

NATIONAL INSTITUTE OF TECHNOLOGY WARANGAL



PROJECT TITLE:

INTERNET CONTROLLED HOME AUTOMATION USING NodeMCU ESP8266

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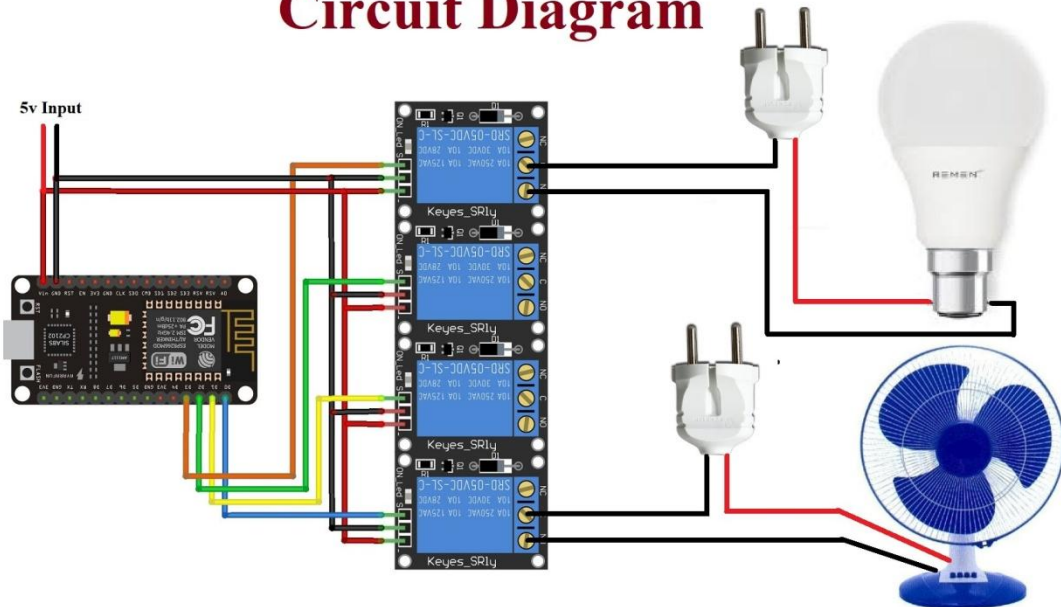
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Introduction:

Today, we are entering post-PC era where mobile devices (e.g. iPads, Smartphones and Handheld tablets) are handling daily tasks that traditional desktop and laptop computers once handled. Several reports show that personal computers are no longer on the leading the edge of computing and the use of mobile devices are quickly taking over. With the availability of products which integrate mobile devices and cloud networking rapidly increasing, many users can see how new technology can impact their everyday lives. In this paper we have developed a Home Automation system that employs the integration of multi-touch mobile devices, cloud networking, wireless communication to provide the user with remote control of various lights and appliances within their home. Home automation can be useful to those who need to access home appliances while away from their home and can incredibly improve the lives of the disabled. Many of the home automation systems that are commercially available can be separated into two categories: locally controlled systems and remotely controlled systems. Locally controlled systems use an in-home controller to achieve home automation. This allows users complete use of their automation system from within their home via a stationary or wireless interface. Remotely controlled systems use an Internet connection or integration with an existing home security system to allow the user complete control of their system from their mobile device or personal computer.

Block Diagram:

