What is EC2?

Amazon Elastic Compute Cloud (Amazon EC2) is a web service that provides resizable compute capacity in the cloud. Amazon EC2 reduces the time required to obtain and boot new server instances to minutes, allowing you to quickly scale capacity, both up and down, as your computing requirements change.

What is EC2?

Amazon EC2 changes the economics of computing by allowing you to pay only for capacity that you actually use. Amazon EC2 provides developers the tools to build failure resilient applications and isolate themselves from common failure scenarios.
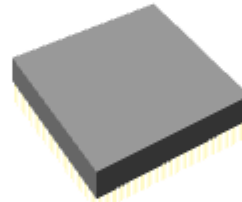
EC2 Basics

Conceptually Understanding EC2

Basic Computer Components

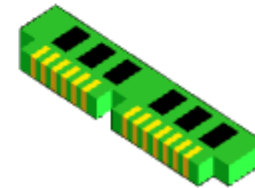**Operating System
(Linux or Windows)**

**CPU
(Processing Power)**

**Hard Drive
(Local Storage)**

**Network Card
(Internet Access)**

**Firewall
(Security)**

RAM

EC2 Options

- On Demand - allow you to pay a fixed rate by the hour with no commitment.

- Reserved - provide you with a capacity reservation, and offer a significant discount on the hourly charge for an instance.1 Year or 3 Year Terms

- Spot - enable you to bid whatever price you want for instance capacity, providing for even greater savings if your applications have flexible start and end times.
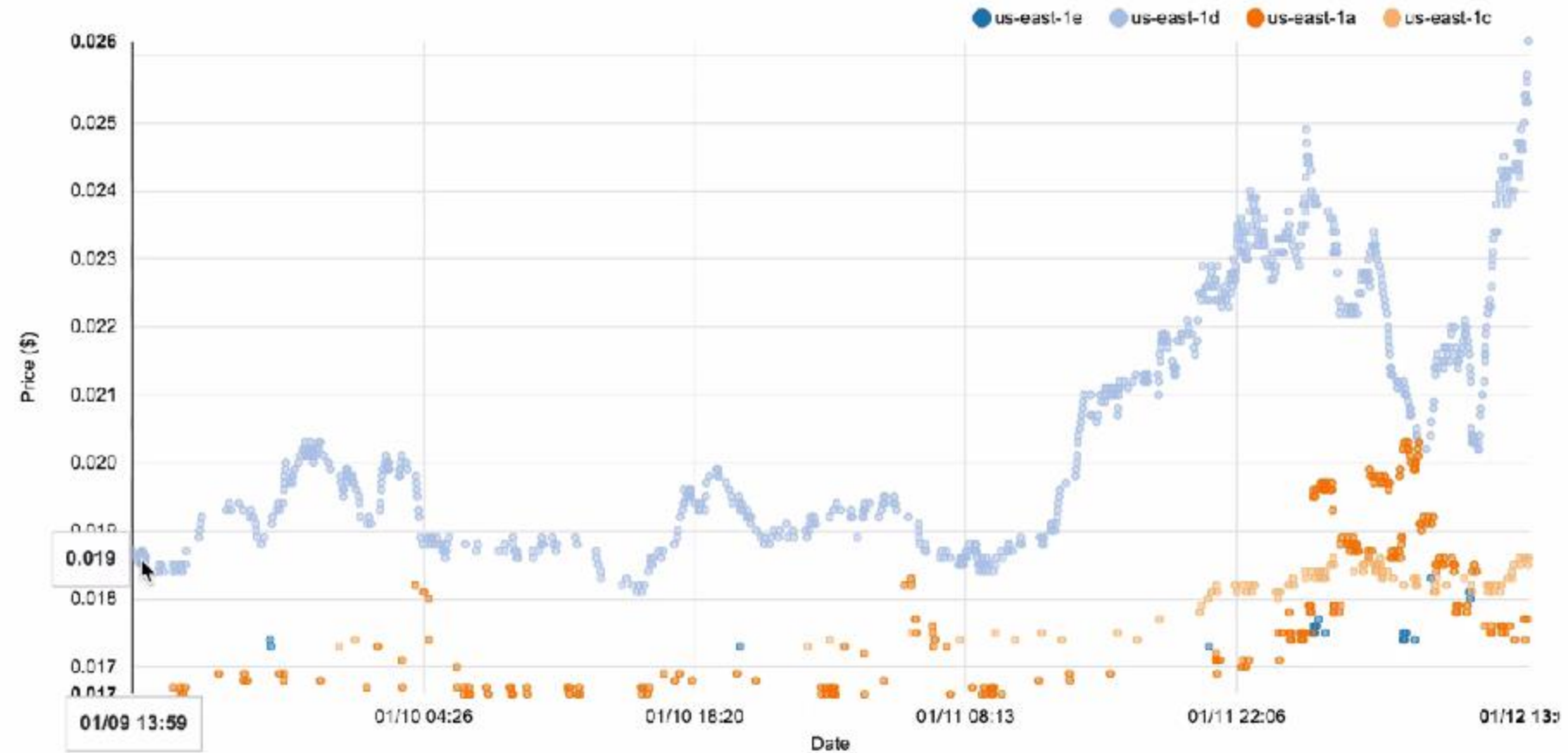
EC2 Spot Prices

