

Aim

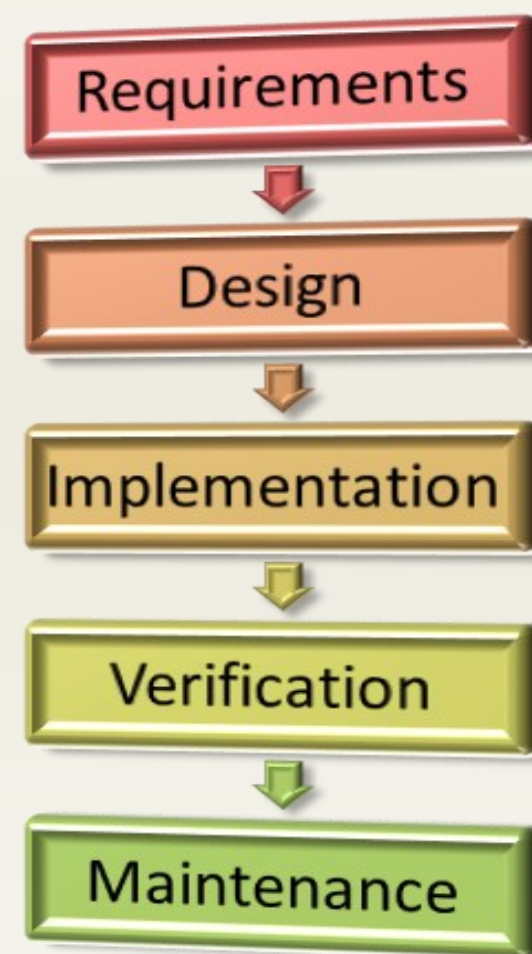
To propose a new or improved platform for teaching virtualised based curriculum at BCU.

Objectives

1. Identify a method of establishing change in an ICT Infrastructure
2. Model and capture existing platform of delivery
3. Research and analyse alternative platform and technologies
4. Propose and design a secure solution for the 'Infrastructure Technologies' theme at CTN/ BCU
5. Develop and test a prototype solution for delivery of virtualised labs
6. Evaluate the sustainability of the solution, and make recommendations

Waterfall Methodology

The chosen methodology was waterfall, as is explained here.



This stage explains why the project was created and the reason for requirement of the project by identifying the problem and a possible solution.

In this stage the requirements identified in the previous stage are used to create a design plan that meets the identified requirements.

