

CC Week 2

Week 2

Deployment Models

- **Public** Cloud • **Private** Cloud • **Hybrid** Cloud • **Community** Cloud

Public Cloud: open to all to store and access info via internet

- pay as per use for the services
- managed by third parties (cloud service provider)
- fundamental character is **multi-tenancy(resources can be shared)**
e.g: Dropbox, google drive , amazon ec2, etc.

advantage:

- managed by cloud service provide so **we dont need to maintain it**
- **location independent** can be accessed from any place
- highly scalable
- cost effective cause **pay per use**

disadvantages:

- less secure
- less customizable

Private cloud: services accessible only within the organization

- internet/ corporate cloud
- On-site private cloud and Outsourced private cloud
- **On-site Private Cloud:**
 - This refers to a private cloud implementation that resides within an organization's own premises.
 - In an on-site private cloud scenario, the organization owns and manages the entire cloud infrastructure, including the physical servers, networking equipment, and virtualization software.
- **Outsourced Private Cloud:**

- In contrast, an outsourced private cloud involves leveraging a third-party hosting company to manage the server-side infrastructure.
- While the servers and infrastructure may physically reside in a data center operated by the hosting company, the cloud environment itself is dedicated exclusively to the organization, providing the benefits of a private cloud while offloading the management burden to a specialized provider.

advantages:

- high security
 - data privacy
 - more customizable
- disadvantages:

- area of operation is limited within an organization.
- high cost to invest in hardware and software
- limited scalability

Hybrid cloud: features of public and private cloud

- Critical activities performed using private cloud and non critical activities done by using public cloud

Advantages:

- Scalability, security, low cost, flexibility

Disadvantages:

- managing is complex cause there is more than one deployment model.
- dependency on the infrastructure.

Community cloud: allows services to be accessible by a group of several organizations to share information

- owned and managed by more than one organization or third party

advantages:

- cost reduction/effective
- more secure than public cloud

disadvantages:

- data accessible bw organizations so risk of leak
- consistent maintenance cost

- Examples of Community Cloud:
- Google Apps for Government
- Microsoft Government Community Cloud

- **On-site Community Cloud:**

- In an on-site community cloud, multiple organizations come together to share a common cloud infrastructure.
- Each organization may contribute resources, consume services, or both within the community cloud.
- Security perimeters are established by each organization to protect their data and resources.
- At least one organization within the community must provide cloud services to facilitate collaboration among members.

- **Outsourced Community Cloud:**

- In contrast, an outsourced community cloud involves leveraging a third-party provider to manage the cloud infrastructure.
- Organizations considering this option should evaluate network dependency, as multiple communication links connect community members to the provider's facility.
- Workload locations within the cloud infrastructure are hidden from clients, similar to an outsourced private cloud setup.

Virtualization

- Virtualization is a technique, which allows to share a **single physical instance of a resource or an application among multiple customers and organizations.**
- The machine on which the virtual machine is going to create is known as **Host Machine** and that virtual machine is referred as a **Guest Machine**

Virtualization

- Virtualization is way to **run multiple operating systems and user applications on the same hardware**
 - E.g., run both Windows and Linux on the same laptop
- How is it different from **dual-boot**?
 - Both OSes run **simultaneously**
- The OSes are **completely isolated** from each other

IaaS:

- Subscribers gain access to **virtual computing resources**, including virtual machines (VMs), network-accessible storage, and networking components like firewalls.

Usage fees are typically calculated based on several factors:

- Per CPU hour: The amount of time a virtual CPU is used.
- Data GB stored per hour: The amount of data stored in network-accessible storage.
- Network bandwidth consumed: The amount of data transferred over the network.
- Network infrastructure used: Charges may apply for additional IP addresses or other networking resources used.
- Value-added services: Optional services like monitoring or automatic scaling may have additional fees associated with their usage.

Hypervisor: VMM (Virtual Machine Monitor) software that creates and runs the virtual machines on physical machines.

Hypervisor is also known as

- a) Cluster Manager
- b) Virtual Machine Handler
- c) Virtual Machine Manager
- d) **Virtual Machine Monitor**

Correct Answer: d

Detailed Solution: The hypervisor is also known as Virtual Machine Monitor

Data Object Storage (DOS)

- DOS generally **stores the subscriber's metadata like user credentials, operating system images**. DOS service is (usually) **single for a cloud**.

QUESTION 1:

_____ generally stores the cloud subscriber's metadata like user credentials and OS images.

- a) SLA (Service Level Agreement)
- b) Cloud Manager
- c) **DOS (Data Object storage)**
- d) MOS (Metadata Object storage)

Correct Option: c

Detailed Solution: DOS generally stores the cloud subscriber's metadata like user credentials and OS images.

