500

DEVOPS

ERRORS, SOLUTIONS AND RCA

Devops Shack

DevOps Shack

500 DevOps Errors, Solutions And Root Cause Analysis

1. CI/CD Pipeline Failure

- **Scenario: The Jenkins build pipeline is stuck at the "Build" stage and times out.**
- **RCA:**
  - **Incorrect permissions on the workspace directory.**
  - **Dependencies in the build are not resolved (e.g., missing Maven packages).**
  - **Insufficient resources (CPU/Memory) allocated to the build agent.**
- **Solution:**
  - **Check the Jenkins logs for error details (`/var/log/jenkins/jenkins.log`).**
  - **Verify and fix directory permissions (`chmod` and `chown` commands).**
  - **Ensure the build dependencies are declared and installed properly.**
  - **Allocate more resources to the build agent via the Jenkins configuration.**
- **Prevention:**
  - **Use containerized build agents to ensure consistency.**
  - **Define resource allocation clearly in Jenkins agent configurations.**
  - **Validate permissions during pipeline setup.**

2. Kubernetes Pod CrashLoopBackOff

- **Scenario: A Kubernetes pod is in a `CrashLoopBackOff` state.**
- **RCA:**
  - **The application inside the pod is failing to start due to missing environment variables or incorrect configurations.**

- ○ **Insufficient memory or CPU resources are causing the container to crash.**
- ○ **Dependency services (e.g., a database) are unavailable.**
- ● **Solution:**
  - ○ **Inspect the pod logs: `kubectl logs <pod-name>`.**
  - ○ **Check the pod's event history: `kubectl describe pod <pod-name>`.**
  - ○ **Verify environment variables and configurations in the deployment YAML.**
  - ○ **Adjust resource limits in the pod specification if resource exhaustion is the cause.**
  - ○ **Ensure that dependent services are running and accessible.**
- ● **Prevention:**
  - ○ **Implement readiness and liveness probes in the deployment spec.**
  - ○ **Use Helm charts with validated configurations.**
  - ○ **Perform pre-deployment testing in a staging environment.**

3. Terraform State File Locking Issue

- ● **Scenario: Terraform commands fail with an error: "Error acquiring the state lock."**
- ● **RCA:**
  - ○ **Another process is holding the lock on the state file.**
  - ○ **The state lock was not released due to an abrupt interruption (e.g., a crashed Terraform process).**
- ● **Solution:**
  - ○ **Identify and terminate the locking process.**
  - ○ **Manually unlock the state using: `terraform force-unlock <lock-id>`.**
  - ○ **Investigate logs to determine why the lock was not released.**
- ● **Prevention:**
  - ○ **Use Terraform Cloud or remote backends (e.g., AWS S3 with DynamoDB for locking) to handle state locking efficiently.**
  - ○ **Avoid abrupt interruptions during Terraform operations.**

4. Docker Image Pull Backoff

- **Scenario: Kubernetes pods fail to pull the Docker image, showing** `ImagePullBackOff` **errors.**
- **RCA:**
    - **Incorrect image name or tag in the deployment YAML.**
    - **Image is not available in the specified registry.**
    - **Authentication failure with the private container registry.**
- **Solution:**
    - **Verify the image name and tag.**
    - **Check the image availability in the container registry.**

If using a private registry, ensure proper credentials are configured in Kubernetes secrets.

bash

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```
kubectl create secret docker-registry regcred \
  --docker-server=<registry-url> \
  --docker-username=<username> \
  --docker-password=<password>
```

- **Update the deployment to reference the secret.**
- **Prevention:**
    - **Test image pull locally before deploying.**
    - **Use automated CI pipelines to validate image integrity.**

5. High Latency in Application After Deployment

- **Scenario: The deployed application shows high response times in production.**
- **RCA:**
    - **Increased traffic after deployment exceeding the server's capacity.**

- ○ **Incorrect database query optimization leading to delays.**
- ○ **Load balancer misconfiguration causing uneven traffic distribution.**
- **Solution:**
  - ○ **Monitor server metrics (CPU, memory, disk I/O) using Prometheus/Grafana.**
  - ○ **Profile database queries and optimize slow queries.**
  - ○ **Verify load balancer configurations to ensure round-robin or sticky sessions are working as expected.**
  - ○ **Scale the application horizontally using Kubernetes or cloud auto-scaling.**
- **Prevention:**
  - ○ **Load test the application before deployment using tools like JMeter or Locust.**
  - ○ **Implement auto-scaling policies based on traffic patterns.**

6. Git Merge Conflicts

- **Scenario: Developers encounter frequent merge conflicts when integrating their branches into the main branch.**
- **RCA:**
  - ○ **Multiple developers modifying the same files or lines of code simultaneously.**
  - ○ **Lack of proper branching strategy.**
  - ○ **Changes not rebased with the latest version of the main branch.**
- **Solution:**
  - ○ **Identify conflicting files with `git status`.**
  - ○ **Open each file and resolve conflicts manually.**
  - ○ **Mark resolved files with `git add`.**
  - ○ **Complete the merge with `git commit`.**
- **Prevention:**
  - ○ **Adopt a Git branching strategy like GitFlow.**
  - ○ **Encourage developers to pull the latest changes regularly and rebase before pushing.**
  - ○ **Use CI pipelines to automatically detect conflicts during pull requests.**

7. Ansible Playbook Syntax Error

- **Scenario: Ansible playbook execution fails with a YAML syntax error.**
- **RCA:**
  - **Indentation errors in the YAML file.**
  - **Incorrect use of special characters like `:` or `-`.**
  - **Missing modules or invalid parameters in tasks.**
- **Solution:**
  - **Validate the playbook using `ansible-lint` or `yamllint`.**
  - **Fix the reported syntax issues.**
  - **Test the playbook with `--check` mode before applying it to production.**
- **Prevention:**
  - **Use an IDE with YAML support and syntax validation.**
  - **Follow Ansible best practices for playbook structure.**

8. AWS S3 Bucket Access Denied

- **Scenario: Applications cannot access an AWS S3 bucket, showing a "403 Access Denied" error.**
- **RCA:**
  - **Incorrect IAM policy attached to the application role.**
  - **Bucket policy is restrictive or missing required permissions.**
  - **S3 bucket is configured to block public access.**
- **Solution:**
  - **Verify the IAM policy using the AWS Management Console or CLI.**
  - **Update the bucket policy to allow access to the specific role.**

Check and adjust the block public access settings as needed.

```
{

  "Version": "2012-10-17",

  "Statement": [
```

```
{

    "Effect": "Allow",

    "Principal": "*",

    "Action": "s3:GetObject",

    "Resource": "arn:aws:s3:::<bucket-name>/*"

  }

]

}
```

- **Prevention:**
  - Use IAM roles instead of static access keys for applications.
  - Regularly audit S3 policies and permissions.

9. Kubernetes Node Disk Pressure

- **Scenario:** A Kubernetes node is marked as `NotReady` with the condition `DiskPressure`.
- **RCA:**
  - Disk usage on the node exceeded the threshold.
  - Logs or temporary files are consuming excess space.
  - Persistent volumes or container storage not configured properly.
- **Solution:**
  - Identify disk usage with `df -h` and `du` commands on the node.
  - Clean up unnecessary logs, unused images, or temporary files.
  - Configure log rotation for containers and system logs.
  - Adjust the eviction thresholds in Kubernetes if needed.

- **Prevention:**
  - Monitor node resource usage with Prometheus and alert on high disk usage.
  - Use persistent volumes to avoid excessive local storage use.

10. CI/CD Pipeline Secrets Leak

- **Scenario: Sensitive credentials (e.g., API keys) are accidentally exposed in CI/CD logs.**
- **RCA:**
  - Secrets were hard-coded in pipeline scripts or environment variables.
  - Logs were not configured to mask sensitive data.
- **Solution:**
  - Rotate the exposed credentials immediately.
  - Update the pipeline to use a secure secrets management tool (e.g., HashiCorp Vault, AWS Secrets Manager).
  - Configure CI/CD tools to redact sensitive information in logs.
- **Prevention:**
  - Avoid hard-coding secrets; use encrypted storage or environment variables.
  - Periodically review pipeline configurations for potential leaks.

11. DNS Resolution Failure in Docker

- **Scenario: Containers cannot resolve external DNS names (e.g., `google.com`).**
- **RCA:**
  - Misconfigured DNS settings in the Docker daemon.
  - Firewall or network policies blocking DNS traffic.
  - Host system's DNS resolver is unavailable.
- **Solution:**

Add a custom DNS resolver to the Docker daemon configuration (`/etc/docker/daemon.json`):

```
{

  "dns": ["8.8.8.8", "8.8.4.4"]

}
```

  - ○ **Restart the Docker service: `systemctl restart docker`.**
  - ○ **Verify DNS resolution using `ping` or `nslookup` inside the container.**
- ● **Prevention:**
  - ○ **Test DNS resolution during container builds.**
  - ○ **Use a corporate DNS server if required by internal policies.**

12. ELK Stack Memory Issues

- ● **Scenario: Elasticsearch crashes frequently due to memory errors.**
- ● **RCA:**
  - ○ **Insufficient heap memory allocation.**
  - ○ **High indexing rates causing memory exhaustion.**
  - ○ **Large queries or aggregations overloading the cluster.**
- ● **Solution:**
  - ○ **Increase the Elasticsearch heap size by modifying the `jvm.options` file.**
  - ○ **Optimize indexing by batching and reducing refresh intervals.**
  - ○ **Monitor cluster metrics and scale horizontally if necessary.**
- ● **Prevention:**
  - ○ **Regularly monitor Elasticsearch performance with Kibana or Grafana.**
  - ○ **Archive old logs or use tiered storage.**

13. Azure Virtual Network Connectivity Issue

- ● **Scenario: Applications running in an Azure Virtual Network cannot communicate with each other.**
- ● **RCA:**
  - ○ **Incorrect Network Security Group (NSG) rules blocking traffic.**

- - ○ Subnet IP ranges overlapping with another VNet or on-premises network.
    - ○ Peering between VNets not configured properly.
  - ● Solution:
    - ○ Verify and update NSG rules to allow required traffic.
    - ○ Check and correct subnet IP ranges in the VNet.
    - ○ Configure VNet peering and verify that "Allow forwarded traffic" is enabled.
  - ● Prevention:
    - ○ Use network diagrams and planning tools to avoid IP range conflicts.
    - ○ Periodically review NSG rules and subnet configurations.

14. Jenkins Out of Disk Space

- ● Scenario: Jenkins server crashes due to insufficient disk space.
- ● RCA:
  - ○ Old build artifacts and logs consuming disk space.
  - ○ No cleanup policy for temporary files and caches.
- ● Solution:
  - ○ Identify large directories using `du -sh`.
  - ○ Configure build cleanup policies in Jenkins:
    - ■ Navigate to job configuration → "Discard Old Builds."
  - ○ Use a dedicated storage volume for Jenkins data.
- ● Prevention:
  - ○ Automate cleanup using periodic cron jobs or Jenkins plugins.
  - ○ Monitor disk usage with system monitoring tools.

15. Prometheus Scrape Timeout

- ● Scenario: Prometheus alerts for scrape timeouts from certain targets.
- ● RCA:
  - ○ Target endpoints are slow to respond or unreachable.
  - ○ Prometheus scrape timeout is set too low.

- **Solution:**

  Increase the scrape timeout in the Prometheus configuration:

```
scrape_configs:

- job_name: "example"

