



KubeCon



CloudNativeCon

Europe 2026





KubeCon



CloudNativeCon

Europe 2026

#KubeCon #CloudNativeCon

Navigating the Gateway API Maze

*40+ Implementations, 55+ Features
and a Path to Portability*





KubeCon



CloudNativeCon

Europe 2026



Beka Modebadze
Software Engineer
Google



Christine Kim
Software Engineer
Isovalent at Cisco

Agenda



KubeCon



CloudNativeCon

Europe 2026

- Intro (user's perspective)
 - C: Any necessary context - intro to gateway api, personas, ecosystem
 - C: Choice overload of selecting implementation
- Solutions
 - B: Docs, Wizard, what users can get started with and how conformance ties everything together
 - C: Tooling: Ingress2gateway (blog will be published), gwctl.
 - B: Experimental releases, 3 sponsors, inference extensions
- Next steps for attendees
 - B Link to resources and wrap up
 - Future work, extension of AI workload (might fit better here)
 - Docs links, qr codes for slack/github



KubeCon



CloudNativeCon

Europe 2026

What seems to be the problem?

What seems to be the problem?



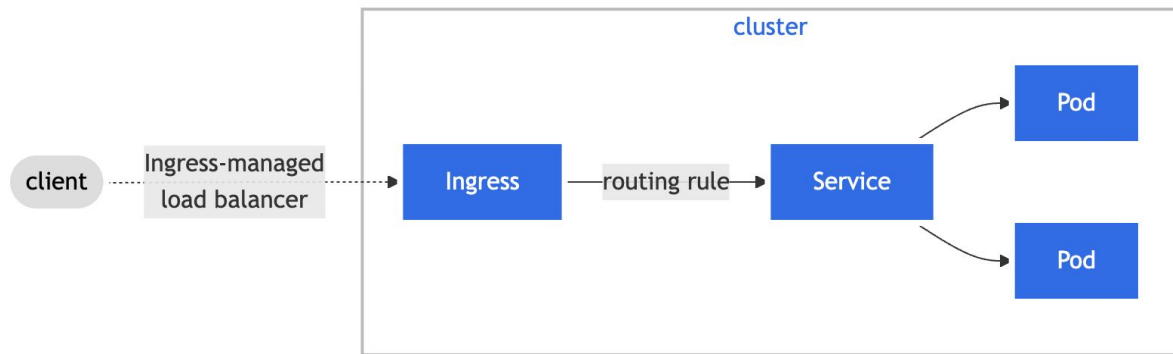
KubeCon



CloudNativeCon

Europe 2026

- Ingress
 - Stable and simple



What seems to be the problem?



KubeCon



CloudNativeCon

Europe 2026

- No portability
- Annotation bloat
- One ingress, many teams

What seems to be the problem?



KubeCon



CloudNativeCon

Europe 2026

- No portability
- Annotation bloat
- One ingress, many teams



gateway api

What seems to be the problem?



KubeCon



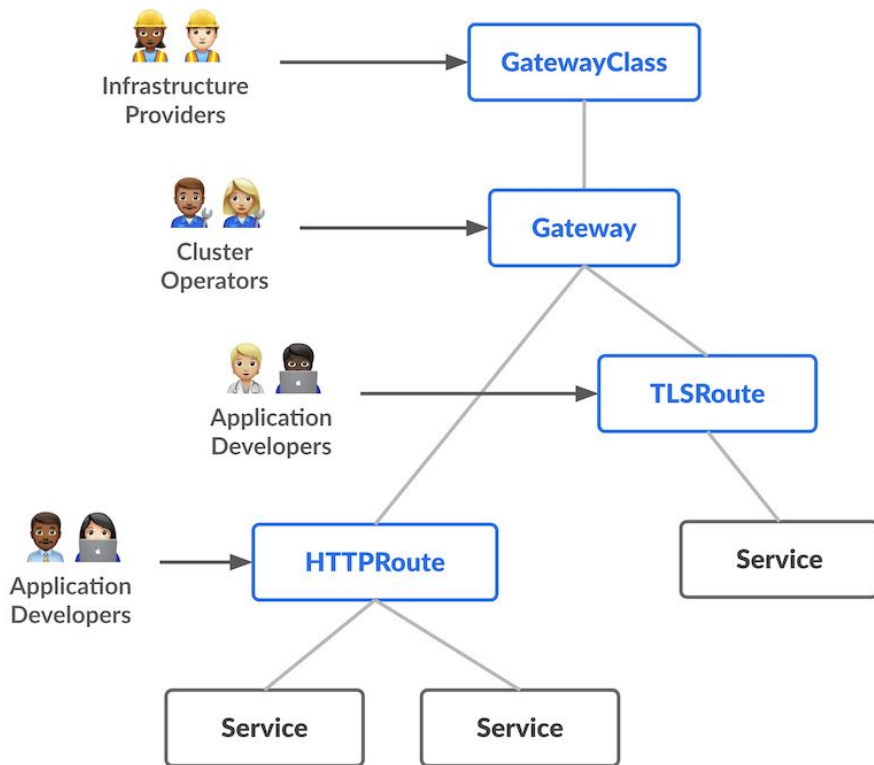
CloudNativeCon

Europe 2026

- No portability
- Annotation bloat
- One ingress, many teams
- Ingress-nginx retiring



gateway api



gateway api

Personas



Infrastructure
Providers



Cluster
Operators



Application
Developers

Personas



Infrastructure
Providers

(Ian)



