

# Why We STILL Don't Know How to Simulate Networks

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Discrete event simulation has been used in the evaluation of computer communications networks for three or four decades. Over this period of time our simulation capability has improved significantly due to the efforts of the simulation research community. There has also been significant progress over the years by the networking research community in understanding the use of simulation in the design and evaluation of network architectures, protocols and services. I will argue in this talk that, despite these advances, we still do not have an acceptable and widely-used methodology to simulate networks which often leads to the questioning of the credibility of simulation results. This can be attributed to many reasons, including 1) confusion and uncertainty within the networking community regarding the role that simulation plays in networking research, 2) fundamental limits that make it basically impossible to simulate Internet-scale networks, 3) the difficulty in building realistic network models and 4) the lack of acceptable standards for validity and repeatability of simulation experiments. I will suggest a high-level research agenda that addresses these issues with the ultimate aim of enriching the networking research community's ability to use simulation as a meaningful tool for performance evaluation and prediction.