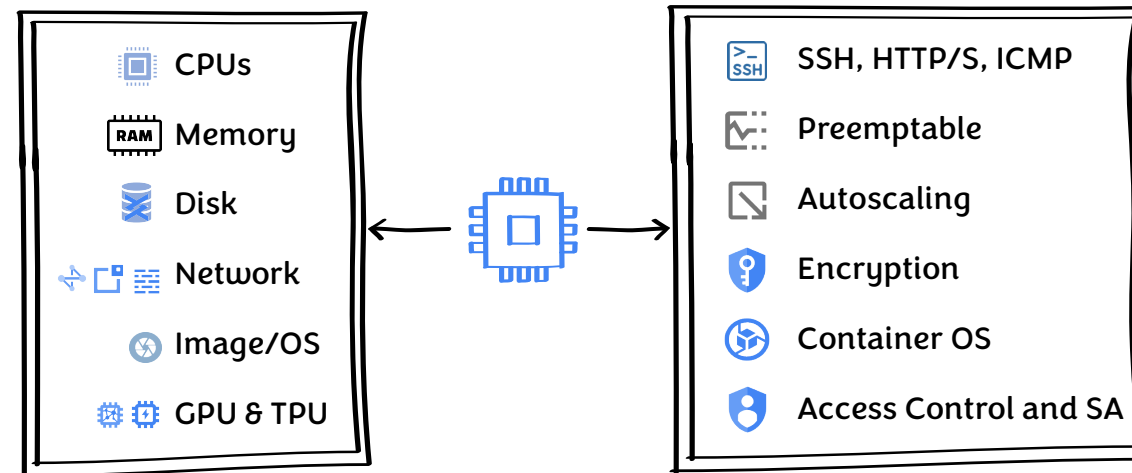
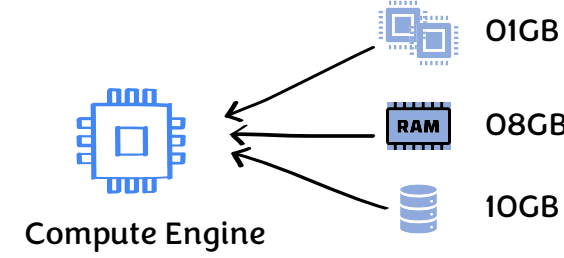


