AWS Solutions Architect Associate Cheat Sheet



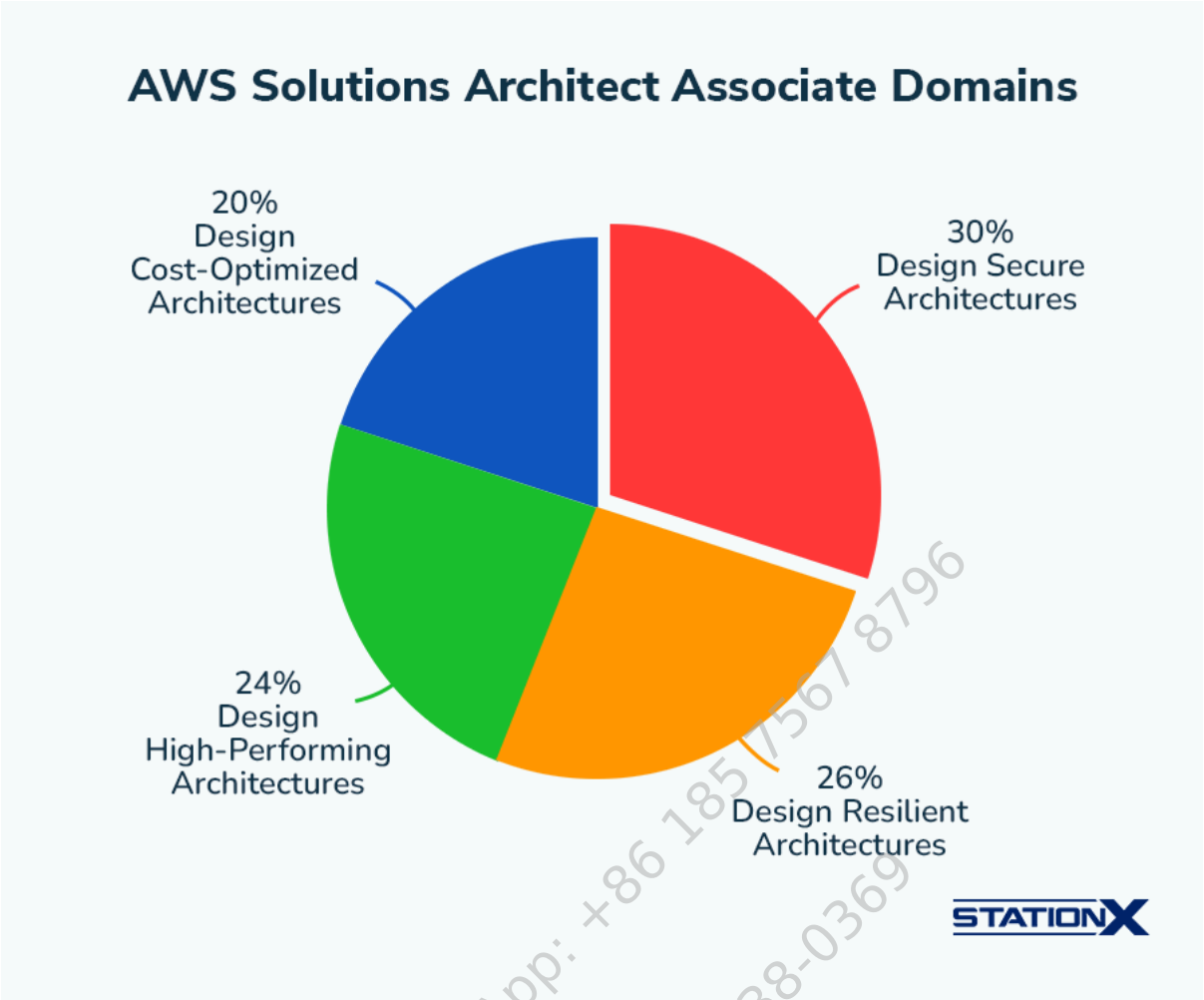
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About AWS Solutions Architect

The AWS Certified Solutions Architect - Associate exam **(SAA-C03)** is a single test comprising 65 questions. The question formats are multiple-choice and multiple-response, and the exam lasts 130 minutes and has four domains:

- Design Secure Architectures (30%)
- Design Resilient Architectures (26%)
- Design High-Performing Architectures (24%)
- Design Cost-Optimized Architectures (20%)

