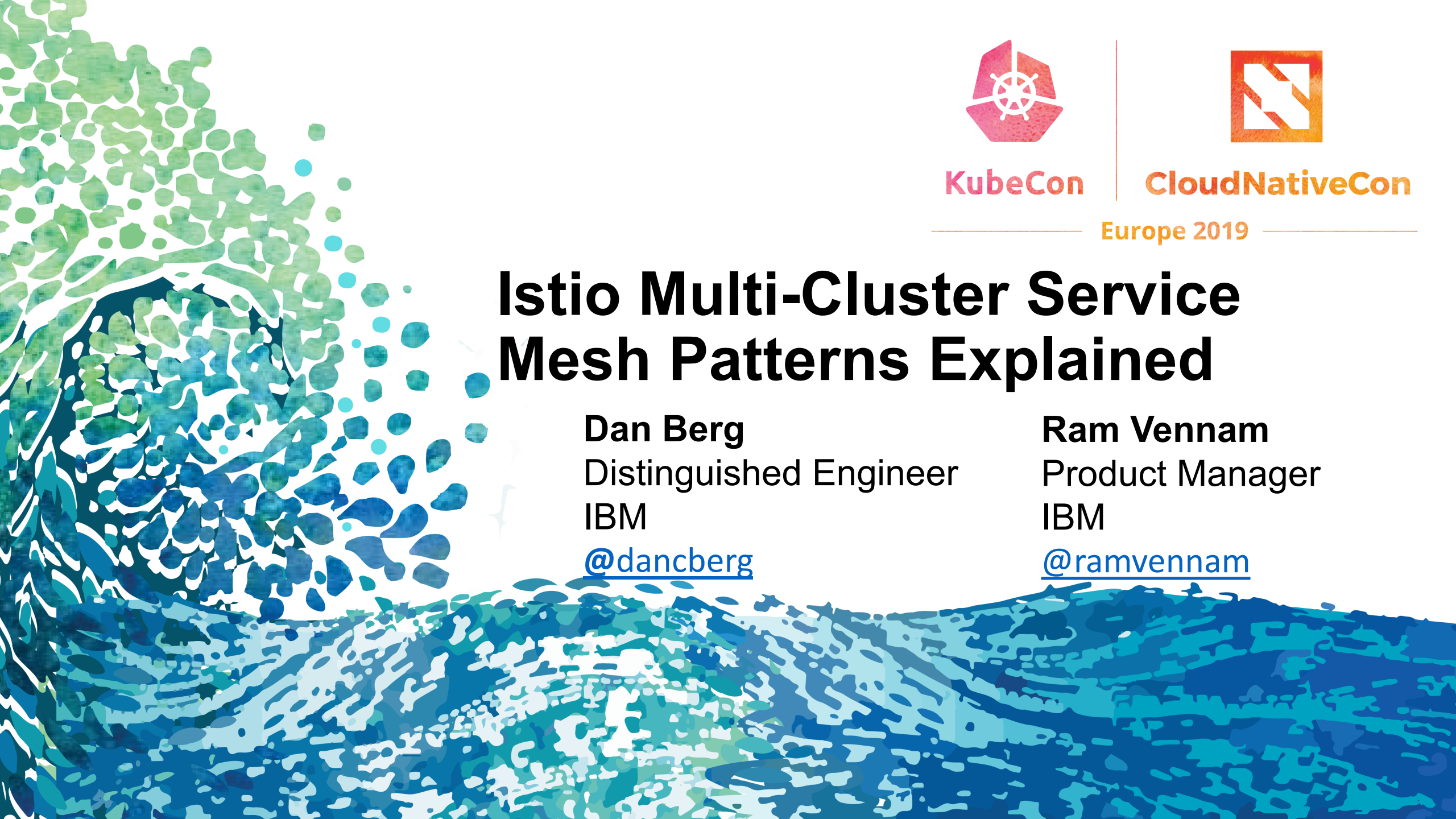


KubeCon | CloudNativeCon

Europe 2019

Istio Multi-Cluster Service Mesh Patterns Explained

Dan Berg
Distinguished Engineer
IBM
@dancberg

Ram Vennam
Product Manager
IBM
@ramvennam

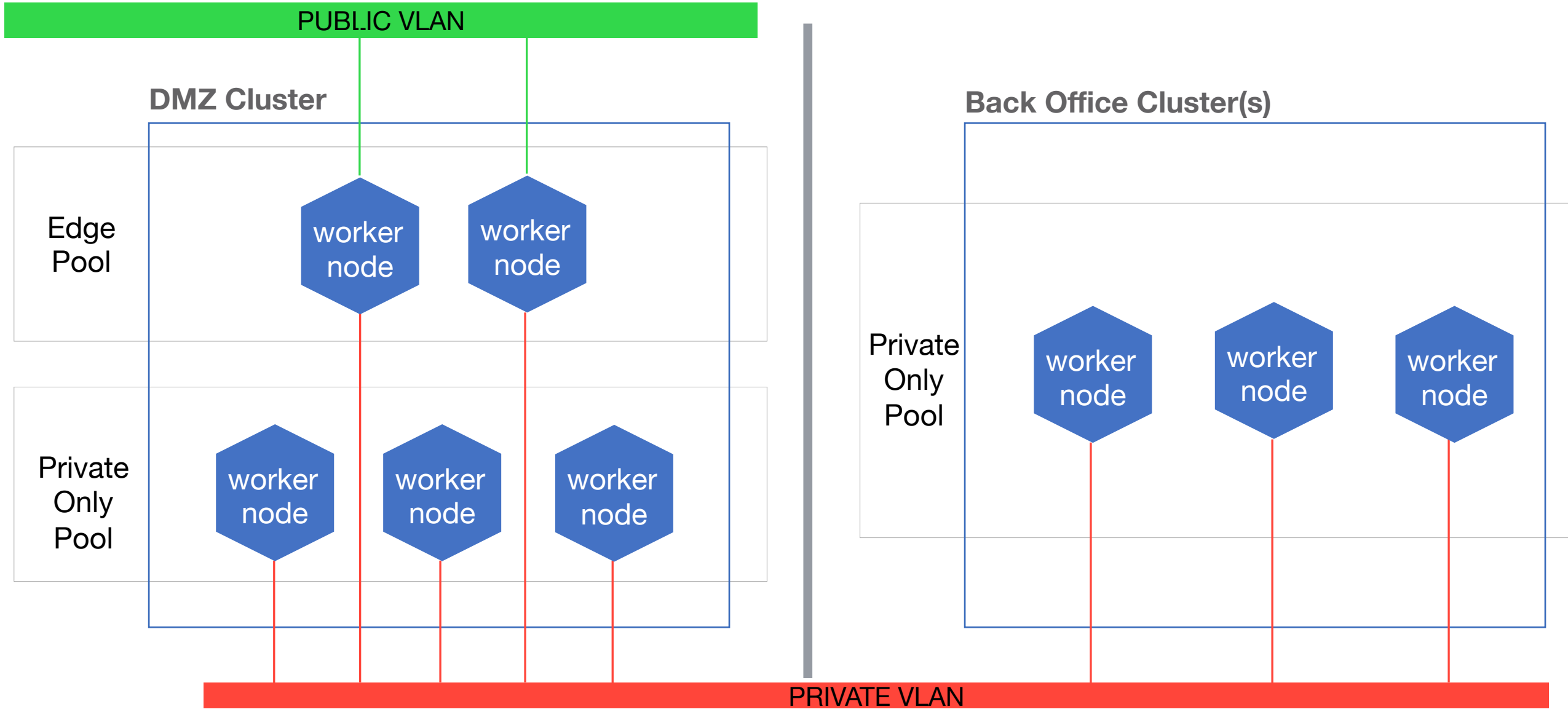
Multicluster and Multicloud

- Performance
- Workload isolation
- Dev/Test/Prod environments
- Cost
- Failover and redundancy

