Architecting for Security on AWS

PROTECTING AWS CREDENTIALS

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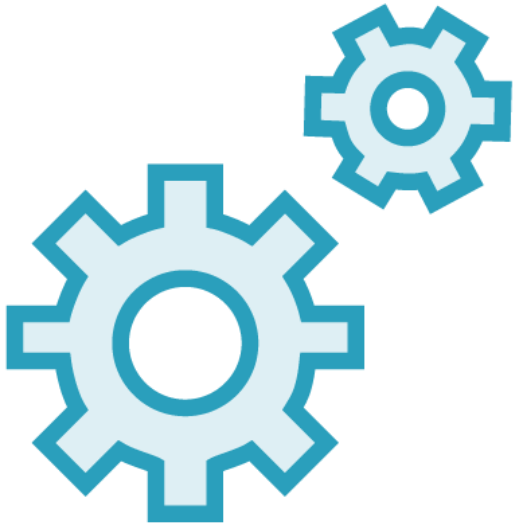
Views of Security

A good feeling



Restrictive configuration settings

Security patching

Monitoring

Security is about
protecting data

The CIA Triad

Confidentiality

Integrity

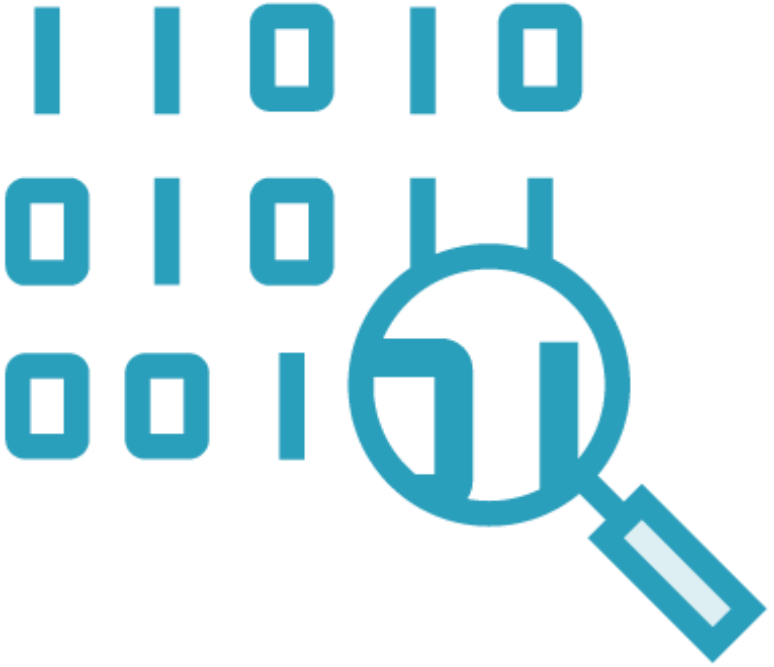
Availability

Confidentiality

Only authorized parties can access data

Examples: ACLs and encryption

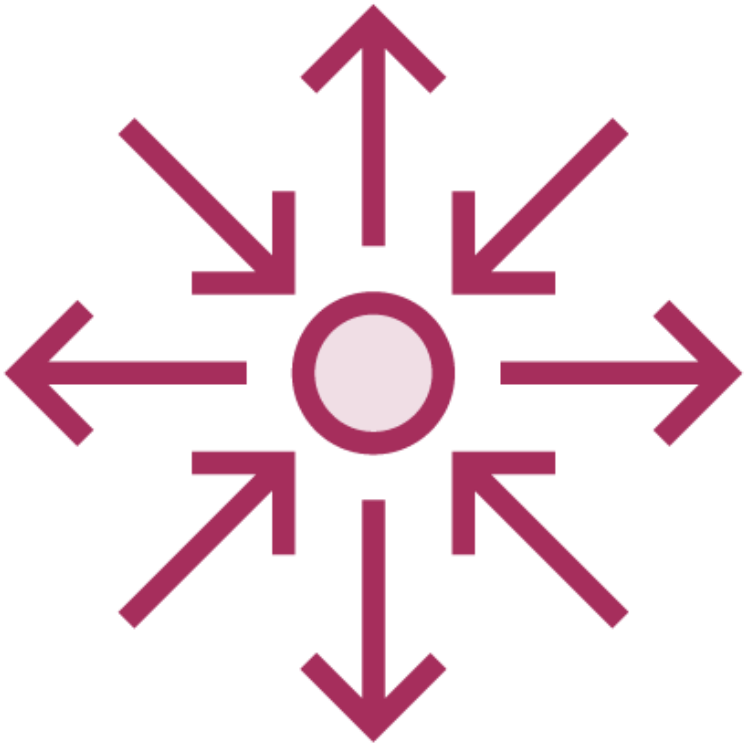
Integrity



Data has not been improperly modified

Includes knowing if data has been modified

Availability



Authorized parties have access to data when they need it

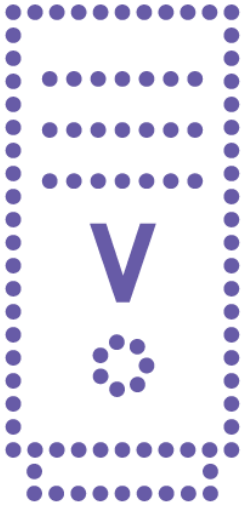
Includes protecting systems that store, process, and deliver data

Defense in depth

Protecting the confidentiality, integrity, and availability of data by securing everything that touches the data, including storage, compute, and networking

Levels of Architecture

AWS services



Operating systems

Applications

Course Overview

Prerequisites

6 months of technical experience with AWS

AWS root user access

Amazon Web Services (AWS) Fundamentals for System Administrators by Elias Khnaser

Course Overview

Protecting AWS credentials

Capturing and analyzing logs

Protecting network and host-level boundaries

Protecting data at rest

Protecting data in transit

Configuring data backup, replication, and recovery

Protecting AWS Credentials

Identity and Access Management (IAM)

