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گام اول: Linux for DevOps

Partitioning , File system, LVM

Introduction to Disk Partitioning

- Overview of disk partitioning
- Importance of partitioning in system setup

Master Boot Record (MBR)

- Explanation of MBR structure and layout
- Limitations of MBR partitioning
- MBR partition types (primary, extended, logical)

GUID Partition Table (GPT)

- Introduction to GPT and its advantages over MBR
- Understanding GPT structure and layout
- GPT partition types (primary, secondary, logical)

Differences Between MBR and GPT

- Comparing MBR and GPT partitioning schemes
- Limitations and benefits of each partitioning scheme
- Choosing between MBR and GPT for different use cases

Partitioning Tools and Utilities

- Overview of partitioning tools (fdisk, parted, gdisk)
- Using command-line utilities for disk partitioning
- GUI-based partitioning tools (GParted, KDE Partition Manager)

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Partitioning , File system, LVM

Disk Partitioning in Linux Installation

- Disk partitioning during Linux installation
- Guided vs. manual partitioning options
- Best practices for partitioning Linux systems

Logical Volume Manager (LVM)

- Introduction to LVM and its advantages
- Logical Volume Management concepts (Physical Volumes, Volume Groups, Logical Volumes)
- Benefits of LVM over traditional partitioning schemes

Creating and Managing LVM Volumes

- Setting up Physical Volumes (PVs)
- Creating Volume Groups (VGs) and adding PVs to VGs
- Creating Logical Volumes (LVs) from VGs

System Performance and Monitoring

CPU Usage Monitoring

- top – Real-time CPU and process monitoring
- htop – Interactive and user-friendly process viewer
- mpstat – Detailed CPU utilization statistics
- iostat – CPU and disk performance analysis

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System Performance and Monitoring

Memory Usage Monitoring

- free -m – Check RAM usage
- vmstat – Memory, CPU, and disk statistics
- /proc/meminfo – Detailed memory usage

Disk I/O Performance

- iostat – Monitor disk read/write speed
- iotop – Show real-time disk I/O usage by processes
- df -h – Check disk space usage
- du -sh /path – Find largest files/directories

Network Performance

- netstat -tulnp – View open ports and active connections
- ss -tulnp – Modern alternative to netstat
- iftop – Real-time network traffic monitoring
- nload – Simple bandwidth usage tool

Shell Scripting (Bash)

- Writing and executing shell scripts (.sh files)
- Conditional statements (if-else, case)
- Loops (for, while, until)
- Functions and exit codes
- Using cron and systemd for automation

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Process and Job Management

- Foreground & backgro processes (fg, bg, jobs, nohup, &, disown)
- Process monitoring (ps aux, pgrep, pkill)
- Resource limits (ulimit, nice, cgroups)

Systemd system and service manage

Introduction to systemd

- Overview of systemd and its role in modern Linux distributions
- Advantages of systemd over traditional init systems

Basics of systemd Services

- Understanding systemd service units
- Types of systemd services (simple, forking, oneshot, etc.)
- Anatomy of a systemd service unit file
- Creating and Managing systemd Services
- Creating a basic systemd service unit
- Starting, stopping, restarting, and reloading services
- Enabling and disabling services to start at boot

Service Dependencies and Ordering

- Defining service dependencies with Requires, Wants, Before, After, etc.
- Controlling service startup order
- Handling service dependencies dynamically with
- systemd.target units

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Systemd system and service manage

Logging and Monitoring systemd Services

- Viewing service logs with journalctl
- Monitoring service status and health
- Setting up service-specific logging options

Environment Variables and Configuration for Services

- Passing environment variables to systemd services
- Using environment files for service configuration
- Managing service-specific configuration options

Resource Control and Limiting

- Configuring resource limits for systemd services (CPU, memory, etc.)
- Setting service execution priorities
- Controlling resource usage with systemd resource control directives

Managing Multi-Instance Services

- Introduction to multi-instance services
- Creating and configuring multiple instances of a service
- Managing and monitoring multiple service instances

Template Units for Multi-Instance Services

- Creating template unit files for multi-instance services
- Dynamic instance naming and instantiation
- Modifying and customizing template units for specific instances

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Systemd system and service manage

Writing systemd Service Unit for Flask API

- Understanding systemd service units
- Writing systemd service unit file for Flask API
- Configuring service options such as restart policies and environment variables

Setting up Multi-Instance Flask API

- Understanding the concept of multi-instance Flask API
- Writing multiple configuration files for different instances
- Starting multiple instances of Flask API with systemd

Bind DNS Server and CoreDNS

Introduction to BIND DNS Server

- Overview of BIND DNS Server
- Role and Importance of DNS in Networking
- Installation and Basic Configuration

Installing BIND DNS Server on Various Platforms (Linux, Windows)

- Configuration Files (named.conf, named.conf.options, named.conf.local)
- Starting and Stopping BIND Service

