CloudWeGo Intro

An overview of CloudWeGo's open-source middleware for building and governing microservices

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Content

Part 01

What is CloudWeGo

CloudWeGo Overview

- **CloudWeGo** is a set of microservices middleware developed by ByteDance that can be used to quickly build Enterprise-class cloud-native Microservice architectures. (Go & Rust)

> *"Over the past three years, Bytedance has witnessed rapid growth in the number and scale of its microservices. In 2018, we had about 7,000–8,000 online microservices, and by May 2021, the number had exceeded 50,000. Now, we have decided to open source these technologies to help more developers. "*
>
> — Service Framework Team, ByteDance， 2021.9

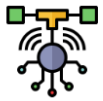
CloudWeGo Features

High-Performance

We integrate advanced features such as asynchronous RPC, streaming capabilities, non-blocking I/O networking, and Just-in-Time (JIT) compilation, allowing CloudWeGo to deliver superior performance for high-demand environments.

Strong Extensibility

CloudWeGo employs a modular, layered framework providing a set of interfaces for tailor-made functionality. This ensures that it can meet the specific requirements of any project with precision and efficiency.



Multi-Protocol Support

We provide out-of-the-box support for Thrift, gRPC, HTTP/1, HTTP/2 and WebSocket, and the capability to easily extend to other protocols, ensuring maximum adaptability.

Built-In Code Generation Tools

CloudWeGo can streamline your development process by providing built-in scaffold code generation tools for Thrift and gRPC.

CloudWeGo Projects

Framework

Kitex
Golang RPC Framework

Hertz
Golang HTTP Framework

Volo
Rust RPC&HTTP Framework

CODEC

Frugal
Dynamic Thrift serializer & deserializer

Fastpb
Protobuf serializer & deserializer

Sonic
JSON serializer & deserializer

Pilota
Thrift & Protobuf serializer & deserializer

Network Lib & Runtime

Netpoll
Network framework focusing on RPC scenarios

Shmipc
Inter-process communication lib based on shared memory

Monoio
Async runtime based on io-uring

Tool

Thriftgo
Thrift code generator in Golang

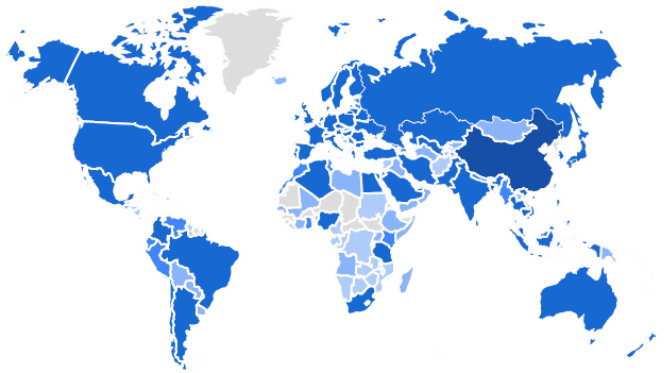
cwgo
All-in-one code generation tool

Middleware

Dynamicgo
Dynamically and efficiently operate RPC data

Motore
Async middleware abstraction powered by AFIT and RPITIT

CloudWeGo Community



China Mainland	107K
Singapore	24K
United States	15K
Hong Kong	14K
Japan	8.7K
Taiwan	2.6K
Indonesia	1.9K

