K.S. INSTITUTE OF TECHNOLOGY, BANGALORE - 560109

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

TEACHING AND LEARNING

Details of Content beyond Syllabus Activities-2022-23(EVEN)

Semester/ Section	Course Name	Content beyond syllabus activity conducted	POs Covered	Faculty	Number of students Participated
VI/A	Cloud Computing and its applications-18CS643	Case study	1,2,3,5,9,10	Supreetha Ganesh	05
VI/A	Cloud Computing and its applications-18CS643	Case study	1,2,3,5,9,10,12	Supreetha Ganesh	05
VI/A&B	System simulation and Modelling-18CS645	Spreadsheet exercises	9,10,12	Dr. Rekha B.Venkatapur	120

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DEARTMENT OF COMPUTER SCIENCE & ENGINEERING

CONTENT BEYOND SYLLABUS

Academic Year	**2022-23**
Name of the Faculty	**Supreetha Ganesh**
Course Name /Code	**Cloud Computing and its applications/ 18CS643)**
Semester/Section	**6th A**
Activity Name	Case Study on Ubisoft's Cloud using AWS for multi player gaming support
Date	**19-06-2023**
No. of Participants	**05**
Objectives/Goals	Study the multi player gaming model on cloud by Ubisoft to simplify management and increase reliability and scalability using AWS
ICT Used	**LCD**
Appropriate Method/Instructional materials/Exam Questions **Level 3: Apply, CO3-CO5**	
Relevant PO's:	**PO:1,2,3, 5, 9, 10**
Significance of Results/Outcomes	Motivate students to learn from the existing cloud applications and innovate new ideas.
Reflective Critique	The main goal of this activity to understand cloud Deployment and various cloud services
Proofs (Reports Attached)	

Signature of Course In charge

Signature of HOD CSE

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CASE STUDY ON

UBISOFT'S CLOUD USING AWS FOR MULTI PLAYER GAMING SUPPORT

Cloud computing is the on-demand delivery of IT resources over the Internet with pay-as-you-go pricing. Instead of buying, owning, and maintaining physical data centers and servers, you can access technology services, such as computing power, storage, and databases, on an as-needed basis from a cloud provider like Amazon Web Services (AWS).

Who is using cloud computing?

Organizations of every type, size, and industry are using the cloud for a wide variety of use cases, such as data backup, disaster recovery, email, virtual desktops, software development and testing, big data analytics, and customer-facing web applications. For example, healthcare companies are using the cloud to develop more personalized treatments for patients. Financial services companies are using the cloud to power real-time fraud detection and prevention. And video game makers are using the cloud to deliver online games to millions of players around the world.

- **Infrastructure as a Service (IaaS)** : IaaS contains the basic building blocks for cloud IT. It typically provides access to networking features, computers (virtual or on dedicated hardware), and data storage space. IaaS gives you the highest level of flexibility and management control over your IT resources. It is most similar to the existing IT resources with which many IT departments and developers are familiar.
- **Platform as a Service (PaaS)** : PaaS removes the need for you to manage underlying infrastructure (usually hardware and operating systems), and allows you to focus on the deployment and management of your applications. This helps you be more efficient as you don't need to worry about resource procurement, capacity planning, software maintenance, patching, or any of the other undifferentiated heavy lifting involved in running your application.
- **Software as a Service (SaaS)** : SaaS provides you with a complete product that is run and managed by the service provider. In most cases, people referring to SaaS are referring to end-user applications (such as web-based email). With a SaaS offering, you don't have to think about how the service is maintained or how the underlying

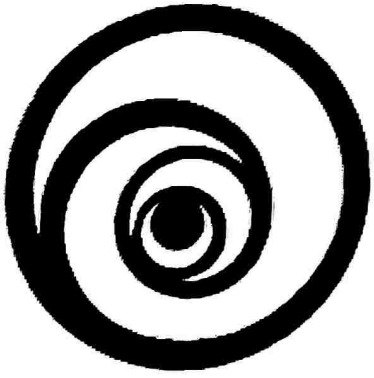
infrastructure is managed. You only need to think about how you will use that particular software.

Amazon Web Services (AWS) is the world's most comprehensive and broadly adopted cloud platform, offering over 175 fully featured services from data centers globally. Millions of customers—including the fastest-growing startups, largest enterprises, and leading government agencies—are using AWS to lower costs, become more agile, and innovate faster.