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Bind DNS Server and CoreDNS

DNS Zone Configuration

- Understanding DNS Zones (Forward and Reverse Zones)
- Configuring Forward and Reverse Zones
- Zone Files Syntax and Records (A, CNAME, MX, NS, PTR, etc.)
- Primary and Secondary DNS Servers
- Configuring Primary and Secondary DNS Servers
- Zone Transfer (AXFR and IXFR)

DNS Security

- DNSSEC (Domain Name System Security Extensions)
- TSIG (Transaction Signature) for Zone Transfers
- ACLs (Access Control Lists) for DNS Queries

DNS Resolution and Forwarding

- Configuring Forwarders in BIND
- DNS Resolution Process in BIND
- Recursive and Iterative Queries

Traefik web server

Introduction to Traefik

- What is Traefik?
- Why use Traefik as a reverse proxy and load balancer?
- Differences between Traefik and other reverse proxies (like Nginx, HAProxy).

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Traefik web server

Traefik Architecture

- Understanding Traefik's architecture and components.
- How Traefik works with microservices.
- Dynamic configuration with Traefik.
- Traefik's support for multiple backends (Docker, Kubernetes, etc.).

Installing and Configuring Traefik

- Installation methods (Docker, Kubernetes, Binary, etc.).
- Basic Traefik configuration.
- Configuring entrypoints, routers, and services.
- Configuring Traefik with a single container or Kubernetes cluster.

Traefik and Docker Integration

- Running Traefik with Docker containers.
- Using Docker labels to configure routing.
- Traefik as an ingress controller for Docker Swarm.
- SSL termination with Docker and Traefik.

Traefik and Kubernetes Integration

- Setting up Traefik as an ingress controller in Kubernetes.
- Working with Kubernetes annotations and labels for routing.
- Traefik’s support for Kubernetes secrets and TLS certificates.
- Handling ingress resources and services.

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Traefik web server

Monitoring and Logging in Traefik

- Enabling access logs in Traefik.
- Using Traefik's dashboard for monitoring.
- Integrating with Prometheus for metrics and Grafana for dashboards.
- JSON and log aggregation setup.

Traefik Dashboard and API

- Accessing and configuring the Traefik dashboard.
- Using the Traefik API for dynamic configuration.
- Customizing Traefik's web UI for better visibility.

Traefik and Service Discovery

- How Traefik discovers services in Docker and Kubernetes.
- Working with static and dynamic backends.
- Service discovery using labels in Docker and annotations in Kubernetes.

Traefik and High Availability

- Setting up a highly available Traefik cluster.
- Scaling Traefik with Docker Swarm and Kubernetes.
- Handling failover and redundancy with Traefik.

Advanced Traefik Features

- Using Traefik for edge routing (e.g., API gateway use case).
- Traefik with multi-cluster and multi-cloud setups.
- Traefik and microservices architecture.

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Traefik web server

Traefik Plugins and Extensions

- Extending Traefik with plugins.
- Using community and custom plugins in Traefik.
- Setting up plugins for custom behavior and features.

Troubleshooting and Debugging Traefik

- Common issues and how to fix them.
- Using Traefik logs and debug mode.
- Diagnosing routing and load balancing problems.
- Troubleshooting SSL/TLS and certificate issues.

Traefik vs Nginx vs HAProxy

- Pros and cons of Traefik compared to Nginx and HAProxy.
- Which use cases are best for Traefik vs other reverse proxies?

Nginx

Installation and Basic Configuration

- Installing Nginx on Different Platforms
- Introduction to nginx.conf Configuration File
- Basic Server Block Configuration

HTTP Server

- Handling HTTP Requests
- Location Blocks and Directives
- Static File Serving

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Nginx

Reverse Proxy

- Configuring Nginx as a Reverse Proxy
- Proxy_pass Directive
- Load Balancing Methods

SSL/TLS Configuration

- Generating SSL Certificates
- Configuring HTTPS
- SSL/TLS Best Practices

Advanced Configuration Directives

- Rewrite Rules
- Access Control
- Rate Limiting

Caching

- Proxy Cache
- Fastcgi_cache
- Cache Invalidation

Performance Optimization

- Tuning Worker Processes
- Connection Handling
- Gzip Compression

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Nginx

Security Features

- Securing Server Blocks
- Preventing Common Attacks
- Using HTTP Headers for Security

High Availability and Scalability

- Load Balancing Strategies
- Session Persistence
- Clustering

Monitoring and Logging

- Nginx Access and Error Logs
- Monitoring Tools and Techniques
- Log Analysis

Integration with Other Technologies

- PHP-FPM Integration
- Node.js Integration
- Caching Solutions Integration

Introduction to High Availability with Keepalived and Nginx

- Overview of Keepalived and its role in achieving high availability
- Introduction to Nginx as a load balancer
- Use cases and benefits of a highly available Nginx load balancer setup

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Nginx

Installation and Configuration of Keepalived

- Installing Keepalived on Linux
- Basic Configuration File (keepalived.conf)
- Setting up Virtual IP (VIP) for Nginx load balancer

