Shift Left Compliance & Security

Jim Doran, IBM

What's at Stake

Brand reputation

25%

company value attributed to reputation

Client trust

69%

of consumers believe companies are vulnerable to cyberattacks

Financial fines

$425M

Fines levied on Equifax to help people affected by the data breach

Industry Pain points

Skills shortage

1.8 million

unfulfilled cybersecurity jobs by 2022 facing CISO

Compliance

$31M

Average cost for Financial Services Company

Complexity

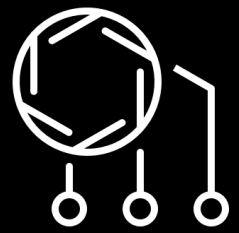
94%

of organizations have multiple clouds

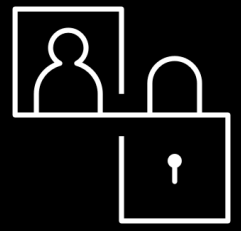
DevOps has changed

Speed with Control for all Apps.

Everything as Code



Automate Everything



Team Collaboration

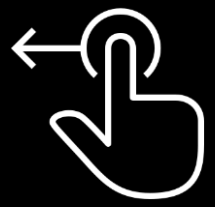
SecDevOps

> We have integrated the IBM Cloud hosted in data centers dedicated to the bank. We will also strengthen our Hybrid Cloud 'As a Service' capabilities using IBM solutions offered via its public Cloud to support the development of new services, including Continuous Delivery, Tekton pipelines, test and applications environments.
>
> *- IBM Banking Client*

Security has changed

Governance and Compliance is Built-Into Your App.

