WSO2CON 2025

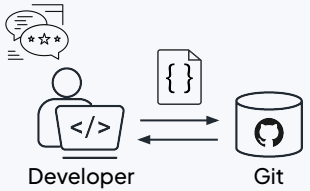
Choreo Bridging Kubernetes and Enterprise Development



Lakmal Warusawithana
Vice President & Distinguished Engineer
WSO2


Unique digital experiences you create are your competitive advantages.

The reality of software manufacturing in the cloud native era



Code reusability limited

Resource discovery delays

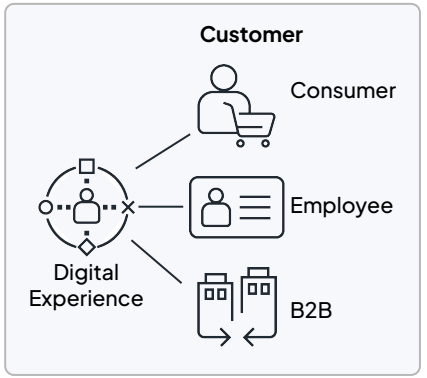
Collaborative development hindered

Testing cycles extended

Slow product iteration

You write code. You want to get it to the hands of the customer ASAP.

- Runtime architecture, CICD, DevOps, Environments, SecOps, Configuration Management, Version management, Testing, Observability, Analytics, SRE,
- Code writing also needs access to reuse
- DevOps goes to Canary etc.
- Self Service and policy-driven
- Zero Trust environment



To simplify, building a platform requires mastering technical complexities, essential skills, and significant time and financial investment.

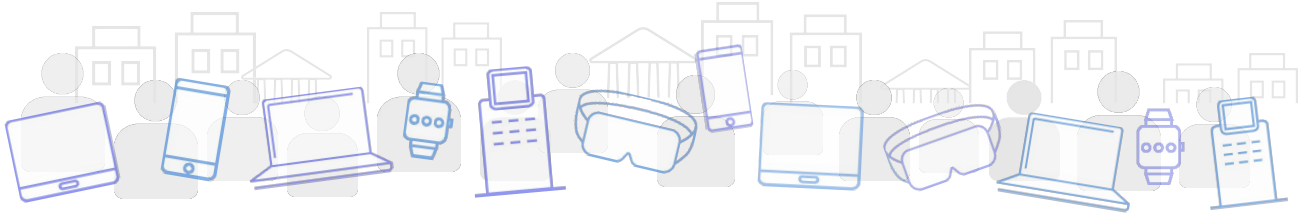
Does Kubernetes offer all essential features for an enterprise developer platform?



Kelsey Hightower ✓
@kelseyhightower

Kubernetes is a platform for building platforms. It's a better place to start; not the endgame.

Choreo – an Internal Developer Platform as a Service



Digital Experiences

Choreo

Internal Developer Platform

Enterprise Software Engineering

Software Delivery & Operations

What does Choreo deliver?

Establish your **enterprise software engineering** practice

- API-first development
- Domain driven design
- Microservice architecture
- Test driven development
- Automated DevOps
- Secure by default
- Version management
- Iterative architecture
- AI augmented engineering

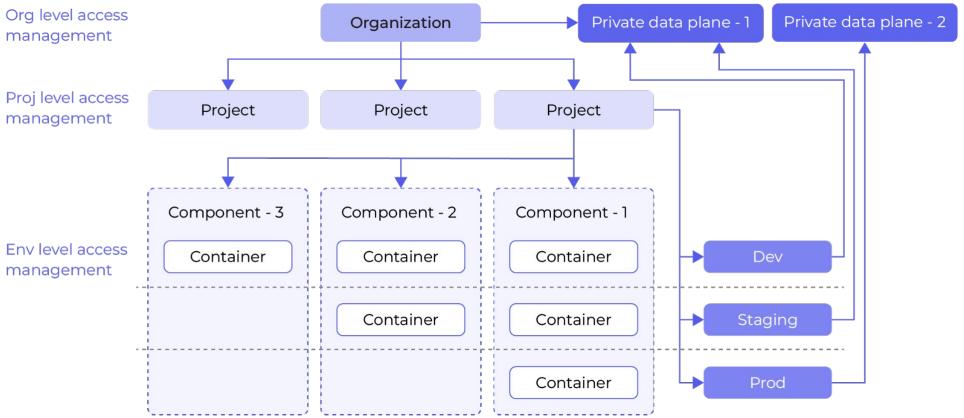
Refine modern **software delivery & operations**

- Higher-Level Abstractions
- Developer self-service
- Infrastructure management
- Multi-cloud, multi-environment
- CI/CD & GitOps
- Resource optimization
- Observability, insights & alerting
- Security & Compliance
- Resiliency, scalability & HA

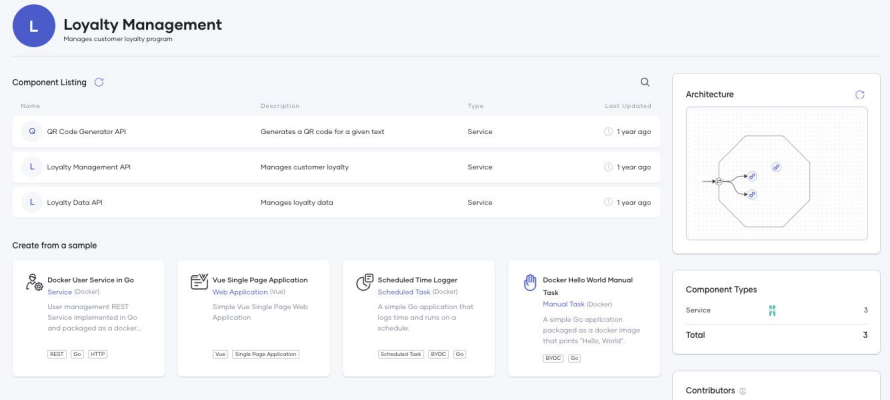
Higher-Level Abstractions for Enterprises

Kubernetes: Offers only low-level abstractions, requiring enterprises to manually structure and manage workloads.