HAProxy

Introduction to HAProxy

- Overview of HAProxy
- Use cases and scenarios

Installation and Basic Configuration

- Installing HAProxy on Different Platforms
- Basic Configuration Files
- Starting and Stopping HAProxy

Frontend and Backend Configuration

- Configuring Frontend and Backend Sections
- Bind Options and Listening Ports
- Backend Server Configuration

Load Balancing Algorithms

- Overview of Load Balancing Algorithms (Round Robin, Least Connections, Source IP Hash, etc.)
- Configuring Load Balancing Algorithms

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HAProxy

Health Checks and Monitoring

- Implementing Health Checks for Backend Servers
- Monitoring Backend Server Health
- Failover Strategies

SSL/TLS Termination

- SSL/TLS Offloading with HAProxy
- SSL/TLS Configuration Options
- Certificates and Key Management

High Availability Setup

- Implementing High Availability with HAProxy
- Active-Passive and Active-Active Configurations
- Heartbeat and Failover Mechanisms

گام دوم: Container Runtime & Container Engines

Containerization

Overview of Containerization

- Introduction to containerization and its benefits
- Comparison between containers and virtual machines
- Use cases for containerization in software development and deployment

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Containerization

Container Components and Architecture

- Understanding the components of a container: image, container runtime, container engine
- Exploring the architecture of container runtimes and engines
- Overview of container orchestration and its role in managing containers at scale

Container Runtime

Understanding Container Runtimes

- Definition and role of container runtimes in container execution
- Types of container runtimes: high-level and low-level runtimes
- Comparison between container runtimes: Docker, containerd, rkt, cri-o, etc.

High-level Container Runtimes

- Exploring high-level container runtimes like Docker and containerd
- Understanding the features and functionalities provided by high-level runtimes
- Use cases and considerations for choosing a high-level container runtime

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گام سوم: Docker and Docker Registry

Docker

Docker

- Overview of containerization
- Introduction to Docker and its components
- Docker use cases and benefits

Docker Architecture

- Understanding Docker architecture (client-server model)
- Docker Engine components (Docker daemon, REST API, CLI)
- Containerd and other components

Docker Images

- Understanding Docker images
- Dockerfile syntax and best practices
- Building custom Docker images

Docker Containers

- Creating and running Docker containers
- Managing container lifecycle (start, stop, restart)
- Inspecting container logs and status

Docker Log Drivers

- Overview of Docker log drivers
- Different log driver options (json-file, syslog, journald, fluentd, etc.)
- Configuring logging options for Docker containers

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Docker

Docker Networking

- Overview of Docker networking modes (bridge, host, overlay, macvlan)
- Docker networking drivers and plugins
- Configuring container networking (port mapping, network aliases)

Docker Storage

- Understanding Docker storage drivers
- Persistent storage options for Docker containers (volumes, bind mounts)
- Docker volume management and backup strategies

Docker Volumes

- Introduction to Docker volumes
- Creating and managing Docker volumes
- Volume types and usage scenarios (local, named, anonymous)

Docker Compose

- Introduction to Docker Compose
- Writing Docker Compose YAML files
- Managing multi-container applications with Docker Compose

Docker Swarm

- Introduction to Docker Swarm
- Setting up Docker Swarm cluster
- Deploying and managing services with Docker Swarm

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Docker

Docker Orchestration with Kubernetes

- Comparing Docker Swarm and Kubernetes

Docker API

- Overview of Docker Remote API
- Using Docker Remote API for container management
- Building applications with Docker API

Docker Registry

Introduction to Docker Registry

- Overview of Docker Registry and its role in containerization
- Purpose and benefits of using Docker Registry

Setting up a Docker Registry

- Installing and configuring a private Docker Registry
- Securing Docker Registry with authentication and access control

Pushing and Pulling Images

- Pushing Docker images to a private Docker Registry
- Pulling Docker images from a private Docker Registry
- Managing image versions and tags in Docker Registry

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Docker Registry

Harbor:

Introduction to Harbor

- Overview of Harbor as an enterprise-class container registry
- Features and benefits of using Harbor for container management

Installing and Configuring Harbor

- Deploying Harbor in Kubernetes or standalone mode
- Configuring Harbor projects, users, and permissions

Image Management with Harbor

- Uploading and downloading images to/from Harbor
- Scanning images for vulnerabilities with Harbor's integrated security features

Replication and High Availability

- Configuring image replication between Harbor instances
- Implementing high availability and disaster recovery strategies with Harbor

Harbor as a Helm Chart Repository

- Using Harbor as a Helm chart repository for Kubernetes applications
- Managing Helm charts and releases with Harbor

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گام چهارم: API

API, REST API, and HTTP Requests

What is an API?

- Types of APIs (REST, SOAP, GraphQL, etc.)
- Importance of APIs in modern software development

Understanding REST API

- Principles of RESTful architecture
- Key components: Resources, URIs, HTTP methods, Representations (JSON, XML)
- Characteristics of RESTful APIs: Statelessness, Uniform Interface, Layered System, etc.

