

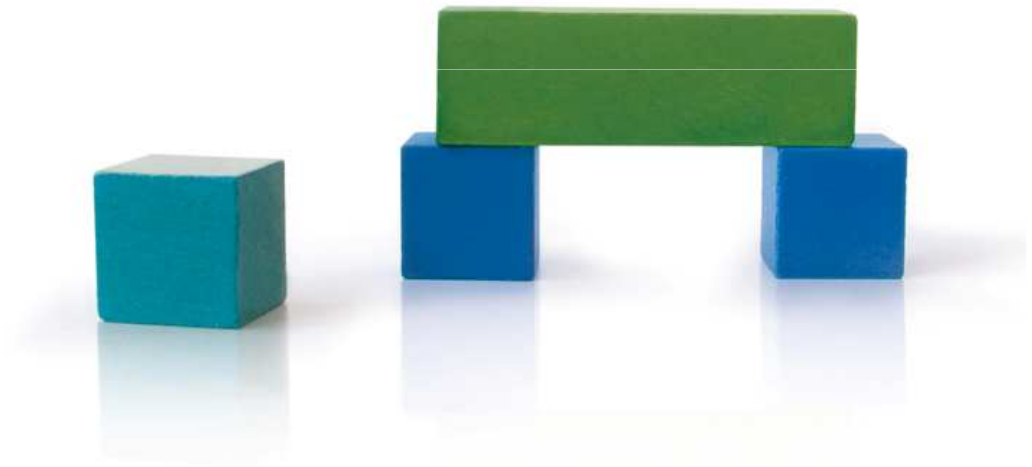


connect. manage. personalize.

IHE profiles for SMC 2011

Actors and transactions

Tarik Idris, 14.03.2011



connect.

manage.

personalize.

What is IHE?



- international initiative of eHealth vendors
- aimed at achieving interoperability between eHealth products
- based on established standards like HL7 or DICOM
- offers an open platform, upon which integration profiles may be built
- annual and extensive integration testing at the IHE Connec-tathons

Relevant IHE profiles for SMC 2011

PDQ

- Patient Demographics Query

XDS.b

- Cross-Enterprise Document Sharing

BPPC

- Basic Patient Privacy Consent

ATNA

- Audit Trail and Node Security

PDQ Overview

PDQ allows a **Consumer** to query a **Supplier** to retrieve a patient's demographics (and visit data, but we'll ignore that bit)

The following **query parameters** must be supported:

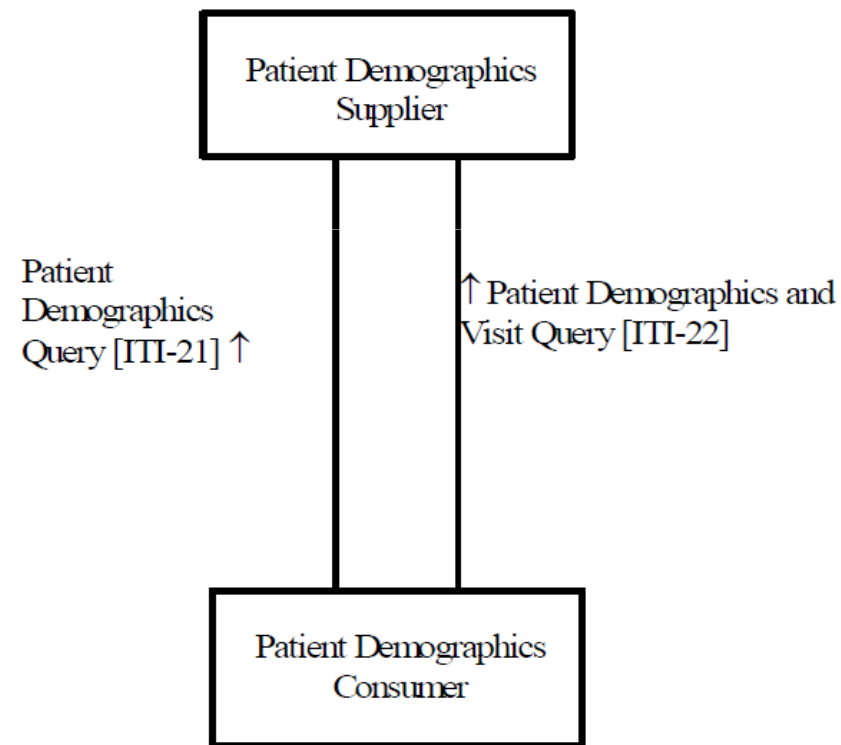
- Patient Identifier / Account Number
- Patient Name
- Date/Time of Birth
- Administrative Sex
- Patient Address

