

IHE Change Proposal

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Tracking information:

IHE Domain	Radiology
Change Proposal ID:	CP-RAD-460
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Person assigned:	Lynn Felhofer

Change Proposal Summary information:

XCA-I Clarify IIG and RIG behavior with local community and remote communities	
Submitter's Name(s) and e-mail address(es):	Lynn Felhofer
Submission Date:	20 Jan 2021
Integration Profile(s) affected:	XCA-I
Actor(s) affected:	Initiating Imaging Gateway Remote Imaging Gateway, Imaging Document Source
IHE Technical Framework or Supplement modified:	RAD TF Rev 19, Sep 2020
Volume(s) and Section(s) affected:	Several sections in Vol 1 and 2
Rationale for Change: There are 3 items that are not clear in the existing XCA-I specification. No normative changes are intended; the changes in this CP address these: (1) How an XCA-I Initiating Imaging Gateway interacts with its local community and the Responding Imaging Gateways is not clearly specified. A vendor doing IIG conformance testing was not clear about whether it was required to be able to contact multiple RIGs. (2) It is not clear whether an IIG is required to be able to retrieve from its local Imaging Doc Source. (3) It is not explicitly stated that a RIG must be able to contact multiple Imaging Document Sources in its local community This CP improves the description of actor groupings, using new template conventions. This CP updates RAD-69 and RAD-75 to remove redundant content and to move some content to the proper section. Note that line numbers are included in the CP to facilitate ballot review.	
Sep 3, 2021 post-ballot notes: <ul style="list-style-type: none">This CP was balloted in May 2021. The ballot had 3 voting members participate, which did not meet quorum. At the Sep 2 2021 CP review call, RAD Tech decided to re-ballot this CP to attempt to get quorum.The ballot did receive these comments that were reviewed by RAD Tech. Considerations shared by RAD Tech members in response include:<ul style="list-style-type: none">The consolidation requirements on the XCA-IIG in RAD-75 mirrors XCA requirements for retrieving documents in ITI-39. Whether this is used or not in real world is a different consideration. If this is over-specified, that feedback would have to come from the vendor community as a whole, not just a particular vendor or project, because the specification is used internationally.Vendor IIG implementations have tested consolidation requirements at Connectathons and using the XCA-I Imaging Tools (based on NIST XDS Toolkit).	

Editor: Update Vol 1 Sec 29:

29 Cross-Community Access for Imaging (XCA-I)

The Cross-Community Access for Imaging (XCA-I) Integration Profile specifies actors and transactions to query and retrieve ~~patient-relevant~~ a patient's medical imaging data being held ~~by other~~ in multiple communities.

- 15 Within a community, a group of facilities/enterprises shares clinical information via an established mechanism such as XDS-I (in which case the community can be referred to as an XDS Affinity Domain). This profile addresses sharing between such communities.

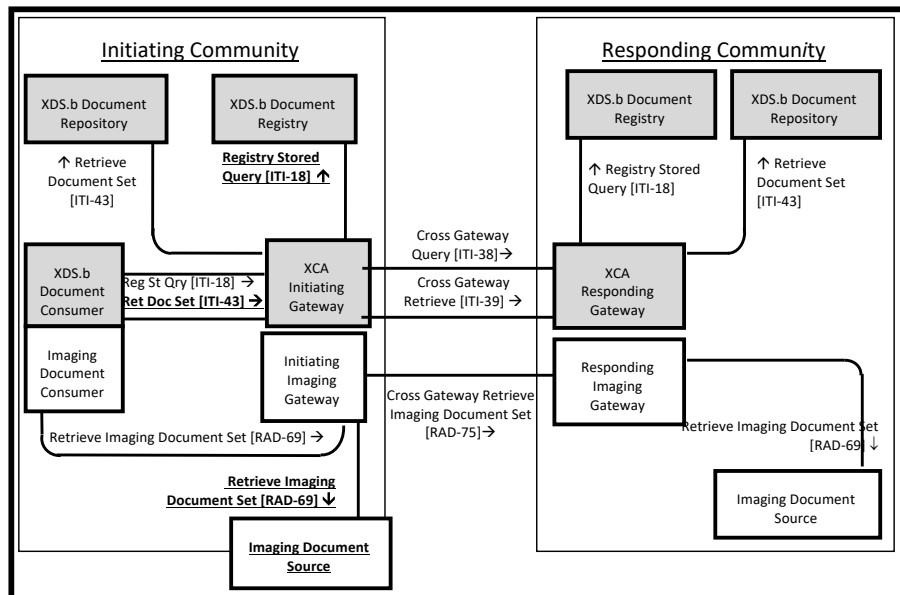
- 20 The XCA-I Profile extends the IT Infrastructure Cross Community Access (XCA) ~~XCA~~ Profile. XCA provides access to ~~D~~diagnostic reports and Imaging Manifests. XCA-I provides access to the imaging objects referenced in the Manifests. The reader of XCA-I is expected to have read and understood the XCA Profile, including the meaning of terms such as Community, homeCommunityId, etc.

Editor: Update Section 29.1 and update Figure 29.1-1 to add Imaging Document Source and missing ITI-18, ITI-43, and RAD-69 transactions to the Initiating Community.

25 29.1 Actors/ Transactions

Figure 29.1-1 shows the actors defined in the Cross-Community Access for Imaging (XCA-I) Profile and the transactions between them.

