

# Document details

< Back to results | < Previous 2 of 3 Next >

Export Download Print E-mail Save to PDF Add to List More... >

[Full Text](#) View at Publisher

Asian Journal of Scientific Research  
Volume 10, Issue 4, 2017, Pages 394-399

## Cost effective factor of a midimew connected mesh network (Article)

Rahman, M.M.H.<sup>a</sup>, Mohd Nor, R.<sup>a</sup>, Akhand, M.A.H.<sup>b</sup>, Sembok, T.M.T.<sup>c</sup>

<sup>a</sup>KICT, International Islamic University Malaysia (IIUM), Kuala Lumpur, Malaysia

<sup>b</sup>Khulna University of Engineering and Technology (KUET), Khulna, Bangladesh

<sup>c</sup>Cyber Security Center, National Defense University Malaysia, Kuala Lumpur, Malaysia

### Abstract

[View references \(21\)](#)

Background and Objective: Hierarchical Interconnection Network (HIN) is very much essential for the practical implementation of future generation Massively Parallel Computers (MPC) systems which consists of millions of nodes. It yields better performance with low cost due to reduction of wires and by exploring the locality in the communication and traffic patterns. The main objective of this paper is to analyze the static cost effective factor of Midimew connected Mesh Network (MMN). Materials and Methods: A Midimew connected Mesh Network (MMN) is a HIN comprised of numerous basic modules, where the basic modules are 2D-mesh networks and they are hierarchically interconnected using midimew network to assemble the higher level networks. Results: This study, present the architecture of a MMN and evaluate the cost effective factor of MMN, TESH (Tori-connected Mesh), mesh and torus networks. The results shows that the cost effective factor of MMN was trivially higher than that of mesh and torus network. Conclusion: It was revealed that the proposed MMN yields a little bit high cost effectiveness factor with small diameter and average distance. Overall, performance with respect to cost effective factor with small diameter and average distance suggests that the MMN will be a promising choice for next generation MPC systems. © 2017 M.M. HafizurRahman et al.

### Author keywords

Hierarchical interconnection network Massively parallel computers Mesh network

### Funding details

Funding number	Funding sponsor	Acronym	Funding opportunities
	Ministry of Higher Education, Malaysia		<a href="#">See opportunities</a>
	Ministry of Education		<a href="#">See opportunities</a>

### Funding text

This present study is supported by the research project FRGS grant No. 13-065-0306, Ministry of Education, Government of Malaysia. The authors are grateful to the respected reviewers for their valuable suggestions and comments to improve the quality of the study.

ISSN: 19921454

Source Type: Journal

Original language: English

DOI: 10.3923/ajsr.2017.394.399

Document Type: Article

Publisher: Asian Network for Scientific Information

### References (21)

[View in search results format >](#)

All Export Print E-mail Save to PDF Create bibliography

### Metrics

0 Citations in Scopus  
0 Field-Weighted Citation Impact



### PlumX Metrics

Usage, Captures, Mentions, Social Media and Citations beyond Scopus.

### Cited by 0 documents

Inform me when this document is cited in Scopus:

[Set citation alert >](#)

[Set citation feed >](#)

### Related documents

Time-cost effective factor of a Midimew connected Mesh Network

Rahman, M.M.H. , Ali, M.N.M. , Nor, R.M. (2017) *Proceedings - 6th International Conference on Information and Communication Technology for the Muslim World, ICT4M 2016*

Packing Density and Message Traffic Density of a Midimew Connected Mesh Network

Rahman, M.M.H. , Faisal, F.A. , Nor, R.M. (2016) *Proceedings - 6th International Conference on Computer and Communication Engineering: Innovative Technologies to Serve Humanity, ICCCE 2016*

Cost effectiveness analysis of a vertical midimew-connected mesh network (VMMN)

Hafizur Rahman, M.M. Al

- 1 Adhikari, N., Tripathy, C.R.  
The folded crossed cube: A new interconnection network for parallel systems  
(2010) *Int. J. Comput. Applic*, 4, pp. 43-50. Cited 12 times.