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On Demand

- Users that want the low cost and flexibility of Amazon EC2 without any up-front payment or long-term commitment
- Applications with short term, spiky, or unpredictable workloads that cannot be interrupted
- Applications being developed or tested on Amazon EC2 for the first time

Reserved

- Applications with steady state or predictable usage
- Applications that require reserved capacity
- Users able to make upfront payments to reduce their total computing costs even further

Spot

- Applications that have flexible start and end times
- Applications that are only feasible at very low compute prices
- Users with urgent computing needs for large amounts of additional capacity

Spot Prices - Exam Tip

If the Spot instance is terminated by Amazon EC2, you will not be charged for a partial hour of usage. However, if you terminate the instance yourself, you will be charged for any hour in which the instance ran.

EC2 Instance Types

Family	Speciality	Use case
D2	Dense Storage	Fileservers/Data Warehousing/Hadoop
R4	Memory Optimized	Memory Intensive Apps/DBs
M4	General Purpose	Application Servers
C4	Compute Optimized	CPU Intensive Apps/DBs
G2	Graphics Intensive	Video Encoding/ 3D Application Streaming
I2	High Speed Storage	NoSQL DBs, Data Warehousing etc
F1	Field Programmable Gate Array	Hardware acceleration for your code.
T2	Lowest Cost, General Purpose	Web Servers/Small DBs
P2	Graphics/General Purpose GPU	Machine Learning, Bit Coin Mining etc
X1	Memory Optimized	SAP HANA/Apache Spark etc

EC2 Instance Types

EC2 Instance Types

DIRTMCGFPX

EC2 Instance Types

- How I remember them now;
  - **D** for Density
  - **R** for RAM
  - **M** - main choice for general purpose apps
  - **C** for Compute
  - **G** - Graphics
  - **I** for IOPS
  - **F** for FPGA
  - **T** cheap general purpose (think T2 Micro)
  - **P** - Graphics (think Pics)
  - **X** - Extreme Memory

DR MC GIFT PX

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What is EBS?

Amazon EBS allows you to create storage volumes and attach them to Amazon EC2 instances. Once attached, you can create a file system on top of these volumes, run a database, or use them in any other way you would use a block device. Amazon EBS volumes are placed in a specific Availability Zone, where they are automatically replicated to protect you from the failure of a single component.

EBS Volume Types

- General Purpose SSD (GP2)
  - General purpose, balances both price and performance.
  - Ratio of 3 IOPS per GB with up to 10,000 IOPS and the ability to burst up to 3000 IOPS for extended perionds of time for volumes under 1Gib.
- Provisioned IOPS SSD (IO1)
  - Designed for I/O intensive applications such as large relational or NoSQL databases.
  - Use if you need more than 10,000 IOPS.
  - Can provision up to 20,000 IOPS per volume.

EBS Volume Types

- Magnetic (Standard)
  - Lowest cost per gigabyte of all EBS volume types that is bootable. Magnetic volumes are ideal for workloads where data is accessed infrequently, and applications where the lowest storage cost is important.

Exam Tips EC2

- Know the differences between;
  - On Demand
  - Spot
  - Reserved
  - Dedicated Hosts
- Remember with spot instances;
  - If you terminate the instance, you pay for the hour
  - If AWS terminates the spot instance, you get the hour it was terminated in for free.

Exam Tips EBS

- EBS Consists of;
  - SSD, General Purporse - GP2 - (Up to 10,000 IOPS)
  - SSD, Provisioned IOPS - IO1 - (More than 10,000 IOPS)
  - HDD, Throughput Optimized - ST1 - frequently accessed workloads
  - HDD, Cold - SC1 - less frequently accessed data.
  - HDD, Magnetic - Standard - cheap, infrequently accessed storage

- You cannot mount 1 EBS volume to multiple EC2 instances, instead use EFS.