

Common Production Issues in DevOps – Causes & Fixes

1. CrashLoopBackOff Pods

- **Why it happens:** Wrong env variables, missing dependencies, app crash on startup.
 - **How to fix:** Check pod logs, correct env/configs, ensure dependencies are present, fix code crash.
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2. ImagePullBackOff

- **Why it happens:** Invalid Docker image name/tag, missing image in registry, or private registry auth failure.
 - **How to fix:** Verify image tag, check registry credentials, update secret for private repo.
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3. OOMKilled

- **Why it happens:** Container exceeds memory limit defined in resource requests/limits.
 - **How to fix:** Optimize app memory usage, increase memory limits, or fix memory leaks.
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4. CPU Throttling

- **Why it happens:** CPU limits too low, noisy neighbors on shared nodes.
 - **How to fix:** Adjust CPU limits, use dedicated node pools, monitor usage with metrics.
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5. Insufficient IP Addresses

- **Why it happens:** Pod CIDR exhausted in CNI or VPC subnet full.
 - **How to fix:** Expand VPC subnet/CNI range, use larger CIDR blocks, or add more nodes with IPs.
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6. DNS Resolution Failures

- **Why it happens:** CoreDNS crash, network policy blocking DNS, or misconfigured cluster DNS.
 - **How to fix:** Restart CoreDNS, check network policies, verify `/etc/resolv.conf`.
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7. Database Latency / Connection Leaks

- **Why it happens:** Too many open connections, slow queries, lack of connection pooling.
 - **How to fix:** Optimize queries, enable pooling, increase DB instance size, tune max connections.
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8. SSL/TLS Certificate Expiry

- **Why it happens:** Certificates not renewed on time.
 - **How to fix:** Automate renewals (Cert-Manager, ACM, Let's Encrypt), monitor expiry dates.
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9. PersistentVolume Pending

- **Why it happens:** Storage class not found, no matching nodes, or quota exhausted.
 - **How to fix:** Verify storage class, check PV availability, ensure nodes support requested volume type.
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10. Node Disk Pressure

- **Why it happens:** Node runs out of disk due to logs, temp files, or large images.
 - **How to fix:** Clean unused Docker images/logs, add more disk, or move workloads.
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11. Node NotReady / Node Evictions

- **Why it happens:** Node crash, taints not handled, resource starvation.
 - **How to fix:** Replace or restart nodes, configure tolerations, enable auto-healing.
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12. Configuration Drift

- **Why it happens:** Manual changes in production not tracked in Git/IaC.
 - **How to fix:** Use GitOps (ArgoCD/Flux), enforce IaC pipelines, avoid manual changes.
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13. Secrets Mismanagement

- **Why it happens:** Expired tokens, secrets not rotated, hardcoded secrets in code.
 - **How to fix:** Use Vault/Secrets Manager, rotate regularly, avoid storing in plain text.
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14. CI/CD Pipeline Failures

- **Why it happens:** Bad build artifacts, missing rollback, wrong pipeline logic.
 - **How to fix:** Add rollback strategy, test pipeline in staging, use artifact versioning.
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15. High Latency in Services

- **Why it happens:** Overloaded services, poor load balancing, inefficient code.
 - **How to fix:** Scale horizontally, optimize code/DB queries, use caching/CDN.
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16. Network Partition / Split-Brain

- **Why it happens:** Nodes lose connectivity (firewall, routing, AZ failure).
 - **How to fix:** Fix network routing, use quorum-based cluster configs, multi-zone setup.
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17. Service Discovery Failures

- **Why it happens:** Misconfigured Ingress/Service/DNS.
 - **How to fix:** Check service endpoints, verify DNS records, review ingress rules.
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18. Canary / Blue-Green Deployment Failures

- **Why it happens:** Traffic shifting misconfigured, new version unstable.
 - **How to fix:** Validate version in staging, monitor canary rollout, rollback on failure.
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19. Health Probe Misconfiguration

- **Why it happens:** Wrong liveness/readiness endpoints.
 - **How to fix:** Set correct healthcheck URLs, adjust timeouts, test before deploying.
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20. Pod Pending State

- **Why it happens:** Not enough resources (CPU/RAM), affinity/taint mismatch.
 - **How to fix:** Increase cluster capacity, fix taints/tolerations, relax scheduling rules.
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21. Log Flooding / Noisy Logs

- **Why it happens:** Excessive debug logs or recursive logging.

- **How to fix:** Reduce log level, rotate logs, use centralized logging with rate limits.
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22. Alert Fatigue

- **Why it happens:** Too many false/duplicate alerts.
 - **How to fix:** Tune thresholds, add deduplication, categorize alerts by severity.
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23. Node Autoscaling Failures

- **Why it happens:** Hitting cloud quota, wrong autoscaler config.
 - **How to fix:** Increase quotas, validate autoscaler policies, enable multiple instance types.
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24. Security Incidents

- **Why it happens:** Exposed IAM roles, open ports, unpatched images.
 - **How to fix:** Follow least privilege IAM, patch regularly, scan images, enforce network policies.
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25. Rate Limiting from External APIs

- **Why it happens:** Too many requests to third-party API.
 - **How to fix:** Implement retry/backoff, caching, request throttling.
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26. Time Sync Issues (NTP Drift)

- **Why it happens:** Nodes not synced with NTP → token/auth failures.
 - **How to fix:** Enable NTP/chrony, sync clocks across cluster.
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27. Application Memory Leaks

- **Why it happens:** App doesn't release memory, leading to OOMKilled.
 - **How to fix:** Profile memory, fix leaks, set pod limits, restart policy.
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28. Indexing Issues (ELK/Databases)

- **Why it happens:** Missing indexes, unoptimized queries.
 - **How to fix:** Add indexes, optimize queries, archive old data.
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29. Cloud Provider Quota Limits

- **Why it happens:** Running out of IPs, EBS volumes, or API limits.
 - **How to fix:** Request quota increase, monitor usage, optimize resources.
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30. Zombie Processes in Containers

- **Why it happens:** Orphaned processes not cleaned up.
- **How to fix:** Use proper init process (tini), monitor processes, fix app termination logic.