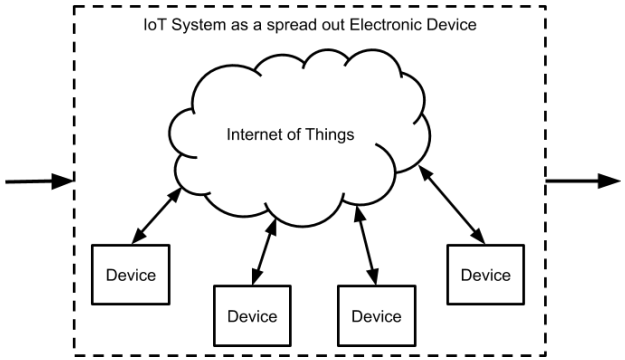
Comunicare

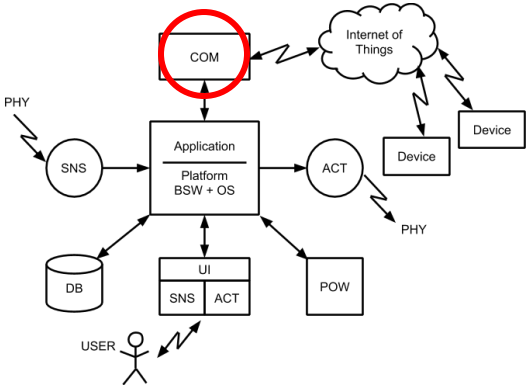
Andrei Bragarenco

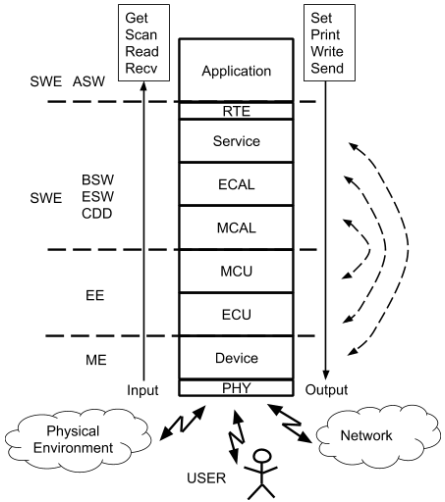
Comunicare

Schimb de informație între interlocutori

- Notiune de comunicare
- Mediu de transmise
- Topologie retea
- Protocol fizic
- Protocol logic
- Internet/Clouding







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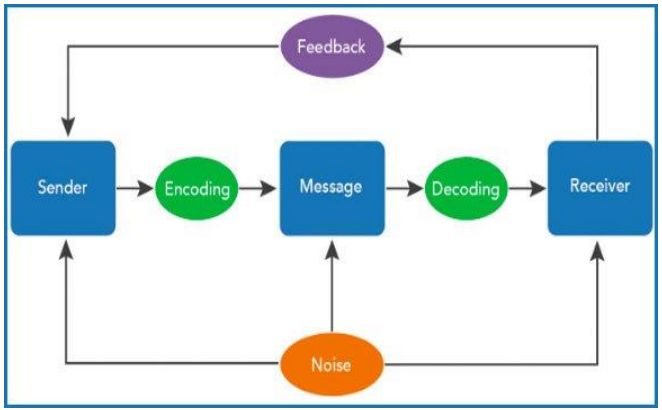
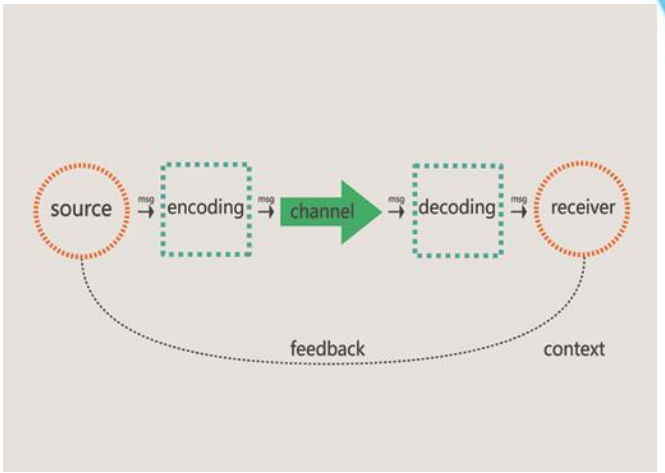
Notiune de comunicare

