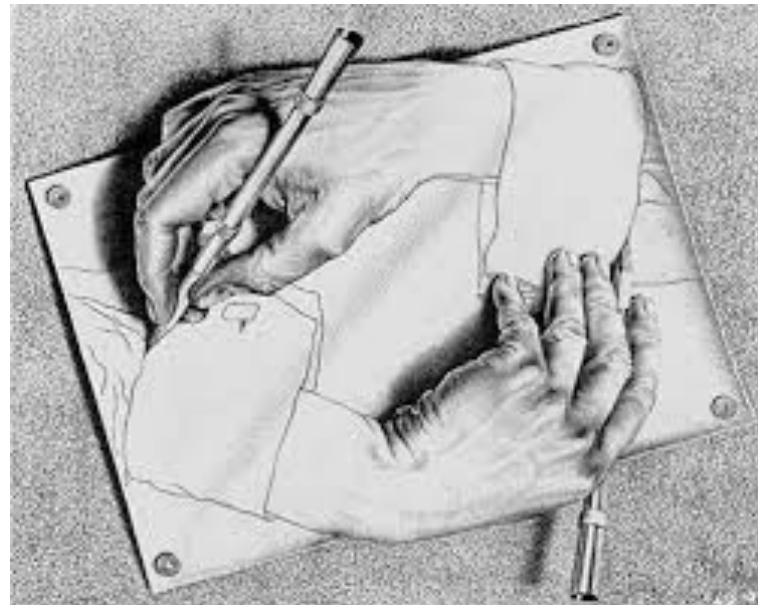# 1 Introduction to EC2

CLARUSWAY
WAY TO REINVENT YOURSELF

Today's Takeaways
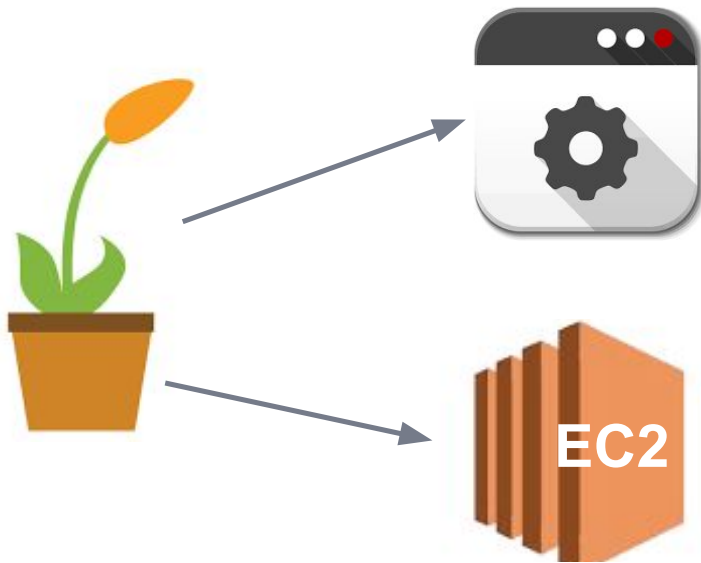
▶ Introduction to EC2

▶ EC2 Instance Types

▶ Creating an EC2 instance

CLARUSWAY
WAY TO REINVENT YOURSELF

Introduction to EC2

EC2

- EC2 stands for Elastic Compute Cloud in AWS.
- EC2 is a service that allows you to run application programs in the computing environment.
- EC2 is a web service that provides secure, resizable compute capacity in the cloud. It is designed to make web-scale cloud computing easier for developers.
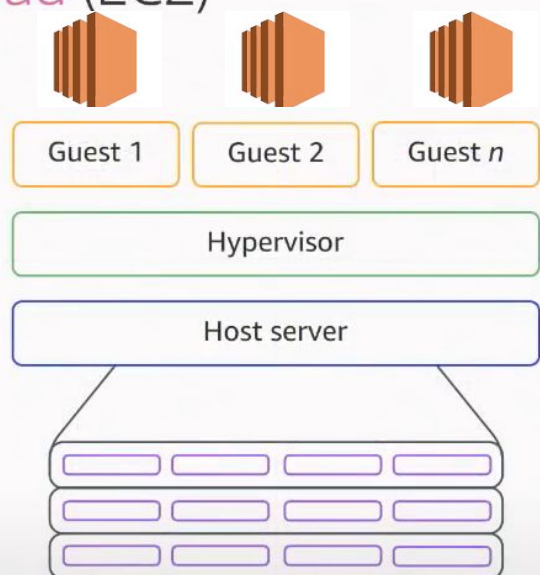
CLARUSWAY
WAY TO REINVENT YOURSELF

3

Amazon Elastic Compute Cloud (EC2)
Virtual servers in the cloud

Guest 1   Guest 2   Guest n

Hypervisor

Host server

Physical servers in AWS global regions

CLARUSWAY
WAY TO REINVENT YOURSELF

4

Introduction to EC2
What is EC2?

