

Research on Wireless Sensor Network Techniques and Enterprise

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ABSTRACT

In this article we will deal with large amount or unlimited data in wireless sensor network. Wireless sensor networks can have many interesting applications such as energy-saving, assisted-living application, the health and needs of the individuals, fire-monitoring, military applications, and so on. Each sensor node generates a stream of data items that are readings obtained from one or more sensing devices on the node. In the real world applications, wireless sensor networks can generate large amount or unlimited data. The network should have the capability of handling large amount or unlimited data in the limited time or real-time environment. Resources are limited, for example the computational power, the memory size, etc. We will identify and discuss these problems for handling large amount or unlimited data in wireless sensor networks. Because sensor networks can be used as a kind of database system, library space will be inadequate in practice. In order to solve the problems, cloud computing is a new important applications. We try to combine cloud computing and distributed database systems to solve the problems.

Keywords : Wireless Sensor Networks、Unlimited Data、Cloud Computing

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REFERENCES

- 一、中文部份 Mill, M. (2009), 雲端運算(林家瑜譯), 台北:碁峰資訊, (原文於2005年出版)。工研院IEK(2008), 無線通訊技術市場商機探討[線上資料], 來源: <http://www.itis.org.tw/rptDetailFreeEPaper.screen?industry=1&ctgy=5&rptidno=71343014>[2008, August 19]。中央研究院經濟研究所(2009), 台灣經濟情勢總展望[線上資料], 來源: http://www.econ.sinica.edu.tw/upload/file/IEAS_Forecast-981222.pdf[2009, December 22]。正文科技(2010), Wireless Broadband Anywhere[線上資料], 來源: <http://www.gemtek.com.tw/>[2010, June 1]。吳啟源, 盧東華(1995), 資料庫系統概論(3版), 台北:儒林出版社。亞旭電腦(2010), Askey[線上資料], 來源: <http://www.askey.com.tw/> [2010, June 1]。亞美地科技(2010), Rfid Reader[線上資料], 來源: <http://www.ymd.com.tw/about.php>[2010, June 1]。佳景科技(2010), Homescenario[線上資料], 來源: <http://www.homescenario.com/home/index.html>[2010, June 1]。明泰科技(2010), Global Leader In Networking ODM, OEM Industry [線上資料], 來源: http://www.alphanetworks.com/index_tw.php[2010, June 1]。昇暉能源科技(2010), Solar Monitoring Solution[線上資料], 來源: <http://www.geoprotek.com/>[2010, June 1]。林育竹(2010), 雲端運算Cloud Computing的概念與應用[線上資料], 來源: <http://eblog.cisnet.org.tw/post/Cloud-Computing.aspx>[2010, January 22]。科技城(2010), A Professional Home Automation Manufacturer[線上資料], 來源: <http://www.techcity.com.tw/>[2010, June 1]。盛暘科技(2010), Total Solution Provider For DSP-FPGA-WSN[線上資料], 來源: <http://www.surewin.com.tw/>[2010, June 1]。黃瀚, 黃檜(1996), 資料庫寶典, 台北:儒林出版社。瑞帝電通(2010), Ready International INC[線上資料], 來源: <http://www.rיתי.com/ch/>[2010, June 1]。經濟部技

術處(2008), 無線感測智慧生活[線上資料], 來源:

<http://doit.moea.gov.tw/news/newscontent.asp?ListID=0884&TypeID=4&CountID=74&IdxID=3>[2008, June 5]。達盛電子(2010), Ubec Company Overview[線上資料], 來源: <http://www.ubec.com.tw/chinese/about/about.html>[2010, June 1]。達創科技(2010), Delta Networks, INC[線上資料], 來源: <http://www.dninetworks.com/>[2010, June 1]。電子商務研究中心(2006), 無線感測技術應用[線上資料], 來源: http://ebrc.ntpu.edu.tw/modules/news/article.php?mode=nocomments&order=0&item_id=785[2006, April 28]。識方科技(2010), Bandwave Technology INC[線上資料], 來源: <http://www.bandwavetech.com/>[2010, June 1]。二、英文部份 Akyildiz, I. F., & Stuntebeck, E.P. (2006). Wireless underground sensor networks: Research challenges. *Ad Hoc networks*, 4, 669-686. Akyildiz, I. F., Su, W., & Cayirci, E. (2002). Wireless sensor networks: A survey. *Computer networks*, 38, 393-422. Bogena, H. R. (2007). Evaluation of a low-cost soil water content sensor for wireless network applications. *Journal of Hydrology*, 344(2), 32-34. Chessa, S., & Santi, P. (2002). Crash faults identification in wireless sensor networks. *Computer Communications*, 25, 1273-1282. Comer, D. E. (2008). *Computer networks and internets*. New Jersey: Prentice Hall. Gupta, H., & Chowdhary, V. (2007). Communication-efficient implement of join in sensor networks. *Ad Hoc Networks*, 5, 929-942. Heidemann, J. F. (2001). Building efficient wireless sensor networks with low-level naming. *Proceedings of the Symposium on Operating Systems Principles* (pp. 146-159). Alberta, Canada: ACM. Heinzelman, W. (2000). Application-specific protocol architectures for wireless networks. Published doctoral dissertation, Massachusetts Institute of Technology, Boston. Kalpakis, K., Dasgupta, K., & Namjoshi, P. (2003). Efficient algorithms for maximum lifetime data gathering and aggregation in wireless sensor networks. *Computer Networks*, 42, 697-716. Liu, C. M., Lee, C. H., & Wang, L. C. (2007). Distributed clustering algorithms for data-gathering in wireless mobile sensor networks. *Journal of Parallel and Distributed Computing*, 67, 1187-1200. Perkins, C. (2000). *Ad Hoc Networking*. Reading, Massachusetts: Addison-Wesley. Porter, M. (1979). How competitive forces shape strategy. *Harvard business Review*, March-April. Sharieh, S. (2008). An ad-hoc network based framework for monitoring brain function, 8, 49-55. Shih, E. S. (2001). Physical layer driven protocol and algorithm design for energy-efficient wireless sensor networks. *Proceedings of ACM MobiCom '01* (pp. 272-286). Rome, Italy. Stankovic, J. A. (2008). *Wireless sensor networks*. *IEEE Computer Magazine*, 41(10), 92-95. Tamer, M., & Patrick V. (1999). *Distributed DBMS Architecture*. *Distributed Database Systems* (2nd ed.). (pp. 75-101). New Jersey: Prentice-Hall. Tian, H., Sudha, K., & Stankovic, J. A. (2006). An integrated sensor network system for energy-efficient surveillance. *ACM Transactions on Sensor Networks*, 2(1), 1-28. Tilak, S., Abu-Ghazaleh, B., & Heinzelman, W. (2002). A taxonomy of wireless micro-sensor network models. *ACM SIGMOBILE Mobile Computing and Communications Review*, 1(2), 28-36. Wood, A., Stankovic, J., & Virone, G. (2008). Context-aware wireless sensor networks for assisted-living and residential monitoring. *IEEE networks*, 22(4), 1-14. Zhang, L. J., & Zhou, Q. (2009). CCOA: Cloud computing open architecture. *IEEE international conference on web services*, 607-615.