CSE423:VIRTUALIZATION AND CLOUD COMPUTING

L:3 T:0 P:0 Credits:3

Course Outcomes: Through this course students should be able to

CO1 :: illustrate the main aspects, key technologies and mechanisms of Virtualization technology

CO2 :: examine the appropriate technologies, algorithms and approaches for the provisioning of various resources and implementation of cloud computing

CO3 :: understand the main issues involved in cloud computing such as cloud architecture, capacity planning and service level agreement

CO4 :: evaluate the economical cloud solution by considering appropriate cost estimation strategy and laws of cloudonomics

CO5 :: enumerate the core aspects of cloud security, privacy and reliable cloud environment

CO6 :: understand the emerging technologies of cloud computing and how it bring changes in the traditional cloud computing models

Unit I

Virtualization techniques : virtualization technology, overview of x86 virtualization, types of virtualization, concept of VLAN , SLAN and VSAN and benefits, concept of VLAN ,VSAN and benefits

Overview of Distributed computing : Parallel and Distributed Systems, Parallel Computing, Parallel Computer Architecture, Distributed Systems, Differences and Similarities among Different Types of Computing

Unit II

Introduction to Cloud Computing : Cloud Computing in a Nutshell, Roots of Cloud Computing., Layers and Types of Clouds., Desired Features of a Cloud, Cloud Infrastructure Management., Examining the Characteristics of Cloud Computing, cloud types

Migrating into a Cloud : Broad Approaches to Migrating into the Cloud, The Seven-Step Model of Migration into a Cloud VM Migration, Cloud Middleware and Best Practices, Concept and Need of Cloud Middleware, QoS Issues in Cloud, Data Migration and Streaming in Cloud, Interoperability

Unit III

Understanding cloud architecture : exploring the cloud computing stack, Workload distribution architecture, Capacity planning, Cloud bursting architecture, Disk provisioning architecture, Dynamic failure detection and recovery architecture, Cloud Computing Architecture, Service Level Agreements, Service Oriented Architecture

Unit IV

Cloud Computing Technologies and Applications : Cloud Content Delivery Network Services, Multi-CDN, Features of Meta CDN, Mobile Cloud Computing, InterCloud Issues

Cloud Economics : Developing an Economic Strategy, Exploring the Costs, Laws of cloudonomics, Cost estimation, Economics of Cloud

Unit V

Cloud security : Cloud Security Fundamentals, Cloud Risk, Cloud Risk Division, Policy and Organizational Risks, Technical Risks, Legal Risks, Other Risks, Cloud Computing Security Architecture, VM Security Challenges

Cloud Database : Operational Model for Cloud Database, Types of Cloud Database, Cloud File System, Distributed File System Basics, Concept of GFS and HDFS, Comparison of Features

Unit VI

Container technology : Introduction to containers, container architectures, Docker containers, Kubernetes

Cloud Platforms in Industry : Amazon Web services, Google App Engine, Microsoft Azure, Case studies

Other aspects of Cloud : Edge Computing, Fog Computing, IIoT, Green Cloud computing practices, Complexity in Cloud-native systems

Text Books:

1. CLOUD COMPUTING: FUNDAMENTALS, INDUSTRY APPROACH AND TRENDS by RISHABH SHARMA, WILEY

References:

References:

1. MASTERING CLOUD COMPUTING by RAJKUMAR BUYYA,CHRISTIAN VECCHIOLA ,S.THAMARAI SELVI, MCGRAW HILL EDUCATION

2. CLOUD COMPUTING: A HANDS-ON APPROACH by ARSHDEEP BAHGA, VIJAY MADISETTI, UNIVERSITIES PRESS PVT. LTD