# IAM Section

* **Summary**
  + Users: mapped to a physical user, has a password for AWS Console
  + Groups: contains users only
  + Policies: json document that outlines permissions for users or groups
  + Roles: for EC@ instances or AWS services
  + Security: MFA + password policy
  + AWS CLI: manage your AWS services using the command-line
  + AWS-SDK: manage your AWS services using a programming language
  + Access Keys: access AWS using the CLI or SDK
  + Audit: IAM Credentials Reports & IAM Access Advisor

# EC2 (Elastic Compute Cloud)

* **Section - Summary**
  + EC2 Instance: AMI (OS) + Instance Size (CPU + RAM) + Storage + security groups + EC2 User Data
  + Security Groups: Firewall attached to the EC2 instance
  + EC2 User Data: Script launched at the first of an instance
  + SSH: start a terminal into our EC2 Instances (port 22)
  + EC2 Instance Role: link to IAM roles
  + Purchasing Options: On-Demand, Spot, Reserved (Standard + Convertible + Scheduled), Dedicated Host, Dedicated Instance

# EC2 Instance Storage Section

* **EC2 Instance Storage - Summary**
  + **EBS volumes:**

• network drives attached to one EC2 instance at a time

• Mapped to an Availability Zones

• Can use EBS Snapshots for backups / transferring EBS volumes across AZ

* + **AMI**: create ready-to-use EC2 instances with our customizations
  + **EC2 Image Builder:** automatically build, test and distribute AMIs
  + **EC2 Instance Store**:
    - High performance hardware disk attached to our EC2 instance
    - Lost if our instance is stopped / terminated
  + **EFS**: network file system, can be attached to 100s of instances in a region
  + **EFS-IA**: cost-optimized storage class for infrequent accessed files
  + **FSx for Windows:** Network File System for Windows servers
  + **FSx for Lustre**: High Performance Computing Linux file system

# Elastic Load Balancing & Auto Scaling Groups Section

* **ELB & ASG – Summary**
  + **High Availability** vs **Scalability** (vertical and horizontal) vs **Elasticity** vs **Agility** in the Cloud
  + **Elastic Load Balancers (ELB)**
    - Distribute traffic across backend EC2 instances, can be Multi-AZ
    - Supports health checks
    - 3 types: Application LB (HTTP – L7), Network LB (TCP – L4), Classic LB (old)
  + Auto Scaling Groups (ASG)
    - Implement Elasticity for your application, across multiple AZ
    - Scale EC2 instances based on the demand on your system, replace unhealthy
    - Integrated with the ELB

# ****Amazon S3 Section****

* **Amazon S3 – Summary**
  + **Buckets vs Objects**: global unique name, tied to a region
  + **S3 security**: IAM policy, S3 Bucket Policy (public access), S3 Encryption
  + **S3 Websites**: host a static website on Amazon S3
  + **S3 Versioning**: multiple versions for files, prevent accidental deletes
  + **S3 Replication**: same-region or cross-region, must enable versioning
  + **S3 Storage Classes**: Standard, IA, 1Z-IA, Intelligent, Glacier (Instant, Flexible, Deep)
  + **Snow Family**: import data onto S3 through a physical device, edge computing
  + **OpsHub**: desktop application to manage Snow Family devices
  + **Storage Gateway**: hybrid solution to extend on-premises storage to S3

# ****Databases Section****

* **Databases & Analytics Summary in AWS**
  + **Relational Databases - OLTP**: RDS & Aurora (SQL)
  + **Differences between Multi-AZ, Read Replicas, Multi-Region**
  + **In-memory Database**: ElastiCache
  + **Key/Value Database**: DynamoDB (serverless) & DAX (cache for DynamoDB)
  + **Warehouse** - OLAP: Redshift (SQL)
  + **Hadoop Cluster**: EMR
  + **Athena**: query data on Amazon S3 (serverless & SQL)
  + **QuickSight**: dashboards on your data (serverless)
  + **DocumentDB**: “Aurora for MongoDB” (JSON – NoSQL database)
  + **Amazon QLDB**: Financial Transactions Ledger (immutable journal, cryptographically verifiable)
  + **Amazon Managed Blockchain**: managed Hyperledger Fabric & Ethereum blockchains
  + **Glue**: Managed ETL (Extract Transform Load) and Data Catalog service
  + **Database Migration**: DMS
  + **Neptune**: graph database
* **Databases & Shared Responsibility on AWS**
  + AWS offers use to manage different databases
  + Benefits include:
    - Quick Provisioning, High Availability, Vertical and Horizontal Scaling
    - Automated Backup & Restore, Operations, Upgrades
    - Operating System Patching is handled by AWS
    - Monitoring, alerting
  + Note: many databases technologies could be run on EC2, but you must handle yourself the resiliency, backup, patching, high vailability, fault tolerance, scaling…