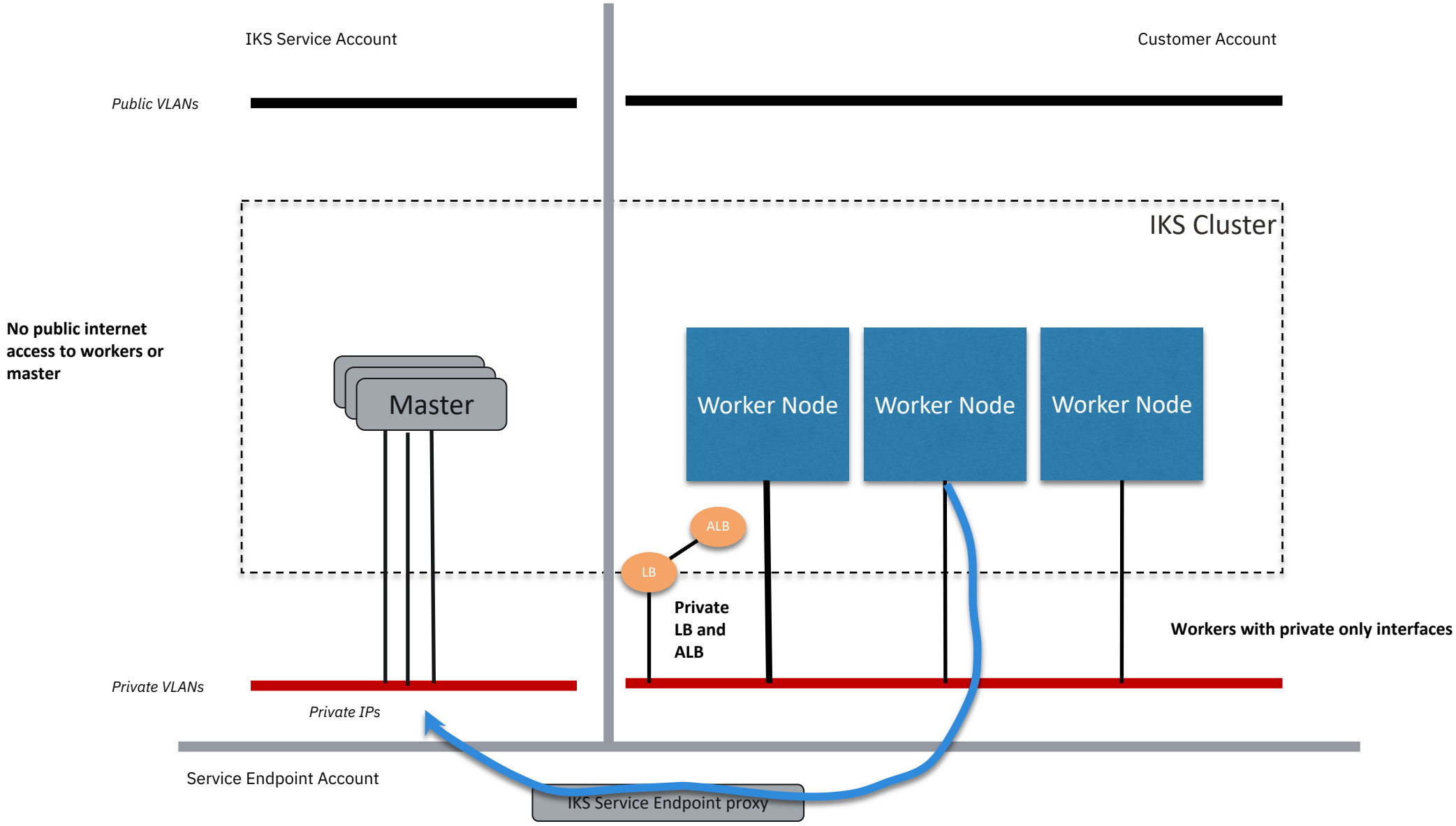
Customer Requirements

- Reduce attack vector of business applications
- Controls for public internet access
- Auditing of public internet traffic
- Connection to on-premises network
- Secure data in transit across all inter and intra application communication

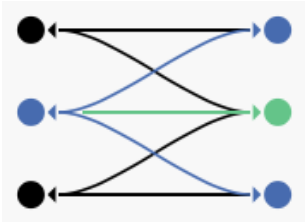
Cluster configuration



Private Cluster Access



Service Mesh

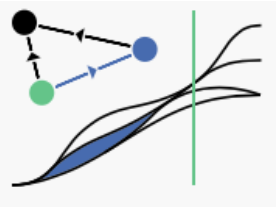


Connect

Traffic Control, Discovery, Load Balancing, Resiliency

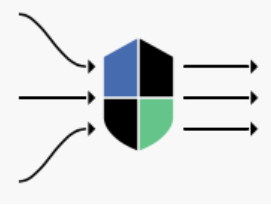
Secure

Encryption (TLS), Authentication, and Authorization of service-to-service communication