QUESTION 4:

What is/are the main difference(s) between virtualization and dual boot?

- a) In virtualization, both operating systems run simultaneously, but not in dual boot.
- b) In virtualization, operating systems are not isolated from each other, but not in dual boot.
- c) In a dual boot, both operating systems run simultaneously, but not in virtualization.
- d) No difference between dual boot and virtualization.

Correct Option: a

Detailed Solution: Virtualization is a method of running multiple operating systems and user applications on the same hardware. Both OSs run simultaneously and are completely isolated from each other.

QUESTION 3:

Which factors should an organization consider while planning to deploy an outsourced private cloud?

- a) Only Network Dependency
- b) Only Risks from multi-tenancy
- c) Both Network Dependency and Risks from multi-tenancy
- d) Neither Network Dependency nor Risks from multi-tenancy

Correct Answer: c

QUESTION 6:

Ubuntu Enterprise Cloud (UEC) is an example of

- a) Public cloud
- b) Hybrid cloud
- c) Private cloud
- d) Community Cloud

Correct Option: c

Detailed Answer: Ubuntu Enterprise Cloud (UEC) is an example of a private cloud.

- Examples of Private Cloud:
 - Eucalyptus
 - Ubuntu Enterprise Cloud - UEC
 - Amazon VPC (Virtual Private Cloud)
 - VMware Cloud Infrastructure Suite
 - Microsoft ECI data center.

Server Virtualization:

Server Virtualization is the process of dividing a physical server into several virtual servers, called **virtual private servers**. Each virtual private server can run independently.

Types:

1. **Full virtualization**: uses a **hypervisor** to directly communicate with the CPU and physical server. **VMWare ESX server** is the best example of full virtualization. Hypervisor has its own processing needs, so it can slow down the application and server performance.
2. **Para Virtualization**: is quite similar to the Full Virtualization. Para virtualization hypervisor does not need too much processing power to manage the OS.
3. **Operating system virtualization**: **No need of hypervisor**. Divides one operating system into multiple isolated user-space called **virtual environments**. Linux OS Virtualization and **Windows OS Virtualization** are the types of Operating System virtualization. e.g: **FreeVPS**, **OpenVZ**, and **Linux Vserver**
4. **Hardware-assisted virtualization**: guest os runs at ring 0

XML : ==eXtensible Markup Language==

XML (Extensible Markup Language) is a markup language that defines rules for encoding documents in a format that is both human-readable and machine-readable.

XML parser: types: non validating and validating

XML parser is software that reads XML data, checks for syntactic and possibly structural constraints (like DTD or Schema validation), and makes the data available to an application.

There are three main types of XML parser APIs:

- **SAX (Simple API for XML)**: Event-based parsing approach. very fast speed.
- **DOM (Document Object Model)**: Object-based or tree-based parsing approach. slower and memory intensive
- **JDOM (Java Document Object Model)**: A Java-specific implementation of DOM.

QUESTION 10:

While DOM operates on the documents as a whole, _____ parsers operate on each piece of the XML document sequentially.

- a) FTP
- b) MQTT
- c) SAX
- d) XAS

Correct Answer: c

Detailed Solution: DOM operates on the documents as whole, SAX parsers operate on each piece of the XML document sequentially.

Explanation: DOM (Document Object Model) operates on the XML document as a whole, allowing the entire document to be loaded into memory and manipulated as a tree-like structure. In contrast, **SAX (Simple API for XML)** parsers operate sequentially on each piece of the XML document as it is being read, processing the document in a stream-like manner. Therefore, SAX parsers are well-suited for handling large XML documents efficiently, as they do not require the entire document to be loaded into memory at once.

QUESTION 9:

Simple Object Access Protocol (SOAP) provides a way to communicate between applications running on different operating systems, with the same technologies and programming languages.

- a) True
- b) False

Correct Answer: b

Detailed Solution: Simple Object Access Protocol (SOAP) provides a way to communicate between applications running on different operating systems, with different technologies and programming languages.

message format standards:

- XML-RPC is a simple protocol for sending remote procedure calls (RPCs) over the internet using XML messages.
- **SOAP** is a more comprehensive and complex protocol for exchanging structured information in the implementation of web services.

QUESTION 5:

Web services enhance distributed interoperability through the use of open standards, enabling any two software components to communicate and are designed to address firewall issues.

- a) True
- b) False

Correct Answer: a

Detailed Solution: Web services indeed improve distributed interoperability by utilizing open standards, which allows different software components to communicate effectively. Additionally, they are designed to navigate and resolve firewall issues, making them suitable for use across various network configurations.

QUESTION 2:

Universal Description, Discovery, and Integration (UDDI) represents a format for data exchange, designed to hold and convey data objects that are made up of pairs of attributes and values.