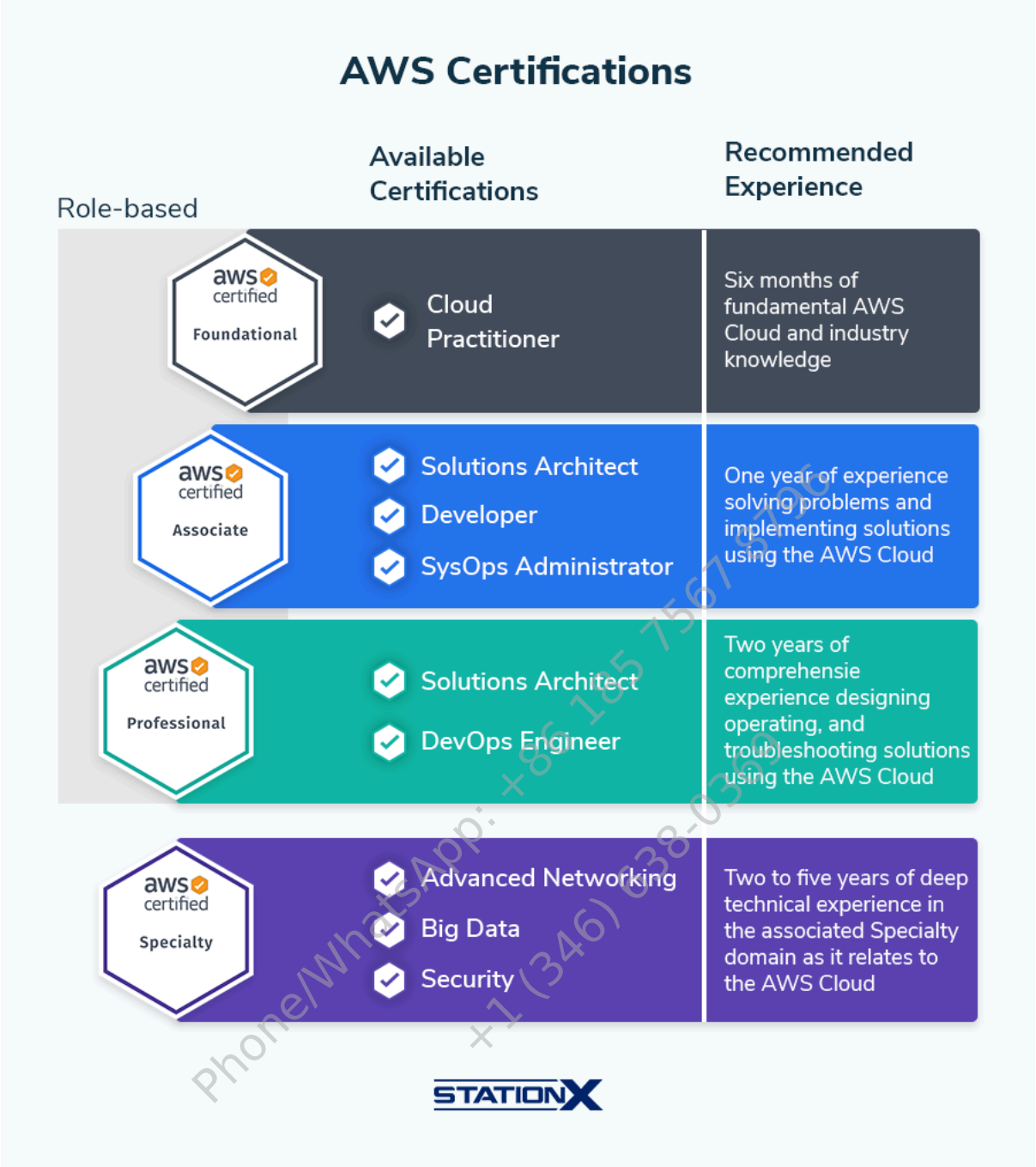
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The exam has no prerequisites, but familiarity with basic programming concepts and at least a year of hands-on experience designing cloud solutions that use AWS services would be an advantage.

Knowledge of AWS Cloud Practitioner also helps, and the passing score is 720 out of 1000. Each exam attempt costs $150 USD.

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AWS Certification Pathway

Although AWS Solutions Architect Associate isn't a vendor-neutral certification, mastering the cloud computing services it encompasses will help you make the most out of AWS.

It is popular among many large companies such as Facebook, Netflix, Adobe, and BBC, and that's what makes it such an in-demand certification in cloud computing.

