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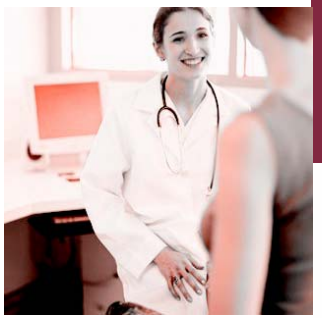
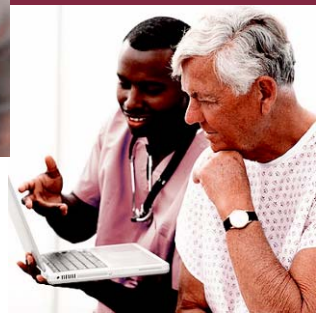
EHRS BLUEPRINT
an interoperable EHR framework

SOA in the pan-Canadian EHR





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Outline

- Infoway
- EHR Solution
- EHRS Blueprint Approach
- EHR Standards
- Services Oriented Architecture
- Summary & Conclusion

Mission

To foster and accelerate the development and adoption of electronic health information systems with compatible standards and communications technologies on a pan-Canadian basis with tangible benefits to Canadians.

Vision

A high-quality, sustainable and effective Canadian healthcare system supported by an infostructure that provides residents of Canada and their healthcare providers timely, appropriate and secure access to the right information when and where they enter into the healthcare system. Respect for privacy is fundamental to this vision.

Goal

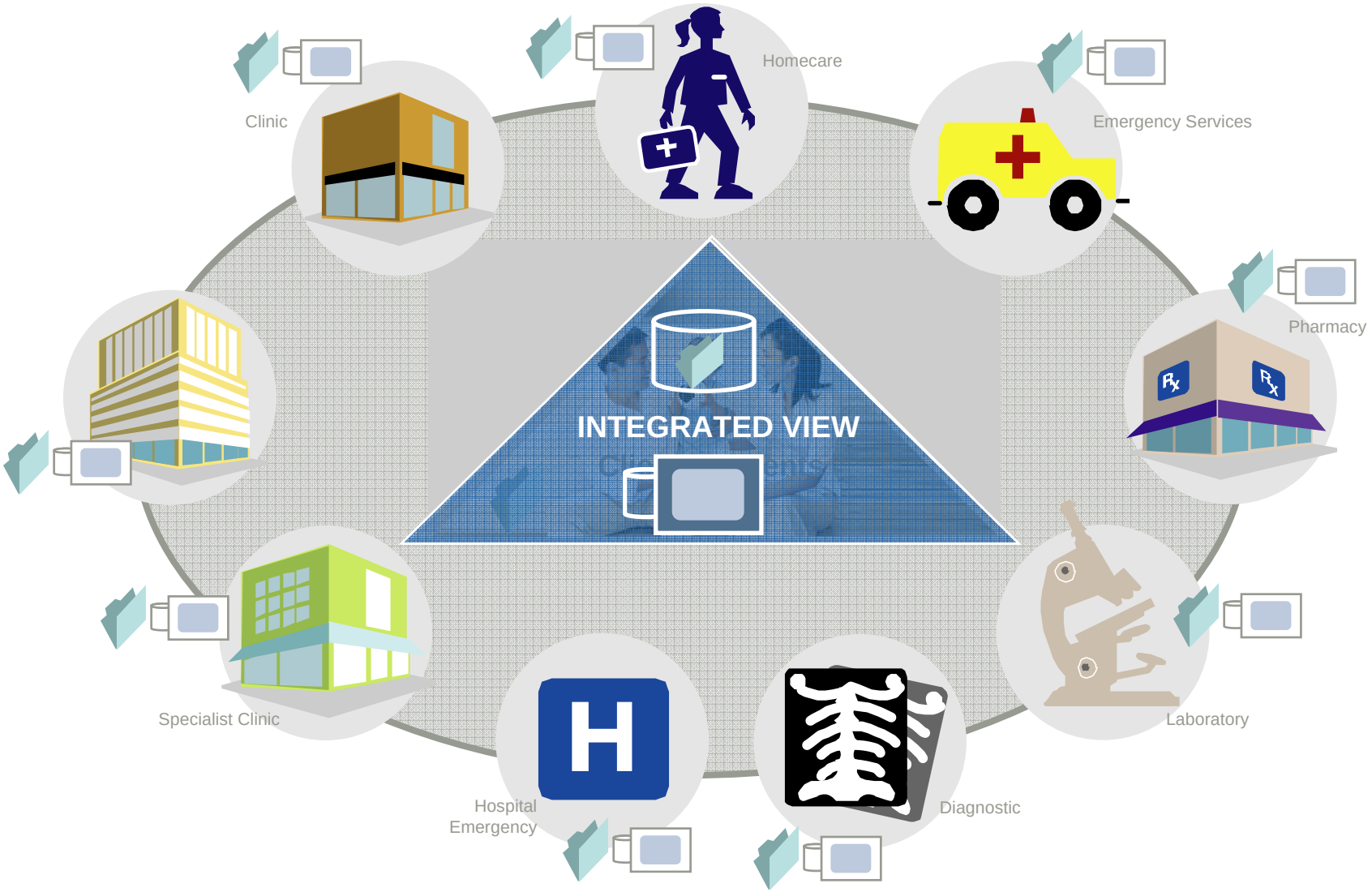
By 2010, every province and territory and the populations they serve will benefit from new health information systems that will help transform their healthcare system. Further, by 2010, 50 per cent of Canadians and by 2016, 100% of Canadians will have their electronic health record available to their authorized professionals who provide their healthcare services