Circuit Diagram



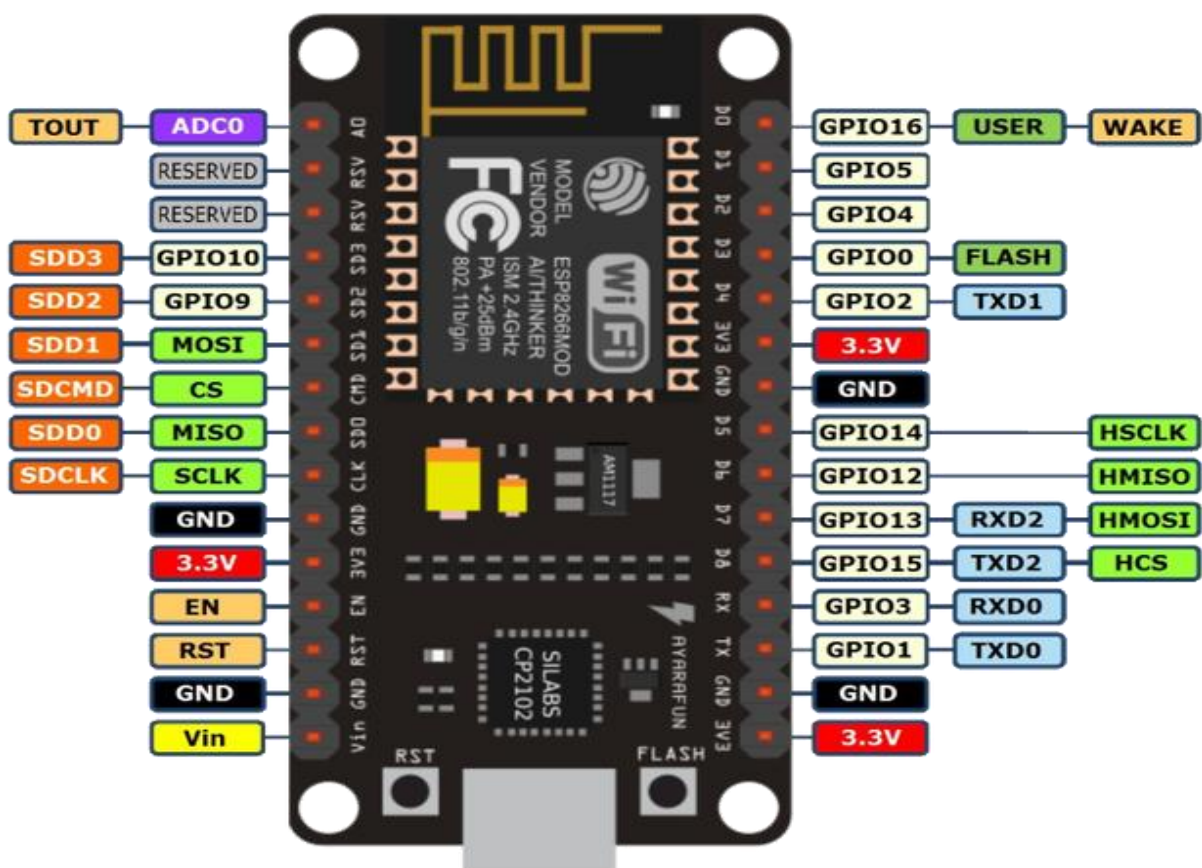
Hardware requirements

- NodeMCU esp8266
- Relay Modules
- BreadBoard, Jumper wires
- Power Supply

NodeMCU:

- It is an open-source firmware development kit that helps you to prototype or build IoT products

