EPANET-MATLAB-Toolkit (EMT) Installation Instructions

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In this document, we provide the installation instructions of the EPANET-MATLAB-Toolkit. The EPANET-MATLAB Toolkit is an open-source software, originally developed by the KIOS Center of Excellence at the University of Cyprus. It provides a programming interface for the latest version of EPANET, a hydraulic and quality modeling software created by the US EPA, with MATLAB, a high-level technical computing software. The goal of the EPANET-MATLAB Toolkit is to serve as a common programming framework for research and development in the growing field of smart water networks. The Toolkit provides easy-to-use commands/wrappers for viewing, modifying, simulating and plotting results produced by the EPANET libraries. Moreover, various tools have been implemented to allow the execution of tasks which are complicated with the standard EPANET library.

Contents

Setting up EPANET-MATLAB Toolkit

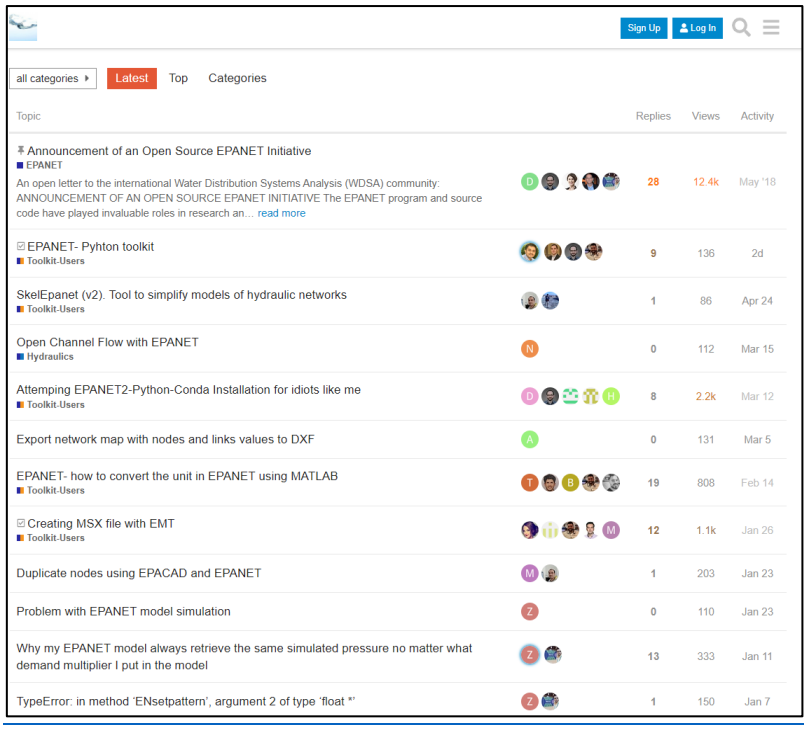
MATLAB usage

You can install MATLAB® on your machine by following the steps on the following MathWorks link: https://www.mathworks.com/products/matlab/student.html

We suggest to use MATLAB® for windows platform.