  scrape_interval: 15s

  scrape_timeout: 10s
```

  - ○ **Optimize target endpoints to reduce response times.**
  - ○ **Verify network connectivity to the targets.**
- **Prevention:**
  - ○ **Test target availability and response times before adding them to Prometheus.**
  - ○ **Scale targets horizontally if needed.**

16. Docker Container Exits Immediately

- **RCA: The container's main process terminates because:**
  1. **The entry point script fails.**
  2. **The application inside the container encounters an error.**
- **Solution:**
  1. **Inspect logs using `docker logs <container-id>`.**
  2. **Check the `CMD` or `ENTRYPOINT` commands in the Dockerfile.**
  3. **Debug and fix the application issue causing termination.**

17. Kubernetes Service Not Accessible Externally

- **RCA:**
  1. **Service type is `ClusterIP` instead of `NodePort` or `LoadBalancer`.**
  2. **Missing ingress or external IP configuration.**
- **Solution:**

1. Change service type to `NodePort` or `LoadBalancer`.
2. Use `kubectl expose` to expose the service correctly.

18. Terraform Resource Drift

- **RCA: Manual changes made outside Terraform cause a mismatch with the state file.**
- **Solution:**
    1. Run `terraform plan` to identify drifts.
    2. Use `terraform import` to update the state or recreate the resource.

19. High Latency in Load Balancer

- **RCA:**
    1. Overloaded backend servers.
    2. Improper health checks.
- **Solution:**
    1. Scale backend instances.
    2. Optimize health check configurations and reduce retry intervals.

20. Jenkins Job Not Triggered Automatically

- **RCA:**
    1. Incorrect webhook configuration.
    2. Polling intervals not set.
- **Solution:**
    1. Verify webhook settings in the repository.
    2. Check "Poll SCM" or similar triggers in Jenkins.

21. AWS Lambda Timeout

- **RCA:**
    1. Function execution exceeds the configured timeout.
- **Solution:**

1. Increase the timeout in the Lambda configuration.
2. Optimize the function code to execute faster.

22. Docker Network Conflict

- **RCA: Overlapping subnets in custom Docker networks.**
- **Solution:**
    1. Redefine network subnets to avoid conflicts.
    2. Use `docker network inspect` to identify overlaps.

23. Monitoring Metrics Missing

- **RCA:**
    1. Prometheus scrape configs missing target endpoints.
    2. Exporter services are down.
- **Solution:**
    1. Verify and update `scrape_configs` in Prometheus.
    2. Restart exporter services.

24. Ansible SSH Connection Timeout

- **RCA:**
    1. Incorrect inventory configuration.
    2. Target machine not reachable.
- **Solution:**
    1. Test SSH connectivity manually.
    2. Increase the timeout in Ansible configs.

25. CI Build Artifacts Not Found

- **RCA:**
    1. Incorrect artifact path in pipeline configs.
- **Solution:**
    1. Update artifact path to match build directory.
    2. Validate paths in pipeline configurations.

26. AWS EC2 Key Pair Loss

- **RCA:**
  1. **Private key file deleted or not backed up.**
- **Solution:**
  1. **Create a new key pair.**
  2. **Update instance access by replacing the public key.**

27. ELK Stack Disk Overflow

- **RCA:**
  1. **Logs consuming all disk space.**
- **Solution:**
  1. **Enable index lifecycle management (ILM).**
  2. **Configure log rotation and retention policies.**

28. Kubernetes Deployment Rolling Back

- **RCA:**
  1. **Readiness probes failing during updates.**
- **Solution:**
  1. **Fix readiness probe configurations.**
  2. **Test deployment changes in staging.**

29. Azure Function App Deployment Fails

- **RCA:**
  1. **Incorrect runtime stack or app settings.**
- **Solution:**
  1. **Match runtime stack with function app code.**
  2. **Update application settings.**

30. GitLab Runner Fails to Start

- **RCA:**
    1. Invalid token or missing registration.
- **Solution:**
    1. Re-register the runner with a valid token.
    2. Verify runner configurations.

31. Database Connection Refused in Containers

- **RCA:**
    1. Containers not on the same network.
    2. Database service not started.
- **Solution:**
    1. Use `docker network connect` to link containers.
    2. Start the database service.

32. AWS RDS Backup Failure

- **RCA:**
    1. Insufficient storage or permissions.
- **Solution:**
    1. Increase allocated storage.
    2. Update IAM roles to include backup permissions.

33. Kubernetes Pod Logs Missing

- **RCA:**
    1. Logging driver misconfigured.
- **Solution:**
    1. Verify the `log-driver` setting in Kubernetes.
    2. Use tools like Fluentd to collect logs.

34. Terraform Destroy Deletes Critical Resources

- **RCA:** Resources not excluded from state file.

- **Solution:**
    1. Use `lifecycle` blocks in Terraform to prevent deletion.
    2. Manually remove critical resources from the state.

35. Jenkins Stuck in Queued State

- **RCA:**
    1. No available build agents.
- **Solution:**
    1. Start or add new build agents.
    2. Verify agent configurations.

36. Docker Build Hangs

- **RCA:**
    1. Large files or cache issues.
- **Solution:**
    1. Use `.dockerignore` to exclude unnecessary files.
    2. Clear build cache with `--no-cache`.

37. Monitoring Alert Fatigue

- **RCA:**
    1. Too many low-priority alerts.
- **Solution:**
    1. Prioritize alerts based on severity.
    2. Adjust thresholds and group similar alerts.

38. Kubernetes Ingress Not Routing

- **RCA:**
    1. Missing ingress rules or DNS misconfiguration.
- **Solution:**
    1. Define proper rules in ingress YAML.

2. Verify DNS resolution.

39. AWS CloudFormation Stuck in CREATE_FAILED

- **RCA:**
    1. Resource dependency issues.
- **Solution:**
    1. Identify failed resources in the CloudFormation console.
    2. Fix dependencies and retry.

40. Kubernetes PersistentVolume Not Bound

- **RCA:**
    1. Mismatch between PVC and PV configurations.
- **Solution:**
    1. Update PVC specs to match available PVs.
    2. Verify storage class compatibility.

41. Kubernetes CrashLoopBackOff for StatefulSets

- **RCA:**
    1. Misconfigured volume mounts or missing environment variables.
- **Solution:**
    1. Inspect pod logs: `kubectl logs <pod-name>`.
    2. Ensure volume mounts match PVCs.
    3. Check environment variable definitions in the YAML.

42. Jenkins Slave Disconnected

- **RCA:**
    1. Network issues or incorrect slave configurations.
- **Solution:**
    1. Verify network connectivity between master and slave.
    2. Update slave settings, including the authentication token.

43. AWS ECS Task Stuck in Pending

- **RCA:**
    1. **Insufficient resources in the cluster.**
- **Solution:**
    1. **Scale up cluster instances.**
    2. **Check task definitions for resource requirements.**

44. Docker Image Size Too Large

- **RCA:**
    1. **Including unnecessary dependencies in the image.**
- **Solution:**
    1. **Use a minimal base image (e.g., `alpine`).**
    2. **Optimize Dockerfile by reducing intermediate layers.**

45. Prometheus Retention Policy Exceeded

- **RCA:**
    1. **High retention period or excessive data collection.**
- **Solution:**
    1. **Reduce retention period in Prometheus configs.**
    2. **Limit metrics collected with `metric_relabel_configs`.**

46. Azure AKS Pods Not Scaling

- **RCA:**
    1. **Misconfigured Horizontal Pod Autoscaler (HPA).**
- **Solution:**
    1. **Verify HPA metrics source.**
    2. **Update deployment resource limits.**

47. CI/CD Pipeline Fails at Unit Testing Stage

- **RCA:**
    1. **Missing dependencies or misconfigured test frameworks.**
- **Solution:**
    1. **Ensure dependencies are installed in the build stage.**
    2. **Debug failing tests locally before committing.**

48. Kubernetes NodePort Service Not Accessible

- **RCA:**
    1. **Node firewall blocking traffic.**
- **Solution:**
    1. **Open the NodePort range (e.g., 30000-32767) in the firewall.**
    2. **Verify the service configuration in YAML.**

49. Terraform Plan Shows Unexpected Changes

- **RCA:**
    1. **Provider API changes or manual modifications in resources.**
- **Solution:**
    1. **Reimport affected resources with `terraform import`.**
    2. **Review Terraform state and plan output.**

50. Git Submodule Not Synced

- **RCA:**
    1. **Submodule update missing after a pull.**
- **Solution:**
    1. **Run `git submodule update --init --recursive`.**
    2. **Verify `.gitmodules` configurations.**

51. Kubernetes Pod Stuck in Pending

- **RCA:**

1. No available nodes due to resource constraints.
- Solution:
    1. Check pod events with `kubectl describe pod`.
    2. Scale cluster nodes or reduce resource requests.

52. AWS CloudWatch Logs Not Ingested

- RCA:
    1. Missing IAM permissions or incorrect log group configuration.
- Solution:
    1. Update IAM roles with `logs:PutLogEvents` and `logs:CreateLogStream`.
    2. Verify log group and stream settings.

53. Jenkins Pipeline Groovy Syntax Error

- RCA:
    1. Incorrect syntax in `Jenkinsfile`.
- Solution:
    1. Validate syntax with Groovy tools.
    2. Use IDE plugins to lint the pipeline code.

54. AWS S3 Bucket Versioning Not Enabled

- RCA:
    1. Versioning not configured during bucket creation.
- Solution:
    1. Enable versioning via the AWS Console or CLI.
    2. Use Terraform to manage versioning configurations.

55. Kubernetes ConfigMap Not Updating Pods

- RCA:
    1. Pods not automatically reloading ConfigMap changes.

- **Solution:**
    1. Trigger pod restarts manually after updating the ConfigMap.
    2. Use `kubectl rollout restart`.

56. Prometheus Targets Down

- **RCA:**
    1. Network issues or incorrect scrape URLs.
- **Solution:**
    1. Verify target availability with `curl` or similar tools.
    2. Update Prometheus configs to correct scrape URLs.

57. Docker Container Cannot Access Host Services

- **RCA:**
    1. Missing `host.docker.internal` mapping.
- **Solution:**
    1. Use `--network host` for accessing host services.
    2. Verify DNS settings in the container.

58. Jenkins Credentials Misconfigured

- **RCA:**
    1. Incorrect or expired credentials in Jenkins.
- **Solution:**
    1. Update credentials in Jenkins under "Manage Credentials."
    2. Test connections to the service using the new credentials.

59. AWS IAM Role Not Assumed

- **RCA:**
    1. Role trust policy does not allow the principal.
- **Solution:**
    1. Update the role's trust relationship.

2. Validate with `aws sts assume-role`.

60. ELK Stack Kibana Not Loading Dashboards

- **RCA:**
    1. Elasticsearch indices missing or Kibana configs incorrect.
- **Solution:**
    1. Verify indices with `_cat/indices`.
    2. Check Kibana logs for configuration errors.

61. Kubernetes Helm Release Stuck

- **RCA:**
    1. Chart misconfiguration or resource conflicts.
- **Solution:**
    1. Use `helm rollback` to revert to the previous state.
    2. Debug with `helm get manifest`.

62. Jenkins Pipeline Artifact Not Uploaded

- **RCA:**
    1. Incorrect storage path or missing permissions.
- **Solution:**
    1. Validate artifact storage configuration.
    2. Update pipeline scripts for correct paths.

63. Terraform Output Not Displayed

- **RCA:**
    1. Missing `output` block in Terraform configs.
- **Solution:**
    1. Add required outputs to Terraform files.
    2. Use `terraform refresh` to sync state.

64. Docker Logs Too Verbose

- **RCA:**
  1. Application logging level set to `DEBUG`.
- **Solution:**
  1. Update application logging configuration to reduce verbosity.
  2. Rotate Docker logs using `log-driver`.

65. AWS EKS Cluster Authentication Fails

- **RCA:**
  1. Expired or invalid `kubeconfig`.
- **Solution:**
  1. Regenerate `kubeconfig` using `aws eks update-kubeconfig`.
  2. Ensure IAM role permissions are correct.

66. AWS EC2 Instance Fails to Start

- **RCA:**
  1. Incorrect instance type, insufficient permissions, or unavailable AMI.
- **Solution:**
  1. Check instance configuration and change to a supported type.
  2. Verify the AMI status and permissions.

67. Kubernetes PVC Stuck in Pending

- **RCA:**
  1. No matching storage class or insufficient storage resources.
- **Solution:**
  1. Validate the storage class and capacity in PVC and cluster.
  2. Check the storage backend configuration.

68. GitLab CI Fails Due to Cache Issue

- **RCA:**
    1. Cache key mismatch or corrupted cache.
- **Solution:**
    1. Clear the pipeline cache.
    2. Ensure consistent cache keys across stages.

69. Kubernetes Secret Not Applied to Pods

- **RCA:**
    1. Secret not mounted or incorrect environment variable reference.
- **Solution:**
    1. Update deployment YAML to mount the secret.
    2. Check variable references in the application.

70. AWS Auto Scaling Not Triggered

- **RCA:**
    1. Incorrect scaling policy or metrics.
- **Solution:**
    1. Verify and update scaling policies.
    2. Test auto-scaling with simulated traffic.

71. Jenkins Job Stuck at Checkout

- **RCA:**
    1. Repository inaccessible or network issue.
- **Solution:**
    1. Test repository access using the Jenkins credentials.
    2. Restart the Jenkins agent or master if needed.

72. Terraform Provider Plugin Version Conflict

- **RCA:**

1. Mismatch in provider versions specified in different modules.

- **Solution:**

    1. Pin provider versions in `required_providers`.

    2. Run `terraform init -upgrade`.

73. Docker Swarm Service Not Scaling

- **RCA:**

    1. Insufficient resources on nodes or incorrect constraints.

- **Solution:**

    1. Verify resource availability on worker nodes.

    2. Remove unnecessary constraints in the service spec.

74. Prometheus Alerts Not Triggering

- **RCA:**

    1. Incorrect alert rules or misconfigured alertmanager.

- **Solution:**

    1. Validate alert rules syntax.

    2. Test alert delivery with `amtool`.

75. Kubernetes Pod Evicted

- **RCA:**

    1. Node resource limits exceeded (CPU, memory).

- **Solution:**

    1. Scale nodes or adjust pod resource requests/limits.

    2. Implement taints and tolerations for resource-sensitive workloads.

76. ELK Logstash Pipeline Fails

- **RCA:**

    1. Syntax error in Logstash configuration.

- **Solution:**

1. Test configuration with `logstash --config.test_and_exit`.
2. Fix syntax issues and restart the service.

77. AWS IAM Policy Too Permissive

- **RCA:**
    1. Wildcard permissions (`*`) in policies.
- **Solution:**
    1. Audit and replace wildcard permissions with specific actions.
    2. Follow the principle of least privilege.

78. Jenkins Builds Triggered Twice

- **RCA:**
    1. Duplicate webhooks or poll configurations.
- **Solution:**
    1. Remove duplicate webhooks from the source control system.
    2. Disable polling if webhooks are used.

79. Kubernetes Service Not Resolving DNS

- **RCA:**
    1. CoreDNS misconfigured or crashed.
- **Solution:**
    1. Restart the CoreDNS pod.
    2. Update DNS configuration in the cluster.

80. AWS CloudFormation Stack Rollback

- **RCA:**
    1. Dependency failures or misconfigured resources.
- **Solution:**
    1. Check rollback events for details.
    2. Fix dependencies and redeploy.

81. Docker Volume Not Persisting Data

- **RCA:**
    1. Incorrect volume mount path or ephemeral storage used.
- **Solution:**
    1. Verify volume path in the `docker run` or Compose file.
    2. Use named volumes for persistent storage.

82. Kubernetes Helm Chart Upgrade Fails

- **RCA:**
    1. Resource conflicts or invalid chart values.
- **Solution:**
    1. Use `--dry-run` to test the upgrade.
    2. Resolve conflicts and reapply.

83. Jenkins Blue Ocean View Not Loading

- **RCA:**
    1. Blue Ocean plugin incompatible or corrupted.
- **Solution:**
    1. Update or reinstall the Blue Ocean plugin.
    2. Restart Jenkins.

84. Ansible Playbook Skipping Tasks

- **RCA:**
    1. Incorrect `when` conditions or task dependencies.
- **Solution:**
    1. Debug tasks with `ansible-playbook -vvv`.
    2. Fix `when` conditions and dependencies.

85. AWS RDS Slow Query Performance

- **RCA:**
    1. Large unindexed queries or high traffic.
- **Solution:**
    1. Add proper indexes to tables.
    2. Enable query optimization using RDS Performance Insights.

86. Kubernetes PersistentVolume Reclaimed Incorrectly

- **RCA:**
    1. Reclaim policy set to `Delete` instead of `Retain`.
- **Solution:**
    1. Update the PV reclaim policy.
    2. Use `kubectl patch` to change policy dynamically.

87. Docker Container Cannot Access Internet

- **RCA:**
    1. Missing bridge network configuration.
- **Solution:**
    1. Verify the Docker network settings.
    2. Use `--network bridge` in the `docker run` command.

88. Terraform State File Corruption

- **RCA:**
    1. Concurrent changes or improper manual edits.
- **Solution:**
    1. Restore the state file from backups.
    2. Enable remote state locking with backends like S3 and DynamoDB.

89. CI/CD Pipeline Runs Slow

- **RCA:**
    1. Large dependencies or inefficient steps.

- Solution:
  1. Cache dependencies in the pipeline.
  2. Optimize pipeline stages and parallelize steps.

90. AWS ELB Returns 504 Gateway Timeout

- RCA:
  1. Backend server timeout or unreachable instances.
- Solution:
  1. Increase idle timeout settings in ELB.
  2. Fix backend instance health issues.

91. Kubernetes DaemonSet Not Running on All Nodes

- RCA:
  1. Taints on nodes or missing tolerations in the DaemonSet.
- Solution:
  1. Add tolerations in the DaemonSet YAML.
  2. Remove unnecessary taints from nodes.

92. Jenkinsfile Declarative Pipeline Syntax Error

- RCA:
  1. Incorrect block definitions or stage hierarchy.
- Solution:
  1. Validate the syntax using Jenkins pipeline linter.
  2. Fix misaligned blocks.

93. AWS Security Group Blocks Inbound Traffic

- RCA:
  1. Missing or restrictive inbound rules.
- Solution:
  1. Add appropriate inbound rules for required ports.