HTTP Basics

- Overview of HTTP (Hypertext Transfer Protocol)
- Understanding HTTP methods: GET, POST, PUT, DELETE, PATCH
- HTTP status codes and their meanings (2xx, 3xx, 4xx, 5xx)
- Hands-on exercises: Making HTTP requests using tools like cURL, Postman, or browser Developer Tools

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گام پنجم: Certificates and Certificate Authorities (CAs)

CA and Cerificates

Basics of Cryptography

- Symmetric vs Asymmetric Cryptography
- Public Key Infrastructure (PKI)

Digital Certificates

- Definition and Purpose
- Components of a Digital Certificate
- X.509 Standard

Certificate Authorities (CAs)

- Role of CAs in PKI
- Types of CAs: Root CAs, Intermediate CAs
- Certificate Chain of Trust

Hands-on with OpenSSL

Introduction to OpenSSL

- Overview of OpenSSL
- Installation on Various Platforms

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Hands-on with OpenSSL

Working with CSRs and Keys

- Generating Private Keys
- Creating CSRs
- Self-Signed Certificates

Managing Certificates

- Viewing Certificate Details
- Verifying Certificates
- Converting Certificate Formats

Implementing SSL/TLS

- Configuring SSL/TLS on Apache
- Configuring SSL/TLS on Nginx
- Testing SSL/TLS Configuration

گام ششم: Git and Gitlab and ArgoCD

Git

Introduction to Version Control Systems (VCS)

- Overview of version control
- Importance of version control in software development
- Introduction to distributed version control systems (DVCS) like Git

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Git

Git Basics

- Understanding the Git workflow
- Git terminology (repository, commit, branch, merge, etc.)
- Installing Git and setting up Git configurations
- Git Repository
- Initializing a Git repository
- Cloning existing repositories
- Adding and removing files from the staging area

Git Commits

- Committing changes to the repository
- Writing good commit messages
- Amending and squashing commits

Branching and Merging

- Creating and managing branches
- Switching between branches
- Merging branches and resolving merge conflicts

Remote Repositories

- Adding remote repositories
- Pushing and pulling changes from remote repositories
- Managing upstream branches

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Git

Collaborating with Git

- Forking and cloning repositories from remote platforms (e.g., GitHub, GitLab)
- Pull requests and code reviews
- Managing repository permissions and access control

Gitlab

Introduction to GitLab

- Overview of GitLab and its features
- Key components of GitLab (repositories, issues, merge requests, pipelines, etc.)
- Comparison with other Git hosting platforms (e.g., GitHub, Bitbucket)

Setting up GitLa

- Installing and configuring GitLab (self-hosted or cloud-based)
- Creating user accounts and managing access permissions
- Configuring GitLab projects and groups

GitLab Repositories

- Creating and managing Git repositories in GitLab
- Cloning repositories from GitLab
- Pushing and pulling changes to/from GitLab repositories

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Gitlab

GitLab Merge Requests

- Introduction to merge requests (MRs) in GitLab
- Creating merge requests for code review and collaboration
- Reviewing and approving merge requests

GitLab Pipelines

- Understanding GitLab CI/CD pipelines
- Configuring CI/CD pipelines with .gitlab-ci.yml files
- Running tests, building artifacts, and deploying applications using pipelines

GitLab Runners and Executors

- Introduction to GitLab Runners
- Configuring and registering GitLab Runners
- Understanding different types of executors (e.g., shell, Docker, Kubernetes)

GitLab Snippets

- Sharing code snippets and examples in GitLab
- Creating, editing, and managing snippets
- Collaborating on snippets with team members

GitLab Security Features

- Overview of GitLab's security capabilities
- Security scanning for vulnerabilities (SAST, DAST, Dependency scanning)

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Gitlab

- Implementing security policies and best practices

GitLab Integrations

- Integrating GitLab with other tools and services (e.g., Slack, JIRA, Jenkins)
- Configuring webhooks and service integrations
- Streamlining workflows with third-party integrations

GitLab API

- Introduction to GitLab API
- Authentication and access control with GitLab API
- Using GitLab API for automation, scripting, and integration with external systems

Integration with Kubernetes

- Overview of integrating GitLab with Kubernetes
- Deploying applications to Kubernetes clusters from GitLab CI/CD pipelines
- Managing Kubernetes resources through GitLab's interface

ArgoCD

Introduction to ArgoCD

- What is ArgoCD?
- Overview of GitOps and how ArgoCD fits into the GitOps paradigm.
- Differences between ArgoCD and other CD tools.

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ArgoCD

- Key benefits of using ArgoCD for continuous delivery.

ArgoCD Architecture

- Understanding the components of ArgoCD (API server, repository server, application controller, etc.).
- ArgoCD's role in Kubernetes-based environments.
- How ArgoCD connects to Git repositories and Kubernetes clusters.
- Understanding ArgoCD’s declarative configuration model.