Schimb de informație între interlocutori

- Mesaj
- Emițător
- Codare
- Canal
- Decodare
- Receptor
- Raspuns
- Zgomot



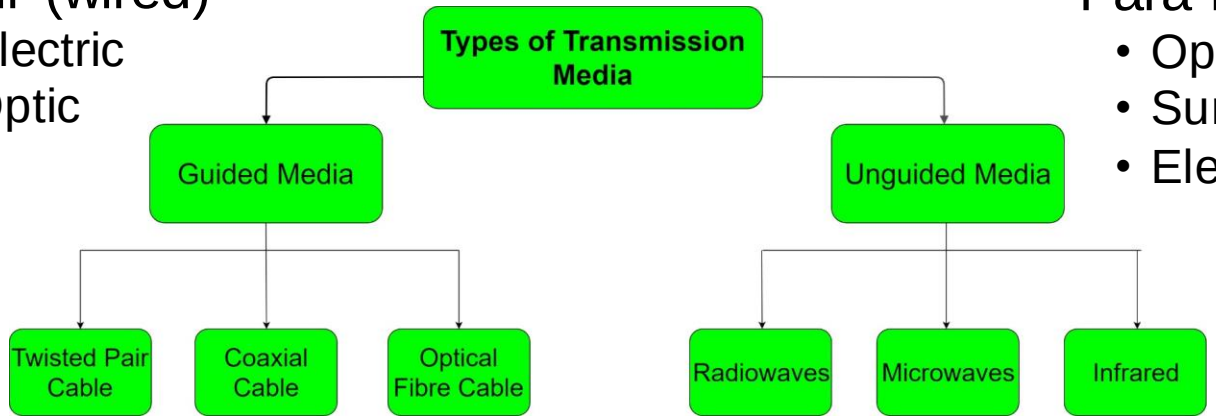
https://learntechit.com/the-process-of-communication/



https://www.open.edu/openlearn/ocw/mod/oucontent/view.php?id=87012&section=4

Mediu de comunicare

- Cu fir (wired)
  - Electric
  - Optic



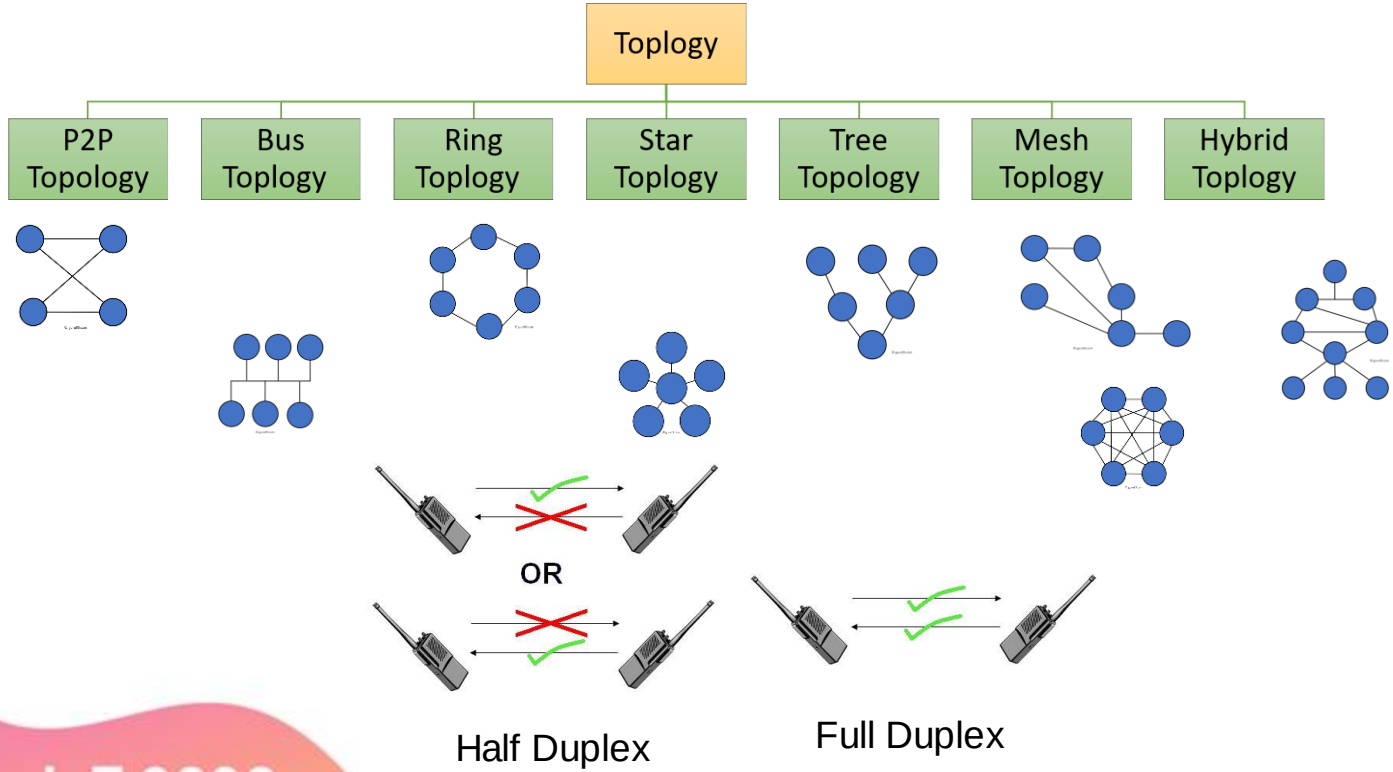
- Fara fir (wireless)
  - Optic
  - Sunet
  - Electromagnetic

https://www.geeksforgeeks.org/types-transmission-media/

https://en.wikipedia.org/wiki/List_of_interface_bit_rates

https://www.electronicdesign.com/technologies/communications/article/21800967/serial-io-interfaces-dominate-data-communications