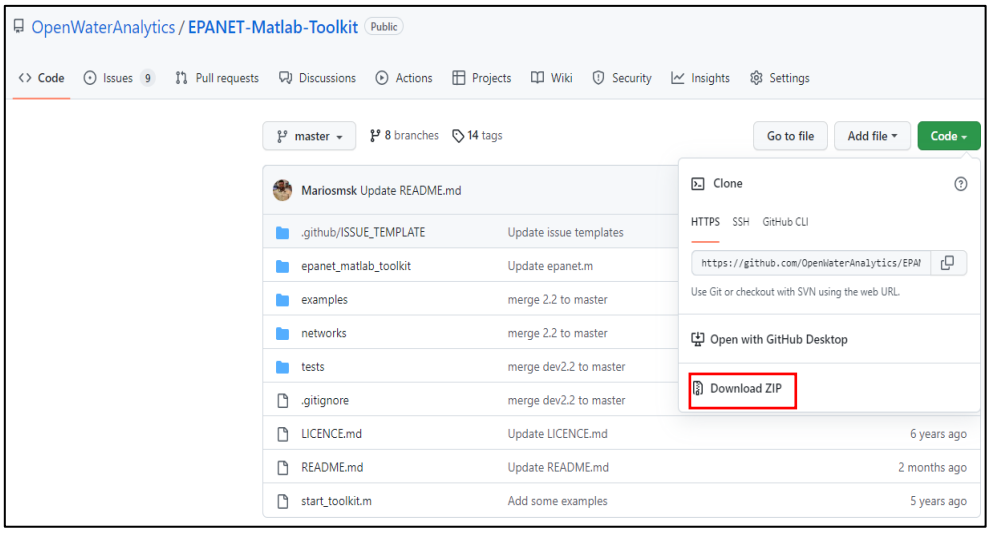
How to ask for help

There is an online community, which is actively supported by KIOS. You can ask for comments and help at http://community.wateranalytics.org

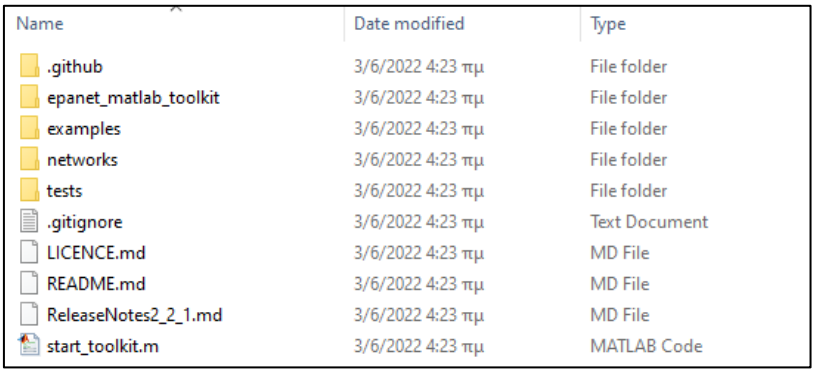


Download

The EPANET-MATLAB Toolkit is available at the following link:
https://github.com/OpenWaterAnalytics/EPANET-Matlab-Toolkit



Structure of the Toolkit

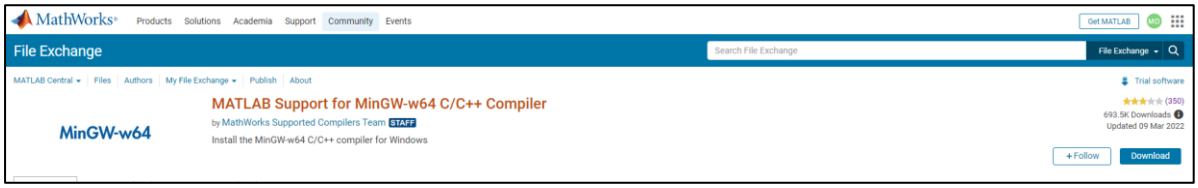


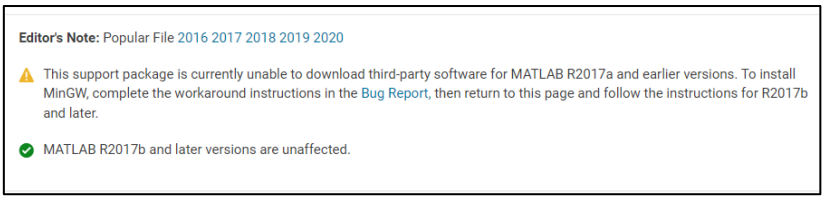
Name	Date modified	Type
.github	3/6/2022 4:23 πμ	File folder
epanet_matlab_toolkit	3/6/2022 4:23 πμ	File folder
examples	3/6/2022 4:23 πμ	File folder
networks	3/6/2022 4:23 πμ	File folder
tests	3/6/2022 4:23 πμ	File folder
.gitignore	3/6/2022 4:23 πμ	Text Document
LICENCE.md	3/6/2022 4:23 πμ	MD File
README.md	3/6/2022 4:23 πμ	MD File
ReleaseNotes2_2_1.md	3/6/2022 4:23 πμ	MD File
start_toolkit.m	3/6/2022 4:23 πμ	MATLAB Code

