



Core AWS Services for DevOps

Compute Services

EC2 (Elastic Compute Cloud)	<p>Virtual servers in the cloud. Choose from various instance types, operating systems, and software packages.</p> <ul style="list-style-type: none">• Scalable compute capacity.• Pay-as-you-go pricing.• Supports Linux, Windows, and macOS.
Lambda	<p>Serverless compute service that runs your code in response to events.</p> <ul style="list-style-type: none">• No servers to provision or manage.• Automatic scaling.• Supports multiple languages (Python, Node.js, Java, Go, etc.).
ECS (Elastic Container Service)	<p>Container management service that supports Docker containers.</p> <ul style="list-style-type: none">• Run containerized applications on AWS.• Integrates with other AWS services.• Supports both EC2 and Fargate launch types.
EKS (Elastic Kubernetes Service)	<p>Managed Kubernetes service to run containerized applications.</p> <ul style="list-style-type: none">• Simplifies Kubernetes deployment and management.• Highly scalable and reliable.• Integrates with AWS networking and security services.

Storage Services

S3 (Simple Storage Service)	<p>Object storage service for storing and retrieving any amount of data.</p> <ul style="list-style-type: none">• Highly scalable and durable.• Supports versioning and lifecycle policies.• Used for storing backups, media files, and application data.
EBS (Elastic Block Storage)	<p>Block storage volumes for use with EC2 instances.</p> <ul style="list-style-type: none">• Provides persistent storage for EC2 instances.• Supports different volume types (SSD, HDD).• Can be attached and detached from EC2 instances.
EFS (Elastic File System)	<p>Scalable file storage for use with EC2 instances.</p> <ul style="list-style-type: none">• Provides shared file system access for multiple EC2 instances.• Supports NFSv4 protocol.• Automatically grows and shrinks as you add or remove files.

Database Services

RDS (Relational Database Service)	<p>Managed relational database service that supports various database engines (MySQL, PostgreSQL, Oracle, SQL Server, MariaDB).</p> <ul style="list-style-type: none">• Simplifies database administration.• Provides automated backups and patching.• Supports read replicas for improved read performance.
DynamoDB	<p>NoSQL database service that provides fast and predictable performance at any scale.</p> <ul style="list-style-type: none">• Fully managed and serverless.• Supports key-value and document data models.• Ideal for applications with high read and write volumes.

Configuration Management & Automation

Infrastructure as Code (IaC)

<p>Managing and provisioning infrastructure through code, rather than manual processes.</p> <p>Key benefits:</p> <ul style="list-style-type: none">• Version control• Automation• Reproducibility

AWS CloudFormation

CloudFormation Overview	<p>A service that allows you to define and provision AWS infrastructure as code using templates.</p> <ul style="list-style-type: none">• Supports JSON and YAML formats.• Allows for creating, updating, and deleting AWS resources in a predictable way.
Example Template (YAML)	<pre>Resources: MyEC2Instance: Type: AWS::EC2::Instance Properties: ImageId: ami-0c55b24cd011c7154 InstanceType: t2.micro</pre>

AWS Systems Manager

Systems Manager Overview	<p>Provides a unified interface to manage AWS resources at scale.</p> <ul style="list-style-type: none">• Automation: Automate operational tasks across AWS resources.• Patch Manager: Automate the process of patching operating systems and applications.• Run Command: Remotely and securely manage the configuration of managed instances.
Key Features	<ul style="list-style-type: none">• State Manager: Maintain consistent configuration across instances.• Inventory: Collect software and hardware inventory information.• Session Manager: Securely access EC2 instances without opening inbound ports.

CI/CD Pipelines on AWS

AWS CodePipeline

CodePipeline Overview	<p>A fully managed continuous delivery service that helps you automate your release pipelines for fast and reliable application and infrastructure updates.</p> <ul style="list-style-type: none">• Automates the build, test, and deploy phases of your release process.• Integrates with other AWS services like CodeCommit, CodeBuild, and CodeDeploy.
Key Concepts	<ul style="list-style-type: none">• Pipeline: A workflow that defines the steps for releasing code changes.• Stage: A logical unit in a pipeline that performs actions, such as building or testing code.• Action: A task performed within a stage, such as running a build command or deploying code.

AWS CodeBuild

CodeBuild Overview	<p>A fully managed build service that compiles source code, runs tests, and produces software packages that are ready to deploy.</p> <ul style="list-style-type: none">• Scales automatically to meet peak build demands.• Supports multiple build environments (e.g., Docker, Java, Python).• Integrates with CodePipeline for continuous integration.
Build Specification (buildspec.yml)	<p>A YAML file that defines the build commands and settings for CodeBuild.</p> <pre>version: 0.2 phases: install: commands: - echo "Installing dependencies..." - npm install build: commands: - echo "Building the application..." - npm run build</pre>

AWS CodeDeploy

CodeDeploy Overview	<p>A fully managed deployment service that automates software deployments to various compute services, such as EC2 instances, Lambda functions, and ECS clusters.</p> <ul style="list-style-type: none">• Supports multiple deployment strategies (e.g., blue/green, rolling).• Provides rollback capabilities to revert to previous deployments.• Integrates with CodePipeline for continuous deployment.
AppSpec File (appspec.yml)	<p>A YAML file that defines the deployment steps and settings for CodeDeploy.</p> <pre>version: 0.0 os: linux files: - source: /dist destination: /var/www/html hooks: AfterInstall: - location: scripts/install_dependencies.sh timeout: 300 runas: root</pre>

Monitoring and Logging

AWS CloudWatch

CloudWatch Overview	<p>A monitoring and observability service that collects and tracks metrics, logs, and events from AWS resources and applications.</p> <ul style="list-style-type: none">Provides real-time insights into the performance of your applications.Allows you to set alarms to trigger actions based on metric thresholds.Integrates with other AWS services for comprehensive monitoring.
Key Features	<ul style="list-style-type: none">Metrics: Collect numerical data about resource utilization, application performance, and other key indicators.Logs: Aggregate and analyze log data from various sources, such as EC2 instances, Lambda functions, and containerized applications.Alarms: Set thresholds on metrics and trigger notifications or automated actions when the thresholds are breached.

AWS CloudTrail

CloudTrail Overview	<p>A service that records API calls made to AWS services in your account and delivers log files to an S3 bucket.</p> <ul style="list-style-type: none">Provides an audit trail of user activity and API usage.Helps you meet compliance and governance requirements.Enables security analysis and troubleshooting.
Key Benefits	<ul style="list-style-type: none">Security: Monitor and detect unauthorized access or suspicious activity.Compliance: Track API usage to meet regulatory requirements.Operational Troubleshooting: Identify the root cause of operational issues by analyzing API call history.