2.0 Network architecture DMO

2.1 Version control

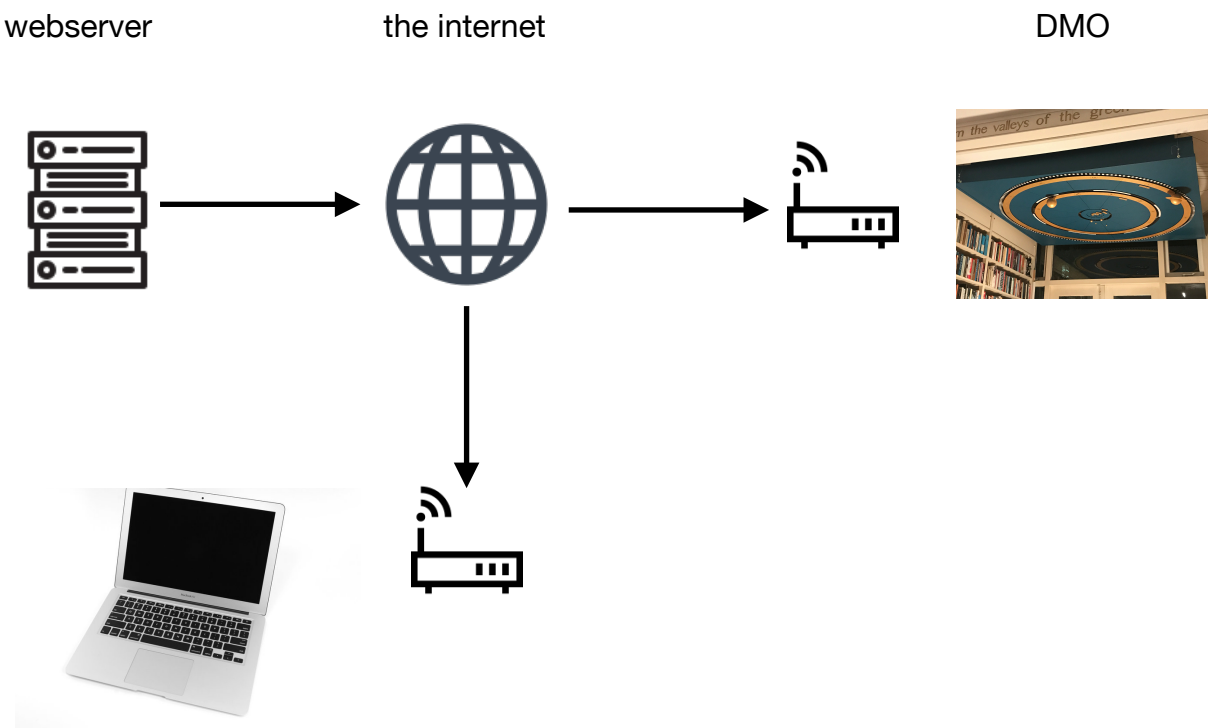
Version 1.0 - 2 February 2021 - first version
Version 1.1 - 9 February 2021 - typos fixed

2.2 Introduction

Each planet has its own computer (Raspberry Pi Zero W). A stepper motor (Nema 17) with accompanying driver (Adafruit Motor HAT) is connected so the planet can be exactly positioned. Initial positioning is done with reed-switches that react to magnets on the track.

The position of the planet is calculated on a website which is hosted on a webserver. Each planet can read the output via WiFi and calculate where its place is on the planet orbit for the entered date and then "drive" to it.

2.3 Architecture



2.3.1 Webserver and software

The webserver can be any hosting-server, it is used to store the solar-system-software. You can use any hosting-partner or set up one yourself in your network. As long as it runs the original JS Orrery software: http://mgvez.github.io/jsorrery/

Hosting it on an external server has the benefit you can operate the DMO outside your local premisses (anywhere in the world in fact).

The original JS Orrery software has been modified with adding a “save positions” button. What is basically does is sending out a string of degrees where the planets are on the entered date.

The string can be read at:

http://yourdomain.xxx/positions.txt

Example of possible output:

360185244155101132045097

The first three digits are for Mercury and so on (inside out until Pluto). The last three planets are not in the DMO but maybe in your DMO.

In our DMO Git account you will find the adjusted JS Orrery software you need to install on your webserver.

2.3.2 DMO

The DMO consist of 6 Raspberry Pi Zero W’s (RPI) which are all connected to the same local WiFi network. All planets (from Mercury to Saturn) “know” who they are and read their own part of the string for their position in their orbit.

2.3.3 Laptop, phone or tablet

With your terminal (doesn’t matter what it is as long as it runs a web-browser and supports Javascript) you can acces the webserver on your domain (http://yourdomain.xxx).

You enter the desired date, hit return and push “save positions”. The string is published and picked up by the relevant RPI’s. A RPI “knows” where it is via a reed switch which runs over a magnet, recalculates the degrees into number of steps and moves to the desired position.