



50 common errors in Kubernetes and some tips on troubleshooting them:

1. Pod in CrashLoopBackOff:

- Check the pod logs using `kubectl logs`.
- Ensure the required dependencies are available.

2. ImagePullBackOff:

- Verify the image name and availability.
- Check image pull secrets and registry authentication.

3. Invalid ClusterIP or Service Port:

- Ensure correct service and port configurations.
- Verify network policies and firewall rules.

4. NodeNotReady:

- Check the node's status with `kubectl get nodes`.
- Examine the kubelet logs on the node.

5. Insufficient Resources:

- Confirm resource requests and limits in pod specifications.
- Use `kubectl describe` to analyze resource allocations.

6. **CrashLoopBackOff for Init Containers:**

- Inspect init container logs and configurations.
- Ensure init container dependencies are satisfied.

7. **ConfigMap or Secret Mounting Issues:**

- Verify ConfigMap/Secret existence and correctness.
- Check pod configuration for volume mounts.

8. **Pod stuck in Pending state:**

- Investigate resource constraints on the nodes.
- Examine events with `kubectl describe pod`.

9. **API Server Unreachable:**

- Verify API server status.
- Check kubeconfig file for correct API server address.

10. **Network Policy Restrictions:**

- Inspect network policies.
- Ensure correct podSelector and policy rules.

11. **RBAC Permission Issues:**

- Validate service account permissions.
- Check ClusterRoleBindings and RoleBindings.

12. PersistentVolumeClaims (PVC) Pending:

- Check available storage classes.
- Ensure the requested storage is available.

13. NodePort Service Not Accessible:

- Confirm the node's firewall allows the specified port.
- Check Service and NodePort configurations.

14. Kube-proxy Issues:

- Inspect kube-proxy logs for errors.
- Verify kube-proxy configuration.

15. DNS Resolution Problems:

- Verify CoreDNS status.
- Check DNS policy and cluster DNS settings.

16. Pod Eviction Due to Resource Pressure:

- Check resource usage across nodes.
- Adjust resource limits or add more nodes.

17. NodeOutOfMemory:

- Inspect node memory usage.
- Check for memory leaks in applications.

18. Volume Mount Permissions:

- Ensure correct file permissions in mounted volumes.
- Verify SELinux or AppArmor settings.

19. Ingress Controller Misconfiguration:

- Validate Ingress resource configurations.
- Check the Ingress controller logs.

20. ETCD Cluster Issues:

- Check etcd pod logs.
- Verify etcd cluster health.

21. CNI Plugin Issues:

- Verify CNI plugin status on nodes.
- Check plugin configurations and logs.

22. Invalid Labels or Selectors:

- Ensure correct labels and selectors in resources.
- Use `kubectl get` with appropriate labels.

23. Pod Security Policies:

- Check PodSecurityPolicy (PSP) violations.
- Adjust PSP or use PodSecurity admission controllers.

24. Kubelet Certificate Rotation:

- Monitor kubelet certificate expiration.
- Rotate certificates if needed.

25. Cluster Autoscaler Issues:

- Verify autoscaler configuration.
- Check node group scaling policies.

26. ServiceAccount Token Expiration:

- Ensure service account tokens are not expired.
- Rotate service account tokens if needed.

27. Scheduler Issues:

- Inspect scheduler logs for errors.
- Check for node affinity and anti-affinity issues.

28. Readiness and Liveness Probe Failures:

- Review pod configurations for probes.
- Check probe logs and adjust thresholds.

29. Inconsistent API Versions:

- Verify client and server API versions match.
- Use compatible kubectl versions.

30. Kube-dns Service Missing:

- Ensure CoreDNS (or kube-dns) service is running.
- Validate DNS settings in kubelet configurations.

31. ImageRegistryAuthentication:

- Check image pull secrets in pod specifications.
- Verify registry credentials.

32. HorizontalPodAutoscaler Not Scaling:

- Check metrics server and HPA configurations.
- Inspect HPA events and logs.

33. Pod Affinity/Anti-affinity Issues:

- Verify pod affinity/anti-affinity rules.
- Check node labels for affinity.

34. Custom Resource Definitions (CRD) Issues:

- Validate CRD creation and versions.
- Check for CRD controller errors.

35. Resource Quotas Exceeded:

- Review resource quotas with `kubectl describe`.
- Adjust quotas or request more resources.

36. RuntimeClass Configuration Issues:

- Verify RuntimeClass in PodSpec.
- Check container runtime compatibility.

37. Secrets Decoding Errors:

- Validate encoded secrets.
- Ensure proper base64 encoding.

38. Invalid Ingress Controller Configuration:

- Inspect Ingress controller logs.
- Verify controller configurations.

39. Pod Priority and Preemption Issues:

- Check priorityClass in PodSpec.
- Verify kube-scheduler settings.

40. Node Network Connectivity Issues:

- Check node network configurations.
- Verify firewall rules on nodes.

41. Service External IP Not Assigned:

- Check cloud provider integration.
- Verify LoadBalancer service configurations.

42. PodSecurityContext Misconfigurations:

- Validate pod security context settings.
- Ensure compatibility with node settings.

43. Kubelet Certificate Rotation Issues:

- Monitor and rotate kubelet certificates.
- Verify certificate expiration dates.

44. Volume Plugin Not Loaded:

- Check kubelet logs for volume plugin errors.
- Verify plugin installation and configuration.

45. NetworkPolicy Not Enforced:

- Check NetworkPolicy existence.
- Inspect podSelector and policy rules.

46. Image Vulnerability Scanning Failures:

- Integrate image scanning tools.
- Ensure scanning results are reviewed.

47. Pods Stuck in Terminating State:

- Check for stuck processes in containers.
- Examine pod logs for termination issues.

48. Invalid Pod Restart Policy:

- Verify restartPolicy in PodSpec.
- Adjust policy if necessary.

49. Incorrect Ingress Path Matching:

- Check path specifications in Ingress rules.
- Verify backend service configurations.

50. NodeDrain Failures:

- Check node drain status with `kubectl drain`.
- Investigate any evicted pods.

When troubleshooting, it's crucial to gather information from various sources such as logs, events, and configuration files. Use `kubectl describe`, `kubectl logs`, and relevant logs from components like kubelet, kube-proxy, and controllers. Additionally, monitoring tools and dashboards can help identify patterns and trends in the cluster's behavior.