Abstract

This paper presents a performance benchmarking of a Raspberry Pi 2 Beowulf cluster. Parallel computing systems with high performance parallel processing capabilities has become a popular standard for addressing not only scientific but also commercial applications. The fact that the raspberry pi is a tiny and affordable single board computer (SBC), given the chance to almost everyone to experiment with knowledge and practices in a wide variety of projects akin to super-computing to run parallel jobs. This research project involves the design and construction of a high performance Beowulf cluster, composed of 12 Raspberry Pi 2 model B computers with CPU 900MHz, 32-bit quad-core ARM Cortex-A7 CPU processors and RAM 1GHz each node. All of them are connected over an Ethernet Network 100 Mbps in a parallel mode of operation so that to build a kind of supercomputer. In addition, with the help of the High Performance Linpack (HPL), we observe and depict the cluster performance benchmarking of our system by using mathematical applications to calculate the scalar multiplication of a matrix, extracting performance metrics such as runtime and GFLOPS.
References


Index Terms

Computer Science
Circuits and Systems

Keywords
Raspberry Pi cluster, Cluster Computing, Message Passing Interface, High Performance Linpack (HPL), Benchmarking RPi clusters.