ABSTRACT

Traditional communication architectures are not suitable for multi-core chips, thus a new communication media is needed. Network on Chip (NoC) is an emerging paradigm for on chip communication. Network on chip comprises of cores, connected to each other through a network of routers and they communicate between them through the packet switched network. Communication performance of a NoC depends heavily on the routing algorithm. Routing algorithms determines the path taken by a packet between source and destination. Quality-of-Service (QoS) in networks-on chip is of important consideration for the complex multi-core chips.

In this thesis, a NoC architecture based on novel XYYX routing algorithm is proposed, offering hybrid Quality of service (QoS) mechanism combining both guaranteed services and best effort services. The architecture is implemented and is analyzed against different QoS measurement. SystemC is used as the modeling language for the implementation of proposed architecture.

Simulations were performed on a 4x4 mesh network. Two routing algorithm, XY routing, Shortest Path routing are compared with the proposed XYYX algorithm. Throughput and reliability of network shows the superiority of the proposed NoC architecture.