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Deployment Options¶

These options are configured using `pool-member-type` parameter in CIS deployment.

NodePort¶

This section documents K8S with integration of CIS and BIG-IP using NodePort configuration. Benefits of NodePort are:

- It works in any environment (no requirement for SDN)

- No persistence/visibility to backend Pod

- Can be deployed for "static" workloads (not ideal)

Similar to Docker, BIG-IP communicates with an ephemeral port, but in this case the kube-proxy keeps track of the backend Pod (container). This works well, but the downside is that you have an additional layer of load balancing with the kube-proxy.
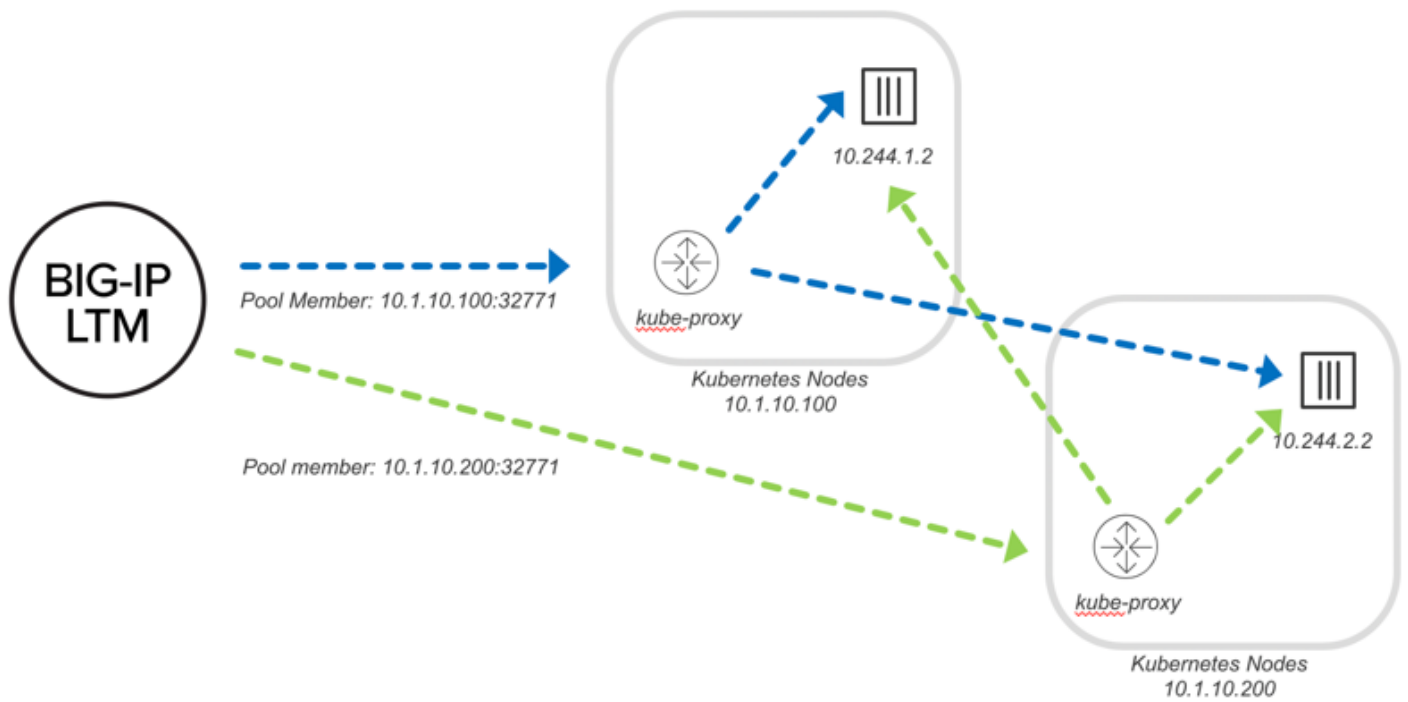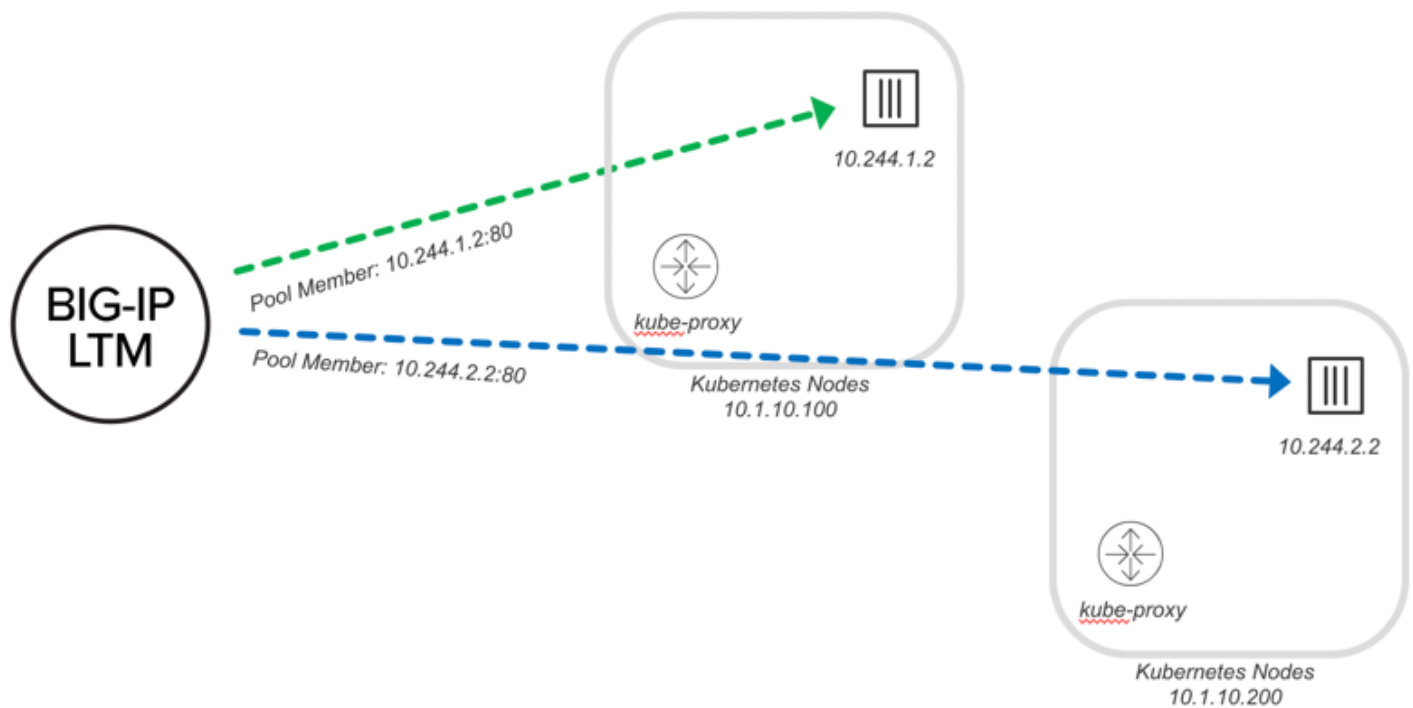
(../_images/nodeport-diagram.png)

