Cloud storage

- *Cloud storage is a digital storage solution which utilizes multiple servers to store data in logical pools.*
- *The organizations buy the storage capacity from the providers to store user, organization, or application data.*

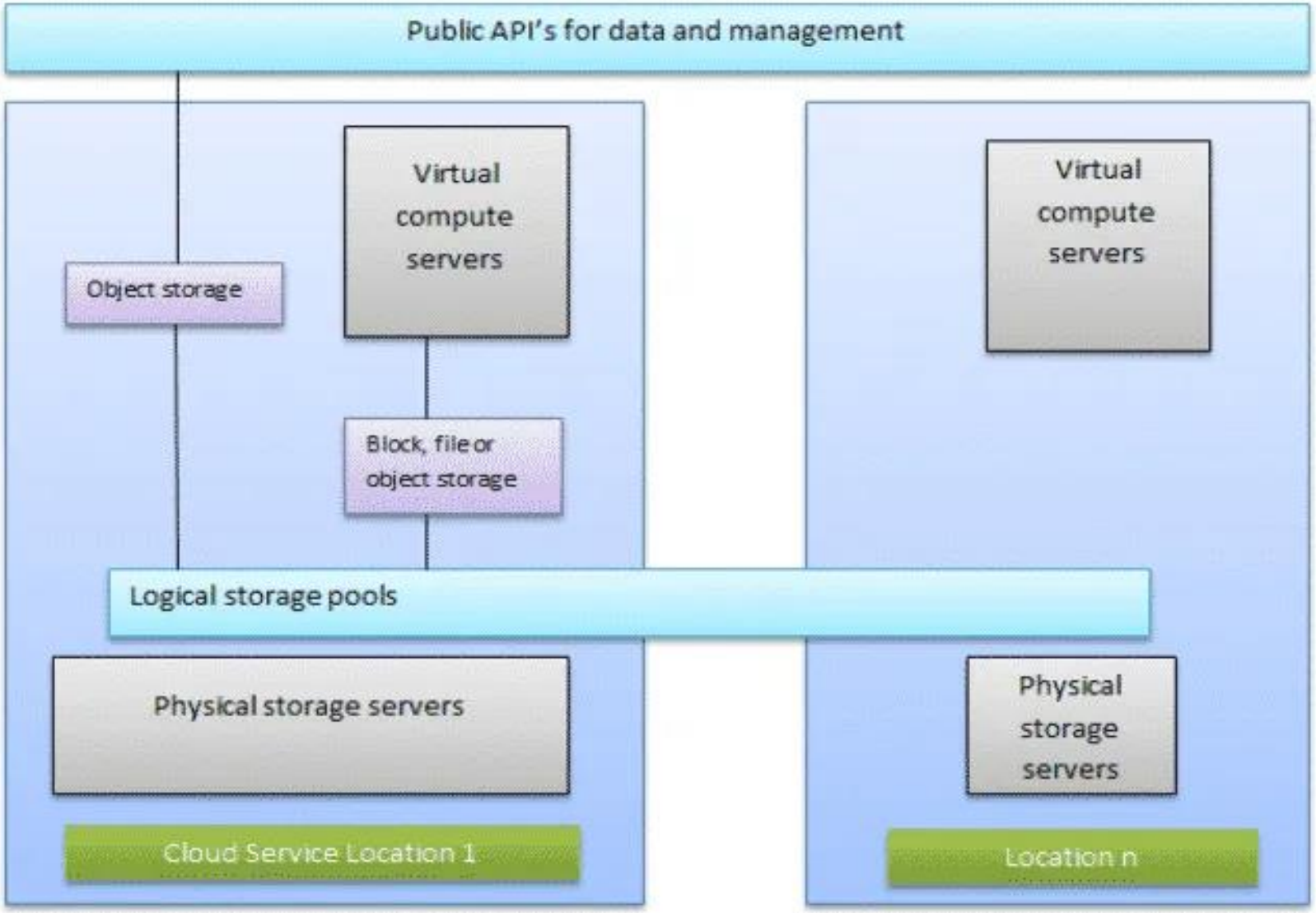
Cloud storage

- **Security**: The backups are located across multiple servers and are better protected from data loss or hacking.
- **Accessibility**: The data stored is accessible online regardless of location.

Cloud storage

- There are two major providers in the field of cloud storage namely:
- **Amazon S3:** It enables file storage to multiple servers and offers file encryption wherein we can share the data publicly.
- **Google Cloud:** It offers unlimited storage space. It also has the ability to resume the file transfer after a failure.

