

# Cloud Computing Concepts

CS 3132

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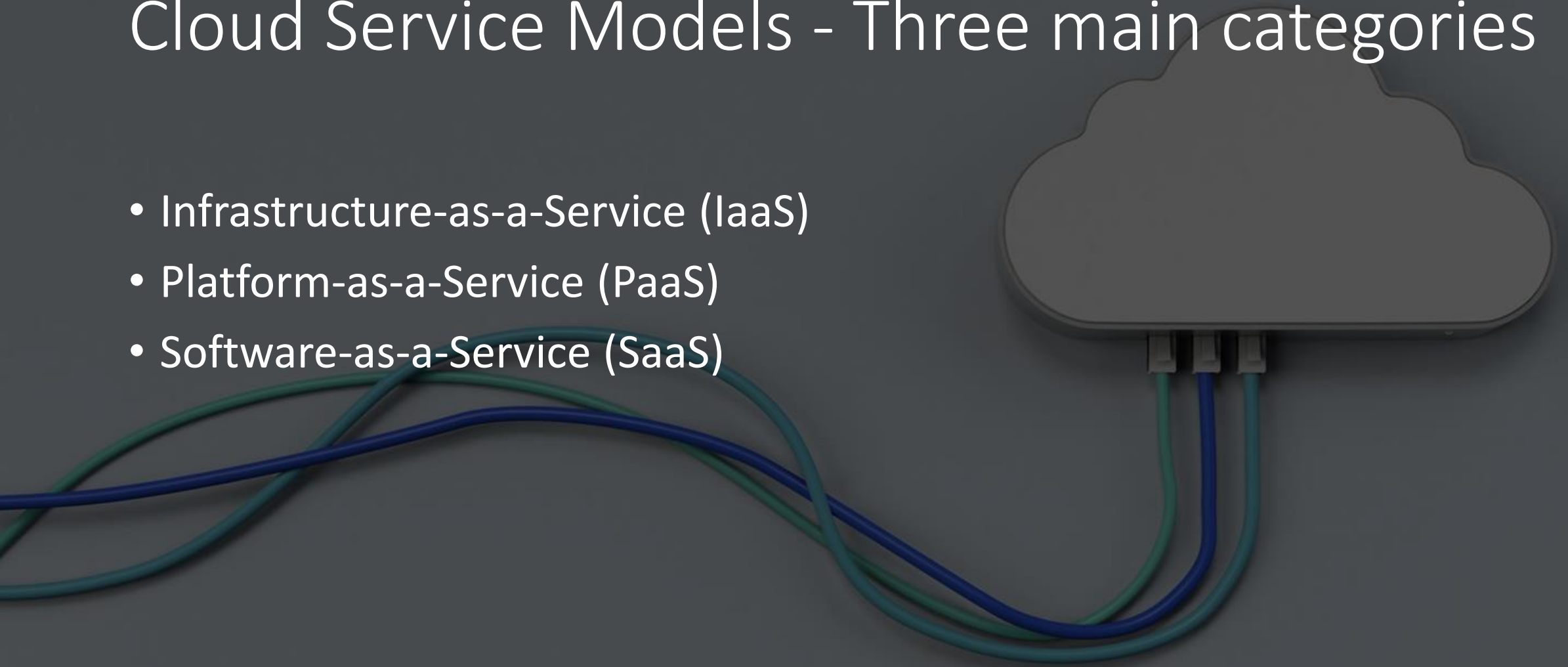
NIIT University

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# Cloud Computing Service Models

# Cloud Service Models - Three main categories

- Infrastructure-as-a-Service (IaaS)
- Platform-as-a-Service (PaaS)
- Software-as-a-Service (SaaS)

