WSO2CON 2024

Software Engineering for Digital Businesses



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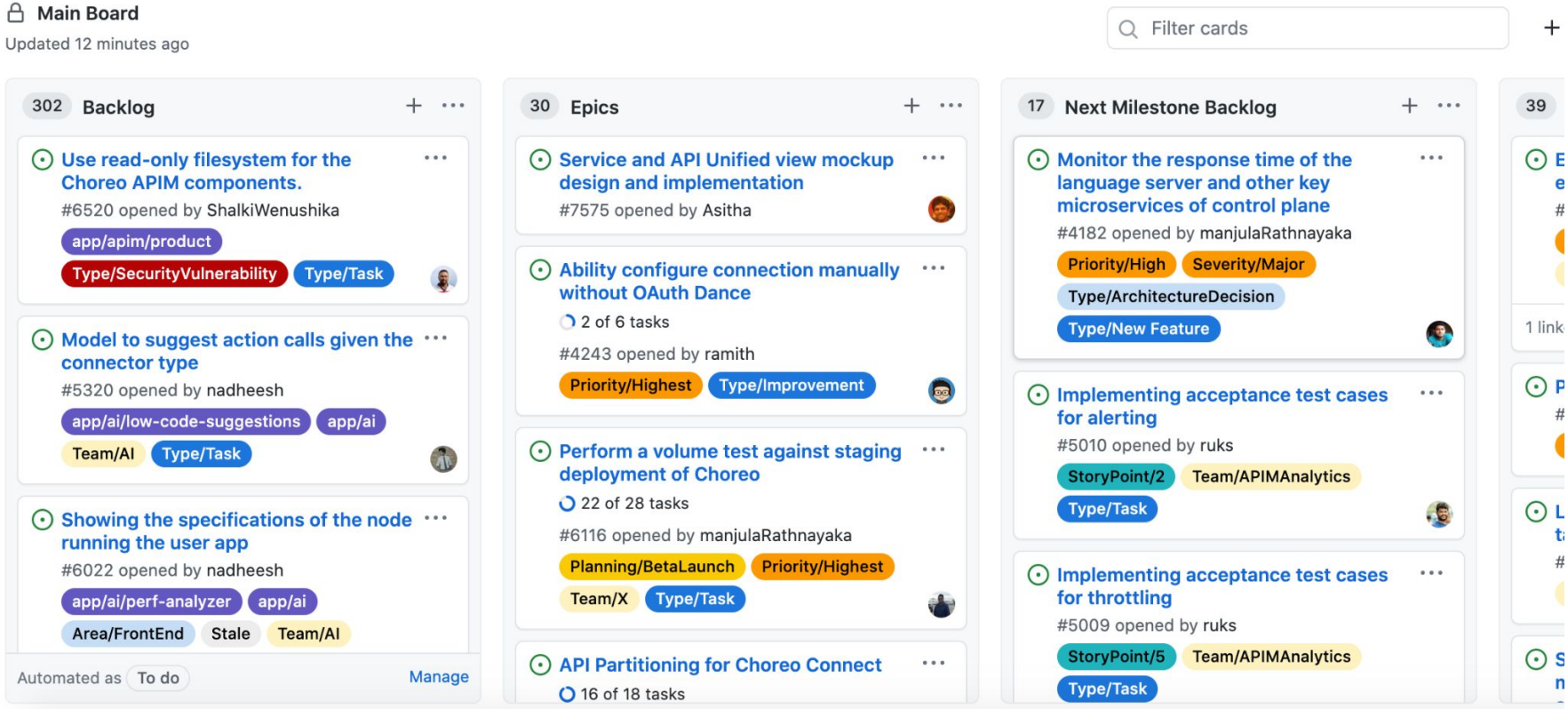
Ideas have value, but flawless execution is what determines success

What we will cover in this talk

- WSO2's software engineering processes
- Key takeaways for digital businesses
- How this thinking has influenced the development of Choreo

