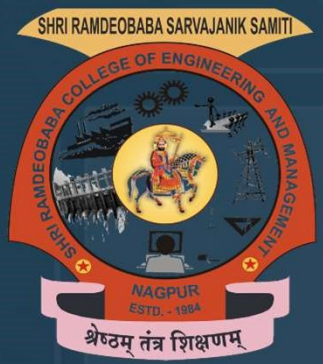

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Device Automation & Control Using ESP8266 (DACE)

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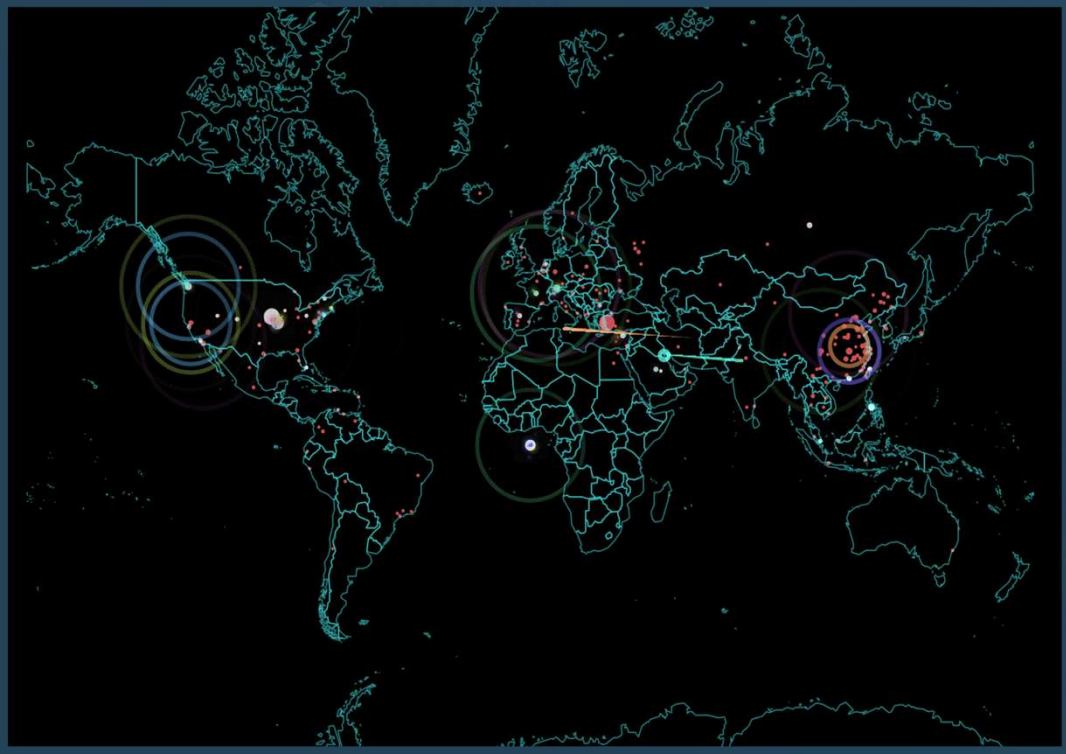
Device Automation & Control Using ESP8266 (DACE)

