Peer Testing Report #1

TMI Project
Team 0

DICOManon / “DPHIANT”

“DICOM Personal Health Information Anonymization Tool”

DPHIANT is a plugin for Orthanc, the free and open-source, lightweight DICOM server for medical imaging. DPHIANT is a plugin to anonymize DICOM files.

Our current system runs three docker separate containers using the Orthanc server framework. Currently, we have developed a modality container which simulates a medical imaging machine, like an X-ray or MRI machine. Another Container represents our ‘Middleman’ server which will run the anonymization processes on incoming DICOM files. The last container is our output PACS server which stores images modified by middleman.

The current configuration allows us to manually interact with each part of the pipeline and view the DICOM files through a web interface. As demonstrated in the video, a file can be manually uploaded to the modality container, and manually sent to the middleman. The middleman container automatically processes the file and sends it to the PACS server.

Currently, no anonymization processes are taking place, instead we are only changing a few tags in the DICOM file’s metadata to test the middleman’s ability to modify these tags and send the file back intact with its new changes. It does this successfully. Finally the PACS container receives the file and it is viewable with its web interface. We are also not yet storing or interfacing with any personal identifiable health information and therefore there are no risks involved as of yet. Upon closing down the containers, all data uploaded to the servers are deleted.

In summary, below a list of functional features that was available during testing:

- Three separate instances of Orthanc running in Docker containers
- Access Orthanc web interface
- Upload DICOM file in Orthanc modality container
- Transfer DICOM file from Orthanc modality to PACS server via middleman
- Ability to change DICOM file tags in middleman, chiefly name and patient ID.

During our testing of these functionalities, we came to find that there were no issues to occur amongst any parts and/or processes of the DPHIANT pipeline. We tested a few different DICOM files, some with lots of metadata and some without, as well as another generic, non-DICOM

imaging file. All files were successfully passed through the pipeline with no errors or holdups. All of the features listed above were successfully executed and demonstrated.
To set up the environment to run our project, follow the steps below.

Setup

Download the project package from our GitHub repository

1. To start the setup, type “docker-compose up --build in your project path”. This will begin to install the various images and dependencies required to run Orthanc servers via Docker
2. After the Orthanc server has started up, it will ask for login information, use the following to log in.

   LOGIN/PASSWORD = demo/demo

3. Each instances of Orthanc can be accessed at the following localhost address:
   a. Orthanc Modality simulation: http://localhost:8044/
   b. Orthanc Middleman simulation: http://localhost:8043/
   c. Orthanc PACS simulation: http://localhost:8042/
4. Open Orthanc Modality instance and select ‘send to modality’, then select middleman as the destination.
5. The middleman instance serves as a temporary buffer to modify the images and for de-identification. DICOM file is then automatically sent to Orthanc PACS.
6. DICOM finally arrives at the Orthanc PACS instance, where users can view the de-identified DICOM file.