The shaded actors are NOT included in this profile but are shown to illustrate the full set of actors that play a role **in the full XCA-I interactions (see Section 3.3.2), other endpoint of transactions that ARE part of the profile (e.g., the Document Registry is an endpoint for the Registry Stored Query [ITI-18] transaction).** As a result, the shaded actors are not listed in Table 29.1-1. **XCA-I actors which have a required grouping are shown in conjoined boxes (see Section 29.3.3).**



50 **Figure 29.1-1: Cross-Community Access for Imaging Actor Diagram**

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Editor: Update Table 29.1-1 as follows.

55 **Note for CP Ballot reviewers:** This change clarifies that an IIG can be an Initiator of RAD-69, to retrieve from an *Img Doc Source* in its local community in addition to retrieving from RIGs. Adding the column for "Initiator or Responder" is just a newer, clearer documentation convention.)

60 **Table 29.1-1: Cross-Community Access for Imaging Integration Profile - Actors and Transactions**

Actors	Transactions	Initiator or Responder	Optionality	TF Reference
Imaging Document Consumer	Retrieve Imaging Document Set [RAD-69]	<u>Initiator</u>	R	RAD TF-2: 4.69
Imaging Document Source	Retrieve Imaging Document Set [RAD-69]	<u>Responder</u>	R	RAD TF-2: 4.69
Initiating Imaging Gateway	Retrieve Imaging Document Set [RAD-69]	<u>Initiator and Responder</u>	R	RAD TF-2: 4.69
	Cross Gateway Retrieve Imaging Document Set [RAD-75]	<u>Initiator</u>	R	RAD TF-2: 4.75
Responding Imaging Gateway	Cross Gateway Retrieve Imaging Document Set [RAD-75]	<u>Responder</u>	R	RAD TF-2: 4.75
	Retrieve Imaging Document Set [RAD-69]	<u>Initiator</u>	R	RAD TF-2: 4.69

...

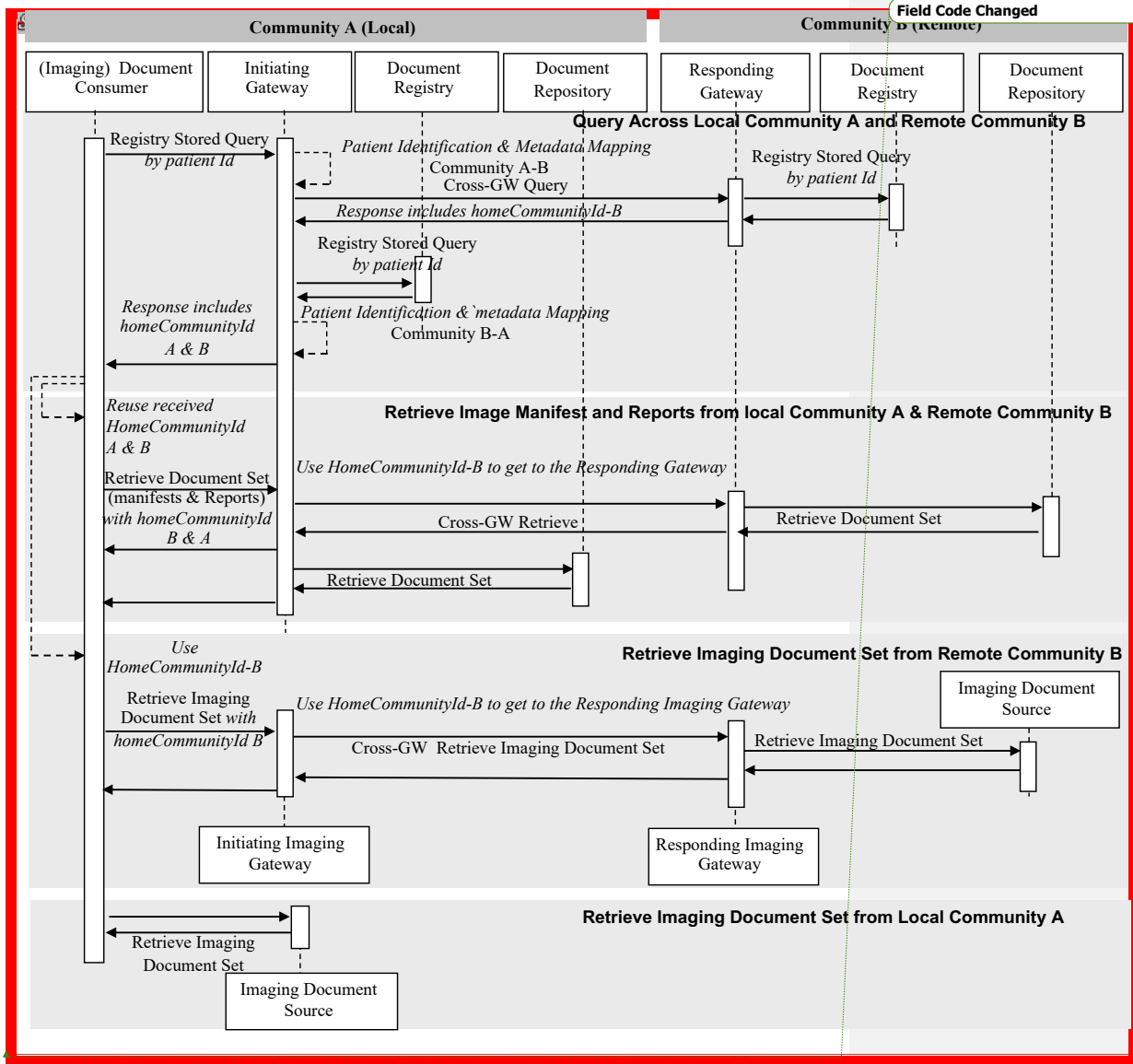
Editor: Completely replace existing Figure 29.3.2-1 with the figure below.