Governance



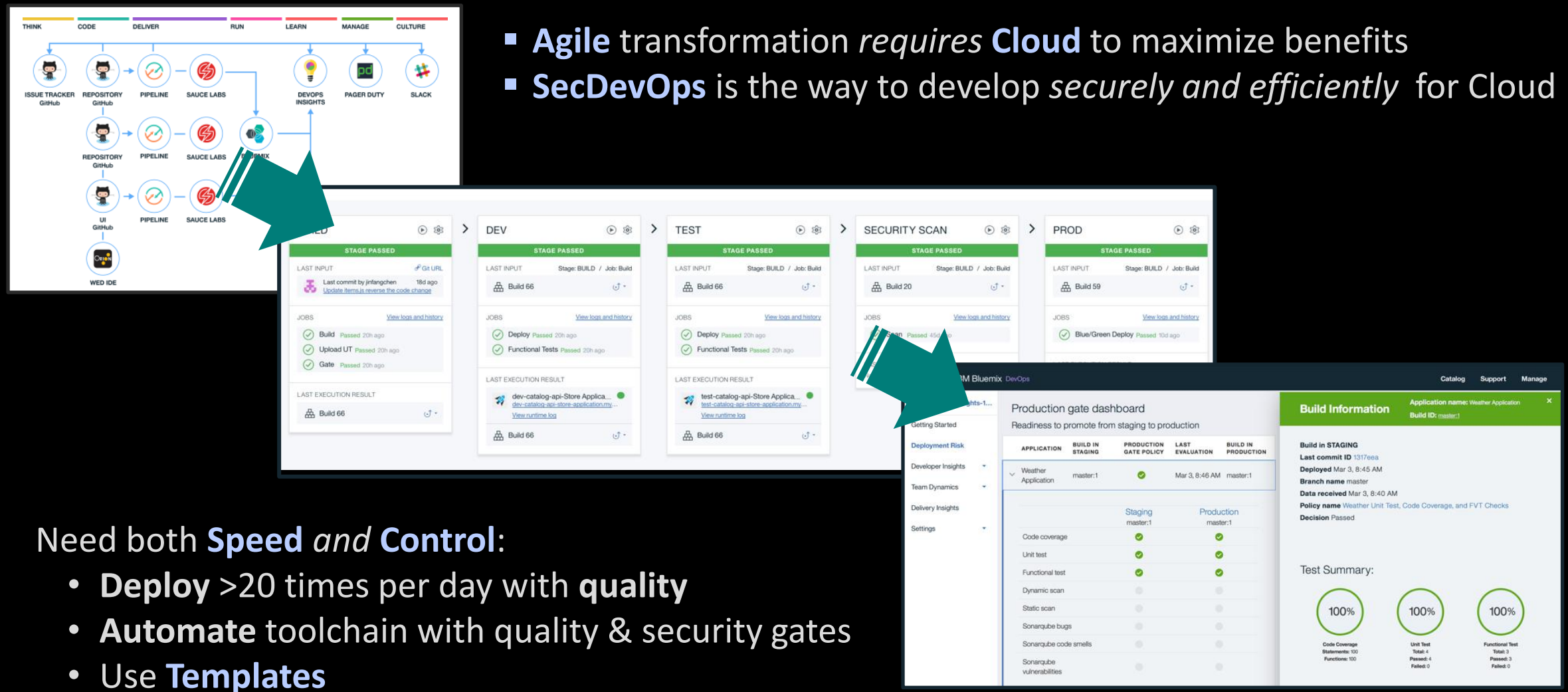
Shift-Left

Vulnerability Detect

Audit-Ready

> "I need to ensure that my organization workloads comply with regulations and security best practices by setting guardrails around what application teams can do, by continuously monitoring the security and compliance posture and identifying violations, and by collecting evidence for audit without disrupting agile development processes or application availability."
>
> *- IBM Financial Services Client*

Securely Develop at the Speed of Cloud



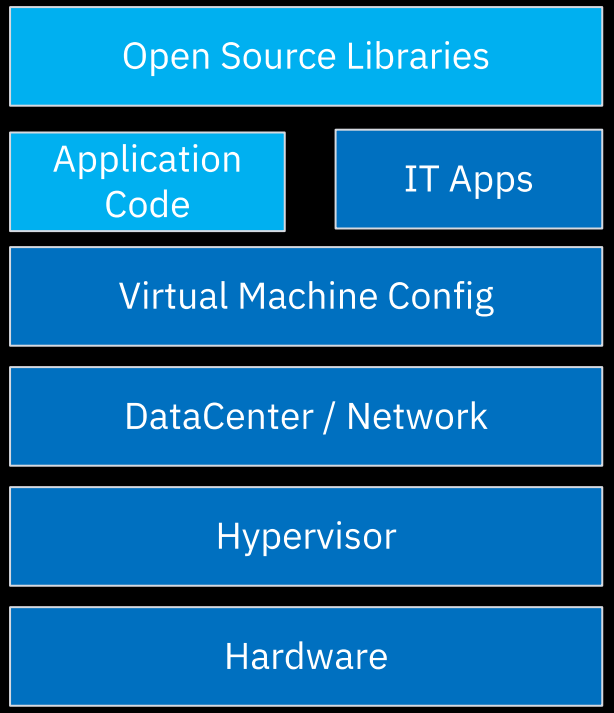
- **Agile** transformation *requires* **Cloud** to maximize benefits
- **SecDevOps** is the way to develop *securely and efficiently* for Cloud

Need both **Speed** *and* **Control**:

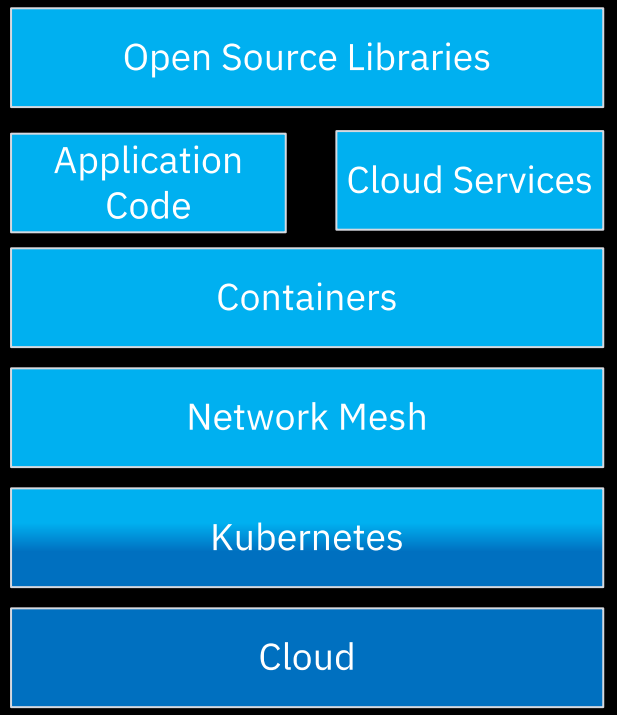
- **Deploy** >20 times per day with **quality**
- **Automate** toolchain with quality & security gates
- Use **Templates**

