



IHE for RHIOs Interoperability

Portland, April 19th 2005

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IHE IT Infrastructure Technical Committee Co-chair*

- **What is IHE ?**
- **What is an IHE Integration Profile ?**
- **Cross-Enterprise Information Exchange.
Where to start ?**
- **HIMSS 2005 Interoperability Showcase
and vendor engagement**
- **Will IHE provide enough interoperability
to build a regional health information
network ?**



Providers and Vendors
Working Together to Deliver
Interoperable Health Information Systems
in the Enterprise
and Across Care Settings

WWW.IHE.NET

Standards Alone Are Not Enough

- Managing the domain boundaries with mapping of information flow across boundaries
- Standards offer generality, ambiguity and alternatives.
- Standards Implementation Guides are focused on a single standard.
- Vendor proprietary interests
- Complexity!!

We need a standard process for how to implement multiple standards!

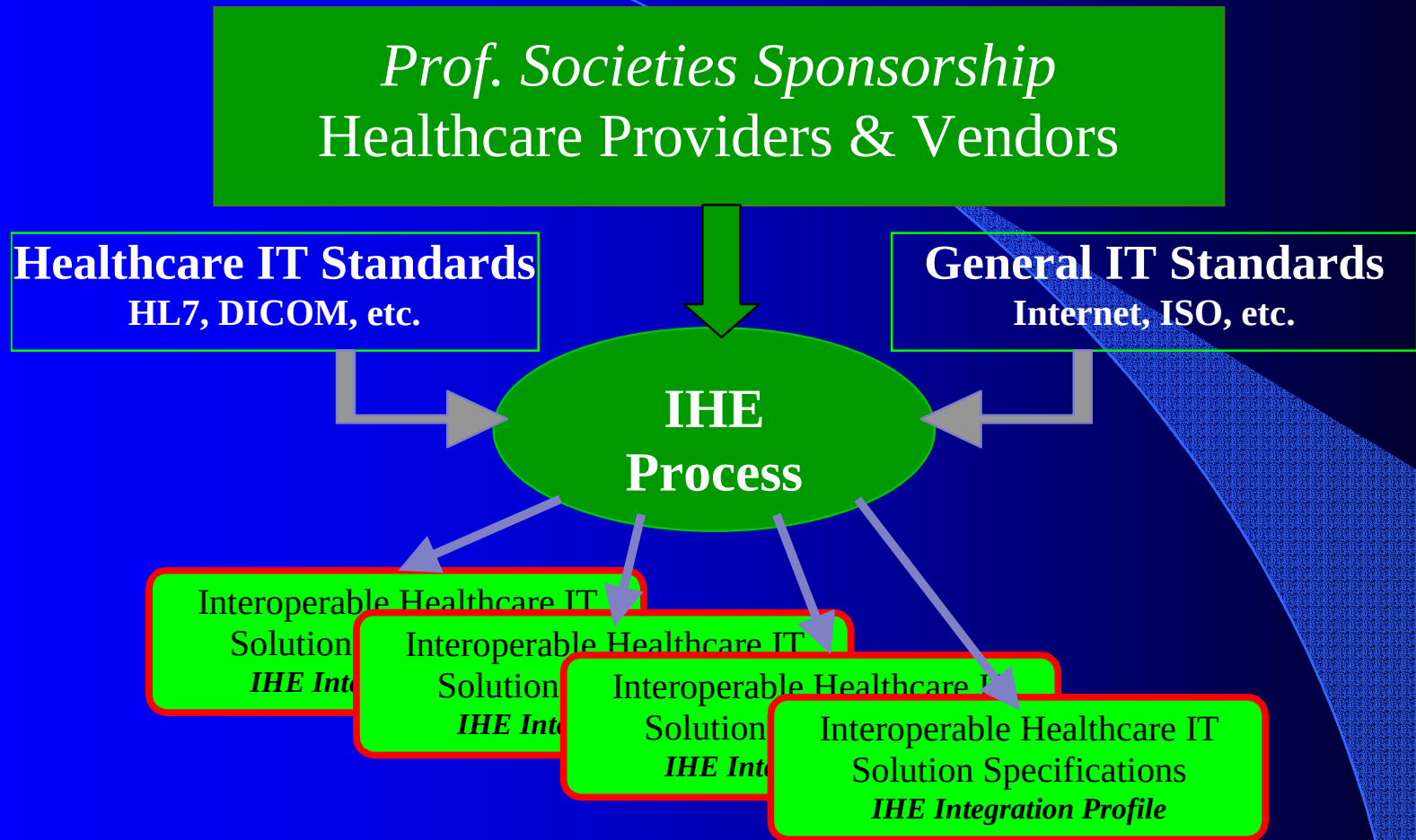
Connecting Standards to Care

■ Care providers must work with vendors to coordinate the implementation of standards to meet their needs

- Care providers need to identify the key interoperability problems they face
- Drive industry to develop and make available standards-based solutions
- Implementers need to follow common guidelines in purchasing and integrating systems that deliver these solutions

What is the effective way to establish those “standards” for how to implement standards ?

Driving healthcare standards-based integration



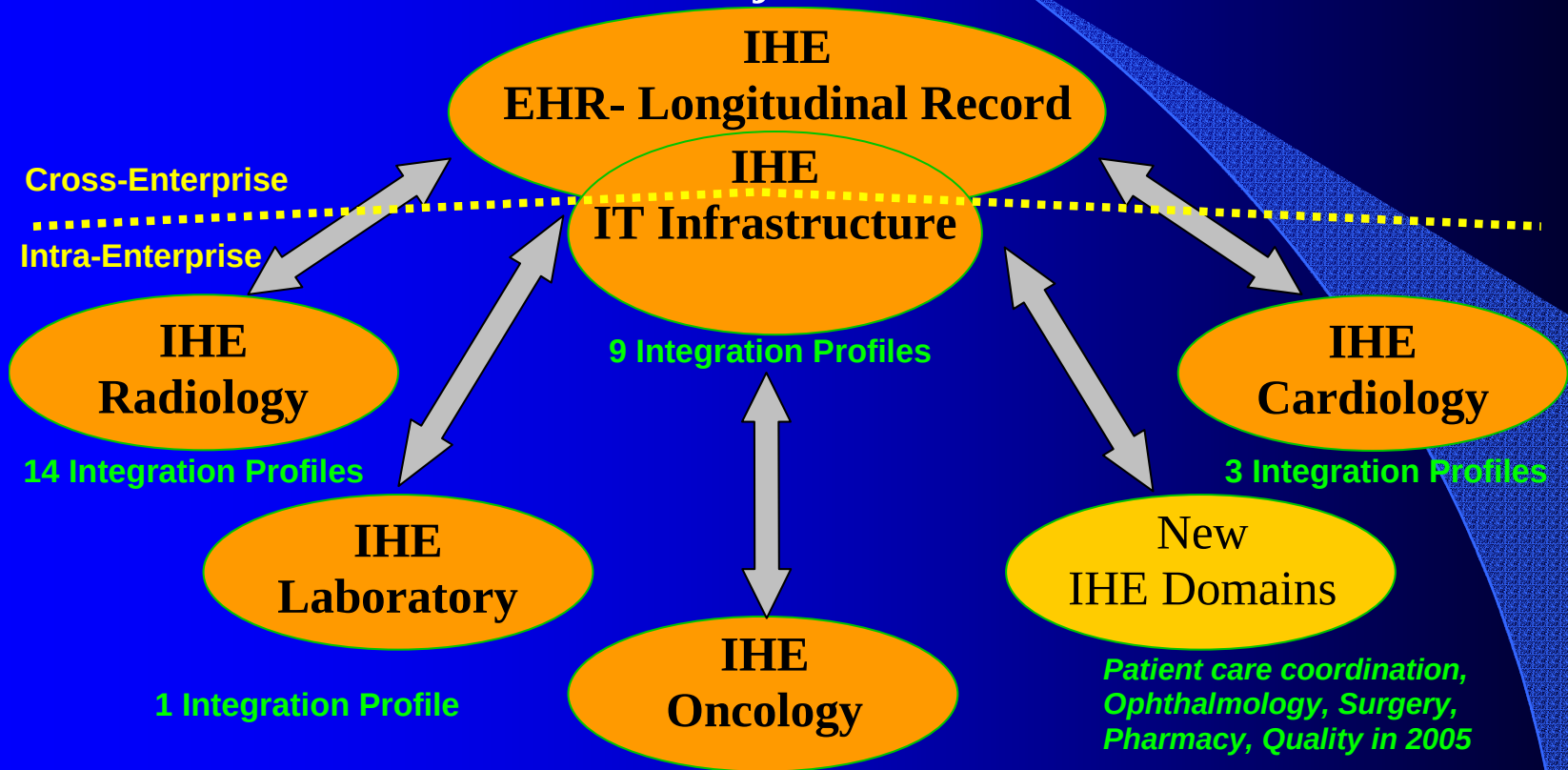
IHE Integration Profile: A well-defined and tested solution to a specific information exchange problem

What is Integrating the Healthcare Enterprise ?

