**Senior Design Presentation Outline**

1. Introduction
2. Purpose
   1. Build Raspberry Pi Server Cluster featuring parallel computing.
   2. Deploy a website that enables the Client to teach C programming language and parallel computing
3. Requirements
4. Website needs to be available to the students in Saint Martin’s University
5. Easily understandable documentation
6. Website includes 13 weeks of study materials
7. Website needs to be easily navigable
8. Constraints:

5 - port Network switch was insufficient to build LAN via ethernet cable

1. Organization
   1. Team
      1. **Sanju Byanjankar** : Network Administrator
      2. **Joshua Schulz** : Software Engineer
      3. **Connor Dickinson** : Software Engineer
   2. Stakeholder
      1. Dr. Xuguang Chen
2. Engineering
   1. Research Specifications:
      1. C programming.
      2. Linux scripting in Raspbian OS
      3. Networking Fundamentals
   2. Tools and Resources to be used for design

Hardware:

* + 1. Three Raspberry Pi 3 Model B+, 16GB SD cards, power supply, server frame
    2. HDMI cables, ethernet cables
    3. 5 - port Network Switch

Software:

* + 1. HTML/CSS languages are used for software design
    2. Putty for remote desktop connection
    3. C programming language for back end programming
  1. Visuals

Haproxy

Internet

Server 1

Server 2

Server 3

Connection is based on the least amount of traffic on a server

* 1. Risks
     1. Risks identified at stage of the project

Domain Name Server is still to be configured, or else there is a probability of ip address conflict in the network

* + 1. Process for managing risks

Configure domain name server to assign a specific domain name so that it is more secure and user friendly

1. Milestones
   1. Deliverables

Raspberry Pi Cluster Server featuring parallel computing and the website is estimated to be delivered no later than May 7, 2020.

1. Budget
   1. Saint Martin’s University allocated $ 150.00 of the budget, specifically to support this project.
   2. For construction/development of prototype : N/A
2. Monitoring and Controls (i.e. QA/QC processes)

a. Remote desktop is used to monitor and control the servers remotely pre and post software deployment.

b. For Software QA, Black-Box testing is going to be implemented to ensure the best quality possible.

1. Next Steps
   1. Design Development
      1. Node Server is up and running
      2. Website Home Page has been deployed.
      3. Each raspberry Pi is communicating with each other bypassing authentication.
      4. Raspberry Pi are up for parallel computing.
      5. Next Steps

Add Contents to the links on the Home Page

Write the back end in C programming language to implement parallel computing

If timeline allows failover server is to be created to minimize downtime of the website.

* + 1. Improvements (address in 2nd semester)
    2. Suitable for more future design teams (address in 2nd semester)
  1. Prototype Build (if applicable): N/A

1. Conclusion

In conclusion, we have made good progress on our project for this semester by hitting every deadline we have set. We look forward to finishing this project next semester so Dr. Chen can have it for his upcoming class.