Shared Governance Facilitates Collaboration

Canada Health Infoway is an independent not-for-profit organization, whose Members are Canada's 14 federal, provincial and territorial deputy ministers of health.

Client / Patient at the Centre of the Circle of Care

EHR: Integrated Shared View of Client / Patient Data



EHR – The Infoway Definition

An **Electronic Health Record** (EHR) provides each individual in Canada with a secure and private lifetime record of their key health history and care within the health system. The record is available electronically to authorized health providers and the individual anywhere, anytime in support of high quality care.

This record is designed to facilitate the sharing of data across the continuum of care, across health care delivery organizations and across geographies.

Guiding Principles for EHRS

- Patient-centric
- Mass customized views of all clinical data
- Value add for the provider
- Timely, accurate information
- Enable sharing at local, regional, cross-jurisdictional
- Interoperable, integrated
- Standards based
- Replicable solution – patterns, components

- Leverage legacy systems & solutions
- Design for phased rollout with near term results
- Scalable
- Extensible to support future growth
- Cost-effective
- Secure & private
- Allow for innovation & competition
- Comprehensive

Key Factors Affecting How to Share

- Sharing creates some very profound issues & requirements
  - Unique identification of clients, providers, service delivery locations, etc.
  - Protecting privacy and confidentiality of patients and providers while simultaneously not limiting the ability to deliver appropriate services
  - Ensuring information is stored, shared securely
  - Ensuring compatibility of how data is interpreted/understood
- These issues are the same no matter which model is chosen to share patient identified information
- Canadian governance model for healthcare means these issues are F/P/T jurisdictional responsibilities – requirements vary
- People increasingly mobile, especially when considering long periods of time
- Provider's confidence in the mechanisms to enable sharing is crucial

Integrating Health IT Systems: Key Challenges

- Protecting Privacy
  - Governance, accountability & data custodianship
  - Controlling access
  - Managing & applying consent directives
  - Controlling feeds and queries to the data
  - Trust relationships & contracts
- Existence & availability of data
  - Discovery capability
  - Availability in electronic format
  - Timeliness
- Harmonization
  - Data structures (format)
  - Vocabularies (encoding, normalization)
  - Semantics
- Heterogeneous technology environments
- Number of organizations, connection points & systems
- Costs inherent to integration

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Methods of Sharing EHR Information

The "Big Database in the Sky"

- All Point-of-Service (POS) systems share same data store

Broadcast to other systems

- Replication of data from one system to all other relevant/ participating POS systems
- Every POS system holds same information