CONTENTS

AIM

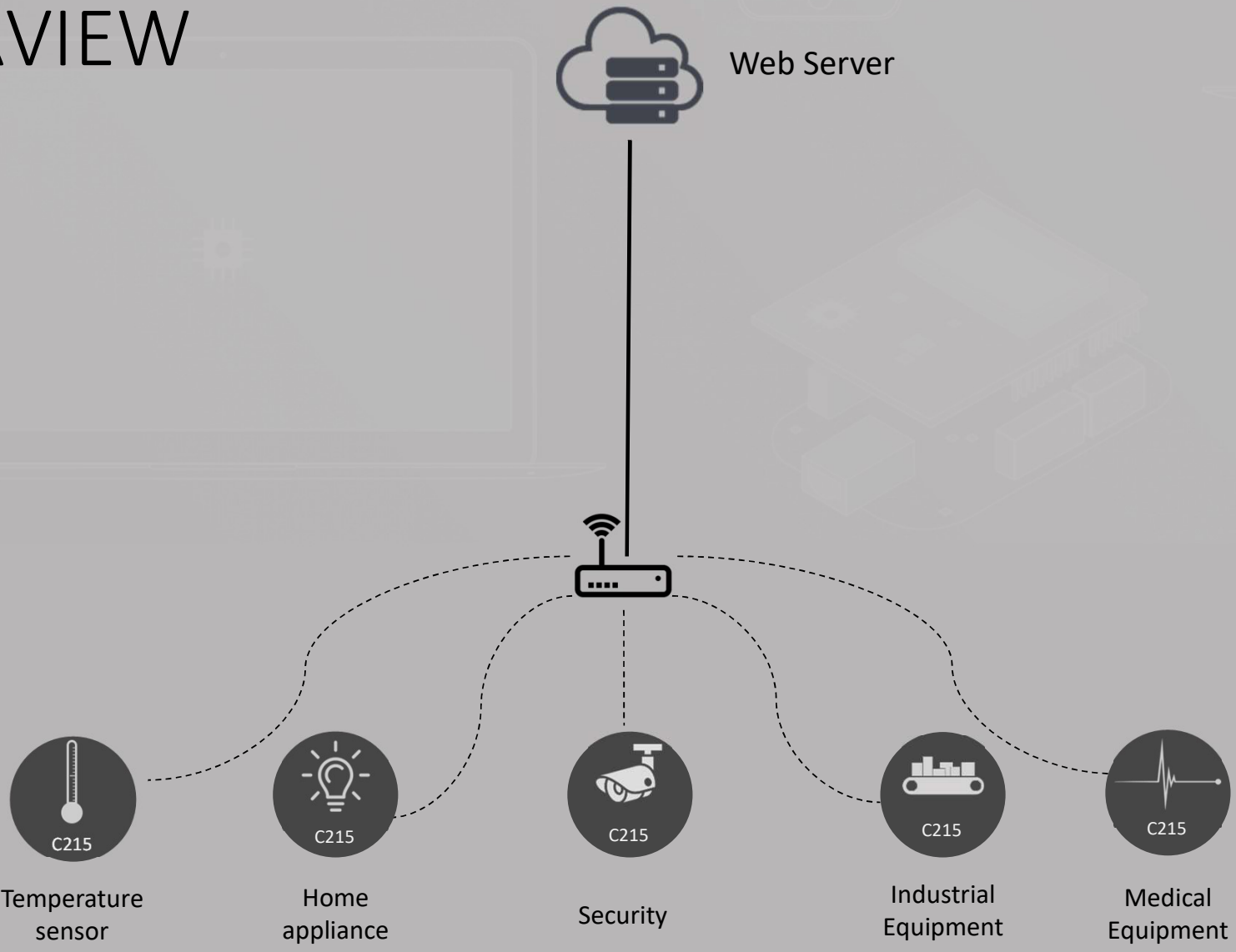
The aim of the project is to collect data from sensors (in this case, LM35 Temperature sensor) and store that data on a hosted server. Also, the module allows you to control the state of a device from the server itself along with an added feature of controlling a device from a voice command.



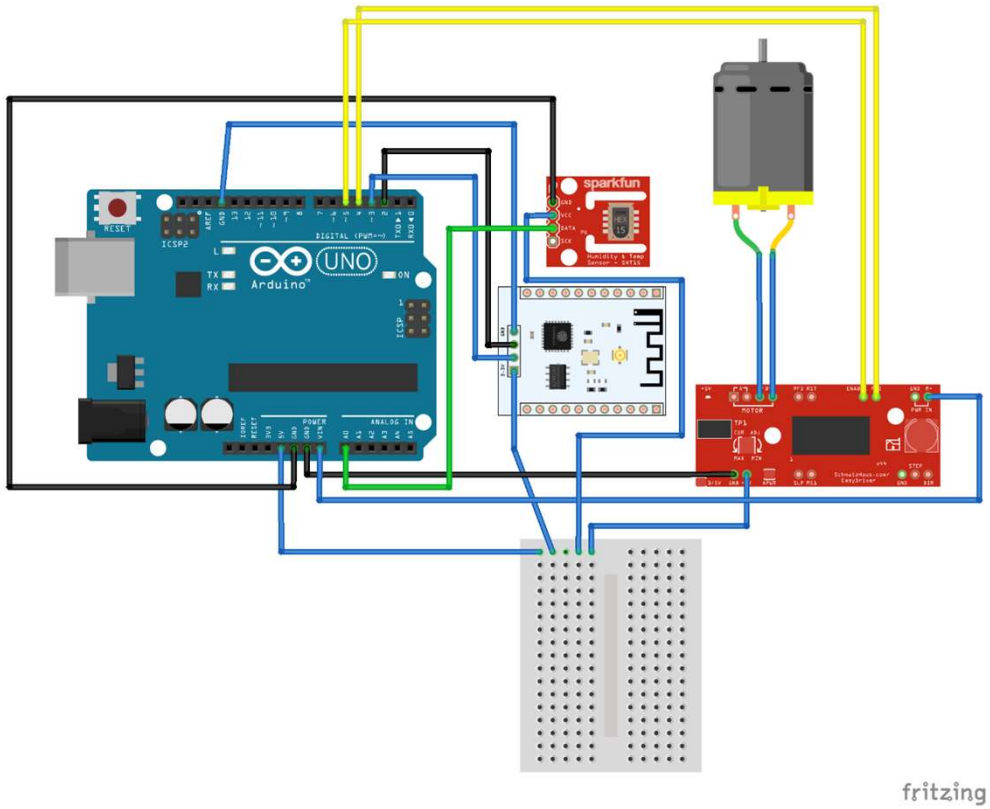
What is the "Internet of things"?