AWS Solutions Architect Associate Domains

This AWS Solutions Architect Associate cheat sheet arranges concepts to align with our AWS Solutions Architect course subtopics. Diagrams put concepts into a visual form, and tables compartmentalize information.

Here's a key to finding items by domain:

Hashtag (remember to type the # symbol)	Domain
#sec	Design Secure Architectures (30%)
#res	Design Resilient Architectures (26%)
#hp	Design High-Performing Architectures (24%)
#co	Design Cost-Optimized Architectures (20%)

<<<<>>>>

AWS Foundations and Services

Here are basic terms in AWS that recur throughout our cheat sheet:

Domain	Concept	Explanation
#sec #res #hp #co	Region	Separate geographic area that AWS serves.
#sec #res #hp #co	Availability Zone (AZ)	Multiple isolated locations in each Region.
#sec #res #hp #co	Management Console	For managing and monitoring users, services, health, and billing.
#sec #res #hp #co	AWS Direct Connect	An alternative to using the internet to connect to AWS.

AWS Security and Costs

This section concerns who you allow to access your AWS services and how much it costs to use AWS.

Domain	Concept	Explanation
#sec	Identity and Access	Fine-grained access control

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	Management (IAM)	system across all of AWS.
#sec	Key Management Service (KMS)	For data encryption, to centrally manage and securely store your encryption keys.
#co	Budgets	For setting budget alerts for your budgeted cost or usage amount.
#co	Cost Explorer	Explore AWS costs and usage at high and detailed levels of analysis.

AWS Cloud Services Overview

The following table is about cloud computing on AWS.

Domain	Concept	Explanation
#hp	Infrastructure as a Service (IaaS)	Provides access to an AWS global network, computers (virtual or on dedicated hardware), and data storage space.
#hp	Platform as a Service (PaaS)	Provides supporting infrastructure, usually hardware and operating systems, to allow users to focus on deploying and managing applications.
#hp	Software as a Service (SaaS)	The service provider runs and manages a completed product for end users.

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AWS Storage Design

We must know what storage services are available with AWS to choose the ones that best fulfill our needs.

Domain	Concept	Explanation
#sec #res #hp #co	Simple Storage Service (S3)	Object-level storage in the cloud. Objects are files.

#sec #res #hp #co	Glacier	For archival data (cold).
#sec #res #hp #co	CloudFront	To bring data closer to end users.
#sec #res #hp #co	Elastic Block Store (EBS)	Block-level, for rapid-access data (hot).
#sec #res #hp #co	Storage Gateway	Quasi-VPN connection into the Amazon Cloud for data retrieval.
#sec #res #hp #co	Snow family (Snowball, Snowball Edge, Snowmobile)	For mass data migration to the cloud.

Virtual Private Cloud (VPC)

A VPC is your personal data center in the AWS cloud.

