Architectural Design

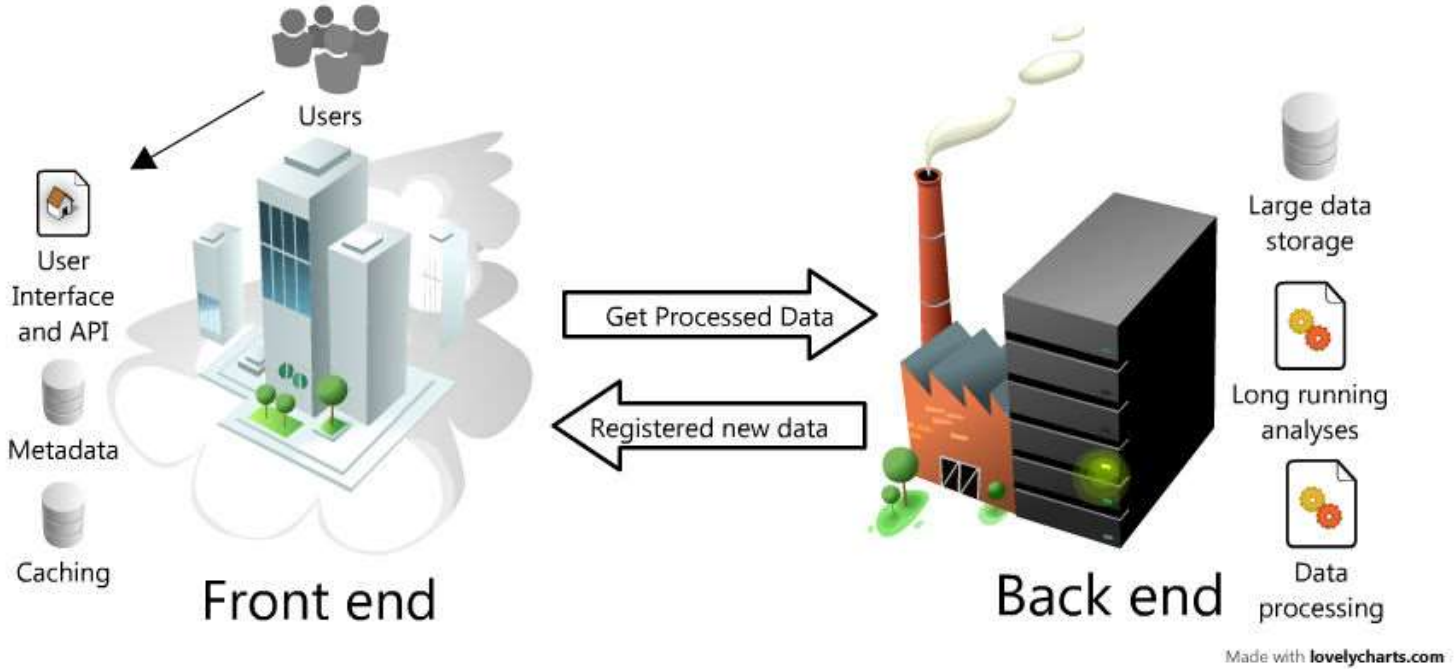
COURSE: **23**CAE717 - Cloud Computing & Virtualization Techniques

UNIT III : Cloud Infrastructure

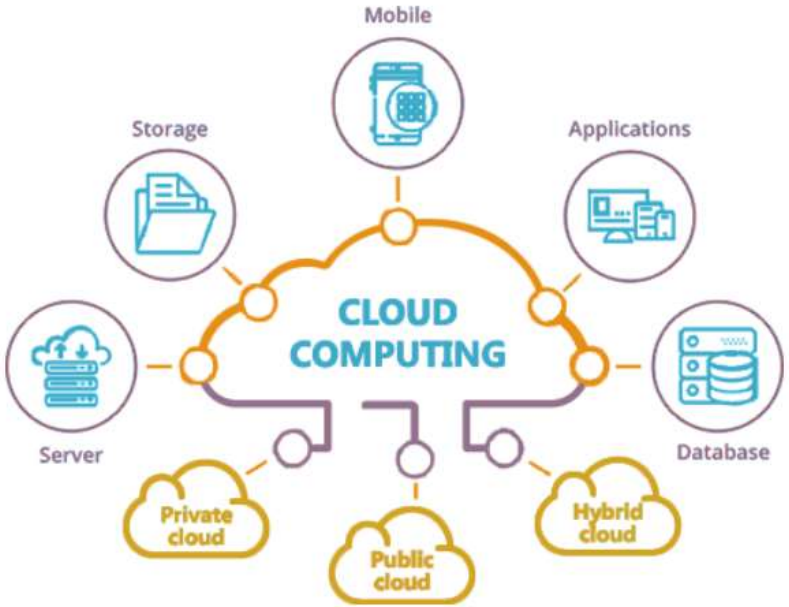
CLASS : II Semester / I MCA

- Refers to the components and subcomponents required for cloud computing
- **Front end** refers to the client part consists of interfaces and applications that are required to access the cloud computing platforms
- **Back End** refers to the cloud itself which consists of all the resources required to provide cloud computing services
  - includes data storage, virtual machines, security mechanism, services, deployment models, servers

