



Web-based Image Access (WIA)

Formerly known as MHD-I

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IHE Radiology Technical Committee Co-Chair



Problems to Solve in Imaging



Secure web access
to imaging studies

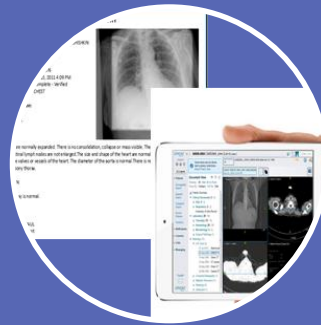


Image sharing &
Interactive
viewing



Ease of integration

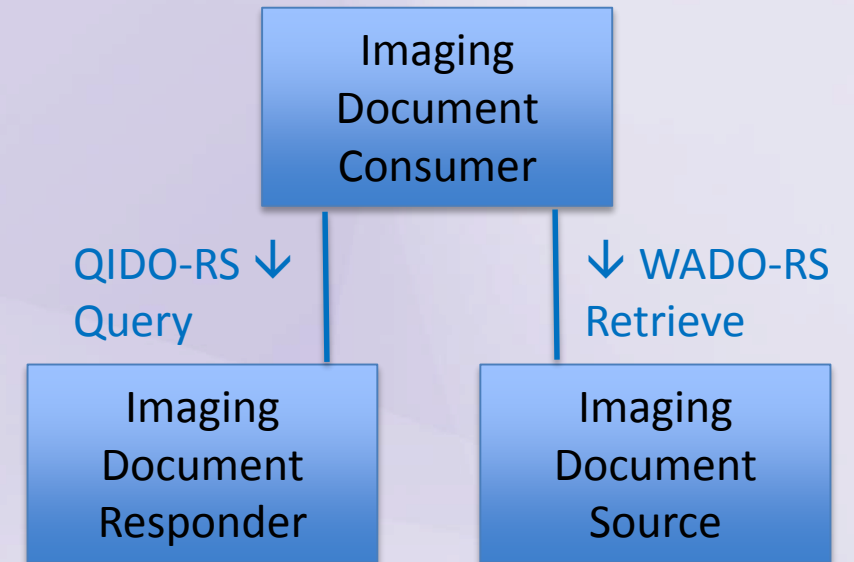
Neutral to image sharing infrastructure: DICOM, XDS-I, MHD

Web-based Image Access Value Proposition

Methods for **image sharing** and
interactive viewing of imaging studies
using **RESTful services** such as
WADO-RS and QIDO-RS.

WIA Technical Highlights

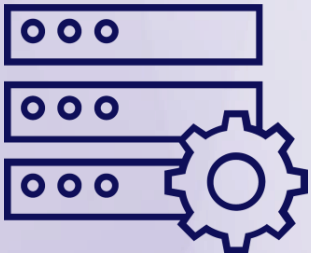
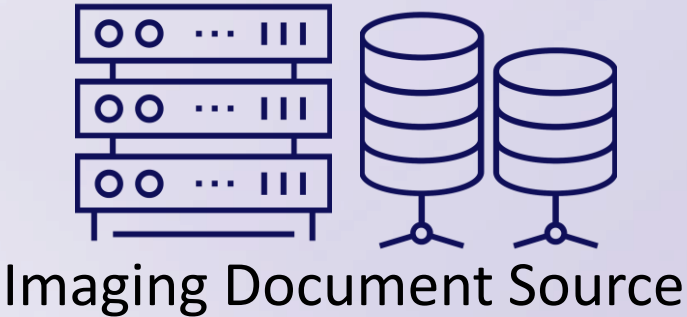
- Neutral about backend image sharing infrastructure
 - XDS / XDS-I
 - DICOM / DICOMweb
- Integrates with ITI MHD
 - Document Consumer can locate and interact with imaging studies more efficiently using document metadata



WIA in Two Easy Steps

Step 1: QIDO-RS Query

What studies do you have for patient 12345?