- In fact, EC2 is a kind of computer such as your desktop in your home.Components of the EC2 are similar to conventional computer devices.

- Each EC2 component refers to one of the conventional computer parts such as Operation System, Hard Disk and Intel/AMD processors, etc.
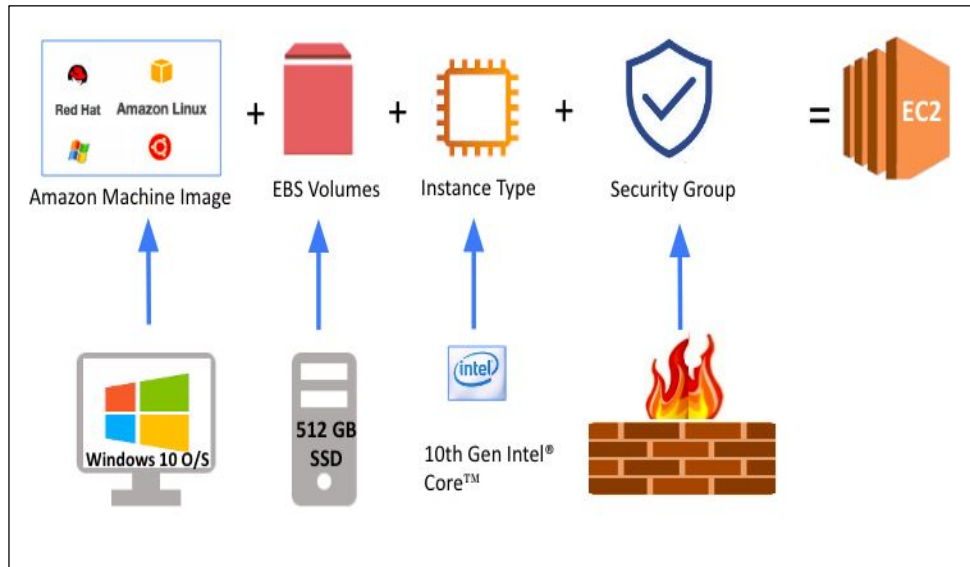
Introduction to EC2
EC2 Features

- Pay as you go,

- Setup and ready to use within 1 minute,

- CPU, Memory and Storage Capacity needs can be arranged within minutes,

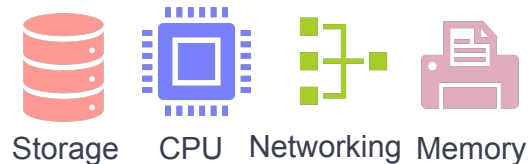- Create, Stop or Terminate instances via EC2 console easily.

2 Types of Instances

EC2 Instances
Types of Instances
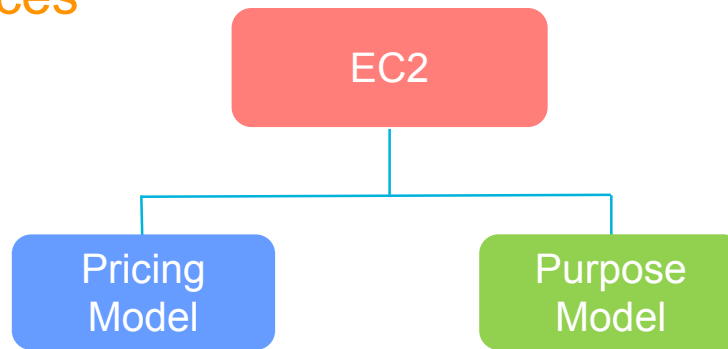
Storage   CPU   Networking   Memory

EC2

- Amazon EC2 provides a wide selection of instance types optimized to fit different use cases.

