

星狀網路二生成路徑邊容錯之研究

劉驥雷、洪春男

E-mail: 9707318@mail.dyu.edu.tw

摘要

在連結網路中Star graph是一個耳熟能詳的拓樸網路架構。此論文中探討有關星狀網路的邊容錯之二生成路徑性質。假設 $S_n = (V_1 \cup V_2, E)$ 為 n 維星狀網路拓樸圖。我們要證明在 $n \geq 5$ 且 $|F_e| \leq n-4$ 中S-F後仍然存在二生成路徑 $P(x_1, y_1)$ 和 $P(x_2, y_2)$ 其中 $x_1, y_1 \in V_1, x_2, y_2 \in V_2$ 且 F_e 包含於 E 。並且我們在這篇論文中討論在star和hypercube的圖形中base case的範圍是多少時geodesic Hamiltonian laceable會成立。

關鍵詞：星狀網路，容錯，生成路徑

目錄

授權.....	iii	英文摘要.....	iv	中文摘要.....	iv
要.....	v	誌謝.....	vi	目錄.....	vi
錄.....	vii	圖目錄.....	viii	Chapter 1 Introduction.....	viii
.....	1	Chapter 2 Definitions and Notation.....	3	Chapter 3 Edge fault tolerance for two spanning paths in Star graph.....	5
.....	5	Chapter 4 Related work.....	28	Chapter 5 Conclusion.....	32

參考文獻

- [1] S.B. Akers, D. Harel, B. Krishnamurthy, "The star graph: an attractive alternative to the n -cube", Proc. Internat. Conf. Parallel Processing, pp. 393-400, 1987.
- [2] SHELDON B. AKERS, "A Group-Theoretic Model for Symmetric Interconnection Networks," IEEE Transactions on Computers, pp.555-566, 1989.
- [3] R. Balakrishnan, K. Ranganathan, "A Textbook of Graph Theory," [4] H. C. Chan, J. M. Chang, Y. L. Wang, and S. J. Horng, "Geodesic-pancyclic graphs", Discrete Applied Mathematics 155(15), pp. 1971-1978, 2007 [5] Shou-Yi Cheng, Jen-Hui Chuang, "Varietal Hypercube-A New Interconnection Network Topology for Large Scale Multicomputer," IEEE Transactions on Computers, pp.0-8186-655-6, 1994 [6] J. Duato, S. Yalamanchili, L. Ni, "Interconnection Networks: An Engineering Approach", IEEE Computer Society Press, 2003.
- [7] K. Efe, "A variation on the hypercube with lower diameter", IEEE Transactions on Computers, pp. 1213-1316, 1991.
- [8] S. Gao, B. Novick and K. Qiu, "From Hall's matching theorem to optimal routing on hypercubes," Journal of Combinatorial Theory, pp. 291-301, 1998.
- [9] Sun-Yuan Hsieh, "Embedding Longest Fault-Free Paths onto Star Graphs with More Vertex Faults," Theoretical Computer Science, pp. 370-378, 2005.
- [10] Sun-Yuan Hsieh, Gen-Huey Chen, and Chin-Wen Ho, "Longest fault-free paths in Star Graphs with Vertex Faults," Theoretical Computer Science, pp. 215-227, 2001.
- [11] Sun-Yuan Hsieh, Gen-Huey Chen, and Chin-Wen Ho, "Longest fault-free paths in star graphs with edge faults," IEEE Transactions on Computers, pp. 960-971, 2001.
- [12] H.-C Hsu, P.L. Lai, and H.-L. Huang, "Geodesic pancyclicity and balanced pancyclicity of augmented cubes," Information Processing Letters 101(6), pp. 227-232, 2007.
- [13] Chun-Nan Hung and Guan-Yu Shi, "Vertex fault tolerance for multiple spanning paths in hypercube," Processing of the 24rd Workshop on Combinatorial Mathematics and Computational Theory, pp.241-250, 2007.
- [14] Chun-Nan Hung and Chun-Nan Wang, "The Study of Two Spanning Disjoint Paths of Star Networks." Dayeh University Information engineering [15] P.L. Lai, H.-C Hsu, and C.-H. Tsai, "On the geodesic pancyclicity of crossed cubes," WSEAS Transactions on Circuits and Systems 5(12), pp. 183-1810, 2006.
- [16] F. T. Leighton, "Parallel Algorithms and Architectures: Arrays, Trees and Hypercubes," Morgan Kaufmann, San Mateo, 1992.
- [17] Hsien-Yang Liao, Chien-Hung Huang, "The Geodesic Bipancyclic of the Hypercube." The 25th Workshop on Combinatorial Mathematics and Computation Theory., pp. 101-107, 2008 [18] Tseng-Kuei Li, Jimmy J.M. Tan and Lih-Hsing Hsu, "Hyperhamiltonian

laceability on edge fault star graph, " Information Sciences, pp. 59-71, 2004.

[19] C. K. Lin, H. M. Huang, and L. H. Hsu, " The super connectivity of the pancake graphs and the super laceability of the star graphs, " Theoretical Computer Science, pp. 257-271, 2005.

[20] S. Madhavapeddy, I. H. Sudborough, " A topological property of hypercubes: node disjoint paths, " Proc. of the 2th IEEE Symposium on Parallel and Distributed Processing, pp. 532-539, 1990.

[21] M. Noakes, W.J. Dally, " System design of the J-machine, in: Proceedings of the Advanced Research in VLSI " , pp. 179-192, 1990.

[22] C. D. Park and K. Y. Chwa, " Hamiltonian properties on the class of hypercube-like networks, " Information Processing Letters, pp.11-17, 2004.

[23] Y. Saad and M. H. Schultz, " Topological properties of hypercubes, " IEEE Transactions on Computers, pp. 867-872, 1998.

[24] Wen-Yan Su, and Chun-Nan Hung, " The longest ring embedding in faulty hypercube, " The 23rd Workshop on Combinatorial Mathematics and Computation Theory,] pp. 262-272, 2006.

[25] Chao-Ming Sun, " Path and Cycle Embedding in Faulty Hypercubes, " 2005.

[26] C. H. Tsai, J.J.M. Tan, T.Liang, and L.H.Hsu, " Fault-tolerant Hamiltonian laceability of hypercubes, " Information Processing Letters, pp.301-306, (2002).

[27] Chun-Yen Yang, Chun-Nan Hung, " Adjacent Vertices Fault Tolerance Hamiltonian Laceability of Star Graphs " The 23rd Workshop on Combinatorial Mathematics and Computation Theory, pp.