<https://radiology.hospital.com/qidors/studies?PatientID=12345&includefield=NumberOfStudyRelatedSeries&includefield=NumberOfStudyRelatedInstances HTTP/1.1>
Accept: application/dicom+json



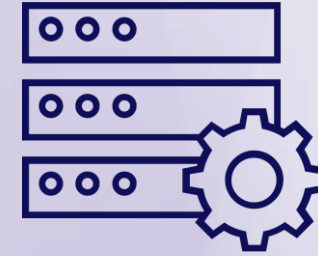
Patient's Name	Patient ID	Patient's Birth Date
WALLACE^PETE	12345	19740701
Study Instance UID	Accession Number	Modality in Study
1.2.250.1.59.40211.12345678.678910	1619823	CT
Study Date	Instance Availability	Retrieve URL
20170405	ONLINE	https://radiology.hospital.com/wadors/studies/1.2.250.1.59.40211.12345678.678910

Step 2: WADO-RS Retrieve

Retrieve Study!



Imaging Document Source

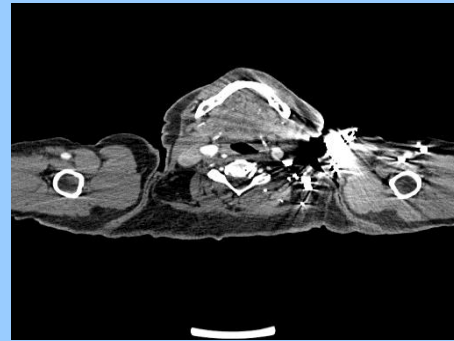


Imaging Document Responder

<https://radiology.hospital.com/wadors/studies/1.2.250.1.59.40211.12345678.678910>