Capturing and Analyzing Logs

What to log and how to organize logs

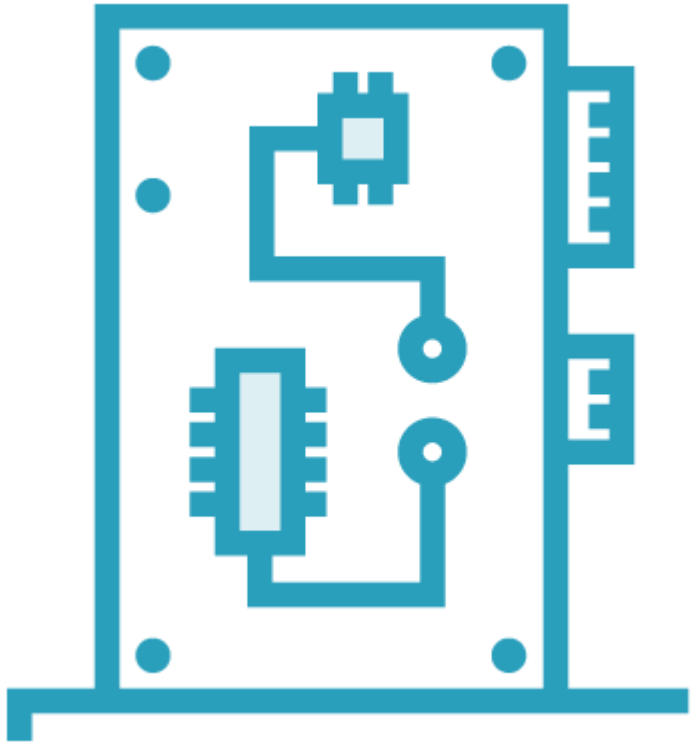
Storing logs

Alerting

Searching

CloudTrail and CloudWatch

Protecting Network and Host-level Boundaries



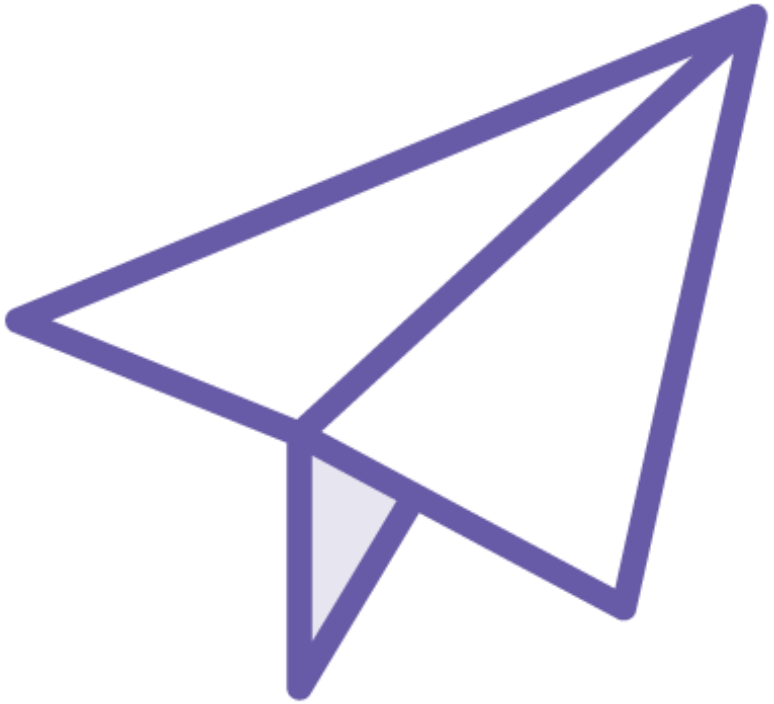
Network and OS-based controls

Protecting Data at Rest

Encryption

Permissions

Protecting Data in Transit



Encryption ensures confidentiality and integrity

Data Backup, Replication, and Recovery

Ensures the availability of data

Understanding AWS Credentials

AWS Credential Types

