



Devops

Linux / Bash scripting

Easy	Medium	Hard
Basic bash commands		
aliases, .bashrc/.zshrc ,		
interactive vs non interactive shells	Process Management	
	Cron jobs	
	File transfer - ftp, scp	
	File permissions	
Creating your own bash script - variables, loops, conditionals, functions		
	args in bash scripts	
	stderr, stdout, File descriptors, piping	
	grep	
	Creating a CLI in Node.js	

Projects

1. Create a script that `ssh's` into a VM and pull the latest code and restarts it
2. Do the same using `ssh2`

VMs/EC2/GCP VMs

easy	medium	hard
What are VMs?		
Creating a VM in various cloud providers. Specs, pricing ...		
GUI vs clis for creating VMs	Keypairs and ssh'ing into VMs	
	Deploying a <code>non containerized</code> app to a VM	
Process management		
Reverse proxies		
	Certificate management	
	Load balancers	

ASGs/MIG

Easy	Medium	Hard
What is autoscaling, why do you need it?		
	Images, Target groups, ASGs, LBs, Autoscaling policies	
	MIG Internals	

Containerization

What is a container		
	What is docker	
		Docker vs other container runtimes
	How to dockerize your app, WORKDIR, CMD, RUN, ENV, COPY, ARG	
		Volumes and networks
Publishing to dockerhub, other registries		
	Running a docker container in a VM, exposing it over the internet	
		Multi stage builds
	docker-compose	

ECS (Warming up for k8s)

easy	medium	hard
What is ECS, common use cases		
	ECR vs Dockerhub	
	Setting up Task definitions	
	Serverless vs EC2 instances for deploying , pros and cons of either	
	Autoscaling policies	

Kubernetes

Easy	Medium	Hard
Introduction to Kubernetes, clusters, nodes, pods, worker node vs control plane		
		Kubernetes architecture
	Local deployment using kind/minikube	
	Replicasets, Deployments	
	Networking Concepts - Services, Types of services	

		Ingress, Ingress controllers
	Certificate management	
	Storage, PVs, PVCs, StorageClasses, Static vs dynamic provisioning	
		StatefulSets, DaemonSets, Jobs and CronJobs
	Conifgmaps and secrets	
	Kubernetes Policies, Role-Based Access Control, CRDs	
		HPAs, VPA, Cluster autoscaler
	EKS, eksctl, eks best practises	
	Extra - k9s, kubctx	

Iac, Terraform

Easy	Medium	Hard
What is iac		
	iac using bash scripts, aws cli/eksctl	
	Various iac tools, ansible vs terraform.	
	Installing tf, What is a resource, HCL syntax, Providers	
	Running Terraform Commands (init, plan, apply, destroy)	
		Managing state, variables, counts
		Terraform with AWS
		Remote state on S3

Monitoring

Easy	Medium	Hard
Introduction to monitoring, why do you need to monitor your systems		
	Datadog vs newrelic vs sentry. Logging vs process observability vs Infrastructure observability. p95, p99.	
	Self hosted monitoring using prometheus. metrics, counters, gauges, histograms, promQL, Graphs in Prom	
	Pulling vs pushing metrics, Push gateway	
	Grafanna for charting, observability.	
	Prometheus and grafanna service discovery in a kubernetes cluster	

Package managers (helm)

easy	medium	hard
	Why package managers, what is helm?	
	Installing helm cli, values and templates	
	Helm charts, Dependency management	
	Helm hubs, repos, custom values,	
		Release management in Helm 2.0 and 3.0
		Templates, Go templating logic,
		functions, pipelines, with blocks, creating and uploading charts
	Exploring other package mangers (glasskube)	

CI/CD in github

Easy	medium	Hard
What is CI/CD?		
Github CI CD yaml format, Github actions		
Using CI/CD to deploy to a VM		
	Using CI/CD to provision infrastructure using lac	
	Using CI/CD to deploy to a kubernetes cluster	

Gitops

Easy	Medium	Hard
What is GitOps? Why gitops		
	Creating aws resources using gitops	
	Creating/Updati ng k8s clusters	
	GitOps using ArgoCD	
		Gitops in a multi cluster environment using ArgoCD

CDNs and Object stores

Easy	Medium	Hard
What are object stores, Why object stores?		
Intro to CDNs		
	S3, R2 for assets	
	Cloudfront as a CDN	
	Attaching a custom domain to your CDN, certificate management	

Project

1. Building a serverless provider (aws lambda) / repl.it
 - a. http layer, cli layer, auth
2. Building a distributed video transcoder / image resizer
3. Building a alerts manager (better stack) and status page provider