Software Engineering @ WSO2

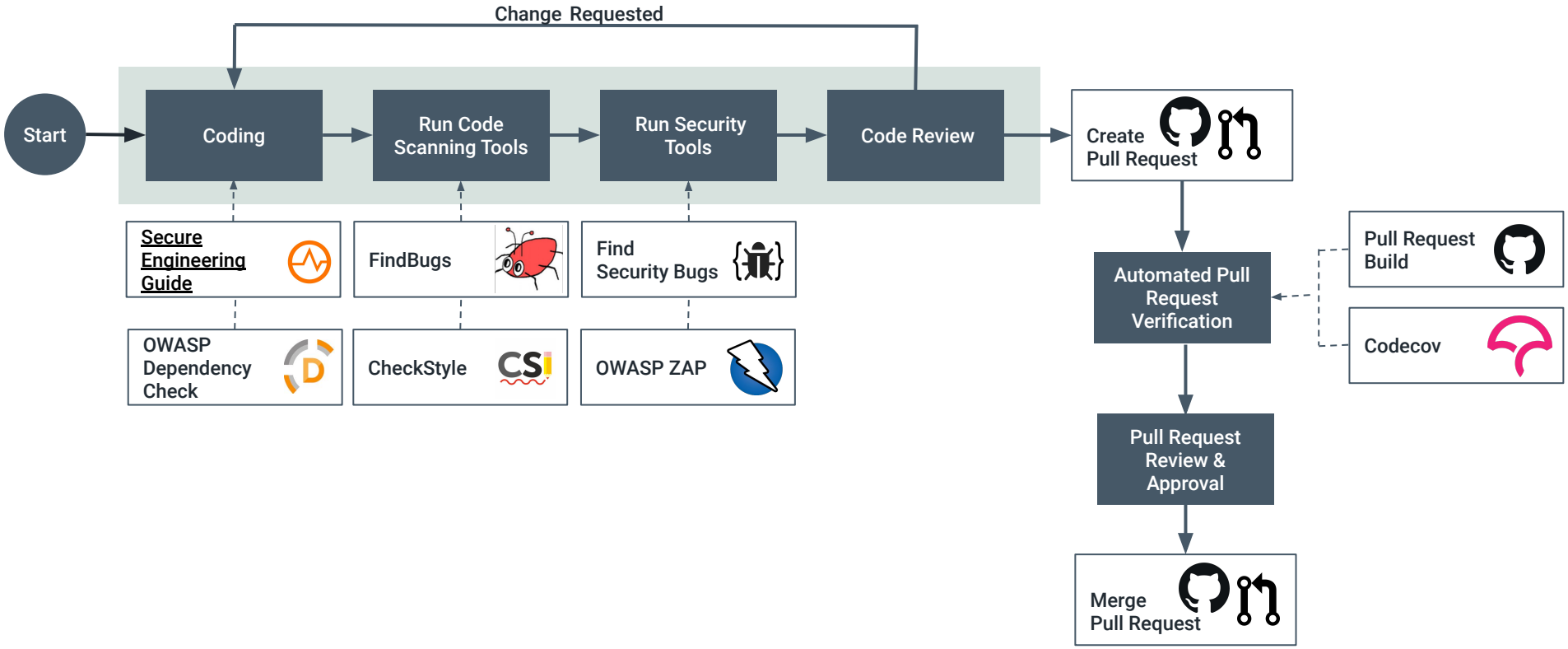
Requirements



Design

- Communications in mailing list, github issues and github discussions
- Tools
  - Google docs and several other diagraming tools (e.g draw.io, excalidraw)
  - Figma
- Review meetings
  - Architecture review
  - API design review
  - UX design review
  - Security review

