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**Roll no -- 7**

**Topic -- Local SSD**

Definition---

Local SSDs in Google Cloud Platform ***(GCP)*** provide fast, low-latency storage that is directly attached to the physical server hosting a Virtual Machine ***(VM)***.

**What is a local SSD in GCP?**

Local SSDs are designed for temporary storage use cases such as scratch processing space. Because Local SSDs are located on the physical machine where your VM is running, they allow for very fast temporary storage space for HPC or data analytics.

**Physical Location:**

* **On-Host Storage**: Local SSDs are directly attached to the host server where your VM is running. This means the SSDs are part of the server's local hardware infrastructure rather than being a networked storage solution.
* **Data Center**: The physical storage devices are housed in Google's data centers. The exact physical location is managed by Google, and users do not have direct access to or control over the specific hardware**.**
* **Key Points**

1. ***Very Fast Storage****:*
   * Using Local SSDs allows you to read and write data with minimal delay.
   * They are especially good for tasks where data needs to be processed quickly, like analyzing large files or running responsive databases.
2. ***Temporary Storage****:*
   * The data stored on Local SSDs is temporary, meaning if you shut down or restart the VM, the data might be lost.
   * Therefore, they should be used for tasks where data is backed up elsewhere or can be recreated.
3. ***Capacity:***
   * Each Local SSD is 375 GB in size, and you can add multiple Local SSDs to a single VM to get more storage.
4. ***Cost-Effective:***

* You pay for Local SSDs on an hourly basis, so you only spend money for the storage you actually use.

*Local SSDs are great for tasks that require high speed and performance, but keep in mind that the data stored on them is not permanent.*

1. ***Pricing Model***

* **Hourly Pricing**: Local SSDs are billed on an hourly basis, depending on the number of Local SSDs attached to your VM. This cost is in addition to the cost of the VM instance itself.
* **No Sustained Use Discounts**: Unlike Persistent Disks, Local SSDs do not qualify for sustained use discounts. They are a premium storage option and are priced accordingly.

***6.Use Cases***

* **High-Performance Databases**: Applications like MySQL, Cassandra, and MongoDB, where fast disk I/O is critical.
* **Data Caching**: For applications that require temporary storage of frequently accessed data, such as Redis or Memcached.
* **Big Data and Analytics**: Processing large datasets that require high throughput and low latency, like Hadoop or Spark.
* **Temporary Scratch Space**: For batch processing tasks where intermediate data is stored temporarily and discarded afterward.
* **Local SSD data backup**
* Since you can't back up Local SSD data with disk images, standard snapshots, or disk clones, Google recommends that you always store valuable data on a  durable storage option.
* If you need to preserve the data on a Local SSD disk, attach a Persistent Disk or Google Cloud Hyperdisk to the VM. After you mount the Persistent Disk or Hyperdisk copy the data from the Local SSD disk to the newly attached disk.
* **Setting Up Local SSDs in GCP:**

You can configure Local SSDs either while creating a VM instance or by attaching them to an existing VM. Here's how:

1. **Console Method**:
   * Go to the Google Cloud Console.
   * Select "Compute Engine" > "VM Instances".
   * Click "Create Instance" or select an existing instance to edit.
   * Under the "Storage" section, click "Add a Local SSD".
   * Select the number of SSDs to add (up to 24).
   * Proceed with the VM configuration and launch the instance.
2. **Command-Line (gcloud) Method**:
   * Use the following command to create a VM with Local SSDs attached:
   * gcloud compute instances create my-instance \
   * --local-ssd interface=[SCSI | NVME] \
   * --zone=your-zone
   * You can specify multiple --local-ssd flags to add more Local SSD partitions.