Installing ArgoCD

- Installation methods (using Helm, kubectl, or ArgoCD operator).
- Deploying ArgoCD on a Kubernetes cluster.
- Accessing the ArgoCD web UI and CLI.
- Initializing ArgoCD with the argocd CLI and setting up your first Kubernetes cluster.

Configuring Repositories in ArgoCD

- Adding Git repositories to ArgoCD.
- Managing SSH keys and HTTPS credentials for Git repositories.
- Configuring repository access with webhooks and basic authentication.
- Syncing repositories with ArgoCD to track changes.

ArgoCD Applications

- Creating and managing applications in ArgoCD.
- How ArgoCD works with Kubernetes manifests (YAML files).

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ArgoCD

- Deploying and managing Helm charts through ArgoCD.
- Handling different environments (development, staging, production) with ArgoCD applications

Syncing and Managing Deployments

- The synchronization process in ArgoCD.
- Manual vs. automated sync options.
- Understanding the sync status and resolving sync issues.
- Sync waves and rollout strategies.
- Using ArgoCD to track and manage deployments across multiple clusters.

ArgoCD's Declarative Setup

- Defining applications declaratively in Git repositories.
- Storing ArgoCD configuration as code.
- Versioning your application and Kubernetes configurations with Git.
- Best practices for using GitOps with ArgoCD.

Rollback and History Management

- Understanding application history in ArgoCD.
- How to rollback to a previous deployment in ArgoCD.
- Viewing and comparing previous application states.
- Troubleshooting failed deployments and rollbacks.

Access Control and Security in ArgoCD

- Configuring user authentication and authorization with ArgoCD.

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ArgoCD

- Integrating ArgoCD with Identity Providers (e.g., GitHub, LDAP, SSO).
- Role-based access control (RBAC) in ArgoCD.
- Managing ArgoCD secrets and credentials securely.

ArgoCD and Helm Integration

- Deploying Helm charts with ArgoCD.
- Handling Helm values and custom configurations.
- Managing Helm releases through ArgoCD.
- Syncing Helm-based applications and tracking their changes.

ArgoCD Notifications

- Setting up notifications in ArgoCD.
- Integrating ArgoCD with Slack, email, or custom notification channels.
- Configuring notification triggers for different events like sync success, failure, or manual intervention.

ArgoCD CLI Usage

- Overview of the ArgoCD CLI and its commands.
- Managing applications with the argocd CLI.
- Using the CLI for tasks such as syncing applications, viewing application status, and performing rollbacks.
- Troubleshooting deployments and configurations using the CLI.

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ArgoCD

ArgoCD with Multiple Clusters

- Managing multiple Kubernetes clusters with ArgoCD.
- Configuring ArgoCD to deploy across different clusters.
- Best practices for working with ArgoCD in multi-cluster environments.

Advanced ArgoCD Features

- ArgoCD's support for Kustomize for configuration management.
- GitOps workflows with multiple Git repositories and environments.
- Using ArgoCD for blue/green deployments and canary releases.
- Automated and manual approvals for deployments.
- Integrating with other CI/CD tools (e.g., Jenkins, GitLab CI) for more advanced pipelines.

ArgoCD Monitoring and Metrics

- Monitoring ArgoCD's health and status.
- Using Prometheus and Grafana for metrics and monitoring ArgoCD applications.
- Setting up logging for ArgoCD and troubleshooting deployment issues.
- Understanding ArgoCD's health checks and alerts.

ArgoCD Best Practices

- How to structure Git repositories for GitOps with ArgoCD.
- Optimizing ArgoCD performance in large-scale deployments.
- Setting up ArgoCD in a production-ready environment.

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دوره جامع مهندسی دواپس

ArgoCD

- How to manage secrets and sensitive data securely with ArgoCD.

Troubleshooting ArgoCD

- Common issues and error messages in ArgoCD.
- How to debug synchronization issues.
- Solving common problems related to Git repository access or sync failures.
- Logs and event tracking to diagnose problems in ArgoCD deployments.

ArgoCD and GitOps

- Understanding the GitOps workflow with ArgoCD.
- Benefits of using GitOps principles in software delivery.
- How ArgoCD supports continuous deployment with GitOps.
- Challenges in adopting GitOps and how ArgoCD helps mitigate them.

گام هفتم: Kubernetes and Rancher

Kubernetes

Overview of Kubernetes a(K8s)

- Introduction to Kubernetes
- Key features and benefits of Kubernetes
- Use cases and industry adoption of Kubernetes

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Kubernetes

Kubernetes Components

- Master components (kube-apiserver, kube-controller-manager, kube-scheduler, etcd)
- Node components (kubelet, kube-proxy, container runtime)
- Add-ons (DNS, Dashboard, Ingress controller, etc.)

