# IoT Testbed Tower - Results

**Team Name: ESP TESTBED**

**Student Names: Michael Trifilo, Christopher Rogash**

**School of Engineering, RMIT University, Melbourne, Australia**

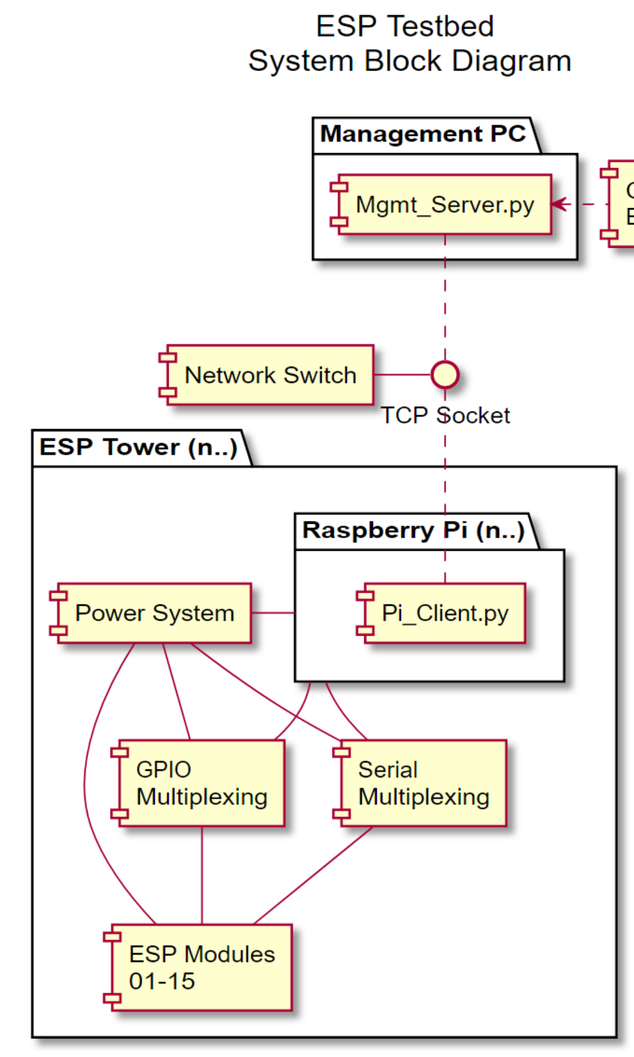


**Figure 1: System Block Diagram**

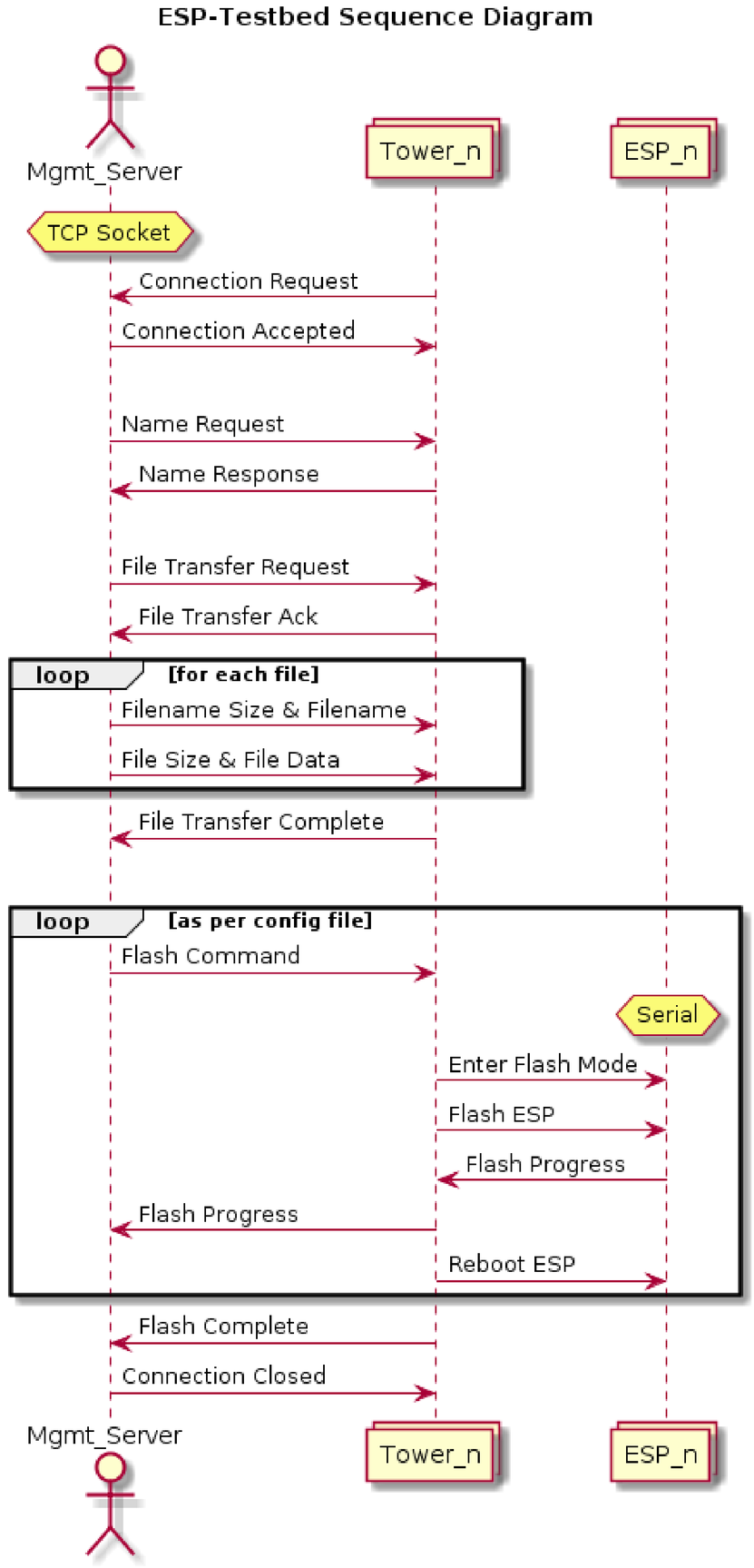


**Figure 2: Software Sequence Diagram**

## DESIGN OF TOWER

Each ESP Tower was made from a set of requirements provided by our client, Tyler Steane. Each tower must:

- Power 15 ESP-01 modules and a Raspberry Pi.
- Provide the ability to remotely program all ESP-01 modules.
- Allow for Wi-Fi testing in 3 dimensions.
- Stand vertically with a sturdy footing.

The PCB's are split into 4 distinct component sections. These are power, Pi control, communication via multiplexers, and the ESP-01 modules.

## KEY ACHIEVEMENTS

- Schematic & PCB Design
- Electronic Prototyping
