


# My grades for **Midterm**



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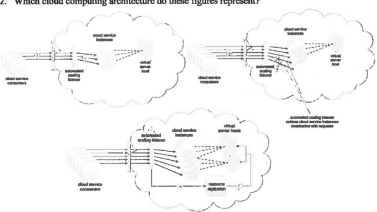
**Part 1: Multiple Choice (12 points total)**

(1 point per question) Choose the correct answer for each question. There is a bubble sheet attached to the end of this exam, flip to it and fill in the bubble for the letter corresponding to the right answer. If you make a mistake, erase, or cross out the bubble for the incorrect choice and fill in the bubble for the correct answer.

1. The step after provisioning IT infrastructure is:

- a. virtualization
- b. containerization
- c. modernization
- d. configuration

2. Which cloud computing architecture do these figures represent?



a. Dynamic Scalability Architecture  
b. Work Distribution Architecture  
c. Cloud Bursting Architecture  
d. Cloud Balancing Architecture

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3. In the figure for question 2, what is happening?
  - a. Vertical scaling up
  - b. Vertical scaling down
  - c. Horizontal scaling out
  - d. Horizontal scaling in
4. What is the purpose of a Kubernetes pod?
  - a. It is responsible for running the state of each node, ensuring containers on the node are healthy.
  - b. It is the basic scheduling unit where containers are executed inside a node.
  - c. It drives the actual cluster state towards the desired state.
  - d. It selects on which node an unscheduled task runs, based on resource availability.
5. Without \_\_\_\_\_, multi tenancy would not be a problem, because every customer would need one physical server.
  - a. virtualization
  - b. cloud bursting
  - c. high availability of cloud services
  - d. edge computing
6. TCP/IP, HTTP and other protocols enable this benefit of cloud computing:
  - a. Measured usage
  - b. Multi tenancy
  - c. Resiliency
  - d. Ubiquitous access
7. \_\_\_\_\_ refers to the amount of time a data packet takes to travel from one point to another; whereas \_\_\_\_\_ refers to the volume of data sent.
  - a. route table, throughput
  - b. bandwidth, latency
  - c. route table, persistent volume
  - d. latency, bandwidth



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8. Which kind of virtualization turns multiple physical IT resources into a single virtual resource?
- a. Aggregation
  - b. Multiplexing
  - c. Emulation
  - d. Simulation
9. Which of these is the best reason to prefer JSON over XML?
- a. JSON generally makes smaller data representations
  - b. XML is complex
  - c. The processing of JSON is faster and more flexible than that of XML
  - d. JSON is a more modern data representation than XML
10. If my delivery model provides a pre-defined, ready-to-use environment, but I still need to write some code for my app, I must be using:
- a. FaaS
  - b. IaaS
  - c. PaaS
  - d. SaaS
11. Which choice lists the cloud delivery models in the ascending order of the level of control granted to cloud consumers?
- a. SaaS, FaaS, IaaS, PaaS
  - b. PaaS, FaaS, IaaS, SaaS
  - c. FaaS, SaaS, IaaS, PaaS
  - d. SaaS, FaaS, PaaS, IaaS
12. Which deployment model has the lowest security?
- a. Multi-cloud
  - b. Public cloud
  - c. Private cloud
  - d. Community cloud

Q13

0.6

Q14

3

Q15

1

Part 2 – Short Answer (x points total)

13. (1 points) When might scaling up be a better choice than scaling out?  
When we need more computational power.

14. (3 point) List at least 3 cloud characteristics that you use.  
① measured usage  
they use and  
② data replication  
ensures that if  
data center  
③ multi-availability zones

15. (1 point) What is a multi-availability zone?  
Student mentions availability clusters that maintain the event of failure by redirecting workload from failed nodes automatically.

Scaling out also gives the more computational power. but why we have to use the scaling up?  
Student mentions the ability to be widely available across work on many devices.

Student mentions the ability to have multiple redundant implementations spread across multiple physical locations.

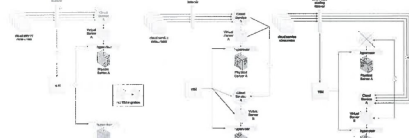
Q16

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16. (3 point) The following figures show an example of Non-Disruptive Service Relocation Architecture. Explain what is happening.



