WSO2CON 2024

Choreo: Empowering the Future of Enterprise Software Engineering



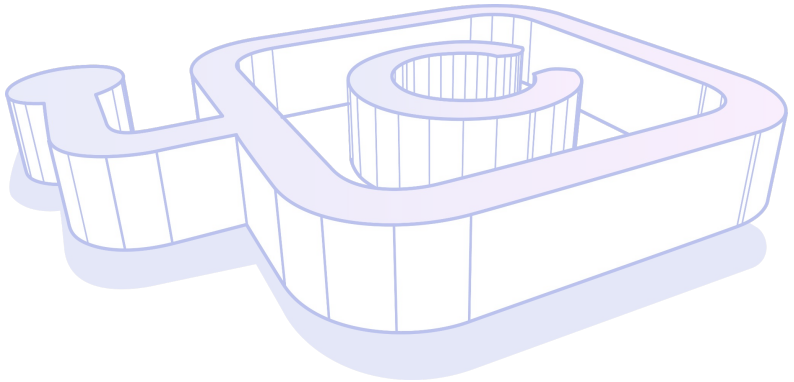
Ramith Jayasinghe
Director - Solutions Architecture
WSO2



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Associate Director
WSO2

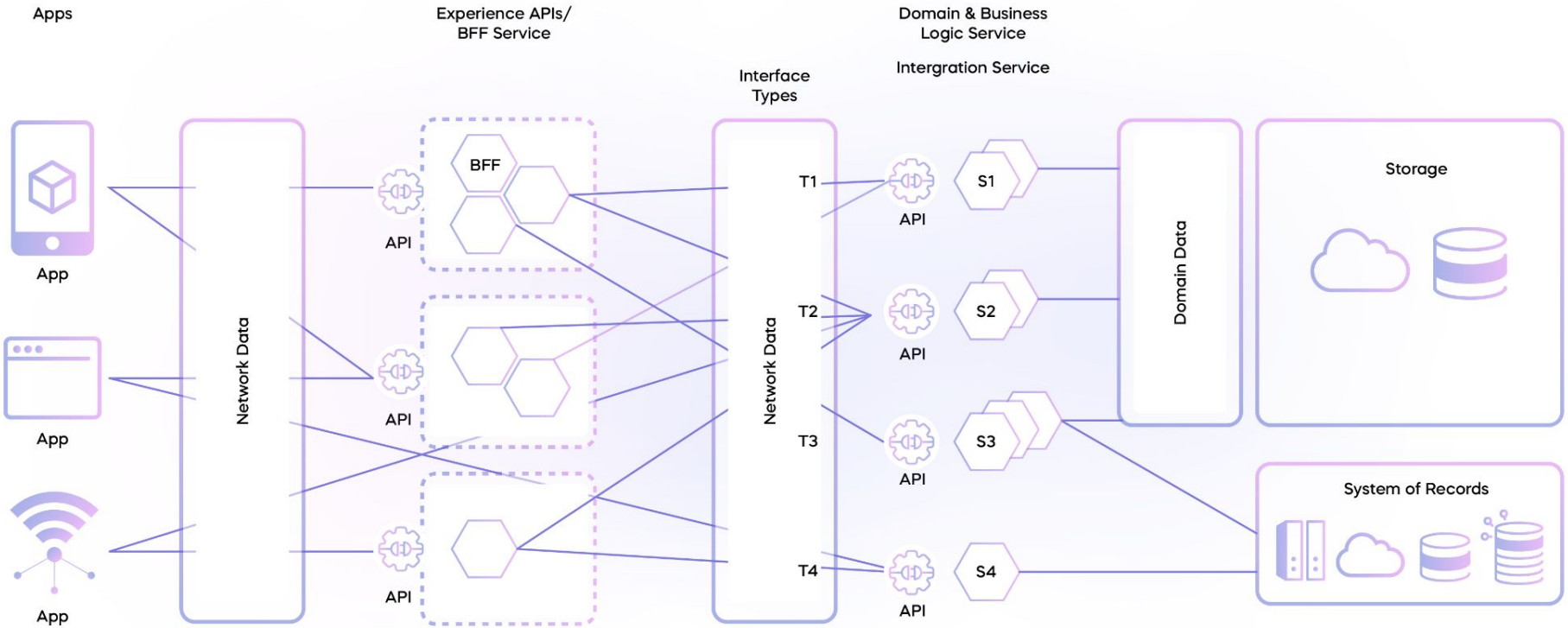
The cloud native era is transforming how we build and deliver technology, creating more dynamic and immersive digital experiences than ever before.

Choreo allows you to focus just on on creating and delivering awesome digital experiences.

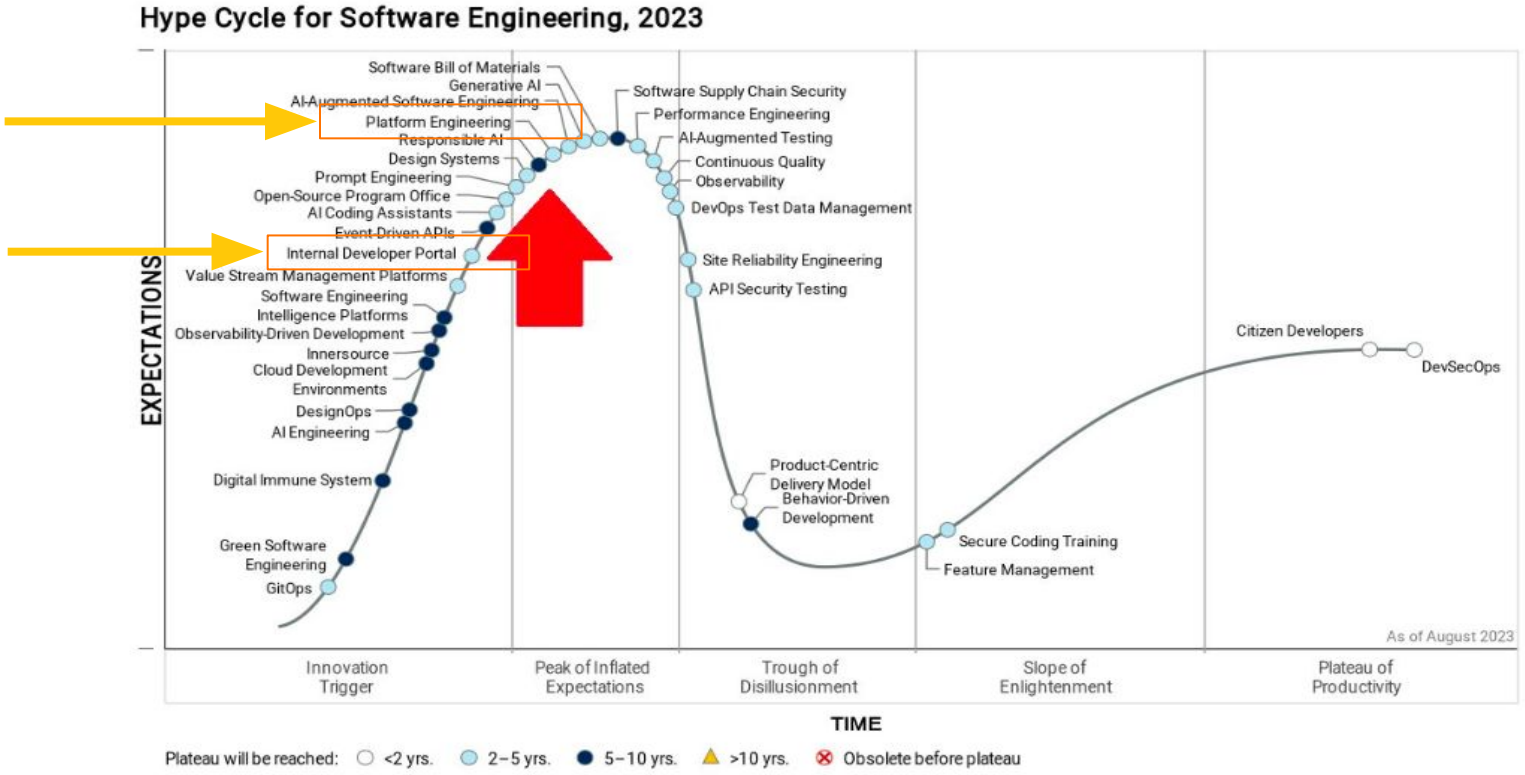


Choreo is an **internal developer platform** that facilitates **enterprise software engineering** and **software delivery & operations**.

Enterprise application architecture is evolving

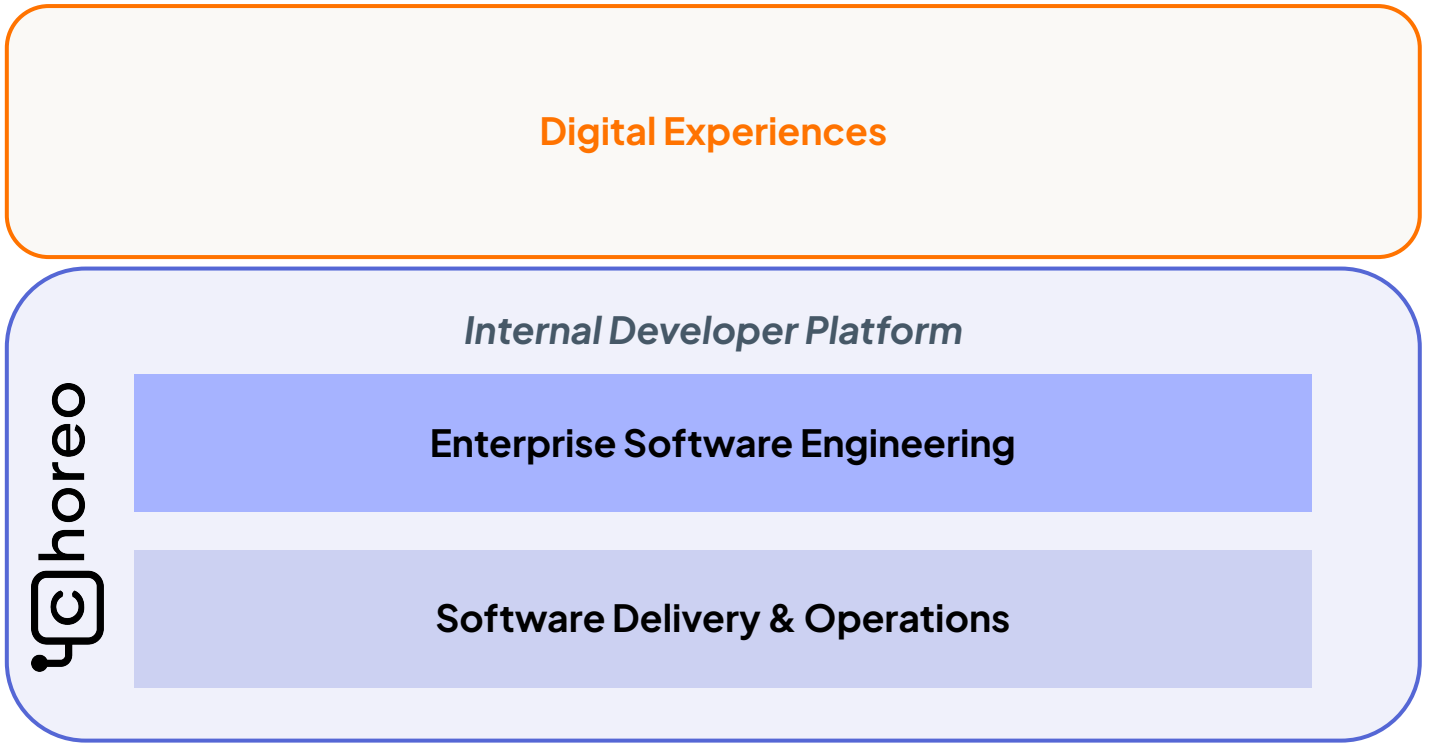


“CIOs are engineering platforms to foster composable technology practices.” – Gartner

