

# DevOps Shack

## The Ultimate DevOps Survival

### Guide

#### 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.

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#### 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.

```
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.

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## 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:

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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:

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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.

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## 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.

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## 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.

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#### 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.

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## 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.

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## 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.

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## 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).

---

2. Test connectivity using `telnet` or

## 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.

---

**176. Kubernetes Service DNS Not**

- **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****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.



---

## 2. Test SSH connectivity manually and debug permission issues.

---

### 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:**



- 
- 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.

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#### 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:

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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.

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#### 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:**

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- 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.