Development

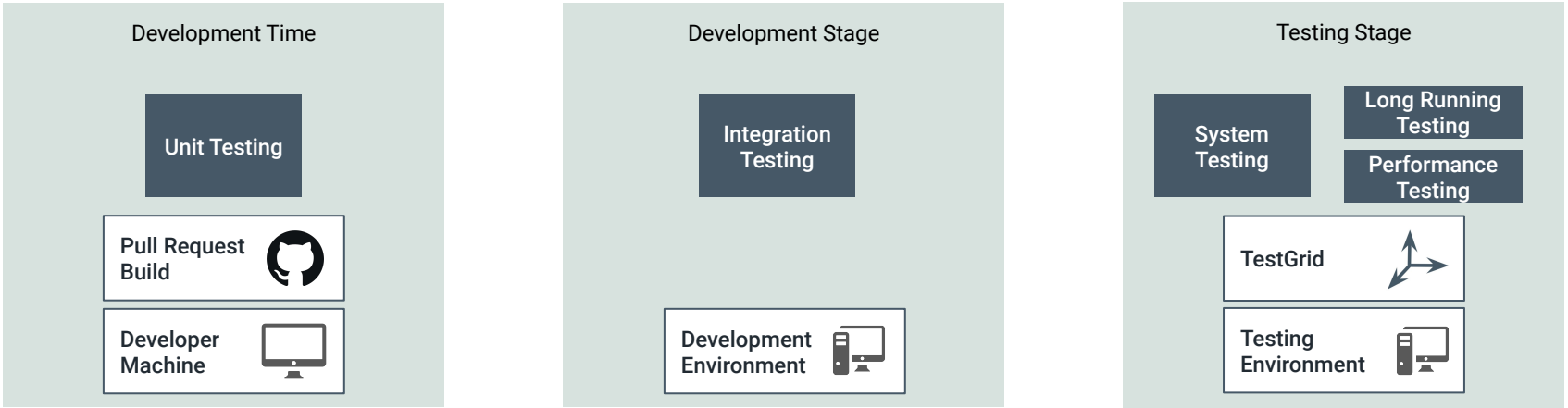


Development

- Communications in mailing list
- 3rd party dependency approvals
- Feature branches
- Test cases (unit test, integration tests, scenario tests)
- Documentation, samples
- Dependa bot - Automatically update dependencies to their latest version

Testing

Test Case Management



TestNG : For server-side feature testing

React-testing library : For React apps

Storybook : For UI design assurance

Mockito, Powermock : Test double objects

Jacoco : Reporting

Cypress : For UI/front-end & API testing

Rest Assured : For REST API testing

TestNG : For server-side feature testing

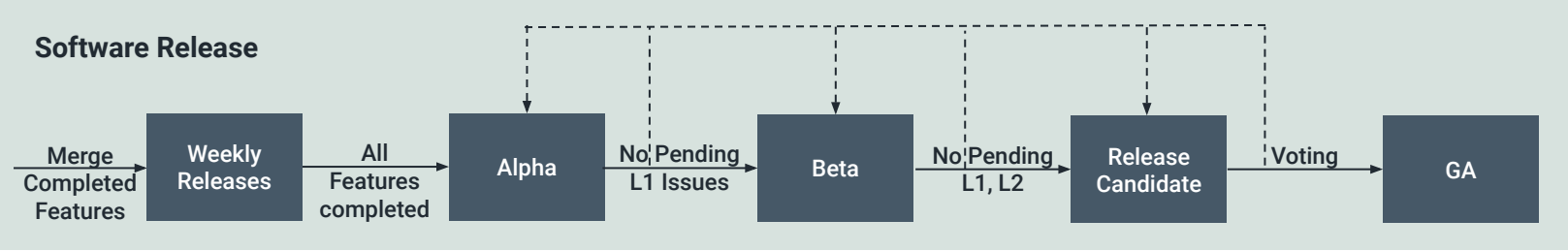
Cypress : For UI/front-end & API testing

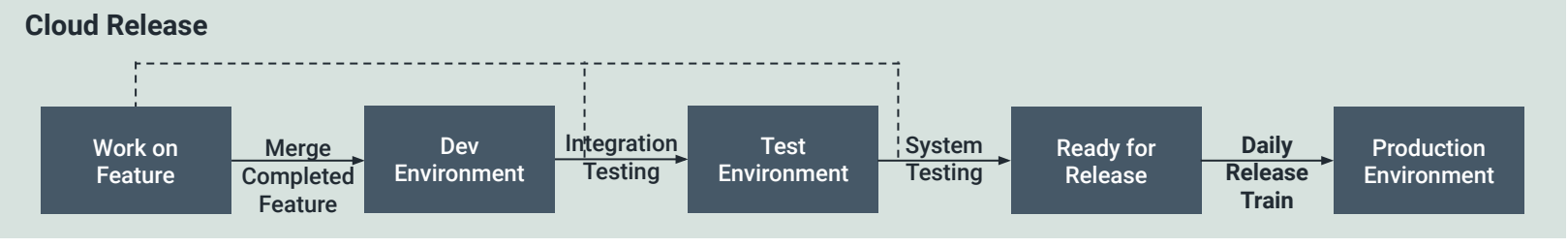
TestNG : For server-side feature testing

