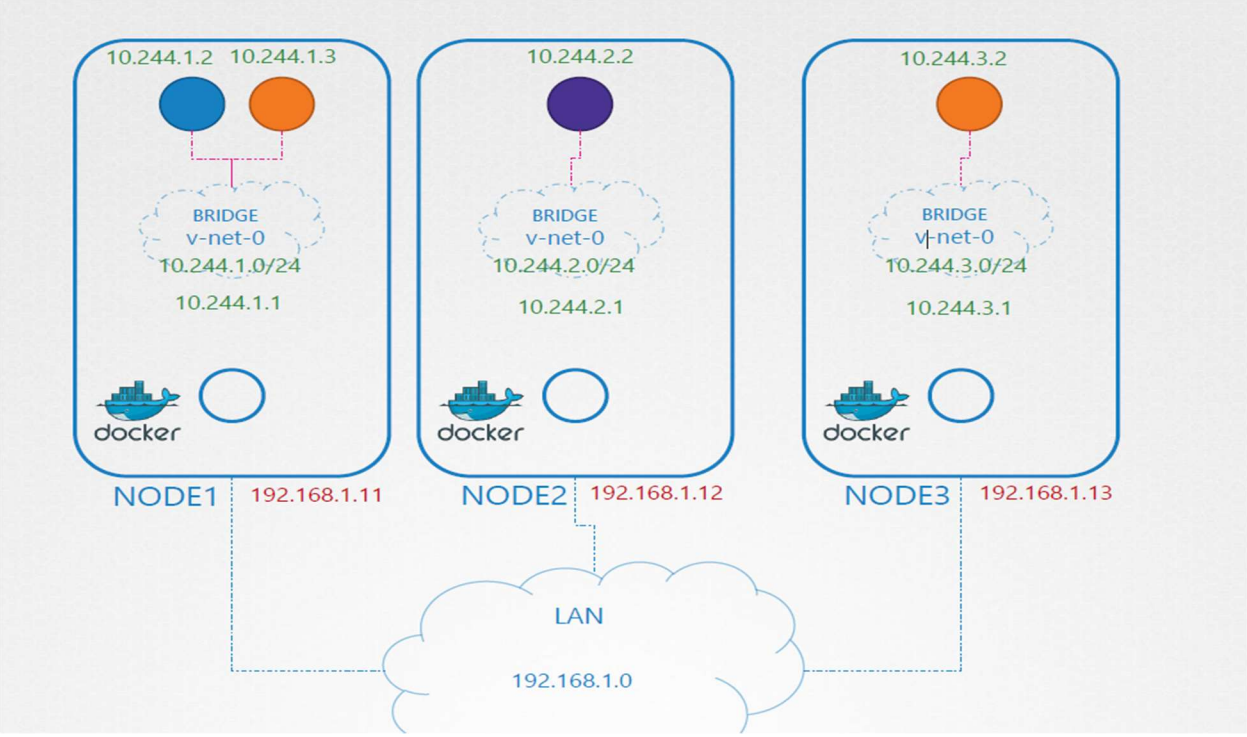
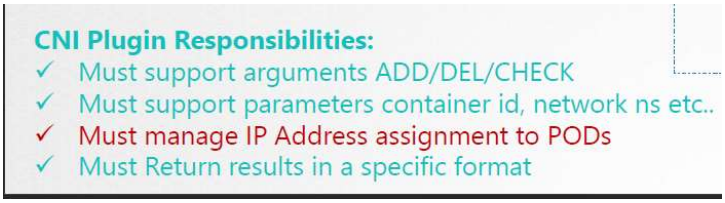
In this lecture we discuss about IP address management. So how does IP address management work and Kubernetes? This section does not concern the IP address assigned to the nodes in the network. You can manage that on your own or with your own external IPAM solutions. What this section covers is how are the virtual bridge networks in the nodes assigned an IP subnet and how are the pods assigned an IP? Where is this information stored? And who is responsible for ensuring there are no duplicate IP's assigned?