65 **Note for CP Ballot reviewers:** The figure below with a **red** border is in the current TF. It is replaced in this CP, but it is included here now for the purpose of CP review.

70 The new/updated figure is on the next page with a **green** border. The changes are in the bottom two boxes. In the current Figure, the Imaging Document Consumer initiates two RAD-69 retrieves, one to its IIG (an XCA-I workflow), and one to its local Imaging Doc Source (which is really XDS-I). In the new figure, the Imaging Doc Consumer initiates one RAD-69 to the IIG, and the IIG contacts the local Imaging Doc Source and the Responding Gateways, and consolidates the results before sending the response back to the Consumer.

29.3.2 Detailed Interactions

75 The following diagram **Figure 29.3.2-1** presents a high level view of the interactions between actors when both initiating and responding communities are XDS-I.b Affinity Domains. Details on each interaction follow the **figure diagram**.



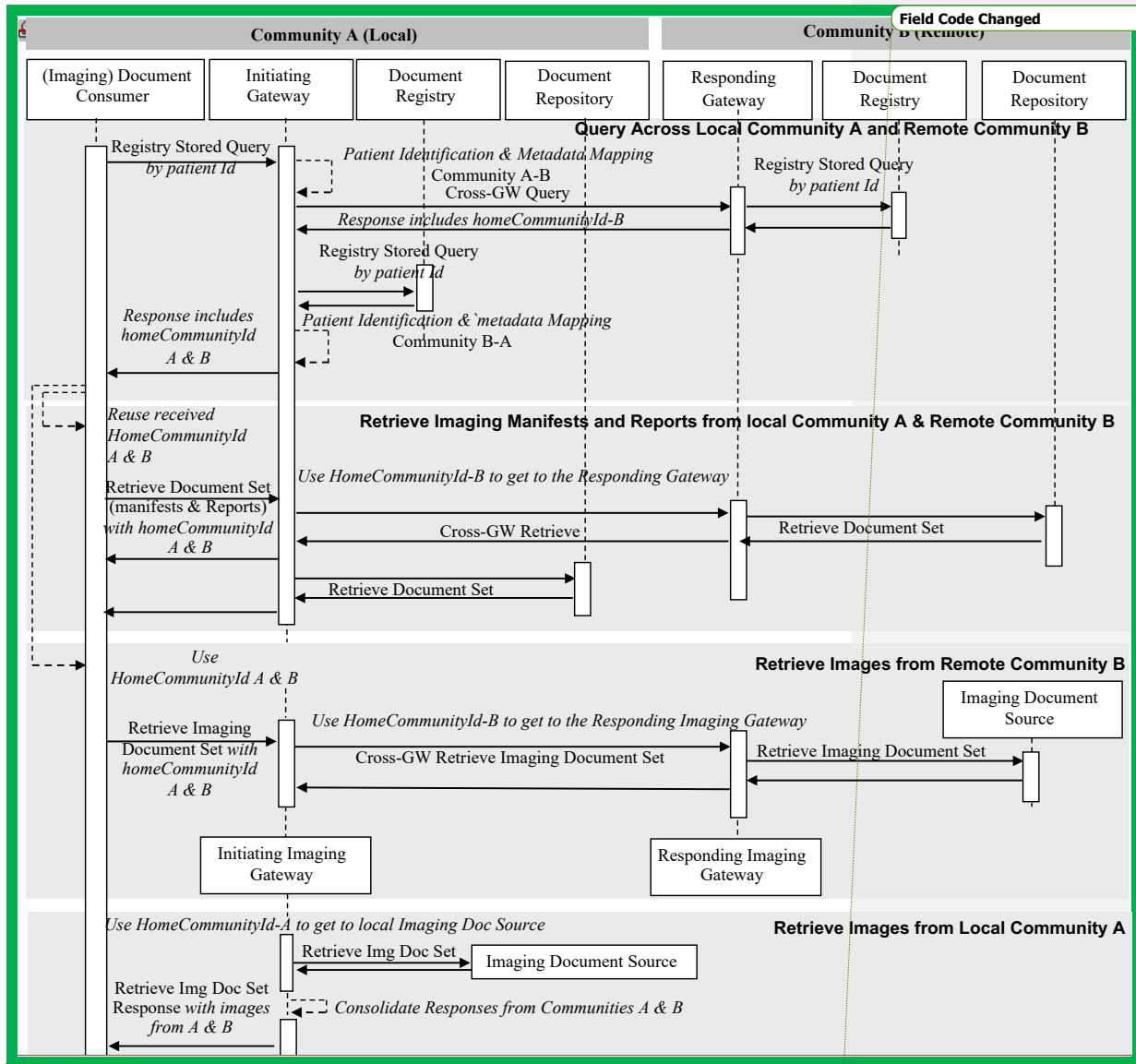


Figure 29.3.2-1: XCA-I Detailed Interactions

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Editor: Update the text under Figure 29.3.2-1 as follows.

Note for CP Ballot reviewers: The proposed changes in the text beneath Figure 29.3.2-1 are extensive. For ease of review, the edits below are done using Word change tracking rather than traditional CP markup.

