plan4res installation

Sandrine Charousset,
EDF

June, 4, 2025

This project receives funding from the European Union's Horizon 2023 Framework Programme for Research and Innovation under Grant Agreement no. 101118123

Installing plan4res on windows

If not already there, install Git for Windows (use default settings) https://git-for-windows.github.io/

2 options to install plan4res on Windows:

- (Highly recommened): WSL (Windows Subsystem for Linux
- (Highly UN-recommended): Vagrant and VirtualBox

WSL as well as Vagrant+VirtualBox allow to emulate a UNIX system on the windows computer

This project receives funding from the European Union's Horizon 2023 Framework Programme for Research and Innovation under Grant Agreement no. 101118123

Installing plan4res in WLS

Requirements:

- Windows 10 or higher
- powershell

Procedure:

- Open PowerShell as administrator and enter: `wsl –install`
  - For more advanced option see https://learn.microsoft.com/en-us/windows/wsl/install

- Open a linux terminal and follow the plan4res linux installation procedure
  - See https://learn.microsoft.com/en-us/windows/wsl/tutorials/linux to find out how to open a terminal

This project receives funding from the European Union's Horizon 2023 Framework Programme for Research and Innovation under Grant Agreement no. 101118123

Installing plan4res with Vagrant

Requirements:

- Windows 7 pro 64bit SP1 or higher
- powershell 3.0 or higher
- CPU must support hardware virtualization (which may require beeing enabled in the BIOS)

Procedure:

- Install Git for Windows (use default settings) https://git-for-windows.github.io/
- Install VirtualBox and Extension Pack https://www.virtualbox.org/wiki/Downloads
- Install Vagrant https://www.vagrantup.com/downloads.html
- Open Git Bash and follow the Linux installation procedure

See **https://gitlab.com/cerl/plan4res/p4r-env#windows**

This project receives funding from the European Union's Horizon 2023 Framework Programme for Research and Innovation under Grant Agreement no. 101118123

Installing plan4res in linux

Create a directory (e.g. P4R_DIR) and move into it

- mkdir P4R_DIR && cd P4R_DIR

Prepare your installers/licence for commercial solvers (LINUX versions required)

- plan4res can use HiGHS (default), SCIP , Gurobi or CPLEX
- For CPLEX: copy your cplex_studioXXXX.linux_x86_64.bin installer in P4R_DIR
- For Gurobi: copy yout gurobiXX.X.X_linux64.tar.gz installer and your gurobi.lic licence file in P4R_DIR

Download the installation script and launch the installation

- git clone https://github.com/plan4res/install
- mv install/$.sh . && rm –rf install && chmod a+x $.sh
- Launch the installer: ./plan4res_install.sh WITH specific options

This project receives funding from the European Union's Horizon 2023 Framework Programme for Research and Innovation under Grant Agreement no. 101118123

Installing plan4res in linux

The installer is launched as follows:

./plan4res_install.sh [-S <SOLVER>] [-I <installer>] [-L <license>] [-v <version>]
[-M <mpi>] [-V <memory>]

- -S SOLVER: CPLEX or GUROBI or SCIP or HiGHS (default: HiGHS)
- -I Installer: name of installer file for CPLEX or GUROBI
- -L license: license file for gurobi
- -V version: version number for SCIP (default 9.2.0)
- -M mpi : if running on a system with MPI, you can choose MPICH or OpenMPI (default: OpenMPI); With Vagrant, MPICH is mandatory
- -V memory: option –V is mandatory when using Vagrant. Memory is the memory which will be given to the virtual machine

This project receives funding from the European Union's Horizon 2023 Framework Programme for Research and Innovation under Grant Agreement no. 101118123

OpenMod Africa

plan4res

The plan4res environment

Sandrine Charousset,
EDF

June, 4, 2025

This project receives funding from the European Union's Horizon 2023 Framework Programme for Research and Innovation under Grant Agreement no. 101118123

Plan4res
Power System Model

- Generation mix (capacities, costs, constraints) (incl. Storages....)
- Electricity demand (and system services rqrts)
- Interconnections
- Uncertainties
- Costs (OPEX and CAPEX)
- Investment potentials

- Generation schedules
- Emissions
- Marginal costs
- Costs and revenues
- Power not served

- Additional Generation capacities
- Additional Interconnection capacities
- Additional storage capacities

This project receives funding from the European Union's Horizon 2023 Framework Programme for Research and Innovation under Grant Agreement no. 101118123

Plan4res environment

plan4res is set-up as a container

Containers are executable units of software that package application code along with its libraries and dependencies. They allow code to run in any computing environment, whether it be desktop, traditional IT or cloud infrastructure.

This project receives funding from the European Union's Horizon 2023 Framework Programme for Research and Innovation under Grant Agreement no. 101118123

Plan4res structure

plan4res is composed of the following pieces:

- **The p4r-env container : https://gitlab.com/cerl/plan4res/p4r-env**
- **The SMS++ modelling and optimization library : https://gitlab.com/smspp**
- **The plan4res python linkage, data pre/post processing, and visualisation scripts : https://github.com/plan4res/plan4res-scripts**
- **The plan4res workflow scripts: https://github.com/plan4res/include**

The plan4res installation script install all the pieces

This project receives funding from the European Union's Horizon 2023 Framework Programme for Research and Innovation under Grant Agreement no. 101118123

p4r-env: the plan4res environment

It is composed of the following sub-repos

- (hidden) **.cache_p4r** : contains the .sif singularity image of the plan4res container
- **bin**: contains executables to run the container or to update/rebuild it
- **config**: contains the configuration files of the plan4res container
- **executor**: contains the definition files of the plan4res container
- **scripts**: contains all software installed after the container was built
  - **python**: contains all plan4res python scripts
  - **include**: contains the bash scripts used for plan4res workflows
  - **add-ons**: contains the main softwares=> SMS++ and the solvers

This project receives funding from the European Union's Horizon 2023 Framework Programme for Research and Innovation under Grant Agreement no. 101118123

The container

The plan4res container is a singularity image (.sif)

- **It includes:**
  - A full linux installation (currently debian:bullseye, soon debian:bookworm)
  - All dependencies required by of SMS++ (in particular boost, eigen, netcdf-C++, see https://gitlab.com/smspp/smspp#getting-started)
  - Python3 and all packages needed by the plan4res python scripts
  - Soon: julia and the packages needed by GENeSYS-MOD
- **It can be ran by typing bin/p4r from p4r-env/**
  - This will launch a linux prompt within the container environment. All plan4res modules can be manually ran from this prompt.

This project receives funding from the European Union's Horizon 2023 Framework Programme for Research and Innovation under Grant Agreement no. 101118123

OpenMod Africa

is now ready for running!

Thanks for your attention!

This project receives funding from the European Union's Horizon 2023 Framework Programme for Research and Innovation under Grant Agreement no. 101118123