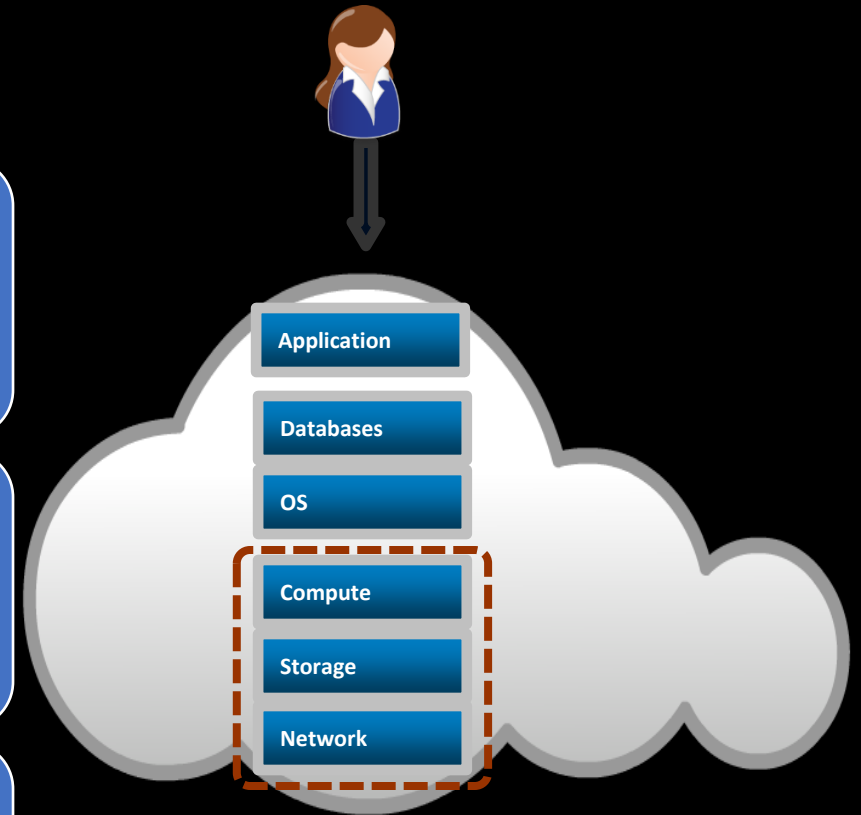


# Infrastructure-as-a-Service

Provides capability to the consumer to hire infrastructure components such as servers, storage, and network

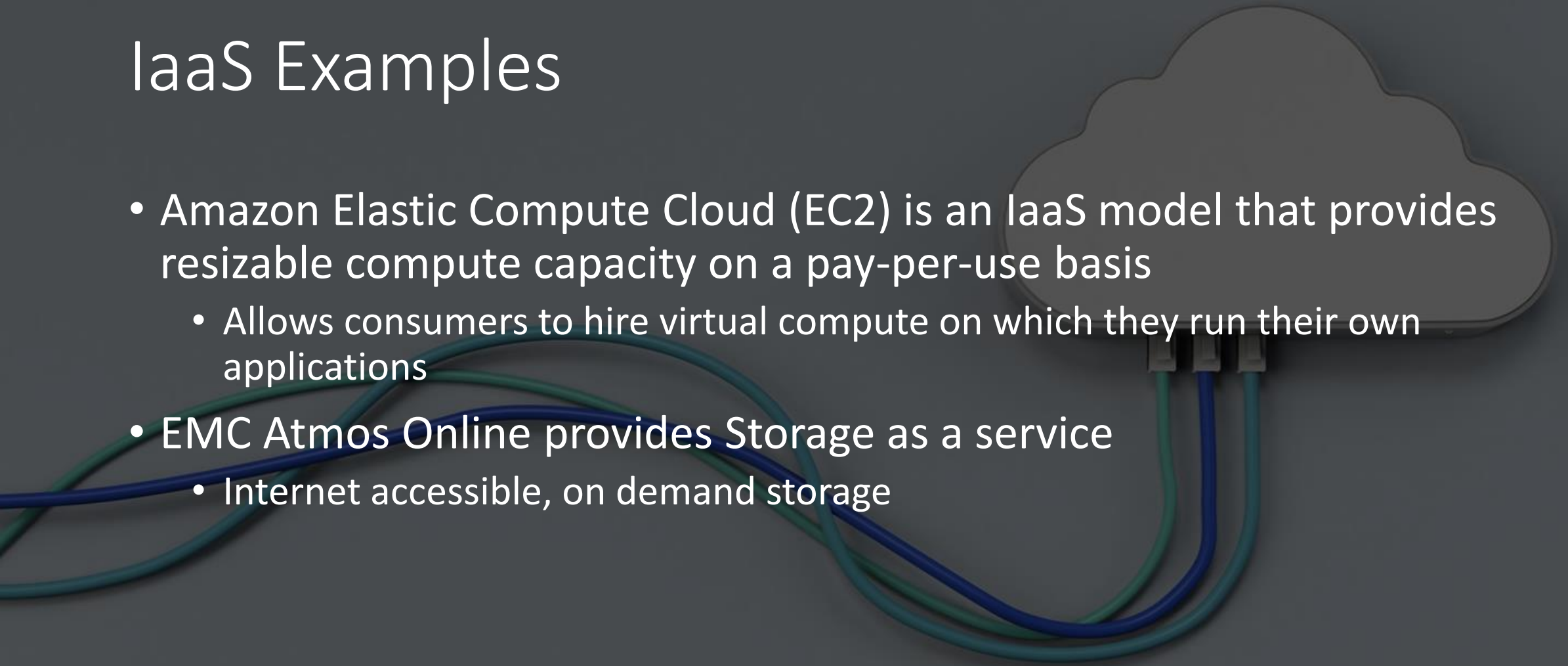
Enables consumers to deploy and run software, including OS and applications