Cypress Dashboard : For Reporting

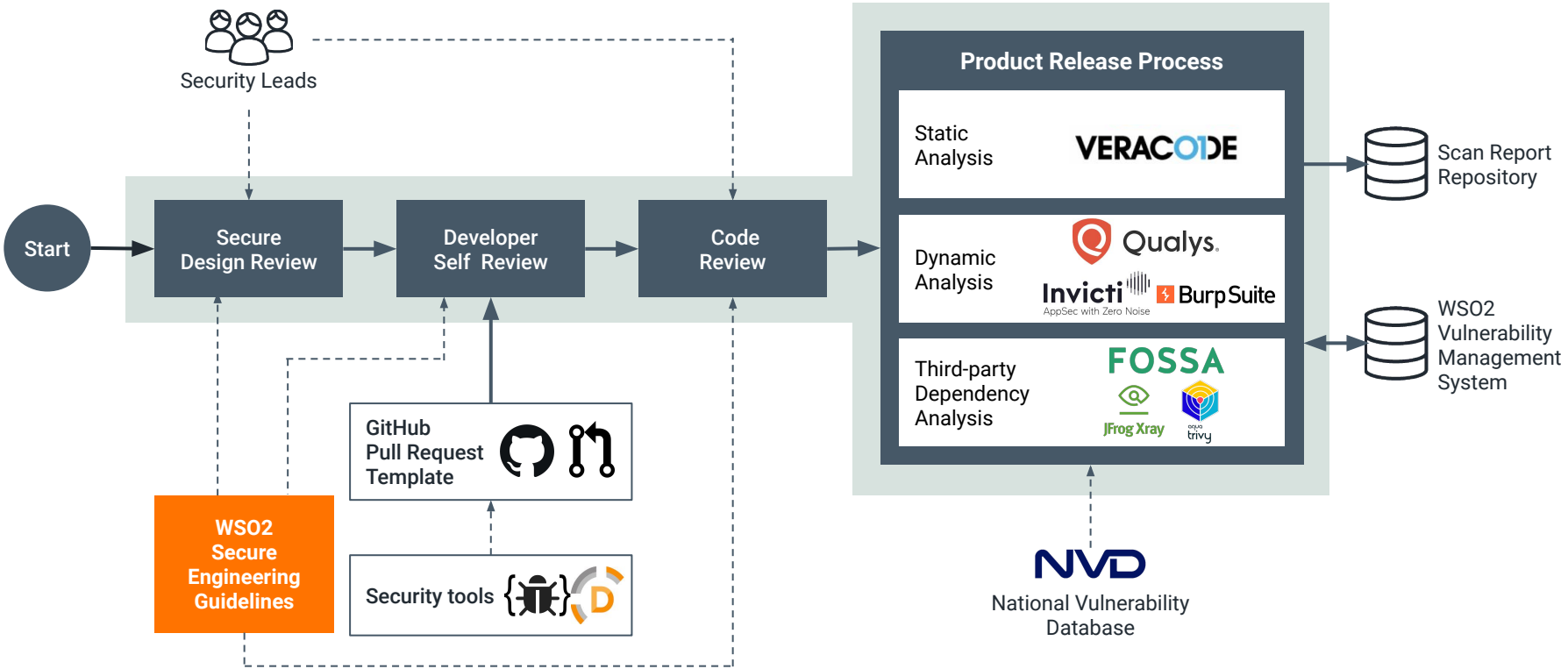
Release

- Release is ready when ...
  - All planned features are done
  - Documentations are available for the features
  - Testgrid reports
  - Long running test reports
  - Performance numbers
  - Security scanning
  - No L1, L2 issues



