SESSION 7

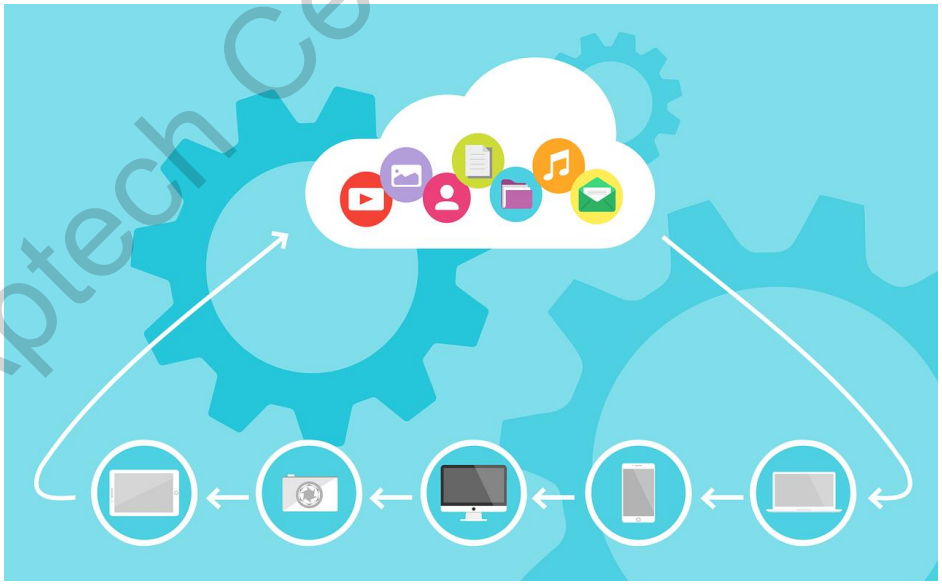
The Power of Big Data, Cloud, and IoT

Objectives

- Describes Cloud Architecture and its components
- Explain the IoT and issues around IoT
- Describe the power of Big Data and IoT

Cloud Architecture (1-3)

- Cloud Computing is the process of manipulating, configuring, and accessing applications online.
- In simple terms, it is the delivery of computing services (such as infrastructure, storage, databases, networking, software, and more) over the Internet.



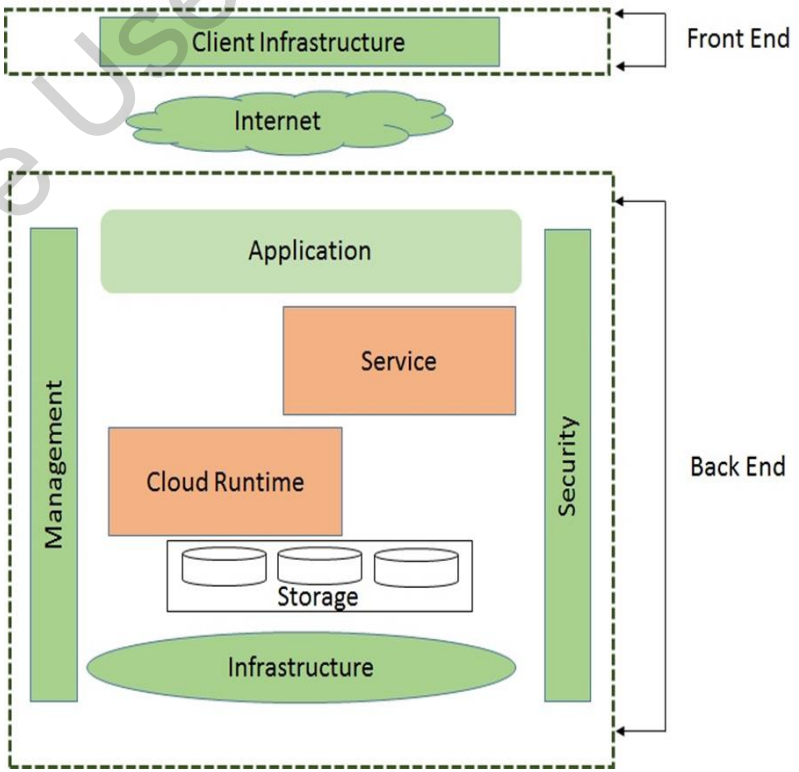
Cloud Architecture (2-3)