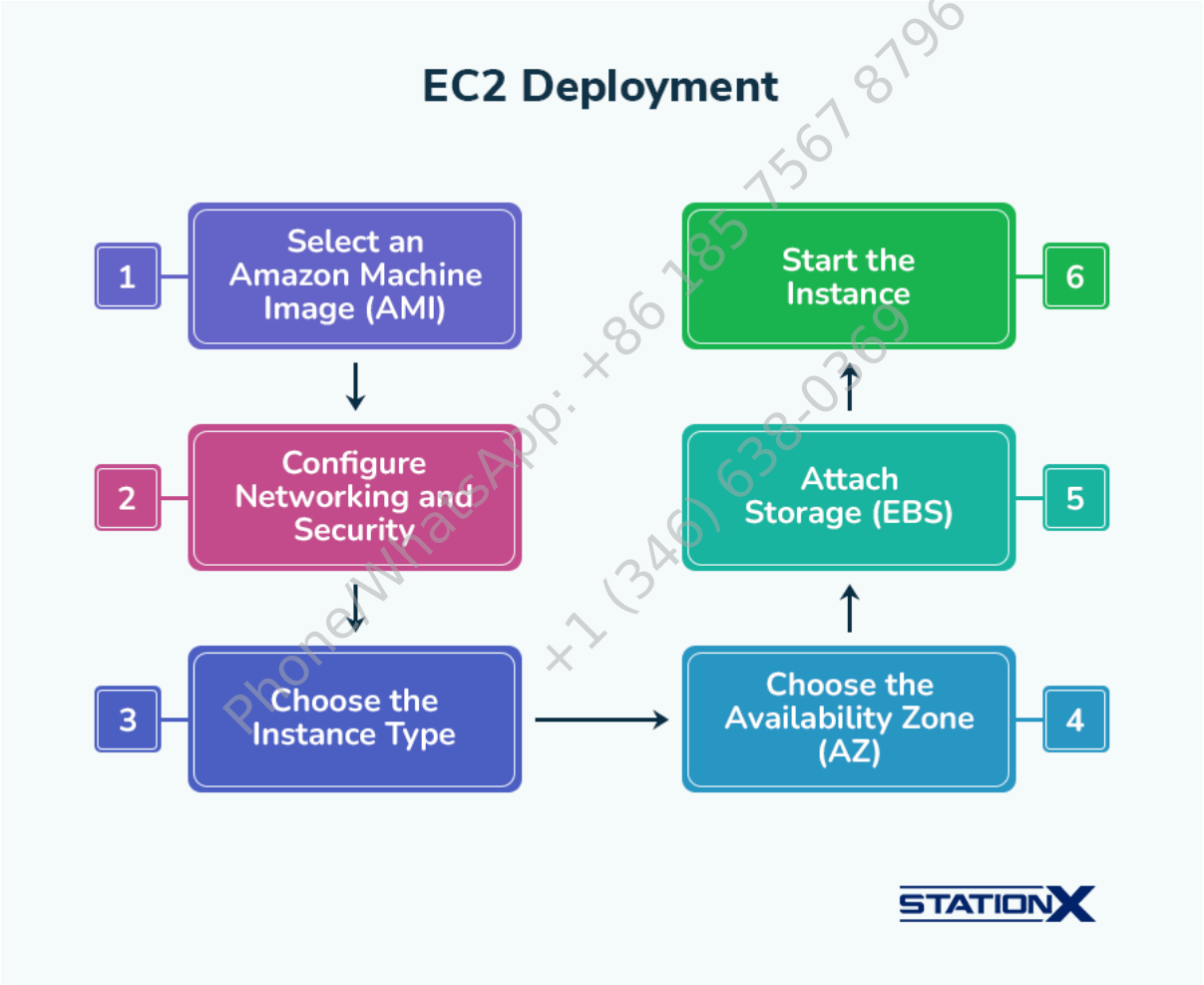
Domain	Concept	Explanation
#sec #hp #co	Elastic IP Addresses (EIPs)	Public IP addresses from the VPC Region.
#sec #hp #co	Elastic Network Interfaces (ENIs)	Virtual network interface attached to an instance.
#sec #hp #co	Endpoints	AWS endpoints connect VPCs to different AWS services.
#sec #hp #co	VPC Peering	Connects one VPC to another non-transitively.
#sec #hp #co	Security Group	• Acts like a firewall • Defines allowed traffic flows - Ingress (entrance) - Egress (exit) • Implicit deny
#sec #hp #co	Network Access Control Lists (NACLs)	• Applied on subnets • Stateless processing • Supports allow and deny rules
#sec #hp #co	Network Address Translation (NAT)	Translates between private IP addresses and public IP addresses
#sec #hp #co	Virtual Private Gateway	• Connects local networks to

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	(VPG)	the VPC • VPG is the VPN concentrator
#sec #hp #co	Customer Gateway (CGW)	Physical device or software application that connects to the VPG.

Compute Services Design

This section focuses on EC2 and how to use AWS to perform computing operations on data stored in the AWS cloud.



EC2 Deployment

Domain	Concept	Explanation
#sec #res #hp #co	Elastic Compute Cloud (EC2)	Virtual machine in the cloud

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#hp #co	**EC2 Instance Types**	• General Purpose • Compute Optimized • Memory Optimized • Storage Optimized • Advanced Computing
#hp #co	**General Purpose:** T2, M5, M4, and M3	• T2 provides burst performance • M5, M4, and M3 have no burst option - Good for development, staging, etc.
#hp #co	**Compute Optimized:** C5, C4, and C3	Useful for CPU-intensive applications - Media coding - Intensive batch jobs - Many concurrent users - Gaming servers - Anything compute-intensive
#hp #co	**Memory Optimized:** X1e, X1, R4, and R3	Useful for high memory requirements - Processing large data sets - In-memory databases - Big data processing
#hp #co	**Storage Optimized:** H1, I3, and D2	Useful for high sequential read/writes to local storage - Relational databases - Data warehousing - Image storage and processing
#hp #co	**Advanced Computing:** P3, P2, G3, and F1	Useful for specialty hardware compute requirements - Graphic Processing Unit (GPU) - Field Programmable Gate Array (FPGA)
#co	EC2 Pricing Categories	• On-demand • Reserved • Spot
#res #co	EBS Considerations	Persistent block storage.
#hp #co	Compute Optimizer	AWS tool to reduce costs and improve performance.