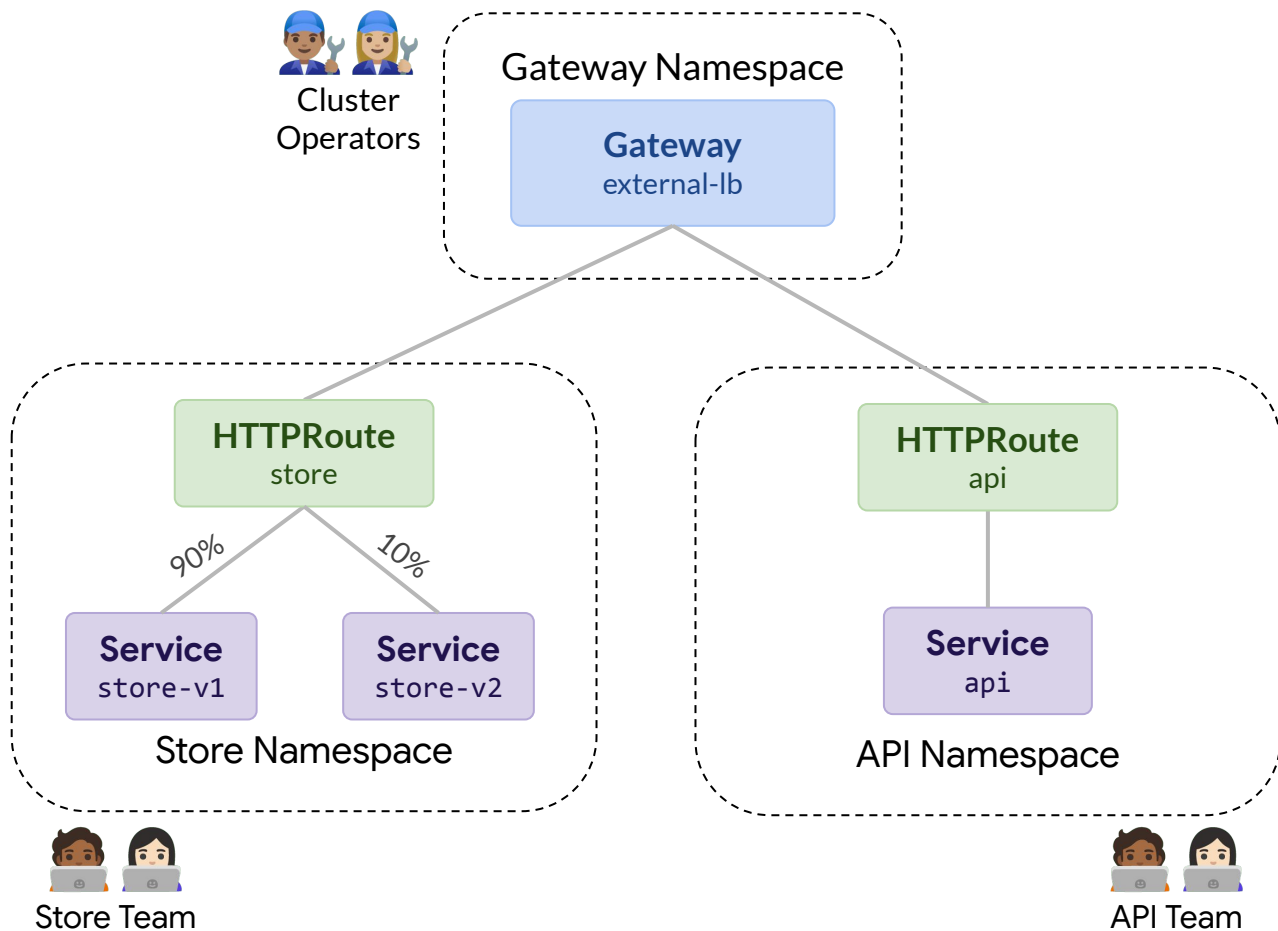
Cluster
Operators

(Chihiro)



Application
Developers

(Ana)



```
apiVersion: gateway.networking.k8s.io/v1
kind: HTTPRoute
metadata:
  name: reviews
spec:
  parentRefs:
  - group: ""
    kind: Service
    name: my-app
    port: 8080
  rules:
  - backendRefs:
    - name: my-store-inventory
      port: 8000
```

Gateway API for Mesh Management and Administration



KubeCon



CloudNativeCon

Europe 2026

Solved!





KubeCon



CloudNativeCon

Europe 2026

Solved!



