

# PetaLinux SDK User Guide

## *Installation Guide*

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## Revision History

Date	Version	Notes
2009-11-26	1.1	Initial version for SDK 1.1 release
2009-12-04	1.2	Updated host package dependency list
2010-12-02	1.3	Updated supported OS list
2011-04-04	2.1	Updated for PetaLinux SDK 2.1 release - 64-bit Ubuntu supported
2012-08-03	3.1	Updated for PetaLinux SDK 3.1 release
2012-09-03	12.9	Updated for PetaLinux SDK 12.9 release
2012-12-17	2012.12	Updated for PetaLinux SDK 2012.12 release
2013-04-22	2013.04	Updated for PetaLinux SDK 2013.04 release

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## About this Guide

This document provides information on how to install the PetaLinux SDK.

*Please note: the reader of this document is assumed to have basic Linux knowledge such as how to run Linux commands.*

## Prerequisites

This getting started document assumes that the following prerequisites have been satisfied:

- Minimum workstation requirements:
  - 2GB RAM (recommended minimum for Xilinx tools)
  - Pentium 4 2GHz CPU clock or equivalent
  - 5 GB free HDD space
  - Recommended OS: CentOS / RHEL 5 (32-bit), or Ubuntu 10.04 (32-bit or 64-bit)
- PetaLinux release package downloaded.
- Valid PetaLinux license.
- Common system packages and libraries are installed on your workstation. The installation process will check for these. See the section Required Tools and Libraries for more details.

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# PetaLinux SDK Installation

## Extract the PetaLinux Package

Assuming all the prerequisites described in the last subsection are satisfied, PetaLinux installation is very straight forward.

Extract the compressed PetaLinux package by running the following command on your workstation:

```
$ tar xzf petalinux-v2013.04-final-full.tar.gz
```

PetaLinux will be installed in the "petalinux-v2013.04-final-full" directory, directly underneath the working directory of this command.

So, if you extract the package from your home directory "/home/user", PetaLinux will be installed in "/home/user/petalinux-v2013.04-final-full".

You may move the resulting "petalinux-v2013.04-final-full" directory to a preferred location before continuing.

## Install License

PetaLinux licenses are managed using the same system as all other Xilinx Design Tools. For more details on licensing and setup of license please refer to the *ISE Design Suite 14: Release Notes, Installation, and Licensing (UG631)* ([http://www.xilinx.com/support/documentation/sw\\_manuals/xilinx14\\_5/iil.pdf](http://www.xilinx.com/support/documentation/sw_manuals/xilinx14_5/iil.pdf)) section Obtaining and Managing a License.

## Setup PetaLinux Working Environment

After extracting the package, the remainder of the setup is completed automatically.

1. Go to the PetaLinux top-level directory directory by running this command on the command console:

```
$ cd <path-to-installed-PetaLinux>
```

e.g.:

```
$ cd /home/user/petalinux-v2013.04-final-full
```

2. Source the appropriate PetaLinux setup script by running this command on the command console:

- For Bash:

```
$ source settings.sh
```

**WARNING:**

- *PetaLinux recommended shell is bash. Please set your default shell as bash, otherwise, there may be issues when building PetaLinux.*
- *You must run the settings script each time you open a new terminal window or shell. PetaLinux SDK will not operate correctly otherwise.*
- *You must be within the PetaLinux top-level directory directory (e.g. `"/home/user/petalinux-v2013.04-final-full"`) to source the settings file.*
- *If you intend to source the Xilinx tools `"settings.sh"`, you must source the Xilinx `"settings.sh"` before the PetaLinux settings script. Alternatively after sourcing the Xilinx `"settings.sh"`, source the PetaLinux settings script again.*

The first time the setup script is sourced, it will perform some post installation tasks to check system dependencies and initialise the Linux kernel source tree.