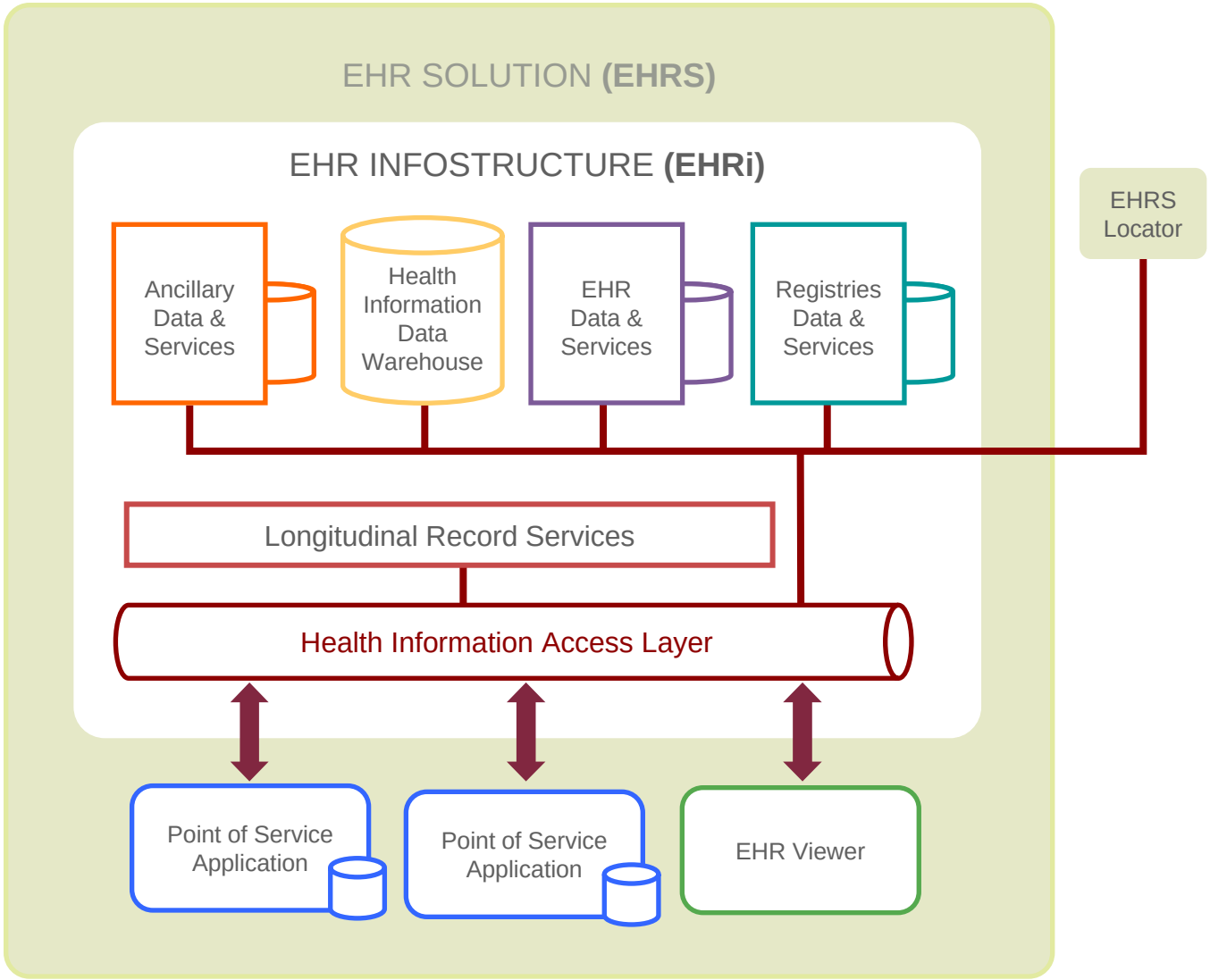
The "Big Index in the Sky"

- EHR Index or locator service that holds links to all POS systems where information resides
- Each POS system interfaces to other systems

Our Choice: A Shared Space

- POS systems populate Shared, Interoperable EHR
- POS systems or viewers reference it
- External to the "operational" store

EHR Infostructure – The Framework for Sharing



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EHR Infostructure

The **EHR Infostructure** is a collection of common and reusable components in the support of a diverse set of health information management applications. It consists of software solutions for the EHR, data definitions for the EHR and messaging standards for the EHR.

