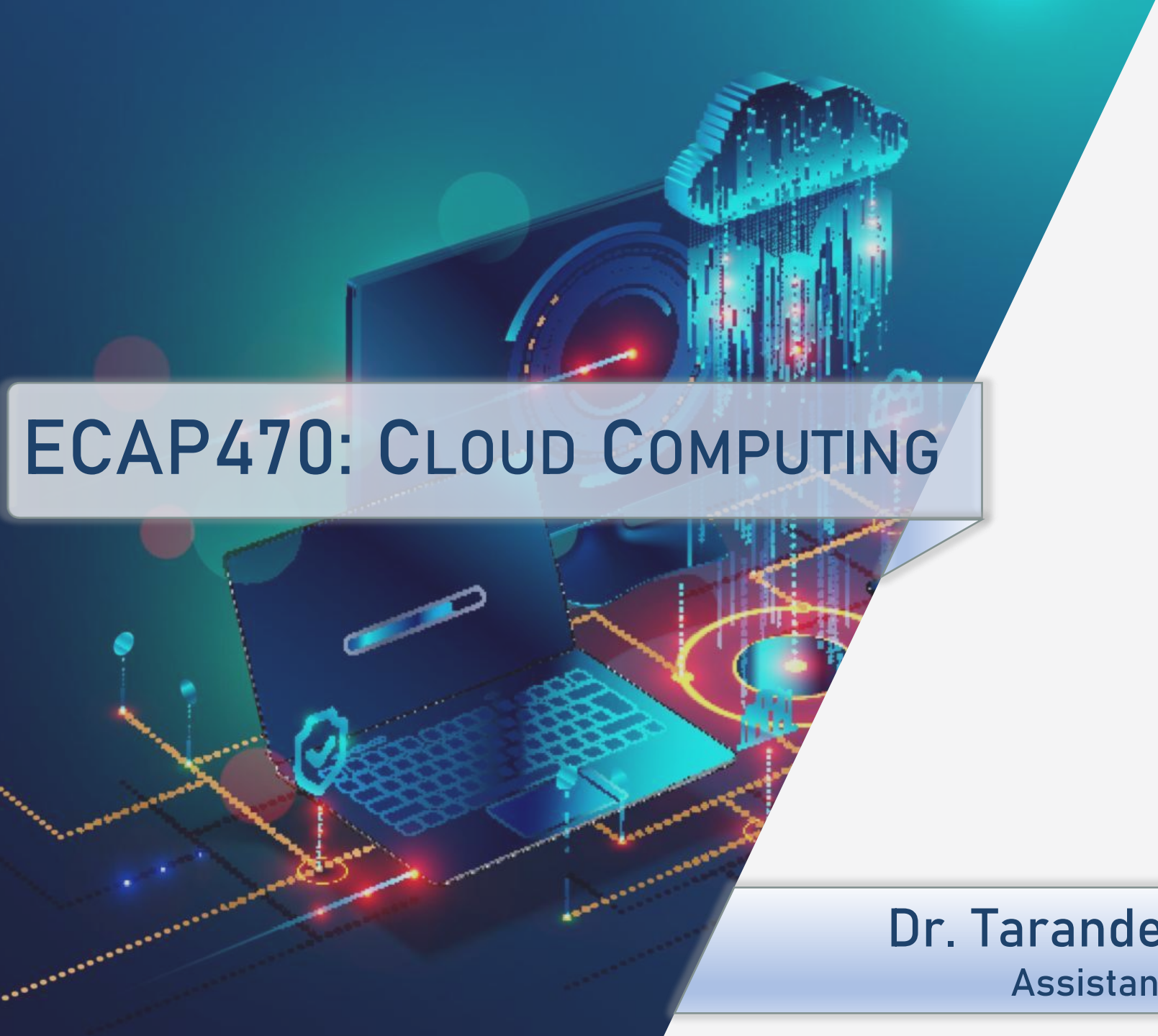

ECAP470: Cloud Computing

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Assistant Professor

Learning Outcomes

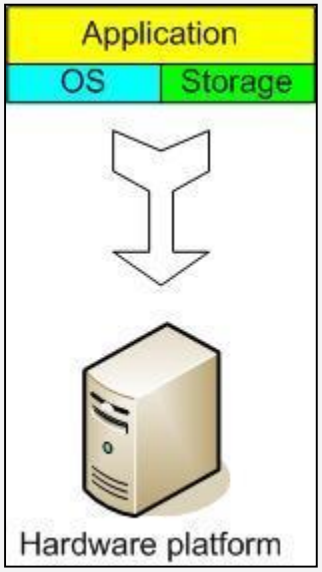
After this lecture, you will be able to,

- ✓ learn about cloud server.
- ✓ know about the cloud storage.
- ✓ explore database storage offered through cloud computing.