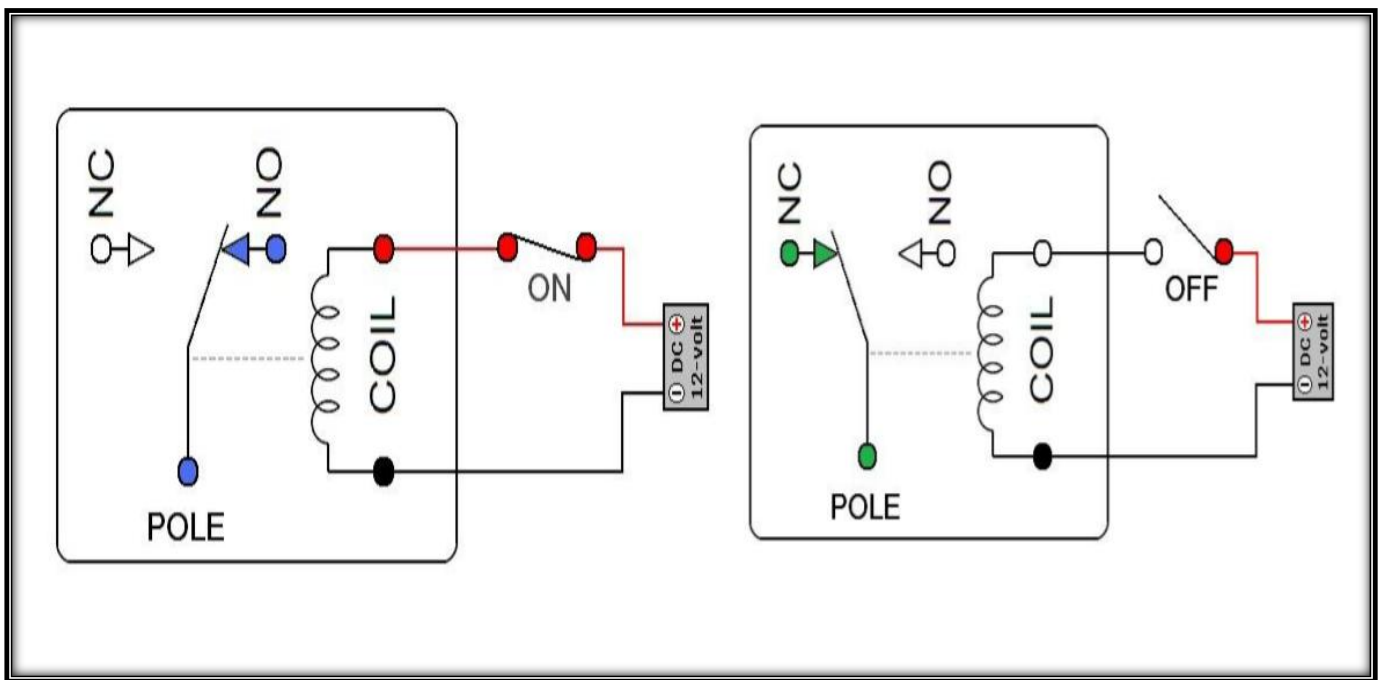
- It includes firmware which runs on ESP 8266 Wi-Fi Soc and hardware from Espressif Systems and hardware which is based on the ESP-12 module.
- The Esp8266 has 17 GPIO pins(0-16),however,you can only use 11 of them ,because 6 pins(GPIO 6-11) are used to connect the flash memory chip.
- GPIO 1 and 3 are used as TX and RX of the hardware serial port(UART),so in most cases,you cant use them as normal i/o while sending and receiving serial data.



RELAY:

- Relay is basically an electromagnetic switch which can be turned on and off by an applying the voltage across its contacts.
- In this project, we used two 5v relay modules .

How Relay Works?



All relays contain a sensing unit, the electric coil, which is powered by AC or DC current. When the applied current or voltage exceeds a threshold value, the coil activates the armature, which operates either to close the open contacts or to open the closed contacts. When a power is supplied to the coil, it generates a magnetic force that actuates the switch mechanism. The magnetic force is, in effect, relaying the action from one circuit to another. The first circuit is called the control circuit; the second is called the load circuit.

