Chapter 2

Storage:

1) Object storage:
- It is relatively new option for data storage, optimized for general binary or unstructured data, often multimedia.
- It is storage and retrieval of unstructured blobs of data and metadata using an HTTP API.
- Object cloud be an image file, logs, HTML files or any self contained blob of bytes.

Benefits:

a) It is easy to use. Each objects gets a unique ID and HTTP URL that can be publicly accessible.
- Data read and write operations are very simple and may be performed directly by user's browser via REST, without having to go through control of server app.
- The app is released from rigid structure of db tables and file system hierarchy.

b) It provides scalability.
- Unlike classical storage using files and tables, the infrastructure to store objects grow in complexity when data grows.
- Object storage can grow quickly, without limits.

c) It provides agility.
- File system and db are complex and require constant care by db admin.
- Because of it's simplicity, developer/owner doesn't have to depend on professionals, which eliminates bottlenecks in app's evolution.
- A developer has more freedom to make change in an app.

d) It provides a cost structure that means we only for what we use.

e) It provides optional versioning that means old versions of objects can be retrieved to recover from accidental overwrites of data.

f) By using it, we don't have to maintain hard drives and RAID arrays, as that's handled by service provider.

g) It helps to store chunks of metadata alongside data blob which simplifies application architecture

Use cases:

1) Disaster Recovery - Backup
   - It's provides highly durable, secure, global infrastructure offers a robust disaster recovery solution designed to provide superior data protection.

2) Static website hosting:
   - key advantage is ability to distribute data objects to internet using HTTP.
   - It eliminates need to build or provide own webserver to host static content. because because Internet Object Storage can be simply configured to behave as a static website for stored objects.

3) Document store and file sharing.
   - It utilizes strong in-transit encryption and granular security controls on buckets and objects.
   - Many document management system (DMS) provide a function to directly store and retrieve documents from Object storage service.

4) Big Data analytics:
   - Big Data consists of high volume, high velocity and high variety of information assets that require efficient forms of information processing to support insight and decision making.
   - What complicates task for companies is not data itself but management of metadata which adds more information making data itself more valuable asset.
   - Properly tagged data is searchable and becomes meaningful
   - Internet Object Storage supports creation of user defined object metadata (key-value pairs) so metddata are controllable.

Block storage:

- They are relatively simple and familiar
- They provide a traditional block storage device - hard drive over n/w
- used to host database, support random read/write operation and keep system files of running VM.

Advantages:

- It is a familiar paradigm. People and software understand and support files and filesystems almost universally.
- Block devices are well supported. Every programming language can easily read/write files.
- file system permissions and access controls are familiar and well understood.
- Block storage devices provide low latency so they are suitable for use by dbs.
- It helps to take live snapshots of entire device easily for backup purposes.
- Block storage devices can be resized to accomodate growing needs.
- Block storage devices can be easily detached and moved between machines.

Use cases:

1) Relational database.
   - It scales performance needs so RDS like Oracle, MySQL etc. are widely deployed on Amazon EBS.

2) NoSQL databases.
   - provides consistent and low latency performance for application when running NoSQL db.

3) Enterprise applications:
   - meets diverse needs of organization by proving reliable block storage to run critical application.

4) Development and test:
   - enables organization to be more agile and responsive to customer needs.

5) Business continuity:
   - minimizes loss of data and recovery time by regularly backing up data helps in business.