Global network of AWS Regions

AWS has the most extensive global cloud infrastructure. No other cloud provider offers as many Regions with multiple Availability Zones connected by low latency, high throughput, and highly redundant networking. AWS has 77 Availability Zones within 24 geographic regions around the world, and has announced plans for nine more Availability Zones and three more AWS Regions in Indonesia, Japan, and Spain. The AWS Region/Availability Zone model has been recognized by Gartner as the recommended approach for running enterprise applications that require high availability.

Ubisoft is a leading creator, publisher, and distributor of interactive entertainment and services, with a rich portfolio of world-renowned brands, including **Assassin's Creed, Just Dance, Tom Clancy's** video game series, **Rayman, Far Cry,** and **Watch Dogs.** Headquartered in Paris, France, Ubisoft's teams are committed to delivering original and memorable gaming experiences across all popular platforms, including multiplayer experiences enjoyed by millions of gamers around the world.



UBISOFT®

Finding Agility and Scalability in the AWS Cloud

Ubisoft decided to move its Storm platform—and several online multiplayer games—to the cloud to simplify management and increase reliability and scalability. After a short evaluation phase, Ubisoft chose the **Amazon Web Services** (AWS) Cloud. "The range of services provided by AWS is overwhelming, so the decision was easy for us," says Fortin. Additionally, other Ubisoft business areas had been using AWS for several years to speed development of new games and scale on demand. "We saw how effective AWS was in terms of scalability and agility, and that definitely influenced our decision to go with AWS."

Ubisoft moved its development, staging, and production environments to AWS for Storm, running on 40 **Amazon Elastic Compute Cloud (Amazon EC2)** instances. The company also uses **Auto Scaling** for automated provisioning of compute resources, and takes advantage of the orchestration features in **Amazon EC2 Container Service (Amazon ECS)** to manage the Storm relay service. "We had been scheduling Docker containers manually, but **Amazon ECS** takes care of that for us now," says Fortin. Ubisoft uses **Amazon ElastiCache** to set up and manage distributed in-memory data stores.

The Storm solution routes traffic between two consoles through AWS. Based on the number of players using the solution, Ubisoft can automatically scale the service up or down. Ubisoft debuted Storm for its **Watch Dogs 2** action-adventure game in late 2016, and plans to use the service for other upcoming releases.

Simplifying Management Using Containers

Ubisoft can now easily scale Storm using AWS. "Scalability is mandatory for us, because our gaming service is global and we don't spin up new stacks for each game to meet demand," says Fortin. "Using AWS, we can automatically scale to support large traffic spikes. Over the last Christmas holiday, we met traffic demands for Watch Dogs 2 by scaling up to 120 relay servers, routing 70 terabytes of data in 20 days."

The company can more easily manage its Storm relay service by using Amazon ECS. "Managing Storm is very simple now, because we use Amazon ECS for orchestration and deployment," says Fortin. "And combined with Auto Scaling groups, it essentially becomes a container-as-a-service model. As a managed service, Amazon ECS does everything for us—it always works and we don't need to spend time maintaining it." As an example, Fortin points to the automated scalability of Watch Dogs 2. "We operated 120 servers with a team of three

people here, because we didn't have to spend our time managing the backend," he says. "Instead of installing and overseeing a management and orchestration tool ourselves—which would have taken us weeks—we configured our service to support the traffic spike in a few days using Amazon ECS."

Deploying Global Updates in Minutes

Ubisoft is now more agile because it runs its solutions in the cloud. "By taking advantage of AWS, we have agility we would have never had in an on-premises IT environment," says Fortin. "As a result, we can try things much faster. For instance, we can spin up a new Redis database in a few seconds using Amazon ElastiCache, instead of installing and configuring the database on our own."

Taking advantage of this agility, Ubisoft can deploy new features and updates faster than before. "We do rolling deployments in three regions in less than 30 minutes, because we use Amazon ECS for all our updates," says Fortin. "By using AWS, we have the autonomy to try new things very quickly, so we don't spend weeks investigating something to see if it will work. That speed and agility ultimately makes us more competitive."

Ubisoft uses these AWS Services

- **Amazon EC2 :** Amazon Elastic Compute Cloud (Amazon EC2) is a web service that provides secure, resizable compute capacity in the cloud. It is designed to make web-scale cloud computing easier for developers.
- **Amazon ECS :** Amazon Elastic Container Service (Amazon ECS) is a highly scalable, high-performance container orchestration service that supports Docker containers and allows you to easily run and scale containerized applications on AWS.
- **Amazon ElastiCache :** Amazon ElastiCache offers fully managed Redis and Memcached. Seamlessly deploy, run, and scale popular open source compatible in-memory data stores.
- **Auto Scaling :** AWS Auto Scaling monitors your applications and automatically adjusts capacity to maintain steady, predictable performance at the lowest possible cost.