Standard **supports**

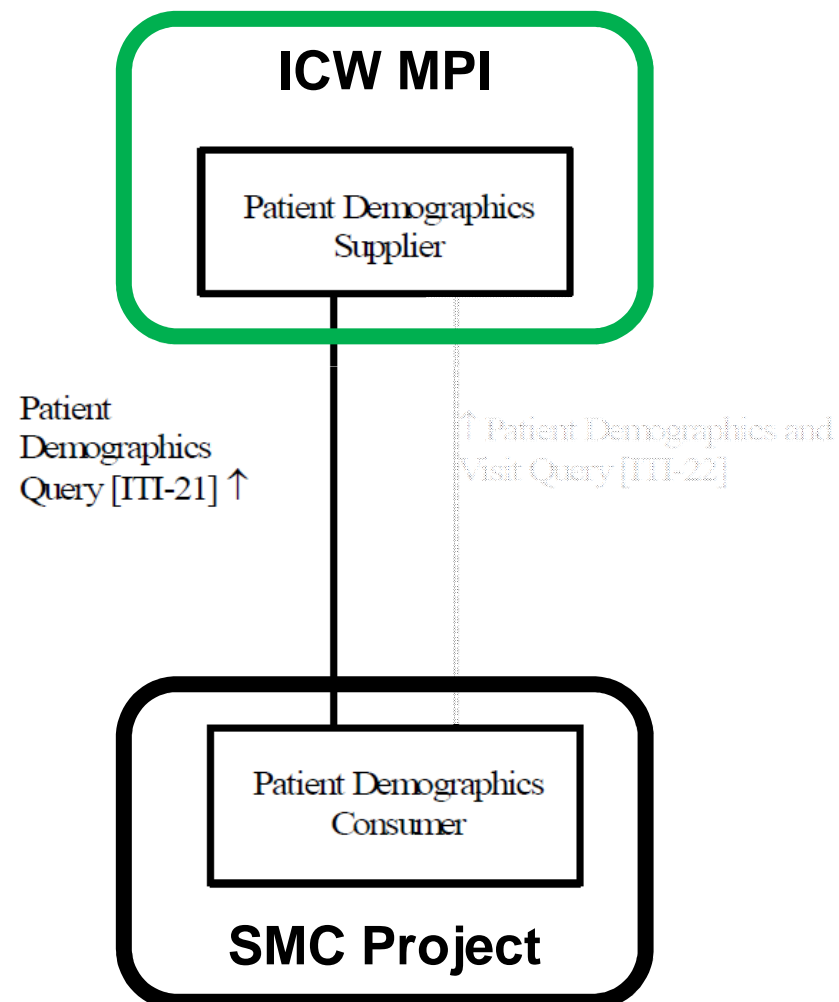
- different matching strategies (exact, fuzzy, phonetic) per query
- wildcards
- continuations

Implemented using HL7v2.5

PDQ Actor Diagram



PDQ Actor Diagram



XDS.b Overview

XDS.b describes how to store and retrieve documents and their metadata

- Allows creation of a longitudinal patient record

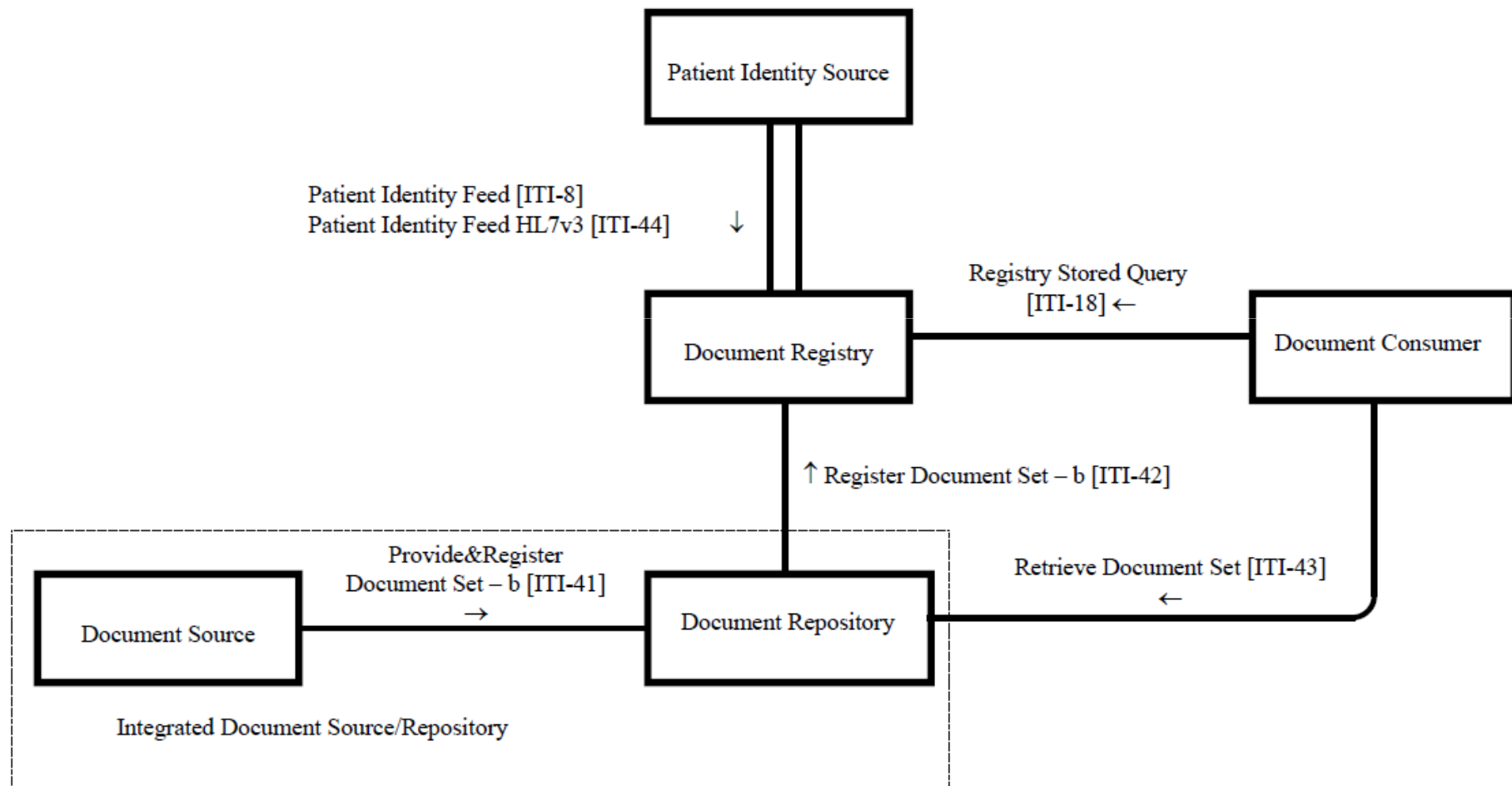
XDS is content-neutral, i.e. in principle any type of binary data may be stored using this profile

