Multiparameter resources selection for next generation HPC platforms

Yiannis Georgiou, David Glesser,
Dineshkumar Rajagopal
BULL S.A.S
Email: {yiannis.georgiou, david.glesser,
dineshkumar.rajagopal}@bull.net

Matthieu Hautreux
CEA DAM
Email: {matthieu.hautreux}@cea.fr

***Abstract*—SLURM(Simple Linux Utility for Resource Management) is a Resource and Job Management System(RJMS) in the High Performance Computing(HPC) System software stack. It is a middleware system software between User applications and Operating system to distribute the HPC Computing resources(Nodes) to the users Job requirements(Constraints) effectively. Computing nodes internal architecture is evolving and having many-socket,many-core and multi-threaded features to increase the HPC and user applications performance and throughput. SLURM select/cons_res resource selection plugin consuming nodes internal resources of cores,sockets,memory,GPUs to satisfy the users requirement. This will increase the performance and throughput of HPC environment, But resource selection is slow and compute nodes internal architecture information from minimum data. If we represent the internal nodes architecture informations and relationships between sub-resources, than the resource selection will not be manageable for the future architecture evolutions and introduction of new types of resources. To Resolve that by using general resource management framework called LAYOUTS in slurm to represent informations,relations to manipulate physical(e.x Node) and virtual(e.x Rack, Room, etc.) resources in HPC.**