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FAULT TOLERANT METHOD TO IMPROVING QUALITY OF SERVICE OF BE SLACK TIME ROUTING IN NOC SYSTEMS

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ABSTRACT

The network on chip (NoC) architectures is being proposed for implementing a routing performance on the systems for real-time multi-media applications. The Guaranteed throughput (GT) and best effort (BE) traffic on main working concept on this system. GT traffic not only lead to under-utilization of communication links and routers, but also leads to degradation of QoS parameters for BE traffic. We propose a dynamic routing scheme with using the Slack-Time management for using to reducing jitter in the latency of BE traffic affected by the GT traffic. Our results from modeling and simulation indicate that a significant improvement in jitter can be achieved. The fault tolerant network to proposed quality of service, our proposed method will reduce the packet dropping ration from the single queue based data from the network management. Traffic Aware routing (TAR) to the use improve a performnace of quality services of this method the important data packet will passed as much soon to the designation due to the dual queue with the support of priority data droping ration were reduced here.

Keywords: *NOC, AODV, BE, GT, TAR, QOS*

1. INTRODUCTION

Networks-on-chip (NoC) for general-purpose multiprocessors require quality of service mechanisms to allow real-time streaming applications to be executed along with latency sensitive general purpose processing tasks. In this paper, we propose a NoC link arbitration technique that supports bandwidth guarantees along with best effort latency optimizations. In contrast to many existing quality of service mechanisms, our technique prioritizes best effort over guaranteed bandwidth traffic for optimal latency. The Traffic aware routing model to use an offer to improving a Best Effort Traffic model and then guarantees over previously reserved connections. Initial simulation results show that our arbitration scheme can provide tight bandwidth guarantees for streaming traffic under network overload conditions. The NoC based system design for a purpose of increasing a throughput level and improving a network performance on the system.

The QoS communication performance on a simple scheme for efficient handling of mixed GT and BE traffic in NoC systems. The scheme proposes that the slack time available in GT traffic should be managed by the GT traffic producer. We have shown that the scheme can balance the traffic over links and lead to packet drop and latency improvement of BE traffic flows in NoC. Many other improvements are possible in management of GT slack time. Fault Tolerant network to using to avoiding the traffic and improving a performance on the network. The routers on the GT path are more aware of other traffic than the producer and thus can take better decisions. It's to avoiding network traffic quickly and improving the QOS performance on the network.

The Traffic process are information can be detected by the distributed on the sensor. Each router can also get the information of throttled

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tiles by the propagation of the traffic information on to the base station. The routing information can be known in advance to design the routing algorithm. Hence, the network can result in more balanced traffic loads. Proposed TAR use the NoC information for routing. The TAR has two major features, as described as follows:

1. Avoid routing paths along the neighbors of the tiles: TAR selects the routing paths away from the neighbors of the throttled tiles. With this feature, the TAR can achieve more balanced traffic loads in each layer of the NoC.

2. Avoid the routing paths downward to the bottom layer: The bottom layer of NoC suffers extra traffic loads from other layers. If the packets at the all layers could be routed properly to stay at the same layer, the extra traffic loads at the bottom layer are reduced.

2. PREVIOUS RESEARCH

Yongfei Zang on 2011, that issue of router buffer sizing is an important research problem and is still open though researchers have debated this for many years. The research method can be classified into two kinds: one is based on queuing theory, the other uses TCP as model. From the point of TCP model, many researchers concluded that buffer size can be significantly reduced. It’s desirable that the buffers are so small that fast memory technology and all-optical buffering can be used. But queuing model with self-similar incoming traffic suggested that extremely large buffers are needed to achieve acceptable packet loss rate.

Lilt Kishore Aurora on November 2012, the packet loss and packet delay are the measure performance parameter for evaluating the network topologies in Interconnection Network design. This paper, evaluates the performance of packet loss on two different interconnection networks, Mesh and Torus, with source routing. But here the main emphasis is on the packet transmission delay on both networks. The simulation framework designed and simulated for these networks using NS2 and evaluates the latency in both networks.

Deepika Pandey on 2009, as the integration density and complexity of the system-on-Chip (SOC) increases, the conventional interconnects are not suitable to fulfils the demands. The application of traditional network technologies in the form of Network-on-Chip is a possible solution. NoC design space has numerous variables. As an improved topology is selected complexities decrease and power-efficiency increases. The main research field in Network-on-chip design focusing on optimized topology design is analyzed.

Yi-Ran Sun on 2010 the current manufacturing technology, can integrate hundreds of millions of transistors, and the integration density with increase by Moore's law that is the number of transistors that can be integrated on a single die would grow exponentially with time. This proceeding will require lots of task-level parallelism to satisfy processing capacity requirements, for example, creating a demand for huge interconnection bandwidths within a single chip.

