The Design of Intelligent Residence Surveillance System Based on Grid Structure

劉家瑋、高富建

E-mail: 9701098@mail.dyu.edu.tw

ABSTRACT

A traditional residence surveillance system only can continuously capture monitoring images from image sensor that cannot actively perform the intelligent identification. Image sensors produce lots of continuous monitoring images so that the system spends a lot of time and storage space in processing these images, which is needlessly expensive. The system captures all images from image sensors in turn, so some monitoring blind spots exist among image sensors in the traditional surveillance system. This research proposed a design of intelligent residence surveillance system based on Grid structure to improve t he shortcoming of traditional surveillance systems in real-time monitoring. The proposed image sensor could judge whether images are abnormal or normal by comparing the difference of the background image and captured images; therefore, this could prevent from storing a large number of images that are normal. The proposed intelligent image sensor also provides a mechanism for multiple front-end image sensors to capture the monitoring images in real time and solve the problem of monitoring bind spots in the traditional surveillance system. In order to eliminate the congestion from images storing, this research proposed a distributed storing structure based on Grid technologies. The proposed system structure utilizes Ganglia Broker to integrate the backend-distributed computer resources and then solve congested problem. The proposed system also uses data replication to collect abnormal image files located at the back-end storing servers, and provides users to monitor and manage.

Keywords : Grid ; Intelligent Image Sensor ; Image Identification

Table of Contents

目錄 封面內頁 簽名頁 中文摘要..... ii ABSTRACT..... iii 致謝..... iv 目錄..... v 圖目錄..... vii 表目錄..... ix 第一章..... 1 1.1 前言..... 1 1.2 研究動機與目的..... 2 1.3 論文架構..... 4 第二章　相關研究..... 5 2.1　格網概念..... 5 2.2　格網架構..... 7 2.3　GRID MIDDLEWARE..... 10 2.3.1　GSI （Grid Security Infrastructure）... 12 2.3.2　資源管理.....13 2.3.3　資訊服務.....15 2.3.4 資料管理..... 16 2.4　JAVA COG KIT..... 20 第三章　Ganglia 代理伺服器設計..... 22 3.1　改良型GANGLIA BROKER.....24 3.2　GANGLIA 系統安裝..... 26 第四章　系統建構與數據分析..... 31 4.1　影像感測器設計與實作 .....32 4.2　智慧型居家保全系統之代理伺服器實作..... 34 4.3 智慧型居家保全系統之影像儲存伺服器設計與實作37 4.3.1 Globus安裝與設置Gridftp..... 37 4.3.2　整合後端分散式影像儲存伺服器.....45 4.4　GRID　PORTAL設計.....46 第五章　結論.....47 參考文獻..... 49

REFERENCES

[1] Ian Foster, “ What is the Grid? A Three Point Checklist ”, Argonne National Laboratory & University of Chicago July 20, 2002 [2] Ian Foster , Carl Kesselman and Steven Tuecke , “ The Anatomy of the Grid Enabling Scalable Virtual Organizations ”, Supercomputer Application, 2001 Page: 2 – 6 [3] The Globus Project , http://www.globus.org/ [4] Ian Foster , Carl Kesselman and Steven Tuecke , “ The Anatomy of the Grid Enabling Scalable Virtual Organizations ” Supercomputer Application, 2001 Page: 6-14 [5] BORJA SOTOMAYOR , “ Globus Toolkit 4 PROGRAMMING　JAVA Services ”, Pages；7-10 [6] The Grid Architecture , http://www.globus.org/toolkit/about.html [7] Grid Security Infrastructure （GSI）, Globus Project-Globus Toolkit,2005, http://www-unix.globus.org/toolkit/docs/4.0/security/ [8] IBM Red Book , “ Introduction to Grid Computing with Globus ”, Pages:51-78 [9] Globus GRAM Architecture , http://www.globus.org/toolkit/docs/4.0/execution/prewsgram/ [10] IBM Red Book , “ Introduction to Grid Computing with Globus ”, Pages:135-138 [11] Globus MDS Architecture , http://www.globus.org/toolkit/docs/4.0/info/ [12] IBM Red Book , “ Introduction to Grid Computing with Globus ”, Pages:138-140 [13] BORJA SOTOMAYOR , “ Globus Toolkit 4 PROGRAMMING　JAVA Services ”, Pages:39-41 [14] IBM Red Book “ Introduction to Grid Computing with Globus ”, Pages:140-142 [15] OpenSSL , http://www.openssl.org/ [16] Ann Chervenak , Ewa Deelman , Ian Foster , Leanne Guy, Wolfgang Hoschek , Adriana Iamnitchi , Carl Kesselman , Peter Kunszt , Matei Ripeanu , Bob Schwartzkopf , Heinz Stockinger, Kurt Stockinger , Brian Tierney, ” Giggle: A Framework for Constructing Scalable Replica

Location Services ”, Proceedings of the IEEE/ACM SC2002 Conference [17] Globus RLS Architecture , http://www.globus.org/toolkit/docs/4.0/data/rls/index.pdf [18] Java Cog Kit , http://wiki.cogkit.org/index.php/Main_Page [19] IBM Ganglia , http://www.ibm.com/developerworks/cn/views/grid/tutorials.jsp?cv_doc_id=97804 [20] http://ganglia.sourceforge.net/ [21] Maozhen Li , Mark Baker , “ The Grid: Core Technologies ”， Page:153-243 [22] Apache HTTP SERVER PROJECT , http:// httpd.apache.org/ [23] Simple CA, http://www.globus.org/toolkit/docs/4.0/security/simpleca/ [24] 夏靖波、劉穎、汪勝榮， ”網格原理與開發,Theory and Developmnet of Grid ”，西安電子科技大學出版社，Page:121 [25] RFT , http://www.globus.org/toolkit/docs/4.0/data/rls/index.pdf