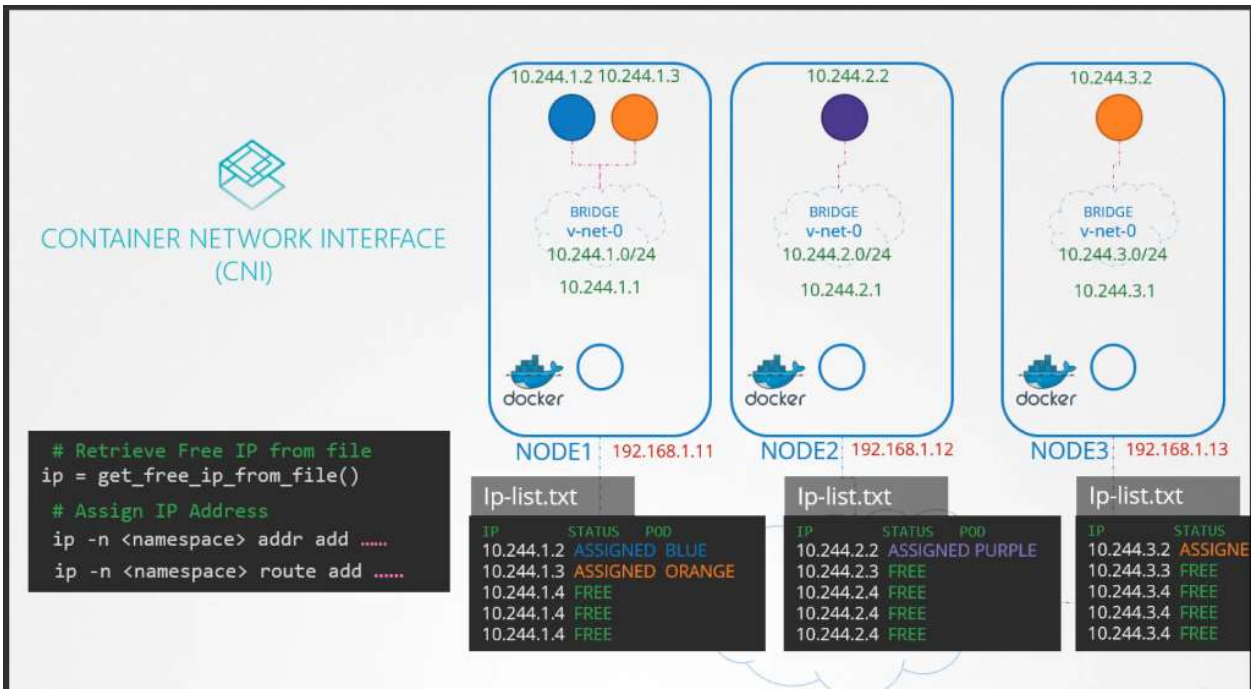
Let's start with the who

Let's ask CNI as they're the ones who define the standards. CNI says, it is the responsibility of the CNI plugin the network solution provider to take care of assigning IP's to the containers. Remember the basic plugin we built earlier? We actually took care of assigning IP addresses within this plugin. There was a section for assigning IP to the container network namespace.



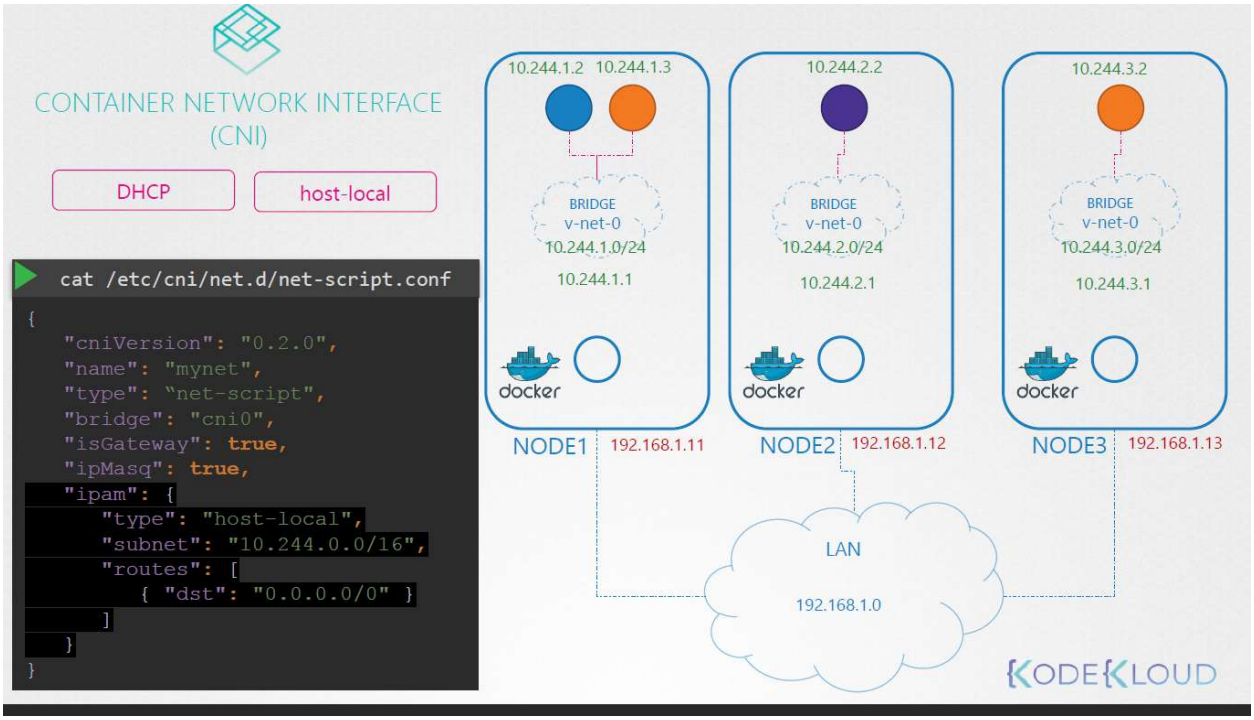
But how do we manage these IP's? Now, Kubernetes doesn't care how we do it. We just need to do it by making sure we don't assign any duplicate IP's and manage it properly.

And easy way to do it is to store the list of IP's in a file and make sure we have necessary code in our script to manage this file properly. This file will be placed on each host and manages the IP's of parts on those nodes.



Instead of coding that ourselves in our script, CNI comes with two built-in plug-ins to which you can outsource this task too. In this case, the plug-in that implements the approach that we followed for managing the IP addresses locally on each host is the host local plugin.

But it is still our responsibility to invoke that plugin in our script, or we can make our script dynamic to support different kinds of plugins. The CNI configuration file has a section called IPAM in which we can specify the type of plugin to be used, the subnet and route to be used. These details can be read from our script to invoke the appropriate plugin instead of hard coding it to use host local every time.



Different network solution providers does it differently. Let's see how Weaveworks manages IP addresses. In fact, you have seen some of the IP's assigned by Weave in the previous practice test. Weave, by default, allocates the IP range 10.32.0.0/12 for the entire network. That gives the network IP's from range 10.32.0.1 to 10.47.255.254. That's about a million IP's that you can use for pods on the network. From this range, the peers decide to split the IP addresses equally between them and assigns one portion to each node. Pods created on these nodes will have IP's in this range. Of course, these ranges are configurable with additional options past while deploying the Weave plugin to a cluster.