- IHE provides a common framework for passing health information seamlessly:
 - within the healthcare enterprise
 - across multiple healthcare enterprises
 - for local, regional & national health information networks.
- IHE is sponsored by healthcare professional associations (ACC, HIMSS, RSNA, etc.).
- IHE drives standards adoption to address specific clinical needs.

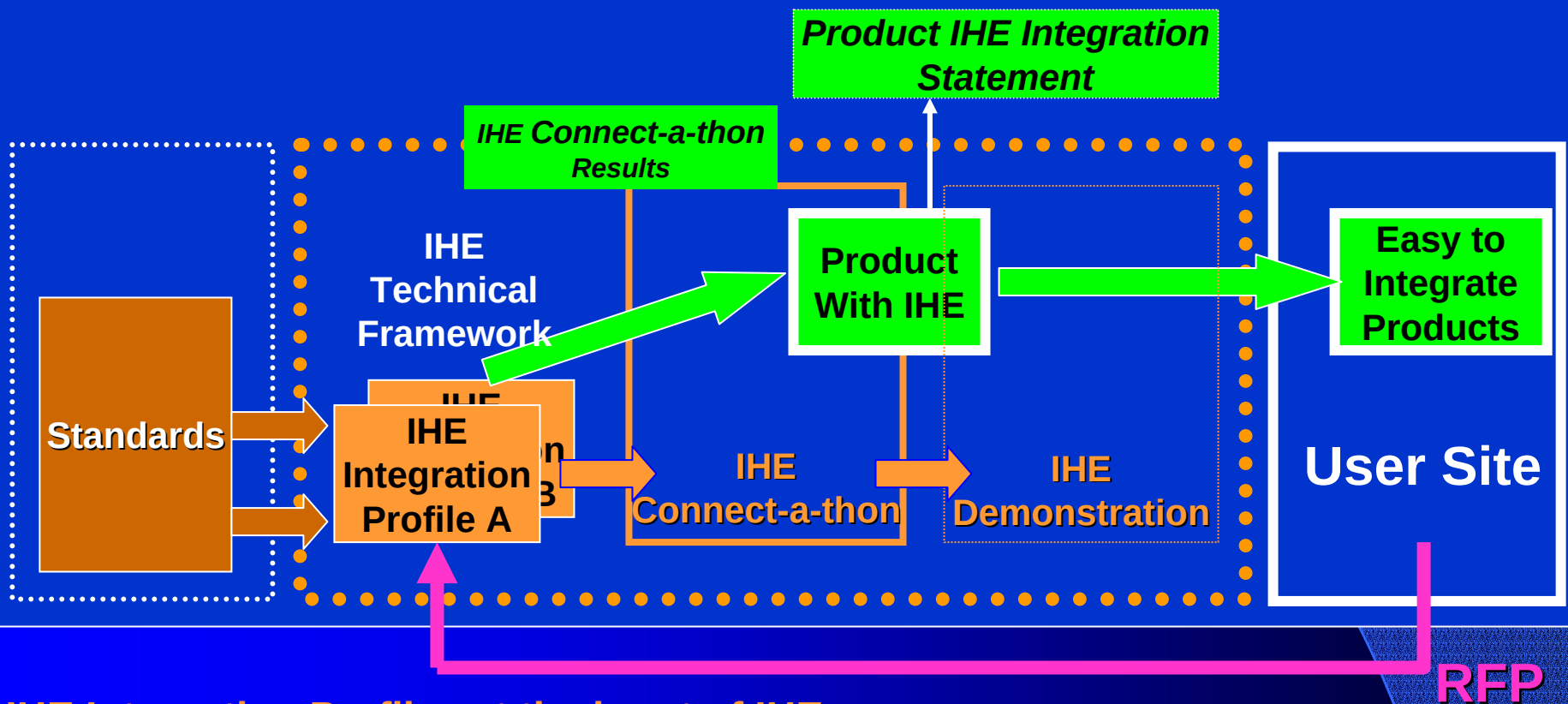
Achievements and expanding scope

15 Active national chapters on 4 continents, 4 Technical Frameworks
27 Integration Profiles, Testing at yearly Connectathons,
Demonstrations at major exhibitions world-wide



Vendors claim compliance to *IHE Integration Profiles* by publishing an *IHE Integration Statement* for each product.

A Proven Standards Adoption Process



IHE Integration Profiles at the heart of IHE :

- Detailed selection of standards and options each solving a specific integration problem
- A growing set of effective provider/vendor agreed solutions
- Vendors can implement with ROI
- Providers can deploy with stability
- Process started in 1998 with continuous improvements

Key IHE Concepts

- Generalized Systems -> Actors
- Interactions between Actors -> Transactions
- Problem/Solution Scenarios -> Integration Profiles
- For each Integration Profile:
 - the context is described (which real-world problem)
 - the actors are defined (what systems are involved)
 - the transactions are defined (what must they do)

IHE Connectathons

**Massive yearly events :
40-50 vendors**



**Vendors do not pass...
until an IHE Project Manager attest it !**

IHE Radiology 2003
Connectathon

IHE Radiology 2003 Connectathon	Scheduled Workflow		Patient Information Reconciliation				Consistent Presentation of Images				Presentation of Grouped Procedures		*Post- proc. WF	Reporting Workflow		Evidence Documents		Key Image Note		Simple Image and Numeric Report				Charge Posting		Basic Security		Access to Radiology Information																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
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• = Results obtained at IHE Radiology North America 2003 Connectathon

• = Previous Connetathon results

* = Post processing Work Flow

Participating and Contributing Vendors (America)

Agfa HealthCare

Algotec Systems, Ltd.

Berdy

Camtronics

Canon Medical Systems

Carefx

Cedara Software
Corporation

Cerner Corporation

CSIST

Dictaphone

DR Systems

Dynamic Imaging

Eastern Informatics

Eastman Kodak Company

Emageon

Eclipsys

Fujifilm Medical Systems

GE Healthcare

Heartlab

Hitachi Medical Corporation

Hologic, Inc

IDX Systems Corporation

IMCO Technologies

InSiteOne

INFINITT

Konica Minolta

Marotech, Inc.

McKesson Information
Solutions

Medcon

Medical Manager Health
Systems

Mediface Co., Ltd.

Merge eFilm

Mortara

Procom

Philips Medical Systems

RASNA Imaging Systems

Sectra

Sentillion

Siemens Medical Solutions

Softmedical

Stentor, Inc

StorCOMM, Inc

Swissray International, Inc

Tiani Medgraph AG

Toshiba America Medical Systems

UltraVisual Medical Systems

Vital Images, Inc.