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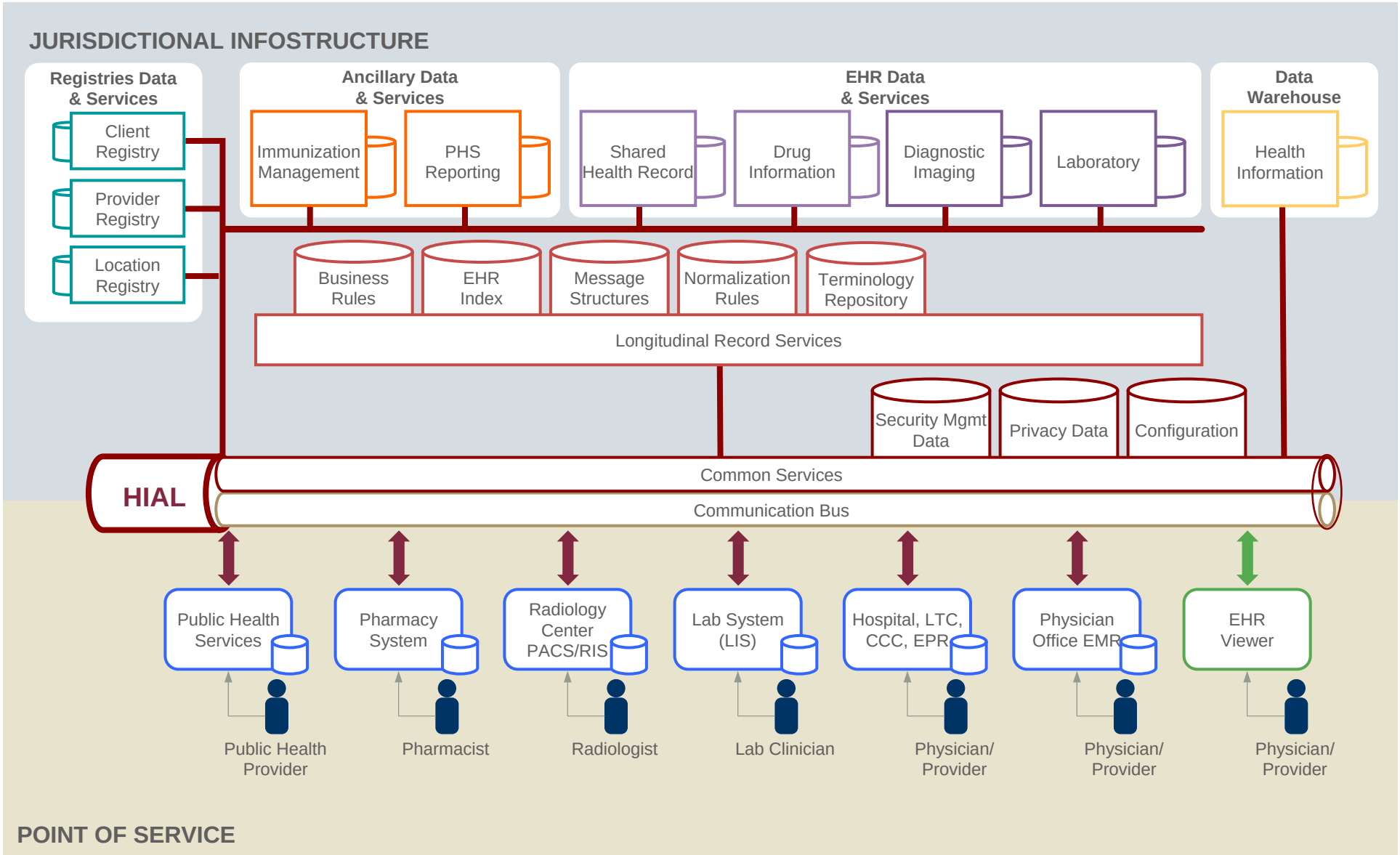
EHR Infostructure: Conceptual Architecture



