



E0: Installation

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Software Requirements

In order to successfully install PALM, please make sure to meet the following software requirements:

- The **bash** shell (available at `/bin/bash`)
- A recent Fortran Compiler (GNU, Intel, Cray, PGI)
- The Message Passing Interface (MPI) library with MPI-3 support (compiled with the same Compiler as PALM)
- A netCDF library not earlier than version 3.6.3 (compiled with the same Compiler as PALM)
- The Subversion version control system (**svn**) is required in order to retrieve the PALM source code.
- The build software **cmake** is used by the automatic installer script in order to detect all required libraries
- A FFTW library (optional) PALM also comes with a build-in FFT (slower)
- **Python** (optional in case you want to use the GUI)

With Ubuntu 16.04 you are lucky. This one-liner will set you up:

```
sudo apt-get install subversion cmake gfortran mpich libmpich-dev libnetcdf-dev netcdf-bin libfftw3-dev
```

└ The automatic installer

PALM can be installed with an Automatic Installer Script as follows:

- Download the Automatic Installer Script at:
https://palm.muk.uni-hannover.de/trac/raw-attachment/wiki/doc/install/automatic/palm_installer
- Execute the installer in your download directory by typing

```
bash palm_installer
```

- The script will lead you through the Installation process.
- Make sure no errors have occurred by carefully checking the output of the installation script.

Common Problems

Required libraries are missing:

- Symptom: You experience a configuration error like:
 - Could NOT find MPI_Fortran (missing: MPI_Fortran_LIBRARIES)
 - Could NOT find NetCDF (missing: NetCDF_LIBRARIES)
- Explanation: The installer automatically looks for the required MPI and NetCDF libraries. Sometimes (especially with manual library installations) the libraries can not be automatically detected.
- Solution: Make sure you successfully installed all required libraries including their Fortran versions. Add the library locations to the environment variable `LD_LIBRARY_PATH`. You can also force the installer to use the MPI compiler wrapper `mpif90` and specify the NetCDF library location instead of the automatic detection.

Common Problems

Your MPI or NetCDF libraries have been build with another compiler:

- Symptom: During compilation some code error is detected.
 - Fortran compiler "ifort" does not match netCDF Fortran compiler "gfortran"
 - File 'mpi.mod' opened at (1) is not a GNU Fortran module file
- Explanation: PALM requires MPI and NetCDF libraries to be build with the same compiler it is supposed to be build with.
- Solution: Use the same compiler for MPI, NetCDF and PALM

Common Problems

You have libraries from multiple MPI implementations installed (e.g OpenMPI and MPICH):

- Symptom: Between compilation and linking the libraries get mixed.
 - *Any error that talks about multiple missing MPI functions at link time.*
- Explanation: It could happen that the compiler includes the header/module file of one implementation but the linker later uses the library from the other implementation.
- Solution: Avoid having multiple MPI implementations installed. In case you really need them both, make sure they do not sit in the same location and only have the one activated in your environment, that you like to use for PALM (e.g. do not add both to your LD_LIBRARY_PATH)

Common Problems

Your compiler is too old (especially GNU 4.8.X is too old) :

- Symptom: During compilation some code error is detected.
 - 'x' argument of 'c_sizeof' intrinsic at (1) must be an interoperable data entity
 - argument 'array' to 'c_loc' at (1) must be an associated scalar POINTER
- Explanation: A specific function or feature is not known to the compiler in use (as we test PALM regularly, it is unlikely that this is a bug in PALM)
- Solution: Install a recent compiler!

Common Problems

Your MPI library is missing features:

- Symptom: During compilation some code error is detected.
 - Error: There is no specific subroutine for the generic 'mpi_alloc_mem'
- Explanation: PALM uses a wide range of MPI-3 functions. In some older MPI library versions, some of these functions are not implemented yet. There have been problems especially with older OpenMPI versions.
- Solution: Install a recent MPI implementation (we recommend mpich or mvapich).

└ Post-installation state

The installation script should have placed the following inside the chosen installation directory:

- The PALM source code directory `trunk/`
- a configuration file `.palm.config.default`
- a directory named `JOBS/` that contains a test setup
- a directory named `MAKE_DEPOSITORY_default/` that contains the compiled PALM binaries

In in your `~/.bashrc` file the `trunk/SCRIPTS` directory should be added to your `PATH` environment variable.

In order to start working with PALM please restart your shell or type:

```
source ~/.bashrc
```

Update PALM

A PALM update to the newest revision can be performed as follows:

- Go to your PALM installation directory and type:

```
svn update trunk/
```

- To rebuild PALM after you have updated the source code type:

```
palmbuild -h "default"
```