  2. Test connectivity using `telnet`.

94. Docker Image Tagging Overwritten

- **RCA:**
    1. **Multiple builds using the same tag.**
- **Solution:**
    1. **Use unique tags with build metadata (e.g., `git commit hash`).**
    2. **Automate tagging in CI/CD pipelines.**

95. Kubernetes Pod Fails Liveness Probe

- **RCA:**
    1. **Incorrect liveness probe configurations or resource starvation.**
- **Solution:**
    1. **Adjust liveness probe thresholds.**
    2. **Allocate more resources to the pod.**

96. AWS Lambda Function Not Triggering

- **RCA:**
    1. **Misconfigured event source or permissions.**
- **Solution:**
    1. **Verify event source mappings.**
    2. **Update the Lambda execution role with necessary permissions.**

97. Prometheus High Cardinality Issue

- **RCA:**
    1. **Excessive unique label combinations in metrics.**
- **Solution:**
    1. **Limit labels and use aggregation.**
    2. **Apply `metric_relabel_configs` to reduce cardinality.**

98. Kubernetes Node Out of Memory (OOMKilled Pods)

- **RCA:**

1. Pods consuming excessive memory.
- Solution:
    1. Set resource requests and limits for pods.
    2. Monitor memory usage with tools like Grafana.

99. Azure DevOps Build Pipeline Fails

- RCA:
    1. Missing dependencies or incorrect agent pool.
- Solution:
    1. Verify agent pool configurations.
    2. Install missing dependencies in the build environment.

100. Jenkins Slave Disconnects Due to Java Heap Size

- RCA:
    1. Insufficient heap size allocated to the Jenkins slave.
- Solution:
    1. Increase the Java heap size for the slave.
    2. Restart the slave process.

101. Kubernetes Pod Deployment Fails Due to ImagePullBackOff

- RCA:
    1. Invalid image name, private registry without proper authentication, or unavailable image tag.
- Solution:
    1. Verify the image name and tag are correct.
    2. If pulling from a private registry, configure Kubernetes secrets for authentication.
    3. Test image pull locally with `docker pull`.

102. Terraform Module Not Found

- **RCA:**
    1. Incorrect module source path or missing initialization.
- **Solution:**
    1. Check the module path in `main.tf`.
    2. Reinitialize Terraform with `terraform init`.

103. AWS S3 Bucket Public Access Blocked Unexpectedly

- **RCA:**
    1. Organization SCP or bucket policy denies public access.
- **Solution:**
    1. Update the bucket policy to allow public access if required.
    2. Review and modify the organization's SCP settings.

104. Jenkins Job Configuration Lost

- **RCA:**
    1. Jenkins master restarted without persisting configurations.
- **Solution:**
    1. Restore job configurations from backup.
    2. Store configurations on persistent storage.

105. Kubernetes HPA Not Scaling Pods

- **RCA:**
    1. Metrics-server not installed or HPA misconfigured.
- **Solution:**
    1. Ensure metrics-server is deployed and running.
    2. Verify HPA target metrics are reachable.

106. Prometheus Scrape Configuration Not Updated

- **RCA:**

1. Prometheus configuration file changes not applied.

- **Solution:**

  1. Reload Prometheus configuration with the API endpoint.

  2. Restart the Prometheus service if necessary.

107. Docker Network Communication Blocked

- **RCA:**

  1. Firewall rules or custom network misconfiguration.

- **Solution:**

  1. Verify firewall rules on the host system.

  2. Use `docker network inspect` to debug network configurations.

108. Jenkins Master High CPU Usage

- **RCA:**

  1. Too many concurrent jobs or inefficient plugins.

- **Solution:**

  1. Distribute jobs across agents.

  2. Disable unnecessary plugins and optimize pipelines.

109. Ansible Playbook Ignores Inventory

- **RCA:**

  1. Incorrect inventory file path or missing hosts.

- **Solution:**

  1. Use the `-i` flag to specify the inventory file.

  2. Verify the inventory file syntax and structure.

110. AWS CloudWatch Alarm Not Triggered

- **RCA:**

  1. Incorrect metric thresholds or evaluation period.

- **Solution:**

1. Update the alarm thresholds in CloudWatch.
2. Test alarm triggering with simulated metrics.

111. Kubernetes Node DiskPressure Condition

- **RCA:**
    1. Excessive local storage usage or pod logs filling disk space.
- **Solution:**
    1. Clean up old logs and unused Docker images.
    2. Add additional storage to the node.

112. GitLab Merge Request Pipeline Not Triggering

- **RCA:**
    1. Incorrect pipeline trigger settings in `.gitlab-ci.yml`.
- **Solution:**
    1. Verify `only` and `except` rules in the pipeline configuration.
    2. Test pipeline triggers with a manual job run.

113. Terraform Plan Outputs Invalid Credentials

- **RCA:**
    1. Environment variables for sensitive data not set.
- **Solution:**
    1. Export required environment variables.
    2. Use a secure secrets manager for credentials.

114. Kubernetes Pod Liveness Probe Continually Failing

- **RCA:**
    1. The endpoint being probed is not ready or misconfigured.
- **Solution:**
    1. Test the liveness probe endpoint with `curl`.
    2. Adjust the `initialDelaySeconds` or `timeoutSeconds` settings.

115. AWS VPC Peering Not Working

- **RCA:**
    1. **Missing or incorrect route table entries.**
- **Solution:**
    1. **Add route table entries to allow traffic between VPCs.**
    2. **Verify security group rules.**

116. Jenkins Build Artifact Upload to S3 Fails

- **RCA:**
    1. **Missing IAM permissions for S3 upload.**
- **Solution:**
    1. **Update the IAM role attached to Jenkins with `s3:PutObject` permissions.**
    2. **Check the S3 bucket policy for upload permissions.**

117. Kubernetes Ingress Returns 404

- **RCA:**
    1. **Ingress rules not configured or backend service unreachable.**
- **Solution:**
    1. **Verify ingress rules in YAML.**
    2. **Check service availability and DNS configuration.**

118. Docker Build Fails Due to ADD/COPY Command

- **RCA:**
    1. **File paths incorrect or missing files in the build context.**
- **Solution:**
    1. **Validate paths in the Dockerfile.**
    2. **Ensure required files are present in the build context.**

119. Prometheus AlertManager Notifications Not Sent

- **RCA:**
    1. Incorrect receiver configuration or network issues.
- **Solution:**
    1. Test AlertManager configurations with a dry run.
    2. Verify network connectivity to the notification service.

120. AWS RDS Instance Fails to Connect

- **RCA:**
    1. Security group blocking inbound traffic or database engine not started.
- **Solution:**
    1. Open required database ports in the security group.
    2. Ensure the RDS instance is in the `Available` state.

121. Kubernetes Service IP Not Accessible

- **RCA:**
    1. Incorrect service type or missing port configuration.
- **Solution:**
    1. Change service type to `NodePort` or `LoadBalancer`.
    2. Verify port definitions in the service spec.

122. Jenkins Build Timeout

- **RCA:**
    1. Resource-intensive tasks exceeding the default timeout.
- **Solution:**
    1. Increase the build timeout in the pipeline settings.
    2. Optimize the build tasks to reduce execution time.

123. Terraform Resource Deletion in Plan

- **RCA:**
    1. Resource changes causing a replacement rather than an in-place update.
- **Solution:**
    1. Use the `lifecycle` block to retain specific resources.
    2. Review changes before applying the plan.

124. Git Commit Hook Failing

- **RCA:**
    1. Hook script errors or missing executable permissions.
- **Solution:**
    1. Debug the hook script for syntax errors.
    2. Set executable permissions using `chmod +x`.

125. Docker Compose Networking Issues

- **RCA:**
    1. Missing or overlapping network configurations.
- **Solution:**
    1. Use distinct custom network definitions in `docker-compose.yml`.
    2. Inspect network settings with `docker network inspect`.

126. Kubernetes Deployment Scaling Delayed

- **RCA:**
    1. Resource constraints on cluster nodes.
- **Solution:**
    1. Verify node resource availability.
    2. Use cluster autoscaler for dynamic node scaling.

127. Jenkins Agent Connection Refused

- **RCA:**
    1. Network issues or incorrect agent/master URL configuration.
- **Solution:**
    1. Test network connectivity between the agent and master.
    2. Update agent connection URLs and restart.

128. Prometheus Node Exporter Failing

- **RCA:**
    1. Incorrect installation or port conflicts.
- **Solution:**
    1. Reinstall the node exporter with the correct configuration.
    2. Ensure the default port (9100) is not in use.

129. Kubernetes API Server Unreachable

- **RCA:**
    1. Misconfigured kubeconfig or network issue.
- **Solution:**
    1. Verify kubeconfig with `kubectl config view`.
    2. Check API server logs for errors.

130. Terraform Destroy Deletes Dependent Resources

- **RCA:**
    1. Incorrect resource dependencies defined in Terraform.
- **Solution:**
    1. Use `depends_on` to explicitly set dependencies.
    2. Confirm the plan output before applying changes.

131. AWS EBS Volume Not Attaching to Instance

- **RCA:**
  1. Volume is in a different availability zone than the instance.
- **Solution:**
  1. Verify the volume and instance are in the same availability zone.
  2. Move the volume or create a snapshot to create a new volume in the correct zone.

132. Kubernetes StatefulSet Pods Restarting Repeatedly

- **RCA:**
  1. Persistent storage issue or misconfigured readiness probes.
- **Solution:**
  1. Ensure PVCs are bound correctly.
  2. Check readiness and liveness probes and adjust if necessary.

133. Jenkinsfile Pipeline Stage Skipped

- **RCA:**
  1. Incorrect conditions in the `when` block.
- **Solution:**
  1. Review and correct `when` conditions in the Jenkinsfile.
  2. Debug pipeline execution using logs.

134. Docker Daemon Not Starting

- **RCA:**
  1. Corrupted Docker configuration or insufficient permissions.
- **Solution:**
  1. Check the Docker daemon logs (`journalctl -u docker`).
  2. Restore or correct `/etc/docker/daemon.json`.

135. Prometheus Disk Usage Too High

- **RCA:**
    1. High retention period or excessive metrics collection.
- **Solution:**
    1. Reduce the retention period in Prometheus configurations.
    2. Limit metrics collected by applying relabeling rules.

136. Kubernetes Service External IP Not Assigned

- **RCA:**
    1. Misconfigured `LoadBalancer` service type or cloud provider integration.
- **Solution:**
    1. Verify the cloud provider integration with Kubernetes.
    2. Check service annotations for external load balancer requirements.

137. AWS IAM Role Not Working with Lambda

- **RCA:**
    1. Incorrect trust relationship or missing permissions.
- **Solution:**
    1. Update the role's trust relationship to include `lambda.amazonaws.com`.
    2. Add required policies to the role.

138. Jenkins Node Executor Limit Reached

- **RCA:**
    1. Too many jobs running concurrently on the node.
- **Solution:**
    1. Increase the executor count for the node.
    2. Distribute jobs across multiple nodes.

139. Kubernetes Pod NodeSelector Not Working

- **RCA:**
  1. **Node labels do not match the selector.**
- **Solution:**
  1. **Verify node labels with `kubectl get nodes --show-labels`.**
  2. **Update the Pod spec with the correct `nodeSelector`.**

140. AWS S3 Object Not Found Error

- **RCA:**
  1. **Object key mismatch or incorrect bucket configuration.**
- **Solution:**
  1. **Verify the object key and bucket name.**
  2. **Check bucket permissions and policies.**

141. Terraform Apply Hangs Indefinitely

- **RCA:**
  1. **Waiting for an external resource that is not completing.**
- **Solution:**
  1. **Check the resource creation logs.**
  2. **Use `terraform apply -parallelism=N` to debug individual resources.**

142. Kubernetes Pod Fails Due to Init Container

- **RCA:**
  1. **Init container script failure or missing resources.**
- **Solution:**
  1. **Check logs of the init container with `kubectl logs <pod-name> -c <init-container-name>`.**
  2. **Debug and fix the script or resource dependencies.**

143. Docker Push Fails with Unauthorized Error

- **RCA:**
    1. Incorrect Docker credentials or expired token.
- **Solution:**
    1. Re-login to the registry with `docker login`.
    2. Check the registry permissions for the user or role.

144. Prometheus Grafana Dashboard Not Loading

- **RCA:**
    1. Incorrect data source configuration in Grafana.
- **Solution:**
    1. Verify Prometheus data source settings in Grafana.
    2. Test the data source connection.

145. AWS EC2 Spot Instance Terminated

- **RCA:**
    1. Spot price exceeded the bid price or capacity constraints.
- **Solution:**
    1. Increase the bid price for the spot instance.
    2. Use spot instance fleets for greater availability.

146. Kubernetes Deployment Rolling Update Fails

- **RCA:**
    1. Readiness probes failing during the update.
- **Solution:**
    1. Debug readiness probe endpoints and adjust thresholds.
    2. Pause the rolling update and fix the underlying issue.

147. Jenkins Credentials Injected Incorrectly

- **RCA:**

1. Incorrect variable name mapping in the pipeline.

- Solution:
    1. Verify the credentials binding in the pipeline.
    2. Use `withCredentials` to test the variables.

148. Docker Container High Memory Usage

- RCA:
    1. Application memory leak or lack of resource limits.
- Solution:
    1. Monitor memory usage with `docker stats`.
    2. Set memory limits in the container configuration.

149. Kubernetes Cluster Autoscaler Not Scaling Nodes

- RCA:
    1. Autoscaler misconfiguration or resource quotas exceeded.
- Solution:
    1. Verify autoscaler logs for errors.
    2. Adjust resource quotas or scale manually.

150. GitLab Runner Jobs Stuck in Pending

- RCA:
    1. No available runners or incorrect runner tags.
- Solution:
    1. Check runner availability with `gitlab-runner list`.
    2. Assign matching tags to the runner and the job.

151. AWS Lambda Throttled by Concurrency Limit

- RCA:
    1. Function concurrency limit reached.
- Solution:

1. Increase the function concurrency limit in AWS.
2. Use reserved concurrency to manage limits.

152. Kubernetes Pod Security Policies Blocking Pods

- **RCA:**
    1. Security policy restricts pod permissions or configurations.
- **Solution:**
    1. Update the PodSecurityPolicy to allow required actions.
    2. Assign the correct roles to the namespace.

153. Jenkins Pipeline Build Artifact Missing

- **RCA:**
    1. Incorrect artifact path or failure in the archive stage.
- **Solution:**
    1. Verify the path to the artifact in the pipeline script.
    2. Ensure the `archiveArtifacts` step is configured correctly.

154. Docker Swarm Fails to Deploy Service

- **RCA:**
    1. Node resources exhausted or missing images on nodes.
- **Solution:**
    1. Add more nodes to the swarm.
    2. Pre-pull the required images on all nodes.

155. Terraform Backend Locking Issue

- **RCA:**
    1. Concurrent operations or improper lock release.
- **Solution:**
    1. Use `terraform force-unlock` to manually release the lock.
    2. Enable proper state locking with remote backends.

156. Kubernetes CronJob Fails to Run

- **RCA:**
    1. **Incorrect schedule syntax or image issues.**
- **Solution:**
    1. **Validate the cron schedule format.**
    2. **Check pod logs for errors in the job execution.**

157. AWS S3 Cross-Region Replication Fails

- **RCA:**
    1. **Missing replication role permissions or bucket configuration.**
- **Solution:**
    1. **Update the IAM role to allow replication actions.**
    2. **Verify the source and destination bucket policies.**

158. Jenkins Web UI Not Loading

- **RCA:**
    1. **Jenkins master overloaded or plugin issues.**
- **Solution:**
    1. **Check server resource usage.**
    2. **Disable or remove problematic plugins.**

159. Kubernetes NetworkPolicy Blocking Traffic

- **RCA:**
    1. **NetworkPolicy rules too restrictive.**
- **Solution:**
    1. **Update the NetworkPolicy to allow required traffic.**
    2. **Verify rules with `kubectl describe networkpolicy`.**

160. Prometheus Target Down After Deployment

- **RCA:**
    1. **New target endpoints misconfigured or unreachable.**
- **Solution:**
    1. **Verify target configurations in Prometheus.**
    2. **Check network connectivity to the target.**

161. AWS Elastic Load Balancer (ELB) Health Check Failing

- **RCA:**
    1. **Backend instances not responding within health check thresholds.**
- **Solution:**
    1. **Verify the health check URL and port configurations.**
    2. **Adjust health check intervals and timeouts in ELB settings.**
    3. **Ensure the application responds within the configured thresholds.**

162. Kubernetes Pod Scheduling Fails Due to Taints

- **RCA:**
    1. **Node taints not tolerated by the pod.**
- **Solution:**
    1. **Add tolerations to the pod spec in the deployment YAML.**
    2. **Use `kubectl describe node` to inspect taints and adjust as needed.**

163. Git Submodule Not Cloning Automatically

- **RCA:**
    1. **Submodule initialization is missing after the main repository is cloned.**
- **Solution:**
    1. **Run `git submodule update --init --recursive` to initialize and update submodules.**
    2. **Ensure the submodule path is correctly defined in `.gitmodules`.**

- **RCA:**
    1. **Certain changes in resource configuration trigger a resource replacement (e.g., changing `name` or `type`).**
- **Solution:**
    1. **Use resource lifecycle settings such as `prevent_destroy`.**
    2. **Plan changes carefully and test in staging before applying.**

165. Docker Compose Fails to Start Services

- **RCA:**
    1. **Missing dependencies or incorrect service links in `docker-compose.yml`.**
- **Solution:**