Uses WebServices based on the **ebXML** specification

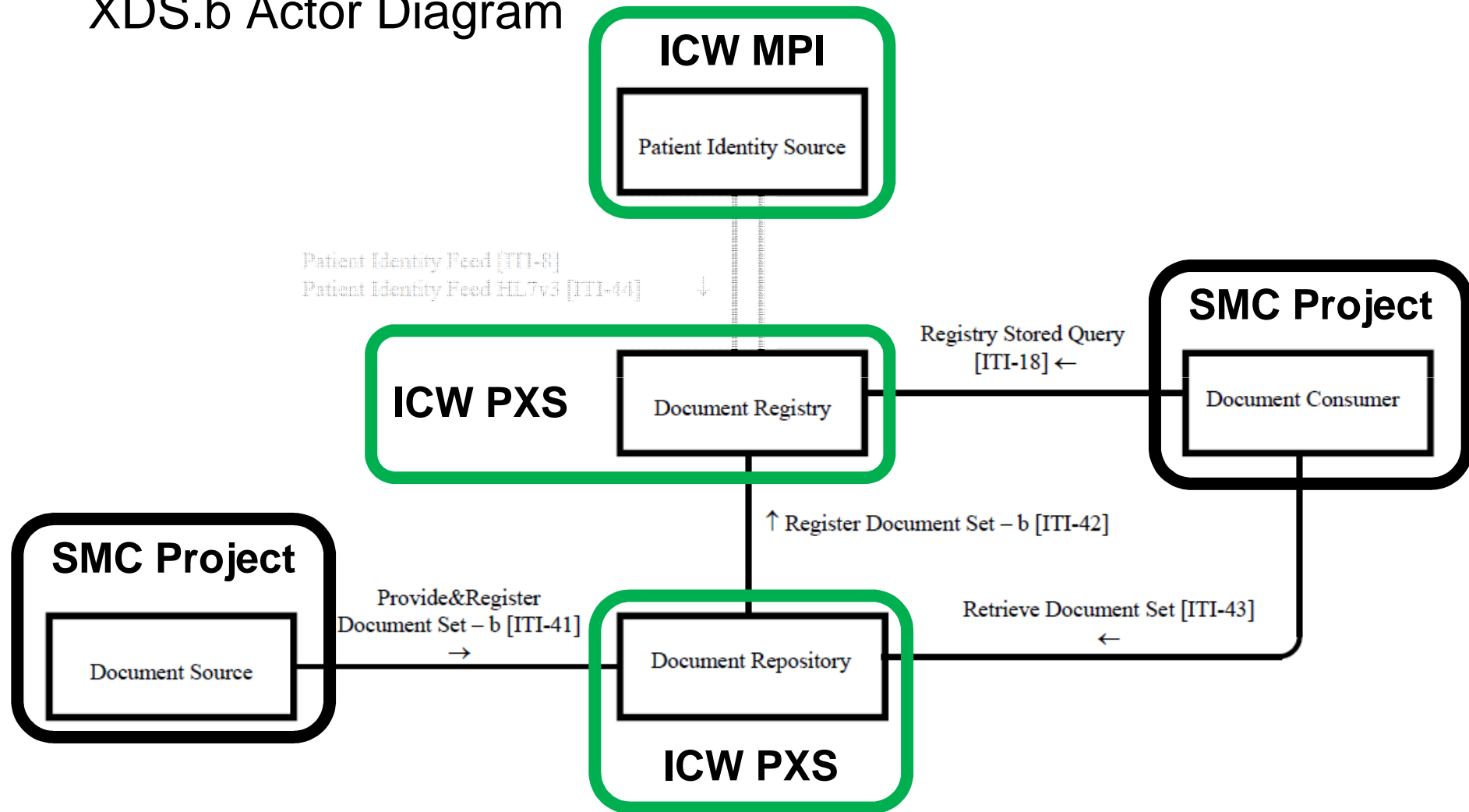
XDS.b is the replacement profile for XDS.a

