SmartSoft Tutorial Lesson 2: First steps with RobotinoXT and the SmartSoft MDSD Toolchain

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http://smart-robotics.sourceforge.net/
http://www.zafh-servicerobotik.de/ULM/index.php
http://www.youtube.com/user/roboticsathsulm

FESTO

SmartSoft Tutorial Lesson 2: What is this lesson about?

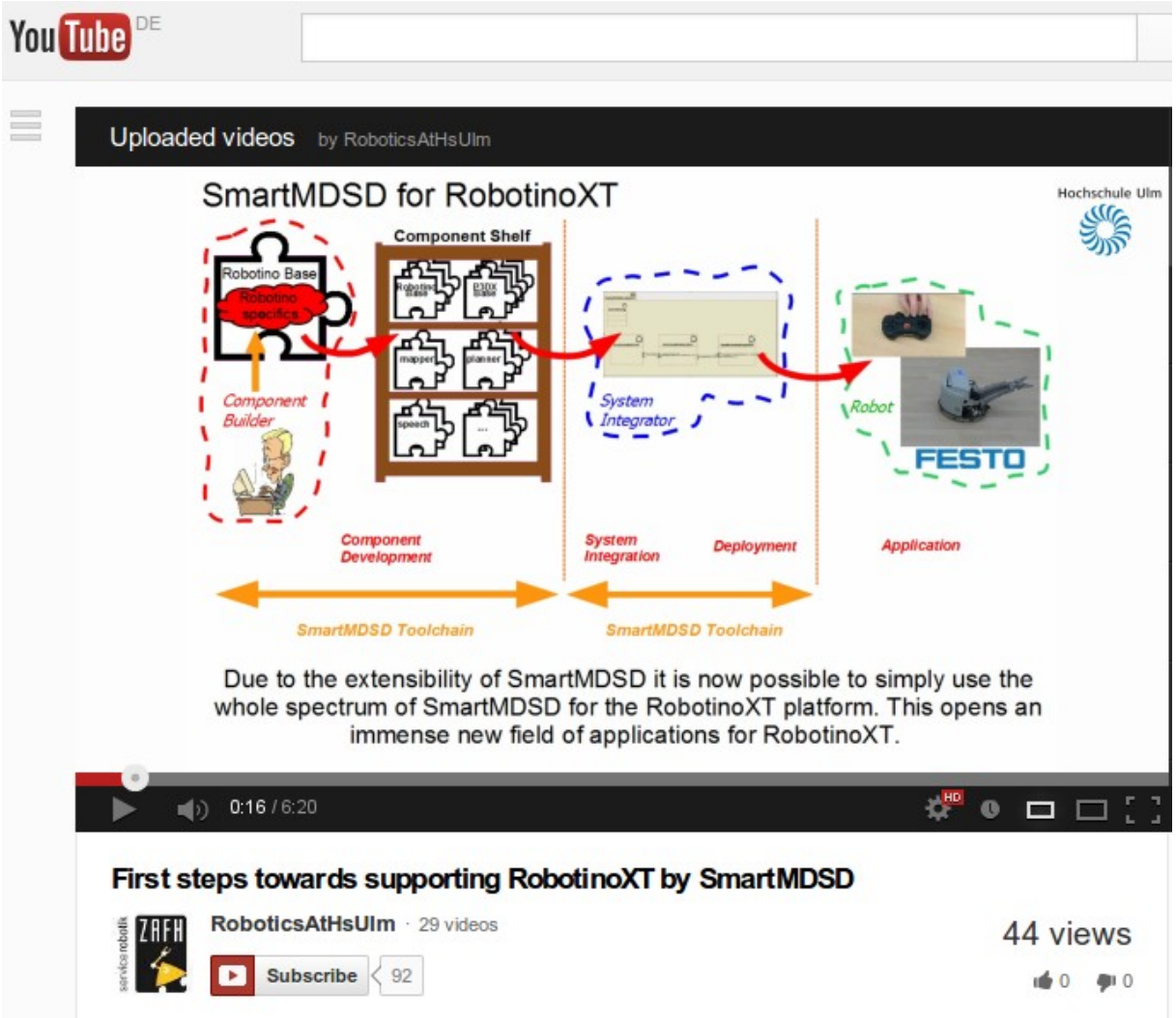
- we guide you through the first steps to use RobotinoXT in combination with the MDSD Toolchain
  - the effort is fairly low since we provide a VMware installation of all required packages
  - due to the VMware image, there is no need to modify the current settings of your computer
  - due to the VMware image, there is no danger to mess up something and to get stuck with a broken configuration since you can always go back to our original VMware image
  - you can use the VMware image on your prefered operating system

