

# PSINS: An Open Source Event Tracer and Execution Simulator for MPI Applications

**Title:** [PSINS: An Open Source Event Tracer and Execution Simulator for MPI Applications](#)

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**Abstract:** The size of supercomputers in numbers of processors is growing exponentially. Today's largest supercomputers have upwards of a hundred thousand processors and tomorrow's may have on the order one million. The applications that run on these systems commonly coordinate their parallel activities via MPI; a trace of these MPI communication events is an important input for tools that visualize, simulate, or enable tuning of parallel applications. We introduce an efficient, accurate and flexible trace-driven performance modeling and prediction tool, PMAc's Open Source Interconnect and Network Simulator (PSINS), for MPI applications. A principal feature of PSINS is its usability for applications that scale up to large processor counts. PSINS generates compact and tractable event traces for fast and efficient simulations while producing accurate performance predictions. It also allows researchers to easily plug in different event trace formats and communication models, allowing it to interface gracefully with other tools. This provides a flexible framework for collaboratively exploring the implications of constantly growing supercomputers on application scaling, in the context of network architectures

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