



HL7 FHIR DevDays 2017



DICOM and Imaging Tools

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Amsterdam, 15-17 November | [@fhir_furore](#) | [#fhirdevdays17](#) | [www.fhirdevdays.com](#)

Quick Introduction



Mohannad Hussain

- Software engineer
- Team lead at Agfa HealthCare, Integrations and Customizations
- Coordinator, annual SIIM Hackathon

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SIIM HACKATHON DATASET

SIIM?!?

- Society for Imaging Informatics in Medicine is a US organization advocating for, you guessed it, imaging informatics!
- SIIM holds an **Educational Conference** (aka annual general meeting)
 - Next one is May 31st- June 2nd in Washington DC



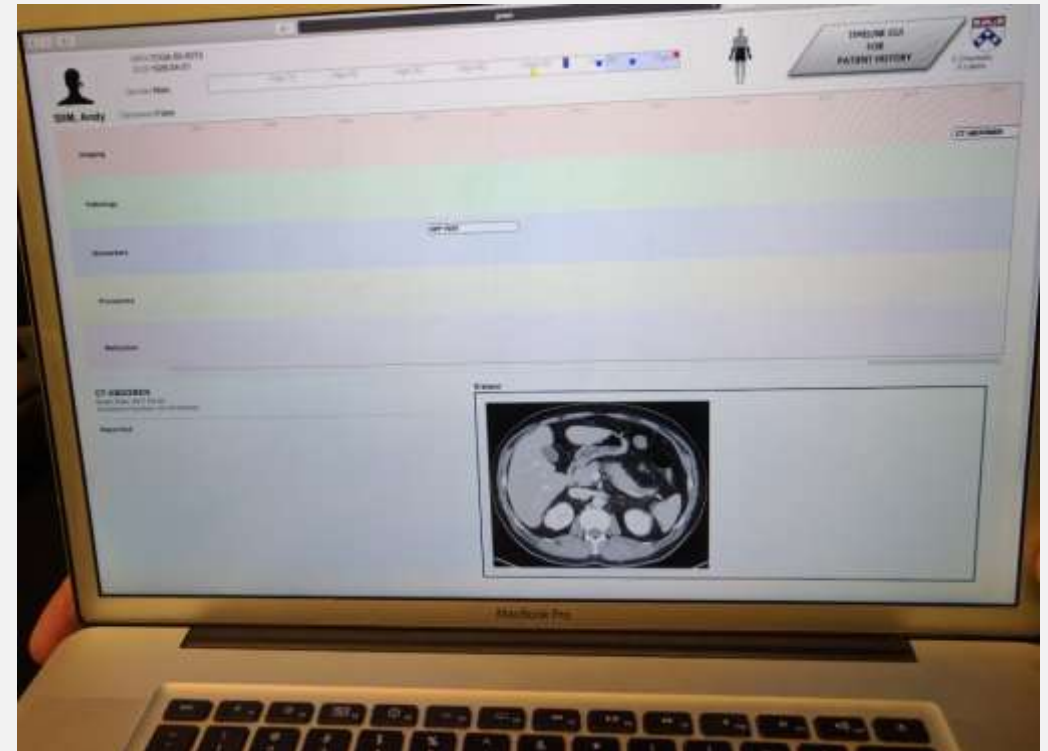
SIIM Hackathon?!?

- SIIM is an evangelist of FHIR and DICOMweb, began holding Hackathons in 2014 featuring those two standards
- After the first Hackathon, SIIM decided we needed a cohesive, rich dataset that will allow people to build interesting applications



SIIM Hackathon Dataset – Why?

- A good dataset helps developers find realistic data to test with
 - Thus accelerate pace of innovation
 - vs. testing with randomly generated, not so representative data



What?

- Set of 5 patient narratives, **marrying FHIR resources with DICOM images.**
 - Fictitious but believable narratives, along with DICOM images that corroborate each patient's story.
- Real-life radiologists heavily contributed to the dataset.

Patient Narratives

Sally SIIM (mrn: BreastDx-01-0003)

58 yo female DOB: 04/12/1950

HPI: Had a palpable left breast mass discovered on self-breast exam. Patient 4/12/2008. Patient had a lumpectomy on 5/24/2008.