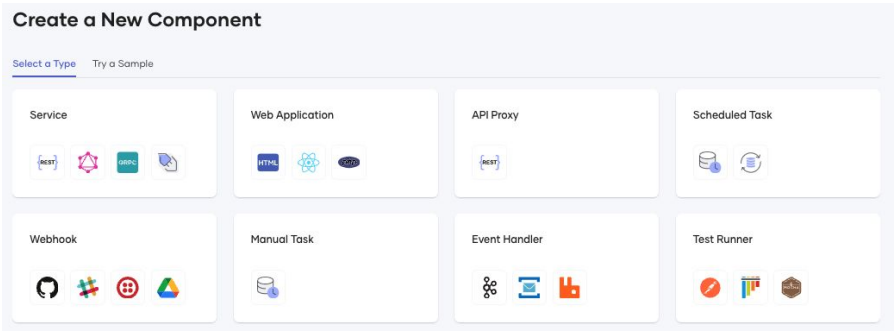
Choreo: High-level abstractions like organizations, projects, environments and components, simplifying enterprise application management.



Ease of Use and Unified Console



Kubernetes: Requires deep expertise; developers must learn YAML, Helm, and CLI tools. Complex configuration management slows down development.

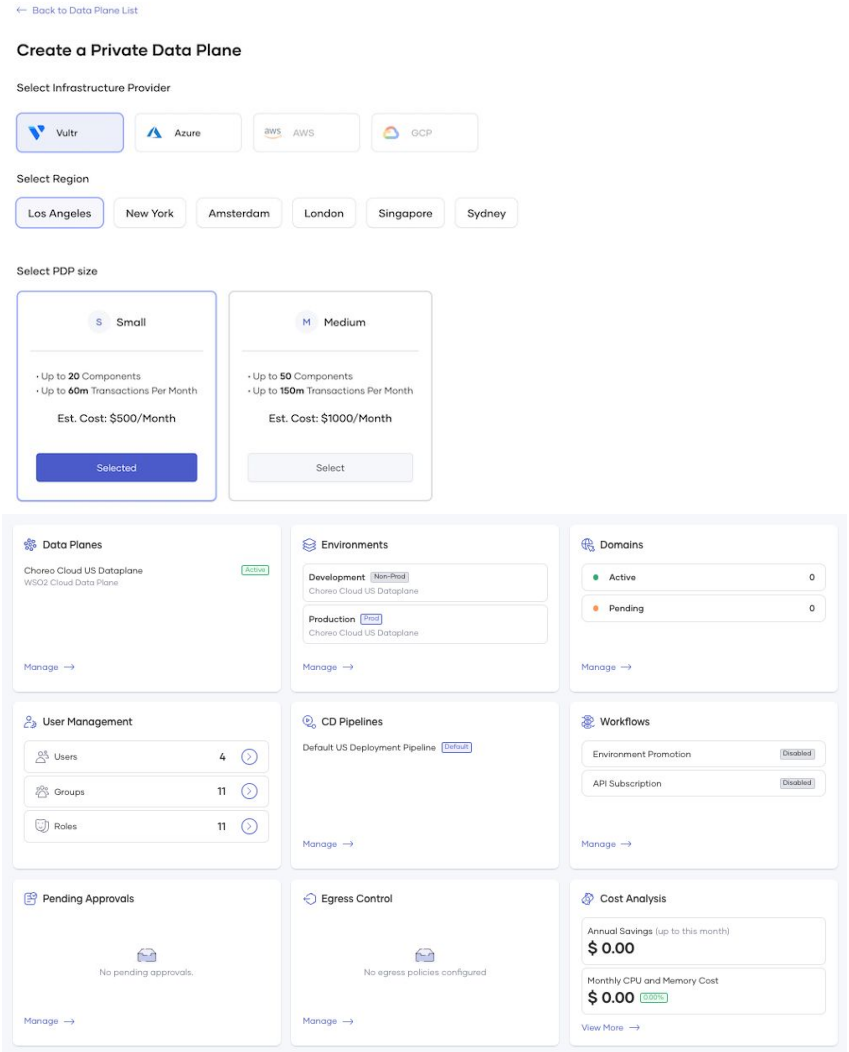


Choreo: Provides an intuitive UI, API-driven workflows, and developer-friendly abstractions, allowing developers to focus on innovation rather than infrastructure.

