Proview on Raspberry PI

2014 02 14

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Introduction

Raspberry PI is a small single board computer developed to promote the the teaching of basic computer science in schools. This document describes how build a Proview project for raspbian on Raspberry PI. The reader expects to have some knowledge of how to create an build projects in Proview.

Development

There are two ways to develop a system for Raspberry PI. On way is to install the Proview development package on an RPI board with raspbian installed. The installation and creation of a projects follows the same procedure as for an ordinary debian system. It will work for small projects but is not ideal for larger projects.

The other way is to use an ordinary pc with ubuntu or debian, and to install the rpi cross compiler to generate code for the Raspberry PI. In this case you have to have access to the Proview runtime archives, cross compiled for RPI, and they are available in the pwrrpi package. This document will describe how to install the cross compiler, and configure a Proview project for Raspberry PI.

Install the cross compiler

On the development station, the cross compiler for RPI should be installed.

The cross compiler is fetched from github.com with git.

Install git

```
> sudo apt-get install git
```

Download the cross compiler to /usr/local/rpi.

This is done as super user.

```
> sudo su
> mkdir /usr/local/rpi
> cd /usr/local/rpi
> git clone git://github.com/raspberrypi/tools.git
```

When this is written in February 2014, the latest version contains a severe bug, so checkout a previous version

```
> cd tools
> git checkout 9c3d7b6ac692498dd36fec2872e0b55f910baac1
```

On 64-bit also install 32-bit archives and header files

64-bit ubuntu:

```
apt-get install libc6:i386 libgcc1:i386 gcc-4.6-base:i386
     libstdc++5:i386 libstdc++6:i386 lib32z1 lib32ncurses5
     lib32bz2-1.0
```

On 64-bit debian:

```
dpkg –add-architecture i386
apt-get update
apt-get install ia32-libs
```