Topologie Rețea

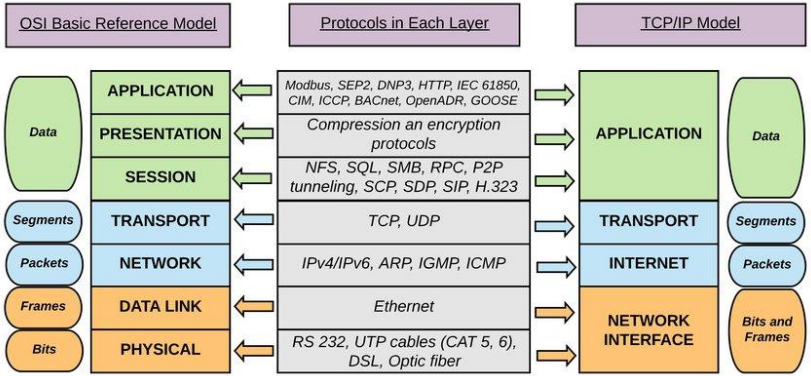


https://en.wikipedia.org/wiki/Duplex_(telecommunications)

https://www.guru99.com/type-of-network-topology.html

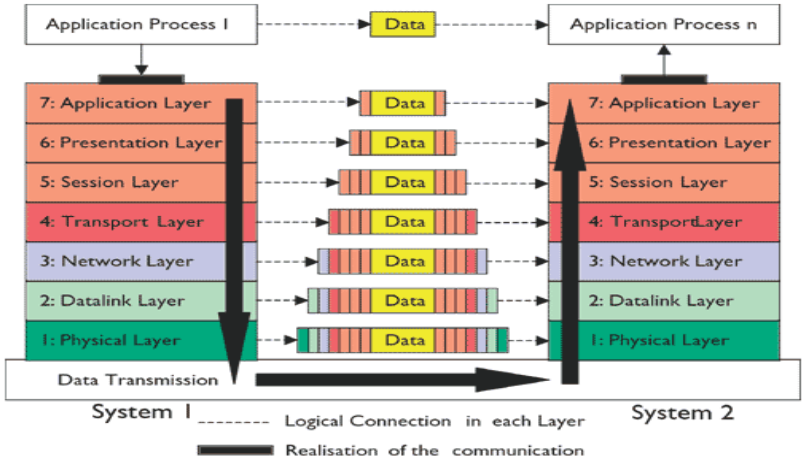
Protocol de comunicare

Un set de reguli agrea intre interlocutori pentru a asigura transmiterea sigura a informatiei



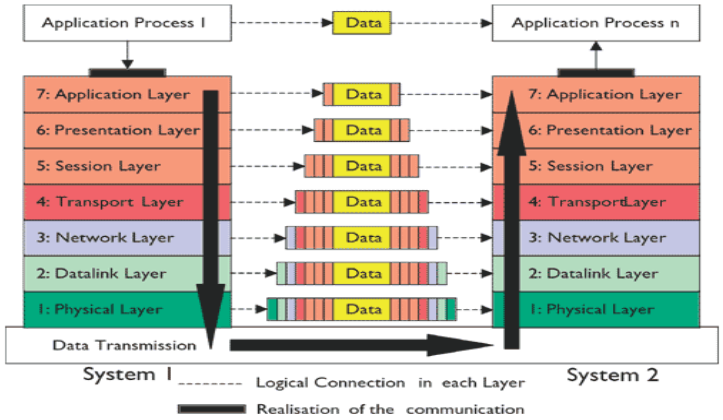
- Protocoale fizice
- Protocoale logice

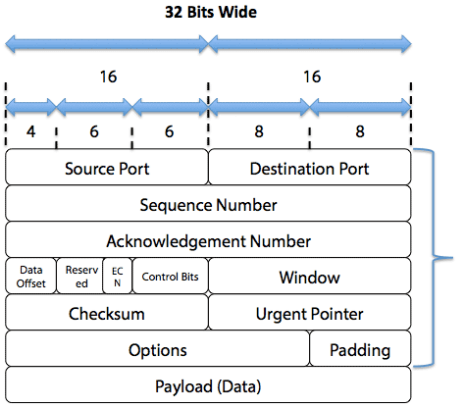
Mesaj - structura de date impachetată conform protocolului specific de comunicare



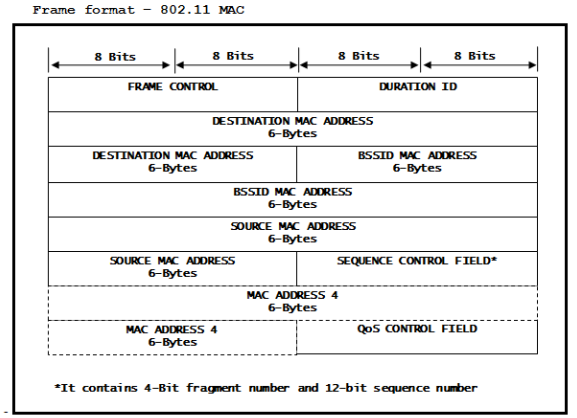
https://iebmedia.com/index.php?id=4582&parentid=63&themeid=255&showdetail=true

