

Simulation Launcher

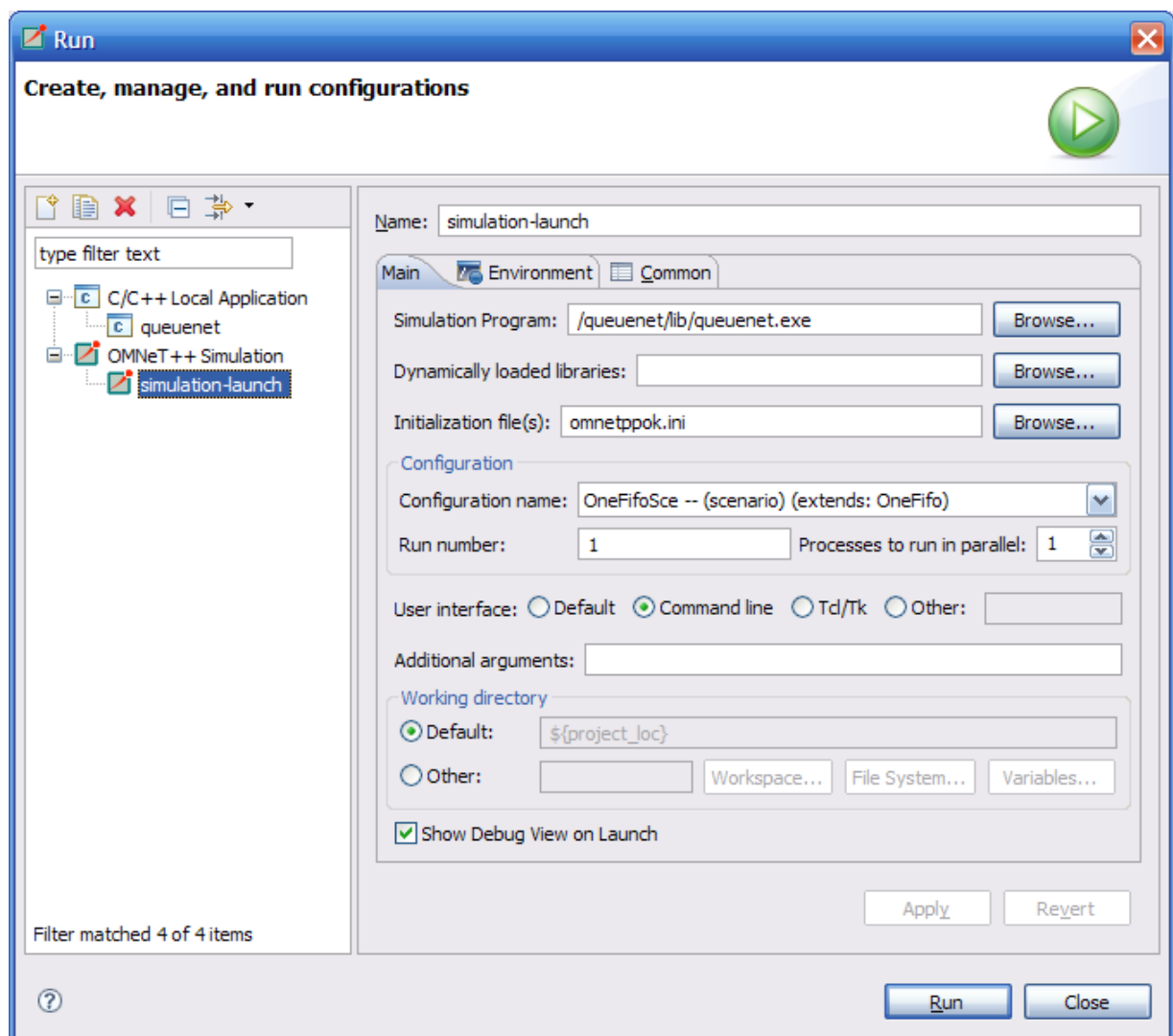
1.Introduction

In previous versions of OMNeT++, executing a simulation or carrying out experiments was done by manually launching the executable file from the windowing environment or from a command line shell. Experiments that needed several runs with different parameters required external scripts to be written and executed. The new version of the OMNeT++ IDE allows for running simulations and simulation batches directly from the IDE.