Root user

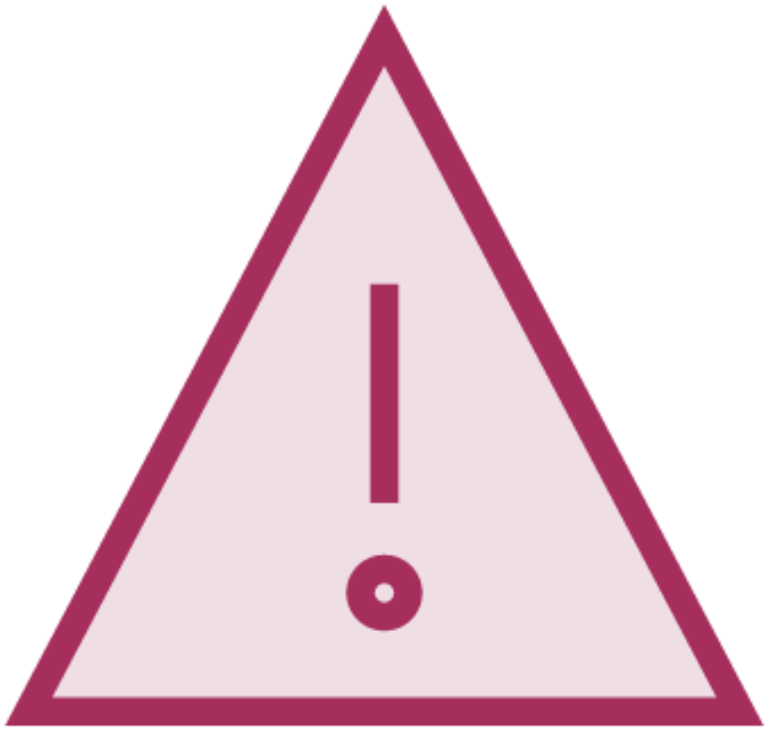
Full access to all AWS resources

Only one root user per account

IAM (non-root) principal

Any entity that can perform actions on AWS services and resources

Policies determine what permissions a principal has



Be careful about using the word “account”

An AWS account is the container that houses resources and billing information

You can log into an AWS account using the root user

Locking Down the Root User

Locking Down the Root User

Enable multi-factor authentication (MFA)