# Other Compute Section

* **Other Compute - Summary**
  + **Docker**: container technology to run applications
  + **ECS**: run Docker containers on EC2 instances
  + **Fargate**:
    - Run Docker containers without provisioning the infrastructure
    - Serverless offering (no EC2 instances)
  + **ECR**: Private Docker Images Repository
  + **Batch**: run batch jobs on AWS across managed EC2 instances
  + **Lightsail**: predictable & low pricing for simple application & DB stacks
* **Lambda Summary**
  + Lambda is Serverless, Function as a Service, seamless scaling, reactive
  + **Lambda Billing**:
    - By the time run x by the RAM provisioned
    - By the number of invocations
  + **Language Support**: many programming languages except (arbitrary) Docker
  + **Invocation time**: up to 15 minutes
  + **Use cases**:
    - Create Thumbnails for images uploaded onto S3
    - Run a Serverless cron job
  + **API Gateway**: expose Lambda functions as HTTP API

# Deploying and Managing Infrastructure at Scale Section

* **Deployment - Summary**
  + CloudFormation: (AWS only)
    - Infrastructure as Code, works with almost all of AWS resources
    - Repeat across Regions & Accounts
  + Beanstalk: (AWS only)
    - Platform as a Service (PaaS), limited to certain programming languages or Docker
    - Deploy code consistently with a known architecture: ex, ALB + EC2 + RDS
  + CodeDeploy (hybrid): deploy & upgrade any application onto servers
  + Systems Manager (hybrid): patch, configure and run commands at scale
  + OpsWorks (hybrid): managed Chef and Puppet in AWS
* **Developer Services - Summary**
  + CodeCommit: Store code in private git repository (version controlled)
  + CodeBuild: Build & test code in AWS
  + CodeDeploy: Deploy code onto servers
  + CodePipeline: Orchestration of pipeline (from code to build to deploy)
  + CodeArtifact: Store software packages / dependencies on AWS
  + CodeStar: Unified view for allowing developers to do CICD and code
  + Cloud9: Cloud IDE (Integrated Development Environment) with collab
  + AWS CDK: Define your cloud infrastructure using a programming language

# Global Infrastructure Section

* **Global Applications in AWS - Summary**
  + **Global DNS: Route 53** • Great to route users to the closest deployment with least latency • Great for disaster recovery strategies
  + **Global Content Delivery Network (CDN): CloudFront** • Replicate part of your application to AWS Edge Locations – decrease latency • Cache common requests – improved user experience and decreased latency
  + **S3 Transfer Acceleration** • Accelerate global uploads & downloads into Amazon S3
  + **AWS Global Accelerator:** • Improve global application availability and performance using the AWS global network
* **Global Applications in AWS - Summary**
  + **AWS Outposts**
    - Deploy Outposts Racks in your own Data Centers to extend AWS services
  + **AWS WaveLength**
    - Brings AWS services to the edge of the 5G networks
    - Ultra-low latency applications
  + **AWS Local Zones**
    - Bring AWS resources (compute, database, storage, …) closer to your users
    - Good for latency-sensitive applications

# Cloud Integration Section

* **Integration Section – Summary**
  + **SQS**: • Queue service in AWS • Multiple Producers, messages are kept up to 14 days • Multiple Consumers share the read and delete messages when done • Used to **decouple** applications in AWS
  + **SNS**: • Notification service in AWS • Subscribers: Email, Lambda, SQS, HTTP, Mobile… • Multiple Subscribers, send all messages to all of them • No message retention
  + **Kinesis**: real-time data streaming, persistence and analysis
  + **Amazon MQ**: managed message broker for ActiveMQ and RabbitMQ in the cloud (MQTT, AMQP.. protocols)