- Instance types comprise varying combinations of CPU, memory, storage, and networking capacity
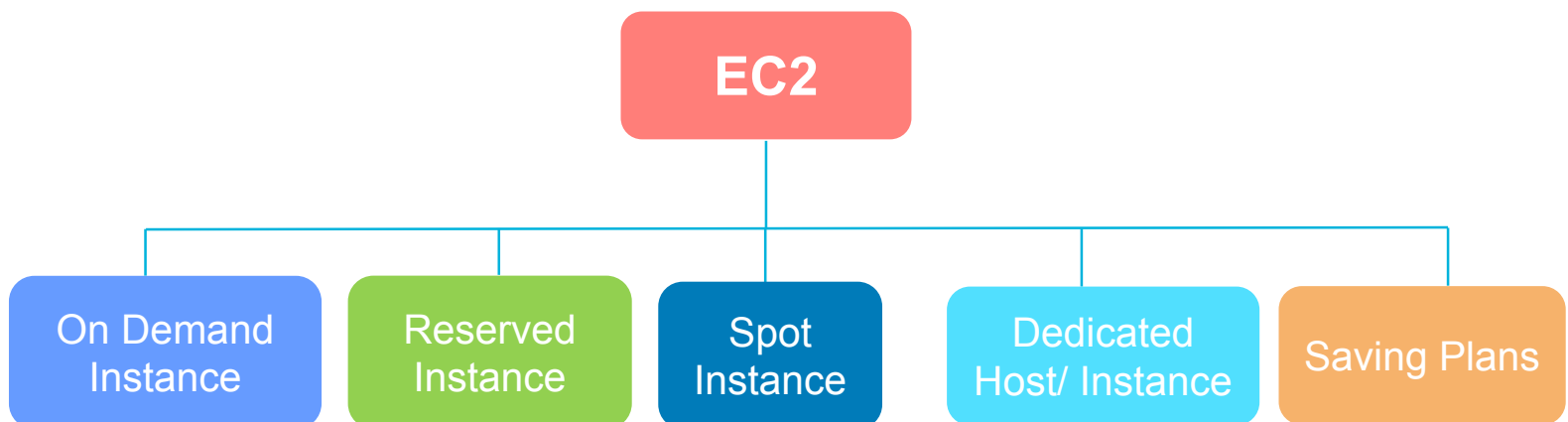
CLARUSWAY
WAY TO REINVENT YOURSELF

EC2 Instances
Types of Instances

```
                    ┌──────────┐
                    │   EC2    │
                    └────┬─────┘
              ┌──────────┴──────────┐
        ┌─────┴─────┐         ┌─────┴─────┐
        │  Pricing  │         │  Purpose  │
        │   Model   │         │   Model   │
        └───────────┘         └───────────┘
```

- Instance types are grouped into a variety of families based on target application profiles and pricing options. It is possible to categorize EC2 types under two main perspective :

- These are Pricing Model and Purpose Model.

EC2 Instances
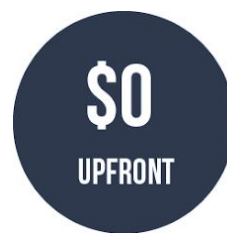## Pricing Model of Instances

```
                        ┌──────────┐
                        │   EC2    │
                        └────┬─────┘
    ┌──────────┬────────────┼────────────┬────────────┐
┌───┴───┐  ┌───┴───┐    ┌───┴───┐    ┌───┴────┐   ┌───┴────┐
│  On   │  │Reserved│   │ Spot  │    │Dedicated│  │ Saving │
│Demand │  │Instance│   │Instance│   │  Host/  │  │ Plans  │
│Instance│ └────────┘   └───────┘    │Instance │  └────────┘
└────────┘                           └─────────┘
```

When we look at the pricing perspective, AWS offers 5 different types of instance pricing.

