Certified Kubernetes Administrator

Kubernetes: Troubleshooting

Learning Objectives

By the end of this lesson, you will be able to:

- Check pod status, logs, and events
- Check control panel failure status in pod and service
- Check node status and describe a node to get the Kubernetes environment status
- Use top command to check node performance
- Check the status of master and cert connectivity, service connectivity, and nslookup
- Perform kube-proxy check, CNI plugin check, and network failure check

Application Failure

Check Pod Status, Logs, and Events

Use the **kubectl get pods** command to check the state of the pod

Use the **kubectl logs counter** command to fetch the logs

Use the **kubectl get events** command to fetch the events for all resources

Checking Pod Status, Logs, and Events

Problem Statement: You are given a project to check the pod state, logs, and events.

ASSISTED PRACTICE

Control Panel Failure

Checking Control Panel Failure Status

Problem Statement: You are given a project to check control panel failure status in pod and service.

ASSISTED PRACTICE

Worker Node Failure

Checking Node Status

The **kubectl describe node <insert-node-name-here>** command is used to check the status of a node. It displays the node status and a few other details.

The node status contains the following information:

- Addresses
- Conditions
- Capacity and Allocatable
- Info

Top Command: Checking Node Performance

The top command **kubectl top [options]** is used to see the resource consumption of the nodes or pods.

It is important that Heapster is configured correctly and is working on the server.

Below are a few options inherited from the parent commands:	
➢ --alsologtostderr=false	➢ --context=""
➢ --application-metrics-count-limit=100	➢ --enable-load-reader=false
➢ --as=""	➢ --kubeconfig=""
➢ -as-group=[]	➢ --log-dir=""
➢ --azure-container-registry-config=""	➢ -log-file=""
➢ --boot-id-file="/proc/sys/kernel/random/boot_id"	➢ --logtostderr=true
➢ --cache-dir="/builddir/.kube/http-cache"	➢ --profile="none"
➢ --certificate-authority=""	➢ --skip-headers=false
➢ --client-certificate=""	➢ --token=""
➢ --cloud-provider-gce-lb-src-	➢ --username=""
➢ --cluster=""""	➢ --version=false

Master and Cert Connectivity Status

The master and cert connectivity terminates at the kubelet's HTTP endpoints.

The **--kubelet-certificate-authority** flag is used to provide the apiserver with a root certificate bundle.

The master and cert connectivity status is used to:

- Fetch logs for pods
- Attach to running pods
- Provide the kubelet's port-forwarding functionality

Checking Node Status

Problem Statement: You are given a project to check node status and describe a node to know the status of the Kubernetes environment.

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Top Command to Check Node Performance

Problem Statement: You are given a project to demonstrate the use of the top command to check node performance.

ASSISTED PRACTICE

Master and Cert Connectivity Status

Problem Statement: You are given a project to check the status of master and cert connectivity.

ASSISTED PRACTICE

Worker Node Failure Check

Problem Statement: You are given a project to perform the worker node failure check.

ASSISTED PRACTICE

Network Failure

Service Connectivity Check

Command to check the connectivity of a service:

```
kubectl expose deployment hostnames --port=80 --target-port=9376
service/hostnames exposed
```

Command to check the details of the existing services:

```
kubectl get svc hostnames
NAME        TYPE        CLUSTER-IP   EXTERNAL-IP   PORT(S)   AGE
hostnames   ClusterIP   10.0.1.175   <none>        80/TCP    5s
```

nslookup Check

nslookup can be used to check the working of the DNS.

You can execute **nslookup** in the environment once the pod is running. You will see the following if the DNS is running:

```
kubectl exec -ti busybox -- nslookup kubernetes.default
Server:    10.0.0.10
Address 1: 10.0.0.10
Name:      kubernetes.default
Address 1: 10.0.0.1
```

nslookup Check

Things to check if the nslookup check fails:

- Local DNS configuration
- Running of DNS pod
- Errors in the DNS pod
- Is DNS service up?
- Are DNS endpoints exposed?
- Are DNS queries being processed?