Bullets have been added in this section to enhance readability.

XCA Interactions to query for and retrieve Imaging Manifests for a patient

XCA Query across Local Community A and Remote Community B:

Document Consumer wants to find Imaging Manifests for a patient -

- The Document Consumer initiates a Registry Stored Query [ITI-18] to the Initiating Gateway. The query contains the Local Affinity Domain patient id, discovered by PIX, PDQ, or some other means.

Deleted: Document Consumer initiates a Registry Stored Query request by patient id – the Document Consumer initiates the initial transaction by formatting a Registry Stored Query request by patient identifier. The consumer uses PDQ, PIX or some other means to identify the Local Affinity Domain patient id, formats that information plus any other query parameters into a Registry Stored Query request and sends this request to an Initiating Gateway.

Initiating Gateway processes Registry Stored Query by patient id request –

- The Initiating Gateway sends a Registry Stored Query [ITI-18] to its local Document Registry.
- The Initiating Gateway sends a Cross Gateway Query [ITI-38] to each Responding Gateway it is configured to contact, using the Patient ID as known in the remote community. In this example there is one Responding Gateway, but there may be more than one.

Responding Gateway processes Cross Gateway Query [ITI-38] by patient id –

- The Responding Gateway initiates a Registry Stored Query [ITI-18] to the local Document Registry. The Responding Gateway updates the response from the Document Registry to ensure that the homeCommunityId is specified on every applicable element. This updated response is sent to the Initiating Gateway as the response to the Cross Gateway Query [ITI-38].

Deleted: processes the Cross Gateway Query by initiating

Initiating Gateway processes the query responses –

- The Initiating Gateway collects the responses from its local Document Registry and from all Responding Gateways it contacted. For each response it verifies that the homeCommunityId is present in each appropriate element.
- Once all responses are received the Initiating Gateway consolidates them into one Registry Stored Query response to the Document Consumer.

Deleted: Cross Gateway Query by patient id

Deleted: all updated response data

Deleted: The Initiating Gateway returns to the Document Consumer the same homeCommunityId attribute values that it received from Responding Gateway(s).

Document Consumer receives Registry Stored Query by patient id response –

- The Document Consumer receives the results of the query from the Initiating Gateway and must account for three unique aspects of the response; namely that
 - a) the homeCommunityId attribute will be specified,
 - b) the Document Consumer may not be able to map the repositoryUniqueId value directly to a Document Repository located in a remote community,

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c) the Document Consumer may not be able to understand the terminology used in the response. For example, if the local and remote community have different Requested Procedure vocabularies, then the Initiating Gateway's response to the Document Consumer's request will contain coding/vocabulary from the remote community.

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Deleted: responding

Deleted: common

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Deleted: scheme

Deleted: <#>The Document Consumer retains the values of the homeCommunityId attribute for future interaction with the Initiating Gateway.

XCA Retrieve from local Community A & Remote Community B:

Document Consumer *wants to retrieve the Imaging Manifests for the patient* –

- a) The Document Consumer sends Retrieve Document Set [ITI-43] transaction to the Initiating Gateway including values it received in the query response:
 - a) the document uniqueId(s)
 - b) the repositoryUniqueId(s)
 - c) the homeCommunityId(s)

Deleted: Image Manifest and Reports

Deleted: initiates a Retrieve Document Set

Deleted: If the Document Consumer issued a Registry Stored Query, the response to the Registry Stored Query by patient id includes a) the document uniqueId b) the repositoryUniqueId, and c) the homeCommunityId attribute.

Deleted: shall specify these three parameters in its

Deleted: attributes it received in the query response

Initiating Gateway processes Retrieve Document Set [ITI-43] –

- If a homeCommunityId represents the local community, the Initiating Gateway will initiate a Retrieve Document Set [ITI-43] to the local Document Repository for Imaging Manifest documents.
- The Initiating Gateway uses homeCommunityID(s) to determines which Responding Gateway(s) to retrieve from and initiates a Cross Gateway Retrieve [ITI-39] request to the Responding Gateway(s) for Imaging Manifest documents.

Deleted: The Initiating Gateway determines which Responding Gateway(s) to contact by using the homeCommunityId to obtain the Web Services endpoint of the Responding Gateway(s). If the homeCommunityId represents the local community, the Initiating Gateway will initiate a Retrieve Document Set to the indicated local Document Repository. The Retrieve Document Set may contain more than one unique homeCommunityId so the Initiating Gateway may have to initiate requests to more than one Responding Gateway, and consolidate the results. The Initiating Gateway specifies the homeCommunityId in the Cross Gateway Retrieve transaction. The homeCommunityId identifies the community associated with the Responding Gateway.

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Responding Gateway processes Cross Gateway Retrieve –

- The Responding Gateway initiates a Retrieve Document Set [ITI-43] transaction to its local Document Repository for Imaging Manifest documents. If the Cross Gateway Retrieve requests multiple documents with different repositoryUniqueIds, the Responding Gateway will contact multiple Document Repositories in its community, consolidate the responses, and send them to the Initiating Gateway.

Initiating Gateway consolidates the results from its local Document Repository and from the Responding Gateway(s) and sends a Retrieve Document Set Response to the Document Consumer.

The Document Consumer now has Imaging Manifests for the patient from its local Community A and Remote Community B.

Deleted: The Responding Gateway within an XDS Affinity Domain processes the Cross Gateway Retrieve initiating a Retrieve Document Set transaction to the Document Repository identified by the repositoryUniqueId within the request. If the Cross Gateway Retrieve requests multiple documents with different repositoryUniqueIds, the Responding Gateway will contact multiple Document Repositories and consolidate the responses.