Individual **Contributors**: 400+

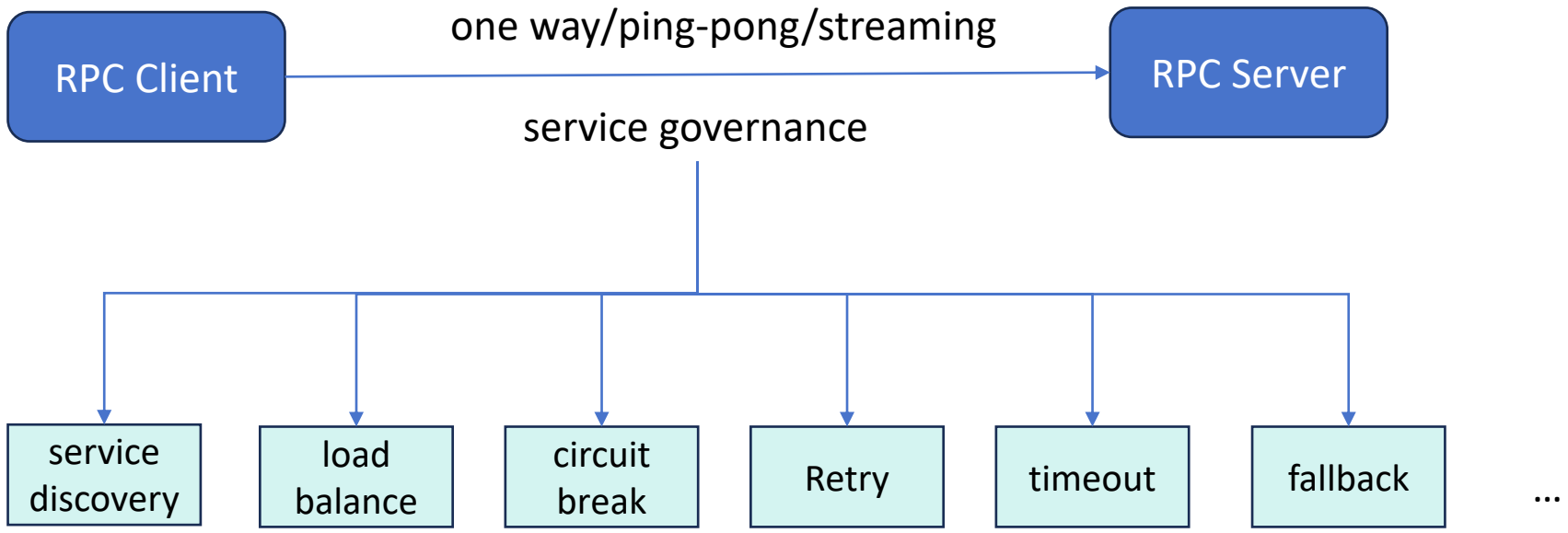
Unique **Visitors**: 170k+

Part 02

What problem does it solve

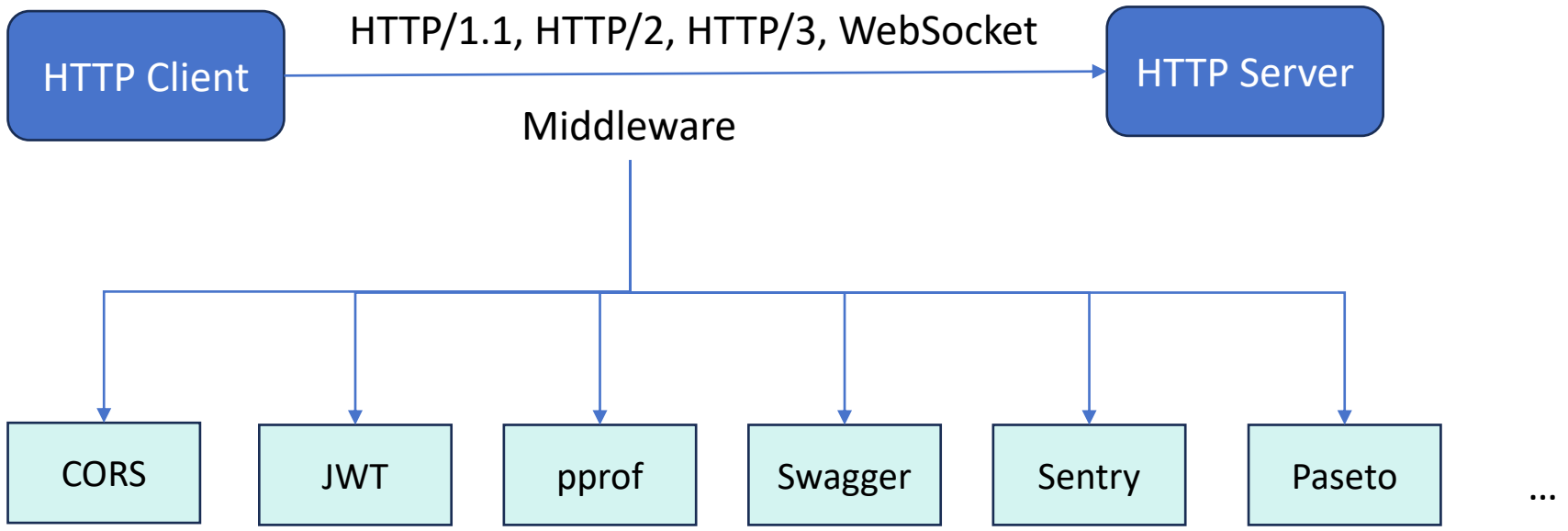
CloudWeGo Capability

- Microservices Communication and Governance: RPC (Kitex)