Protocoale Logice





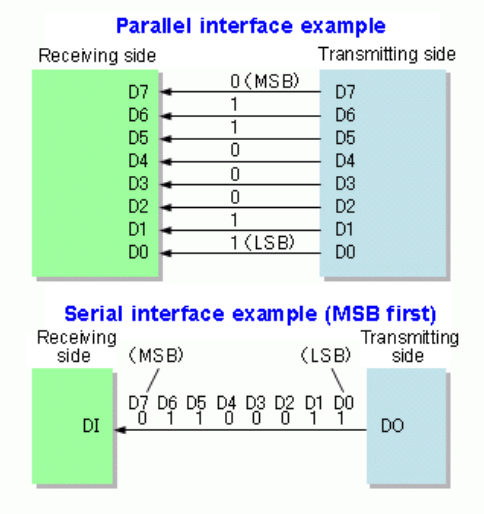
4-bit	8-bit	16-bit	32-bit
Ver.	Header Length	Type of Service	Total Length
Identification		Flags	Offset
Time To Live	Protocol	Checksum	
Source Address			
Destination Address			
Options and Padding			



https://jialinwu.com/post/ip-network-stack-writing-network-apps/

http://tefnutsecure.blogspot.com/2014/03/ip-address-ipv4-header.html

Protocoale Fizice – Serial vs Paralel



ARINC 818 Avionics Digital Video Bus

Atari SIO (Joe Decuir credits his work on Atari SIO as the basis of USB)

Binary Synchronous Communications BSC - Binary Synchronous Communications

CAN Control Area Network Vehicle Bus

ccTalk Used in the money transaction and point-of-sale industry

CoaXPress industrial camera protocol over Coax

DMX512 control of theatrical lighting

Ethernet

Fibre Channel (high-speed, for connecting computers to mass storage devices)

FireWire

HyperTransport

InfiniBand (very high speed, broadly comparable in scope to PCI)

I²C multidrop serial bus

MIDI control of electronic musical instruments

MIL-STD-1553A/B

Morse code telegraphy

PCI Express

Profibus

RS-232 (low-speed, implemented by serial ports)

RS-422 multidrop serial bus

RS-423

RS-485 multidrop multimaster serial bus

SDI-12 industrial sensor protocol

Serial ATA

Serial Attached SCSI

SONET and SDH (high speed telecommunication over optical fibers)

SpaceWire Spacecraft communication network

SPI

T-1, E-1 and variants (high speed telecommunication over copper pairs)

Universal Serial Bus (for connecting peripherals to computers)

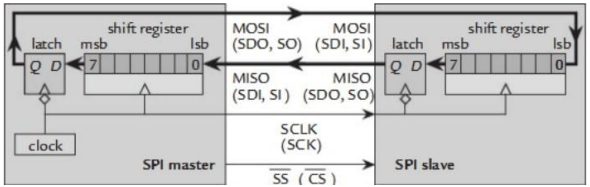
UNI/O multidrop serial bus

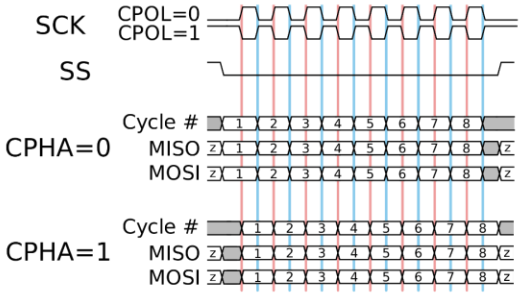
1-Wire multidrop serial bus

https://en.wikipedia.org/wiki/Serial_communication https://en.wikipedia.org/wiki/Parallel_communication

