While gearing up for the Patient Protection and Affordable Care Act (PPACA), payers and providers are facing issues with the storage of medical images. Imaging devices, such as CT and PACS, use Digital Imaging and Communications in Medicine (DICOM) for storage and archival/retrieval of medical images. However, they face challenges of higher hardware costs, lack of scalability and compliance to HL7 for replication of patient data.

Healthcare providers, insurers, and care givers are finding it difficult to manage the shift while containing costs. Medical image archives are increasing by 20-40 percent each year, with an estimate of 1.4 billion medical images stored only in the U.S. by 2014. It is challenging for organizations to efficiently archive a large number of medical images in accordance with FDA-approved medical imaging algorithms. Further, the image processing has to support DICOM.

The fastest growing area in healthcare organization in terms of data is the medical images storage. As data volumes increase, hospitals continue to wrestle with some of their largest data management challenges in terms of storage and protection.

Compliance to HL7 standards requires replication of data and this needs investment in expensive infrastructure. Efficient archiving of large number of medical images is supported by Hadoop Distributed File System (HDFS). Healthcare stakeholders need a cost-effective, user-friendly solution to aid tagging of vast number of medical images.

A partner with expertise in using HDFS provides organizations with the ability to aptly archive retrieve and correlate medical images with patient data.

Syntel Solution

Syntel leverages Big Data Technologies like Hadoop, Apache Solr for efficient archival and retrieval of medical images. **Syntel’s Medical Image store on Hadoop** enables DICOM Medical Image archival and retrieval coupled with a user-friendly search. The Medical Image store is a cost-effective option as it is built with open-source software. Generally, achieving and retrieving medical images require heavy spending on the licensing and IT Infrastructure.

Syntel’s Medical Image store is designed with out-of-the-box replication and fault tolerance in storage that allows it to withstand hardware failures. The solution has features that provide advanced image processing and Analytics on stored medical images, with a user interface enabled with an advanced metadata-based search option.

Some of the salient features of the solution are enlisted below:
- Efficient archival of a large number of medical images in HDFS
- User interface with Advanced Medical Image’s metadata based search.
- Ability to quickly lookup a patient and intuitive hierarchical view of patient’s history
- Helps End User to retrieve and compose Medical images based on criteria
- Platform and interface for large scale distributed image processing by adding support for DICOM. Helps in saving time to perform the analysis
- Distributed indexing of extracted image metadata
- Use of HDFS to store images, and provide high scalability and fault tolerance
- Download DICOM images on local computers to analyze on local DICOM viewer

**Business Benefits**

Syntel’s Medical Image store is an economical option as it is based on open source software. Some of the benefits offered by Syntel’s Medical Image store are:

- **Scalability** – Distributed storage provides large scale medical images; distributed as well as horizontally scalable storage, for increased demand
- **Unique** – First of its kind for Medical Image store like CT and MRI
- **Reduced downtime** – Replicated and fault-tolerant storage
- **Advanced features like Quick Search** and retrieval of required Images
- **Deployment on commodity hardware**, minimizing the cost
- **Helps Medical Professionals in diagnosis** and is very secure.

**WHY SYNTEL?**

- A leading global IT and KPO service provider
- Established in 1980 (NASDAQ: SYNT)
- More than 24 offices in North America, Europe, and Asia
- Flexible onsite-offshore global delivery model
- Dedicated Centers of Excellence to help clients with expert advice and project guidance
Digital medical images are typically stored locally on a PACS for retrieval. Syntel has successfully leveraged Hadoop and related tools to devise a system that will help the Healthcare Management Industry to scale their image storing infrastructure.

Necessity

Medical imaging technologies have revolutionized health care delivery around the world. Hospitals need to store these images for ready reference, maintaining patient’s records and for regulatory purposes. The PACS (Picture Archiving and Communications System) is burdened with images and needs constant upgrading.

Challenges Faced

Increased number of medical Images from patients creates challenges to existing PACS system.

- **Scalability** – PACS systems need expensive hardware for better scalability, which in turn increases the cost to store images.
- **Image Replication** – PACS need to follow HL7 standards, which require replication of data. This feature increases the system and system maintenance cost.
- **Analysis** – PACS do not support analysis of images stored. Further, PACS do not support retrieval of images with parameterized search.

Syntel’s Medical Image Store

Solution provided by Syntel for medical image storage and retrieval overcomes all the limitations of existing PACS System. Syntel’s Medical Image Store offers horizontal scalability and is cost effective as it runs on commodity hardware. This solution gives user a flexible search option for image where user can search images by giving up to 10 image parameters.

Technical Advantages

- Scalable yet economical option
- Facilitates functions like archival and retrieval
- Embedded Search functions
- Facilitates Analysis
- Feature of a dashboard with consolidated information