- a) True
- b) False

Correct Answer: a

Detailed Solution: Universal Description, Discovery, and Integration (UDDI) is an XML based registry for business internet services. JavaScript Object Notation (JSON) is a data interchange format to store and transmit data objects consisting of attribute-value pairs.

- 4) Web Services are used to -
- (a) Reuse application-components.
 - (b) Solve the interoperability problem
 - (c) Connect existing software
 - (d) Implement client-server paradigm

- ☐ (a)
- ☐ (b)
- ☐ (c)
- ☐ (d)

No, the answer is incorrect.
Score: 0

Accepted Answers:

- (a)
- (b)
- (c)

- 4) Web Services are used to -
- (a) Reuse application-components.
 - (b) Solve the interoperability problem
 - (c) Connect existing software
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- ☐ (a)
- ☐ (b)
- ☐ (c)
- ☐ (d)

No, the answer is incorrect.
Score: 0

Accepted Answers:

- (a)
- (b)
- (c)

- 6) Which is/are not a correct name(s) for an XML element?
- a) <age>
 - b) <_NAME>
 - c) <first name>
 - d) <last name>

- ☐ a)
- ☐ b)
- ☐ c)
- ☐ d)

No, the answer is incorrect.
Score: 0

Accepted Answers:

- c)
- d)

there

should be no space.

- 7) XML with correct syntax is "_____ " XML
- (a) Well Parameterized
 - (b) Well Formed
 - (c) Mature
 - (d) None of these

- ☐ (a)
- ☐ (b)
- ☐ (c)
- ☐ (d)

No, the answer is incorrect.

Score: 0

Accepted Answers:

(b)

- 9) Which of the following cloud concept is related to pooling and sharing of resources?
- (a) Polymorphism
 - (b) Abstraction
 - (c) Virtualization
 - (d) None of the mentioned

- ☐ (a)
- ☐ (b)
- ☐ (c)
- ☐ (d)

No, the answer is incorrect.

Score: 0

Accepted Answers:

(c)

A: Google Cloud Platform	1	1- Public Cloud
B: Amazon Elastic Compute Cloud	1	2- Private Cloud
C: Eucalyptus	3 2	3- Hybrid Cloud
D: Meghamala (provided by IIT kharagpur)	2	4- Service Cloud

Which of the following is/are example(s) of public cloud?

- a. Amazon VPC
- ☒ b. Google App Engine
- c. Eucalyptus
- ☒ d. Microsoft Azure

Correct Answer: b, d

Question 4:

Which cloud service model provides virtualized computing resources over the internet?

- ☒ A) IaaS (Infrastructure as a Service)
- B) PaaS (Platform as a Service)
- C) SaaS (Software as a Service)
- D) AaaS (Anything as a Service)

Accepted Answer: A) IaaS (Infrastructure as a Service)

Question 5:

What does the term "Elasticity" mean in the context of Cloud Computing?

- A) The ability to stretch cloud servers
- ☒ B) The ability to scale resources up or down based on demand
- C) The ability to limit access to cloud services
- D) The ability to make clouds transparent

Accepted Answer: B) The ability to scale resources up or down based on demand

Question 11:

Which cloud service model allows users to develop, run, and manage applications without dealing with the complexity of building and maintaining the infrastructure?

- A) IaaS (Infrastructure as a Service)
- B) PaaS (Platform as a Service)
- C) SaaS (Software as a Service)
- D) DaaS (Desktop as a Service)

Accepted Answer: B) PaaS (Platform as a Service)

Question 12:

What does CDN stand for in Cloud Computing?

- A) Central Data Network
- B) Cloud Data Network
- C) Content Delivery Network
- D) Cloud Distribution Network

Accepted Answer: C) Content Delivery Network

Question 13:

Which cloud service model allows users to rent virtualized hardware and computing resources over the internet?

- A) IaaS (Infrastructure as a Service)
- B) PaaS (Platform as a Service)
- C) SaaS (Software as a Service)
- D) CaaS (Compute as a Service)

Accepted Answer: A) IaaS (Infrastructure as a Service)

Question 16:

multiple tenants/renters

What does the term "Multi-Tenancy" mean in Cloud Computing?

- A) The ability to access multiple clouds simultaneously
- B) The ability to run multiple operating systems on a single computer
- C) The ability to serve multiple customers using the same physical resources with each customer's data and applications kept separate
- D) The ability to switch between multiple cloud providers

Accepted Answer: C) The ability to serve multiple customers using the same physical resources, with each customer's data and applications kept separate

QUESTION 1:

Public cloud has _____ and _____ service level agreements(SLAs).

- A) loosely coupled, default
- B) restrictive, customized
- C) customized, default
- D) default, restrictive

Correct Answer: D

Detailed Solution: Public cloud has default and restrictive service level agreements(SLAs).