Observe

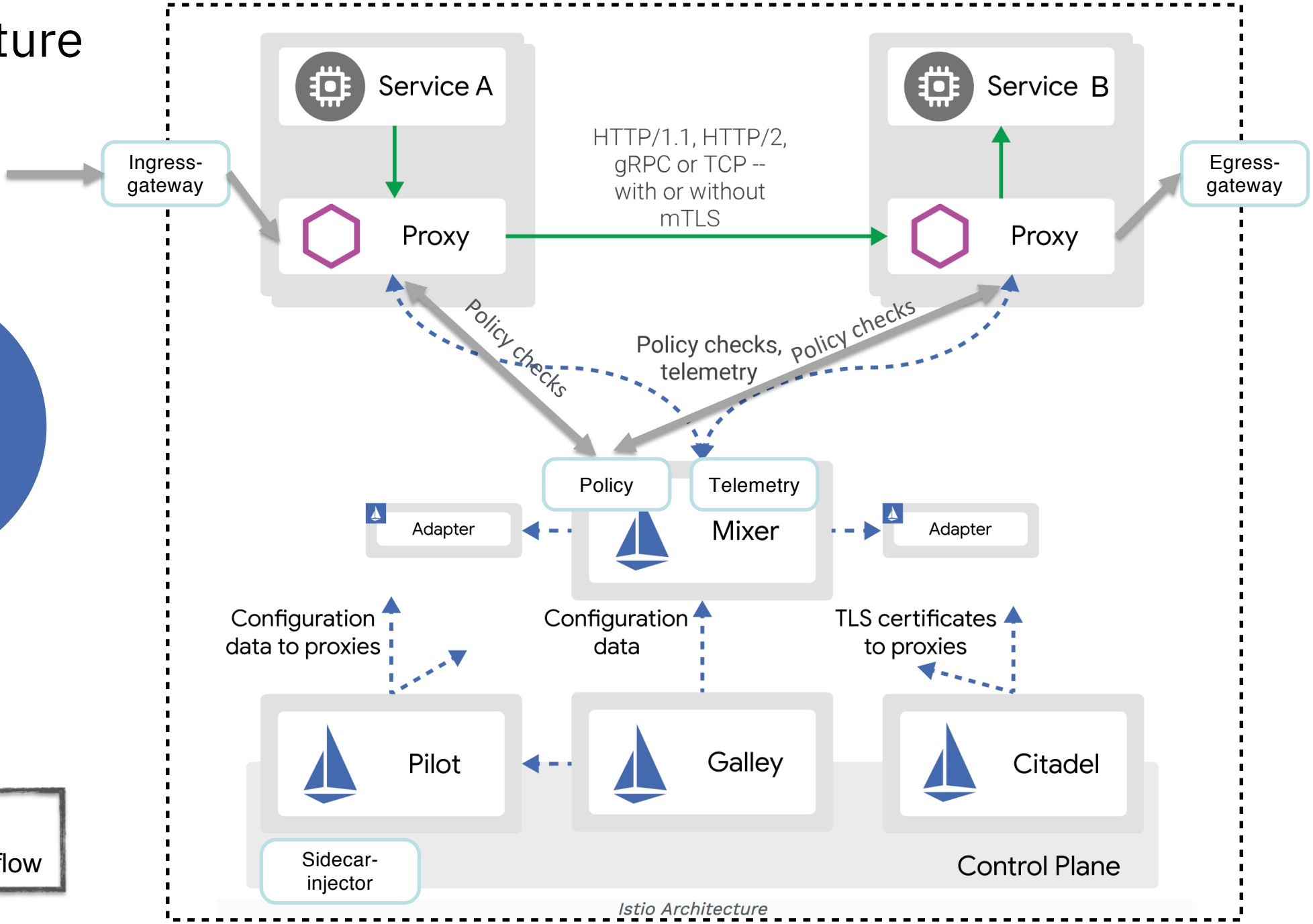
Metrics, Logging, Tracing



Control

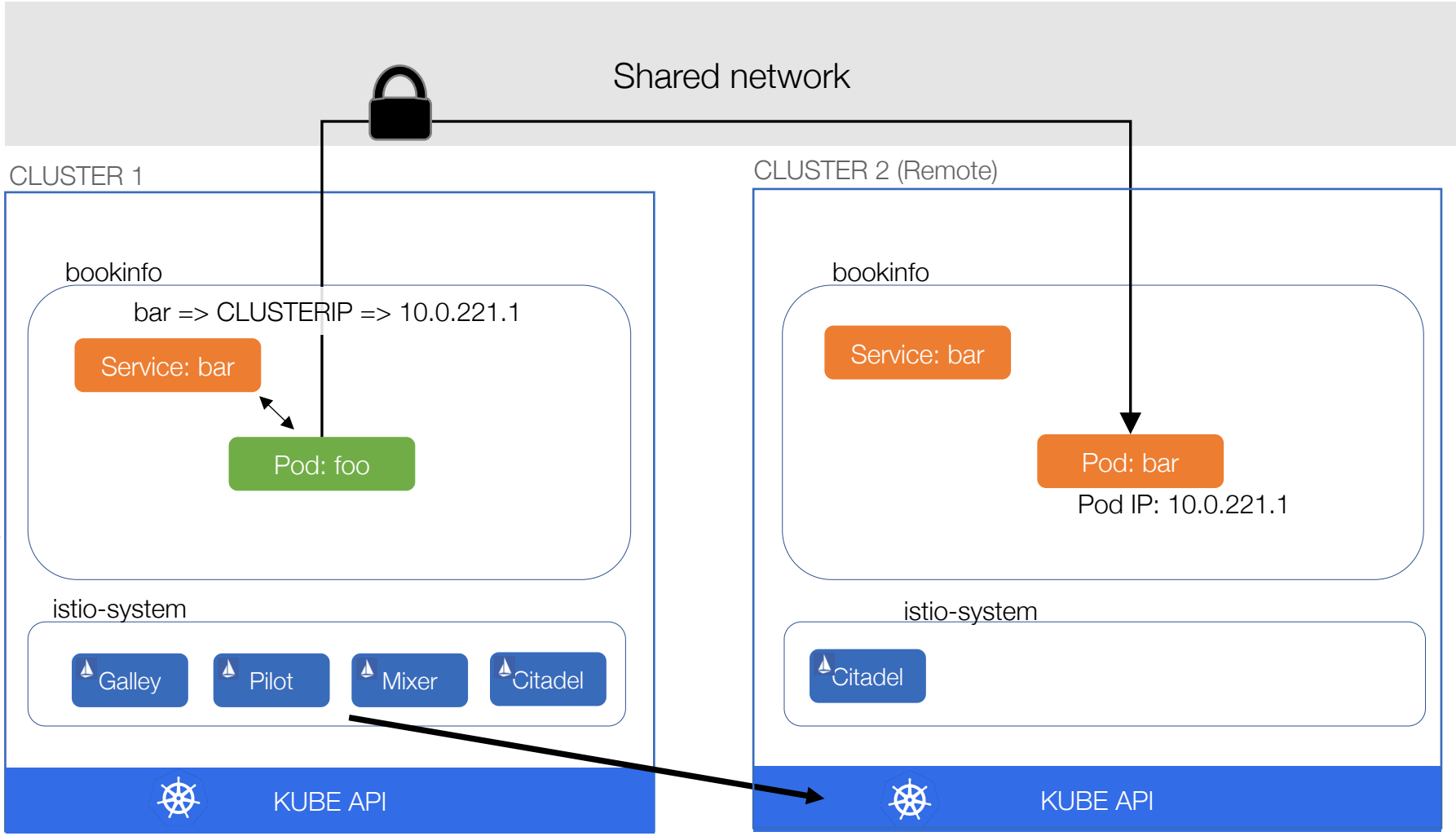
Policy Enforcement

Istio Architecture



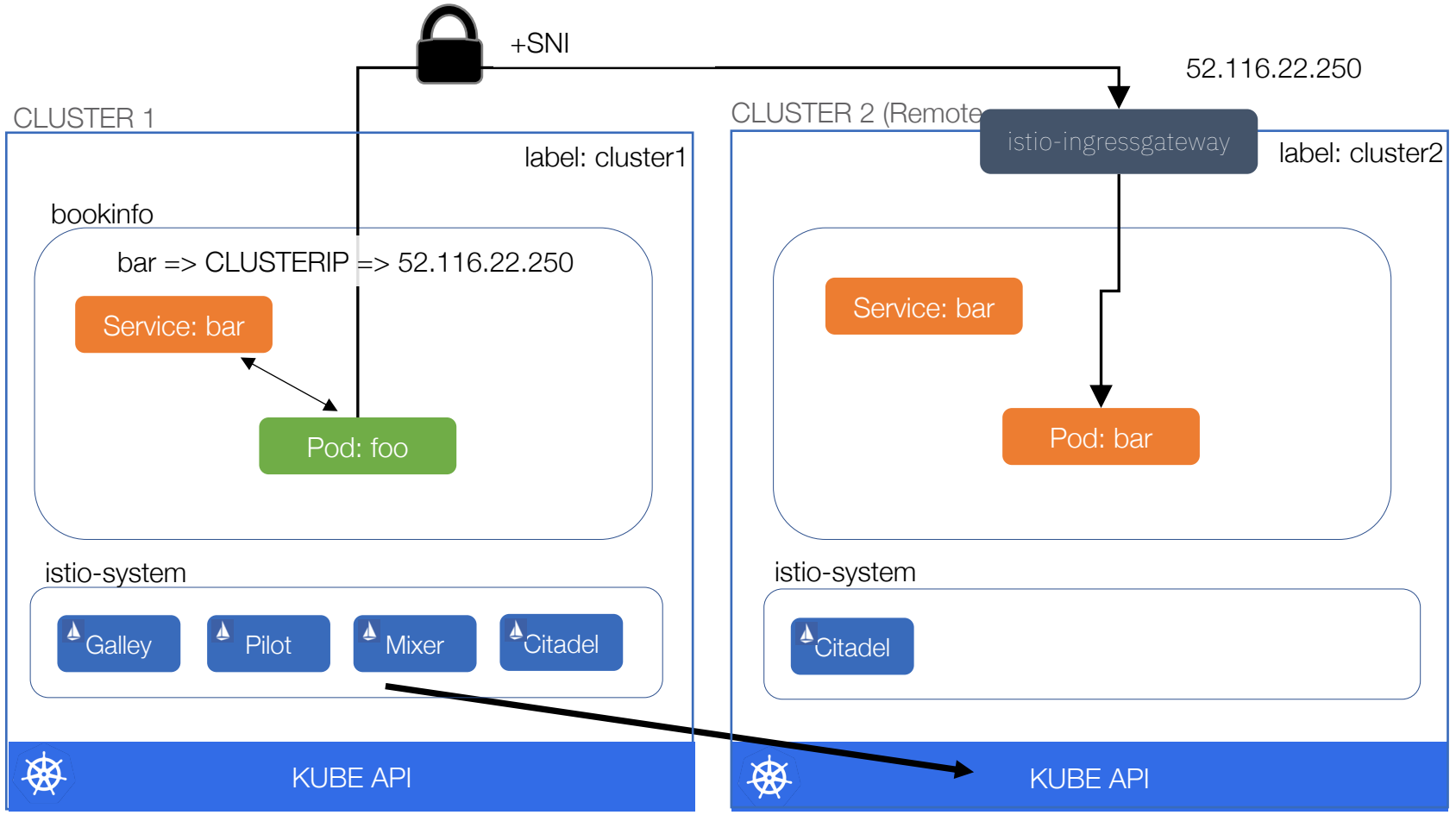
Single network, single control plane

- Remotes have smaller Istio
- Internal CIDRs routable
- Share remote cluster config
- Service defined everywhere
- Changing Istio service endpoints



