ORTHANC AS PACS:
A MALAYSIAN EXPERIENCE OF DEPLOYMENT WITHOUT FUNDING

KIM-ANN GIT, MD MMED CIIP

SELAYANG HOSPITAL, MALAYSIA
Thanks for your interest in Orthanc! You can download the requested package at the following location:

A tutorial about Orthanc is available at the following location:

Further instructions can be found on the official website:
http://www.orthanc-server.com/resources.php

As a reminder, here is the content of your download request:
Version: Orthanc-0.8.6-Installer.exe
First name: Kim Ann
Last name: Git(MyLastNameIsOnly3Chars)
E-mail: ftsvd@yahoo.com
Company: Hospital Selayang
Sector: Large hospital (> 50 beds)
Other sector:
Country: Malay
Address:
Lebuhraya Selayang-Kepong
68100 Batu Caves Selangor
TAIPING HOSPITAL

Established 1880

Beds: 608

First X-ray in 1897

CR / US / MG / CT / MR / RF
A LONG, LONG TIME AGO

Clinics / Wards

Radiology Department

[Diagram showing the flow of medical imaging data from clinics/wards to the radiology department]

[Images of medical professionals and computer screens with medical images]
JUST ANOTHER DAY IN THE ORTHOPAEDIC CLINIC
THE COMPLETELY EXPECTED HAPPENS

Clinics / Wards

Radiology Department
Necessity is the mother of invention.
PROJECT MANAGEMENT: SURVEY
OUR DESIGN
OUR DESIGN

Modality -> Workstation -> Orthanc -> mcdcmReporter

Orthanc

PostgreSQL
  - OrthancDB
  - IsenDB
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OUR DESIGN

- Modality
- Workstation
- Orthanc
- Postgres
- OrthancDB
- IsenDB
- mcdcmReporter
- Web Viewer Plug-in
- Lua
- UACP
- Reverse Proxy
PHOTOS
SURGICAL WARD
SURGICAL WARD
CHANGE MANAGEMENT
STATISTICS
/STATISTICS (8 DEC 2019)

{
    "CountInstances" : 2839310,
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    "CountSeries" : 175558,
    "CountStudies" : 103679,
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}

100,000+ studies
2,800,000+ instances
2.8Tb
OUR DESIGN

Modality

Workstation

Orthanc

PostgreSQL

Client

mcdcmReporter

UACP

Audit Trail

Orthanc

OrthancDB

IsenDB

Reverse Proxy

Lua

Osimis

Web

Viewer

Plug-in

Audit Trail
STUDIES VIEWED PER MONTH
STUDIES VIEWED PER DAY (NOV 2019)
STUDIES VIEWED PER 5-MIN
(10AM 12 NOV 2019)
Miri
(Hospital Miri)
100,000+ studies
2,000,000+ instances
3.0Tb
PACS

Kuching
(Sarawak General Hospital)
120,000+ studies
600,000+ instances
1.5Tb
PACS
...OTHER SITES

Selangor
(Selayang Hospital → Health Clinics)
2,000+ studies
Teleradiology

Kuala Lumpur
(KL Health Clinic → KL Hospital)
35,000+ studies
45,000+ instances
0.3Tb
PACS + Teleradiology
CHALLENGES
CHALLENGE #0: UNQUALIFIED DEV

1. Services stopping / not starting
2. Bugs
3. Backup takes too long

99.9% Problems
CHALLENGE #1: INTEGRATION COSTS

**Solution 1:**
Modify pre-existing nodes as routers or take over deprecated nodes

**Price Per Connection (IP, Port, AET)**
- RM7,000 → RM25,000
- $1,600 → $6,000
- €1,500 → €5,000

**Solution 2:**
Ask a friendly engineer or beg from the vendor

**Solution 3:**
Threaten the vendor
CHALLENGE #2: BACKUP

PostgreSQL

OrthancDB

IsenDB

Initial Solution:
Nightly ZIP and COPY the [pgdata] folder to external HDD

Current Solutions:
[pgdata] on RAID5
Nightly DSYNCHRONIZE [pgdata] with external HDD

[ HELP! ]
CHALLENGE #3: I CAN HAZ IT?

Future Direction:
Containers
CHALLENGE #4: MAINTENANCE

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Hospital IT

Radiology
EXTRA STUFF
#1: THE ORIGINAL MCDCMREPORTER
#2: MOBILE VIEWING

Client

Basic Web Server with FTP access

Orthanc

Internet

Intranet

Client

mcdcmLite Processor

LLAP1701

Jim Kirk

LLAP1701
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#3: CT DOSE DATABASE

Uninterrupted Orthanc service running 24/7 since April 2015

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ORTHANC AS PACS: A MALAYSIAN EXPERIENCE OF DEPLOYMENT WITHOUT FUNDING

KIM-ANN GIT, MD MMED CIIP

SELAYANG HOSPITAL, MALAYSIA