Storage Architecture



Storage Architecture

- *Cloud storage is based on virtualized infrastructure and is like cloud computing in terms of accessible interfaces, scalability and metered resources.*
- *A cloud-storage service is utilized from an off-premises service (Amazon S3).*
- *Object storage services like Amazon S3, Oracle Cloud-Storage and Microsoft Azure Storage, Object Storage Software like Open Stack Swift are all examples of storage that can be hosted and deployed with cloud-storage characteristics.*

Types of storage

- Block level storage, or block storage, is storage used for structured data and is commonly deployed in Storage Area Network (SAN) systems. It uses Internet Small Computer Systems Interface (iSCSI) and Fibre Channel (FC) protocols.
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- BLOCK STORAGE ARCHITECTURE
- Block storage uses *blocks*, which are a set sequence of bytes, to store structured workloads.
- Each block is assigned a unique hash value which functions as an address.
- In block storage, the data is stored without any metadata e.g. data format, type, ownership, etc.
- The ability to store data in blocks delivers structured workloads such as databases, applications, etc. the freedom to decide how blocks are accessed, combined, or modified. Consequently, this makes block storage faster than other storage.

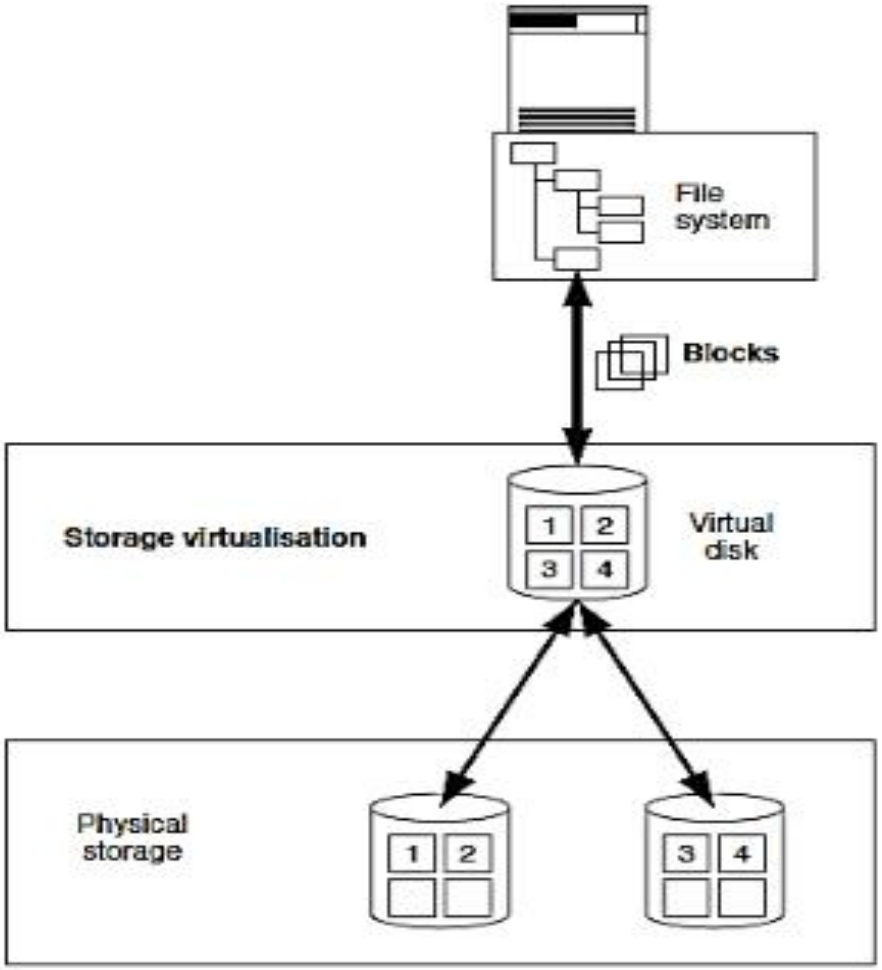

Figure 5.12 In virtualisation on block level the virtualisation entity provides the virtual storage to the servers in the form of a virtual disk.

File level storage

- File level storage, or file storage, is storage used for unstructured data and is commonly deployed in Network Attached Storage (NAS) systems.
- It uses Network File System (NFS) for Linux, and Common Internet File System (CIFS) or Server Message Block (SMB) protocols for Windows.