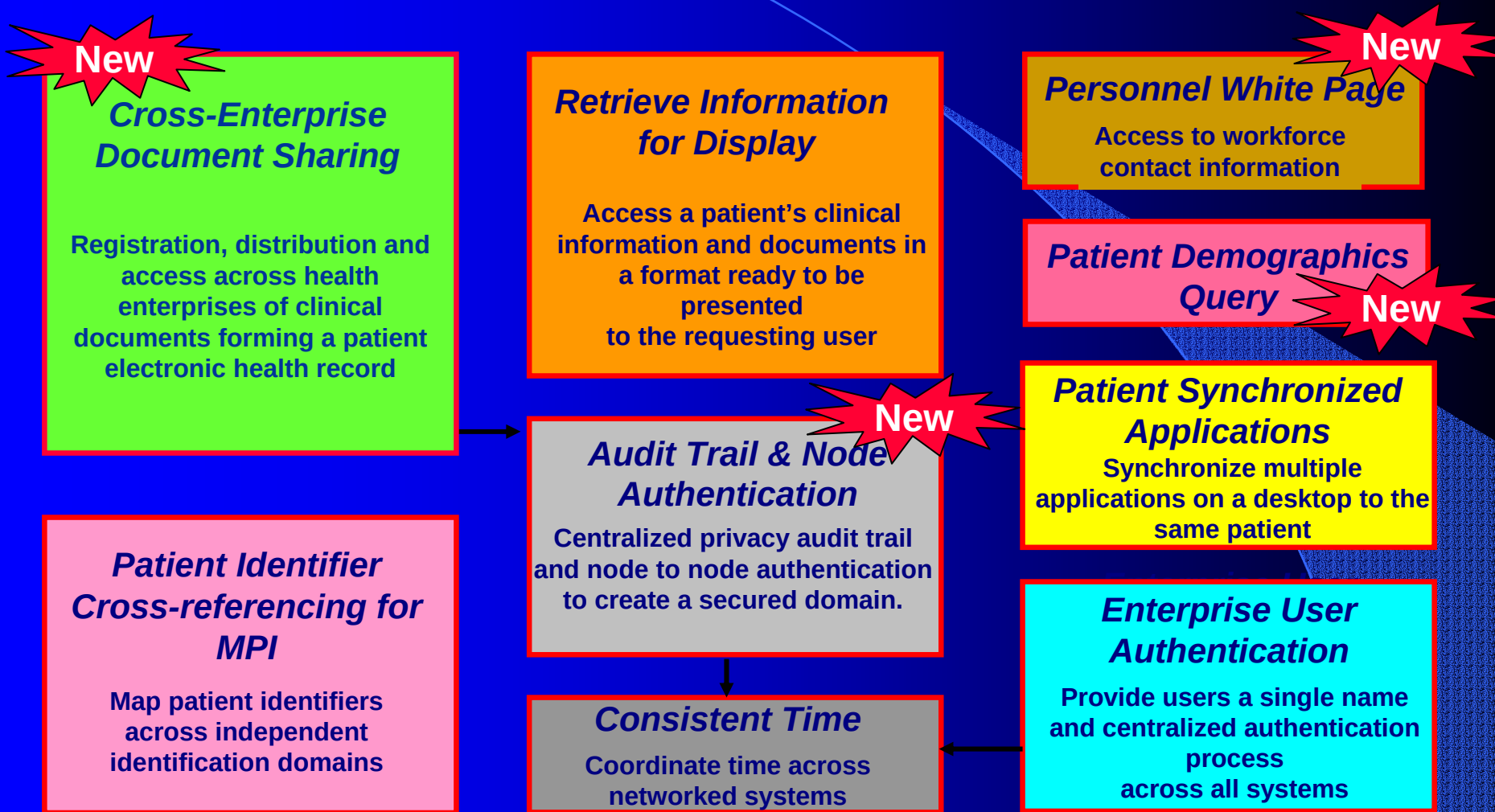
Voxar Limited

WebMD

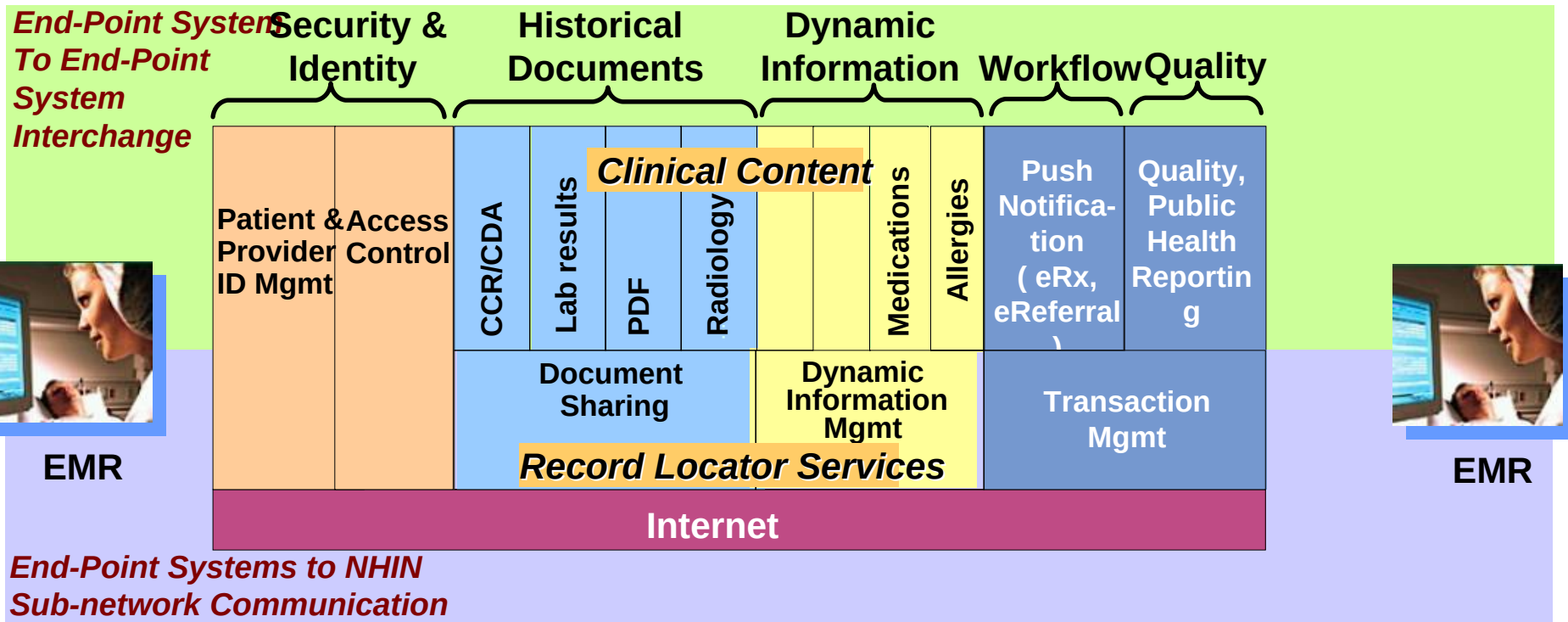
XIMIS

In yellow, companies with IHE Committees Chairs (Summer 2004)

IHE IT Infrastructure 2004-2005



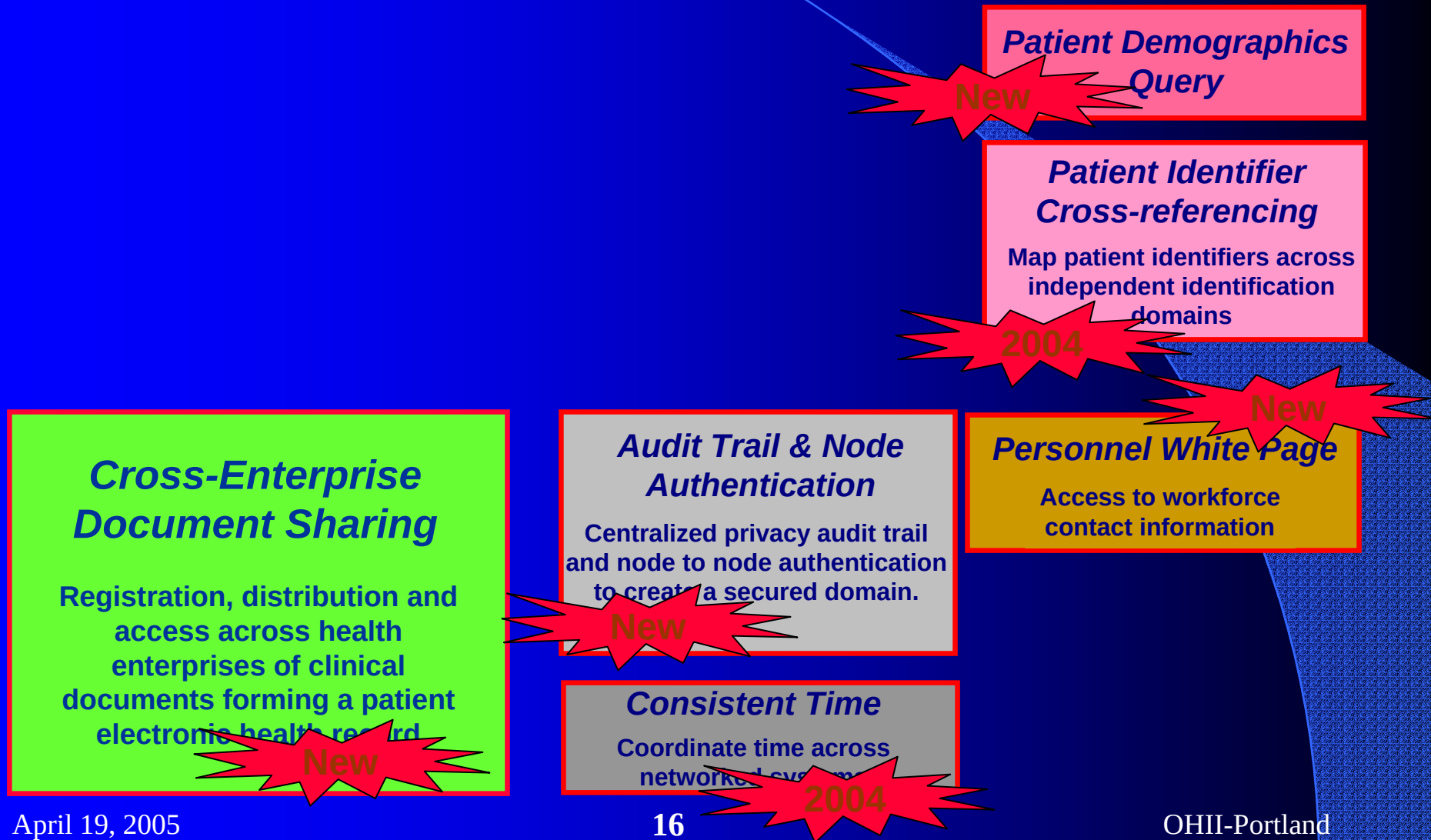
A thin set of NHIN services facilitate info. exchange between End-Point Systems



