**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

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