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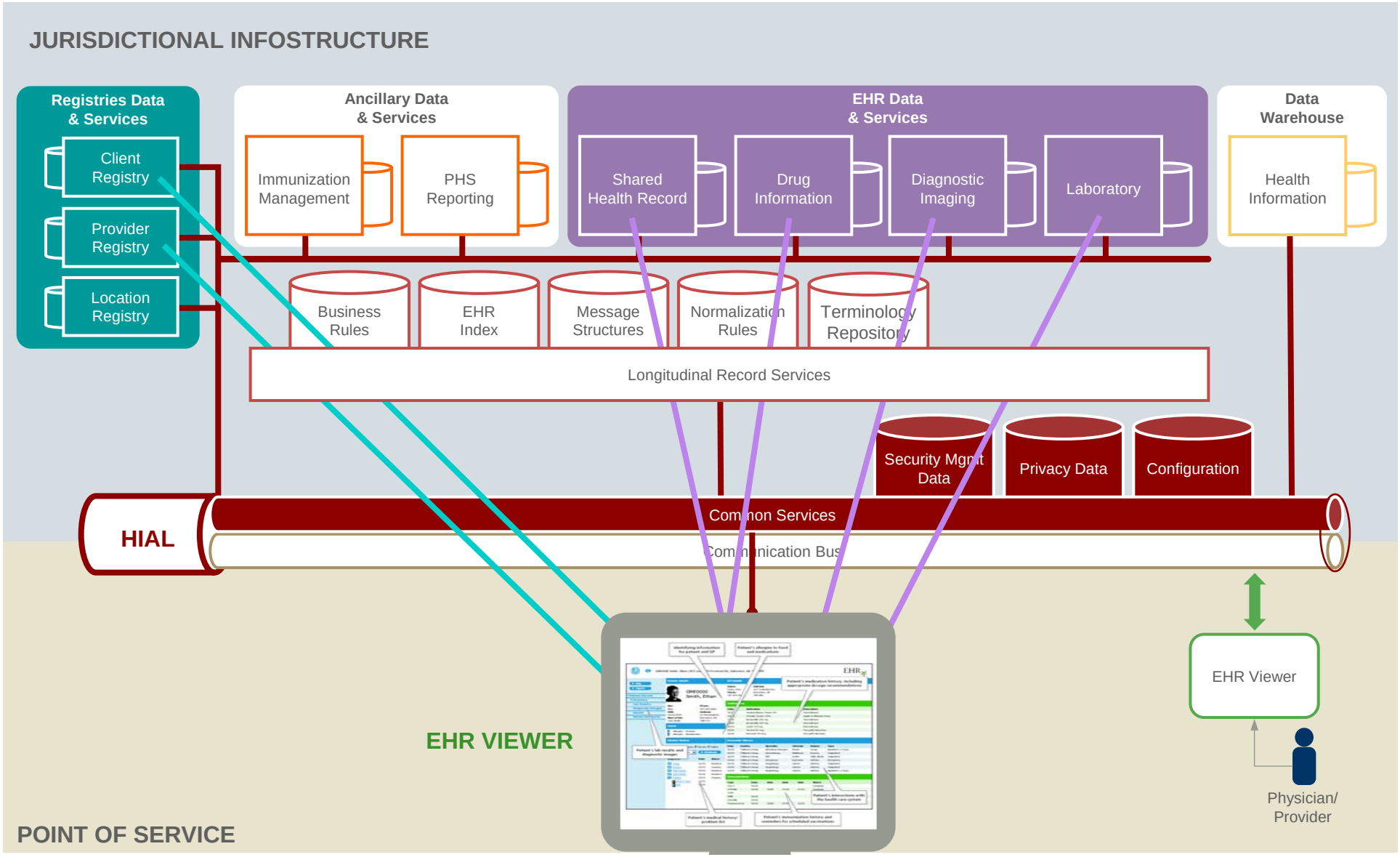
End-User Perspective: EHR Viewer



