Notice of the Final Oral Examination
for the Degree of Master of Applied Science

of

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BE (Sarhad University of Science and Information Technology, 2013)

"Investigating the Effect of Virtual Channel on the Performance of Network-on-Chip"

Department of Electrical and Computer Engineering

Tuesday, December 20, 2016
2:00 P.M.
Engineering and Computer Science Building
Room 468

Supervisory Committee:
Dr. Fayez Gebali, Department of Electrical and Computer Engineering, University of Victoria (Supervisor)
Dr. Samer Moein, Department of Electrical and Computer Engineering, UVic (Member)

External Examiner:
Dr. Sudhakar Ganti, Department of Computer Science, UVic

Chair of Oral Examination:
Dr. Dante Canil, School of Earth and Ocean Sciences, UVic

Dr. David Capson, Dean, Faculty of Graduate Studies

Abstract

Network-on-Chip (NoC) is the communication backbone in domain of multi-core processor system. As the number of cores in conventional bus based architecture is increasing communication techniques are becoming ineffective and complex. Wormhole flow control is the most commonly flow control algorithm which is used in Noc. However As the work load is increased in the NoC wormhole ow control causes head-of-line blocking which results in to contention for the physical channel. This issue can be resolved by using virtual channel flow control. In this work we investigate the effect of input-queued Virtual Channels router model on the performance of NoC by varying different parametrs like injection rate and the packet length. We simulate K-ary-n cubes mesh topology with dimension order routing (DOR) under Synthetic workloads in order to find the effect of virtual channels on the performance of Mesh network in term of throughput and latency. We show that as the number of virtual channels is increased there is an improvement in the throughput and latency of the network up to a certain number of virtual channels beyond which the network reaches saturated state. Our work can be used as a guidance to find the optimal number of virtual channels for a given NoC conguration and traffic parameters.