- The *Internet of things* (IoT) is the network of everyday objects
- Physical things embedded with electronics, software, sensors, and connectivity enabling data exchange.
- Basically, a little networked computer is attached to a thing, allowing information exchange to and from that thing.
- A little networked computer can be combined with it to
  - accept input (especially object control)
  - to gather and generate informational output (typically object status and other sensory data)
- Because of low-cost, networkable micro-controller modules, the Internet of things is really starting to take off.

OVERVIEW


Web Server
C215
Temperature sensor
C215
Home appliance
C215
Security
C215
Industrial Equipment
C215
Medical Equipment

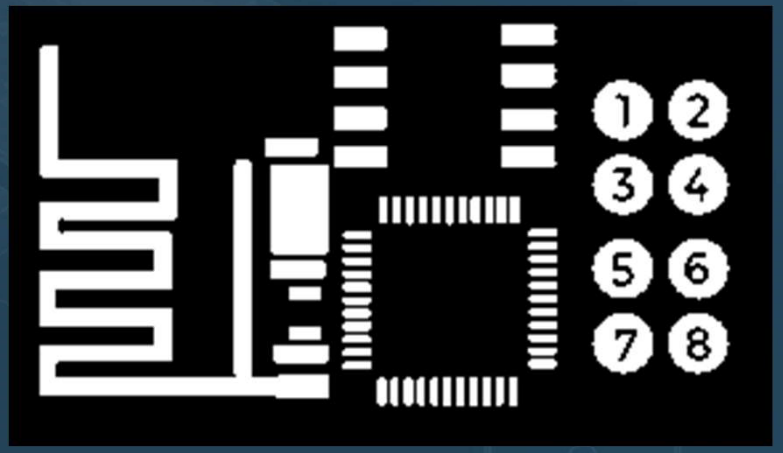
CIRCUIT



ESP8266

- The ESP 8266 is a low cost, high performance System on-chip Wi-Fi to serial module.
- For communication, the ESP8266 has UART communication pins; RX and TX.
- Self contained SOC with integrated TCP/IP protocol stack
- Can give any microcontroller access to your Wi-Fi network
- Comes pre-programmed with an AT command set firmware
- Can be integrated with the sensors and other application specific devices through its GPIOs
- Minimal development up-front and minimal loading during runtime

- RXD : Receive data
- Vcc : 3V3
- GPIO 0 : Used to enter flash mode, Active low
- RST : Reset
- GPIO 2 : General purpose I/O
- CH_PD : Chip Enable, Active High
- GND : Ground
- TXD : Transmit data



FEATURES

- 802.11 b/g/n
- Wi-Fi Direct (P2P), soft-AP
- Integrated TCP/IP protocol stack
- Integrated TR switch, balun, LNA, power amplifier and matching network
- Integrated PLLs, regulators, DCXO and power management units
- +19.5dBm output power in 802.11b mode
- Power down leakage current of <10uA
- 1MB Flash Memory
- Integrated low power 32-bit CPU could be used as application processor
- SDIO 1.1 / 2.0, SPI, UART
- STBC, 1×1 MIMO, 2×1 MIMO
- A-MPDU & A-MSDU aggregation & 0.4ms guard interval
- Wake up and transmit packets in < 2ms
- Standby power consumption of < 1.0mW (DTIM3)

WEB-SERVER

- Every user can create unique account
- Log in to access resources
- Temperature analysis in graphical format
- Control devices through website
- Basic functionalities available such as, help, profile editing and device information
- Remote access to information

