Manual inspection
- Automated inspection
- Packaging Guidelines
- Build Roots
- Quality Assurance
- Certifications
- Signing
- Distribution
- Response
- Support
- Security Updates



OPENSHIFT SECURE REGISTRY

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THE VALUE OF TRUSTED CONTENT

Red Hat Registry Stats

- 227 repositories
- 2,169 images
- 1+ TB storage

Red Hat Security Statistics 2016

- 97 critical RHSA
- 286 important RHSA
- 100% fixed in <1d

Red Hat Customer Portal Stats 2016

- 13,100,000 visitors
- 2,400,000 searches
- 108,300,000 views

- Image Documentation
- Image Advisories

RED HAT® CONTAINER CATALOG

- Container Health Index
- Extensive Image Metadata

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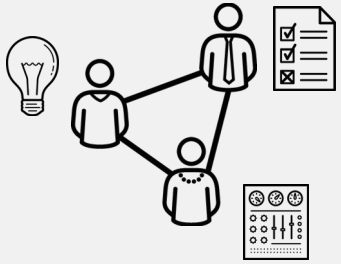
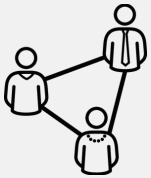


PULL OR CREATE

SCM

BUILD | LOAD | SCAN | SIGN



Pre-receive Hooks With Security Compliance Checks

[GitHub]

DEV | INSPECT | BUILD | SCAN | TEST | DEPLOY | MONITOR

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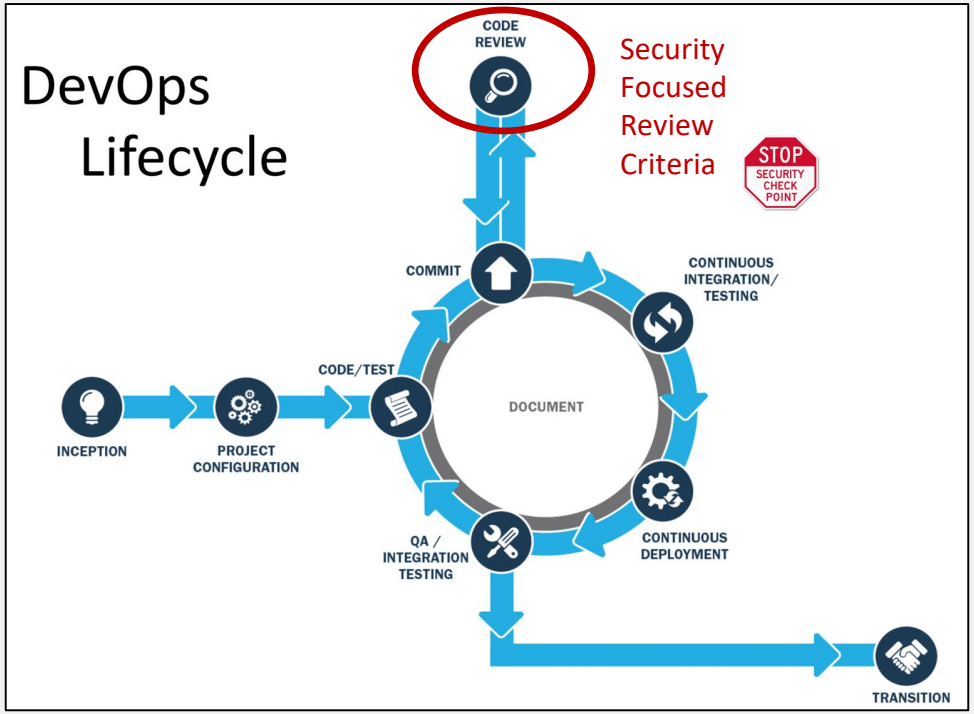
AUTOMATE WHAT YOU CAN & BUILD TRUST



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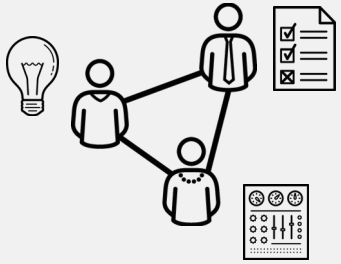
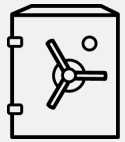
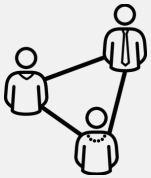


PULL OR CREATE

SCM



BUILD LOAD SCAN SIGN



Pre-receive Hooks With Security Compliance Checks

[GitHub]

Code Review

DEV INSPECT BUILD SCAN TEST DEPLOY MONITOR

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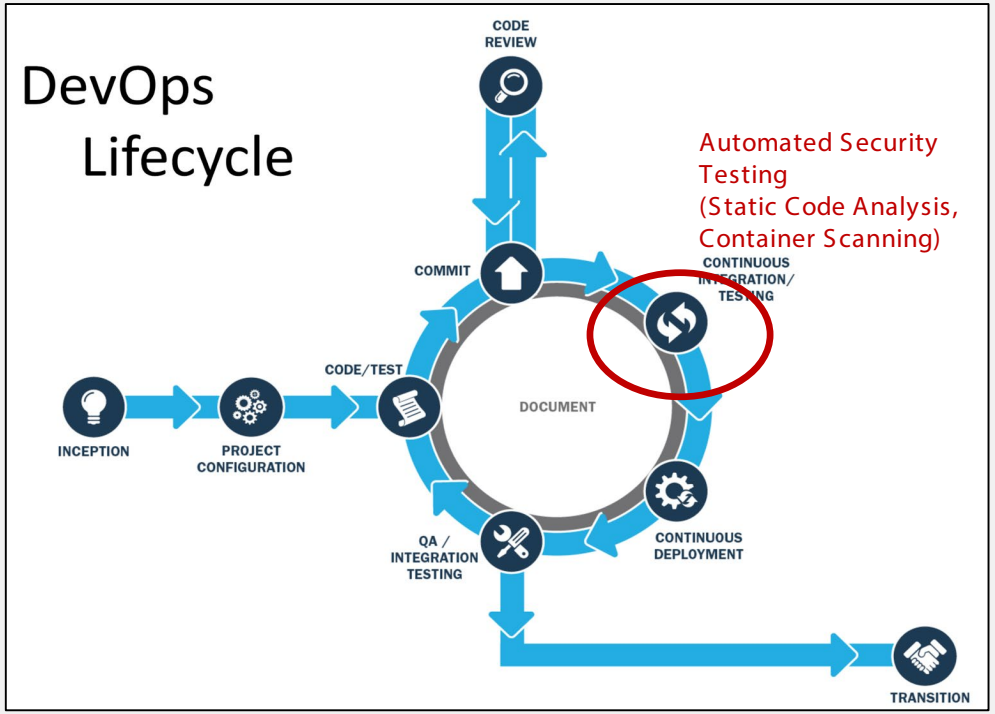
DON'T WASTE COMPUTE OR TIME