Choosing Controller



KubeCon



CloudNativeCon

Europe 2026



Choosing Controller

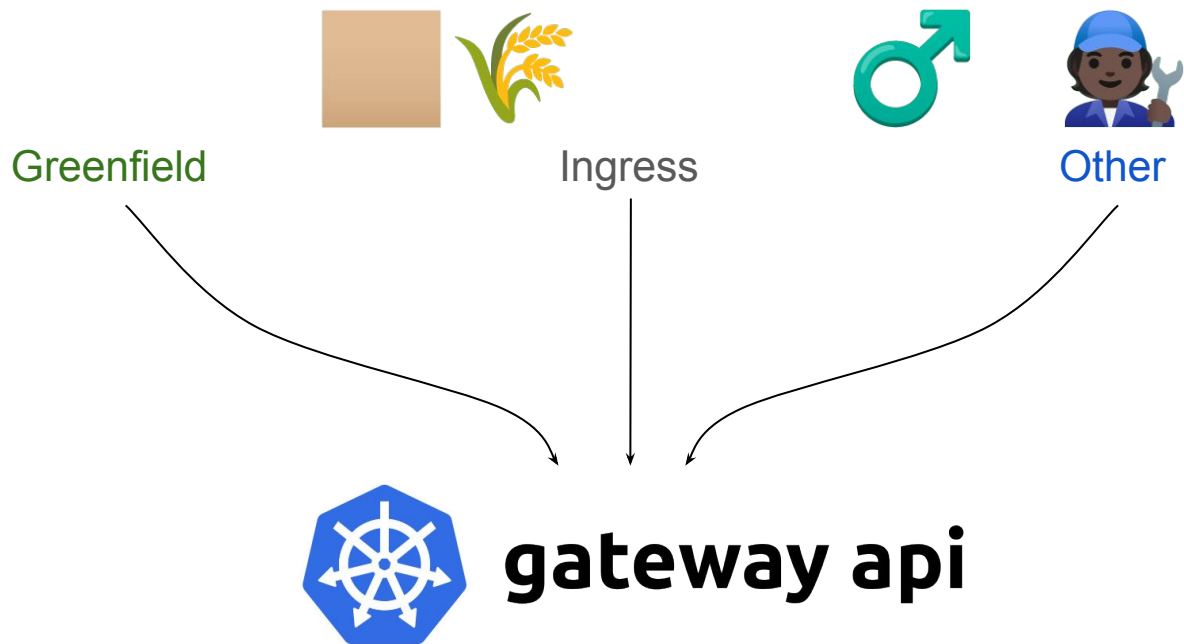


KubeCon



CloudNativeCon

Europe 2026



Choosing Controller



KubeCon



CloudNativeCon

Europe 2026

Help me choose Gateway API controller



I got you fam! 🍌🍷

Controller Matching Wizard



KubeCon



CloudNativeCon

Europe 2026



Search



kubernetes-sigs/gateway-api

v1.5.1 2.7k 689

Overview

Introduction

Concepts

Service Mesh

Implementations

List

Matching Wizard

Comparisons

v1.5

v1.4

v1.3

v1.2

FAQ

Glossary

Introduction

Gateway API is an official Kubernetes project focused on L4 and L7 routing in Kubernetes. This project represents the next generation of Kubernetes Ingress, Load Balancing, and Service Mesh APIs. From the outset, it has been designed to be generic, expressive, and role-oriented.

The overall resource model focuses on 3 separate **personas** and corresponding resources that they are expected to manage:

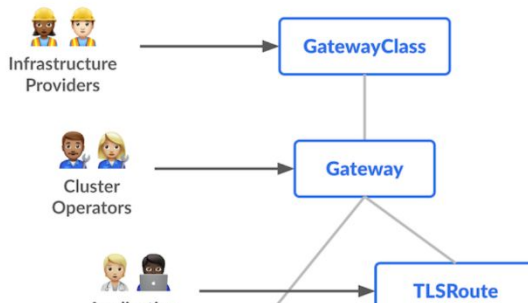


Table of contents

Gateway API for Ingress

Gateway API for Service Mesh
(the GAMMA initiative)

Getting started

Gateway API concepts

Why does a role-oriented API
matter?

Personas

Use Cases

What's the difference between
Gateway API and an API
Gateway?

Who is working on Gateway API?

Controller Matching Wizard



KubeCon



CloudNativeCon

Europe 2026



gateway api



Search



kubernetes-sigs/gateway-api

v1.5.1 ☆ 2.7k 🗨 689

Overview

Introduction

Concepts

API Overview

Troubleshooting and Status

Conformance

Roles and Personas

Security

Tools

Use Cases

Versioning

Traffic Matching

Hostnames

Service Mesh

Overview

GAMMA Initiative

Service Facets

Implementations

Controller Matching Wizard

Minimum Gateway API version >=

v1.5.0

✓ v1.4.0

v1.3.0

Matches are generated from the [conformance reports](#) uploaded by project implementations. **Must have** determines which controllers match, **Nice to have** optionally ranks your results. Feature names match the [v1.4 conformance tables](#). Implementations only appear in this page if they pass Core conformance for the resource type. Implementations that submit conformance reports with skipped tests won't appear.

Gateway

Core Features

☐ Must have

☐ Nice to have

All controllers matched by this wizard include core support of Gateway. That includes many core features, including:

- Specifying listeners on different ports and protocols
- TLS configuration (protocol dependent)
- Hostname matching (protocol dependent)
- Configuring which Routes can be attached, including the ability to accept Routes from other namespaces

For extended Gateway features, first select the Gateway Resource, and then you can choose from the following list of extended (optional) features.

