Integrating the Healthcare Enterprise

IHE IT Infrastructure

Technical Framework Supplement

Cross-Community Fetch (XCF)

Trial Implementation

Date: August 19, 2011

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Foreword

This is a supplement to the IHE IT Infrastructure Technical Framework 8.0. Each supplement undergoes a process of public comment and trial implementation before being incorporated into the volumes of the Technical Frameworks.

This supplement is submitted for Trial Implementation as of August 19, 2011 and will be available for testing at subsequent IHE Connectathons. The supplement may be amended based on the results of testing. Following successful testing it will be incorporated into the IT Infrastructure Technical Framework. Comments are invited and can be submitted at http://www.ihe.net/iti/iticomments.cfm or by email to iti@ihe.net.

This supplement describes changes to the existing technical framework documents and where indicated amends text by addition (**bold underline**) or removal (~~**bold strikethrough**~~), as well as addition of large new sections introduced by editor's instructions to "add new text" or similar, which for readability are not bolded or underlined.

"Boxed" instructions like the sample below indicate to the Volume Editor how to integrate the relevant section(s) into the relevant Technical Framework volume:

Replace Section X.X by the following:

General information about IHE can be found at: www.ihe.net

Information about the IHE IT Infrastructure Domain can be found at: http://www.ihe.net/Domains/index.cfm

Information about the structure of IHE Technical Frameworks and Supplements can be found at: http://www.ihe.net/About/process.cfm and http://www.ihe.net/profiles/index.cfm

The current version of the IHE Technical Framework can be found at: http://www.ihe.net/Technical_Framework/index.cfm

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Introduction

The Cross-Community Fetch (XCF) profile defines a single transaction for accessing medical data between gateways that facilitate multiple dimensions of communication (trust, semantics, encoding, legislation, authority, etc.). The profile is highly inspired by the Cross Gateway Query/Cross Gateway Retrieve transactions and integrates these originally distinct transactions.

In specific use cases, for example when a few dynamically created documents need to be accessed from interacting communities with centralized data localization, a single transaction (versus independent query and retrieve) may reduce the coordination and maintenance of the transactional dependencies and transaction states.

For such use cases, and in environments where stateless Responding Gateways can be designed, it simplifies the implementation of such Responding Gateways. However, it may increase the implementation complexity of Initiating Gateways serving some types of communities, such as XDS Affinity Domains. XCF offers a different deployment option from the general purpose XCA Profile.

Open Issues and Questions

XCF008: This supplement introduces the concept of automated document transforms at the XCF Responding Gateway while not necessarily making the transformed document persistent. For patient safety and traceability reasons this aspect might need to be discussed further.

XCF009: The relationship/difference to on-demand should be provided.

Closed Issues

XCF001: Can the XDS FindDocuments UUID be used as a query id for the Fetch, too? Decision is made (TCon on 2011-04-20) to assign a new UUID as Fetch is an adapted subset of FindDocuments query with a specific semantics.

XCF002: How does the initiating side interact with an XDS affinity domain (e.g. if the Initiating Gateway is part of that affinity domain)? How can an XDS document consumer actor interact with an XCF Initiating Gateway? Are there at all any use cases, where it makes sense that an XDS document consumer performs cross-community document sharing by using XCF instead of XCA? See section 29.3 for guidance.

XCF003: What happens if a message is routed through a network of both XCA and XCF gateways? Are these gateways interoperable? See section 29.3 for guidance.

XCF004: How can document relationships be expressed in a Fetch response? Document relationship can be expressed by ebRS Association Objects which are places within the RegistryObjectList.

XCF005: OASIS ebXML Registry allows for iterations on query results by defining an optional startIndex element within a query request. By using this element one of the major limitations of Fetch – the inability to deal with large result sets – could be resolved. Should the use of startIndex be allowed as an option for the XCF profile? Decision is: NO. Such functionality may

contradict the "simple" approach of the profile by greatly adding to its potential complexity. XCA is assumed to be used for massive data sets that require special treatment.

XCF006: How should actors and transaction be named? Options discussed for the transaction are "Query and Retrieve", "Simple Query" and "Cross Gateway Simple Query". The actor names "Initiating Gateway" and "Responding Gateway" are already used for XCA Gateways. Decision is "Cross-Community Fetch" for the profile and "Cross Gateway Fetch" for the transaction.

XCF007: Risk analysis must be performed on the question whether a Responding Gateway should respond with a NoConsent error in case that the patient has not given consent to sharing his data. As an alternative a "neutral" error or an empty result set could be returned. Using a NoConsent error only makes sense if the patient could then give the required consent at the point of care which would allow a physician to re-issue the request. Decision: In a rather general environment issuing such an error might be considered as an unlawful data disclosure by revealing that there (1) is such a patient that (2) has data available but (3) did not consent into electronic data processing of his medical information. While the accompanying XUA assertion of a health care professional may be interpreted as forming a trusted environment that may actually justify this error message as facilitator, such an assumption is not valid for all environments/contexts. Therefore, such an error may not be issued by default. We agreed to return no documents.

Volume 1 – Profiles

1.7 History of Annual Changes

155

Add the following bullet to the end of the bullet list in section 1.7

- Added the Cross-Community Fetch Profile for exchanging accessing medical data between stateless gateways that facilitate multiple dimensions of communication (trust, semantics, encoding, legislation, authority, etc.).

160 *Add the following section to section 2.2*

2.1 Dependencies among Integration Profiles

Cross-Community Fetch	ATNA	Each XCF Actor shall be grouped with the ATNA Secure Node or Secure Application Actor.	Required to manage audit trail of exported PHI, node authentication and transport encryption.
Cross-Community Fetch	CT	Each XCF actor shall be grouped with the Time Client Actor	To ensure consistency among document and submission set dates.
Cross-Community Fetch	XUA	Each XCF Actor shall be grouped with the appropriate XUA Actor	Required to provide user identity and context

Add the following new section

165 # 29 Cross-Community Fetch (XCF) Profile

The Cross-Community Fetch (XCF) profile defines a single transaction for accessing medical data between gateways that facilitate multiple dimensions of communication (trust, semantics, encoding, legislation, authority, etc.). The profile is highly inspired by the Cross Gateway Query/Cross Gateway Retrieve transactions.

170 In specific use cases, for example when a few dynamically created documents need to be accessed from interacting communities with centralized data localization; a single transaction (versus independent query and retrieve) may reduce the coordination and maintenance of the transactional dependencies and transaction states.

For such use cases, and in environments where stateless Responding Gateways can be designed,
175 XCF simplifies the implementation of such Responding Gateways. However, it may increase the implementation complexity of Initiating Gateways serving some types of communities, such as XDS Affinity Domains. XCF offers a different deployment option from the general purpose XCA Profile.

The transaction fetches a small number of documents based upon a few retrieval parameters. This transaction is simplified to permit easier implementation and better performance on Responding Gateways.

Transcoding and translation of the documents and other data can be performed on the Responding Gateway as part of the transaction.

The XCF Profile stipulates that the following prerequisites are met:

- the document properties to be communicated are known in advance
- the result data sets can be characterized in advance
- the documents are feasible to be returned in a single response
- no further selection and/or manual interaction is needed in the communication process
- preconditions, such as purpose of use, legitimate data, and environment, are agreed upon in advance and are documented in a community or framework agreement
- the document fetching may not always be repeatable – it may not be assumed in every case that the same query with the same query parameters will return the same document version with the same document id.

Ideally, only one document will satisfy the Fetch (e.g., only the most current instance of a patient summary is provided by the Responding Gateway). If the size of the set of documents matching the request is too large to be packed into a single response, an error code is returned by the Responding Gateway. The assumption is that the XCA profile is used when requests are expected to return a large number of documents.

29.1 Actors/Transactions

Figure 29.1-1 shows the actors directly involved in the XCF Profile and the relevant transactions between them.

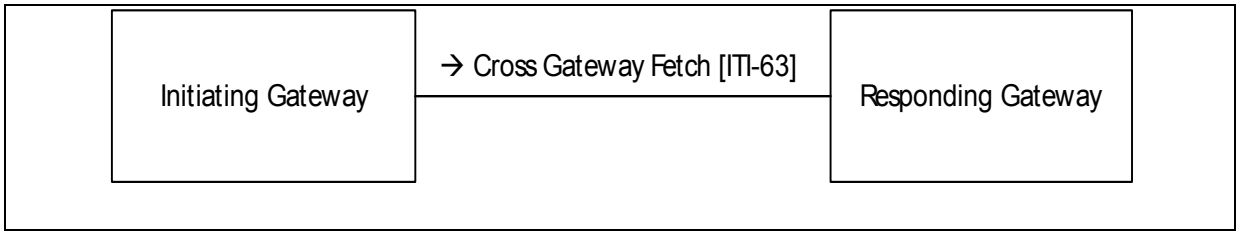


Figure 29.1-1. XCF Actor Diagram

Table 29.1-1 lists the transactions for each actor directly involved in the XCF Profile. In order to claim support of this Profile, an implementation must perform the required transactions (labeled "R"). Transactions labeled "O" are optional. A complete list of options defined by this Profile and that implementations may choose to support is listed in Volume 1, Section 29.2.

Table 29.1-1. XCF Profile - Actors and Transactions

Actors	Transactions	Optionality	Section in Vol. 2b
Initiating Gateway	Cross Gateway Fetch [ITI-63]	R	ITI-TF-2b:3.63
Responding Gateway	Cross Gateway Fetch [ITI-63]	R	ITI-TF-2b:3.63

29.2 XCF Profile Options

Options that may be selected for this Profile are listed in the table 29.2-1 along with the Actors to which they apply. Dependencies between options when applicable are specified in notes.

Table 29.2-1 XCF - Actors and Options

Actor	Options	Vol & Section
Responding Gateway	no options	
Initiating Gateway	Asynchronous Web Services Exchange	29.2.1

The Responding Gateways shall support Asynchronous Web Services Exchange Option on the Cross Gateway Fetch. Support for this function is required in order to enable use of Asynchronous Web Services Exchange in any cross-community interaction.

29.2.1 Asynchronous Web Services Exchange Option

Initiating Gateways which support Asynchronous Web Services Exchange shall support Asynchronous Web Services Exchange on the Cross Gateway Fetch [ITI-63] transaction.

29.3 XCF Actor Groupings and Profile Interactions

29.3.1 XCF Required Groupings

The Initiating Gateway shall be grouped with ATNA Secure Node or ATNA Secure Application, CT Time Client and XUA X-Service User.

The Responding Gateway shall be grouped with ATNA Secure Node or ATNA Secure Application, CT Time Client and XUA X-Service Provider.

29.3.2 XDS/XCA Interactions (Informative)

Interoperable interaction between communities which have chosen to implement only XCF and those that are based on XDS or XCA may be enabled through transformation agents. IHE does not specify the mechanism used by such transformation agents or any details about their implementation. The following sections give a high level perspective on the challenges of enabling four cases of agents:

1. “responding agent” for XDS- acts as an XCF Responding Gateway and converts incoming Cross Gateway Fetch transactions into XDS transactions to collect the content needed for the response.

