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GitOps in Action: Navigating Application Deployment in the Platformless Landscape



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GitOps Principles

OpenGitOps(https://opengitops.dev/), a CNCF project defines GitOps principles as:

- Declarative
  - A system managed by GitOps must have its desired state expressed declaratively.
- Versioned and Immutable
  - Desired state is stored in a way that enforces immutability, versioning and retains a complete version history.
- Pulled Automatically
  - Software agents automatically pull the desired state declarations from the source.
- Continuously Reconciled
  - Software agents continuously observe actual system state and attempt to apply the desired state.

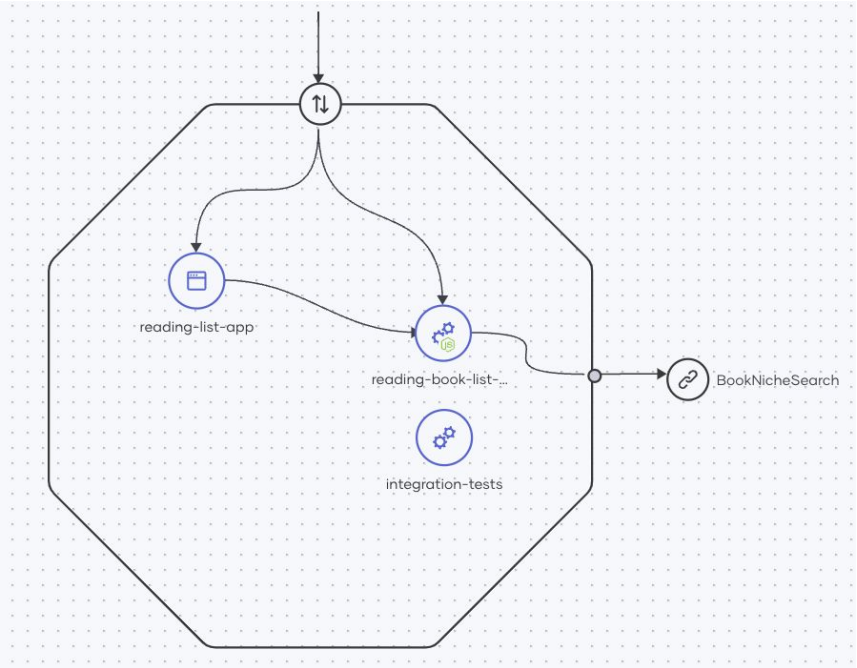
What GitOps Delivers: Key Outcomes

- Accelerated Development and Deployment
  - Simplify and accelerate deployment processes.
  - Deploy changes faster and more frequently.
- Enhanced Recovery and Reliability
  - Easily revert to known-good configurations in case of errors.
  - Minimize downtime and impact on users.
- Consistent Environments
  - Ensure consistency in configurations across different environments.
  - Reduce the risk of configuration drift.
- Comprehensive Version Control and Auditing
  - Track changes to infrastructure and deployment configurations over time.
  - Enhance traceability, accountability, and facilitate audits.

