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— AHMEDABAD —



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The Art of Continuous Operation: Zero Downtime EKS Upgrades in Production

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Agenda

- ✓ Understanding Versioning
- ✓ Importance of EKS Upgrades
- ✓ Types of EKS Workers
- ✓ Ways to Upgrade an EKS Cluster
- ✓ Upgrade Recommendations
- ✓ In-Place Upgrade
- ✓ Node Groups Update Behavior
- ✓ Pros & Cons of In-Place Upgrade
- ✓ Blue-Green Upgrade
- ✓ Pros & Cons of Blue-Green Upgrade

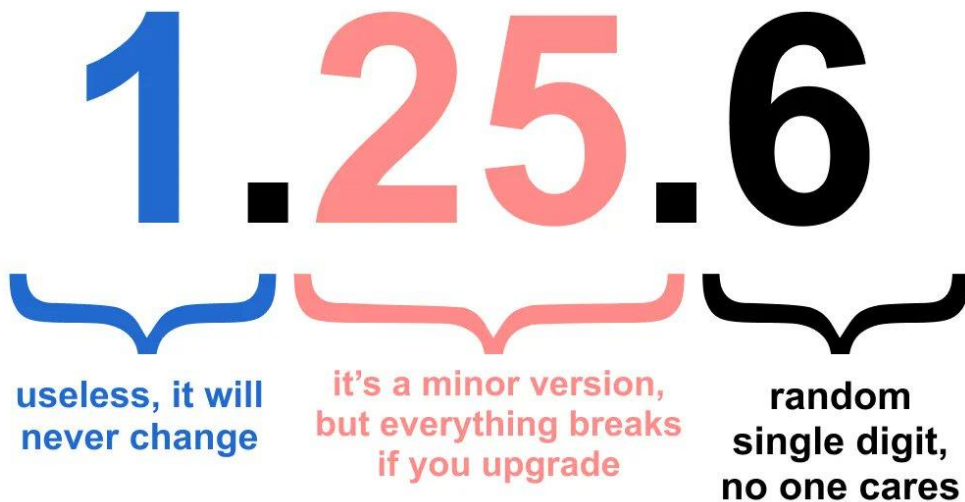
Understanding Versioning



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Semantic Versioning

KUBERNETES “SEMANTIC” VERSIONING EXPLAINED

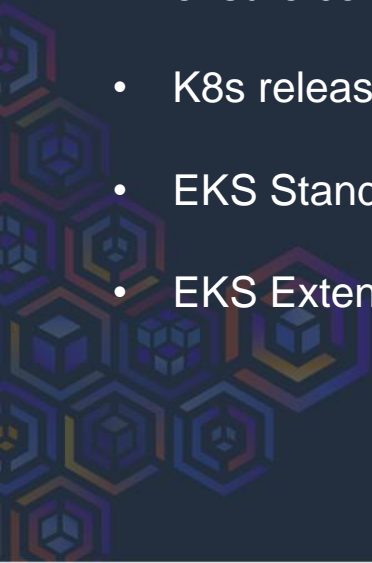




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Why is EKS Upgrade Important?

- Take Advantage of latest features, security patches, improvements and ensure compatibility with the ecosystem
- K8s releases new version approximately 3 times per year
- EKS Standard Support - Last 4 K8s versions for 14 months
- EKS Extended Support – 12 months at additional cost





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Why is EKS Upgrade Important?