2. "responding agent" for XCA- acts as an XCF Responding Gateway and converts incoming Cross Gateway Fetch transactions into XCA transactions to collect the content needed for the response.
3. "initiating agent" for XDS – acts as an XCF Initiating Gateway and converts XDS transactions into Cross Gateway Fetch transactions to collect content from XCF only communities.
4. "initiating agent" for XCA– acts as an XCF Initiating Gateway and converts XCA transactions into Cross Gateway Fetch transactions to collect content from XCF only communities.

Some agents are relatively easy to implement and others are quite complicated. In environments where integration of with XCA and XDS is important it would be advisable to consider XCA with the On-Demand option as an alternative to the use of XCF.

29.3.2.1 "responding agent" for XDS (Grouping with Document Consumer)

A "responding agent" for XDS converts incoming Cross Gateway Fetch transactions into Registry Stored Query and Retrieve Document Set transactions which are directed to a local XDS Registry/Repository. This type of agent has value because it allows access by XCF only communities to content within XDS based communities.

A "responding agent" for XDS can be enabled through a relatively simple grouping of XDS Document Consumer and XCF Responding Gateway. The agent must convert the Cross Gateway Fetch query into a collection of Registry Stored Query and Retrieve Document Set transactions. This conversion is relatively straightforward; the query in the Cross Gateway Fetch transaction maps closely to the Find Documents stored query of Registry Stored Query and from this query the agent can generate appropriate Retrieve Document Set transactions to get the document contents. Several additional details need to be managed by the agent, like supplying document associations and handling situations when the results are too large to be returned in the Cross Gateway Fetch response. Figure 29.3.2.1-1 depicts this environment.

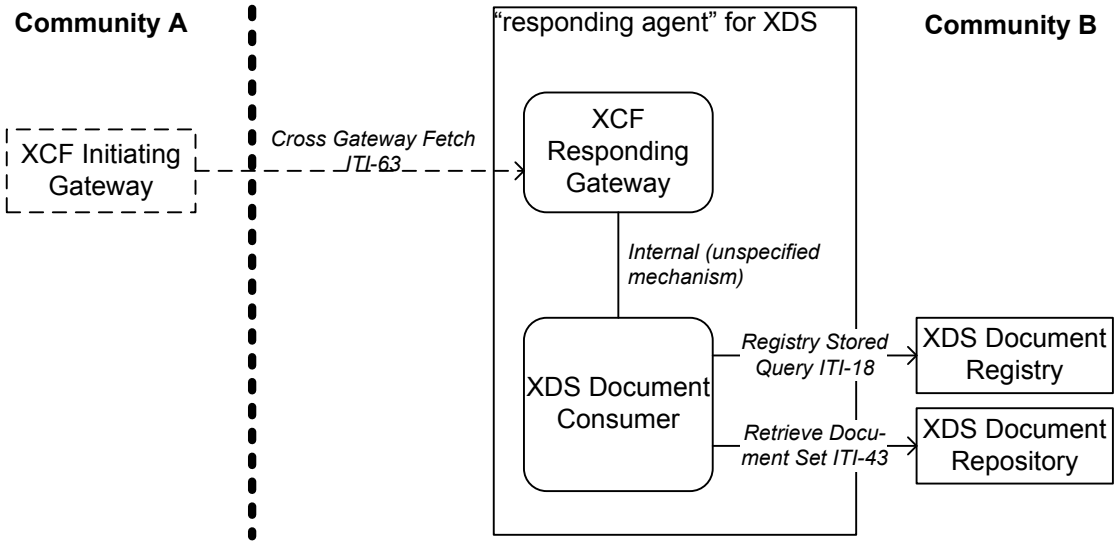


Figure 29.3.2.1-1 "responding agent" for XDS

29.3.2.2 "responding agent" for XCA

A "responding agent" for XCA converts incoming Cross Gateway Fetch transactions into Cross Gateway Query and Cross Gateway Retrieve transactions which are directed to a XCA Responding Gateway. This type of agent has value because it allows access by XCF only communities to content within XCA based communities.

A "responding agent" for XCA groups with an XCA Initiating Gateway in order to initiate Cross Gateway Query and Cross Gateway Retrieve transactions to a XCA Responding Gateway. The agent must convert the Cross Gateway Fetch query into an appropriate query supported by Cross Gateway Query and must interpret and collect the results of the Cross Gateway Query and Cross Gateway Retrieve in order to respond to the Cross Gateway Fetch transaction. The query mapping and translation across transactions is equivalent to the work involved in a "responding agent" for XDS. Figure 29.3.2.2-1 depicts this environment.

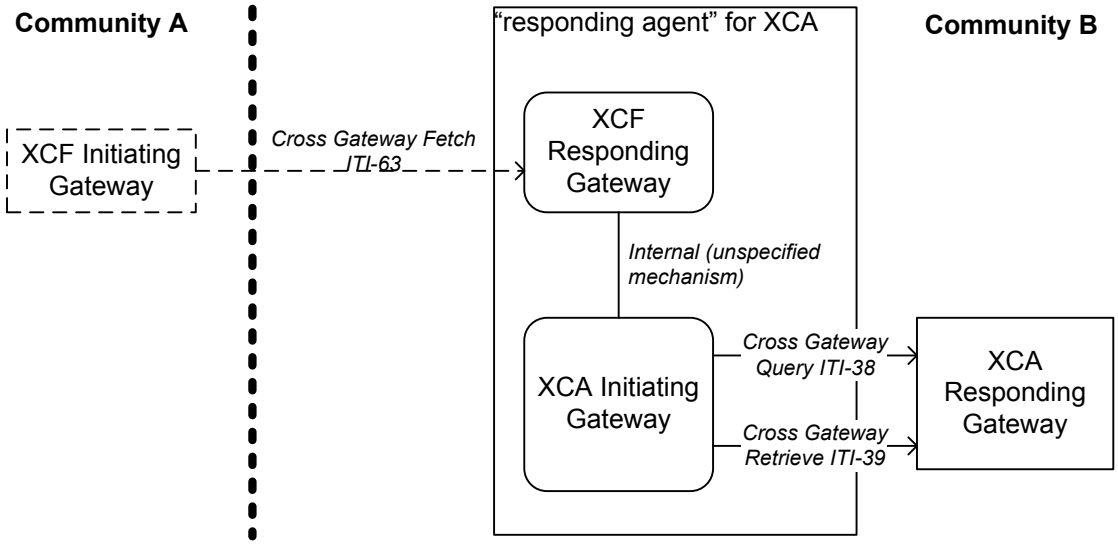


Figure 29.3.2.2-1 "responding agent" for XCA

29.3.2.3 "initiating agent" for XDS

An "initiating agent" for XDS enables access by the significant number of products supporting the XDS Document Consumer Actor to content within a community that only supports XCF. Without this kind of enablement EMR/EHR systems (and others) will be cut off from the content held by a community that chooses to support only XCF. Enabling this interaction is more difficult than the other direction and this section only skims the surface of the work involved.

The "initiating agent" for XDS must be able to convert the contents of Registry Stored Query [ITI-18] transactions into Cross Gateway Fetch transactions. Typically this will involve the conversion of the Find Documents stored query. Along with copying all the parameters, the "initiating agent" for XDS must also manage a few other aspects of the query request. Handling the response from the Cross Gateway Fetch transactions involves storing locally the parts not immediately requested by the XDS Document Consumer and returning only the parts that are appropriate. For example, the Cross Gateway Fetch transaction will return the documents associated with the metadata. The "initiating agent" for XDS cannot return these documents in the Registry Stored Query transaction so must save them locally in order to be able to return them upon receipt of a Retrieve Document Set transaction. The local storage, called "Copy of Community B content" in the diagram, looks a little like an XDS Registry/Repository system managed and used by the "initiating agent" for XDS. This storage will also need to hold the metadata returned in the Cross Gateway Fetch to respond to Registry Stored Query transactions that use stored queries other than Find Documents. The complete design of the "initiating agent" for XDS is a non-trivial task and not further described by IHE.

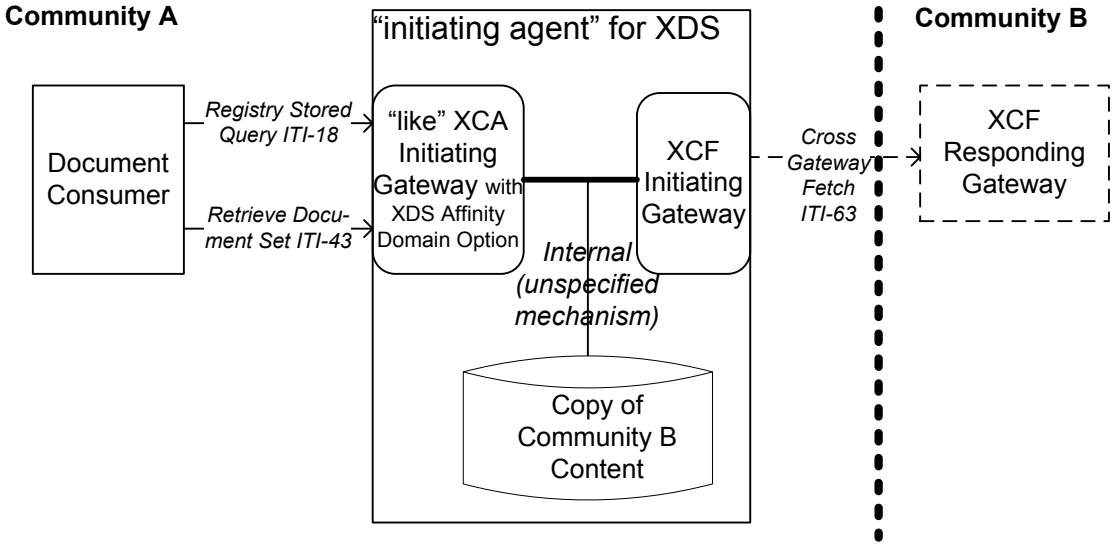


Figure 29.3.2.3-1 "initiating agent" for XDS

29.3.1.4 "initiating agent" for XCA

An "initiating agent" for XCA enables access by communities using a XCA Initiating Gateway to access content within a community that only supports XCF. Without this kind of enablement XCA communities will be cut off from the content held by a community that chooses to support only XCF. Enabling this interaction is very similar to the enablement for XDS. Figure 29.3.1.4-1 presents a view of how this enablement might be designed and represents the small differences from the "initiating agent" for XDS described in section 29.3.2.4.