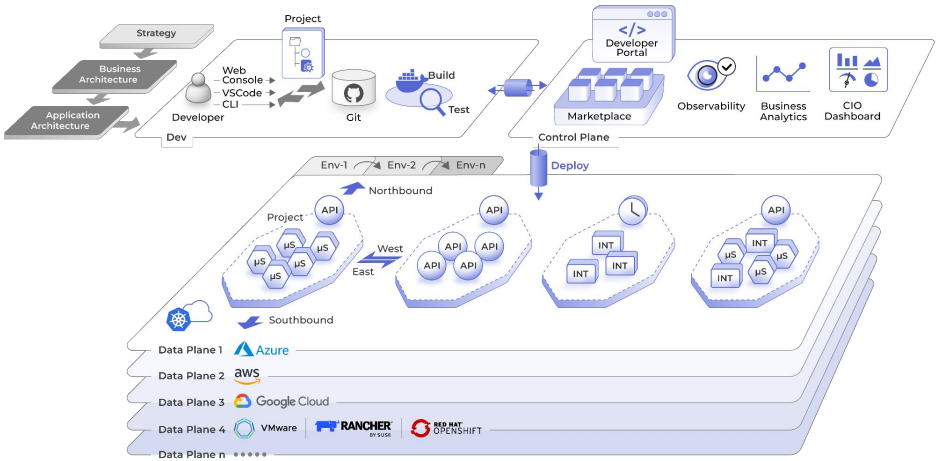
Infrastructure Management

Kubernetes: Manual setup of networking, storage, and compute. Requires DevOps intervention for cluster management.

Choreo: Automates provisioning and configuration, reducing infrastructure overhead and ensuring seamless integration with enterprise needs.



Multi-Cloud & Hybrid Support



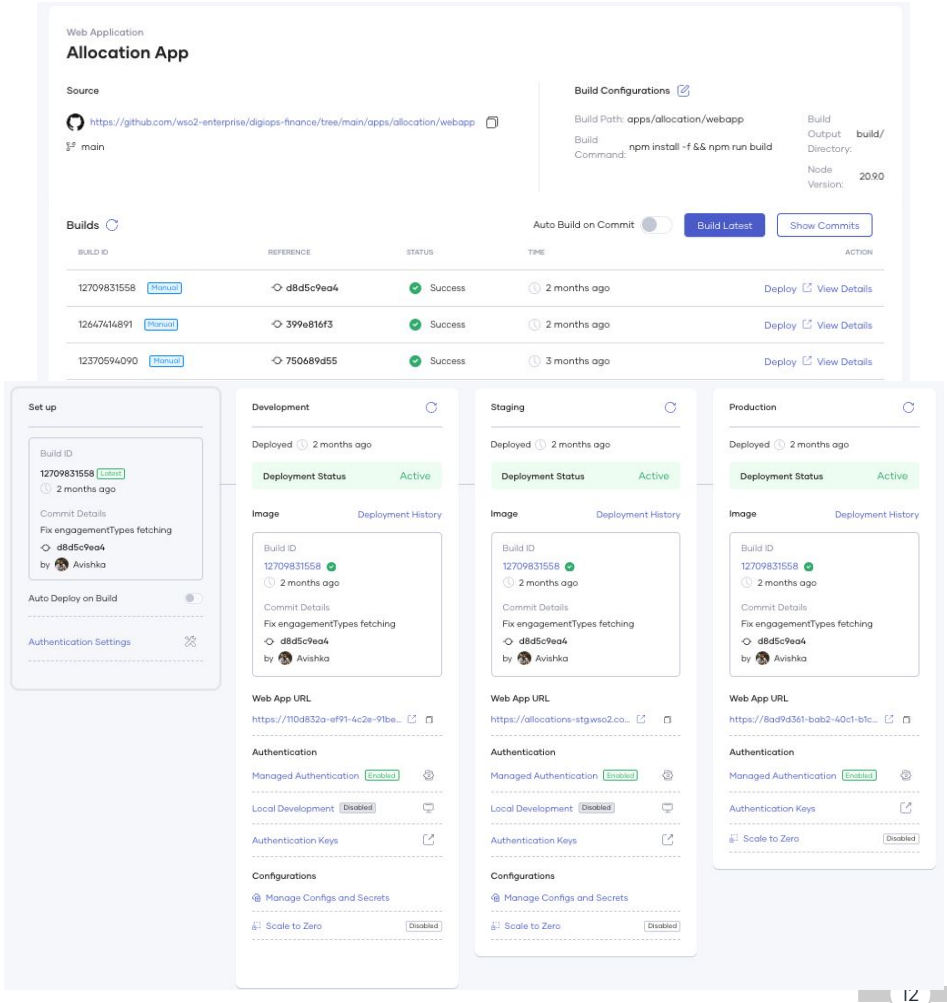
Kubernetes: Supports multi-cloud but requires additional setup with tools like Anthos, Crossplane or service mesh solutions.

Choreo: Natively supports multi-cloud and hybrid cloud environments with seamless deployment across different providers.

CI/CD Integration

Kubernetes: Needs third-party tools like ArgoCD, Tekton, or Jenkins for continuous deployment. Requires custom pipeline configurations.