Technologies Used For The Website

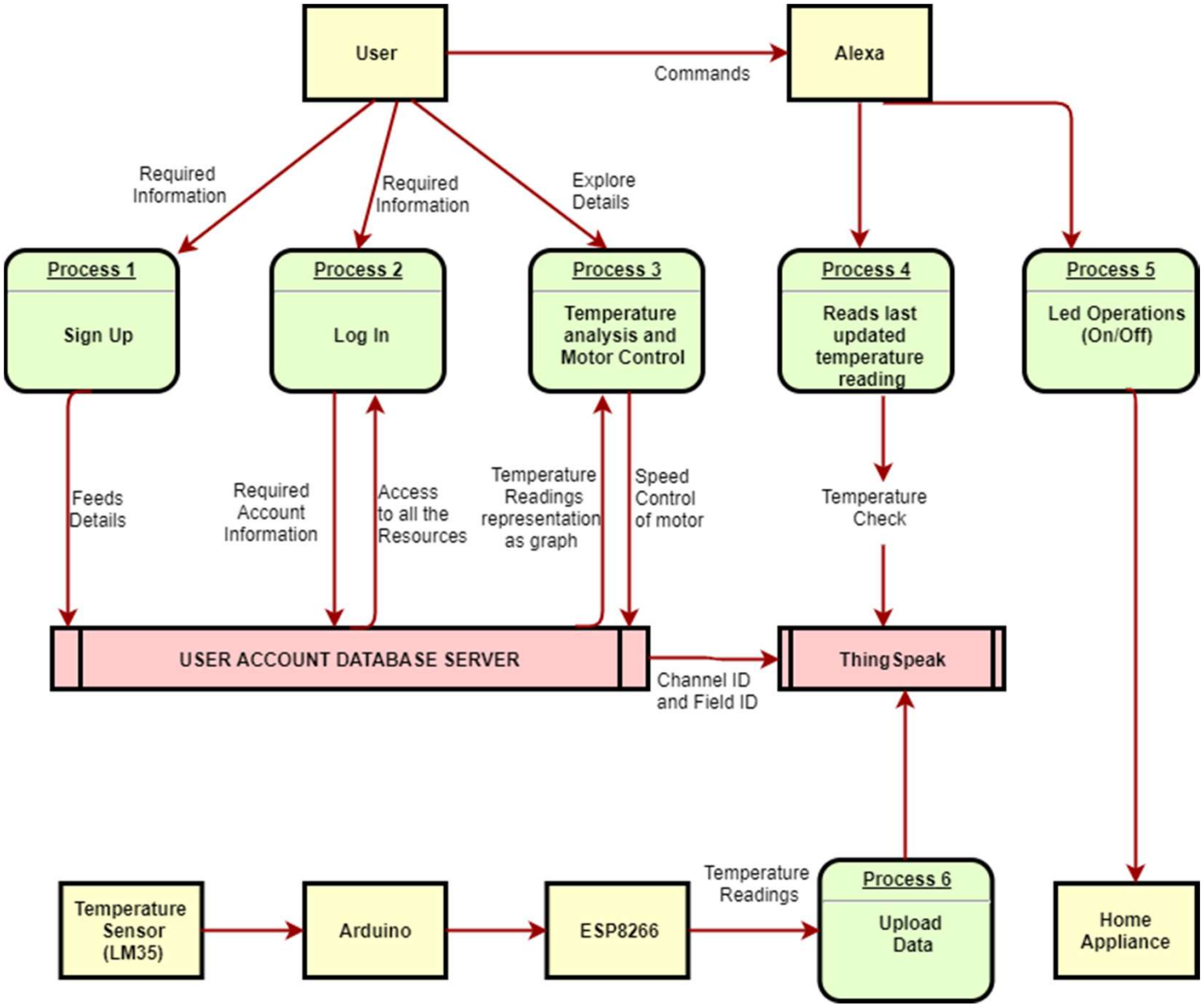
- PHP (Hypertext Pre-processor)
- HTML (Hypertext Mark-up Language)
- JavaScript
- jQuery
- MySQL

ALEXA SKILL

ALEXA is Amazon’s voice-first based AI interaction module.

Developed Skill ‘ThermoCheck’

Responds with the last recorded temperature.


User
Commands
Alexa
Required Information
Required Information
Explore Details
Process 1
Sign Up
Process 2
Log In
Process 3
Temperature analysis and Motor Control
Process 4
Reads last updated temperature reading
Process 5
Led Operations (On/Off)
Feeds Details
Required Account Information
Access to all the Resources
Temperature Readings representation as graph
Speed Control of motor
Temperature Check
USER ACCOUNT DATABASE SERVER
Channel ID and Field ID
ThingSpeak
Temperature Sensor (LM35)
Arduino
ESP8266
Temperature Readings
Process 6
Upload Data
Home Appliance

FURTHER SCPOE

- Use of JSON and MQTT to provide advanced connectivity and control through web.
- Build an advanced dashboard.
- Extensive use through ALEXA.
- Auto configuration of devices.
- Use of newer ESP8266 based modules which provide I2C, ADC, SPI, PWM features.
- Improving Quality of Service.

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THANK YOU