

## Compute

<ul style="list-style-type: none"><li>• <b>AWS Global infrastructure</b><ul style="list-style-type: none"><li>• Regions</li><li>• Availability zones</li><li>• Edge locations (POPs)</li></ul></li></ul>	<ul style="list-style-type: none"><li>• <b>Azure Global infrastructure</b><ul style="list-style-type: none"><li>• Regions</li><li>• Availability zones</li><li>• Azure Edge Zones</li></ul></li></ul>
<ul style="list-style-type: none"><li>• <b>Hierarchy in AWS cloud</b><ul style="list-style-type: none"><li>• AWS Organizations</li><li>• Accounts</li><li>• Resource Groups (Not widely used and not mandatory)<ul style="list-style-type: none"><li>▪ Resources</li></ul></li></ul></li></ul>	<ul style="list-style-type: none"><li>• <b>Hierarchy in Azure cloud</b><ul style="list-style-type: none"><li>• Management Groups</li><li>• Subscriptions</li><li>• Resource Groups (Mandatory)<ul style="list-style-type: none"><li>▪ Resources</li></ul></li></ul></li></ul>
<ul style="list-style-type: none"><li>• <b>Amazon EC2 instance</b><ul style="list-style-type: none"><li>• AMIs (and custom AMIs)</li><li>• Instance Type</li><li>• Instance purchasing options (On-demand, Reserved)</li><li>• Storage options</li></ul></li></ul>	<ul style="list-style-type: none"><li>• <b>Azure Virtual Machines</b><ul style="list-style-type: none"><li>• AMIs (and custom AMIs)</li><li>• Instance Type</li><li>• Instance purchasing options (On-demand, Reserved)</li><li>• Storage options</li></ul></li></ul>
<ul style="list-style-type: none"><li>• <b>EC2 Auto Scaling</b><ul style="list-style-type: none"><li>• Manual</li><li>• Scheduled</li><li>• Dynamic<ul style="list-style-type: none"><li>• Step scaling</li><li>• Target tracking</li></ul></li><li>• Predictive</li></ul></li></ul>	<ul style="list-style-type: none"><li>• <b>Virtual Machine Scale Set</b><ul style="list-style-type: none"><li>• Manual</li><li>• Custom auto scale<ul style="list-style-type: none"><li>• Based on any schedule</li><li>• Based on any Metrics</li></ul></li><li>• Predictive</li></ul></li></ul>
<ul style="list-style-type: none"><li>• <b>Elastic Load Balancers</b><ul style="list-style-type: none"><li>• ALB</li><li>• NLB</li></ul></li></ul>	<ul style="list-style-type: none"><li>• <b>Load Balancing Services</b><ul style="list-style-type: none"><li>• Azure Application Gateway</li><li>• Azure Load Balancer</li></ul></li></ul>
<ul style="list-style-type: none"><li>• <b>AWS Lambda</b></li></ul>	<ul style="list-style-type: none"><li>• <b>Azure Functions</b></li></ul>

## Networking

<ul style="list-style-type: none"><li>• <b>VPC</b><ul style="list-style-type: none"><li>○ CIDR block/notation - <a href="https://www.ipaddressguide.com/cidr">https://www.ipaddressguide.com/cidr</a></li></ul></li><li>• <b>Subnets</b><ul style="list-style-type: none"><li>○ Public subnet</li><li>○ Private subnet</li></ul></li><li>• <b>NACLs</b></li><li>• <b>Security Groups</b></li><li>• <b>NAT Gateway</b></li><li>• <b>Bastion Host</b></li><li>• <b>VPC peering.</b></li><li>• <b>Transit Gateway</b></li></ul>	<ul style="list-style-type: none"><li>• <b>VNET</b><ul style="list-style-type: none"><li>○ CIDR block/notation - <a href="https://www.ipaddressguide.com/cidr">https://www.ipaddressguide.com/cidr</a></li></ul></li><li>• <b>Subnets</b><ul style="list-style-type: none"><li>○ Public subnet</li><li>○ Private subnet</li></ul></li><li>• <del><b>NACLs</b></del></li><li>• <b>Security Groups</b></li><li>• <b>NAT Gateway</b></li><li>• <b>Jumpbox (server)</b></li><li>• <b>VPC peering.</b></li><li>• <b>Azure Virtual WAN</b></li></ul>
<ul style="list-style-type: none"><li>• <b>Amazon CloudFront</b><ul style="list-style-type: none"><li>○ CloudFront patterns (S3 &amp; ELB)</li></ul></li><li>• <b>Amazon Route53</b><ul style="list-style-type: none"><li>○ Hosted Zones - Public, and Private</li><li>○ TTL</li><li>○ Record types (A record), CNAME, Alias record)</li><li>○ Routing Policy (Simple, Weighted, Geolocation, GeoProximity)</li><li>○ Health checks</li></ul></li><li>• <b>VPN</b></li><li>• <b>Direct Connect</b></li><li>• <b>Elastic IP Addresses (EIPs)</b></li><li>• <b>VPC Endpoints</b></li></ul>	<ul style="list-style-type: none"><li>• <b>Azure Content Delivery Network</b><ul style="list-style-type: none"><li>○ CDN patterns</li></ul></li><li>• <b>Azure DNS</b><ul style="list-style-type: none"><li>○ Hosted Zones - Public, and Private</li><li>○ TTL</li><li>○ Record types (A record), CNAME, <del>Alias record</del> (Azure Traffic Manager and Azure Front Door)</li><li>○ Routing Policy (Simple, Weighted, Geolocation, GeoProximity)</li><li>○ Health checks</li></ul></li><li>• <b>Azure VPN Gateway</b></li><li>• <b>Azure ExpressRoute</b></li><li>• <b>Azure Public IP Addresses</b></li><li>• <b>Azure Private Link / Azure Service Endpoints</b></li></ul>