https://en.wikipedia.org/wiki/Wireless_network

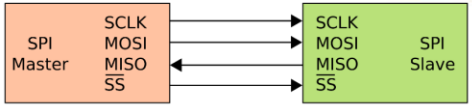
Protocoale Fizice - SPI



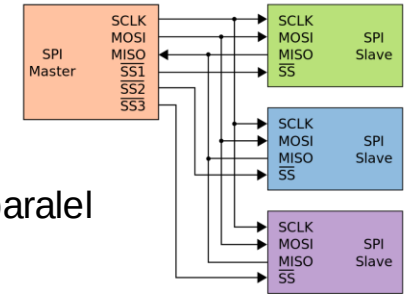


https://microcontrollerslab.com/introduction-to-spi-communication-protocol/

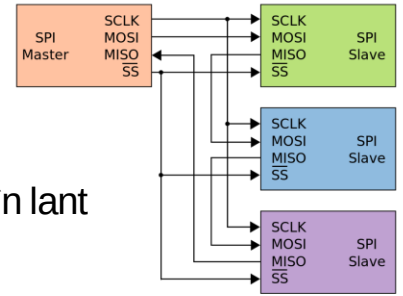
Peer to peer



paralel

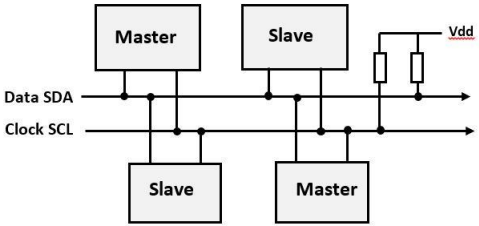


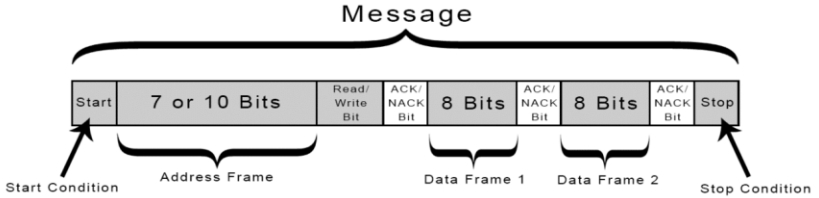
Serial în lant

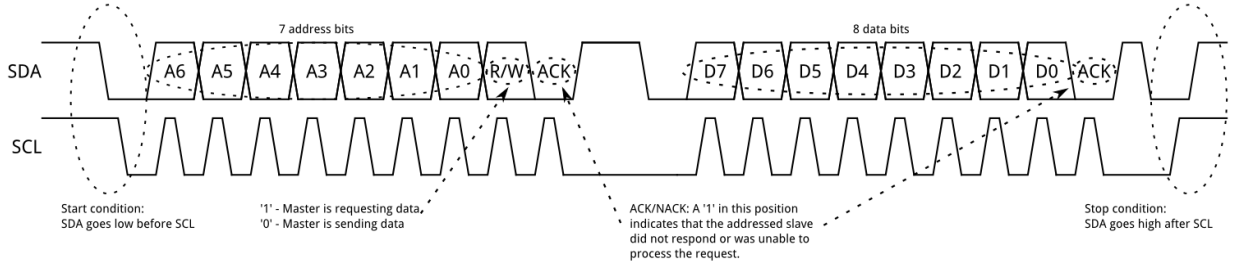


https://en.wikipedia.org/wiki/Serial_Peripheral_Interface

Protocoale fizice - I2C





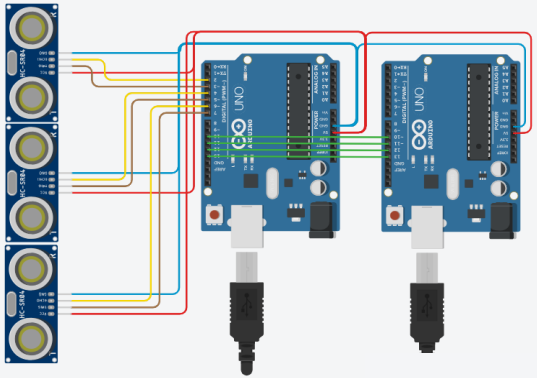


- https://www.slideshare.net/shudhanshu29/i2c-protocol-94259889
- https://www.slideshare.net/komalmehna/38-i2-c-protocol-spi-protocol

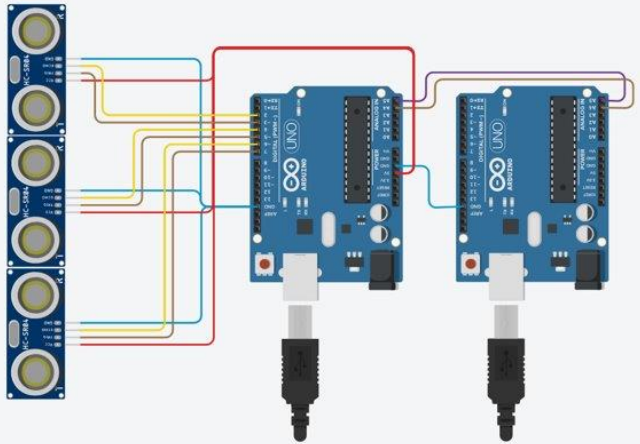
https://learn.sparkfun.com/tutorials/i2c/all