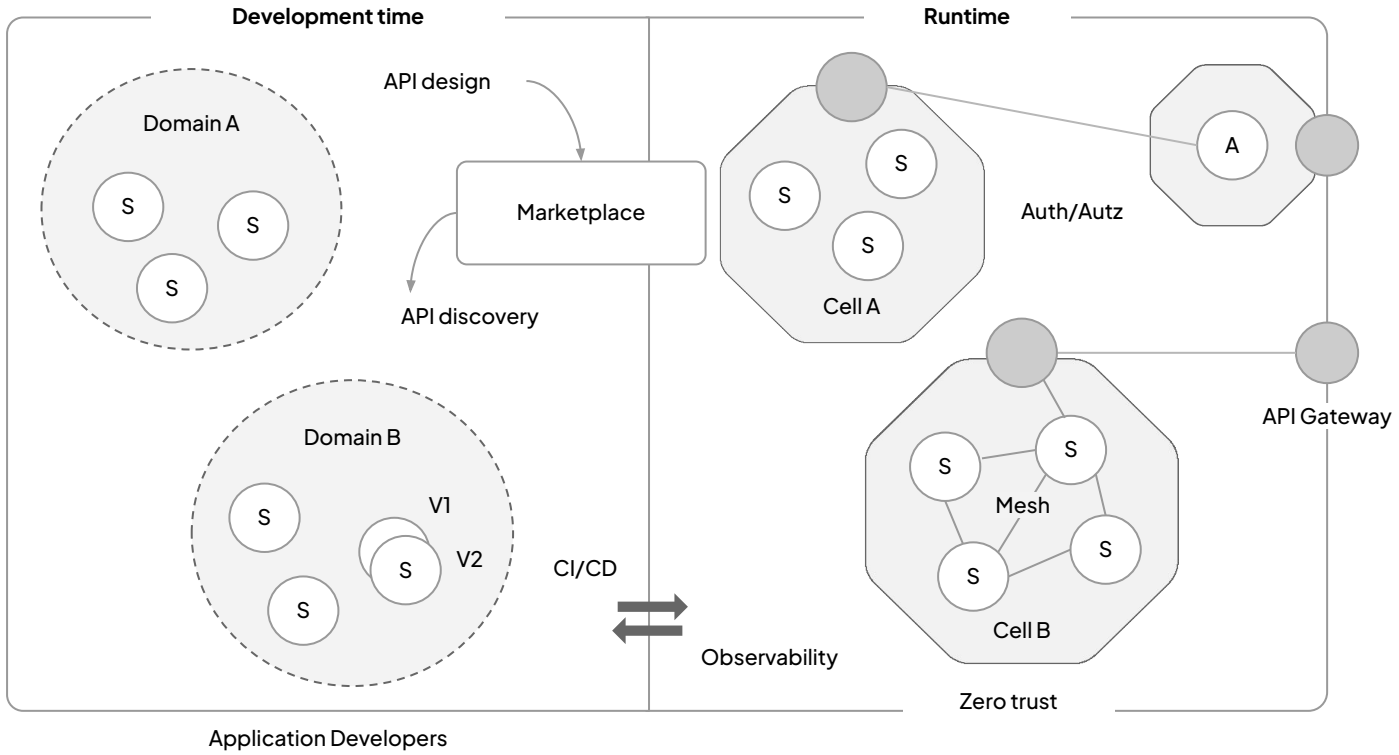


source: https://www.gartner.com/document/4008081

Your digital business, with Choreo



IDevP must facilitate enterprise software engineering



What does Choreo deliver?

Establish your **enterprise software engineering** practice

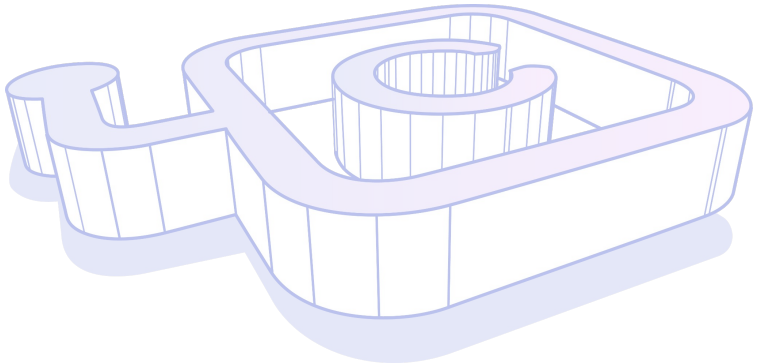
- API-first development
- Domain driven design
- Microservice architecture
- Test driven development
- Automated DevOps
- Secure by default
- Version management
- Iterative architecture
- AI augmented engineering

Refine modern **software delivery & operations**

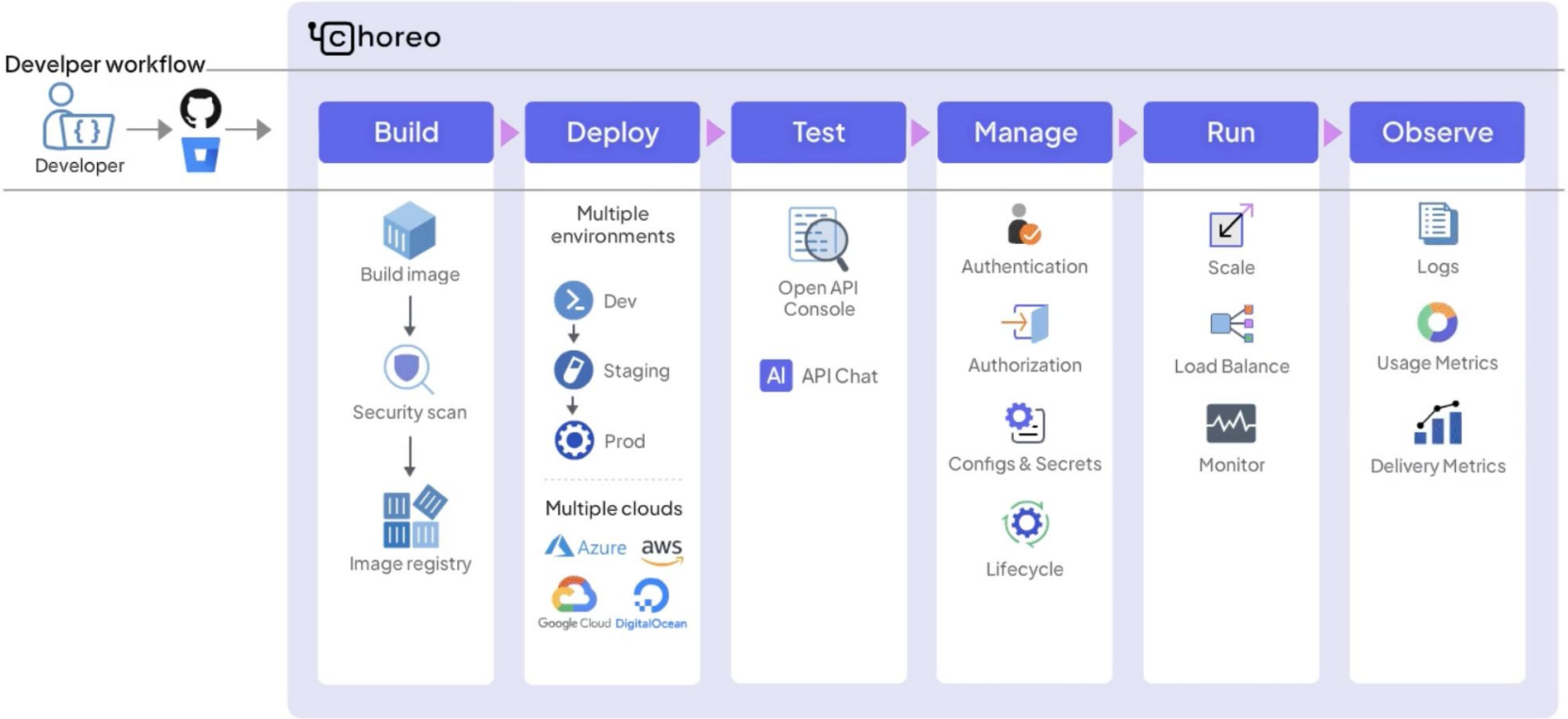
- Developer self-service
- Containerization & Kubernetes
- CI/CD & GitOps
- Resource optimization
- Multi-cloud, multi-environment
- Observability & alerting
- Config & secret management
- Resiliency, scalability & HA
- Operational & business insights

Go platformless and just add developers with WSO2 choreo

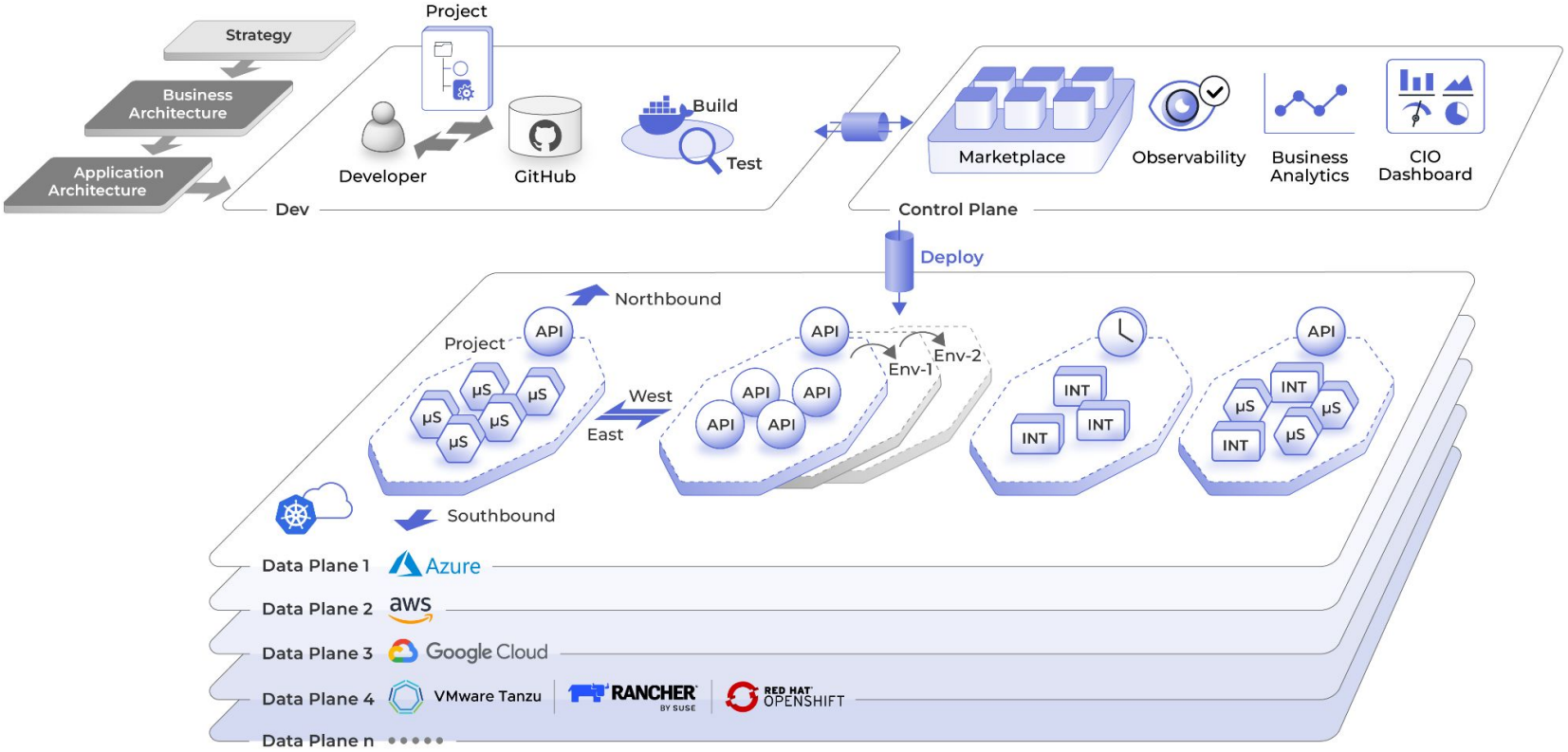
- Built by productizing 15 years of experience in helping customers create their own internal platforms
- End to end platform as a service
- Multi-cloud SaaS
- De-risked and more secure
- Pay as you go - no capex



What is Choreo?



What is Choreo?



