KUBERNETES TROUBLESHOOTING SCENARIOS

1. Error: Unable to connect to the cluster

o Troubleshooting:
▪ Check kubeconfig file for correct cluster information.
▪ Verify network connectivity to the cluster.
o Example Commands:
kubectl config view
kubectl cluster-info

2. Error: Pod stuck in Pending state

o Troubleshooting:
▪ Check events for the pod using kubectl describe pod.
▪ Inspect the pod's YAML for resource constraints or affinity issues.
o Example Commands:
kubectl describe pod <pod-name>
kubectl get events --namespace <namespace>

3. Error: Insufficient resources to schedule pod

Troubleshooting:
▪ Check resource requests and limits in the pod specification.
▪ Verify node resources using kubectl describe node.o Example Commands:
kubectl describe pod <pod-name>
kubectl describe node <node-name>

4. Error: ImagePullBackOff

o Troubleshooting:
▪ Verify the image name and availability.

▪ Check image pull credentials using kubectl describe pod.
o Example Commands:
kubectl describe pod <pod-name>
kubectl get pods --namespace <namespace> -
o=jsonpath='{.items[*].status.containerStatuses[*].state}'

5. Error: CrashLoopBackOff

o Troubleshooting:
▪ Check container logs for details on the crash.
▪ Inspect pod events using kubectl describe pod.
o Example Commands:
kubectl logs <pod-name> <container-name>
kubectl describe pod <pod-name>

6. Error: Unauthorised access

o Troubleshooting:
▪ Verify RBAC permissions for the user.
▪ Check kubeconfig for correct credentials.
o Example Commands:
kubectl auth can-i --list
kubectl config view

7. Error: ConfigMap not updating in the pod

o Troubleshooting:
▪ Check if the ConfigMap is updated.
▪ Verify that the pod is configured to use the latest version.Example Commands:
kubectl get configmap <configmap-name> -o yaml
kubectl describe pod <pod-name>

8. Error: Service not reachable

o Troubleshooting:
▪ Check service endpoints using kubectl describe service.
▪ Verify network policies and firewall rules.
o Example Commands:
kubectl describe service <service-name>
kubectl get networkpolicies

9. Error: Node not ready

o Troubleshooting:
▪ Check node status with kubectl get nodes.
▪ Review kubelet logs on the node for issues.
o Example Commands:
kubectl get nodes
kubectl describe node <node-name>

10. Error: PersistentVolumeClaim (PVC) pending

o Troubleshooting:
▪ Verify available storage in the cluster.
▪ Check storage class and provisioner.
o Example Commands:
kubectl get pvc
kubectl describe storageclass

11. Error: VolumeMounts not working in pod

o Troubleshooting:
▪ Check pod's YAML for correct volume mounts.
▪ Verify if the volume exists and is accessible.o Example Commands:
kubectl describe pod <pod-name>
kubectl get pv

12. Error: Pod Security Policies (PSP) blocking pod

o Troubleshooting:
▪ Check PSP rules and RBAC for the pod.
▪ Inspect pod events using kubectl describe pod.
o Example Commands:
kubectl get psp
kubectl describe pod <pod-name>

13. Error: ServiceAccount permissions

o Troubleshooting:
▪ Verify ServiceAccount permissions using kubectl auth can-i.
▪ Check RBAC roles and role bindings.
o Example Commands:
kubectl auth can-i --list --
as=system:serviceaccount:<namespace>:<serviceaccount-name>
kubectl get roles,rolebindings --namespace <namespace>

14. Error: NodeSelector not working

o Troubleshooting:
▪ Check pod's YAML for correct node selector.
▪ Verify that nodes have the required labels.
o Example Commands:
kubectl describe pod <pod-name>
kubectl get nodes --show-labels

15. Error: Ingress not routing traffic

o Troubleshooting:
▪ Check Ingress resource for correct backend services.▪ Verify that the Ingress controller is running.
o Example Commands:

kubectl describe ingress <ingress-name>
kubectl get pods --namespace <ingress-controller-namespace>

16. Error: Unable to scale deployment

o Troubleshooting:
▪ Verify available resources in the cluster.
▪ Check replica count in the deployment specification.
o Example Commands:
kubectl get deployments
kubectl describe deployment <deployment-name>

17. Error: Custom Resource Definition (CRD) not creating resources

o Troubleshooting:
▪ Check CRD definition for correct syntax.
▪ Verify controller logs for errors.
o Example Commands:
kubectl get crd
kubectl describe crd <crd-name>

18. Error: Pod in Terminating state

o Troubleshooting:
▪ Check for stuck finalizers in pod metadata.
▪ Force delete pod using kubectl delete pod --grace-period=0.
o Example Commands:
kubectl get pods --all-namespaces --field-selector=status.phase=Terminating
kubectl delete pod <pod-name> --grace-period=0 –force

19. Error: Resource quota exceeded

o Troubleshooting:
▪ Check resource quotas for the namespace.
▪ Verify resource usage in the namespace.
o Example Commands:
kubectl describe quota --namespace <namespace>
kubectl top pods --namespace <namespace>

20. Error: Rolling update stuck or not progressing

o Troubleshooting:
▪ Check rollout status using kubectl rollout status.
▪ Verify image versions in the deployment.
o Example Commands:
kubectl rollout status deployment <deployment-name>
kubectl set image deployment/<deployment-name> <container-name>=<new-image>

21. Error: Node draining or cordoning

o Troubleshooting:
▪ Check node conditions and events.
▪ Use kubectl drain with caution.
o Example Commands:
kubectl get nodes
kubectl describe node <node-name>
kubectl drain <node-name> --ignore-daemonsets

22. Error: Resource creation timeout

o Troubleshooting:
▪ Check for issues with the API server.
▪ Verify network connectivity to the API server.
o Example Commands:
kubectl get events --sort-by='.metadata.creationTimestamp'
kubectl describe pod <pod-name>

23. Error: Pod stuck in ContainerCreating state

o Troubleshooting:
▪ Check container runtime logs on the node.
▪ Inspect kubelet logs for errors.
o Example Commands:
kubectl get pods
kubectl describe pod <pod-name>

24. Error: Invalid YAML syntax

o Troubleshooting:
▪ Validate YAML syntax using online tools or linters.
▪ Check for indentation and formatting issues.
o Example Commands:
kubectl apply -f <file.yaml> --dry-run=client

25. Error: etcd cluster issues

o Troubleshooting:
▪ Check etcd logs for errors.
▪ Verify etcd cluster health.
o Example Commands:
kubectl get events --all-namespaces --field-selector=involvedObject.kind=Pod,involvedObject.name=etcd
kubectl exec -it etcd-pod-name --namespace kube-system -- sh
etcdctl member list
etcdctl cluster-health