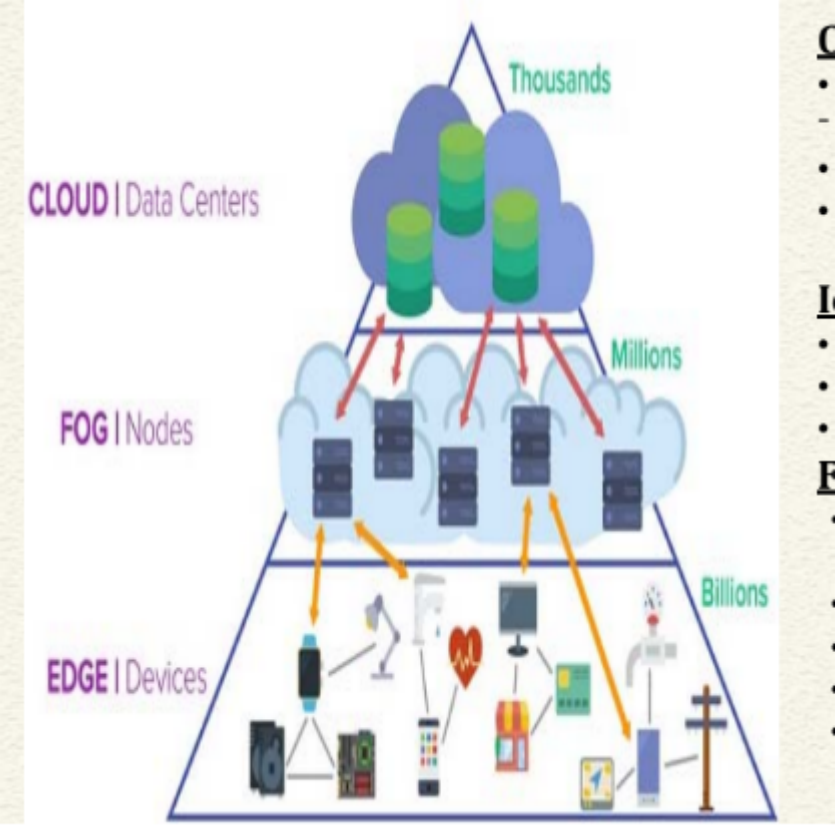
CC Week 9

Fog computing a model in which data, processing and applications are concentrated in devices at the network edge rather than existing almost entirely in the cloud.



Source: https://www.learntechnology.com/network/fog-computi

A) Hybrid/Bursting Architecture
In a hybrid/bursting architecture, organizations utilize a combination of on-premises infrastructure and cloud resources.

B) Aggregated Architecture
In an aggregated cloud federation architecture, multiple partner clouds collaborate and interoperate to combine their resources, providing users with a larger virtual infrastructure.

C) Broker Architecture:
In a broker architecture, a centralized broker or intermediary facilitates the interaction and coordination between multiple cloud providers and consumers. The broker acts as an intermediary that manages the negotiation, provisioning,

and management of cloud services on behalf of users.

QUESTION 1:

In which of the following architectures, two or more partner clouds interoperate to aggregate their resources and provide users with a larger virtual infrastructure?

A) Hybrid/Bursting Architecture

B) Aggregated Architecture

C) Broker Architecture

D) Multiplier Architecture

Correct Answer: B

Detailed Solution: In aggregated cloud federation architecture, two or more partner clouds interoperate to aggregate their resources and provide users with a larger virtual infrastructure.

Offloading refers to the process of transferring computational tasks, data, or resources from one location to another within a computing environment. Offloading is like delegating tasks to different places within a computer network to make things run smoother and faster.

- **Offloading from user devices to the edge**
- ~~**Offloading from edge to cloud**~~ from cloud to the edge

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QUESTION 2:

Select the correct statement(s) regarding offloading.

A) Offloading is a technique in which a server, an application, and the associated data are moved from the edge to the cloud.

B) Offloading augments the computing requirements of individuals or a collection of user devices.

C) Offloading from cloud to the edge can be achieved by server offloading.