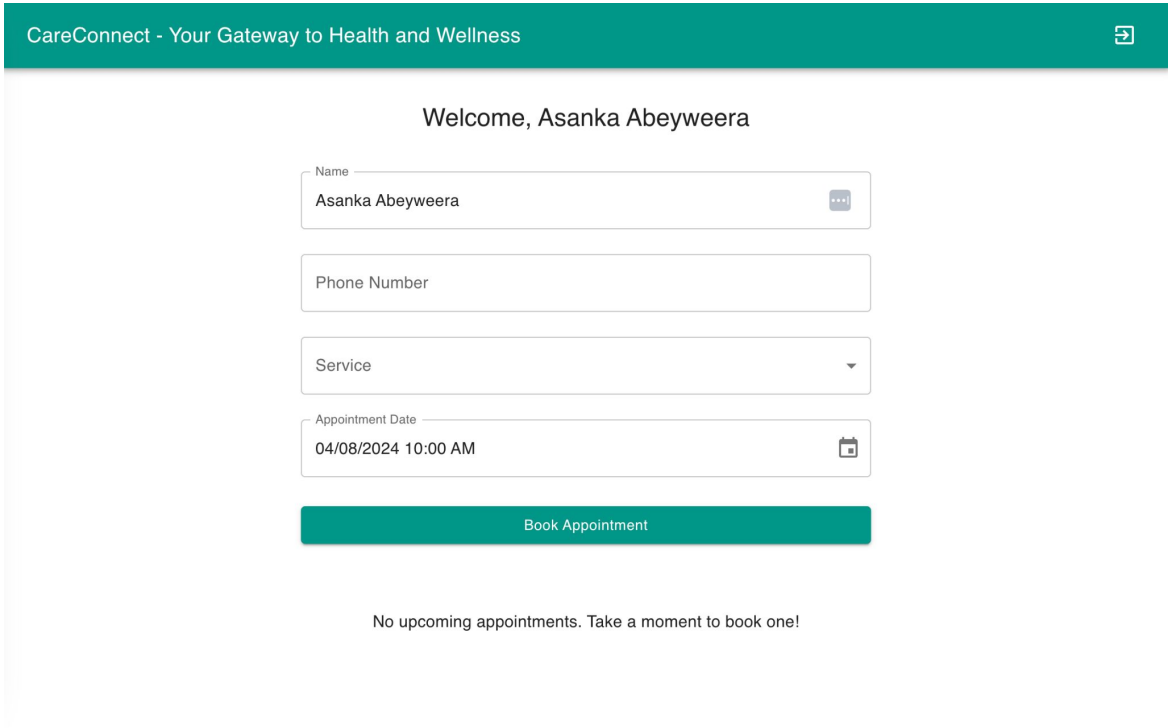
Tutorial GitHub Repository



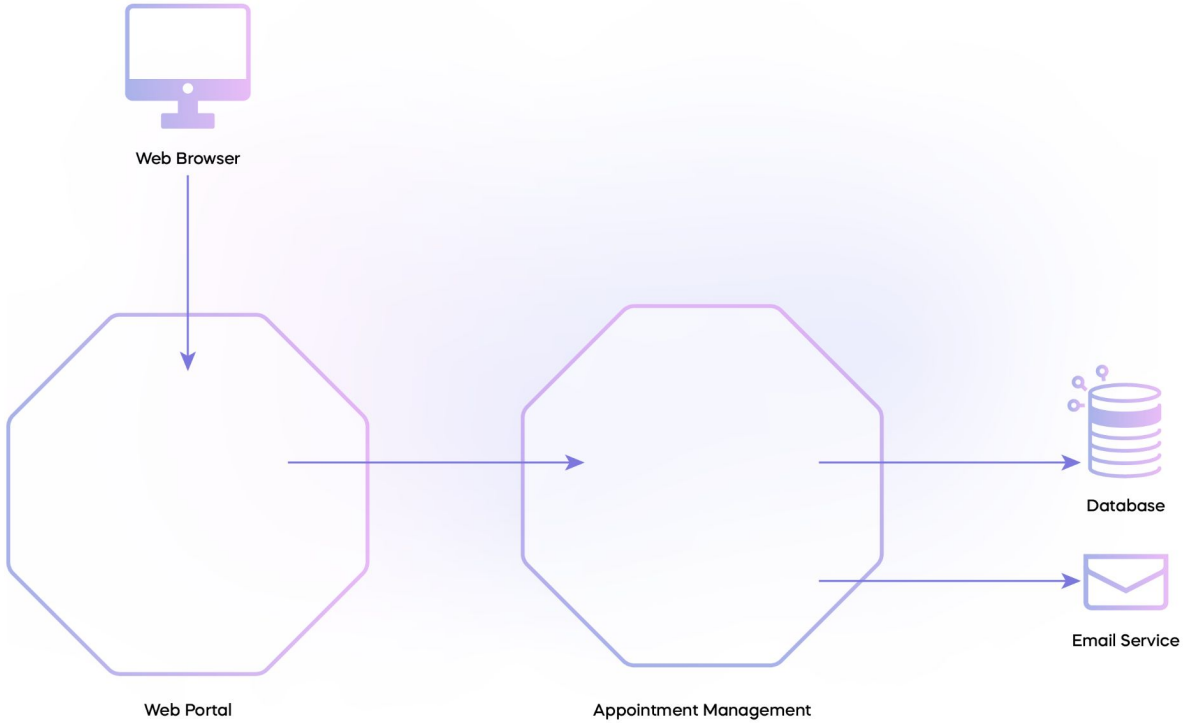
https://github.com/wso2con2024/choreo-tutorial

Demo: Deploying a Microservice in Choreo

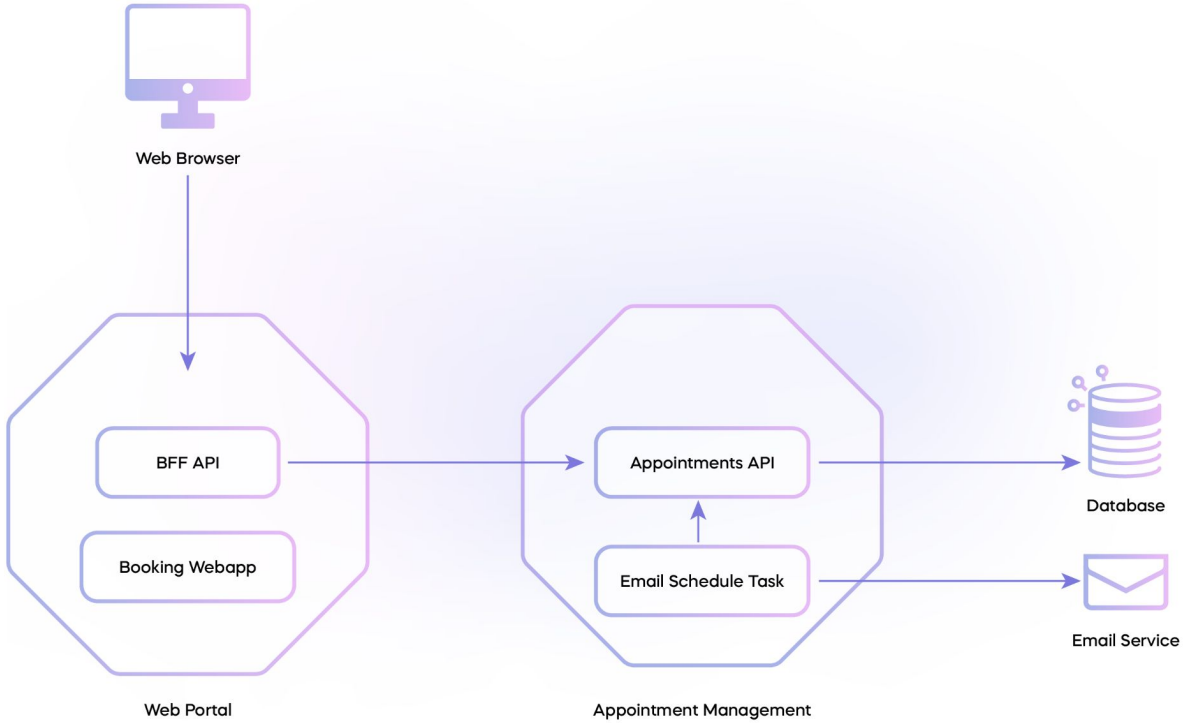
Introduction to the Use Case



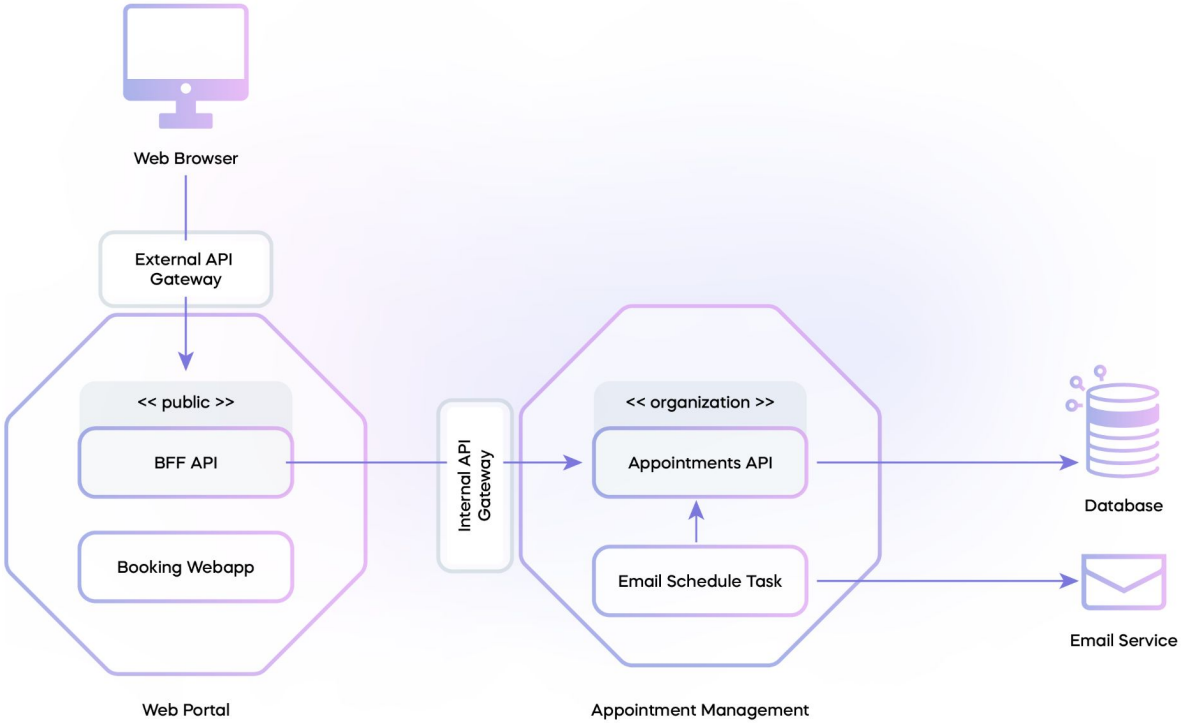
Application Architecture



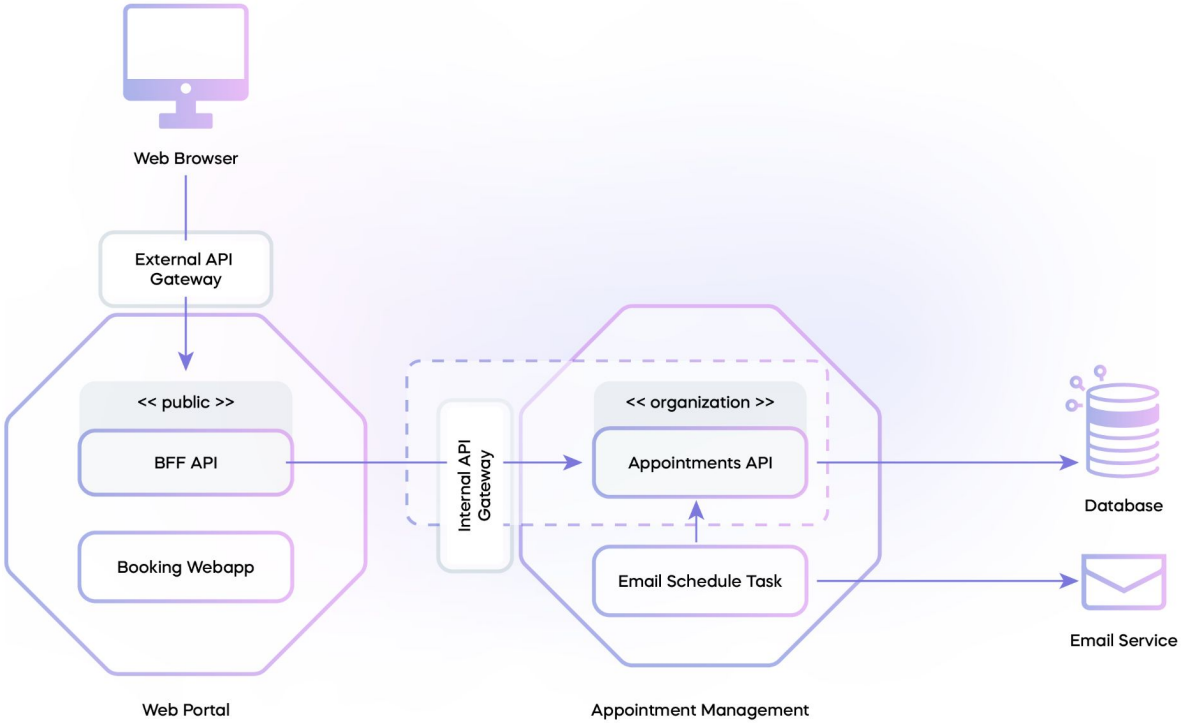
Application Architecture



Application Architecture



Deploying a micro service on Choreo



Tutorial GitHub Repository



https://github.com/wso2con2024/choreo-tutorial

Choreo Concepts

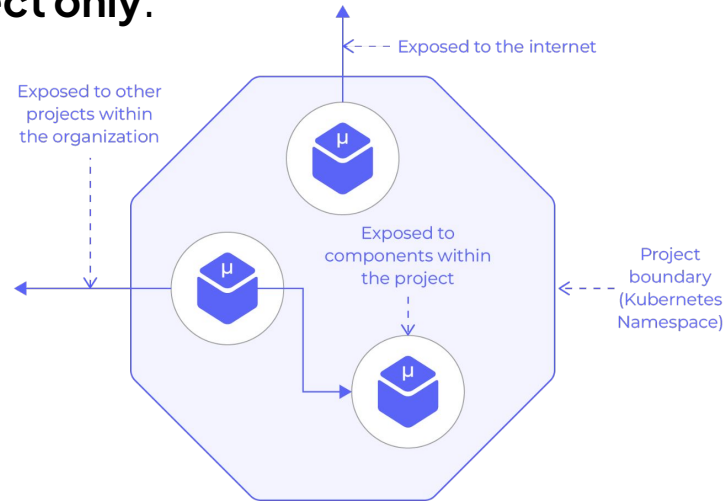
- **Organization:** A logical grouping of users and users' resources.
  - An organization may represent a company, community, or single user.
  - A user can belong to multiple organizations in Choreo.