Requires an email address, password, and one-time passcode

Don't **use the root user for administrative tasks**

Use a non-root IAM user with administrative permissions

Demo

Enable multi-factor authentication for the root user

Introduction to Principals and Policies

IAM Principal

The foundation of IAM

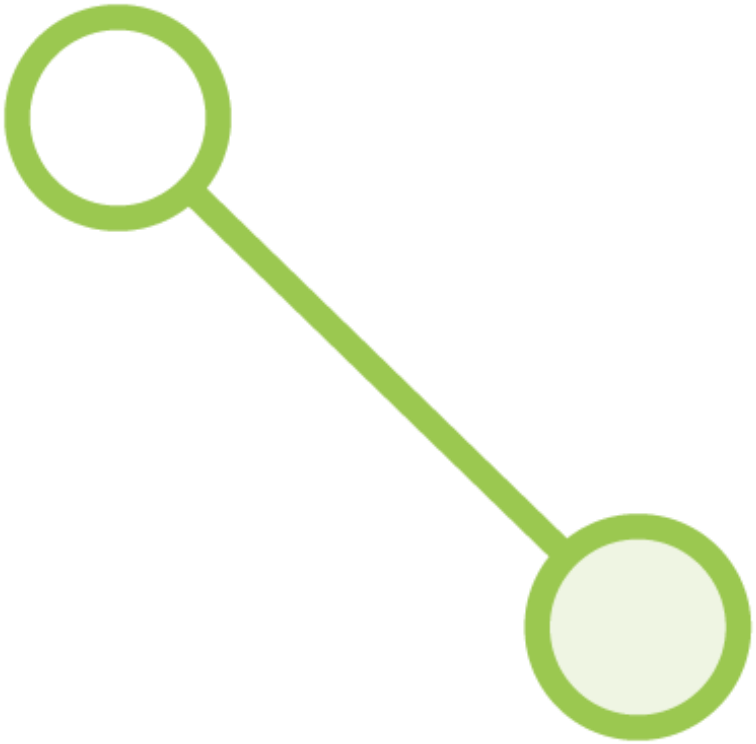
An entity that can take an action on an AWS resource

Often used as a synonym for identity

Principles include users and roles

A non-root *principal* has no permissions by default

Policies determine what permissions a principal has



You must grant permissions to a principal by associating it with a policy

Understanding Policies

Permission Statement

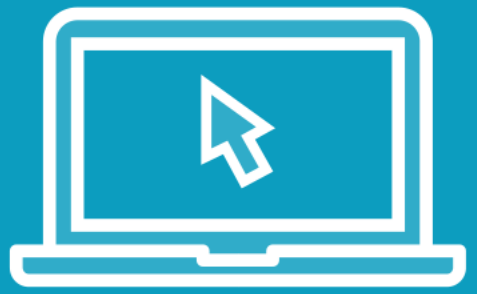
Element	Example
Effect (allow or deny)	Allow
Service	EC2
Action/operation	RunInstances
Resource (depends on service)	image/ami-e5d9439a
Request condition (MFA, IP range, time)	198.51.100.0/24

AWS Managed Policies

Cover a variety of common scenarios

Updated regularly to include new services and actions

Demo



Examine the `AdministratorAccess` policy

Create a new IAM user

Attach the `AdministratorAccess` policy to the new user

Denying Access with User Policies

Using the Deny Effect

AdministratorAccess		RestrictAdmin
Effect:	allow	deny
Service:	*	EC2
Action:	*	TerminateInstances
Resource:	*	*

Demo

Create another user and associate with the `AdministratorAccess` policy

Implement another policy to deny access to the `TerminateInstances` action

Summary

Implement MFA for the root user

Use an administrative user instead of root

AWS Managed Policies are updated as new services and actions are added

A policy permission consists of an effect, service, action/operation, and resource

A user policy is an inline policy embedded in a user

A group policy is embedded in a group

Customer Managed Policies work like AWS Managed Policies, but are created by you

Coming up Next

Capturing and Analyzing Logs