- we guide you through the necessary steps to update your RobotinoXT in order to use the SmartRobotinoBaseServer component
  - you get a step by step instruction how to update RobotinoXT to the new API2

- Example: Robotino Joystick Navigation
  - simple usage of the deployment to control RobotinoXT via a joystick
  - set of off-the-shelf software components for joystick navigation
  - applied example to illustrate how you can compose complex systems out of prebuild components
  - the generation of the deployment used in this example is demonstrated in http://youtu.be/-ei8KNR5534

SmartSoft Tutorial Lesson 2: What skills do you acquire in this lesson?

- RobotinoXT Deployment



SmartSoft Tutorial Lesson 2:
What skills do you acquire in this lesson?

- Outline of Tutorial Lesson 2

  - Introduction:
    - Part 1: The VMware Image:

      The system requirements and how to use the VMware with the latest SmartSoft virtual machine are described in lesson 1 part 1

      (see http://smart-robotics.sourceforge.net/tutorials.php)

  - Example: Robotino Joystick Navigation
    - Part 2: Prepare RobotinoXT
    - Part 3: Using Robotino Joystick Navigation Deployment

SmartSoft Tutorial Lesson 2: Part 2: Prepare RobotinoXT

- Update RobotinoXT packages
  - update RobotinoXT to API2

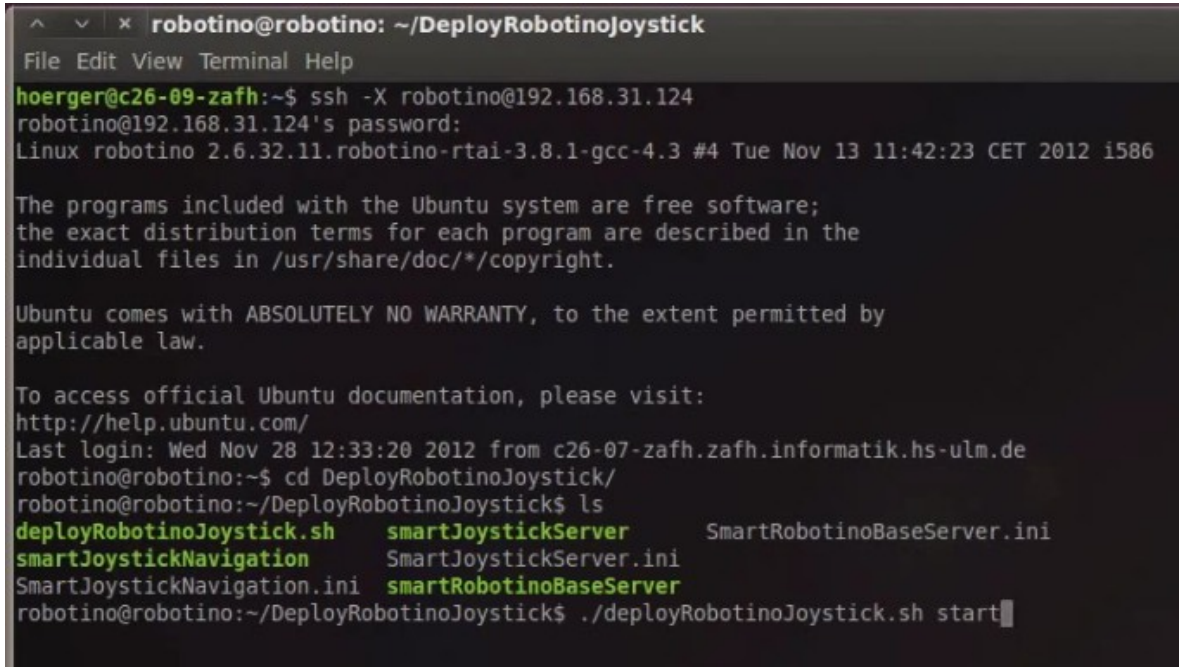
- You will learn
  - how to delete the Openrobotino API and install the new API2