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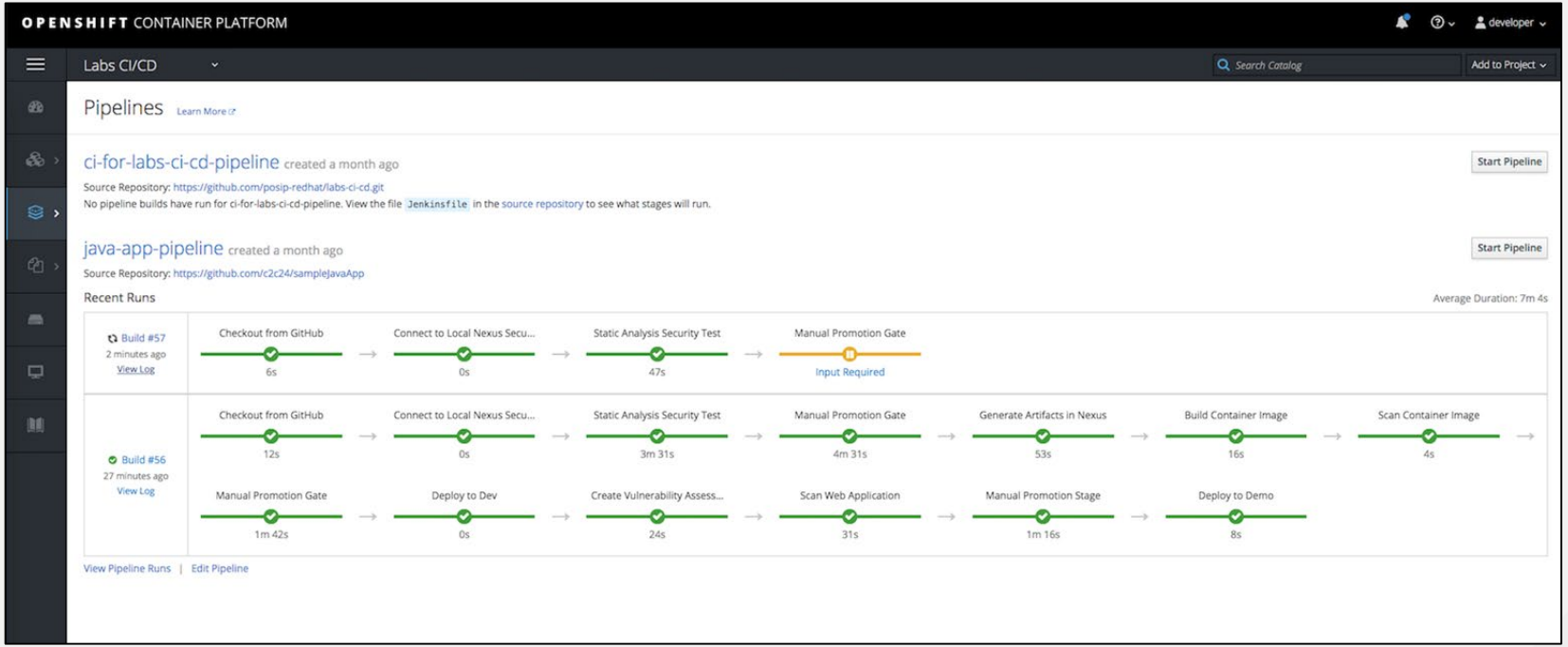
DEMO OUTPUT FOR PIPELINE INVOCATION POST CODE REVIEW



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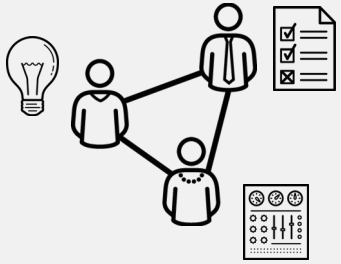

PULL OR CREATE

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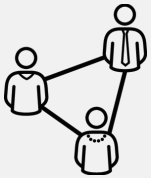
OPENSCAP EVALUATE & REMEDIATE

IMAGE

BUILD | LOAD | SCAN | SIGN



Pre-receive Hooks With Security Compliance Checks

[GitHub]

Static Analysis Security Test (SAST)

[SonarQube]

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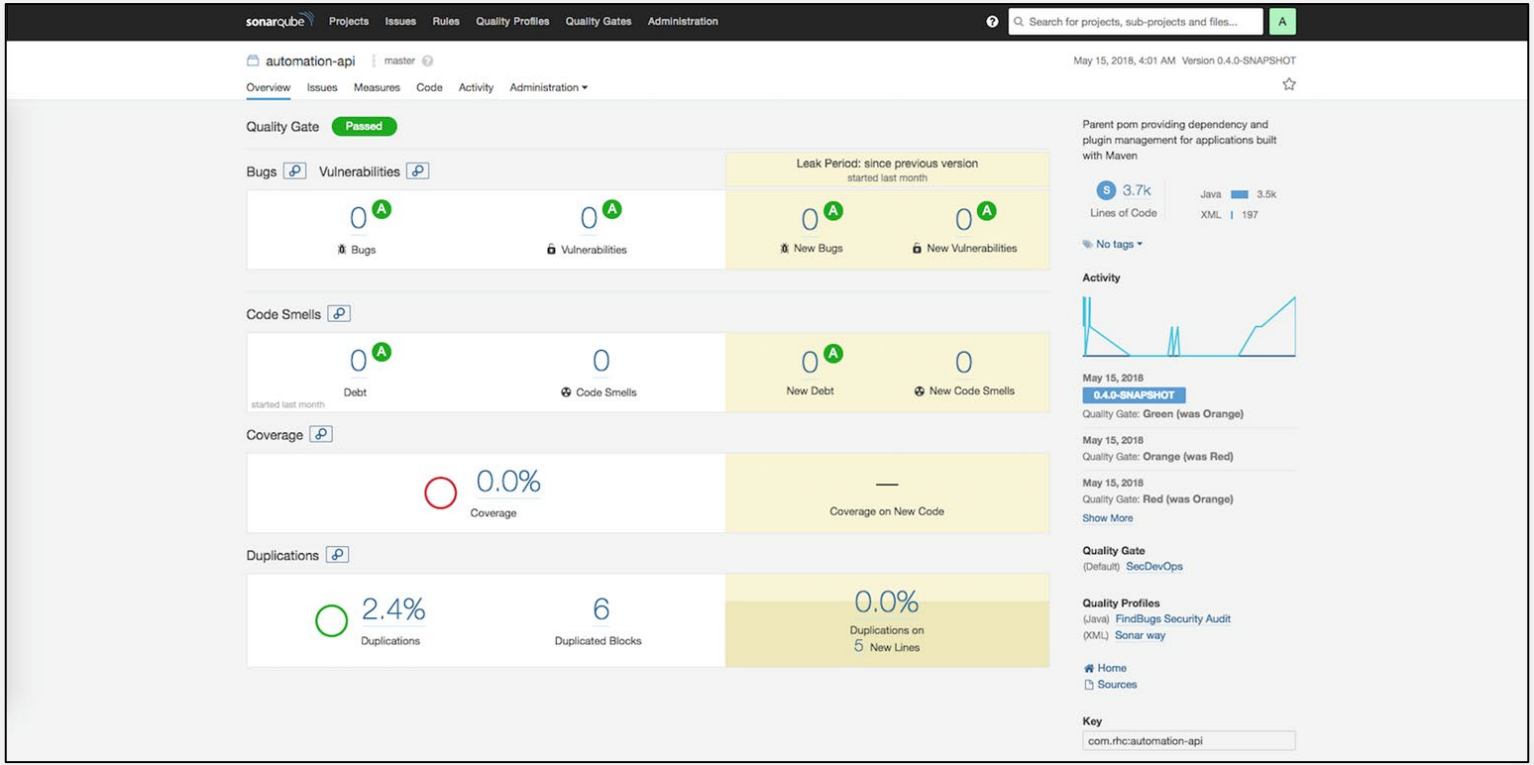
DEMO OUTPUT FOR STATIC ANALYSIS SECURITY TEST