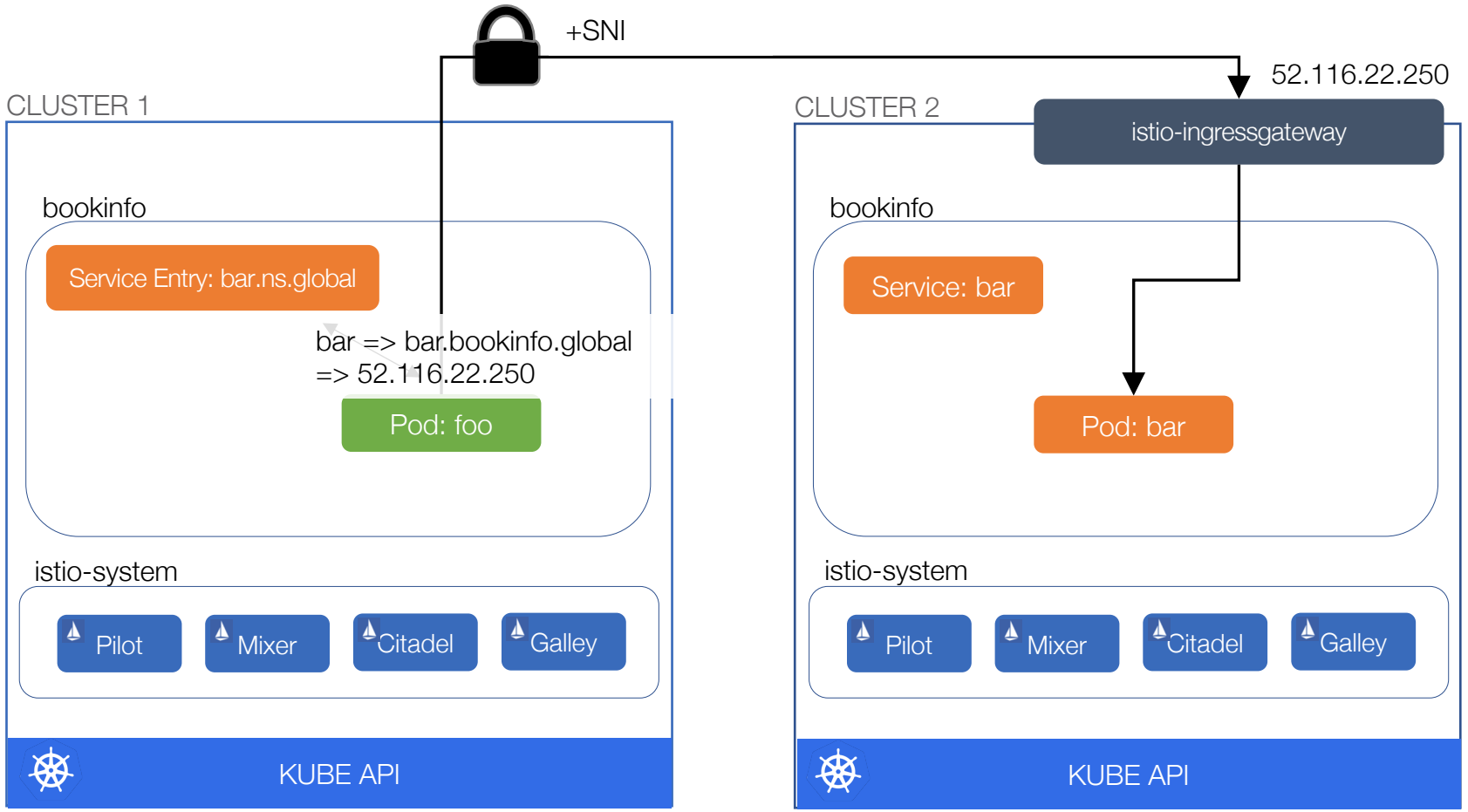
Single control plane, separate networks

- Remotes have smaller Istio
- Separate internal CIDRs
- Service defined everywhere
- Gateway routing
- Split Horizon EDS
- SNI routing
- Changing Istio gateway IPs
- Pass-through mTLS