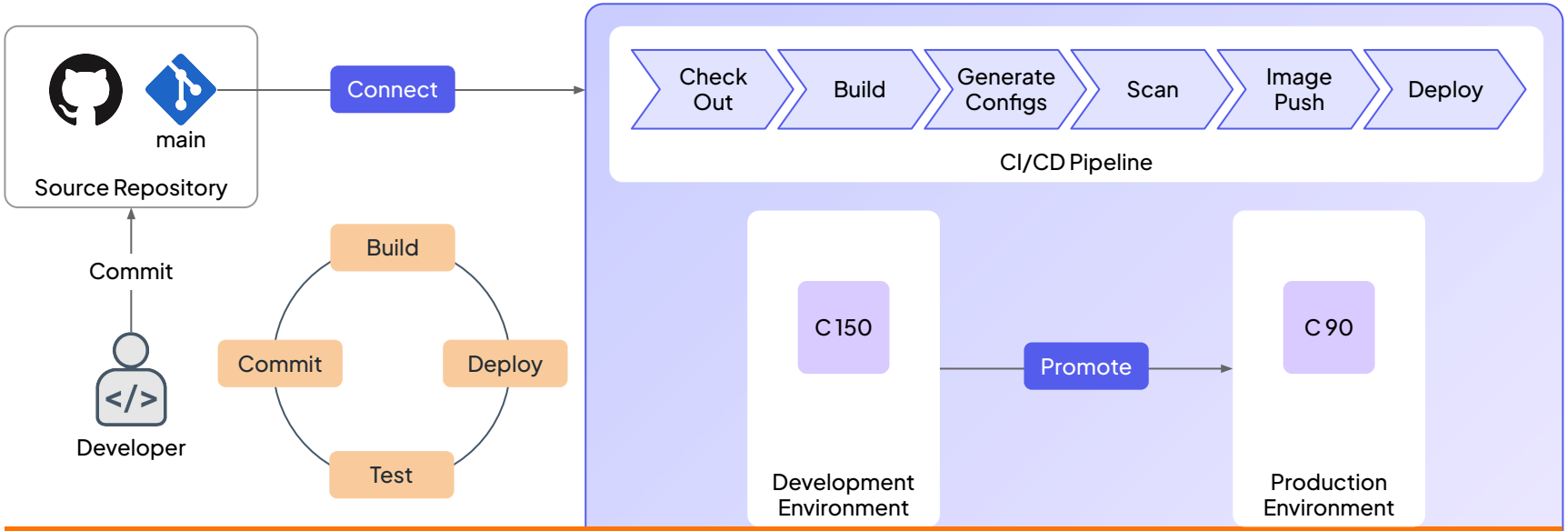
How Choreo Features Support GitOps Outcomes

What is an Application in Choreo?

- An application in Choreo consists of one or more projects, each containing components like services, web apps, API proxies, webhooks, tasks, event handlers, and test runners. These components work together to provide seamless digital experiences.