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Compute Services Implementation

This section is about how to get EC2 instances up and running and various other considerations.

The table below lists considerations with pros and cons:

Domain	Concept	Explanation
#co	Shared Tenancy	Multiple instances on a physical machine.
#sec #co	Dedicated Hosts	Physical machines run the virtual machines.
#hp	Dedicated Instances	Runs singly on a physical machine.

The following table lists other concepts in this section:

Domain	Concept	Explanation
#sec #res #hp #co	Amazon Machine Image (AMI)	• Blueprint with server configuration details • AMI launch permissions: - Public: Anyone - Explicit: Specified - Implicit: Owner
#co	Hardware Virtual Machine (HVM) AMI	Fully virtualizes the hardware.
#co	Paravirtual (PV) AMI	Runs on hosts without specific support for virtualization.

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Compute Services Management

AWS supports up-and-running instances in the following ways:

Domain	Concept	Explanation
#sec	Security Groups	Network Load Balancer (NLB) collection on which you enforce access control policies.
#res #hp	Elastic Container Service (ECS)	Allows you to run Docker containers without virtual machine builds.

#res	Elastic Beanstalk	Automatically handles the deployment details of an uploaded application.
#res #hp #co	Advanced EC2 management methods	• Resource optimization recommendations • Host recovery • Traffic mirroring
#hp	Batch	Easily and efficiently runs batch computing jobs en masse.

Comparison between Security Group and Network ACL

Security Group	Network ACL
Operates at the instance level	Operates at the subnet level
Supports allow rules only	Supports allow rules and deny rules
Is stateful: Return traffic is automatically allowed, regardless of any rules	Is stateless: Return traffic must be explicitly allowed by rules
We evaluate all rules before deciding whether to allow traffic	We process rules in number order when deciding whether to allow traffic
Applies to an instance only if someone specifies the security group when launching the instance, or associates the security group with the instance later on	Automatically applies to all instances in the subnets it's associated with (therefore, you don't have to rely on users to specify the security group)

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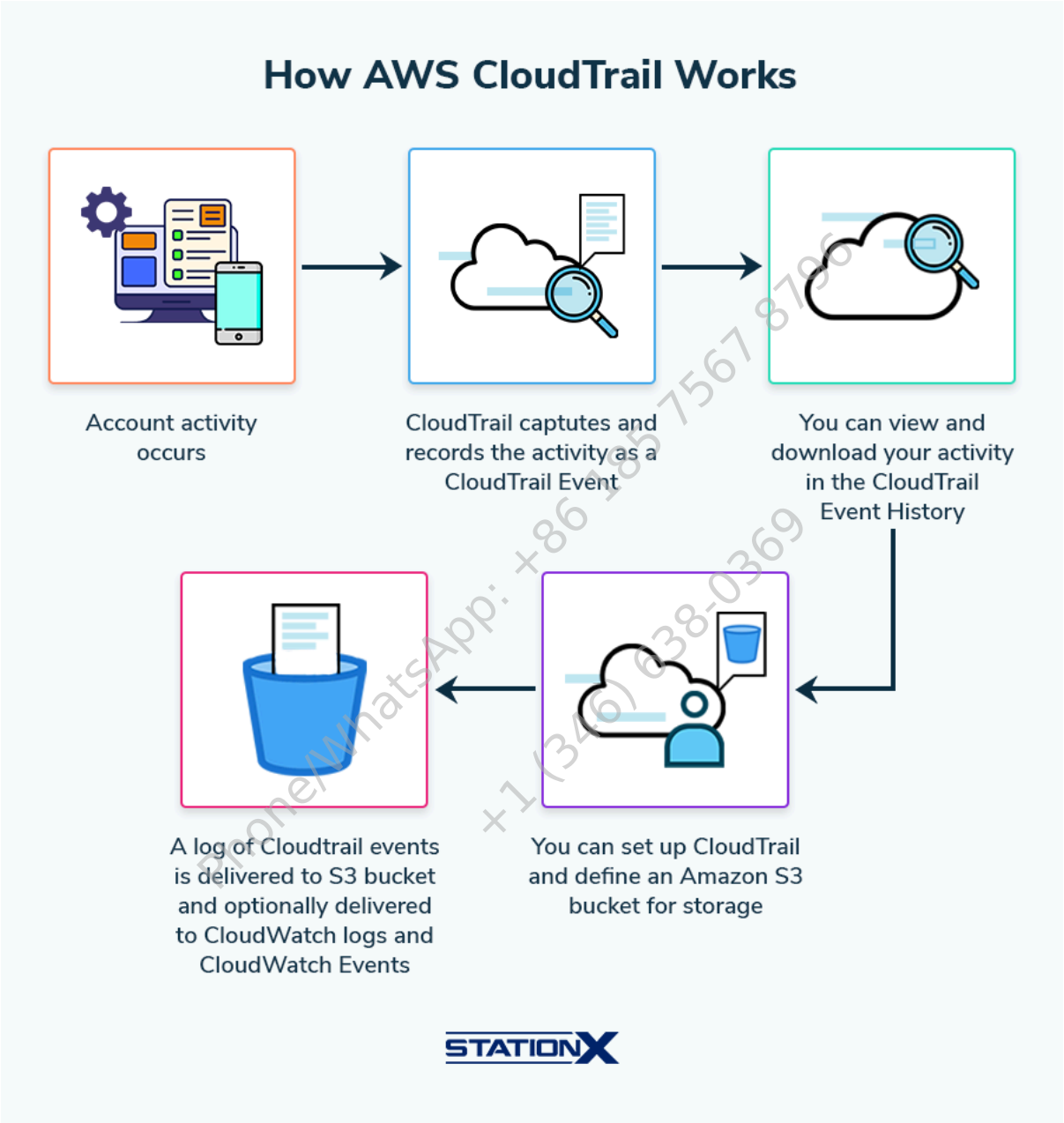
Identity and Access Management (IAM)