How Ubisoft benefited by AWS?

- Quickly scales to support demands of 80,000 players
- Deploys global game-service updates in less than 30 minutes
- Increases competitiveness through speed and agility

- Submitted by,

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DEARTMENT OF COMPUTER SCIENCS & ENGINEERING
CONTENT BEYOND SYLLABUS

Academic Year	**2022-23**
Name of the Faculty	**Supreetha Ganesh**
Course Name /Code	**Cloud Computing and its applications/ 18CS643)**
Semester/Section	**6th A**
Activity Name	**Case Study On Education & Training In Cloud Computing And Big Data by Manjrasoft**
Date	**19-06-2023**
No. of Participants	**05**
Objectives/Goals	With this sweeping change, there is a demand for new skill sets in parallel and distributed computing. Universities play an important role in this regard in training the next generation of ICT professionals and equipping them with the necessary tools and knowledge to tackle the challenges. In addition to the research being done in this field, there are several courses on offer on Parallel, Grid and Distributed computing. Complementing these are network based parallel and distributed computing technologies such as Manjrasoft's Aneka, which offer low cost solution for teaching and learning in this field.
ICT Used	**LCD**
Appropriate Method/Instructional materials/Exam Questions **Level 3: Apply, CO3-CO5**	
Relevant PO's:	**PO:1,2,3, 5, 9, 10 and 12**
Significance of Results/Outcomes	Help educate a new generation of students in the latest area of computing. Add Parallel, Distributed and Cloud Computing into your curriculum.
Reflective Critique	The main goal of this activity to • Parallel data mining • Parallel searching algorithms

	• Parallel sorting algorithms • Mass document searching
Proofs (Reports Attached)	

Signature of Course In charge

Signature of HOD CSE

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CASE STUDY ON

EDUCATION & TRAINING IN CLOUD COMPUTING AND BIG DATA

OBJECTIVES:

Help educate a new generation of students in the latest area of computing. Add Parallel, Distributed and Cloud Computing into your curriculum. Various teaching tools, software and examples to get your program up and running quickly.

Cloud Computing is the delivery of computing services such as servers, storage, databases, networking, software, analytics, intelligence, and more, over the Cloud (Internet). Cloud Computing provides an alternative to the on-premises datacenter.

With an on-premises datacenter, we have to manage everything, such as purchasing and installing hardware, virtualization, installing the operating system, and any other required applications, setting up the network, configuring the firewall, and setting up storage for data. After doing all the set-up, we become responsible for maintaining it through its entire lifecycle, not only that the upfront cost is also to be fulfilled by us.

The advent and adoption of the Internet in the 90s changed the way the ICT industry functions, permanently. Lowering costs in computation and communication is driving the focus from personal to DataCenter centric computing. Although, parallel and distributed computing has been around for several years, in its new forms as, Multicore, Grid and Cloud Computing, has brought about a sweeping change in the industry. These trends are pushing industry focus from developing applications for PCs to Data Centers and Clouds that enable millions of users make use of software simultaneously. ICT services are billed to be delivered as "computing utilities" over shared delivery networks akin to the water, electricity, gas and telephony services.

With this sweeping change, there is a demand for new skill sets in parallel and distributed computing. Universities play an important role in this regard in training the next generation of ICT professionals and equipping them with the necessary tools and knowledge to tackle the challenges. In addition to the research being done in this field, there are several courses on offer on Parallel, Grid and Distributed computing. Complementing these are network

based parallel and distributed computing technologies such as Manjrasoft's Aneka, which offer low cost solution for teaching and learning in this field.

Manjrasoft, which was born out of The University of Melbourne's Cloud Computing and Distributed Systems (CLOUDS) Laboratory, has been doing significant work in this area and has implemented relevant courses to prepare the students for the real world. Manjrasoft's flagship product Aneka, enables one to build virtual supercomputer or an enterprise Cloud out of LAN-connected desktop computers under Windows /.NET environment and provide remote access to this capability as Cloud services. After successful validation of the technology in the market, Aneka is being offered to educational institutions to help students gain knowledge on the practical implementation of the technology.

Manjrasoft offers a seminar and training program aimed at introducing and covering topics ranging from fundamental concepts to using state of the art Aneka technology and how to adopt them to teaching parallel and distributed computing. Manjrasoft would like to work with educational institutions to develop courseware in emerging areas of parallel and distributed computing (multicore programming, Cloud and Big-Data computing) and enable them to train next-generation ICT professionals.

