

# Evaluating the Performance and Cost Efficiency of HPC Interconnections on the Azure Cloud

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**Abstract**—The availability of computing resources has significantly changed due to the growing adoption of the cloud computing paradigm. Aiming at potential advantages such as cost savings through the *pay-per-use* premise and resource allocation in a scalable/elastic way, we witnessed consistent efforts to execute high-performance computing (HPC) applications in the cloud. Performance in this environment heavily depends upon two main system components: processing power and network interconnection. If, on the one hand, allocating more powerful hardware theoretically boosts performance, on the other hand, it increases the allocation cost. In this paper, we evaluated how the network interconnection impacts performance and cost-efficiency. Our experiments were carried out using NAS Parallel Benchmarks and Alya HPC application on Microsoft Azure public cloud provider, with three different cloud instances/network interconnections. The results revealed that through the use of the accelerated networking approach, which allows the instance to have a high-performance interconnect without additional charges, HPC applications' performance can be significantly improved with better cost-efficiency.

## I. DISCLAIMER

This abstract describes the paper entitled “Performance and Cost-aware HPC in Clouds: A Network Interconnection Assessment” from the same authors, that has been accepted for publication on the IEEE symposium on Computers and Communications (ISCC 2020).