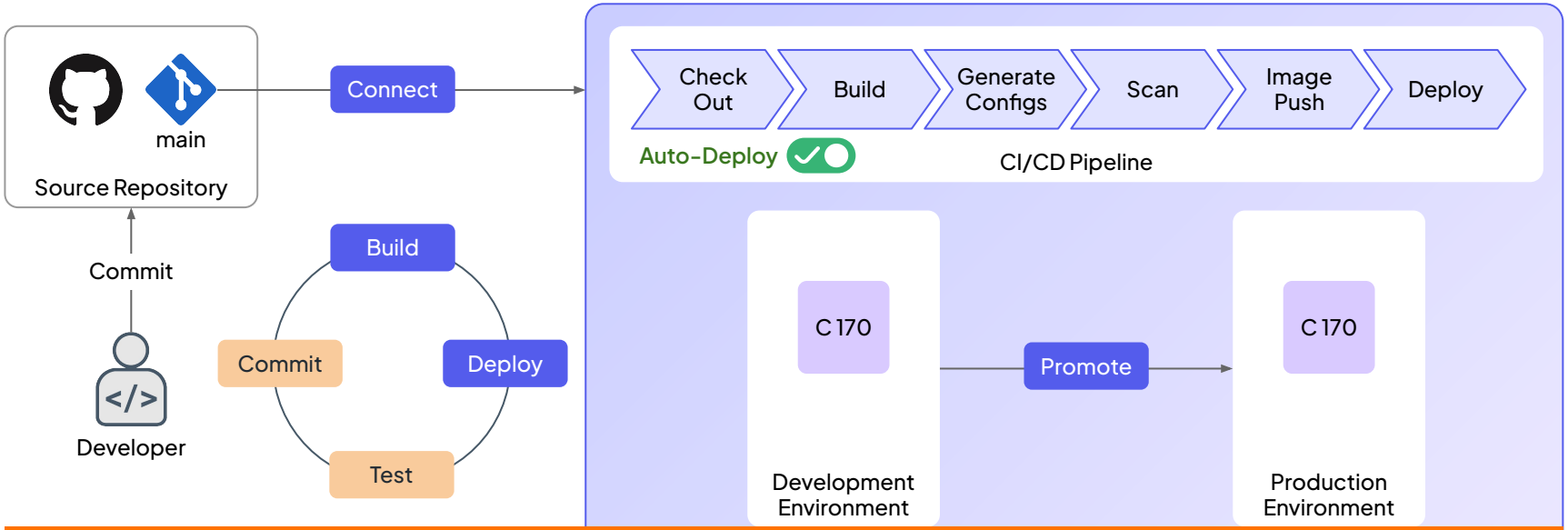
Accelerated Application Onboarding



Outcome: **Accelerated Development and Deployment**

By minimizing setup time and automating repetitive tasks, developers can directly focus on code development.

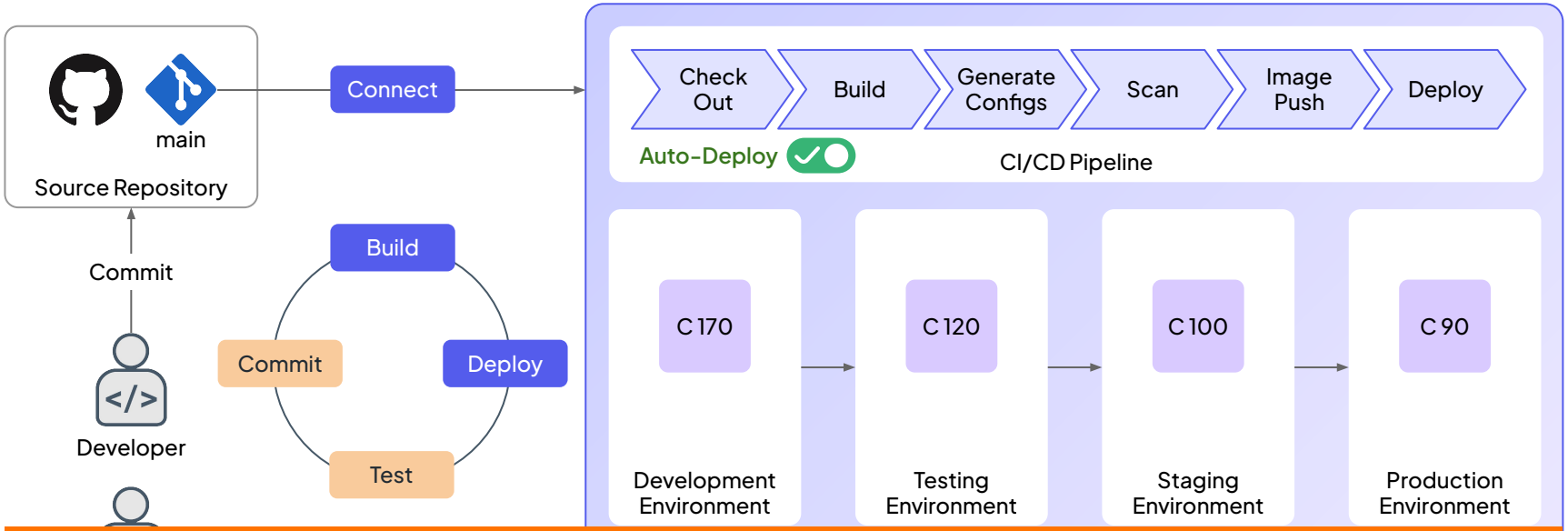
Automated Deployment on Pull Request Merges



Outcome: **Accelerated Development and Deployment**

Merging a pull request automatically triggers deployment, allowing rapid release cycles and reducing manual intervention.