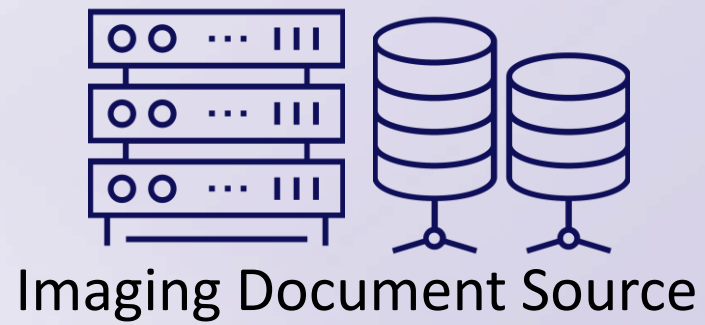
Imaging Document Consumer



now?
what?
■ ■ ■

Interactive Viewing: More QIDO-RS Queries

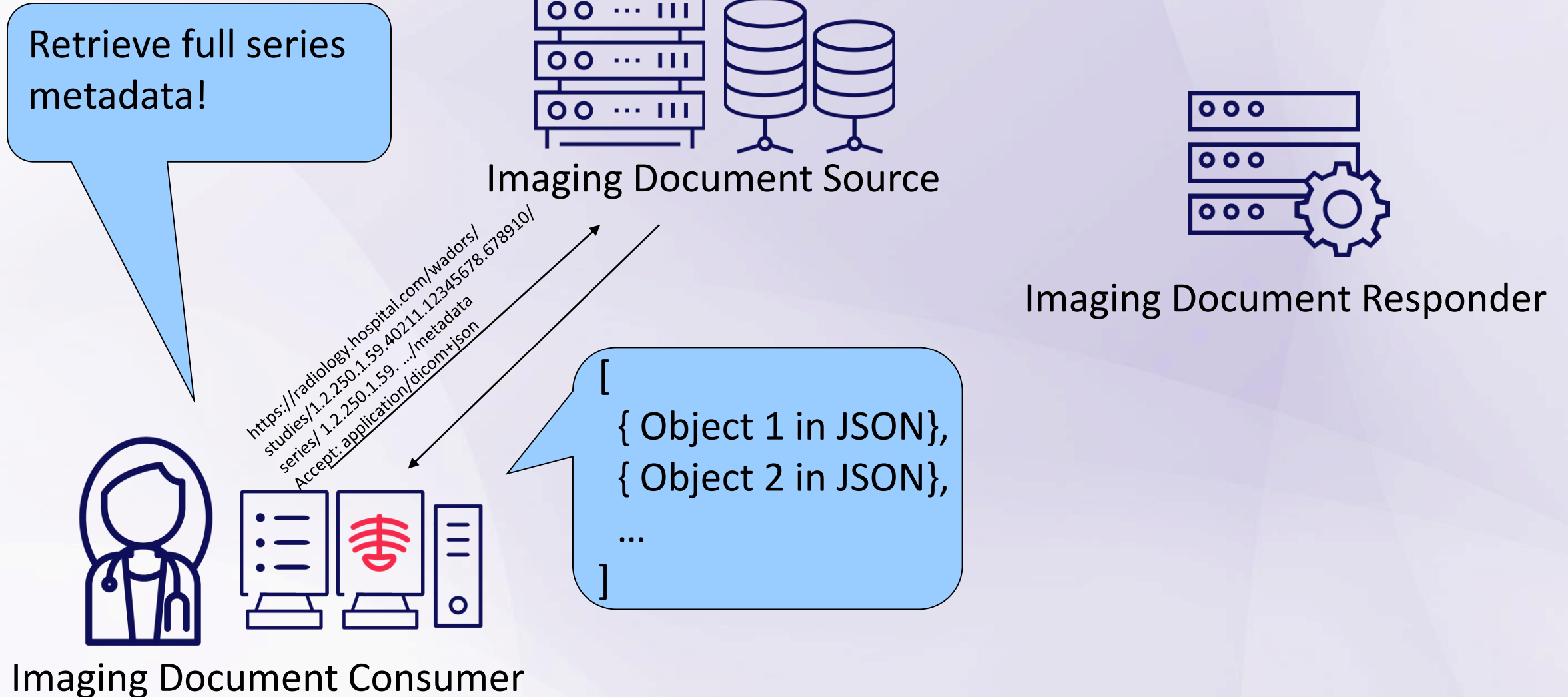
Give me the detailed metadata for the study!



<https://radiology.hospital.com/qidors/studies/1.2.250.1.59.40211.12345678.678910/instance?includefield=all HTTP/1.1>
Accept: application/dicom+json

Patient's Name	Patient ID	Study Instance UID
WALLACE^PETE	12345	1.2.250.1.59.40211.12345678.678910
Series Instance UID	Modality	Image Number
1.2.250.1.59.40211.12345678.678910.12445	CT	1
Rows	Columns	Retrieve URL
512	512	https://radiology.hospital.com/wadors/studies/1.2.250.1.59.40211.12345678.678910/...

Interactive Viewing (2): WADO-RS RetrieveMetadata



What is your experience with XDS-I?



XDS-I Integration: QIDO-RS to XDS Registry Query Transformation

What studies do you have for patient 12345?

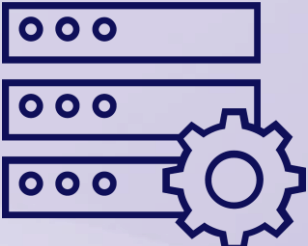


Imaging Document Consumer



Imaging Document Source

<https://radiology.hospital.com/qidors/studies?PatientID=12345&includefield=NumberOfStudyRelatedInstances HTTP/1.1>
Accept: application/dicom+json