Install C Compiler

Windows: MinGW-w64 Compiler for MATLAB
https://www.mathworks.com/matlabcentral/fileexchange/52848-matlab-support-for-mingw-w64-c-c-compiler

Tutorial: https://youtu.be/R_RABL3_6EY





If you have multiple C or C++ compilers, use mex -setup to choose MinGW. After installation, run in MATLAB's command window:

```
>>> mex -setup
```

If this has been correctly configured, you should see the following:

MEX configured to use '**MinGW64 Compiler (C)**' for C language compilation.

Linux: GCC C/C++

For Linux GNU Compiler Collection (GCC) can be used (versions 7.x-10.x). Run the following on linux cmd:

```
$ gcc --version
```

If gcc is not installed, run the following:

```
$ sudo apt update
$ sudo apt-get install manpages-dev
```

After installation, run in MATLAB's command window:

```
>>> mex -setup
```

If this has been correctly configured, you should see the following:

MEX configured to use '**gcc**' for C language compilation.

1. Open terminal
2. cd epanet_matlab_toolkit/glnx
3. sudo cp libepanet2.so /lib64/libepanet.so (centos)
   sudo cp libepanet2.so /lib/x86_64-linux-gnu/libepanet.so (ubuntu)
4. >>start_toolkit
5. >> d = epanet('Net1.inp');

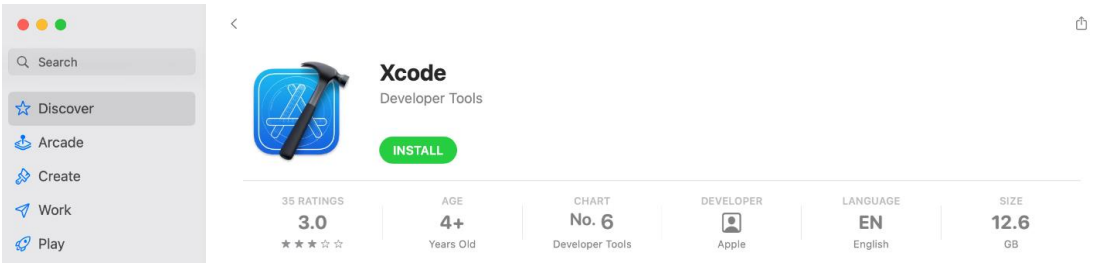
Mac: Xcode

To avoid the following warning message when mex -setup:

```
Command Window
>> mex -setup
Warning: Xcode is installed, but its license has not been accepted. Run Xcode and accept its license agreement.

Error using mex
No supported compiler was found. For options, visit https://www.mathworks.com/support/compilers.
```

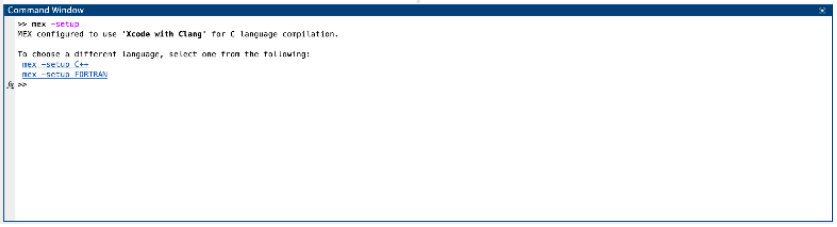
```
>> start_toolkit
EPANET-MATLAB Toolkit Paths Loaded.
>> d=epanet('Net1.inp')
Error using loadlibrary
No supported compiler was found. For options, visit https://www.mathworks.com/support/compilers.

Error in loadlibrary

Error in epanet/ENLoadLibrary (line 685)
                        loadlibrary(LibEPANET, [LibEPANETpath, LibEPANET, '.h']);

Error in epanet (line 3419)
            obj.ENLoadLibrary(obj.LibEPANETpath, obj.LibEPANET);
```