Cloud Server

- A powerful physical or virtual infrastructure that performs application- and information-processing storage.
- Created using virtualization software to divide a physical (bare metal) server into multiple virtual servers.
- Key Features.

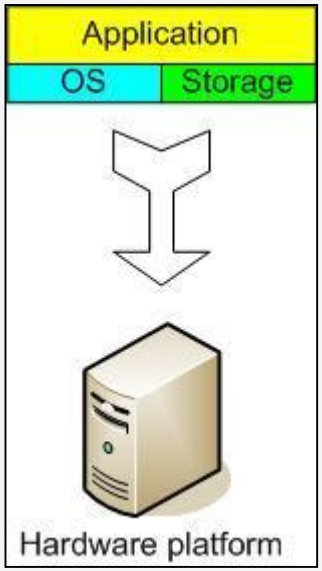
Traditional Server Concept



Web Server

Windows

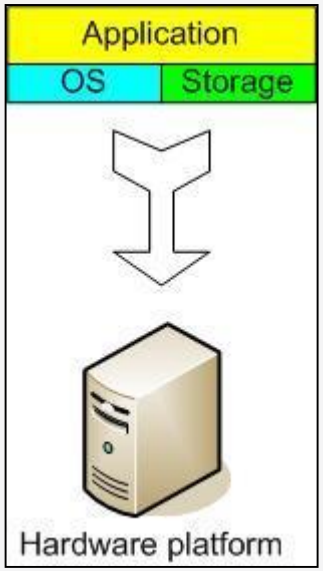
IIS



App Server

Linux

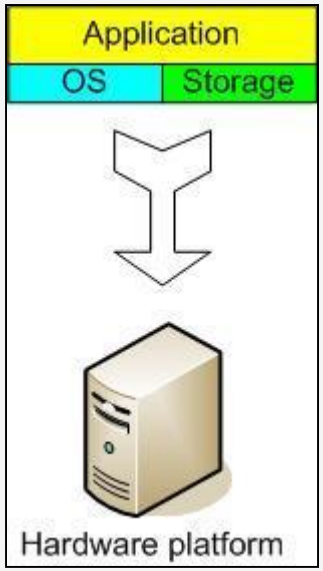
Glassfish



DB Server

Linux

MySQL

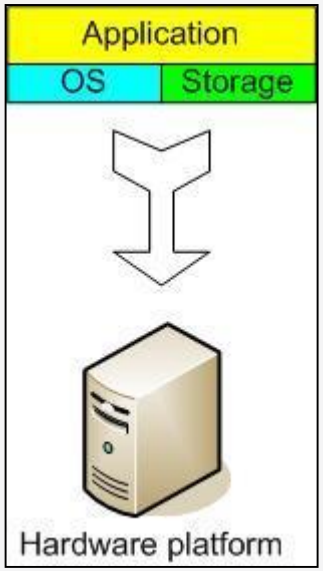


EMail

Windows

Exchange

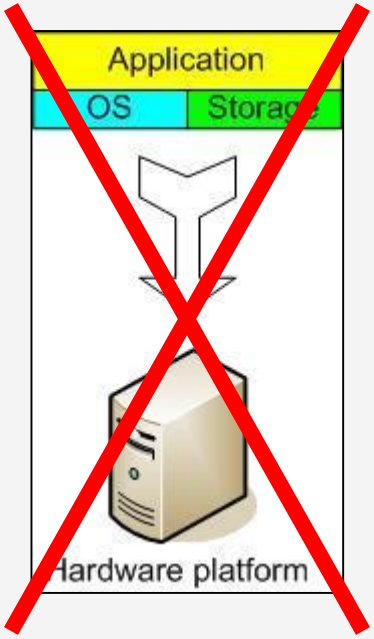
And If Something Goes Wrong ...



