KUBERNETES ARCHITECTURE

Kubernetes Architecture

Networking Setup

Getting all the previous components running is a common task for system administrators who are accustomed to configuration management. But, to get a fully functional Kubernetes cluster, the network will need to be set up properly, as well.

A detailed explanation about the Kubernetes networking model can be seen on the Cluster Networking page in the Kubernetes documentation.

If you have experience deploying virtual machines (VMs) based on IaaS solutions, this will sound familiar. The only caveat is that, in Kubernetes, the lowest compute unit is not a container, but what we call a pod.

A pod is a group of co-located containers that share the same IP address. From a networking perspective, a pod can be seen as a virtual machine of physical hosts. The network needs to assign IP addresses to pods, and needs to provide traffic routes between all pods on any nodes.

The three main networking challenges to solve in a container orchestration system are:

- Coupled container-to-container communication (solved by the pod concept).
- Pod-to-pod communication.
- External-to-pod communication (solved by the services concept, which we will discuss later).

Kubernetes expects the network configuration to enable pod-to-pod communication to be available; it will not do it for you.

Tim Hockin, one of the lead Kubernetes developers, has created a very useful slide deck to understand the Kubernetes networking: *An Illustrated Guide to Kubernetes Networking*.