

Amazon Web Services (AWS) Primer

Introduction to Resources and Terminology

AWS Primer

- **Global Infrastructure**
- Security
- Networking
- Compute
- Storage
- Databases
- CloudFormation Scripts

AWS Global Infrastructure

- Regions
 - An independent collection of AWS resources in a defined geography
- Availability Zones
 - Designed as independent failure zones
 - Physically separated within a typical metropolitan region
 - Minimum of 2 AZ's per region
- Edge Locations
 - To deliver content to end users with lower latency
 - Supports global DNS infrastructure (Route 53) and Cloud Front CDN

Global Infrastructure

Global infrastructure



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Security

- Identity Access Management (IAM) Roles and Policies
 - Create users and set permissions
 - Control how users, services, and applications can use your EC2 resources (without sharing your security credentials)
- Key pairs
 - AWS uses public-key crypto to encrypt and decrypt login information
 - Each user needs a key pair to access AWS resources
 - Use generated private key when connecting to resources

Security

- Security Groups
 - Virtual firewall that controls traffic for one or more EC2 instances
 - Add rules to the security group to allow traffic to and from instances



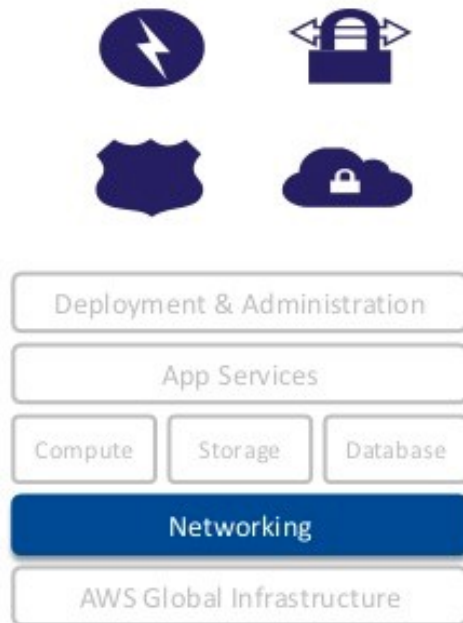
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Networking

- All enterprises will use Virtual Private Cloud (VPC)
- All new accounts use VPC by default
- An account can have multiple VPCs
- You can peer between VPCs that do not have overlapping IP ranges
- Network egress from the VPC is via a NAT (network address translation) instance

Networking



Direct Connect

Dedicated connection to AWS

VPN Connection

Secure internet connection to AWS

Virtual Private Cloud

Private, isolated section of the AWS Cloud

Route 53

Highly available and scalable Domain Name System

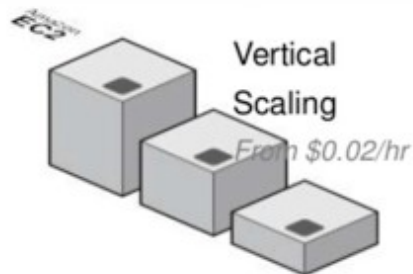
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Compute

- There are over 20 instance types!
- The installer uses recommended types
 - Mostly t2 class, some larger m3 class
- Spot instances are not supported or advised
- A new AWS account has a restricted number of EC2 instances that can be run
 - Open a support ticket to raise limits, usually taken care of quickly

Compute



Elastic Compute Cloud (EC2)

Basic unit of compute capacity

Range of CPU, memory & local disk options

13 Instance types available, from micro to cluster compute

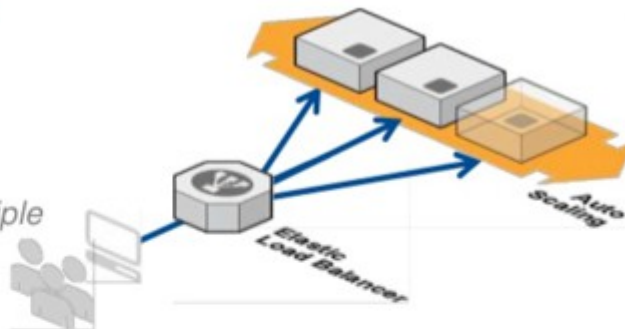
Feature	Details
Flexible	Run windows or linux distributions
Scalable	Wide range of instance types from micro to cluster compute
Machine Images	Configurations can be saved as machine images (AMIs) from which new instances can be created
Full control	Full root or administrator rights
Secure	Full firewall control via Security Groups
Monitoring	Publishes metrics to Cloud Watch
Inexpensive	On-demand, Reserved and Spot instance types
VM Import/Export	Import and export VM images to transfer configurations

Compute

Elastic Load Balancing

Create highly scalable applications

Distribute load across EC2 instances in multiple availability zones



Feature	Details
Auto-scaling	Automatically scales to handle request volume
Available	Load balance across instances in multiple availability zones
Health checks	Automatically checks health of instances and takes them in or out of service
Session stickiness	Route requests to the same instance
Secure sockets layer	Supports SSL offload from web and application servers with flexible cipher support

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Storage



S3 - Durable storage, any object

99.999999999% durability of objects

Unlimited storage of objects of any type

Up to 5TB size per object



Elastic Block Store

High performance block storage device

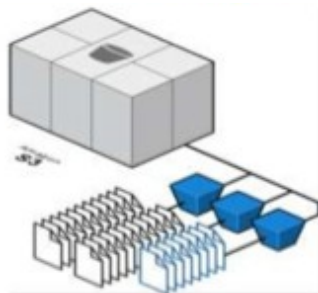
1GB to 1TB in size

Mount as drives to instances

Storage

- S3 bucket names must be unique GLOBALLY
 - All regions share the same namespace (but not physically)
- Choose DNS safe names to be safe

Storage



Deployment & Administration

App Services

Compute

Storage

Database

Networking

AWS Global Infrastructure

S3 - Durable storage, any object

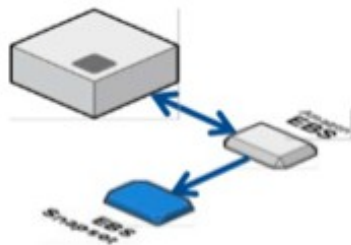
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Feature	Details
Flexible object store	Buckets act like drives, folder structures within
Access control	Granular control over object permissions
Server-side encryption	256bit AES encryption of objects
Multi-part uploads	Improved throughput & control
Object versioning	Archive old objects and version new ones
Object expiry	Automatically remove old objects
Access logging	Full audit log of bucket/object actions
Web content hosting	Serve content as web site with built in page handling
Notifications	Receive notifications on key events
Import/Export	Physical device import/export service

Storage



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Feature	Details
High performance file system	Mount EBS as drives and format as required
Flexible size	Volumes from 1GB to 1TB in size
Secure	Private to your instances
Available	Replicated within an Availability Zone
Backups	Volumes can be snapshotted for point in time restore
Monitoring	Detailed metrics captured via CloudWatch

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Database



Relational Database Service

Database-as-a-Service

No need to install or manage database instances

Scalable and fault tolerant configurations



DynamoDB

Provisioned throughput NoSQL database

Fast, predictable performance

Fully distributed, fault tolerant architecture

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CloudFormation Scripts

- Create AWS resources
- For PCF installation:
 - S3 Buckets for Ops Manager and ER, IAM user for PCF, keypair, VPC
 - Configure security groups for Ops Manager, PCF VM's, Elastic Load Balancer, Outbound NAT, MySQL
 - Configure the Pivotal Ops Manager AMI
 - Prepare a load balancer
 - Configure the NAT instance
 - Record the Ops Manager instance public DNS address
 - Setup subnets for RDS