Imaging Document Responder

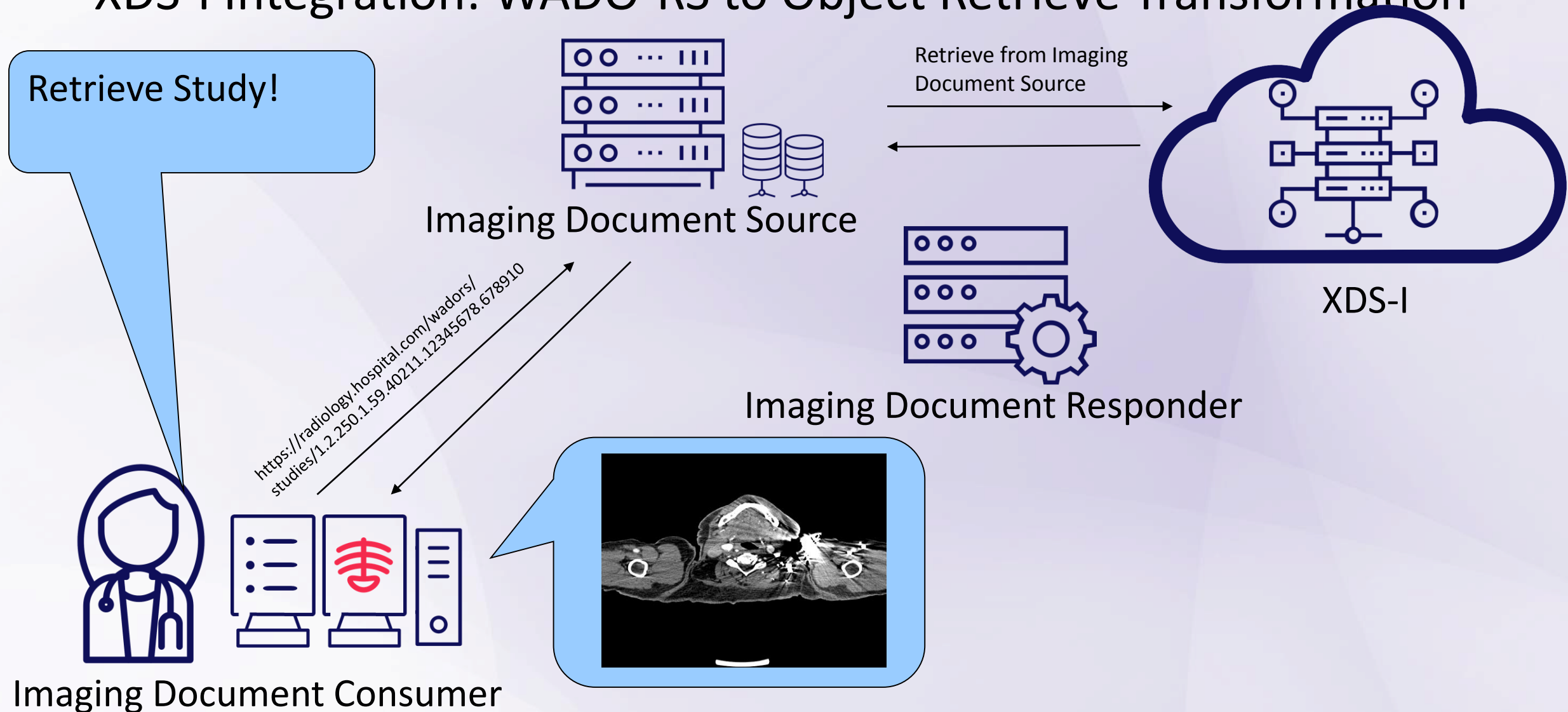
XDS Registry
Stored Query



XDS-I

Patient's Name	Patient ID	Patient's Birth Date
WALLACE^PETE	12345	19740701
Study Instance UID	Accession Number	Modality in Study
1.2.250.1.59.40211.12345678.678910	1619823	CT
Study Date	Instance Availability	Retrieve URL
20170405	ONLINE	https://radiology.hospital.com/wadors/studies/1.2.250.1.59.40211.12345678.678910