# Cloud Monitoring Section

* **Monitoring Summary**
  + **CloudWatch**: • **Metrics**: monitor the performance of AWS services and billing metrics • **Alarms**: automate notification, perform EC2 action, notify to SNS based on metric • **Logs**: collect log files from EC2 instances, servers, Lambda functions… • **Events (or EventBridge)**: react to events in AWS, or trigger a rule on a schedule
  + **CloudTrail**: audit API calls made within your AWS account
  + **CloudTrail** **Insights**: automated analysis of your CloudTrail Events
  + **X-Ray**: trace requests made through your distributed applications
  + **Service Health Dashboard**: status of all AWS services across all regions
  + **Personal Health Dashboard**: AWS events that impact your infrastructure
  + **Amazon CodeGuru**: automated code reviews and application performance recommendations

# VPC Section

* **VPC - Summary**
  + VPC Endpoints: Provide private access to AWS Services within VPC
  + PrivateLink: Privately connect to a service in a 3rd party VPC
  + VPC Flow Logs: network traffic logs
  + Site to Site VPN: VPN over public internet between on-premises DC and AWS
  + Client VPN: OpenVPN connection from your computer into your VPC
  + Direct Connect: direct private connection to AWS
  + Transit Gateway: Connect thousands of VPC and on-premises networks together

# Security & Compliance Section

* **Section Summary: Security & Compliance**
  + **Shared Responsibility on AWS**
  + **Shield**: Automatic DDoS Protection + 24/7 support for advanced
  + **WAF**: Firewall to filter incoming requests based on rules
  + **KMS**: Encryption keys managed by AWS
  + **CloudHSM**: Hardware encryption, we manage encryption keys
  + **AWS Certificate Manager**: provision, manage, and deploy SSL/TLS Certificates
  + **Artifact**: Get access to compliance reports such as PCI, ISO, etc…
  + **GuardDuty**: Find malicious behavior with VPC, DNS & CloudTrail Logs
  + **Inspector**: For EC2 only, install agent and find vulnerabilities
  + **Config**: Track config changes and compliance against rules
  + **Macie**: Find sensitive data (ex: PII data) in Amazon S3 buckets
  + **CloudTrail**: Track API calls made by users within account
  + **AWS Security Hub**: gather security findings from multiple AWS accounts
  + **Amazon Detective**: find the root cause of security issues or suspicious activities
  + **AWS Abuse**: Report AWS resources used for abusive or illegal purposes
  + **Root user privileges**:
    - Change account settings
    - Close your AWS account
    - Change or cancel your AWS Support plan
    - Register as a seller in the Reserved Instance Marketplace

# Machine Learning Section

* **AWS Machine Learning - Summary**
  + Rekognition: face detection, labeling, celebrity recognition
  + Transcribe: audio to text (ex: subtitles)
  + Polly: text to audio
  + Translate: translations
  + Lex: build conversational bots – chatbots
  + Connect: cloud contact center
  + Comprehend: natural language processing
  + SageMaker: machine learning for every developer and data scientist
  + Forecast: build highly accurate forecasts
  + Kendra: ML-powered search engine
  + Personalize: real-time personalized recommendations
  + Textract: detect text and data in documents