- Thin set of NHIN services – facilitates information exchange
- End-Point System services exist at two distinct levels
 - Sub-network communication level – e.g., IHE/XDS (Cross-Enterprise Document Share)
 - Peer-to-Peer level – transparent to NHIN, e.g., document content / type

IHE Profiles for a RHIO

Integration Profiles completed by HIMSS 2005



Patient Identifier Cross-referencing for MPI

Abstract / Scope

- **Allow all enterprise participants to register the identifiers they use for patients in their domain**
- **Participants retain control over their own domain's patient index(es)**
- **Support domain systems' queries for other systems' identifiers for their patients**
- **Optionally, notify domain systems when other systems update identifiers for their patients**

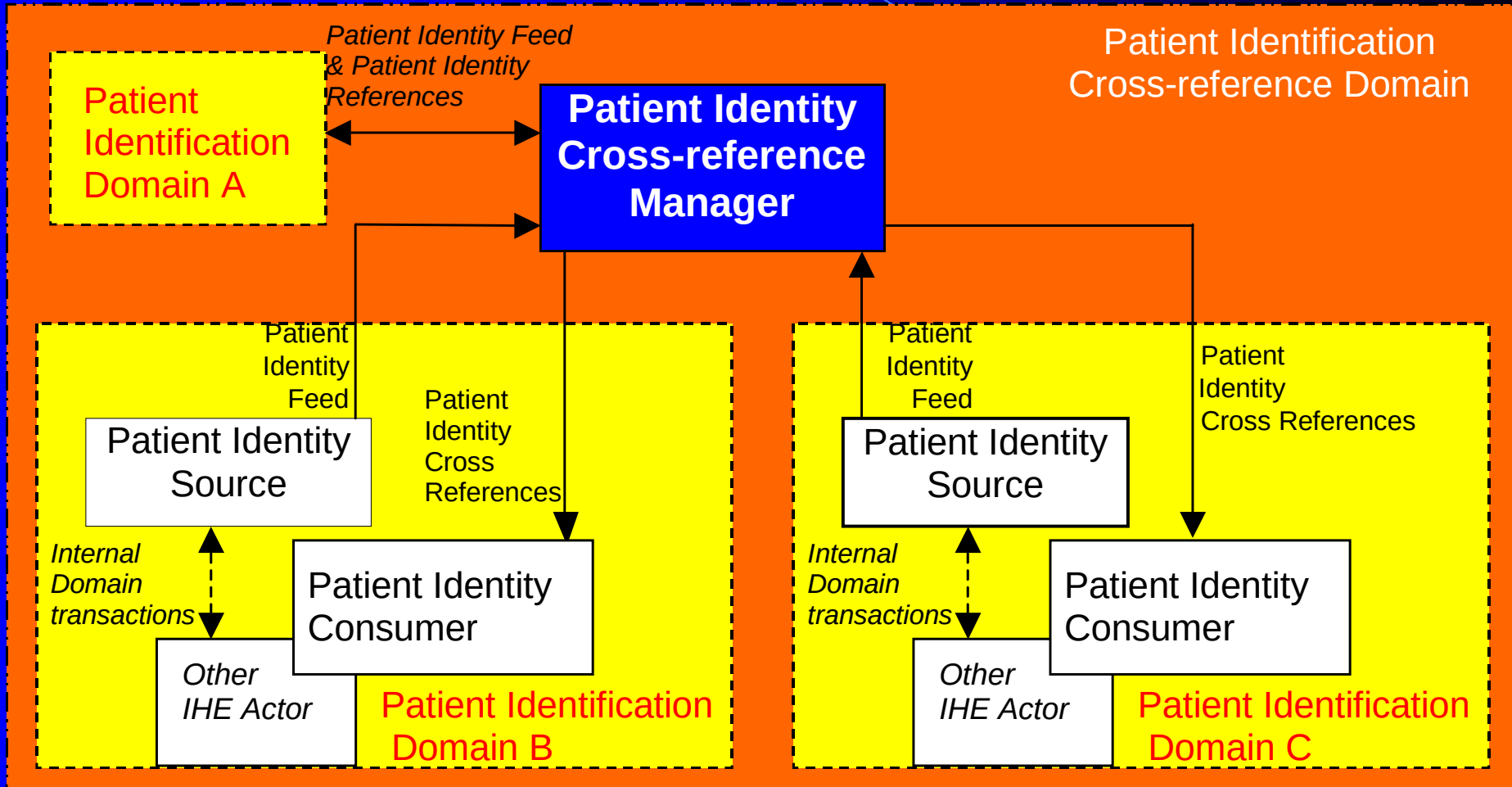
Patient Identifier Cross-referencing for MPI

Value Proposition

- **Maintain all systems' identifiers for a patient in a single location**
- **Use any algorithms (encapsulated) to find matching patients across disparate identifier domains**
- **Lower cost for synchronizing data across systems**
 - No need to force identifier and format changes onto existing systems
- **Leverages standards and transactions already used within IHE**

Patient Identifier Cross-referencing for MPI

Process Flow Showing ID Domains & Transactions

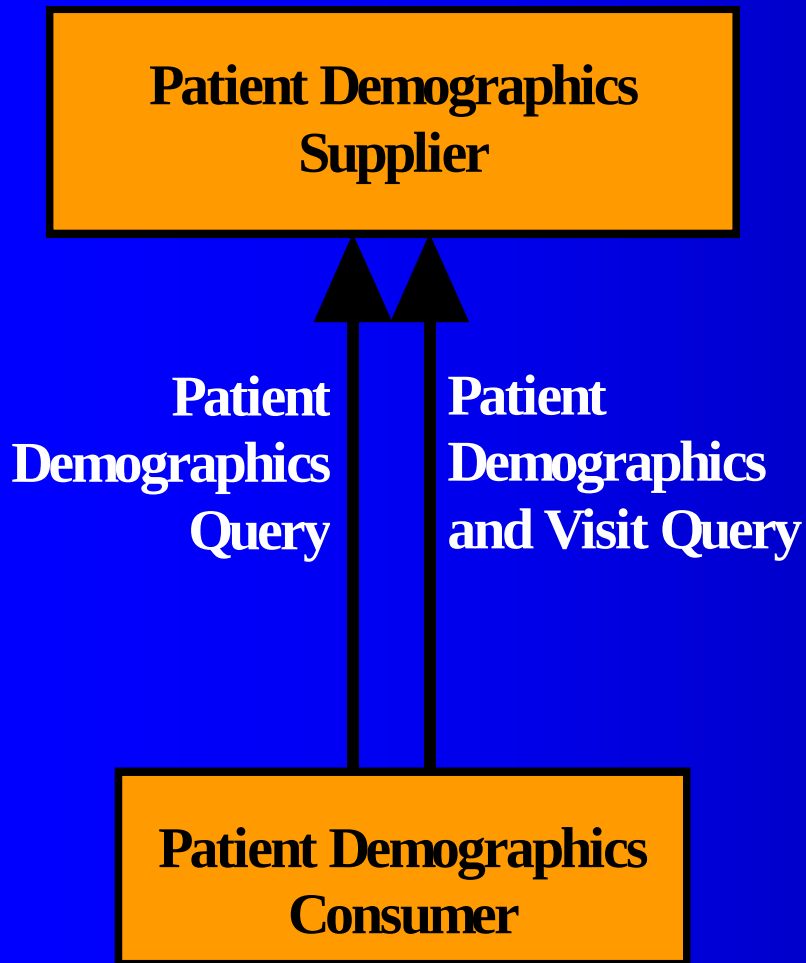


Patient Demographics Query

Abstract/Scope

- **Allow quick retrieval of a patient list including common patient names, identifiers, contacts, and visit information**
- **Enable selection of correct patient when full identification data may not be available**
- **Limits access to only a subset of demographic and visit information**

Patient Demographics Query *Transaction Diagram*



A system that is connected on demand to the registration system.