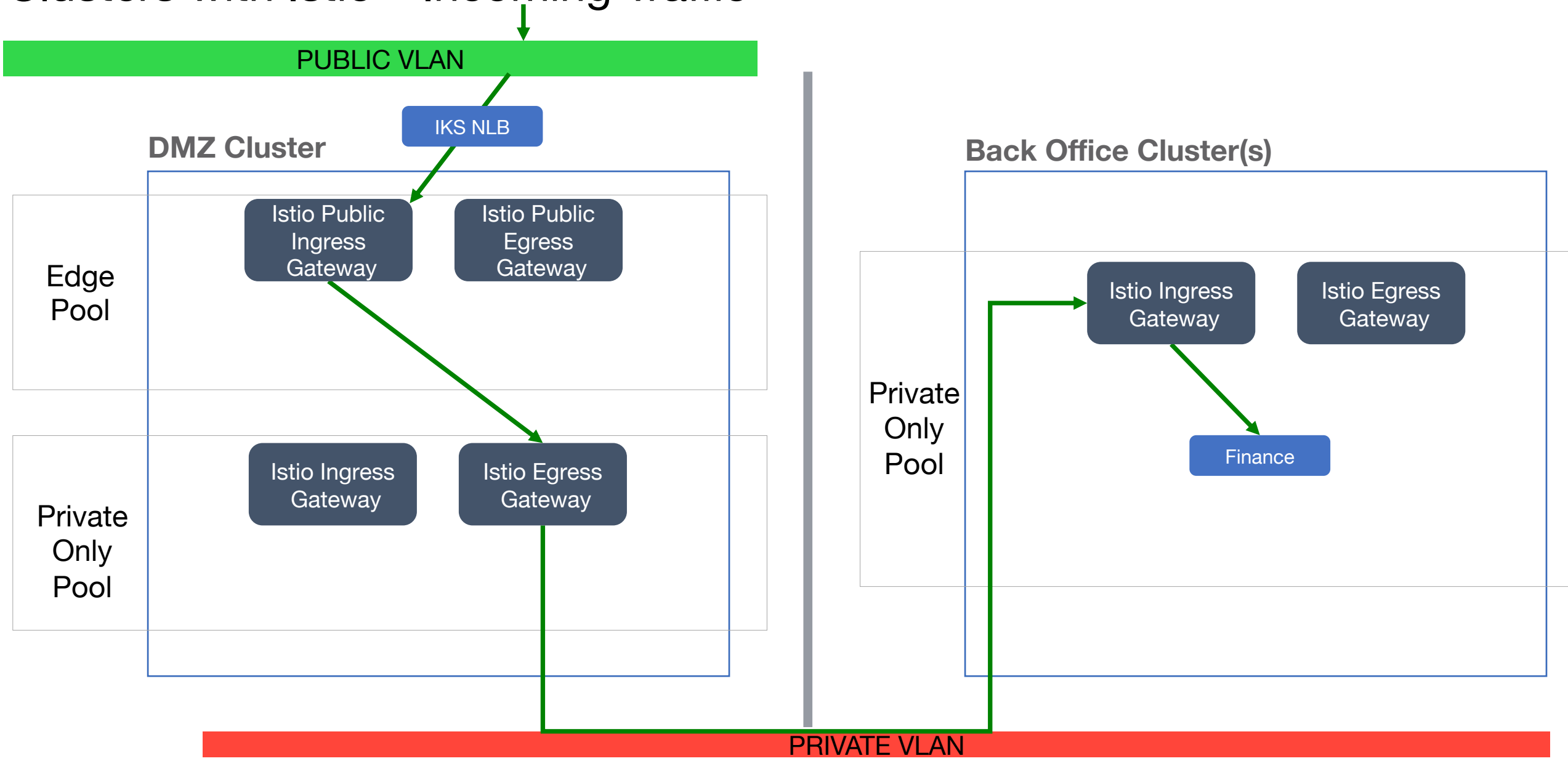


Multiple control planes

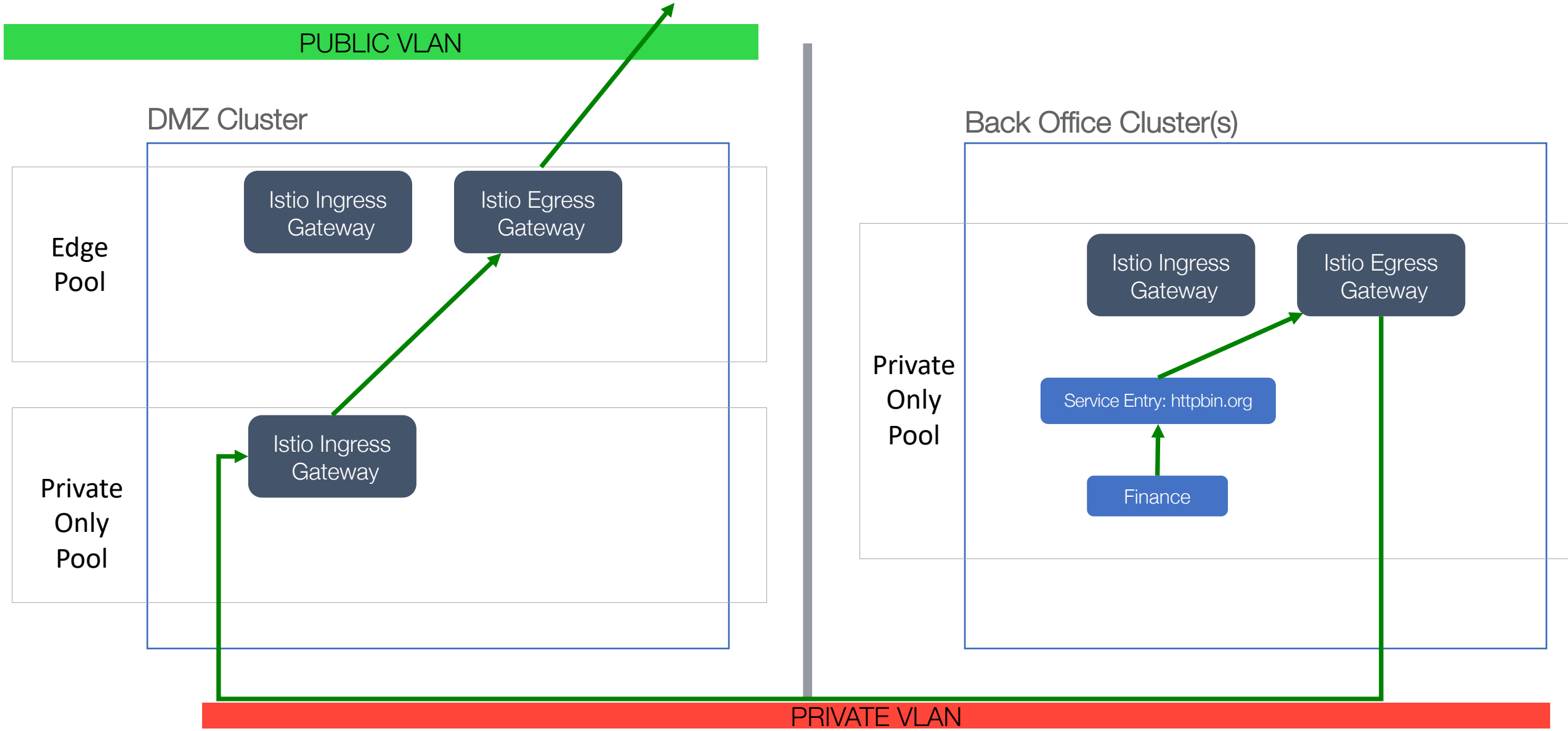
- Simple to setup and scale
- ServiceEntry for remote services
- CoreDNS for resolving .global
- Pass-through mTLS



Clusters with Istio – Incoming Traffic



Clusters with Istio – Outgoing traffic



Istio Multicluster Patterns Com

https://www.ibm.com/blogs/bluemix/2019/02/istio-multicluster-support/

IBM

Search

IBM Cloud Blog

Compute Services

Istio Multicluster Patterns Coming in 1.1

February 7, 2019 | Written by: Etai Lev Ran

Istio 1.1 multicluster functionality

There is a growing interest in running workloads across clusters. Multicluster deployments can result in better scaling, failure isolation, and application agility. Towards that end, Istio v1.1 builds on and enhances the Istio 1.0 multicluster support.