HTTPRoute

Controller Matching Wizard



KubeCon



CloudNativeCon

Europe 2026



gateway api



Search



kubernetes-sigs/gateway-api

v1.5.1 ☆ 2.7k 🗨 689

Overview

Introduction

Concepts

API Overview

Troubleshooting and Status

Conformance

Roles and Personas

Security

Tools

Use Cases

Versioning

Traffic Matching

Hostnames

Service Mesh

Overview

GAMMA Initiative

Service Facets

Implementations

HTTPRoute

Core Features

☒ Must have ☐ Nice to have

Controllers that pass conformance tests for HTTPRoute are guaranteed to support the following features:

1. Traffic splitting with weighted backends
2. Safe cross-namespace references with ReferenceGrant
3. Request header modification
4. Exact and prefix path matching
5. Hostname matching
6. HTTP redirects

For extended HTTPRoute features, first select the HTTPRoute Resource, and then you can choose from the following list of extended (optional) features.

HTTPROUTE	REQUIREMENT	
Host Rewrite	☒ Must have	☐ Nice to have
Path Redirect	☒ Must have	☐ Nice to have
Request Mirror	☒ Must have	☐ Nice to have
Request Percentage Mirror	☐ Must have	☐ Nice to have
Response Header Modification	☐ Must have	☐ Nice to have
CORS	☐ Must have	☐ Nice to have

Controller Matching Wizard



KubeCon



CloudNativeCon

Europe 2026



gateway api



Search



kubernetes-sigs/gateway-api

Overview

Introduction

Concepts

API Overview

Troubleshooting and Status

Conformance

Roles and Personas

Security

Tools

Use Cases

Versioning

Traffic Matching

Hostnames

Service Mesh

Overview

GAMMA Initiative

Service Facets

Implementations

HTTPRoute

↑ Back to top

Core Features

☒ Must have ☐ Nice to have

Controllers that pass conformance tests for HTTPRoute are guaranteed to support the following features:

1. Traffic splitting with weighted backends
2. Safe cross-namespace references with ReferenceGrant
3. Request header modification
4. Exact and prefix path matching
5. Hostname matching
6. HTTP redirects

For extended HTTPRoute features, first select the HTTPRoute Resource, and then you can choose from the following list of extended (optional) features.

HTTPROUTE

REQUIREMENT

Host Rewrite

☐ Must have ☐ Nice to have

Path Redirect?

☐ Must have ☐ Nice to have

Issue HTTP redirects (e.g. 302) with a modified path.

☐ Must have ☐ Nice to have

Request Percentage Mirror

☐ Must have ☐ Nice to have

Response Header Modification

☐ Must have ☐ Nice to have

CORS

☐ Must have ☐ Nice to have

BACKEND TLS

REQUIREMENT

Controller Matching Wizard



KubeCon



CloudNativeCon

Europe 2026



gateway api



Search



kubernetes-sigs/gateway-api

v1.5.1 ☆ 2.7k 🗨 689

Overview

Introduction

Concepts

API Overview

Troubleshooting and Status

Conformance

Roles and Personas

Security

Tools

Use Cases

Versioning

Traffic Matching

Hostnames

Service Mesh

Overview

GAMMA Initiative

Service Facets

Implementations

13 controllers match.

Match

Reset

Matching controllers

Organization	Project	Conformance	Must have	Nice to have	Missing
agentgateway	agentgateway v1.0.0	Core, GRPCRoute, TLSRoute	4/4	1/1	—
nginx	nginx-gateway-fabric v2.5.0-pre-release	Core, GRPCRoute, TLSRoute	4/4	1/1	—
envoyproxy	envoy-gateway v1.7.0	Core, GRPCRoute, TLSRoute	4/4	1/1	—
GKE	gke-gateway 1.34.4-gke.1047000	Core	4/4	0/1	Backend TLS Policy
cilium	cilium 1.19.0-pre.2	Core, GRPCRoute, TLSRoute	4/4	0/1	Backend TLS Policy
kgateway-dev	kgateway v2.3.0-beta.3	Core, GRPCRoute, TLSRoute	4/4	0/1	Backend TLS Policy
istio	istio 1.28	Core, GRPCRoute, TLSRoute	4/4	0/1	Backend TLS Policy



- The feature matrix
- Direct access to provider resources
- Version-specific investigation
- Profile-based analysis

