Taken notes from TechWorldWithNana pods network video

Pods - The smallest unit of a kubernetes cluster

- Every pod has a unique IP address

Network of pod

- Example of Networking
  - Docker run -p 5000:5432 …
  - The host port - 5000
  - The port of the application running inside the container - 5432
  - Run docker ps and see
  - 0.0.0.0:5000 ->5432/tcp
  - We can then run the same command with 5001:5432 and then we will have
  - 0.0.0.0:5001->5432/tcp

The point of this example is to show that we must manually manage the ip of each and every pod when run running docker alone on a machine

This is why we need pods. The simple fact that the pods have their ip address fixes this problem. Now pods aren't containers, but are commonly seen as a wrapper around containers.

Pods have

- Own IP Address
- Usually have one main container
- Own network namespace
- Contains a virtual ethernet connection

A pod is comparable to a laptop in the sense that it contains it's own ip and has a limited range of ports

However, there are times where we will need a helper or an extra container running in our pod for various different reasons.

Some of the reasons that we may do this include

- A back up container
- Authentication
- Synchronizing with stateful data
- Scheduler

Containers can communicate within a pod

Recall that a pod is simply an isolated virtual host that has its own network namespace.

This means that containers can communicate amongst each other via localhost and a simple port

- localhost:5000 < - - -> localhost:8080

One thing to note is that within each pod contains a “pause” or also called “sandbox” container that reserves and holds the network namespace (netns)

The pause container makes it possible for containers within a pod to communicate with each other

So, if the main container dies (the application container) , then the container will be rebuilt and the pod will maintain the same ip address.

However, if the pod were to die, then the entire pod will be rebuilt with a new ip address.

Now there are many different topics that can be discussed when talking about Kubernetes networking

This focused container communication within a pod, however there’s a lot more with networking in kubernetes itself. Here are some examples.

- Pod communication regardless of which node the pod is located in
- Communication from outside of the kubernetes cluster
- How kubernetes plugs into a cloud providers underlying networking
- Docker container networking