This blog post highlights the multicluster functionality in Istio. We describe what capabilities exist and how to use them.

Terminology

Multicluster Istio Questionnaire

https://docs.google.com/forms/d/e/1FAIpQLSfZ_bDtfmG8r

Multicluster Istio Questionnaire

There is a growing community interest in running workloads on multiple clusters to achieve better scaling, failure isolation and application agility. Naturally, the requirement of a multi-cluster service mesh arises as services communicate with one another across clusters. Istio v1.0 supports some multi-cluster capabilities and new ones are added in v1.1. At a high level, there are two patterns for this configuration:

1. Multiple synchronized Istio control planes that have replicated service and routing configurations.
2. A single Istio control plane that can access and configure all the services in the mesh.

Each of these topologies further offer more than one way to configure your mesh, depending on your application, platform and security requirements and limitations.

On 2/6/2019, Etai Lev-ran from IBM presented a deep dive into various options available, discussed the pros and cons of each approach and asked the community to share feedback.

You can watch the recording at https://youtu.be/Ze5m46vkOZ8
Or read the blog post https://www.ibm.com/blogs/bluemix/2019/02/istio-multicluster-support/

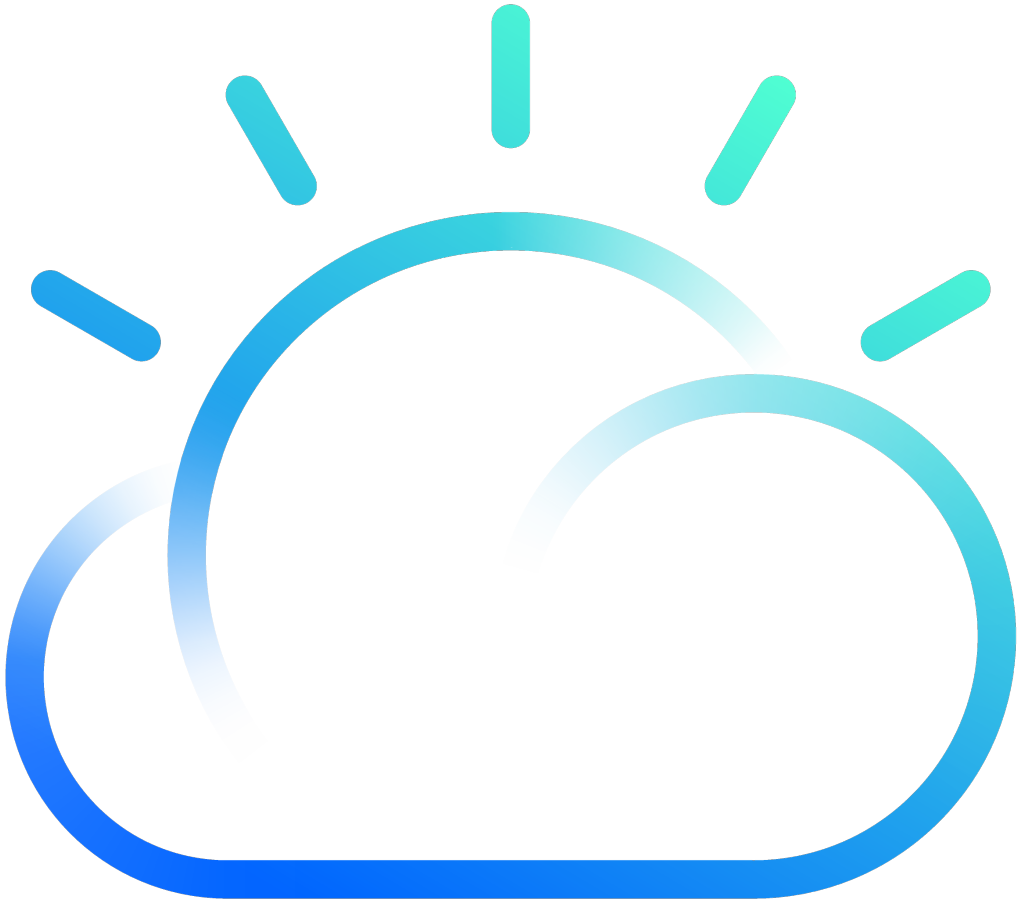
Please take a couple of minutes to answer the survey below to help the Istio contributors understand the requirements of our users.

Are you currently running or planning to run workloads across multiple clusters?

Thank you!

Dan Berg
Distinguished Engineer
IBM
@dancberg

Ram Vennam
Product Manager
IBM
@ramvennam



IBM Cloud