EC2 Instances
On Demand Instances

- You pay for compute capacity by the "hour "or the "second"
- No commitments
- No upfront payments
- You can increase or decrease your compute capacity
- Pre-estimated

EC2 Instances
On Demand Instances

On-Demand instances are recommended for:

- Users that prefer 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
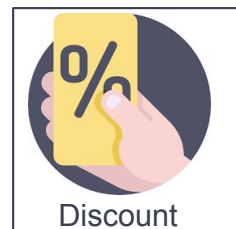
EC2 Instances
On Demand Pricing

- t2.micro in us-east-1 (N.Virginia)
- cost : $ 0.0116/hour

- 25 seconds usage--->>> $ 0.0116 / 60= $ 0.00019 (min 60 seconds)
- 60 seconds usage--->>> $ 0.0116 / 60= $ 0.00019 (min 60 seconds)
- 30 minutes usage--->>> $ 0.0116 / 2= $ 0.0058   )
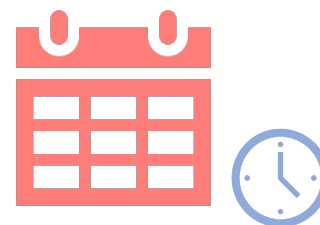- 1 month usage---->>> $ 0.0116 * 24 *30 = $8.32   )

EC2 Instances
Reserved Instances (RI)

Commitments   Discount   CAPACITY RESERVATION

- Reserved Instances provide you with a significant discount (up to 75%) compared to On-Demand instance pricing.

- It is a tariff that takes advantage of the discounted price by giving AWS a 1 or 3-year commitment.

EC2 Instances
Scheduled Reserved Instances

- It's an Instance model derived from Reserved Instance

- This model is very similar to the Reserved Instance and provides you to make the purchase over 24 hours.

- Thanks to the Scheduled Reserved Instance, you can run an instance only between the hours you reserved in reduced price.

EC2 Instances
Reserved Instances (RI)

Reserved Instances are recommended for:

- Applications with steady state usage

- Applications that may require reserved capacity

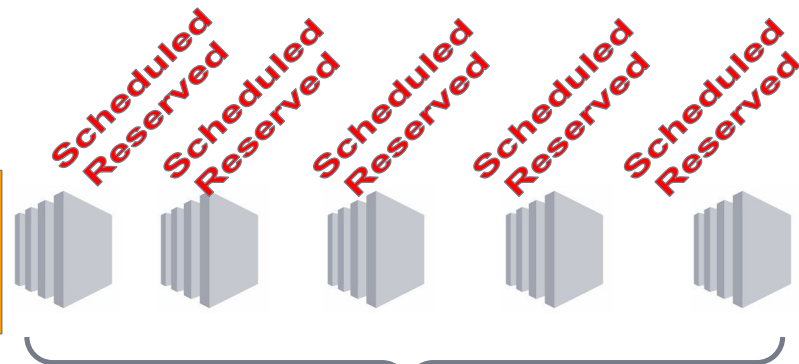- Customers that can commit to using EC2 over a 1 or 3 year term to reduce their total computing costs

EC2 Instances
Example

www.e-commerce

RESERVED INSTANCE: 7/24

Scheduled Reserved | Scheduled Reserved | Scheduled Reserved | Scheduled Reserved | Scheduled Reserved