Below is an example of the output from sourcing the setup script for the first time:

```
$ source settings.sh
PetaLinux environment set to '/home/user/petalinux-v2013.04-final-full'
INFO: Finalising PetaLinux installation
INFO: Checking free disk space
INFO: Checking installed tools
INFO: Checking installed development libraries
INFO: Checking network and other services
INFO: Checking for sudo permissions - you may be prompted to enter
your password
Password: *****
INFO: Initialising kernel tree. Please be patient.
INFO: PetaLinux post-installation completed successfully
```

The post-install step only occurs once. Subsequent runs of the settings script should be much quicker, and simply output a confirmation message such as that shown below:

```
$ source settings.sh
PetaLinux environment set to '/home/user/petalinux-v2013.04-final-full'
```

### 3. Verify that the PetaLinux working environment has been set:

```
$ echo $PETALINUX
/home/user/petalinux-v2013.04-final-full
```

Environment variable "`$PETALINUX`" should point to the installed PetaLinux path. Your output may be different from this example, depending upon where you installed PetaLinux.

## PetaLinux BSP Installation Procedure

PetaLinux includes reference designs for you to start working with and customise for your own projects. These are provided in the form of installable BSP (Board Support Package) files, and include all necessary design and configuration files, including pre-built and tested hardware and software images, ready for download to your board or for booting in the QEMU system simulation environment.

Below are the steps to install a PetaLinux BSP:

1. Run `petalinux-install-bsp` command on the command console:

```
$ petalinux-install-bsp <Path-to-BSP0> [Path-to-BSP1]...
```

To install a single BSP, simply provide the path to the ".bsp" file:

```
$ petalinux-install-bsp ~/bsps-to-install/Xilinx-SP605-v2013.04-final.bsp
```

You will see output similar to the following, according to which BSP you are installing:

```
INFO: Processing BSP package 'Xilinx-SP605-v2013.04-final.bsp'
INFO:   BSP package contents:
      * Xilinx-SP605-AXI-full-14.5
      * Xilinx-SP605-AXI-lite-14.5
INFO:   Extracting package...
      * Xilinx-SP605-AXI-full-14.5
      * Xilinx-SP605-AXI-lite-14.5
INFO:   Updating BSP(s)...
INFO: Default BSP settings restored
INFO: Default BSP settings restored
INFO: BSP successfully installed.
```




---

**WARNING:** *The command texts are all in one line.*

---

You may install more than one BSP at a time, simply specified the filenames of each on the command line. You may also install all available BSPs in a single directory, as follows:

```
$ petalinux-install-bsp ~/path/to/*.bsp
```

## Going Further

Congratulations, you have completed the installation of PetaLinux SDK! Next, please refer to the *PetaLinux SDK* document to build and boot your first PetaLinux projects.

## Troubleshooting

This section describes some common issues you may experience when installing PetaLinux, and ways to solve them.

If the PetaLinux installation fails, the file "\$PETALINUX/post-install.log" will be generated in your PetaLinux installation directory.

Problem/Error Message	Description and Solution
<p>WARNING: You have less than 1Gbyte free space on the installation drive</p>	<p><b>Problem Description:</b> This warning message tells that installation drive is almost full. You may not have enough free space to develop your hardware project and/or software project after the installation.</p> <p><b>Solution:</b></p> <ul style="list-style-type: none"> <li>• Move the PetaLinux to another hard disk drive.</li> </ul> <p>Alternatively,</p> <ul style="list-style-type: none"> <li>• Cleanup the installation drive to clear some more free space.</li> </ul>
<p>WARNING: No tftp server found - please install or enable before continuing</p>	<p><b>Problem Description:</b> This warning message tells that you don't have a TFTP service running on your workstation. Without TFTP service, you cannot download Linux system images to your MicroBlaze system using u-boot's network/TFTP capabilities.</p> <p><b>Solution:</b> Enable the TFTP service on your workstation. If you are unsure how to enable this service, please contact your system administrator.</p>



Problem/Error Message	Description and Solution
<p>WARNING: You do not have sudo permission - please refer to PetaLinux SDK Installation Guide for its impact and solution</p>	<p><b>Problem Description:</b> This is only a warning message indicates that you do not have sudo permission. PetaLinux will continue to install however certain features will not function without sudo permission. The following tools require sudo permission:</p> <ul style="list-style-type: none"> <li>• PetaLinux QEMU Software Simulator System (please refer to <i>PetaLinux SDK QEMU System Simulation Guide (UG982)</i> for more details)</li> </ul> <p><b>Solution:</b> Please contact your system administrator to get sudo permission. Alternatively you can use PetaLinux without sudo permission, with certain features unavailable.</p>
<p>ERROR: GCC is not installed - unable to continue. Please install and retry</p>	<p><b>Problem Description:</b> This error message tells that you don't have gcc installed on your workstation.</p> <p><b>Solution:</b> Please install gcc using your Linux workstation's package management system. If you are unsure how to do this, please contact your system administrator.</p>
<p>ERROR: You are missing the following system tools required by PetaLinux: <i>missing-tools-list</i> <b>OR</b> ERROR: You are missing these development libraries required by PetaLinux: <i>missing-library-list</i></p>	<p><b>Problem Description:</b> This error message tells that you don't have the required tools or libraries listed in the "<i>missing-tools-list</i>" or "<i>missing-library-list</i>".</p> <p><b>Solution:</b> Please install the packages of the missing tools, Refer to section Required Tools and Libraries for details.</p>