- Uses updated WebService Standards
- Uses updated ebXML Standard (3.0 instead of 2.1)
- Uses WebServices instead of HTTP GET for document retrieval

XDS.b Actor Diagram



XDS.b Actor Diagram



XDS Concepts: Affinity Domain

An XDS Affinity Domain is a group of healthcare enterprises that have agreed to work together using a common set of policies and share a common infrastructure.

- Must contain only one Document Registry and only one Patient Identity Source
- All Document Consumers, Document Sources and Document Repositories connected to this registry are part of the AD
- All systems in AD communicate patient related information using the same patient identifier root
- All systems in AD agree on codes to use in XDS metadata
- All participants agree on supported Privacy Policies and enforcement mechanisms

XDS Concepts: DocumentEntries

XDS distinguishes between a document's content (XDSDocument) and its metadata (XDSDocumentEntry)

- Metadata includes things like document title, document type, author information, patient ID, etc.
 - The metadata's primary ID is the XDSDocumentEntry.**entryUUID**
 - The **Document Registry** is responsible for storing the metadata
 - A XDSDocumentEntry **references a single document** in a single repository
- Document **content** is the **binary data** of the actual document (e.g. the PDF)
 - The content's primary ID is the XDSDocument.**uniqueID**
 - The **Document Repository** is responsible for storing the content
 - A XDSDocument may be referenced **by many XDSDocumentEntries**

XDS Concepts: Folders

A XDSFolder is a grouping mechanism for XDSDocumentEntries of one patient

Folders in XDS do not have any predefined meaning

- The affinity domain must agree what to use folders for
- Example: Folders could be used to identify documents related to one particular healthcare episode (e.g. a broken leg) or related to one hospital stay

XDS Folders are not like „normal“ folders

- XDS Folders cannot be nested
- One document can be in more than one folder
- Metadata for folder is fixed after initial definition (e.g. title cannot be changed)

Therefore XDS Folders are more like „tags“

XDS Concepts: SubmissionSets

XDSSubmissionSets group new data that was submitted together or referenced in the submission

All new DocumentEntries in a RegisterDocumentSet-b message belong to one SubmissionSet (as well as referenced DocumentEntries)

The main differences to folders are

- the supported metadata (richer in SubmissionSet)
 - includes author, originating system, code for the content, ...
- that no one can add anything to a SubmissionSet after its creation

Please note that SubmissionSets may reference already existing documents that do not belong to the same patient!

Folders, and additions to folders are also linked to a submission set

XDS Concepts: Document Relationships

A XDSDocumentEntry may be related to one „parent“ document and to one or more „child“ documents

There are 5 document relationship types:

- Replace (RPLC)
- Transform (XFRM)
- Append (APND)
- Transform with replace (XFRM_RPLC)
- Signs

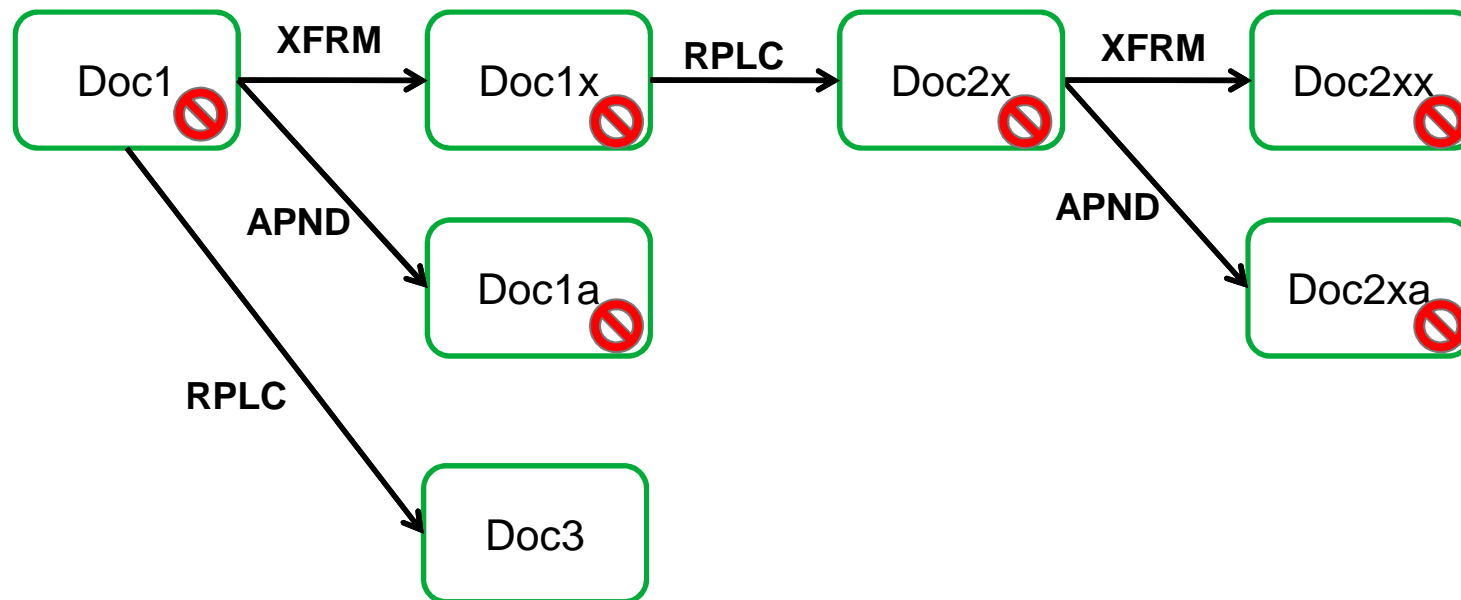
If DocumentEntry B replaces (RPLC or XFRM_RPLC) DocumentEntry A, the Document Registry must deprecate DocumentEntry A (and all transformation and addendum documents)

