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Title: Omnetpy: Modeling Networks with Python, Simulating them in Omnet++

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Abstract: OMNeT++ is a discrete event simulator in which users define the model to be simulated through code written in the C++ language. The resulting performance has been very well received by the community, making OMNeT++ one of the most popular simulator frameworks nowadays. However, modeling in C++ has turned out to be a pedagogical barrier, as we verified in our networking lectures in the computer science faculty in FAMAFA (Córdoba, Argentina). The core reason lies in the complexity of C++ as a language: the difficulty of managing pointers, the type system, the verbosity of the syntax, and the lack of features such as garbage collection - especially in a context where Python is continuously gaining popularity among students. To overcome this issue we have developed a package that enables the development of Python modules in the context of OMNeT++. Achieving this goal requires a careful integration of an interpreted language with the workflow of a compiled language. Specifically, in this talk, we analyze the internal architecture of OMNeT++ and cPython to then identify the best strategy to extend the Python interpreter, as well as embedding it in OMNeT++. Having the core approach implemented in a proof-of-concept package coined Omnetpy, we here offer a brief tutorial on how to use it. Also, we study and compare the performance of several OMNeT++ sample models implemented both in Python and C++. We find that describing modules in Python greatly simplifies the model description process, which is particularly valuable for pedagogical use in future computer science and related lectures.