Cluster Architecture

- Understanding Kubernetes cluster architecture
- Master node and worker node roles
- High availability and fault tolerance considerations

Namespace

- Introduction to Kubernetes namespaces
- Creating and managing namespaces
- Namespace isolation and resource quotas

Labels

- Understanding labels in Kubernetes
- Label selectors and matching
- Best practices for labeling resources

Pod VS Container

- Difference between a Pod and a Container
- Why Pods are used in Kubernetes
- Pod design patterns and best practices

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Kubernetes

Init Containers

- Introduction to init containers
- Use cases for init containers
- Writing and configuring init containers in Kubernetes manifests

Controllers

- Overview of Kubernetes controllers (ReplicaSet, Deployment, StatefulSet, DaemonSet)
- Role and responsibilities of controllers
- Use cases and best practices for different types of controllers

Probes

- Understanding Kubernetes probes (liveness, readiness, startup probes)
- Configuring probe parameters
- Handling container lifecycle events with probes

Networking

- Overview of Kubernetes networking model
- Kubernetes Services for service discovery and load balancing
- Ingress and Ingress Controllers for HTTP/HTTPS routing
- Using Ingress resources to define routing rules

Ingress Controller

- Introduction to Ingress Controllers
- How Ingress Controllers work in Kubernetes
- Configuring and deploying Ingress Controllers

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Kubernetes

Nginx Ingress Controller

- Introduction to Nginx Ingress Controller
- Installing and configuring Nginx Ingress Controller
- Advanced features and customization options

Traffic Ingress Controller

- Overview of Traffic Ingress Controller
- Features and advantages of Traffic Ingress Controller
- Installation and configuration steps

CNI Types (Container Network Interface)

- Introduction to CNI and its importance in Kubernetes networking
- Overview of different CNI types (e.g., Calico, Flannel, Weave Net, Cilium)
- Features, use cases, and considerations for each CNI type

Services

- Introduction to Kubernetes Services
- Types of Services (ClusterIP, NodePort, LoadBalancer, ExternalName)
- Use cases and considerations for each type of Service

RBAC (Role-Based Access Control)

- Introduction to RBAC in Kubernetes
- Role, RoleBinding, ClusterRole, and ClusterRoleBinding resources
- Implementing RBAC policies for users and service accounts

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Kubernetes

Secret

- Managing sensitive information with Kubernetes secrets
- Creating, accessing, and updating secrets
- Best practices for securing and managing secrets

ConfigMap

- Managing configuration data with Kubernetes ConfigMaps
- Creating, accessing, and updating ConfigMaps
- Using ConfigMaps to configure applications

PVC (Persistent Volume Claim) and PV (Persistent Volume)

- Introduction to Persistent Volumes (PVs) and Persistent Volume Claims (PVCs)
- Configuring storage resources with PVs and PVCs
- Dynamically provisioning storage with StorageClasse

Taints and Tolerations and Node Selector

- Understanding node affinity and anti-affinity with taints and tolerations
- Using node selectors to schedule Pods onto specific nodes
- Implementing node affinity rules for workload placement

Helm

- Introduction to Helm and Helm charts
- Managing Kubernetes applications with Helm
- Templating and deploying complex applications with Helm charts

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Rancher

Overview of Rancher

- Introduction to Rancher and its role in container orchestration and management
- Key features and benefits of Rancher

Installation and Setup

- Options for installing Rancher: Docker, Kubernetes, Helm charts
- Step-by-step guide to installing Rancher
- Initial configuration and setup

گام هشتم: AWS

AWS

VPC (Virtual Private Cloud)

- Overview of VPC
- CIDR Blocks and IP Addressing
- Public vs. Private Subnets
- Route Tables and Network ACLs
- NAT Gateway and Bastion Host
- VPC Peering and Transit Gateway

EC2 (Elastic Compute Cloud)

- EC2 Instance Types
- Amazon Machine Images (AMI)

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AWS

- Auto Scaling Groups
- Elastic Block Store (EBS)
- Security Groups and Key Pairs
- Elastic IPs and Placement Groups

Subnets

- Types of Subnets (Public, Private, Isolated)
- Subnet CIDR Block Planning
- Multi-AZ Subnet Design
- Subnet Route Tables

Internet Gateway (IGW)

- Attaching IGW to a VPC
- Route Table Configuration for IGW
- Public and Private Network Access

Virtual Private Gateway (VPG)

- Site-to-Site VPN
- AWS Direct Connect
- Configuring a VPN Connection

Elastic Load Balancer (ELB)

- Application Load Balancer (ALB)
- Network Load Balancer (NLB)
- Classic Load Balancer (CLB)

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AWS

- Target Groups and Health Checks
- Sticky Sessions and SSL Termination

AWS Lambda (Serverless Computing)

- Event-Driven Architecture
- Triggers (S3, DynamoDB, SNS, API Gateway)
- IAM Roles for Lambda
- Writing and Deploying Lambda Functions

AWS IAM (Identity and Access Management)

- Users, Groups, and Roles
- IAM Policies and Permissions
- MFA (Multi-Factor Authentication)
- IAM Roles for EC2, Lambda, and Other Services

AWS KMS (Key Management Service)

- Creating and Managing Encryption Keys
- Integrating KMS with S3, RDS, EBS
- Key Rotation and Access Control

DynamoDB (NoSQL Database)

- DynamoDB Tables and Indexing
- Partition Keys and Sort Keys
- Read and Write Capacity Modes
- DynamoDB Streams and Triggers

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AWS

AWS Regions and Availability Zones

- Difference Between Regions and AZs
- High Availability and Disaster Recovery
- Multi-Region Deployment Strategies

گام نهم: Ansible and Terraform

Ansible

Basics of Ansible

Introduction to Ansible.