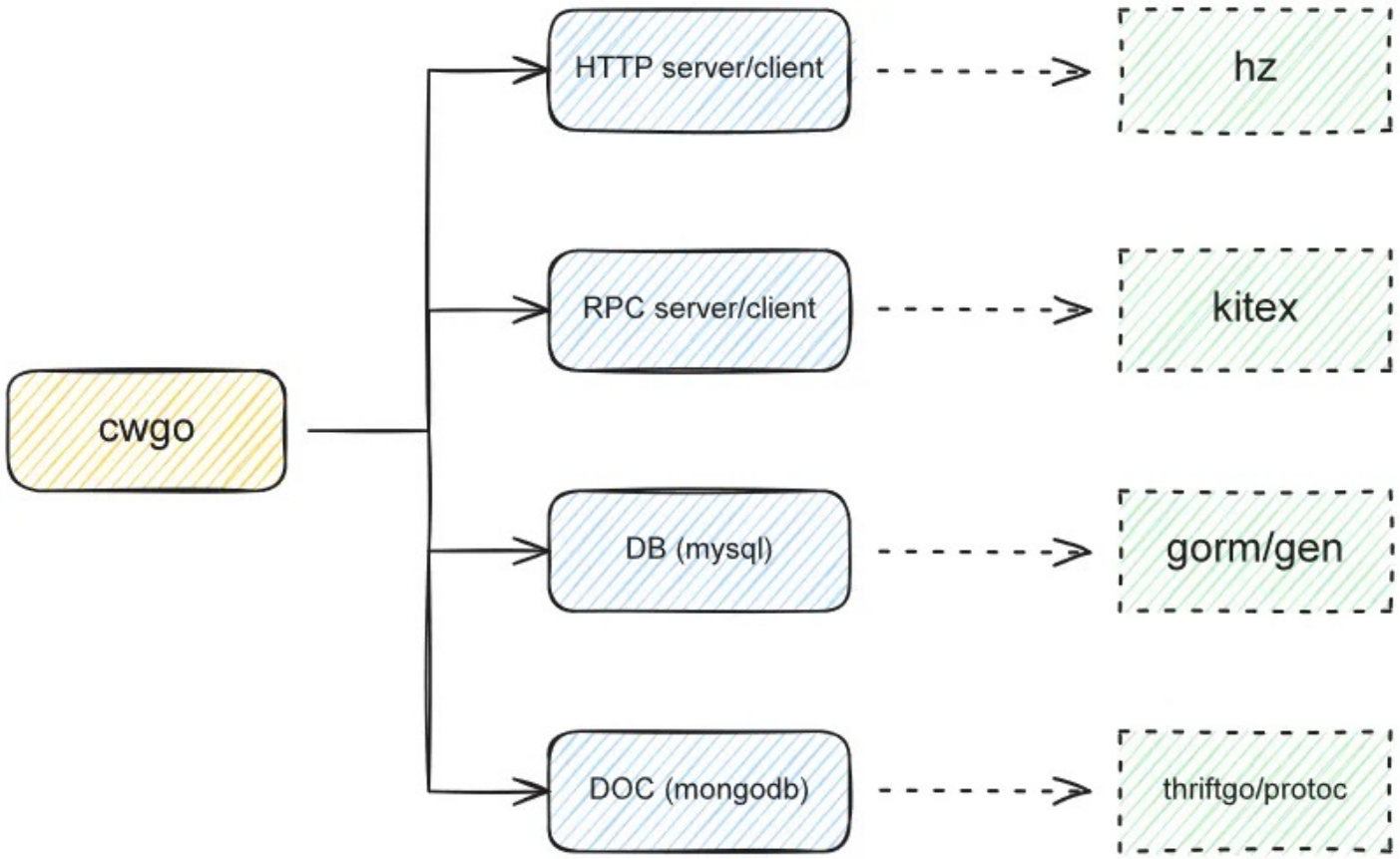
CloudWeGo Capability

- Microservices Communication and Governance: HTTP (Hertz)