In educational environment, Manjrasoft's Aneka technology is used to:

Setup a Lab by building an enterprise Grid or "on premise" Cloud using existing LAN-connected desktop computers

Teach concepts of parallel and distributed programming using models such as Task, Thread, and MapReduce

Conduct Lab classes and mount student projects in parallel and distributed computing

Teach concurrent programming using the Thread model on multi-core desktop computers or servers

Teach and demonstrate Cloud computing concepts by deploying on public Clouds such as Amazon EC2 by renting the computing infrastructure

Outcomes of activity

Students are encouraged to write applications on:

- Parallel data mining
- Parallel searching algorithms
- Parallel sorting algorithms
- Mass document searching

Submitted by,

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ANIRUDDHA K
MANJUNATH R
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TEACHING AND LEARNING

Academic Year -2022-23

Content Beyond Syllabus Report

Course Code : 18CS645 **Type: Core/ Elective** √

Course Name: System Simulation and Modelling **Semester a& Section: 6th A & B**

Name of the Faculty: Dr Rekha B Venkatapur

Objective : To apply the knowledge gained through the topics in simulation examples which are beyond curriculum and solve problems through collaborative learning

Gaps Identified in the curriculum: In Discrete event System simulation Examples, only Single channel and Multi channel Queuing Models are simulated manually using tables**.** Other application areas where simulation can be applied like reliability problems are not explored, Individual/Team work, communication and lifelong learning cannot be achieved - Gaps : PO9,PO10 and PO12

Course Out Come: CO1, CO2, CO3, CO4, CO5

Level : 3 Apply

CO1: Identify the System components and apply analytical modelling methods to simulate the activities of systems

CO2: Make use of the characteristics of a Discrete system and Event scheduling time advance algorithm to model the Single Queuing Simulation, Identify useful statistical models, discrete and continuous distributions

CO3: Model the behaviour of M/G/1 queue behaviour with measures of performance of queuing systems, Random number and variate generation, Tests for random numbers.

CO4: Identify the steps in Input Modelling by choosing parameters, Solve Goodness of fit tests problems.

CO5: Apply effective verification, calibration and validation of methods, Plan Optimization through Simulation.

Program Out Comes: PO9, PO10 and PO12

Appropriate Method/Instructional materials: Spread Sheet exercises

Examples taught in the class room

1. **Reliability Problem**: Bearing replacement in Spinning Mill

   Source Courtesy: Discrete – Event System Simulation Jerry Banks et.al, 4th Edition

Teaching Tool: Spread sheet

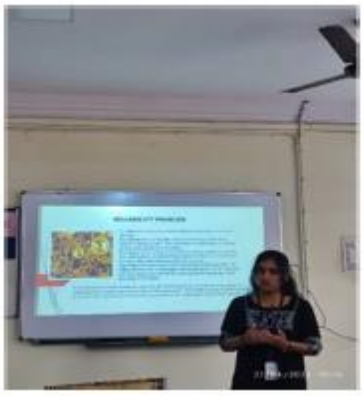
https://drive.google.com/drive/folders/1maNNgF-Dt8zhObYxZdLGGM02uUlsRTvx

Implementation by student's teams:

Date of Presentations/Problem solving : 27-4-2023

Reliability Problem: Bearing Replacement in Spinning Mill- Cost estimation

Presentation of both existing method and Proposed method and problem solving manually



Team Members Presentation :

Manual Simulation Reliability Problem solved through Role play

Assessment Method:

Group Discussion and Presentation by Teams after teaching the Content Beyond syllabus where students applied knowledge to compare existing method for bearing replacement and impact of proposed method on replacement cost and the overall flow of Simulation Process

Rubrics: Presentation

Sl.No	Criteria
1.	Quality of the power point/poster
2.	Technical content
3.	Structuring of the speech
4.	Time Management
5.	Voice modulation
6.	Body language

Strategy to award marks for presentations based on the criteria for each student

Sl. No.	Criteria	Marks for assignments
1.	Assignment not submitted in time or assignment submitted in time but not presented	No marks
2.	Assignment submitted in time, presented and any 04 or more criteria not met	2 marks
3.	Assignment submitted in time, presented and any 03 or more criteria not met	4 marks
4.	Assignment submitted in time, presented and any 02 or more criteria not met	6 marks
5.	Assignment submitted in time, presented and any 01 or more criteria not met	8 marks
6.	Assignment submitted in time, presented and all criteria are met	10 marks

Maximum Marks obtained: 10 **Minimum Marks obtained: 4**

Signature of Staff
Dr. REKHA B. VENKATAPUR

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