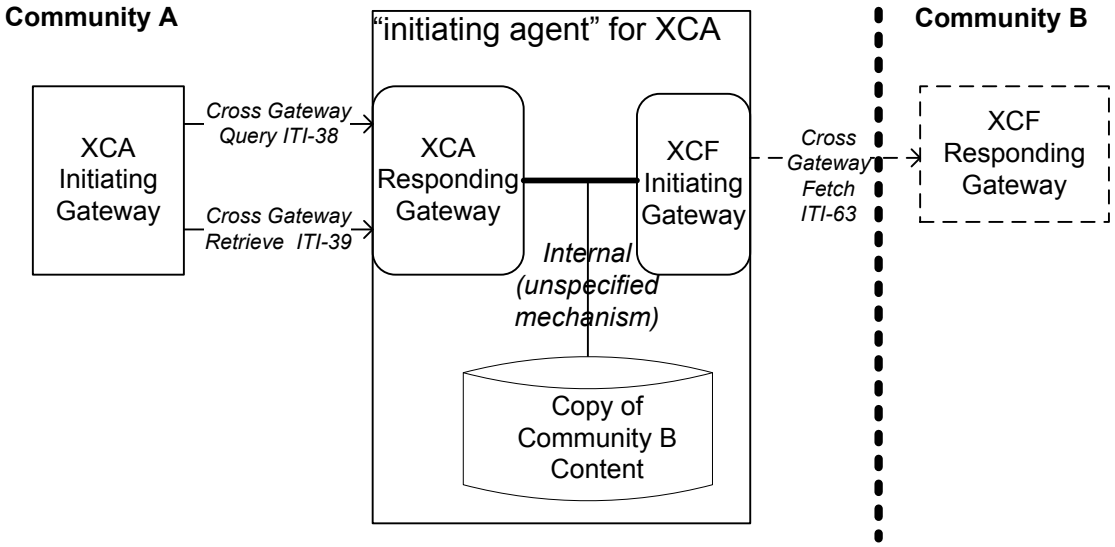


Figure 29.3.2.4-1 "initiating agent" for XCA

29.3.3 Profile Interactions (Informative)

Potential interactions for XCF with other IHE profiles are illustrated in this real world example.

It is assumed that a gateway infrastructure is set up for sharing patient's medical summary data among autonomous regions. Each region collects a different set of data for its patients and makes use of its own document schema and builds upon its specific taxonomies for coding values. Patients may define privacy policies for their data and give general consent for data sharing in their region of affiliation while healthcare professionals are authenticated in the region of care. Gateways perform all the transcoding, trust brokerage and access control enforcement such that all the (technical) complexity of this use case is hidden from the existing regional infrastructures and the acting persons.

As a result of this hidden complexity, from the physician's perspective this use case is just a single operation: retrieval of an identified patient's medical summary.

Organizationally, the concrete service delivery steps may be assigned to existing relevant IHE profiles for partial task fulfillment.

Table 29.3.3-1: IHE Profile Assignment / Interaction

Service Delivery Step	Support provided by IHE Profiles
Claim about requestor authenticity	Initiating gateway grouped with **IHE XUA** X-Service-User Actor Responding gateway grouped with **IHE XUA** X-Service-Provider Actor
Provisioning of requestor identity attributes (local roles, permissions, treatment context, delegation)	**IHE XUA** attributes
Establishing and Verifying Trust Relationships between the initiating and responding gateways	Deployment of the gateways as **IHE ATNA** Secure Nodes
Establishing an Audit Trail for traceability between initiating and responding gateway	**IHE ATNA** Audit Trail
Verification of the patient's privacy consent	**IHE BPPC** encoded consents accessed through **IHE XDS** transactions.
Assurance of health information integrity and originator authenticity	**IHE DSG** for document digital signatures
Policy Decision and Policy Enforcement at each of the gateways	Policy Decision and Policy Enforcement (IHE White Paper on Access Control)
Health Information Exchange with opaque regional infrastructures	May be implemented by **IHE XDS** or other Entity Services → intentionally opaque
Canonical encoding of patient summary document for sharing information among autonomous regions	e.g. IHE PCC XDS-MS (Medical Summary Document Content) as content model

The translation and transcoding of patient summary data from a regional encoding into the canonical encoding at the Responding Gateway and the reverse transformation at the Initiating Gateway are out of the scope of IHE and subject to individual implementation (even though profiles like IHE SVS can help with the management of value sets). The figure 29.3.3-1 shows

the respective document transformations, which require – from the consumer's perspective - at least two intermediary documents.

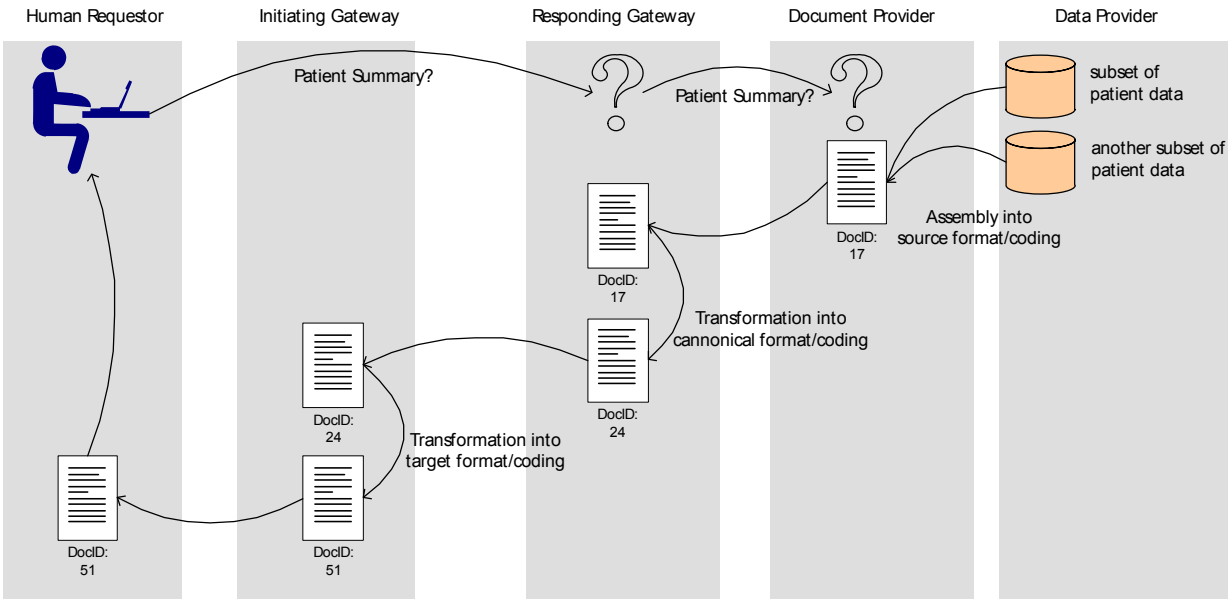


Figure 29.3.3-1: Document ID flown in cross-country use case with translation/transcoding scenario

This use case gives an impression of the problems that may arise if data discovery and retrieval across data processing gateways are split among multiple transactions within a logical session:

- Consents and policies have to be enforced again with each request. This requires that each transaction carries enough information to allow the responding gateway to discover and enforce the matching policies

By using the Cross Gateway Fetch transaction, the participating Responding Gateways and actors do not have save the intermediate formats and objects. Another way of avoiding saving intermediate formats is to use the on-demand option of XCA. For accessing the requested, transcoded data all security checks must only be performed once (including certificate verification, consent fetching, and policy enforcements) and common information for policy discovery and assessment (particularly patient identifier and document type) is available at the responding gateway before any medical data has been accessed. However, it may increase the implementation complexity of Initiating Gateways serving some types of communities, such as XDS Affinity Domains.

29.4 XCF Process Flow

29.4.1 Use Cases

29.4.1.1 Patient Summary Service with Translation/Transforming Use Case

This use case may be supported either by XCA or XCF. A typical use case where data is processed on gateways is health data sharing among autonomous regions (states, countries) with distinct healthcare infrastructures and regulatory frameworks. As modifications on existing

services and systems are typically not possible, gateways are used to encapsulate the specifics of the regional infrastructures and regulations. These gateways perform a transformation of data schema and coding from regional format to a canonical format and vice versa and implement means to broker trust among the regions by acting as guarantors for the enforcement of agreed security services (e.g. on originator authenticity and proper authentication).

Health data sharing among autonomous regions is limited to an agreed set of documents because for example:

- many of the use cases of cross-regional care cover unscheduled care scenarios where a physician does not want to access the full EHR of a patient but is rather interested in aggregated health status information
- reimbursement regulations only cover specific phases of a treatment (e.g. Dutch patients being allowed to go to Germany for certain surgeries) that require access to be restricted to a defined set of documents

The XCF Profile provides simple access to documents of limited number and volume within a gateway infrastructure, where the initiating regions have simple environments.

29.4.1.2 Highly Regulated Data Sharing Scenarios

Two states are enabling access for their citizen's emergency data-sets. The contents of the data set are well specified in advance, and only documents that are sanctioned will be accessed. A framework or community agreement needs to exist that governs, which documents, what contents and encoding are to be communicated under which conditions and environments.

Both states reserve the right to enforce policies at their respective domain and may not be forced to adapt or change their existing I.T.-systems due to the principle of sovereignty.

Furthermore, only the most recent version of the emergency data-set is to be communicated at any time, potentially existing older version must not be communicated or made available for patient safety reasons: querying for just "any" document is disallowed.

29.4.2 Process Flow

Figure 29.4.2-1 shows a typical Cross-Community Fetch data access pattern where the XCF profile can be used:

1. An initial requestor requests a defined kind of document about an already identified patient. The requestor connects to the Initiating Gateway actor using a mechanism not constrained by the XCF profile. Examples of such mechanisms are filling a form at a web portal that is grouped with the Initiating Gateway or using a proprietary document type specific web service that is grouped with the Initiating Gateway (e.g. a dedicated "patient summary service").
2. The Initiating Gateway initiates a XCF Fetch request message to the Responding Gateway will be able to fulfill the initial request.
3. The Responding Gateway processes the request message (e.g. enforcing community specific security policies) and obtains the requested information from any data

managing actor within its community. The provided data is processed as previously agreed between the communicating communities (encoding, schema, etc.).

4. The Responding Gateway sends a XCF Fetch response message to the Initiating Gateway.
5. The Initiating Gateway verifies that the data provided confirm to the agreed policies. It processes the data to match its domain's local policies and sends it to the Initial Requestor.

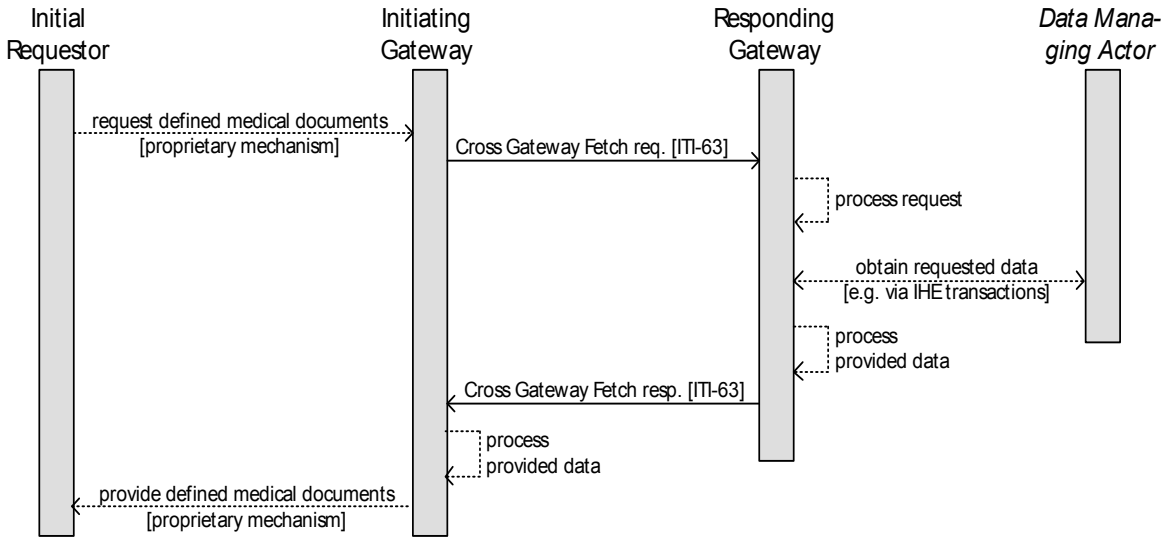


Figure 29.4.2-1 Basic Process Flow in XCF Profile

Figure 29.4.2-2 shows an illustration of this basic process flow described above. In this scenario, IHE Audit Trail and Node Authentication (ATNA) and IHE Cross-Enterprise User Assertion (XUA) are used to safeguard the communication and allowing the responding side to enforce fine-grained local security policies. Part of the initial request processing at the Responding Gateway is the verification that the patient has given consent to the use of his data for this purpose. For this purpose the Responding Gateway may be grouped with a Document Consumer actor to obtain an IHE Basic Patient Privacy Consent (BPPC) coded consent document via XDS Registry Stored Query [ITI-18] and Retrieve Document Set [ITI-43] transactions.