FILE STORAGE ARCHITECTURE

- *File storage, as opposed to block storage, stores data in a hierarchical architecture; as such that the data and its metadata are stored as is – in the form of files and folders.*
- *Consequently, the stored data appears in a similar fashion to both systems; the one writing it and the one reading it.*

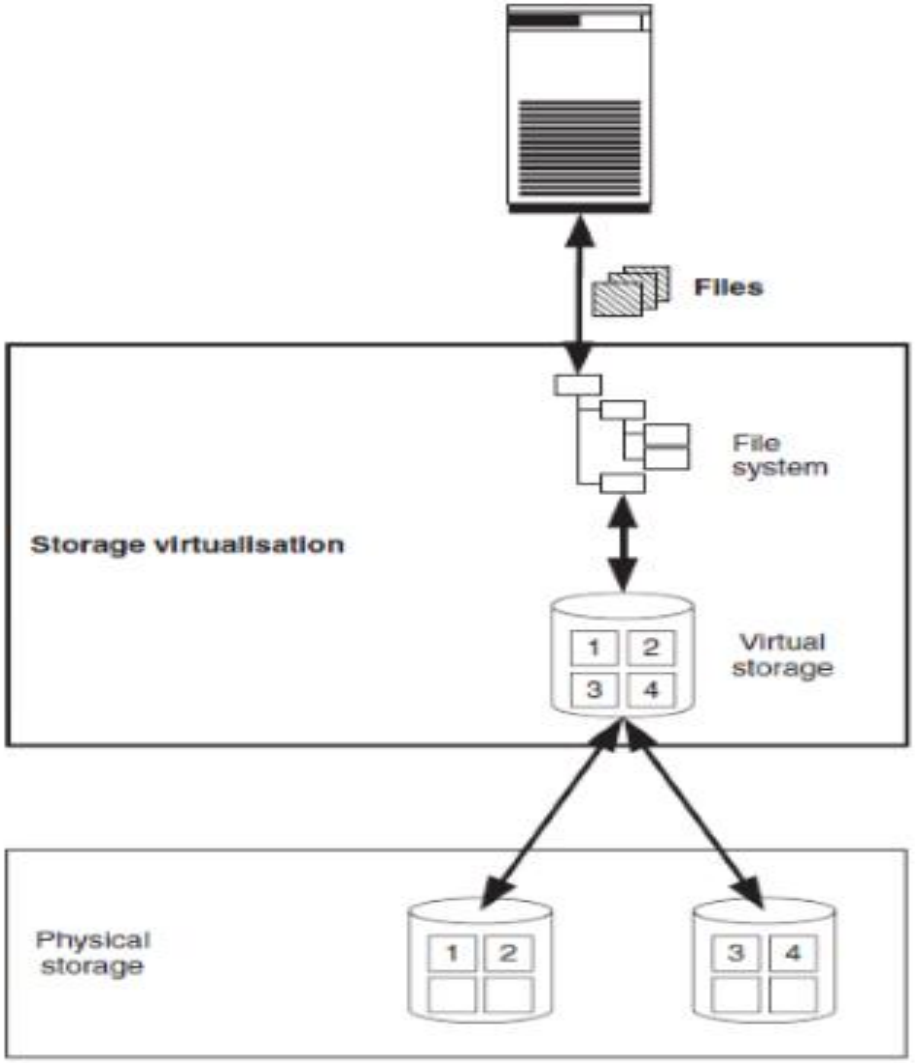

Figure 5.13 In virtualisation on file level the virtualisation entity provides the virtual storage to the servers in the form of files and directories.

Object Storage

- **Object storage** (also known as **object**-based **storage**) is a computer data **storage architecture** that manages data as **objects**, as opposed to other **storage architectures** like file systems which manages data as a file hierarchy, and block **storage** which manages data as blocks within sectors and tracks.

- Technical benefits of a virtual data center
- Use Role-Based Access Control (RBAC) to delegate resource management
- Set out a mix of compute-heavy, memory-intensive, general-purpose, and custom configured instances to align with the demands of your workload
- Align deployment architecture with your product development architecture
- Easily improve the availability of legacy applications by moving them to virtual Data Centers
- Automate cross-continental Disaster-Recovery on top of vDCs that span across traditional data centers
- Transition to Infrastructure-as-code mindset using API driven deployments

- A virtual data center is a container for all inventory objects that are required to complete a functional environment for operating virtual machines. You can create multiple data centers or organize sets of environments.