(2017) *Advances in Intelligent Systems and Computing*

View all related documents based on references

- 2 Faisal, F.A., Rahman, M.M.H., Inoguchi, Y.  
A new power efficient high performance interconnection network for many-core processors

(2017) *Journal of Parallel and Distributed Computing*, 101, pp. 92-102.  
<http://www.elsevier.com/inca/publications/store/6/2/2/8/9/5/index.htm>  
doi: 10.1016/j.jpdc.2016.11.007

View at Publisher

Find more related documents in Scopus based on:

Authors > Keywords >

- 3 Andújar-Muñoz, F.J., Villar-Ortiz, J.A., Sanchez, J.L., Alfaro, F.J., Duato, J.  
N-dimensional twin torus topology

(2015) *IEEE Transactions on Computers*, 64 (10), art. no. 6980092, pp. 2847-2861. Cited 9 times.  
<http://ieeexplore.ieee.org/xpl/RecentIssue.jsp?punumber=12>  
doi: 10.1109/TC.2014.2378267

View at Publisher

- 4 Awal, M.R., Rahman, M.M.H., Akhand, M.A.H.  
A new hierarchical interconnection network for future generation parallel computer

(2014) *16th Int'l Conf. Computer and Information Technology, ICCIT 2013*, art. no. 6997341, pp. 314-319. Cited 13 times.  
ISBN: 978-147993497-3  
doi: 10.1109/ICCITechn.2014.6997341

View at Publisher

- 5 Awal, Md.R., Rahman, M.M.H., Mohd Nor, R., Bin Tengku Sembok, T.M., Akhand, M.A.H.  
Architecture and network-on-chip implementation of a new hierarchical interconnection network

(2015) *Journal of Circuits, Systems and Computers*, 24 (2), art. no. 1540006. Cited 6 times.  
<http://www.worldscinet.com/jcsc/jcsc.shtml>  
doi: 10.1142/S021812661540006X

View at Publisher

- 6 Beckman, P.  
Looking toward exascale computing  
(2008) *Proceedings of the 9th International Conference on Parallel and Distributed Computing, Applications and Technologies, December 1-4 2008*. Cited 9 times.  
Dunedin, New Zealand

- 7 Dongarra, J.  
(2016) *Report on the Sunway Taihu light system*. Cited 15 times.  
Oak Ridge National Laboratory

- 8 Dongarra, J.J., Meuer, H.W., Strohmaier, E.  
(2016) *TOP500 supercomputer sites*. Cited 322 times.  
June 2016  
<http://www.top500.org/>

- 9 Feldman, M.  
(2016) *HPC in 2016: Hits and misses*  
<http://www.top500.org>
- 
- 10 Hag, A.A.Y., Rahman, M.M.H., Nor, R.M., Moh, T., Sembok, T.  
On uniform traffic pattern of symmetric midimew connected mesh network  
(2015) *Procedia Computer Science*, 50, pp. 476-481. Cited 6 times.  
<http://www.sciencedirect.com/science/journal/18770509>  
doi: 10.1016/j.procs.2015.04.017  
View at Publisher
- 
- 11 Lai, P.-L., Hsu, H.-C., Tsai, C.-H., Stewart, I.A.  
A class of hierarchical graphs as topologies for interconnection networks  
(2010) *Theoretical Computer Science*, 411 (31-33), pp. 2912-2924. Cited 28 times.  
doi: 10.1016/j.tcs.2010.04.022  
View at Publisher
- 
- 12 Mohanty, S.P., Ray, B.N.B., Patro, S.N., Tripathy, A.R.  
Topological properties of a new fault tolerant interconnection network for parallel computer  
(2008) *Proceedings - 11th International Conference on Information Technology, ICIT 2008*, art. no. 4731294, pp. 36-40. Cited 8 times.  
ISBN: 978-076953513-5  
doi: 10.1109/ICIT.2008.64  
View at Publisher
- 
- 13 Nagel, W.E.  
From TERA-to PETA-to EXA-scale computing: What does that mean for our community?  
(2011) *Keynote speech in the 10th IASTED PDCN, February 15-17 2011*  
Innsbruck, Austria
- 
- 14 (2012) *Introducing Titan*. Cited 2 times.  
Advancing the Era of Accelerated Computing  
<http://www.olcf.ornl.gov/titan/>
- 
- 15 Psarras, A., Lee, J., Mattheakis, P., Nicopoulos, C., Dimitrakopoulos, G.  
A Low-power network-on-chip architecture for tile-based chip multi-processors  
(2016) *Proceedings of the ACM Great Lakes Symposium on VLSI, GLSVLSI, 18-20-May-2016*, pp. 335-340. Cited 8 times.  
ISBN: 978-145034274-2  
doi: 10.1145/2902961.2903010  
View at Publisher
- 
- 16 Rahman, M.M.H., Al Faisal, F., Nor, R.M., Sembok, T.M.T., Behera, D.K.Y., Inoguchi  
(2017) *Cost Effectiveness Analysis of a Vertical Midimew-Connected Mesh Network (VMMN)*, 556.  
Computational Intelligence in Data Mining, Behera, H. and D. Mohapatra (Eds.), AISC., Springer, Singapore
- 
- 17 Rahman, M.M.H., Mohd, N.R., Awal, M.R., Sembok, T.M.T., Miura, Y.  
(2016) *Long Wire Length of Midimew-Connected Mesh Network*  
Distributed Computing and Internet Technology, Bjorner, N., S. Prasad and L. Parida (Eds.). LNCS., Vol. 9581. Springer, Switzerland