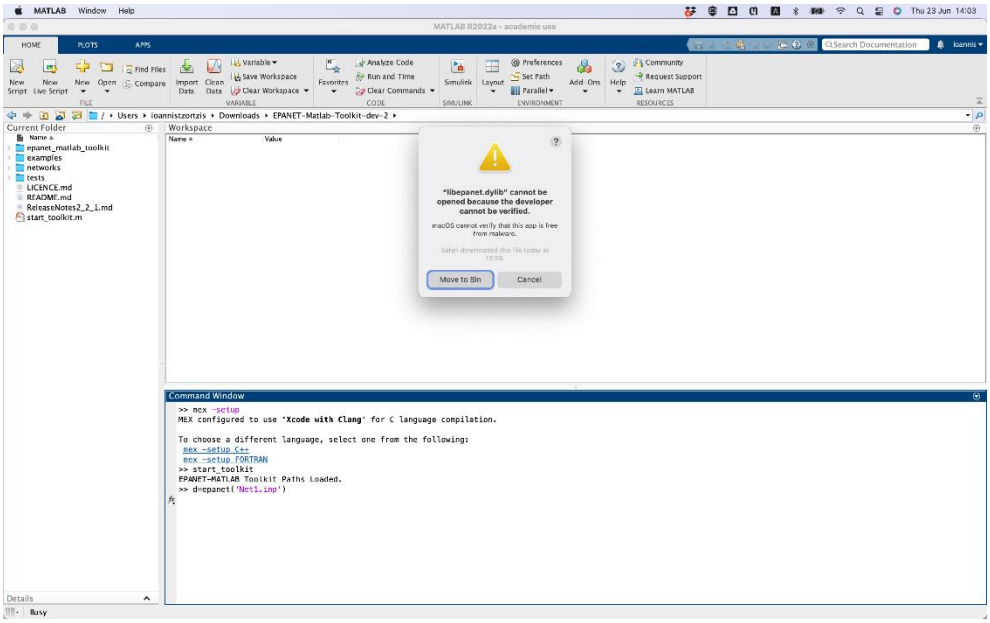
Install Xcode compiler



>> start_toolkit;

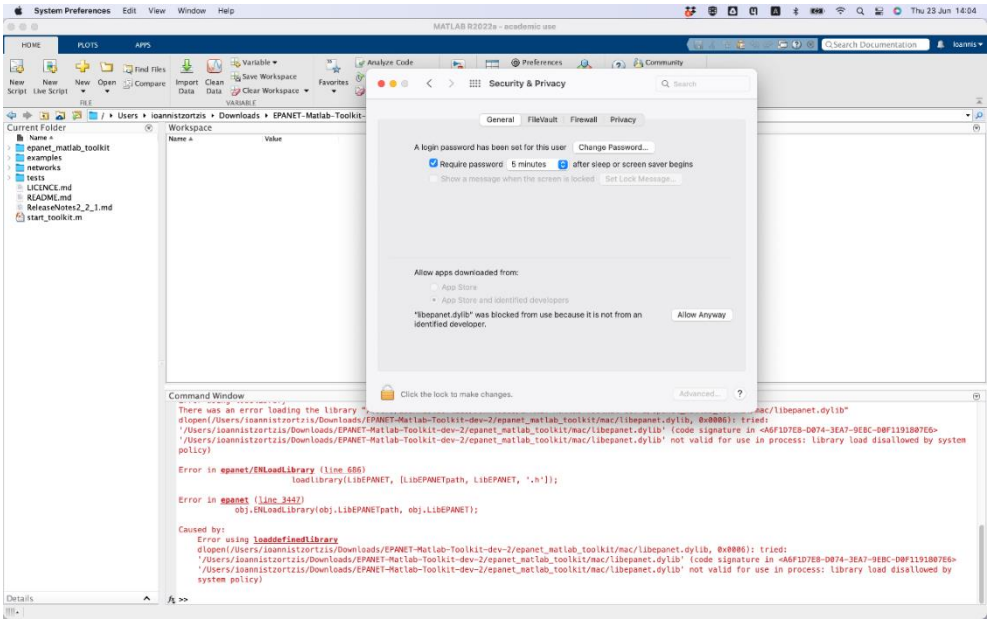
>> d = epanet('Net1.inp');