D) Offloading from user device to edge can be achieved by application partitioning.

Correct Answer: B, C, D

Detailed Solution: Offloading is a technique in which a server, an application, and the associated data are moved onto the edge of the network. Hence, A is false. All the other statements are correct. Refer to slide-12 of Resource Management - II.

QUESTION 3:

Fog computing is a model in which data, processing and applications are concentrated in devices at the _____ rather than existing almost entirely in the cloud.

a. fog

b. local node

c. network station

d. network edge

Correct Answer: d

So, in fog-edge computing, "online placement" means making decisions in real-time as the system operates, while "offline placement" means making decisions in advance based on predictions or predefined rules.

QUESTION 4:

According to the service placement taxonomy in fog-edge computing, which of the following can be classified as online vs offline?

A) Control plan design
B) Placement characteristic
C) System dynamicity
D) Mobility support

Correct Answer: B
Detailed Solution: According to the service placement taxonomy in fog-edge computing, placement characteristic can be classified as online vs offline.

QUESTION 5:

Fog infrastructure consisting of IoT devices, Fog Nodes, and at least one Cloud Data Center never ensures scalability

a. True
b. False

Correct Answer: b
Detailed Solution: Scalability is one of the characteristics of fog computing.

Cloud federation is a model where multiple cloud computing providers or data centers collaborate and interoperate to share resources, services, and workloads. The goal of cloud federation is to create a unified and scalable computing environment that spans multiple geographic locations, allowing organizations to access a wider range of resources and capabilities while improving redundancy, resilience, and flexibility.

QUESTION 6:

Cloud Federation should prefer maximum geographical separation.

a. True
b. False

Correct Answer: a
Detailed Solution: Cloud Federation should prefer maximum geographical separation.

QUESTION 7:

In which of the following cloud federation architectures, creation of cross-site networks and cross-site migration of VMs are used?

A) Loosely coupled federation

B) Partially coupled federation

C) Tightly coupled federation

D) None of the above

Correct Answer: C

Detailed Solution: Advanced features like creation of cross-site networks and cross-site migration of VMs are found in tightly coupled federation.

- Loosely Coupled Federation: Think of this like friends who live in different houses but sometimes share things like tools or books. They're independent but might help each other occasionally. Cloud service provider has little or no control over remote resources.
- Partially Coupled Federation: This is like friends who live nearby and sometimes share groceries or go on outings together. They're somewhat connected but still have their own lives and routines.
- Tightly Coupled Federation: Imagine a group of friends who live in the same building and share everything - groceries, chores, and even take care of each other's pets. They're very integrated and work closely together. It involved high level of integration and coordination between CSPs and they have greater control and collaboration over resources and features.

In tightly coupled federation, where everyone is closely connected, advanced features like creating networks that span different locations and moving virtual machines (VMs) between sites are common

QUESTION 10:

A CSP has little or no control over remote resources in case of
a. Tightly Coupled Federation
b. Medium Coupled Federation
c. Loosely Coupled Federation
d. None of these

Correct Answer: c
Detailed Solution: In loosely coupled federation, a CSP has little or no control over remote resources (for example, decisions about VM placement are not allowed), monitoring information is

QUESTION 8:

What is(are) the application placement constraint(s) for fog nodes?

a. Network constraints
b. Interoperability
c. Resource constraints
d. None of these

Correct Answer: A,C
Detailed Solution: Network constraints: such as latency, bandwidth, etc. and these constraints need to be considered when deploying applications.
Resource constraints: an infrastructure node is limited by finite capabilities in terms of CPU, RAM, storage, bandwidth, etc. While placing application(s) (service components), the resource

Application placement constraints for fog nodes refer to limitations or considerations that need to be taken into account when deploying applications or services on fog computing nodes.

QUESTION 9:

The _____ used for resource management in fog/edge computing are classified on the basis of data flow, control and tenancy.
a. Algorithms
b. Architectures
c. Hardware
d. Infrastructure

Correct Answer: b
Detailed Solution: The architectures used for resource management in fog/edge computing is classified based on data flow, control, and tenancy.

