Using the OMNeT++ Discrete Event Simulation System in Education

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***Index Terms*— Computer networks, discrete-event simulation, distributed, parallel, graphical user interface.**

I. SUMMARY

The intent of this paper is to contribute to the teaching of computer networks, parallel and distributed systems, and discrete-event simulation by presenting a simulation system that is ideally suited for educational use. OMNeT++ is a C++-based discrete-event simulator which uses the process-interaction approach. An OMNeT++ model consists of modules communicating by message passing. Modules can be arbitrarily nested. Model topology is specified by a topology description language which supports separation of interface and functionality and facilitates model reuse. One of the strengths of OMNeT++ is that one can execute the simulation under a powerful graphical user interface. The GUI makes the internals of a simulation model fully visible to the person running the simulation: it displays the network graphics, animates the message flow and lets the user peek into objects and variables within the model. The use of the tracing/debugging capabilities does not require extra code to be written by the simulation programmer. The combination of these features make OMNeT++ a good choice for use in the education. OMNeT++ is open-source and free for nonprofit use. The CD-ROM contains the full source distribution, the manual in HTML format, and a Win95/NT executable with several sample simulation models and their sources.

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