In the above diagram, the physical server A is going down due to maintenance on any other reason so all the resources are moved to an empty physical server B to avoid disruption of our service. Once moved the automated scaling listener will redirect the traffic towards cloud service running from physical server B.

17. (1 point) Which delivery model will run code only when needed?  
 FaaS (Function as a Service)

18. (3 points) List at least 3 risks and challenges of cloud computing and briefly explain their causes.

- ① Security is the major risk of cloud computing because the <sup>server</sup> data may be hacked and leaked (data breach)
- ②

Q17

1

Q18

1

Student correctly identified **FaaS**.

1

Q19

1

Q20

0

Q21

1

Q22

1

19. (1 points) I turned off all ports on my virtual server except the one my webapp is listening to. What am I practicing or adhering to?

Least privilege

20. (1 point) How does the AWS Well-Architected framework define cloud reliability?

Reliability

21. (1 points) Which virtualization technique as virtual memory (e.g. paging)?

Answer: The cus-

Student mentions the **principle of least privilege**.

Half true, it's not like containers are a golden pill. They do require dependencies and environment variables. Container's don't need to run on OSes like VMs, making them lightweight.

hardware to run them!

Containers running on VMs. Please look at the CONs provided.

Q23

5



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Part 3 -- Scenario/Long Answer (x points total)

23. (5 points) My company is transitioning to the cloud. Currently, on premise, we have a small physical server which is running a small web API that receives a POST from each of our clients once per day which stores some data in a NoSQL database. The service is idle most of the time. I am concerned about costs. The service should not require human intervention or management to operate. Which cloud delivery model should I use for the new service I am going to create in the cloud? Explain your answer, why did you pick the delivery model, and why is it better than other choices?

I recommend to use FaaS (Function As A Service) delivery model because your company's web API is idle for the entire day except once per day. FaaS delivery model is considered as the fastest to execute our code by utilizing the maximum computational power that is required ~~for~~ ~~executing~~ ~~executing~~. During this we need not worry about ~~resources~~. the resources or other things like RAM, instances. Moreover, the cost is also less when compared to ~~other~~ choosing other delivery models specially for your use case because the operational costs are charged based on per request and ~~per~~ time for execution.

Q24

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24. (5 points) An IT support company has recently secured a significant contract with NA focusing on managing and supporting software to perform Computational Fluid Dynamics (CFD) analysis for predicting various critical factors in their newly designed aircraft and subsystems. This analysis entails examining meshing files using complex solver software, which is offered by only a few prominent companies. Furthermore, the software necessitates numerous specialized libraries and dependencies to function optimally. To effectively manage the solver software, the company requires a stable compute option that can meet the software's demanding requirements. Additionally, due to the sensitivity of the data being processed, the company must implement stringent and customized security measures on the selected compute platform.

Which deployment model should the company combine to satisfy their requirements? Explain your answer by describing where each of the organization's two services is deployed.


~~The company should use a hybrid cloud deployment model. In this model, by using private cloud they can store sensitive data and use public cloud for running complex solver software which is offered by prominent companies. For storing the sensitive data, the organization can use AWS S3 buckets and for the software to run they can use EC2 instances.~~

The company should use <sup>private</sup> deployment. In this model, by using private cloud they can store sensitive data and use ~~public~~ <sup>private</sup> cloud for running complex solver software which is offered by prominent companies. For storing the sensitive data, the organization can use AWS S3 buckets and for the software to run they can use EC2 instances.

Private cloud is an option, but not the best option (hybrid cloud). Also, the company needs a stable compute option that can meet the software's demanding requirements. So they would have to run their demanding jobs on a public cloud. You didn't mention which compute services you will deploy the services. Look at the last two sentences



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Name: \_\_\_\_\_

Student ID Number: \_\_\_\_\_

Instructions:

Please completely fill in the rectangle associated with your response. Example: ☐ C ☐ D ☐ E ☐ F

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(not in bold) that describe the requirements of the compute platform. Please refer to the correct answer below to learn. The best answer is: Hybrid model is the best deployment model in this case because the company's data is highly confidential so they want to save their sensitive data on the on-prem servers or their own private cloud. However, their computation is very demanding so they would need a

public cloud to run their simulations. They may want to use a community cloud for the computation requirement, but public cloud is better because it provides "unlimit" resources and stable compute platform compared to the community cloud. Since the solver software the company uses is only provided by several vendors and the software necessitates numerous specialized libraries and dependencies to

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