Cloud Native Apps require increased scope

Pre Cloud Era



Cloud Native Era

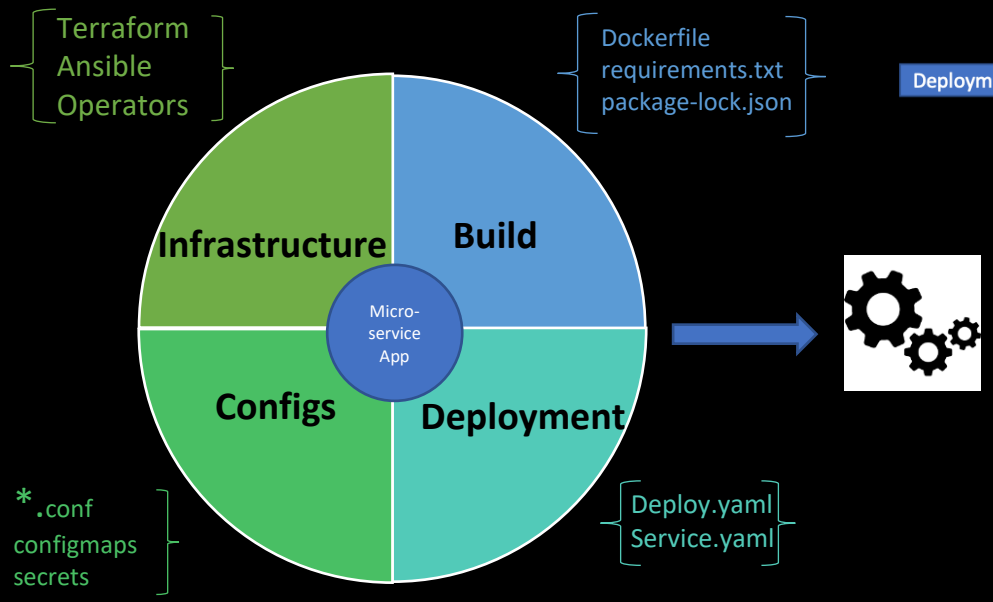


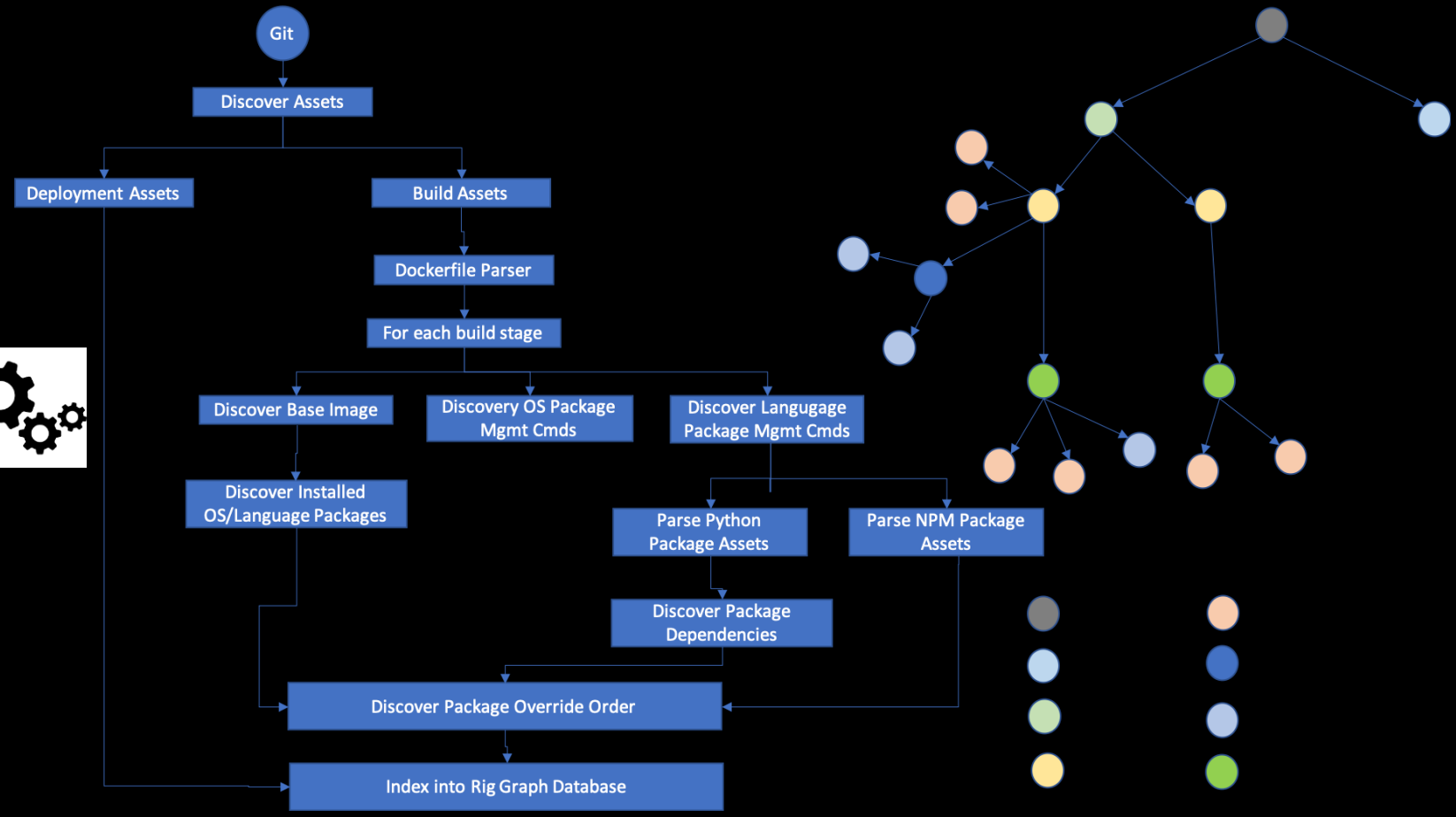
Development

Traditional I/T

DevOps drives infrastructure to be part of the application

Anatomy of a modern cloud application





Vulnerability Checks | Network | Bill-of-Material / Evidence | OpenSource Licenses | Third-party Service | CIS Checks | Cloud Services

Pipeline Integration

- PR Pipeline – Trigger checks on every pull request
- CI Pipeline – Trigger checks in every build pipeline
- CD Pipeline – Trigger checks before every deployment