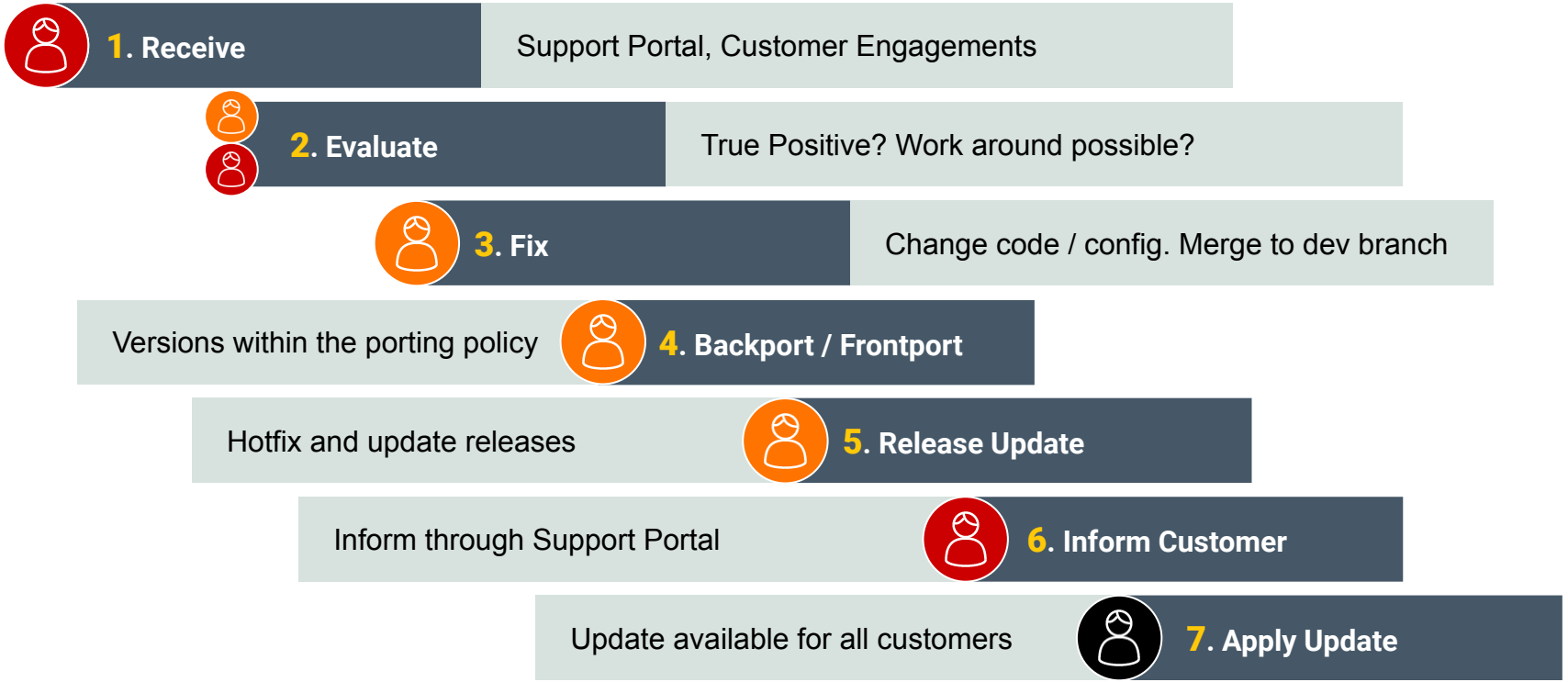


Summary of Secure Development Lifecycle



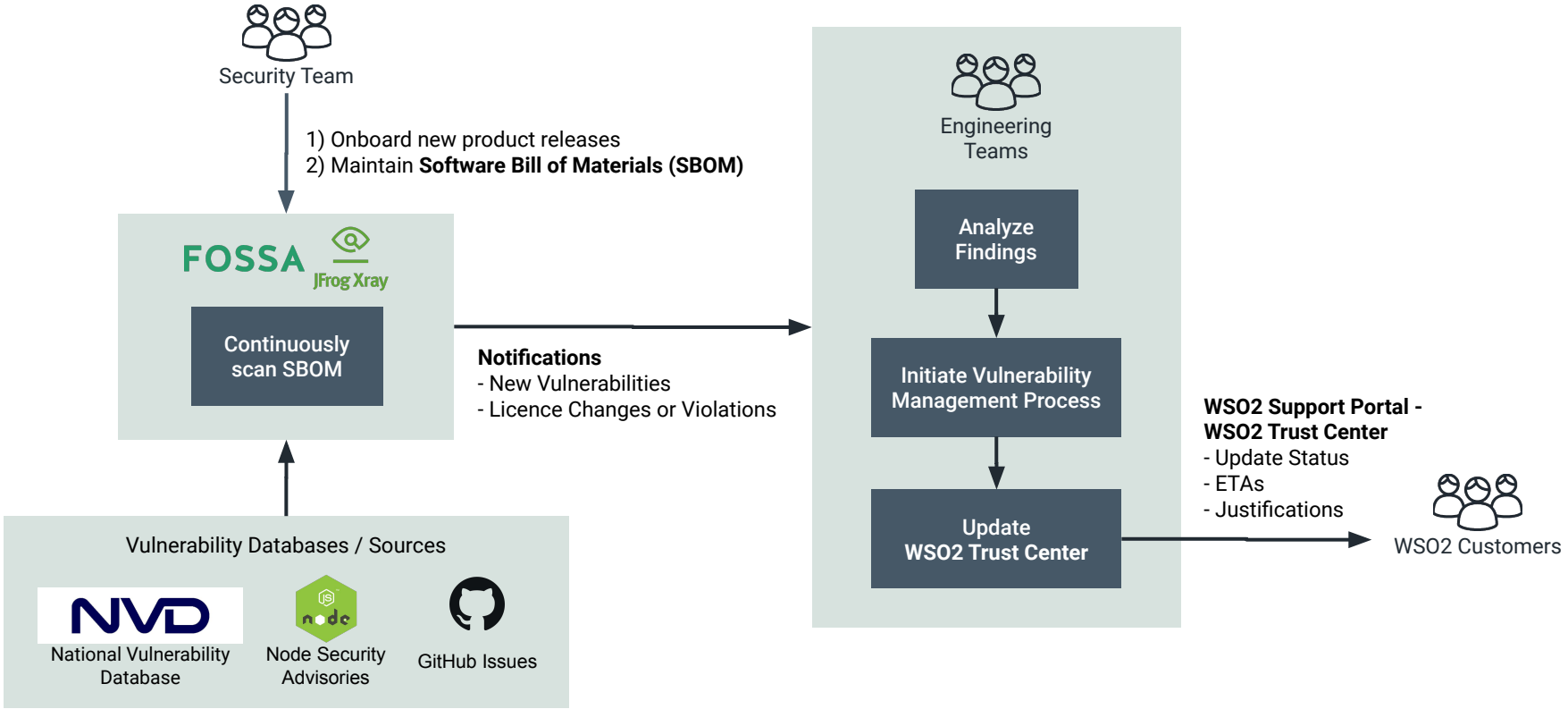
https://security.docs.wso2.com/en/latest/security-processes/secure-software-development-process/

Maintenance



Product Team Support Team Customer

Continuous Monitoring of Third Party Dependency Vulnerabilities



DevOps

- Infrastructure as Code (IaaC)
  - Terraform
- GitOps Process
- System monitoring
  - Azure Monitor and Kusto query
- Application monitoring
  - Site24x7
- Alerting
  - PagerDuty to generate call alerts for all critical alerts
  - Email/chat notifications for non-critical failures

DevSecOps

Build Pipeline
Mandatory Quality and Security Checks

Software Composition Analysis (SCA)