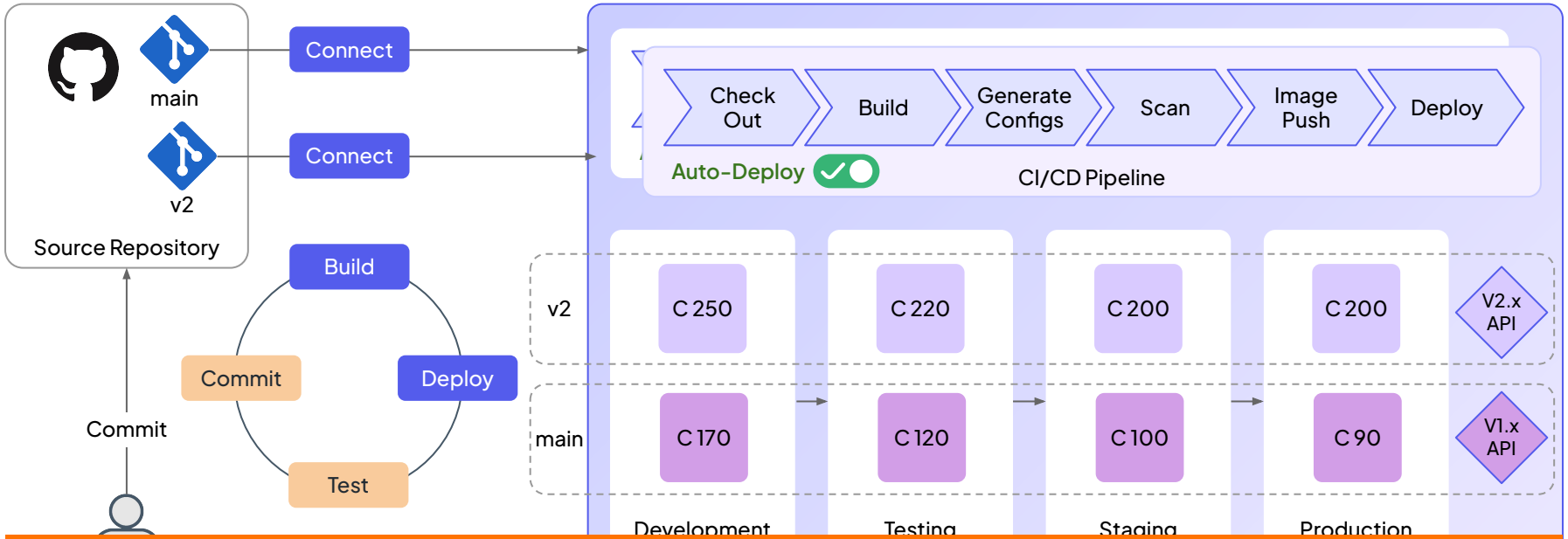
Rapid Environment Onboarding in Choreo



Outcome: **Consistent Environments**

Choreo enables rapid onboarding of new environments with a few clicks, ensuring consistency across development, testing, staging, and production.

