Benchmarking P2C for HPC

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Abstract

We report some benchmarking results of the Peak-Two(P2C) Cloud for High-Performance Computing(HPC) using the NAS Parallel Benchmarks (NPB).

1   Introduction

In order to evaluate the performance of the P2C[1] for HPC, NPB[1] version 3.3.1 was run on a 16-node MPI cluster provisioned using vcluster[2].

NPB consists of a set of programs that implements different computational approaches associated with Computational Fluid Dynamics(CFD). These programs represent the types of applications that are run in supercomputers and HPC clusters. In running the benchmark, classes A and B were used for each program. Different classes have different problem sizes and parameters which result to different measurements.

The programs were run using 1, 2, 4, 8, and 16 nodes. The completion time were recorded and plotted. The figure below shows the hosts where the VMs used in the cluster were instantiated.
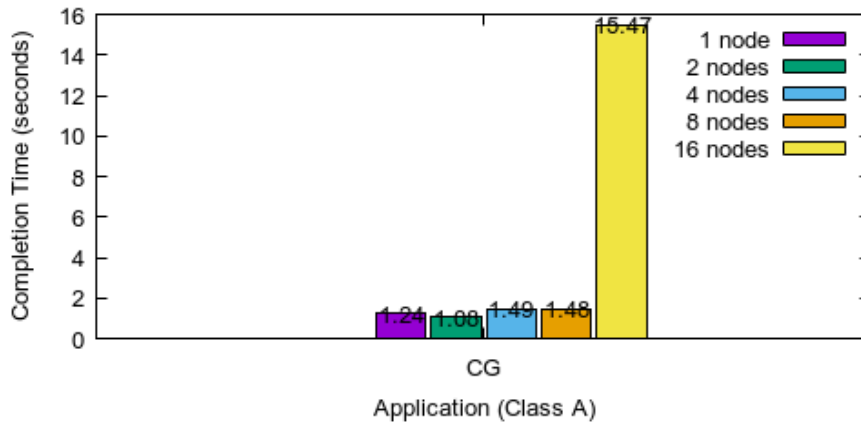
2   Results

2.1   Conjugate Gradient

Figure 1:

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[1] https://www.nas.nasa.gov/publications/npb.html
[2] http://srg.ics.uplb.edu.ph/projects/peak-two-cloud/peak-two-cloud-resources/deployinganmpiclusterusingvcluster
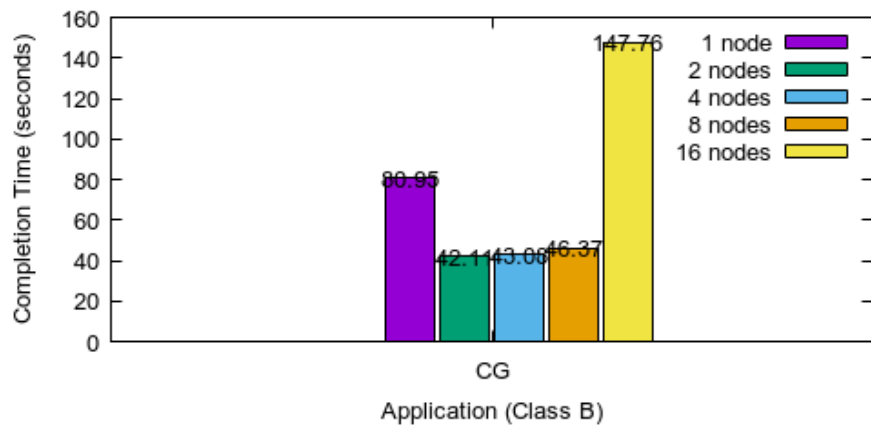
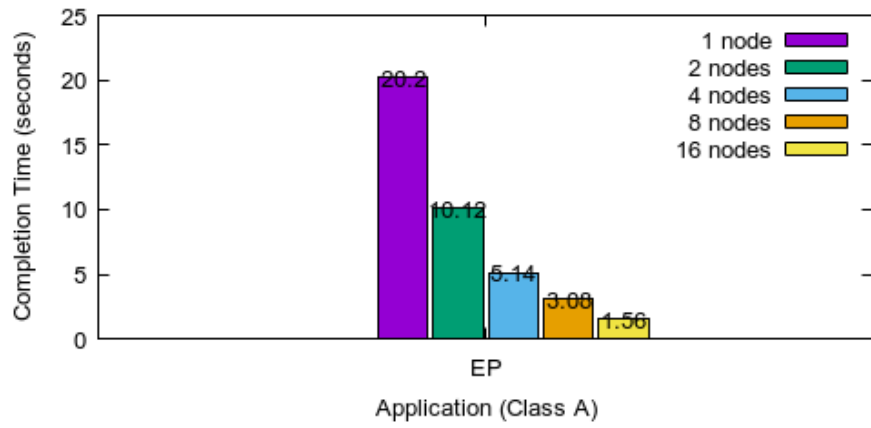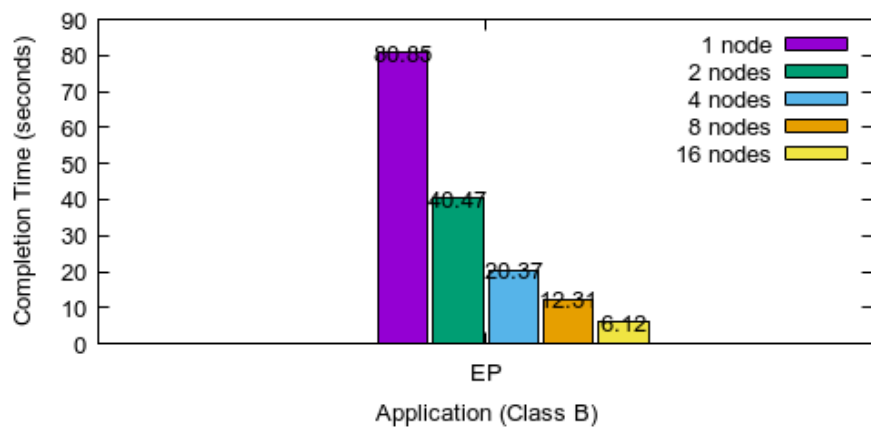Figure 2:

2.2 Embarassingly Parallel

Figure 3:

Figure 4:
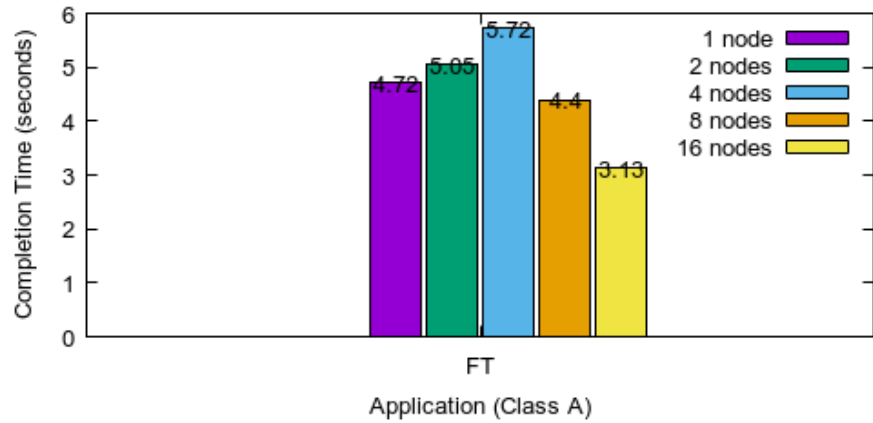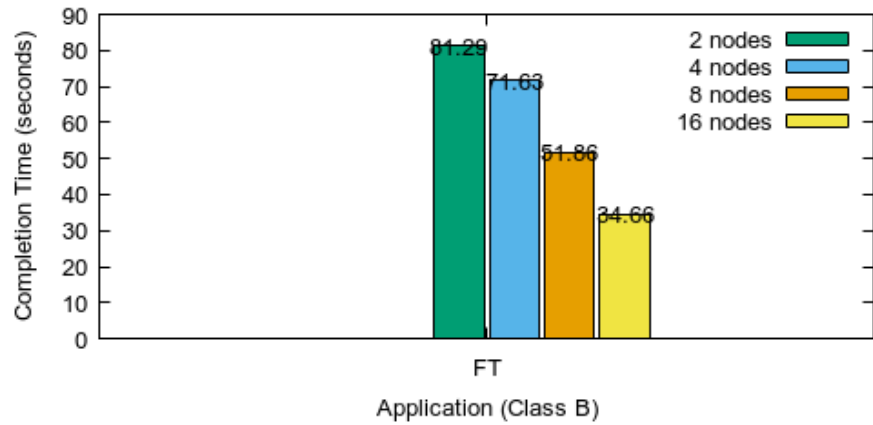
2.3 Fourier Transform
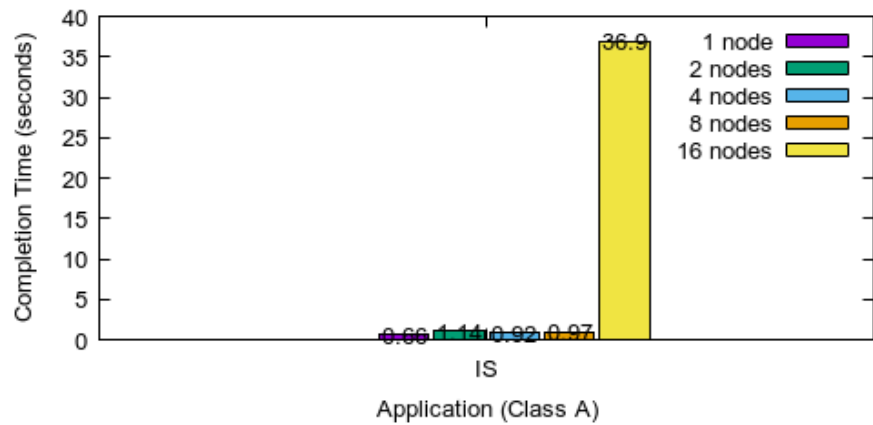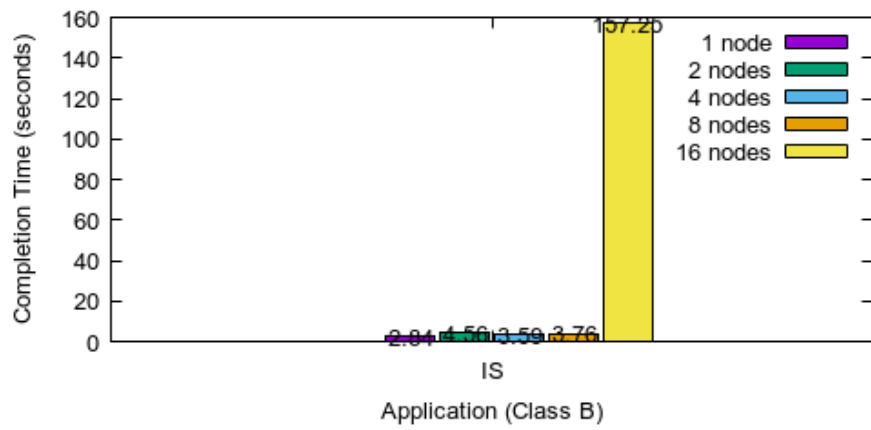

Figure 5:

Figure 6:

2.4 Integer Sort

Figure 7:

Figure 8:

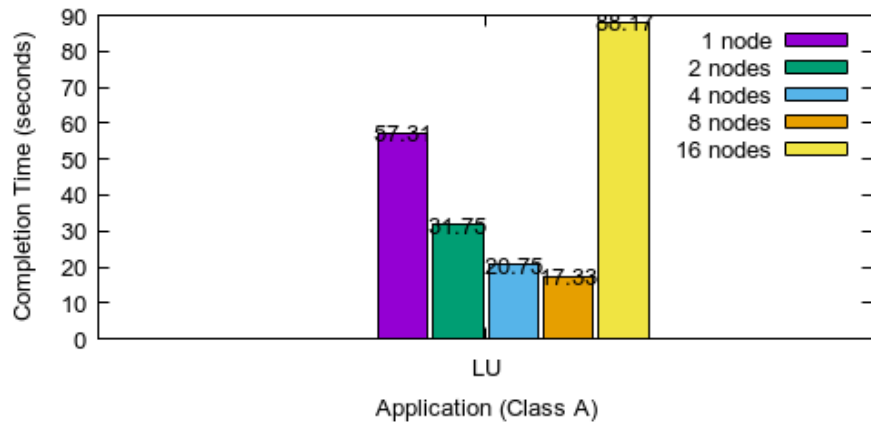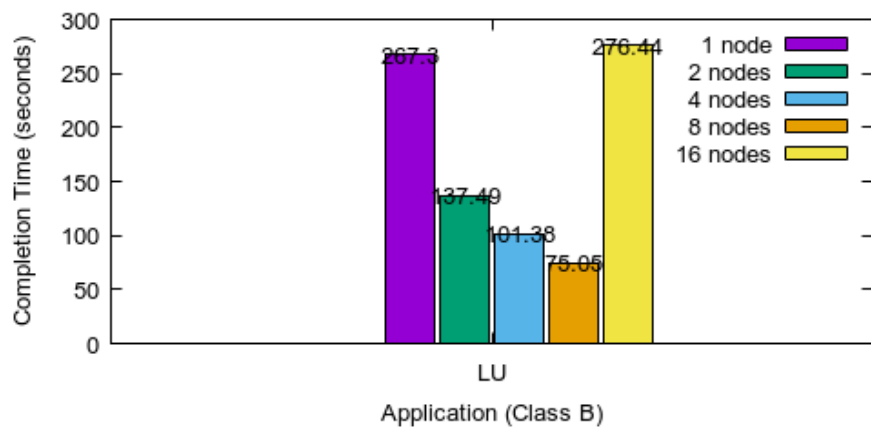## 2.5 Lower-Upper Gauss-Seidel Solver

Figure 9:

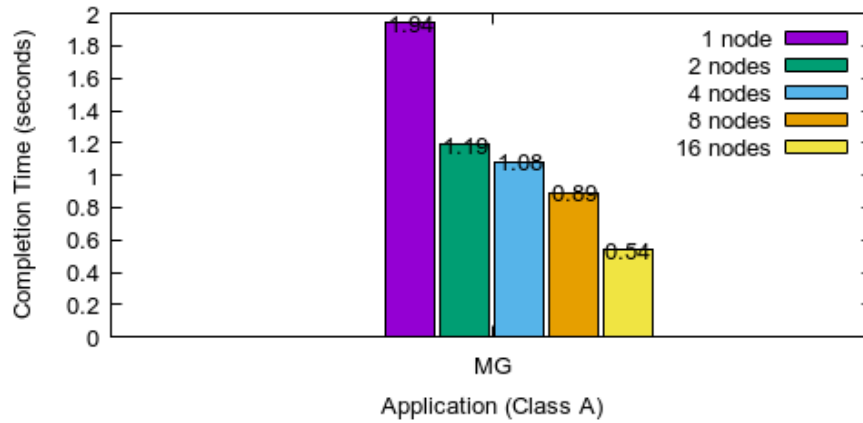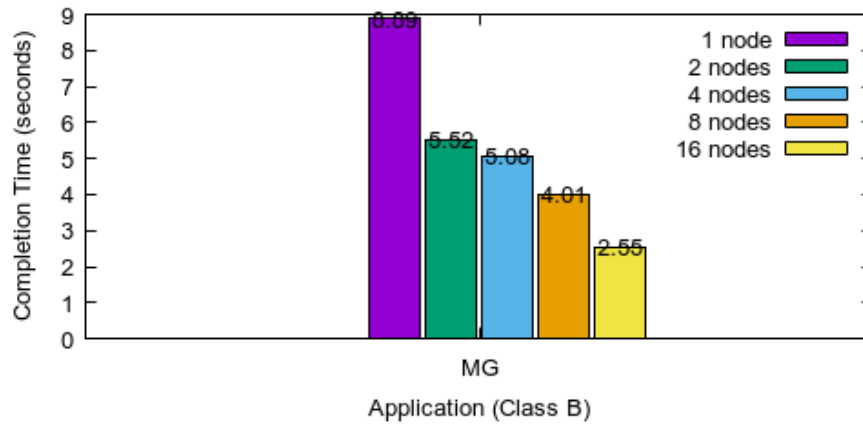Figure 10:

2.6 Multi-Grid

Figure 11:

Figure 12:

References

[1] J. A. C. Hermocilla. P2c: Towards scientific computing on private clouds. In *Proceedings of the 12th National Conference on IT Education (NCITE 2014)*, pages 163–168. Philippine Society of Information Technology Educators, Oct. 2014.