AWS IAM is a web service that helps you securely control access to AWS resources. It appears on every AWS exam, involving services taking on different IAM roles. A deep understanding of IAM will lay a solid foundation for the rest of your educational journey in AWS.

Domain	Concept	Explanation
#sec	User	Person or service with permissions
#sec	Group	Collection of IAM users on which you manage permissions
#sec	Role	Temporary security credential
#sec	Root user	• Email address used to create the AWS subscription • Capability to delete AWS account
#sec	Authentication	• Validation of credentials • Credentials provide identity • Single-factor • Multi-factor • Authentication of persons • Authentication of processes
#sec	Shared Responsibility Model	- AWS provides security of the cloud. - You provide security in the cloud.
#sec	Identity-based authorization policies	Used with users, groups, or roles.
#sec	Resource-based authorization policies	Used for cross-account access (multiple AWS accounts and subscriptions).
#sec	Key Rotation	The recurring creation of new access keys to replace the ones in use.
#sec	CloudTrail	Logging services - Governance - Compliance - Auditing

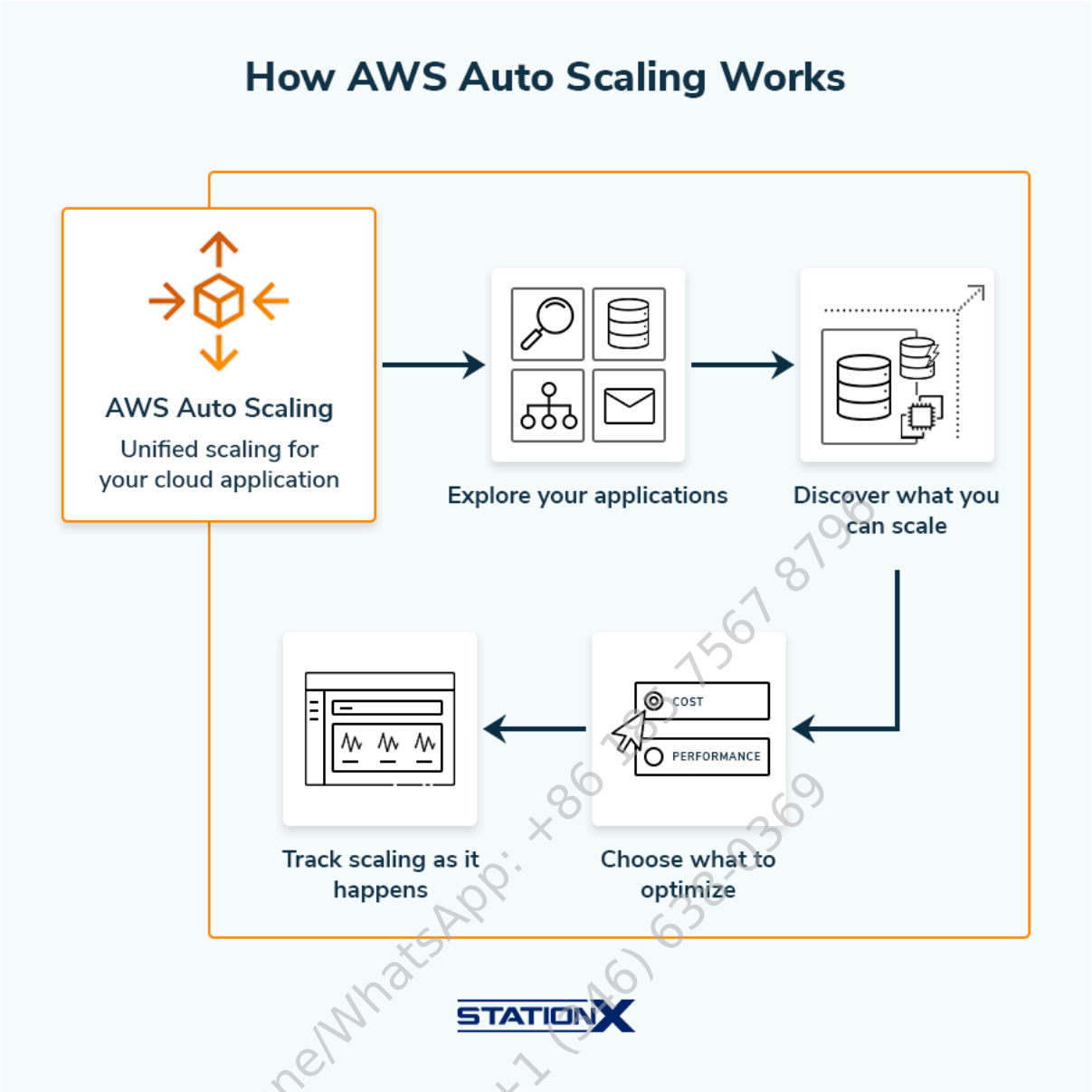
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		Event histories - Management Console - AWS SDK - Command line - Additional AWS services



Auto Scaling Solutions

This section is about AWS's built-in dynamic scaling capabilities for your instances there.



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How AWS Auto Scaling Works