Cloud Architecture



Ref: https://mappinglife.wordpress.com/2011/04/21/40/



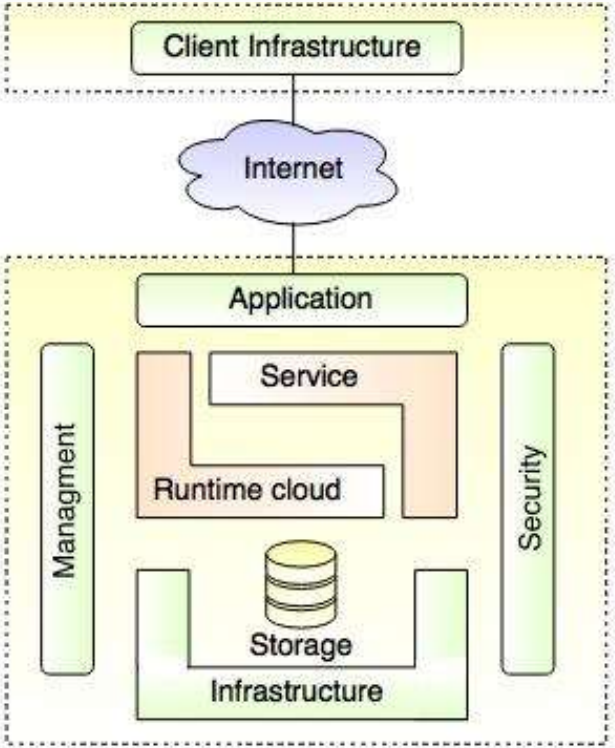


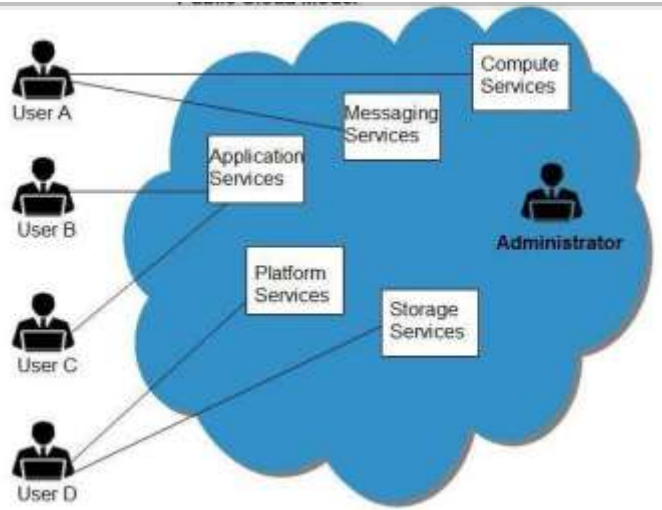
Fig. - Graphical View of Cloud Computing Architecture

- **Application** – Based on user need
- **Service** – this component provides utility like storage and web
- **Storage –** keeps deals with any measure of information, part of capacity
- **Management** - manages resources for a specific task application, task, administration, security, and cloud framework
- **Security** - ensures assets, documents of cloud from attacks

6 Principles of Cloud Architecture

- Integrated Ecosystem Management for Cloud
- Virtualization for Cloud Infrastructure
- Service-Orientation for Common Reusable Services
- Extensible Provisioning and Subscription for Cloud
- Configurable Enablement for Cloud Offerings
- Cloud Quality and Governance

- Public Cloud allows systems and services to be easily accessible to general public
- Example: Google, Amazon and Microsoft offer via Internet