Diverse systems including bedside monitors, physician office systems, lab applications, mobile blood bank registries; might be any system at the point of contact.

Introduction:

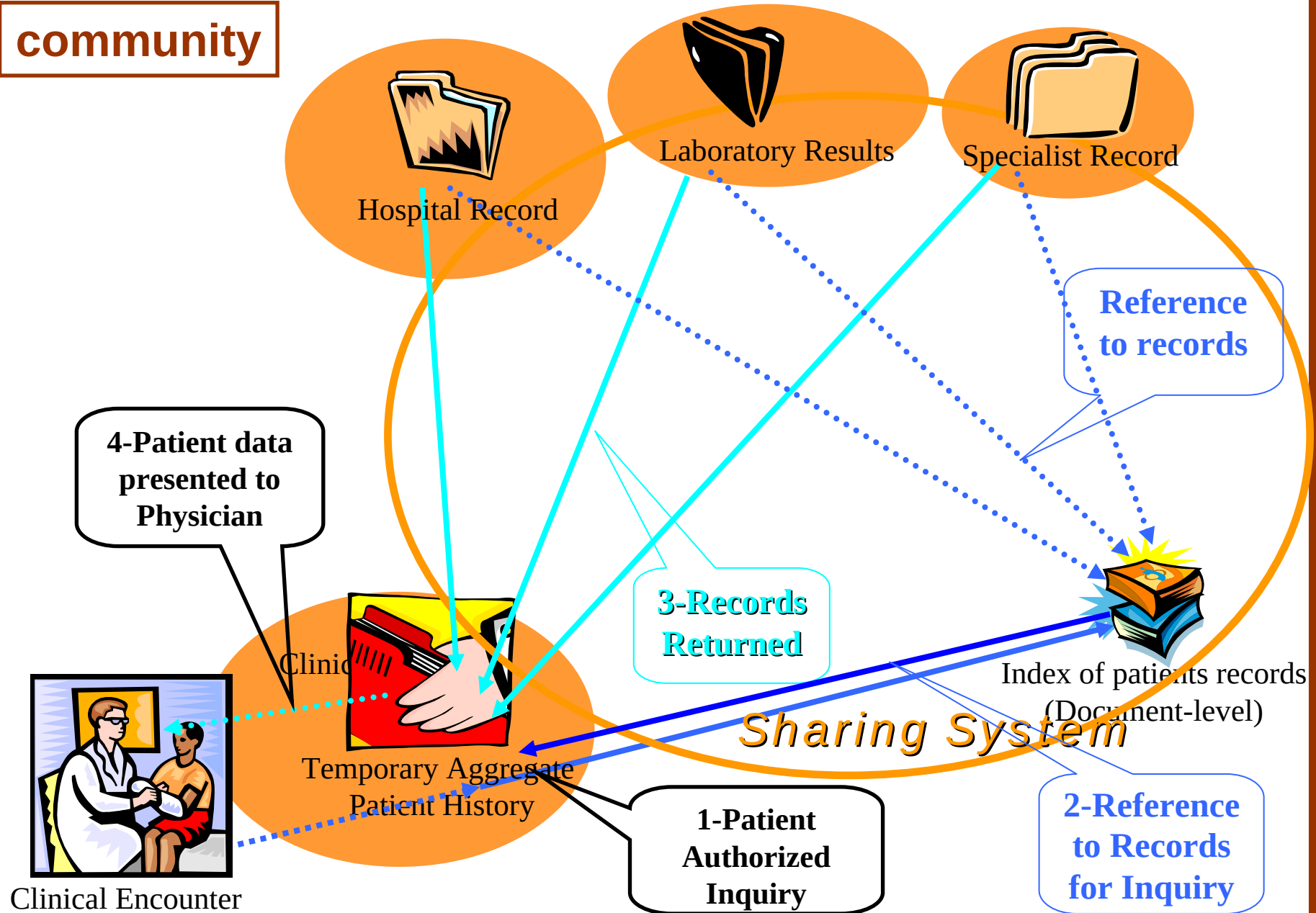
EHR Cross-Enterprise Document Sharing

Enables the
longitudinal dimension of the EHR

Focus: Support document sharing between EHRs in different care settings and organizations

