Cloud Contraptions
TRAINING & CONSULTING

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Migrating from Ingress NGINX to the Kubernetes Gateway API

Class Duration

7 hours of live training delivered over 1 day.

Student Prerequisites

- Working experience with Kubernetes: Deployments, Services, and kubectl
- Familiarity with Ingress resources and the ingress-nginx controller
- Basic understanding of DNS, TLS certificates, and HTTP routing
- Helm experience is helpful but not required

Target Audience

Platform engineers, SREs, DevOps engineers, and cluster operators who run the community ingress-nginx controller, plus developers who own Ingress manifests. It also fits architects choosing a Gateway API implementation across clusters or clouds. Teams that need Kubernetes foundations first can take Kubernetes Essentials for Programmers.

Description

The Kubernetes project retired the community ingress-nginx controller in March 2026 and archived its repository. This one-day course moves teams to the Kubernetes Gateway API, the role-oriented successor to Ingress. Students learn the Gateway API resource model and choose an implementation from conformance data. They translate Ingress resources with ingress2gateway and map annotations to filters and policies. The course ends with TLS, canary releases, and a side-by-side cutover with a tested rollback.

Learning Outcomes

- Explain what ingress-nginx retirement means for existing clusters.
- Tell community ingress-nginx apart from vendor-maintained NGINX controllers.
- Describe GatewayClass, Gateway, ListenerSet, and the route types.

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- Choose a Gateway API implementation from conformance reports and feature needs.
- Inventory Ingress resources and annotations.
- Translate Ingress resources with ingress2gateway.
- Map ingress-nginx annotations to Gateway API filters and policies.
- Identify ingress-nginx behaviors that need redesign.
- Configure TLS termination, passthrough, and backend TLS.
- Replace canary annotations with weighted traffic splitting.
- Run a side-by-side cutover with a tested rollback.

Training Materials

Comprehensive courseware is distributed online at the start of class. All students receive a downloadable MP4 recording of the training.

Software Requirements

Students will need a free, personal GitHub account to access the courseware, Docker Desktop or Podman, kind (or another local Kubernetes cluster), kubectl, Helm, and Visual Studio Code. The course is taught with Gateway API v1.7 and ingress2gateway v1.2.

Training Topics

Why ingress-nginx Was Retired

- The retirement announcement and timeline
- Final releases and the archived repository
- No further bug fixes or security patches
- Existing installations keep running
- Community ingress-nginx vs. F5 NGINX Ingress Controller
- Ingress is frozen, not deprecated
- Finding ingress-nginx in your clusters
- Assessing exposure

Gateway API Concepts

- Infrastructure, cluster, and application roles
- GatewayClass, Gateway, and ListenerSet
- HTTPRoute and GRPCRoute
- TLSRoute, TCPRoute, and UDPRoute

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- ReferenceGrant for cross-namespace references
- Standard and experimental channels
- Core, Extended, and Implementation-specific support
- Policy attachment

Choosing an Implementation

- Reading conformance reports
- Envoy Gateway, Istio, and Cilium
- NGINX Gateway Fabric, Traefik, Kong, and kgateway
- GKE Gateway and the AWS Load Balancer Controller
- Application Gateway for Containers
- The AKS application routing add-on
- Selection criteria
- One or several implementations per cluster

Inventory and Translation with ingress2gateway

- Inventorying Ingress resources and IngressClasses
- Cataloging annotations
- Translating resources with ingress2gateway
- Standard vs. implementation-specific emitters
- Untranslated annotation notifications
- Committing generated manifests to Git

Annotation Mapping and Behavior Differences

- `rewrite-target` to `URLRewrite`
- `ssl-redirect` and `force-ssl-redirect` to `RequestRedirect`
- CORS annotations to the CORS filter
- Timeouts, retries, and backend protocols
- Authentication and rate limiting policies
- IP allow lists
- Snippets with no Gateway API equivalent
- Redesigning `configuration-snippet` and `server-snippet`
- Case-insensitive regex matching
- Host-wide `use-regex`
- Implied regex from `rewrite-target`
- Trailing-slash redirects and URL normalization

TLS and Certificates

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- TLS termination on Gateway listeners
- Cross-namespace certificates with ReferenceGrant
- cert-manager with the Gateway API
- HTTP-to-HTTPS redirects
- TLS passthrough with TLSRoute
- Backend TLS with BackendTLSPolicy

Canary Releases and Traffic Splitting

- Mapping `canary`, `canary-weight`, and `canary-by-header`
- Weighted `backendRefs` on HTTPRoute
- Header matching for targeted canaries
- Request mirroring
- Progressive delivery with Argo Rollouts or Flagger

Cutover and Rollback

- Running ingress-nginx and Gateway side by side
- DNS weights and low TTLs
- Validating routes, certificates, and error rates
- Rollback triggers
- A tested rollback path
- Removing ingress-nginx and IngressClasses
- Gateway API resources in GitOps

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