Dmitri Vain brand and Ran Ginosar, on 2009 providing highly flexible connectivity is a major architectural challenge for hardware implementation of reconfigurable neural networks. We perform an analytical evaluation and comparison of different configurable interconnects architectures emulating variants of two neural network topologies. We derive analytical expressions and limits for performance and cost of the interconnect architectures considering three communication methods. It is shown that multicast mesh NoC provides the highest ratio and consequently it is the most suitable interconnect architecture for configurable neural network implementation.

A. Sarathy, A.K. Kodi and A. Louri, 2008, in the deep sub-micron regime, the performance of network-on-chip (NoC) architectures is bound by the limited power and area budget. Proposed is low-power low-area NoC architecture using a novel power-efficient control circuit that enables repeaters along the interrupter links to function as adaptive link buffers, thereby reducing the number of buffers required in the router.

3. PROPOSED APPROACH

In this scheme, we have to implementing a NoC based on improved performance on system. Router flow control Traffic aware routing algorithms, such as on-off, credit based and ack mechanisms regulate the traffic flow locally by exchanging control information between the neighboring routers. These approaches have a small communication overhead, since they do not require explicit communication between source sink pairs. The switch-to-switch flow

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control does not regulate the actual packet injection rate directly at the traffic source level. Instead, it relies on a backpressure mechanism which propagates the availability of the buffers in the downstream routers to the traffic sources. Consequently, before the congestion information gets the chance to reach the traffic sources, the packets generated in the meantime can seriously congest the network.

The parameter is concerned, similar considerations can be drawn a small value makes difficult to detect empty scenario values, thus making the advertisement mechanism ineffective. On the other hand, a high value increases the advertisement overhead. When their using exists with scarce traffic, this event can be detected by means of observations of their network model on the system. The minimum interference path between a particular source-destination pair is the path which maximizes the minimum between all other source-destination pairs. The idea is that a new request must follow a path that does not “interfere excessively” with a route that may be critical to satisfy a future demand. The problem of finding the minimum interference path is proved to be NP-hard. There are proposed to determine appropriate link costs and data’s are to be loss on their network performance level.

The packets that arrive in the network are normally of two types. One type of packets is normal packet with no priority. This is the typical user data between the end hosts. Another type of packets is urgent packets that are used by to exchange certain routing information between the networks on chips and priority based to improving the QOS.

They use of data preference and simple priority aware routing protocol and traffic Aware Routing (TAR). TAR does not use multiple priority queues, an aware MAC layer or specialized scheduling algorithms. But this TAR to be used multiple priority queues to use and then data secure from the resources of the required network topology design networks.

3.1. Traffic Aware Routing Algorithm

R-Router, P-Packet, S-source, D-destination, E-Energy, T-Traffic

Step1: S send message to D
S sends to D
Available Node Check on networks
Step2: If (Status=R)
Check Router on Network.
R Available Free space
S node sends data to R
Following R to D
Step3: If (N =T)
Aware Routing Model
Neighbor node list to Router
Else if
Step 4: Check D return to the S
Step 5: E=N (Energy)
Intermediate node on N
Step 6: Check R Status (TAR)
P transmit to R (Data transmission on region)
Else
Step 7: Packet Dropped (Not send to region)
P=Loss
D sends return to the S
Step 8:E≠N (Performance Low Level)
No energy to nodes
Step 9: E=N Energy Level High on Network.
Step 10: Better Performance on network S=D
Stop Data
End
End

4. PERFORMANCE ANALYSIS

The goal of our simulation performance of the security enhanced probability based AODV by MANET. The simulation location is formed in NS2, a network limitation to give carry for suggest mobile ad-hoc networks. NS-2 was written using C++ language and it uses the Object Oriented Tool Command Language (OTCL). It came as an extension of Tool Command Language (TCL). The simulations were carried out using a MANET environment consisting of 71 wireless mobile nodes roaming over a simulation area of 1000 meters x 1000 meters flat space operating for 10 minutes of simulation time. The radio and MAC layer models were used. Nodes in our simulation move according to Random Waypoint mobility model, which is in random direction with maximum speed from 0 m/s to 20 m/s. A free space propagation channel is assumed for the simulation. Hence, the simulation experiments do not account for the overhead produced when a multicast members leaves a group. Multicast sources start and stop sending packets; each packet has a constant size of 512 bytes. Each mobile node in the network starts its journey from a random location to a random destination with a

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randomly chosen speed.

4.1. Simulation Result

In our simulation scenario is calculated particularly towards to evaluate the routine of the network on chip routing model systems. The network designed with number of nodes more than a set four-sided figure topology region of 1000m x 1000m by 5m/s node equal sources to destination relations. They have using a NoC model using to avoid a traffic aware routing model system on the network has a security based data transmission on their network to using a AODV protocol and then secure process also have enhanced on this model of the network.