Deleted: initiates a Retrieve Imaging Document Set.

XCA-I Interactions to retrieve images for a patient

XCA-I Retrieve Image Set from Local Community A and Remote Community B:

Imaging Document Consumer *wants to retrieve the studies referenced in the Imaging Manifests:*

- The Imaging Document Consumer initiates a Retrieve Imaging Document Set [RAD-69] to the Initiating Imaging Gateway. The request includes values from the retrieved Imaging Manifests:

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- a) the repositoryUniqueIds identifying the Imaging Document Sources,
- b) the documentUniqueIds identifying the imaging documents (DICOM SOP Instance UIDs) within the Imaging Document Source
- c) list of one or more DICOM transfer syntax UIDs,
- d) Study Instance UIDs,
- e) Series Instance UIDs
- f) the homeCommunityId(s) identifying the community associated with the local Initiating Imaging Gateway and Responding Imaging Gateway(s).

- Note: The Imaging Document Consumer may initiate a Retrieve Imaging Document Set [RAD-69] directly to the Imaging Document Source(s) in its local community, rather than retrieving local studies via the Initiating Imaging Gateway. This may be necessary to avoid delay associated with the Initiating Imaging Gateway collecting and collating local and remote results, but also implies the following:
 - The Imaging Document Consumer is coordinating the two separate retrieve requests directly rather than delegating the consolidation of results by the Initiating Imaging Gateway.
 - The Imaging Document Consumer needs to be aware of partial result or potential time gaps in receiving local versus remote results because it is coordinating the two separate retrieve requests.

Initiating Imaging Gateway processes Retrieve Imaging Document Set [RAD-69] –

- The Initiating Imaging Gateway uses repositoryUniqueId and homeCommunityId values to determine where to retrieve from. The Initiating Imaging Gateway may have to initiate a Retrieve Imaging Document Set [RAD-69] request to its local Imaging Document Source(s) and Cross Gateway Retrieve Imaging Document Set [RAD-75] requests to one or more Responding Imaging Gateway(s).

Responding Imaging Gateway processes Cross Gateway Retrieve Imaging Document Set –

- The Responding Imaging Gateway processes the Cross Gateway Retrieve Imaging Document Set request by initiating a Retrieve Imaging Document Set [RAD-69] transaction to the Imaging Document Source identified by the repositoryUniqueId within the request. If the Cross Gateway Retrieve Imaging Document Set requests multiple documents with different repositoryUniqueIds, the Responding Imaging Gateway will contact multiple Imaging Document Sources and consolidate the responses.

Initiating Imaging Gateway consolidates the results from its local Imaging Document Source and from the Responding Imaging Gateway(s) and sends a Retrieve Imaging Document Set Response to the Imaging Document Consumer.

The Imaging Document Consumer now has images for the patient from its local Community A and Remote Community B.

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Deleted: The Imaging Document Consumer specifies these parameters in its Retrieve Imaging Document Set transaction to the Initiating Imaging Gateway.

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Deleted: within an XDS Affinity Domain

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Editor: Update Vol 1 Sec 29.3.3 to accurately describe groupings, using new template conventions and clarify text in Sec 29.3.3.3.

275 **29.3.3 XCA-I Required Actor Groupings Actor-Grouping Considerations**

An actor from this profile (Column 1) shall implement all of the required transactions and/or content modules in this profile in addition to all of the requirements for the grouped actor (Column 2).

Table 29.3.3-1: XCA-I - Required Actor Groupings

XCA-I Actor	Actor(s) to be grouped with	Reference
Imaging Document Consumer	<u>ITI XDS.b / Document Consumer</u>	<u>ITI TF-1: 10.1</u>
	<u>ITI ATNA / Secure Node or Secure Application</u>	<u>ITI TF-1: 9.1</u>
Imaging Document Source	<u>ITI ATNA / Secure Node or Secure Application</u>	<u>ITI TF-1: 9.1</u>
Initiating Imaging Gateway	<u>ITI ATNA / Secure Node or Secure Application</u>	<u>ITI TF-1: 9.1</u>
Responding Imaging Gateway	<u>ITI ATNA / Secure Node or Secure Application</u>	<u>ITI TF-1: 9.1</u>

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29.3.3.3 Cross-Profile Considerations

The XCA-I Profile requires that the Initiating and Responding Imaging Gateways are used in conjunction with the XCA Initiating and Responding Gateways and will be part of XDS communities that support XDS.b.

285 XCA-I ~~presumes the initiating and responding communities use community-uses~~ the XDS-l.b and XDS.b integration profiles for enabling Imaging Document Set behavior. ~~XCA-I defines no required grouping with any actor.~~

290 The implementer may consider grouping actors as needed. For example, an Image Document Source may choose to group with an IRWF Importer for importing images. The XCA-I Profile does not explicitly group the XCA-I Initiating Imaging Gateway and XCA Initiating Gateway pair and the XCA-I Responding Imaging Gateway and XCA Responding Gateway pair.

The XCA-I Profile requires that the Initiating and Responding Imaging Gateways are used in conjunction with the XCA Initiating and Responding Gateways and will be part of XDS communities that support XDS.b.

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Editor: Fix typo in Vol 1 Sec 29.4.2

29.4.2 Requirements/Recommendations

The following mitigations shall be implemented by all XCA-I actors. These mitigations moderate all high impact risks.

