Symbiotic Space-Sharing on SDSC's Datastar System.

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Abstract: Using a large HPC platform, we investigate the effectiveness of "symbiotic space-sharing", a technique that improves system throughput by executing parallel applications in combinations and configurations that alleviate pressure on shared resources. We demonstrate that relevant benchmarks commonly suffer a 10-60% penalty in runtime efficiency due to memory resource bottlenecks and up to several orders of magnitude for I/O. We show that this penalty can be often mitigated, and sometimes virtually eliminated, by symbiotic space-sharing techniques and deploy a prototype scheduler that leverages these findings to improve system throughput by 20%.

Reference:
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@INPROCEEDINGS{weinberg06symbiotic, author = {J. Weinberg and A. Snavely}, title = {Symbiotic Space-Sharing on SDSC's Datastar System}, booktitle = {The 12th Workshop on Job Scheduling Strategies for Parallel Processing (JSSPP '06)}, year = {2006}, address = {St. Malo, France}, month = {June} }
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