CloudWeGo Capability

- Code Generation – more than Scaffold



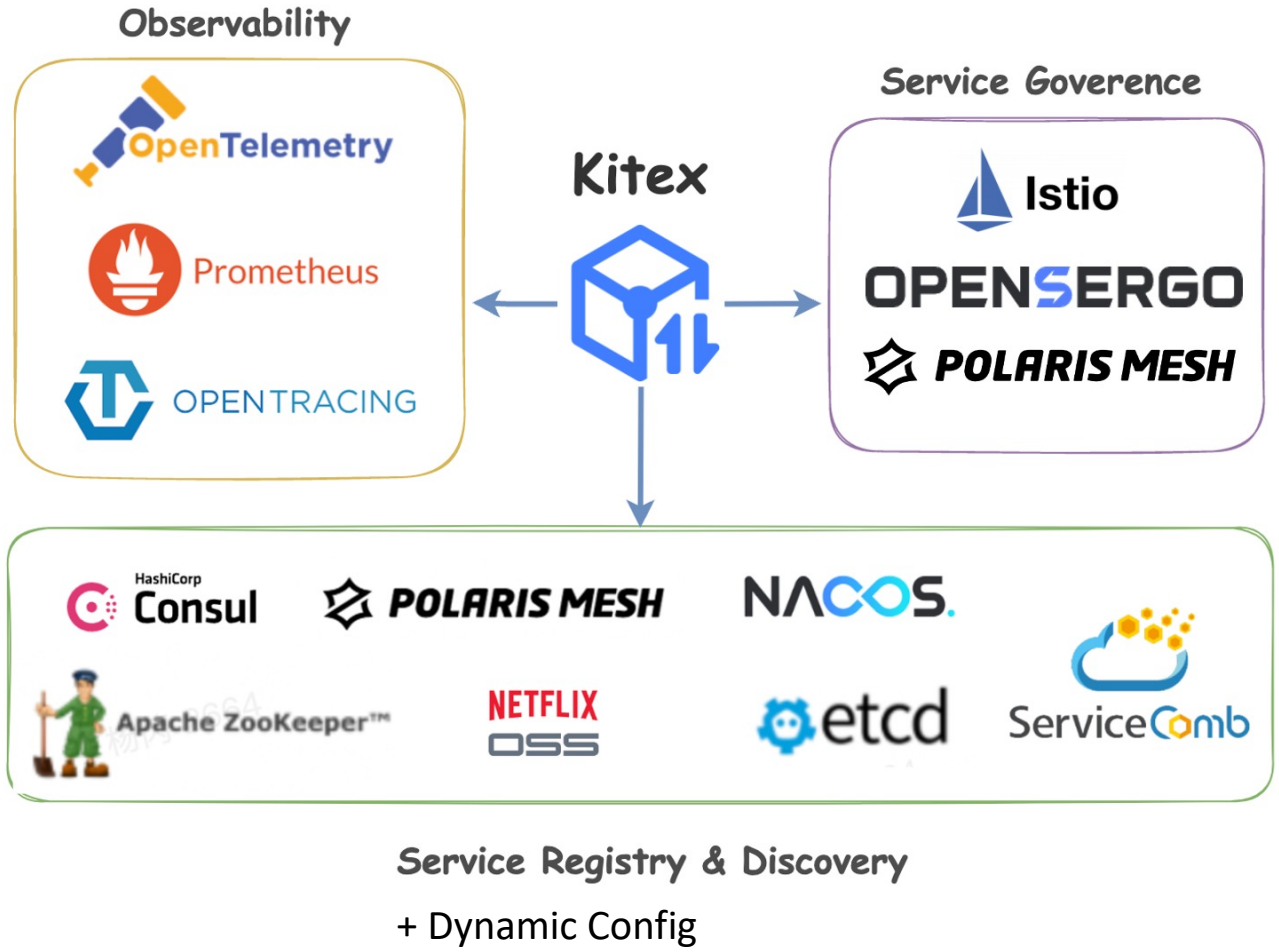
Service Governance Code

\+ raw SQL

Swagger Doc

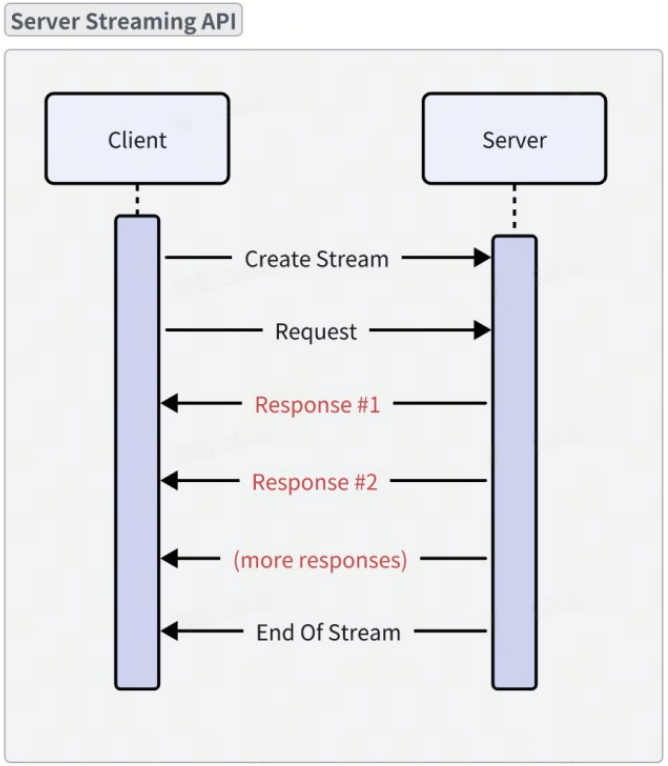
CloudWeGo Capability

- Cloud Native
  - k8s & container friendly
  - supports Istio with xDS
  - supports Prometheus and OpenTelemetry for metrics and tracing
  - graceful shutdown solution
  - many others

