

001.64.2
12.1.1

**PERFORMANCE ANALYSIS OF A SMALL LOW COST
BEOWULF CLUSTER WITH MATHEMATICAL MODELING IN
A PARALLEL COMPUTING ENVIRONMENT**

A THESIS PRESENTED BY

HERATH MUDIYANSELAGE ARUNA KUDA BANDARA HERATH
✓

to the Board of Study in Statistics and Computer Science of the
POSTGRADUATE INSTITUTE OF SCIENCE

*in partial fulfillment of the requirements
for the award of the degree of*

MASTER OF SCIENCE IN COMPUTER SCIENCE

of the

**UNIVERSITY OF PERADENIYA
SRI LANKA
2005**

603387

PERFORMANCE ANALYSIS OF A SMALL LOW COST BEOWULF CLUSTER WITH MATHEMATICAL MODELING IN A PARALLEL COMPUTING ENVIRONMENT

H. M. A. K. B. Herath

Postgraduate Institute of Science

University of Peradeniya

Peradeniya

Sri Lanka

Cluster computing has become the paradigm of choice for executing large scale science, engineering and commercial applications. This is due to their low cost, high performance, availability of off the shelf hardware components and freely accessible software tools that can be used for developing cluster applications.

Commodity supercomputing clusters known as Beowulf clusters have become a low cost alternative to traditional supercomputers. Beowulf clusters combine inexpensive computers and specialized software to achieve supercomputing power. Beowulf clusters use commodity off-the-shelf hardware, and little information is available about their performance. This research includes the construction of a Beowulf cluster, research the available performance measurement schemes and measure the performance with increment of client nodes and changing memory at the nodes with mathematical modeling in a parallel computing environment. In addition, it is proposed to investigate the cluster technologies, system architecture, and the software tools for developing applications using low cost clusters in an environment for interacting with and steering large scale scientific computation running on clusters.