IoT Workshop

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What is IoT

What is IoT

- Not "a computer connected to the internet"
  - Then it is really just another computer connected to the internet
- Must be something else
  - It is simply devices that are resource constrained
    - Usually in more than one way
- Autonomous operation, the connection might not be permanent

IoT is just a concept

- *The Internet of Things (IoT) is the network of physical devices, vehicles, home appliances and other items embedded with electronics, software, sensors, actuators, and connectivity which enables these objects to connect and exchange data.*[1]

What differentiates a computer from an IoT device?

- Constrained in (one or more of):
  - Memory
  - CPU
  - Network bandwidth and/or latency
  - Storage

[1] Wikipedia "Internet of Things"

Going back to basics

What is the internet again?

OSI model

1. Physical Layer
2. Data Link Layer
3. Network Layer
4. Transport Layer
5. Session Layer
6. Presentation Layer
7. Application Layer

- Wikipedia: OSI model
- Wikipedia: OSI model#Examples

Følges ikke veldig slavisk

Layer 1: Physical Layer

- 10BASE5, 10BASE2
- 10BASE-T / 100BASE-TX / 1000BASE-TX
- 802.11a/b/g/n PHY
- RS-232

Huber og switcher (som gjør en slags routing) er ikke en av disse lagene. Mere en implementasjonsdetalj. RS-232 sin signallering brukes i *alle* MCUer, mange har flere porter tilgjengelige. Kun signallering, ikke spenningsnivåer. Mange støtter veldig høye datarater (>= 1Mbit/s)

Layer 2: Data Link Layer

- Ethernet
- WiFi
- Bluetooth
- Token Ring

Layer 3: Network Layer

- IP
- ICMP
- IPX

Layer 4: Transport Layer

- TCP
- UDP

Layer 5: Session Layer

- “sockets”
- NetBIOS

Layer 6: Presentation Layer

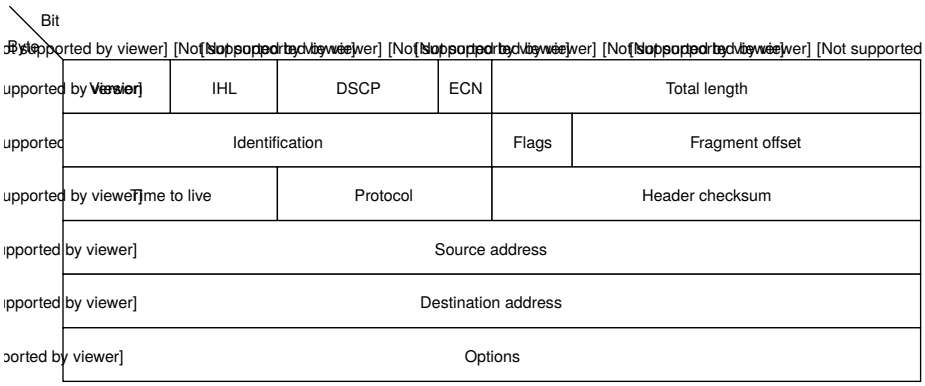
- SSL

This layer is not really much used in the IP stack

Layer 7: Application Layer

- HTTP
- MQTT
- DNS
- (everything else..)

Details: IP



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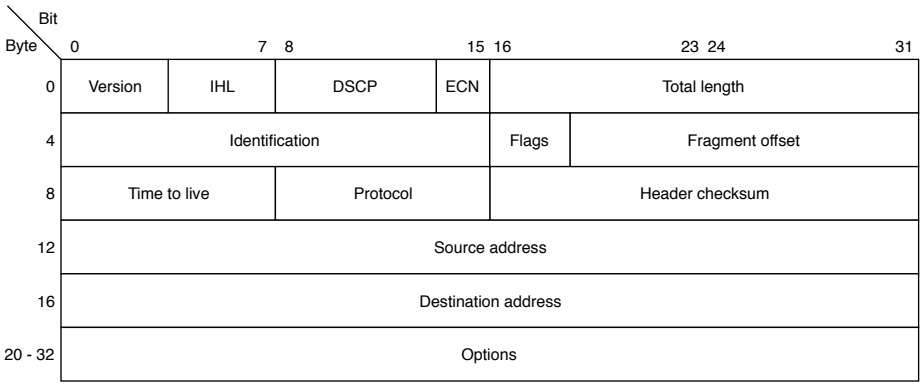

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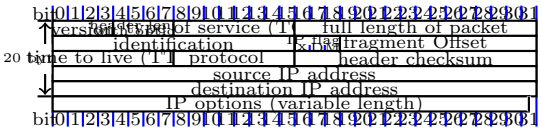

Notes

Assignments

- Measure round trip time/latency. Measure UDP, TCP. Measure when the packet size is greater than the MTU