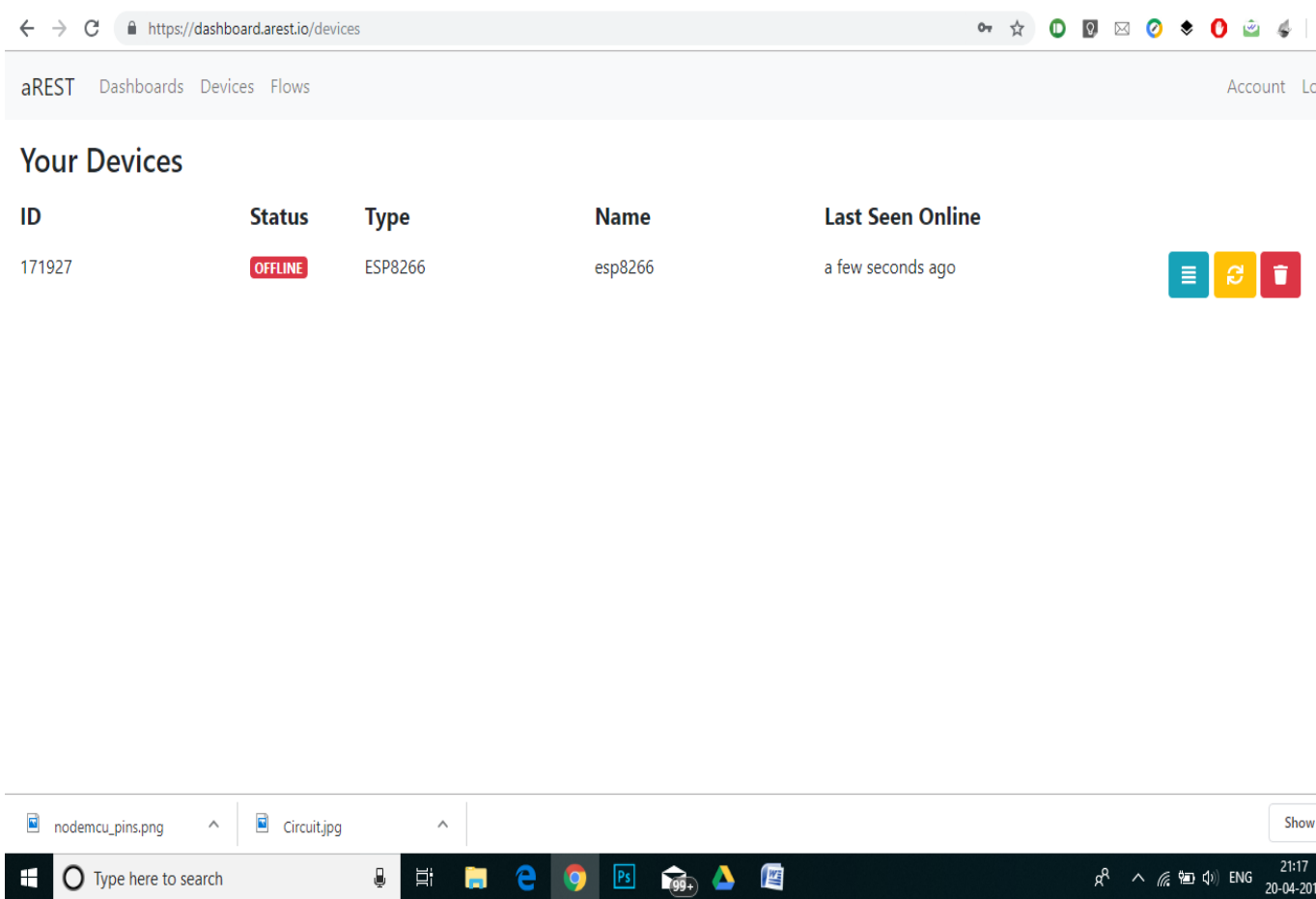
[aREST cloud:](#)

aREST was originally created to easily control your local Arduino, Raspberry Pi or ESP8266 projects, using WiFi, Ethernet, Bluetooth, or other means of communication. However, we are living in the age of the Internet of Things, and it was impossible not to have a feature inside the aREST framework that would allow you to control your devices from anywhere, even if you are on the other side of the globe.