Sharing records that have been published

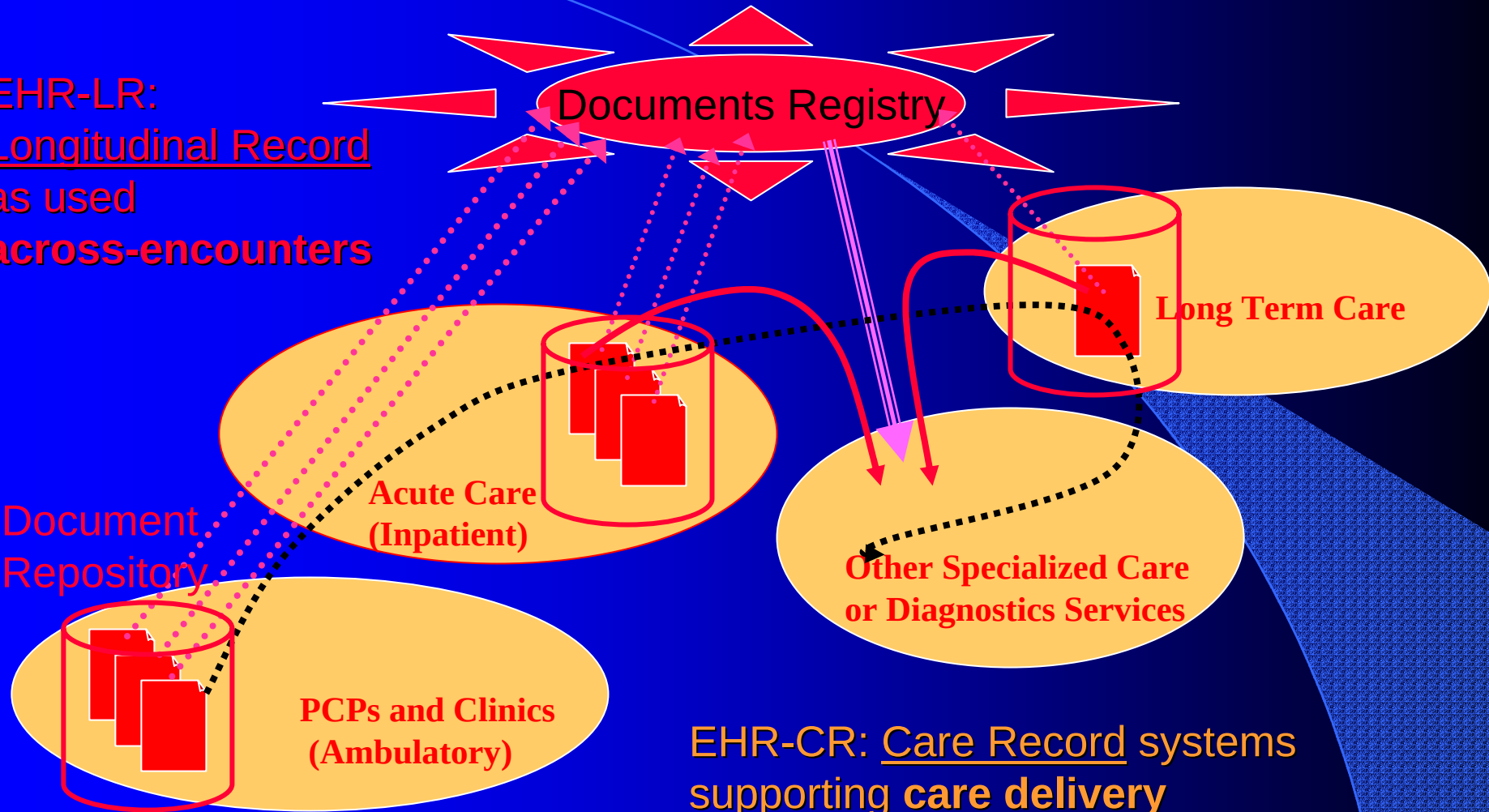
community



Sharing and accessing Documents

EHR-LR:
Longitudinal Record
as used
across-encounters

**Document
Repository**



EHR-CR: Care Record systems
supporting **care delivery**

Submission of Document References

Retrieve of selected Documents

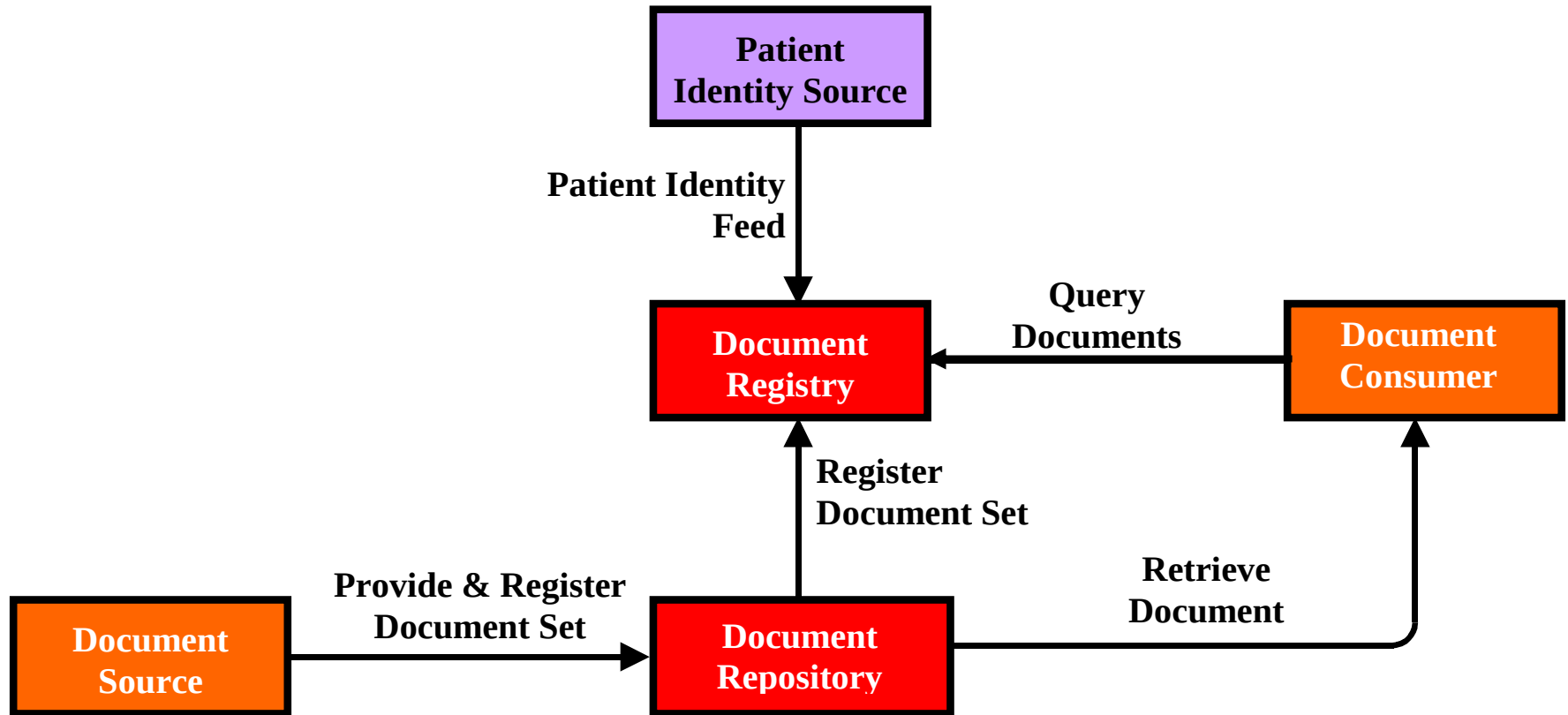
XDS – Value Proposition

- **Foundation for Health IT Infrastructures:** Shared Electronic Health Record, in a community, region, etc.
- **Effective means to contribute and access** clinical documents across health enterprises.
- **Scalable sharing of documents** between private physicians, clinics, long term care, pharmacy, acute care with different clinical IT systems.
- **Easy access:** Care providers are offered means to query and retrieve clinical documents of interest.

XDS - Value Proposition

- **Distributed:** Each Care delivery organization “publishes” clinical information for others. Actual documents may remain in the source EHR-CR.
- **Cross-Enterprise:** A Registry provides an index for published information to authorized care delivery organizations belonging to the same clinical affinity domain (e.g. an RHIO).
- **Document Centric:** Published clinical data is organized into “clinical documents”. using agreed standard document types (HL7-CDA, PDF, DICOM, etc.)
- **Document Content Neutral:** Document content is processed only by source and consumer IT systems.
- **Standardized Registry Attributes:** Queries based on meaningful attributes ensure deterministic document searches.

XDS Actors and Transactions



Standards selection for IHE XDS

*No single standard can address
Cross-enterprise Document Sharing*

Electronic Business Standards

ebXML Registry, ebMS, SOAP, etc.

Internet Standards

XML, HTTP,
ISO, etc.

*Healthcare
Content Standards*
HL7 CDA, CEN EHRcom
HL7, ASTM CCR
DICOM, etc.

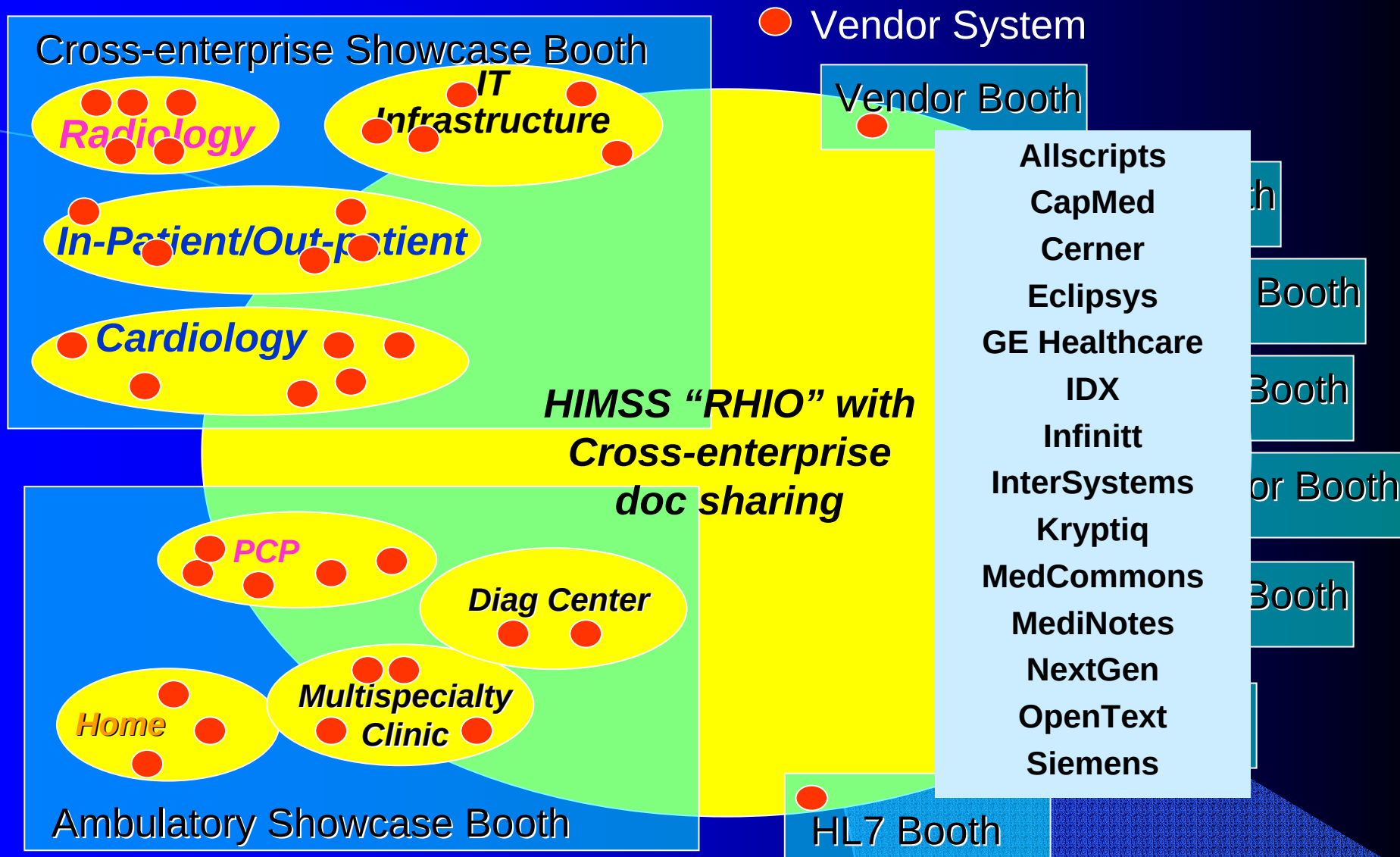
Marriage of healthcare standards facilitates implementation and leverages complementary technologies (e.g. security & privacy).

