



# System design component checklist - Study sheet

@SunilGudivada

Date:

## ○ Client Side Components

- Web Clients  
Browser, Web Applications
- Mobile Clients  
Android, IOS applications

## ○ Server Side Components

- Web Servers  
Apache, NGINX
- Application Servers  
Node JS, Spring Boot, Flask
- Database Servers  
MySQL, PostgreSQL

## ○ Databases

- Relational Databases (SQL)  
MySQL, PostgreSQL
- NoSQL Databases  
MongoDB, Cassandra

## ○ Cache

- In-Memory Cache  
Redis, Memcached
- Content Delivery Network (CDN)  
Cloudflare, Akamai

## ○ Load Balancers

HAProxy, AWS ELB

## ○ Message Queues

RabbitMQ, Apache Kafka

## ○ API Gateways

NGINX, Kong

## ○ Microservices

Authentication Service, Search Service,  
Profile Service, Analytics Service

## ○ Service Discovery

Consul, Eureka - For Microservices Management

## ○ Configuration Management

etcd, Consul

## ○ Monitoring and Logging

- Monitoring  
Prometheus, Grafana
- Logging  
ELK Stack - Elasticsearch, Logstash, Kibana

## ○ Authentication and authorization

- Authentication  
OAuth, JWT
- Authorization  
RBAC, ABAC

## ○ Analytics and Reporting

Google Analytics, Tableau

## ○ Scalability and Reliability

- Horizontal Scaling
- Vertical Scaling
- Redundancy
- Backup and Disaster Recovery

## ○ Networking

- DNS  
Domain name resolution
- Firewalls and Security Groups  
Access control

## ○ DevOps and CI/CD

- CI/CD  
Jenkins, GitLab CI
- Infrastructure as Code (IaC)  
Terraform, Ansible

## ○ Data Processing

- Batch Processing  
Hadoop
- Stream Processing  
Apache Flink, Apache Storm

Notes

Important Points





# System design component checklist in Azure - Study sheet

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Date:

## ○ Client Side Components

- Web Clients  
Browser, Web Applications
- Mobile Clients  
Android, iOS applications

## ○ Server Side Components

- Web Servers  
Azure App Service
- Application Servers  
Azure Functions, Azure App Service
- Database Servers  
Azure SQL Database, Azure Cosmos, Azure Gremlin

## ○ Databases

- Relational Databases (SQL)  
Azure SQL Database
- NoSQL Databases  
Azure Cosmos DB, Azure Table Storage

## ○ Cache

- In-Memory Cache  
Azure Cache for Redis
- Content Delivery Network (CDN)  
Azure CDN, Azure Front door

## ○ Load Balancers

Azure Load Balancer, Azure Application Gateway

## ○ Message Queues

Azure Service Bus, Azure Queue Storage

## ○ API Gateways

Azure API Management

## ○ Microservices

Azure Kubernetes Service (AKS), Azure Service Fabric

## ○ Service Discovery

Inbuilt in Azure Kubernetes Service (AKS),  
Azure Service Fabric

## ○ Configuration Management

Azure App Configuration

## ○ Monitoring and Logging

- Monitoring  
Azure Monitor, Azure Application Insights
- Logging  
Azure Log Analytics

## ○ Authentication and authorization

- Authentication  
Azure Active Directory (Azure AD), Azure AD B2C

## ○ Analytics and Reporting

Azure Synapse Analytics, Power BI

## ○ Scalability and Reliability

- Horizontal Scaling  
Azure Virtual Machine Scale Sets, Azure App Service
- Vertical Scaling  
Azure VMs or services
- Redundancy  
Azure Availability Zones, Azure Regions
- Backup and Disaster Recovery  
Azure Backup, Azure Site Recovery

## ○ Networking

- DNS  
Azure DNS
- Firewalls and Security Groups  
Azure Firewall, Azure Virtual Network (VNet)

## ○ DevOps and CI/CD

- CI/CD  
Azure DevOps
- Infrastructure as Code (IaC)  
GitHub Actions for Azure

## ○ Data Processing

- Batch Processing  
Azure Batch
- Stream Processing  
Azure Stream Analytics, Azure Event Hubs

Notes

Important Points





## ○ Client Side Components

- Web Clients  
Browser, Web Applications
- Mobile Clients  
Android, iOS applications