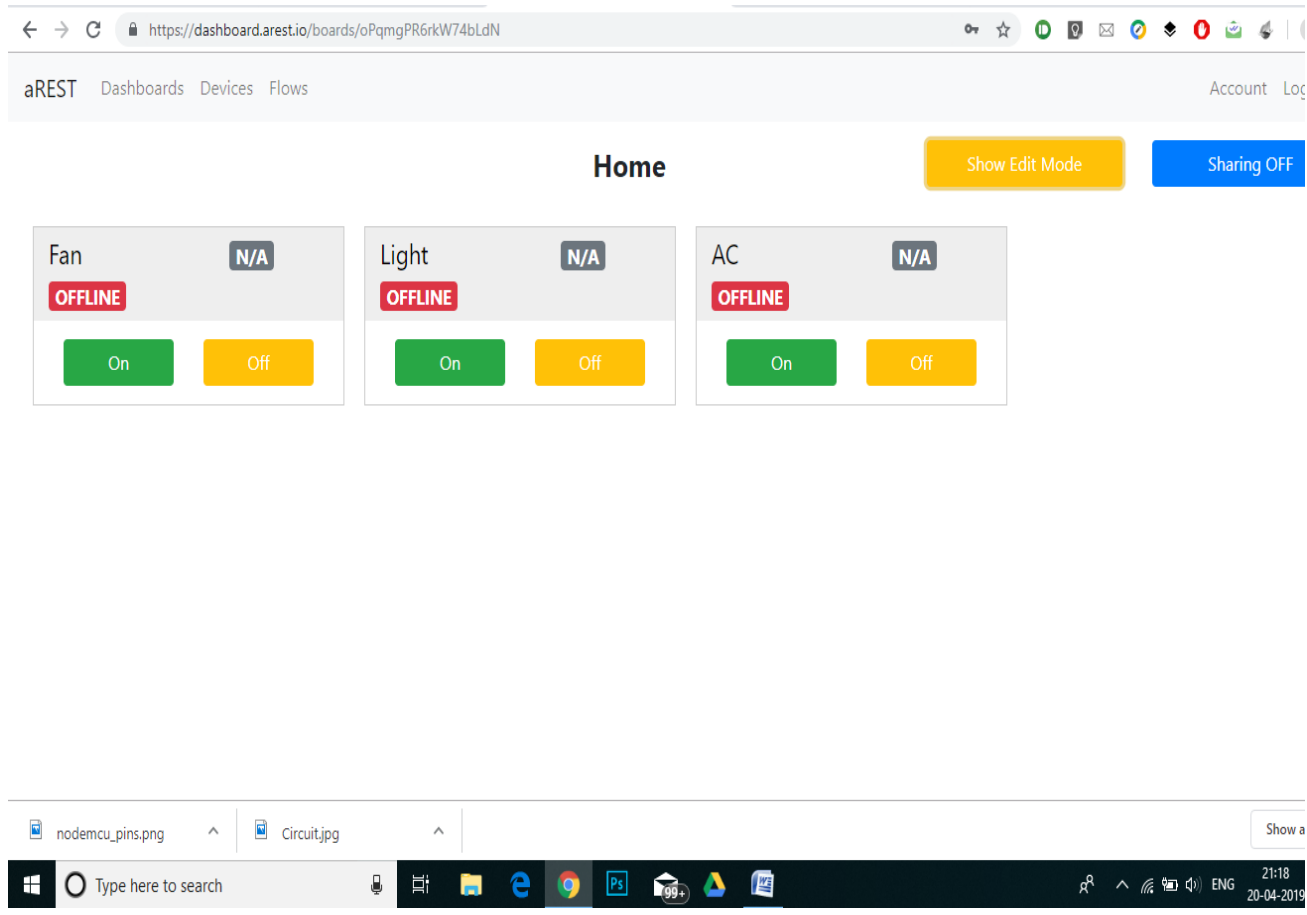
This is why the cloud access was introduced in the version 2.0 of aREST. With the help of aREST, you can access your projects from anywhere in the world using aREST, via the aREST.io cloud server. You just need to choose an identifier for the device, configure it with aREST, and it will immediately be accessible at `cloud.arest.io/device_id`.

aREST can be used to control ESP8266 boards from anywhere in the world, by communicating with the board via MQTT commands. The ESP8266 board basically acts as a web client that accepts incoming commands from the cloud.arest.io website, and process those commands via the library.

This cloud platform gives all the tools necessary to control all the devices you would like to which are connected to internet from anywhere.



In the devices section, status information about all your devices can be known. Each device which is connected to cloud is assigned a device ID which uniquely identifies the device.



Dashboard section consists of different electrical devices connected to a particular device. Each device consists of two buttons-ON and OFF which are used to control them.

SOFTWARE USED:

- Arduino IDE
- aREST cloud platform

Advantages:

- It is a robust and easy to use system.
- All the control of different lot devices would be in your hands by using this home automation system.

- This project can provide the facility of monitoring all the appliances in the home from anywhere provided you have an internet connection.

FUTURE WORK:

- Memory can be used to store the appliance status during power failure.
- Appliance scheduler/timer can be implemented using RTC (Real Time Clock)