    1. **Verify service dependencies and ensure required services are defined and linked.**
    2. **Check the logs of each service for startup issues.**

166. Prometheus Alert Rules Syntax Error

- **RCA:**
    1. **Misconfigured or invalid PromQL in alert rules.**
- **Solution:**
    1. **Validate alert rules with `promtool check rules`.**
    2. **Fix syntax errors in the rules file and reload Prometheus.**

167. Kubernetes ConfigMap Environment Variables Not Injected

- **RCA:**
    1. **ConfigMap not referenced properly in the pod spec.**
- **Solution:**
    1. **Verify the `envFrom` or `env` section in the deployment YAML.**

2. Check for typos or missing keys in the ConfigMap.

168. AWS Lambda Cold Start Latency

- **RCA:**
    1. Function execution environment takes time to initialize due to memory size or dependencies.
- **Solution:**
    1. Use provisioned concurrency to keep Lambda environments warm.
    2. Optimize function size and dependencies for faster startup.

169. Jenkins Node Disconnected Due to Network Latency

- **RCA:**
    1. High network latency or unstable connection between Jenkins master and node.
- **Solution:**
    1. Test network stability with tools like `ping` or `traceroute`.
    2. Configure retry settings and increase the connection timeout.

170. Kubernetes PersistentVolumeClaim Bound to Wrong Storage Class

- **RCA:**
    1. PVC and PV storage classes do not match.
- **Solution:**
    1. Ensure PVC and PV definitions have the same storage class.
    2. Use dynamic provisioning if available in the cluster.

171. AWS EC2 Instance Unreachable After Security Group Changes

- **RCA:**
    1. Security group rules block SSH or application traffic.
- **Solution:**
    1. Add inbound rules for required ports (e.g., port 22 for SSH).

172. Docker Registry Fails to Authenticate

- **RCA:**
    1. Incorrect registry credentials or expired token.
- **Solution:**
    1. Reauthenticate with `docker login`.
    2. Verify registry permissions and access policies.

173. Kubernetes Pod Logs Not Captured by Fluentd

- **RCA:**
    1. Fluentd configuration does not include the pod namespace or log paths.
- **Solution:**
    1. Update Fluentd config to include the missing namespaces.
    2. Test the log collection with simulated log entries.

174. Terraform Backend State Drift

- **RCA:**
    1. Manual resource modifications outside Terraform.
- **Solution:**
    1. Use `terraform refresh` to sync the state file.
    2. Implement stricter controls to prevent manual modifications.

175. AWS CloudFormation Fails Due to Circular Dependency

- **RCA:**
    1. Resource dependencies defined incorrectly, causing a loop.
- **Solution:**
    1. Reorganize resource definitions to eliminate circular dependencies.
    2. Use `DependsOn` explicitly for dependent resources.

- **RCA:**
    1. **CoreDNS pods are not running or have incorrect configurations.**
- **Solution:**
    1. **Restart CoreDNS pods using `kubectl rollout restart`.**
    2. **Verify DNS settings in the cluster and troubleshoot with `nslookup`.**

177. Jenkins Pipeline Fails to Retrieve Secrets

- **RCA:**
    1. **Incorrect secret path or missing permissions for the credentials plugin.**
- **Solution:**
    1. **Verify the secret configuration in Jenkins.**
    2. **Test secret access with a simple pipeline script.**

178. Prometheus Query Returns No Data

- **RCA:**
    1. **Metrics not being scraped or relabeling drops relevant data.**
- **Solution:**
    1. **Check the scrape targets and logs for errors.**
    2. **Review `relabel_configs` to ensure metrics are not being dropped.**

179. AWS RDS Backup Retention Policy Not Applied

- **RCA:**
    1. **Incorrect backup settings or policy not associated with the RDS instance.**
- **Solution:**
    1. **Update the backup retention period in the RDS settings.**
    2. **Test backups manually to ensure policy enforcement.**

180. Kubernetes Ingress TLS Not Working

- **RCA:**

1. **Misconfigured TLS certificate or secret.**

- **Solution:**
    1. **Verify the TLS secret exists and is correctly referenced in the ingress spec.**
    2. **Use `kubectl describe secret` to check certificate details.**

181. Terraform Module Outputs Not Propagated

- **RCA:**
    1. **Outputs not explicitly declared or passed between modules.**
- **Solution:**
    1. **Define output variables in each module and reference them properly.**
    2. **Test output propagation with `terraform output`.**

182. Docker Swarm Service Deployment Fails Due to Resource Constraints

- **RCA:**
    1. **Insufficient CPU or memory on nodes.**
- **Solution:**
    1. **Add more nodes to the swarm cluster.**
    2. **Adjust resource limits in the service spec.**

183. GitLab CI Pipeline Fails Due to Shared Runner Configuration

- **RCA:**
    1. **Shared runner lacks required dependencies or permissions.**
- **Solution:**
    1. **Install necessary dependencies on the shared runner.**
    2. **Use a dedicated runner with customized configurations.**

184. Kubernetes Pod Disrupted During Node Maintenance

- **RCA:**
    1. **Pod not configured with appropriate disruption budgets.**
- **Solution:**

1. Define `PodDisruptionBudget` for critical pods.

2. Schedule node maintenance during low-traffic periods.

185. AWS Lambda Logs Not Showing in CloudWatch

- **RCA:**
    1. CloudWatch log group not created or IAM permissions missing.
- **Solution:**
    1. Ensure the Lambda execution role includes `logs:CreateLogGroup` and `logs:CreateLogStream`.
    2. Verify the log group exists and matches the Lambda configuration.

186. Prometheus Rule Group Not Firing Alerts

- **RCA:**
    1. Alert evaluation interval too long or conditions not met.
- **Solution:**
    1. Adjust the evaluation interval in the rule group configuration.
    2. Test alert conditions manually with PromQL.

187. Terraform Plan Fails Due to Missing Provider

- **RCA:**
    1. Provider plugin not initialized or incompatible version.
- **Solution:**
    1. Reinitialize providers with `terraform init`.
    2. Specify compatible provider versions in the configuration.

188. Docker Daemon Out of Disk Space

- **RCA:**
    1. Excessive unused images, containers, or volumes.
- **Solution:**
    1. Clean up unused resources with `docker system prune`.

2. Monitor disk usage and configure regular cleanups.

189. Kubernetes StatefulSet Scaling Issue

- **RCA:**
    1. StatefulSet pods require unique identities, making scaling slow.
- **Solution:**
    1. Adjust StatefulSet scaling policies if supported.
    2. Pre-provision storage and configuration for faster scaling.

190. Jenkins Pipeline Syntax Check Fails

- **RCA:**
    1. Incorrect Groovy syntax in the `Jenkinsfile`.
- **Solution:**
    1. Validate the `Jenkinsfile` with the Jenkins syntax checker.
    2. Use an IDE with Groovy support for linting.

191. Kubernetes Deployment Not Rolling Back

- **RCA:**
    1. Deployment history is missing due to `revisionHistoryLimit` set to a low value.
- **Solution:**
    1. Increase `revisionHistoryLimit` in the deployment spec.
    2. Use `kubectl rollout undo deployment/<deployment-name>` to manually rollback.

192. Jenkins Pipeline Fails on SSH Stage

- **RCA:**
    1. Incorrect SSH key configuration or missing permissions on the target server.
- **Solution:**
    1. Verify the SSH key is added to the Jenkins credentials store.

193. AWS S3 Lifecycle Policy Not Deleting Old Objects

- **RCA:**
    1. Incorrect prefix or filter configuration in the lifecycle rule.
- **Solution:**
    1. Review and update the lifecycle policy to include the correct object prefixes.
    2. Test the policy with small test objects.

194. Prometheus High Query Latency

- **RCA:**
    1. Large datasets being queried without sufficient resources.
- **Solution:**
    1. Optimize PromQL queries with aggregation and filtering.
    2. Increase Prometheus resources or shard the dataset across instances.

195. Docker Container Networking Conflict

- **RCA:**
    1. Two containers using overlapping subnet ranges.
- **Solution:**
    1. Reconfigure Docker networks with unique subnet ranges.
    2. Inspect the existing networks with `docker network ls`.

196. Kubernetes Horizontal Pod Autoscaler Scaling Slowly

- **RCA:**
    1. Metrics collection interval too high or resource limits not appropriately set.
- **Solution:**
    1. Decrease the metrics-server collection interval.
    2. Adjust HPA thresholds for faster scaling.

197. Terraform Destroy Command Fails

- **RCA:**
    1. Dependencies between resources preventing deletion.
- **Solution:**
    1. Identify dependencies with `terraform plan`.
    2. Manually remove dependent resources before running `terraform destroy`.

198. AWS EC2 Instance Fails to Attach to Target Group

- **RCA:**
    1. Security group or health check misconfiguration.
- **Solution:**
    1. Add the correct security group rules for the target group.
    2. Verify the health check path and port.

199. Kubernetes Job Keeps Restarting

- **RCA:**
    1. The job is failing and configured with a high restart policy.
- **Solution:**
    1. Check pod logs to debug job failures.
    2. Adjust the job's restart policy to `OnFailure` or `Never`.

200. Jenkins Pipeline Node Allocation Error

- **RCA:**
    1. No available executors on the designated node.
- **Solution:**
    1. Increase the executor count on the node.
    2. Use `label` to route the job to an appropriate node.

201. AWS CloudFront Distribution Returns 403

- **RCA:**
    1. **S3 bucket policy denies access to the CloudFront origin request.**
- **Solution:**
    1. **Update the bucket policy to allow access from the CloudFront origin identity.**
    2. **Confirm the origin settings in the CloudFront distribution.**

202. Kubernetes PersistentVolume Stuck in Terminating

- **RCA:**
    1. **The volume is still bound to a PVC or used by a pod.**
- **Solution:**
    1. **Unbind the PVC or delete the associated pod.**
    2. **Force delete the PersistentVolume if necessary.**

203. Terraform Outputs Not Displaying in Plan

- **RCA:**
    1. **Outputs depend on resources not created yet.**
- **Solution:**
    1. **Ensure output variables reference existing resources.**
    2. **Apply the configuration first, then query outputs with `terraform output`.**

204. Kubernetes Pod Stuck in ContainerCreating

- **RCA:**
    1. **Image pull issues or missing node resources.**
- **Solution:**
    1. **Check pod events with `kubectl describe pod`.**
    2. **Verify image availability and node resource limits.**

205. GitLab Runner Not Registering

- **RCA:**
    1. Incorrect registration token or network issues.
- **Solution:**
    1. Verify the runner registration token in the GitLab UI.
    2. Test connectivity to the GitLab server.

206. Prometheus Target Marked as Unknown

- **RCA:**
    1. TLS misconfiguration or invalid scrape URL.
- **Solution:**
    1. Check the TLS certificate validity and hostname matching.
    2. Update the scrape URL and test manually with `curl`.

207. Jenkins Pipeline Stage Timeout

- **RCA:**
    1. Stage execution exceeds the configured timeout.
- **Solution:**
    1. Increase the timeout value in the pipeline.
    2. Optimize the stage tasks to execute faster.

208. Kubernetes NetworkPolicy Blocks Internal Traffic

- **RCA:**
    1. Missing `allow` rules for internal communication.
- **Solution:**
    1. Update the NetworkPolicy to allow traffic between namespaces or pods.
    2. Test traffic flows using tools like `curl` or `ping`.

209. AWS RDS Instance in Storage Full State

- **RCA:**
    1. **High write activity or logs filling up storage.**
- **Solution:**
    1. **Increase the allocated storage for the RDS instance.**
    2. **Enable automated backups and log cleanup policies.**

210. Kubernetes DaemonSet Pods Not Scheduled on Some Nodes

- **RCA:**
    1. **Taints on nodes prevent scheduling.**
- **Solution:**
    1. **Add tolerations to the DaemonSet configuration.**
    2. **Remove unnecessary taints from the nodes.**

211. Terraform State File Locked

- **RCA:**
    1. **A previous Terraform process did not release the lock.**
- **Solution:**
    1. **Use `terraform force-unlock` to release the lock manually.**
    2. **Ensure proper cleanup after Terraform operations.**

212. AWS Auto Scaling Group Not Adding Instances

- **RCA:**
    1. **Launch template misconfiguration or insufficient permissions.**
- **Solution:**
    1. **Verify the launch template or configuration.**
    2. **Check IAM role permissions for auto-scaling actions.**

213. Jenkins Plugins Not Updating

- **RCA:**

1. Network issues or incorrect update center URL.
- Solution:
    1. Verify the update center URL under Jenkins configuration.
    2. Test network connectivity to the update server.

214. Kubernetes Pod Recreated Unexpectedly

- RCA:
    1. Deployment `replicas` count mismatch or readiness probe failure.
- Solution:
    1. Check the deployment spec for the correct `replicas` count.
    2. Debug readiness probes with `kubectl describe pod`.

215. Prometheus Alert Firing Too Frequently

- RCA:
    1. Low threshold values or insufficient evaluation intervals.
- Solution:
    1. Increase threshold values in the alert rule.
    2. Adjust the evaluation interval to reduce alert frequency.

216. Kubernetes CronJob Not Executing on Schedule

- RCA:
    1. Invalid cron syntax or controller issues.
- Solution:
    1. Validate the cron schedule with a tool like `crontab.guru`.
    2. Check the CronJob controller logs for errors.

217. Git Commit History Shows Detached HEAD

- RCA:
    1. Operations performed in detached HEAD state.
- Solution:

1. Create a new branch from the detached HEAD state.
2. Reattach the HEAD to the appropriate branch.

218. AWS IAM Policy Not Restricting Access

- RCA:
    1. Policy conditions not applied correctly.
- Solution:
    1. Update the IAM policy with proper condition keys.
    2. Test the policy using the IAM Policy Simulator.

219. Jenkins Build Artifact Upload Fails

- RCA:
    1. Incorrect file path or missing permissions.
- Solution:
    1. Verify the artifact path in the pipeline.
    2. Ensure the target storage location has the required write permissions.

220. Kubernetes PersistentVolumeClaim Bound to Wrong Volume

- RCA:
    1. Volume binding mode mismatch or incorrect selector labels.
- Solution:
    1. Update the PVC to use a valid selector matching the PV labels.
    2. Check for conflicting PVCs bound to the same PV.

221. Kubernetes Pod Stuck in `Terminating` State

- RCA:
    1. Finalizers are not allowing pod deletion, or resources are still being used.
- Solution:
    1. Remove finalizers manually using `kubectl edit pod`.
    2. Force delete the pod with `kubectl delete pod <pod-name> --force --grace-period=0`.

222. Terraform Remote State Access Denied

- **RCA:**
    1. Incorrect permissions for the backend storage (e.g., S3, GCS).
- **Solution:**
    1. Update IAM policies for the Terraform user or role.
    2. Verify and configure backend access credentials.

223. AWS ECS Task Stops Immediately After Starting

- **RCA:**
    1. Container entry point failure or misconfigured task definition.
- **Solution:**
    1. Check ECS task logs and container logs for errors.
    2. Fix entry point scripts or adjust container parameters.

224. Jenkins Job Fails with "No Space Left on Device"

- **RCA:**
    1. Disk space exhausted on the Jenkins agent.
- **Solution:**
    1. Clear old build artifacts or workspace directories.
    2. Add additional storage to the agent.

225. Kubernetes Secret Not Found Error

- **RCA:**
    1. Secret does not exist in the namespace or incorrect name referenced.
- **Solution:**
    1. Verify the secret exists in the correct namespace with `kubectl get secrets`.
    2. Update the deployment YAML to reference the correct secret name.

226. Docker Build Cache Not Used

- **RCA:**
    1. Dockerfile instructions invalidating the cache (e.g., `ADD`/`COPY` changes).
- **Solution:**
    1. Optimize Dockerfile to minimize cache invalidation.
    2. Use `--cache-from` during the build process to reuse layers.

227. Prometheus Scrape Config Missing Metrics

- **RCA:**
    1. Target endpoint returns 404 or scrape path is incorrect.
- **Solution:**
    1. Verify the scrape path using `curl` or `wget`.
    2. Update Prometheus config with the correct path.

228. AWS CloudFormation Stack Fails with "Resource Already Exists"

- **RCA:**
    1. Attempting to create resources with names that already exist.
- **Solution:**
    1. Change the resource names in the CloudFormation template.
    2. Import existing resources into the stack using `resource import`.

229. Kubernetes Service Not Accessible from Outside the Cluster

- **RCA:**
    1. Missing ingress rules or misconfigured `LoadBalancer`.
- **Solution:**
    1. Check the ingress configuration and ensure backend services are reachable.
    2. Verify the external IP assigned to the `LoadBalancer` service.

230. Jenkins Pipeline Fails at Docker Build Stage

- **RCA:**
  1. Incorrect Dockerfile or missing build context.
- **Solution:**
  1. Validate the Dockerfile syntax and fix errors.
  2. Ensure the build context contains all required files.

231. AWS Auto Scaling Group Terminating Healthy Instances

- **RCA:**
  1. Misconfigured health checks or scaling policies.
- **Solution:**
  1. Adjust health check thresholds to avoid premature termination.
  2. Review scaling policies for aggressive downscaling.

232. Kubernetes Pod Affinity Rules Prevent Scheduling

- **RCA:**
  1. Strict `affinity` or `anti-affinity` rules prevent the pod from finding a suitable node.
- **Solution:**
  1. Update affinity rules to make them more flexible.
  2. Add nodes that satisfy the affinity conditions.

233. Terraform Variables Not Populating Correctly

- **RCA:**
