

Below is a **hands-on DevOps roadmap** using **AWS (EC2, EKS, ECR, S3, EBS, IAM, VPC)** plus **Docker, Kubernetes, Terraform, Ansible, Jenkins, GitHub Actions, Prometheus & Grafana**, showing **how** and **when** to add or scale each service as your user base grows (1 → 10 → 100 → 1 000 → 10 000 users). You'll learn the **who, what, why, and how**, plus **approximate monthly costs** so you can speak confidently in interviews.

1. Service Roles & Unit Costs

Service	Role	Cost Component
IAM / VPC	Access control & network isolation	No charge (Amazon EC2 T3 Instances - Amazon Web Services (AWS) .)
EC2 (t3.small)	Kubernetes worker nodes	\$0.0208/hr → \$14.98/mo (EC2 On-Demand Instance Pricing - Amazon Web Services)
EKS Control Plane	Managed K8s control plane	\$0.10/hr → \$72/mo for standard support ([Amazon EKS Pricing
ECR	Docker image registry	\$0.10/GB-month storage (Amazon Elastic Container Registry Pricing - Amazon Web Services)
S3	Object storage (backups, assets)	Pay-as-you-go, no minimum; 12-month free tier (5 GB) (Amazon S3 Pricing - Cloud Object Storage - AWS , Amazon S3 - Cloud Object Storage - AWS)
EBS (gp3)	Block storage for pods/data volumes	\$0.125/GB-month (High-Performance Block Storage- Amazon EBS Pricing - AWS , Amazon EBS Volume Types - Amazon Web Services)
Docker	Containerization	OSS, free
Kubernetes	Orchestration	OSS, free (you pay infra above)
Terraform	Infrastructure as Code	OSS free; Terraform Cloud free tier
Ansible	Configuration management	OSS free
Jenkins	CI server (optional)	OSS free
GitHub Actions	CI/CD pipelines	Free 2 000 min/mo public; \$0.008/min beyond (About billing for GitHub Actions , Usage limits, billing, and administration - GitHub Actions)
Prometheus & Grafana	Monitoring & dashboards	OSS free; runs on EC2/EKS nodes

2. Scale-Up Cost Estimates

Users	EKS	EC2 Nodes	ECR	S3 (5	EBS	GitHub	Total/mo
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	CP (\$72)	(t3.small)	(1 GB)	GB→beyond)	(20 GB→)	Actions (1 000 min→)	
1	\$72	1 × \$14.98	\$0.10	Free (5 GB)	\$2.50	\$8.00	\$97.58
10	\$72	1 × \$14.98	\$0.10	\$0.50 (50 GB)	\$5.00	\$8.00	\$100.58
100	\$72	2 × \$29.96	\$0.50	\$2.00 (200 GB)	\$10.00	\$16.00	\$129.46
1 000	\$72	4 × \$59.92	\$1.00	\$5.00 (500 GB)	\$25.00	\$32.00	\$194.92
10 000	\$72	8 × \$119.94	\$2.00	\$10.00 (1 TB)	\$50.00	\$64.00	\$427.76

- **EC2 cost** from t3.small: \$0.0208/hr ≈ \$14.98/mo ([EC2 On-Demand Instance Pricing - Amazon Web Services](#)).
- **EKS control plane**: \$0.10/hr standard support ([Amazon EKS Pricing | Managed Kubernetes Service - AWS](#), [Managed Kubernetes Service - Amazon EKS FAQs](#)).
- **ECR**: \$0.10/GB-mo ([Amazon Elastic Container Registry Pricing - Amazon Web Services](#)).
- **S3**: pay-as-you-go; free first 5 GB for 12 months ([Amazon S3 Pricing - Cloud Object Storage - AWS](#), [Amazon S3 - Cloud Object Storage - AWS](#)).
- **EBS gp3**: \$0.125/GB-mo ([High-Performance Block Storage- Amazon EBS Pricing - AWS](#), [Amazon EBS Volume Types - Amazon Web Services](#)).
- **GitHub Actions**: \$0.008/min Linux, assume 1 000 min use → \$8 ([About billing for GitHub Actions](#), [Usage limits, billing, and administration - GitHub Actions](#)).

3. Timeline & Actions

Phase	Users	Actions	Who
Initial (P1)	1	- Terraform: provision VPC, IAM roles - ECR: push initial image - EKS: create cluster + 1 node	DevOps / Developer
Scale-up (P2)	10	- Ansible: patch nodes - Terraform: upgrade worker → t3.small	DevOps
Scale-up (P3)	100	- Terraform: add second nodegroup (2×t3.medium) - Enable Cluster Autoscaler	DevOps
Scale-up (P4)	1 000	- Terraform: add 4×t3.large nodes - Implement Kubernetes HPA for app pods	DevOps
Scale-up (P5)	10 000	- Terraform: add 8×t3.xlarge - Integrate Spot Instances & node taints/affinities	DevOps
CI/CD	All	- Jenkins or GitHub Actions pipelines	Developer/DevOps

		for build/test/deploy - Store infra code in GitHub & Terraform	
Monitoring	All	- Deploy Prometheus & Grafana on EKS via Helm - Configure alerts for CPU, memory, errors	DevOps
Backup & DR	All	- S3: daily backups of DB dumps - EBS Snapshots & archival in Glacier	DevOps

4. Hands-On Skills Gained

- **Infrastructure as Code:** Terraform modules for VPC, EKS, nodegroups.
- **Configuration Management:** Ansible playbooks for patching and security.
- **CI/CD:** Jenkins or GitHub Actions workflows, Docker builds, ECR pushes.
- **Container Orchestration:** Kubernetes on EKS, Cluster Autoscaler, HPA.
- **Monitoring & Alerting:** Prometheus metrics, Grafana dashboards.
- **AWS Services:** IAM policies, VPC networking, EBS volumes, S3 lifecycle, ECR registry.

5. Cost Optimization Tips

- **Savings Plans / Reserved Instances:** Up to 72% savings on EC2/EKS ([EC2 Reserved Instance Pricing – Amazon Web Services](#)).
- **Spot Instances:** Use for non-critical workloads to save ~90% on compute.
- **Auto-Scaling:** Combine Cluster and Pod autoscaling to only pay for needed capacity.
- **ECR Lifecycle Policies:** Clean stale images to reduce storage bills.
- **S3 Lifecycle:** Transition infrequently accessed data to Infrequent Access/Glacier tiers.

With this **detailed plan**, you'll not only deploy and scale your copy trading app but also gain practical experience with the full AWS + DevOps toolchain, complete with real-world cost insights—perfect preparation for any interview.