Third Party Dependency Vulnerabilities
License Violations
Container Scanning

FOSSA

aqua trivy

Linting and Static Security Analysis



Gosec

Bandit

FindSecBugs

Super-linter

Infrastructure as Code (IaC) Scanning

checkov by bridgecrew

aqua tfsec

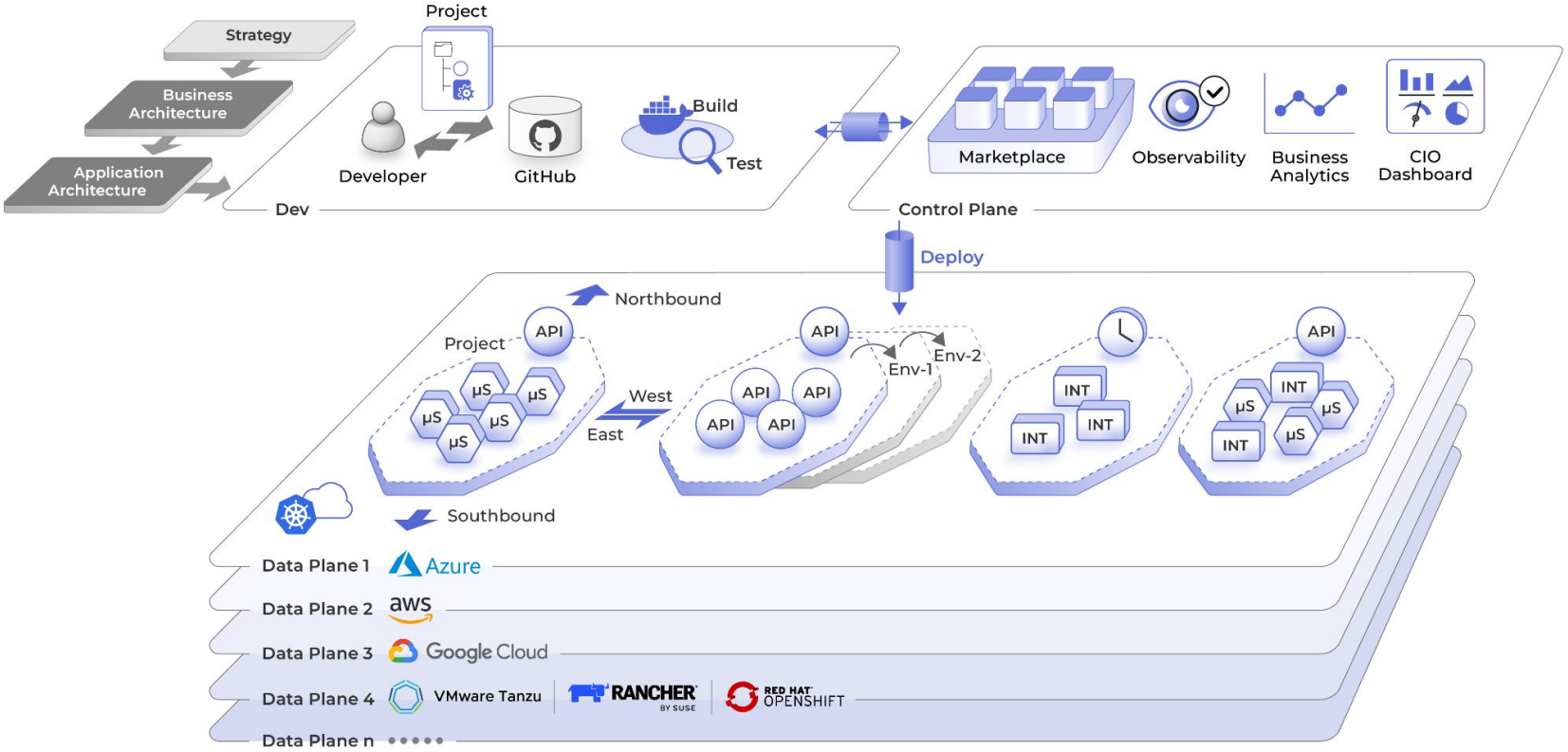
Key takeaways from WSO2's processes for digital businesses