# Account Management, Billing & Support Section

* **Account Best Practices – Summary**
  + Account Best Practices – Summary
  + Operate multiple accounts using Organizations
  + Use SCP (service control policies) to restrict account power
  + Easily setup multiple accounts with best-practices with AWS Control Tower
  + Use Tags & Cost Allocation Tags for easy management & billing
  + IAM guidelines: MFA, least-privilege, password policy, password rotation
  + Config to record all resources configurations & compliance over time
  + CloudFormation to deploy stacks across accounts and regions
  + Trusted Advisor to get insights, Support Plan adapted to your needs
  + Send Service Logs and Access Logs to S3 or CloudWatch Logs
  + CloudTrail to record API calls made within your account
  + If your Account is compromised: change the root password, delete and rotate all passwords / keys, contact the AWS support
* **Billing and Costing Tools – Summary**
  + **Compute Optimizer:** recommends resources’ configurations to reduce cost
  + **Pricing Calculator**: cost of services on AWS
  + **Billing Dashboard**: high level overview + free tier dashboard
  + **Cost Allocation Tags**: tag resources to create detailed reports
  + **Cost and Usage Reports**: most comprehensive billing dataset
  + **Cost Explorer**:View current usage (detailed) and forecast usage
  + **Billing Alarms**: in us-east-1 – track overall and per-service billing
  + **Budgets**: more advanced – track usage, costs, RI, and get alerts
  + **Savings Plans**: easy way to save based on long-term usage of AWS

# Advanced Identity Section

* Advanced Identity - Summary
  + **IAM**
    - Identity and Access Management inside your AWS account
    - For users that you trust and belong to your company
  + **Organizations** – manage multiple AWS accounts
  + **Security Token Service (STS)** – temporary, limited-privileges credentials to access AWS resources
  + **Cognito** – create a database of users for your mobile & web applications
  + **Directory Services** – integrate Microsoft Active Directory in AWS
  + **IAM Identity Center** – one login for multiple AWS accounts & applications