When using NodePort, pool members represent the kube-proxy service on the node. BIG-IP needs a local route to the nodes. There is no need for VXLAN tunnels or Calico. BIG-IP can dynamically ARP for the Kube-proxy running on node.

ClusterIP¶

This section documents K8S with integration of CIS and BIG-IP using clusterIP configuration. Benefits of clusterIP are:

- Requires ability to route to Pod

- Flannel VXLAN, OpenShift VXLAN

- Alternately Pod routable through network, for example:

  - Calico BGP

  - Public Cloud network

  - Static Routing Mode (CIS adds the static routes for Kubernetes nodes on BIG-IP, managing them for node updates). Currently supported with antrea, ovn-k8s, cilium-k8s and flannel CNIS.

The BIG-IP CIS also supports a cluster mode where Ingress traffic bypasses the Kube-proxy and routes traffic directly to the pod. This requires that the BIG-IP have the ability to route to the pod. This could be by using an overlay network that F5 supports (Flannel VXLAN, or OpenShift VXLAN). Leave the kube-proxy intact (no changes to underlying Kubernetes infrastructure).


(../_images/clusterip-diagram.png)

NodePortLocal¶

This section documents K8S with integration of CIS and BIG-IP using the NodePortLocal feature provided by Antrea CNI. Benefits of NodePortLocal are:

- CIS consumes NPL port mappings published by the Antrea Agent (as K8s Pod annotations). So unlike NodePort mode, it bypasses the Kube-proxy and routes traffic directly to the pod removing the secondary hop of load balancing carried by kube-proxy.

- Exposes the port on node where pod is running. It decreases the port range requirements, unlike NodePort which requires a range of ports to be exposed in all Kubernetes nodes.
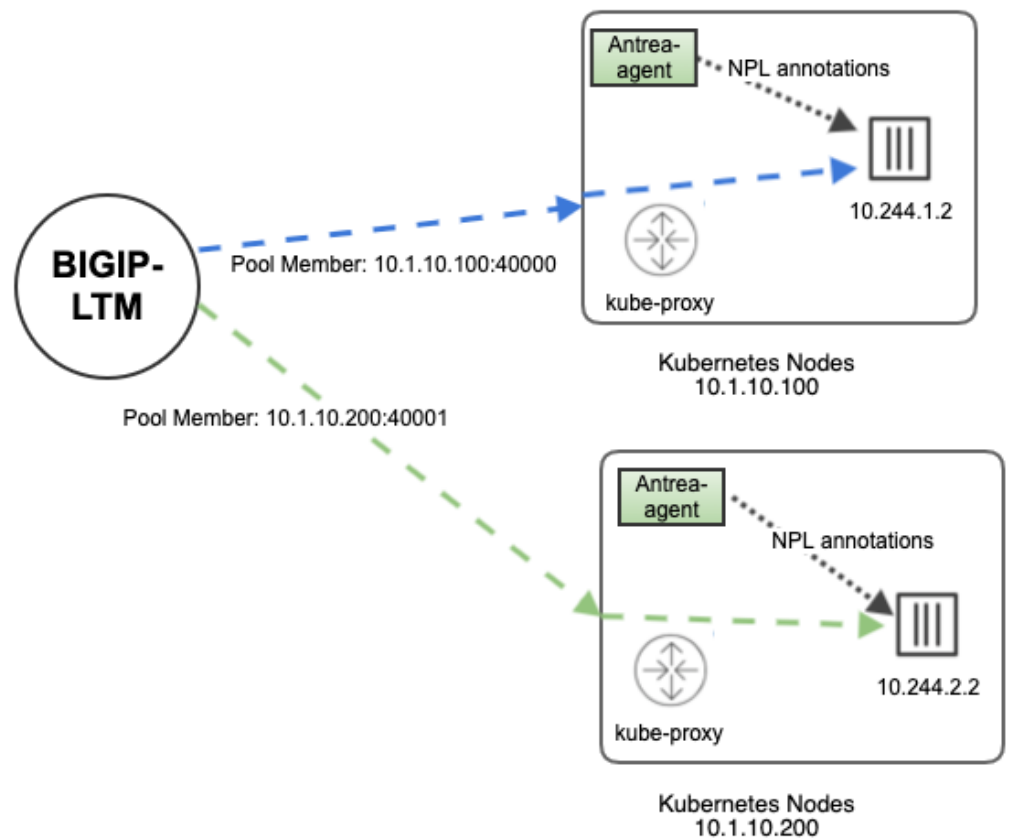
(../_images/nodeportlocal-1.png)

In NodePortLocal, rather than using kube-proxy for node to pod routing, there is a single iptables entry per pod which means direct connectivity to each pod.

Auto¶

This section documents K8S with integration of CIS and BIG-IP using the `auto` configuration.

Auto mode is a combination of cluster and nodeport mode. In `auto` mode, CIS will learn the service type and populates the BIG-IP with the respective pool members.

- If the service type is `ClusterIP`, then pod IPs are populated on the BIGIP for the respective pool.

- If the service type `NodePort`, then node IPs are populated on the BIGIP for the respective pool.

ⓘ Note

User can also use Pool member type `Auto` to configure CIS Controller to route the traffic to the node directly when pods are using the `hostNetwork` property.

For detailed documentation, see: Pool Member Type - auto (https://github.com/F5Networks/k8s-bigip-ctlr/blob/2.x-master/docs/config_examples/PoolType-Auto/README.md).

ⓘ Note

To provide feedback on Container Ingress Services or this documentation, please file a GitHub Issue (https://github.com/F5Networks/k8s-bigip-ctlr/issues).

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