The parent document must be active when a relationship is formed

A transformation may be replaced, but not appended

XDS Concepts: Document Relationships

These rules imply that document relationships can be modeled as a tree:



Mapping XDS concepts to ebXML using Associations

The following are the important objects used in XDS

- XDSDocumentEntry
- XDSSubmissionSet
- XDSFolder

Each of them has a registry-internal identifier (for DocumentEntries that is equivalent to the entryUUID) and an external identifier

Association objects are used to link these concepts together

- Associations have a type, a source, a target, and an identifier
- Use the internal identifiers of XDSDocumentEntry, XDSSubmissionSet, XDSFolder or Associations as the source or the target

Mapping XDS concepts to ebXML using Associations

Associations can be used to express

- Document Relationships
 - e.g. **source**: newDoc's id, **target**: oldDoc's id, **type**: RPLC
- that a DocumentEntry belongs in a Folder
 - e.g. **source**: folder's id, **target**: doc's id, **type**: HasMember
- that a DocumentEntry is part of a SubmissionSet
 - e.g. **source**: submissionSet's id, **target**: doc's id, **type**: HasMember
- that putting a DocumentEntry into a Folder is part of a SubmissionSet
 - e.g. **source**: submissionSet's id, **target**: association's id, **type**: HasMember

BPPC Overview

The Basic Patient Privacy Consents profile

- provides a mechanism to record the patient privacy consents
- provides a method for clients to retrieve patient privacy consents to support access control decisions

BPPC assumes that the affinity domain agrees on a set of privacy policies that all connected systems can enforce

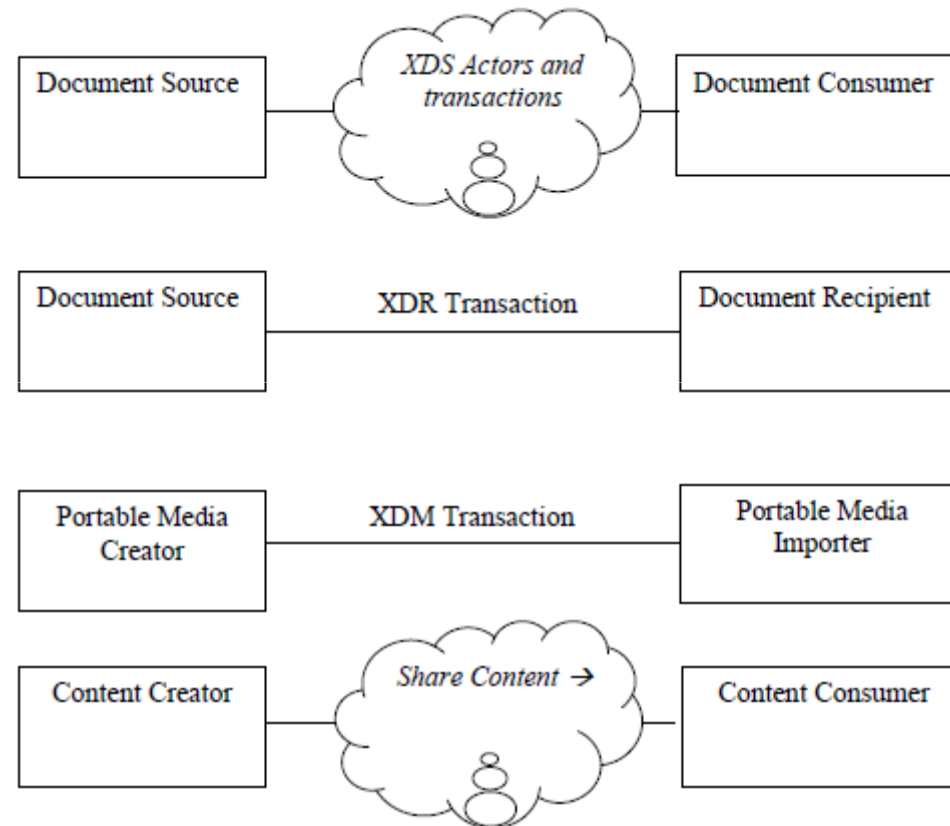
Enforcement of BPPC consents is the client's responsibility

