

INF-2220: CLOUD COMPUTING & BIG DATA

ASSIGNMENT 1 - CLOUD COMPUTING CASE STUDY DESIGN

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Question 1

1 What type of cloud service would you recommend?

We would recommend using the cloud service type: **Infrastructure as a Service (IaaS)**. Several reasons for this choice will be detailed in the next questions, but the main ones are in total control over the security required to comply with *HIPAA* standards, and great flexibility in adjusting resources (to avoid overloading).

2 How would you justify your choice related to the problems being encountered by the IT team?

The rationale for using Infrastructure as a Service (IaaS) to solve IT team problems is multifaced. Firstly, availability is significantly improved (between 99.9% and 99.999% uptime for an entire year), thanks in particular to the replication of virtual machines (VMs) on Azure.

What's more, IaaS enables resources to be adjusted fairly quickly in the event of overload, thus avoiding the problems encountered previously (waiting two hours for the problem to be solved). The final point is that this approach is advantageous because it offers an integrated development platform that is simpler for the IT team who don't have the knowledge required to manage an on-premises infrastructure.

3 How would you justify your choice related to the problems being encountered by the development team?

Cloud services offer advanced logging tools. For example, in the case of Azure for, *Azure Monitor* enables "*rapid detection of errors and resolution of application-related problems*" (source: [2]). These tools give the development team visibility over the application and the data to spot and fix problems faster. Thanks to IaaS, the team can add additional virtual machines without opening additional ports, thus guaranteeing security and makes some tests to deploy more easily.

4 What other benefits will please your manager if your advice is followed?

Other advantages could be of interest to the manager following the solutions proposed above. With an IaaS, it is possible to control overall costs by only paying for the resources we use, which would be more profitable than at present (maintenance, etc.). Furthermore from a security perspective, cloud services offer measures such as data encryption, access control, etc... guaranteeing the protection of sensitive medical data (*HIPAA* law).

5 How can you meet the requirements related to the medical records and the need to control them?

To meet the requirements for medical records in terms of accessibility and security, several steps can be taken.

Firstly, data encryption (using Azure Encryption, for example) will ensure security in compliance with HIPAA requirements.

Secondly, strict access and identity management can be achieved through the use of Azure Active Directory. This allows us to control who has access to sensitive data, aligning with HIPAA standards.

Another crucial point is the selection of servers located in our country. This ensures that the cloud manager adheres to the same laws and regulations (such as HIPAA and GDPR).

While these measures are fundamental, it's important to note that additional steps may be necessary to achieve full compliance.

References

- [1] Courses INF-2220 Cloud computing & big data
- [2] rboucher. Azure Monitor overview - Azure Monitor — learn.microsoft.com. <https://learn.microsoft.com/en-us/azure/azure-monitor/overview>, [Accessed 19-09-2023]
- [3] L'IaaS, qu'est-ce que c'est ? — redhat.com. <https://www.redhat.com/fr/topics/cloud-computing/what-is-iaas>, [Accessed 17-09-2023]