2.Launching the simulation

1.1 Creating launch configuration

OMNeT++ IDE adds a new Eclipse launch configuration type that supports launching simulation executables. This launch type, *OMNeT++ Simulation*, is available from the *Run* dialog. To create a new run configuration, select *Open Run Dialog...* from the *Run* menu. A dialog appears, with the possible launch types on the left. Select *OMNeT++ Simulation*, click the *New launch configuration* icon, then enter a configuration name at the top of the dialog form that appears.



The main tab of the configuration dialog was designed to make the launching of simulation as easy as possible. The only required field is the simulation program, all others have defaults. If you only select the simulation program, it will run *Run 1* of the first configuration from the *omnetpp.ini* file in the working directory.

- ☐ **Simulation program:** you must set the name of the simulation executable here. This path is relative to the workspace root. You may use the *Browse...* button to select the executable directly.
- ☐ **Dynamically loaded libraries:** A simulation may load additional DLLs or shared libraries before execution. The browse button is available to select one or more files (use CTRL click for multiple selection). This option can be used to load simulation code (i.e. simple modules), user interface libraries, or other extension libraries (scheduler, output file managers, etc)
- ☐ **Initialization file(s):** You should specify an INI file(s) that will be used to launch the simulation. If no filename is specified here, *omnetpp.ini* will be assumed in the current working directory. Specifying more than one file simply loads all those files in the specified order.
- ☐ **Configuration name:** Once you specified a legal INI file, the box will present all of the Config and Scenario sections in that file. In addition it will display the description of that section and the info that which Config section is extended by this section). You may select which Configuration should be launched. (NOTE: the working directory and the INI file must contain valid entries before trying to set this option)
- ☐ **Run number:** It is possible to specify which run number(s) must be executed for the simulation. If the executable name and the INI file was already selected and a *Scenario* was specified for the configuration name, it is possible to hover above the field to get more info about the possible run numbers. You can use comma and hyphen to separate the run numbers; for example, 1,2,5-9,20 corresponds to run numbers 1,2,5,6,7,8,9,20. Entering a single asterisk (*) corresponds to *all* run numbers. Running several simulations in this manner is called *batch* execution.

NOTE: Batch execution is possible only if the User interface is command line (simulation was built to support command line environment (Cmdenv) and the User interface. (see User interface selection)

- ☐ **Processes to run in parallel:** with batch execution, it is possible to tell the launcher to keep two or more simulations running at a time. This way you can take advantage of multiple CPUs or CPU cores. Use this option carefully, only if your simulation is CPU-limited, and you have enough physical RAM to support all of them at the same time. Do not set it higher than the number of physical processors you have in your machine.

NOTE: This is usually an easier and more efficient way to exploit multiprocessing power than parallel simulation (PDES).

- ☐ **User interface:** You can specify which UI environment should be used during execution, currently command line (Cmdenv) and Tcl/Tk (Tkenv) is supported. The executable must be linked with the correct UI library or the UI should be loaded dynamically.

NOTE: Batch execution and progress feedback during execution is supported only for command line environment.

- ☐ **Additional arguments:** any other command line argument can be specified here and will be passed to the simulation process.
- ☐ **Working directory:** you can change the default working directory for the process. You can specify a workspace relative or absolute file system path, or even a path relative to predefined system variables.

NOTE: All paths (except for the Simulation Program) are relative to the working directory. Changing the working directory invalidates all previously selected entries.

- ☐ Show Debug View on Launch: convenience function to open the debug view on simulation execution. Debug View allows you to see and terminate the processes you have launched and allows to switch between their output in the console view.

Most settings in the dialog simply translate to command-line options to the simulation executable. This is summarized in the following table:

- ☐ Dynamically loaded libraries: maps to multiple “-l <library>” options
- ☐ Initialization files: maps to multiple “-f <infile>” options
- ☐ Configuration name: adds a “-c <configname>” option
- ☐ Run number: adds a “-r <runnumber>” option
- ☐ User interface: adds a “-u <userinterface>” option

