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Scalable and multi-tenant Kubernetes ingress infrastructure

Monday 21 October 2024 16:00 (15 minutes)

Since 2016, CERN has been using the OpenShift Kubernetes Distribution to host a platform-as-a-service (PaaS). This service is optimized for hosting web applications and has grown to tens of thousands of individual websites. By now, we have established a reliable framework that deals with varied use cases: thousands of websites per ingress controller (8K+ hostnames), handling with long-lived connections (30K+ concurrent sessions) and high traffic applications (25TB+ per day).

This session will discuss:

- CERN's web hosting infrastructure based on OpenShift Kubernetes clusters;
- usage of open source and in-house developed software for providing a seamless user experience:
- integrations for registering hostnames (local DNS, LanDB, external providers)
- provisioning of certificates (automatic with external-dns / ACME HTTP-01, manual provisioning)
- access control policies and "connecting" different components with OpenPolicyAgent
    - enforcing unique hostnames across multiple Kuberenetes clustes
- strategies for setting up Kubernetes Ingress Controllers for multi-tenant clusters;
- methods for scaling and sharding ingress controllers according to application requirements (specifically HAProxy ingress controllers);

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