Domain	Concept	Explanation
#res #hp #co	Auto Scaling Groups	Collection of instances with similar characteristics.
#res #hp	Scaling out	Adding instances.
#res #hp	Scaling in	Removing instances.
#hp #co	Auto Scaling termination policies	Control the instances you prefer to terminate first.
#res #hp #co	Load balancing categories	• Sender initiated • Receiver initiated

#res #hp #co	Load balancing algorithms	• Round robin • Randomized • Centrally managed • Threshold-based
#res #hp #co	Elastic Load Balancing (ELB)	Automatic web traffic distribution system.

Virtual Network Services

Here's what you need to know about networking in the AWS cloud environment.

Domain	Concept	Explanation
#sec #res #co	DNS (Domain Name System)	Provides name to IP address mapping.
#res	Route 53	Amazon DNS service.
#sec	Access Control List (ACL)	Rules that allow or deny access to a system. Also see NACL.
#sec #co	Flow Log	Allows you to log traffic flows at network interfaces in your VPC.

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AWS Application Deployment

A fantastic aspect of AWS is its serverless architecture, as exemplified by its Lambda and API Gateway services.

Domain	Concept	Explanation
#res #hp	Serverless architecture	Transfers data and processes functions across the cloud without instances.
#sec	Reference Architectures	Examples: - HIPAA - PCI-DSS - UK-OFFICIAL
#res #hp	Lambda	AWS compute service that runs code without servers.
#res #hp	API Gateway	API management in the cloud.