Scheduled Reserved 08:00 AM - 08:00 PM

CLARUSWAY
WAY TO REINVENT YOURSELF

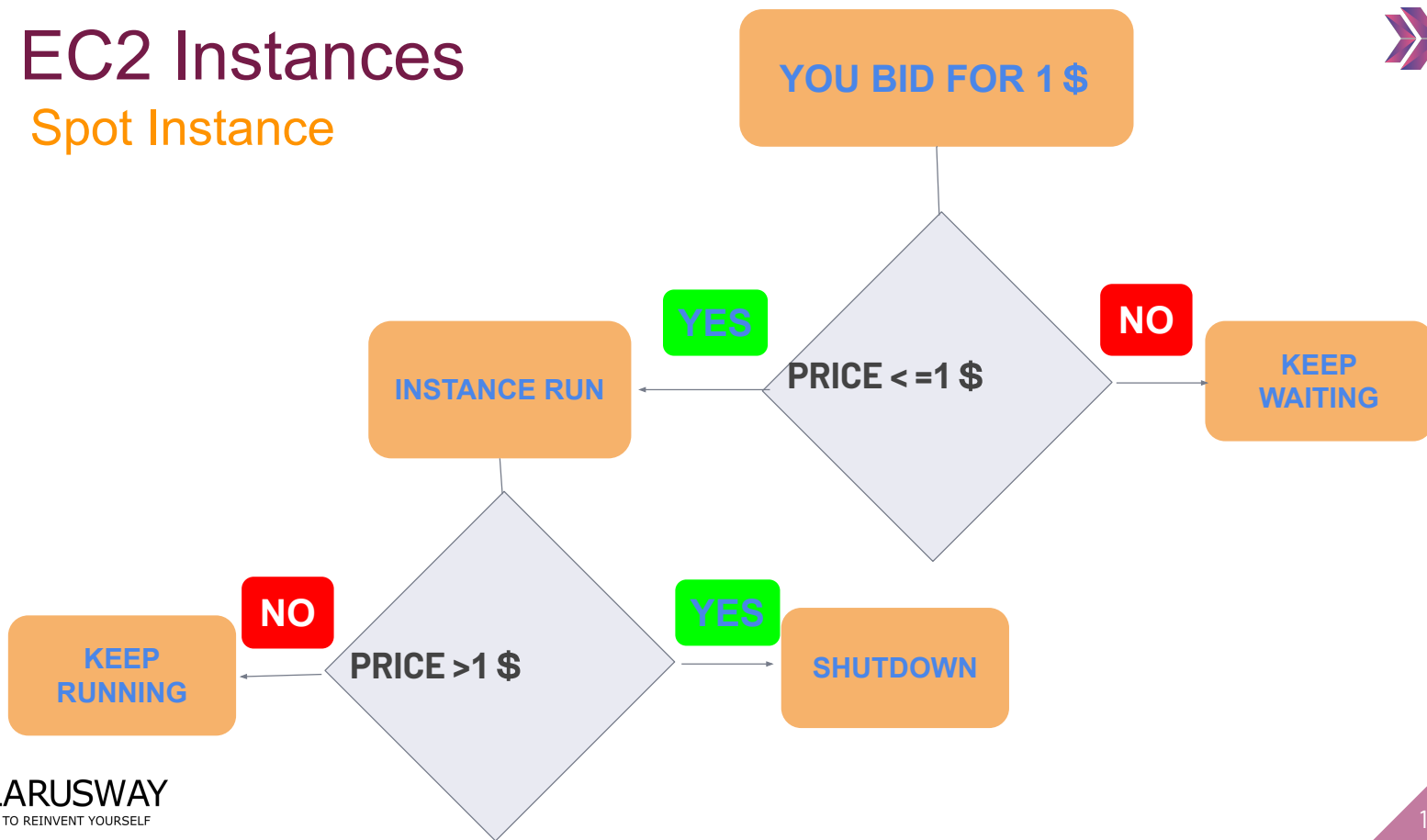# EC2 Instances
Spot Instance

Run **Shut down**

- In Spot Instance, you can enter a purchase order by setting a target price.

- The machine runs when the current price falls below the target price.

- The machine automatically shuts down if the price exceeds that target price.

- You can save up to 90% cost advantage.

CLARUSWAY
WAY TO REINVENT YOURSELF

EC2 Instances
Spot Instance

YOU BID FOR 1 $

PRICE < =1 $

YES → INSTANCE RUN

NO → KEEP WAITING

PRICE >1 $

NO → KEEP RUNNING

YES → SHUTDOWN

CLARUSWAY
WAY TO REINVENT YOURSELF

EC2 Instances
Spot Instance vs. On Demand Price

ON-DEMAND

45 minutes

Spot Instance

Pay for 45 minutes

???????

CLARUSWAY
WAY TO REINVENT YOURSELF

EC2 Instances
Spot Instance

Spot instances are recommended for:

- Applications that have flexible start and end times

- Non-continuity jobs such as testing

EC2 Instances
Dedicated Host/Instance

A Dedicated Host is a physical server the whole capacity of with EC2 instance is dedicated to your use.

Not only your instances are reserved but also they physically separated from the other servers.

