Ingress Objects vs. Ingress Controller

In Kubernetes, external access to cluster services is overseen by Ingress, consisting of two core components: the Ingress API object and the Ingress controller. Let's understand these elements and their collaborative functionality.

Ingress objects

The Ingress acts as a supervisor for external access, exposing routes from outside the cluster to internal services, mainly focusing on HTTP and HTTPS traffic. It adheres to rules defined on the Ingress resource to regulate traffic routing.

It doesn't manage arbitrary ports or protocols. Instead, it can provide services with externally accessible URLs, balance traffic, handle SSL/TLS termination, and enable name-based virtual hosting. For non-HTTP and non-HTTPS services, specific service types such as Service.Type=NodePort or Service.Type=LoadBalancer are typically used.

Ingress controllers

On the operational side, the Ingress controller is the deployed cluster resource responsible for implementing rules specified by the Ingress API object. Unlike certain controllers that automatically run as part of the kube-controller-manager binary, the Ingress controller requires explicit activation for the Ingress resource to function. Its primary role is to execute the directives outlined in the Ingress, commonly utilizing a load balancer or setting up additional frontends to handle incoming traffic.

Ingress objects vs Ingress controllers

Feature	Ingress Objects	Ingress Controllers
Definition	API object managing external access to services	Cluster resource implementing rules specified by Ingress
Primary Function	Regulates external access routing	Implements rules, fulfilling the Ingress
Configuration Source	Rules defined on the Ingress resource	Reads and processes information from the Ingress object
Traffic Handling	Manages HTTP and HTTPS routes	Utilizes load balancer, configures frontends for traffic
Activation	Active upon configuration with Ingress resource	Must be explicitly running for Ingress to function
Handling Protocols	Focused on HTTP and HTTPS	Implements rules for various protocols and ports
Automatic Startup	Activated with configuration	Requires explicit activation in the cluster
Analogy	Traffic rule set for the cluster	Executor, similar to Nginx instance handling rules

Conclusion

In Kubernetes, overseeing external access includes Ingress, which consists of Ingress objects and Ingress controllers. Ingress manages the routing of HTTP and HTTPS traffic, and Ingress controllers implement these rules in the cluster. Understanding this interplay is essential for effective external access management in Kubernetes.

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