  1. Missing or incorrect variable definitions in the `.tfvars` file.
- **Solution:**
  1. Verify the variable names in the Terraform configuration.
  2. Pass the correct `.tfvars` file during the `terraform apply` command.

234. Jenkins Master Fails After Restart

- **RCA:**
    1. Corrupted `config.xml` or other critical files.
- **Solution:**
    1. Restore Jenkins configuration files from a backup.
    2. Inspect logs and fix issues preventing the master from starting.

235. AWS Lambda Function Reaching Timeout

- **RCA:**
    1. Function execution takes longer than the configured timeout.
- **Solution:**
    1. Optimize the function code to reduce execution time.
    2. Increase the timeout setting in the Lambda configuration.

236. Kubernetes Pod Fails with OOMKilled

- **RCA:**
    1. Pod exceeds its memory limit.
- **Solution:**
    1. Increase the memory limits in the pod spec.
    2. Monitor memory usage using `kubectl top pods`.

237. Prometheus Alert Not Resolving

- **RCA:**
    1. The alert condition remains true or incorrect `for` duration.
- **Solution:**
    1. Verify the alert condition with PromQL queries.
    2. Adjust the `for` duration to resolve the alert when conditions improve.

238. Docker Container Cannot Access Host Network

- **RCA:**
    1. Container is not running in host networking mode.
- **Solution:**
    1. Use the `--network host` flag when starting the container.
    2. Ensure the host services are accessible on the expected ports.

239. Terraform Outputs Not Accessible in Another Module

- **RCA:**
    1. Outputs not declared as `module.<module-name>.output`.
- **Solution:**
    1. Reference outputs using the module path in the parent configuration.
    2. Test output access with a `terraform plan`.

240. Kubernetes Deployment Pods Not Updated

- **RCA:**
    1. Deployment spec changes do not trigger pod updates.
- **Solution:**
    1. Use `kubectl rollout restart deployment <deployment-name>`.
    2. Ensure image tags are updated to trigger new pod creation.

241. AWS S3 Cross-Region Replication Lagging

- **RCA:**
    1. High volume of objects or network latency.
- **Solution:**
    1. Optimize object uploads and ensure replication rules are correct.
    2. Monitor replication metrics in CloudWatch.

242. Jenkins Job Fails at Archive Stage

- **RCA:**
    1. Artifacts directory not found or access permissions missing.
- **Solution:**
    1. Verify the path to the artifacts in the pipeline.
    2. Check permissions for the workspace directory.

243. Kubernetes CronJob Fails with "BackoffLimitExceeded"

- **RCA:**
    1. The job failed repeatedly and exceeded the backoff limit.
- **Solution:**
    1. Debug job failures with `kubectl logs`.
    2. Increase the `backoffLimit` in the CronJob spec if needed.

244. Docker Container Stops Unexpectedly

- **RCA:**
    1. Application crash or incorrect CMD/ENTRYPOINT in Dockerfile.
- **Solution:**
    1. Inspect container logs with `docker logs <container-id>`.
    2. Fix application issues or update the Dockerfile.

245. AWS Security Group Blocking Outbound Traffic

- **RCA:**
    1. Default outbound rules removed or overly restrictive rules applied.
- **Solution:**
    1. Add outbound rules for required protocols and ports.
    2. Test connectivity with tools like `telnet` or `curl`.

246. Prometheus Config Reload Fails

- **RCA:**
    1. Syntax errors in the configuration file.
- **Solution:**
    1. Validate the configuration file with `promtool`.
    2. Fix syntax errors and reload Prometheus.

247. Kubernetes Ingress TLS Certificate Not Applied

- **RCA:**
    1. Incorrect certificate secret or missing annotations.
- **Solution:**
    1. Verify the TLS secret exists in the correct namespace.
    2. Update ingress annotations for TLS settings.

248. GitLab CI/CD Pipeline Stuck in "Pending"

- **RCA:**
    1. No runners are available or runner tags do not match the job.
- **Solution:**
    1. Check runner status with `gitlab-runner list`.
    2. Update the job configuration to use matching runner tags.

249. Kubernetes PersistentVolume Not Released After PVC Deletion

- **RCA:**
    1. Reclaim policy set to `Retain`.
- **Solution:**
    1. Manually delete the PersistentVolume if it's no longer needed.
    2. Update the reclaim policy to `Delete` for future PVCs.

250. Jenkins Build Fails Due to Missing Environment Variables

- **RCA:**
    1. Required environment variables are not defined or incorrectly referenced.
- **Solution:**
    1. Add missing environment variables in the Jenkins configuration.
    2. Reference the variables correctly in the pipeline.

251. Kubernetes Deployment Stuck in Progressing

- **RCA:**
    1. Readiness probes failing or resource constraints on nodes.
- **Solution:**
    1. Check pod events and logs with `kubectl describe pod`.
    2. Adjust readiness probe settings or allocate more resources.

252. AWS IAM Policy Blocks Valid Requests

- **RCA:**
    1. Incorrect conditions or overly restrictive policy.
- **Solution:**
    1. Debug with the IAM Policy Simulator.
    2. Remove conflicting conditions and test the policy.

253. Docker Build Fails on `RUN` Command

- **RCA:**
    1. Missing dependencies or invalid syntax in the command.
- **Solution:**
    1. Verify the `RUN` command syntax.
    2. Add required dependencies in earlier layers.

254. Prometheus Metrics Not Exported by Node Exporter

- **RCA:**

1. Node exporter process stopped or port blocked.
- Solution:
    1. Restart the node exporter service.
    2. Ensure the port (default 9100) is accessible.

255. Kubernetes Job Not Retrying on Failure

- RCA:
    1. BackoffLimit reached or restart policy set to `Never`.
- Solution:
    1. Increase the `backoffLimit` in the Job spec.
    2. Change the restart policy to `OnFailure`.

256. Terraform Destroy Deletes Shared Resources

- RCA:
    1. No safeguards in place to prevent deletion of shared infrastructure.
- Solution:
    1. Use `lifecycle.prevent_destroy` in Terraform configurations.
    2. Tag shared resources and manage them outside of Terraform.

257. Kubernetes Pods Scheduled on Unsuitable Nodes

- RCA:
    1. Missing node affinity or taints/tolerations misconfiguration.
- Solution:
    1. Add appropriate node affinity rules in the deployment spec.
    2. Verify and adjust taints and tolerations on nodes.

258. AWS CloudWatch Logs Missing Entries

- RCA:
    1. Log group not created or application logs not directed to CloudWatch.
- Solution:

1. Ensure the application is configured to send logs to CloudWatch.
2. Verify log group and log stream creation.

259. Jenkins Pipeline Fails on Parallel Stage

- **RCA:**
    1. Resource contention or incorrect pipeline configuration.
- **Solution:**
    1. Allocate sufficient resources to parallel stages.
    2. Test the pipeline with fewer parallel stages to isolate issues.

260. Kubernetes StatefulSet Pods Stuck in Initializing

- **RCA:**
    1. Persistent storage not provisioned or init containers failing.
- **Solution:**
    1. Check PVC binding and storage class configuration.
    2. Debug init container logs for errors.

261. AWS S3 Bucket Policy Allows Unintended Access

- **RCA:**
    1. Overly permissive wildcard entries in the bucket policy.
- **Solution:**
    1. Replace wildcard entries with specific principals or conditions.
    2. Test the policy using AWS Policy Simulator.

262. Kubernetes ConfigMap Not Applied

- **RCA:**
    1. Syntax errors or ConfigMap not updated in the cluster.
- **Solution:**
    1. Use `kubectl apply` to reapply the ConfigMap.
    2. Validate the YAML syntax with `kubectl explain`.

263. Prometheus Alerts Delayed

- **RCA:**
    1. **Long evaluation intervals or alertmanager misconfiguration.**
- **Solution:**
    1. **Reduce evaluation intervals in Prometheus alert rules.**
    2. **Verify alertmanager connectivity and logs.**

264. Terraform Plan Includes Unexpected Changes

- **RCA:**
    1. **Manual changes made outside Terraform or drift in the state file.**
- **Solution:**
    1. **Run `terraform refresh` to sync the state.**
    2. **Use `terraform import` for resources created outside Terraform.**

265. Kubernetes CronJob Runs Twice Unexpectedly

- **RCA:**
    1. **Timezone mismatch or cluster clock drift.**
- **Solution:**
    1. **Synchronize the cluster nodes' clocks using NTP.**
    2. **Validate the CronJob schedule and timezone settings.**

266. Jenkins Agent Fails to Start Due to Java Errors

- **RCA:**
    1. **Incompatible Java version or corrupted agent JAR file.**
- **Solution:**
    1. **Install the recommended Java version for Jenkins.**
    2. **Re-download the agent JAR file.**

267. AWS Lambda Function Hits Concurrency Limit

- **RCA:**
    1. Burst traffic exceeds configured concurrency limit.
- **Solution:**
    1. Increase the concurrency limit for the Lambda function.
    2. Implement retries with exponential backoff in the client.

268. Docker Container Logs Not Accessible

- **RCA:**
    1. Logging driver misconfiguration or log rotation issues.
- **Solution:**
    1. Set the appropriate logging driver in `daemon.json`.
    2. Verify log rotation settings.

269. Kubernetes Node Out of CPU

- **RCA:**
    1. Pods consuming more CPU than allocated.
- **Solution:**
    1. Set CPU requests and limits in the pod spec.
    2. Scale the cluster to add more nodes.

270. AWS RDS Instance Not Accessible

- **RCA:**
    1. Security group rules blocking traffic or database engine stopped.
- **Solution:**
    1. Allow inbound traffic on the RDS port in the security group.
    2. Start the RDS instance if stopped.

271. Prometheus Remote Write Fails

- **RCA:**

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1. Endpoint unreachable or authentication issues.
- **Solution:**
  1. Test the remote write endpoint with `curl`.
  2. Verify the authentication credentials.

272. Jenkins Pipeline Fails to Fetch Repository

- **RCA:**
  1. Invalid credentials or repository access denied.
- **Solution:**
  1. Update the credentials in Jenkins.
  2. Test repository access with the configured credentials.

273. Kubernetes PersistentVolume Not Automatically Provisioned

- **RCA:**
  1. Dynamic provisioning not enabled for the storage class.
- **Solution:**
  1. Use a storage class that supports dynamic provisioning.
  2. Ensure the provisioner is installed and configured.

274. Docker Compose Service Restarts Repeatedly

- **RCA:**
  1. Health check failures or application errors.
- **Solution:**
  1. Debug container logs for health check or application errors.
  2. Fix the application or adjust health check thresholds.

275. AWS Elastic Beanstalk Deployment Fails

- **RCA:**
  1. Application package missing or invalid configuration.

- Solution:
    1. Verify the application package structure.
    2. Check Elastic Beanstalk logs for detailed error messages.

276. Kubernetes NetworkPolicy Blocks Ingress Traffic

- RCA:
    1. Missing allow rules for ingress traffic in the NetworkPolicy.
- Solution:
    1. Update the NetworkPolicy to include ingress rules.
    2. Test traffic with tools like `curl`.

277. Prometheus TSDB Out of Disk Space

- RCA:
    1. Retention period too long or excessive metrics collection.
- Solution:
    1. Reduce retention period in the Prometheus configuration.
    2. Limit metrics collection using relabeling.

278. Terraform Module Source Not Found

- RCA:
    1. Incorrect module source path or version tag.
- Solution:
    1. Verify the module source and version.
    2. Reinitialize Terraform with `terraform init`.

279. Jenkins Blue Ocean View Crashes

- RCA:
    1. Plugin version incompatibility or corrupted cache.
- Solution:

1. Update the Blue Ocean plugin to the latest version.
2. Clear Jenkins plugin cache and restart.

280. Kubernetes Pod Cannot Access Cluster DNS

- **RCA:**
    1. CoreDNS is not running or misconfigured.
- **Solution:**
    1. Restart CoreDNS pods with `kubectl rollout restart`.
    2. Check the CoreDNS logs for errors.

281. Kubernetes DaemonSet Pods Not Running on New Nodes

- **RCA:**
    1. Node labels or taints not matching the DaemonSet configuration.
- **Solution:**
    1. Ensure nodes are labeled or tolerations are defined in the DaemonSet spec.
    2. Verify node readiness with `kubectl get nodes`.

282. AWS EC2 Instance Metadata Not Accessible

- **RCA:**
    1. Instance metadata service (IMDS) misconfigured or disabled.
- **Solution:**
    1. Check the instance's IMDS settings.
    2. Ensure `http://169.254.169.254` is reachable from the instance.

283. Prometheus Rule Groups Not Evaluating

- **RCA:**
    1. Rule group configuration errors or incorrect evaluation intervals.
- **Solution:**
    1. Validate the rule groups with `promtool check rules`.
    2. Adjust evaluation intervals and test rule firing.

284. Jenkins Job Stuck in Build Queue

- **RCA:**
    1. **No available executors or node offline.**
- **Solution:**
    1. **Verify node status and restart offline nodes.**
    2. **Increase executor count on the nodes.**

285. Docker Swarm Overlay Network Not Routing Traffic

- **RCA:**
    1. **Firewall blocking overlay network traffic or misconfigured network.**
- **Solution:**
    1. **Open required ports (e.g., 7946, 4789) for Docker overlay networking.**
    2. **Recreate the overlay network and redeploy services.**

286. AWS Auto Scaling Group Fails to Launch Instances

- **RCA:**
    1. **Launch template errors or insufficient IAM permissions.**
- **Solution:**
    1. **Verify the launch template and ensure it references valid AMIs.**
    2. **Check IAM role permissions for auto-scaling actions.**

287. Kubernetes ConfigMap Not Reflecting Changes in Pods

- **RCA:**
    1. **ConfigMaps do not trigger rolling updates automatically.**
- **Solution:**
    1. **Manually restart pods using `kubectl rollout restart`.**
    2. **Use a hash annotation in the pod spec to trigger updates on ConfigMap changes.**

288. AWS CloudFormation Stack Fails Due to Insufficient IAM Permissions

- **RCA:**
    1. The user or role executing the stack lacks required permissions.
- **Solution:**
    1. Add the necessary permissions for the stack resources.
    2. Test the IAM role using the AWS Policy Simulator.

289. Kubernetes Pod Scheduling Fails Due to Resource Constraints

- **RCA:**
    1. Nodes lack sufficient CPU or memory for the pod.
- **Solution:**
    1. Scale the cluster to add more nodes or increase node resources.
    2. Adjust pod resource requests and limits.

290. Prometheus Target Down Due to SSL Errors

- **RCA:**
    1. Target endpoint uses invalid or self-signed SSL certificates.
- **Solution:**
    1. Add `insecure_skip_verify: true` to the Prometheus scrape config.
    2. Fix the SSL certificate or add the CA to Prometheus.

291. Jenkins Pipeline Stuck Waiting for Input

- **RCA:**
    1. Manual input step requires user intervention.
- **Solution:**
    1. Approve the pipeline input in the Jenkins UI.
    2. Remove or automate the input step in the pipeline.

292. AWS Lambda Unable to Access DynamoDB

- **RCA:**
    1. **Missing IAM permissions for the Lambda function role.**
- **Solution:**
    1. **Add `dynamodb:*` actions to the Lambda execution role.**
    2. **Verify the role association with the Lambda function.**

293. Docker Container Fails Due to Port Binding Conflict

- **RCA:**
    1. **The specified port is already in use by another process or container.**
- **Solution:**
    1. **Use `docker ps` or `netstat` to identify the conflicting process.**
    2. **Update the container configuration to use a different port.**

294. Kubernetes Horizontal Pod Autoscaler Not Scaling Down

- **RCA:**
    1. **HPA configuration prevents scaling below a specific threshold.**
- **Solution:**
    1. **Adjust the `minReplicas` setting in the HPA spec.**
    2. **Verify CPU or memory metrics are within the scaling range.**

295. AWS S3 Object Versioning Not Enabled

- **RCA:**
    1. **Versioning not configured during bucket creation.**
- **Solution:**
    1. **Enable versioning on the S3 bucket using the console or CLI.**
    2. **Test versioning by uploading multiple versions of an object.**

296. Kubernetes Node Not Ready

- **RCA:**

1. Node out of resources, network issues, or kubelet not running.
- Solution:
  1. Check node status with `kubectl describe node`.
  2. Restart the kubelet service and resolve resource constraints.

297. Jenkins Pipeline Fails to Archive Artifacts

- RCA:
  1. Incorrect file path or missing artifacts in the workspace.
- Solution:
  1. Verify artifact paths in the pipeline script.
  2. Ensure the artifacts are generated before the archive step.

298. Prometheus Disk Usage Surges Unexpectedly

- RCA:
  1. High churn in time-series data or excessive label cardinality.
- Solution:
  1. Optimize label usage to reduce cardinality.
  2. Increase disk space or shard Prometheus instances.

299. AWS CloudWatch Alarms Not Triggering

- RCA:
  1. Metrics not meeting threshold conditions or incorrect alarm settings.
- Solution:
  1. Test alarm conditions with historical metrics.
  2. Adjust thresholds and evaluation periods.

300. Kubernetes StatefulSet Pods Not Terminating

- RCA:
  1. Finalizers preventing deletion or volume detachment issues.

- **Solution:**
    1. Remove finalizers manually from the StatefulSet pods.
    2. Debug volume detachment with `kubectl describe`.

301. Terraform Backend State Not Found

- **RCA:**
    1. Backend storage misconfigured or state file deleted.
- **Solution:**
    1. Verify backend configuration in `main.tf`.
    2. Restore the state file from backups if available.

302. Kubernetes Job Pods Not Deleted After Completion

- **RCA:**
    1. `ttlSecondsAfterFinished` not set in the Job spec.
- **Solution:**
    1. Add `ttlSecondsAfterFinished` to automatically clean up completed jobs.