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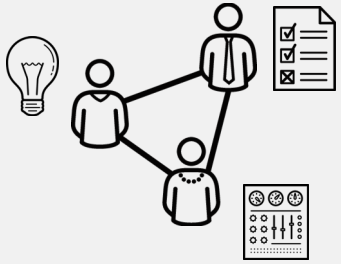


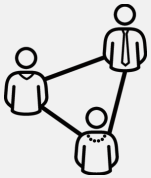
PULL OR CREATE

SCM

OPENSCAP EVALUATE & REMEDIATE

IMAGE

BUILD LOAD SCAN SIGN



Pre-receive Hooks With Security Compliance Checks

[GitHub]

Static Analysis Security Test (SAST)

[SonarQube]

Policy Enforcement For Build Artifacts & Images

[OCP]

DEV INSPECT BUILD SCAN TEST DEPLOY MONITOR

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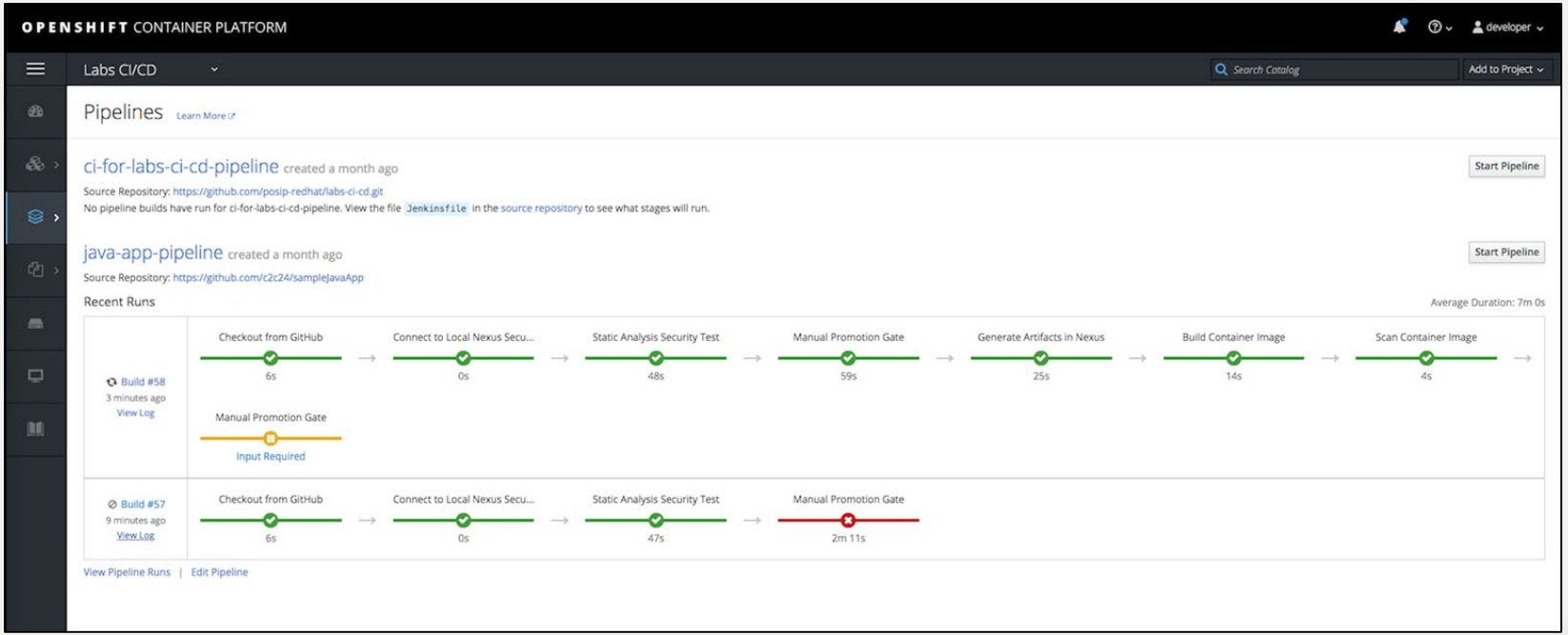
DEMO OUTPUT FOR OPENSCAP IMAGE SCAN FROM PIPELINE



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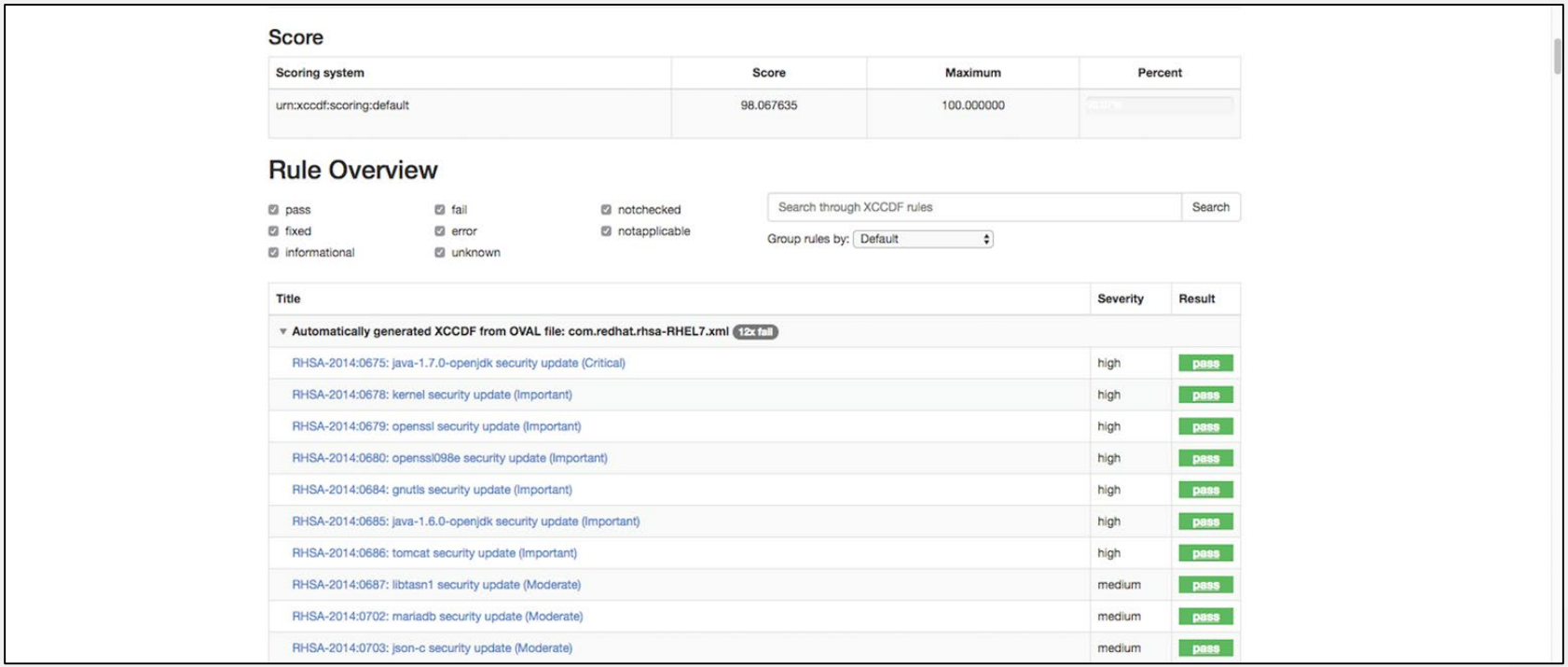
DEMO OUTPUT FOR OPENSCAP IMAGE SCAN