- **Project:** A logical grouping of components you can create in Choreo allowing users to organize their work effectively. Typically represents a single cloud native application.

- **Component:** A component within a project represents a single unit of work in a cloud native application. Ex: Microservices, manual/scheduled tasks, web apps, webhooks, API Proxies
  - All components within a given project are deployed into a **single namespace of the Kubernetes cluster (dataplane).**

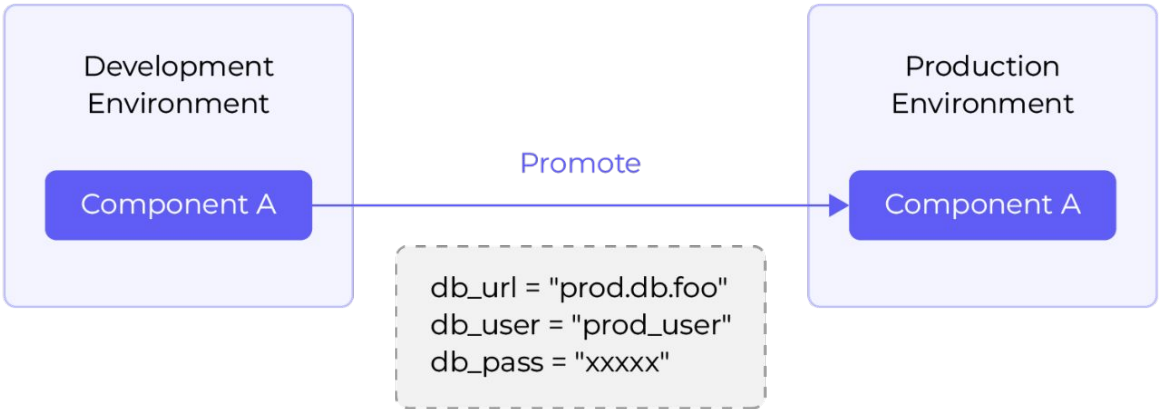
Choreo Concepts

- **Endpoint:** A network-exposed function that resides within a component.
  - Service components can expose one or more endpoints.
  - Each endpoint in a component can have a service contract (OpenAPI, GraphQL SDL) associated with it.
- An endpoint within a project can be exposed to the **internet**, **to neighbouring projects**, or **within the project only**.

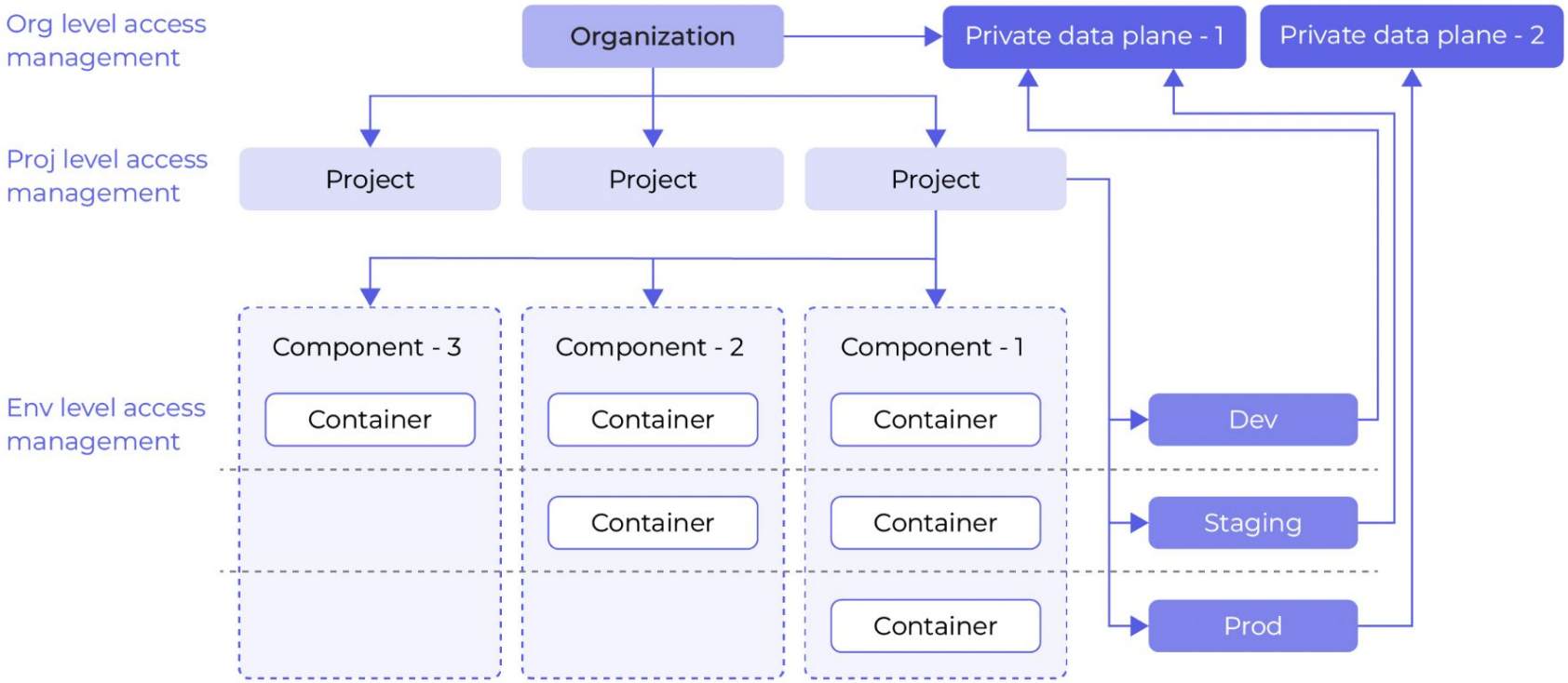


Choreo Concepts

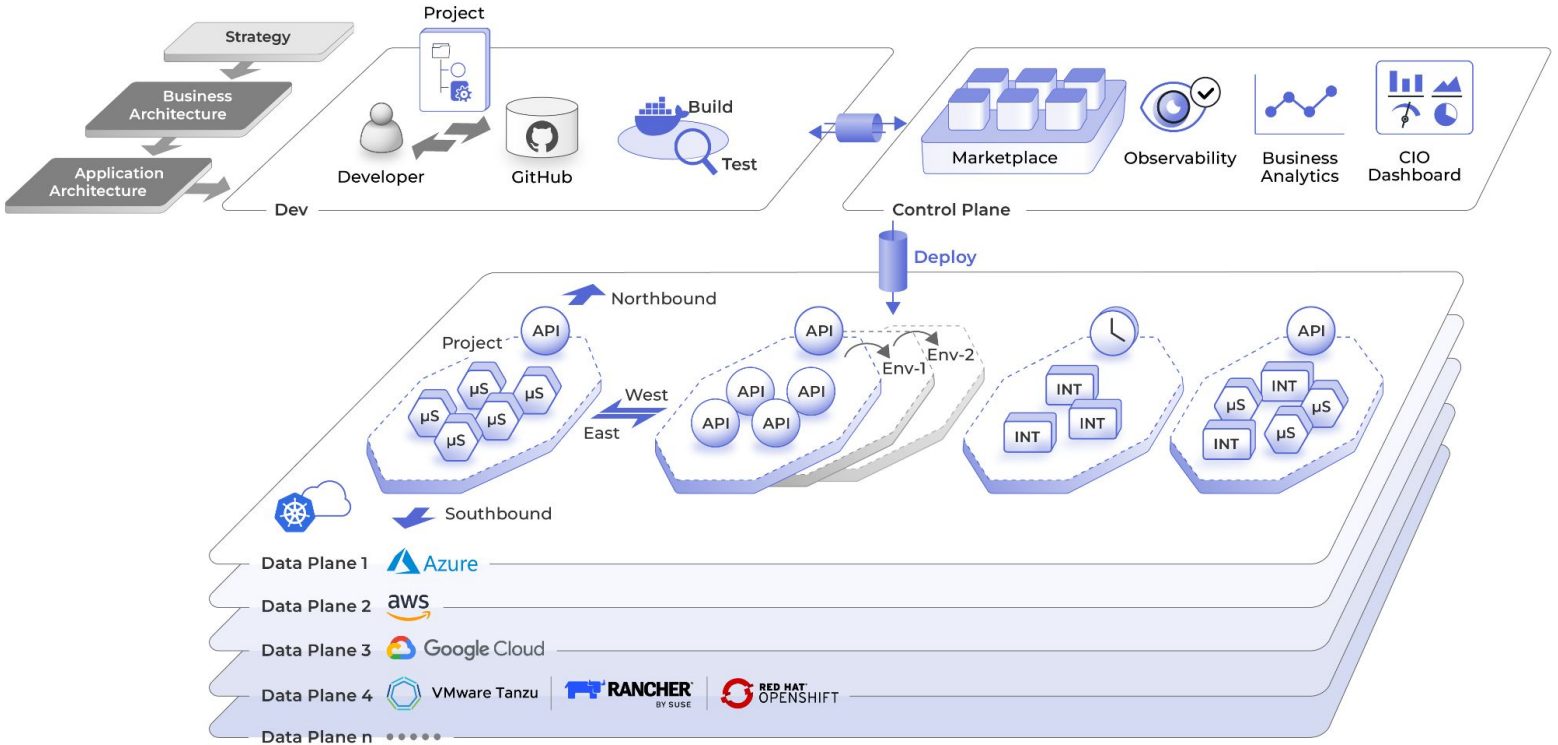
- An **environment** refers to a specific set of configurations and isolated infrastructure/resources where user workloads are executed.
- Choreo supports any number of environments per organization.



Choreo Concepts



Choreo Architecture



Choreo Concepts

- **Control Plane:** Centralized management component of Choreo that oversees and coordinates the workloads deployed by customers. It provides a unified point of control and visibility for the organization, allowing administrators to manage, monitor, and orchestrate the organization's resources efficiently.