BPPC does not define any privacy policies, only how a patient can express agreement to one (in a CDA) and how to store/retrieve such a consent acknowledgment document (via XDS)

All relevant information in the CDA is also stored in the XDS Metadata

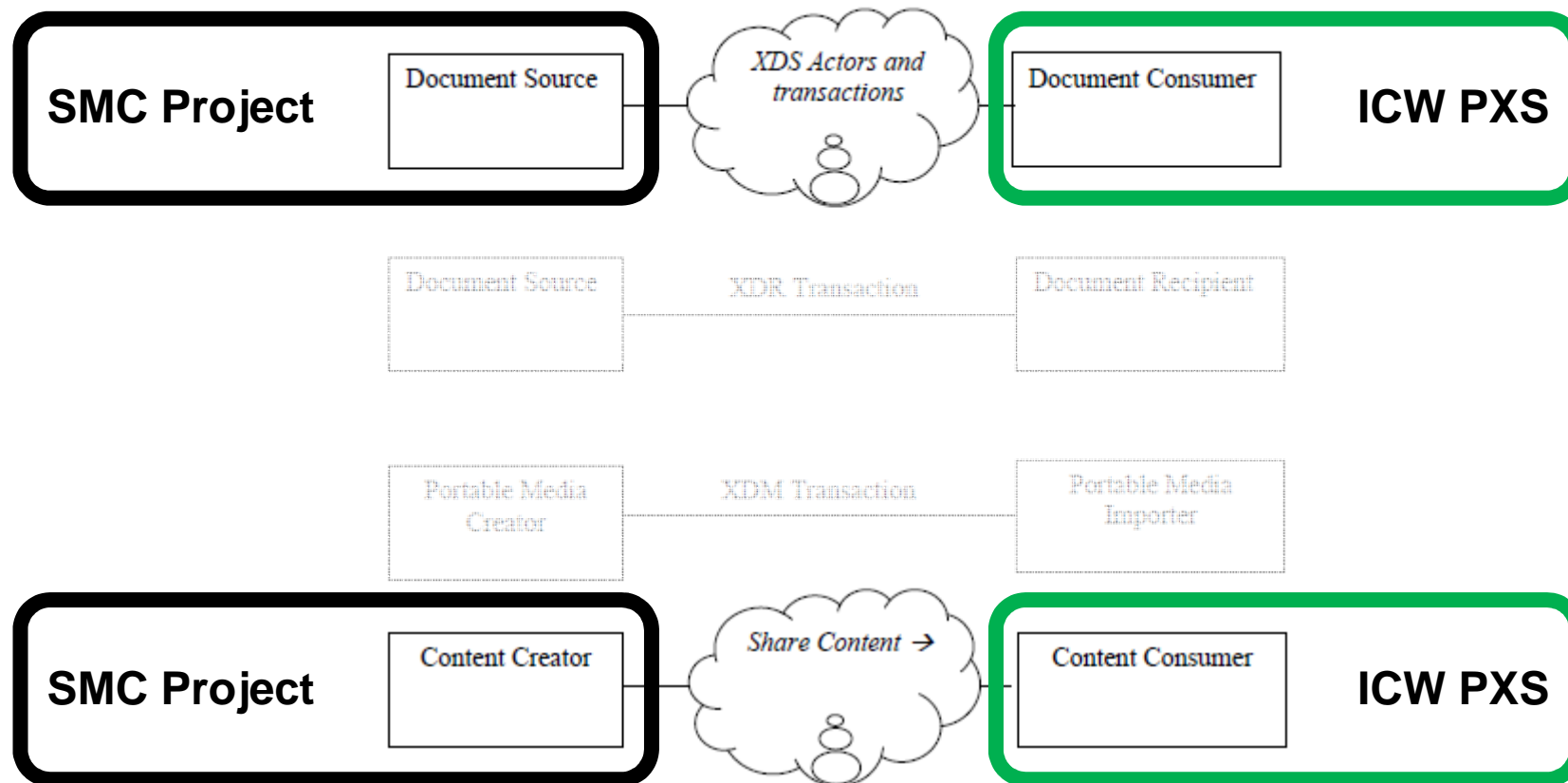
- allows clients to avoid parsing the document

BPPC Actor Diagram



“The Content Creator that claims to support the Basic Patient Privacy Acknowledgement option shall be able to create Patient Privacy Consent Acknowledgement Document Content as specified in ITI TF-3: 5.1.”

BPPC Actor Diagram



“The Content Creator that claims to support the Basic Patient Privacy Acknowledgement option shall be able to create Patient Privacy Consent Acknowledgement Document Content as specified in ITI TF-3: 5.1.”

