PTXdist Application Note

Installing PTXdist-1.0.2

PTXdist-1.0.2 comes in several archives. This application note advises users what exactly needs to be done to get a working environment.

Pengutronix

PTXdist Installation

PTXdist is shipped divided into several archives. This application note provides information about which archives are required to be downloaded and installed to get a working environment to build filesystems for their target systems.

Main parts of PTXdist

The main tool of the OSELAS.BoardSupport() Package is PTXdist. So before starting any work we'll have to install PTXdist on the development host. PTXdist consists of the following parts:

The `ptxdist` Program: `ptxdist` is installed on the development host during the installation process. `ptxdist` is called to trigger any action, like building a software packet, cleaning up the tree etc. Usually the `ptxdist` program is used in a *workspace* directory, which contains all project relevant files.

A Configuration System: The config system is used to customize a *configuration*, which contains information about which packages have to be built and which options are selected.

Patches: Due to the fact that some upstream packages are not bug free – especially with regard to cross compilation – it is often necessary to patch the original software. PTXdist contains a mechanism to automatically apply patches to packages. The patches are bundled into a separate archive. Nevertheless, they are necessary to build a working system.

Package Descriptions: For each software component there is a "recipe" file, specifying which actions have to be done to prepare and compile the software. Additionally, packages contain their configuration sniplet for the config system.

Toolchains: PTXdist does not come with a pre-built binary toolchain. Nevertheless, PTXdist itself is able to build toolchains, which are provided by the OSELAS.Toolchain() project. More in-deep information about the OSELAS.Toolchain() project can be found here: http://www.pengutronix.de/oselas/toolchain/index_en.html

Building a toolchain is not part of this application note, refer for application note "Building Toolchains" instead.

Board Support Package This is an optional component, mostly shipped aside with a piece of hardware. There are various BSP available, some are generic, some are intended for a specific hardware.

Download required Archives

In order to follow this application note, some software archives are needed. There are several possibilities how to get these: either as part of an evaulation board package, or by download from a world wide web site.

The central place for OSELAS related documentation is http://www.oselas.com. This website provides all required packages and documentation (at least for software components which are available to the public).

To follow the steps below, these archives should be available on the development host:

- `ptxdist-1.0.2.tgz`

- `ptxdist-1.0.2-patches.tgz`

- `ptxdist-1.0.0-projects.tgz`

Extracting the Sources

To install PTXdist, at least two archives have to be extracted:

ptxdist-1.0.2.tgz The PTXdist software itself.

ptxdist-1.0.2-patches.tgz All patches against upstream software packets (known as the 'patch repository').

ptxdist-1.0.0-projects.tgz Generic projects (optional), can be used as a starting point for self-built projects.

The PTXdist and patches packets have to be extracted into some temporary directory in order to be built before the installation, for example the `local/` directory in the user's home. If this directory does not exist, we have to create it and change into it:

```
~$ cd
~$ mkdir local
~$ cd local
```

Next steps are to extract the archives:

```
~/local$ tar -zxf ptxdist-1.0.2.tgz
~/local$ tar -zxf ptxdist-1.0.2-patches.tgz
```

and if required the generic projects:

```
~/local$ tar -zxf ptxdist1.0.0-projects.tgz
```

> ⚠ This PTXdist-1.0.2 release is one of the stable series. So Pengutronix didn't create new project releases. Instead the project archive of the PTXdist-1.0.0 release can be used. But this arcive extracts into `ptxdist-1.0.0` instead of `ptxdist-1.0.2`. To use it anyway we must move its content manually:
> ```
> ~/local$ mv ptxdist-1.0.0/projects ptxdist-1.0.2
> ```

If everything goes well, we now have a PTXdist-1.0.2 directory, so we can change into it:

```
~/local$ cd ptxdist-1.0.2
~/local/ptxdist-1.0.2$ ls -l

total 472
drwxr-xr-x   3 jb users   4096 2007-06-19 16:52 autoconf/
-rwxr-xr-x   1 jb users     28 2007-06-19 16:52 autogen.sh*
drwxr-xr-x   2 jb users   4096 2008-04-18 15:09 autom4te.cache/
drwxr-xr-x   3 jb users   4096 2008-04-15 14:44 bin/
-rw-r--r--   1 jb users 124874 2008-04-18 12:33 ChangeLog
drwxr-xr-x   9 jb users   4096 2007-06-19 16:52 config/
-rwxr-xr-x   1 jb users 192930 2008-04-18 15:09 configure*
-rw-r--r--   1 jb users   9775 2008-04-18 13:53 configure.ac
-rw-r--r--   1 jb users  18361 2007-06-19 16:52 COPYING
-rw-r--r--   1 jb users   2848 2008-04-07 13:08 CREDITS
drwxr-xr-x   3 jb users   4096 2007-06-19 16:47 debian/
drwxr-xr-x   3 jb users   4096 2008-04-17 12:51 Documentation/
drwxr-xr-x   8 jb users   4096 2007-06-19 16:52 generic/
-rw-r--r--   1 jb users    193 2008-04-17 13:07 INSTALL
-rw-r--r--   1 jb users   2686 2007-06-19 16:52 Makefile.in
drwxr-xr-x 134 jb users   4096 2008-04-07 13:08 patches/
-rw-r--r--   1 jb users   3985 2008-04-17 12:46 README
-rw-r--r--   1 jb users    691 2007-06-19 16:52 REVISION_POLICY
drwxr-xr-x   7 jb users  24576 2008-04-18 15:08 rules/
drwxr-xr-x   7 jb users   4096 2008-04-18 15:08 scripts/
drwxr-xr-x   3 jb users   4096 2007-06-19 16:51 tests/
-rw-r--r--   1 jb users  28512 2008-04-17 12:44 TODO
```

Prerequisites

Before PTXdist can be installed it has to be checked if all necessary programs are installed on the development host. The configure script will stop if it discovers that something is missing.