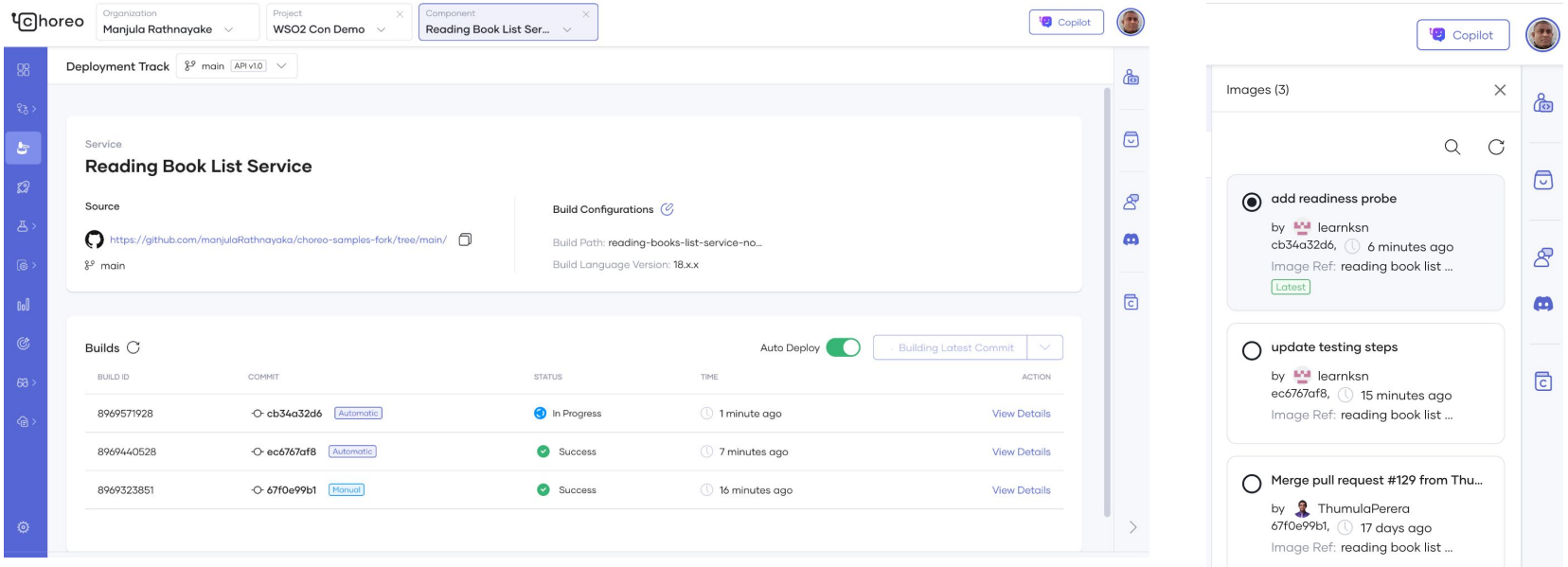
Parallel Development with Deployment Tracks



Outcome: **Accelerated Development and Deployment**

Choreo supports parallel deployment tracks, allowing each branch to maintain its own API version while enabling rapid, concurrent development.