- Overview of Ansible and its features
- Advantages of using Ansible for automation

Ansible Architecture

- Control node and managed nodes.
- Understanding Ansible's agentless architecture
- Components of Ansible (control node, inventory, modules, etc.)

Setting up Ansible and its Prerequisites

- Installing Ansible on different operating systems
- Configuring SSH keys for passwordless authentication
- Installing Python and other dependencies

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Ansible

Ansible Playbooks

Writing and Organizing Playbooks

- Structure of Ansible playbooks
- YAML syntax and formatting
- Defining tasks, plays, and playbooks

Modules and their Usage in Playbooks

- Overview of Ansible modules
- Commonly used modules (e.g., file, copy, template, service)
- Parameters and options for modules

Tasks, Handlers, and Roles

- Defining tasks and task blocks
- Using handlers to trigger actions
- Organizing tasks into reusable roles for better management

Variables and Templates in Playbooks

- Understanding Ansible variables
- Using variables for dynamic configurations
- Creating and using Jinja2 templates in playbooks

Loops and Items in Playbooks

- Using loops for iteration in playbooks
- Iterating over lists, dictionaries, and ranges
- Examples of loop usage in practical scenarios

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Ansible

Inventory and Configuration Management

Creating and Managing Inventory Files

- Inventory file formats (INI, YAML)
- Specifying hosts and groups in the inventory
- Dynamic inventory and plugins

Grouping Hosts and Variables

- Organizing hosts into groups for better management
- Group-specific variables and group_vars directory
- Host-specific variables and host_vars directory

Using Ansible Vault for Secure Variable Management

- Encrypting sensitive data with Ansible Vault
- Managing encrypted files and secrets
- Decrypting and using variables securely in playbooks

Ad-Hoc Commands

Running Ad-Hoc Commands with Ansible

- Overview of ad-hoc commands in Ansible
- Syntax and usage of ad-hoc commands
- Practical examples of ad-hoc tasks (e.g., gathering facts, running commands)

Common Ad-Hoc Modules

- Exploring common ad-hoc modules (ping, shell, command, etc.)
- Use cases and examples for each ad-hoc module
- Advantages and limitations of ad-hoc commands

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Terraform

Introduction to Terraform

What is Terraform

- Overview of Terraform and its features
- Benefits of Infrastructure as Code (IaC) with Terraform

Infrastructure as Code with Terraform

- Understanding the concept of Infrastructure as Code (IaC)
- Advantages of managing infrastructure with Terraform

Terraform Basics

Installing and Configuring Terraform

- Installing Terraform on different operating systems
- Setting up Terraform CLI and environment variables
- Configuring backend for state management

Defining Resources using HashiCorp Configuration Language (HCL)

- Introduction to HCL syntax
- Declaring resources, variables, and outputs in Terraform configurations
- Best practices for organizing and structuring Terraform code

Initializing a Terraform Configuration

- Initializing Terraform projects with terraform init
- Downloading provider plugins and modules
- Initializing a new Terraform workspace

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Terraform

Terraform Providers and Resources
Understanding Terraform Providers

- Overview of Terraform providers and their role
- Supported providers and community providers
- Configuring provider blocks in Terraform configurations

Defining Resources and Managing their Lifecycle

- Declaring and managing infrastructure resources in Terraform
- Resource lifecycle: create, read, update, delete (CRUD)
- Handling dependencies between resources

State Management and Terraform's State File

- Understanding Terraform state
- Importance of state management in Terraform
- State file formats and storage backends

Managing Infrastructure:
Creating, Updating, and Deleting Resources

- Creating infrastructure resources with terraform apply
- Updating resources with configuration changes
- Deleting resources and cleaning up infrastructure with terraform destroy

Terraform Variables and Data Sources

- Using variables to parameterize Terraform configurations
- Different types of variables (input variables, output variables, locals)
- Retrieving data from external sources using Terraform data sources

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Terraform

Terraform Modules for Reusable Configurations

- Introduction to Terraform modules
- Creating and using modules for reusable infrastructure components
- Sharing and managing modules with version control systems (VCS)

Advanced Topics

Terraform Workspaces

- Managing multiple environments with Terraform workspaces
- Use cases for workspaces in development, staging, and production environments

