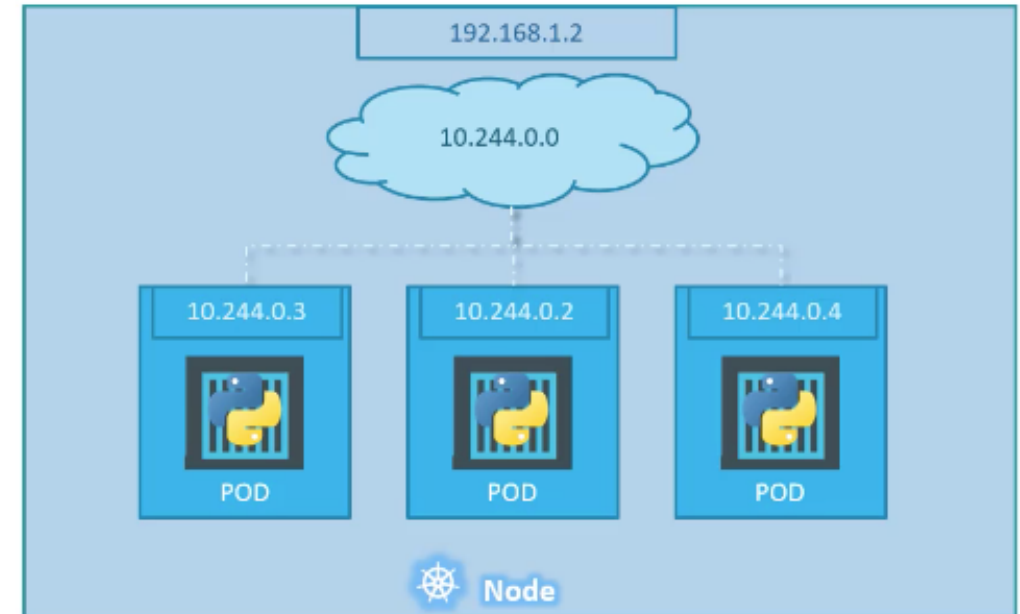# Networking Fundamentals

Kubernetes

Course Objectives

In this module, you will learn:

- Networking at the Pod level
- Networking at the Cluster level

Pods with IP Addresses

- IP address are assigned to a Pod

- Containers in the same pod communicate using localhost

Internet-to-Service Networking

- We need to be able to access our deployments from outside the cluster:

- When setting up external access, there are two techniques you need to use — egress and ingress.

- These are policies that you can set up with either whitelisting or blacklisting to control traffic into and out of your network.

Internet-to-Service Networking

- Egress:
    - Egress is a process that routes traffic from your node to an outside connection.
    - It is often accomplished via an Internet gateway attached to your virtual private cloud (VPC).
    - This gateway uses network address translation (NAT) to map IPs between your users and the machine your node is hosted on.
    - It cannot, however, map to the individual pods on your node.
    - For this step, Kubernetes uses IP tables and cluster-IPs to finalize communications.

- Ingress:
    - Ingress is an opposite process to egress and involves communications from external clients to your Kubernetes services.
    - It operates as a set of rules defining what connections are allowed and which are blocked from communicating with your services.

Cluster Networking
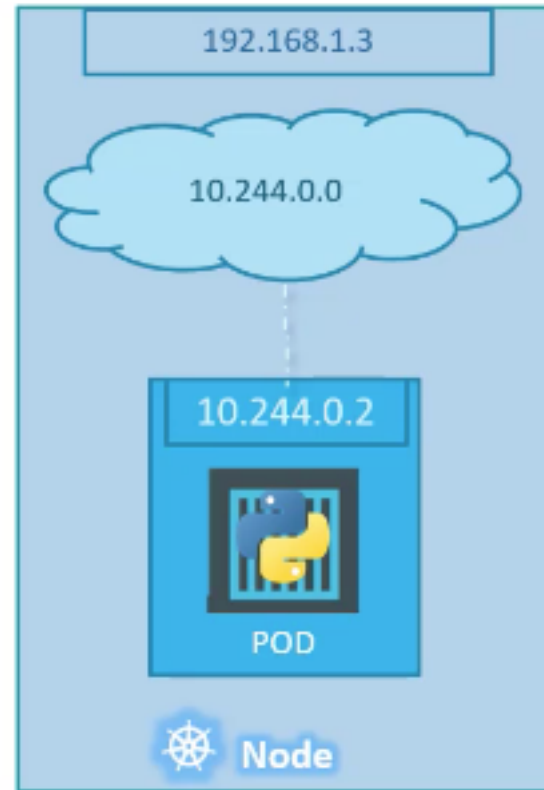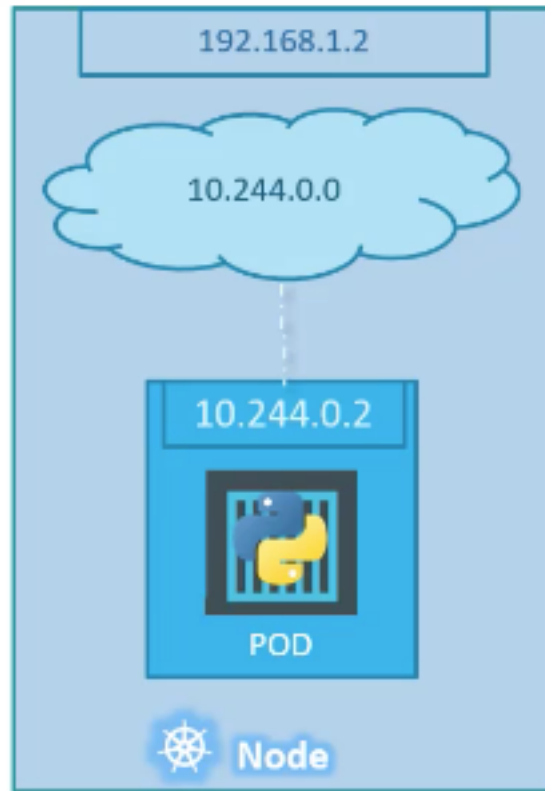
Cluster Networking