ATNA Overview

Audit Trail and Node Security introduces auditing and authentication related transactions

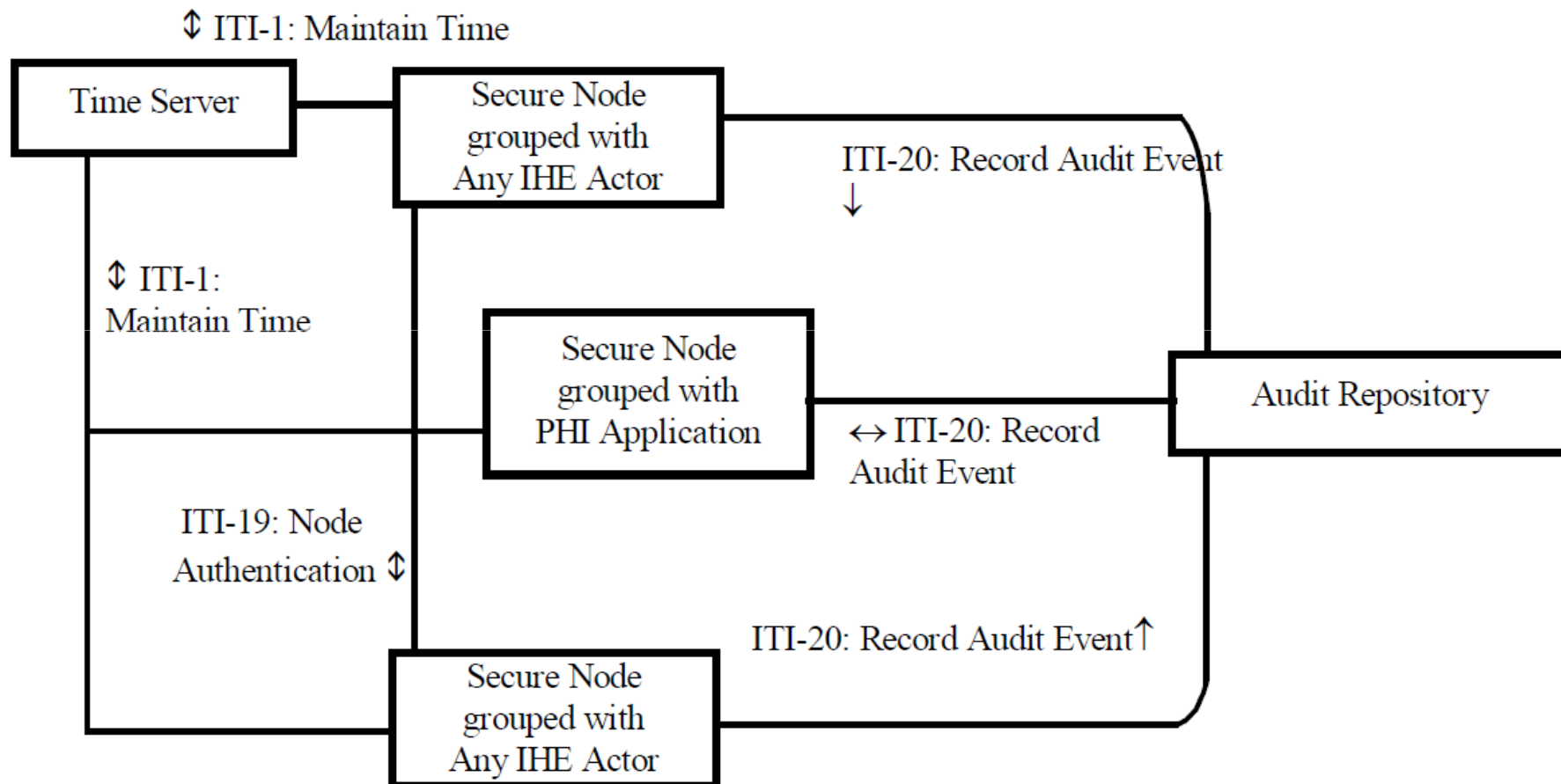
Audit Trail describes how nodes send audit records to a Audit Record Repository

- audit records can be sent using the Syslog protocol via UDP or via TCP
- an audit record is a RFC-3881 XML message in a syslog wrapper

