ISTIO: SOLVING CHALLENGES OF HYBRID CLOUD

Zack Butcher (@ZackButcher) - Stealth Startup
Christian Posta (@christianposta) - Red Hat
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About Us

Zack Butcher  
@ZackButcher  
Founding Engineer - Stealth Startup

Christian Posta  
@christianposta  
Chief Architect - Red Hat
KUBERNETES IS BEST PLACE TO RUN CONTAINERS WORKLOADS

- Place containers on hosts
- Declarative deployment models
- Scaling, autoscaling
- Health checking
- Rudimentary service discovery and load balancing
INTERESTING THINGS HAPPEN WHEN SERVICES TRY TO COMMUNICATE
THINGS WE MUST SOLVE FOR BECAUSE “DISTRIBUTED SYSTEMS”

- Service discovery
- Retries
- Timeouts
- Load balancing
- Rate Limiting
- Circuit Breaking
- Security
- Zone aware balancing
- Outlier detection
- Traffic shaping
- Request mirroring
- Fault Inject
- Distributed tracing
- Logging
- Metrics collection
- Dark launches
- Per-request routing
- Edge routing
LET’S SOLVE THOSE HORIZONTAL CONCERNS OUT OF THE APPLICATION
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Meet Envoy Proxy

http://envoyproxy.io
LET'S SOLVE THOSE HORIZONTAL CONCERNS OUT OF THE APPLICATION
FOUNDATIONS OF A SERVICE MESH
WHAT IS A SERVICE MESH

A service mesh is decentralized application-networking infrastructure between your services that provides resilience, security, observability, and routing control.
ISTIO IS AN OPEN-SOURCE SERVICE MESH TO CONNECT, SECURE, AND MANAGE YOUR SERVICES

http://istio.io
ISTIO GIVES YOU

- Fine grained traffic control/routing
- Service resilience
- Secure communication
- Policy enforcement
- Telemetry collection
DOES EVERYTHING RUN IN THE MESH?
CHALLENGES OF RUNNING HYBRID DEPLOYMENT ENVIRONMENTS
OPERATING THIS ENVIRONMENT IS HARD

- Resilience
- Organizational policy enforcement
- Monitoring / Observability
- Security
- Workload identity
- Routing / networking
ISTIO CAN HELP IN HYBRID DEPLOYMENT ENVIRONMENTS
SERVICE COMMUNICATION AND ROUTING

- Workloads shouldn’t have to know about topology (and topology changes)
- Federate service-discovery registries
- Routing through well-established ingress/egress points
- Fine-grained control for operators to shift/shape traffic
OBSERVABILITY / METRIC COLLECTION

- Understanding what’s happening across entire domain
- Single pane of glass for application-level networking metrics
- Consistent metric collection via istio proxies
- QPS, 500s, Circuit breaking events, Pxx latencies, etc
SECURITY / IDENTITY

- Securing all traffic inter-cluster with mTLS
- Consistent identity for workloads across clusters
- Leverages SPIFEE (Secure Production Identity For Everyone)
- Foundations for zero-trust networking
ISTIO HYBRID DEPLOYMENT ARCHITECTURE
KUBERNETES TO VM MESH EXPANSION

Diagram showing Kubernetes cluster connected to Istio Control Plane and Envoy in VM.
K8S to K8S SINGLE CONTROL PLANE

Remote Kubernetes cluster

Local Kubernetes cluster

Istio pilot
Istio policy

Istio pilot
Istio policy

These are just endpoints
K8S to K8S MULTIPLE CONTROL PLANE
DEMO
Part Two
Part Three
Demo time - Reach out for questions!

Website: http://istio.io
Twitter: @IstioMesh
GitHub: https://github.com/istio/istio/
Community: https://istio.io/community.html
Demo: https://github.com/ZackButcher/hybrid-demo
Demo time - Reach out for questions!

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THANK YOU

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