Software Engineering 2
A practical course in software engineering

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Tutorial 1: Overview of Technologies and Tools

And some additional information on project!
Topics

Infrastructure
- (GitHub)
- Jenkins
- Maven

Underlying platform/technology
- openHAB

Project
Jenkins (Integration Server)

Tool for Continuous Integration (CI):

- Code analysis
- Compile, build and run tests the software
  - on every checkin to the repository
  - in a controlled and explicitly specified environment (→ Maven POM files)
  - revert if not successful
- Deploy software

Many Plugins available:

- Maven
Jenkins Material

Tutorial

https://www.tutorialspoint.com/jenkins/

Homepage:

https://jenkins.io/

Covers installation, Git and Maven setup, configuration, setup of build jobs, testing, …
Project management tool for (Java) applications:

- Define project dependencies
- Build projects in a uniform way
- Test projects
- Reporting

Many plugins: e.g.

- Surefire (JUnit)
- Tycho (Eclipse plugin builder)
<?xml version="1.0" encoding="UTF-8"?>
<project xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" ... >
  <modelVersion>4.0.0</modelVersion>

  <parent>
    <groupId>org.eclipse.smarthome.binding</groupId>
    <artifactId>pom</artifactId>
    <version>0.9.0-SNAPSHOT</version>
  </parent>

  <groupId>org.eclipse.smarthome.binding</groupId>
  <artifactId>org.eclipse.smarthome.binding.hue</artifactId>

  <name>Eclipse SmartHome hue Binding</name>
  <packaging>eclipse-plugin</packaging>

</project>

This would require the parent project to be physically located in the super folder!

Example taken from the Philips Hue binding of OpenHAB
In case, parent is located in a repository

Much more here
Maven stages

- Maven has different stages: e.g.
  - clean
  - verify
  - package
  - ...

- In Eclipse, a build can be started via ”Run as” by right-clicking on the project’s pom.xml file.

If you install openHAB and create projects from skeletons, they will be created with a maven configuration.
openHAB: Installation

For installing openHAB see:

http://docs.openhab.org/developers/development/ide.html

You can import existing openHAB projects into your workspace (as examples and inspiration for your own):

Select: File -> Import -> Oomph -> Projects into Workspace
then select: “openHAB 1 Add-ons”

And similarly of OH2 projects:
Select: File -> Import -> Oomph -> Projects into Workspace
then select: “openHAB 2 Add-ons”
Launch openHAB

- You can start openHAB from the "launch" project via a right-click on file “openHAB_Runtime.launch”

- You can access the running openHAB application in your browser via the URL http://localhost:8080/start/index
Open HAB: Concepts

- Thing
- ThingType
- Channel
- ChannelType
- State

- Configuration (properties of a thing in openHAB)
- Property

- Bridge (BridgeType): A thing that can contain other things (often a gateway to access things)

Sometimes the documentation is a bit sloppy about these distinctions.
Open HAB: Concepts

More technical concepts

- Binding / Binding definitions
- ThingHandlers
- ThingHandlerFactories

See http://docs.openhab.org/developers/development/bindings.html and https://www.eclipse.org/smarthome/documentation/development/bindings/how-to.html for details
Project: Group Meetings

Any students not assigned to groups yet?

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**User Stories & Tasks**

**Overall (see project page):**

- As a home owner, I want to be able to use NorthQ devices with openHAB, so that I can use NorthQ devices together with other devices available in openHAB.

- As an inhabitant of some home, I want the openHAB system to be aware of my location (even outside the home) so that the system can take actions based on this information (which, for example, could be turning on the heating in my room when I am on my way home from work).

- As a home owner, I want openHAB to collect data from sensors and record events, which later can be visualized and analyzed for "some" purpose so that I can optimize my home (e.g. w.r.t energy consumption, well-being, ...).

- As a home owner, I want that the openHAB system and the involved NorthQ system cannot be "hacked" (in particular not through exploiting the extensions), so that I can trust the system.

- ...
Release 0

Technical Tasks

- Set up repository
- Set up integration server Jenkins (including testing)

User Stories:

- Standalone Java application for
  - visualizing and controlling a light via a Q-Plug
  - visualizing the state of Q-motion
  - Option to turn on Q-plug (light) automatically, when motion is detected

Note: Give access to Ekkart: (GitHub user ekki@dtu.dk)

Access information to VM will be given to groups shortly!

Realising the stories includes automatic tests.
Planning Game

- Discuss (& formulate) stories with project owner
- Developers estimate stories (how long do they take)
- If a story is too big, developers split it up in sub-stories and tasks

- Project owner prioritizes and chooses stories for next release (choose scope)
- During iteration: Developers, assign and do stories and adjust (if needed together with project owner)
Every Friday session (13-15) each group will give a status report (ca. 10 minutes):

- What did the group do
- What went well
- What did not go well
- What can you do about it
- What do you do in next week

During the status report, we can do some code review; sometimes Ekkart will explicitly ask to show produced code.
Group Meeting

- **Planning game** (when Ekkart is visiting group); Report the chosen user stories tasks to Ekkart by email (ekki@dtu.dk)
- Decide on a **group leader** and **deputy** and report it to Ekkart by email after the meeting
- **Assign/chose first tasks** (remember: pair programming)
- Decide on **regular group** (sub-group) **meetings**
- Decide **who will do** the **status report** next week
- Decide how you **document and trace your decisions** from the meeting
Rooms for group meeting

Group A: 210.002
Group B: 210.008
Group C: 210.012
Group D: 210.018