# Other AWS Services

* Amazon WorkSpaces
  + Managed Desktop as a Service (DaaS) solution to easily provision Windows or Linux desktops
  + Great to eliminate management of on-premise VDI (Virtual Desktop Infrastructure)
  + Fast and quickly scalable to thousands of users
  + Secured data – integrates with KMS
  + Pay-as-you-go service with monthly or hourly rates
* Amazon AppStream 2.0
  + Desktop Application Streaming Service
  + Deliver to any computer, without acquiring, provisioning infrastructure
  + The application is delivered from within a web browser
* Amazon AppStream 2.0 vs WorkSpaces
  + **Workspaces** • Fully managed VDI and desktop available • The users connect to the VDI and open native or WAM applications • Workspaces are on-demand or always on
  + **AppStream 2.0** • Stream a desktop application to web browsers (no need to connect to a VDI) • Works with any device (that has a web browser) • Allow to configure an instance type per application type (CPU, RAM, GPU)
* Amazon Sumerian
  + Create and run virtual reality (VR), augmented reality (AR), and 3D applications
  + Can be used to quickly create 3D models with animations
  + Ready-to-use templates and assets - no programming or 3D expertise required
  + Accessible via a web-browser URLs or on popular hardware for AR/VR
* AWS IoT Core
  + IoT stands for “Internet of Things” – the network of internet-connected devices that are able to collect and transfer data
  + AWS IoT Core allows you to easily connect IoT devices to the AWS Cloud • Serverless, secure & scalable to billions of devices and trillions of messages
  + Your applications can communicate with your devices even when they aren’t connected
  + Integrates with a lot of AWS services (Lambda, S3, SageMaker, etc.)
  + Build IoT applications that gather, process, analyze, and act on data
* Amazon Elastic Transcoder
  + Elastic Transcoder is used to convert media files stored in S3 into media files in the formats required by consumer playback devices (phones etc..)
  + Benefits: • Easy to use • Highly scalable – can handle large volumes of media files and large file sizes • Cost effective – duration-based pricing model • Fully managed & secure, pay for what you use
* AWS AppSync
  + Store and sync data across mobile and web apps in real-time
  + Makes use of GraphQL (mobile technology from Facebook)
  + Client Code can be generated automatically
  + Integrations with DynamoDB / Lambda
  + Real-time subscriptions
  + Offline data synchronization (replaces Cognito Sync)
  + Fine Grained Security
  + AWS Amplify can leverage AWS AppSync in the background!
* AWS Amplify
  + A set of tools and services that helps you develop and deploy scalable full stack web and mobile applications
  + Authentication, Storage, API (REST, GraphQL), CI/CD, PubSub, Analytics, AI/ML Predictions, Monitoring, Source Code from AWS, GitHub, etc…
* AWS Device Farm
  + Fully-managed service that tests your web and mobile apps against desktop browsers, real mobile devices, and tablets
  + Run tests concurrently on multiple devices (speed up execution)
  + Ability to configure device settings (GPS, language, Wi-Fi, Bluetooth, …)
* AWS Backup
  + Fully-managed service to centrally manage and automate backups across AWS services
  + On-demand and scheduled backups
  + Supports PITR (Point-in-time Recovery)
  + Retention Periods, Lifecycle Management, Backup Policies, …
  + Cross-Region Backup
  + Cross-Account Backup (using AWS Organizations)
* AWS Elastic Disaster Recovery (DRS)
  + Used to be named “CloudEndure Disaster Recovery”
  + Quickly and easily recover your physical, virtual, and cloud-based servers into AWS
  + Example: protect your most critical databases (including Oracle, MySQL, and SQL Server),enterprise apps (SAP), protect your data from ransomware attacks, …
  + Continuous block-level replication for your servers
* AWS DataSync
  + Move large amount of data from on-premises to AWS
  + Can synchronize to: Amazon S3 (any storage classes – including Glacier), Amazon EFS, Amazon FSx for Windows
  + Replication tasks can be scheduled hourly, daily, weekly
  + The replication tasks are incremental after the first full load
* AWS Application Discovery Service
  + Plan migration projects by gathering information about on-premises data centers
  + Server utilization data and dependency mapping are important for migrations
  + Agentless Discovery (AWS Agentless Discovery Connector)
  + VM inventory, configuration, and performance history such as CPU, memory, and disk usage
  + Agent-based Discovery (AWS Application Discovery Agent)
  + System configuration, system performance, running processes, and details of the network connections between systems
  + Resulting data can be viewed within AWS Migration Hub
* AWS Application Migration Service (MGN)
  + The “AWS evolution” of CloudEndure Migration, replacing AWS Server Migration Service (SMS)
  + Lift-and-shift (rehost) solution which simplify migrating applications to AWS
  + Converts your physical, virtual, and cloud-based servers to run natively on AWS
  + Supports wide range of platforms, Operating Systems, and databases
  + Minimal downtime, reduced costs
* AWS Fault Injection Simulator (FIS)
  + A fully managed service for running fault injection experiments on AWS workloads
  + Based on Chaos Engineering – stressing an application by creating disruptive events (e.g., sudden increase in CPU or memory), observing how the system responds, and implementing improvements
  + Helps you uncover hidden bugs and performance bottlenecks
  + Supports the following AWS services: EC2, ECS, EKS, RDS…
  + Use pre-built templates that generate the desired disruptions
* AWS Step Functions
  + Build serverless visual workflow to orchestrate your Lambda functions
  + Features: sequence, parallel, conditions, timeouts, error handling, …
  + Can integrate with EC2, ECS, On-premises servers, API Gateway, SQS queues, etc…
  + Possibility of implementing human approval feature
  + Use cases: order fulfillment, data processing,web applications, any workflow
* AWS Ground Station
  + Fully managed service that lets you control sattelite communications, process data, and scale your satellite operations
  + Provides a global network of satellite ground stations near AWS regions
  + Allows you to download satellite data to your AWS VPC within seconds
  + Send satellite data to S3 or EC2 instance
  + Use cases: weather forecasting, surface imaging, communications, video broadcasts
* Amazon Pinpoint
  + Scalable 2-way (outbound/inbound) marketing communications service
  + Supports email, SMS, push, voice, and in-app messaging
  + Ability to segment and personalize messages with the right content to customers
  + Possibility to receive replies
  + Scales to billions of messages per day
  + Use cases: run campaigns by sending marketing, bulk, transactional SMS messages
  + Versus Amazon SNS or Amazon SES • In SNS & SES you managed each message's audience, content, and delivery schedule • In Amazon Pinpoint, you create message templates, delivery sched

