Software Technology of Internet of Things

To Infinity and Beyond!

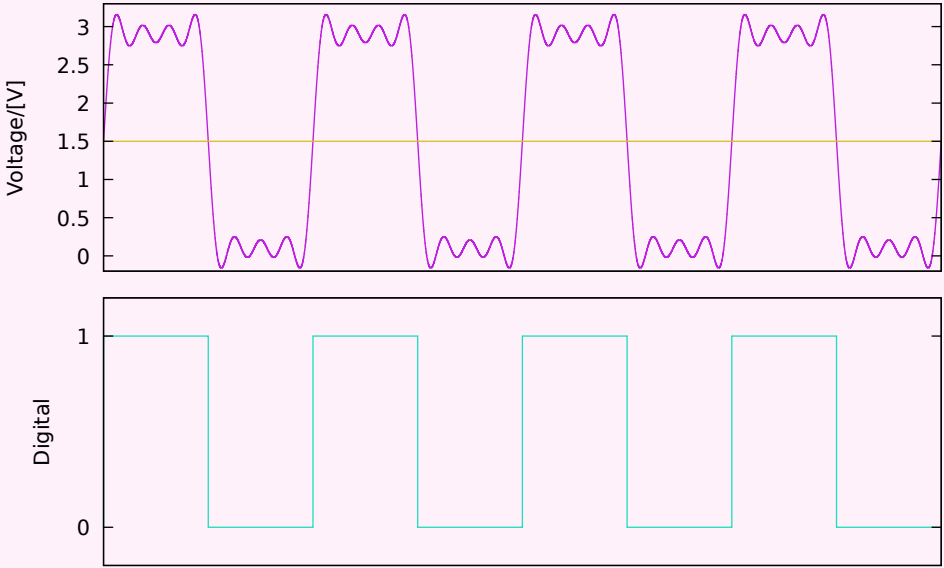
Aslak Johansen asjo@mmmi.sdu.dk

May 6, 2024

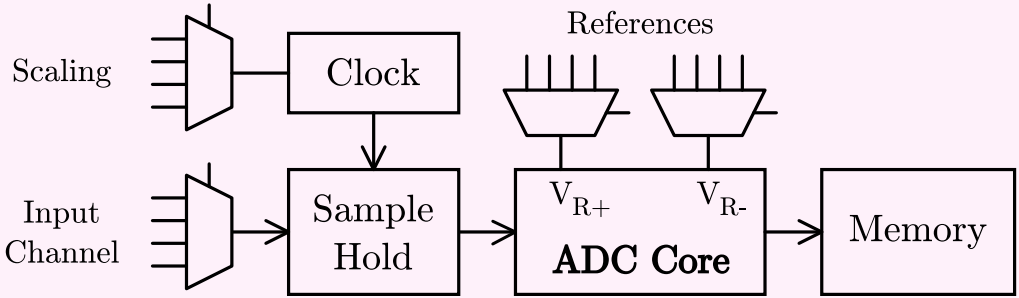
SDU

Part 1:
Summary

Digital Is the New Analog



Analog to Digital Converter

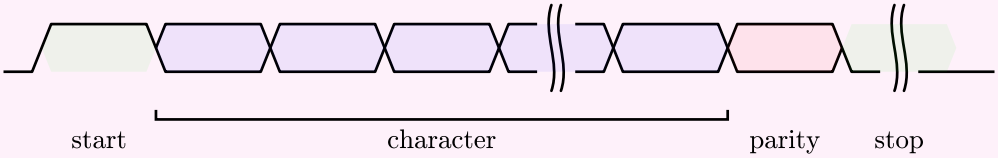


General Data Collection Pipeline

RS232 Frame Format

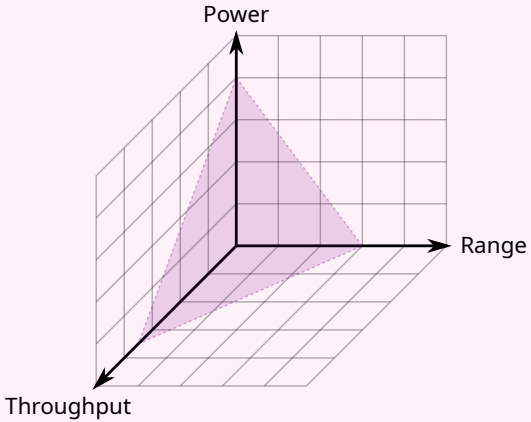
Contents of the RS232 frame:

- 1 start bit
- a *character* spanning 7-8 bits (we will focus on the full byte)
- an (optional) parity bit wich may follow one of a number of standards
- a number of stopbits (usually 1-3)



Performance Space

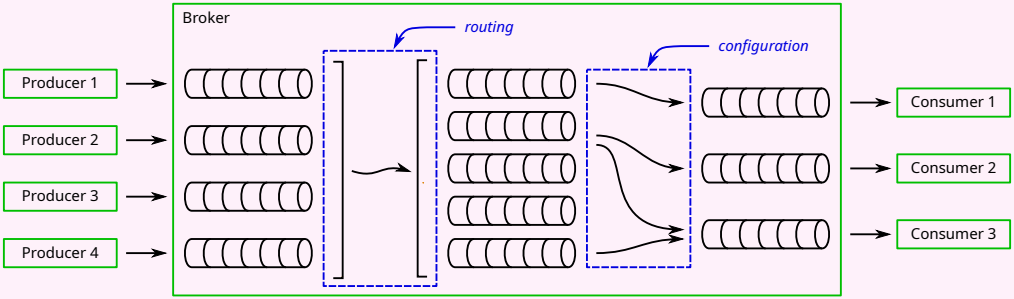
- Three-way tradeoff.
- An improvement along one dimension will result in a penalty along the others.
- True Technological breakthroughs rarely happen.
- There are a few ways to get around this tradeoff.



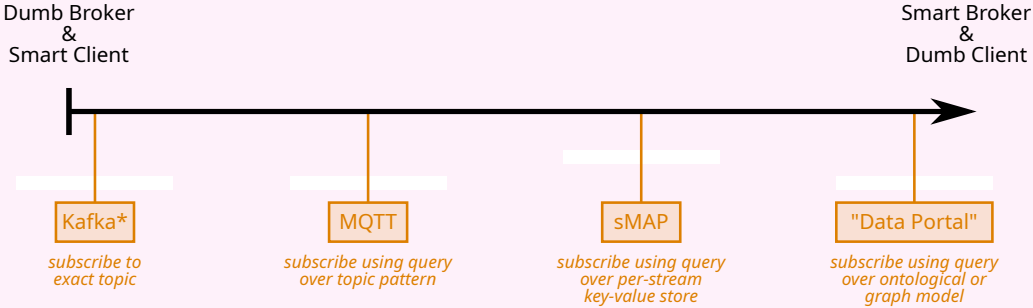
OSI Model

Level 10 **Government**	*"legislation"*	Rules for organizations and compliance
Level 9 **Organization**	*"guideline"*	Organizational framework
Level 8 **Individual**	*"correspondance"*	Application user
Level 7 **Application**	*data*	APIs
Level 6 **Presentation**	*data*	Convenient translations (e.g., encryption and coding)
Level 5 **Session**	*data*	Session management of connections
Level 4 **Transport**	*segment / datagram*	Connection-orientation, multiplexing and flow control
Level 3 **Network**	*packet*	Multi-node and routing
Level 2 **Data Link**	*frame*	Reliable* delivery of frame to local named receiver
Level 1 **Physical**	*bit (or symbol)*	Electrical, audio or radio link