1.2 Controlling the execution and progress reporting

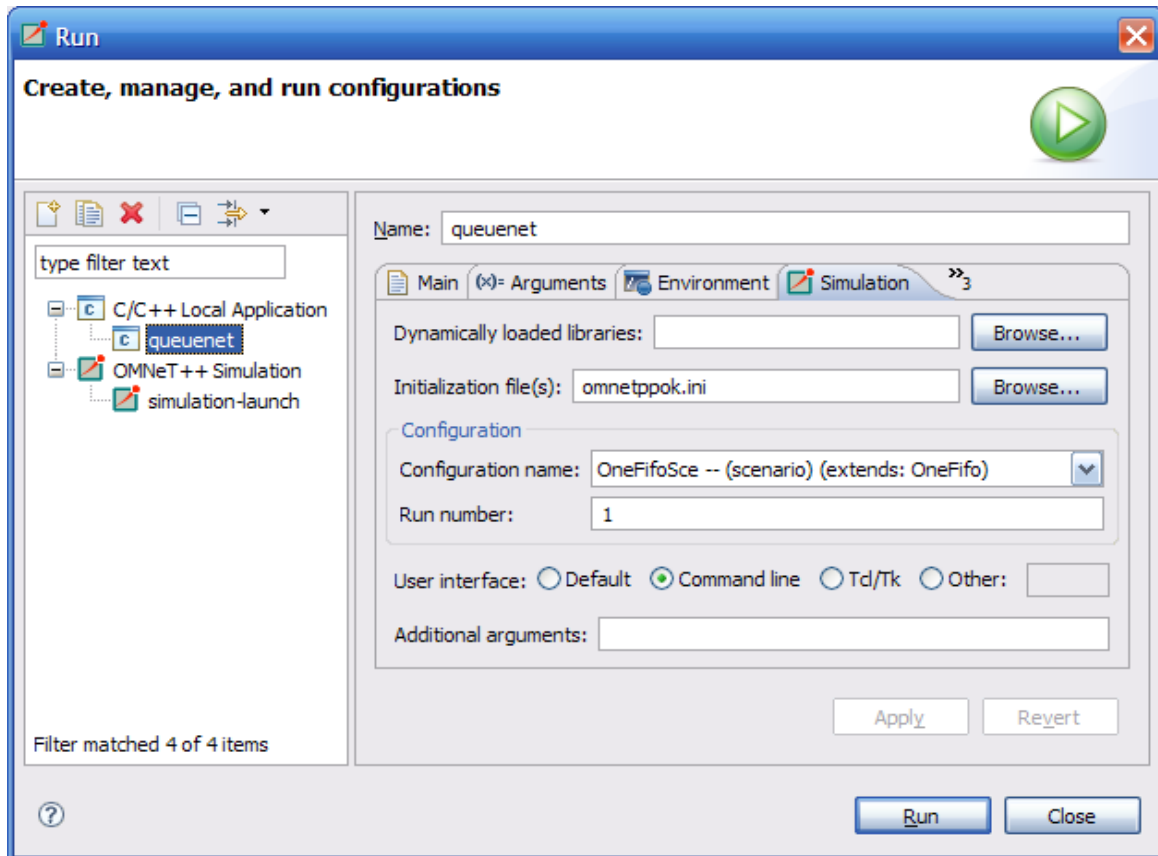
After starting a simulation process or simulation batch we can keep track of the started processes in the Debug View. To open the Debug View check the *Show Debug View on Launch* in the run configuration dialog, or select *Window / Show View... / Other... / Debug / Debug*. Clicking on the process allows terminating the process or switching to the output of that process in the Console view. Use the context menu for more options to control the process execution.

ADVICE: place the debug view to a different tab group than the console so you will be able to switch between the process outputs and see the process list at the same time.

If you have executed the simulation in the command line environment, you can monitor the progress of the simulation in the progress view. See the status line for the overall progress indicator and click on it to open the detailed progress view. It is possible to terminate the whole batch by clicking on the cancel button in the progress view.

NOTE: When progress view displays “Waiting for user input” the simulation is waiting for the user. Switch to the appropriate console and provide the requested input for the simulation.

3. Using CDT to launch and debug the simulation



The OMNeT++ IDE integrates with the CDT (C/C++ Development Tooling). If you want to debug your application you have to launch/debug your application by starting it as a C/C++ Local Application. OMNeT++ contributes an additional tab to the CDT launch dialog for your convenience. You will be able to specify simulation related command line options on this tab and CDT will launch your simulation with these arguments. The executable name must be specified on the Main tab. The rest of the fields have similar meaning like in the OMNeT++ Simulation launch type. You can add additional arguments on the default Arguments tab.

NOTE: Debugging your application is possible only if you launch it as a C/C++ Local Application. The OMNeT++ Simulation launch type does not support debugging.

NOTE: Batch (and parallel) execution is not possible in this launch type, so you may specify only a *single* run number.