Compute Engine

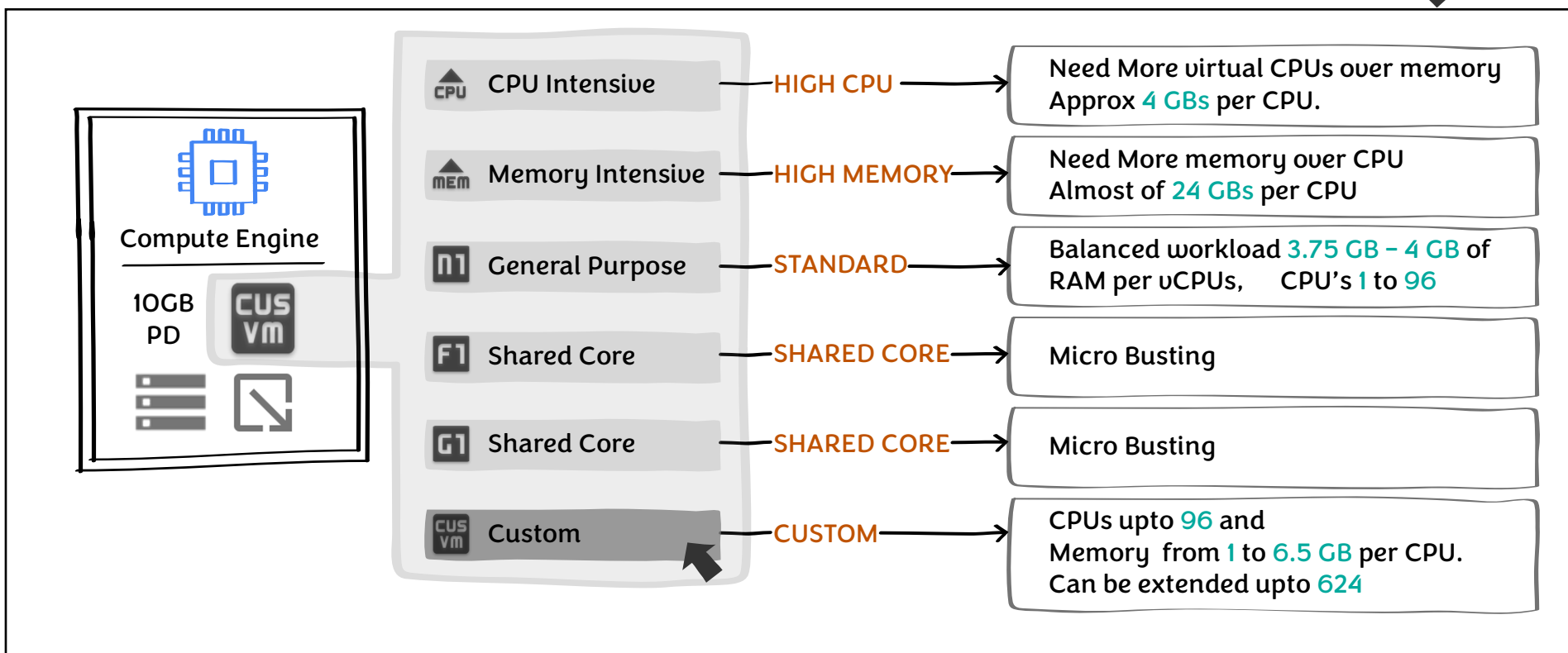
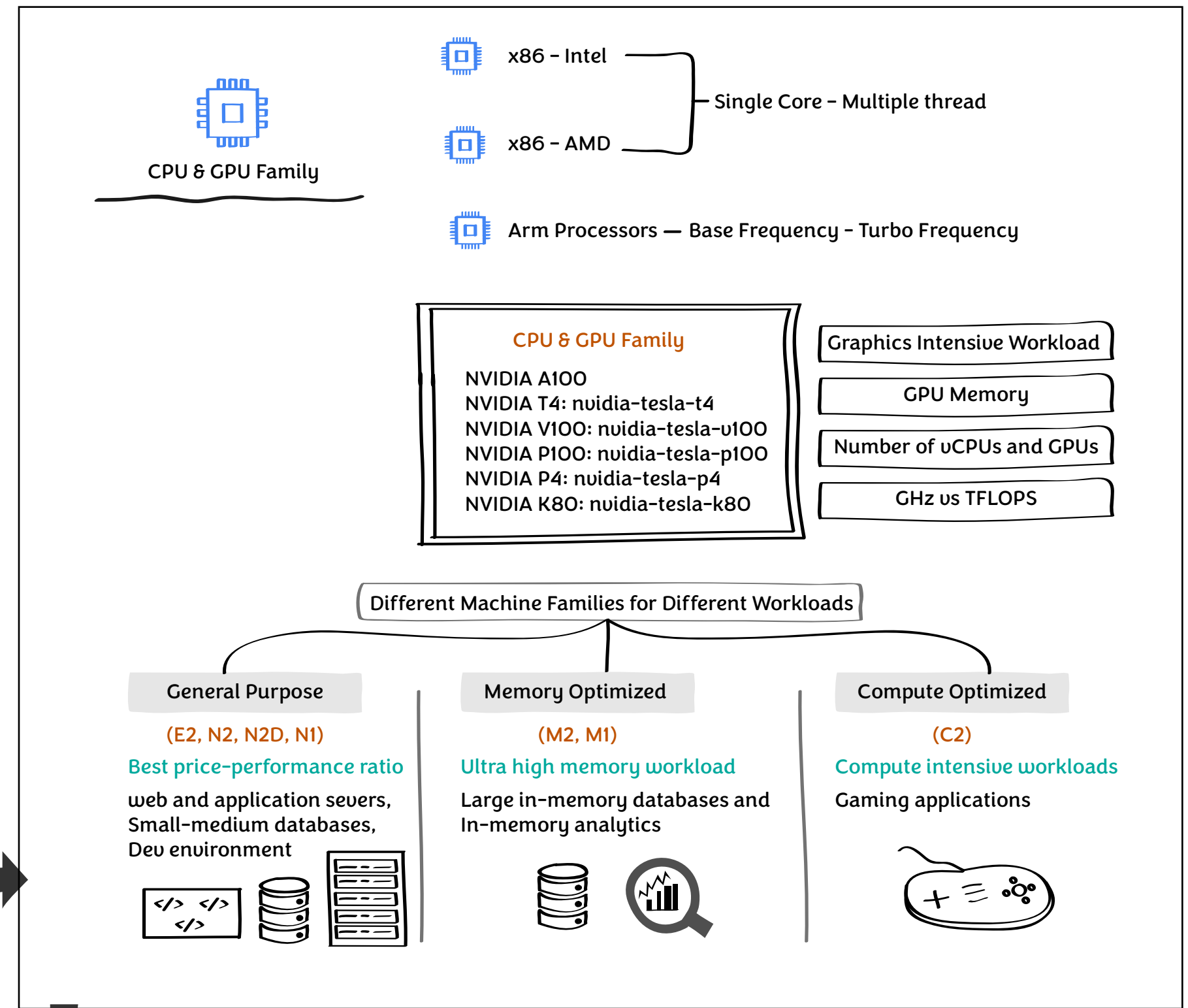
Udemy GCP Gurus