Web Server

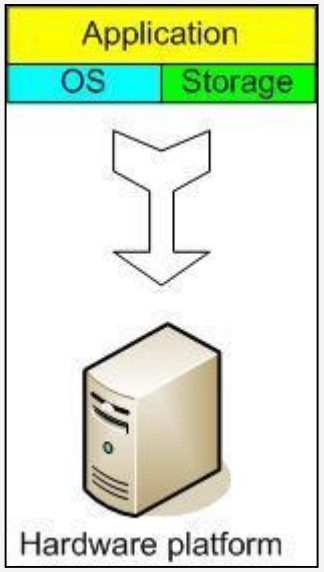
Windows

IIS



App Server

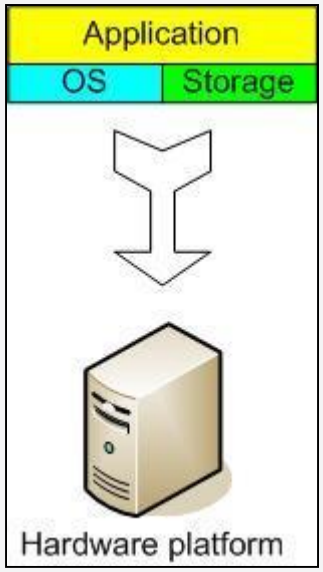
DOWN!



DB Server

Linux

MySQL



EMail

Windows

Exchange

Traditional Server Concept

- System Administrators often talk about servers as a whole unit that includes the hardware, the OS, the storage, and the applications.
- Pros and Cons.