300 **M1:** All actors in XCA-I shall be grouped with an ATNA Secure Node or Secure Application Actor and a CT Time Client Actor.

M2: An Imaging Document Source shall include a SHA1 hash of the image document content in the Document metadata of the [RAD-69] ~~[RAD-68]~~-response. The Imaging Document

305 Consumer shall have the ability to verify the SHA1 hash of the image document with the SHA1 hash in the metadata.

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Editor: Update Vol 1, Sec 2.1 because we now have the grouping requirements in Sec 29.3.3

2.1 Required Actor Groupings (Dependencies)

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310 Note: In early versions of IHE Technical Framework documents, required actor groupings were referred to as “Profile Dependencies”. Table 2.1-1 defines the required dependencies between these profiles. In newer profiles, these “dependencies” are specified in a “Required Actor Groupings” section within each profile in Volume 1, and are not repeated in Table 2.1-1.

315 **Table 2.1-1: IHE Radiology Integration Profiles Dependencies**

Integration Profile	Depends on	Dependency Type	Comments
Consistent Presentation of Images	<i>None</i>	<i>None</i>	-
...			
Cross-Community Access for Imaging (XCA-I)	XDS.b (ITI)	Required for access of documents.	
	XCA (ITI)	Required for cross community access of documents.	
	Audit Trail and Node Authentication, incl. Radiology Audit Trail Option	Each XCA-I Actor shall be grouped with Secure Node or Secure Application.	Required to manage audit trail of exported PHI, node authentication and transport encryption.
	Consistent Time (ITI)	Each XCA-I Actor shall be grouped with the Time Client.	To ensure consistency among document and submission set dates.
...			

Editor: Update Vol 2, Sec 4.69 and subsections:

4.69 Retrieve Imaging Document Set [RAD-69]

4.69.1 Scope

320 This transaction is used to retrieve ~~a set of DICOM objects~~ DICOM instances that are referenced within an XDS-I.b DICOM manifest.

- ~~an XDS-I.b Imaging Document Consumer retrieves from an Imaging Document Source~~
- 325 • ~~an XCA-I Imaging Document Consumer retrieves from an Initiating Imaging Gateway~~
- ~~an XCA-I Responding Imaging Gateway to retrieve from an Imaging Document Source in its own community.~~

~~The objects retrieved are those that are referenced within an XDS-I.b manifest document (KOS) as described in Section 4.68.~~

330 ~~This transaction is derived from, and is nearly identical to, the Retrieve Document Set [ITI-43] transaction of the IHE IT Infrastructure Technical Framework. It adds minor additional semantics and constraints on the requirements defined in [ITI-43].~~

4.69.2 Actor Roles

335 Actor: Imaging Document Consumer

~~Role: Issues a web service request to retrieve requests a set of DICOM instances from an Imaging Document Source or from ~~remote~~ multiple communities through an Initiating Imaging Gateway.~~

Actor: Responding Imaging Gateway

340 ~~Role: Issues a web service request to retrieve requests a set of DICOM instances from an Imaging Document Source(s) in its own community.~~

Actor: Imaging Document Source

~~Role: returns requested DICOM instances. Receives a web service request from an Imaging Document Consumer or Responding Imaging Gateway for retrieval of a set of DICOM instances and generates the web service response with the appropriate content.~~

345 Actor: Initiating Imaging Gateway

~~Role: routes a request for DICOM instances to local Imaging Document Source(s) or remote Responding Imaging Gateway(s) and returns the consolidated results. Receives a web service request from an Imaging Document Consumer for retrieval of a set of DICOM instances and generates the web service response with the appropriate content.~~

4.69.4.1 Retrieve Imaging Document Set Request message

This message is an extension of the Retrieve Document Set transaction as defined in ITI TF-2b: 3.43.

- 355 • ~~In XDS-I.b, an Imaging Document Consumer sends a request to an Imaging Document Source to retrieve the set of images referenced within a manifest object.~~
- ~~In XCA-I, an Imaging Document Consumer sends a request to an Initiating Imaging Gateway to retrieve the set of images referenced within a manifest object.~~

360 • ~~In XCA-I, a Responding Imaging Gateway sends a request to an Imaging Document Source(s) in the responding community to retrieve the set of images referenced within a manifest object.~~

4.69.4.1.1 Trigger Events

365 ~~The An Imaging Document Consumer wishes to retrieve a set of DICOM instances that are referenced within a one or more DICOM Manifest; see Section 4.68.4.1.2.1 “Sharing a Set of DICOM instances”.~~

370 ~~The Imaging Document Consumer obtains the documents’ uniqueIds (i.e., the SOP Instance UIDs referenced within the DICOM manifest) along with the associated study and series instance UIDs. The Imaging Document Consumer will either compute the repositoryUniqueid(s) from the Retrieve AE Title attribute(s) within the DICOM manifest or populate the repositoryUniqueid(s) using the Retrieve Location UID attribute(s) within the DICOM manifest. The Imaging Document Consumer also maps the repositoryUniqueid(s) to web services endpoint(s) which are the targets of the message.~~

375 ~~The Imaging Document Consumer obtains the homeCommunityID for the Imaging Document Source from the Registry Stored Query response.~~

375 ~~Once the documents’ homeCommunityIDs, uniqueIds and repositoryUniqueid(s) have been obtained, the Imaging Document Consumer will send the Retrieve Imaging Document Set Request to the Imaging Document Source.~~