    2. Manually delete completed pods as needed.

303. AWS ECS Task Stops Due to Resource Limits

- **RCA:**
    1. Task definition resource limits exceeded.
- **Solution:**
    1. Increase CPU and memory limits in the task definition.
    2. Monitor resource usage with CloudWatch.

304. Jenkins Nodes Disconnect Due to Outdated Agent

- **RCA:**
    1. Incompatible agent version with the Jenkins master.
- **Solution:**

1. Update the Jenkins agent JAR to the latest version.
2. Restart the agent process on the nodes.

305. Kubernetes CronJob Missing Scheduled Runs

- RCA:
    1. CronJob controller disabled or cluster issues.
- Solution:
    1. Verify the CronJob controller is running.
    2. Check cluster logs for scheduling errors.

306. Prometheus Remote Write API Returns 400

- RCA:
    1. Incorrect remote write configuration or invalid payload.
- Solution:
    1. Validate the remote write configuration.
    2. Test the endpoint with a minimal valid payload.

307. Docker Container Cannot Access External Network

- RCA:
    1. Network bridge misconfiguration or firewall blocking traffic.
- Solution:
    1. Restart the Docker service to recreate the default bridge network.
    2. Test connectivity from the container using `ping`.

308. Kubernetes Deployment Fails with ImagePullSecrets

- RCA:
    1. Incorrect secret name or missing permissions for private registry access.
- Solution:
    1. Verify the image pull secret exists in the namespace.
    2. Update the deployment spec with the correct secret reference.

309. AWS Elastic Beanstalk Rolling Update Stuck

- **RCA:**
    1. Deployment issues or health checks failing on new instances.
- **Solution:**
    1. Check Elastic Beanstalk logs for detailed error messages.
    2. Fix health check paths and redeploy.

310. Terraform Plan Fails Due to Provider Configuration

- **RCA:**
    1. Missing or invalid provider block in the Terraform configuration.
- **Solution:**
    1. Add or correct the provider block in `main.tf`.
    2. Reinitialize Terraform with `terraform init`.

311. Kubernetes PersistentVolumeClaim Bound to Incorrect Volume

- **RCA:**
    1. Volume labels or storage class mismatch.
- **Solution:**
    1. Verify the PVC spec matches the PV labels and storage class.
    2. Update the PVC or create a new one with correct configurations.

312. Jenkins Pipeline Fails at Checkout

- **RCA:**
    1. Repository URL is incorrect or credentials are invalid.
- **Solution:**
    1. Verify the repository URL and update it in Jenkins.
    2. Ensure the correct credentials are configured in Jenkins.

313. AWS RDS Read Replica Lagging

- **RCA:**
  1. **High write volume on the primary instance or replication issues.**
- **Solution:**
  1. **Monitor replication metrics in CloudWatch.**
  2. **Optimize database queries and reduce write traffic on the primary.**

314. Kubernetes Node Not Joining the Cluster

- **RCA:**
  1. **Missing token or incorrect kubelet configuration.**
- **Solution:**
  1. **Regenerate the join token on the master node with `kubeadm token create`.**
  2. **Check the kubelet logs on the node for errors.**

315. Prometheus Rules Not Reloaded

- **RCA:**
  1. **Configuration file changes not applied.**
- **Solution:**
  1. **Reload Prometheus configuration with a `POST` request to the `/-/reload` endpoint.**
  2. **Restart Prometheus if reloading fails.**

316. Docker Service Cannot Access External Database

- **RCA:**
  1. **Network connectivity issues or incorrect database connection string.**
- **Solution:**
  1. **Verify network connectivity using `telnet` or `nc` commands.**
  2. **Update the connection string with the correct host and port.**

317. AWS Auto Scaling Launch Configuration Invalid

- **RCA:**
    1. AMI ID no longer exists or IAM role not assigned.
- **Solution:**
    1. Verify the AMI ID in the launch configuration.
    2. Attach the correct IAM role with required permissions.

318. Kubernetes Pod Security Policy Blocks Deployment

- **RCA:**
    1. PSP restricts permissions or required capabilities.
- **Solution:**
    1. Update the PSP to allow the necessary permissions.
    2. Bind the updated PSP to the appropriate service account.

319. Jenkins Pipeline Fails on Declarative Syntax

- **RCA:**
    1. Incorrect block structure in the `Jenkinsfile`.
- **Solution:**
    1. Validate the pipeline syntax using the Jenkins editor.
    2. Fix block nesting and ensure proper stage declarations.

320. AWS Lambda Function Exceeds Memory Allocation

- **RCA:**
    1. Memory-intensive code or unoptimized libraries.
- **Solution:**
    1. Increase the memory allocation in the Lambda configuration.
    2. Optimize code to reduce memory usage.

321. Kubernetes HPA Not Using Custom Metrics

- **RCA:**

1. Metrics API not configured or custom metrics missing.

- Solution:

    1. Deploy the custom metrics adapter in the cluster.

    2. Verify custom metrics are exposed with `kubectl get --raw`.

322. Terraform Module Outputs Not Referenced Correctly

- RCA:

    1. Parent module does not reference the child module's outputs.

- Solution:

    1. Add output references in the parent module configuration.

    2. Test the outputs with `terraform output`.

323. Kubernetes Ingress 502 Bad Gateway

- RCA:

    1. Backend service is unreachable or unhealthy.

- Solution:

    1. Verify backend service endpoints with `kubectl get endpoints`.

    2. Check ingress logs for errors.

324. AWS S3 Event Notifications Not Triggering

- RCA:

    1. Event rules not configured or permissions missing for the target.

- Solution:

    1. Verify the event notification configuration in the S3 bucket.

    2. Ensure the target service has proper permissions.

325. Jenkins Master High Memory Usage

- RCA:

    1. Too many active jobs or memory leaks in plugins.

- Solution:

1. Optimize job scheduling and reduce concurrent builds.
2. Disable unused plugins and monitor memory usage.

326. Docker Compose Fails Due to Version Mismatch

- **RCA:**
    1. The `docker-compose.yml` file uses unsupported features for the installed version.
- **Solution:**
    1. Update Docker Compose to the latest version.
    2. Use compatible syntax based on the installed version.

327. Prometheus Alertmanager Not Sending Alerts

- **RCA:**
    1. Invalid receiver configuration or unreachable endpoint.
- **Solution:**
    1. Verify Alertmanager configuration and test receivers.
    2. Check logs for connection errors with the alert endpoint.

328. Kubernetes Pod Using Old ConfigMap

- **RCA:**
    1. ConfigMap updates do not automatically propagate to running pods.
- **Solution:**
    1. Restart pods using `kubectl rollout restart`.
    2. Use `checksum` annotations to trigger updates on changes.

329. AWS CloudFormation Template Validation Error

- **RCA:**
    1. Syntax errors or unsupported properties in the template.
- **Solution:**
    1. Validate the template using the AWS CLI or console.

2. **Correct the errors based on the validation output.**

330. Terraform Plan Shows No Changes Despite Drift

- **RCA:**
    1. **Drift in manually updated resources not detected due to state file mismatch.**
- **Solution:**
    1. **Run `terraform refresh` to update the state file.**
    2. **Use `terraform import` to add manually updated resources.**

331. Kubernetes Service IP Not Reachable

- **RCA:**
    1. **Service type is `ClusterIP` and not exposed externally.**
- **Solution:**
    1. **Change the service type to `NodePort` or `LoadBalancer`.**
    2. **Verify cluster networking and service configurations.**

332. AWS RDS Connection Timeout

- **RCA:**
    1. **Security group or subnet access restrictions.**
- **Solution:**
    1. **Add inbound rules in the RDS security group for the client IP.**
    2. **Verify the RDS instance is in a publicly accessible subnet.**

333. Jenkins Pipeline Environment Variables Missing

- **RCA:**
    1. **Variables not declared globally or incorrectly scoped.**
- **Solution:**
    1. **Define environment variables in the `environment` block.**

2. Use `echo` to debug variable values during the pipeline.

334. Kubernetes PersistentVolume Remains Bound After PVC Deletion

- RCA:
    1. Reclaim policy set to `Retain`.
- Solution:
    1. Change the reclaim policy to `Delete` for future PVCs.
    2. Manually delete the PV if no longer required.

335. Docker Network Bridge IP Conflict

- RCA:
    1. Default bridge network overlaps with existing network subnets.
- Solution:
    1. Create a custom bridge network with a unique subnet.
    2. Reconfigure containers to use the new network.

336. AWS Lambda Execution Role Missing Permissions

- RCA:
    1. Role lacks required permissions for the service accessed by Lambda.
- Solution:
    1. Add necessary actions to the Lambda execution role policy.
    2. Test permissions using AWS CLI commands.

337. Prometheus Retention Period Not Enforced

- RCA:
    1. Incorrect `storage.tsdb.retention.time` configuration.
- Solution:
    1. Update Prometheus configuration with the desired retention period.
    2. Restart Prometheus to apply changes.

338. Kubernetes Pod Stuck in Init Container

- **RCA:**
  1. Init container script failure or resource constraints.
- **Solution:**
  1. Check init container logs with `kubectl logs <pod> -c <init-container>`.
  2. Allocate sufficient resources to the init container.

339. Jenkins Pipeline Timeout Due to Long Execution

- **RCA:**
  1. Default timeout exceeded for the pipeline stage.
- **Solution:**
  1. Increase the timeout in the pipeline script using `timeout`.
  2. Optimize pipeline steps to reduce execution time.

340. AWS ECS Tasks Not Scaling

- **RCA:**
  1. Autoscaling policies not configured or insufficient resource limits.
- **Solution:**
  1. Configure ECS service autoscaling policies.
  2. Increase task resource limits in the task definition.

341. Kubernetes Pods Unable to Communicate Across Namespaces

- **RCA:**
  1. Network policies are restricting inter-namespace communication.
- **Solution:**
  1. Update the NetworkPolicy to allow traffic between namespaces.
  2. Test connectivity using tools like `curl` or `ping` between pods.

342. Terraform Apply Fails Due to Provider Rate Limits

- **RCA:**
    1. Cloud provider API rate limits exceeded during resource creation.
- **Solution:**
    1. Add `time_sleep` resources to introduce delays in the plan.
    2. Break the resource creation into smaller, staged plans.

343. Jenkins Pipeline Fails on Docker Image Push

- **RCA:**
    1. Authentication issues with the container registry.
- **Solution:**
    1. Verify Docker credentials in Jenkins credentials manager.
    2. Reauthenticate with the container registry and update the credentials.

344. Prometheus Target Shows High Latency

- **RCA:**
    1. Scrape interval is too frequent, or the target endpoint is overloaded.
- **Solution:**
    1. Increase the scrape interval for high-latency targets.
    2. Optimize the target application to handle Prometheus requests more efficiently.

345. AWS S3 Static Website Returns 403

- **RCA:**
    1. Bucket policy does not allow public access, or objects are not public.
- **Solution:**
    1. Update the bucket policy to allow public access for static website hosting.
    2. Make objects publicly accessible using ACLs or bucket policies.

346. Kubernetes Deployment Not Updating After Image Change

- **RCA:**
    1. **Deployment spec has no changes, and the existing pods remain running.**
- **Solution:**
    1. **Update the image tag in the deployment YAML.**
    2. **Use `kubectl rollout restart deployment <deployment-name>` to force an update.**

347. AWS Lambda Fails Due to Timeout on External API Call

- **RCA:**
    1. **External API latency exceeds the Lambda timeout setting.**
- **Solution:**
    1. **Increase the timeout duration in the Lambda function configuration.**
    2. **Implement retries with exponential backoff for the API call.**

348. Docker Compose Fails to Start Services with "network not found"

- **RCA:**
    1. **Custom network defined in the compose file does not exist.**
- **Solution:**
    1. **Ensure the network is created using `docker network create`.**
    2. **Use `docker-compose down` and `docker-compose up` to recreate the environment.**

349. Kubernetes CronJob Overlapping Runs

- **RCA:**
    1. **`concurrencyPolicy` is set to `Allow`.**
- **Solution:**
    1. **Update the CronJob spec to set `concurrencyPolicy: Forbid`.**
    2. **Monitor the job schedule to avoid overlaps.**

350. Jenkins Agent Fails Due to Disk Space Exhaustion

- **RCA:**
    1. **Old build artifacts or workspace directories are not cleaned up.**
- **Solution:**
    1. **Configure periodic cleanup of workspaces and build artifacts.**
    2. **Increase disk space or move builds to a larger volume.**

351. AWS RDS Backup Fails Due to Insufficient Storage

- **RCA:**
    1. **Storage allocated to the instance is nearly full.**
- **Solution:**
    1. **Increase the storage allocation for the RDS instance.**
    2. **Enable automated backups and delete old snapshots.**

352. Kubernetes Pods Failing Readiness Probes After Scaling

- **RCA:**
    1. **Backend services cannot handle the increased load or incorrect probe configuration.**
- **Solution:**
    1. **Verify readiness probe endpoints and thresholds.**
    2. **Scale backend services to handle additional traffic.**

353. Prometheus Alerting on Old Data

- **RCA:**
    1. **High scrape intervals or delayed data ingestion.**
- **Solution:**
    1. **Reduce scrape intervals for critical targets.**
    2. **Ensure Prometheus has sufficient resources to handle ingestion.**

354. Terraform Destroy Hangs on Resource Deletion

- **RCA:**
    1. Dependencies or locks preventing resource deletion.
- **Solution:**
    1. Use `terraform force-unlock` to release locks.
    2. Manually delete resources that are stuck, then update the state.

355. Kubernetes Node Disk Pressure Due to Log Files

- **RCA:**
    1. Container and system logs consuming excessive disk space.
- **Solution:**
    1. Configure log rotation for container and system logs.
    2. Periodically clean up old logs or increase node storage.

356. Jenkins Build Fails Due to Missing Dependencies

- **RCA:**
    1. Required libraries or tools are not installed on the build node.
- **Solution:**
    1. Install the necessary dependencies on the Jenkins node.
    2. Use a containerized build environment with all dependencies pre-installed.

357. Kubernetes Service Not Routing Traffic Correctly

- **RCA:**
    1. Misconfigured service selector or endpoint issues.
- **Solution:**
    1. Verify service selectors match pod labels.
    2. Check endpoints with `kubectl get endpoints <service-name>`.

358. AWS CloudWatch Metric Data Missing

- **RCA:**
    1. **Application not publishing metrics or incorrect namespace configuration.**
- **Solution:**
    1. **Verify the application is publishing metrics to CloudWatch.**
    2. **Ensure the correct namespace and dimensions are used in the metric queries.**

359. Prometheus Not Retaining Data for Configured Duration

- **RCA:**
    1. **Disk space constraints or incorrect retention settings.**
- **Solution:**
    1. **Increase disk space or attach additional storage for Prometheus.**
    2. **Verify and correct `storage.tsdb.retention.time` in the configuration.**

360. Jenkins Job Fails Due to Workspace Lock

- **RCA:**
    1. **Previous build did not release the workspace lock.**
- **Solution:**
    1. **Manually delete the lock file from the workspace directory.**
    2. **Use the `retry` block in the pipeline to handle workspace contention.**

361. Kubernetes Cluster Autoscaler Not Adding Nodes

- **RCA:**
    1. **Insufficient quota in the cloud provider or misconfigured autoscaler.**
- **Solution:**
    1. **Check cloud provider quotas for node additions.**
    2. **Update the autoscaler configuration with correct node pool parameters.**

362. AWS ECS Service Failing Health Checks

- **RCA:**
    1. **Incorrect health check path or target application not responding in time.**
- **Solution:**
    1. **Verify the health check path in the ECS task definition.**
    2. **Optimize the target application to respond within the health check interval.**

363. Kubernetes Pods Stuck in `CrashLoopBackOff`

- **RCA:**
    1. **Application failure or missing dependencies.**
- **Solution:**
    1. **Check the pod logs with `kubectl logs <pod-name>`.**
    2. **Debug and fix the application or add missing dependencies.**

364. Terraform Apply Recreates Existing Resources

- **RCA:**
    1. **Changes in immutable resource attributes force replacement.**
- **Solution:**
    1. **Use `lifecycle.prevent_destroy` for critical resources.**
    2. **Review changes in the plan and adjust configurations to avoid replacements.**

365. Docker Container High CPU Usage

- **RCA:**
    1. **Resource-intensive application or lack of CPU limits.**
- **Solution:**
    1. **Set CPU limits in the container configuration.**
    2. **Debug the application to identify resource bottlenecks.**

366. AWS Lambda Logs Not Appearing in CloudWatch

- **RCA:**
    1. **Lambda execution role missing CloudWatch permissions.**
- **Solution:**
    1. **Add `logs:CreateLogGroup` and `logs:PutLogEvents` to the execution role.**
    2. **Verify the log group exists for the Lambda function.**

367. Prometheus Query Returns Partial Data

- **RCA:**
    1. **Some scrape targets are down or misconfigured.**
- **Solution:**
    1. **Verify target status in Prometheus with `targets` endpoint.**
    2. **Fix or restart problematic scrape targets.**

368. Kubernetes Deployment Rolling Update Fails

- **RCA:**
    1. **Readiness probes failing during updates.**
- **Solution:**