Score

Scoring system	Score	Maximum	Percent
urn:xccdf:scoring:default	98.067635	100.000000	

Rule Overview

pass fail notchecked
fixed error notapplicable
informational unknown

Search through XCCDF rules Search

Group rules by: Default

Title	Severity	Result
Automatically generated XCCDF from OVAL file: com.redhat.rhsa-RHEL7.xml 12x fail		
RHSA-2014:0675: java-1.7.0-openjdk security update (Critical)	high	pass
RHSA-2014:0678: kernel security update (Important)	high	pass
RHSA-2014:0679: openssl security update (Important)	high	pass
RHSA-2014:0680: openssl098e security update (Important)	high	pass
RHSA-2014:0684: gnutls security update (Important)	high	pass
RHSA-2014:0685: java-1.6.0-openjdk security update (Important)	high	pass
RHSA-2014:0686: tomcat security update (Important)	high	pass
RHSA-2014:0687: libtasn1 security update (Moderate)	medium	pass
RHSA-2014:0702: mariadb security update (Moderate)	medium	pass
RHSA-2014:0703: json-c security update (Moderate)	medium	pass

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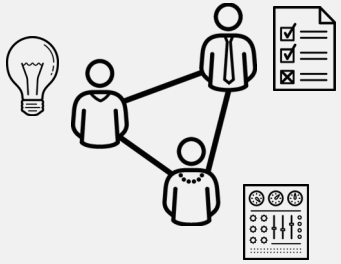


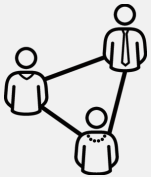
PULL OR CREATE

SCM

OPENSCAP EVALUATE & REMEDIATE

IMAGE

BUILD | LOAD | SCAN | SIGN



Pre-receive Hooks With Security Compliance Checks

[GitHub]

Static Analysis Security Test (SAST)

[SonarQube]

Policy Enforcement For Build Artifacts & Images

[OCP]

Image Scanning w/ tailored profiles

[OpenSCAP] [Clair]

Compliance Check

DEV | INSPECT | BUILD | SCAN | TEST | DEPLOY | MONITOR

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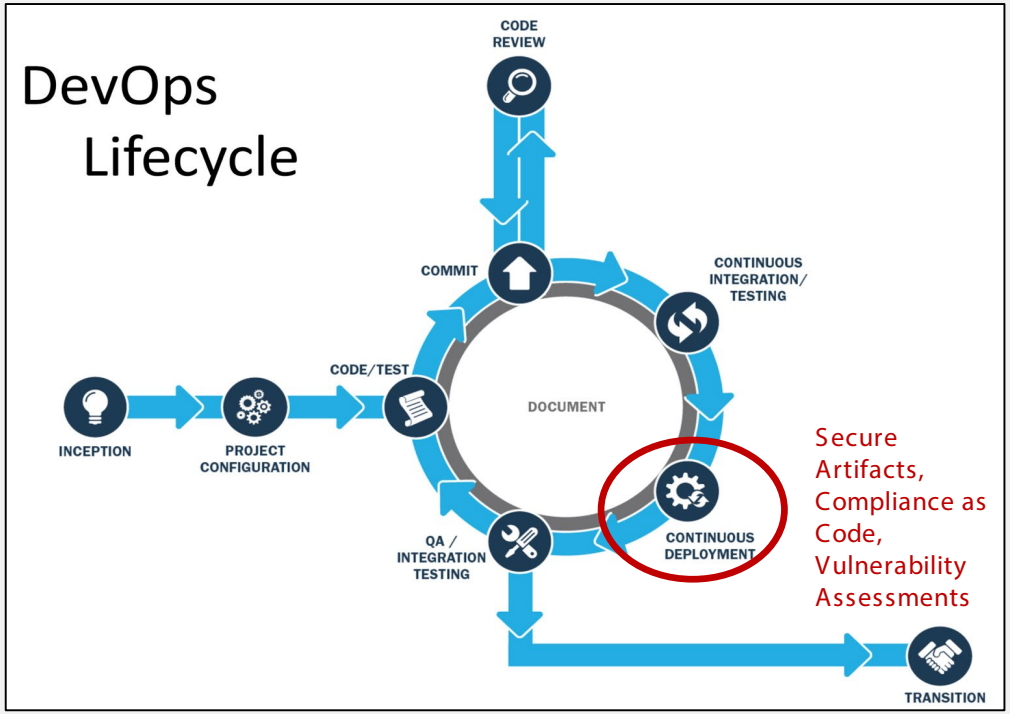
POLICY DRIVEN DEPLOY AND COMPLIANCE



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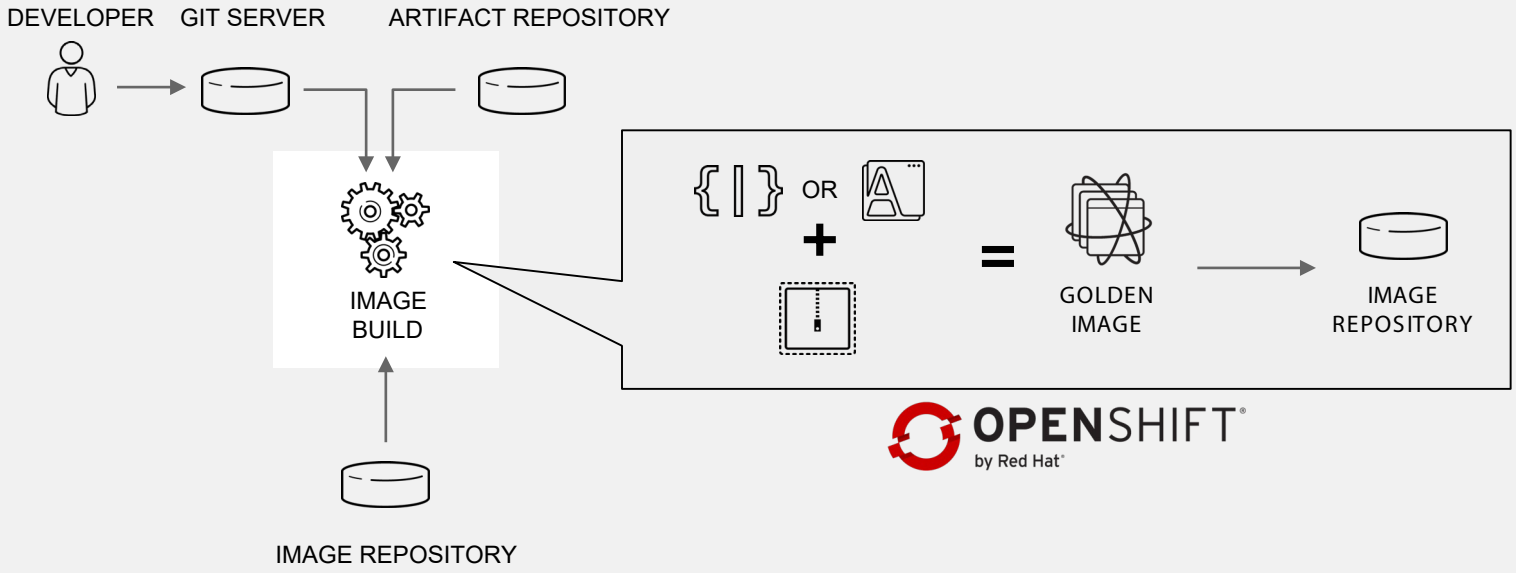
BUILDING APPLICATION ON OPENSHIFT