#sec #res #hp #co	Cross-Origin Resource Sharing (CORS)	Allow client web applications loaded in one domain to interact with resources in a different domain.
#sec #hp	Kinesis	Processes streaming data with real-time analytics.
#res #hp #co	CloudFront	Amazon's Content delivery network (CDN).
#sec	Web Application Firewall (WAF)	Controls access to HTTP and HTTPS servers.
#res #hp	Simple Queue Service (SQS)	Breaks applications into separate processing tasks which, combined, give the complete solution.
#res #hp	Simple Notification Service (SNS)	Paging in the cloud.
#res	Simple Workflow (SWF)	Defines the sequence of events required to achieve a workflow in decoupled applications.
#res	Step Functions	Replacement for SWF.
#sec	Cognito	User identity and data synchronization service.
#hp	Elastic MapReduce (EMR)	Distributes processing across user-defined clusters, pulls data from S3 buckets, and uses EC2 instances.
#res	CloudFormation	Uses templates to build entire solutions in AWS rapidly.
#sec #res	CloudWatch	Monitors the cloud and on-premises systems.
#sec #co	Trusted Advisor	Scans the AWS cloud for recommendations on security and other issues.
#sec #co	AWS Organizations	Centralized management interface for AWS accounts.

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AWS Database Design

Here are some essential concepts for designing secure databases on AWS.

Database Hosting Method Comparison

Instance-Based Considerations	Service-Based Considerations
Complete Control	Less Control
Manual Performance Management	Automatic Performance Management
Manual Updates	Automatic Updates



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Domain	Concept	Explanation
#res #hp #co	Relational Database Service (RDS)	Quickly and easily launch relational databases such as: - Aurora MySQL - Aurora PostgreSQL - Oracle - SQL Server - MySQL - PostgreSQL - MariaDB
#res #hp	Flat file databases	One line per record.
#res #hp	Relational databases	Unique identifiers connect tables containing data.
#sec #res #hp #co	Redshift	Data warehouse database optimized for Online Analytical Processing (OLAP).
#res #hp #co	DynamoDB	Non-relational database on

		AWS.
#hp #co	Normalization	Process for evaluating and correcting relational database structures in stages called **normal forms (NF).**
#hp #co	Database hosting methods	- EC2 instance-based - AWS service-based
#hp #co	High availability solutions	- Clustering - Standby instances - Single AZ deployment - Multiple AZ deployment
#hp #co	Read replica	A read-only copy of the database offloads read-only traffic from the main database.
#sec	At rest encryption of RDS databases	Enable upon creation or manually upon recovery.
#sec	Compliance	External (what) - Government regulations - Industry requirements - Partner agreements
#sec	Policy	Internal (how) - Data creation - Data management - Data destruction
#sec	Backups	Centrally manage and automate backups across AWS services and third-party applications.

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Operational Excellence With AWS

Getting the best performance at the lowest cost is the hallmark of a great AWS Certified Solutions Architect. This section covers relevant concepts.

Choosing Performant Storage on AWS

Storage	Services	Latency	Throughput	Shareable
Block	EBS, EC2 instance store	Lowest, consistent	Single	Mounted on single instance, copies via snapshots
File system	EFS	Low, consistent	Multiple	Many clients
Object	S3	Low-latency	Web scale	Many clients
Archival	Glacier	Minutes to hours	High	No



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Domain	Concept	Explanation
#co	Well-Architected Framework	• Operational Excellence • Security • Reliability • Performance Efficiency • Cost Optimization
#co	**Operational Excellence Process**	• Prepare • Operate • Evolve
#co	**Prepare**	• Understand workloads and expected behaviors • Considerations • Operational priorities • Design for operations • Operational readiness
#co	**Operate**	• Monitor • Environment health • Discover business and technical insights • Respond • Security • Reliability

		• Performance • Cost
#co	**Evolve**	• Learn from experience • Share learning • Improve • Scale
#res	Resilient Design	• Provides reliability • Automation • Recovery • Scaling • Backups • Automatic recovery from failures • Data recovery from effective backup plans
#hp	Performant Design	• Consume advanced technologies managed in the cloud • Deploy to multiple regions • Use serverless architectures • Experiment with game days
#sec	Secure Design	• Implement a strong identity foundation • Enable traceability • Apply security at all layers • Automate security best practices • Protect data in transit and at rest
#co	Cost Optimization	• Consumption model • Measure overall efficiency • Stop spending on data center operations • Analyze and attribute expenditure • Use managed services

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Conclusion

As you can see, the AWS Certified Solutions Architect Associate certification helps prove to employers your competence in using AWS services like a pro.

This AWS Solutions Architect Associate cheat sheet gives you an overview of key AWS topics to remember, but we also offer a complete course—listed below—to help you prepare for the AWS Certified Solutions Architect Associate exam.

Don't forget to check out our StationX Membership to access a wide range of cloud computing, security, and related courses.

No matter how you prepare for the AWS Certified Solutions Architect Associate exam, we wish you great success and a bright future!

- TOTAL: AWS Solutions Architect Associate
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