Pays for infrastructure components usage, for example, Storage capacity, CPU usage, etc.



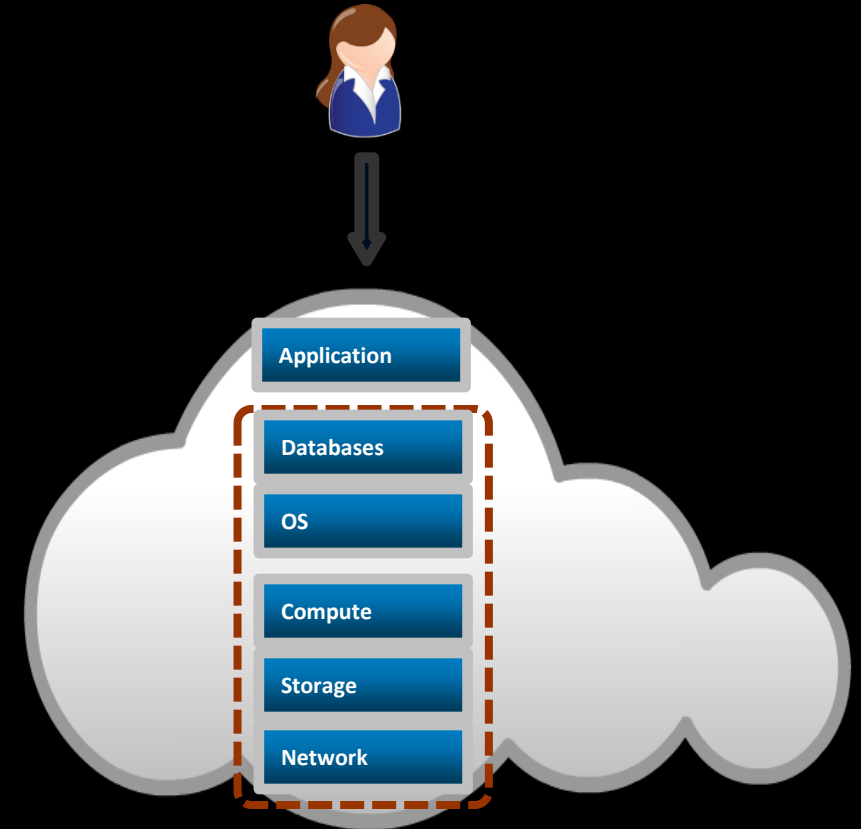
# IaaS Examples

- Amazon Elastic Compute Cloud (EC2) is an IaaS model that provides resizable compute capacity on a pay-per-use basis
  - Allows consumers to hire virtual compute on which they run their own applications
- EMC Atmos Online provides Storage as a service
  - Internet accessible, on demand storage



# Platform-as-a-Service

- Capability provided to the consumer to deploy consumer-created or acquired applications on the Cloud provider's infrastructure
- Consumer has control over
  - Deployed applications
  - Possible application hosting environment configurations
- Consumer is billed for platform software components
  - OS, Database, Middleware