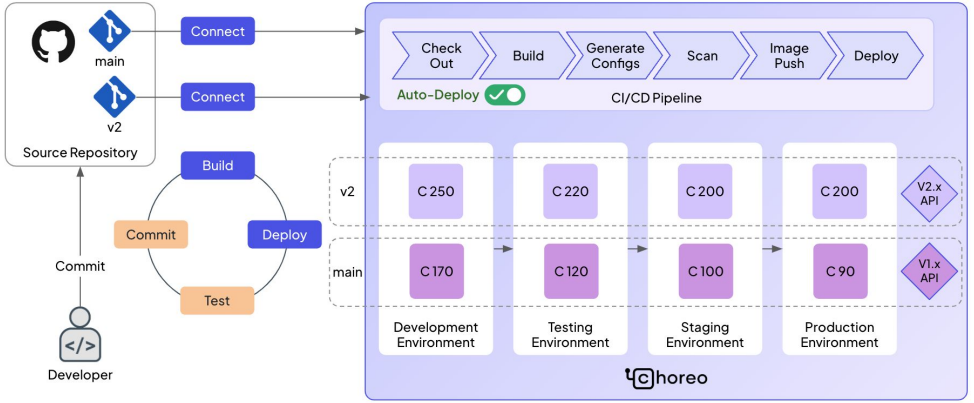
Choreo: Comes with built-in CI/CD pipelines, simplifying code-to-production workflows and enabling seamless deployments.



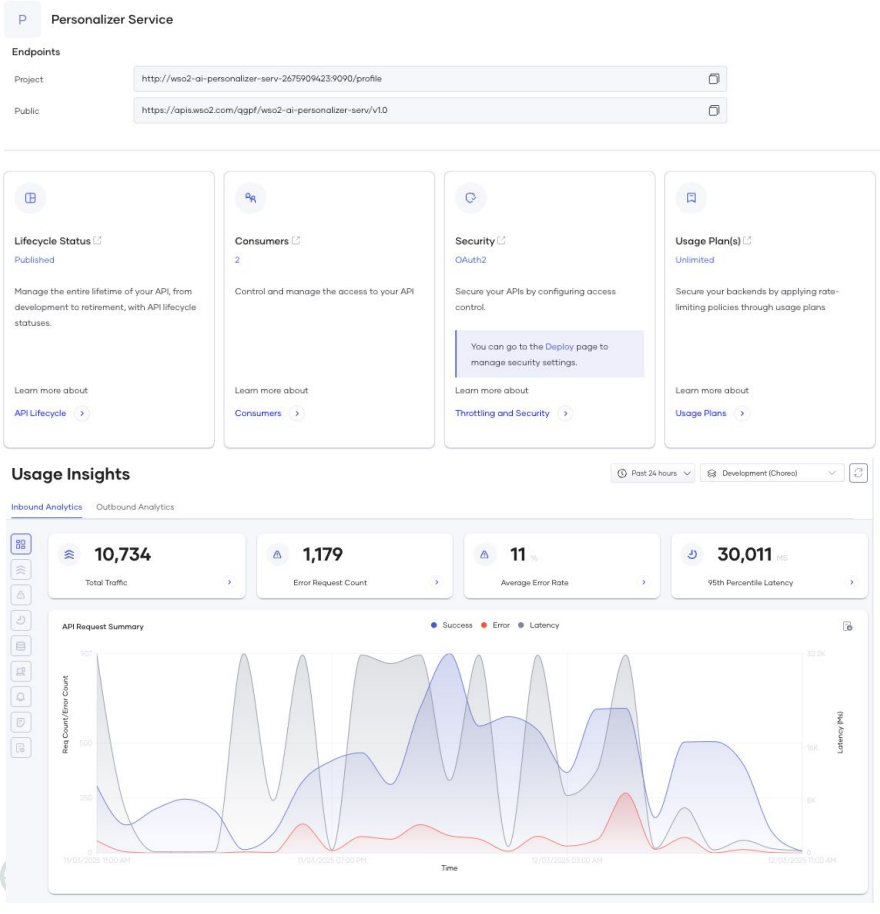
Application Lifecycle Management

Kubernetes: Manual upgrades, rollbacks, and versioning management.

Choreo: Provides built-in versioning, rollback, and progressive delivery strategies, reducing risk and simplifying release management.