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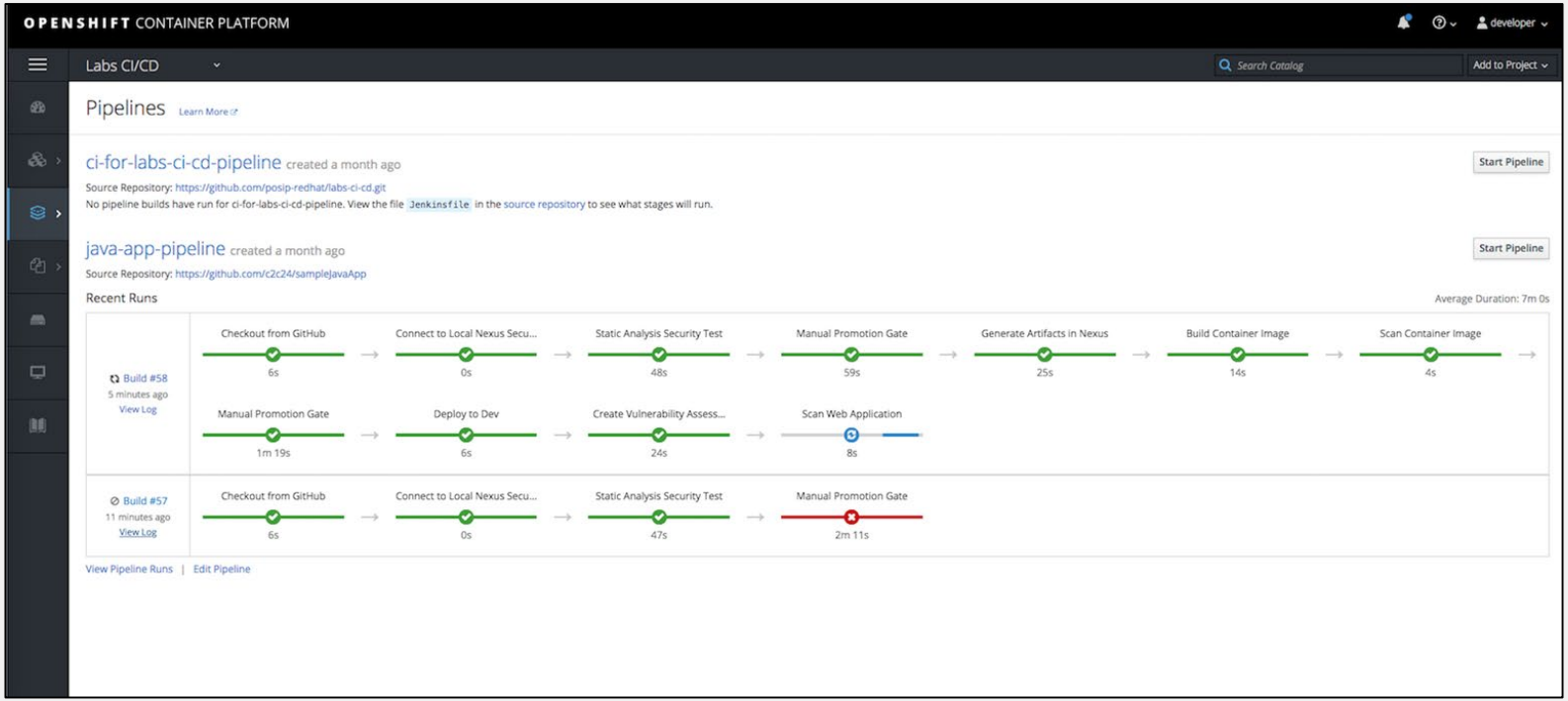
DEMO VULNERABILITY ASSESSMENT FROM PIPELINE



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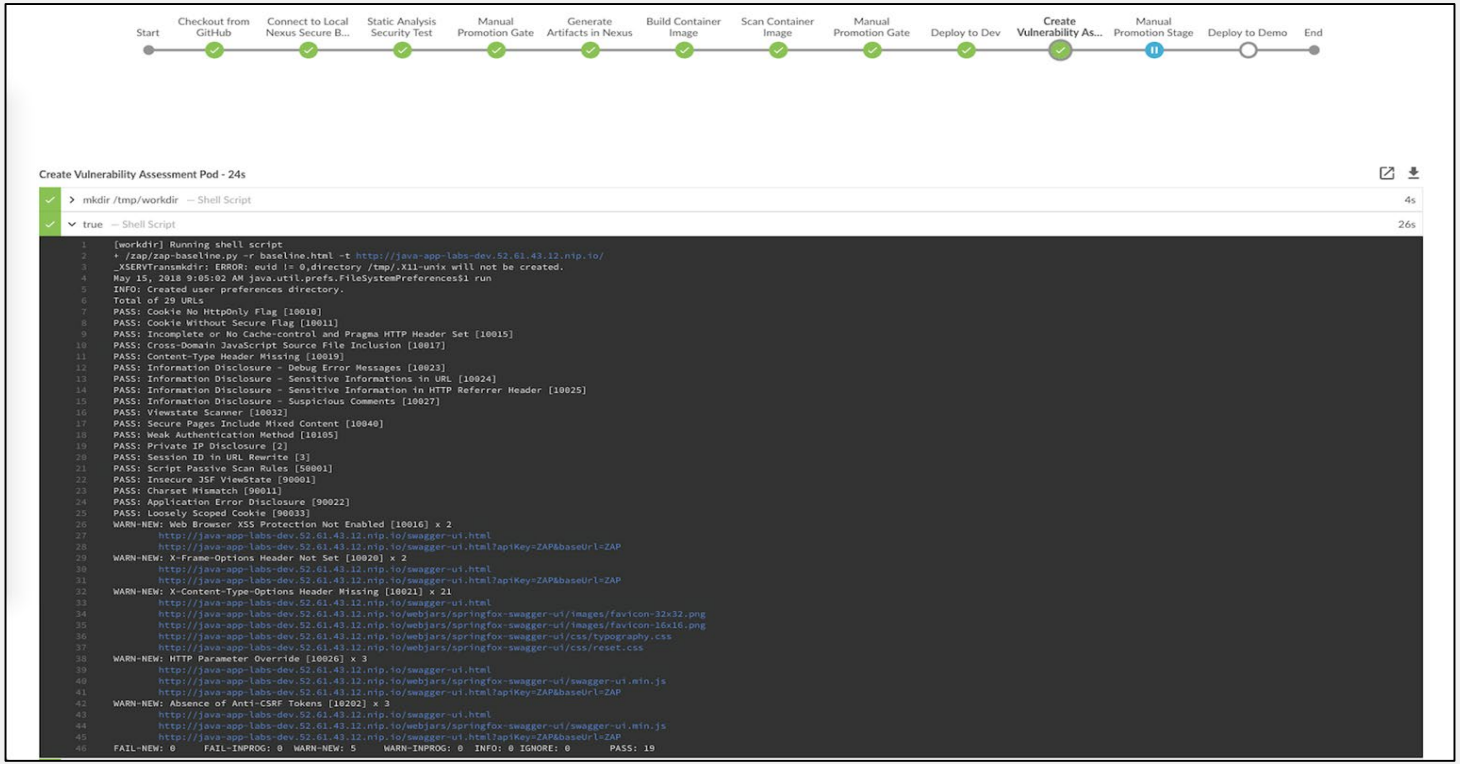
DEMO OUTPUT FOR VULNERABILITY ASSESSMENT



