National College of Ireland

M.Sc in Cloud Computing – Full Time – Year 1 - MSCLOUDJAN
M.Sc in Cloud Computing – Part Time – Year 1 - MSCCLOUDE

Semester Two Examinations – 2013/2014

Wednesday 14th May 2014
6.30pm - 8.30pm

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Cloud Architecture

Dr. Daniel Doolan
David Tracey

Answer **ALL** questions

Duration of exam: 2 hours
Attachments: None

Question 1:

(i) Describe the features you would use to distinguish between each of the following Computing Systems: Multicomputer Clusters, Peer-2-Peer Networks, Computational Grids, Cloud Platforms.

[10marks]

(ii) Give examples of each type to illustrate the features of each of the systems. [5marks]

Question 2:

(i) List 5 key technology advances which have enabled the challenges in cloud computing to be addressed. [5 marks]

(ii) Discuss the key features of each technology advance that have contributed to cloud technology, citing examples of each technology to support the points made. [20 marks]

Question 3:

(i) Distinguish between IaaS and PaaS with examples to illustrate the differences in terms of what is offered to consumers and how this maps to the architectures used. [5 marks]

(ii) The following are key possible benefits of a distributed system: High availability (HA), Fault Tolerance, Scalability, High Performance. Select one of these and discuss it in detail using examples of architectures that illustrate how it can be achieved. [10 marks]

Question 4:

(i) Describe the advantages of Virtualisation in both a single machine and cluster environment.

[5 marks]

(ii) Discuss the advantage/disadvantages of each of the 5 Levels of virtualisation with particular emphasis on the Hardware and Operating Systems aspects. [15 marks]

Question 5:

(i) Describe the HDFS Architecture, the roles of the key components and the HA, scalability and fault tolerance features it provides. [15 marks]

(ii) Describe the MapReduce programming model using an example program and illustrate how this maps to the Hadoop stack. [10 marks]