- Description of the Example:
  - API2
    - Typically the old openrobotino API is installed on Robotino's CF card image
    - The SmartRobotinoBaseServer uses the new RobotinoXT API2 v0.5.0
    - To use SmartRobotinoBaseServer you have to delete the old API and replace it with the new one

SmartSoft Tutorial Lesson 2:
Part 2: Prepare RobotinoXT

RobotinoXT system information:

- CF card image v2.4 (factory settings)
- yet to be installed API2 v0.5.0



How to remove the old API:

- to connect under Linux, open a terminal and type :

  ssh -X robotino@<ip-address>

- delete old API packages:

sudo dpkg -r robview2

sudo dpkg -r openrobotino2

sudo dpkg -r openrobotino1

SmartSoft Tutorial Lesson 2: Part 2: Prepare RobotinoXT

How to download and unpack the necessary packages:

- download the packages in a directory of your choice:
  - type directly on RobotinoXT (internet connection required):

```
wget http://doc.openrobotino.org/download/packages/i386/rec-rpc-qt4.5.0_1.3.3_i386.deb
wget http://doc.openrobotino.org/download/packages/i386/robotino-common_0.5.0_i386.deb
wget http://doc.openrobotino.org/download/packages/i386/robotino-daemons_0.5.0_i386.deb
wget http://doc.openrobotino.org/download/packages/i386/robotino-api2_0.5.0_i386.deb
```

  - or download the packages to your PC and transfer them to RobotinoXT

    Note: *Version 0.5.0 is required in order to function properly.*

- unpack the files:

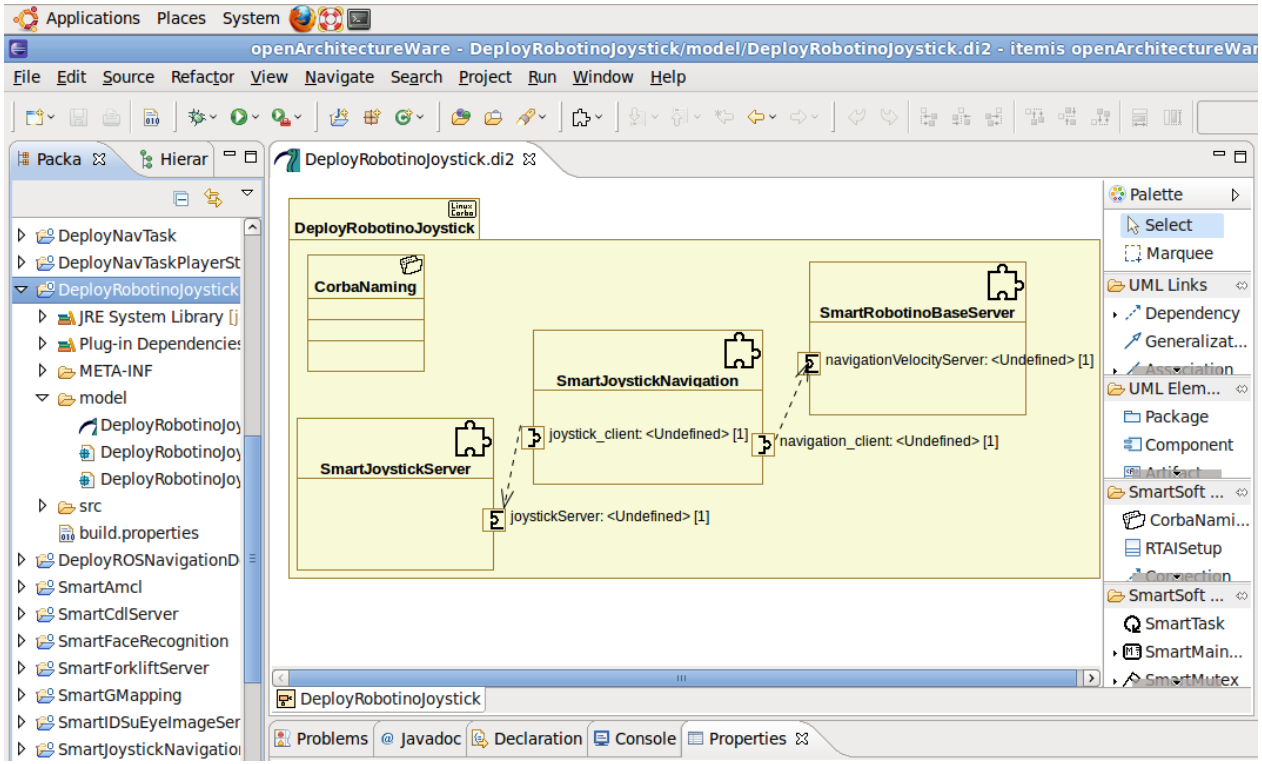
```
sudo dpkg -i rec-rpc-qt4.5.0_1.3.3_i386.deb
sudo dpkg -i robotino-common_0.5.0_i386.deb
sudo dpkg -i robotino-daemons_0.5.0_i386.deb
sudo dpkg -i robotino-api2_0.5.0_i386.deb
```