XDS-I Integration: WADO-RS to Object Retrieve Transformation



Populate Registry Stored Query Parameters

Registry Stored Query Parameter	QIDO-RS Matching Keys
\$XDSDocumentEntryPatientId	Patient ID (0010,0020) and Issuer of Patient ID (0010,0021)
\$XDSDocumentEntryReferenceIdList	Accession Number (0008,0050) and Issuer of Accession Number Sequence (0008,0051) Study Instance UID (0020,000D)
\$XDSDocumentEntryEventCodeList	Modalities in Study (0008,0061) Anatomic Regions in Study Code Sequence (0008,0063)
\$XDSDocumentEntryServiceStartTimeFrom \$XDSDocumentEntryServiceStartTimeTo	Study Date (0008,0020) and Study Time (0008,0030)
\$XDSDocumentEntryTypeCode	Procedure Code Sequence (0008,1032)
\$XDSDocumentEntryPracticeSettingCode	Requesting Service Code Sequence (0032,1034)

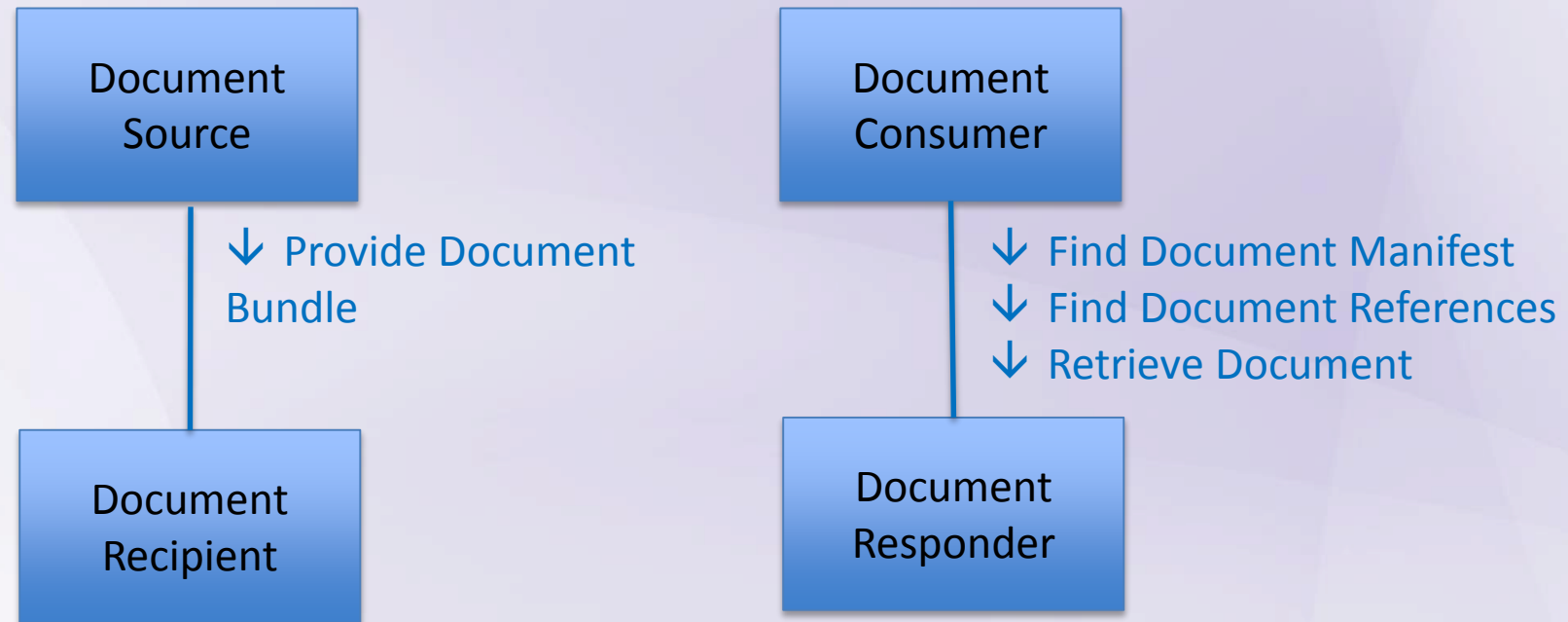
DICOMweb x HL7 FHIR



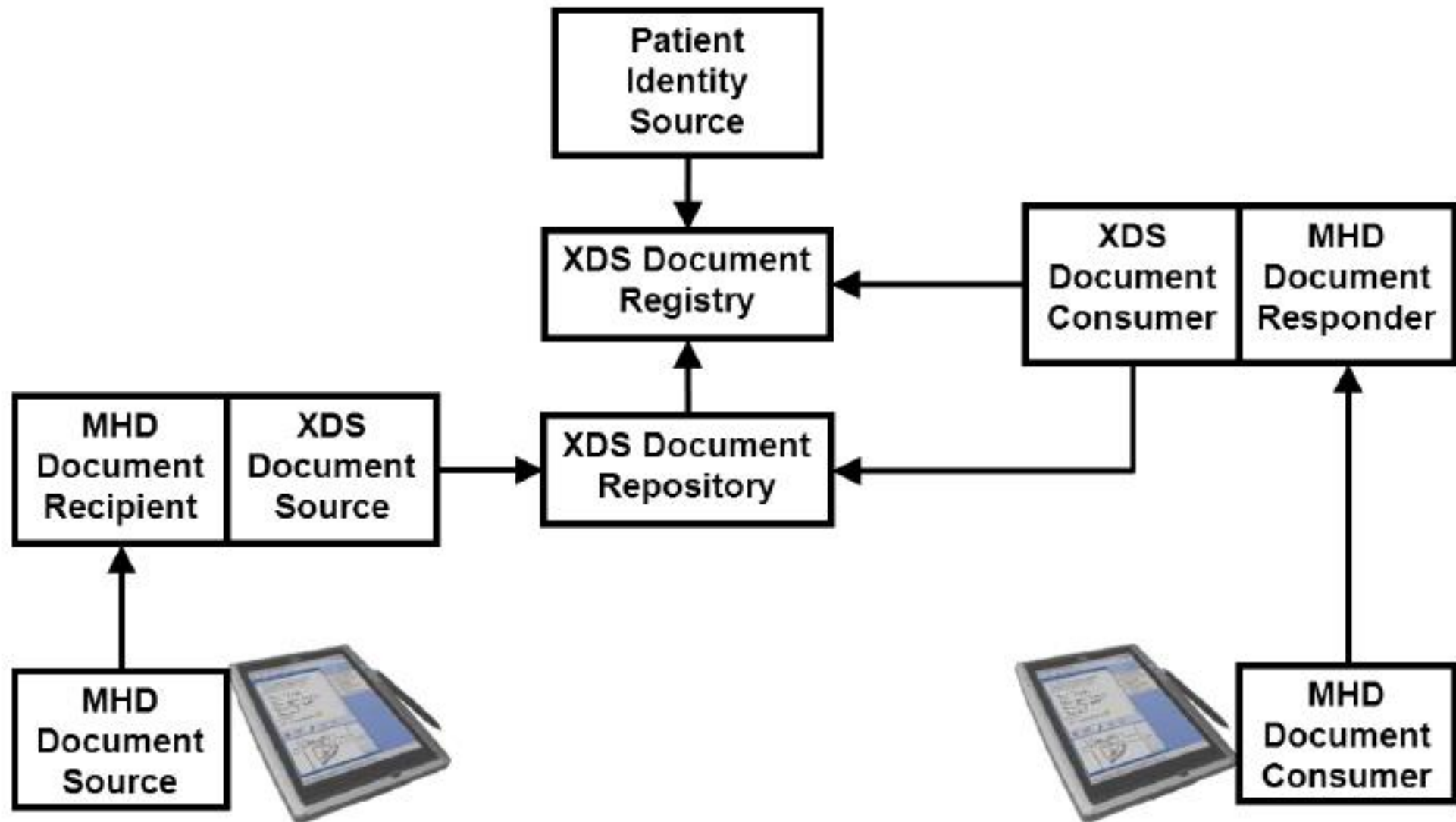
FHIR®



Mobile Access to Health Document (MHD)



MHD: XDS on FHIR Option



MHD Integration: Imaging Study Discovery Continuation

What **documents** do you have for patient 12345?



