



DUBLIN INSTITUTE OF TECHNOLOGY

DT228 BSc. (Honours) Degree in Computer Science

Year 3

WINTER EXAMINATIONS 2015/2016

Cloud Computing [CMPU3007]

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MONDAY 11TH JANUARY

1.00 P.M. – 3.00 P.M.

Two Hours

Question 1 is **compulsory**.
Answer question 1 **and** two of the other three questions.

- 1 (a) Give a definition of cloud computing, identifying and describing 4 key characteristics. (12 marks)
- (b) Explain the difference between IAAS and PAAS giving an example of each in your answer. (10 marks)
- (c) Distinguish between public, private, community and hybrid cloud deployment models. (8 marks)
- (d) Briefly describe the evolution of computer architectures which, in your opinion, ultimately contributed to the cloud computing architecture. (10 marks)
- (e) Explain your understanding of RESTFUL architecture while identifying 3 architectural constraints. (10 marks)

2. (a) Describe how Docker can be used to solve the increasing interoperability issues associated with a growing number of software products and versions used in a cloud services. Give specific examples comparing Docker to Traditional Virtual Machines.

(8 marks)

- (b) Describe the function of the following *Docker* commands and briefly explain the purpose of each of the parameters.

- `docker run -d -p 8080:5000 -v $(pwd)/data:/data --name container1 lab4`
- `docker exec -it A637jd9dja /bin/bash`
- `docker create -v /data --name datastore1 hello-world /bin/true`

(9 marks)

- (c) In the context of Computer Science, why is BIG DATA an issue now, and what factors in your opinion have lead to this so-called Tsunami of Data

(8 marks)

3. (a) Describe the key features of the AWS Simple Queue Service. Give an example of how it can be used to facilitate the communication of distributed large-scale applications.

(8 marks)

- (b) Identify and discuss the key differences between *grid computing* and *cloud computing*?

(8 marks)

- (c) What does the CAP Theorem state and how is this relevant to constructing distributed applications? Illustrate your answer with a diagram.

(9 marks)

4. (a) Identify and describe 3 classifications of NoSQL databases?

(9 marks)

(b) Compare ACID versus BASE transactional compliance in the context of a Cloud Database Management System.

(8 marks)

(c) Discuss 4 security implications of cloud computing.

(8 marks)