- All containers/PODs can communicate to one another without NAT
- All nodes can communicate with all containers and vice versa without NAT
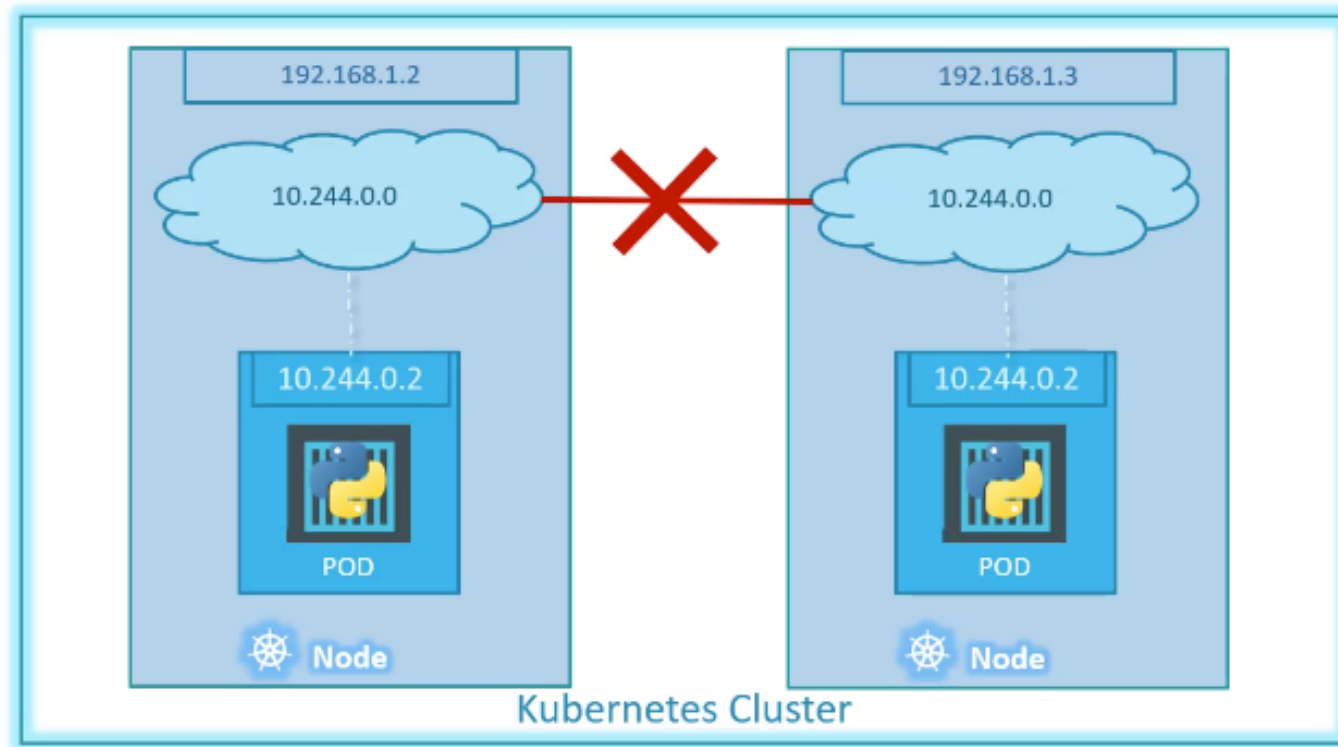
Networking Tools

Cluster Networking