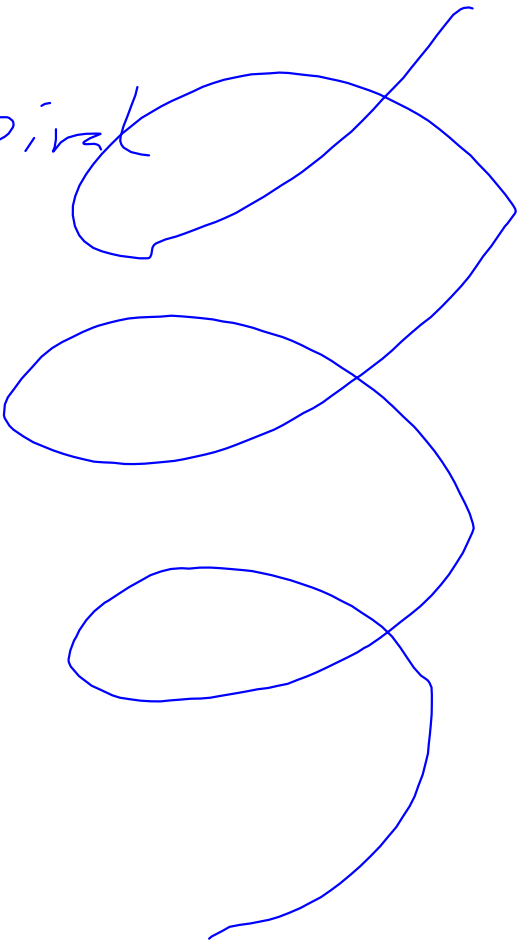


Final Exam 60%

New date(?)
2 Jun 2016

- Present Group Work
- Questions to The Group work
- "Random learning outcomes"

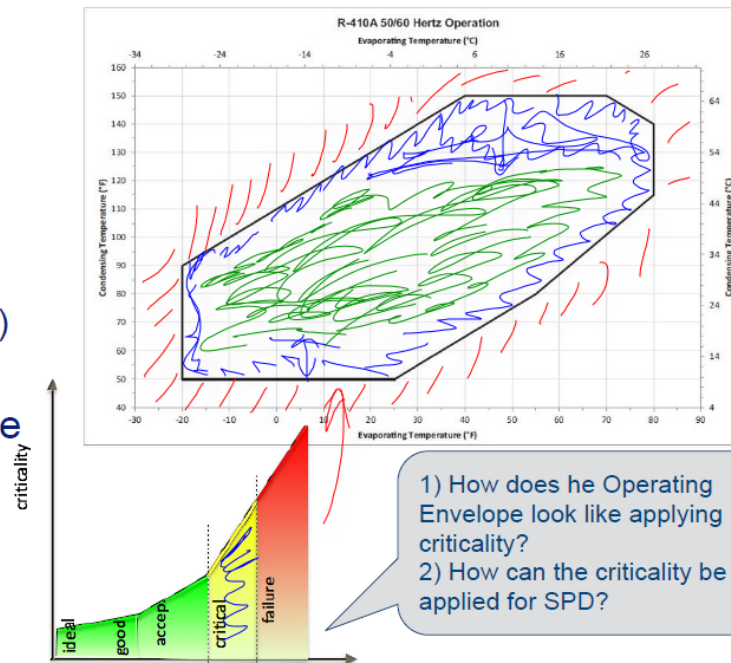
Security spiral



Recap: Conversion and operating envelope



- Operating envelope: the operational parameters where our network can work “well”, depends on the technology and on the task
- For traffic estimation we need it in “communication” QoS
 - ➔ Bandwidth, delay, jitter, (redundancy)
- Often can be done with simple arithmetic with a certain confidence level