If the responding community is organized as a XDS Affinity Domain, XDS can be used to obtain the requested data (See section 29.3.2.1). In this case the Responding Gateway is grouped with a Document Consumer actor (which may be the same as used for consent retrieval) that initiates the XDS transactions for obtaining the requested data.

In advance, the communicating communities agreed on a canonical format for sharing documents. It is the responsibility of the Responding Gateway to transform, translate and transcode the data from its local format to the canonical format as agreed between the Initiating and Responding Gateways. The reverse action is taken at the Initiating Gateway: the data

received from the Responding Gateway is transformed at the Initiating Gateway, translated and transcoded into the local format.

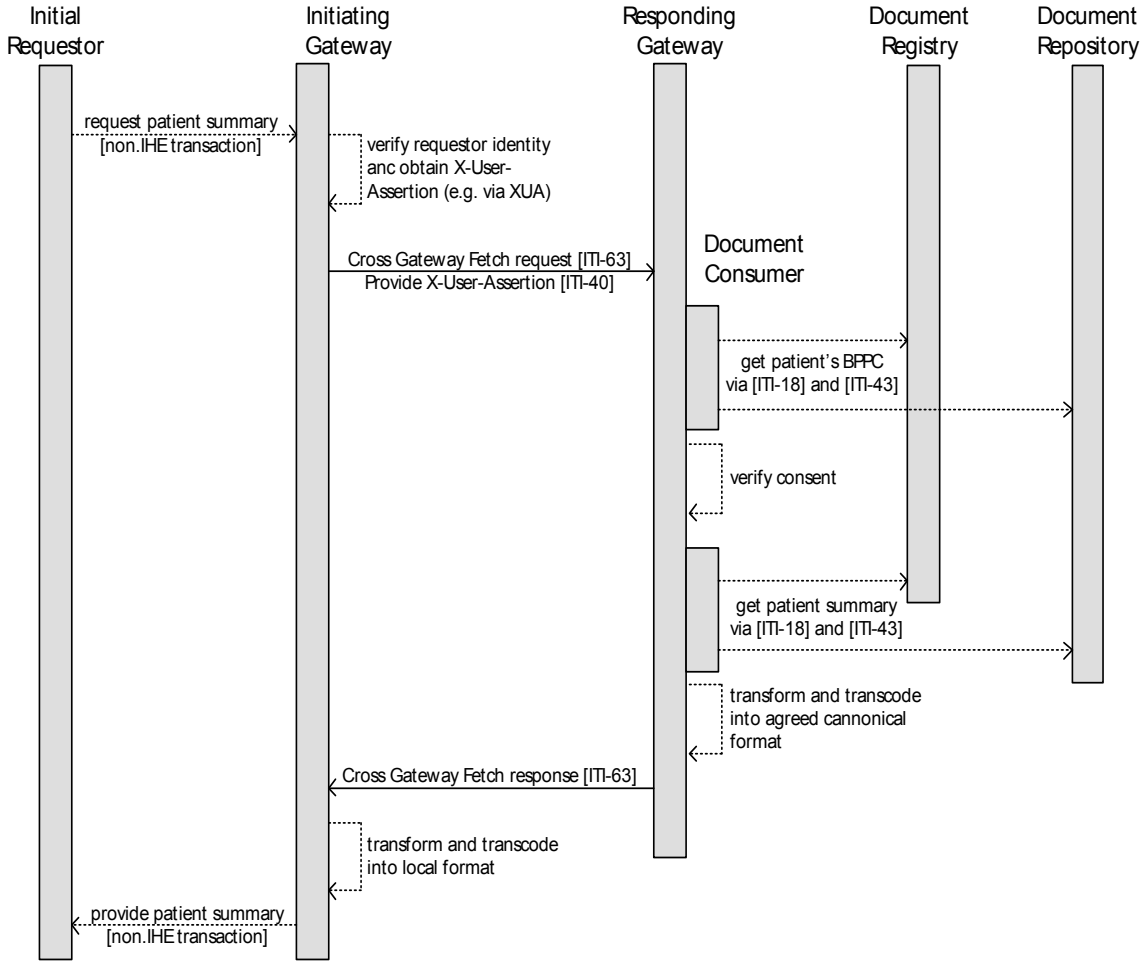


Figure 29.4.2-2 Process Flow with Consent/Policy Enforcement and Document Transcoding

29.5 XCF Profile Security Considerations

29.5.1 XCF Risk Assessment

The risk analysis for XCF enumerates assets, threats, and mitigations. The complete risk data may be found at ftp://ftp.ihe.net/IT_Infrastructure/iheitiyr9-2011-2012/Technical_Cmte/Profile_Work/XCA-QueryRetrieve/XCFetch_Risk_assessment_and_mitigation_table_V1.xls.

This risk analysis extends the general IHE risks and threats analysis (see ITI TF-1: Appendix L) for risks and mitigations that are specific to the XCF actors. Vendor and operators of XCF actors are also advised that many risks cannot be mitigated by the IHE profile and instead the responsibility for mitigation is transferred to the vendor, and occasionally to the communities

and enterprises that operate XCF gateways. In these instances, IHE fulfills its responsibility to notify affected parties through the following section.

The following general mitigations shall be implemented by all XCF actors. These mitigations moderate all currently known high impact risks. Implementers are strongly advised to periodically reassess threats and mitigations to those threats, and to employ robust and secure design, programming and operational management practices.

- In case that any or both of the gateways perform transcoding, transformation or translation of metadata or document data, the following mitigation addresses the risks associated with wrong transformations. The original (human) requestor should be given the ability to additionally fetch an original document which is not automatically modified during the Cross Gateway Fetch transaction. This may either be implemented through a dedicated document class code for original data or by using the document relationship mechanism as described in section 3.63.4.1.2.3.
- All actors in XCF shall be grouped with an ATNA Secure Node actor and a CT Time Client actor to, respectively, ensure confidentially and consistent logs.
- Document metadata shall include a hash of the document content to enable low/moderate assurance document integrity confirmation. Use of document digital signatures (DSG) may be used, if needed, for more high assurance document integrity and non-repudiation of origin purposes.
- The Initiating Gateway should issue Cross Gateway Fetch requests that result in a single, unambiguous, document to be found and returned whenever possible and must supply both a patient identifier and a document class code identifier.
- To reduce the ability of attackers to "phish" for data, a Responding Gateway which receives a fetch request for unknown patient identifiers or document class codes shall return a response containing zero documents, with no further information. This applies to patient identifiers and class code identifiers that are properly formatted or improperly formatted.
- Initiating Gateways shall provide an X-user Assertion (XUA) with the Cross Gateway Fetch request in order to allow the Responding Gateway to enforce a local security policy. Responding Gateways should assess a local security policy before responding to the request or retrieval of any metadata or data. The local security policy should include the enforcement of a Basic Patient Privacy Policy (BPPC).
- Initiating Gateways may verify the patient identifier included with a received document's header against the original patient identifier that was used for the request

General developmental and operational best practices should be observed.

Add the following new item to Appendix B

Appendix B Transaction Summary Definitions

Cross Gateway Fetch - fetches a document or a set of documents from a remote community that match a given set of metadata attribute values.

Volume 2 – Transactions

Add section 3.63

3.63 Cross Gateway Fetch

This section corresponds to Transaction 63 of the IHE ITI Technical Framework. Transaction 63 is used by the Initiating Gateway and Responding Gateway actors.

3.63.1 Scope

This transaction is used to fetch a document or a set of documents that match a given set of metadata attribute values.

The transaction always returns:

- Metadata, if any, for zero or more registry objects, and
- Zero or more Association objects (linking the targeted DocumentEntries), and
- Document contents, if any.

3.63.2 Use Case Roles

Actor: Initiating Gateway

Role: Initiates the Cross Gateway Fetch transaction for obtaining a defined set of documents

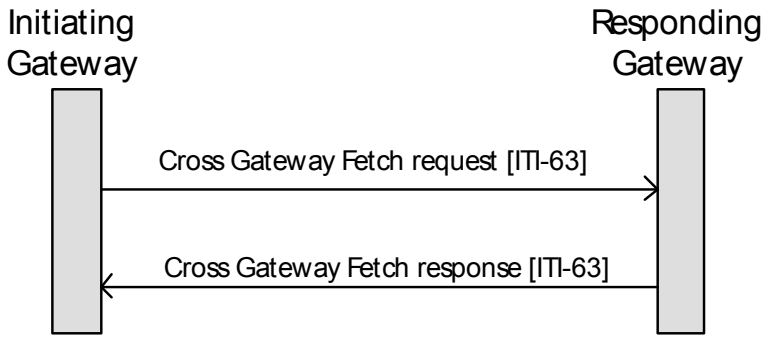
Actor: Responding Gateway

Role: Responds to a Cross Gateway Fetch transaction by providing the registry data and document content of a defined set of documents

3.63.3 Referenced Standards

- ebRIM: OASIS/ebXML Registry Information Model v3.0 - OASIS ebRIM 3.0
- ebRS: OASIS/ebXML Registry Services Specifications v3.0 - OASIS ebRS 3.0
- MTOM: SOAP Message Transmission Optimization Mechanism - W3C MTOM
- XOP: XML-binary Optimized Packaging - W3C XOP
- ITI TF-2x Appendix V: Web Services for IHE Transactions
- WSSE1.1: OASIS Web Service Security v1.1

3.63.4 Interaction Diagram



3.63.4.1 Cross Gateway Fetch Request

The Cross Gateway Fetch request message is implemented as an ebRS Registry Stored Query with requesting the registry items and their linked repository items as a response. The Cross Gateway Fetch request message is fully compliant with the ebRS 3.0 standard. The request message shall use SOAP 1.2 MTOM with XOP encoded attachments.

3.63.4.1.1 Trigger Events

This message is initiated when the Initiating Gateway has determined that it must interact with the Responding Gateway to obtain a document as was requested from an initial requestor.