How real is XDS ?

- **Specification work since Nov 2003**
- **Under Public Comments June-July 2004**
 - 600 constructive comments received.
 - *Validity of XDS approach confirmed (e.g. CfH Collaborative Response).*
- **Stable specification IHE Technical Framework Published Aug 15th, 2004 (TI Supplement)**
- **IHE Connectathon - January 2005 (USA)**
 - 14 Vendors passed
- ***HIMSS Feb 2005 - show-wide demonstration***
 - *17 EHRs, 800 patients, 7700 documents registered, 41000 queries.*
- **IHE Connectathon - April 2005 (Europe)**
 - 22 Vendors registered

Several Implementation Projects by health authorities in 2005
Italy: Linguini & Veneto Regions - Canada: Newfoundland – France: Trials

HIMSS 2005 – Show-Wide Interoperability



HIMSS 2005 Interoperability Show Case Vendors

Leadership Level

CapMed/SanDisk

Eclipsys

GE Healthcare

IDX

InterSystems

Kryptiq

Quovadx/CareScience

Siemens

WebMD

Participant Level

Allscripts

Cedara

Cerner

Dictaphone

Eastman Kodak

Eclipsys

Emageon

Epic

ETIAM

INFINITT Tech.

MedcomSoft

MediNotes

MedCommons

MidMark

Mortara Instrument, Inc

**National Institute of
Standards and Technology**

NextGen

Novell

Open Text

Sentillion

Supporter Level

AccessPt

EMC

AGFA

Healthvision

dbMotion

Healthramp

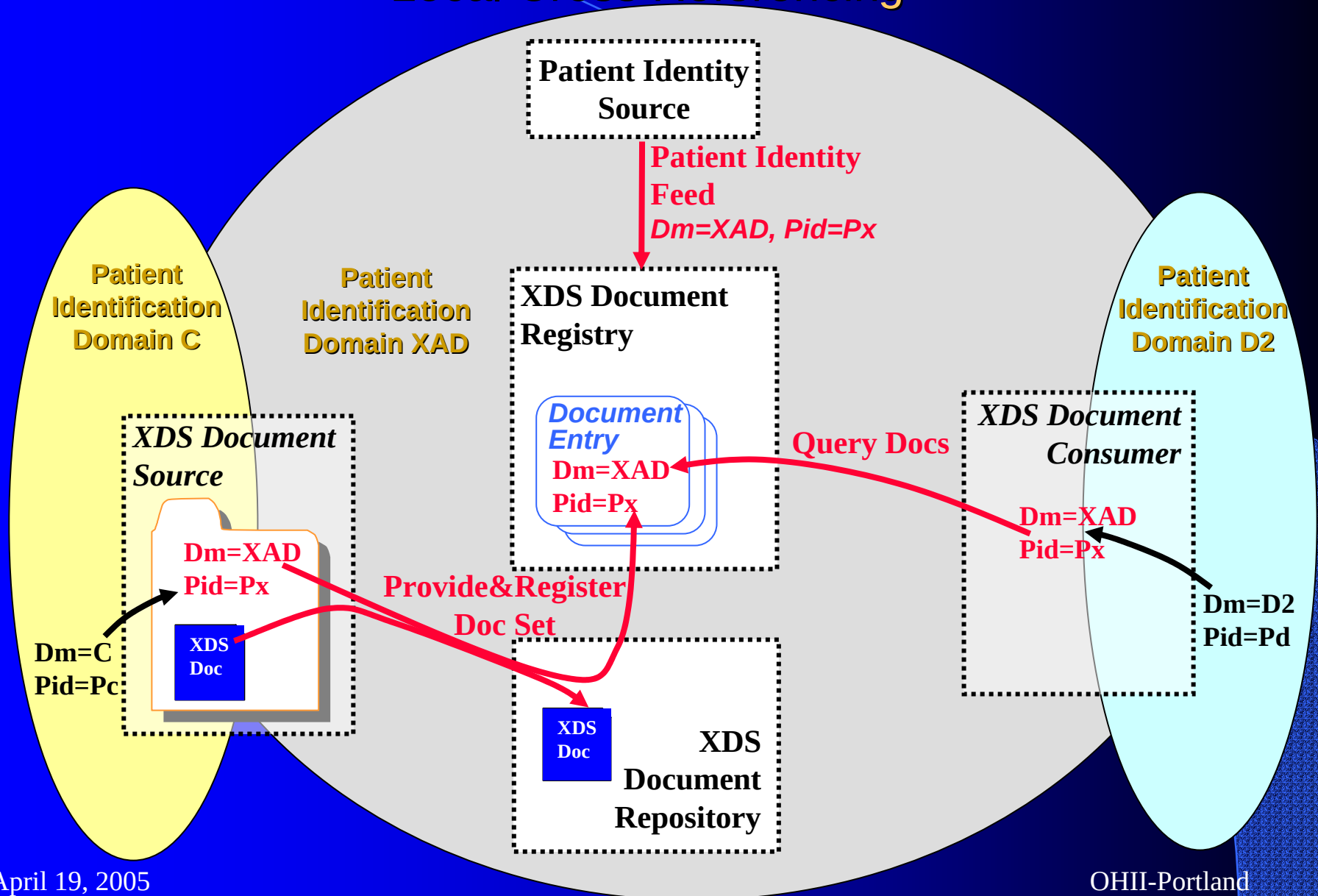
Valco Data Systems

Dinmar – Oacis

McKesson