Examples of Security challenges in the IoT



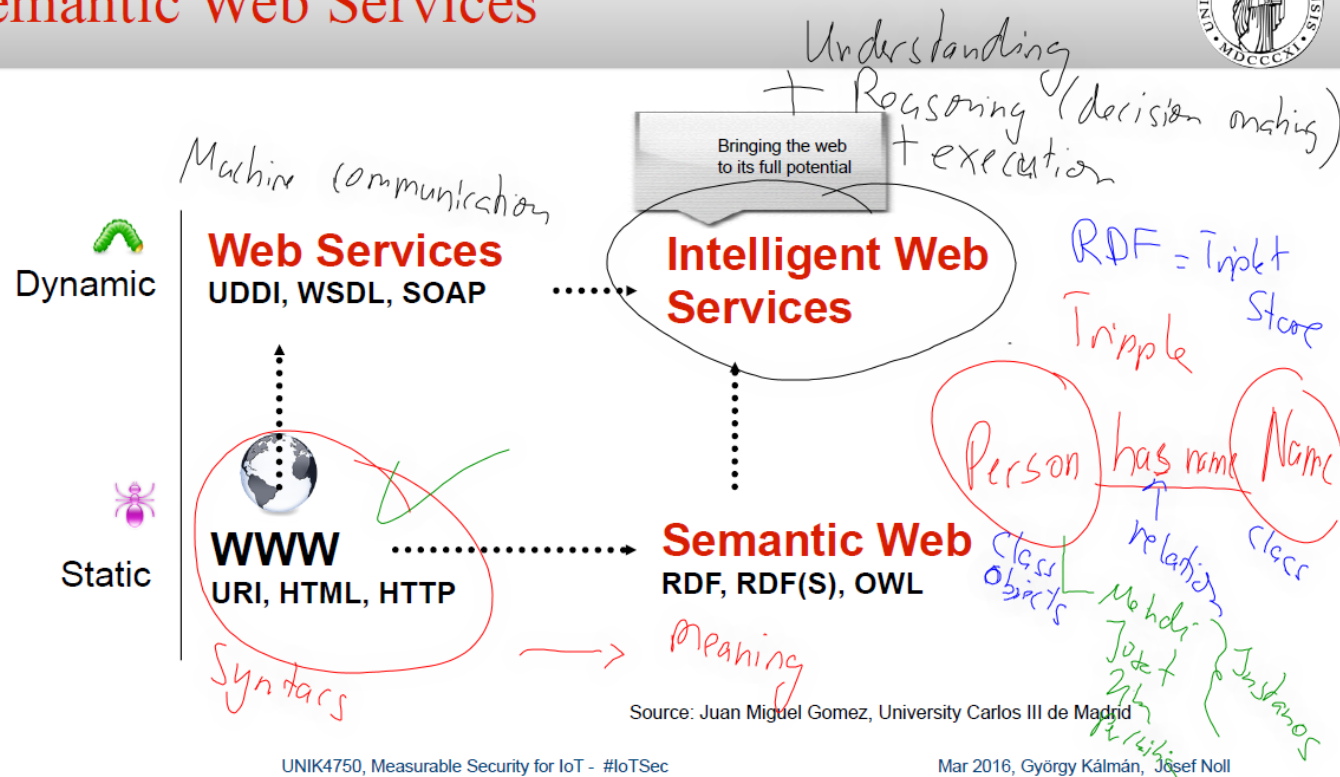
- **System:** Intrusion awareness, fault-tolerance, data redundancy and diversity
- **Platform:** Auto start up on power failure, Auto reconfigurable on software failure, Auto synchronization on software failure, End-to-end secure communication, Mal-user detection, Access control for accessing sensor data
- **Middleware:** SPD Audit, Cryptographic Support, Identification and Authentication, Protection of the SPD functionalities, Security Management
- **Hardware:** SPD metrics, Self-recovery from hardware transient faults (through fault-injection), Auto-reconfiguration, Data encryption, Provision of security and privacy services, data encryption/decryption
- **Radio:** Threats tolerant transmission

System components classified after objective

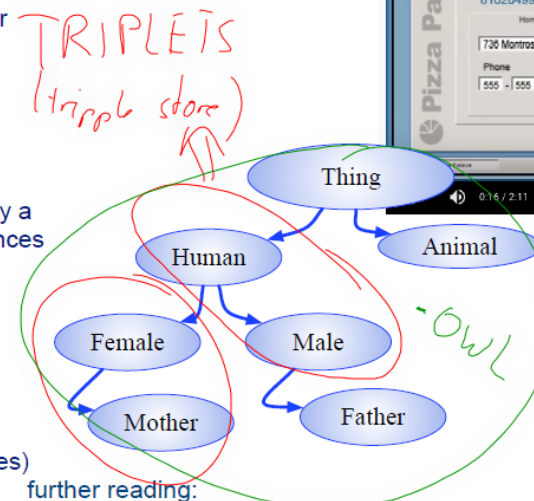
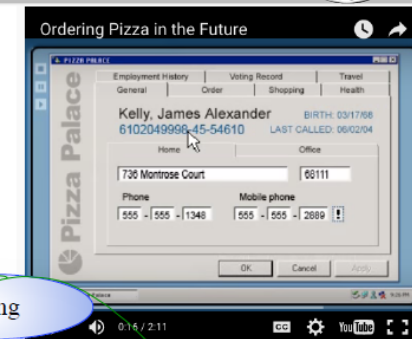