- At least 1 or 2 upgrade cycles annually – One/Multiple versions at a time

Kubernetes version	Upstream release	Amazon EKS release	End of standard support	End of extended support
1.28	August 15, 2023	September 26, 2023	November 2024	November 2025
1.27	April 11, 2023	May 24, 2023	July 2024	July 2025
1.26	December 9, 2022	April 11, 2023	June 2024	June 2025
1.25	August 23, 2022	February 22, 2023	May 2024	May 2025
1.24	May 3, 2022	November 15, 2022	January 31, 2024	January 31, 2025



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Types Of Workers

- Self Managed Node Groups – Bring-Your-Own-Server, More control but more overhead
- AWS Managed Node Groups – AWS manages the servers for you
- Fargate – Serverless, Each Pod is represented by a node

SAVE YOURSELF SOME TROUBLE



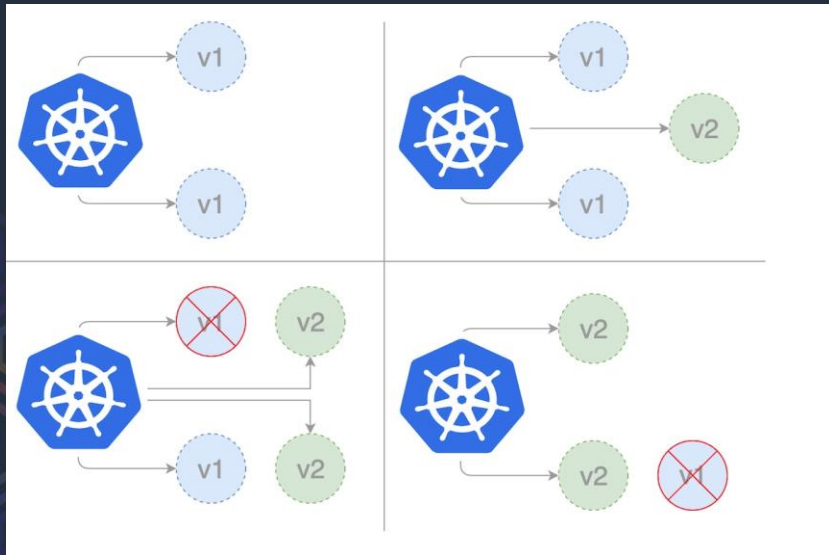
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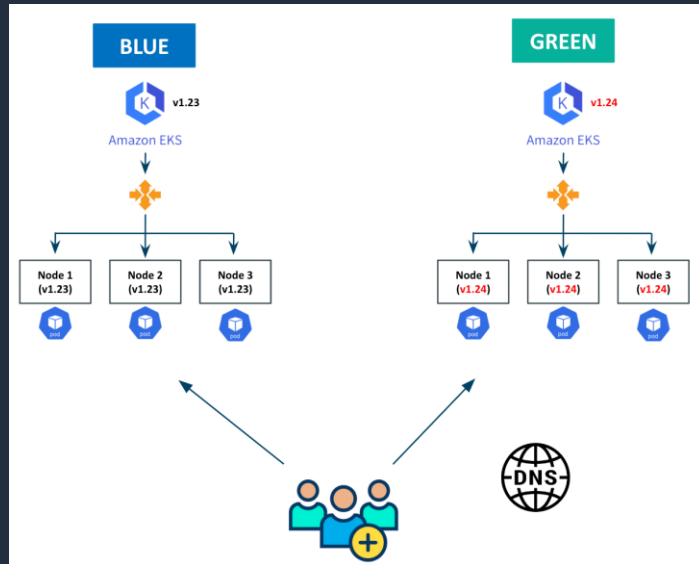
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Ways to Upgrade an EKS Cluster

In-Place



Blue-Green





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EKS Upgrade Recommendations

- Always read the release notes for the new version
- Always test the upgrade process in lower environments first
- Check the functionality extensively in lower environment with upgraded version
- Check Add-ons compatibility
- The more AWS EKS managed features you use, the more you simplify the upgrade process



Let's Upgrade





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In-Place / Rolling EKS Upgrade

- Upgrading Control Plane
- Upgrading Worker Nodes
- Upgrading Add-Ons like CNI, Autoscaler, CoreDNS etc.