Gateway Profile

HTTPRoute

Organization	Project	Version	Mode	Standard Features	Experimental Features	Core	Backend TLS Policy
agentgateway	agentgateway	v1.0.0-alpha.2	default	26/26	1/1	✓	✓
airlock	microgateway	4.8.0	default	20/26	1/1	✓	✓
aws	aws-application-networking-k8s	v2.0.1	default	0/26	0/1	✗	✗
cilium	cilium	1.19.0-pre.2	default	22/26	1/1	✓	✗
envoyproxy	envoy-gateway	v1.7.0	default	24/26	1/1	✓	✓
envoyproxy	envoy-gateway	v1.7.0	gateway-namespace-mode	25/26	1/1	✓	✓
GKE	gke-gateway	1.34.1-gke.1829001	default	7/26	0/1	✗	✗
gravitee.io	gravitee-kubernetes-operator	4.10.3	default	6/26	0/1	✗	✗
istio	istio	1.28	default	24/26	1/1	✓	✗
kgateway-dev	kgateway	v2.2.1	default	22/26	1/1	✓	✗
Kong	kong-operator	v2.1.2	traditional_compatible	4/26	0/1	✗	✗

Features ↔ Conformance



KubeCon



CloudNativeCon

Europe 2026

- Write once, run anywhere
- Source of truth
- Automated verification (v1.4+)

Code Blame

```
1  apiVersion: gateway.networking.k8s.io/v1
2  date: "2025-11-11T06:59:42Z"
3  gatewayAPIChannel: experimental
4  gatewayAPIVersion: v1.4.0
5  implementation:
6    contact:
7      - https://github.com/envoyproxy/gateway/blob/main/GOVERNANCE.md
8    organization: envoyproxy
9    project: envoy-gateway
10   url: https://github.com/envoyproxy/gateway
11   version: v1.6.0
12  kind: ConformanceReport
13  mode: gateway-namespace-mode
14  profiles:
15    - core:
16      result: success
17      statistics:
18        Failed: 0
19        Passed: 11
20        Skipped: 0
21    extended:
22      result: success
23      statistics:
24        Failed: 0
25        Passed: 2
26        Skipped: 0
```

Examining Existing Controller



KubeCon



CloudNativeCon

Europe 2026

- [GEP-2162](#)
SupportedFeatures in
GatewayClass.Status
- Used by Conformance test
suite

```
apiVersion: gateway.networking.k8s.io/v1beta1
kind: GatewayClass
...
status:
  conditions:
    - lastTransitionTime: "2022-11-16T10:33:06Z"
      message: Handled by XXX controller
      observedGeneration: 1
      reason: Accepted
      status: "True"
      type: Accepted
  supportedFeatures:
    - HTTPRoute
    - HTTPRouteHostRewrite
    - HTTPRoutePortRedirect
    - HTTPRouteQueryParamMatching
```



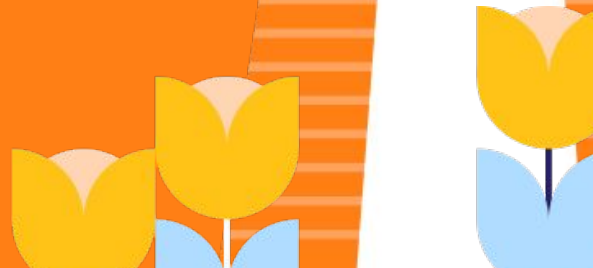
KubeCon



CloudNativeCon

Europe 2026

Tooling



github.com/kubernetes-sigs/ingress2gateway



KubeCon



CloudNativeCon

Europe 2026

The screenshot displays the GitHub repository page for `kubernetes-sigs/ingress2gateway`. The interface includes a top navigation bar with the repository name and a search bar. Below the navigation bar, there is a table listing recent commits, followed by a section for repository navigation tabs. The main content area shows the README, which describes the project's purpose and scope. The right sidebar features a list of contributors and a language usage chart.

File	Commit Message	Time Ago
SECURITY_CONTACTS	Update OWNERS, OWNERS_ALIASES and SECURITY_CO...	4 years ago
code-of-conduct.md	Initial commit	4 years ago
go.mod	Refactor notification mechanism (#360)	2 weeks ago
go.sum	Refactor notification mechanism (#360)	2 weeks ago
main.go	Fix OIDC authentication support (#245)	6 months ago

Navigation Tabs: README (selected), Code of conduct, Contributing, Apache-2.0 license, Security

Ingress to Gateway

Ingress2gateway helps translate Ingress and provider-specific resources (CRDs) to Gateway API resources. Ingress2gateway is managed by the [Gateway API](#) SIG-Network subproject.

Scope

Ingress2gateway is primarily focused on translating Ingress and provider-specific resources(CRDs) to Gateway API resources. Widely used provider-specific annotations and/or CRDs *may* still not be supported. Please refer to [supported providers](#) for the current supported providers and their documentation. Contributions for provider-specific annotations and/or CRDs support are mostly welcomed as long as they can be translated to [Gateway API](#) directly.

Note: Ingress2gateway is not intended to copy annotations from Ingress to Gateway API.

Providers vs Emitters

Ingress2gateway has two main components: **providers** and **emitters**.

- **Providers** read Ingress resources and provider-specific CRDs, then convert them into a generic intermediate representation (IR).