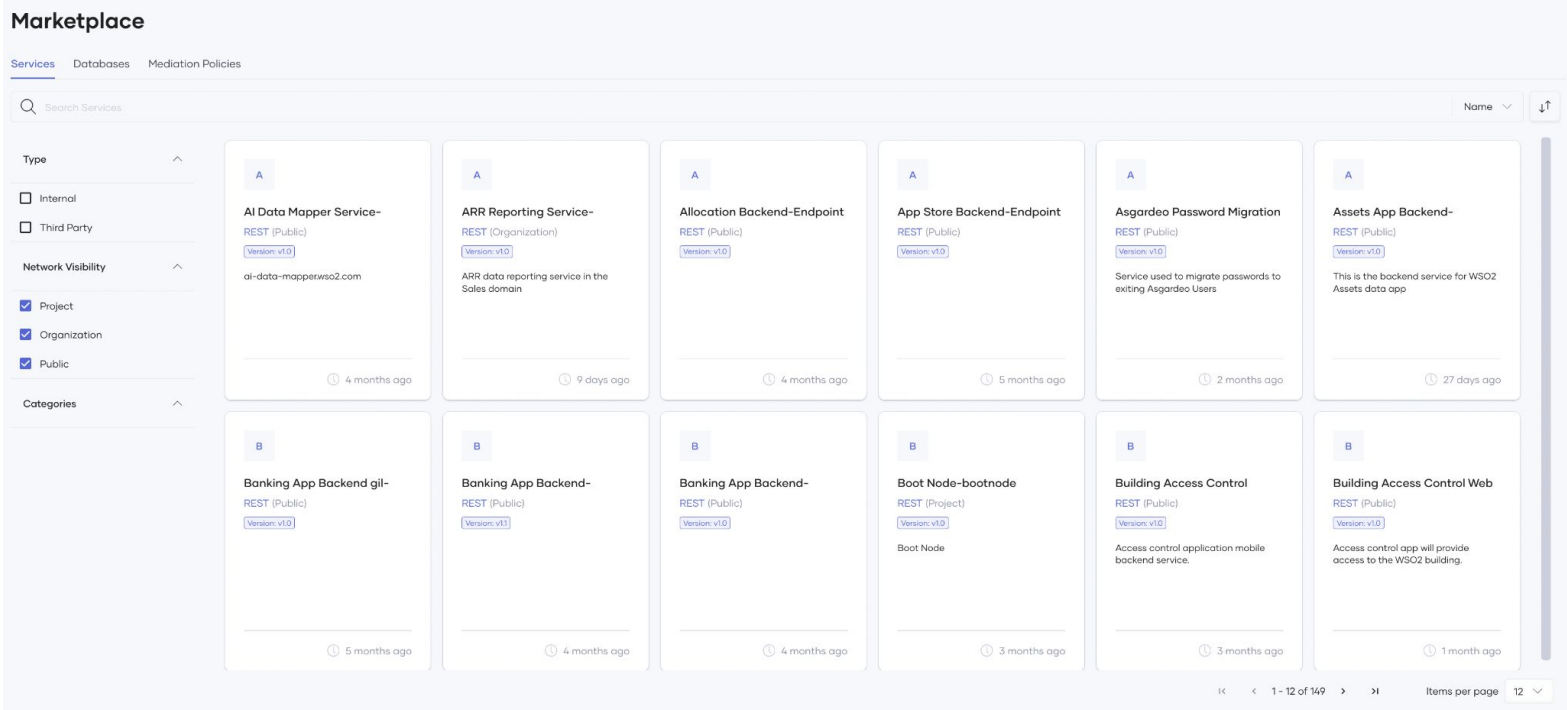
- **Data Plane:** A Choreo integrated computing environment designed for running customer workloads in a dedicated cloud infrastructure either owned by the customer (private data planes) or WSO2 (cloud data plane).

- The control plane and data plane communicate via APIs. The data plane can continue to operate independently even if the control plane is out of reach



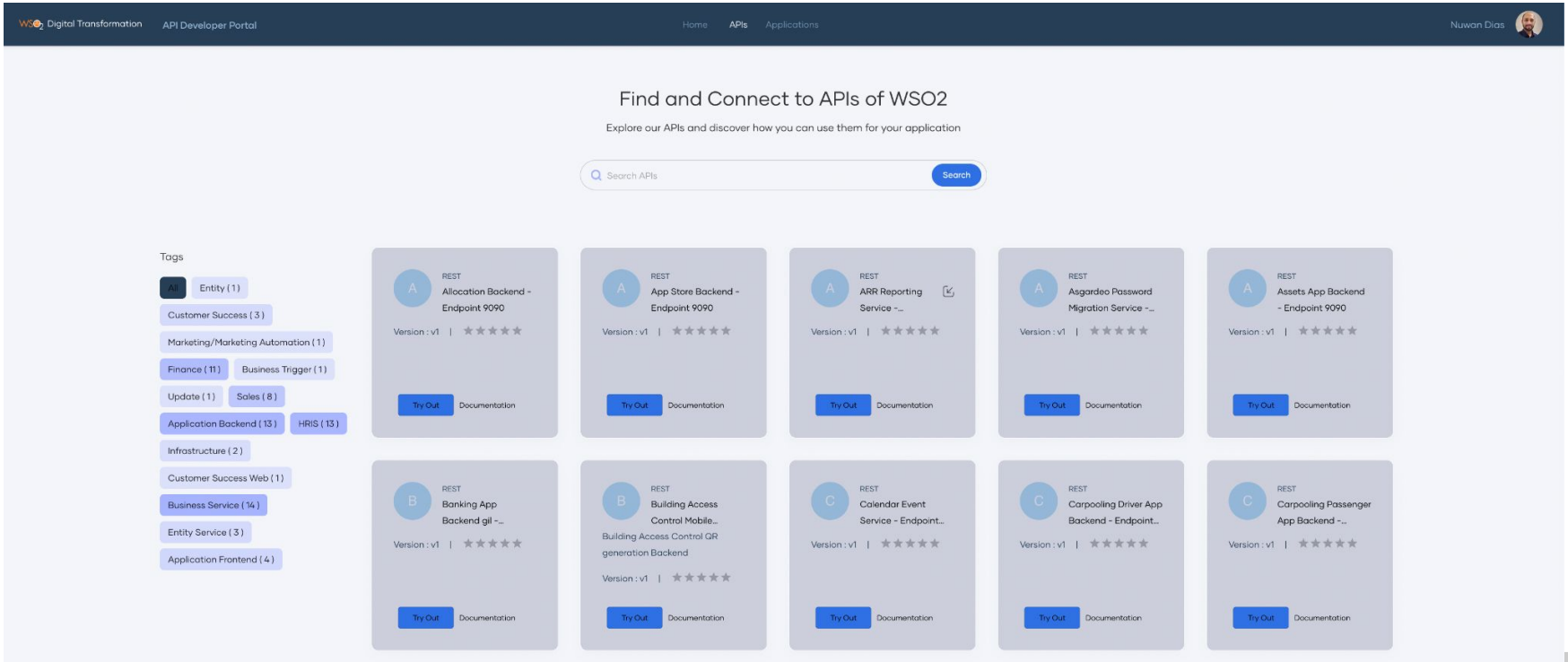
Choreo Concepts

- **Internal Marketplace:** One stop shop for discovering all reusable assets within the organization.



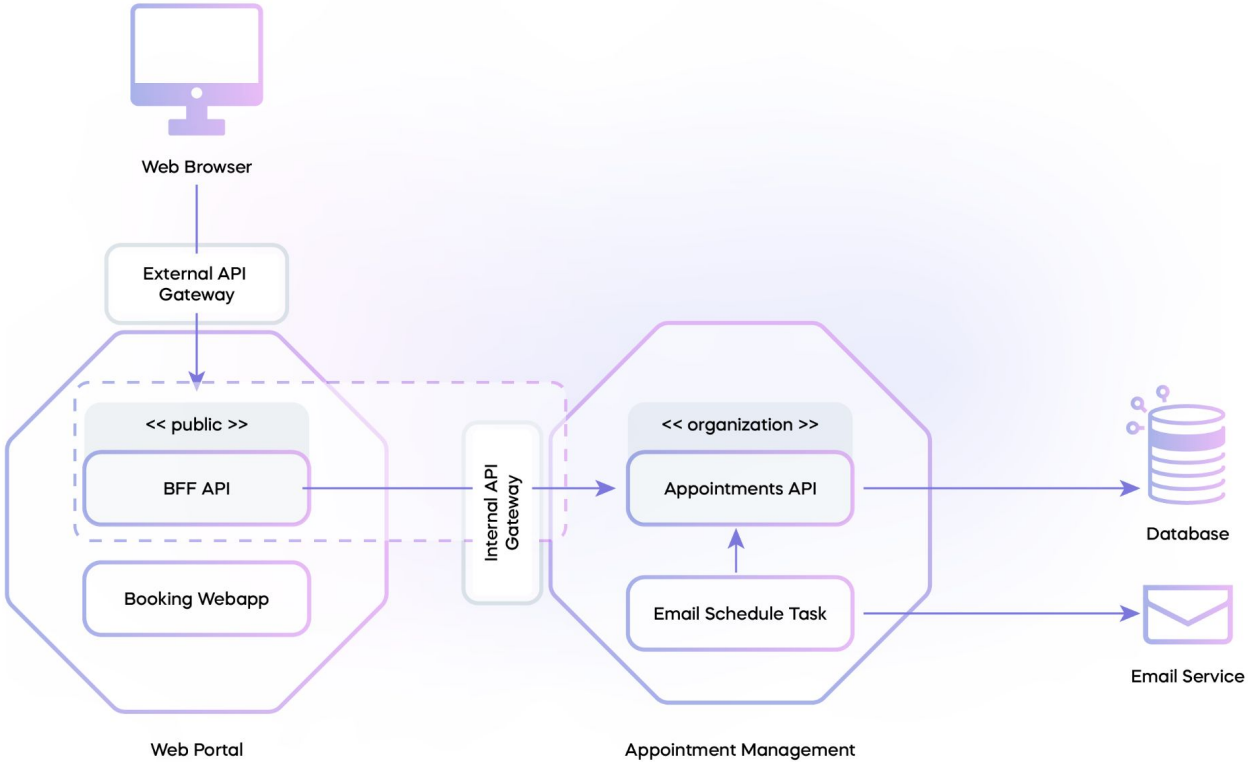
Choreo Concepts

- **Developer Portal:** To expose APIs outside of the organization.
  - Invite third party developers.
  - Enable Monetization



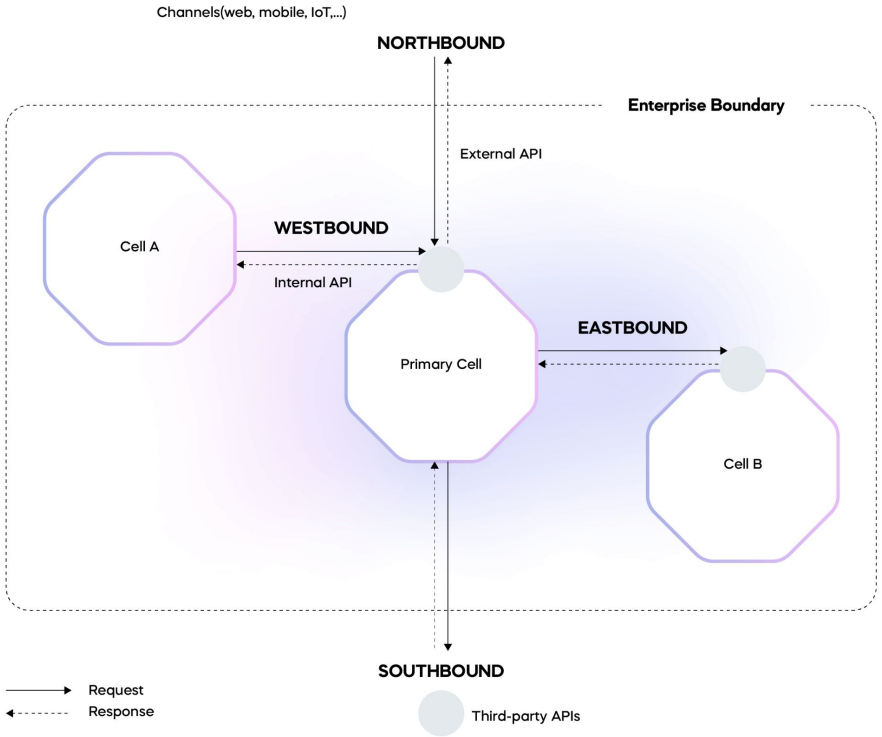
Demo: Service to Service Communication

Service to service communication on Choreo



Choreo Concepts

- **Connections: Reusable, shareable, governed links to endpoints both within and outside the organization**

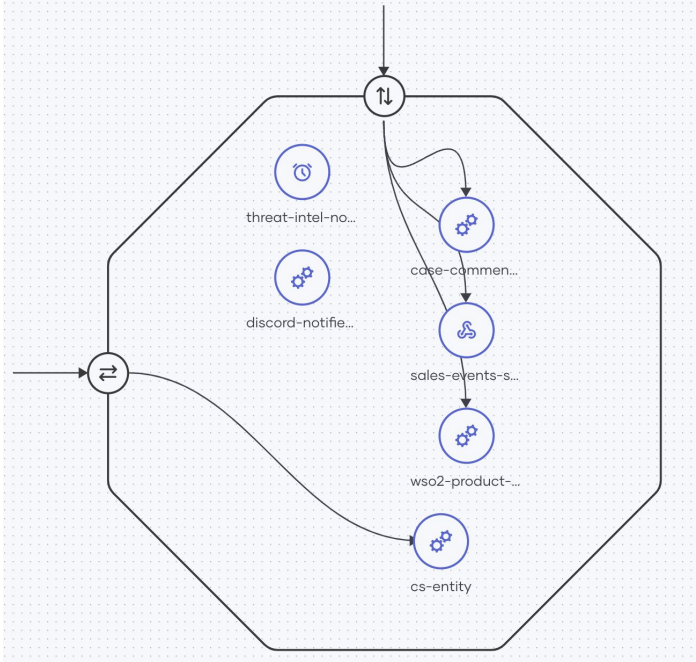


Choreo Concepts

- **Cell Based Architecture:** Organizing your applications for agility and scale.

