

Project Proposal:

Using Public Cloud for systems research **Version 1.0**

Suitable for BSc in Computer Engineering or BSc in Telecoms Engineering students.

1. Project title:

Using Public Cloud for systems research

2. Problem to be addressed and justification

Research into large computing and telecommunications systems presents a significant financial challenge to academic institutions, particularly in developing countries. As a result projects are relying on the output results of simulations and making conclusions based on such outputs. Another possible approach is emulation and as telecommunication systems are evolving to a more software defined approach could better research results be obtained by large emulations in public clouds.

3. Project background

3.1 The Computing and Telecommunications labs



Illustration 1: Insight Research Centre, National University of Ireland, Galway

Internationally, well funded computing and telecommunications laboratories of Research centres in Universities, Institutes of Technology and Commercial centres have made significant financial outlay on laboratory equipment in order to build emulations and Proof of Concepts (PoC) leaving students in underfunded institutions at a significant disadvantage.

3.2 Cloud Computing

Cloud computing has seen enterprises across the globe move their compute to the Data Centre or rely on, Infrastructure as a Service (SaaS), Platform as a Service (PaaS) or Software As A Service (SaaS) solutions offered by various cloud providers.

Amazon Web Services (AWS) started this cloud revolution by offering virtualised services on a pay per use basis, thereby significantly reducing the overall cost of compute. While AWS continue to lead the market other major providers like Google Cloud Engine and Microsoft Azure as well as more niche providers like RackSpace, Linode have widened the market and forced prices to continue in a downward trajectory.

Other cloud business have sprung up like Ravello Systems recently acquired by Oracle provide cloud services using AWS and Google as underlying infrastructure.

4. Project objectives

Investigate the possibilities afforded to Universities and Institutes of Technology to use public clouds as a platform for research and emulation of systems.

- Investigate Cloud Computing and its potential for research.
 - What are the options open to Institutions.
 - What are the costings.
- Develop a large deployment emulation.
 - Apply it on the cloud.
- Consider the possible uses of the Cloud to circumvent the challenge of underfunding in Institutes for student research.

Lévai, T., Németh, F. (2016). "Distributed Network Emulation over Cloud Infrastructure [online]" Available: http://mesterproba.hu/files/kiadvany_2016.pdf pp 57-60. Mesterpróba 2016, Budapest. 26 May 2016.

5. Expected results

This project will demonstrate the possibility of the Public Cloud as a platform for system emulation without the need for hardware outlay within the research institution. It will provide a roadmap to an institution wishing to carry out complex system research using the Public Cloud as a platform for emulation.