GIN204 - Systèmes cloudifiés

Contrôle de connaissances

(# Questions : 9)

Les documents et les appareils électroniques sont interdits.
Durée : 1h30
Indiquez vos nom et prénom ci-dessous puis répondez aux questions suivantes.

Nom : SOLID
Prénom : Snake (David)
Groupe : MGS1

Select all answers that apply.

1. The technique used to provide several instances of a machine on top of a given infrastructure is called :

   - ☐ Serverless
   - ☒ Virtualization
   - ☐ Resource sharing
   - ☐ Big data
   - ☐ Software-defined networking
   - ☐ Full-metal alchemist

2. What are the services that a cloud system can provide to a customer ?

   - ☒ Storage
   - ☐ TCP and UDP protocols ← C'est le OS, pas le système Cloud !
   - ☒ Processing
   - ☒ Networking
   - ☐ Connection-less access
   - ☐ Hardware components

3. In the function-as-a-service model, a newly spawned container may experience a delay in execution for the first function call. This is called :

   - ☐ Scale-down
   - ☐ Ghost in the shell
   - ☐ Hard provisioning
   - ☒ Cold start
   - ☐ Warm start

4. Choose the correct(s) statement(s) about cloud deployments.

   - [x] Internet connection is required to access a cloud management console
   - [ ] Cloud systems replace native hardware and software
   - [ ] Cloud services are delivered locally
   - [x] IaaS provides virtual servers for application hosting
   - [ ] A SaaS product requires to install the software before using it
   - [ ] With FaaS, the virtual instance is running during the idle-time, incurring additional costs
   - [ ] None of the above

5. Choose the correct(s) statement(s) about cloud services

   - [ ] Computing services are only charged by-the-hour
   - [x] Computing services can be charged by the hour or on a subscription-basis
   - [x] Cloud computing transforms the upfront cost into variable cost
   - [ ] Cloud computing transforms variable costs into upfront costs
   - [x] Services can be added or reduced as needed
   - [ ] Cloud does not offer cost management
   - [ ] None of the above

6. Choose which feature of Cloud services makes it possible to manage computing infrastructure better and more efficiently.

   - [x] Network abstraction
   - [x] Software switching/routing
   - [x] Scalability
   - [ ] Cloud-native applications
   - [ ] None of the above
   - [ ] Not enough data to answer

This is a property of APP DELIVERY!
(Not of Infrastructure Management)

7. Choose the correct(s) statement(s) about Docker and containers :

   - [ ] Docker is a hypervisor
   - [x] The Docker engine is used to spawn and manage containers
   - [ ] Two different Docker containers can run different operating systems
   - [x] A Dockerfile is used to describe the steps to create a novel container
   - [ ] Docker uses a declarative paradigm
   - [ ] None of the above

A Dockerfile is still a list of instructions, unlike a Kube yaml

8. Choose the correct(s) statement(s) about OpenStack :

   - [ ] OpenStack is used to provide SaaS applications
   - [x] OpenStack manages the internal connections via a softwarized programmable network
   - [ ] Thanks to its flexibility, all OpenStack components are optional
   - [ ] It is possible to create VMs with the command `openstack domain create --description "VM" instance`
   - [x] "Floating IPs" can be assigned to any created VM to create external connectivity
   - [ ] None of the above

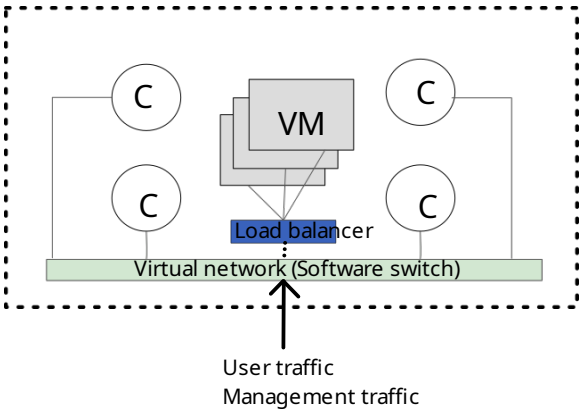
9. You have been hired by the Airbender® company to design their cloud system. After a preliminary analysis, you have the following elements :
   - 4 different micro-services, accessed by 4 different user-bases
   - one management service, that can access any of the previously-mentioned microservices
   - the users' requests are uniformly distributed over a day, without any noticeable pattern
   - the requested data are not privacy-sensitive
   - the user-base is not growing

   Design a cloud system that is suitable for their experience. Provide the important design choices that you take into account (E.g., on-premises vs public cloud, XaaS model, VMs or containers, ...) and briefly justify your choices.

Airbender is a stable company, with a regular user-base and no special constraints for their data. The requests are uniformly distributed, which suggests that a FaaS paradigm is not suitable. However, they already provide microservices, which may still be exploited in a cloud native way.

Depending on their previous infrastructure, they can decide to keep their servers on-premises or offload the infrastructure to a public cloud provider.
If they want to go to the public cloud, it can be reasonable to assume that a migration is easier by adopting a IaaS approach with 1 uservice = 1 "element".

Such element is suitable to be deployed in a containerized way: there are no strict isolation requirements. However, the single management service may have more strict requirements in terms of isolation and reliability. For that, a VM can be used in a redundant manner (load balancer) and a virtual network interacts with all the proposed uservices. Storage can be external or internal



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