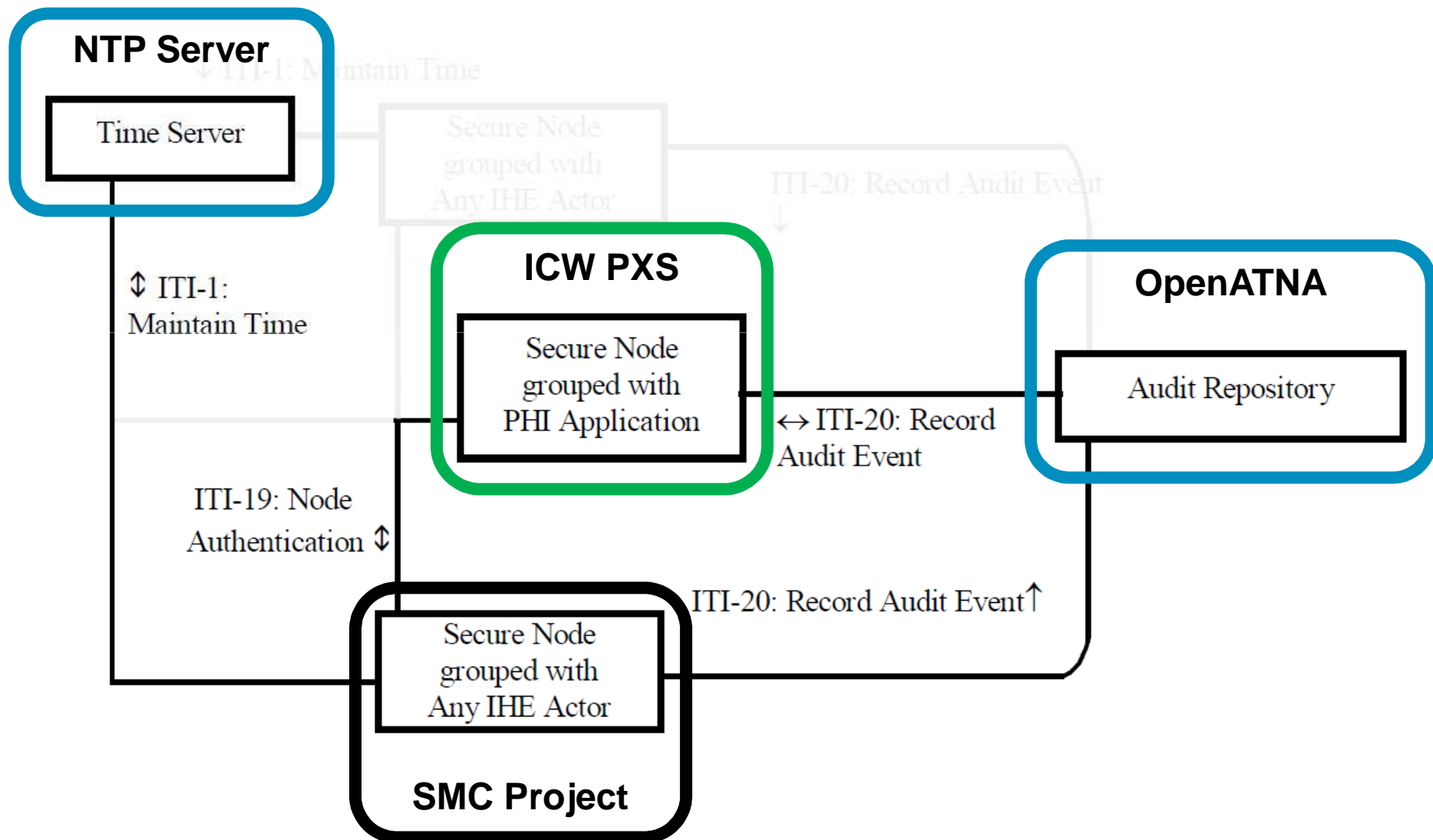
Node Security describes security mechanisms to protect communications, e.g. SSL encryption

- specifies supported algorithms

ATNA Actor Diagram



ATNA Actor Diagram



Links to the Profiles for further reading

PDQ

- Overview: Pages 52-55 in [\[ITIVol1\]](#)
- Transactions: 140 - 156 in [\[ITIVol2a\]](#)

XDS.b

- Overview: Pages 69-99 in [\[ITIVol1\]](#)
- Queries: 94 - 123 in [\[ITIVol2a\]](#)
- Register Documents: 93 - 105 in [\[ITIVol2b\]](#)
- Download Documents: 115 - 126 in [\[ITIVol2b\]](#)
- XDS Metadata: 8 - 10 in [\[ITIVol2x\]](#) and 3 - 58 in [\[ITIVol3\]](#)

BPPC

- Overview: Pages 136 - 145 in [\[ITIVol1\]](#)
- CDA Structure: 59 - 63 in [\[ITIVol3\]](#)

ATNA

- Overview: Pages 56 - 60 in [\[ITIVol1\]](#)
- Transactions: 129 - 139 in [\[ITIVol2a\]](#)

References

[ITIVol1] –

http://www.ihe.net/Technical_Framework/upload/IHE_ITI_TF_Rev7-0_Vol1_FT_2010-08-10.pdf

[ITIVol2a] –

http://www.ihe.net/Technical_Framework/upload/IHE_ITI_TF_Rev7-0_Vol2a_FT_2010-08-10.pdf

[ITIVol2b] –

http://www.ihe.net/Technical_Framework/upload/IHE_ITI_TF_Rev7-0_Vol2b_FT_2010-08-10.pdf

[ITIVol2x] –

http://www.ihe.net/Technical_Framework/upload/IHE_ITI_TF_Rev7-0_Vol2x_FT_2010-08-10.pdf

[ITIVol3] –

http://www.ihe.net/Technical_Framework/upload/IHE_ITI_TF_Rev7-0_Vol3_FT_2010-08-10.pdf

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Questions?