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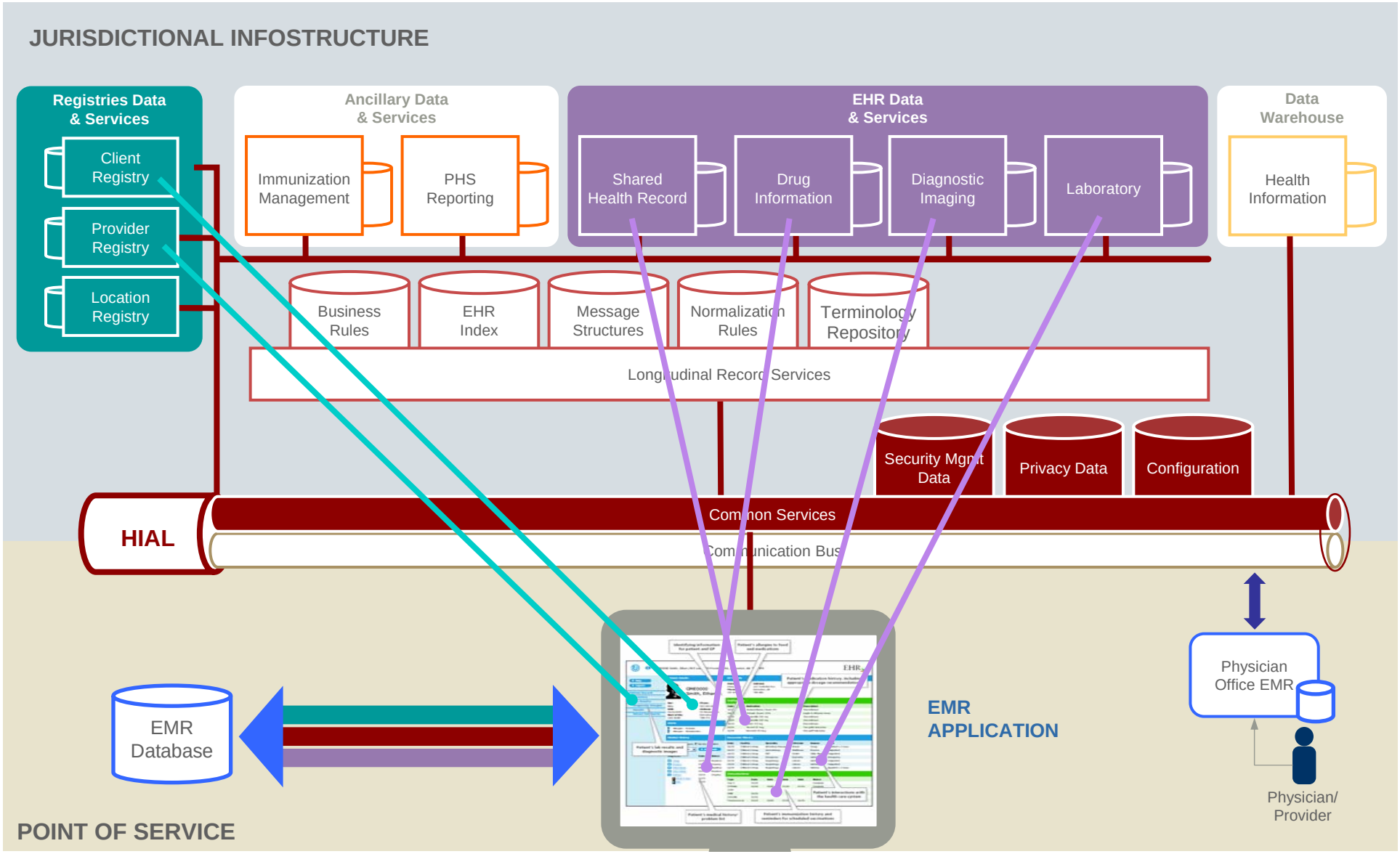