Protocol Fizic - Digital Ultrasonic Sensor HCS-04

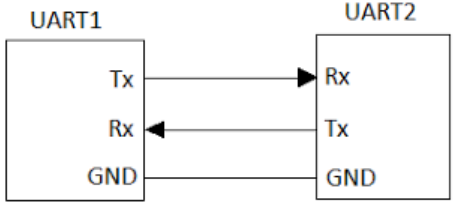
SPI

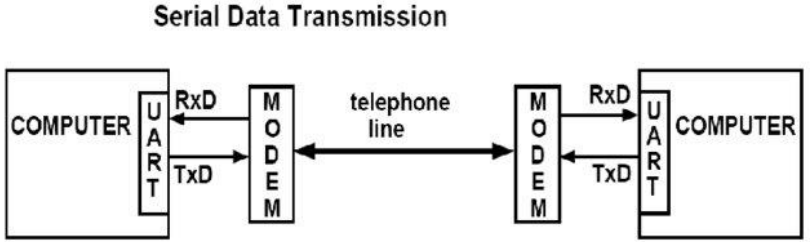


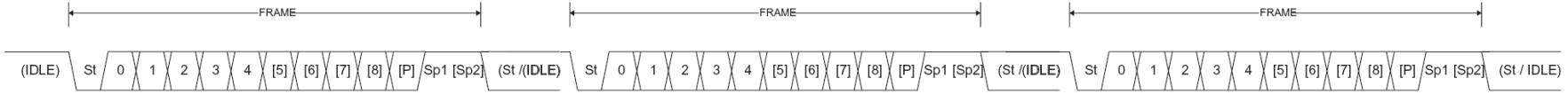
I2C



Protocoale Fizice - USART





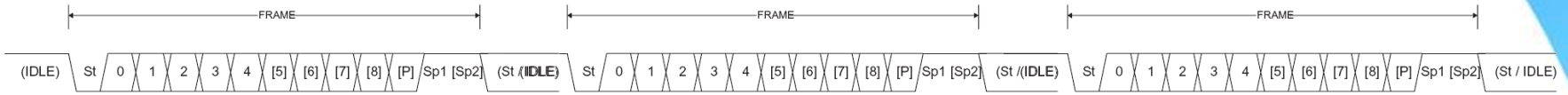


UART protocol

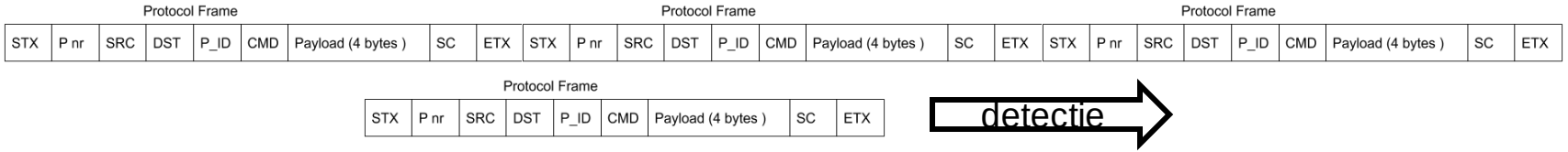
1. Idle – ”1”
2. Start bit – ”0”
3. Data – 5-9 bits
4. Parity
5. Stop bit – ”1” ; 1, 1.5, 2 bits

USART – Protocol Implementare

Protocol fizic



Protocol Logic



- Stx – 0x02
- Etx - 0x03
- Pnr – contorizare pachete
- SRC – ID emitator
- DST – ID receptor
- P_ID – tipul pachetului
- CMD – comada
- Payload – date pachet
- SC – suma de control

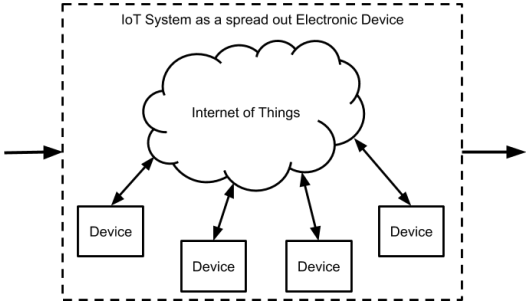
Emitere

1. Selectie Date
2. Impachetare
3. Creare SC
4. Trimitere

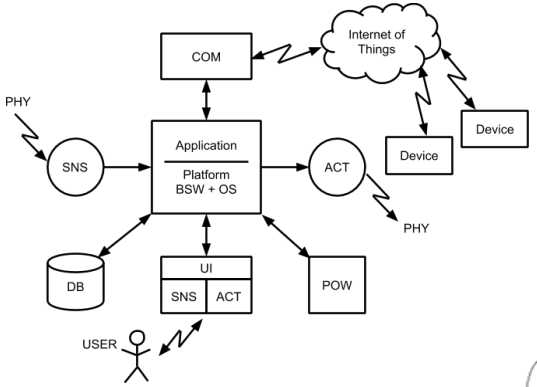
Receptie

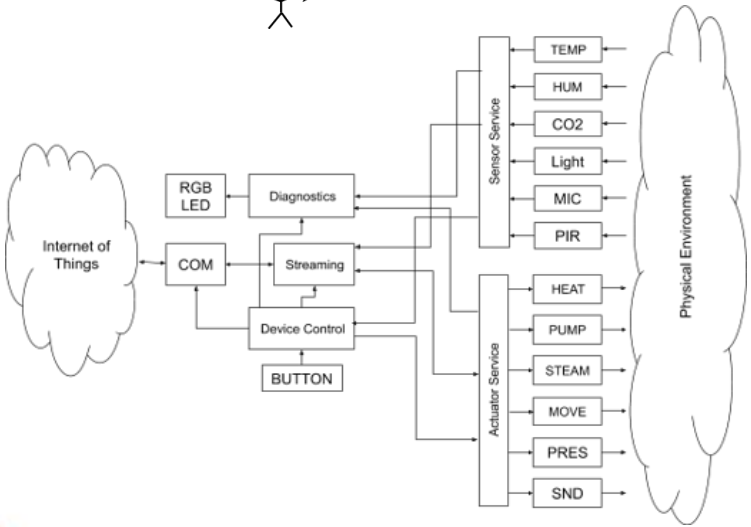
1. Colectare byte
2. Buferizare
3. Verificare
4. Interpretare Date