    1. **Debug readiness probes with `kubectl describe pod`.**
    2. **Fix application readiness issues or adjust probe thresholds.**

369. AWS S3 Access Logs Not Generated

- **RCA:**
    1. **Logging not enabled or incorrect target bucket configuration.**
- **Solution:**
    1. **Enable access logging for the S3 bucket.**
    2. **Verify the target bucket has proper permissions.**

370. Jenkins Job Fails Due to Environment-Specific Configurations

- **RCA:**
    1. Environment variables or configurations missing for the target environment.
- **Solution:**
    1. Configure environment-specific variables in Jenkins.
    2. Use parameterized builds to manage configurations.

371. Kubernetes CronJob Not Running at Scheduled Intervals

- **RCA:**
    1. Cron syntax is incorrect, or the controller is not functioning properly.
- **Solution:**
    1. Verify the cron syntax using a tool like `crontab.guru`.
    2. Check the status of the CronJob controller using `kubectl get pods -n kube-system`.

372. Terraform Plan Shows Resource Replacements Instead of Updates

- **RCA:**
    1. Immutable attributes of a resource were changed in the configuration.
- **Solution:**
    1. Review `terraform plan` output to identify affected resources.
    2. Update configurations to avoid modifying immutable attributes.

373. AWS ECS Tasks Unable to Pull Images from ECR

- **RCA:**
    1. ECS task execution role lacks permissions to access the ECR repository.
- **Solution:**
    1. Add `ecr:GetAuthorizationToken`, `ecr:BatchCheckLayerAvailability`, `ecr:GetDownloadUrlForLayer`, and `ecr:BatchGetImage` to the ECS execution role.

2. Verify the task definition includes the correct execution role.

374. Prometheus Alert Manager Fails to Deliver Alerts

- **RCA:**
  1. Notification endpoint misconfigured or network connectivity issues.
- **Solution:**
  1. Check AlertManager logs for delivery errors.
  2. Update the receiver configuration and test the endpoint.

375. Kubernetes Pods Scheduled on Non-Preferred Nodes

- **RCA:**
  1. Node affinity rules are not set in the deployment spec.
- **Solution:**
  1. Add `preferredDuringSchedulingIgnoredDuringExecution` node affinity rules.
  2. Label nodes appropriately to match affinity requirements.

376. AWS S3 Bucket Versioning Not Applied Retroactively

- **RCA:**
  1. Versioning does not apply to objects uploaded before it was enabled.
- **Solution:**
  1. Enable versioning to manage new object versions.
  2. Use S3 replication to copy old objects to a versioned bucket.

377. Jenkins Pipeline Fails Due to Outdated Plugin

- **RCA:**
  1. The plugin used in the pipeline is incompatible with the current Jenkins version.
- **Solution:**
  1. Update plugins from the Jenkins plugin manager.
  2. Restart Jenkins to apply updates and retry the pipeline.

378. Docker Compose Service Not Restarting After Failure

- **RCA:**
    1. Restart policy is not defined or set to `no`.
- **Solution:**
    1. Add a `restart: always` or `restart: on-failure` policy in the `docker-compose.yml` file.
    2. Restart the services with `docker-compose up -d`.

379. AWS CloudWatch Alarm Triggers Unexpectedly

- **RCA:**
    1. Metrics evaluation period or threshold is set too low.
- **Solution:**
    1. Adjust the evaluation period and threshold for the alarm.
    2. Analyze historical metrics to fine-tune the alarm settings.

380. Kubernetes NodePort Service Not Accessible

- **RCA:**
    1. Firewall rules blocking NodePort range (30000–32767).
- **Solution:**
    1. Open the NodePort range in the cluster nodes' firewall settings.
    2. Verify the service is correctly defined with `kubectl describe service`.

381. Prometheus High Cardinality Metrics Cause Resource Exhaustion

- **RCA:**
    1. Excessive label combinations create too many time-series data points.
- **Solution:**
    1. Use relabeling rules to drop unnecessary labels.
    2. Aggregate metrics using recording rules to reduce cardinality.

382. AWS Lambda Cold Start Causes High Latency

- **RCA:**
    1. Lambda initialization time is slow due to large dependencies or memory allocation.
- **Solution:**
    1. Use provisioned concurrency to keep functions warm.
    2. Optimize the Lambda code and reduce dependencies.

383. Kubernetes Deployment Stuck in `Updating` State

- **RCA:**
    1. Readiness probes are failing during the rollout.
- **Solution:**
    1. Debug pod readiness issues using `kubectl describe pod`.
    2. Temporarily pause the rollout using `kubectl rollout pause`.

384. Terraform State File Becomes Corrupted

- **RCA:**
    1. Simultaneous operations or manual edits to the state file.
- **Solution:**
    1. Restore the state file from a backup.
    2. Use remote state locking to prevent simultaneous modifications.

385. Kubernetes PersistentVolumeClaim Bound to Incorrect Storage

- **RCA:**
    1. Storage class or volume labels mismatch.
- **Solution:**
    1. Update the PVC spec to match the correct storage class.
    2. Recreate the PVC if necessary with proper configurations.

386. AWS ECS Service Not Reaching Desired Task Count

- **RCA:**
    1. **Insufficient cluster resources or scaling policy misconfiguration.**
- **Solution:**
    1. **Add more capacity to the ECS cluster.**
    2. **Update the scaling policy and verify task limits.**

387. Prometheus Remote Write Exceeds Bandwidth

- **RCA:**
    1. **Excessive data sent to the remote storage endpoint.**
- **Solution:**
    1. **Use relabeling to reduce the amount of data sent.**
    2. **Compress data where supported by the remote storage.**

388. Kubernetes Pods Cannot Access External Services

- **RCA:**
    1. **Egress rules block external traffic or DNS resolution issues.**
- **Solution:**
    1. **Update NetworkPolicies to allow egress traffic.**
    2. **Verify DNS resolution inside the pods using `nslookup`.**

389. Jenkins Pipeline Artifacts Not Uploaded

- **RCA:**
    1. **Incorrect artifact path or storage permissions.**
- **Solution:**
    1. **Verify the artifact path in the pipeline configuration.**
    2. **Update storage permissions and retry the upload.**

390. Terraform Plan Fails with `provider configuration not found`

- **RCA:**
    1. Provider block missing in the root module or incorrect initialization.
- **Solution:**
    1. Add the required provider block to the Terraform configuration.
    2. Reinitialize the workspace with `terraform init`.

391. AWS CloudFront Cache Not Updating

- **RCA:**
    1. Cached objects are not invalidated after updates.
- **Solution:**
    1. Invalidate the CloudFront cache using the AWS Console or CLI.
    2. Adjust cache behavior settings for shorter TTL values.

392. Kubernetes Node `NotReady` Due to Kubelet Error

- **RCA:**
    1. Kubelet service is not running or facing configuration issues.
- **Solution:**
    1. Restart the kubelet service and check logs for errors.
    2. Ensure proper kubelet configuration and node registration.

393. Prometheus Scrape Targets Marked as Stale

- **RCA:**
    1. Target endpoint not responding within the scrape interval.
- **Solution:**
    1. Increase the scrape timeout in Prometheus configuration.
    2. Monitor the target application for performance issues.

394. Docker Build Hangs on Large Layers

- **RCA:**
    1. **Large files or inefficient Dockerfile structure.**
- **Solution:**
    1. **Optimize the Dockerfile by reducing layer sizes.**
    2. **Use `.dockerignore` to exclude unnecessary files.**

395. AWS Lambda Execution Exceeds Retries

- **RCA:**
    1. **Persistent errors in the function logic or external dependencies.**
- **Solution:**
    1. **Debug and fix errors in the Lambda function code.**
    2. **Use dead-letter queues to handle failed executions.**

396. Kubernetes Ingress Not Assigning External IP

- **RCA:**
    1. **Cloud provider-specific annotations missing in the ingress spec.**
- **Solution:**
    1. **Add appropriate annotations for the cloud provider (e.g., `service.beta.kubernetes.io` for AWS/Google Cloud).**
    2. **Verify the ingress controller logs for allocation issues.**

397. Terraform Plan Includes Unintended Resource Deletions

- **RCA:**
    1. **Resources removed from the configuration without proper `lifecycle` blocks.**
- **Solution:**
    1. **Add `lifecycle.prevent_destroy` for critical resources.**
    2. **Validate changes before applying the plan.**

398. Jenkins Pipeline Fails on Shell Command Execution

- **RCA:**
    1. **Missing dependencies or incorrect command syntax.**
- **Solution:**
    1. **Verify the command syntax and dependencies on the build node.**
    2. **Test the command manually on the same environment.**

399. Prometheus Query Returns "Query Timeout"

- **RCA:**
    1. **Complex PromQL query or insufficient query timeout.**
- **Solution:**
    1. **Simplify the query or use recording rules to pre-aggregate data.**
    2. **Increase the query timeout in Prometheus configuration.**

400. Kubernetes Pods Failing Due to Insufficient Memory

- **RCA:**
    1. **Pods exceed memory limits defined in the spec.**
- **Solution:**
    1. **Increase memory requests and limits in the pod spec.**
    2. **Monitor pod memory usage with `kubectl top`.**

401. Kubernetes Deployment Scaling Fails

- **RCA:**
    1. **Insufficient cluster resources or resource quotas.**
- **Solution:**
    1. **Check cluster resource availability with `kubectl describe nodes`.**
    2. **Adjust resource quotas or add more nodes to the cluster.**

402. AWS IAM Policy Not Applying Correctly

- **RCA:**
    1. **Policy attached to the wrong user, group, or role.**

- **Solution:**
  1. Verify the target resource for the policy attachment.
  2. Test the policy using the AWS Policy Simulator.

403. Docker Container Stops Immediately After Start

- **RCA:**
  1. Incorrect CMD or ENTRYPOINT in the Dockerfile.
- **Solution:**
  1. Validate the Dockerfile for proper command definitions.
  2. Debug the container logs with `docker logs <container-id>`.

404. Prometheus Fails to Start Due to TSDB Corruption

- **RCA:**
  1. Corrupted time-series database files.
- **Solution:**
  1. Use `prometheus repair` to fix TSDB corruption.
  2. Restore from a backup if repair fails.

405. Jenkins Pipeline Fails Due to Permissions Issues

- **RCA:**
  1. Insufficient permissions for accessing build resources.
- **Solution:**
  1. Update the Jenkins agent's access permissions.
  2. Ensure credentials used in the pipeline are valid.

406. Kubernetes ConfigMap Not Updating Pods

- **RCA:**
  1. ConfigMap changes do not trigger pod restarts automatically.
- **Solution:**
  1. Use `kubectl rollout restart` to restart pods.
  2. Add a hash annotation for the ConfigMap in the deployment spec.

407. AWS ECS Service Stuck in Draining State

- **RCA:**
    1. Tasks are taking too long to shut down during a deployment.
- **Solution:**
    1. Reduce the `deregistration delay` for the target group.
    2. Optimize task shutdown processes.

408. Terraform Remote State Access Denied

- **RCA:**
    1. Backend storage permissions are insufficient.
- **Solution:**
    1. Update IAM roles or credentials for backend access.
    2. Test backend configuration using `terraform init`.

409. Kubernetes Pod Logs Missing

- **RCA:**
    1. Logs not retained due to container restarts or misconfigured logging driver.
- **Solution:**
    1. Check container restart counts with `kubectl describe pod`.
    2. Configure persistent logging or use a logging sidecar.

410. AWS Lambda Trigger Not Invoking Function

- **RCA:**
    1. Misconfigured trigger or missing permissions.
- **Solution:**
    1. Verify the trigger configuration in the AWS Console.
    2. Update the Lambda execution role with required permissions.

411. Kubernetes Service Not Exposing Ports

- **RCA:**
  1. Service spec missing port definitions or selectors.
- **Solution:**
  1. Check the service spec with `kubectl describe service`.
  2. Add or correct port and selector configurations.

412. Prometheus Fails to Scrape New Targets

- **RCA:**
  1. Targets not reachable or incorrect scrape configuration.
- **Solution:**
  1. Test target connectivity with `curl`.
  2. Update the scrape configuration and reload Prometheus.

413. Jenkins Agent Disconnects Due to Network Fluctuations

- **RCA:**
  1. Unstable network connection between master and agent.
- **Solution:**
  1. Increase the agent connection retry limit.
  2. Test network stability with tools like `ping` or `traceroute`.

414. Kubernetes PersistentVolume Remains Bound After PVC Deletion

- **RCA:**
  1. Reclaim policy set to `Retain`.
- **Solution:**
  1. Manually delete the PersistentVolume if it is no longer needed.
  2. Update the reclaim policy to `Delete` for future PVCs.

415. AWS CloudFormation Stack Fails with "CREATE_FAILED"

- **RCA:**

1. Missing resource dependencies or invalid configurations.
- Solution:
    1. Check the stack events in the AWS Console for specific errors.
    2. Correct the template and redeploy the stack.

416. Kubernetes HPA Not Responding to Load

- RCA:
    1. Metrics server not running or HPA misconfigured.
- Solution:
    1. Verify the metrics server is deployed and functional.
    2. Check HPA logs and adjust scaling thresholds.

417. Docker Swarm Fails to Scale Service

- RCA:
    1. Insufficient resources on cluster nodes.
- Solution:
    1. Add more nodes to the swarm cluster.
    2. Adjust resource limits in the service definition.

418. AWS ECS Service Fails with "STOPPED" State

- RCA:
    1. Task definition errors or failed health checks.
- Solution:
    1. Check ECS service logs for task termination reasons.
    2. Correct the task definition and redeploy the service.

419. Terraform State File Not Found

- RCA:
    1. State file accidentally deleted or backend misconfigured.
- Solution:

1. Restore the state file from a backup.
2. Verify backend configuration and reinitialize Terraform.

420. Kubernetes Pods Cannot Reach Internal DNS

- **RCA:**
    1. CoreDNS pods not running or misconfigured.
- **Solution:**
    1. Restart CoreDNS pods with `kubectl rollout restart`.
    2. Verify DNS resolution within pods using `nslookup`.

421. Prometheus Query Returns Incorrect Results

- **RCA:**
    1. Misconfigured time range or incorrect query.
- **Solution:**
    1. Validate the query syntax and time range.
    2. Use simpler queries to isolate the issue.

422. Jenkins Pipeline Fails Due to Timeout

- **RCA:**
    1. Build or deployment stage taking too long to complete.
- **Solution:**
    1. Increase the timeout in the pipeline configuration.
    2. Optimize the pipeline tasks to reduce execution time.

423. Kubernetes Node Not Accepting Pods

- **RCA:**
    1. Node taints prevent scheduling or kubelet issues.
- **Solution:**
    1. Check taints with `kubectl describe node`.
    2. Add tolerations to the pod spec or adjust node taints.

424. AWS Lambda Logs Missing Specific Entries

- **RCA:**
    1. **Logging not enabled for certain parts of the function.**
- **Solution:**
    1. **Add logging statements in the Lambda function code.**
    2. **Verify logs in the corresponding CloudWatch log group.**

425. Terraform Apply Creates Duplicate Resources

- **RCA:**
    1. **Resource blocks missing unique identifiers.**
- **Solution:**
    1. **Add unique `name` or `id` attributes to resources.**
    2. **Test the plan with `terraform plan` to identify duplicates.**

426. Docker Container Cannot Connect to External Database

- **RCA:**
    1. **Network configuration issues or database access restrictions.**
- **Solution:**
    1. **Verify database connectivity with `telnet` or `ping`.**
    2. **Update the database's security group or firewall rules.**

427. Kubernetes Deployment Pods Failing Due to CrashLoopBackOff

- **RCA:**
    1. **Application errors or missing environment variables.**
- **Solution:**
    1. **Check pod logs with `kubectl logs <pod-name>`.**
    2. **Fix application issues or add required environment variables.**

428. AWS S3 Object Replication Failing

- **RCA:**
    1. Missing replication role permissions or bucket policy issues.
- **Solution:**
    1. Add required permissions to the replication role.
    2. Ensure the bucket policies allow replication actions.

429. Prometheus AlertManager Notifications Not Received

- **RCA:**
    1. Incorrect receiver configuration or network issues.
- **Solution:**
    1. Test receiver endpoints manually.
    2. Check AlertManager logs for delivery errors.

430. Jenkins Job Fails on Artifact Download

- **RCA:**
    1. Missing artifact in storage or incorrect download path.
- **Solution:**
    1. Verify the artifact exists in the storage location.
    2. Update the pipeline script with the correct artifact path.

431. Kubernetes Service Unable to Route Traffic to Pods

- **RCA:**
    1. Incorrect pod labels or service selectors.
- **Solution:**
    1. Verify that the pod labels match the service selectors using `kubectl describe service`.
    2. Update the service YAML to correct the selector configuration.

432. AWS EC2 Instance Fails to Start

- **RCA:**
    1. AMI ID is unavailable or the instance type is unsupported in the region.
- **Solution:**
    1. Verify the AMI ID and use a valid one for the region.
    2. Ensure the selected instance type is available in the target region.

433. Prometheus Scraping Slow Metrics

- **RCA:**
    1. Target application is overloaded or unoptimized.
- **Solution:**
    1. Reduce the scrape interval for the target.
    2. Optimize the target application to handle Prometheus scrape requests efficiently.

434. Docker Container Cannot Access Host Ports

- **RCA:**
    1. Incorrect port mappings or bridge network issues.
- **Solution:**
    1. Verify the `-p` flag mappings in the `docker run` command.
    2. Ensure the Docker bridge network is functioning correctly.