- PCB Manufacture & Troubleshooting
- Mastering Python Networking
- IoT Development in Arduino IDE
- Plant UML – Diagram design language
- Team Communication Skills
- Time Management
- Formal Report Writing

## PROGRAMMING

The ESP Testbed uses a client-server model via TCP sockets. The Raspberry Pi acts as the client, indefinitely attempting to connect to the server. The user starts the server, which accepts all client connection requests. The server imports data from the configuration file, processes it and sends commands to the Raspberry Pi. The client is responsible for interfacing with the ESPs, it controls the Pi's GPIO pins and serial communication. During programming the Pi will send progress data back to the server, showing the user progress without the need to connect directly to the tower.

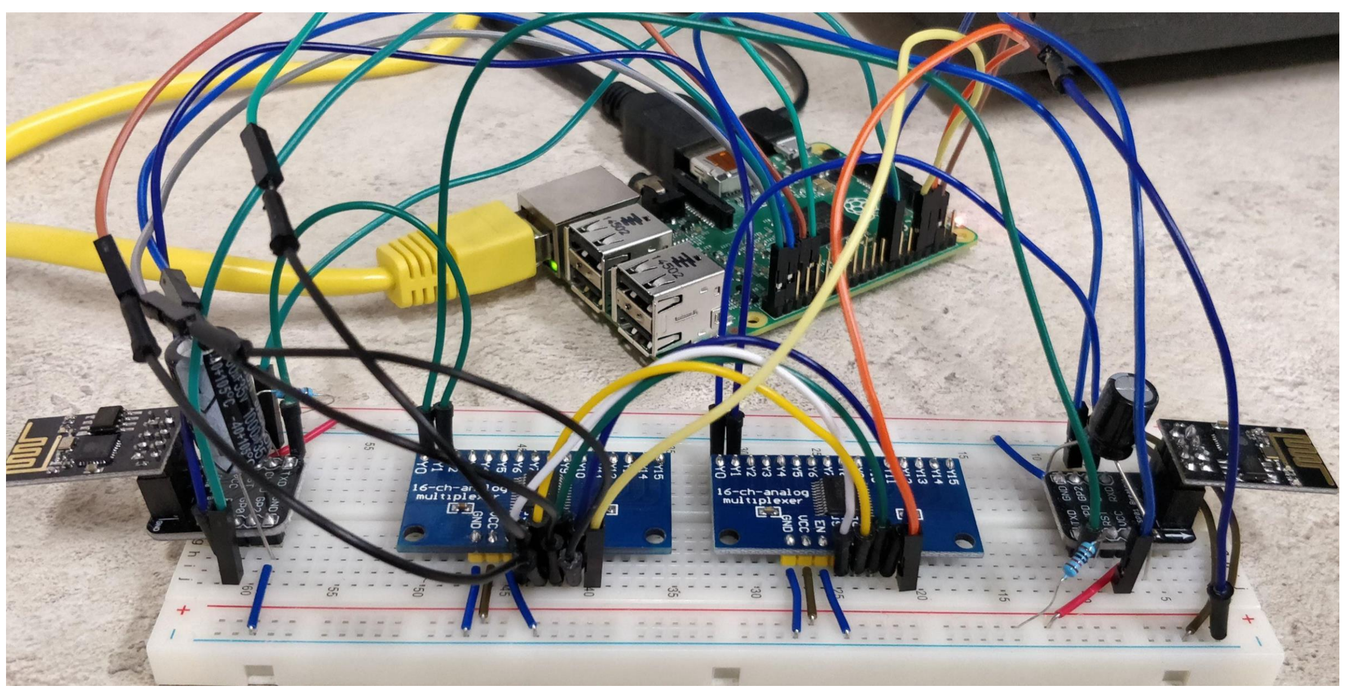

**Figure 3: Proof of Concept**