G H Raisoni College of Arts, Commerce and Science, Wagholi, Pune

Department of Science

Class: FYMSc (CS)

Semester-I

Subject: Cloud Computing

Practical

1) Working and Implementation of Infrastructure as a service.

Infrastructure as a Service is the instant computing infrastructure which serves, manages, and monitors over the internet. It can modify as per the demand and the customer has to pay only for what they have used. IaaS can scale up and down as per the demand so the customer doesn't pay any extra charges.

IaaS reduces the burden to manage and maintain the servers as the infrastructure provides by the company. Every resource has a separate component and the customer can rent that as per the requirement.

The complete management is done by the Cloud Service provider. The installation, configuration, and management of the software are complete by the customer.

Working of IaaS
This part shows the architecture of Infrastructure as a Service.

i. Service Provider Cloud
The client gives an access to the virtualized environment which can also call as an infrastructure served over the internet. They are given such components to build their own IT platforms.

The Cloud is flexible as the user can access IaaS anytime and from anywhere. The only requirement is an internet connection.

ii. Hardware
The place where the data is stored which can be also known as the infrastructure or hardware. It is made reliable and secure where the data stores. It includes many offerings such as virtual server space, network connections, bandwidth, IP addresses, and load balancers.

iii. Servers
The servers are maintained by the Cloud providers and totally managed by them. These servers and networks distributed across numerous data centres. These data centres are secured by cloud providers.

Advantages of Infrastructure as a Service
Following are the advantages of Infrastructure as a Service, let's read them one by one:

i. Protection and Recovery
Protection and recovery of the data is an important aspect. As achieving continuity and disaster recovery is expensive. Due to this, there are more requirements of the staff and technology. So this advantage is provided by the IaaS providers although it seems to be costly.

ii. Flexible in every business conditions
IaaS helps to quickly scale up the resources and makes it flexible as per the demand. When the resources are not in use the resources are back down to save the money.

iii. Rapid Innovation
During the launch of a new product, the computing infrastructure can be ready within minutes or hours rather than days or weeks.

iv. Helps to Integrate Business
IaaS helps the workers of the organization to focus on the business and eliminates the responsibility of Infrastructure.

v. Better Compatibility
There is no need to maintain and upgrade software and hardware or to troubleshoot the problems as there are very fewer compatibility issues with it.

Benefits of Infrastructure as a Service

i. Scalability
ii. Pay-as-you-go
iii. Secure
iv. Save time and cost

Examples of Infrastructure as a Service

DigitalOcean, Linode, Rackspace, Amazon Web Services (AWS), Cisco Metacloud, Microsoft Azure, Google Compute Engine (GCE).

Implementation
Google Compute Engine (GCE)

https://www.youtube.com/watch?v=SKlZzLctmGc
Go to 8mins 51sec follow the instruction and create hello world app
Take the screenshot and attach it with the practical

2) Working and Implementation of Software as a service.

Working

SaaS is also known as "On-Demand Software". It is a software distribution model in which services are hosted by a cloud service provider. These services are available to end-users over the internet so, the end-users do not need to install any software on their devices to access these services.

There are the following services provided by SaaS providers -

Business Services - SaaS Provider provides various business services to start-up the business. The SaaS business services include ERP (Enterprise Resource Planning), CRM (Customer Relationship Management), billing, and sales.

Document Management - SaaS document management is a software application offered by a third party (SaaS providers) to create, manage, and track electronic documents.

Example: Slack, Samepage, Box, and Zoho Forms.

Social Networks - As we all know, social networking sites are used by the general public, so social networking service providers use SaaS for their convenience and handle the general public's information.

Mail Services - To handle the unpredictable number of users and load on e-mail services, many e-mail providers offering their services using SaaS.

Advantages

1) SaaS is easy to buy
2. One to Many
3. Less hardware required for SaaS
4. Low maintenance required for SaaS
5. No special software or hardware versions required
6. Multidevice support
7. API Integration
8. No client-side installation

Provider	Services
Salseforce.com	On-demand CRM solutions
Microsoft Office 365	Online office suite
Google Apps	Gmail, Google Calendar, Docs, and sites
NetSuite	ERP, accounting, order management, CRM, Professionals Services Automation (PSA), and e-commerce applications.
GoToMeeting	Online meeting and video-conferencing software

Constant Contact	E-mail marketing, online survey, and event marketing
Oracle CRM	CRM applications
Workday, Inc	Human capital management, payroll, and financial management.

