Testing Istio's Virtual Machine Integration Locally with Calico

Nina Polshakova
Solo.io, Software Engineer

Virtual Machine Installation

Prerequisites from Istio VM Installation Guide

1. Download the Istio release
2. Perform any necessary platform-specific setup
3. Check the requirements for Pods and Services
4. **Virtual machines must have IP connectivity to the ingress gateway in the connecting mesh, and optionally every pod in the mesh via L3 networking if enhanced performance is desired.**
5. Learn about Virtual Machine Architecture to gain an understanding of the high level architecture of Istio's virtual machine integration.

How do we demonstrate the 4th point? L3 networking- reaching pods directly from VM and vice versa when developing locally?

What's different in a local setup?

General Setup:

- VM has a stable address to connect for bootstrapping
- Control plane traffic sent through east-west gateway in the cluster
  - Single network and multi network
- In production environments, communication between Kubernetes nodes and non-Kubernetes nodes often handled by VPC and VPN

Local Development Setup:

- Kubernetes nodes running in a simulated environment (minikube, k3s or kind)
- VM running locally in simulated environment
- Why test locally?

Setup Cluster

1. Setup single node k3s cluster run with multipass

2. Calculate Pod and Service ranges[1]
   - Example: A /20 range of IP addresses results in $2^{(32-20)} = 2^{12} = 4{,}096$ services

3. Kubernetes settings:

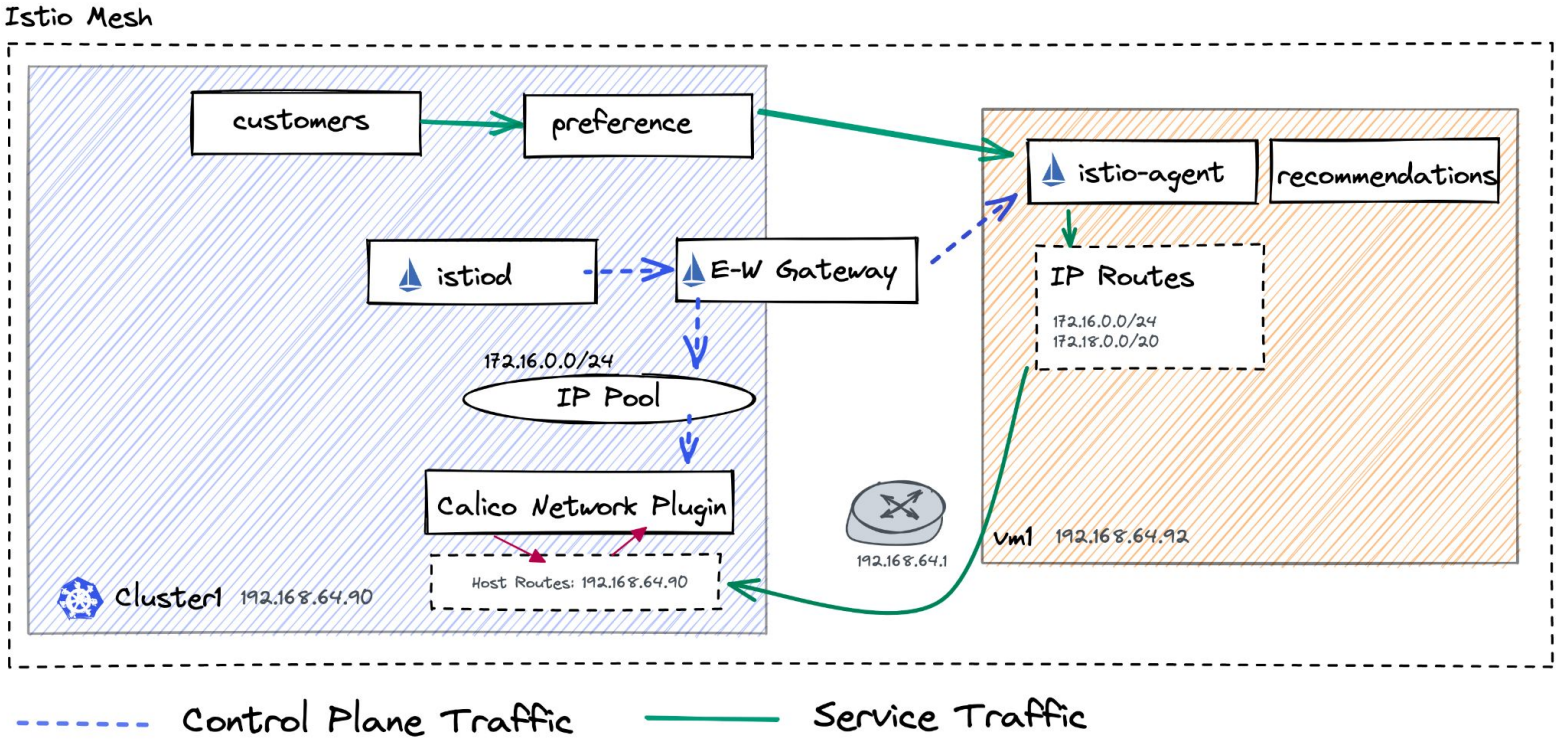
   `--cluster-cidr=172.16.0.0/24` create max 110 Pods

   `--service-cidr=172.18.0.0/20` create max 4096 services

   `--disable=traefik` disable traefik deployment (no loadbalancer!)

[1] https://cloud.google.com/kubernetes-engine/docs/concepts/alias-ips

Demo Overview



Thank you!