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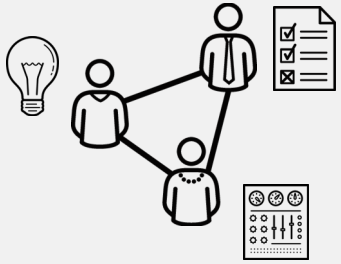

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IMAGE

BUILD LOAD SCAN SIGN

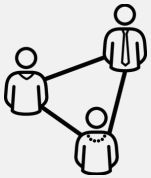

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Image Scanning w/ tailored profiles

[OpenSCAP] [Clair]

Vulnerability Assessment (CVE, OWASP)

[ZAP]

DEV INSPECT BUILD SCAN TEST DEPLOY MONITOR

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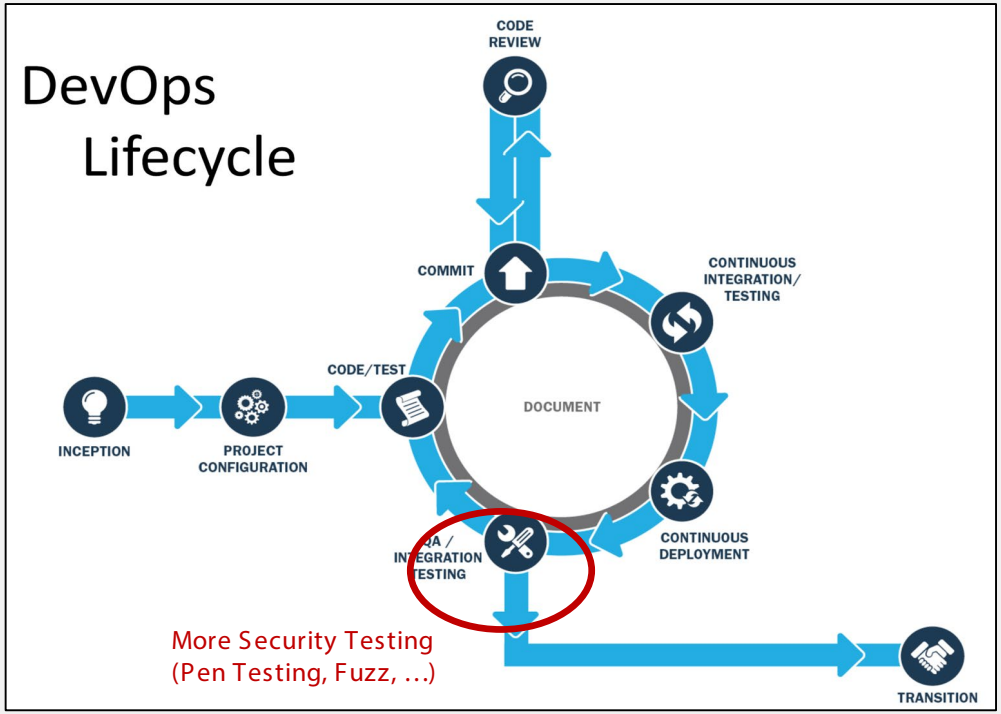
WHAT GETS MEASURED GETS IMPROVED



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FROM CODE TO CAPABILITIES

DEV

- Pre-receive Hooks
- Static Analysis

BUILD

- Dependency Management
- Image Scan

DEPLOY

- Vulnerability Assessment
- Signed Images

TEST

- Integration Tests
- Penetration / Fuzz Testing

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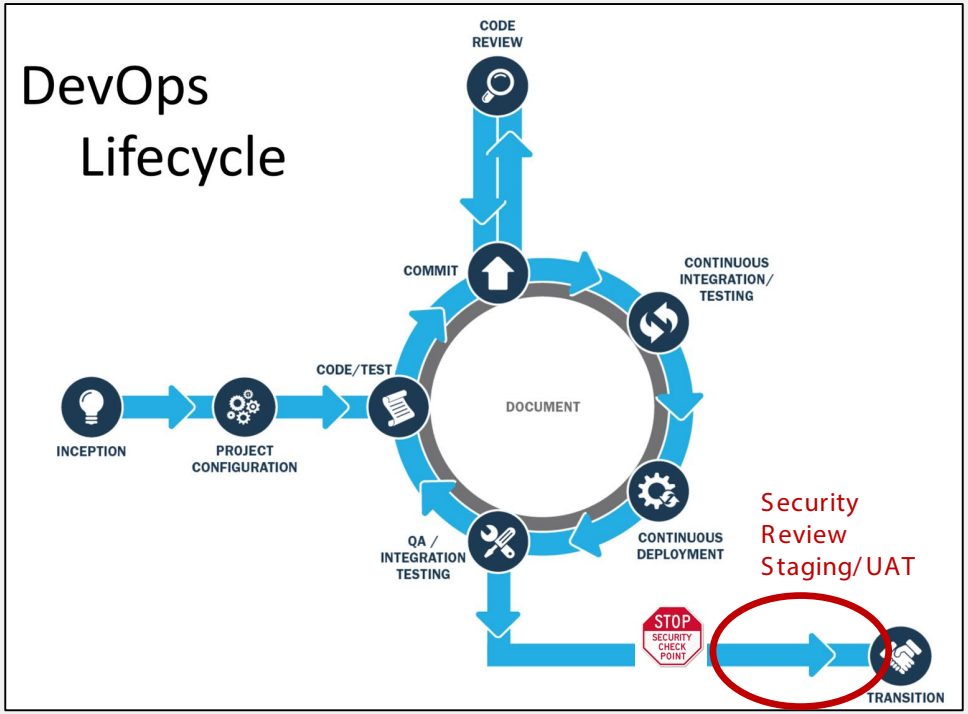
CONTINUE TO BUILD TRUST AND AUTOMATE