QUESTION 1:

Which of the following statements is/are false ?

a. Fog and Edge computing are substitutes for cloud computing.
b. Fog and Edge computing may aid cloud computing in overcoming some of the limitations like latency issues.

Correct Answer: a

Detailed Solution: Fog and Edge computing are no substitutes for cloud computing as they do not completely replace it. So, the correct option is (a).

QUESTION 2:

Which of the following is not a layer of the Cloud-Fog environment model?

a. Client layer
b. Serverless layer
c. Fog layer
d. Cloud layer

Correct Answer: b

Detailed Solution: Cloud-Fog environment model consists of three layers: client (edge) layer, fog layer and cloud layer.

So, the correct option is (b).

QUESTION 3:

In the Cloud-Fog environmental model, servers contain a fog server manager and virtual machines to manage requests by using _____ technique.

a. Image virtualization
b. Container virtualization
c. Server virtualization
d. None of these

Correct Answer: c

Detailed Solution: It uses server virtualization techniques. So, the correct option is (c).

QUESTION 4:

The architecture used for resource management in fog/edge computing is classified on the basis of which of the following?

a. Tenancy
b. Data flow
c. Hardware
d. All of these

Correct Answer: a, b

Detailed Solution: This comes under a new service named Network and Data processing as a service i.e. IaaS. So, the correct options are (a) & (b).

Tenancy: In the context of computing, tenancy refers to how resources are shared among multiple users or tenants.

Data Flow: This refers to the path that data takes as it moves through a system or network.

QUESTION 5:

Which of the following underlying algorithm(s) is used to facilitate fog/edge computing ?

a. Discovery

b. Load balancing

c. Benchmarking

d. Cache Flow

Correct Answer: a,b,c

Detailed Solution: Major underlying algorithm(s) is used to facilitate fog/edge computing are: Discovery, Benchmarking, Load balancing and placement. So, the correct options are (a,b,c)

QUESTION 6:

_____ is a technique in which a server, an application and the associated data are moved onto the edge of the network

a. Containerization
b. Virtualization
c. Offloading
d. None of these

Correct Answer: c

Detailed Solution: offloading is a technique in which a server, an application and the associated data are moved onto the edge of the network. So, the correct option is (c).

QUESTION 7:

Cloud federation is the collaboration between cloud service providers to achieve which of the following? Choose the most appropriate option.

a. Capacity utilization
b. Interoperability
c. Offloading
d. None of these

Correct Answer: a,b

Detailed Solution: Cloud federation is the collaboration between cloud service providers to achieve Capacity utilization, Interoperability, Catalog of services and Insight about providers and SLA's. So, the correct options are (a) and (b).

QUESTION 8:

Which of the following is false about loosely coupled federations?

a. Limited inter operations between cloud instances.
b. Usually no support for advanced features.
c. Advanced control over remote resources.
d. None of these

Correct Answer: c
Detailed Solution: A cloud instance in a tightly coupled federation has advanced control over remote resources. Correct option is (c).

Loosely coupled federations refer to a type of cloud computing environment where different cloud instances or services are connected, but they operate relatively independently.

QUESTION 9:

In which of the following different CSPs establish an agreement stating the terms and conditions under which one partner cloud can use resources from another.

a. Loosely coupled federation
b. Partially coupled federation
c. Tightly coupled federation
d. All of these

Correct Answer: b
Detailed Solution: In partially coupled federation, different CSPs establish an agreement stating the terms and conditions under which one partner cloud can use resources from another. So, the correct option is (b).

QUESTION 10:

Hybrid architecture combines the existing on-premise infrastructure (usually a private cloud) with remote resources from one or more public clouds to provide extra capacity to satisfy peak demand periods.

a. True
b. False

Correct Answer: a
Detailed Solution: Cloud bursting or hybrid architecture combines the existing on-premise infrastructure (usually a private cloud) with remote resources from one or more public clouds to provide extra capacity to satisfy peak demand periods. So, the correct option is (a).