Developer Feedback

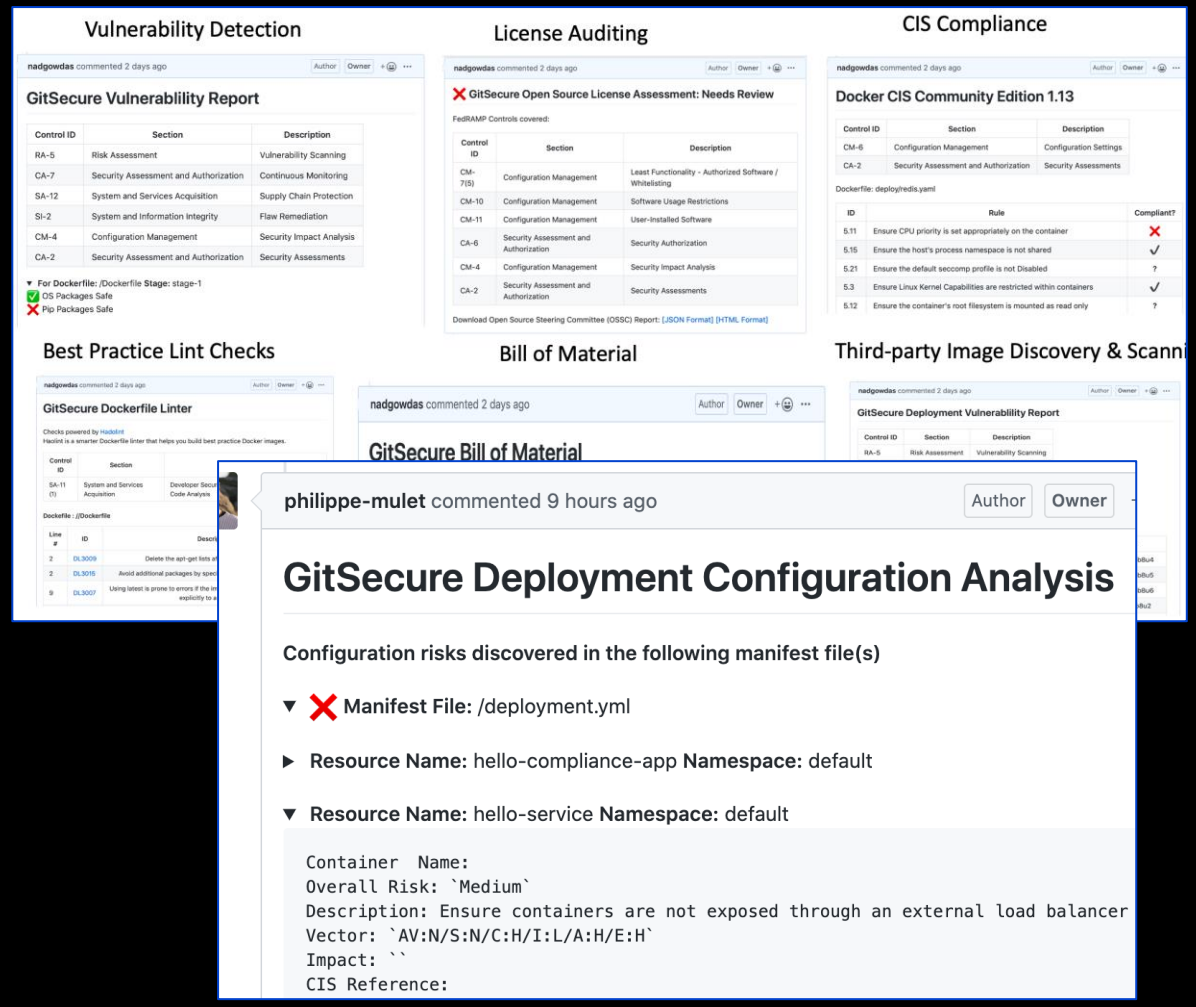
- PR Comments: All findings are reported as comments to PR in PR pipeline
- Issues: In CI/CD pipeline, any failures are reported as issues

OPA-based Policy Control

- Policy configuration are defined out-of-band of pipeline
- Pipeline Gates: Control PR merge through policy gates

Code Risk Analyzer

Automate security and compliance checks and remediation based on static assets in git repository, leveraging threat intelligence from Snyk and Clair.