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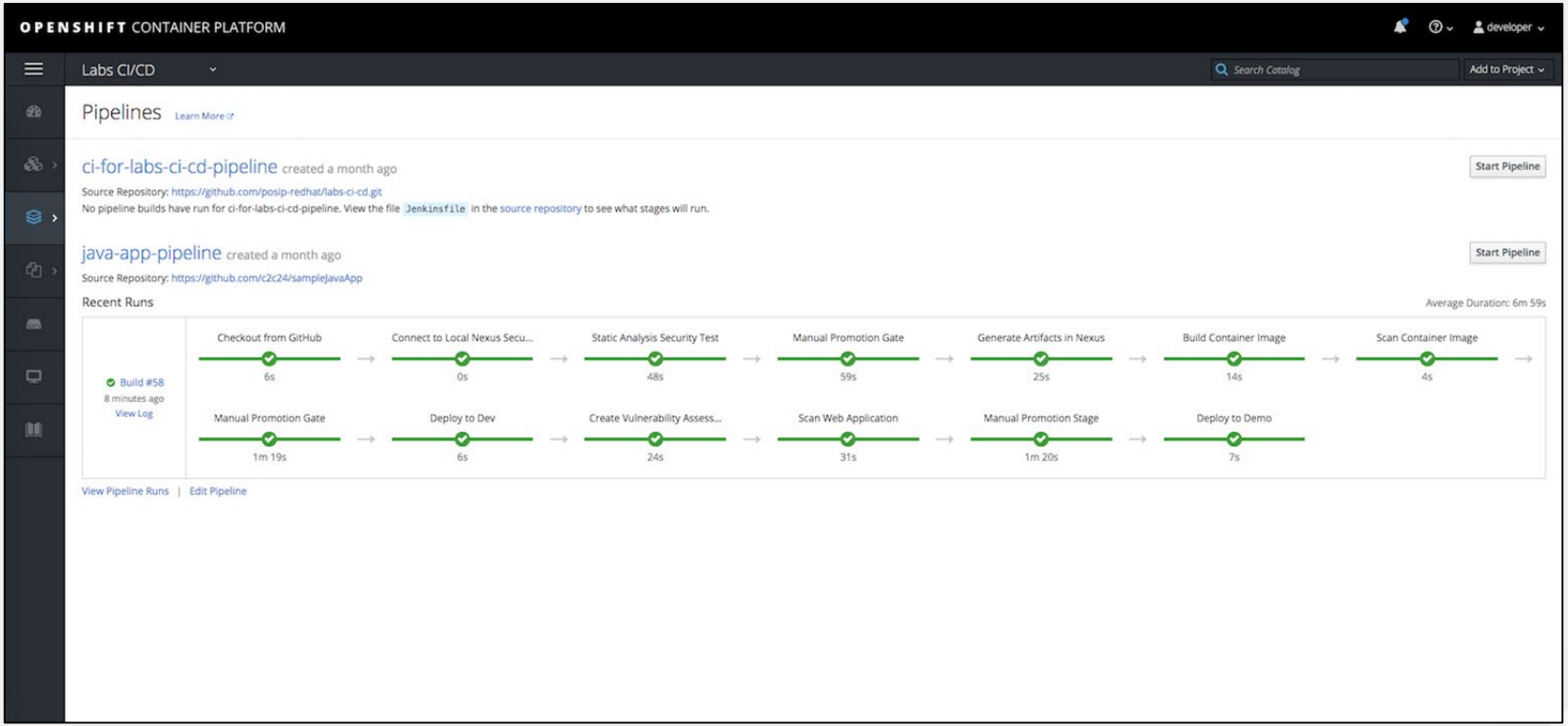
DEMO OUTPUT OF COMPLETED PIPELINE



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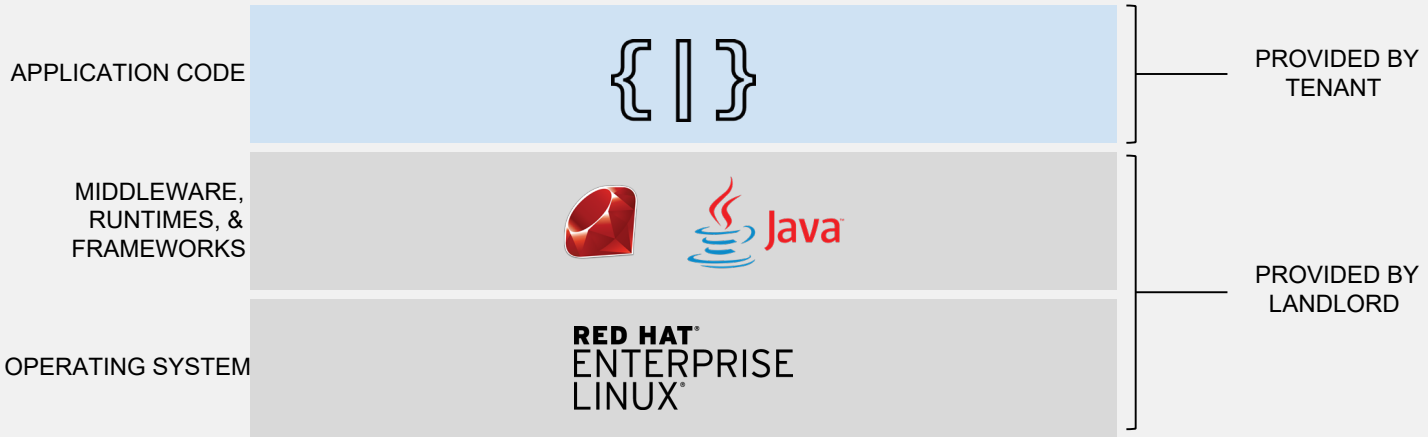
THE GOLDEN IMAGE



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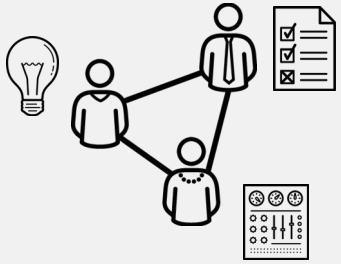

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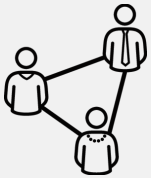

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Push/Pull Signed Images [OCP]