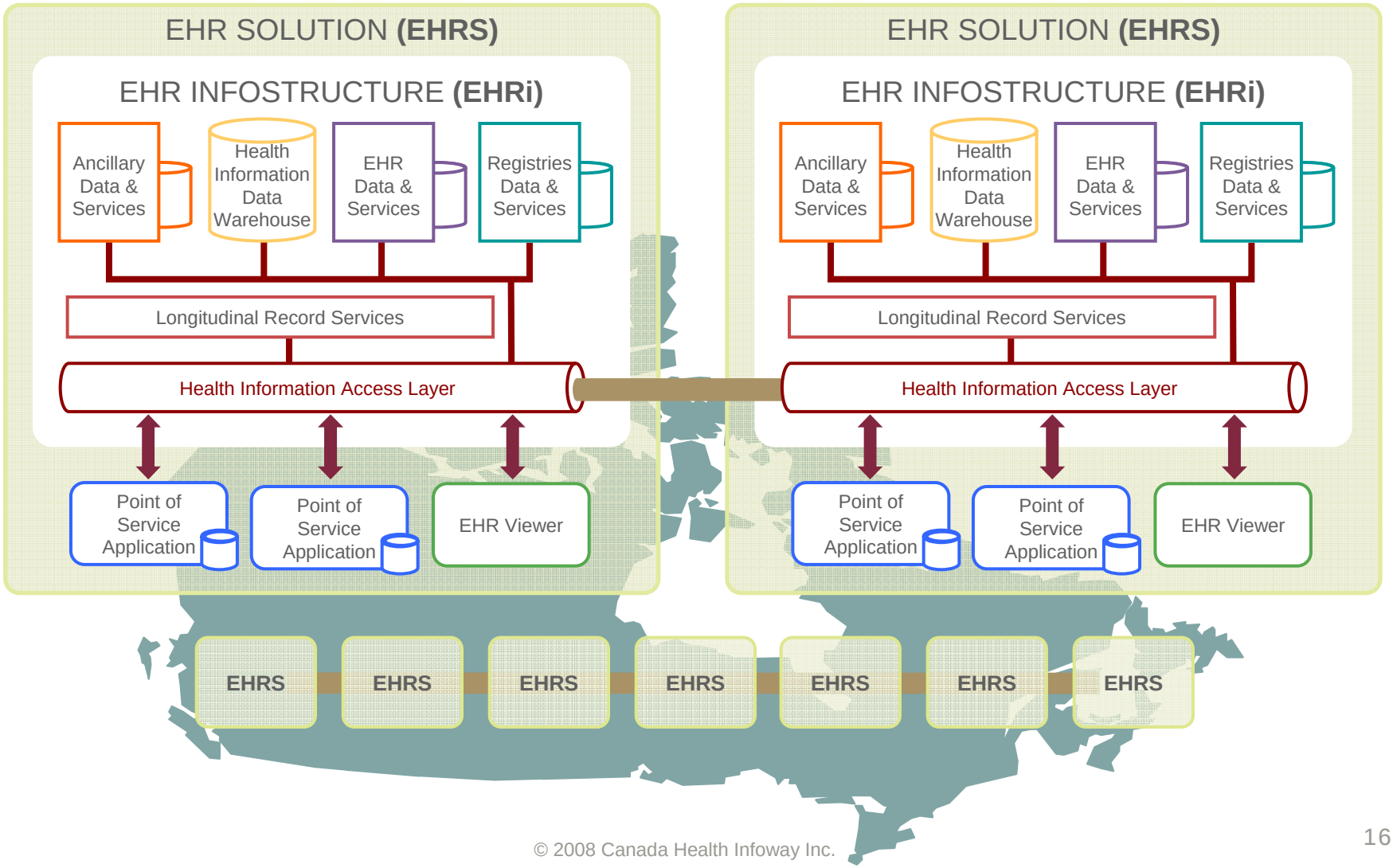
End-User Perspective: EMR Application