Log out as super user

```
> exit
```

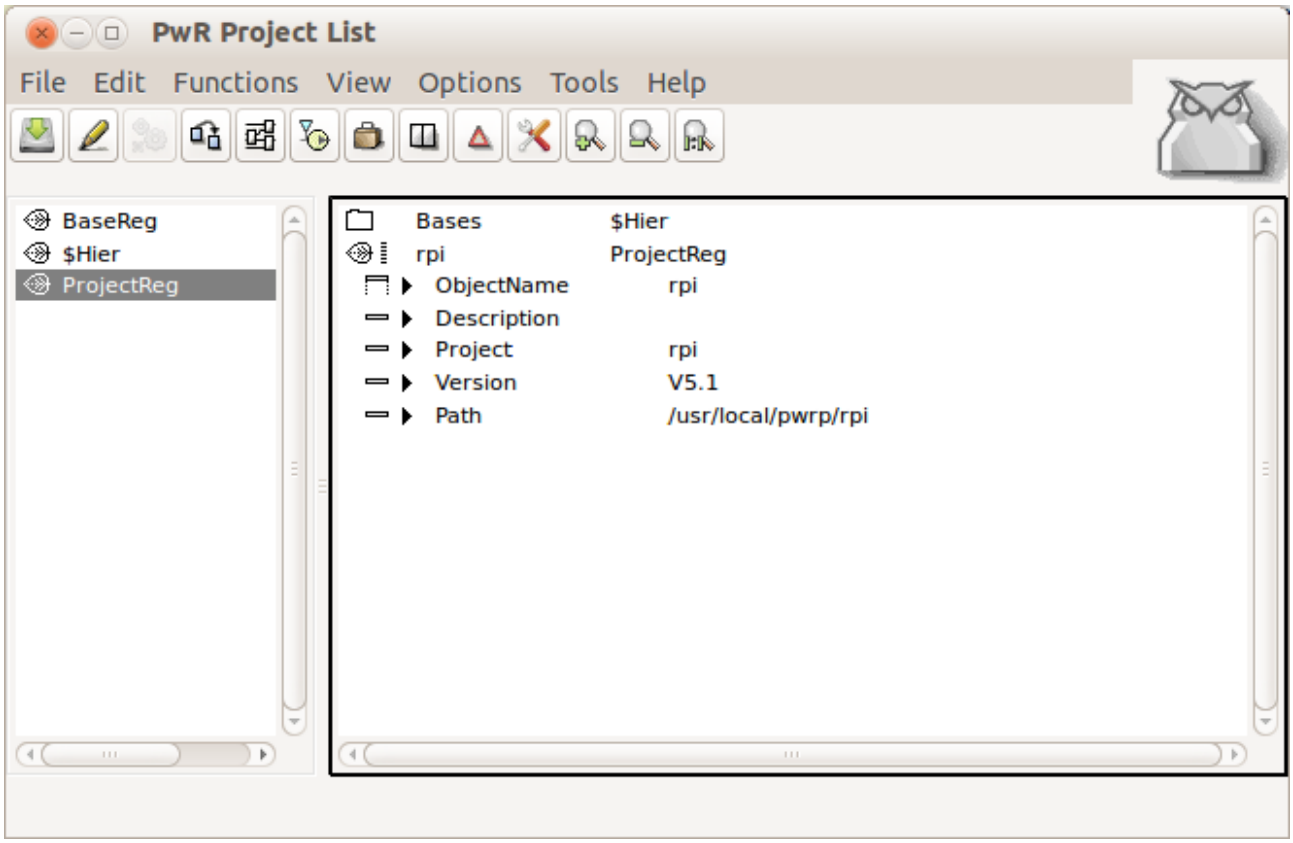
Install Proview

Download and install the Proview development package, pwr51, and the corresponding Proview RPI development package pwrrpi51.

Create a project

Log in as user pwrp and start the administrator to create an rpi project.

In this example the project name is set to rpi.



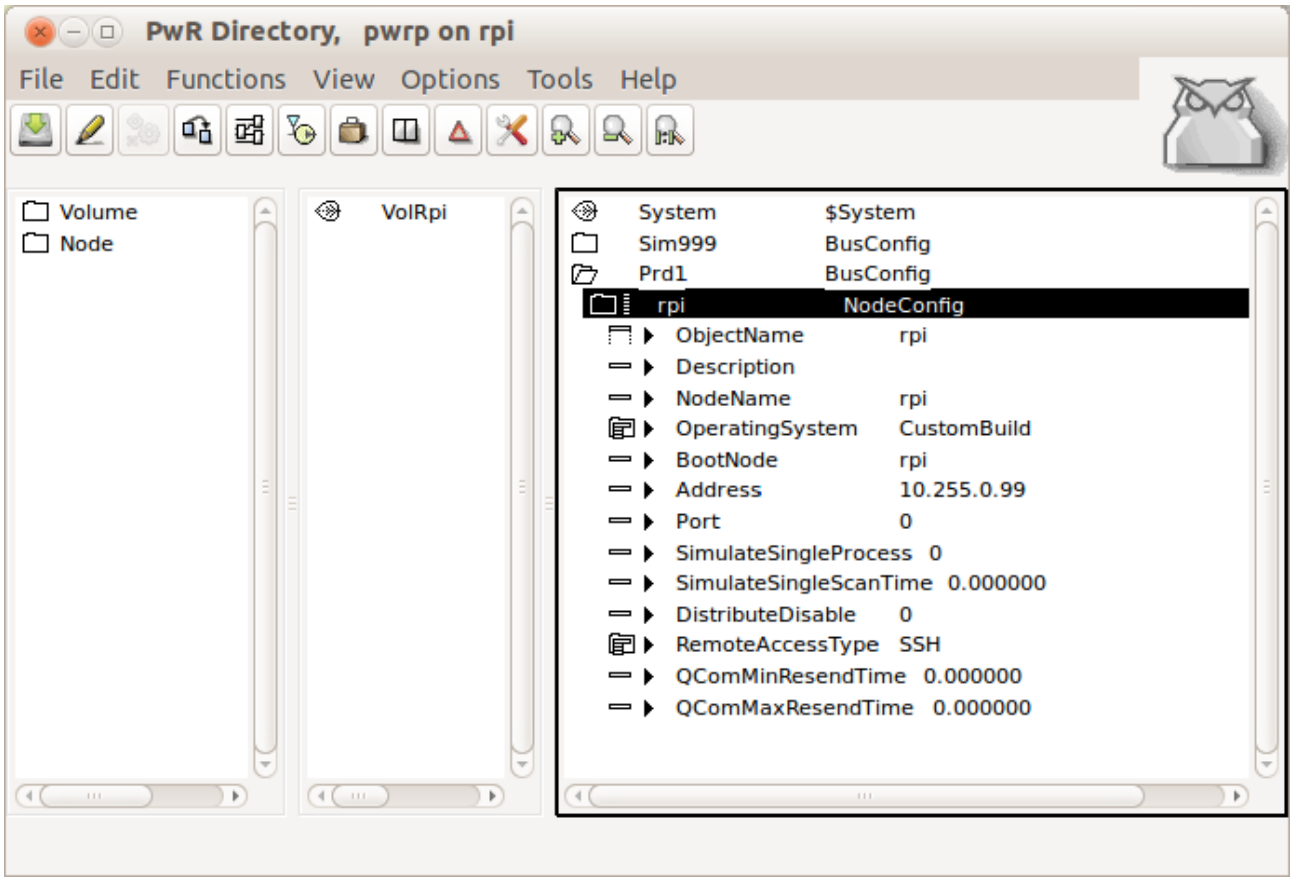
Open the new project by leaving edit mode and activate 'Open Project' in the popup menu for the ProjectReg object.