□ 18 Rahman, M.M.H., Inoguchi, Y., Faisal, F.A., Kundu, M.K.  
Symmetric and folded tori connected torus network  
(2011) *Journal of Networks*, 6 (1), pp. 26-35. Cited 10 times.  
<http://ojs.academypublisher.com/index.php/jnw/article/view/06012635/2545>  
doi: 10.4304/jnw.6.1.26-35

[View at Publisher](#)

□ 19 Rahman, M.M.H., Inoguchi, Y., Sato, Y., Horiguchi, S.  
TTN: A high performance hierarchical interconnection network for massively parallel computers  
(2009) *IEICE Transactions on Information and Systems*, E92-D (5), pp. 1062-1078. Cited 12 times.  
[http://www.jstage.jst.go.jp/article/transinf/E92.D/5/1062/\\_pdf](http://www.jstage.jst.go.jp/article/transinf/E92.D/5/1062/_pdf)  
doi: 10.1587/transinf.E92.D.1062

[View at Publisher](#)

□ 20 (2010) *The opportunities and challenges of exascale computing*. Cited 73 times.  
Report of the Advanced Scientific Computing Advisory Committee, US Department of Energy, 2010

□ 21 Yokokawa, M., Shoji, F., Uno, A., Kurokawa, M., Watanabe, T.  
The K computer: Japanese next-generation supercomputer development project  
(2011) *Proceedings of the International Symposium on Low Power Electronics and Design*, art. no. 5993668, pp. 371-372. Cited 57 times.  
ISBN: 978-161284659-0  
doi: 10.1109/ISLPED.2011.5993668

[View at Publisher](#)

👤 Rahman, M.M.H.; KICT, International Islamic University Malaysia (IIUM), Kuala Lumpur, Malaysia  
© Copyright 2017 Elsevier B.V., All rights reserved.

[< Back to results](#) | [< Previous](#) 2 of 3 [Next >](#)

[^ Top of page](#)

## About Scopus

[What is Scopus](#)  
[Content coverage](#)  
[Scopus blog](#)  
[Scopus API](#)  
[Privacy matters](#)

## Language

[日本語に切り替える](#)  
[切换到简体中文](#)  
[切换到繁體中文](#)  
[Русский язык](#)

## Customer Service

[Help](#)  
[Contact us](#)

ELSEVIER

[Terms and conditions](#) [Privacy policy](#)

Copyright © 2018 Elsevier B.V. All rights reserved. Scopus® is a registered trademark of Elsevier B.V.

Cookies are set by this site. To decline them or learn more, visit our [Cookies page](#).

 RELX Group™