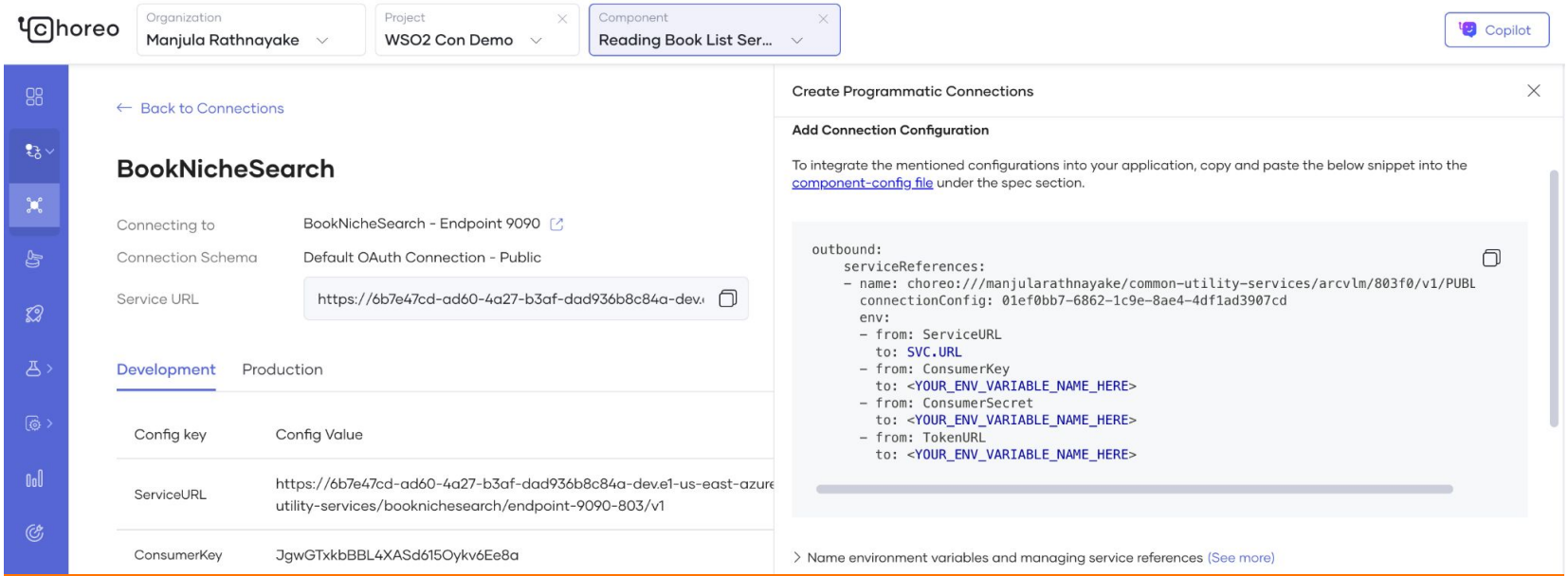
Build History and Rollback Capability



Outcome: **Enhanced Recovery and Reliability**

Choreo maintains build history with commit details, allowing teams to redeploy previous builds efficiently and ensure reliable rollback when necessary.

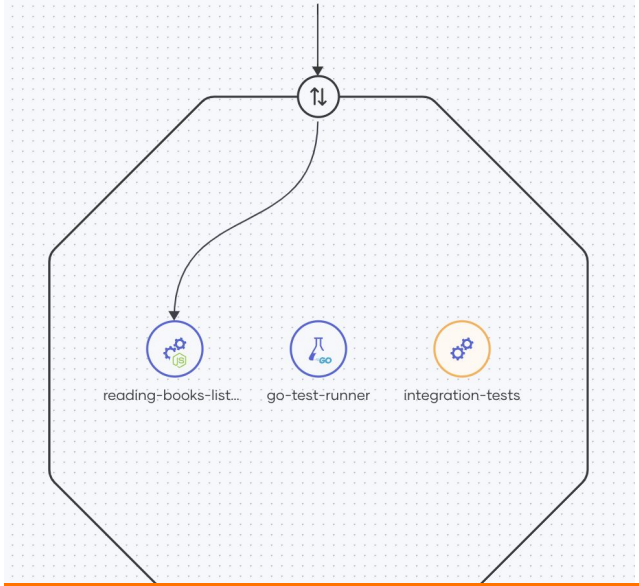
Environment-Specific Configuration Management

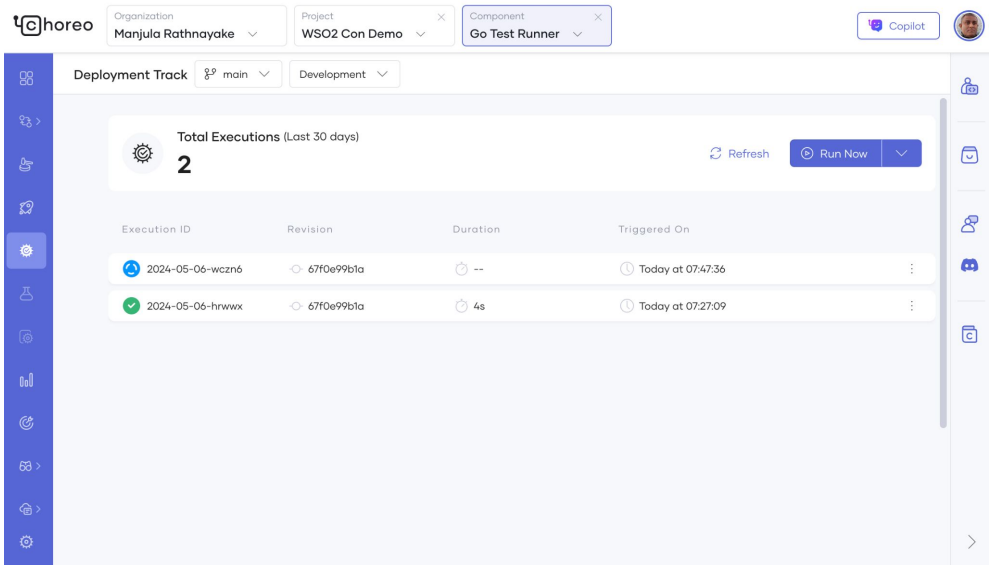


Outcome: **Consistent Environments**

Automated configuration value injection ensures secure, environment-specific settings, supporting consistent and reliable deployments.

