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K8s Troubleshooting Overview



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DEVOPS TRAINING ARCHITECT

K8s Troubleshooting Overview

- Troubleshooting Your K8s Cluster
- Checking Cluster and Node Logs
- Troubleshooting Your Applications
- Checking Container Logs
- Troubleshooting K8s Networking Issues



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Troubleshooting Your K8s Cluster



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Troubleshooting Your K8s Cluster

LESSON BREAKDOWN

Kube API Server

Checking Node Status

Checking K8s Services

Checking System Pods

Hands-On Demonstration



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Kube API Server

If the **K8s API server is down**, you will not be able to use kubectl to interact with the cluster. You may get a message that looks something like:

```
cloud_user@k8s-control:~$ kubectl get nodes  
The connection to the server localhost:6443 was refused -  
did you specify the right host or port?
```

Assuming your kubeconfig is set up correctly, this may mean the API server is down.

Possible fixes:

Make sure the docker and kubelet services are up and running on your control plane node(s).

Checking Node Status

Check the status of your nodes to see if any of them are experiencing issues.

Use `kubectl get nodes` to see the overall status of each node.

```
$ kubectl get nodes
```



Checking Node Status

Check the status of your nodes to see if any of them are experiencing issues.

Use `kubectl describe node` to get more information on any nodes that are not in the READY state.

```
$ kubectl describe node node name
```





If a node is having problems, it may be because a **service** is down on that node.

Each node runs the kubelet and container runtime (i.e. Docker) services.

1

systemctl status

View the status of a service.

```
$ systemctl status kubelet
```

2

systemctl start

Start a stopped service.

```
$ systemctl start kubelet
```

3

systemctl enable

Enable a service so it starts automatically on system startup.

```
$ systemctl enable kubelet
```

Checking System Pods

In a kubeadm cluster, several K8s components run as pods in the `kube-system` namespace.

Check the status of these components with `kubectl get pods` and `kubectl describe pod`.

```
$ kubectl get pods -n kube-system
```

```
$ kubectl describe pod podname -n kube-system
```

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Checking Cluster and Node Logs



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Service Logs

Cluster Component Logs

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Service Logs

You can check the logs for K8s-related services on each node using `journalctl`.

```
$ sudo journalctl -u kubelet
```

```
$ sudo journalctl -u docker
```

Cluster Component Logs

The Kubernetes cluster components have log output redirected to `/var/log`. For example:

`/var/log/kube-apiserver.log`

`/var/log/kube-scheduler.log`

`/var/log/kube-controller-manager.log`

Note that these log files may not appear for kubeadm clusters, since some components run inside containers. In that case, you can access them with `kubectl logs`.

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Troubleshooting Your Applications



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Checking Pod Status

Running Commands Inside Containers

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Checking Pod Status

You can see a Pod's status with `kubectl get pods`.

```
$ kubectl get pods
```

Use `kubectl describe pod` to get more information about what may be going on with an unhealthy Pod.

```
$ kubectl describe pod podname
```

Running Commands Inside Containers

If you need to troubleshoot what is going on inside a container, you can execute commands within the container with `kubectl exec`.

```
$ kubectl exec podname -c containername -- command
```

Note that you cannot use `kubectl exec` to run any software that is not present within the container.

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Checking Container Logs



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Checking Container Logs

Container Logging

`kubectl logs`

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Container Logging

K8s containers maintain **logs**, which you can use to gain insight into what is going on within the container.

A container's log contains everything written to the standard output (stdout) and error (stderr) streams by the container process.

kubectl logs

Use the `kubectl logs` command to view a container's logs.

```
$ kubectl logs podname -c containername
```



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Checking Container Logs

Container Logging

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Troubleshooting K8s Networking Issues



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kube-proxy and DNS

netshoot

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kube-proxy and DNS

In addition to checking on your K8s networking plugin, it may be a good idea to look at kube-proxy and the K8s DNS if you are experiencing issues within the K8s cluster network.

In a kubeadm cluster, the K8s DNS and kube-proxy run as Pods in the `kube-system` namespace.

netshoot

Tip: You can run a container in the cluster that you can use to run commands to test and gather information about network functionality.

The `nicolaka/netshoot` image is a great tool for this. This image contains a variety of networking exploration and troubleshooting tools.

Create a container running this image, and then use `kubectl exec` to explore away!



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Troubleshooting Summary



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