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Construction of DICOM Server using Oracle and CTN Software

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I Introduction

CTN[1] provides useful template source code files for custom made DICOM[2] software. CTN's image server (Storage Service Class Provider; Storage-SCP and Query/Retrieve Service Class Provider; Q/R-SCP). CTN uses Mini SQL (Hughes Technologies Pty Ltd.) or Sybase (Sybase, Inc.) as database software for UNIX. However, CTN does not support Oracle (ORACLE Co Ltd.) which is one of the most popular database software in Japan. We modified CTN, therefore, to support Oracle Structured Query Language (SQL) and tried to construct a practical DICOM image server.

II Method

CTN 2.10.2 and Oracle 8.0.4 Workgroup Server were installed on the Sun Soralis Server. SQL commands and Application Programming Interface (API) in source code files of CTN were replaced to that of Oracle SQL. The modified source code files were in the directories of include, facilities, apps (applications) and others (**Fig.1**). We also extended file quota to the appropriate size for the practical use (**Table.1**).

We tested newly constructed image server with Oracle SQL, using CTN's commands, namely send_image (Storage Service Class User; Storage-SCU) and query_client (Query/Retrieve Service Class User; Q/R-SCU) (**Fig.2**).

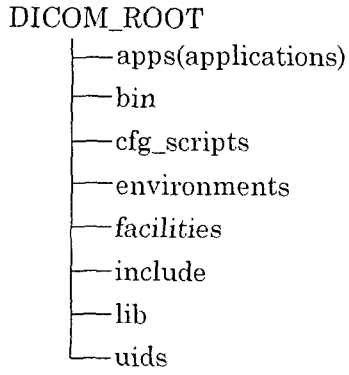

Fig.1 Directory Structure of CTN

Table.1 Extended file quota of Image Server with Oracle

Type	Quota size
Patient	10,000
Study	100 per patient
Series	100 per study
Image	300 per series

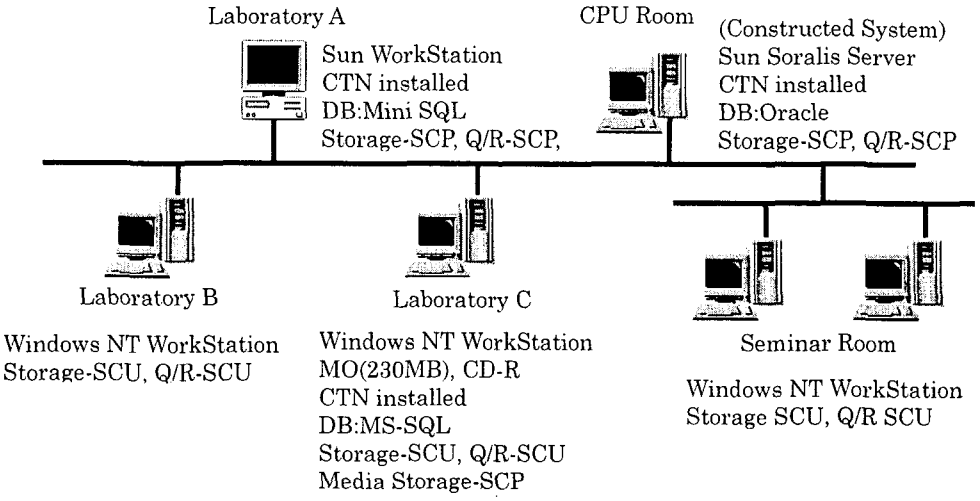

Fig.2 DICOM Server construction in Tokyo Metropolitan University of Health Sciences

DB :database software

Ⅲ Results and Discussion

CTN was modified to support Oracle SQL. The constructed system represented good performance for research and education.

In the next step of this project, The constructed system will be extended to support Media Storage Service Class such as Compact Disc Recordable (CD-R) which is defined by DICOM supplement 19[3] and Digital Video Disc Random Access Memory (DVD-RAM) which is defined DICOM supplements in near future. The image server will be more useful, if it supports functions such as transaction process, auto back-up and others using Oracle's API.

References

1) CTN: Central Test Node Software; Electronic Radiology Laboratory, Mallinckrodt Institute of Radiology, Washington University School of Medicine
2) Digital Imaging and Communications in Medicine (DICOM): National Electrical Manufactures Association, 1998
3) Digital Imaging and Communications in Medicine (DICOM) Supplement 19 General Purpose CD-R Image Interchange Profile: National Electrical Manufactures Association, 1997