380 ~~An Initiating Imaging Gateway receives a Retrieve Imaging Document Set [RAD-69] request, and forwards it to one or more Imaging Document Source(s) in its community.~~

380 ~~In response to the Cross Gateway Retrieve Imaging Document Set [RAD-75], the A Responding Imaging Gateway receives a Cross Gateway Retrieve Imaging Document Set [RAD-75] request and initiates a Retrieve Imaging Document Set request to one or more the Imaging Document Source(s) in its the responding community.~~

4.69.4.1.2 Message Semantics

385 ~~The Retrieve Imaging Document Set messages is a SOAP 12 message in MTOM/XOP format; see Section 4.69.5 “Protocol Requirements”.~~

The Retrieve Imaging Document Set Request shall carry the following information:

- 390 • A required repositoryUniqueid that identifies the ~~XDS-I~~ Imaging Document Source from which the DICOM instance is to be retrieved. This value shall either be “computed” based on the Retrieve AE Title (0008,0054) attribute(s) present in the DICOM manifest or be populated from the Retrieve Location UID (0040,E011) attribute(s) that is present in the DICOM manifest. For a description of how this “computation” can be achieved, see RAD TF-2x: Appendix G.3.
- 395 • A required list of one or more documentUniqueids ~~that identify the documents within the Imaging Document Source~~. These values correspond to the SOP Instance UIDs referenced within the DICOM manifest.

- A required list of one or more DICOM transfer syntax UIDs that the Imaging Document Consumer is capable of processing.
- 400 • A required Study Instance UID value that identifies the study containing the DICOM ~~instances images/objects~~ to be retrieved. The Study Instance UID is extracted from the ~~DICOM KOS~~ manifest.
- A required Series Instance UID value that identifies the series containing the DICOM ~~instances images/objects~~ to be retrieved. The Series Instance UID is extracted from the ~~DICOM KOS~~ manifest.
- 405 • A homeCommunityId that identifies the community holding the DICOM instances, required if the request is from an XCA-I Imaging Document Consumer, Initiating Imaging Gateway, or Responding Imaging Gateway actor.
 - ~~the Retrieve Imaging Document Set request is to an XCA-I Initiating Imaging Gateway, or~~
 - 410 • ~~the Retrieve Imaging Document Set request is from an XCA-I Responding Imaging Gateway to an XDS-I Imaging Document Source.~~

415 The repositoryUniqueid and homeCommunityId associated with the requested DICOM instances can be different, allowing a single request to identify multiple Imaging Document Sources in multiple communities.

The message shall be structured as described in Section 4.69.5 Protocol Requirements.

4.69.4.1.3 Expected Actions

When receiving a Retrieve Imaging Document Set Request, an Imaging Document Source or Initiating Imaging Gateway shall generate a Retrieve Imaging Document Set Response.

420 An Imaging Document Source shall generate a Retrieve Imaging Document Set Response message; see Section 4.69.4.2.

The Initiating Imaging Gateway:

- shall determine which local Imaging Document Source(s) hold the DICOM instances requested and initiate a [RAD-69] transaction to those Imaging Document Sources
- 425 • shall determine which remote communities hold the requested DICOM instances and initiate a [RAD-75] transaction to the community's Responding Imaging Gateway
- shall consolidate the results from the multiple sources into one response to the Imaging Document Consumer.
- 430 • shall generate a Retrieve Imaging Document Set Response message; see Section 4.69.4.2.

435 In XCA-I, an Initiating Imaging Gateway initiates a Cross-Gateway Retrieve Imaging Document request to all Responding Imaging Gateways that can satisfy the request, to obtain the information from responding communities in order to construct the Retrieve Imaging Document Set Response.

4.69.4.2 Retrieve Imaging Document Set Response message

4.69.4.2.1 Trigger Events

This message ~~will be~~ **is** triggered by receipt of a Retrieve Imaging Document Set Request Message.

440 4.69.4.2.2 Message Semantics

The semantics of the Retrieve Imaging Document Set Response Message are identical to those inherited from the [ITI-43] transaction and are specified in ITI TF-2b: 3.43.4.2.2.

4.69.4.2.3 Expected Actions

445 ~~An Imaging Document Source or Initiating Imaging Gateway shall provide the Imaging Document Set(s) indicated in the request.~~

The Initiating Imaging Gateway shall consolidate results from all Responding Imaging Gateways and local Imaging Document Sources.

450 The Imaging Document Source or Initiating Imaging Gateway shall return the **requested DICOM instances and a status code, imaging document(s)** or an error code ~~in case the document could not be returned.~~

The status codes, conditions of failure and possible error messages are given in the ebRS standard and detailed in ITI TF-3: Table 4.2.4.2-4 “[ITI-43] Retrieve Document Set and [ITI-39] Cross Gateway Retrieve Responses”.

455 ~~Note: A Responding Imaging Gateway may have suppressed failures resulting in the Initiating Imaging Gateway reporting a success.~~

The Imaging Document Source shall encode the pixel data ~~The pixel data shall be encoded~~ using one of the DICOM transfer syntaxes included in the Retrieve Imaging Document Set Request Message. If the Imaging Document Source cannot encode the pixel data using any of the requested transfer syntaxes then an error status shall be returned.