PMHx: Hypothyroidism

Allergies: NKDA

Medications: levothyroxine sodium 50mcg once daily

Lab/Radiology

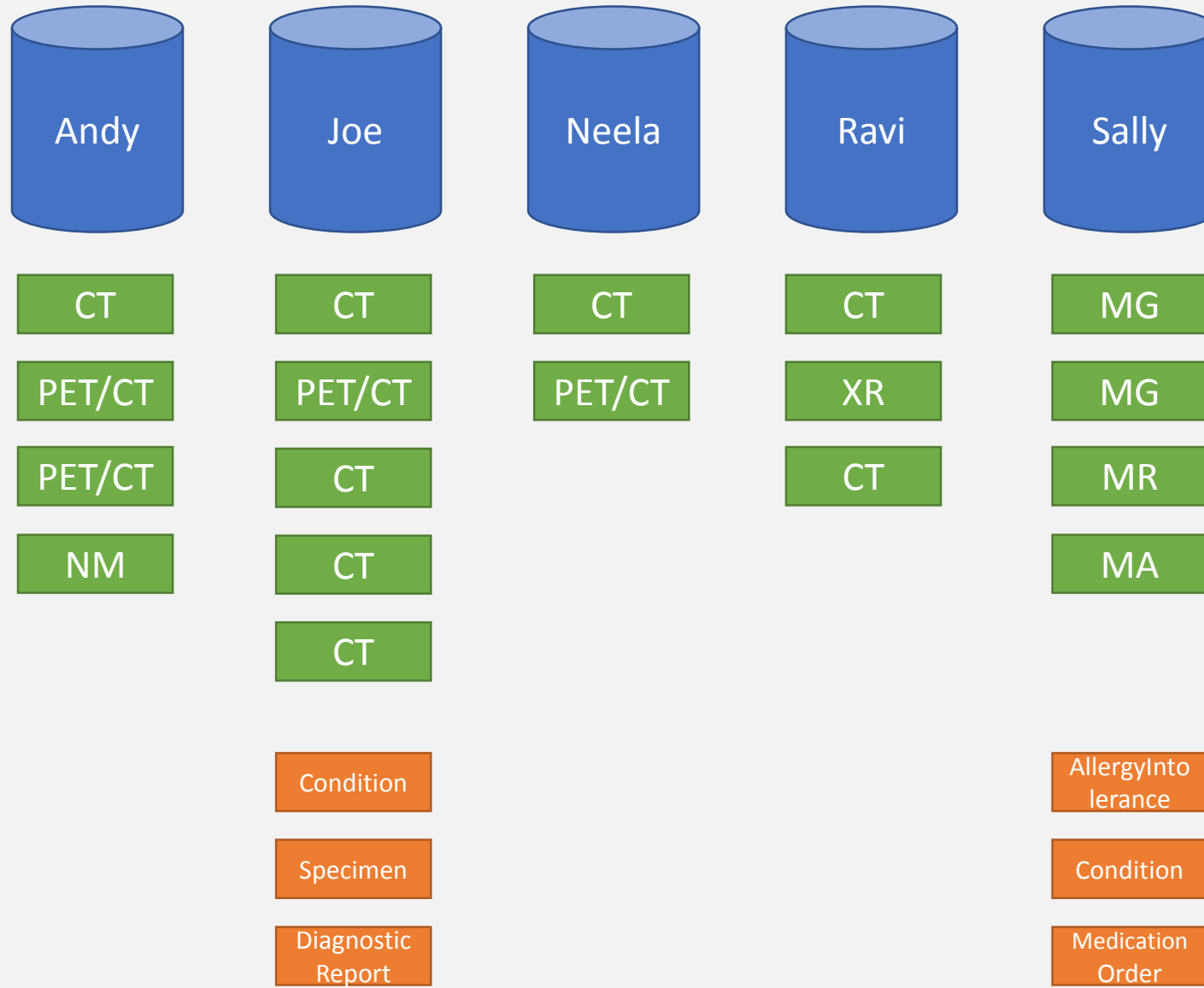
How?

- Dataset is MIT license
- Load it on your own FHIR and/or DICOMweb servers
- Or, use SIIM's cloud servers
 - Requires signing up for an API key, but does NOT cost anything

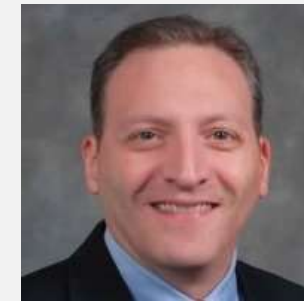


Links

- FHIR: <https://github.com/ImagingInformatics/hackathon-dataset>
- DICOM: <https://github.com/ImagingInformatics/hackathon-images>