Terraform State Locking

- Understanding the need for state locking in Terraform
- Implementing state locking with backend configurations
- Best practices for preventing concurrent state modification

Testing and Continuous Integration

Testing Terraform Configurations

- Writing unit tests for Terraform configurations
- Testing infrastructure changes with Terraform's terraform plan command
- Integration testing of Terraform configurations with test frameworks

Continuous Integration with Terraform

- Integrating Terraform with CI/CD pipelines
- Automating infrastructure deployments with CI/CD tools
- Implementing Infrastructure as Code best practices in CI/CD workflows

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گام دهم: Monitoring

Zabbix

Introduction to Zabbix

- Overview of Zabbix monitoring solution
- Features and capabilities of Zabbix

Installing and Configuring Zabbix

- Installing Zabbix server and agents
- Configuring Zabbix components (server, agent, database)
- Setting up Zabbix frontend and web interface

Monitoring with Zabbix

- Adding hosts and monitoring targets to Zabbix
- Configuring monitoring items (metrics) and triggers
- Creating dashboards and visualizations in Zabbix

Zabbix Alerts and Notifications

- Configuring alerting rules and triggers
- Setting up notification methods (email, SMS, etc.)
- Customizing alert actions and escalations

Prometheus

Introduction to Prometheus

- Overview of Prometheus monitoring and alerting toolkit
- Prometheus data model (metrics, labels, time series)

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Prometheus

Installing and Configuring Prometheus

- Installing Prometheus server and exporters
- Configuring Prometheus scrape targets and service discovery
- Setting up retention policies and storage options

Prometheus Query Language (PromQL)

- Introduction to PromQL for querying Prometheus metrics
- Writing basic PromQL queries for metric retrieval and aggregation
- Advanced PromQL functions and operators

Alerting with Prometheus

- Defining alerting rules in Prometheus
- Configuring alertmanager.yml for alert management
- Sending alerts to various alerting destinations (email, webhook, etc.)

Grafana

Introduction to Grafana

- Overview of Grafana visualization and monitoring platform
- Features and advantages of Grafana for data visualization

Installing and Configuring Grafana

- Installing Grafana server on different platforms
- Configuring data sources (Prometheus, Zabbix, etc.) in Grafana
- Setting up Grafana dashboards and panels

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Grafana

Creating Dashboards in Grafana

- Building custom dashboards in Grafana
- Adding and configuring panels for displaying metrics
- Using variables and templating in Grafana dashboards

Prometheus Alertmanager and Alerting

Introduction to Prometheus Alertmanager

- Overview of Prometheus Alertmanager for handling alerts
- Features and capabilities of Alertmanager for alert management

Configuring Alertmanager

- Setting up alerting rules and routes in Alertmanager configuration
- Defining notification integrations (email, webhook, etc.) in Alertmanager

Alerting and Notifications

- Creating and managing alerting rules in Prometheus
- Configuring notifications for alerting channels (email, Telegram, Discord)
- Customizing alert templates and message formats

Integrating with Email, Telegram, and Discord

- Setting up email notification integration with Alertmanager
- Configuring Telegram bot for sending alerts to Telegram channels
- Setting up Discord webhooks for alert notifications in Discord channels

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جلسات کوچینگ:

توسعه ی فردی

مقدمه به رشد شخصی:

- اهمیت رشد شخصی و حرفه‌ای
- تفاوت بین رشد ثابت و رشد فراگیر

تحلیل اهداف و آرزوها:

- تعیین اهداف کوتاه مدت و بلند مدت
- استفاده از SMART Goals برای تعیین اهداف

مدیریت زمان و اولویت‌بندی:

- تقویت مهارت‌های مدیریت زمان
- تشخیص و ترک عادت‌های زمان‌تلف کننده

ارتباط موثر:

- مهارت‌های ارتباطی در محیط کار
- مدیریت اختلافات و روابط موثر

مهارت‌های حل مسئله و تصمیم‌گیری:

- روش‌های بهبود مهارت‌های حل مسئله
- مدیریت ریسک و تصمیم‌گیری موثر

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توسعه ی فردی

انگیزه و توانمندسازی:

- شناخت عوامل انگیزشی شخصی
- ایجاد محیط موثر برای افزایش انگیزه

توسعه مهارت‌های فردی و تیمی:

- تشویق به یادگیری مداوم
- ایجاد فرهنگ یادگیری در تیم

مقابله با استرس و مدیریت هیجانات:

- راهکارهای مدیریت استرس در محیط کار
- ارتقای هوش هیجانی

خودآگاهی و توسعه شخصی:

- توسعه مهارت‌های خودآگاهی و خودکنترلی
- ایجاد عادت‌های سلامتی روانی و جسمی
-

برنامه‌ریزی برای رشد مستمر:

- ایجاد برنامه‌های عملی برای رشد شخصی و حرفه‌ای
- پایش و ارزیابی پیشرفت‌ها و تصمیم‌گیری در مورد اصلاحات لازم