# PaaS Examples

Google App Engine provides platform for consumers to deploy or create their own applications

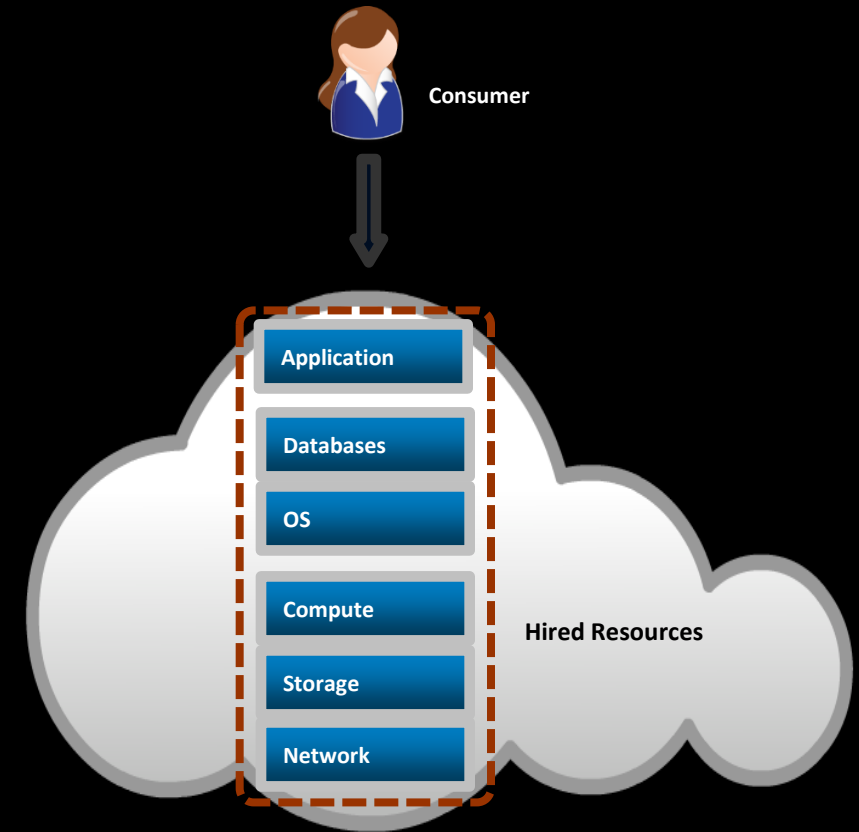
- Allows dynamic allocation of system resources for an application based on the actual demand
- Provides Java and Python environment to create and deploy application

Microsoft Azure Platform provides diverse functionalities to build applications

- Uses existing skills with Visual Studio and .Net to build applications
- Builds applications also in Java and PHP using Eclipse and other tools

# Software-as-a-Service

- Capability provided to the consumer to use provider's applications running in a Cloud infrastructure
- Complete stack including application is provided as a service
- Application is accessible from various client devices, for example, via a thin client interface such as a Web browser
- Billing is based on the application usage





# SaaS Examples

EMC Mozy is a Software-as-a-Service solution for on-line backup

- Consumers can leverage the Mozy console to perform automatic, secured, online backup and recovery of their data with ease

Salesforce.com is a Software-as-a-Service solution for CRM application

- Consumers can access CRM applications from anywhere, any time

# Cloud Computing - Benefits

Reduced IT Cost - Avoids the up-front capital expenditure

Business agility support - Provides the ability to add new resources quickly

Flexible scaling - Scales up and down easily and instantly, based on demand

High availability - Ensures application availability at varying levels

Less energy consumption - Enables organizations to reduce power consumption and space usage

# Cloud Computing - Technological Foundations

## Computing

### Grid Computing –

- Form of distributed computing which applies the resources of numerous computers in a network to work on a single complex task at the same time

## Computing

### Utility Computing –

- Service provisioning model that offers computing resources as a metered service

# • Cloud Computing - Technological Foundations

- Virtualization –

- Provides improved utilization of resources
- Enables optimization of resources by over subscription

- Service Oriented Architecture (SOA) –

- An architectural approach in which applications make use of services available in the network
- Each service provides a specific function, for example, business function (Payroll Tax calculation)