Cloud Server

Why Cloud Server-

- Cost Effectiveness

Cloud Server

Why Cloud Server-

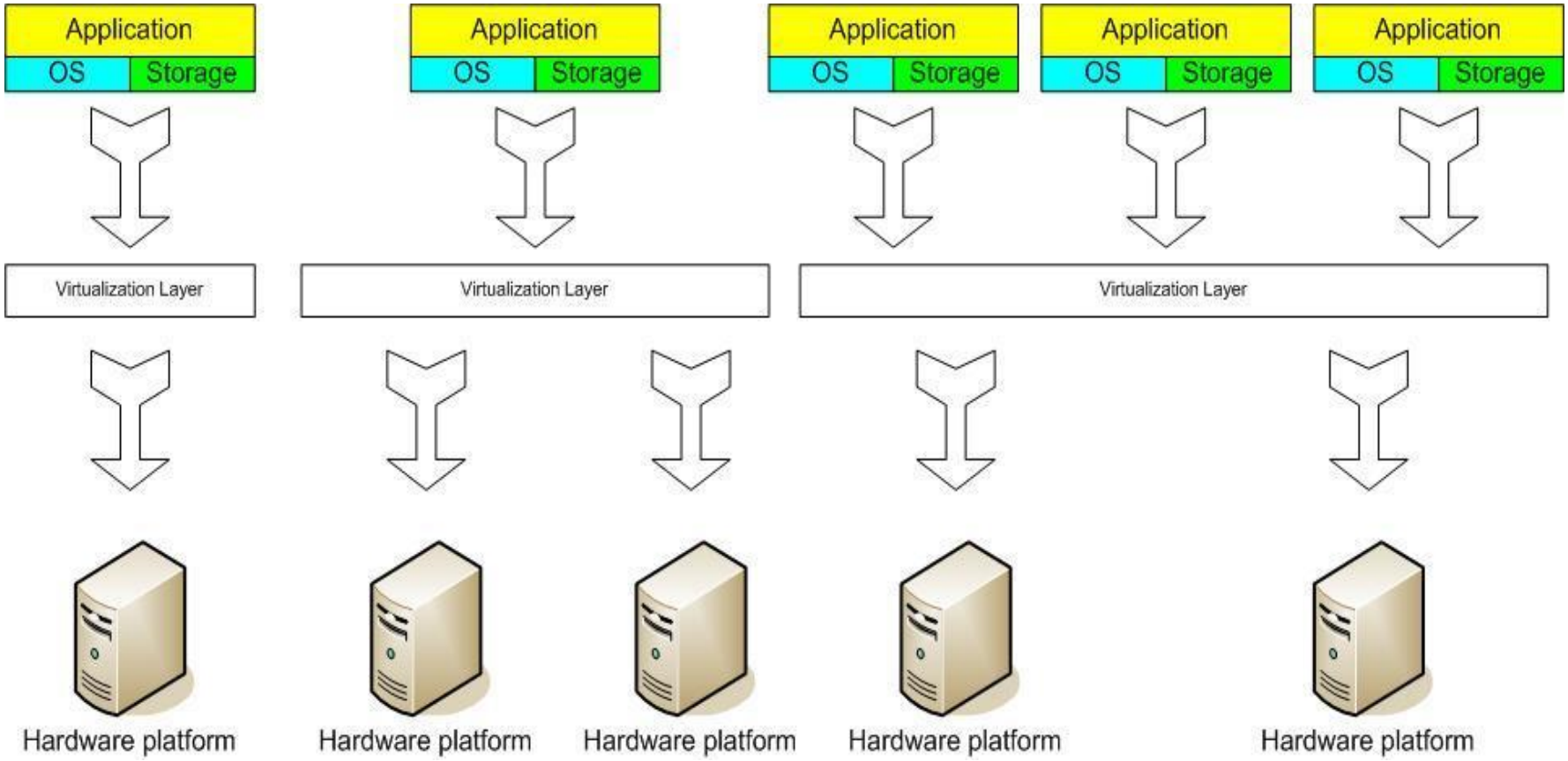
- Cost Effectiveness