Important

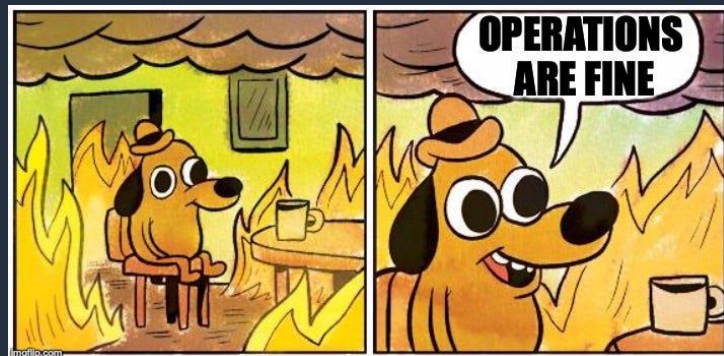
Once you upgrade a cluster, you can't downgrade to a previous version. We recommend that, before you update to a new Kubernetes version, you review the information in [Amazon EKS Kubernetes versions](#) and also review in the update steps in this topic.



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AWS Managed Node Groups Update Behavior

- Can be updated for AMI patching, changing LT configuration, updating labels, tags, taints or Cluster Upgrade
- Update Strategy
 - Rolling – Respects PDB
 - Force – Doesn't respect PDB
- Update Configuration
 - Number – No. of nodes to be updated in parallel
 - Percentage – Percentage of Pods to be updated in parallel





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Rolling Update in Action

Rolling upgrade



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In Place Upgrade

Pros

- Cost effective
- Easier & faster process

Cons

- Difficult to rollback
- Longer rollout time
- Both versions co-exist
- Updates 1 version at a time





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Operator Discretion is Advised

KUBERNETES UPGRADE COMPLETE



PODS ARE NOT COMING UP



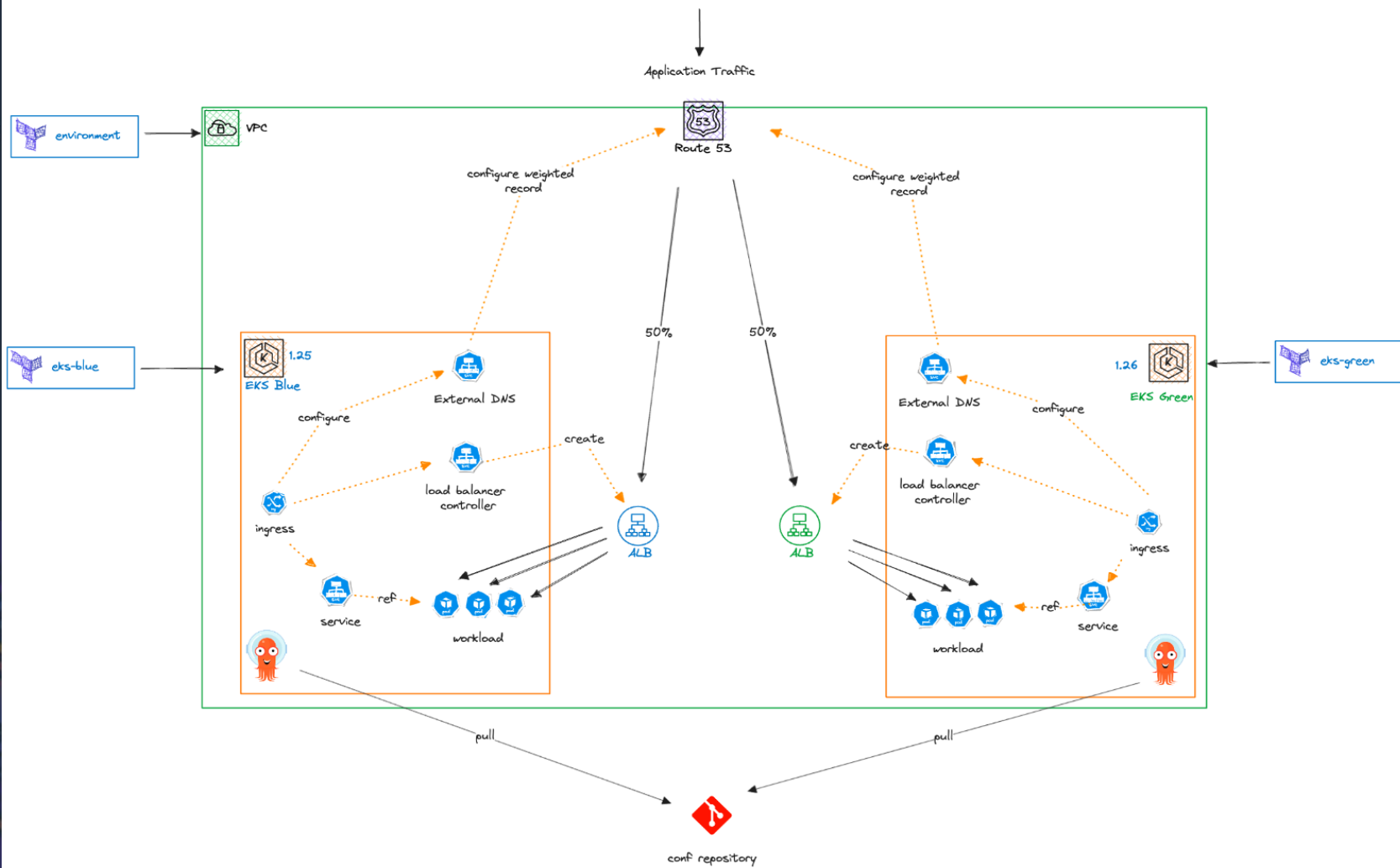
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Blue-Green / Canary Upgrade