SIIM Hackathon Dataset Credits



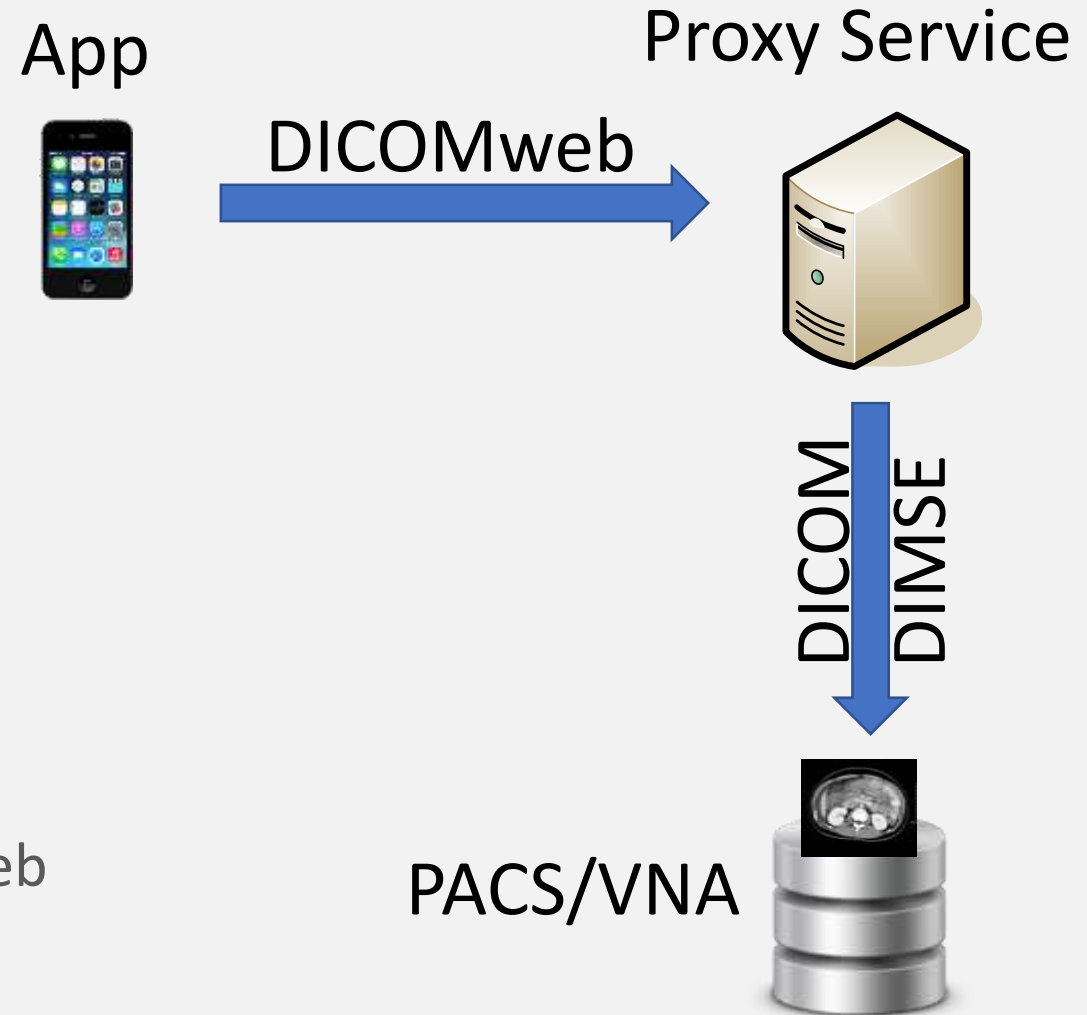
DICOMWEB PROXY

The Problem

DICOMweb is great but my
PACS/VNA vendor does NOT
support it...!@#\$\$%

Solution

- Proxy/facade service:
 - Input: DICOMweb
 - i.e. QIDO-RS, WADO-RS...
 - Output: DICOM DIMSE
 - i.e. C-FND, C-MOVE....
- Can be installed in front of virtually any PACS/VNA
 - Essentially a retrofit for DICOMweb



Great minds think alike!

- Simple proof of concept developed at the SIIM 2017 Hackathon
- In parallel, RSNA & Sync for Science team up to build a DICOM RESTful Server Broker (i.e. DICOMweb proxy)
 - Goal is to make access to studies for research easier across RSNA Image Share Network (ISN) participants, given patient consent.



Enter DICOM-RS Broker!

- Currently implements:
 - Query (QIDO-RS to C-FIND)
 - Retrieve (WADO-RS to C-MOVE)
- Invitation to add support for:
 - Storage (STOW-RS to C-STORE)
 - Tasks (UPS-RS to MWL)
 - ...etc



What's in it for “Sync for Science”?

- Make it very easy for patients to enroll in research studies, by volunteering their clinical & image data.
- All the patient needs to do is give their electronic consent, the rest is automated, making it quite seamless and easy.



DICOM-RS Broker - Links

- Vision: <https://github.com/sync-for-science/imaging/wiki>
- Code: <https://github.com/RSNA/dcmrs-broker>
- Docker: <https://github.com/RSNA/dcmrs-broker-docker>

It just keeps getting better – FHIR Broker

- FHIR Broker can build and return Patient and ImagingStudy FHIR resources on-the-fly based on information from DICOM QIDO-RS (e.g. the DICOM-RS Broker)
- See <https://github.com/sync-for-science/imaging/wiki>

Thank you! Questions?

- Reach out!
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