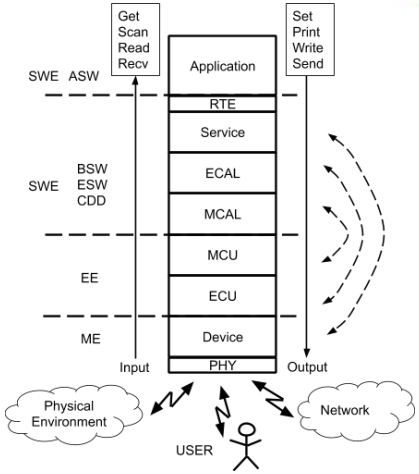
IoT Interactiuni



Device - Network

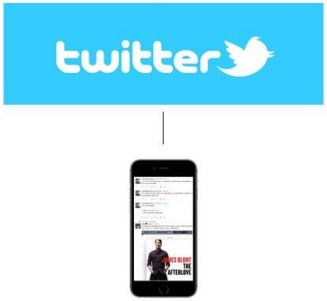




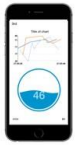


Device - Periferii

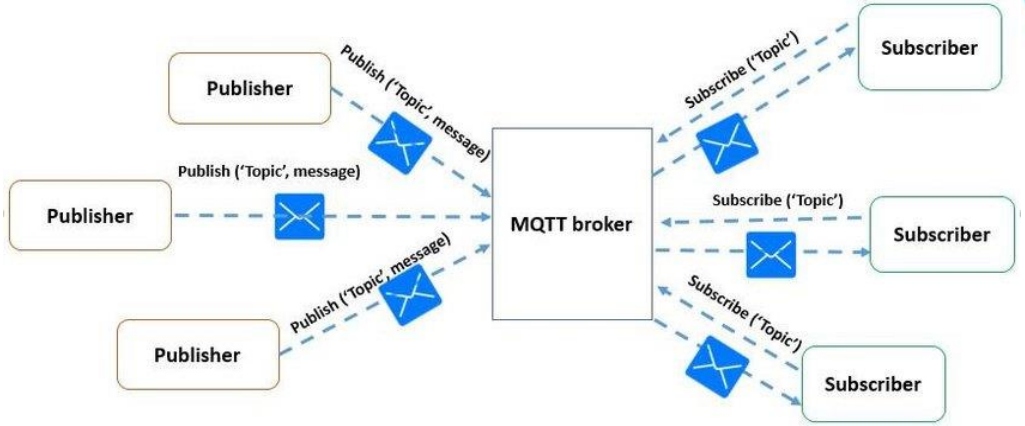
IoT via MQTT



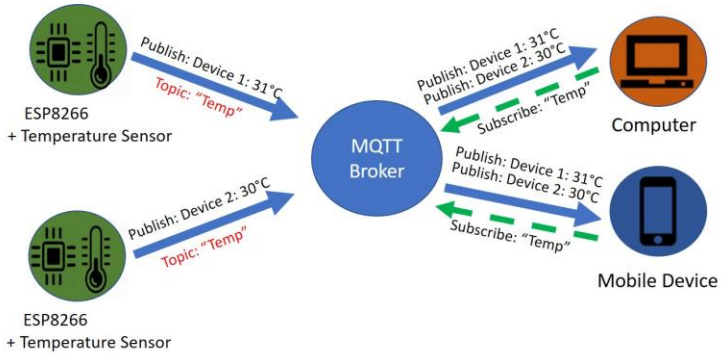
Timeline full of savage comeback tweets



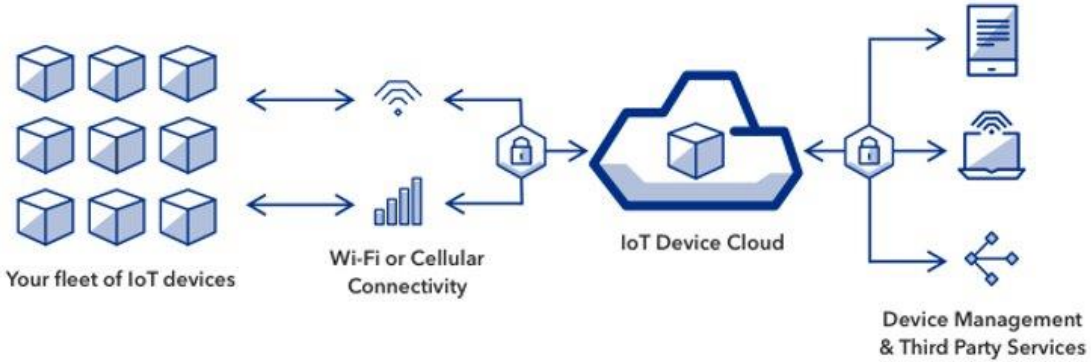
Dashboard full of information



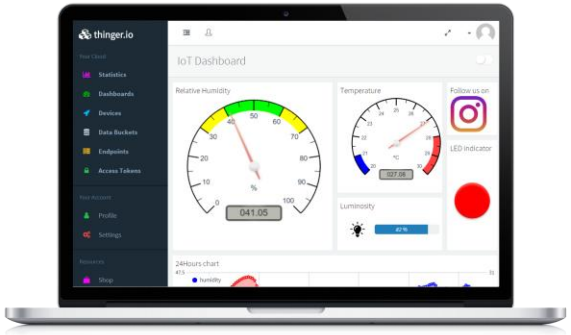
IoT via MQTT

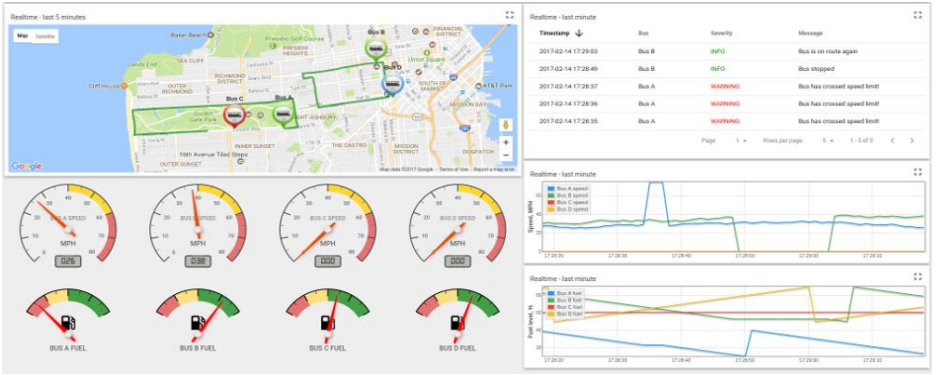

Publish: Device 1: 31°C
Topic: "Temp"
ESP8266
+ Temperature Sensor
Publish: Device 2: 30°C
Topic: "Temp"
ESP8266
+ Temperature Sensor
MQTT
Broker
Publish: Device 1: 31°C
Publish: Device 2: 30°C
Subscribe: "Temp"