- Note: For more possibilities to update Robotino see (http://wiki.openrobotino.org/index.php?title=API2_install_daemons)

SmartSoft Tutorial Lesson 2:

Part 3: Using Robotino Joystick Navigation Deployment

- Robotino Joystick Navigation
  - simple control of RobotinoXT with a joystick
  - use of a already existing deployment
- You will learn
  - how to configure and run an already existing deployment with the SmartSoft MDSD Toolchain
- Description of the Example:
  - in this example we run the components of the deployment in the virtual machine and control RobotinoXT via a network connection



SmartSoft Tutorial Lesson 2:

Part 3: Using Robotino Joystick Navigation Deployment

- Configure SmartRobotinoBaseServer
  - change the IP-Address of RobotinoXT in SmartRobotinoBaseServer.ini
    - on your virtual machine go to :
      ~/SOFTWARE/smartsoft/src/deployments/DeployRobotinoJoystick/src
    - open the file
      SmartRobotinoBaseServer.ini
      and change the parameter
      daemonIP
      to the address RobotinoXT has in your network

SmartSoft Tutorial Lesson 2:

Part 3: Using Robotino Joystick Navigation Deployment

- Simple Joystick Navigation
  - connect your joystick to the PC your virtual machine is running on (make sure the VM recognizes the joystick)
  - the components are started by executing a start script
    - (this script is automatically generated by the toolchain's generation process, see lesson 1 part 4)
    - open a terminal in the VM
      - » `cd ~/SOFTWARE/smartsoft/src/deployments/DeployRobotinoJoystick/src`
      - » `./deployRobotinoJoystick.sh start`
  - now, all components are being started
  - next, you can control the robot with your joystick

  - to stop all components, use the following command in the terminal from which you started all the components:
    - » `./deployRobotinoJoystick.sh stop`

SmartSoft Tutorial Lesson 2:
Part 3: Laser Obstacle Avoid / Real-World

Important Hint:

It is possible to deploy the components to RobotinoXT and run them locally, therefore SmartSoft needs to be installed on RobotinoXT.

- For installation instruction of SmartSoft see
  - http://smart-robotics.sourceforge.net/corbaSmartSoft/install.php

- The target IP-address needs to be changed to Robotino's and the Deploy Type of the DeployRobotinoJoystick project needs to be set to remote

  (see ***3:33*** http://youtu.be/-ei8KNR5534)

- The ***`daemonIP`*** in ***`SmartRobotinoBaseServer.ini`*** must be changed to ***`127.0.1.1`***
  - you find SmartRobotinoBaseServer.ini on RobotinoXT in the directory specified in the project settings (see ***3:57*** http://youtu.be/-ei8KNR5534)

SmartSoft Tutorial Lesson 2: Where to find more information?

- SmartSoft framework and SmartSoft MDSD Toolchain:
  - http://smart-robotics.sourceforge.net
  - http://smart-robotics.sourceforge.net/mdsdSmartSoft/

- Description of available components:
  - http://smart-robotics.sourceforge.net/corbaSmartSoft/components.php
  - in particular:
    - SmartRobotinoBaseServer
    - SmartJoystickServer
    - SmartJoystickNavigation

- SmartSoft Doxygen documentation:
  - http://smart-robotics.sourceforge.net/corbaSmartSoft/doxygen/index.php
  - in particular: Communication Objects
    - CommJoystick
    - CommNavigationVelocity