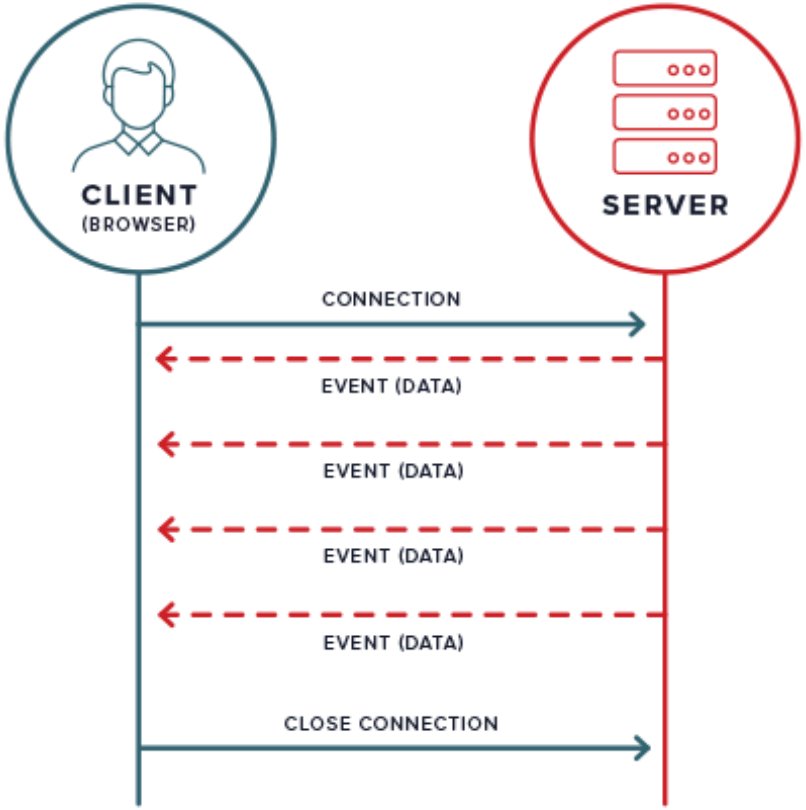


CloudWeGo Capability

- AI native

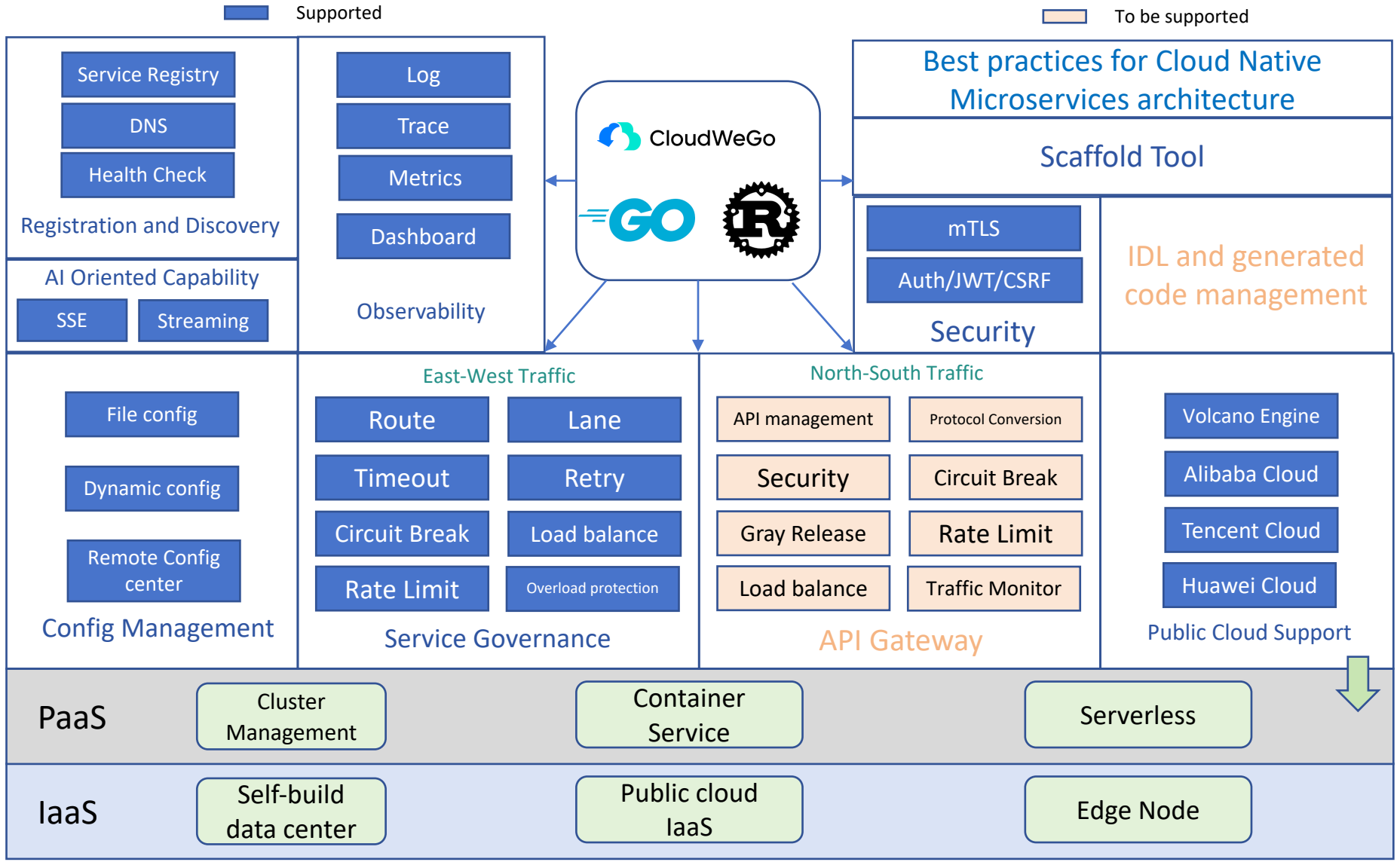


RPC Streaming



HTTP based SSE(Server-Sent Event)

CloudWeGo In Microservice Dev process



Part 03

What are the use cases

Enterprise Users

CloudWeGo can be used to build a variety of other applications, such as web applications, back-end platform applications and other enterprise applications.

Industry adoptions include areas like **Gaming, Securities, E-commerce and AI.**

Enterprise Users: Go users

Huaxing Securities' Kitex Practices in a Hybrid Cloud-Native Architecture

华兴证券

Huaxing Securities, a CloudWeGo enterprise user, has implemented Kitex framework to enable cross-data center communication within a hybrid cloud-native architecture. They've successfully established an observability system tailored for Kitex and conducted practical deployments using Kitex within and across Kubernetes clusters. Learn more

Kitex + K8s

Kitex Implementation in Semir E-commerce

Semir

In recent years, the e-commerce industry has seen rapid growth, and Senma E-commerce's online business has experienced significant expansion, encountering demands for high concurrency and performance in its operations. Senma has officially become an enterprise user of CloudWeGo. By integrating Kitex with Istio, Senma significantly enhanced its capabilities to handle high-concurrency requirements. Learn more

Kitex + Istio

Kitex's Application in Shumei Technology's Usability Governance

数美 NEXTDATA