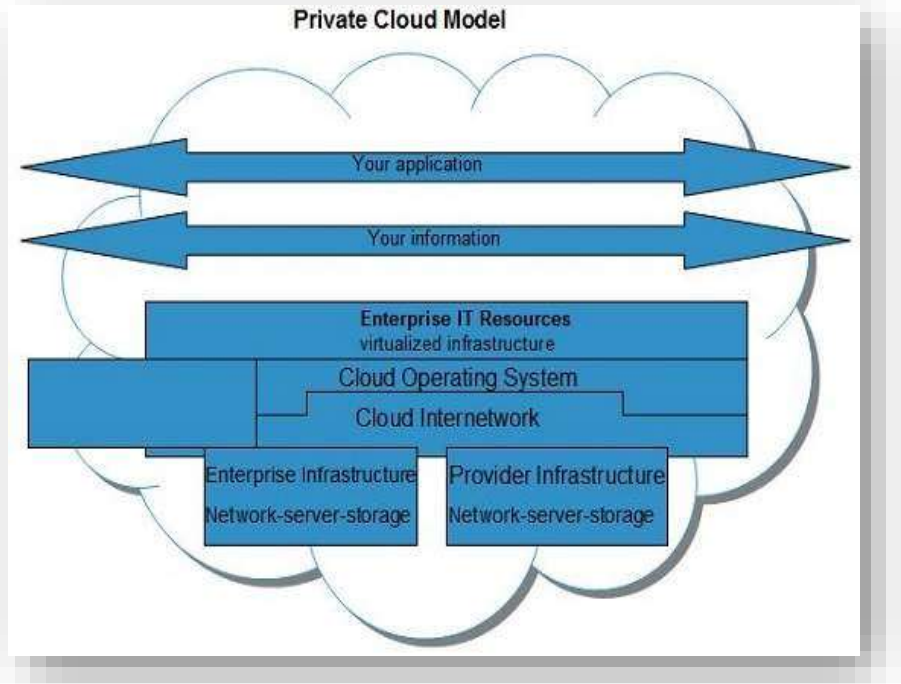
Benefits

- Cost effective
- Reliability
- Flexibility
- Location independence
- High scalability
- Utility style costing

Disadvantages

- Security
- Less customizable

- Private Cloud allows systems and services to be accessible within an organization



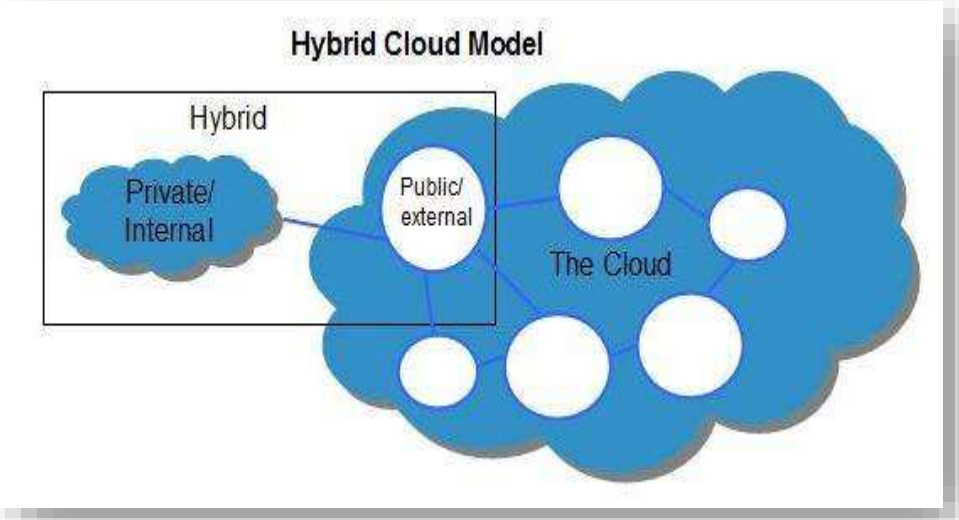
Benefits

- More control
- High Security & privacy
- Cost and energy efficient
- Improved reliability

Disadvantages

- High priced
- Limited scalability
- Restricted area of ops.

- Hybrid Cloud is a mixture of public and private cloud
- Non-critical activities are performed using public cloud while the critical activities are performed using private cloud



Benefits

- scalability
- Flexibility
- Cost efficient
- Security

Disadvantages

- Network issues
- Infrastructure dependency
- Restricted area of ops.

- To process massive amount of data with high degree of parallelism, cloud system needs
  - Virtualization support
  - Resource provisioning
  - Infrastructure management
  - Performance modeling

- **Cloud architecture design issues**
  - Scalability
  - Virtualization
  - Efficiency
  - Reliability

- **Driving forces of cloud architecture**
  - Ubiquity broadband/wireless services
  - Falling storage costs
  - Progressive improvement in internet technologies

- **Customer can able to**
  - Demand more capacity at the peak time
  - Reduce costs
  - Experiment with new services
  - Remove unneeded capacity

- **Service provider can utilize**
  - Multiplexing
  - Virtualization
  - Dynamic resource provisioning

- Fast Platform deployment
  - Fast, Efficient, Flexible deployment of cloud resources
- Virtual clusters on demand
  - Clusters of VMs provisioned to satisfy user demand
  - Virtual cluster reconfigured as workload changes
- Multitenant Techniques
  - SaaS for distributing software to large no users simultaneously
- Web scale communication
  - Supports e-commerce, e-learning and other digital entertainment applications

- Massive data processing
  - Internet search and web services
  - To support personalized services
- Distributed storage
  - Large scale storage of data
  - Distributed
- Licensing and Billing
  - Licensing management
  - Billing – pay on use

References

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Architectural Design Challenges