435. Kubernetes CronJob Misses Scheduled Runs

- **RCA:**
    1. CronJob controller issues or clock drift in the cluster nodes.
- **Solution:**
    1. Restart the CronJob controller if it's not functioning.
    2. Sync node clocks using NTP to avoid schedule mismatches.

436. Jenkins Master Slows Down with High Job Volume

- **RCA:**
    1. Jenkins master is overloaded with queued jobs.
- **Solution:**
    1. Distribute jobs across more Jenkins agents.
    2. Increase memory allocation for the Jenkins master process.

437. Terraform Fails with `dependency cycle detected`

- **RCA:**
    1. Circular dependencies in resource references.
- **Solution:**
    1. Break circular dependencies by creating intermediate resources.
    2. Use `depends_on` to explicitly define dependency order.

438. Kubernetes Pod Fails Due to Failed Liveness Probe

- **RCA:**
    1. Liveness probe endpoint is unavailable or misconfigured.
- **Solution:**
    1. Verify the liveness probe URL using `curl`.
    2. Adjust the liveness probe thresholds and timeout settings.

439. AWS ECS Service Fails to Register Tasks

- **RCA:**
    1. Insufficient permissions for the ECS execution role or target group issues.
- **Solution:**
    1. Ensure the ECS execution role has the necessary permissions.
    2. Verify the target group configuration for the load balancer.

440. Prometheus Retention Period Too Short

- **RCA:**

1. Default retention settings or insufficient disk space.
- **Solution:**
    1. Increase the retention period in Prometheus configuration.
    2. Add more disk space to accommodate the extended retention.

441. Kubernetes PersistentVolume Stuck in `Pending`

- **RCA:**
    1. No available PersistentVolumes match the PVC's requirements.
- **Solution:**
    1. Verify storage class and capacity requirements of the PVC.
    2. Create a matching PersistentVolume or enable dynamic provisioning.

442. Jenkins Agent Stops Responding

- **RCA:**
    1. Network issues or high resource usage on the agent.
- **Solution:**
    1. Restart the agent service and monitor resource usage.
    2. Test network connectivity between the master and the agent.

443. AWS Lambda Cold Start Issues Persist Despite Provisioned Concurrency

- **RCA:**
    1. Provisioned concurrency not enabled or insufficient.
- **Solution:**
    1. Verify that provisioned concurrency is enabled for the Lambda function.
    2. Increase the provisioned concurrency value to handle more requests.

444. Kubernetes Deployment Stuck in `Pending`

- **RCA:**
    1. No available nodes match the pod's resource or affinity requirements.

- **Solution:**
    1. Check node status and resource availability with `kubectl describe nodes`.
    2. Adjust pod resource requests or affinity rules.

445. Terraform Backend State Lock Not Released

- **RCA:**
    1. Previous operation terminated without releasing the lock.
- **Solution:**
    1. Manually unlock the state using `terraform force-unlock`.
    2. Ensure proper cleanup after every Terraform operation.

446. Prometheus Query Results Out of Sync

- **RCA:**
    1. Scrape intervals or delayed ingestion causing outdated metrics.
- **Solution:**
    1. Reduce the scrape interval for high-priority targets.
    2. Monitor the Prometheus ingestion process for delays.

447. Kubernetes NetworkPolicy Blocks Egress Traffic

- **RCA:**
    1. NetworkPolicy does not include rules for egress traffic.
- **Solution:**
    1. Update the NetworkPolicy to include required egress rules.
    2. Test connectivity to external services from the pod.

448. AWS S3 Bucket Access Denied for Specific Users

- **RCA:**
    1. IAM policy conditions restrict access for certain users.

- **Solution:**
    1. Check the IAM policy conditions for the affected users.
    2. Update the policy to allow access for the intended users.

449. Docker Image Build Fails Due to Missing Base Image

- **RCA:**
    1. Base image is no longer available in the registry.
- **Solution:**
    1. Update the Dockerfile with a valid base image tag.
    2. Use a local copy of the base image if available.

450. Kubernetes StatefulSet Pods Out of Order

- **RCA:**
    1. StatefulSet pods depend on each other and fail to start in sequence.
- **Solution:**
    1. Verify the readiness of dependent pods before scaling.
    2. Use `podManagementPolicy: OrderedReady` in the StatefulSet spec.

451. Jenkins Build Triggers Multiple Times

- **RCA:**
    1. Duplicate webhook configurations or SCM polling enabled.
- **Solution:**
    1. Remove duplicate webhooks in the source control system.
    2. Disable SCM polling if webhooks are used.

452. Kubernetes LoadBalancer Service Not Assigning External IP

- **RCA:**
    1. Cloud provider integration issues or service configuration error.
- **Solution:**

1. Check cloud provider logs for errors related to load balancer creation.
2. Verify the service spec and required annotations.

453. AWS Auto Scaling Not Scaling Down

- **RCA:**
    1. Scaling policies prioritize scaling up over scaling down.
- **Solution:**
    1. Adjust the scaling policies to balance up and down scaling.
    2. Monitor resource usage to identify unnecessary instances.

454. Terraform Destroy Leaves Orphaned Resources

- **RCA:**
    1. Dependencies or manual changes outside Terraform.
- **Solution:**
    1. Identify and clean up orphaned resources manually.
    2. Use `terraform import` to manage manually created resources.

455. Prometheus Target Unhealthy After Configuration Change

- **RCA:**
    1. Incorrect target URL or authentication failure.
- **Solution:**
    1. Verify the target endpoint using `curl`.
    2. Update the scrape configuration with correct credentials or endpoints.

456. Kubernetes Pod Logs Flooded with Errors

- **RCA:**
    1. Application misconfiguration or underlying service failures.
- **Solution:**
    1. Debug the application logs to identify the root cause.
    2. Fix the configuration or service causing the errors.

457. AWS ECS Task Fails Due to Disk Space Exhaustion

- **RCA:**
    1. Task uses a container with insufficient storage allocation.
- **Solution:**
    1. Increase the storage allocation in the ECS task definition.
    2. Optimize the container application to reduce disk usage.

458. Kubernetes Ingress SSL Termination Not Working

- **RCA:**
    1. TLS secret is missing or misconfigured in the ingress spec.
- **Solution:**
    1. Ensure the TLS secret is correctly created and referenced.
    2. Validate the ingress spec and check for errors in the controller logs.

459. Jenkins Job Fails Due to Dependency Conflicts

- **RCA:**
    1. Conflicting library versions in the build environment.
- **Solution:**
    1. Use isolated environments like Docker for builds.
    2. Resolve dependency conflicts in the project configuration.

460. Prometheus Fails to Send Alerts Due to Rate Limits

- **RCA:**
    1. Notification endpoint rate limits exceeded.
- **Solution:**
    1. Reduce the number of alerts sent to the endpoint.
    2. Implement aggregation to group similar alerts.

461. Kubernetes Pods Stuck in `Terminating` State

- **RCA:**
    1. Finalizers or active connections preventing pod termination.
- **Solution:**
    1. Remove finalizers using `kubectl edit pod <pod-name>`.
    2. Force delete pods with `kubectl delete pod <pod-name> --force --grace-period=0`.

462. AWS RDS Instance Becomes Unavailable After Update

- **RCA:**
    1. Maintenance window or incompatible parameter changes.
- **Solution:**
    1. Review the RDS maintenance settings and parameter group.
    2. Roll back the parameter group to the previous configuration.

463. Terraform Apply Fails with `unknown module` Error

- **RCA:**
    1. Incorrect module path or uninitialized Terraform workspace.
- **Solution:**
    1. Verify the module path in the configuration.
    2. Run `terraform init` to reinitialize the modules.

464. Kubernetes Deployment Pods Restarting Frequently

- **RCA:**
    1. Liveness probe misconfigured or application crashing.
- **Solution:**
    1. Debug the pod logs for application errors.
    2. Adjust liveness probe configuration or fix application issues.

465. AWS CloudFormation Stack Rollback Fails

- **RCA:**
    1. Rollback dependent resources are in an invalid state.
- **Solution:**
    1. Manually delete or update problematic resources.
    2. Retry the stack creation or update with corrected configurations.

466. Prometheus Scrape Timeout Errors

- **RCA:**
    1. Target endpoints taking too long to respond.
- **Solution:**
    1. Increase the scrape timeout in Prometheus configuration.
    2. Optimize the target endpoint performance.

467. Jenkins Job Fails Due to Missing Environment Variables

- **RCA:**
    1. Required variables are not set in the build environment.
- **Solution:**
    1. Add the required environment variables to the pipeline.
    2. Use the Jenkins credentials manager to securely inject sensitive variables.

468. Kubernetes Node `NotReady` Due to Disk Pressure

- **RCA:**
    1. Node's disk usage exceeds thresholds.
- **Solution:**
    1. Clean up unused Docker images and logs on the node.
    2. Add more storage to the node or adjust disk pressure thresholds.

469. AWS S3 Bucket Replication Configuration Invalid

- **RCA:**

1. Incorrect role permissions or bucket policies.
- Solution:
    1. Update the replication role with required permissions.
    2. Verify the bucket policy allows replication actions.

470. Docker Container Logs Not Rotating

- RCA:
    1. Logging driver not configured with rotation settings.
- Solution:
    1. Configure the Docker logging driver with rotation settings in `daemon.json`.
    2. Restart the Docker daemon to apply changes.

471. Kubernetes Service Not Binding to LoadBalancer

- RCA:
    1. Cloud provider integration or annotation issues.
- Solution:
    1. Verify cloud provider annotations in the service YAML.
    2. Check the cloud provider logs for errors related to load balancer creation.

472. AWS ECS Task Definition Fails Due to Invalid Parameters

- RCA:
    1. Task definition includes unsupported or invalid settings.
- Solution:
    1. Validate the task definition JSON using the AWS CLI.
    2. Correct invalid parameters and retry.

473. Prometheus Alert Manager Configuration Not Loaded

- RCA:
    1. Configuration file has syntax errors or missing receivers.

- **Solution:**
    1. Validate the configuration file using `amtool check-config`.
    2. Fix syntax errors and restart AlertManager.

474. Jenkins Pipeline Stage Hangs on Input

- **RCA:**
    1. Manual input step requires approval in the Jenkins UI.
- **Solution:**
    1. Approve the input step in the Jenkins interface.
    2. Automate the input step with a default value in the pipeline script.

475. Kubernetes PVC Not Binding to PersistentVolume

- **RCA:**
    1. PVC and PV have mismatched storage classes or capacities.
- **Solution:**
    1. Ensure the storage class and capacity in the PVC match an available PV.
    2. Enable dynamic provisioning for the storage class.

476. AWS Lambda Function Fails with Resource Exhaustion

- **RCA:**
    1. Function exceeds memory or execution duration limits.
- **Solution:**
    1. Increase memory allocation or timeout duration in the Lambda configuration.
    2. Optimize the function code for better resource utilization.

477. Kubernetes Pods Not Receiving ConfigMap Changes

- **RCA:**
    1. ConfigMap updates do not automatically propagate to running pods.
- **Solution:**

1. Use `kubectl rollout restart` to restart the pods.
2. Implement a checksum annotation to trigger pod updates.

478. Terraform Apply Recreates Resources Unexpectedly

- **RCA:**
    1. Changes in sensitive or immutable attributes of the resource.
- **Solution:**
    1. Use the `lifecycle.prevent_destroy` option to protect resources.
    2. Review changes in `terraform plan` to identify issues.

479. Docker Compose Containers Fail with Network Not Found

- **RCA:**
    1. The required custom network is missing.
- **Solution:**
    1. Ensure the custom network is defined in `docker-compose.yml`.
    2. Recreate the environment with `docker-compose down && docker-compose up`.

480. Prometheus Fails to Reload Configuration

- **RCA:**
    1. Invalid syntax in the configuration file.
- **Solution:**
    1. Validate the configuration with `promtool check config`.
    2. Fix errors and reload Prometheus using the `/-/reload` endpoint.

481. AWS ECS Tasks Not Registering with Target Group

- **RCA:**
    1. Health check failures or incorrect target group settings.
- **Solution:**

1. Verify health check configuration in the target group.
2. Ensure ECS tasks are deployed in the correct subnets.

482. Kubernetes Node `NotReady` Due to Memory Pressure

- **RCA:**
  1. Node runs out of memory due to excessive pod usage.
- **Solution:**
  1. Monitor and optimize pod resource requests and limits.
  2. Scale the cluster by adding more nodes or increasing node memory.

483. Jenkins Pipeline Fails on SCM Checkout

- **RCA:**
  1. Incorrect repository URL or missing credentials.
- **Solution:**
  1. Verify the repository URL and update it in Jenkins.
  2. Ensure correct credentials are added to the Jenkins credentials store.

484. Kubernetes HPA Not Scaling Beyond Minimum Replicas

- **RCA:**
  1. Metrics server not providing accurate metrics or scaling limits misconfigured.
- **Solution:**
  1. Debug metrics server output and ensure it provides accurate metrics.
  2. Update the HPA spec to adjust maximum replica limits.

485. AWS S3 Lifecycle Rules Not Deleting Old Objects

- **RCA:**
  1. Incorrect prefix or expiration settings in the lifecycle rule.
- **Solution:**
  1. Review and correct the lifecycle rule configuration.
  2. Test the rule with small objects to verify functionality.

486. Prometheus Query Timeout on Large Dataset

- **RCA:**
    1. Query complexity or insufficient resources for Prometheus.
- **Solution:**
    1. Use recording rules to pre-aggregate data for frequent queries.
    2. Increase resources allocated to Prometheus.

487. Docker Build Fails Due to File Permissions

- **RCA:**
    1. Files in the build context have restrictive permissions.
- **Solution:**
    1. Adjust file permissions using `chmod` before building.
    2. Use a `.dockerignore` file to exclude unnecessary files.

488. Kubernetes Pods Stuck in `ContainerCreating` State

- **RCA:**
    1. Node resource constraints or image pull errors.
- **Solution:**
    1. Check node resources and add nodes if required.
    2. Verify the image pull secret or image availability.

489. AWS Auto Scaling Group Launches Incorrect Instance Type

- **RCA:**
    1. Outdated launch configuration or template.
- **Solution:**
    1. Update the launch configuration or template with the desired instance type.
    2. Attach the updated template to the Auto Scaling group.

490. Prometheus Remote Write Fails with Authentication Errors

- **RCA:**
    1. Incorrect credentials or token expired.
- **Solution:**
    1. Update the remote write configuration with valid credentials.
    2. Test the connection to the remote storage endpoint.

491. Kubernetes Deployment Not Recovering After Failed Rollout

- **RCA:**
    1. Rollout history truncated or misconfigured rollback policy.
- **Solution:**
    1. Increase `revisionHistoryLimit` in the deployment spec.
    2. Use `kubectl rollout undo` to revert to the last successful deployment.

492. Jenkins Build Hangs Due to Script Timeout

- **RCA:**
    1. Long-running script without timeout limits.
- **Solution:**
    1. Add a timeout to the affected stage in the pipeline.
    2. Optimize the script for faster execution.

493. AWS ECS Service Not Scaling Down

- **RCA:**
    1. Scaling policies do not allow sufficient downscaling.
- **Solution:**
    1. Update scaling policies to include more aggressive downscaling thresholds.
    2. Monitor service metrics to ensure proper scaling behavior.

494. Kubernetes Service DNS Not Resolving

- **RCA:**
    1. CoreDNS misconfigured or not running.
- **Solution:**
    1. Restart CoreDNS pods with `kubectl rollout restart`.
    2. Verify CoreDNS configuration and logs for errors.

495. Docker Swarm Service Not Starting

- **RCA:**
    1. Insufficient resources on swarm nodes or misconfigured service spec.
- **Solution:**
    1. Scale the swarm cluster by adding nodes.
    2. Verify the service spec for correct resource definitions.

496. AWS Lambda Fails Due to Unsupported Runtime

- **RCA:**
    1. Lambda function configured with an outdated or unsupported runtime.
- **Solution:**
    1. Update the runtime version in the Lambda function configuration.
    2. Test the function with the new runtime before deployment.

497. Prometheus Target Dropped Due to Relabeling

- **RCA:**
    1. Relabeling rules exclude the target unintentionally.
- **Solution:**
    1. Review and update the relabeling rules in Prometheus configuration.
    2. Test the target's inclusion using dry-run configurations.

498. Kubernetes Deployment Not Scaling Beyond Maximum Replicas

- **RCA:**

1. HPA maximum replicas limit set too low.

- **Solution:**
    1. Increase the `maxReplicas` value in the HPA spec.
    2. Ensure cluster nodes have sufficient capacity for scaling.

499. Jenkins Pipeline Fails Due to Missing Node Labels

- **RCA:**
    1. Node labels referenced in the pipeline do not exist.
- **Solution:**
    1. Add the required labels to the Jenkins nodes.
    2. Update the pipeline script to use valid node labels.

500. AWS ECS Task Placement Constraints Not Met

- **RCA:**
    1. Task placement constraints are too restrictive.
- **Solution:**
    1. Review and adjust task placement constraints in the service spec.
    2. Ensure enough resources in the cluster meet the placement requirements.