- Scalability

Cloud Server

Why Cloud Server-

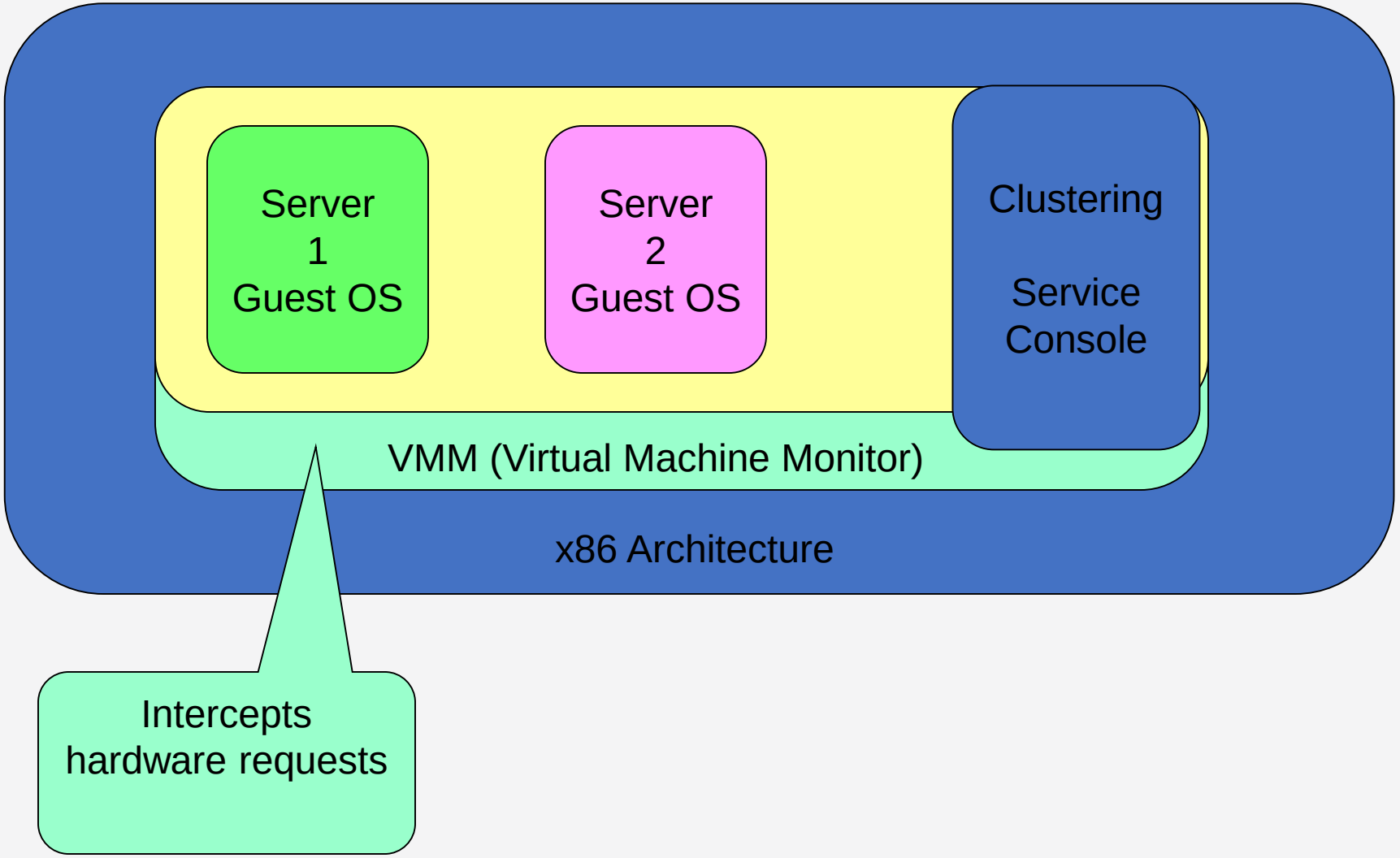
- Cost Effectiveness
- Scalability
- Integration