## Storage

<ul style="list-style-type: none"><li>• <b>Storage types</b><ul style="list-style-type: none"><li>○ File storage</li><li>○ Block storage</li><li>○ Object storage</li></ul></li></ul>	<ul style="list-style-type: none"><li>• <b>Storage types</b><ul style="list-style-type: none"><li>○ Azure Files</li><li>○ Azure Managed Disks</li><li>○ Azure blob storage</li></ul></li></ul>
---	--

<ul style="list-style-type: none"> <li>• <b>Storage Characteristics</b> <ul style="list-style-type: none"> <li>○ Durability</li> <li>○ Availability</li> <li>○ Security</li> <li>○ Cost</li> <li>○ Scalability</li> <li>○ Performance <ul style="list-style-type: none"> <li>▪ IOPS</li> <li>▪ Throughput</li> </ul> </li> <li>○ Integration</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• <b>Storage Characteristics</b></li> </ul> <p style="text-align: center;">Azure storage has same characteristics</p>
<ul style="list-style-type: none"> <li>• <b>Elastic Block Storage (EBS)</b> <ul style="list-style-type: none"> <li>○ <b>SSD</b> <ul style="list-style-type: none"> <li>▪ General purpose (gp3)</li> <li>▪ Provisioned iops (io2)</li> </ul> </li> <li>○ <b>HDD</b> <ul style="list-style-type: none"> <li>▪ Throughput optimized (st1)</li> <li>▪ Cold HDD (sc1)</li> </ul> </li> <li>○ <b>EBS Snapshots</b></li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• <b>Azure Managed Disks</b> <ul style="list-style-type: none"> <li>○ <b>SSD</b> <ul style="list-style-type: none"> <li>▪ Standard &amp; Premium SSD</li> <li>▪ Ultra SSD</li> </ul> </li> <li>○ <b>HDD</b> <ul style="list-style-type: none"> <li>▪ Standard HDD</li> </ul> </li> <li>○ <b>Azure Managed Disks Snapshots</b></li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>• <b>Elastic File Storage (EFS)</b> <ul style="list-style-type: none"> <li>○ <b>Performance modes</b> <ul style="list-style-type: none"> <li>▪ General purpose</li> <li>▪ Max I/O</li> </ul> </li> <li>○ <b>Throughput modes</b> <ul style="list-style-type: none"> <li>▪ Bursting throughput</li> <li>▪ Provisional throughput</li> </ul> </li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• <b>Azure Files</b> <ul style="list-style-type: none"> <li>○ <b>Performance modes</b> <ul style="list-style-type: none"> <li>▪ Standard</li> <li>▪ Premium</li> </ul> </li> <li>○ <b>Throughput modes</b> <ul style="list-style-type: none"> <li>▪ Bursting throughput</li> <li>▪ Premium</li> </ul> </li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>• <b>Amazon S3</b> <ul style="list-style-type: none"> <li>○ Storage classes (or Tiering)</li> <li>○ Versioning</li> <li>○ S3 lifecycle policies</li> <li>○ S3 intelligent tiering</li> <li>○ Cross Region Replication (CRR)</li> <li>○ Same Region Replication (SRR)</li> <li>○ S3 design patterns</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• <b>Azure Storage Account</b> <ul style="list-style-type: none"> <li>○ Azure Blob Storage - Access Tiers</li> <li>○ Azure Blog Storage Versioning</li> <li>○ Storage Account lifecycle policies</li> <li>○ <del>S3 intelligent tiering</del></li> <li>○ Geo - Replication</li> <li>○ Zone - Redundant</li> <li>○ Similar design patterns as S3</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>• <b>Below are good to know (just learn what each service is at high level)</b> <ul style="list-style-type: none"> <li>• AWS Backup</li> <li>• AWS DataSync</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• <b>Below are good to know (just learn what each service is at high level)</b> <ul style="list-style-type: none"> <li>• Azure Backup</li> <li>• Azure Migrate</li> </ul> </li> </ul>