Configure the project

Run the configurator wizard and apply the default configuration.

Before leaving the directory volume, make following modifications.

Change the OperatingSystem of the NodeConfig object for the Raspberry PI node to CustomBuild. Also insert the IP Address if this is not previously done, and the node name of the RPI in NodeName. Note that the default nodename in the raspbian distribution is 'raspberrypi', not rpi as in the figure below. As BootNode you can also set the IP address if the nodename isn't known on the development station.



Add a CustumBuild object below the NodeConfig object.

Set

- OperatingSystem to Linux on ARM

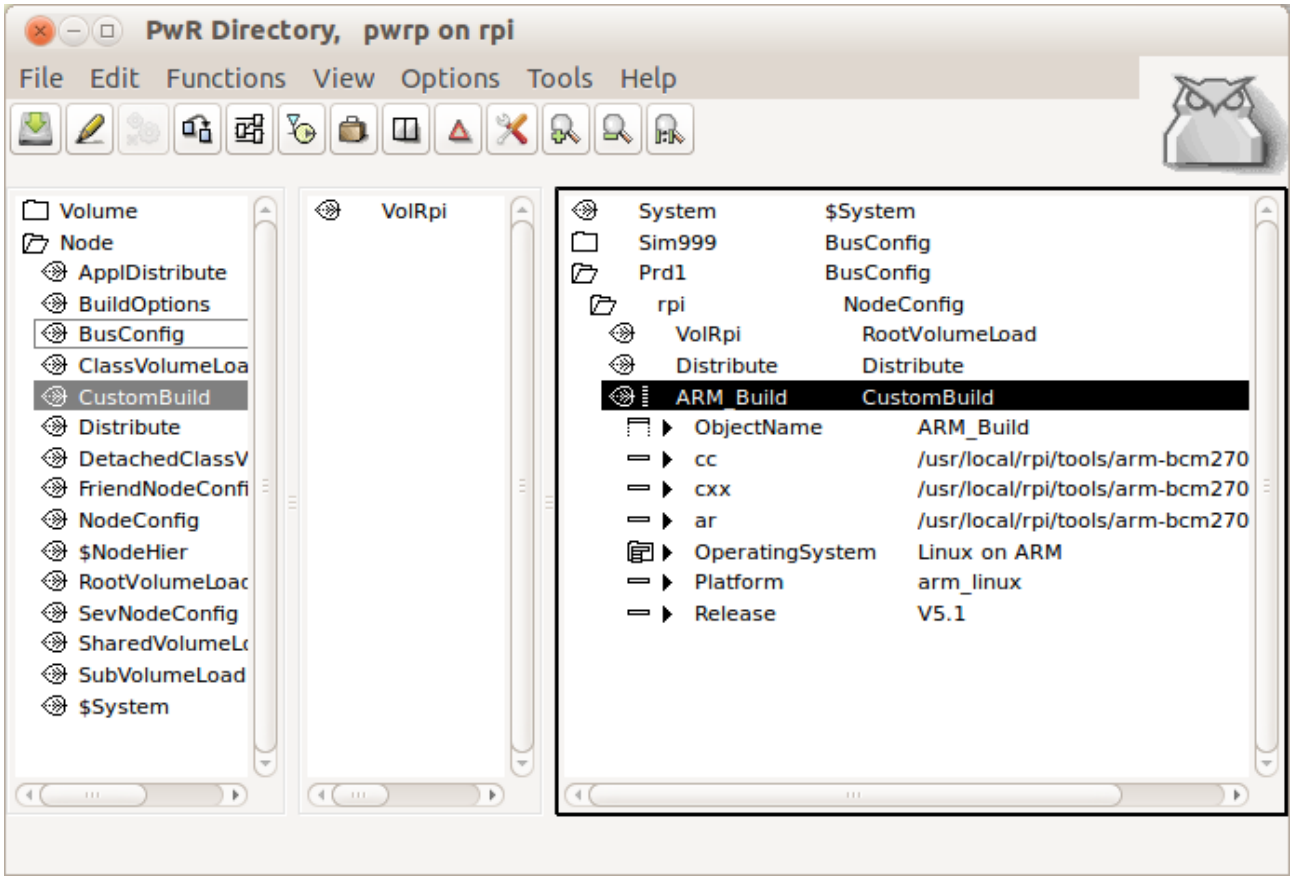
- Platform to arm_linux

- Relase to the current Proview release.