MHD Document Consumer /
Imaging Document Consumer

https://xds.hospital.com/net.ihe/DocumentReference?subject.identifier=2.16.3.6.1.4.1.21367.2005.3.7|12345&format=1.2.840.10008.5.1.4.1.1.88.59&_format=json



MHD
Document Responder

XDS Registry
Stored Query



XDS-I

created	Location	context.related.identifier
10-Jul-2014	http://xds/repo/1.2.3.4.5	A23910 (accession number)
context.event	format	subject.identifier (XAD Patient ID)
CT, Head	1.2.840.10008.5.1.4.1.1.88.59 (Imaging study manifest)	144^^^&2.16.3.6.1.4.1.21367.2005.3.7&ISO

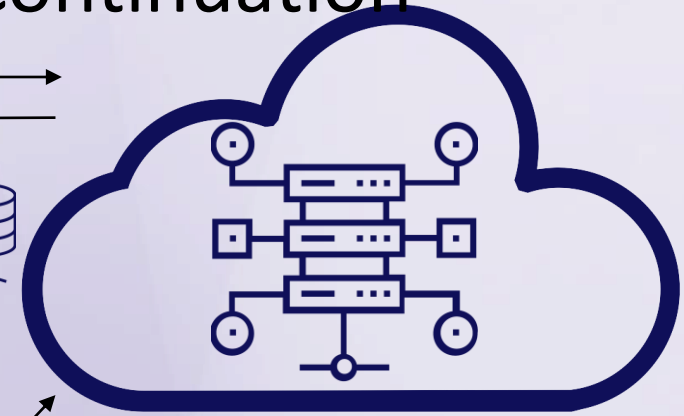
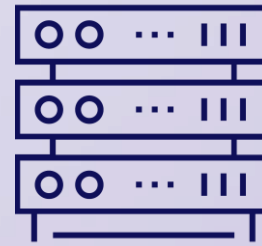
MHD Integration: Imaging Study Discovery Continuation

Retrieve metadata for study with **accession #A23910** and retrieve the images

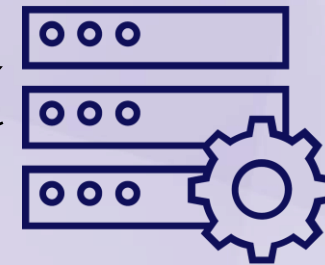


MHD Document Consumer /
Imaging Document Consumer

Imaging
Document Source



XDS-I



Imaging
Document Responder

WADO-RS Retrieve

QIDO-RS Query

No need to retrieve manifest.
No need to extend manifest metadata.

Summary



Secure web access
to imaging studies

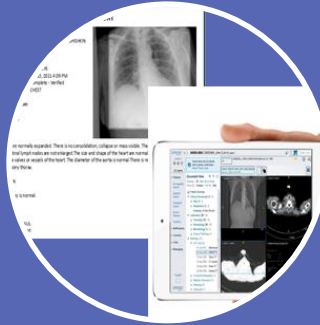


Image sharing &
Interactive viewing



Ease of integration

Neutral to image sharing infrastructure: DICOM, XDS-I, MHD

Recent Enhancements to XDS-I

- Imaging Document Source has a new **Reference ID option**
 - CP-RAD-352
 - Required to provide Accession Number and Study Instance UID in ReferencedIdList
- Imaging Document Source has a new **Delete Imaging Document Option**
 - CP-RAD-320
 - Grouped with ITI Remove Metadata and Document (RMD) Document Administrator actor
 - Delete manifest or report from Document Registry and Repository