QUESTION 2:

In the XML parser processing model, the parser should not stop processing even if the data is not well-formed.

- A) True
- B) False

Correct Answer: B

Detailed Solution: In the XML parser processing model, the parser must stop processing and throw an exception if the data is not well-formed.

QUESTION 3:

The on-site private cloud's network capacity restricts on-demand bulk data import or export.

- A) True
- B) False

Correct Answer: A

Detailed Solution: On-demand bulk data import or export is limited by the network capacity of the on-site private cloud, and real-time processing may be problematic due to networking limitations.

Electronic Data Interchange (EDI) has low errors and high accuracy.

QUESTION 5:

Web services provide capabilities similar to EDI but are _____ expensive to implement.

- A) more
- B) less
- C) not applicable
- D) equal

Correct Answer: B

Detailed Solution: Web services provide capabilities similar to EDI but are simpler and less expensive to implement.

In XML, a special 'xmlns' attribute is used to define the namespace.

QUESTION 7:

Following is(are) example(s) private cloud

- A) Amazon VPC
- B) Eucalyptus
- C) Microsoft Azure
- D) Oracle Cloud

Correct Answer: A and B

QUESTION 8:

What is(are) goal(s) for a virtual machine architecture?

- A) Equivalence
- B) Resource control
- C) Efficiency
- D) None of these

Correct Answer: A, B and C

Detailed Solution: Virtual machine architecture has three goals: equivalence, resource control, and efficiency.

QUESTION 9:

Within a cluster manager, _____ manager is connected via high-speed network.

- A) grid
- B) cloud
- C) computer
- D) Node

Correct Answer: C

Detailed Solution: Within a cluster manager the computer manager is connected via high-speed network.

QUESTION 10:

Which statement(s) is(are) application to Data Object Storage (DOS) ?

Statement(i) DOS stores user credentials; Statement(ii)DOS is usually single for a cloud.

- A) Only Statement (i) is correct
- B) Only Statement (ii) is correct
- C) Both Statements (i) and (ii) are correct
- D) None of the statements is correct

Correct Answer: C

Detailed Solution: Data Object Storage (DOS) stores user credentials and is usually single for a cloud.

MCQ/MSQ Question

QUESTION 1:

What of the following is not an example of Private Cloud?

- a. Eucalyptus
- b. Amazon EC2
- c. Ubuntu Enterprise Cloud
- d. Microsoft ECI data center

Correct Answer: b

Detailed Solution: Amazon EC2 is an example of Public Cloud

QUESTION 3:

Statement 1: In case of Public Cloud, the cloud infrastructure exists on the premises of the cloud provider.

Statement 2: Amazon VPC is an example of public cloud.

Which of the above statements are True?

- a. I only
- b. II only
- c. I and II
- d. None

Correct Answer: a

Detailed Solution: Amazon VPC is an example of private cloud therefore statement 2 is false.

QUESTION 4:

Google Apps for Government is an example of which kind of cloud deployment model?

- a. Public cloud
- b. Private cloud
- c. Community cloud
- d. Hybrid cloud

Correct Answer: c

Detailed Solution: Google Apps for Government is an example of community cloud.

QUESTION 6:

Goals for a virtual machine architecture are:

- a. Equivalence
- b. Resource control
- c. Efficiency
- d. None

Correct Answer: a, b, c

Detailed Solution: All of the above are the goals of VM architecture.

QUESTION 7:

To run a virtual machine with all three desired properties which of the following condition should be satisfied?

- a. Privileged instructions are a subset of sensitive instructions.
- b. Sensitive instructions are a subset of privileged instructions
- c. Both.
- d. None.

Correct Answer: b

Detailed Solution: Popek and Goldberg had shown that we can only run a virtual machine with all three desired properties if the sensitive instructions are a subset of the privileged instructions.

QUESTION 8:

Statement 1: Two types of XML parsers are Validating parsers and Non-Validating parsers.

Statement 2: A Non-Validating parser must retrieve all entities and must process all DTD content. Will stop processing and indicate a failure if it cannot

Which of the above statements are True?

- a. I only
- b. II only
- c. I and II
- d. None

Correct Answer: a

Detailed Solution: Validating parser must retrieve all entities and must process all DTD content.

Will stop processing and indicate a failure if it cannot. Therefore statement 2 is False.

QUESTION 9:

SAX (Simple API for XML) is an event-based interface.

- a. True.
- b. False.

Correct Answer: a

Detailed Solution: The given statement is True.

QUESTION 10:

Which of following is false about SOAP (Simple Object Access Protocol) ?

- a. XML based.
- b. Uses mainly HTTP as transport protocol.
- c. Stateless, one way.
- d. None.

Correct Answer: d

Detailed Solution: All a, b, c, are true for SOAP.