  https://github.com/wso2/reference-architecture/blob/master/reference-architecture-cell-based.md

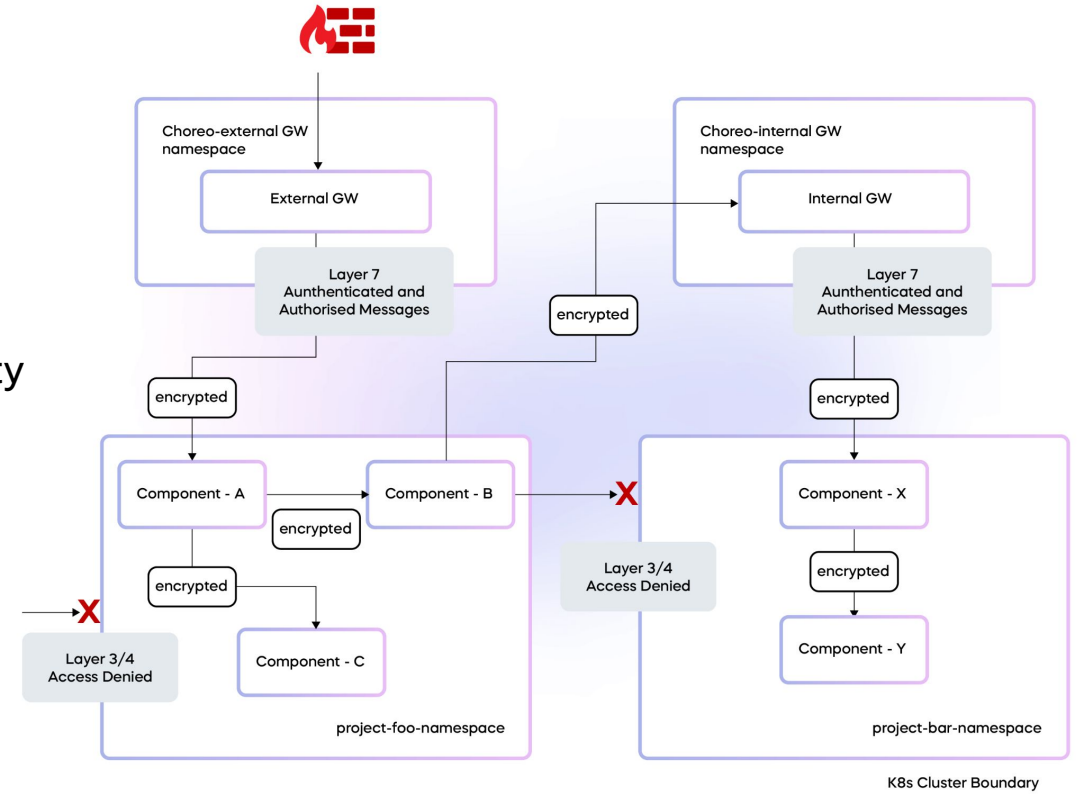
- **Internal vs External APIs:** Different interfaces, different responsibilities.



Choreo Concepts

- **Zero Trust architecture on Choreo data plane**

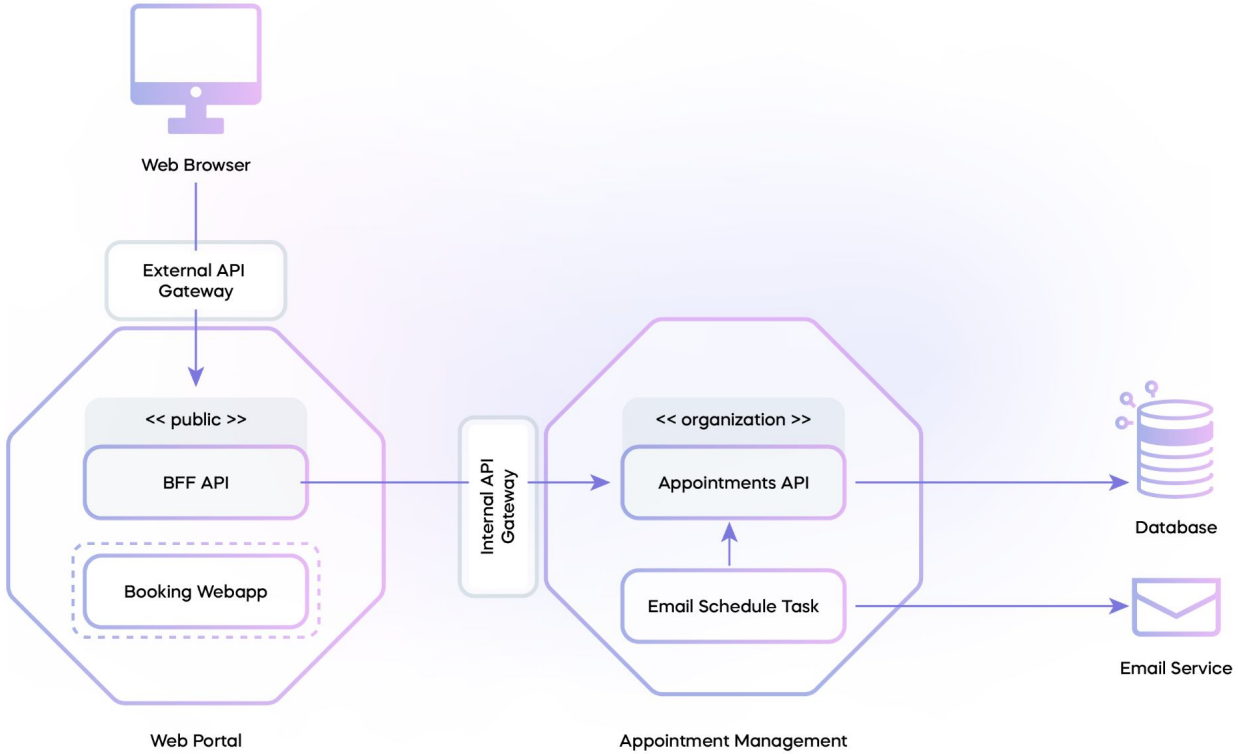
  - Never Trust, Always Verify
  - Least Privilege Access
  - Micro-Segmentation
  - Layered Security Controls
  - Assume Breach
  - End-to-End Encryption
  - Full User and System Visibility



https://wso2.com/library/blogs/how-we-implemented-zero-trust-in-choreo/

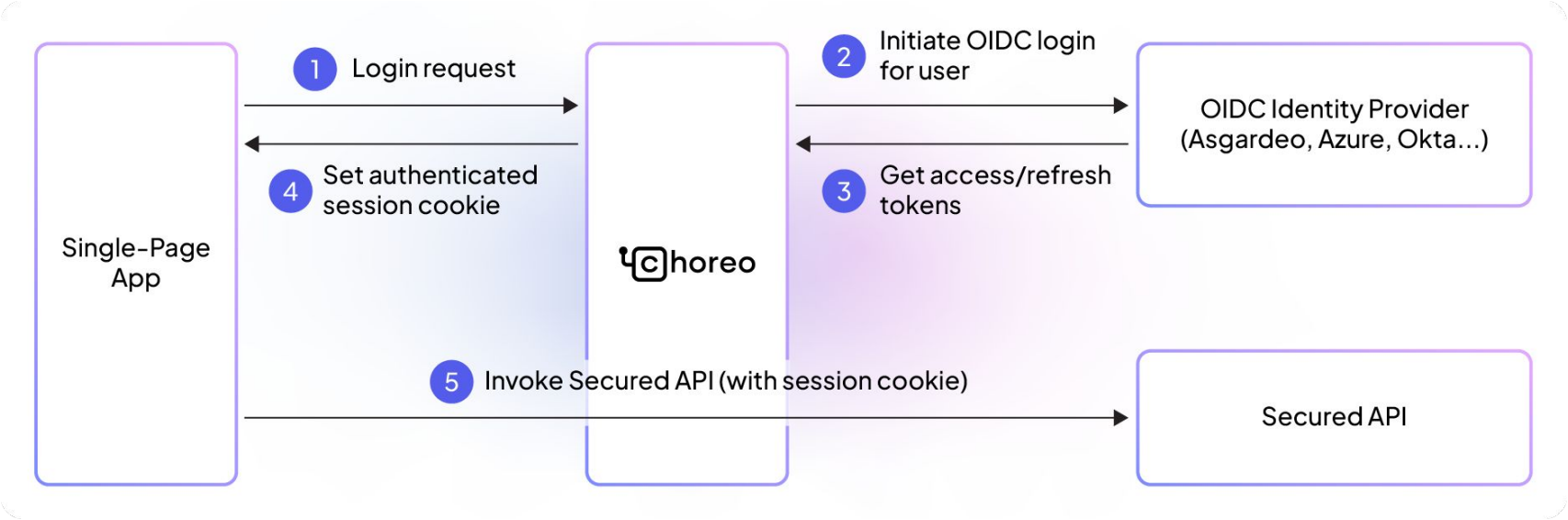
Demo: Deploying a Web Application on Choreo

Deploying a web application on Choreo



Choreo Concepts

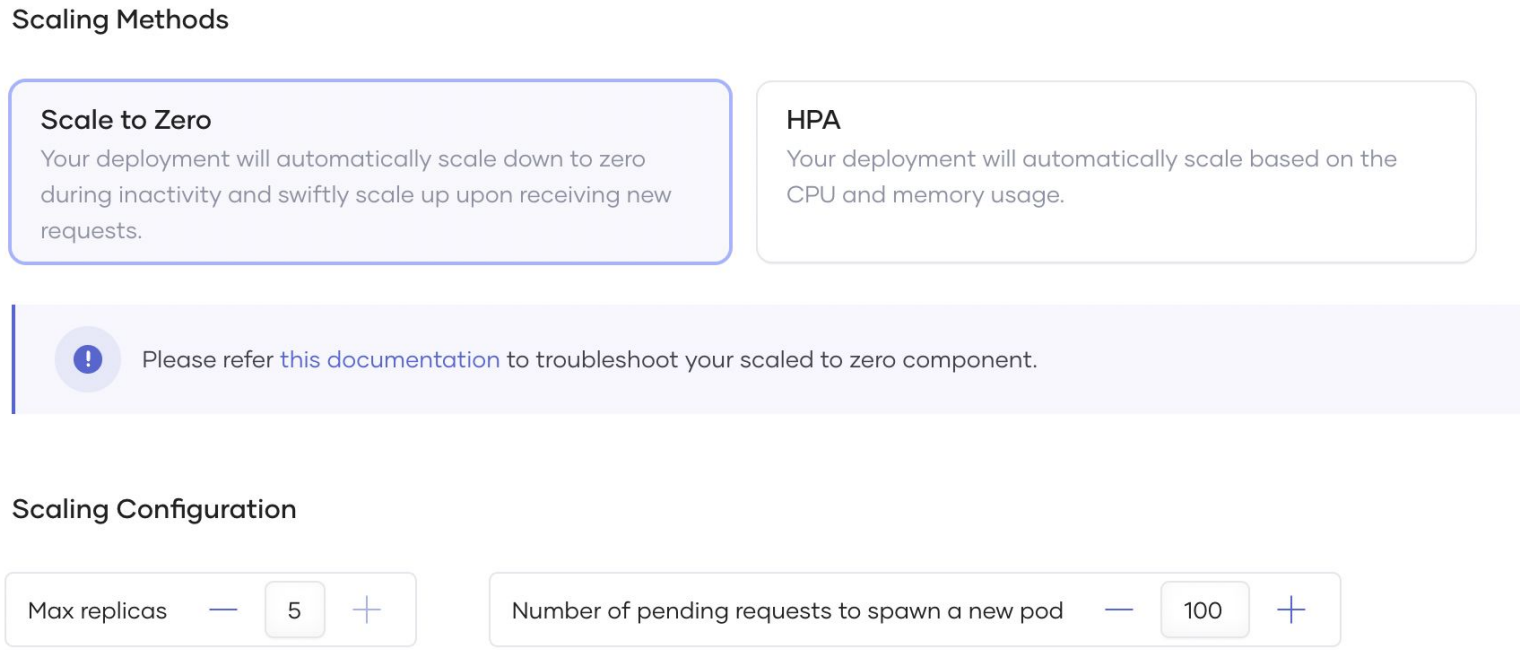
- **Choreo Managed Authentication**



https://wso2.com/library/blogs/choreos-managed-authentication-for-single-page-web-applications/