Contributors: + 35 contributors

Languages:

- Go 98.6%
- Other 1.4%

github.com/kubernetes-sigs/ingress2gateway



KubeCon



CloudNativeCon

Europe 2026

```
ingress2gateway print --providers=<my-cool-provider>
```



KubeCon



CloudNativeCon

Europe 2026

The screenshot shows a web browser displaying the Kubernetes Blog article titled "Announcing Ingress2Gateway 1.0: Your Path to Gateway API". The browser's address bar shows the URL `kubernetes.io/blog/2026/03/20/ingress2gateway-1-0-release/`. The page features a navigation bar with links to Documentation, Kubernetes Blog (active), Training, Careers, Partners, Community, Versions, and English. A search bar is located on the right. The left sidebar contains a search bar and a list of recent articles, with the current article highlighted. The main content area includes the article title, author information (Beka Modebadze from Google and Steven Jin from Microsoft), the date (Friday, March 20, 2026), and the article text. The text discusses the retirement of Ingress-NGINX and the migration to Gateway API. A right sidebar contains links to RSS Feed, Submit a Post, @kubernetes.io, @Kubernetesio, on GitHub, #kubernetes-users, Stack Overflow, Forum, and Kubernetes. The bottom of the page shows the start of the "Ingress2Gateway 1.0" section, mentioning "Ingress-NGINX annotation support".

Announcing Ingress2Gateway 1.0: Your Path to Gateway API

By [Beka Modebadze](#) (Google), [Steven Jin](#) (Microsoft) | Friday, March 20, 2026

With the Ingress-NGINX [retirement](#) scheduled for March 2026, the Kubernetes networking landscape is at a turning point. For most organizations, the question isn't whether to migrate to [Gateway API](#), but how to do so safely.

Migrating from Ingress to Gateway API is a fundamental shift in API design. Gateway API provides a modular, extensible API with strong support for Kubernetes-native RBAC. Conversely, the Ingress API is simple, and implementations such as Ingress-NGINX extend the API through esoteric annotations, ConfigMaps, and CRDs. Migrating away from Ingress controllers such as Ingress-NGINX presents the daunting task of capturing all the nuances of the Ingress controller, and mapping that behavior to Gateway API.

Ingress2Gateway is an assistant that helps teams confidently move from Ingress to Gateway API. It translates Ingress resources/manifests along with implementation-specific annotations to Gateway API while warning you about untranslatable configuration and offering suggestions.

Today, SIG Network is proud to announce the **1.0 release of Ingress2Gateway**. This milestone represents a stable, tested migration assistant for teams ready to modernize their networking stack.

Ingress2Gateway 1.0

Ingress-NGINX annotation support

github.com/kubernetes-sigs/gwctl



KubeCon



CloudNativeCon

Europe 2026

The screenshot displays the GitHub repository page for `kubernetes-sigs/gwctl`. The top navigation bar includes the repository name and a search bar. The main content area is divided into three sections:

- Files:** A list of files with their commit history.

File	Commit Message	Time Ago
SECURITY.md	Initial commit	2 years ago
SECURITY_CONTACTS	update template files for repo specific info	2 years ago
code-of-conduct.md	Initial commit	2 years ago
go.mod	Merge pull request #121 from xvchris/fix/analyze-classify-...	3 days ago
go.sum	build(deps): bump sigs.k8s.io/gateway-api from 1.4.1 to 1.5.1	3 days ago
main.go	Replace old package name with new sigs.k8s.io/gwctl and ...	2 years ago
- README:** The main description of the project, including a note about its experimental status and an installation section.

gwctl

gwctl is a command-line tool for managing and understanding Gateway API resources in your Kubernetes cluster. It allows you to create, view, describe, analyze, and delete Gateway API and other Kubernetes resources. It also provides advanced features like visualizing relationships with DOT graphs and warning about potential issues.

Note

gwctl is still considered an [experimental feature of the Gateway API](#). While we iterate on the early stages of this tool, bugs and incompatible changes will be more likely.

