

Modular Content Structure

- 1. Introduction to Cloud Computing**
 - 1.1. Cloud Computing, services, deployment models
 - 1.2. Introduction to Cloud Computing
 - 1.3. Origins and Motivation
 - 1.4. Types of Clouds and Services
 - 1.5. Cloud Infrastructure and Deployment

- 2. Virtualization Techniques and Types**
 - 2.1. Introduction to Virtualization
 - 2.2. Use & demerits of Virtualization
 - 2.3. Types of Virtualizations
 - 2.4. Examples
 - 2.5. x86 Hardware Virtualization
 - 2.6. Manage the resources for the SaaS, PaaS and IaaS models

- 3. Infrastructure as a Service**
 - 3.1. Introduction to IaaS
 - 3.2. IaaS examples
 - 3.3. Reference Model of AWS
 - 3.4. Amazon cloud services - Compute, Database, Storage
 - 3.5. Region Vs Availability zones
 - 3.6. Case Study - Openstack
 - 3.7. Managing Virtual Resources on the Cloud: Provisioning and Migration
 - 3.7.1. Virtual Machine Provisioning and Manageability
 - 3.7.2. VM Provisioning Process
 - 3.7.3. Virtual Machine Migration Services
 - 3.7.4. Migrations Techniques
 - 3.7.5. VM Provisioning and Migration in action

4. Containers

- 4.1. Linux Containers - LXC and LXD
- 4.2. Dockers - Elements, Images, Files, Containers
- 4.3. Cloud orchestration technologies

5. Platform as a Service and SaaS

- 5.1. Introduction to PaaS
- 5.2. PaaS examples
- 5.3. Windows Azure
- 5.4. 5 Principles of UI Design - AWS PaaS
- 5.5. Introduction to SaaS
- 5.6. Pros and Cons of SaaS model and applications

6. Capacity management and Scheduling in cloud computing

- 6.1. Capacity management and Scheduling
- 6.2. Distributed management of virtual machines
- 6.3. Reservation-based provisioning of virtualized resource
- 6.4. Provisioning to meet SLA commitments
- 6.5. Stages of VM life cycle within OpenNebula
- 6.6. Network model for OpenNebula

7. Issues and Challenges: Availability, Multi-Tenancy, Security and SLA

- 7.1. Multi-Tenancy, 4 levels of multi tenancy
- 7.2. Multi-tenant models for cloud
- 7.3. Introduction to cloud security
- 7.4. Cloud security Issues
- 7.5. Threat Model
- 7.6. Top 5 cloud security threats
- 7.7. Managing security
- 7.8. Service License Agreements: Lifecycle and Management
- 7.9. Traditional approaches to SLO management

- 7.10. SLA Management in Cloud
- 7.11. Automated Policy based management
- 7.12. Managing Clouds: Services and Infrastructure

Modular Content Structure (50 hours theory, 50 hours practical)

1. Introduction to Cloud Computing (4 hours theory)

- 1.1. Cloud Computing, services, deployment models
- 1.2. Introduction to Cloud Computing
- 1.3. Origins and Motivation
- 1.4. Types of Clouds and Services
- 1.5. Cloud Infrastructure and Deployment

2. Virtualization Techniques and Types (10 hours theory, 10 hours practical)

- 2.1. Introduction to Virtualization
- 2.2. Use & demerits of Virtualization
- 2.3. Types of Virtualizations
- 2.4. Examples
- 2.5. x86 Hardware Virtualization
- 2.6. Manage the resources for the SaaS, PaaS and IaaS models

3. Infrastructure as a Service (20 hours theory, 40 hours practical)

- 3.1. Introduction to IaaS
- 3.2. IaaS examples
- 3.3. Reference Model of AWS
- 3.4. Amazon cloud services - Compute, Database, Storage
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- 3.7. Managing Virtual Resources on the Cloud: Provisioning and Migration
 - 3.7.1. Virtual Machine Provisioning and Manageability
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 - 3.7.3. Virtual Machine Migration Services
 - 3.7.4. Migrations Techniques
 - 3.7.5. VM Provisioning and Migration in action

4. Containers (4 hours theory)

- 4.1. Linux Containers - LXC and LXD
- 4.2. Dockers - Elements, Images, Files, Containers
- 4.3. Cloud orchestration technologies

5. Platform as a Service and SaaS (4 hours theory)

- 5.1. Introduction to PaaS
- 5.2. PaaS examples
- 5.3. Windows Azure
- 5.4. 5 Principles of UI Design - AWS PaaS
- 5.5. Introduction to SaaS
- 5.6. Pros and Cons of SaaS model and applications

6. Capacity management and Scheduling in cloud computing (4 hours theory)

- 6.1. Capacity management and Scheduling
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7. Issues and Challenges: Availability, Multi-Tenancy, Security and SLA (4 hours theory)

- 7.1. Multi-Tenancy, 4 levels of multi tenancy
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