Problem/Error Message	Description and Solution
<p>ERROR: Unable to perform initial kernel tree checkout</p>	<p><b>Problem Description:</b> This error message tells that you failed to checkout the Linux kernel tree.</p> <p><b>Solution:</b></p> <ol style="list-style-type: none"> <li>1. Check whether "\$PETALINUX/software/linux-2.6.x" exists.  If this directory doesn't exist, it probably means that the PetaLinux package extraction failed to complete, possibly due to a lack of disk space. Make sure you have at least 5Gbyte free space on your installation drive at first, and then extract PetaLinux from the PetaLinux package again.</li> <li>2. Source the settings script again in the PetaLinux top-level directory directory.</li> </ol>
<p>Failed to open PetaLinux lib, please make sure you have source PetaLinux settings.</p>	<p><b>Problem Description:</b> This error message indicates that a PetaLinux library failed to load. The cause of this issue is one of the following:</p> <ul style="list-style-type: none"> <li>• The PetaLinux "settings.sh" has not been loaded.</li> <li>• If the Linux Kernel you are running has SELinux configured. This can cause issues with regards to security context and loading libraries.</li> </ul> <p><b>Solution:</b></p> <ol style="list-style-type: none"> <li>1. Source the "settings.sh" script from the top-level PetaLinux directory.</li> <li>2. If you have SELinux enabled, determine if SELinux is in 'enforcing mode'.</li> </ol> <p>If SELinux is configured in 'enforcing mode' either reconfigure SELinux to 'permissive mode' (refer to SELinux manual), or change the security context of the libraries to allow access (see below for details).</p> <pre style="border: 1px solid black; padding: 5px; width: fit-content;">\$ cd \$PETALINUX/tools/common/petalogix/ \$ chcon -R -t textrel_shlib_t lib</pre>

## Required Tools and Libraries

PetaLinux requires a number of standard development tools and libraries to be installed on your Linux host workstation. The PetaLinux installation process checks for these packages, and reports an error if any are missing, however it does not attempt to install them - you must do this manually. This section describes the required packages, and how to install them on different Linux workstation environments.

Tool/Library	YUM/RPM Package for RHEL/CentOS/Fedora	APT Package for Debian/Ubuntu
dos2unix	dos2unix	tofrodos
ip	iproute	iproute
gawk	gawk	gawk
gcc	gcc	gcc
git	git	git-core
gpg	gnupg	gnupg
make	gnutls-devel	Make
netstat	net-tools	net-tools
ncurses	ncurses-devel	ncurses-dev
tftp server	tftp-server	tftpd
zlib	zlib-devel	zlib1g-dev
flex	flex	flex
bison	bison	bison



**WARNING:** Consult your system administrator if you are unsure about correct procedures for host system package management.

For RedHat/CentOS/Fedora type systems, the yum package manager is used. To install a package, perform the following command:

```
$ sudo yum install -y <yum-package-name>
```

For Debian/Ubuntu type systems, the apt package manager is used. To install a package, perform the following command:

```
$ sudo apt-get install -y <apt-package-name>
```

## Additional Resources

### References

- PetaLinux SDK Application Development Guide (UG981)
- PetaLinux SDK Board Bringup Guide (UG980)
- PetaLinux SDK Eclipse Plugin Guide (UG979)
- PetaLinux SDK Firmware Upgrade Guide (UG983)
- PetaLinux SDK Getting Started Guide (UG977)
- PetaLinux SDK Installation Guide (UG976)
- PetaLinux SDK QEMU System Simulation Guide (UG982)