Integration Testing as a First-Class Component in Application Architecture



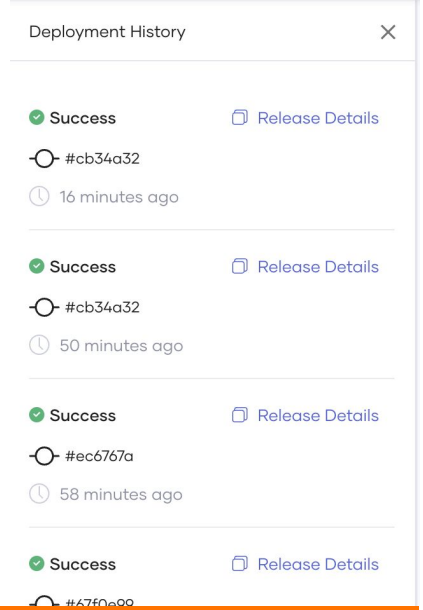


Outcome: **Enhanced Recovery and Reliability**

Integrating testing as a core element in application architecture validates interactions among all dependencies, ensuring smooth operations and reliable recovery from changes.

Audit Logs and Deployment History





Outcome: **Comprehensive Auditing**

Choreo provides detailed audit logs and deployment history views, offering traceability and compliance insights to maintain accountability across development and deployment workflows.

Building on Success: Choreo's Shift to a Declarative API for GitOps Realization

Choreo vs Kubernetes Abstractions

- Project
- Component
  - Web Application, Service, Task, API Proxy, Webhook, Test Runner
- DeploymentTrack
- Build
- Deployment
- ConfigGroup
- Environment
- DataPlane

- Namespace
- Deployment
- ReplicaSet
- Pod
- Service
- NetworkPolicy
- ConfigMap
- Ingress
- Node
- Jobs