3.63.4.1.2 Message Semantics

The ebXML Registry stored query facility (Invoke Stored Query transaction) as profiled for the Cross Gateway Fetch request message shall contain the following parameters:

- **returnType** – shall be "LeafClassWithRepositoryItem" which specifies that the AdhocQueryResponse may contain a collection of ExtrinsicObject XML elements as defined in ebRIM Schema accompanied with their repository items.
- **Query ID** – shall be "urn:uuid:f2072993-9478-41df-a603-8f016706efe8" which indicates a Fetch (which is an adaption of the findDocuments Query as defined in ITI TF-2a:3.18.1)
- **Query Parameters** – as defined in the Query Parameters section below

Other IHE stored query types as listed in ITI TF-2a:3.18.1 are not defined by this transaction and the Responding Gateway may return an error.

3.63.4.1.2.1 Query Parameters for Cross Gateway Fetch Requests

The following table lists the parameters that may be used for Cross Gateway Fetch requests. Other parameters than the ones lists below shall not be used.

Table 3.63.4.1-1 Query Parameters for Cross Gateway Fetch

Parameter Name	Description	Opt	Mult
$XDSDocumentEntryPatientId	See ITI TF-3:4.1-5	R	-
$XDSDocumentEntryClassCode	See ITI TF-3:4.1-5	R	M
$XDSDocumentEntryTypeCode	See ITI TF-3:4.1-5	O	M
$XDSDocumentEntryPracticeSettingCode	See ITI TF-3:4.1-5	O	M
$XDSDocumentEntryCreationTimeFrom	See ITI TF-3:4.1-5	O	-
$XDSDocumentEntryCreationTimeTo	See ITI TF-3:4.1-5	O	-
$XDSDocumentEntryServiceStartTimeFrom	See ITI TF-3:4.1-5	O	-
$XDSDocumentEntryServiceStartTimeTo	See ITI TF-3:4.1-5	O	-
$XDSDocumentEntryServiceStopTimeFrom	See ITI TF-3:4.1-5	O	-
$XDSDocumentEntryServiceStopTimeTo	See ITI TF-3:4.1-5	O	-
$XDSDocumentEntryHealthcareFacilityTypeCode	See ITI TF-3:4.1-5	O	M
$XDSDocumentEntryEventCodeList	See ITI TF-3:4.1-5	O	M
$XDSDocumentEntryConfidentialityCode	See ITI TF-3:4.1-5	O	M
$XDSDocumentEntryAuthorPerson	See ITI TF-3:4.1-5	O	M
$XDSDocumentEntryFormatCode	See ITI TF-3:4.1-5	O	M
homeCommunityId	See 3.63.4.1.2.2	R	-

Coded values shall be coded according to specification in ITI TF-2a: 3.18.4.1.2.3.4 *Coding of Code/Code-Scheme*.

The value for the $XDSDocumentEntryAuthorPerson parameter is a pattern compatible with the SQL keyword LIKE which allows the use of the following wildcard characters: % to match any (or no) characters and _ to match a single character. The match shall be applied to the text contained in the Value elements of the authorPerson Slot on the author Classification (value strings of the authorPerson sub-attribute).

3.63.4.1.2.2 Use of homeCommunityId

The Cross Gateway Fetch request shall contain the homeCommunityId, which is a globally unique identifier for a community and is used to obtain the Web Services endpoint of services that provide access to data in that community. homeCommunityId is structured as an OID limited to 64 characters and specified in URI syntax, for example the homeCommunityId of 1.2.3 would be formatted as `urn:oid:1.2.3`.

The use of homeCommunityId in conjunction with Cross Gateway Fetch is as follows:

- It is a parameter to Fetch requests
- The homeCommunityId value is specified as the home attribute on the AdhocQuery element of the Fetch request, as in: `<AdhocQuery id="…" home="urn:oid:1.2.3" … >`

- Each Fetch request shall only have one homeCommunityId value. Separate individual Fetch requests can be used to fetch data associated with different homeCommunityIds.

A Responding Gateway that receives a Cross Gateway Fetch request message shall behave as follows:

- If the homeCommunityId is an identifier for a community represented by the Responding Gateway, the Responding Gateway shall process the request.
- If the homeCommunityId is an identifier for another community that is supported by the Responding Gateway, the Responding Gateway shall forward the request to the Responding Gateway that is responsible for that community.
- If the value of homeCommunityId is not known by the Responding Gateway, the Responding Gateway shall return an XDSUnknownCommunity error code.
- Verify the homeCommunityId is specified on the query and return an XDSMissingHomeCommunityId error code if missing.

3.63.4.1.2.3 Inclusion of Document Associations

In certain situations, such as patient safety reasons and local policy considerations, the Responding Gateway might be required to transport document associations alongside the requested documents. The ability to transport such additional information is explicitly supported by this transaction. Examples (non-exhaustive) of such associations can be an association to the original document that served as the basis for a transcoding/translation, an appended message such as a dispensation notice accompanying an ePrescription, or a special legal disclaimer required to be put in by the document provider.

The decision on what associations are to be included is based on the Responding Gateway's local policy and on the community agreement that sanctions the data transfer.

In any case, the Responding Gateway only returns associations between documents which are listed in the table at ITI TF-3:4.1-2. It never returns other associations, for example hasMember.

3.63.4.1.3 Cross Gateway Fetch request message example

```
<query:AdhocQueryRequest>
   <query:ResponseOption returnComposedObjects="true"
        returnType="LeafClassWithRepositoryItem"/>
   <rim:AdhocQuery id="urn:uuid:f2072993-9478-41df-a603-8f016706efe8"
home=”2.16.17.710.780.1000”>
      <!—Query slots go in here -->
   </rim:AdhocQuery>
</query:AdhocQueryRequest>
```

3.63.4.1.4 Expected Actions

The Responding Gateway shall:

1. Accept a parameterized query in an AdhocQueryRequest message

2. Verify the required parameters are included in the request
3. Process the query by discovering and fetching DocumentEntries matching the query request parameters.
4. If sanctioned by a community agreement, return appropriate Association objects linking the targeted DocumentEntries (targeted by the query request parameters).
5. Return an error and zero documents for the following conditions:
   a) Unknown query ID
   b) Required parameter missing
   c) Invalid or unknown patient identifier
   d) Unknown or missing homeCommunityId

See 3.63.4.2.5 for further error conditions and error message encoding see section ITI TF-3:4.1.13.

If a problem occurred while transcoding documents, a TranscodingError is issued which is included in the status return value of partial success (see 3.63.4.2.5).

6. Respond to the Cross Gateway Fetch request with a Cross Gateway Fetch response message (see 3.63.4.2)

3.63.4.2 Cross Gateway Fetch Response

The Cross Gateway Fetch response message includes the registry items (meta data) and documents listed in the registry items. The response message shall use SOAP 1.2 MTOM with XOP encoding attachments.

3.63.4.2.1 Trigger Events

The Cross Gateway Fetch response message is triggered by a Cross Gateway Fetch request message.

3.63.4.2.2 Message Semantics

The Cross Gateway Fetch response message semantics and syntax shall comply with ITI TF-2a:3.18.4.1.2 with the following additions.

The response message syntax reuses the XML element `<Document/>` with namespace urn:ihe:iti:xds-b:2007. This element shall appear as the last element child of an `<ExtrinsicObject/>` element. The Document contents are associated with the `<DocumentEntry/>` (ExtrinsicObject) metadata by the fact that it is nested within the XML message. This format is considered the unoptimized format - the only one that can be represented in pure XML. This is not the wire-format for the message but is what is specified by the schema and the WSDL (the XOP/MTOM optimization is applied afterwards).

The respective part of the `<DocumentEntry/>` metadata looks like this:


```
<rim:ExtrinsicObject>
  <!-- lots of stuff missing here -->
  <xdsext:Document xmlns:xdsext="urn:ihe:iti:xds-b:2007">
              VGhpcyBpcyBteSBkb2N1bWVudC4KCkl0IGlzIGdyZWF0IQo=
  </xdsext:Document>
</rim:ExtrinsicObject>
```

The MTOM/XOP optimization of this content replaces the contents of the <Document/> element with a XOP reference to a different MIME part which holds the content. It is this moving of the bulky content out of the XML where it is difficult to handle and into the raw MIME multipart frame that is considered the optimization of MTOM/XOP. The resulting <Document/> element is depicted in ITI TF-2a:3.43.5.1.2.

In addition to document metadata and document content, a Cross Gateway Fetch response may explicitly encode relationships among the documents provided. These are provided as Associations linking the DocumentEntries and placed into the <RegistryObjectList> element (see ITI TF-3:4.1.6 for details).

As a result, the Cross Gateway Fetch response, if configured to do so (see 3.63.4.1.2.3), shall return document associations as sanctioned and explicitly approved by the local policy of the document or data provider.

A Cross Gateway Fetch response shall only contain those associations whose target and source objects are contained in the response.

A Cross Gateway Fetch response shall only return relationships between documents, any potential hasMember associations shall never be returned.

A Cross Gateway Fetch response shall not contain other objects than DocumentEntries and associations between DocumentEntries.

A Cross Gateway Fetch response shall contain the document contents for each DocumentEntry in the returned metadata.

3.63.4.2.3 Expected Actions

If the Cross Gateway Fetch Response is received by the Initiating Gateway shall:

- process the message received and make it available to the requestor

3.63.4.2.4 Document Metadata

Each provided document is further classified by metadata attributes (registry items associated with the document). The Responding Gateway shall provide document metadata attributes as specified in ITI TF-3: Table 4.1-5. Metadata other than that included in these tables shall not be provided by the Responding Gateway and shall not be processed by the Initiating Gateway.

The classification schemes as defined in ITI TF-3: 4.3.1.2 shall be used.

3.63.4.2.5 Error Codes

Error conditions shall be covered according to ITI TF-3: 4.1.13.

Failures that originate in the SOAP header (including SAML assertions that are provided within the SOAP header) shall be covered by the respective error messages of the respective protocol or standard: if the Responding Gateway (acting as X-Service Provider) is unable to successfully process a X-User Assertion, it shall return an error code as described in WS-Security core specification section 12 (Error Handling, using the SOAP Fault mechanism), and the ATNA Audit event for authentication failure shall be returned according to ATNA rules (see ITI TF-2b: 3.40.4.1.3).