Vulnerability Scans

- Discover vulnerabilities in your Application (python, node, java, golang) and OS stack (base image) based on curated threat intelligence from Snyk and Red Hat Clair
- Recommendation to fix vulnerabilities
- Auto-remediations for some available fixes via pull requests
- Continuous monitoring against new vulnerabilities and automated notifications

Deployment Analysis

- Discover misconfigurations in your deployment *.yaml against CIS Standards

Bill-of-Materials

- Generate Bill-of-Materials accounting for all the build dependencies and their sources for your application
- BoM-Diff to allow comparing diffs in any dependency w.r.t. base branch

Network Policy Analysis

- Built-in Checks to identify any redundancy or gaps in network policies

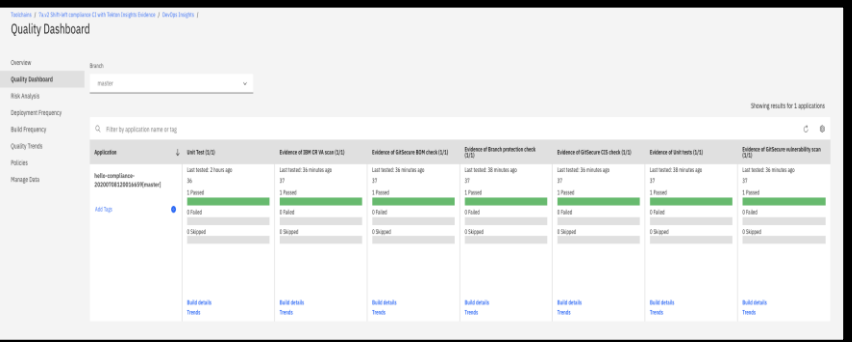
Terraform Configuration Analysis

- Parsing terraform templates for different cloud services (IAM, COS, CIS, LogDNA-AT) to discover any security mis-configurations
- Implements 20+ policy checks, all anchored around NIST controls

CI pipeline

CODE Detect secrets in code
Code reviews
Unit tests
Open source scan
Static code scan

BUILD Build deployable artifacts
Sign deployable artifacts
Run vulnerability scan
Open source scans
Dev deployment



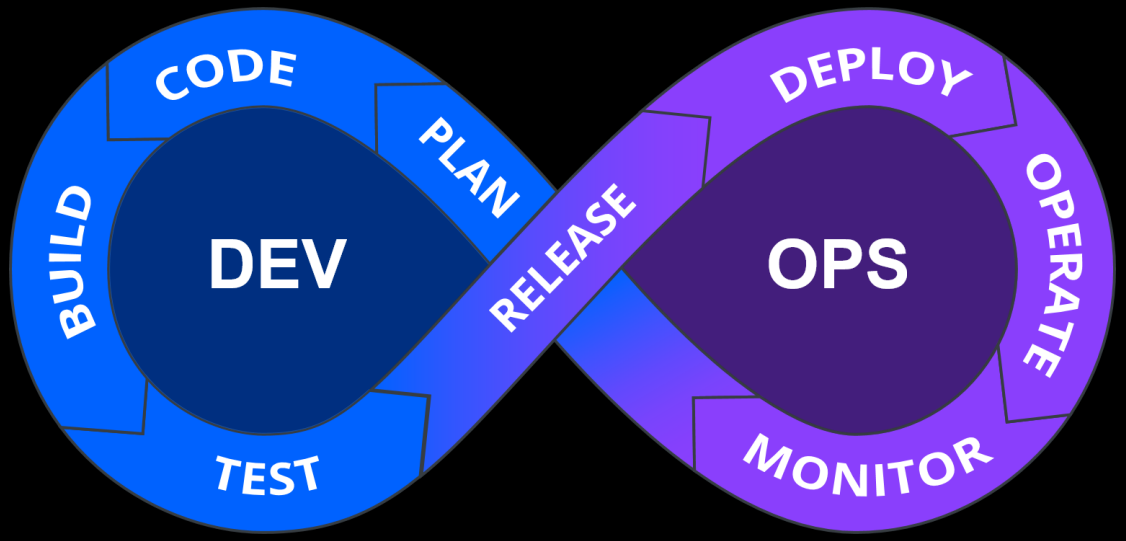
Setup
Code...
Unit Tests
Static Code Scan