Choreo CLI

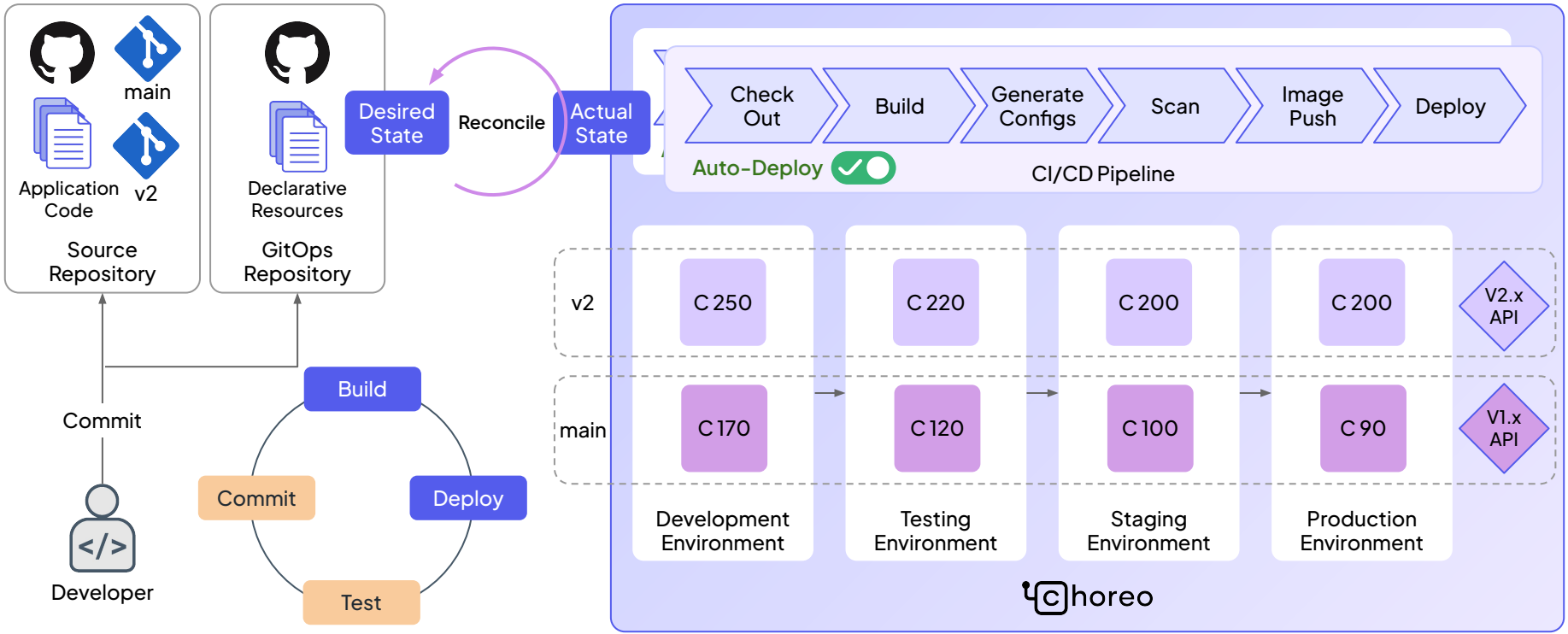
```
[~] choreo --help
Welcome to Choreo CLI, the command-line interface for https://choreo.dev

Available commands:
Resource management:
        create      create a new resource
        delete      delete a resource
        describe    get detailed information about a resource
        list        list available Resources

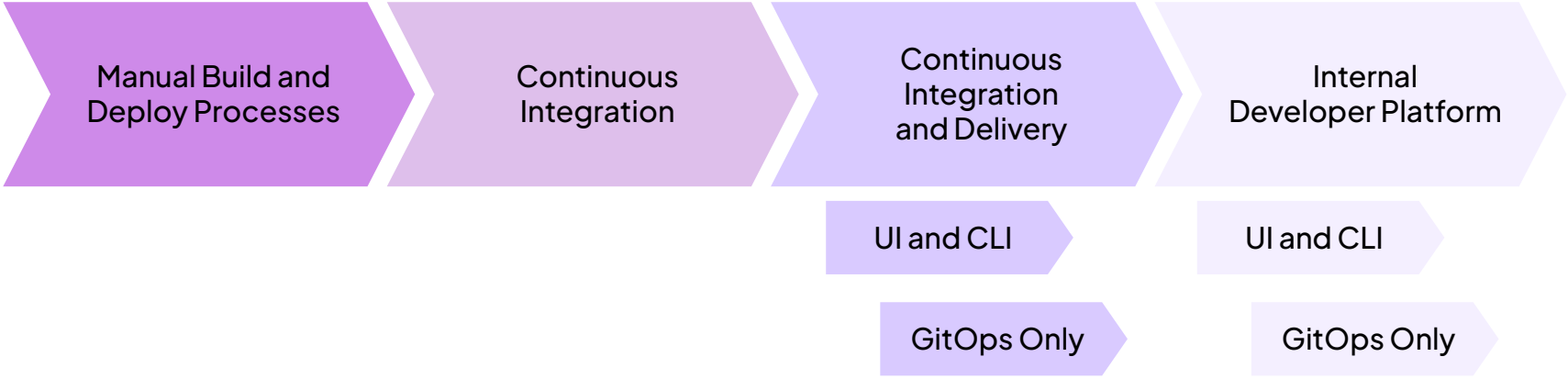
Monitoring:
        logs        print logs

Organization and authentication:
        login       login to Choreo
        logout      logout from Choreo
        change-org  switch the active organization
```

GitOps in Choreo



GitOps Adoption Journey



Perfection is not attainable, but if we chase perfection we can catch excellence.

- Vince Lombardi -



Question Time!



Thank You!