3.63.5 Protocol Requirements

The Cross Gateway Fetch request and response will be transmitted using Synchronous or Asynchronous Web Services Exchange, according to the requirements specified in ITI TF-2x: Appendix V. The protocol requirements are identical to the Registry Stored Query except as noted below

Table 3.63.5-1 WSDL Names

soap	http://schemas.xmlsoap.org/wsdl/soap/
soap12	http://schemas.xmlsoap.org/wsdl/soap12/
wsaw	http://www.w3.org/2006/05/addressing/wsdl/
xsd	http://www.w3.org/2001/XMLSchema
ihe	urn:ihe:iti:xds-b:2007
rs	urn:oasis:names:tc:ebxml-regrep:xsd:rs:3.0
lcm	urn:oasis:names:tc:ebxml-regrep:xsd:lcm:3.0
xop	http://www.w3.org/2004/08/xop/include
query	urn:oasis:names:tc:ebxml-regrep:xsd:query:3.0

Responding Gateway: These are the requirements for the Cross Gateway Fetch transaction presented in the order in which they would appear in the Responding Gateway WSDL definition:

- The following types shall be imported (xsd:import) in the /definitions/types section:
    - namespace=" urn:oasis:names:tc:ebxml-regrep:xsd:query:3.0", schemaLocation="query.xsd"
- The /definitions/message/part/@element attribute of the Cross Gateway Fetch Request message shall be defined as “query:AdhocQueryRequest”
- The /definitions/message/part/@element attribute of the Cross Gateway Fetch Response message shall be defined as “query:AdhocQueryResponse”
- for additional attribute requirements refer to table 3.63.5-2

695 **Table 3.63.5-2 - Attribute Requirements**

/definitions/portType/operation@name	RespondingGateway_CrossGatewayFetch
/definitions/portType/operation/input/@wsaw:Action	urn:ihe:iti:2011:CrossGatewayFetch
/definitions/portType/operation/output/@wsaw:Action	urn:ihe:iti:2011:CrossGatewayFetch
/definitions/binding/operation/soap12:operation/@soapAction	urn:ihe:iti:2011:CrossGatewayFetch

These are the requirements that affect the wire format of the SOAP message. The other WSDL properties are only used within the WSDL definition and do not affect interoperability. For informative WSDL for the Responding Gateway actor see ITI TF-2x: Appendix W.

3.63.6 Security Considerations

700 The Responding Gateway should:

- return either zero documents or XDSUnknownPatientId (if local policy permits) if unknown/invalid patient identifiers are provided in the request.
- return zero documents if no valid consent for the patient was found.
- return zero documents if privacy or security provisions are not met/violated.
705 • be configured for the maximum response size it supports. If the response exceeds this configured size, the Responding Gateway shall return XDSTooManyResults and zero documents.

3.63.6.1 Security Audit Considerations

Both the Initiating Gateway and Responding Gateway shall audit the Cross Gateway Fetch
710 transaction. The audit entries shall be equivalent to the entries required for the Registry Stored Query.

The Initiating Gateway shall audit the Cross Gateway Fetch as if it were a Document Consumer except that for EventTypeCode the Initiating Gateway shall specify EV("ITI-63", "IHE Transactions", and "XCF Fetch"). See ITI TF-2a: 3.18.4.2.4.

715 The Responding Gateway shall audit the Cross Gateway Fetch as if it was a Document Registry except that for EventTypeCode the Responding Gateway shall specify EV("ITI-63", "IHE Transactions", "XCF Fetch"). See ITI TF-2a: 3.18.4.2.4.

The Responding Gateway shall audit the creation of any intermediate format/object as if it was a Document Source except that for EventTypeCode, the Responding Gateway shall specify
720 EV("ITI-63", "IHE Transactions", "XCF Fetch Intermediate Document Creation") and the EventActionCode shall be "C" for Create. See ITI TF-2b: 3.41.7.1.1.

3.63.7 Sample Request Message (Informative)

```
<soapenv:Envelope xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/" ... >
<soapenv:Header> ... </soapenv:Header>
<soapenv:Body>
```



```
<query:AdhocQueryRequest>
   <query:ResponseOption returnComposedObjects="true"
                         returnType="LeafClassWithRepositoryItem"/>
   <rim:AdhocQuery id="urn:uuid:f2072993-9478-41df-a603-8f016706efe8"
home=”2.16.17.710.780.1000.990.1”>
      <rim:Slot name="$XDSDocumentEntryPatientId">
         <rim:ValueList>
            <rim:Value>
                ‘AT12998493069126^^^&amp;amp;2.16.17.710.780.1000.990.1&amp;amp;ISO’
            </rim:Value>
         </rim:ValueList>
      </rim:Slot>
      <rim:Slot name="$XDSDocumentEntryStatus">
         <rim:ValueList>
            <rim:Value>
                ('urn:oasis:names:tc:ebxml-regrep:StatusType:Approved')
             </rim:Value>
         </rim:ValueList>
      </rim:Slot>
      <rim:Slot name="$XDSDocumentEntryClassCode">
         <rim:ValueList>
            <rim:Value>('57833-6^^2.16.840.1.113883.6.1')
            </rim:Value>
         </rim:ValueList>
      </rim:Slot>
  </rim:AdhocQuery>
  </query:AdhocQueryRequest>
</soapenv:Body>
</soapenv:Envelope>
```