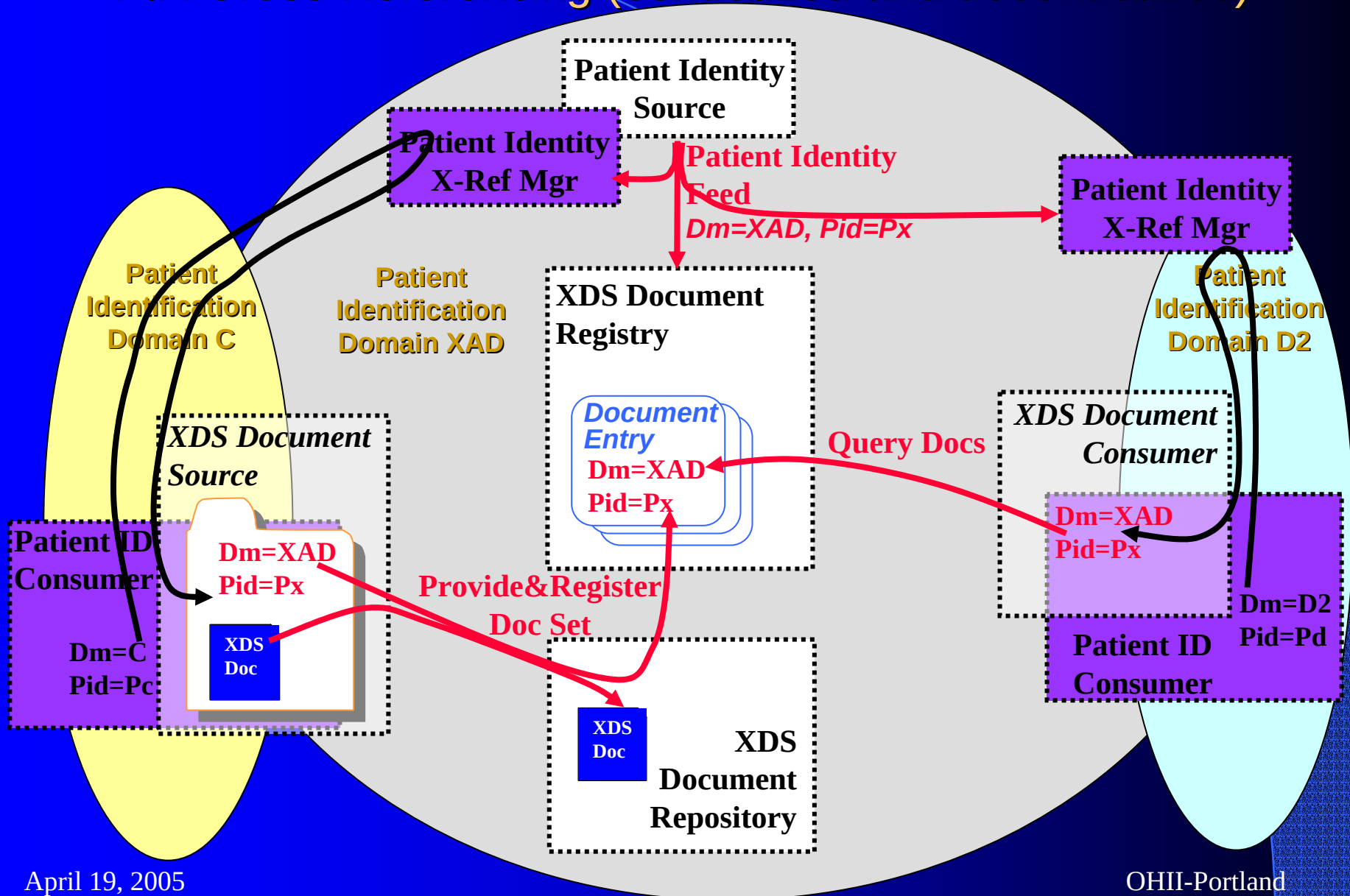
XDS & Patient Identification Management

Local Cross Referencing



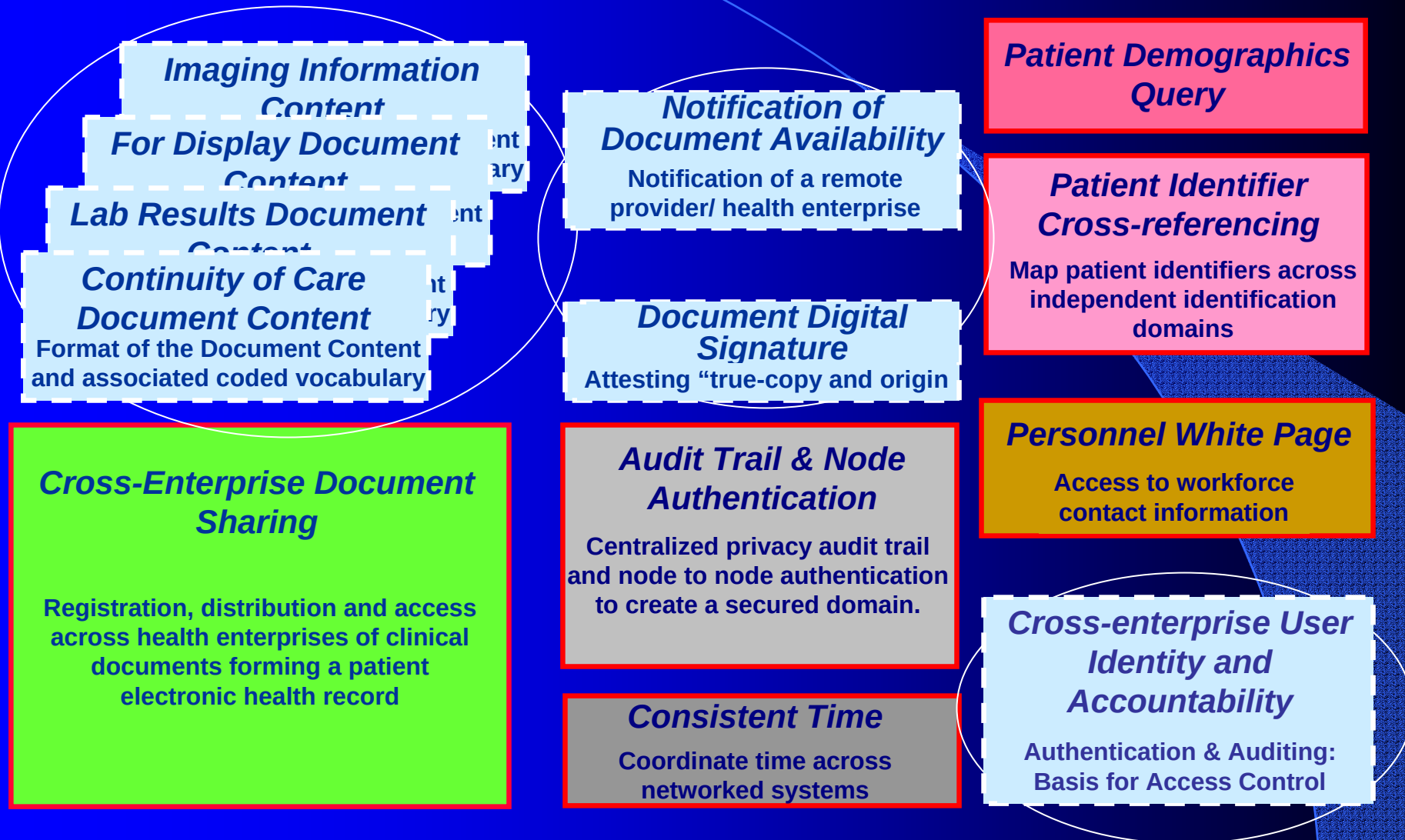
XDS & Patient Identification Management

PIX Cross Referencing (centralized and decentralized)



IHE Profiles for RHIOs

What is available and what is added in 2005



Local & Regional RHIOs Infrastructure and Interoperability

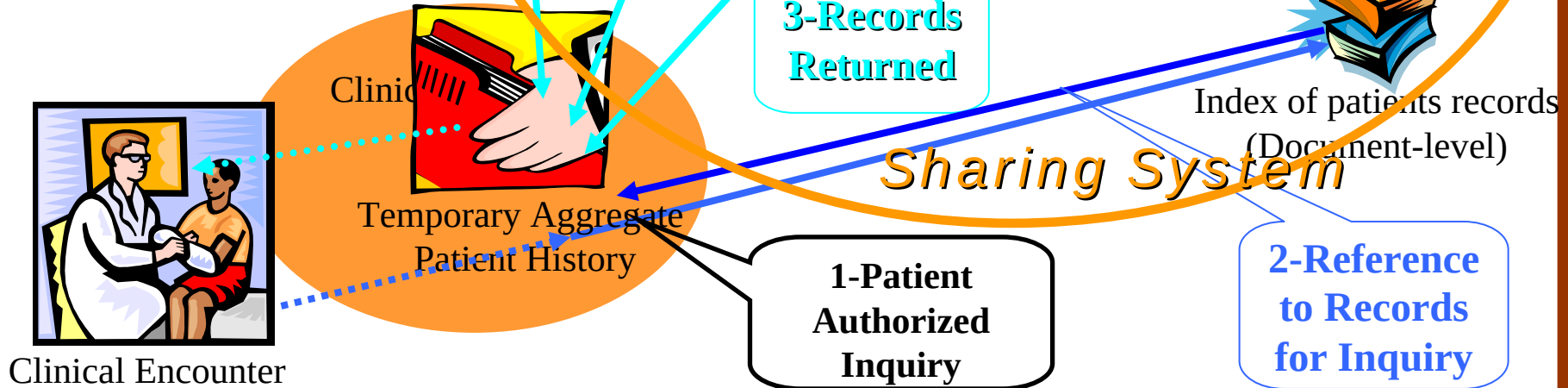
- **Cross-Enterprise Document Sharing (XDS)** minimizes clinical data management by the infrastructure. *Transparency = Ease of Evolution*
- **XDS works with other IHE Integration Profiles:**
 - Audit Trail and Node Authentication (ATNA) and Consistent Time (CT)
 - Patient Id Cross-referencing (PIX)
 - Patient Demographics Query (PDQ)
 - For Intra-enterprise integration (EUA), CT, etc.
- **In 2005, IHE plans to finish base set of integration profiles to build regional health networks and interoperable EHRs:**
 - Security: Identity Management+ Accountability + Doc Signature
 - Content Profiles: DICOM, HL7-CDA/CCR, HL7-Lab, PDF.
 - Notification of Document Availability (with XDS document reference)

Building a RHIO with IHE in 2006 :

community

Secured Sharing of:

- Medical Summaries
 - Lab Results
 - Images & reports
 - ECG Reports
 - Other PDFs
- + *Notif of Doc Avail.*





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