Cloud Virtual Server Concept



Virtual Machine Monitor (VMM) Layer Between Guest OS and Hardware

Cloud Virtual Server Concept



Cloud Virtual Server Concept

- Virtual servers seek to encapsulate the server software away from the hardware.
  - Includes the OS, applications, and storage for that server.

Cloud Virtual Server Concept

- Virtual servers can be scaled out easily.
- Server templates can be created in a virtual environment to be used to create multiple, identical virtual servers.
- Virtual servers themselves can be migrated from host to host almost at will.

Cloud Virtual Server Concept

Pros

- Resource pooling.
- Highly redundant.
- Highly available.
- Rapidly deploy new servers.
- Easy to deploy.
- Reconfigurable while services are running.
- Optimizes physical resources by doing more with less.

Cloud Virtual Server Concept

Cons

- Slightly harder to conceptualize.
- Slightly more costly (must buy hardware, OS, Apps, and now the abstraction layer).

Considerations- Virtual Servers vs Physical Servers

- Physical (bare metal) servers are best for data-intensive workloads.
- Virtual servers are better for highly variable workloads.

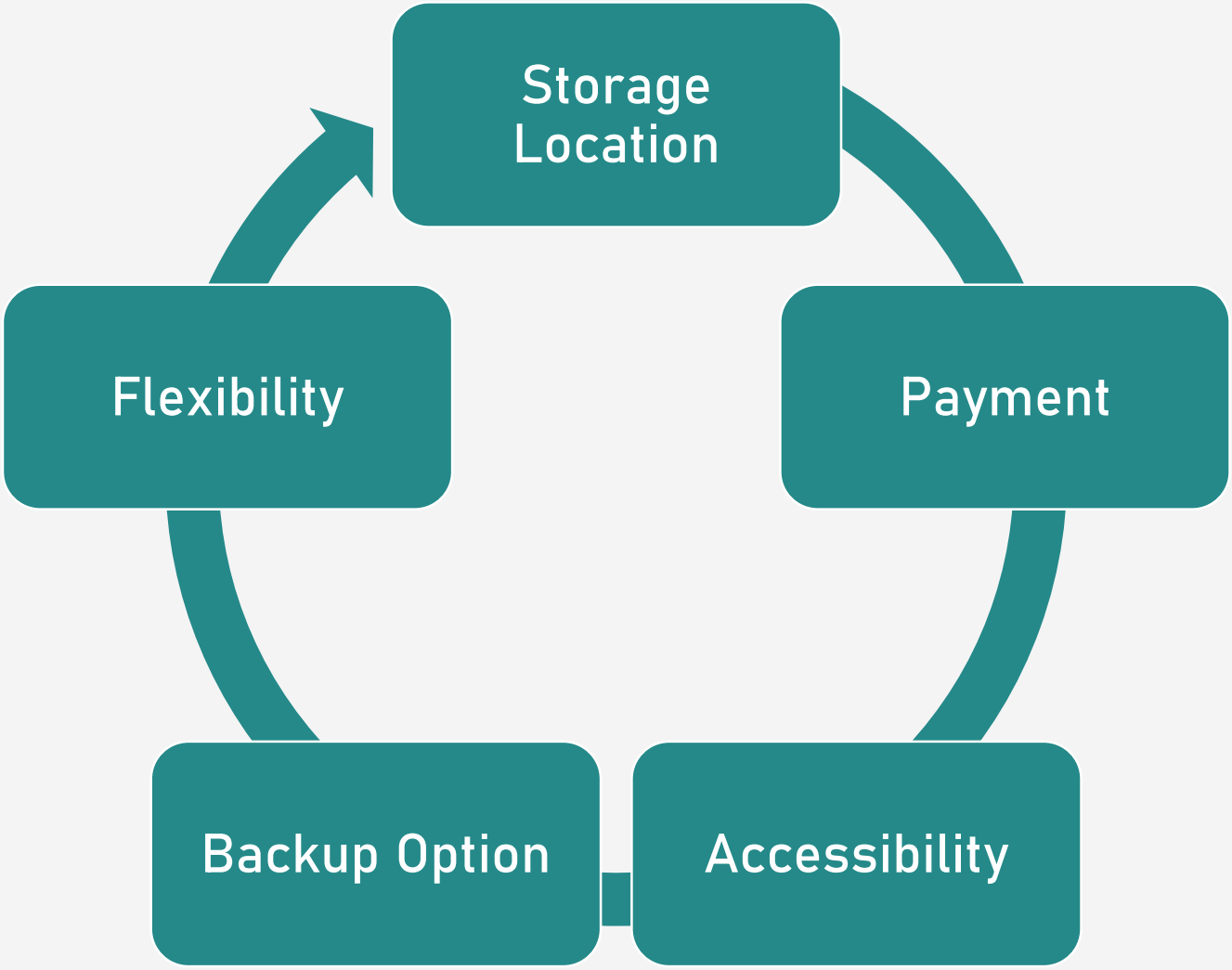
Cloud Storage

- Most innovative technology to store, access, and collaborate through scalable cloud technology.
- Cloud computing model that stores valuable data through the web and operates it through a storage as a device service.
- Delivered on-demand.
- Pay-as-you-go model.
- Third-party vendors.

Traditional Storage

- Storage option in which we use local physical drives to store the data at the primary location of the client.
- User generally uses the disk-based hardware to store data and these are used for copying, managing, and integrating the data to software.
- Features of Traditional Storage.

Cloud Storage vs Traditional Storage



Features of Cloud Storage

- Easily be accessed via a web browser.
- Offer apps for ease of access.
- Facilitates navigation and organisation.
- Ease of Access.
- Online Editing.
- Online Collaboration.

Considerations for Storing Data to Cloud

Various parameters that need to be taken into account whilst saving data on the cloud include:

- Security
- Availability

Examples of Cloud Storage

Examples of Cloud Storage– Google Drive

- ‘Pure’ cloud computing service, with all the apps & storage found online.
- Can be used via desktop top computers, tablets like iPad or on smartphones.
- All of Google's services can be considered cloud – based: Gmail, Google Calendar, Google Voice etc.
- Microsoft’s OneDrive: Similar to Google Drive.

Examples of Cloud Storage- Dropbox

- Commonly used to store documents and images.
- One can set his/her phone to automatically send all pictures taken with it into their Dropbox account, so that even if one loses their phone, the pictures will still be available to him/her up in space.

Examples of Cloud Storage- Apple iCloud

- Apple's cloud service is primarily used by Apple users for online storage and synchronization of user's mail, contacts, calendar, and more.

Common Features of Google Drive, Dropbox, iCloud

- All three platforms are third party services.
- All offer a basic amount of free storage:
  - Dropbox: 5 GB
  - OneDrive (linked to Microsoft live account): 7 GB
  - Google Drive (linked to Gmail account): 15 GB
- Post, user has to pay yearly or monthly subscription fee.
- Example: Google Drive: 100 GB - $4.99/month; 200 GB - $9.99/month.

Cloud Database

- Collection of informational content, either structured or unstructured.
- Resides on a private, public or hybrid cloud computing infrastructure platform.

Cloud Database

- “Cloud database” can be one of two distinct things: a traditional or NoSQL database installed and running on a cloud virtual machine, or a cloud provider’s fully managed database-as-a-service (DBaaS) offering.