# AWS Architecting & Ecosystem Section

* Well Architected Framework General Guiding Principles
  + Stop guessing your capacity needs
  + Test systems at production scale
  + Automate to make architectural experimentation easier
  + Allow for evolutionary architectures
  + Design based on changing requirements
  + Drive architectures using data
  + Improve through game days
    - Simulate applications for flash sale days
* AWS Cloud Best Practices – Design Principles
  + **Scalability**: vertical & horizontal
  + **Disposable** Resources: servers should be disposable & easily configured
  + **Automation**: Serverless, Infrastructure as a Service, Auto Scaling…
  + **Loose Coupling**:
    - Monolith are applications that do more and more over time, become bigger
    - Break it down into smaller, loosely coupled components
    - A change or a failure in one component should not cascade to other components
  + **Services, not Servers**:
    - Don’t use just EC2
    - Use managed services, databases, serverless, etc !
* Well Architected Framework 6 Pillars

OPSRPCS

* + - Operational Excellence
    1. Security
    2. Reliability
    3. Performance Efficiency
    4. Cost Optimization
    5. Sustainability
  + They are not something to balance, or trade-offs, they’re a synergy
  + Operational Excellence
  + Includes the ability to run and monitor systems to deliver business value and to continually improve supporting processes and procedures
  + Design Principles • Perform operations as code - Infrastructure as code • Annotate documentation - Automate the creation of annotated documentation after every build • Make frequent, small, reversible changes - So that in case of any failure, you can reverse it • Refine operations procedures frequently - And ensure that team members are familiar with it • Anticipate failure • Learn from all operational failures
  1. Security
  + Includes the ability to protect information, systems, and assets while delivering business value through risk assessments and mitigation strategies
  + Design Principles • Implement a strong identity foundation - Centralize privilege management and reduce (or even eliminate) reliance on long-term credentials - Principle of least privilege - IAM • Enable traceability - Integrate logs and metrics with systems to automatically respond and take action • Apply security at all layers - Like edge network, VPC, subnet, load balancer, every instance, operating system, and application • Automate security best practices • Protect data in transit and at rest - Encryption, tokenization, and access control • Keep people away from data - Reduce or eliminate the need for direct access or manual processing of data • Prepare for security events - Run incident response simulations and use tools with automation to increase your speed for detection, investigation, and recovery • Shared Responsibility Model
  1. Reliability
  + Ability of a system to recover from infrastructure or service disruptions, dynamically acquire computing resources to meet demand, and mitigate disruptions such as misconfigurations or transient network issues
  + Design Principles • Test recovery procedures - Use automation to simulate different failures or to recreate scenarios that led to failures before • Automatically recover from failure - Anticipate and remediate failures before they occur • Scale horizontally to increase aggregate system availability - Distribute requests across multiple, smaller resources to ensure that they don't share a common point of failure • Stop guessing capacity - Maintain the optimal level to satisfy demand without over or under provisioning - Use Auto Scaling • Manage change in automation - Use automation to make changes to infrastructure
  1. Performance Efficiency
  + Includes the ability to use computing resources efficiently to meet system requirements, and to maintain that efficiency as demand changes and technologies evolve
  + Design Principles • Democratize advanced technologies - Advance technologies become services and hence you can focus more on product development • Go global in minutes - Easy deployment in multiple regions • Use serverless architectures - Avoid burden of managing servers • Experiment more often - Easy to carry out comparative testing • Mechanical sympathy - Be aware of all AWS services
  1. Cost Optimization
  + Includes the ability to run systems to deliver business value at the lowest price point
  + Design Principles • Adopt a consumption mode - Pay only for what you use • Measure overall efficiency - Use CloudWatch • Stop spending money on data center operations - AWS does the infrastructure part and enables customer to focus on organization projects • Analyze and attribute expenditure - Accurate identification of system usage and costs, helps measure return on investment (ROI) - Make sure to use tags • Use managed and application level services to reduce cost of ownership - As managed services operate at cloud scale, they can offer a lower cost per transaction or service
  1. Sustainability
  + The sustainability pillar focuses on minimizing the environmental impacts of running cloud workloads.
  + Design Principles • Understand your impact – establish performance indicators, evaluate improvements • Establish sustainability goals – Set long-term goals for each workload, model return on investment (ROI) • Maximize utilization – Right size each workload to maximize the energy efficiency of the underlying hardware and minimize idle resources. • Anticipate and adopt new, more efficient hardware and software offerings – and design for flexibility to adopt new technologies over time. • Use managed services – Shared services reduce the amount of infrastructure; Managed services help automate sustainability best practices as moving infrequent accessed data to cold storage and adjusting compute capacity. • Reduce the downstream impact of your cloud workloads – Reduce the amount of energy or resources required to use your services and reduce the need for your customers to upgrade their devices
* AWS Well-Architected Tool
  + Free tool to review your architectures against the 6 pillars Well-Architected Framework and adopt architectural best practices
  + How does it work? • Select your workload and answer questions • Review your answers against the 6 pillars • Obtain advice: get videos and documentations, generate a report, see the results in a dashboard
* AWS Right Sizing
  + EC2 has many instance types, but choosing the most powerful instance type isn’t the best choice, because the cloud is elastic
  + Right sizing is the process of matching instance types and sizes to your workload performance and capacity requirements at the lowest possible cost
  + Scaling up is easy so always start small
  + It’s also the process of looking at deployed instances and identifying opportunities to eliminate or downsize without compromising capacity or other requirements, which results in lower costs
  + It’s important to Right Size…
    - before a Cloud Migration
    - continuously after the cloud onboarding process (requirements change over time)
  + CloudWatch, Cost Explorer, Trusted Advisor, 3rd party tools can help
* AWS Ecosystem – Free resources
  + AWS Blogs:

<https://aws.amazon.com/blogs/aws/>

• AWS Forums (community):

<https://forums.aws.amazon.com/index.jspa>

• AWS Whitepapers & Guides:

<https://aws.amazon.com/whitepapers>

• AWS Quick Starts:

<https://aws.amazon.com/quickstart/>

• Automated, gold-standard deployments in the AWS Cloud • Build your production environment quickly with templates • Example: WordPress on AWS

<https://fwd.aws/P3yyv?did=qs_card&trk=qs_card>

• Leverages CloudFormation • AWS Solutions:

<https://aws.amazon.com/solutions/>

• Vetted Technology Solutions for the AWS Cloud • Example - AWS Landing Zone: secure, multi-account AWS environment •

<https://aws.amazon.com/solutions/implementations/aws-landing-zone/>

• “Replaced” by AWS Control Tower

* AWS Ecosystem - AWS Support

DEVELOPER

* + Business hours email access to Cloud Support Associates
  + General guidance: < 24 business hours
  + System impaired: < 12 business hours

BUSINESS

* + 24x7 phone, email, and chat access to Cloud Support Engineers
  + Production system impaired: < 4 hours
  + Production system down: < 1 hour

ENTERPRISE

* + Access to a Technical Account Manager (TAM)
  + Concierge Support Team (for billing and account best practices)
  + Business-critical system down: < 15 minutes
* AWS Marketplace
  + Digital catalog with thousands of software listings from independent software vendors (3rd party)
  + Example: • Custom AMI (custom OS, firewalls, technical solutions…) • CloudFormation templates • Software as a Service • Containers
  + If you buy through the AWS Marketplace, it goes into your AWS bill
  + You can sell your own solutions on the AWS Marketplace
* AWS Training
  + AWS Digital (online) and Classroom Training (in-person or virtual)
  + AWS Private Training (for your organization)
  + Training and Certification for the U.S Government
  + Training and Certification for the Enterprise
  + AWS Academy: helps universities teach AWS
* AWS Professional Services & Partner Network
  + The AWS Professional Services organization is a global team of experts
  + Tey work alongside your team and a chosen member of the APN
  + APN = AWS Partner NetworK
  + APN Technology Partners: providing hardware, connectivity, and software
  + APN Consulting Partners: professional services firm to help build on AWS
  + APN Training Partners: find who can help you learn AWS
  + AWS Competency Program: AWS Competencies are granted to APN Partners who have demonstrated technical proficiency and proven customer success in specialized solution areas.
  + AWS Navigate Program: help Partners become better Partners
* AWS Knowledge Center
  + Contains the most frequent & common questions and requests
* AWS IQ
  + Quickly find professional help for your AWS projects
  + Engage and pay AWS Certified 3rd party experts for on-demand project work
  + Video-conferencing, contract management, secure collaboration, integrated billing
* AWS re:Post