460 ~~If the Imaging Document Consumer or Responding Imaging Gateway specifies~~ **If the request contains** a transfer syntax **field** of 1.2.840.10008.1.2.4.94 (DICOM JPIP Referenced Transfer Syntax) or 1.2.840.10008.1.2.4.95 (DICOM JPIP Referenced Deflate Transfer Syntax), and the Imaging Document Source supports the requested transfer syntax, the following behavior is expected:

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- If the DICOM Image Object(s) already have the same JPIP transfer syntax as the one indicated in the request, the Retrieve Imaging Document Set Response shall include the DICOM Image Objects unchanged.
 - If the DICOM Image Object(s) have a transfer syntax that differs from that of the request, the Retrieve Imaging Document Set Response shall include the DICOM image with the transfer syntax changed to the requested transfer syntax. In addition, the pixel data Attribute (7Fe0,0010) tag will have been removed and replaced with a Pixel Data Provider URL (0028,7FE0) tag. The URL represents the JPIP request and will include the specific target information.
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- 475 • Upon receipt of this Retrieve Imaging Document Set Response, the Imaging Document Consumer may request the pixel data from the pixel data provider using the supplied URL. Additional parameters required by the application may be appended to the URL when accessing the pixel data provider.
 - For example, a JPIP request for a 200 by 200 pixel rendition of the entire image can be constructed from the Pixel Data Provider URL as follows:
- 480 Pixel Data Provider URL (0028,7FE0) = https://server.xxx/jpipserver.cgi?target=imgxyz.jp2,
 URL Generated by the application =
 https://server.xxx/jpipserver.cgi?target=imgxyz.jp2&fsiz=200,200

485 **The conditions of failure and possible error messages are given in the ebRS standard and detailed in ITI TF-3: Table 4.2.4.2-4 “[ITI-43] Retrieve Document Set and [ITI-39] Cross Gateway Retrieve Responses”.**

In XCA-I, the Initiating Imaging Gateway can act as a JPIP proxy and accept the JPIP request from the Imaging Document Consumer and make the corresponding request to the Imaging Document Source. If a direct route is available from the Imaging Document Consumer to the Imaging Document Source, the Imaging Document Consumer is allowed to make a direct JPIP request to the Imaging Document Source, assuming security considerations are observed.

...

Editor: Update Vol 2 Section 4.75 and sub-sections as follows:

4.75 Cross Gateway Retrieve Imaging Document Set [RAD-75]

495 4.75.1 Scope

This transaction is used to retrieve DICOM **instances objects** from remote communities.

~~The scope of the Cross Gateway Retrieve Imaging Document Set transaction is semantically the same as the Retrieve Imaging Document Set [RAD-69] transaction. Differences from the Retrieve Imaging Document Set transaction are:~~

- 500 • ~~The Cross Gateway Retrieve Imaging Document Set is between an Initiating Imaging Gateway and a Responding Imaging Gateway.~~
- ~~The ‘homeCommunityId’ parameter is required. This means that the homeCommunityId parameter which is conditionally required on the Retrieve Imaging Document Set transaction is required by this transaction.~~
- 505 • ~~The Responding Imaging Gateway is required to support Asynchronous Web Services Exchange on the Cross Gateway Retrieve Imaging Document Set.~~

4.75.2 Actor Roles

Actor: Initiating Imaging Gateway

510 **Role:** To ~~request DICOM instances from remote communities~~ **formulate a Cross Gateway Retrieve Imaging Document Set request**

Actor: Responding Imaging Gateway

Role: To return the **DICOM instances Imaging Document Set(s)** requested.

...

4.75.4.1.2 Message Semantics

515 The message semantics for Cross Gateway Retrieve Imaging Document Set are the same as Retrieve Imaging Document Set [RAD-69] **Request message. See Section 4.69.4.1.2.**

~~The Initiating Imaging Gateway shall specify the homeCommunityId parameter within the Cross Gateway Retrieve Imaging Document Set. The homeCommunityId shall contain the value that identifies the community associated with the Responding Imaging Gateway(s).~~

520 4.75.4.1.3 Expected Actions

~~Actors supporting this transaction shall support the Expected Actions described in [RAD-69]. See Section 4.69.4.1.3.~~

525 The Responding Imaging Gateway shall determine the Imaging Document Source(s) which hold the **DICOM instances imaging documents** requested and initiate a [RAD-69] transaction to those Imaging Document Sources.

If more than one Imaging Document Source is contacted, the Responding Imaging Gateway shall consolidate the results from the multiple sources into one response to the Initiating Imaging Gateway.

530 If both successes and failures are received, the Responding Imaging Gateway may choose to use PartialSuccess status to reflect both failure and success. The Responding Imaging Gateway may alternatively choose to suppress the failures and report only successes.

Every RegistryError element returned in the response shall have the location attribute set to the homeCommunityId of the Responding Imaging Gateway.

535 **The Responding Imaging Gateway shall return consolidated responses according to the message semantics for the Retrieve Imaging Document Set Response message in Section 4.69.4.2.2.**

540 ~~The Initiating Imaging Gateway shall consolidate results from all Responding Imaging Gateways. This includes reflecting in the consolidated results returned to the originating Retrieve Imaging Document Set [RAD-69] all successes and failures received from Responding Imaging Gateways. If one of more responses with a status of failure or partial successes are received from Responding Imaging Gateways, the Initiating Imaging Gateway shall respond to the original [RAD-69] request from the Imaging Document Consumer with both DocumentResponse and RegistryErrorList elements in one response and specify PartialSuccess status.~~

545 **Note:** The Responding Imaging Gateway may have suppressed failures resulting in the Initiating Imaging Gateway reporting a success.