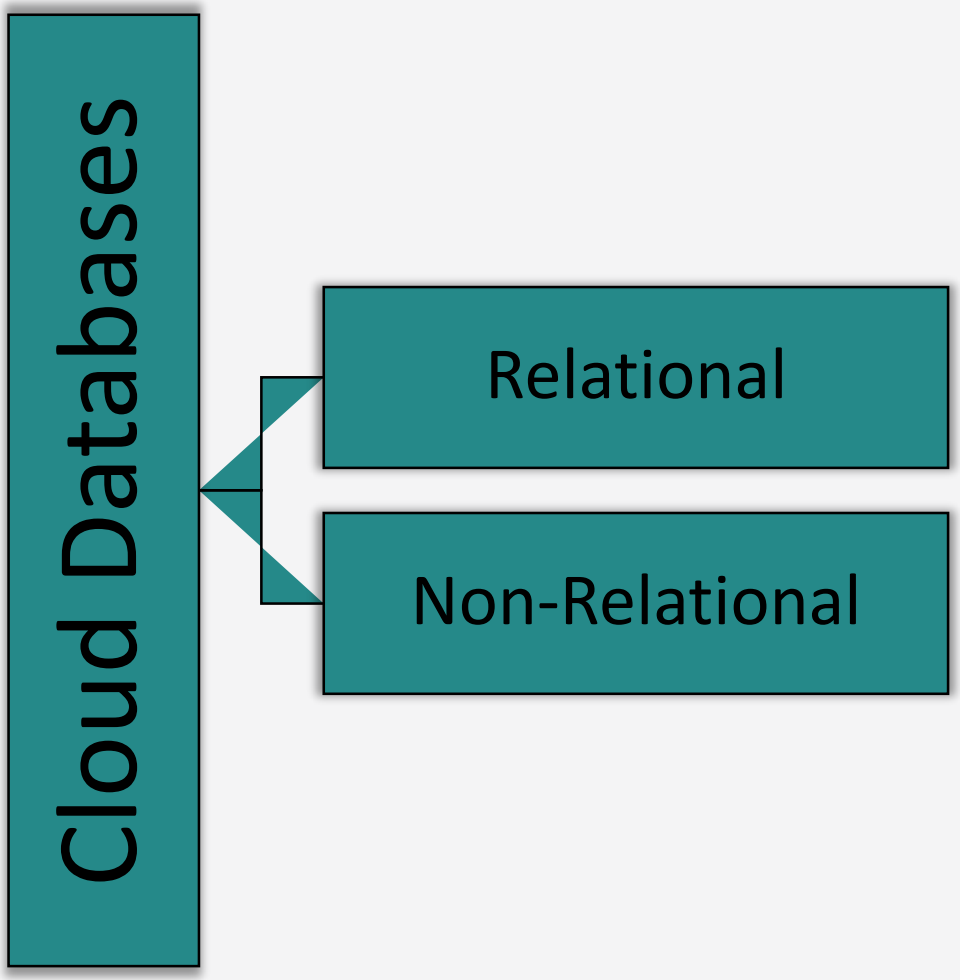
Cloud Database

- Where an on-premises database is connected to local users through a corporation's internal local area network (LAN), a cloud database resides on servers and storage furnished by a cloud or database as a service (DBaaS) provider and it is accessed solely through the internet.