The PTXdist installation is based on GNU autotools, so the first thing to be done now is to configure the packet:

```
~/local/ptxdist-1.0.2$ ./configure
```

This will check your system for required components PTXdist relies on. If all required components are found the output ends with:

```
[...]
configure: creating ./config.status
config.status: creating Makefile
config.status: creating scripts/ptxdist_version.sh
config.status: creating rules/ptxdist-version.in

ptxdist version 1.0.2 configured.
Using '/usr/local' for installation prefix.

Report bugs to ptxdist@pengutronix.de


~/local/ptxdist-1.0.2$
```

Without further arguments PTXdist is configured to be installed into /usr/local, which is the standard location for user installed programs. To change the installation path to anything non-standard, we use the --prefix argument to the configure script. The --help option offers more information about what else can be changed for the installation process.

The installation paths are configured in a way that several PTXdist versions can be installed in parallel. So if an old version of PTXdist is already installed there is no need to remove it.

One of the most important tasks for the configure script is to find out if all the programs PTXdist depends on are already present on the development host. The script will stop with an error message in case something is missing. If this happens, the missing tools have to be installed from the distribution befor re-running the configure script.

(!) In this early PTXdist version not all tests are implemented in the configure script yet. So if something goes wrong or you don't understand some error messages send a mail to support@pengutronix.de and help us improve the tool.

When the configure script is finished successfully, we can now run

```
~/local/ptxdist-1.0.2$ make
```

All program parts are being compiled, and if there are no errors we can now install PTXdist into it's final location. In order to write to /usr/local, this step has to be performed as root:

```
~/local/ptxdist-1.0.2$ su
[enter root password]
/home/username/local/ptxdist-1.0.2$ make install
[...]
```

If we don't have root access to the machine it is also possible to install into some other directory with the --prefix option. We need to take care that the bin/ directory below the new installation dir is added to our $PATH environment variable (for example by exporting it in ~/.bashrc).

The installation is now done, so the temporary folder may now be removed:

```
~/local/ptxdist-1.0.2$ cd
~$ rm -fr local/ptxdist-1.0.2
```

Configuring PTXdist

When using PTXdist for the first time, some setup properties have to be configured. Two settings are the most important ones: Where to store the source packages and if a proxy must be used to gain access to the world wide web.

Run PTXdist's setup:

```
~$ ptxdist setup
```

Due to PTXdist is working with sources only, it needs various source archives from the world wide web. If these archives are not present on our host, PTXdist starts the `wget` command to download them on demand.

Proxy Setup

To do so, an internet access is required. If this access is managed by a proxy `wget` command must be adviced to use it. PTXdist can be configured to advice the `wget` command automatically: Navigate to entry *Proxies* and enter the required addresses and ports to access the proxy in the form:

$$\texttt{<protocol>://<address>:<port>}$$

Source Archive Location

Whenever PTXdist downloads source archives it stores it project locally. If we are working with more than one project, every project would download its own required archives. To share all source archives between all projects PTXdist can be configured to use only one archive directory for all projects it handles: Navigate to menu entry *Source Directory* and enter the path to the directory where PTXdist should store archives to share between projects.

Generic Project Location

If we already installed the generic projects we should also configure PTXdist to know this location. If we already did so, we can use the command `ptxdist projects` to get a list of available projects and `ptxdist clone` to get a local working copy of a shared generic project.

Navigate to menu entry *Project Searchpath* and enter the path to projects that can be used in such a way. Here we can configure more than one path, each part can be delemited by a colon. For example for PTXdist's generic projects and our own previous projects like this:

```
/usr/local/lib/ptxdist-1.0.2/projects:/office/my_projects/ptxdist
```

Leave the menu and store the configuration. PTXdist is now ready for use.

> (!) If there is no toolchain available yet, the next step is to build one at least for the desired target architecture. Refer to the application note "Building Toolchains" for further details.

Additional questions?

Below is a list of locations where you can get help in case of trouble. For questions how to do something special with PTXdist or general questions about Linux in the embedded world, try these.

Mailing Lists

About PTXdist in particular

This is an English language public mailing list for questions about PTXdist. See

> http://www.pengutronix.de/mailinglists/index_en.html

how to subscribe to this list. If you want to search through the mailing list archive, visit

> http://www.mail-archive.com/

and search for the list *ptxdist*.

About embedded Linux in general

This is a German language public mailing list for general questions about Linux in embedded environments. See

> http://www.pengutronix.de/mailinglists/index_de.html

how to subscribe to this list. Note: You also can send mails in English.

News Groups

About Linux in embedded environments

This is an English newsgroup for general questions about Linux in embedded environments.

comp.os.linux.embedded

About general Unix/Linux questions

This is a German newsgroup for general questions about Unix/Linux programming.

de.comp.os.unix.programming

Chat/IRC

About PTXdist in particular

irc.freenode.net:6667

Create a connection to the **irc.freenode.net:6667** server and enter the chatroom **#ptxdist**. This is an English room to answer questions about PTXdist. Best time to meet somebody there is at European daytime.

Miscellaneous

Online Linux Kernel Cross Reference

A powerful online cross reference.

<p style="text-align:center;">http://lxr.linux.no/blurb.html</p>

U-Boot manual (partially)

Manual how to survive in an embedded environment and how to use the U-Boot on target's side

<p style="text-align:center;">http://www.denx.de/wiki/DULG</p>

Commercial Support

You can order immediate support through customer specific mailing lists, by telephone or also on site. Ask our sales representative for a price quotation for your special requirements.

Contact us at:

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