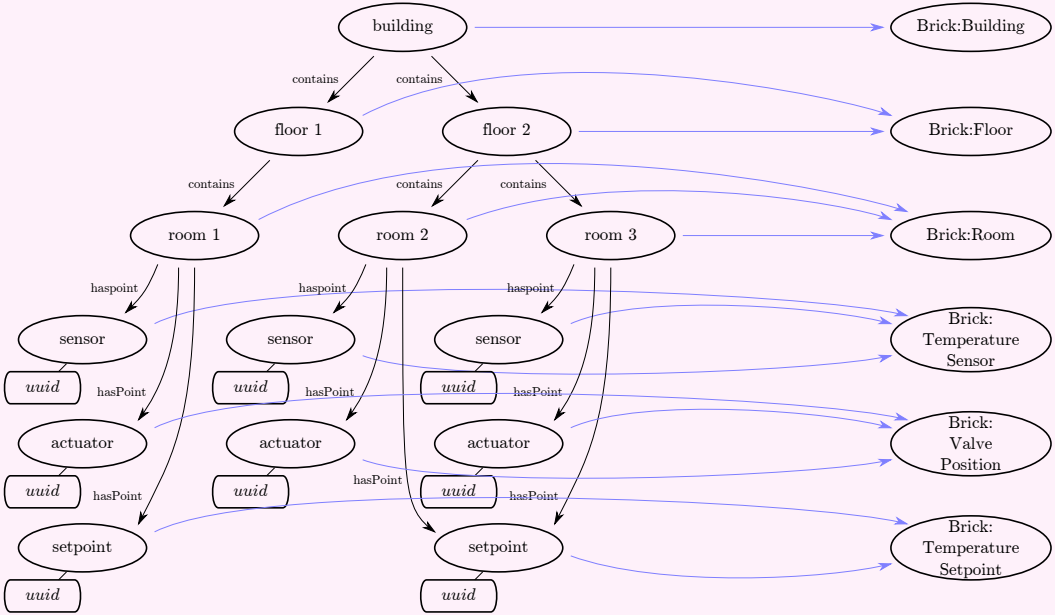
Publish Subscribe



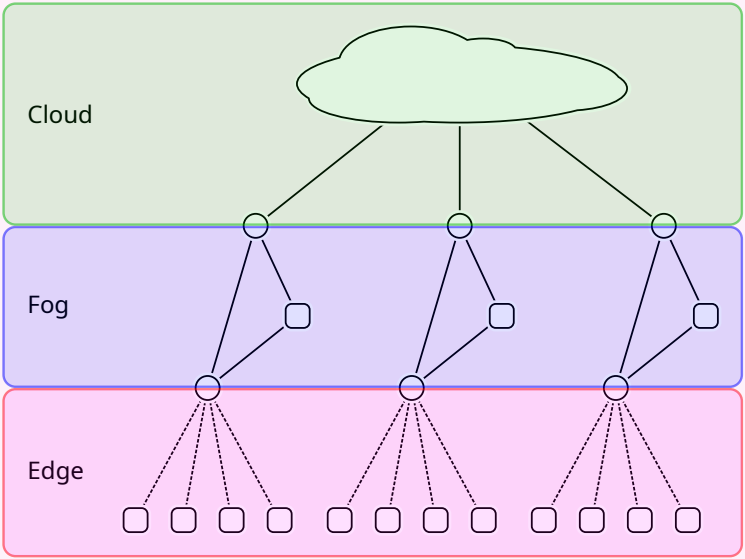
Publish Subscribe ▷ Smart and Dumb Components