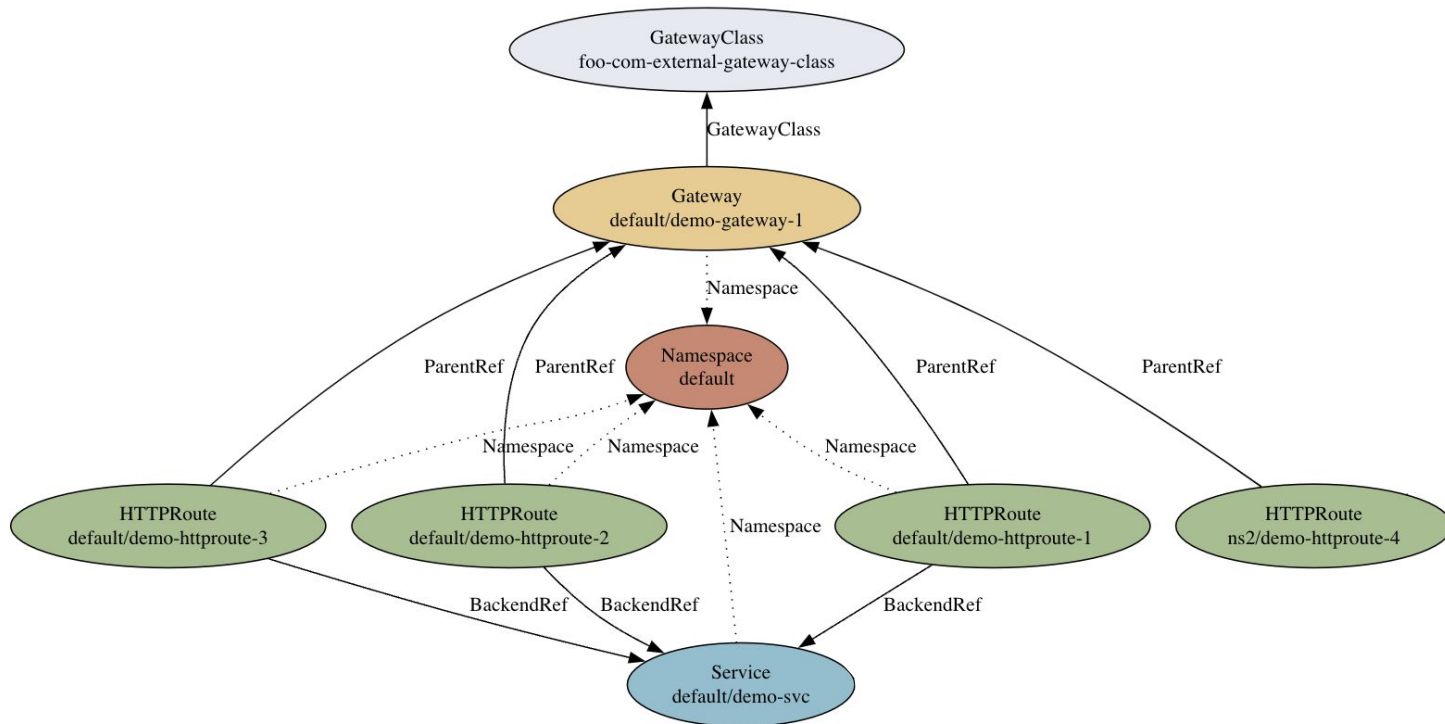
Installation

Installing With A Package Manager

1. On macOS or Linux, you can install gwctl via Homebrew:

```
brew install gwctl
```
- Contributors:** A list of 31 contributors, with a link to view all 17 contributors.
- Languages:** A bar chart showing the distribution of languages used in the repository.

Language	Percentage
Go	97.4%
Shell	2.0%
Makefile	0.6%





KubeCon



CloudNativeCon

Europe 2026

Looking Forward



Releases



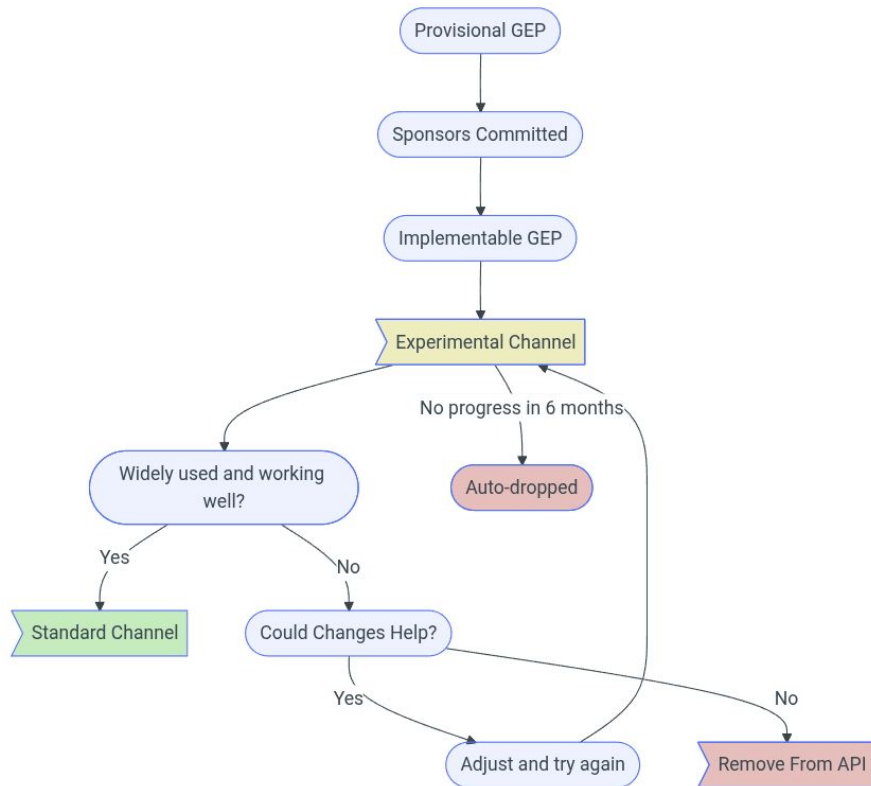
KubeCon



CloudNativeCon

Europe 2026

- Two Primary Release Channels
 - Standard every 4 months
 - Experimental monthly
- Simplified API Stability
 - From Alpha to GA
- Compatibility and Graduation
 - Test coverage and multiple impls



