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Extreme-Scale Parallel Discrete Event Simulation

U.S. ARMY RDECOM

ARL open campus

S&T Campaign: Computational Sciences
Computing Sciences

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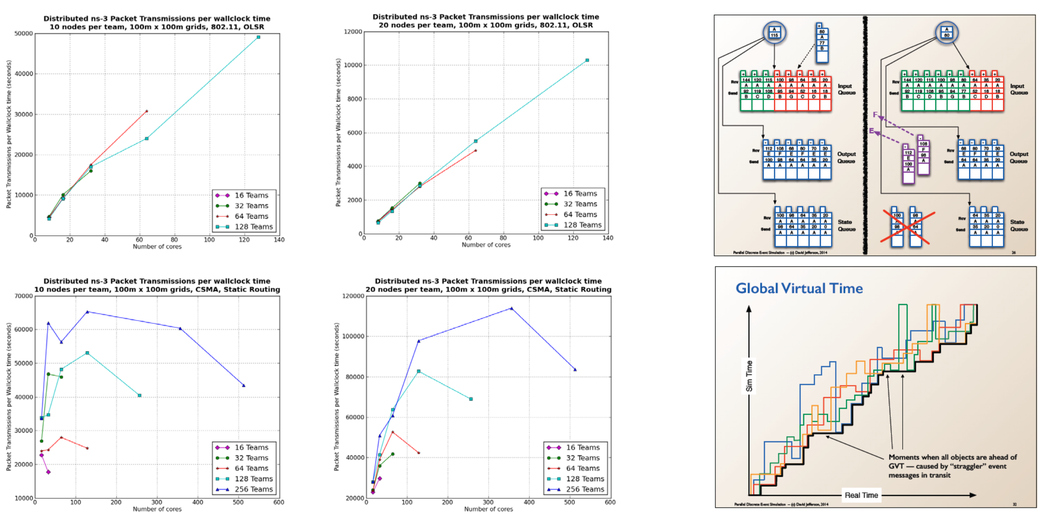
Research Objective

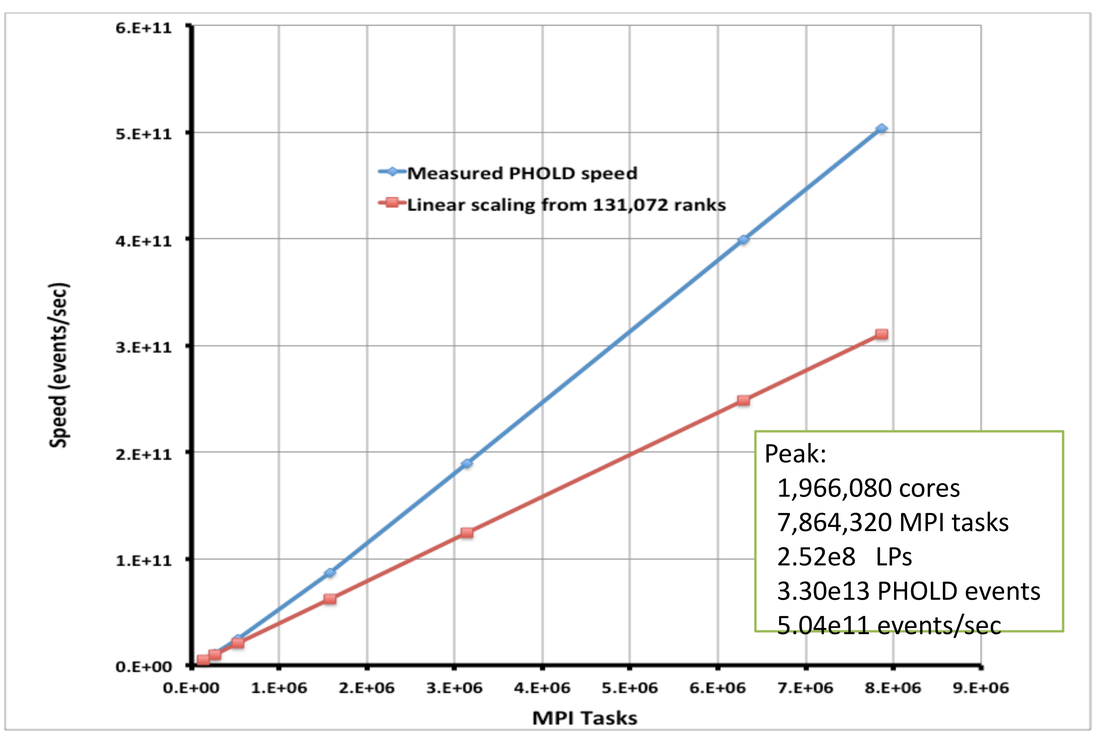
- Develop algorithms for extreme-scale parallel discrete event simulation focusing on new architectures and optimistic approaches
- Integration of algorithms into next generations of network simulation codes



ns-3

Challenges

- Overcoming inter-process communication latencies among processing elements of a simulation
- Algorithms for optimistic parallel discrete event simulation involving roll-backs and automatic reverse computation code generation
- Internet-scale network simulations
- Packet routing in large-scale network simulations



Scaling Performance of Optimistic PDES schedulers

ARL Facilities and Capabilities Available to Support Collaborative Research

- HPCMP/ARL-DSRC supercomputer resources (Pershing, Excalibur)
- Extensive experience with parallel discrete event simulation with NS-3 on HPC platforms
- Demonstrated large-scale simulation on HPC platforms (360M network nodes)

Complementary Expertise/ Facilities/ Capabilities Sought in Collaboration

- Extreme-scale Parallel Discrete Event Simulation expertise
- Optimistic Parallel Discrete Event Simulation systems and tools for building modeling and simulation codes
- Network simulation tools that can perform at large scales

Extreme-Scale Network Simulation

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