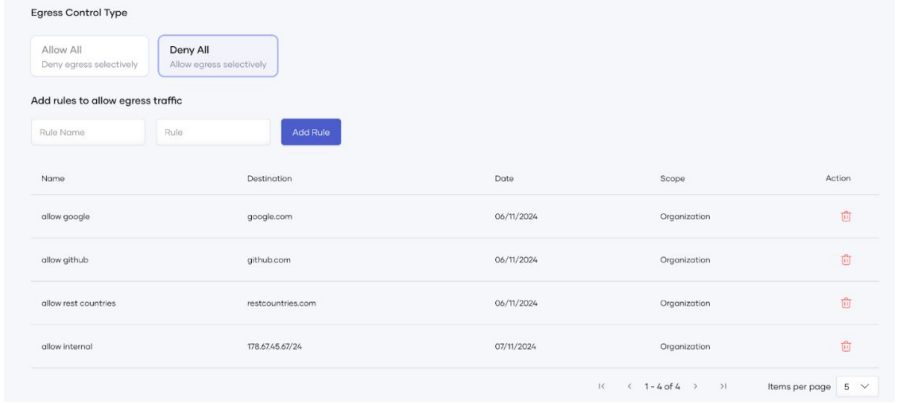
API Management

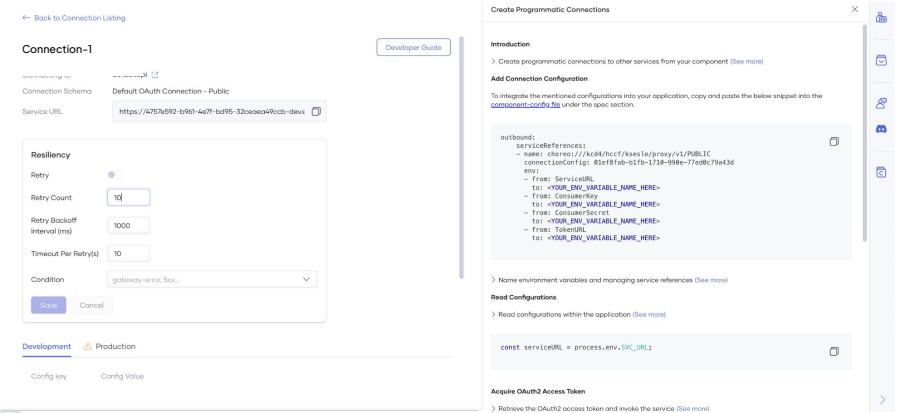


Kubernetes: Lacks built-in API management, requiring external tools like WSO2 for API gateways, policy enforcement, security, and analytics, adding complexity

Choreo: Offers built-in API management with authentication, rate limiting, versioning, and analytics, streamlining API lifecycle management.

Service Mesh & Traffic Control





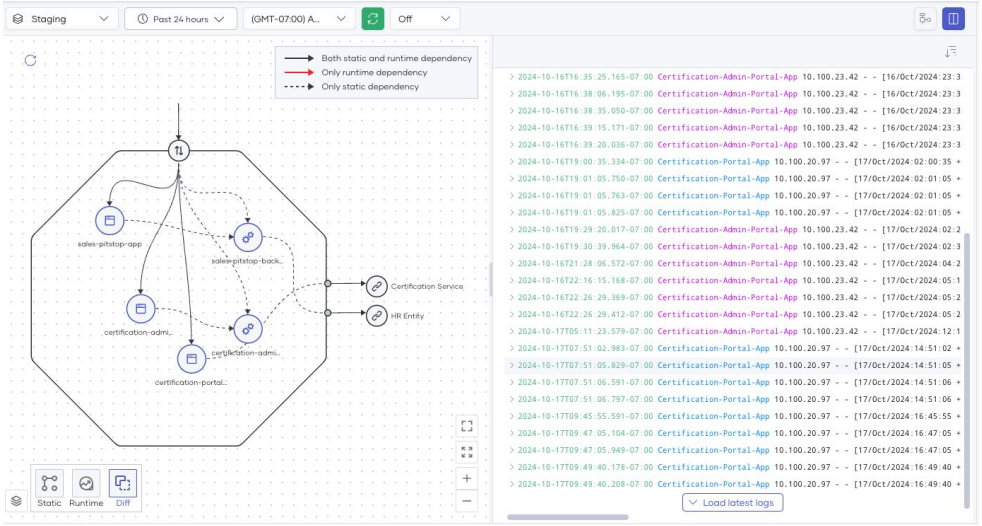
Kubernetes: Needs separate tools like Istio or Linkerd for service mesh capabilities, adding complexity.

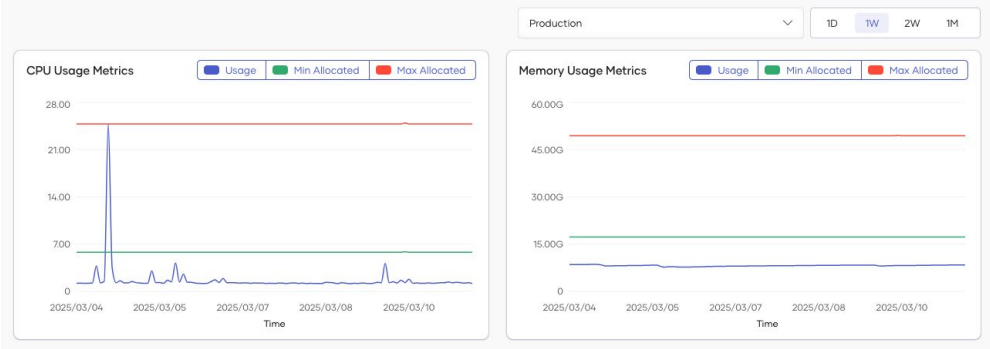
Choreo: Comes with a built-in service mesh, API gateway, and ingress/egress controls, making service-to-service communication secure and efficient.

Observability & Monitoring

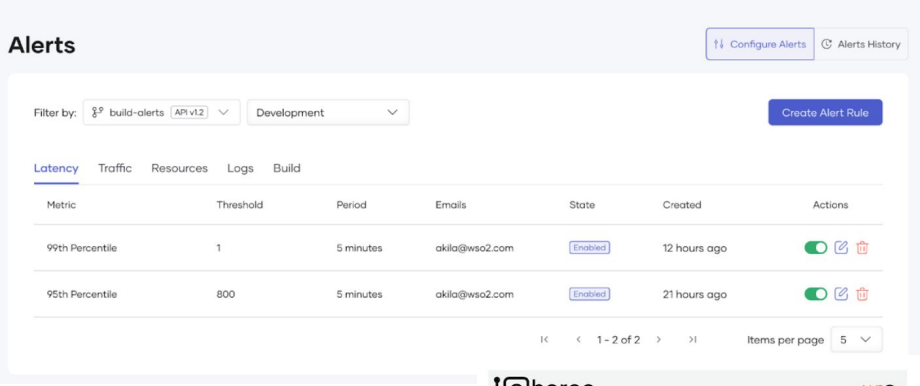
Kubernetes: Requires integration with Prometheus, Grafana, eBPF, OpenTelemetry for insights, adding complexity.