A Dedicated Host consists of Dedicated Instance capacities according to your needs. You may choose to buy a Dedicated Host or only one Dedicated Instance also.
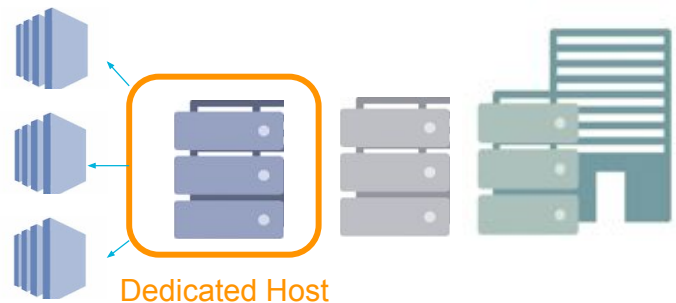
Dedicated Host

EC2 Instances
Saving Plans

ON DEMAND	SAVING PLAN
EC2	EC2
5000 HOURS OF USAGE	5000 HOURS OF USAGE
1500$	1000$

EC2 Instances Recap

Dedicated
Host/Instance

Spot

On Demand

Reserved

Saving Plan

EC2 Instances
Types of Instances Recap

EC2

Pricing Model
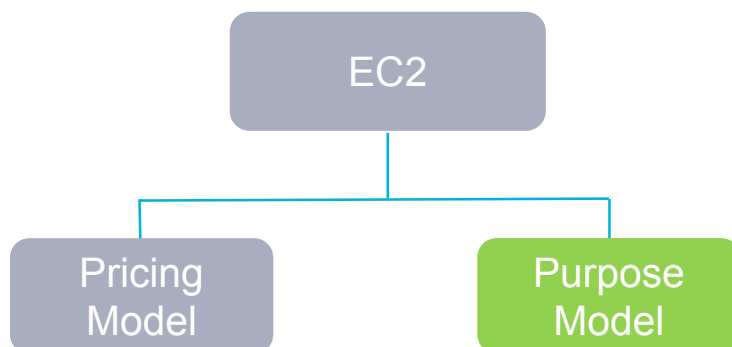
Purpose Model

EC2 Instances
Purpose Model

Purpose Model

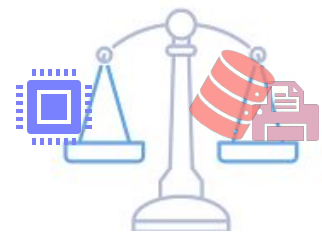| Burstable	General Purpose	Compute Optimized	Memory Optimized	Storage Optimized	Accelerate Computing
T	M	C	R	D	F
	A		X	I	P
			U	H	G
			Z		
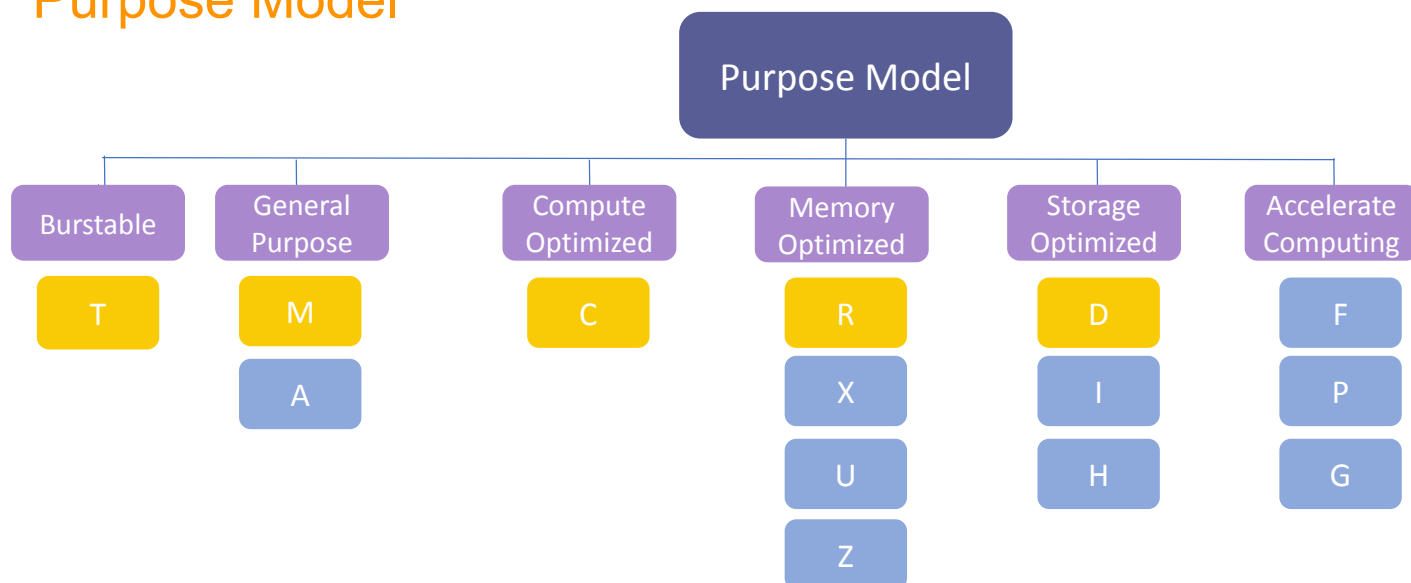
AWS offers different kind of virtual machines in 6 categories