Shumei Technology primarily provides SaaS services externally and operates as a typical machine learning system internally, facing usability challenges. After implementing the Kitex framework, both usability and stability have been greatly improved.

Learn more

Apache Thrift -> Kitex Thrift

Enterprise Users: Others -> Go users

CloudWeGo's Application in Tanwan Game SDK Interface

As a gaming company, the previous PHP-based architecture encountered significant performance and stability bottlenecks. After transitioning to Go and implementing CloudWeGo, performance, stability, business flexibility, and development efficiency have all been significantly improved, achieving cost reduction and efficiency enhancement.

Learn more

PHP -> Go(Kitex+Hertz)

Founder Securities - Financial Technology Cloud-native Microservices Implementation

At the beginning of 2023, Founder Securities initiated the construction of a microservice system, involving microservice governance, observability capabilities, and interface management. The Web and RPC application frameworks adopted CloudWeGo's Hertz and Kitex, respectively.

Learn more

Java(Dubbo) -> Go(Kitex)

Construct's Microservice System Construction from 0 to 1 Based on Kitex + Istio

This article demonstrates Construct Company as an example to explore how they utilized the CloudWeGo framework and Istio service mesh to build an efficient and stable microservice system from scratch.

Learn more

Python -> Go(Kitex) + Istio

What’ s more ?

CloudWeGo Website: https://www.cloudwego.io/

CloudWeGo Twitter: https://twitter.com/CloudWeGo

CloudWeGo GitHub: https://github.com/cloudwego

Lark/Feishu Chat Group

Discord Channel

WeChat Public Account

Thanks.