Computer
Publish: Device 1: 31°C
Publish: Device 2: 30°C
Subscribe: "Temp"
Mobile Device

Hass.io - 1.204
Little Shoal Bay
Onewa Rd
Office Temp
26.4°C
Plant Temperature
27.0°C
Plant Moisture
12%
Pool Temperature
22.69°C
Floodlight
Add a button to MQTT Dashboard
in less than 5 minutes


Your fleet of IoT devices
Wi-Fi or Cellular
Connectivity
IoT Device Cloud
Device Management
& Third Party Services

MQTT – Monitorizare (dashboard)





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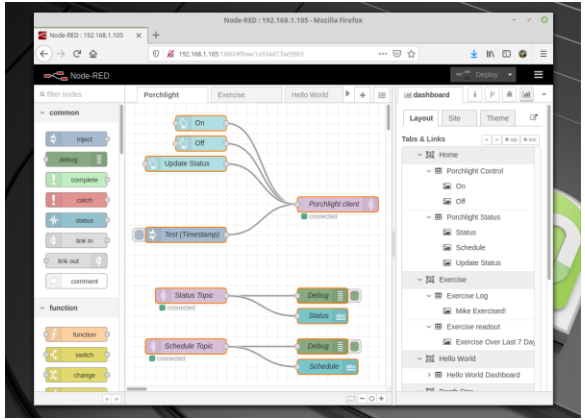
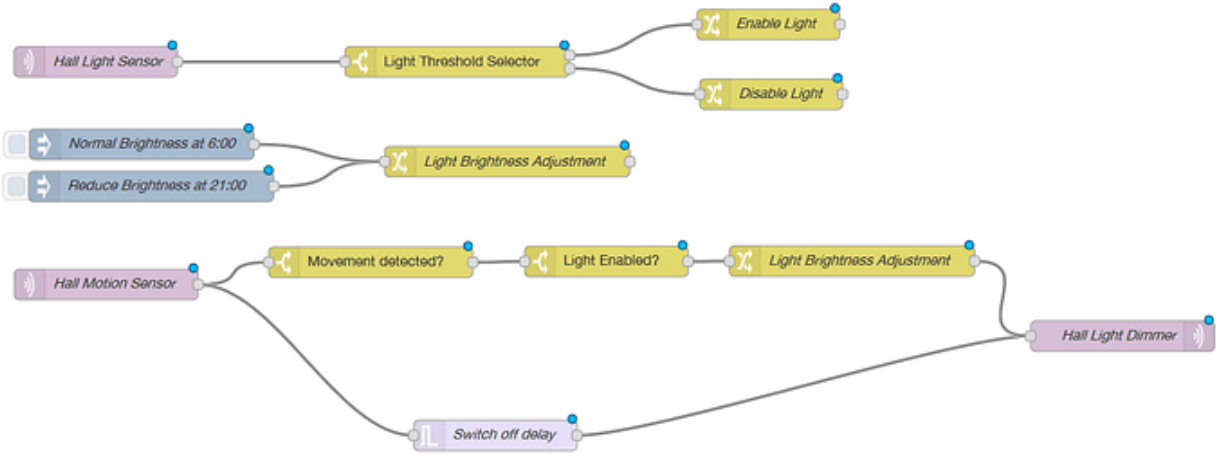
MQTT – Control (rule engine)





Mulțumesc pentru atentie

Întrebari?

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