Table 1: Simulation Process Parameters

Parameter	Value
Simulator	Ns-2.28
Simulation Time	10min
Simulation Area	1000*1000m
Transmission Range	250m
Traffic model	CBR(UDP)
Transfer per Packet	512 Bytes
Data Processing delay	0.5 ,0.10,0.15 ms

4.2. Comparison Result

Table 2 shows the comparison results of NoC with TAR. The proposed approach shows a better result when compared with that of BE traffic and GT traffic model on the networks.

Table 2: Comparison Results

S.NO	PROTOCOL	THROUGHPUT	AVERAGE DELAY	PDF
1.	AODV	0.75	25.20	82.23
2.	TAR-AODV	0.86	20.04	88.93

4.2.1. Throughput

It is the overall network throughput performance level to improving from the existing one from the network performance. They can to improve the data deliver level and then quickly to send the data from source to destination on the network.

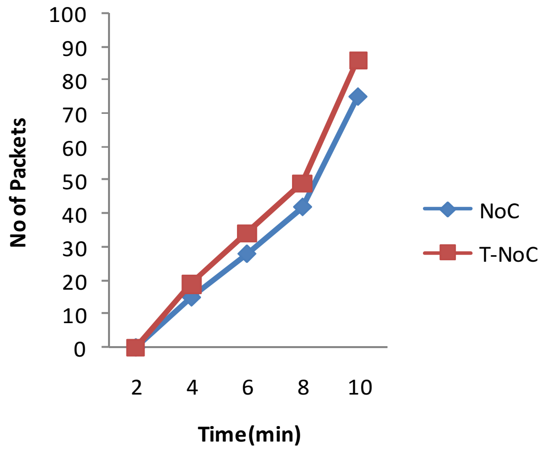

Fig.3 Throughput Ratio

4.2.2. Packet Delivery Fraction

It is the number of data received to the target to generate by the source node. It is calculated in-between the number of data received purpose of the data transmission model on its to the PDF on the network level process.

The PDF = (Pr/Ps)*100

Where the Pr is total packet received & Ps is the whole packet sending on the process.

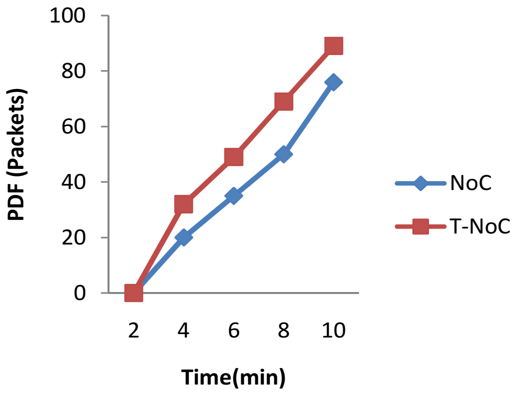

Fig.4 Performance of Packet Delivery Ratio

4.2.3. Average End Delay

This is calculating a delay on the NoC delay performance to improve, if have to improving the NoC level using to avoiding a traffic model on the system, so the delay level to

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be reduce on this retransmission at the MAC, propagation and transfer time.

D = (Tr –Ts).

Where Tr is receive Time and Ts is sent Time.

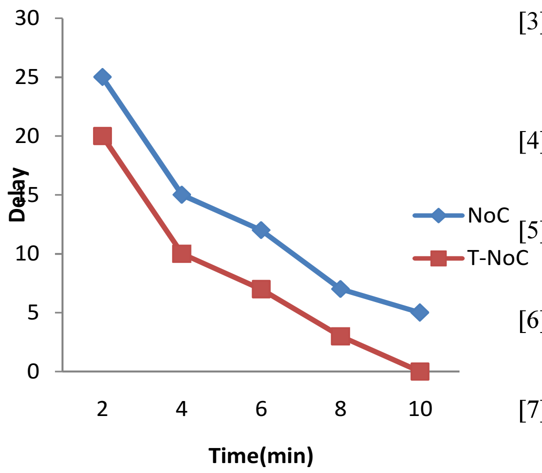

Fig.5Average End-To-End Delay

In this section, to evaluate the end-to-end delay on sender node to receiver node of the position with existing and proposed routing protocol such as AODV using on NoC model methods.

5. CONCLUSION

In this paper, we have presented scheme for a Network-on-Chip targeted to general purpose computing, supporting two traffic classes: jitter and latency-optimized best effort. Our approach allows a minimum allowing a traffic model to consisting for the best effort traffic, which is essential for the performance of general purpose applications. This is achieved by prioritizing the latency-sensitive BE traffic over GT traffic and integrating traffic shapers in the link arbitration to maintain well performed router model on this network. We have presented a model to configure this mechanism and discussed the overheads and possible extensions of the scheme. Initial simulation results have demonstrated the effectiveness of the Slack time scheme to give right guarantees to streaming traffic under high load. They have also shown the positive impact on best effort latency under low load conditions compared to a simple prioritization of streaming traffic.

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