

Combining OpenFabrics Software and Simulation Tools for Modeling InfiniBand-based Interconnection Networks

German Maglione Mathey, Jesus Escudero-Sahuquillo,
Pedro Yebenes, Pedro J. Garcia, Francisco J. Quiles

Redes y Arquitecturas de Altas Prestaciones (RAAP)
University of Castilla-La Mancha

(Work-in-Progress)

Outline

Motivation

The RAAP HPC Tools

Conclusions

Outline

Motivation

The RAAP HPC Tools

Conclusions

Motivation

One of the challenges in the design of interconnection networks is to model the hardware/software interactions, and use them in simulation platforms modeling new features for the interconnect hardware.

Motivation

- ▶ In our research activities we have faced a recurrent issue related to the output treatment when dealing with different InfiniBand tools, the need to write *ad hoc* (error-prone) parsers scripts.
- ▶ We also need to write topology generators and routing algorithms for every network topology on different simulators and static analysis tools.
- ▶ The open source community behind Open Fabrics focus on interoperable tools, drivers diagnostics, simulation, etc.

Motivation

- ▶ *ibsim* it's not adapted **yet** for simulation studies that include different traffic patterns and lacks the data gathering capabilities needed for a statistical analysis.
- ▶ OMNeT++ provides the infrastructure for developing simulators and the data gathering capabilities. However it is required to connect them with Open Fabric Software (OFS) for evaluation purposes. Although there are a few proposals doing that[1], their scope could be broaden.

[1]J. Domke, T. Hoefler, and S. Matsuoka, “Fail-in-place network design: Interaction between topology, routing algorithm and failures”

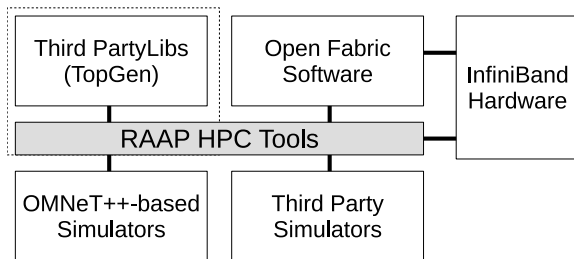
Outline

Motivation

The RAAP HPC Tools

Conclusions

The RAAP HPC Tools



- ▶ A set of tools to perform static analysis of network topologies and routing algorithms.
- ▶ A library to generate network topologies.
- ▶ A library to generate network topologies parsing inputs from InfiniBand tools.

Outline

Motivation

The RAAP HPC Tools

Conclusions

Conclusions

- ▶ We proposed a work-in-progress toolbox which integrates some of the OFS modules with network simulation tools.
- ▶ Static analysis of the network topology properties.
- ▶ The aim of reducing the duplicated work and *ad hoc* error-prone scripts.
- ▶ In the future, we plan to support other OFS modules like: iWarp, RoCE, etc.

We plan to open these tools to the OFS community in the future.

Questions?