Implementation

Google Apps
Write down the steps for creation of Gmail Account and attach screen shot
Gmail, Google Calendar, Docs, and sites

3) Working and Implementation of Platform as a services.

a) Working

Platform as a Service (PaaS) provides a runtime environment. It allows programmers to easily create, test, run, and deploy web applications. You can purchase these applications from a cloud service provider on a pay-as-per use basis and access them using the Internet connection. In PaaS, back end scalability is managed by the cloud service provider, so end- users do not need to worry about managing the infrastructure.

PaaS includes infrastructure (servers, storage, and networking) and platform (middleware, development tools, database management systems, business intelligence, and more) to support the web application life cycle.

Example: Google App Engine, Force.com, Joyent, Azure.

PaaS providers provide the Programming languages, Application frameworks, Databases, and Other tools:

1. Programming languages

PaaS providers provide various programming languages for the developers to develop the applications. Some popular programming languages provided by PaaS providers are Java, PHP, Ruby, Perl, and Go.

2. Application frameworks

PaaS providers provide application frameworks to easily understand the application development. Some popular application frameworks provided by PaaS providers are Node.js, Drupal, Joomla, WordPress, Spring, Play, Rack, and Zend.

3. Databases

PaaS providers provide various databases such as ClearDB, PostgreSQL, MongoDB, and Redis to communicate with the applications.

4. Other tools

PaaS providers provide various other tools that are required to develop, test, and deploy the applications.

Advantages of PaaS

1) Simplified Development
2) Lower risk
3) Prebuilt business functionality
4) Instant community
5) Scalability

b) Implementation

https://www.youtube.com/watch?v=SKlZzLctmGc
Go to 8mins 51sec follow the instruction and create hello world app
Take the screenshot and attach it with the practical

4) Practical Implementation of Storage as a Service.

Cloud Computing in general is termed as a different service through the Internet. It has various resources which include tools and applications like data storage, database, servers, networking, etc. It has applications, platforms, infrastructure which is surrounded by servers, laptops, desktops, phones, and tablets.

Features of cloud computing :

Key features of cloud computing are as follows.

- It has Greater availability of resources.
- Easy Maintenance is one of the key benefits of using Cloud computing.
- Cloud computing has a Large Network Access.
- It has an automatic system.
- Security is one of the major components and using cloud computing you can secure all over the networks.

Storage Systems in the Cloud :

There are 3 types of storage systems in the Cloud as follows.

- Block-Based Storage System
- File-Based Storage System
- Object-Based Storage System

Type-1 :

Block-Based Storage System –

- Hard drives are block-based storage systems. Operating system like Windows or Linux actually sees a hard disk drive. So, it sees a drive on which you can create a volume, and then you can partition that volume and format them.
- For example, If a system has 1000 GB of volume, then we can partition it into 800 GB and 200 GB for local C and local D drive respectively.
- With a block-based storage system, an computer would see a drive, and then we can create volumes and partitions.

Type-2 :

File-Based Storage System –

- In this, you are actually connecting through a Network Interface Card (NIC). You are going over a network, and then you can access the network-attached storage server (NAS). NAS devices are file-based storage systems.
- This storage server is another computing device that has another disk in it. It is already created a file system so that it's already formatted its partitions, and it will share its file systems over the network. Here, you can actually map the drive to its network location.
- In this, like the previous one, there is no need to partition and format the volume by the user. It's already done in file-based storage systems. So, the operating system sees a file system that is mapped to a local drive letter.

Type-3 :

Object-Based Storage System –

- In this, a user uploads objects using a web browser and uploading an object to a container i.e, Object Storage Container. This uses the HTTP Protocols with the rest of the APIs (example: GET, PUT, POST, SELECT, DELETE).

- For example, when you connect to any website, and you need to download some images, text, or anything that the website contains. For that, it is a code HTTP GET request. If you want to review any product then you can use PUT and POST requests.
- Also, there is no hierarchy of objects in the container. Every file is on the same level in an Object-Based storage system.

Advantages :

- **Scalability –**
  Capacity and storage can be expanded and performance can be enhanced.

- **Flexibility –**
  Data can be manipulated and scaled according to the rules.

- **Simpler Data Migrations –**
  As it can add and remove the new and old data when required eliminates disruptive data migrations.

Disadvantages :

- Data centers require electricity and proper internet facility to operate their work, failing in which system will not work properly.

Practical Implementation of Storage as a Service.

Use the Google drive and create folders, files(Googledocs, Googlesheet, etc) take the screenshot and print of the same.

5) Working of Google drive to make spreadsheet and notes.

Same as Practical 4

Only for implementation create a spreadsheet having details of Students like (First Name, Middle Name, Last Name, Age, Gender, Address, Contact Number). Create atleast 10 Students

6) Installing and Developing Application Using Google App Engine.

Same as Practical 3