**🧩 1️⃣ Verify Pod–Node Communication (Basic Health)**

**✅ Step 1: Check Pod’s Node Placement**

Run:

kubectl get pods -o wide

Output example:

NAME READY STATUS NODE IP AGE

myapp-pod 1/1 Running workernode1 10.244.1.5 5m

This shows:

* Pod is on node workernode1
* Pod IP = 10.244.1.5

Now you know which node hosts the pod.

**✅ Step 2: From the Node, Ping the Pod**

SSH into that node:

ssh root@workernode1

Then:

ping <pod-ip>

Example:

ping 10.244.1.5

If the ping works → communication between node and pod is established.

If not → possible issue with **CNI plugin (network)**.

**🧩 2️⃣ Check Pod ↔ Node Port Communication**

If a service (like web app) is running inside the pod on a port (say 8080):

From the node:

curl http://<pod-ip>:8080

If you get a response → communication is working fine.

**🧩 3️⃣ Check Pod ↔ Pod Communication (Cross-Node Test)**

This helps verify if your **CNI plugin** (like Calico, Flannel, Weave) works properly.

**Step 1: Get all pod IPs**

kubectl get pods -o wide

**Step 2: Enter one pod:**

kubectl exec -it <pod1> -- sh

**Step 3: From inside that pod, ping another pod:**

ping <pod2-ip>

If it replies → pod-to-pod communication is working fine.

If not → networking problem between nodes.

**🧩 4️⃣ Check Node ↔ API Server Communication**

On any node:

kubectl get nodes

If it works fine → node is able to reach the control plane (master node).

If you get errors like *“The connection to the server <IP>:6443 was refused”*, that means node–master communication failed.

**🧩 5️⃣ Check CNI Plugin and Routes**

If communication fails:

* Check the CNI (Calico, Flannel, etc.) status
* kubectl get pods -n kube-system
* Look for pods like calico-node or flannel-ds  
  They must be **Running** on all nodes.

**🧩 6️⃣ Optional: Use a Network Testing Tool**

Run a netshoot or busybox pod to test easily:

kubectl run netshoot --image=nicolaka/netshoot -it -- bash

Then test connections:

ping <node-ip>

ping <pod-ip>

curl http://<pod-ip>:8080

**🧠 Summary Table**

| **Communication Type** | **How to Check** | **Tool/Command** |
| --- | --- | --- |
| Node → Pod | ping <pod-ip> from node | Ping |
| Pod → Node | ping <node-ip> from pod | Ping |
| Pod → Pod | ping <other-pod-ip> | Ping |
| Node → API Server | kubectl get nodes | kubectl |
| All Network | kubectl get pods -n kube-system | Check CNI pods |

Would you like me to give a **quick YAML setup + test commands** to verify connectivity between pods on different nodes? (That’s a very practical way to confirm network setup.)