Virtual Machines (VM) - Virtual Server in GCP
 Compute Engine (GCE) - Provision & Manage Virtual Machines



- Virtual Machine on the Public Cloud GCP
- Pay as you go.
- You can customize VM based on application needs
- Scale as and when needed - Vertical and Horizontal
- Supports Autoscaling
- Supports GPUs'
- Have full control of Operating System
- Supports different Images
- Supports Local Storage as well as Network Storage.
- Control Network Performance.
- Support CDN as well as Load Balancer.

- ### Compute Engine - Features
- ✓ Create and manage lifecycle of Virtual Machine (VM) instances
 - ✓ Load balancing and Auto scaling for multiple VM instances
 - ✓ Attach storage (& network storage) to your VM instances
 - ✓ Manage network connectivity and configuration for your VM instances
- Setup VM instances as HTTP (web) Sever
 Distribute load with Load Balancers



Machine Type

How much CPU, Memory or Disk do you want?
 variety of machine types are available for each machine family

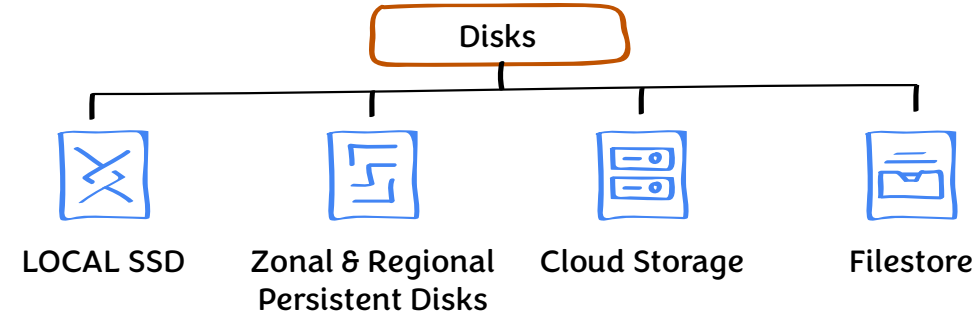
Let's take an example: **e2-standard-2**