- Functional components
 - ➔ input component (sensors, keyboard, mouse,...)
 - ➔ output component (alarm, screen, actuator,...)
 - ➔ processing component
 - ➔ Storing component (data base, files,)
 - ➔ Connection (wireless connection, wired connection)
- Security, Privacy, Dependability (SPD) components:
 - ➔ Encryption: Encryption algorithm, keys,...
 - ➔ Protocols
 - ➔ Authentication(mechanism (fingerprint, password, password complexity,.....) .
 - ➔ Authorization (~~privileges, ..~~) → *functionality & component (door lock)*
- Management components (OS, Web server, data server)
- Human component (admin, user, ..).
- Physical component, car being a component in a car factory. (if treated as “sub-system)

Semantic Web Services



- [Source: Wikipedia]



further reading:

<http://www.slideshare.net/SergeLinckels/semantic-web-ontologies>

You can view and copy the source code

```
{{User  
|Prenome=Bjørnar  
|Name=Dragnes  
|Email=bjdragnes@mil.no  
|Partner=MIL,  
}}
```

Semantics
Info user

Semantics about Project

```
|Title=Ka-Band Radio Characterisation for Satellite Services in Arctic and High Latitude Regions  
|Project leader=Terje Tjelta  
|Project Participant=Bjørn Andersen, Bjørnar Dragnes, Herman Hansen, Jan Erik Håkegård, Jan Hetland, Jos  
Rytir, Michael Cheffena, Michal Ciecko, Per Arne Grotthing, Terje Medby, Terje Mikal Mjelde, Trond Henning  
|StartDate=2012/05/15
```

Reason who is project participant from Partner MIL

```
{{#ask: [[-Project Participant.Project::SAT]] [[Partner::MIL]] |intro=Project members of NDLO: &#10; }}
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Result

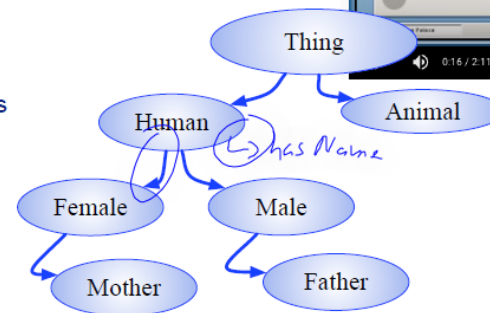
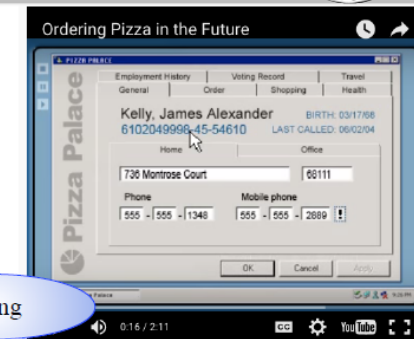
Project members of NDLO: Bjørn Andersen, Bjørnar Dragnes, Trond Henning Johansen

Elements in Semantic Technologies



- Extensible Markup Language (XML) is a markup language that defines a set of rules for encoding documents in a format which is both human-readable and machine-readable.
- RDF - Formal semantics is built upon a W3C XML standard for objects called the Resource Description Framework (RDF)
- OWL - The Web Ontology Language (OWL) is a family of knowledge representation languages for authoring ontologies.
- A semantic reasoner, reasoning engine, rules engine, or simply a reasoner, is a piece of software able to infer logical consequences from a set of asserted facts or axioms.
- Classes (concepts) are abstract groups, sets, or collection of objects (example: human, woman)
- Individuals (instances) are the specific objects, e.g. Josef is a Father
- Attributes (properties) describing objects (individual and classes) in the ontology. Example: Human hasName, Josef has name Josef Noll

[Source: Wikipedia]



further reading:

<http://www.slideshare.net/SergeLinckels/semantic-web-ontologies>