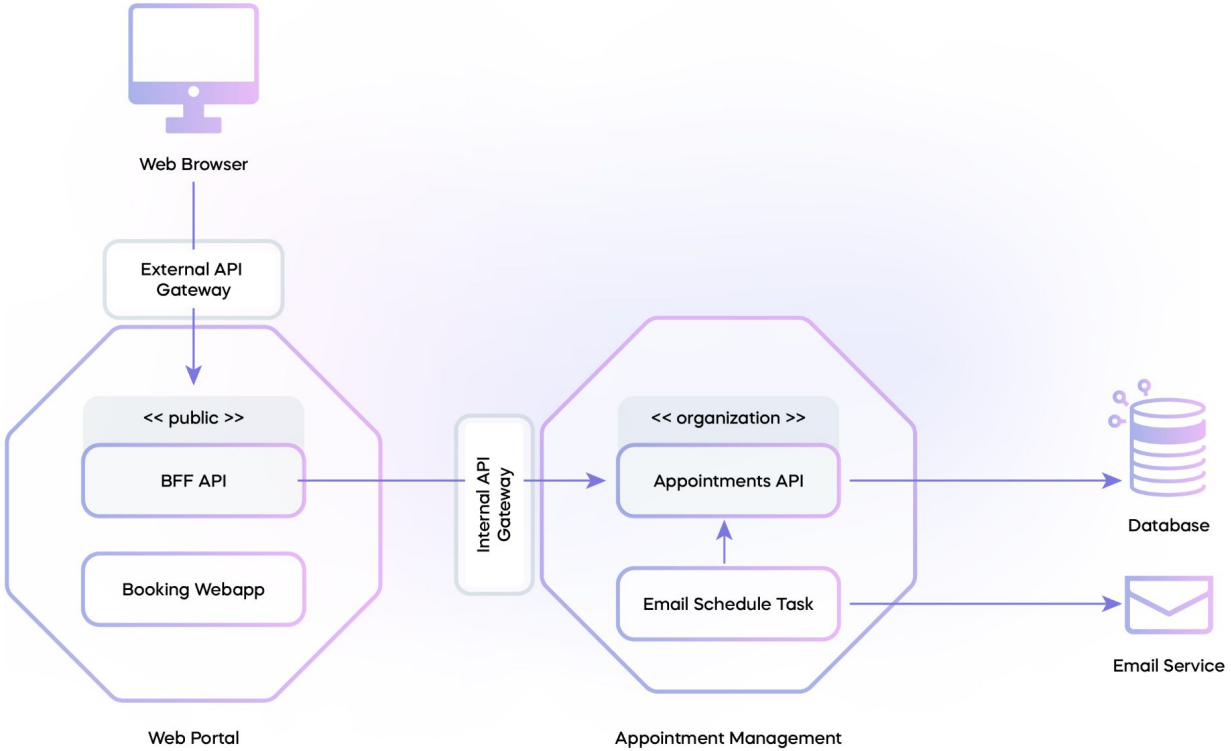
Choreo Concepts

- **Scale to Zero: For optimal usage of resources, especially in non production environments.**

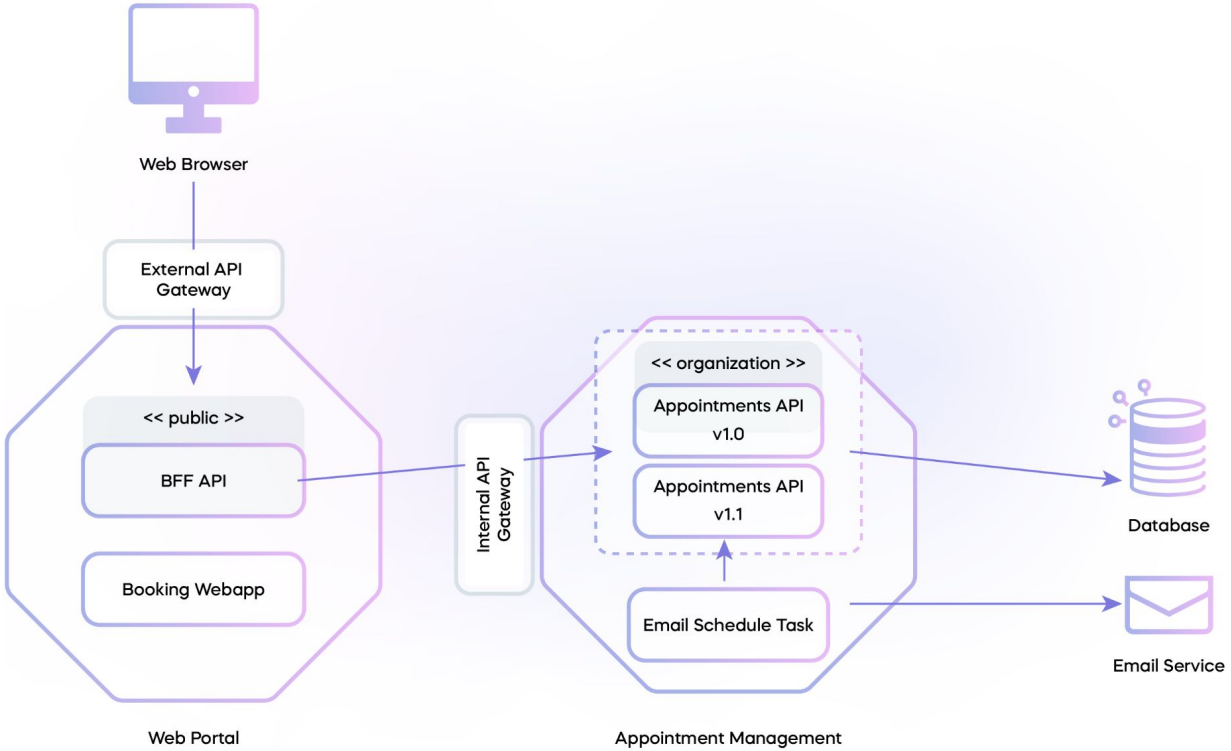


Demo: Versioning and Deployment Tracks

Using Deployment Tracks for API Versioning

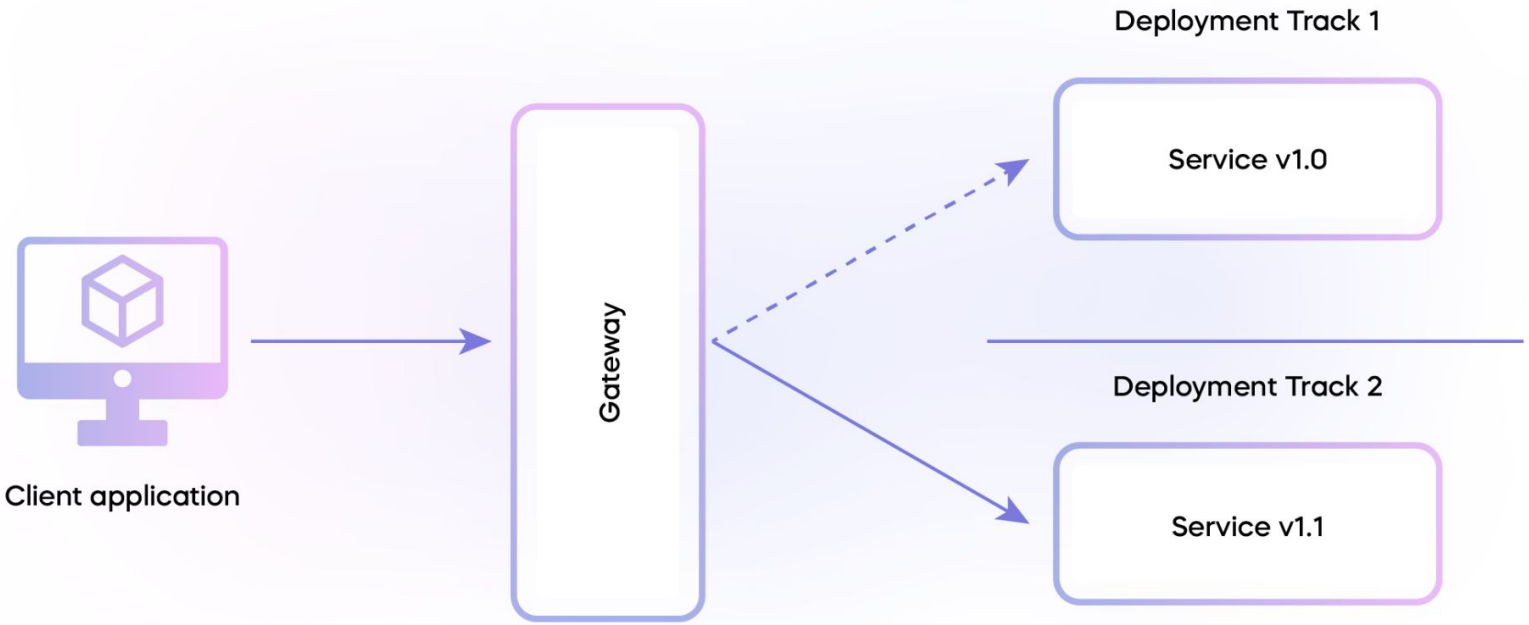


Using Deployment Tracks for API Versioning



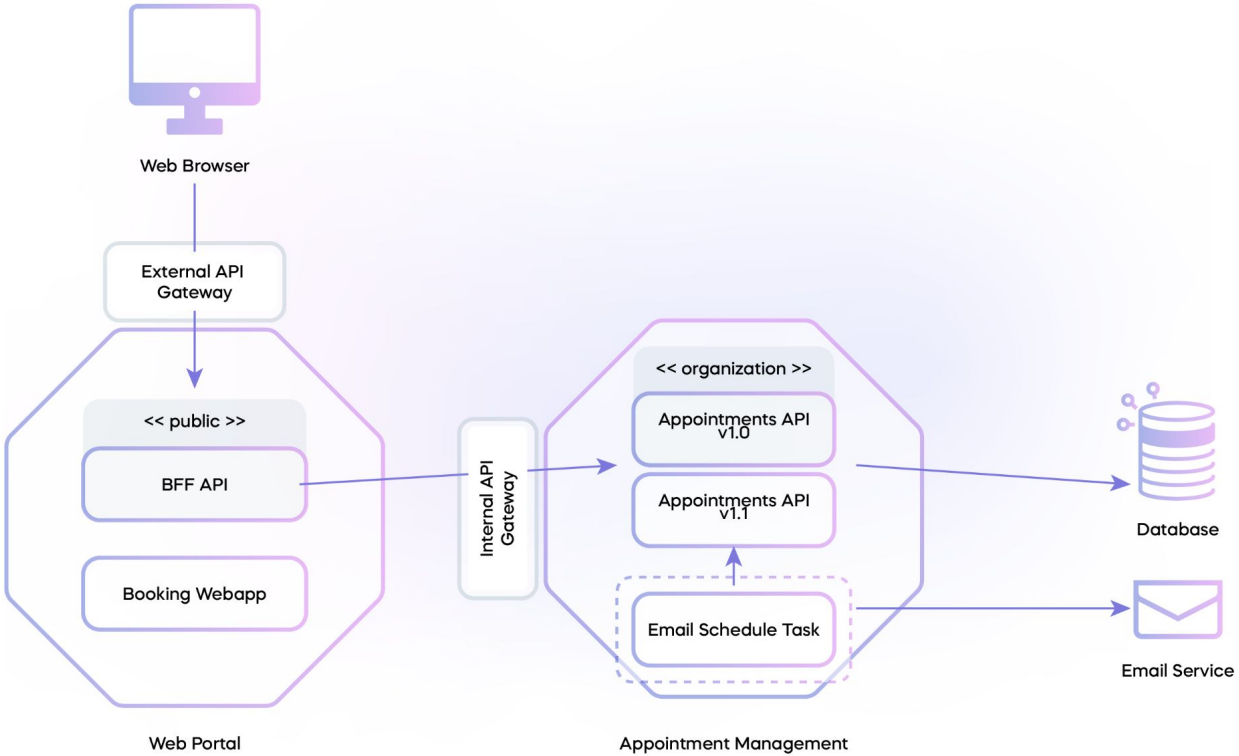
Choreo Concepts

- **Versioning and Deployment Tracks: Handling multiple versions of services, concurrently**



Demo: Scheduling a Task

Scheduling a Task in Choreo



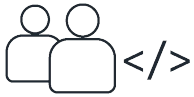
Advantages with Choreo

Without Choreo	With Choreo
Dedicated in-house teams managing infrastructure and production operations	No operations overhead / completely managed by WSO2
Create and maintain DevOps pipelines	Built-in pipelines
Create and maintain different pipelines for different projects/groups/teams	Unified pipeline access to any kind of projects - APIs, Java/Python/.Net services and more...
Create and manage environment config (Terraform)	Built-in environments. Can create dynamic environments from UI without Terraform
DevOps manage patches and updates manually	Patches and updates applied automatically
SSO + auth/authz provided with external identity management tools	Built-in IAM support AND federation to work with existing identity + SSO providers

Advantages with Choreo cont.

