

Marking Rubric

Mark	10	5	0
Idea potential	The idea has great potential and is very well suited for a research project. The idea reflects the current state of the art and represents potentially a hot topic from an emerging research or technological field. The idea reflects the student's programme of study and builds on existing competencies and modules taught and delivered within the programme.	The idea has good potential and is suited to develop as a research project. The idea stems from a well-known area that is well understood and there is a large amount of existing work in the area. The idea reflects the programme of study and builds on existing competencies and modules taught and delivered within the programme.	The idea is not suited for a research project. The idea does not demonstrate any level of ambition and/or is unrelated to the programme of study.
Research Context	The motivation and narrative for the research is very defined and articulated. The high level topic is very well described and challenges related to the topic are specified and detailed. The research context is easy to read and flows logically. The proposal clearly identifies where the contribution fits into existing work in the area. Existing work is appropriately cited and references are included. References are appropriate and are properly specified and the reader is convinced that a comprehensive review of the area was conducted. The student has demonstrated a high level of critical thinking when developing the research context.	The motivation is embedded in the text but sometimes it can be difficult to extract when reading the proposal. The topic does describe some of the challenges in the area but these are not placed in context to the idea. The context reads like a background to the area rather than a critical analysis of where the proposed project fits into the field. Citations are included but the reader is not convinced that a comprehensive review of the area is conducted. Some/most of the references are web references from sources that are not peer reviewed or are proprietary in nature.	The research context does not demonstrate any level of critical analysis and reads more like a proposal that would be presented at undergraduate level.
Aim	A simple statement that refers to the main goal of the project is defined. This goal relates and is developed bearing in mind the research context presented. The aims demonstrate some ambition and are appropriate to the level sought.	A research aim has been defined that relates somewhat to the research context presented.	Research aim is not appropriate to the level sought i.e. MSc. The aim is not related in any way to the context and motivation included as part of the proposal.
Objectives	The research objectives are well defined and constructed correctly. An appropriate number of research objectives/questions have been defined. The research objectives relates to the research context and identified challenges in the field. The research objectives are realistic and are within the scope of the project.	The project proposal may have defined too many objectives and may be presented incorrectly. They objectives are ill defined and only somewhat related to the context presented. Some of the research objectives lack ambition and outline questions that may be clearly answered without undertaking a research project.	The questions/objectives are ill defined, lack ambition and are do not align with a level 9 masters project. The research questions read like what you would expect at an undergraduate level.

Using the rubric above grade the following projects assigned to you.

Example 1

Project Title

Assessment of Modern Datacenters Infrastructure with focus on Hyper-Converged Infrastructure (HCI)

Marking Rubric	
Example Number:	
Idea potential	
Research Context	
Aim	
Objectives	

Research Context

IT infrastructure is a combination of hardware, software, networks, all other IT components that monitor the infrastructure to make sure its running properly. IT Infrastructure has gone through a long journey and a lot of transformations to reach the status we have reached today. Before computers, the first machine that was used to automate calculations and store was the tabulating machines in the 1900, it was used for quite some time till IBM came up with the Mainframe the first computer that has been ever used which used punch cards for data storage and data input. Mainframes ruled the world of IT infrastructure for decades until the Personal Computers (PC) came up in the 80s, then the concept of Client/Server Computing appeared where the PC (client) is communicating with a Server thats running an application or a web server, the server is where all the data is stored and the client is the just an entry point to the system. From the Client/Server architecture, came the modern Enterprise computing with the advancement of software, hardware, Networking and the TCP/IP technologies, although more advanced technologies and architectures which I'll talk about in this research - started to flourish, enterprise computing architecture remains the most dominating architecture there is in today's Datacenters. In modern Enterprise computing or what we are going to call traditional infrastructure, in each Datacenter, we have servers, whether they are high end servers or small form servers, also we have the SAN or NAS storage, we have the SAN switches for storage access, and we have the Network devices such as TOR switches, Aggregation switches, Routers, Firewall, Load Balancers, etc. To setup any new environment for a new application, we need to contact all vendors for servers, storage, network, OS, and applications to purchase all the requirements for our new application. This process usually requires planning for months to coordinate with all the vendors, and issue the purchasing orders PO, for each vendor, then the shipping usually takes 6 to 8 weeks for all hardware to arrive onsite, then you need to communicate with each vendor for the implementation to take place. The amount of money, effort, hassle that you need to spend to implement any project is endless, and not mention the cost spent in Datacenter footprint, power, AC, etc. while this has been the model used for years, new ideas came up to optimize the model used for IT infrastructure. One of these ideas is virtualization which is a technology to utilize the hardware efficiently and abstract the OS and application layer from the hardware layer, virtualization has transformed the way IT infrastructure is managed. Although, we still need to provision servers, storage, SAN, and network like traditional infrastructure, but the servers are being used efficiently, and the time to provision a new VM is much less than provisioning a new physical server, and a lot of saving is being achieved. The next step for virtualization is the cloud offering of Infrastructure As A Service (IaaS), where the deployment of the infrastructure is completely automated by the end user though a self-service portal, and eliminating the need for Infrastructure administrators to deploy new infrastructure. Whether we are adopting cloud model or any other model, we still need hardware to serve the technology running, and to facilitate management and speed up initial provisioning of Infrastructure the concept of Converged Infrastructure emerged, where all the servers, storage, and networking are still discrete but they are all managed from one point of management, validated, and

sold by one vendor. Sometimes the hardware comes pre-built from the vendors factories. Basically, its using the same components of traditional Infrastructure and simplifying the provisioning. In the last couple of years another technology has boomed and is said to be the future of IT infrastructure, it is the Hyper-Converged Infrastructure, in this technology, the same concept used in Converged Infrastructure of packaging all components of Infrastructure in one simple solution but with an extra mile taken of merging all components in a single form factor appliance, saving a lot in TCO and also management. I've been working in the field of IT Infrastructure for 10 years now, I worked as a DBA, UNIX Administrator, Storage and Backup Administrator, and finally an Implementation Engineer. I've deployed traditional Infrastructure and spent months to deploy a new project in IT, I've managed virtualization environment and saw the difference in simplicity and speed of deploying new servers for users. In my recent years working as an Implementation Engineer, Ive come so close to dealing with hardware and building of different components of Infrastructure (Compute Storage Network) from the ground up and saw how hard it's for customers to deal with multiple vendors and coordinate between them, but when I dealt with Hyper-Converged Infrastructure (HCI), Ive seen how easy and fast you can deploy an entire Datacenter Infrastructure in a matter of hours and in almost 1/8 the footprint needed for traditional infrastructure with equivalent capacity. With all the benefits and the enhancements, the HCI has offered, comes some major drawbacks. Ive personally witnessed some major incidents with regards to HCI, where system has gone completely down, and Data has been unavailable for hours, and even some cases where Data has been lost. In this research, Im planning to explain the architecture of these technologies Ive dealt with and discuss the cases I witnessed and assess whether these cases are the result of a deficit in the technology itself or it was the result of a bad design put by the solution architect. Since lots of customers are adopting this new technology, I'll assess whether this technology will fulfil all customers needs in their IT Infrastructure.

Research Aim

My aim of this research is to assess the main features of new IT infrastructure architecture in general and hyper-converged infrastructure in specific, and to examine the main benefits of these new architectures and also the pain points that arises from switching to them.

Research Objectives

1. Discuss new architectures of modern Data Centers infrastructure.
2. Assess the main features of Hyperconverged infrastructure and whether it achieves the critical requirements of any Data Center. (Data Availability Workload Performance Data Integrity)
3. Discuss how to minimize the issues that can be faced in HCI implementations.