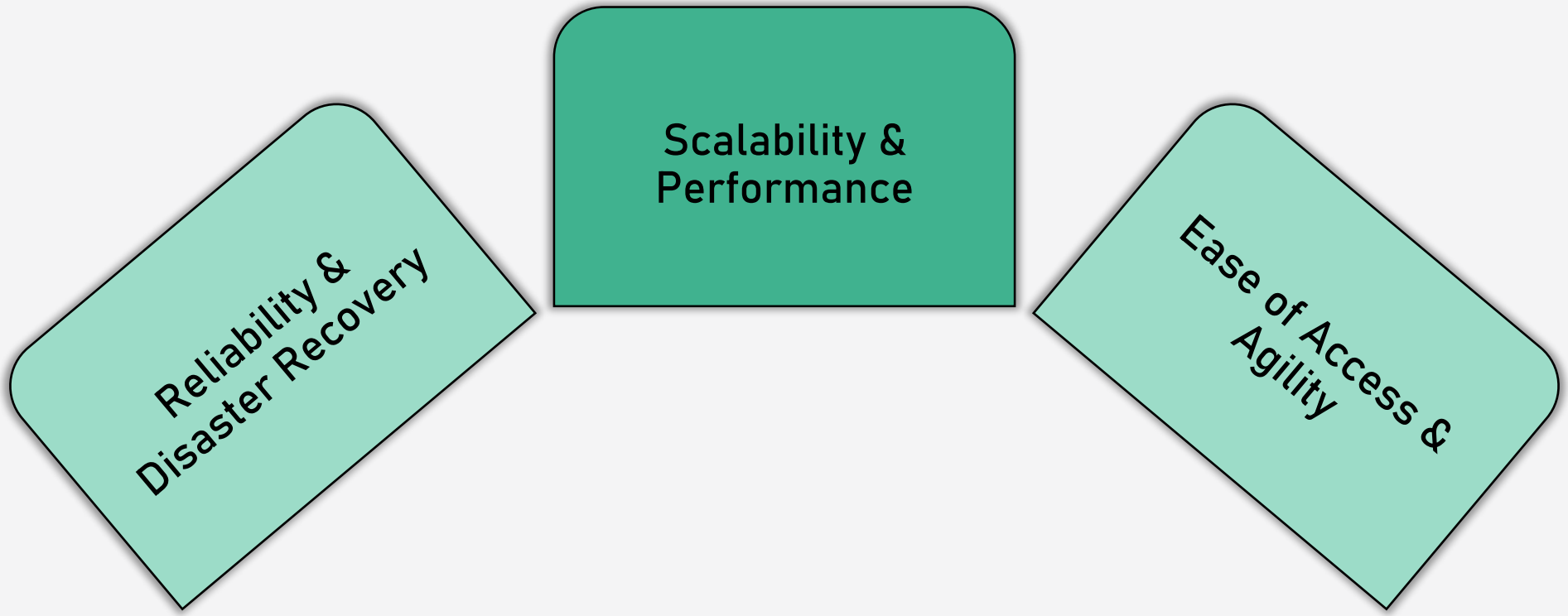
Cloud Database

- Cloud DBaaS is natural database equivalent of software-as-a-service (SaaS).
- Running own self-managed database in a cloud environment.

How Cloud Databases Work



Benefits of Using a Cloud Database



Benefits of Using a Cloud Database

- Overall cost
- Flexible Solutions
- Mobile Access
- Disaster Recovery
- Safe & Secure
- Scaling & Managing Database is Easier

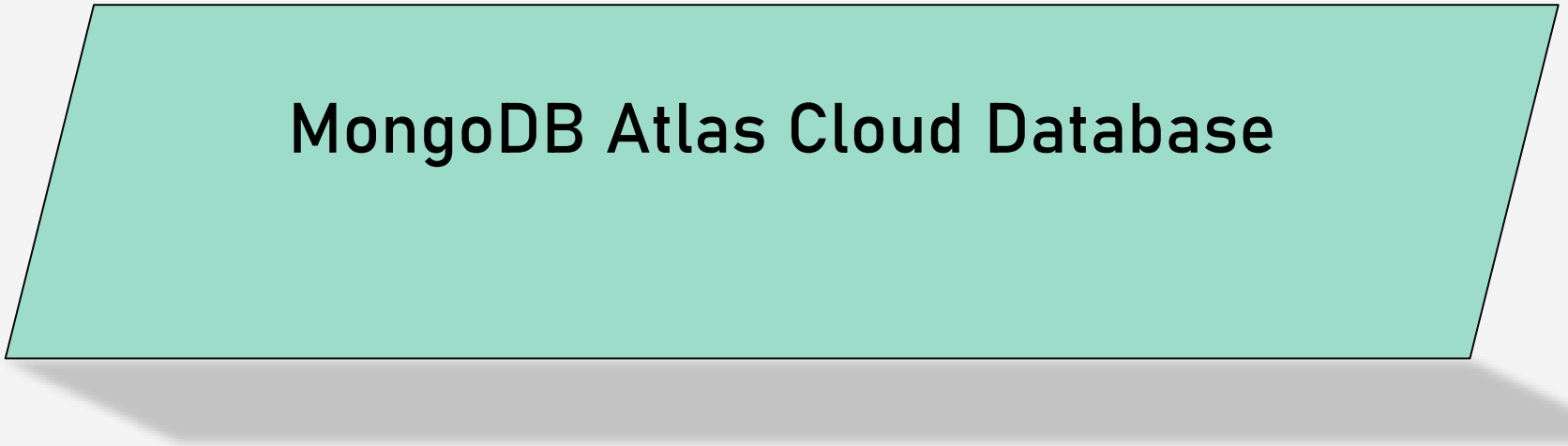
Disadvantages of Using Cloud Database

- Vendor Lock-In
- Cost Concerns
- System Vulnerabilities
- Connection Downtime
- Maintenance

Considerations for Moving Database to Cloud

- What is current database hosting infrastructure?
- Are you expanding the capabilities of the applications you are creating?
- Is 24/7 availability essential for your business's applications?
- Does your business build applications that require large datasets to operate efficiently?

Example of Cloud Database Service



That's all for now...