Adjacent Projects



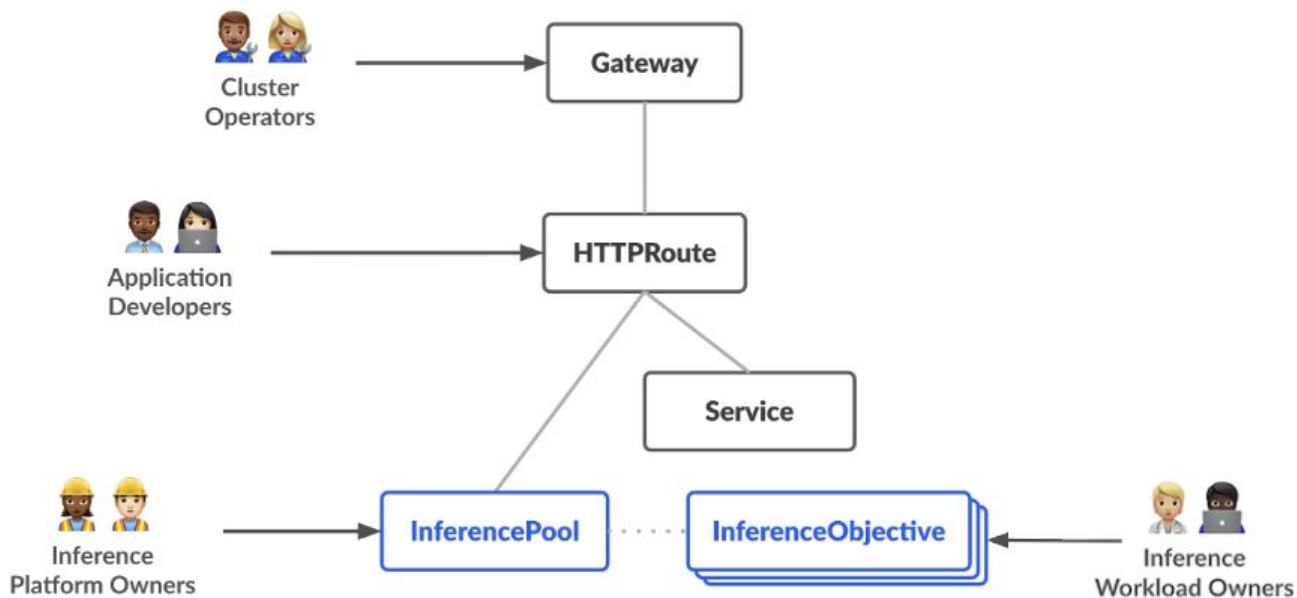
KubeCon



CloudNativeCon

Europe 2026

Inference extension



gateway-api-inference-extension.sigs.k8s.io/

Adjacent Projects



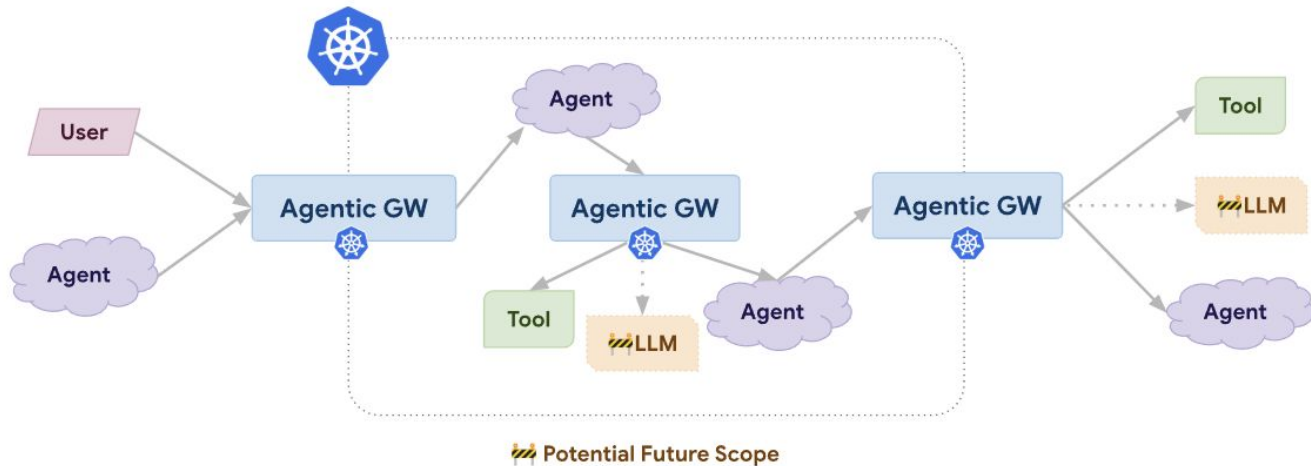
KubeCon



CloudNativeCon

Europe 2026

kube-agentic-networking



kube-agentic-networking.sigs.k8s.io/guides/quickstart

What's next?



KubeCon



CloudNativeCon

Europe 2026

- Guides → gateway-api.sigs.k8s.io/guides
- Controller Wizard → gateway-api.sigs.k8s.io/implementations/wizard
- Get involved!



#sig-network-gateway-api



github.com/kubernetes-sigs/gateway-api



KubeCon



CloudNativeCon

Europe 2026

Feedback!





KubeCon



CloudNativeCon

Europe 2026