3.63.8 Sample Response Message (Informative)

```
<?xml version="1.0" encoding="ISO-8859-1" standalone="yes"?>
<env:Envelope xmlns:env="http://www.w3.org/2003/05/soap-envelope">
  <env:Header xmlns:addressing="http://www.w3.org/2005/08/addressing">…</env:Header>
  <env:Body>
              <query:AdhocQueryResponse status="urn:oasis:names:tc:ebxml-
regrep:ResponseStatusType:Success" xmlns:query="urn:oasis:names:tc:ebxml-regrep:xsd:query:3.0">
      <ns1:RegistryObjectList xmlns:ns1="urn:oasis:names:tc:ebxml-regrep:xsd:rim:3.0">
        <ns1:ExtrinsicObject home="2.16.17.710.780.1000.990.1" id="urn:uuid:283be5bb-2fda-4fc4-
bc06-eeb61efd5c7a" isOpaque="false" lid="urn:uuid:283be5bb-2fda-4fc4-bc06-eeb61efd5c7a"
mimeType="text/xml" objectType="urn:uuid:7edca82f-054d-47f2-a032-9b2a5b5186c1"
status="urn:oasis:names:tc:ebxml-regrep:StatusType:Approved">
         <ns1:Slot name="creationTime">
           <ns1:ValueList>
             <ns1:Value>20110311132002</ns1:Value>
           </ns1:ValueList>
         </ns1:Slot>
```



```
          <ns1:Slot name="hash">
            <ns1:ValueList>
              <ns1:Value>e4f92dadaa0316ee5379e6ed50e18e5f47a2eed8</ns1:Value>
            </ns1:ValueList>
          </ns1:Slot>
          <ns1:Slot name="languageCode">
            <ns1:ValueList>
              <ns1:Value>de-AT</ns1:Value>
            </ns1:ValueList>
          </ns1:Slot>
          <ns1:Slot name="legalAuthenticator">
            <ns1:ValueList>
              <ns1:Value>admin^Admin^Spirit^^^Spirit Admin
User^^^^&amp;2.16.17.710.780.1000.903.1.1.3.3&amp;ISO</ns1:Value>
            </ns1:ValueList>
          </ns1:Slot>
          <ns1:Slot name="repositoryUniqueId">
            <ns1:ValueList>
              <ns1:Value>2.16.17.710.780.1000.990.1</ns1:Value>
            </ns1:ValueList>
          </ns1:Slot>
          <ns1:Slot name="serviceStartTime">
            <ns1:ValueList>
              <ns1:Value>20110311</ns1:Value>
            </ns1:ValueList>
          </ns1:Slot>
          <ns1:Slot name="serviceStopTime">
            <ns1:ValueList>
              <ns1:Value>20110311</ns1:Value>
            </ns1:ValueList>
          </ns1:Slot>
          <ns1:Slot name="size">
            <ns1:ValueList>
              <ns1:Value>21479</ns1:Value>
            </ns1:ValueList>
          </ns1:Slot>
          <ns1:Slot name="sourcePatientId">
            <ns1:ValueList>
              <ns1:Value>AT12998493069126^^^&amp;2.16.17.710.780.1000.990.1&amp;ISO</ns1:Value>
            </ns1:ValueList>
          </ns1:Slot>
          <ns1:Slot name="sourcePatientInfo">
            <ns1:ValueList>
              <ns1:Value>PID-
3|AT12998493069126^^^&amp;2.16.17.710.780.1000.990.1&amp;ISO</ns1:Value>
              <ns1:Value>PID-5|Barrel^Linda</ns1:Value>
              <ns1:Value>PID-7|19791105</ns1:Value>
            </ns1:ValueList>
          </ns1:Slot>
          <ns1:Name>
            <ns1:LocalizedString charset="UTF-8" value="Patient Summary"/>
          </ns1:Name>
```



```
          <ns1:Description>
            <ns1:LocalizedString charset="UTF-8" value="Patient Summary"/>
          </ns1:Description>
          <ns1:VersionInfo versionName="1"/>
          <ns1:Classification classificationScheme="urn:uuid:f33fb8ac-18af-42cc-ae0e-
ed0b0bdb91e1" classifiedObject="urn:uuid:283be5bb-2fda-4fc4-bc06-eeb61efd5c7a"
id="urn:uuid:3139b6b2-2fc4-442f-85f2-ddfc7a1f1fc1" lid="urn:uuid:3139b6b2-2fc4-442f-85f2-
ddfc7a1f1fc1" nodeRepresentation="not used" objectType="urn:oasis:names:tc:ebxml-
regrep:ObjectType:RegistryObject:Classification">
            <ns1:Slot name="codingScheme">
              <ns1:ValueList>
                <ns1:Value>Connect-a-thon healthcareFacilityTypeCodes</ns1:Value>
              </ns1:ValueList>
            </ns1:Slot>
            <ns1:Name>
              <ns1:LocalizedString charset="UTF-8" value="not used"/>
            </ns1:Name>
            <ns1:Description/>
            <ns1:VersionInfo versionName="1"/>
          </ns1:Classification>
          <ns1:Classification classificationScheme="urn:uuid:a09d5840-386c-46f2-b5ad-
9c3699a4309d" classifiedObject="urn:uuid:283be5bb-2fda-4fc4-bc06-eeb61efd5c7a"
id="urn:uuid:35ec49c5-4cde-434a-a925-cd7d9473d0d4" lid="urn:uuid:35ec49c5-4cde-434a-a925-
cd7d9473d0d4" nodeRepresentation="urn:epSOS:ps:ps:2010" objectType="urn:oasis:names:tc:ebxml-
regrep:ObjectType:RegistryObject:Classification">
            <ns1:Slot name="codingScheme">
              <ns1:ValueList>
                <ns1:Value>epSOS formatCodes</ns1:Value>
              </ns1:ValueList>
            </ns1:Slot>
            <ns1:Name>
              <ns1:LocalizedString charset="UTF-8" value="epSOS Patient Summary"/>
            </ns1:Name>
            <ns1:Description/>
            <ns1:VersionInfo versionName="1"/>
          </ns1:Classification>
          <ns1:Classification classificationScheme="urn:uuid:cccf5598-8b07-4b77-a05e-
ae952c785ead" classifiedObject="urn:uuid:283be5bb-2fda-4fc4-bc06-eeb61efd5c7a"
id="urn:uuid:57932d1b-f515-497f-88f5-dbc92c33d6de" lid="urn:uuid:57932d1b-f515-497f-88f5-
dbc92c33d6de" nodeRepresentation="not used" objectType="urn:oasis:names:tc:ebxml-
regrep:ObjectType:RegistryObject:Classification">
            <ns1:Slot name="codingScheme">
              <ns1:ValueList>
                <ns1:Value>Connect-a-thon healthcareFacilityTypeCodes</ns1:Value>
              </ns1:ValueList>
            </ns1:Slot>
            <ns1:Name>
              <ns1:LocalizedString charset="UTF-8" value="not used"/>
            </ns1:Name>
            <ns1:Description/>
            <ns1:VersionInfo versionName="1"/>
          </ns1:Classification>
          <ns1:Classification classificationScheme="urn:uuid:f4f85eac-e6cb-4883-b524-
f2705394840f" classifiedObject="urn:uuid:283be5bb-2fda-4fc4-bc06-eeb61efd5c7a"
id="urn:uuid:82532349-f7e9-49b7-b0c0-fbeedeac789e" lid="urn:uuid:82532349-f7e9-49b7-b0c0-
```



```
fbeedeac789e" nodeRepresentation="N" objectType="urn:oasis:names:tc:ebxml-
regrep:ObjectType:RegistryObject:Classification">
            <ns1:Slot name="codingScheme">
              <ns1:ValueList>
                <ns1:Value>Connect-a-thon confidentialityCodes</ns1:Value>
              </ns1:ValueList>
            </ns1:Slot>
            <ns1:Name>
              <ns1:LocalizedString charset="UTF-8" value="Normal"/>
            </ns1:Name>
            <ns1:Description/>
            <ns1:VersionInfo versionName="1"/>
          </ns1:Classification>
          <ns1:Classification classificationScheme="urn:uuid:41a5887f-8865-4c09-adf7-
e362475b143a" classifiedObject="urn:uuid:283be5bb-2fda-4fc4-bc06-eeb61efd5c7a"
id="urn:uuid:8de3d828-2973-40e6-9e28-c9b7cecf3543" lid="urn:uuid:8de3d828-2973-40e6-9e28-
c9b7cecf3543" nodeRepresentation="60591-5" objectType="urn:oasis:names:tc:ebxml-
regrep:ObjectType:RegistryObject:Classification">
            <ns1:Slot name="codingScheme">
              <ns1:ValueList>
                <ns1:Value>2.16.840.1.113883.6.1</ns1:Value>
              </ns1:ValueList>
            </ns1:Slot>
            <ns1:Name>
              <ns1:LocalizedString charset="UTF-8" value="Patient Summary"/>
            </ns1:Name>
            <ns1:Description/>
            <ns1:VersionInfo versionName="1"/>
          </ns1:Classification>
          <ns1:Classification classificationScheme="urn:uuid:93606bcf-9494-43ec-9b4e-
a7748d1a838d" classifiedObject="urn:uuid:283be5bb-2fda-4fc4-bc06-eeb61efd5c7a"
id="urn:uuid:ef5706fe-dac9-41b2-873a-adbbc119a14d" lid="urn:uuid:ef5706fe-dac9-41b2-873a-
adbbc119a14d" nodeRepresentation="" objectType="urn:oasis:names:tc:ebxml-
regrep:ObjectType:RegistryObject:Classification">
            <ns1:Slot name="authorInstitution">
              <ns1:ValueList>
                <ns1:Value>spirit^^^^^1.2.40.0.32.6.1.10&amp;amp;ISO^^^^2.16.17.710</ns1:Value>
              </ns1:ValueList>
            </ns1:Slot>
            <ns1:Slot name="authorPerson">
              <ns1:ValueList>
                <ns1:Value>admin^Admin^Spirit^^^Spirit Admin
User^^^^&amp;amp;2.16.17.710.780.1000.903.1.1.3.3&amp;amp;ISO</ns1:Value>
              </ns1:ValueList>
            </ns1:Slot>
            <ns1:Name/>
            <ns1:Description/>
            <ns1:VersionInfo versionName="1"/>
          </ns1:Classification>
          <ns1:Classification classificationScheme="urn:uuid:f0306f51-975f-434e-a61c-
c59651d33983" classifiedObject="urn:uuid:283be5bb-2fda-4fc4-bc06-eeb61efd5c7a"
id="urn:uuid:fc3c09f6-2d49-4fc5-bba1-de1f4f34f59a" lid="urn:uuid:fc3c09f6-2d49-4fc5-bba1-
de1f4f34f59a" nodeRepresentation="60591-5" objectType="urn:oasis:names:tc:ebxml-
regrep:ObjectType:RegistryObject:Classification">
            <ns1:Slot name="codingScheme">
```



```
              <ns1:ValueList>
                <ns1:Value>2.16.840.1.113883.6.1</ns1:Value>
              </ns1:ValueList>
            </ns1:Slot>
            <ns1:Name>
              <ns1:LocalizedString charset="UTF-8" value="Patient Summary"/>
            </ns1:Name>
            <ns1:Description/>
            <ns1:VersionInfo versionName="1"/>
          </ns1:Classification>
          <ns1:ExternalIdentifier id="urn:uuid:b85f024c-0e7c-4c1d-a409-fb8e5010e235"
identificationScheme="urn:uuid:2e82c1f6-a085-4c72-9da3-8640a32e42ab" lid="urn:uuid:b85f024c-0e7c-
4c1d-a409-fb8e5010e235" objectType="urn:oasis:names:tc:ebxml-
regrep:ObjectType:RegistryObject:ExternalIdentifier" registryObject="urn:uuid:283be5bb-2fda-4fc4-
bc06-eeb61efd5c7a" value="2.16.17.710.780.1000.902.1.1.3.2^BE978FEFD3BB789">
            <ns1:Name>
              <ns1:LocalizedString charset="UTF-8" value="XDSDocumentEntry.uniqueId"/>
            </ns1:Name>
            <ns1:Description/>
            <ns1:VersionInfo versionName="1"/>
          </ns1:ExternalIdentifier>
          <ns1:ExternalIdentifier id="urn:uuid:349a345c-831a-4215-95f9-99bf5a8c21b6"
identificationScheme="urn:uuid:58a6f841-87b3-4a3e-92fd-a8ffeff98427" lid="urn:uuid:349a345c-831a-
4215-95f9-99bf5a8c21b6" objectType="urn:oasis:names:tc:ebxml-
regrep:ObjectType:RegistryObject:ExternalIdentifier" registryObject="urn:uuid:283be5bb-2fda-4fc4-
bc06-eeb61efd5c7a" value="AT12998493069126^^^&amp;2.16.17.710.780.1000.990.1&amp;ISO">
            <ns1:Name>
              <ns1:LocalizedString charset="UTF-8" value="XDSDocumentEntry.patientId"/>
            </ns1:Name>
            <ns1:Description/>
            <ns1:VersionInfo versionName="1"/>
          </ns1:ExternalIdentifier>

          <ns1:Document>
                   <Include href="cid: BE978FEFD3BB789 "
xmlns="http://www.w3.org/2004/08/xop/include"/>
UjBsR09EbGhjZ0dTQUxNQUFBUUNBRU1tQ1p0dU1GUXhEUzhi.....
          </ns1:Document>
        </ns1:ExtrinsicObject>
        <ns1:ExtrinsicObject home="2.16.17.710.780.1000.990.1" id="urn:uuid:c9b9912b-d715-49d3-
8348-e23d63463d90" isOpaque="false" lid="urn:uuid:c9b9912b-d715-49d3-8348-e23d63463d90"
mimeType="text/xml" objectType="urn:uuid:7edca82f-054d-47f2-a032-9b2a5b5186c1"
status="urn:oasis:names:tc:ebxml-regrep:StatusType:Approved">
          <ns1:Slot name="creationTime">
            <ns1:ValueList>
              <ns1:Value>20110311132002</ns1:Value>
            </ns1:ValueList>
          </ns1:Slot>
          <ns1:Slot name="hash">
            <ns1:ValueList>
              <ns1:Value>509658697e16988640f9056c05076dce0757b521</ns1:Value>
            </ns1:ValueList>
          </ns1:Slot>
          <ns1:Slot name="languageCode">
            <ns1:ValueList>
```



```
              <ns1:Value>de-AT</ns1:Value>
            </ns1:ValueList>
          </ns1:Slot>
          <ns1:Slot name="legalAuthenticator">
            <ns1:ValueList>
              <ns1:Value>admin^Admin^Spirit^^^Spirit Admin
User^^^^&amp;amp;2.16.17.710.780.1000.903.1.1.3.3&amp;amp;ISO</ns1:Value>
            </ns1:ValueList>
          </ns1:Slot>
          <ns1:Slot name="repositoryUniqueId">
            <ns1:ValueList>
              <ns1:Value>2.16.17.710.780.1000.990.1</ns1:Value>
            </ns1:ValueList>
          </ns1:Slot>
          <ns1:Slot name="serviceStartTime">
            <ns1:ValueList>
              <ns1:Value>20110311</ns1:Value>
            </ns1:ValueList>
          </ns1:Slot>
          <ns1:Slot name="serviceStopTime">
            <ns1:ValueList>
              <ns1:Value>20110311</ns1:Value>
            </ns1:ValueList>
          </ns1:Slot>
          <ns1:Slot name="size">
            <ns1:ValueList>
              <ns1:Value>106426</ns1:Value>
            </ns1:ValueList>
          </ns1:Slot>
          <ns1:Slot name="sourcePatientId">
            <ns1:ValueList>
              <ns1:Value>AT12998493069126^^^&amp;amp;2.16.17.710.780.1000.990.1&amp;amp;ISO</ns1:Value>
            </ns1:ValueList>
          </ns1:Slot>
          <ns1:Slot name="sourcePatientInfo">
            <ns1:ValueList>
              <ns1:Value>PID-
3|AT12998493069126^^^&amp;amp;2.16.17.710.780.1000.990.1&amp;amp;ISO</ns1:Value>
              <ns1:Value>PID-5|Barrel^Linda</ns1:Value>
              <ns1:Value>PID-7|19791105</ns1:Value>
            </ns1:ValueList>
          </ns1:Slot>
          <ns1:Name>
            <ns1:LocalizedString charset="UTF-8" value="Patient Summary"/>
          </ns1:Name>
          <ns1:Description>
            <ns1:LocalizedString charset="UTF-8" value="Patient Summary"/>
          </ns1:Description>
          <ns1:VersionInfo versionName="1"/>
          <ns1:Classification classificationScheme="urn:uuid:f0306f51-975f-434e-a61c-
c59651d33983" classifiedObject="urn:uuid:c9b9912b-d715-49d3-8348-e23d63463d90"
id="urn:uuid:14af14d5-d9ab-483d-890c-ae10e31efed3" lid="urn:uuid:14af14d5-d9ab-483d-890c-
```



```
ae10e31efed3" nodeRepresentation="60591-5" objectType="urn:oasis:names:tc:ebxml-
regrep:ObjectType:RegistryObject:Classification">
            <ns1:Slot name="codingScheme">
              <ns1:ValueList>
                <ns1:Value>2.16.840.1.113883.6.1</ns1:Value>
              </ns1:ValueList>
            </ns1:Slot>
            <ns1:Name>
              <ns1:LocalizedString charset="UTF-8" value="Patient Summary"/>
            </ns1:Name>
            <ns1:Description/>
            <ns1:VersionInfo versionName="1"/>
          </ns1:Classification>
          <ns1:Classification classificationScheme="urn:uuid:f4f85eac-e6cb-4883-b524-
f2705394840f" classifiedObject="urn:uuid:c9b9912b-d715-49d3-8348-e23d63463d90"
id="urn:uuid:19944c6f-3f70-4f0b-9d5b-f1dfa616dfb4" lid="urn:uuid:19944c6f-3f70-4f0b-9d5b-
f1dfa616dfb4" nodeRepresentation="N" objectType="urn:oasis:names:tc:ebxml-
regrep:ObjectType:RegistryObject:Classification">
            <ns1:Slot name="codingScheme">
              <ns1:ValueList>
                <ns1:Value>Connect-a-thon confidentialityCodes</ns1:Value>
              </ns1:ValueList>
            </ns1:Slot>
            <ns1:Name>
              <ns1:LocalizedString charset="UTF-8" value="Normal"/>
            </ns1:Name>
            <ns1:Description/>
            <ns1:VersionInfo versionName="1"/>
          </ns1:Classification>
          <ns1:Classification classificationScheme="urn:uuid:a09d5840-386c-46f2-b5ad-
9c3699a4309d" classifiedObject="urn:uuid:c9b9912b-d715-49d3-8348-e23d63463d90"
id="urn:uuid:27536806-1220-488a-8882-80f23c451fb9" lid="urn:uuid:27536806-1220-488a-8882-
80f23c451fb9" nodeRepresentation="urn:ihe:iti:xds-sd:pdf:2008"
objectType="urn:oasis:names:tc:ebxml-regrep:ObjectType:RegistryObject:Classification">
            <ns1:Slot name="codingScheme">
              <ns1:ValueList>
                <ns1:Value>epSOS formatCodes</ns1:Value>
              </ns1:ValueList>
            </ns1:Slot>
            <ns1:Name>
              <ns1:LocalizedString charset="UTF-8" value="Scanned Documents PDF"/>
            </ns1:Name>
            <ns1:Description/>
            <ns1:VersionInfo versionName="1"/>
          </ns1:Classification>
          <ns1:Classification classificationScheme="urn:uuid:f33fb8ac-18af-42cc-ae0e-
ed0b0bdb91e1" classifiedObject="urn:uuid:c9b9912b-d715-49d3-8348-e23d63463d90"
id="urn:uuid:3d2c298a-f4c0-4ed4-803d-ad2a9698cd95" lid="urn:uuid:3d2c298a-f4c0-4ed4-803d-
ad2a9698cd95" nodeRepresentation="not used" objectType="urn:oasis:names:tc:ebxml-
regrep:ObjectType:RegistryObject:Classification">
            <ns1:Slot name="codingScheme">
              <ns1:ValueList>
                <ns1:Value>Connect-a-thon healthcareFacilityTypeCodes</ns1:Value>
              </ns1:ValueList>
            </ns1:Slot>
```



```
            <ns1:Name>
              <ns1:LocalizedString charset="UTF-8" value="not used"/>
            </ns1:Name>
            <ns1:Description/>
            <ns1:VersionInfo versionName="1"/>
          </ns1:Classification>
          <ns1:Classification classificationScheme="urn:uuid:cccf5598-8b07-4b77-a05e-
ae952c785ead" classifiedObject="urn:uuid:c9b9912b-d715-49d3-8348-e23d63463d90"
id="urn:uuid:9546ea5b-9a8b-4214-98df-9107d31a13e4" lid="urn:uuid:9546ea5b-9a8b-4214-98df-
9107d31a13e4" nodeRepresentation="not used" objectType="urn:oasis:names:tc:ebxml-
regrep:ObjectType:RegistryObject:Classification">
            <ns1:Slot name="codingScheme">
              <ns1:ValueList>
                <ns1:Value>Connect-a-thon healthcareFacilityTypeCodes</ns1:Value>
              </ns1:ValueList>
            </ns1:Slot>
            <ns1:Name>
              <ns1:LocalizedString charset="UTF-8" value="not used"/>
            </ns1:Name>
            <ns1:Description/>
            <ns1:VersionInfo versionName="1"/>
          </ns1:Classification>
          <ns1:Classification classificationScheme="urn:uuid:93606bcf-9494-43ec-9b4e-
a7748d1a838d" classifiedObject="urn:uuid:c9b9912b-d715-49d3-8348-e23d63463d90"
id="urn:uuid:9837631b-d5b7-43b3-b646-81b71c782695" lid="urn:uuid:9837631b-d5b7-43b3-b646-
81b71c782695" nodeRepresentation="" objectType="urn:oasis:names:tc:ebxml-
regrep:ObjectType:RegistryObject:Classification">
            <ns1:Slot name="authorInstitution">
              <ns1:ValueList>
                <ns1:Value>spirit^^^^^1.2.40.0.32.6.1.10&amp;amp;ISO^^^^2.16.17.710</ns1:Value>
              </ns1:ValueList>
            </ns1:Slot>
            <ns1:Slot name="authorPerson">
              <ns1:ValueList>
                <ns1:Value>admin^Admin^Spirit^^^Spirit Admin
User^^^^&amp;amp;2.16.17.710.780.1000.903.1.1.3.3&amp;amp;ISO</ns1:Value>
              </ns1:ValueList>
            </ns1:Slot>
            <ns1:Name/>
            <ns1:Description/>
            <ns1:VersionInfo versionName="1"/>
          </ns1:Classification>
          <ns1:Classification classificationScheme="urn:uuid:41a5887f-8865-4c09-adf7-
e362475b143a" classifiedObject="urn:uuid:c9b9912b-d715-49d3-8348-e23d63463d90"
id="urn:uuid:fb406f62-e002-4aa4-948c-90a959548f6d" lid="urn:uuid:fb406f62-e002-4aa4-948c-
90a959548f6d" nodeRepresentation="60591-5" objectType="urn:oasis:names:tc:ebxml-
regrep:ObjectType:RegistryObject:Classification">
            <ns1:Slot name="codingScheme">
              <ns1:ValueList>
                <ns1:Value>2.16.840.1.113883.6.1</ns1:Value>
              </ns1:ValueList>
            </ns1:Slot>
            <ns1:Name>
              <ns1:LocalizedString charset="UTF-8" value="Patient Summary"/>
            </ns1:Name>
```



```
            <ns1:Description/>
            <ns1:VersionInfo versionName="1"/>
          </ns1:Classification>
          <ns1:ExternalIdentifier id="urn:uuid:f3e1201b-faca-4f25-b40d-ab85fd3fcb89"
identificationScheme="urn:uuid:2e82c1f6-a085-4c72-9da3-8640a32e42ab" lid="urn:uuid:f3e1201b-faca-
4f25-b40d-ab85fd3fcb89" objectType="urn:oasis:names:tc:ebxml-
regrep:ObjectType:RegistryObject:ExternalIdentifier" registryObject="urn:uuid:c9b9912b-d715-49d3-
8348-e23d63463d90" value="2.16.17.710.780.1000.902.1.1.3.2^1F384DBE2BC97E1">
            <ns1:Name>
              <ns1:LocalizedString charset="UTF-8" value="XDSDocumentEntry.uniqueId"/>
            </ns1:Name>
            <ns1:Description/>
            <ns1:VersionInfo versionName="1"/>
          </ns1:ExternalIdentifier>
          <ns1:ExternalIdentifier id="urn:uuid:5ce61557-3b49-4950-9435-e40b4c216eb0"
identificationScheme="urn:uuid:58a6f841-87b3-4a3e-92fd-a8ffeff98427" lid="urn:uuid:5ce61557-3b49-
4950-9435-e40b4c216eb0" objectType="urn:oasis:names:tc:ebxml-
regrep:ObjectType:RegistryObject:ExternalIdentifier" registryObject="urn:uuid:c9b9912b-d715-49d3-
8348-e23d63463d90" value="AT12998493069126^^^&amp;2.16.17.710.780.1000.990.1&amp;ISO">
            <ns1:Name>
              <ns1:LocalizedString charset="UTF-8" value="XDSDocumentEntry.patientId"/>
            </ns1:Name>
            <ns1:Description/>
            <ns1:VersionInfo versionName="1"/>
          </ns1:ExternalIdentifier>
          <ns1:Document>
                  <Include href="cid:1F384DBE2BC97E1"
xmlns="http://www.w3.org/2004/08/xop/include"/>
          </ns1:Document>
        </ns1:ExtrinsicObject>
        <ns1:Association associationType="urn:ihe:iti:2007:AssociationType:XFRM"
id="urn:uuid:a193b283-fbd6-40ca-8de8-fc804e7659ce" lid="urn:uuid:a193b283-fbd6-40ca-8de8-
fc804e7659ce" objectType="urn:oasis:names:tc:ebxml-regrep:ObjectType:RegistryObject:Association"
sourceObject="urn:uuid:c9b9912b-d715-49d3-8348-e23d63463d90" status="urn:oasis:names:tc:ebxml-
regrep:StatusType:Approved" targetObject="urn:uuid:283be5bb-2fda-4fc4-bc06-eeb61efd5c7a">
          <ns1:Name/>
          <ns1:Description/>
          <ns1:VersionInfo versionName="1"/>
        </ns1:Association>
      </ns1:RegistryObjectList>
    </query:AdhocQueryResponse>
  </env:Body>
</env:Envelope>
```