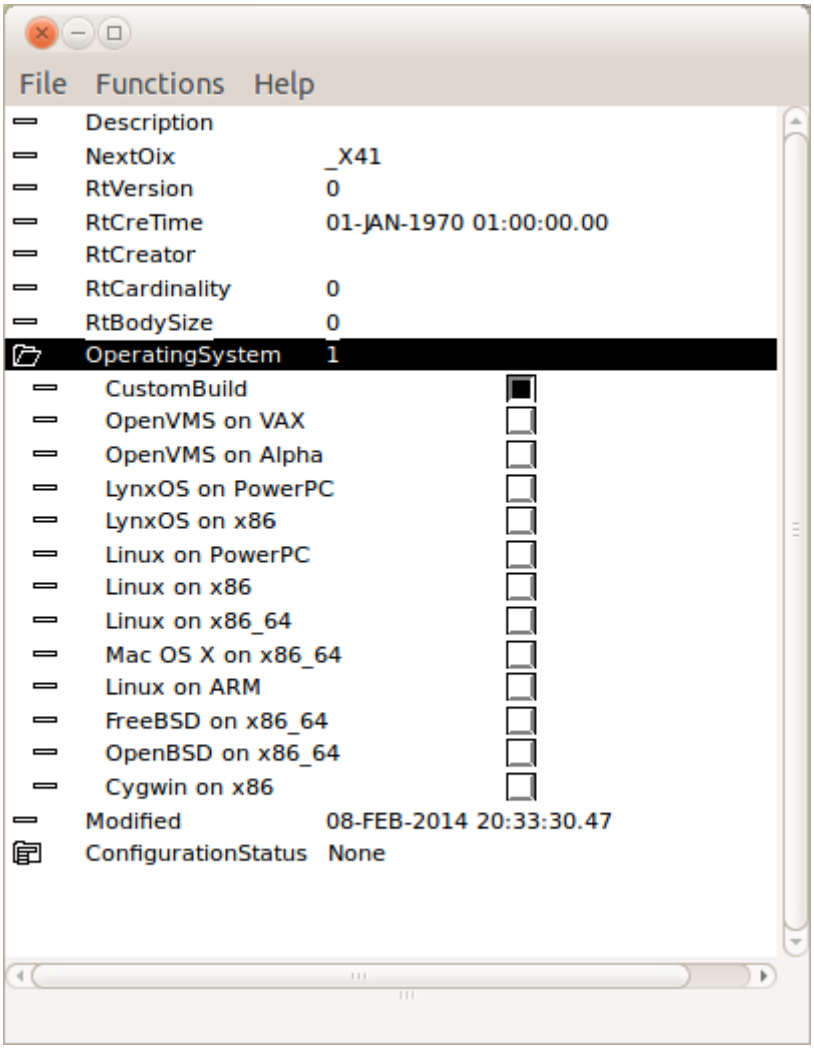
- cc= /usr/local/rpi/tools/arm-bcm2708/gcc-linaro-arm-linux-gnueabihf-raspbian/bin/arm-linux-gnueabihf-gcc

- cxx= /usr/local/rpi/tools/arm-bcm2708/gcc-linaro-arm-linux-gnueabihf-raspbian/bin/arm-linux-gnueabihf-g++

- ar=/usr/local/rpi/tools/arm-bcm2708/gcc-linaro-arm-linux-gnueabihf-raspbian/bin/arm-linux-gnueabihf-ar



Open the root volume, in the example VolRpi, execute the basic configuration with the wizard, and then open volume attributes from File/Volume Attributes in the menu. Set OperatingSystem to CustomBuild.



Build the project

Build the RPI node by activating the build button in the configurator tool bar, and select the rpi node in the list.

RPI installation

Install raspbian on the RPI board, and then download the pwrrt package in the raspbian folder from the Proview download page. Install the pwrr package.

```
> cd Downloads
> sudo apg-get install libdb5.3
> sudo dpkg -i pwrrt_5.1.0-1_armhf.deb
```

Add user pwrp to sudoers by starting visudo and adding the line

```
pwrp ALL=NOPASSWD: ALL
```

Distribute the project

Distribute the RPI project from the development station to the RPI board from Functions/Distribute in the configurator. Select the rpi node in the list. Note that the distributor will prompt for a password in the terminal window for the configurator. Enter the password for user pwrp, pwrp, two times.

Start Proview runtime

Login as user pwrp with password pwrp, on the RPI. Start Proview with

```
> pwr start
```

Start rt_xtt and checkout the runtime environment.

```
> rt_xtt
```