Kube-Proxy Check and CNI Plugin Check

The kube-proxy network runs on each node. The **Kube-proxy [flag]** is used for communicating with the master node and routing.

The CNI is responsible to adhere to the appc/CNI specification, designed for interoperability.

The --network-plugin=cni command-line option is used to select the CNI plugin.

Service Connectivity Check

Problem Statement: You are given a project to perform a service connectivity check.

ASSISTED PRACTICE

nslookup Check

Problem Statement: You are given a project to perform a nslookup check.

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Kube-Proxy Check and CNI Plugin Check

Problem Statement: You are given a project to perform a kube-proxy check and CNI plugin check.

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Network Failure Check

Problem Statement: You are given a project to perform a network failure check.

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Key Takeaways

You are now able to:

- Check pods, logs, and events
- Check control panel failure status in pod and service
- Check node status and describe a node to get the Kubernetes environment status
- Use top command to check node performance
- Check the status of master and cert connectivity, service connectivity, and nslookup
- Perform kube-proxy check, CNI plugin check, and network failure check

Knowledge Check

Knowledge Check 1	_____ command is used to check the state of the pod.

a. kubectl get pods

b. kubectl logs counter

c. kubectl get events

d. kubectl describe node

Knowledge Check 1	_____ command is used to check the state of the pod.

a. kubectl get pods

b. kubectl logs counter

c. kubectl get events

d. kubectl describe node

The correct answer is **a**

kubectl get pods command is used to check the state of the pod.

Knowledge Check

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Which of the following can be used to check the working of DNS?

a. Top command

b. nslookup

c. kubectl get pods

d. kubectl describe node

Knowledge Check 2

Which of the following can be used to check the working of DNS?

a. Top command

b. nslookup

c. kubectl get pods

d. kubectl describe node

The correct answer is **b**

nslookup can be used to check the working of DNS.

Knowledge Check 3	_____ flag is used to provide the apiserver with a root certificate bundle.

a. --kubectl describe node

b. --kubelet-certificate-authority

c. --Kubelet get svc hostnames

d. --kubelet exec -ti busybox -- nslookup kubernetes.default

Knowledge Check 3	_____ flag is used to provide the apiserver with a root certificate bundle.

a. --kubectl describe node

b. --kubelet-certificate-authority

c. --Kubelet get svc hostnames

d. --kubelet exec -ti busybox -- nslookup kubernetes.default

The correct answer is **b**

--kubelet-certificate-authority flag is used to provide the apiserver with a root certificate bundle.

Knowledge Check

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Which of the following commands is used to check the existence of the service?

a. kubectl expose deployment hostnames

b. kubelet-certificate-authority

c. kubectl get svc hostnames

d. Kube-proxy [flag]

Knowledge Check

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Which of the following commands is used to check the existence of the service?

a. kubectl expose deployment hostnames

b. kubelet-certificate-authority

c. kubectl get svc hostnames

d. Kube-proxy [flag]

The correct answer is **c**

kubectl get svc hostnames command is used to check the existence of the service.

Knowledge Check

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What is the purpose of fetching the master and cert connectivity status?

a. To fetch logs for pods

b. To attach to running pods

c. To provide the kubelet’s port-forwarding functionality

d. All of the above

Knowledge Check

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What is the purpose of fetching the master and cert connectivity status?

a. To fetch logs for pods

b. To attach to running pods

c. To provide the kubelet's port-forwarding functionality

d. All of the above

The correct answer is **d**

The master and cert connectivity status is used for fetching logs for pods, attaching to running pods, and providing the kubelet's port-forwarding functionality.

Problem Statement: While developing a highly scalable application, real challenges will come into picture during the deployment of that application into production or real-time data scenario. Having the application stuck while working in normal case scenarios in real-time production environment is one of the biggest drawbacks for any product after development. Kubernetes plays an important role in dubbing the tool once your application deployment is in the production environment.

Objective: Once your application is running, you'll inevitably need to debug the problems with it. Use Kubernetes to debug your application.

LESSON-END PROJECT