e2- Machine Type Family
 standard- Type of workload
 2- Number of CPUs

Memory, disk and networking capabilities increase along with vCPUs

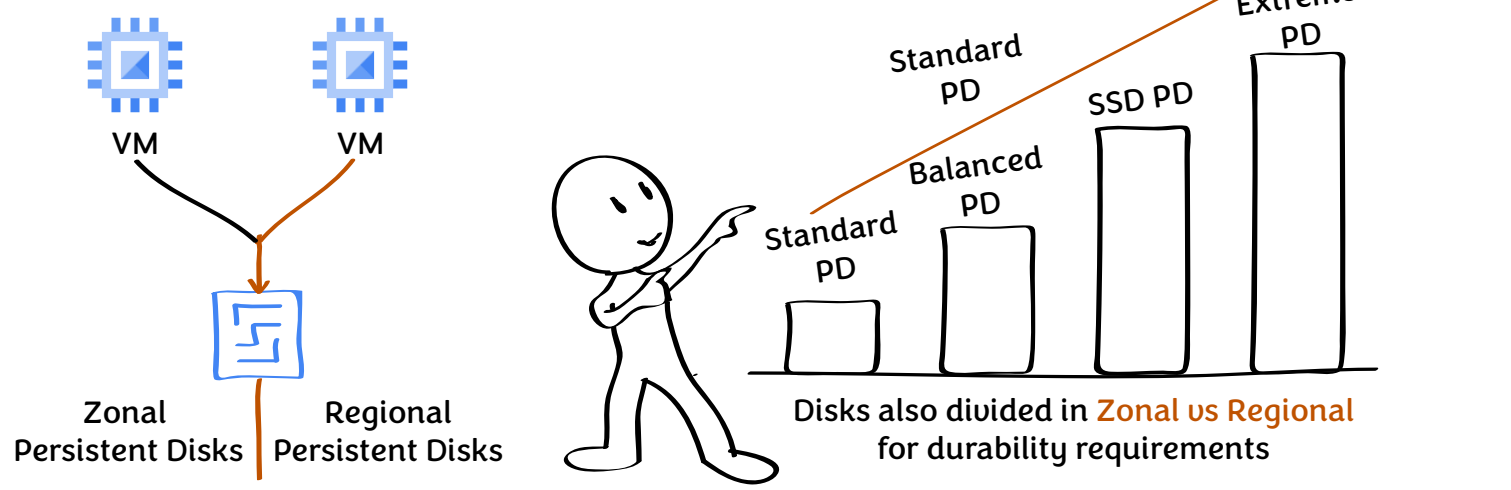
Machine name	vCPUs	Memor(GB)	Max number of PD (PDs)2	Max total PD size (TB)	Local SSD	Maximum egress Bandwidth (Gbps)3
e2-standard-2	2	8	128	257	No	4
e2-standard-4	4	16	128	257	No	8
e2-standard-8	8	32	128	257	No	16
e2-standard-16	16	64	128	257	No	16
e2-standard-32	32	128	128	257	No	16

Disks, Snapshots, Images



Zonal & Regional Persistent Disks

- Efficient, reliable block storage.
- Regional block storage replicated in two zones.
- High performance, transient, local block storage.
- Affordable object storage.
- High-performance file storage for Google Cloud users.



LOCAL SSD

- Its Temporary or ephemeral in nature
- Superior Performance & High IOPS
- Both SCSI and NVME interfaces
- Caches, Process Space, low value data...

Each Local SSD is 375 GB you can go up to 24 Local SSD's for up to 9TB Instance.

Filestore

Fully managed service for file migration and storage. Easily mount file shares on Compute Engine VMs.

Basic Filestore

- 1 - 63.9 TiB
- HDD or SSD
- Zonal

Common file storage needs (file sharing, software development, web hosting, basic AI)

Use Cases

- Data analytics
- Genomic Processing
- Rendering and media processing
- Application migrations
- Web content management

Enterprise Filestore

- 1 - 10 TiB
- SSD
- Regional

Mission-critical workloads

High Scale Filestore

- 10 - 100 TiB
- SSD
- Zonal

High capacity and performance need

Cloud Storage

Cloud Storage is an object store for binary and object data, blobs, and unstructured data. it for any app, any type of data that you need to store, for any duration

Objects stored: ID, metadata, attributes, data

Use Cases

- Data analytics
- Genomic Processing
- Videos
- Websites
- Image
- Backups

Compute Engine Images

Images Contains Boot Loader, Root File systems Everything you need to start Compute Engine Images are Stored in GCS Image

Types Of Images: Private Images (Maintained by you), Public Images (Maintained by google)

To Create and Use:

- Import a boot disk
- Create an image
- Copy one image to another Image

Container VM

Container Optimized OS: OS to run containers on GCP Based on Open Source Chromium OS Project

Benefits of Container OS:

- Run containers out of Box
- Smaller attack surface
- Locked down by default
- Automatic Updates

Limitation:

- Does not have package Manager
- Can not run non Container Apps
- Kernel Locked down
- Not Supported outside GCP.

IAM, SSH & Access Scopes

IAM : IAM is identify and access management in GCP

Primitive/basic IAM roles: Owner, Editor, Viewer, BA

Fine Grained through IAM: Role (compute.instanceAdmin) -> List of Permissions (delete, get, list, setMachineType, start, stop)

- IAM**: Central Place to control permissions and you can create manager user permissions including Service Account.
- SSH Keys**: SSH Keys are used to access Linux Machine. In GCP, you need to use SSH keys to access machines outside of the console (e.g., Putty).
- Access Scope**: Access scope adds up another layer to define restrictions. The service account can execute API methods only if they are allowed by both the access scope and its IAM roles.
- Service Account**: We know service account can be used to access any GCP resource. SA impersonation can be used to access VM without SSH Key.