EC2 Instances
General Purpose
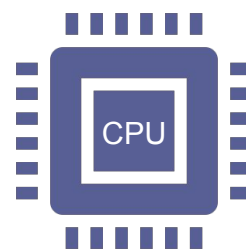

General Purpose

- General purpose instances provide a balance of compute, memory and networking resources, and can be used for a variety of diverse workloads.

- There are T, M and A options that we can use for standard and application needs.

- This is the most commonly used instance type and ideal for web servers.

EC2 Instances
Compute Optimized

- Compute Optimized instances are ideal for compute bound applications that benefit from high performance processors.

- Instances belonging to this family are well suited for batch processing workloads, media transcoding, high performance web servers, dedicated gaming server, etc.
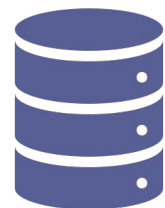
EC2 Instances
Memory Optimized
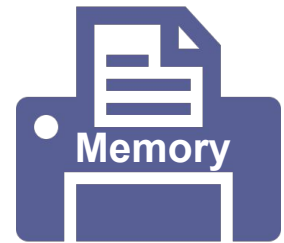
- Memory optimized instances are used in situations requiring a high-performance database, real-time large data analytics, and high memory usage.

- There are R, X, Z and U type instances in this category.
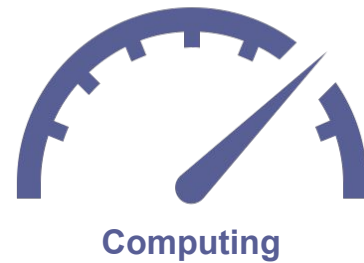
EC2 Instances
Storage Optimized

- Storage optimized instances are designed for workloads that require high, sequential read and write access to very large data sets on local storage.

- It is the best used for the fast disk structures we need in NoSQL databases or data warehouse solutions.

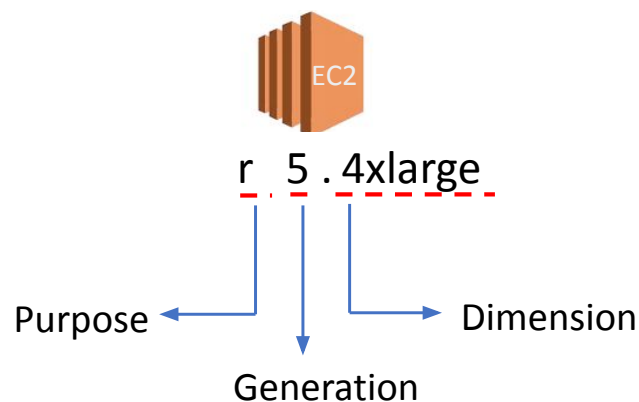- There are D, H and I type of instances in this category.

EC2 Instances
Accelerated Computing

Computing

- Preferred when you need machine learning, deep learning calculation, and analysis.

- There are F, P and G type of instances in this category.

EC2 Instances
Instance Coding

r 5 . 4xlarge

Purpose   Dimension

Generation

- R refers to its purpose. It means this EC2 is Memory Optimized instance.

- 5 refers to instance generation. For example, the last generation of the r-family is 5.

- 4xlarge refers to dimension of instance. AWS has built servers of various sizes to suit every need in instance families. For example, the r5-family has 8 different sizes starting from **large to 24xlarge.**

- Not all models have instances in every generation and size.

Let's get our hands dirty!

- Introduction of EC2 console
- Creating an EC2 instance
- Creating an EC2 instance with user data
- Working with Instance Actions

CLARUSWAY
WAY TO REINVENT YOURSELF

THANKS!

Any questions?

You can find me at:

▸ @osvaldo

▸ osvaldo@clarusway.com

CLARUSWAY
WAY TO REINVENT YOURSELF