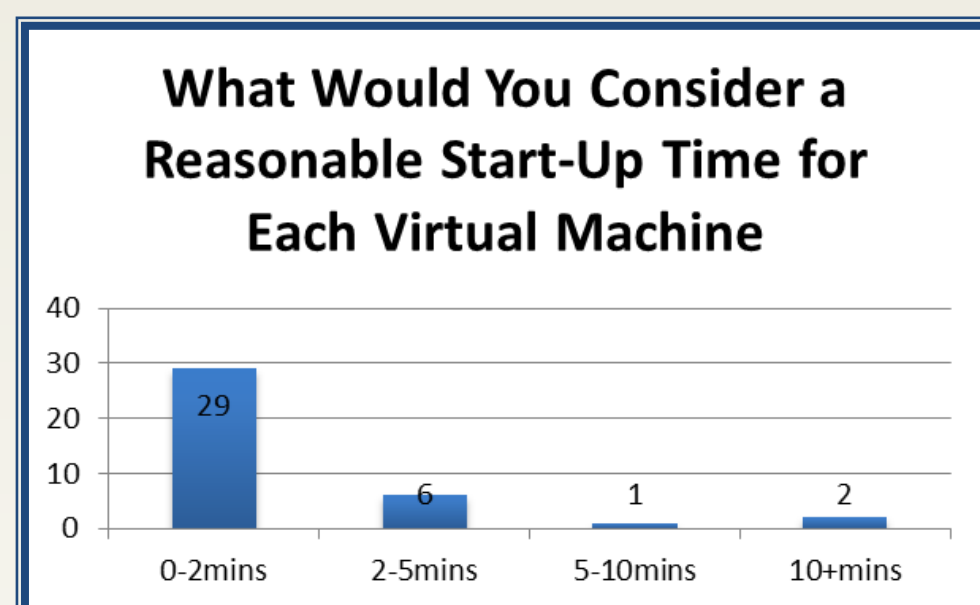
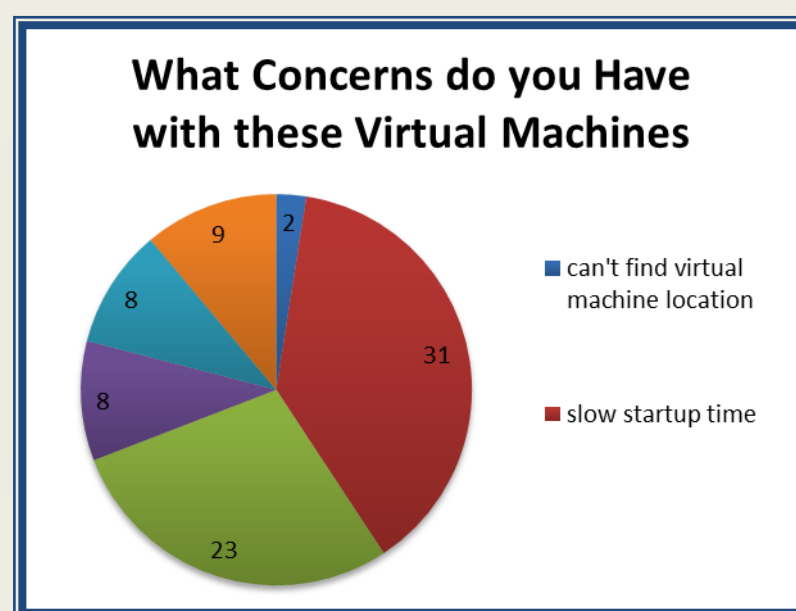
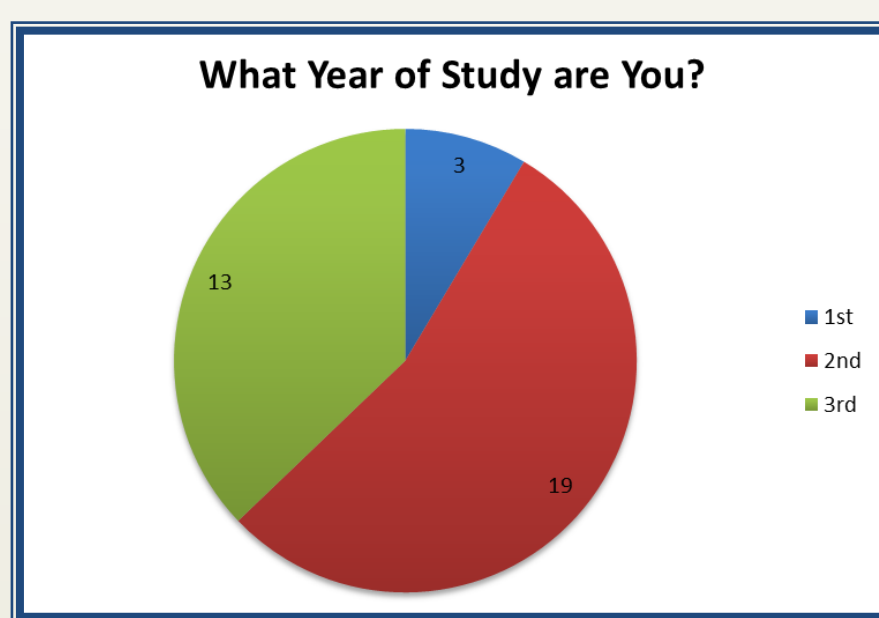
At this stage the created design from the previous stage is created (implemented). The implementation stage is usually the most time consuming.

In this stage the implemented project is verified by identifying whether the implementation was successful usually by testing if it was unsuccessful the project goes back to the design or implementation stage.