## ○ Server Side Components

- Web Servers  
Amazon EC2, AWS Elastic Beanstalk
- Application Servers  
AWS Lambda, Amazon EC2
- Database Servers  
Amazon RDS, Amazon Aurora

## ○ Databases

- Relational Databases (SQL)  
Amazon RDS, Amazon Aurora
- NoSQL Databases  
Amazon DynamoDB, Amazon DocumentDB

## ○ Cache

- In-Memory Cache  
Amazon ElastiCache
- Content Delivery Network (CDN)  
Amazon CloudFront

## ○ Load Balancers

Elastic Load Balancer, Classic Load Balancer

## ○ Message Queues

Amazon SQS, Amazon SNS

## ○ API Gateways

Amazon API Gateway

## ○ Microservices

Amazon ECS, Amazon EKS, AWS Fargate

## ○ Service Discovery

AWS Cloud Map, Amazon ECS Service Discovery

## ○ Configuration Management

AWS Systems Manager Parameter Store, AWS Secrets Manager

## ○ Monitoring and Logging

- Monitoring  
Amazon Cloud Watch, Amazon Open Search Service
- Logging  
AWS CloudTrail

## ○ Authentication and authorization

- Authentication  
AWS IAM, Amazon Cognito

## ○ Analytics and Reporting

Amazon Redshift, Amazon QuickSight, AWS Glue

## ○ Scalability and Reliability

- Horizontal Scaling  
Amazon EC2 Auto Scaling
- Vertical Scaling  
Amazon EC2 resource increase
- Redundancy  
AWS Availability Zones, AWS Regions
- Backup and Disaster Recovery  
AWS Backup, Amazon S3

## ○ Networking

- DNS  
Amazon Route 53
- Firewalls and Security Groups  
AWS Firewall Manager, Amazon VPC

## ○ DevOps and CI/CD

- CI/CD  
AWS CodePipeline,
- Infrastructure as Code (IaC)  
AWS Code Build, AWS Code Deploy, AWS Code Commit

## ○ Data Processing

- Batch Processing  
AWS Batch
- Stream Processing  
Amazon Kinesis, AWS Lambda

Notes

Important Points





# System design component checklist in Google cloud - Study sheet

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## ○ Client Side Components

- Web Clients  
Browser, Web Applications
- Mobile Clients  
Android, iOS applications

## ○ Server Side Components

- Web Servers  
Compute Engine, APP Engine
- Application Servers  
Cloud Functions, App Engine
- Database Servers  
Cloud SQL, Cloud Spanner

## ○ Databases

- Relational Databases (SQL)  
Cloud SQL, Cloud Spanner
- NoSQL Databases  
Firestore, Bigtable

## ○ Cache

- In-Memory Cache  
Cloud Memory store
- Content Delivery Network (CDN)  
Cloud CDN

## ○ Load Balancers

- Cloud Load Balancing, HTTP(S), TCP/UDP, SSL Proxy and TCP Proxy Load Balancing

## ○ Message Queues

- Pub/Sub

## ○ API Gateways

- API Gateway

## ○ Microservices

- Google Kubernetes Engine (GKE), Cloud Run

## ○ Service Discovery

- Service Directory

## ○ Configuration Management

- Secret Manager, Config Connector

## ○ Monitoring and Logging

- Monitoring  
Cloud Monitoring, Error Reporting
- Logging  
Cloud Logging

## ○ Authentication and authorization

- Authentication  
Identity and Access Management, Firebase Authentication

## ○ Analytics and Reporting

- BigQuery, Looker, Data Studio

## ○ Scalability and Reliability

- Horizontal Scaling  
Compute Engine Auto Scaling, App Engine Auto Scaling
- Vertical Scaling  
Increase Compute Engine Resource
- Redundancy  
Multi-Regional Storage, Cloud Load Balancing
- Backup and Disaster Recovery  
Cloud Storage, Cloud SQL

## ○ Networking

- DNS  
Cloud DNS
- Firewalls and Security Groups  
Virtual Private Cloud, Cloud Firewall

## ○ DevOps and CI/CD

- CI/CD  
Cloud Build, Artifact Registry
- Infrastructure as Code (IaC)  
Cloud Source Repositories

## ○ Data Processing

- Batch Processing  
Dataflow
- Stream Processing  
Pub/Sub, Dataflow

Notes

Important Points