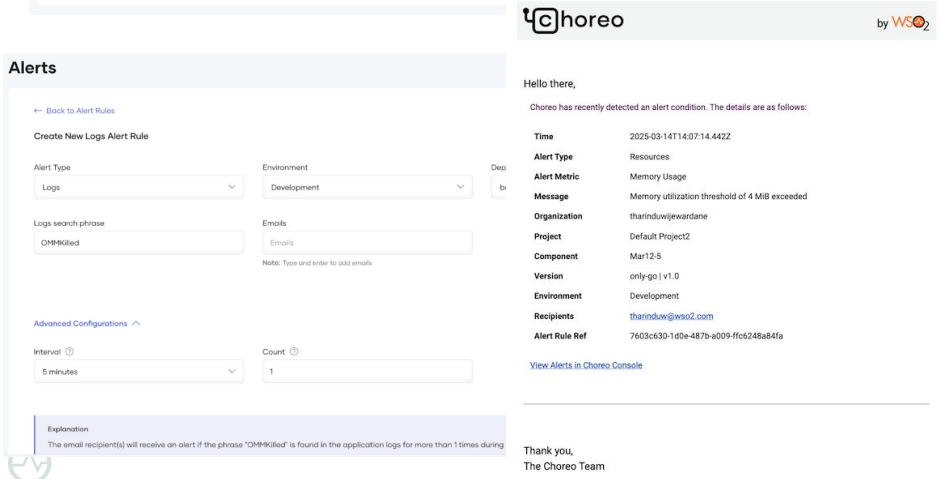
Choreo: Provides real-time monitoring, metrics, and logging with a unified observability dashboard, enabling better visibility and faster troubleshooting.





Application Health Monitoring & Alerting

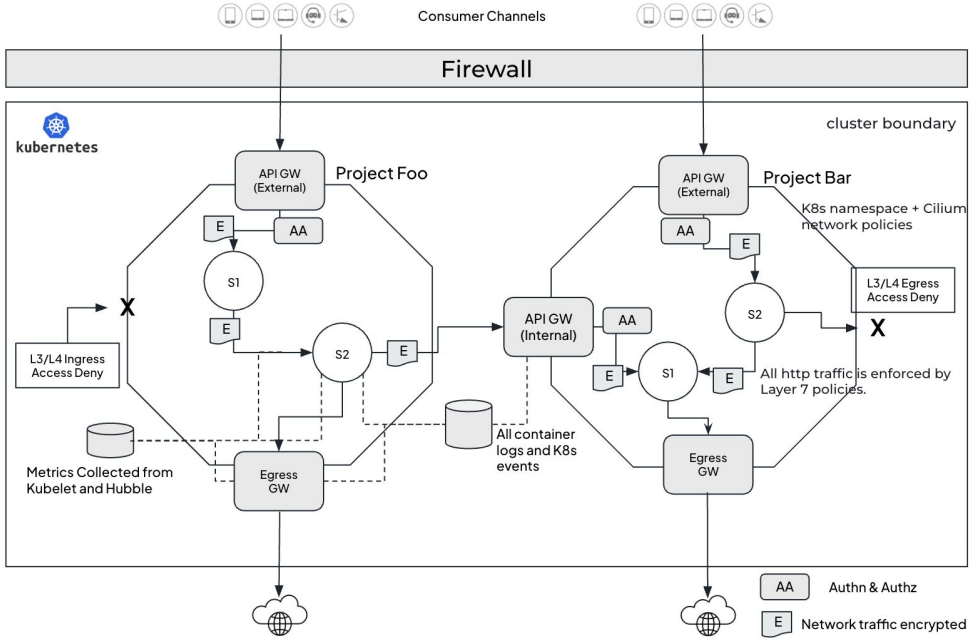




Kubernetes: Lacks built-in health monitoring and alerting, relying on external tools like Prometheus and Grafana with manual setup.

Choreo: Provides integrated health monitoring and proactive alerting with real-time insights, automated anomaly detection, and built-in dashboards, ensuring faster issue resolution.

Security & Compliance



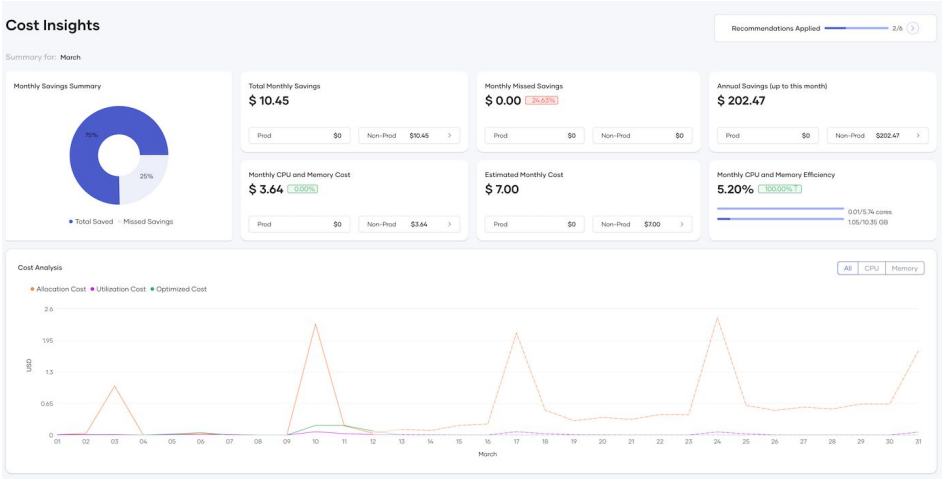
Kubernetes: Security is not built-in; requires manual enforcement of policies like RBAC, Zero-Trust, and network segmentation.