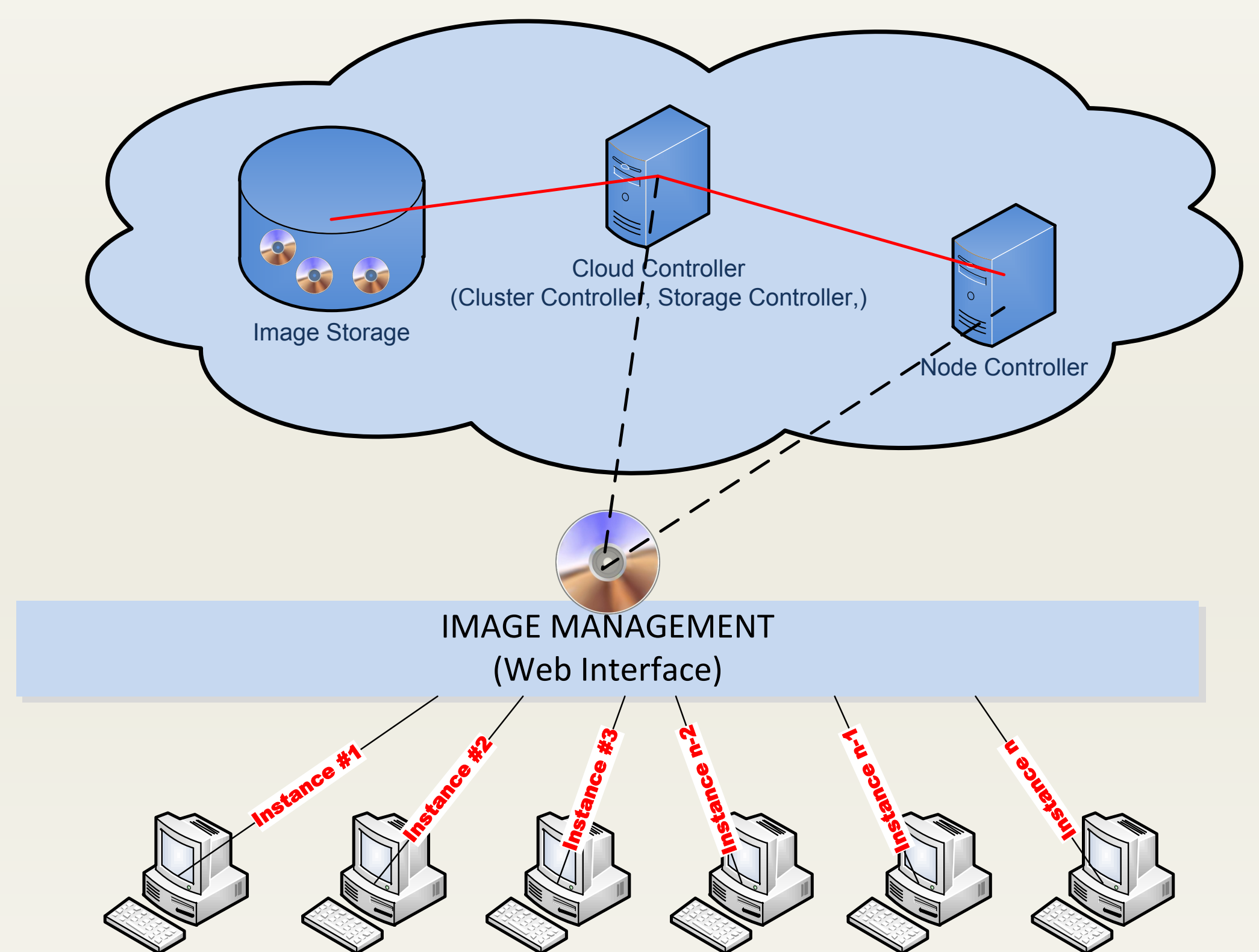
At this stage the system has been successful verified and is maintained and monitored to ensure that it works correctly without issues.

Research

Here are some of the findings from a questionnaire about the existing setup.



The Solution



Conclusion

The purpose of this project was to explore a new way of providing virtualised labs for the BCU/ CTN ICT themed modules as part of degree courses. The Primary research that was conducted suggested that many students were not happy with the current platform and many of the respondents provided good feedback on how they thought the labs should be improved. From this primary research and some existing knowledge in the areas of cloud computing and virtualisation I have developed a prototype solution that offers a best-case scenario view of how a new system could operate. The propose solution is a technically sound private cloud infrastructure which offers security, flexibility and scalability. The solution and evaluation provide an insight into how the system would operate in the university environment, and the methodology, as specified, is adhered to throughout. The implementation of the chosen solution may not have been entirely successful, however with a little more knowledge and more time available this is a very feasible solution to the problem.

Recommendations

The 6th objective is to provide recommendations on the solution, these are:

- The propose solution requires advanced hardware capable of virtualisation at the CPU level. Also a large amount of disk space is required for storing different images, and running multiple instances. RAM is also an essential commodity as this will affect performance with multiple instances running.
- Training of all appropriate staff on how to build and initialise images is essential to ensure a smooth overall system.
- More time needs to be spent on developing a prototype and there needs to be an extended testing phase, perhaps with 1st year students.
- Modification of the HybridFox extension could be made to make it simpler to administer the images, some controls could be phased out that are unnecessary for this implementation and some friendlier interface modifications could be made to allow for ease of use. This would require someone with good coding skills, familiar with Firefox extensions and the UEC commands.
- Recompiling the UEC servers and building images of them would mean simpler, pre-configured setups for future expansions, or extra implementations. Ubuntu is open-source and can be stripped of unnecessary packages and required packages can be added at will, this means the whole OS is fully customisable.