Volume 3 – Cross-Transaction Specifications and Content Specifications

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ITI TF-3: Update Error Reporting section of the ITI TF-3 Section 4.1.13.

Table 4.1-11 – Error Codes

Error Code	Discussion	Transaction (See Note 1)
XDSRegistryError XDSRepositoryError	Internal Registry/Repository Error.	P,R, SQ, XGQ P, RS, XGR
XDSRegistryBusy XDSRepositoryBusy	Too much activity	P,R,SQ, XGQ P, RS, XGR
XDSRegistryOutOfResources XDSRepositoryOutOfResources	Resources are low.	P,R,SQ, XGQ P, RS, XGR
XDSTooManyResults		SQ, XGQ**, XGF**
XDSUnknownStoredQuery	The Query ID provided in the request is not recognized.	SQ, XGQ**, XGF**
XDSStoredQueryMissingParam	A required parameter to a stored query is missing.	SQ, XGQ**, XGF**
XDSStoredQueryParamNumber	A parameter which only accepts a single value is coded with multiple values	SQ, XGQ**, XGF**
XDSDocumentUniqueIdError	The document associated with the DocumentUniqueId is not available. This could be because the document is not available to the Document Repository, the requestor is not authorized to access that document or the document is no longer available.	RS, XGR
XDSUnknownCommunity	A value for the homeCommunityId is not recognized	SQ, XGQ, RS, XGR
XDSMissingHomeCommunityId	A value for the homeCommunityId is required and has not been specified	SQ, XGQ, RS, XGR**, XGF**
XDSUnavailableCommunity	A community which would have been contacted was not available . See Note 2.	SQ, RS
XDSUnknownPatientId	Patient ID referenced in metadata is not known to the Registry actor via the Patient Identity Feed or is unknown because of patient identifier merge or other reasons. The codeContext shall include the value of patient ID in question.	P,R, XGQ**, XGF** Note: this error code is not used in the response to Registry Stored Query
TranscodingError	**The requested document cannot be provided due to a transcoding / translation error.**	**XGF**

Note 1:

P = Provide and Register, Provide and Register-b

R = Register, Register-b

Q = Query

SQ = Stored Query

RS = Retrieve Document Set

XGQ = Cross Gateway Query

XGR = Cross Gateway Retrieve

XGF = Cross Gateway Fetch

Update TF-3:4.1 Table 4.1-15 table heading to add the Cross Gateway Fetch

Table 4.1-15 – Stored Query, Cross Gateway Fetch and Cross Gateway Query Responses