DEV | INSPECT | BUILD | SCAN | TEST | DEPLOY | MONITOR

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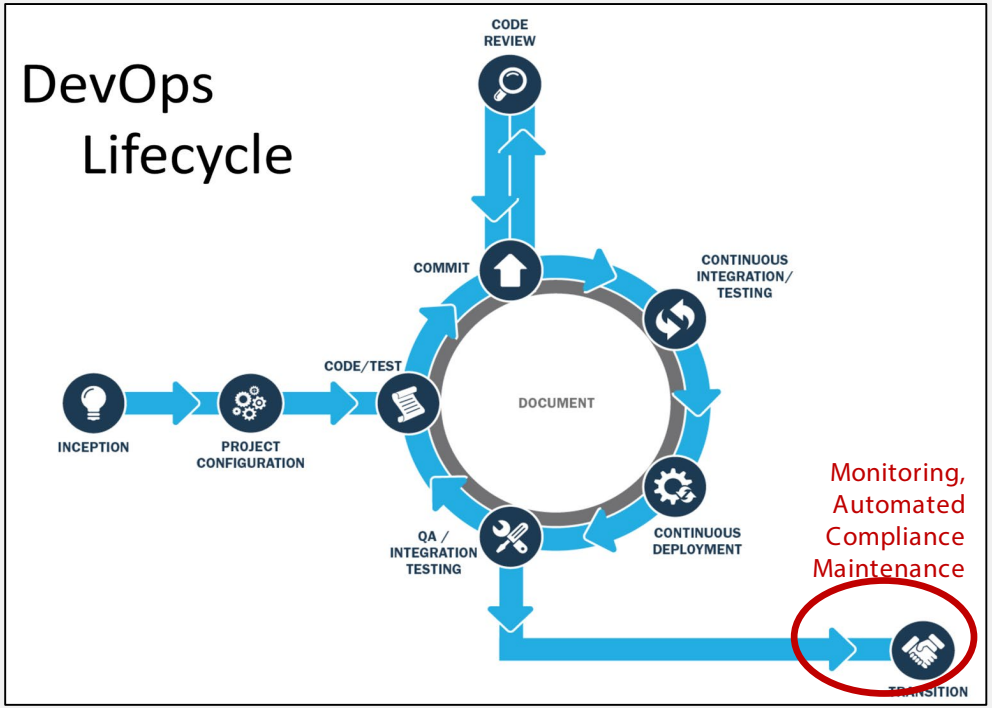
ITERATIVE SECURE DEPLOYMENTS



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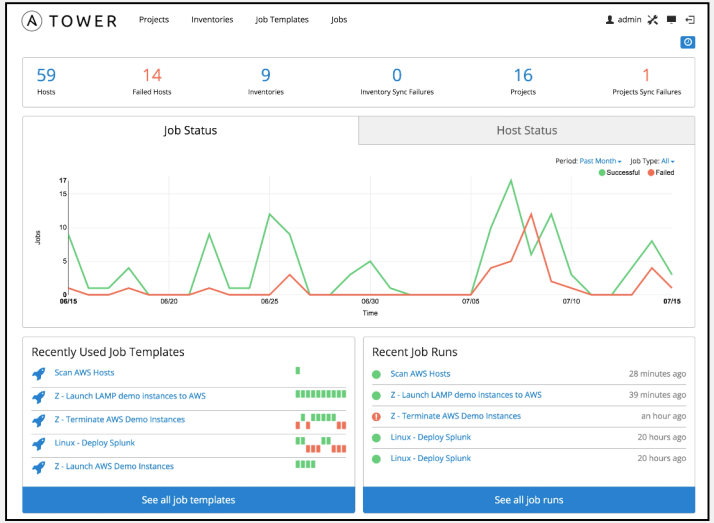
DAY-2 OPERATIONS SAMPLE VIEW FROM ANSIBLE TOWER



ENSURES SOFTWARE SYSTEMS WORK AS ADVERTISED

- Automate compliance with Ansible
- Red Hat Gov GitHub has an 800-53 role that you can use to apply
  STIG settings
- https://github.com/RedHatGov/ansible-role-800-53
- **Configuration Drift?** No problem. Rerun the playbook for continuous
  compliance

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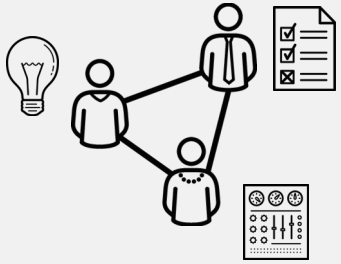

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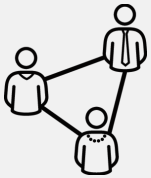

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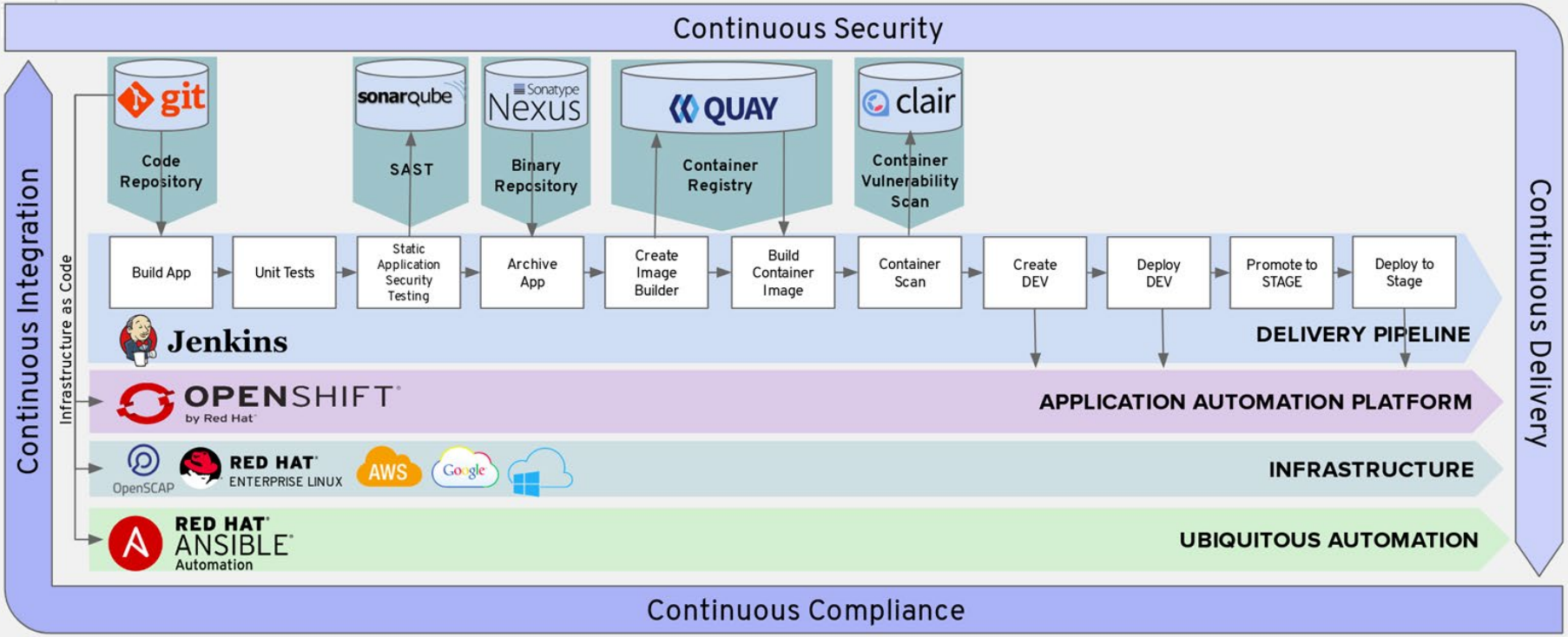
THE SECURE SOFTWARE FACTORY



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