## Databases

<ul style="list-style-type: none"><li>• <b>Amazon Relational Database Service (RDS)</b><ul style="list-style-type: none"><li>○ Engine types</li><li>○ Instance types</li><li>○ Multi-AZ deployments<ul style="list-style-type: none"><li>▪ Replicas</li><li>▪ Failover</li><li>▪ DNS changes</li></ul></li></ul></li></ul>	<ul style="list-style-type: none"><li>• <b>Azure Database Services</b><ul style="list-style-type: none"><li>○ Engine types (Azure SQL Database, Azure Database for MySQL, PostgreSQL etc.)</li><li>○ Instance types</li><li>○ Multi-AZ deployments<ul style="list-style-type: none"><li>▪ Replicas</li><li>▪ Failover</li></ul></li><li>○ DNS changes</li></ul></li></ul>
<ul style="list-style-type: none"><li>• <b>Scaling RDS</b><ul style="list-style-type: none"><li>○ Horizontal vs Vertical</li><li>○ Storage auto scaling<ul style="list-style-type: none"><li>▪ EBS volumes</li></ul></li><li>○ Aurora auto scaling<ul style="list-style-type: none"><li>▪ Shared cluster storage</li></ul></li><li>○ Compute scaling</li></ul></li></ul>	<ul style="list-style-type: none"><li>• <b>Scaling Azure Databases</b><ul style="list-style-type: none"><li>○ Horizontal vs Vertical</li><li>○ Storage auto scaling</li></ul></li></ul>
<ul style="list-style-type: none"><li>• <b>DBA Activities</b><ul style="list-style-type: none"><li>○ Backup &amp; restore</li><li>○ Monitoring &amp; logging</li><li>○ Performance monitoring</li><li>○ Query tuning</li></ul></li></ul>	<ul style="list-style-type: none"><li>• <b>DBA Activities</b><ul style="list-style-type: none"><li>○ Backup &amp; restore (Automated backups, PIT restore, Long-term retention)</li><li>○ Monitoring &amp; logging (Azure Monitor, Azure Log Analytics, Query Store)</li><li>○ Performance monitoring (Query Performance Insight, Azure Monitor)</li><li>○ Query tuning (Query Store, Performance Recommendations)</li></ul></li></ul>
<ul style="list-style-type: none"><li>• <b>RDS Proxy</b><ul style="list-style-type: none"><li>○ Connection pooling</li><li>○ Fast failover during outages</li></ul></li></ul>	<p><b>These features are Built-in for Azure SQL Databases</b></p>
<ul style="list-style-type: none"><li>• <b>Amazon DynamoDB</b></li><li>• <b>Amazon ElastiCache</b></li><li>• <b>Amazon Redshift</b></li></ul>	<ul style="list-style-type: none"><li>• <b>Azure Cosmos DB</b></li><li>• <b>Azure Cache for Redis</b></li><li>• <b>Azure Synapse Analytics</b></li></ul>

## Security

<ul style="list-style-type: none"><li>• <b>Identity &amp; Access Management (IAM)</b><ul style="list-style-type: none"><li>○ Users</li><li>○ Groups</li><li>○ Roles</li><li>○ Policies</li></ul></li></ul>	<ul style="list-style-type: none"><li>• <b>Azure Active Directory (Azure AD) and Azure Role-Based Access Control (RBAC)</b><ul style="list-style-type: none"><li>○ Users</li><li>○ Groups</li><li>○ Roles</li><li>○ Policies</li></ul></li></ul>
<ul style="list-style-type: none"><li>• <b>Secrets Manager</b></li><li>• <b>Key Management Service</b></li></ul>	<ul style="list-style-type: none"><li>• <b>Azure Key Vault</b></li></ul>
<ul style="list-style-type: none"><li>• <b>Below are good to know (learn what each service is at high level)</b><ul style="list-style-type: none"><li>○ Cognito</li><li>○ AWS Firewall manager</li><li>○ WAF &amp; Shield</li><li>○ CloudTrail</li></ul></li></ul>	<ul style="list-style-type: none"><li>• <b>Below are good to know (learn what each service is at high level)</b><ul style="list-style-type: none"><li>○ Azure AD B2C</li><li>○ Azure Firewall Manager</li><li>○ Azure WAF &amp; DDoS Protection</li><li>○ Azure Activity Log &amp; Azure Monitor</li></ul></li></ul>

## Azure Data Factory (For Data Engineers)

- **Introduction to Azure Data Factory**
- **Core Components**
  - **Author**
    - Pipelines
    - Activities
    - Datasets
  - **Manage**
    - Linked Services
    - Integration Runtimes
  - **Monitor**