- Cloud Computing provides:
  - Online data storage facilities, infrastructure, and applications
  - Universal, convenient, and on-demand network
  - Least management effort or service provider interaction

- Its features are:

Cloud Architecture (3-3)

- Cloud computing architecture contains two loosely coupled components:
  - Front End
  - Back End



Big Data Challenges (1-2)

- There are seven challenges of Big Data:

Distinct Cloud Services and On-premises Data Centers

- Difficult to integrate cloud services with existing system
- New skills need to be learnt for enhancing cloud infrastructure

Deciding Right Skills

- There is a lack of resources
- Shortage of experts in cloud architecture, DevOps, and developer skills

Experimentation to Production

- An issue in integrating cloud in production data processes
- Issues in change management and operational hurdles

Big Data Challenges (2-2)

Misunderstood Cloud Security

- Inconsistent, ad hoc usage, or cloud policies defined poorly leading to human errors

Data Movement

- A challenge of moving giant petabyte sized datasets from data centers to the cloud

Non-standardized Cloud Services

- A challenge is to find right cloud providers for existing processes

Determining Strategic Skills

- Managed services supplies enterprise resources and Big Data service offers abstract and automate core cloud complexity

Internet of Things (IoT) (1-2)

- Ability of network devices that sense, collect, and share data across the Internet
- Some consumer applications of IoT are:

- Warnings on mobile phone at the time of physical danger
- Self-parking automobiles
- Automatic groceries ordering
- Automatic exercises tracking

Internet of Things (IoT) (2-2)

- Some benefits of IoT are:
  - Location tracking of manufacturing inventory for individual pieces
  - Fuel savings from smart environmental modeling of gas-powered engines
  - New improved safety measures for people working in hazardous environments
- IoT devices are:
  - Wi-Fi network adapters
  - Cameras
  - Motion sensors
  - Microphones

IoT Issues (1-2)

- Challenges facing the adoptions of standards within IoT:

Standard for handling unstructured data

- Unstructured data are stored in different types of NoSQL databases without a standard querying approach

Technical skills to leverage newer aggregation tools

- Companies often face a shortage of talent to plan, execute, and maintain systems

IoT Issues (2-2)

- Challenges facing the adoptions of intelligent analytics within IoT:
  - Inaccurate analysis due to flaws in the data and/or model
  - Legacy systems' ability to analyze unstructured data
  - Legacy systems' ability to manage real- time data
- Challenges facing the adoption of intelligent actions within IoT:
  - Machines' actions in unpredictable situations
  - Information security and privacy
  - Machine interoperability
  - Mean-reverting human behaviors
  - Slow adoption of new technologies

Power of Big Data and IoT

- IoT with Big Data helps in generating and storing huge amount of new types of data
- IoT and Big Data facilitates:

Easy access	Real-time availability	Large footprint	Appropriate analysis and follow-up action

- Challenges of Big Data and Business Analytics are:

Data storage	Data pooling	Availability of IoT infrastructure and skills	Security and privacy

Predictions and Challenges

- Big Data and IoT are highly dependent upon business demands
- Big Data and IoT technologies facilitate new business opportunities
- With the growth of IoT, huge amount of data is generated for Big Data capabilities
- Ericsson report 2016: prediction of over 16 billion devices will be connected to Internet by IoT by year 2021
- EMC Corporation: Big Data and IoT intersect at the need of process, transform, and analysis for huge amounts of data with high frequency
- There are different levels of data - Some amount of data functions in local scenarios and other works in non-localized scenarios

Summary (1-2)

- Cloud Computing architecture comprises many cloud components, which are loosely coupled. The cloud architecture can be broadly divided into two parts: Front End and Back End.
- Cloud Architecture refers to various components in terms of databases, software capabilities, applications, and so on.
- The components are engineered to leverage the power of cloud resources to solve business problems.
- Entire cloud architecture is aimed at providing the users with high bandwidth, allowing users uninterrupted access to data and applications, and an on-demand agile network.

Summary (2-2)

- IoT represents ability of network devices to sense and collect data from the world around us, and then share that data across the Internet where it can be processed and utilized.
- IoT refers to scenarios where network connectivity and computing capability extends to devices that we use in our daily lives allowing them to generate, exchange, and consume data with minimal human intervention.