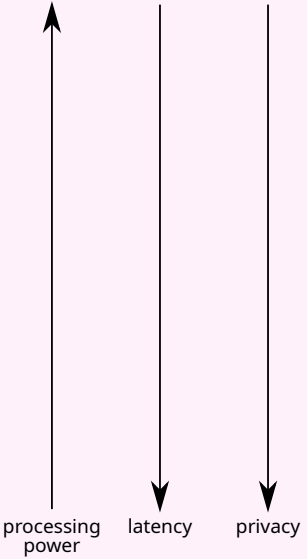


Information Models

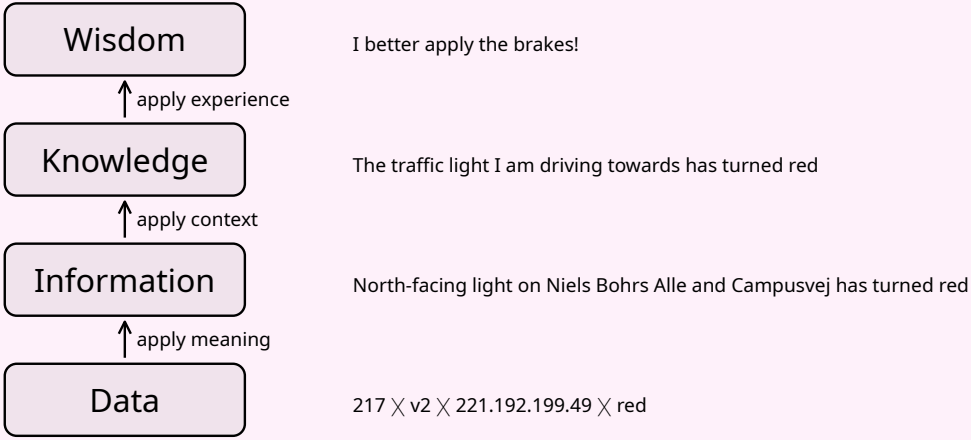


Cloud, Fog, Edge and Mist

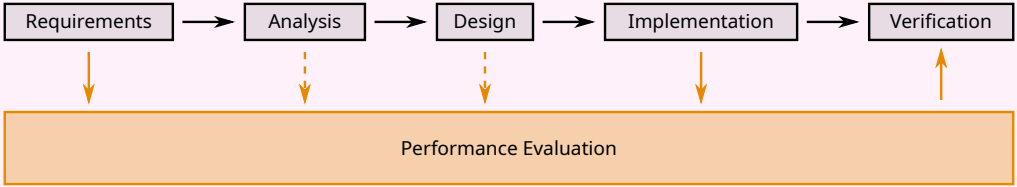




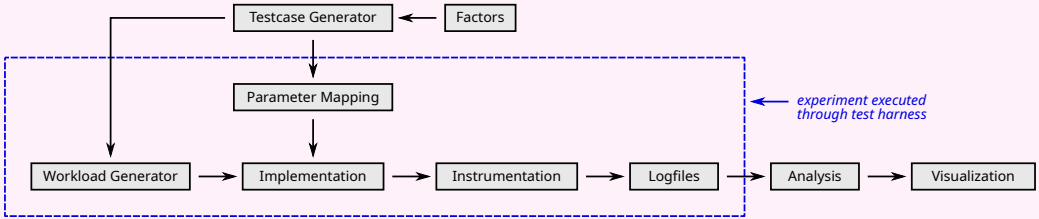
Enriching Data to Wisdom



Performance Evaluation



Performance Evaluation ▷ Methodology



Part 2:
Exam

Date and Duration

Date:

- ***Exam*** June 12th
- ***Reexam*** August 29th

Duration:

MCQ	Text
40 min	2 hours 20 min

MCQ Part

No aids allowed!

Question formats:

- ***Multiple choice*** Pick one out of a number of possible answers.
- ***Multiple answer*** Pick a subset of a number of possible answers.
- ***Text*** Write up to a few lines of text.

Typical types of questions:

- Definitions
- Questions that leads to categorical answers
- Explain a concept (briefly)

Administered through `https://digitaleksamen.sdu.dk`.

Written Part

Restricted aids allowed.

Question formats:

- ***Text*** Free text format.

Typical types of questions:

- Demonstrate knowledge of an area by explaining some intricacy of it.
- Explain (in high-level terms) how code you wrote in one of the exercises worked.
- Detail some tradeoff, and the implications of how that tradeoff is resolved.
- Explain how some concept works.

Upload as PDF through `https://digitaleksamen.sdu.dk`.

Written Part ▷ Aids

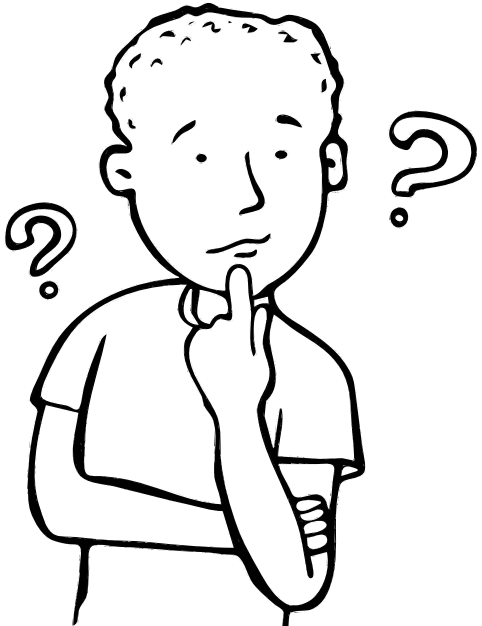
Allowed aids include:

- Any material in PDF form hosted to the course page on itslearning.
- Any scientific article (in PDF form) linked from the course page on itslearning.
- Any part of the course page on itslearning (or on the discord) in PDF form.
- The student-driven presentation in PowerPoint and/or PDF form (where you convert yourself).
- Any code that you develop during the course and any code that was part of the esp-idf git repository. However, all of this code has to be in PDF form. So, print to PDF beforehand.
- Any notes you may have taken in PDF form. Again, you may want to print to PDF. Something to display PDF and PowerPoint files (that does not conflict with the disallowed aids).

Aids that are not allowed:

- Anything with built-in generative AI.
- Any other program besides (i) something to find and display PDF and PowerPoint files, (ii) a browser for taking this test, and (iii) something to produce the PDF file. No browser windows (or tabs) not pointed to the web page of this test will be allowed.

Questions?



https://openclipart.org/detail/238087/boy-thinking-of-question