Without Choreo	With Choreo
Significant knowledge, effort, time and investment to use ECS + Kubernetes (in future)	Fully managed Kubernetes cluster in every data plane. No K8s expertise required
Total number of developers, Y	20% decrease in number of developers due to cloud native middleware and rich developer experience

The value of Choreo for stakeholders



Developers

- Freedom to focus on application design and architecture, and not infrastructure
- Code in any language, and offload all devops + secops to us
- Design and build secure & resilient distributed systems
- More productivity improvements



Architect / CTO / CIO

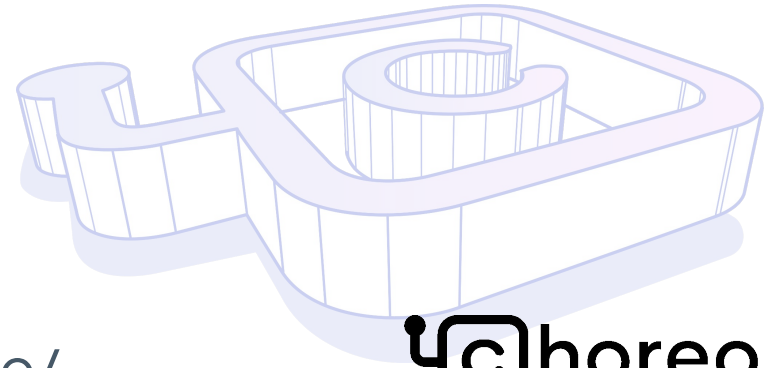
- Govern distributed systems and facilitate easy reuse
- Deliver more business solutions with smaller teams that skill up on the business not platforms
- Lockin-free SaaS
- Security by default



LoB / CMO

- Deliver awesome digital experiences for customers faster
- Build deeper understanding of customers
- Freedom to innovate in a managed environment approved by IT
- Lower TCO and higher ROI

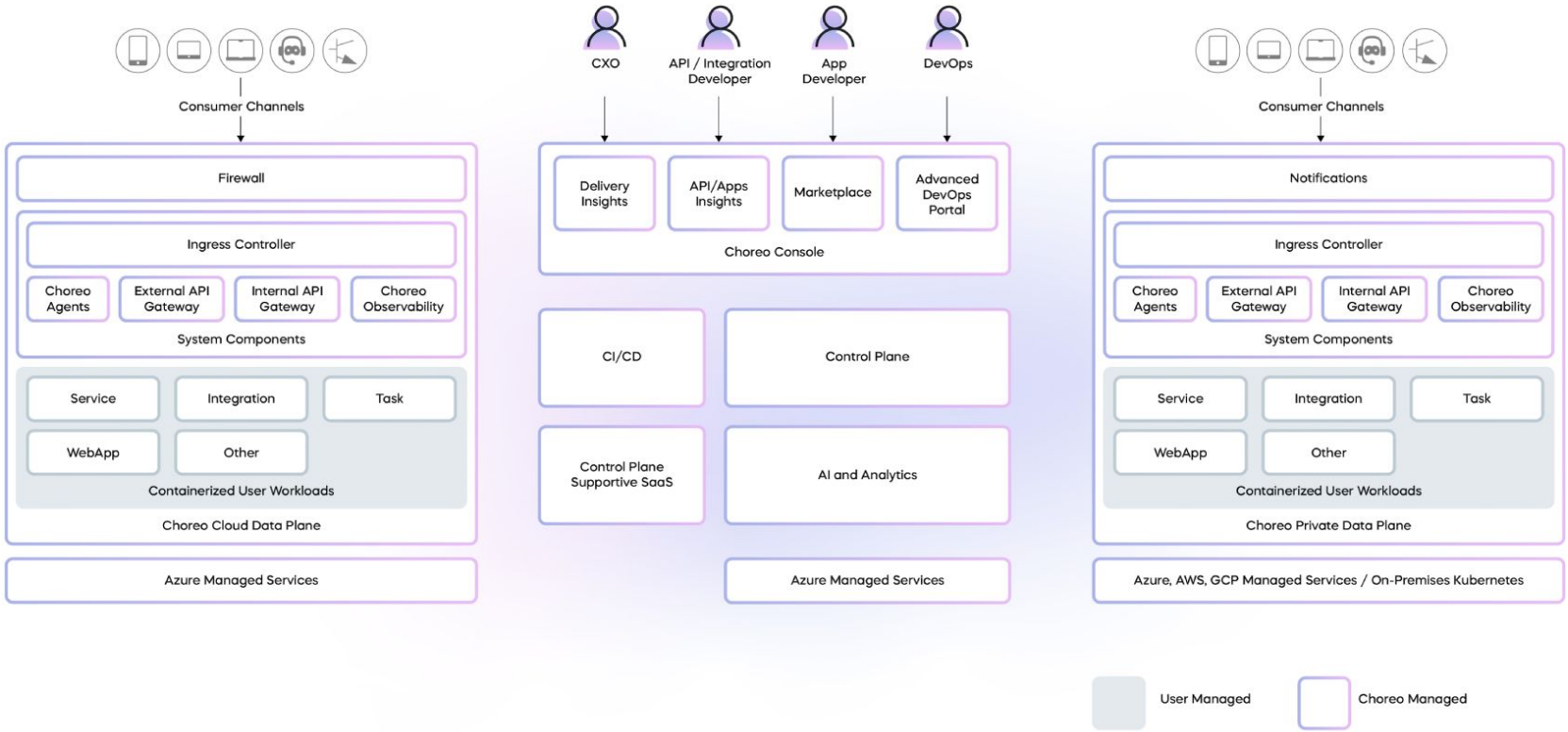
JUST ADD DEVELOPERS.



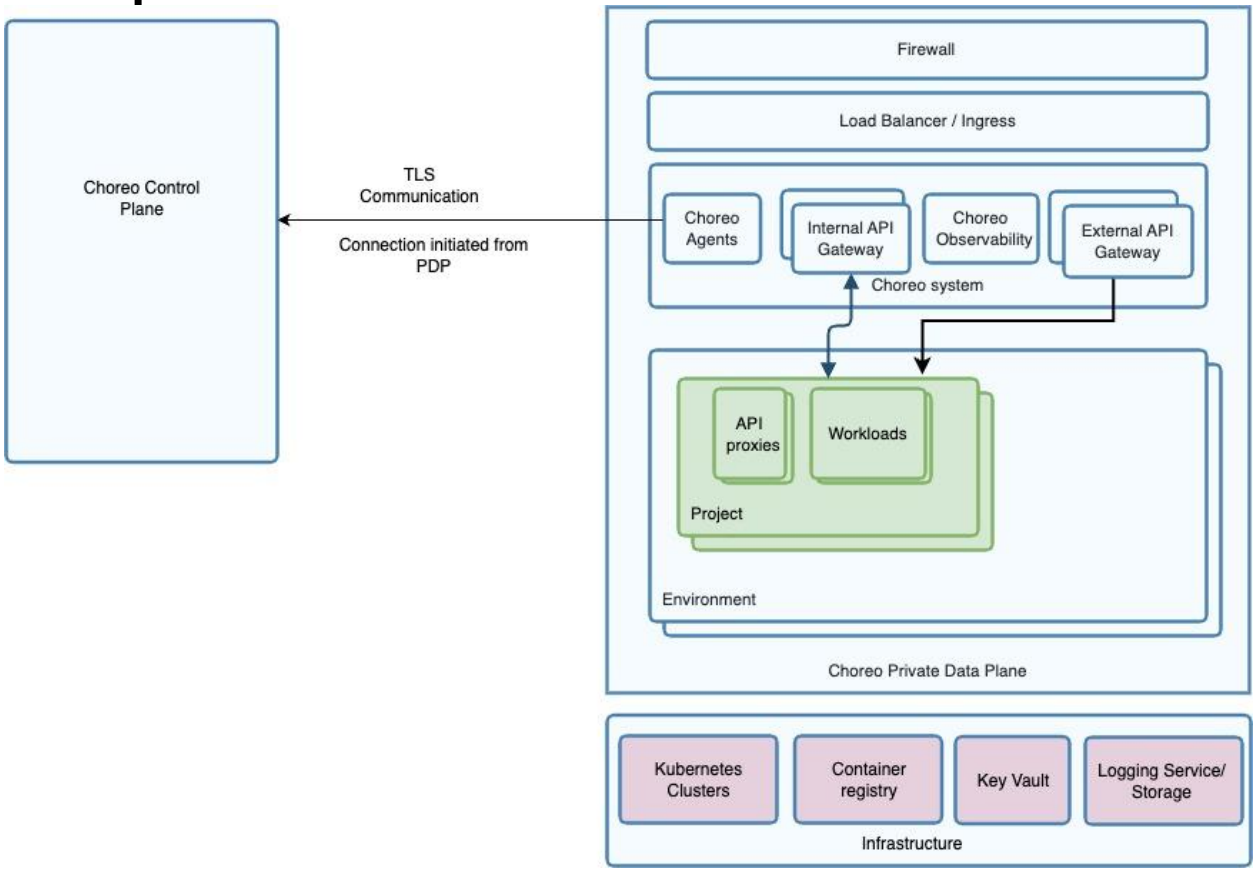
https://wso2.com/choreo/

choreo by WSO2

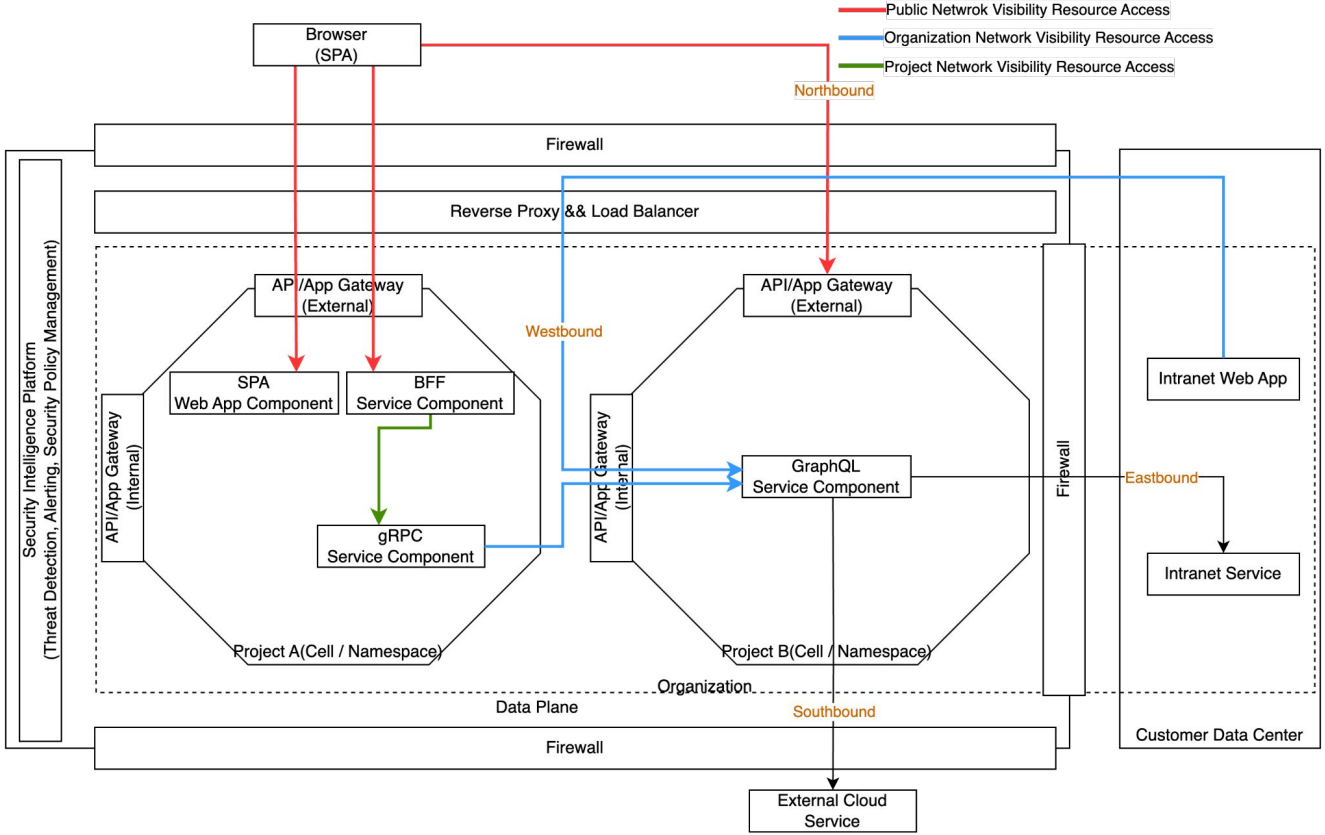
Developer self-service



Private data plane



Choreo data plane architecture & modularity



https://github.com/wso2/reference-architecture/blob/master/reference-architecture-cell-based.md

Thank You!