Key takeaways

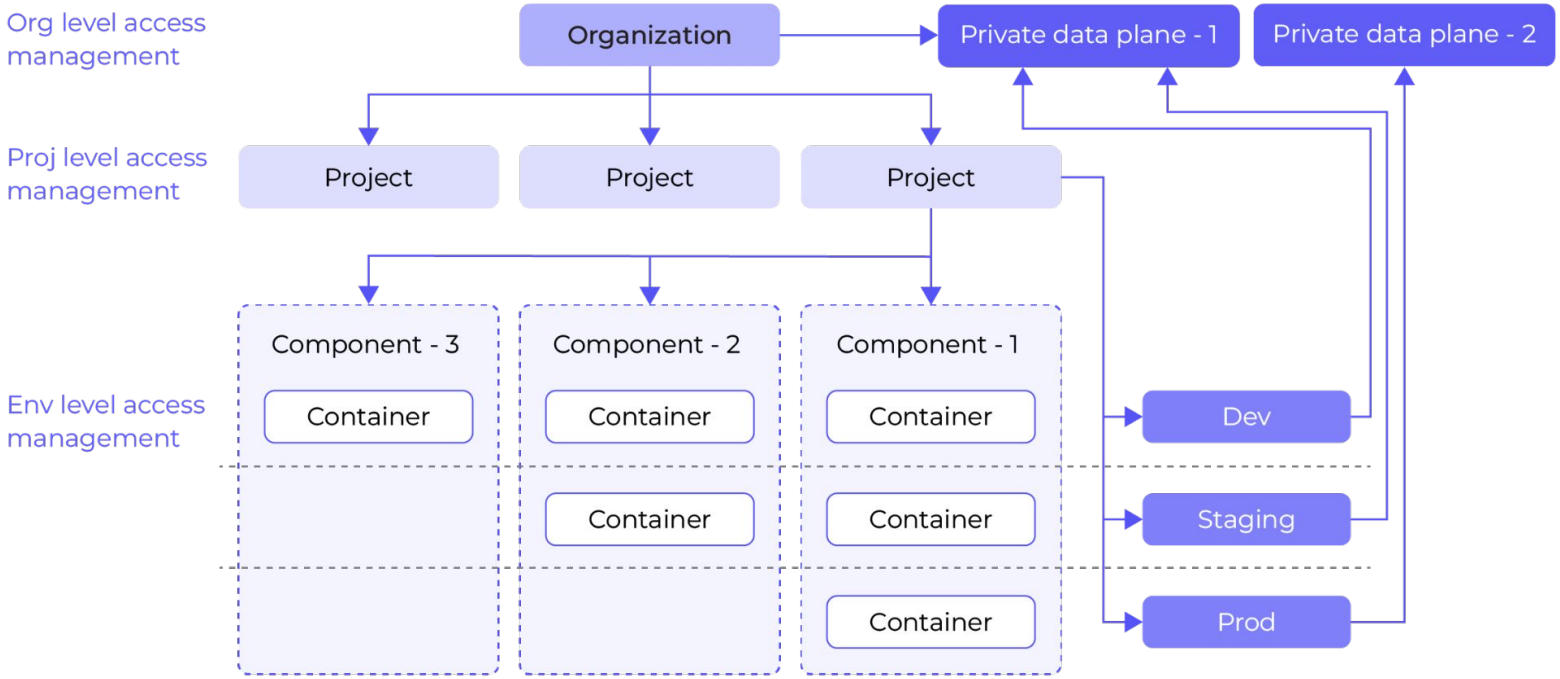
- Record all requirements
- Inner source – Applying open source best practices
- Parallel versions, process to identify bugs in all affected versions
- GitOps
- Automated testing, deployment, and monitoring
- Security at every level, continuous security processing

Choreo

What is Choreo?



Choreo Concepts



How Choreo helps

- ~~Record all requirements~~ - External
- Inner source - Source code repository is attached to projects, components
- Parallel versions - Deployment tracks
- GitOps - environment, configuration management
- Automated testing, deployment, and monitoring - Test components, CI/CD, observability, insights
- Security at every level, continuous security processing - Trivy scans, API gateways, cell architectures

Question Time!



Thank You!