- code-extract-toolchain-crn
- code-fetch-credentials
- code-fetch-evidence-locker
- code-fetch-code
- build-doi-publish-buildrecord
- code-unit-tests
- code-unit-tests-create-issue
- code-unit-tests-create-evidence
- code-unit-tests-create-doi-data
- add-unit-test-results-to-doi
- code-vulnerability-scan-uploader
- code-vulnerability-scan
- code-vulnerability-scan-create-issue
- code-vulnerability-scan-create-evide...
- code-cis-check
- code-cis-check-create-issue
- code-cis-check-create-evidence

Static Code Scan
Code Review Detect Secrets
Build
Build >
V Scan >
Sign >
Completion

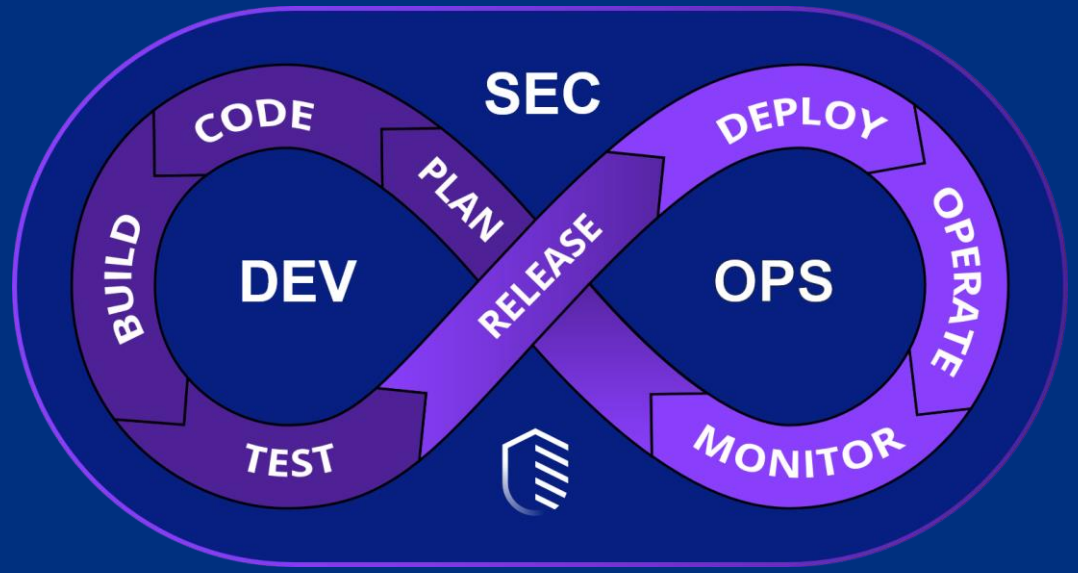
- code-bom-check
- code-bom-check-create-issue
- code-bom-check-create-evidence
- code-branch-protection
- code-branch-protection-create-issue
- code-branch-protection-create-evide...
- code-check-dockerfile
- build-containerize
- build-update-inventory
- build-vulnerability-advisor
- build-vulnerability-advisor-result-ad...
- build-vulnerability-advisor-create-iss...
- build-vulnerability-advisor-create-evi...
- build-docker-image-sign
- build-fetch-iks-cluster-config
- build-pipeline-1-kubectl-task
- build-deploy-dev
- build-pipeline-evaluator

Traditional agile approach



- Siloed roles and level of expertise
- Fragmented / bypassed security checks
- Lack audit readiness
- Lack of visibility into development process
- Reactive and time-consuming security remediation
- Runtime Probes required

Continuous Dev + Sec + Ops



- Auto-Remediation fix vulnerabilities / config
- Consistent security patterns (pipelines)
- Immutable runtime platform
- Continuous threat intelligence model
- Proactive Audit readiness
- Security checks scale with Development process

Backup slides