- Create another cluster with new version (IAC)
- Replicate application deployment in the new cluster (GitOps)
- Use Route53 to switch traffic in a phased-manner

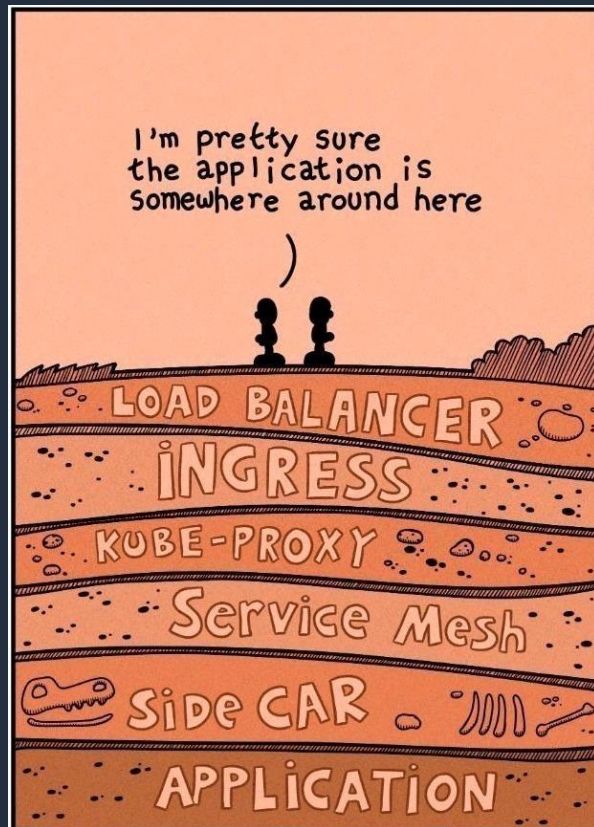
Blue/Green Upgrade







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Blue-Green Upgrade

Pros

- Instant traffic switch
- Easy Rollback
- Isolation of versions
- Upgrade multiple versions at a time
- Include other major configuration changes

Cons

- Higher Cost
- Configuration Sync
- DB Management





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Thank You