Choreo: Implements security best practices out of the box, including role-based access control (RBAC), encryption, and compliance with enterprise security standards.

Cost Optimization

Kubernetes: Requires manual resource allocation and monitoring to avoid over-provisioning or under-utilization.

Choreo: Offers automated cost insights, efficient resource utilization, and built-in optimizations to control expenses.



Effort involved in developing Choreo, an Internal Developer Platform.

Cloud-Native Tools Used in the Current Implementation of Choreo





































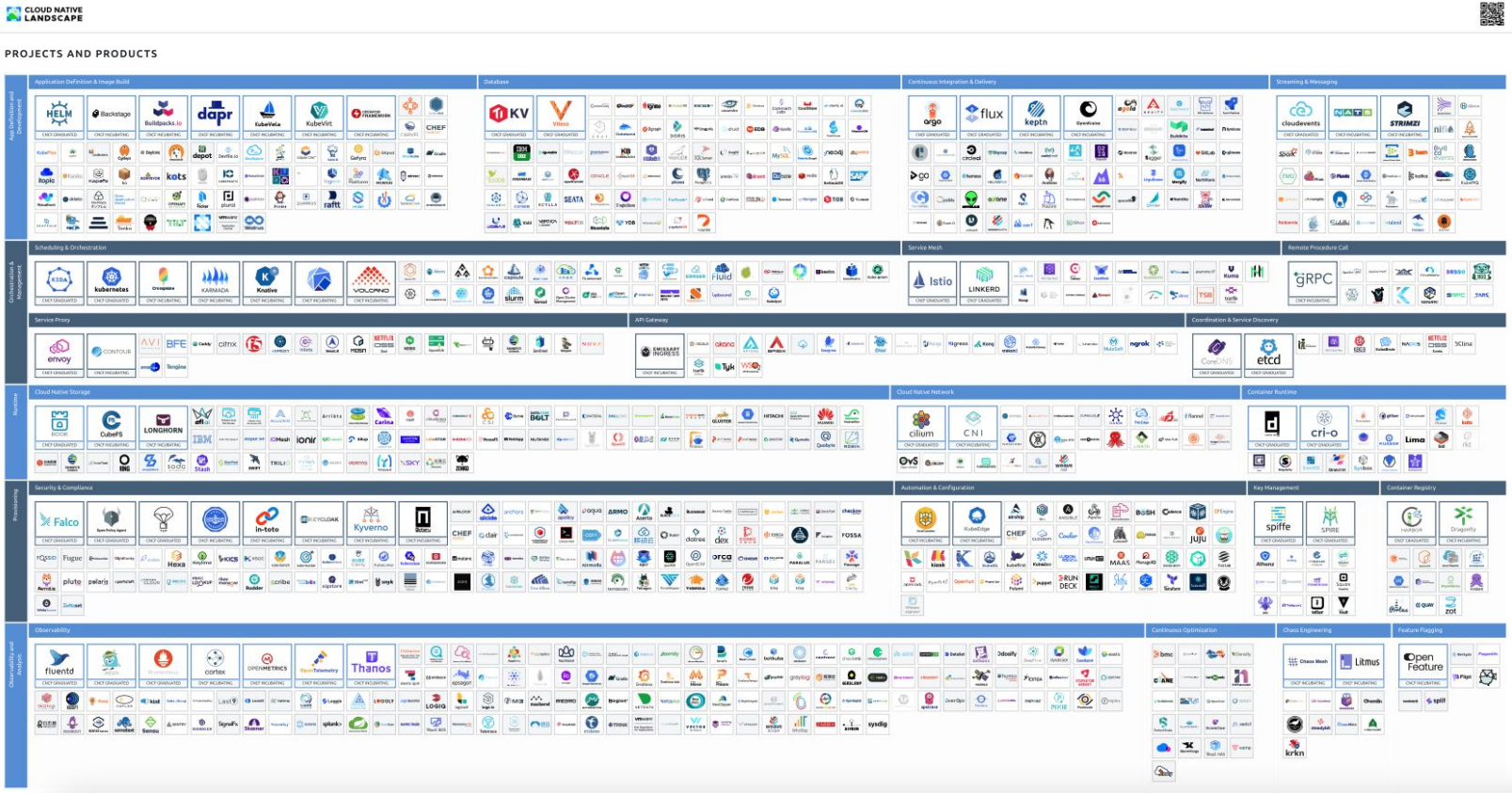


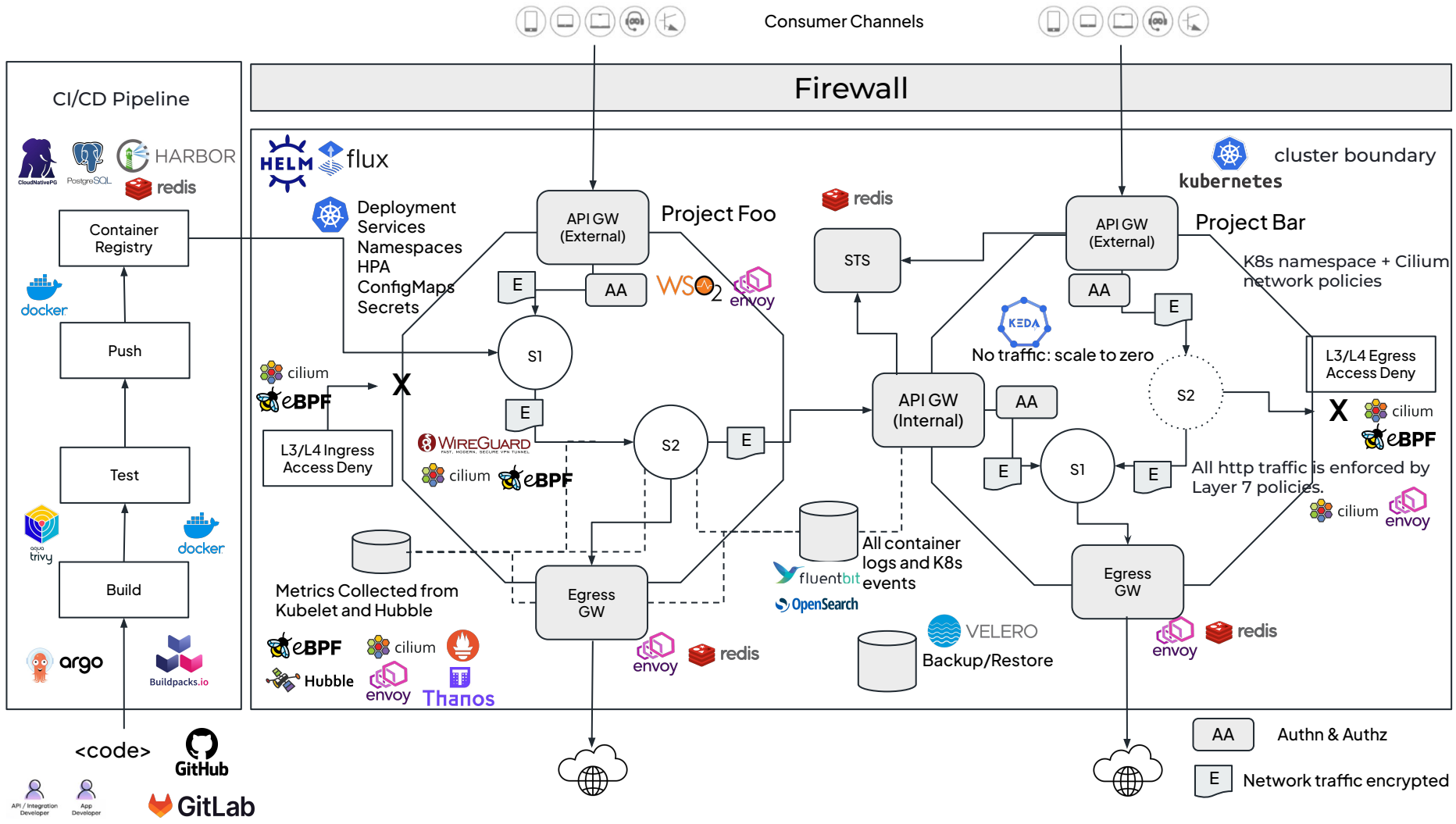






Cloud-Native landscape is very complex




Consumer Channels
Firewall
CI/CD Pipeline
CloudNativePG
PostgreSQL
HARBOR
redis
Container Registry
docker
Push
Test
trivy
docker
Build
argo
Buildpacks.io
<code>
GitHub
GitLab
API / Integration Developer
App Developer
HELM
flux
Deployment
Services
Namespaces
HPA
ConfigMaps
Secrets
cilium
eBPF
L3/L4 Ingress Access Deny
API GW (External)
Project Foo
E
AA
WSO2
envoy
S1
E
WireGuard
cilium
eBPF
S2
E
Metrics Collected from Kubelet and Hubble
eBPF
cilium
Hubble
envoy
Thanos
Egress GW
envoy
redis
redis
STS
API GW (Internal)
AA
E
S1
E
S2
E
fluentbit
OpenSearch
All container logs and K8s events
VELERO
Backup/Restore
cluster boundary
kubernetes
API GW (External)
Project Bar
K8s namespace + Cilium network policies
AA
E
KEDA
No traffic: scale to zero
S2
L3/L4 Egress Access Deny
cilium
eBPF
All http traffic is enforced by Layer 7 policies.
cilium
envoy
Egress GW
envoy
redis
AA
Authn & Authz
E
Network traffic encrypted

Choreo Engineering facts

- Integration of 20+ CNCF Projects
- Single Unified Console for All Functionalities
- Over 80 Team Members Working for 4+ Years
- 20+ Core Platform Engineers
- 15+ Dedicated SREs
- Support for All Major Cloud Providers, Including Azure, GCP, AWS, and On-Premises.

Key Takeaways

- Bare Kubernetes is not enough for enterprise application development and deployment.
- Building an IDP is complex, demanding significant time, investment, and expertise.
- Going platformless by adopting Platform as a Service in your application modernization journey might be a smarter choice.

Question Time!




Thank you!
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