Follow these steps:

System Preferences -> Security & Privacy -> Allow apps downloaded from: allow libepanet.dylib



1. open terminal
2. cd epanet_matlab_toolkit/mac
3. sudo cp libepanet2.dylib /usr/local/lib/libepanet.dylib
4. >> start_toolkit
5. >> d = epanet('Net1.inp');

How to use the EPANET-MATLAB Toolkit

Run the following code in MATLAB environment

Initialize EPANET-MATLAB Toolkit

Load all the paths in MATLAB. You should always begin with this command to load the toolkit.
Run the following command in the directory of EMT (set MATLAB current folder):

Tutorial: https://youtu.be/7fQTeZ0mH8Q

```
>>> start_toolkit
```

You should see the following text:

EPANET-MATLAB Toolkit Paths Loaded.

Note: MATLAB on Mac has limited EPANET MSX functionalities.

Minimum Example

Load a Network

```
% Decide which network to load from the "/networks/" folder (.inp files)
filename = 'net2-cl2.inp';

% Call epanet class and load all data and functions in d structure
d = epanet(filename);
```

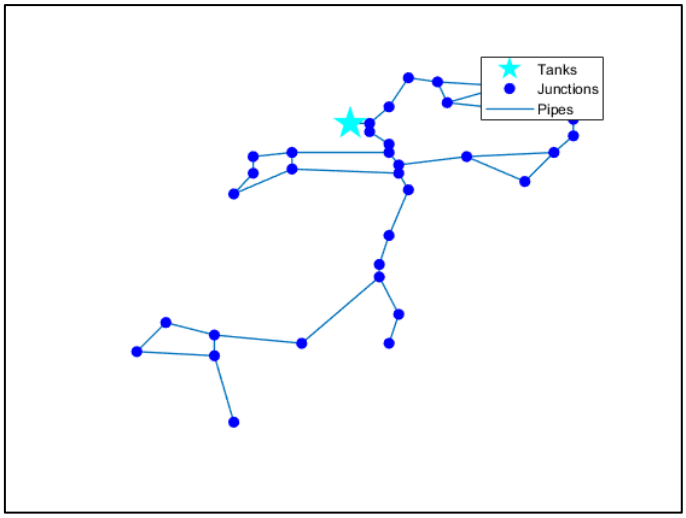
```
EPANET version {20200} loaded (EMT version {v2.2.002}).
Loading File "net2-cl2.inp"...
Input File "net2-cl2.inp" loaded successfully.
```

Display network components information

```
pipeCount = d.getLinkCount
nodeCount = d.getNodeCount
nodeTypes = d.getNodeType
```

```
pipeCount =
  40
nodeCount =
  36
Plot Network
```

```
d.plot;
```



Published with MATLAB® R2022a

MATLAB online

Alternatively, you can use MATLAB Online. You can use the following steps:

1) Create New Folder with name EMT.
2) Clone EMT repository in the new folder (New -> From Git).
3) Run >>start_toolkit from the EMT directory.

Note: MATLAB Online has limited functionalities.