Pan-Canadian EHR Infostructures as Peers
Distributed, Federated, Message Based



Rational for Recommended Approach

- Only cost effective scenario to handle degree of application integration required
- Maximized ability to deliver proper response time and consistent access to data across thousands of source systems
- Maximized ability to apply privacy and security policies in a harmonized and consistent fashion
- Enables evolutionary path to semantic harmonization of health information across service delivery points
- Enables high degree of scalability from local health services integration, to regional, provincial or territorial and cross-jurisdictional
- Enables high degree of flexibility in reconfiguration of health services delivery networks


Standardized Architecture
Standardized Interfaces
Standardized Data Structures
Standardized Data Vocabularies
Standardized Functional Behavior
Standards-based EHR Solutions

Standards-based EHR Solutions

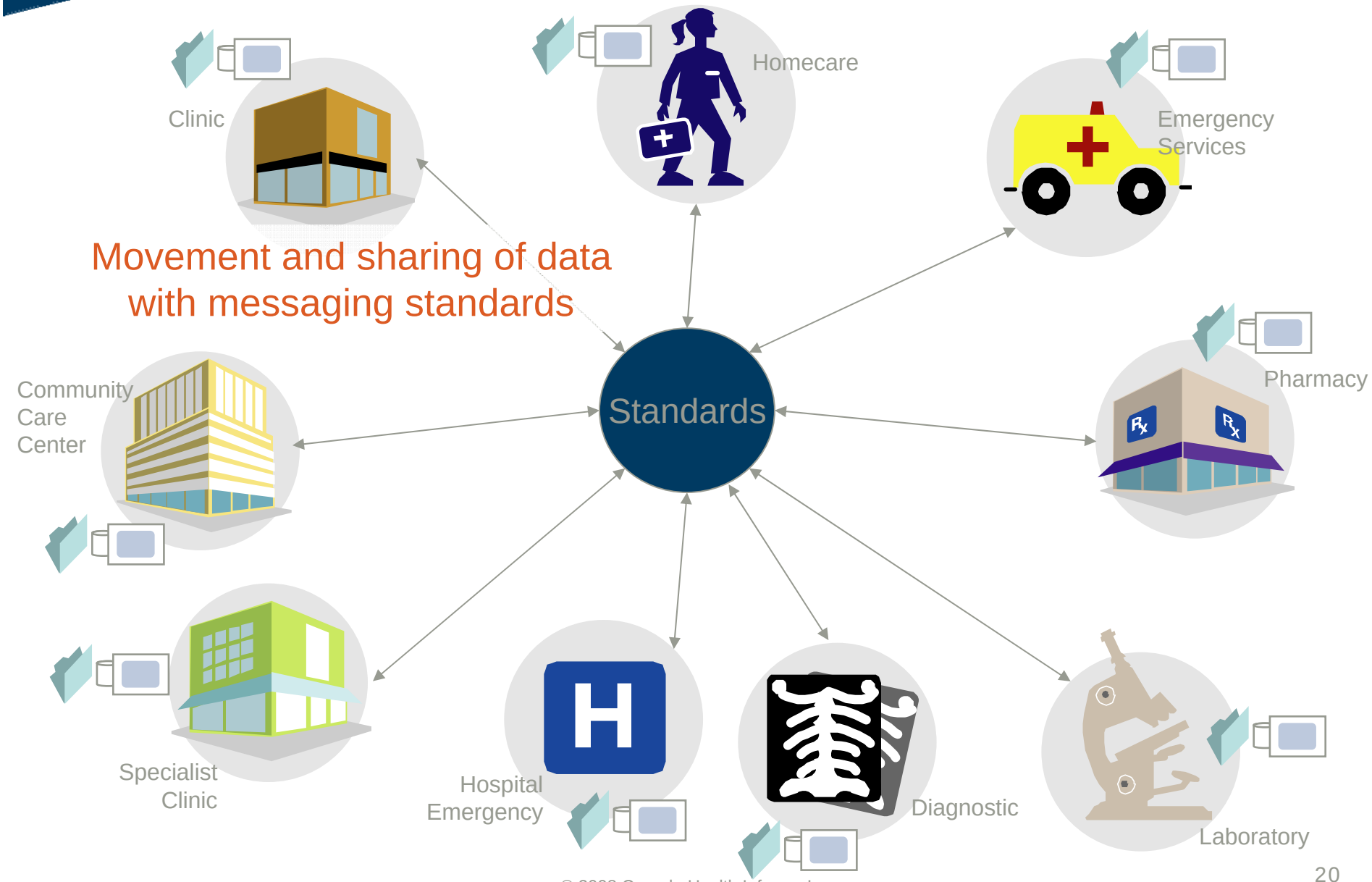
Why Standards?

- They facilitate information exchange; are a critical foundation for EHR
- They create opportunity for future cost reduction as vendors and systems converge on pan-Canadian and international standards
- They ease effort required for replication

Mandatory Investment Requirements

- Compliance to standards (infostructure, interoperability)
- Initiatives must comply with existing guidelines or standards adopted by Infoway
- Where standards or guidelines do not exist, projects must support longer-term interoperability and congruence of solutions

Infoway's role is to set standards and requirements for robust, interoperable products and outcomes



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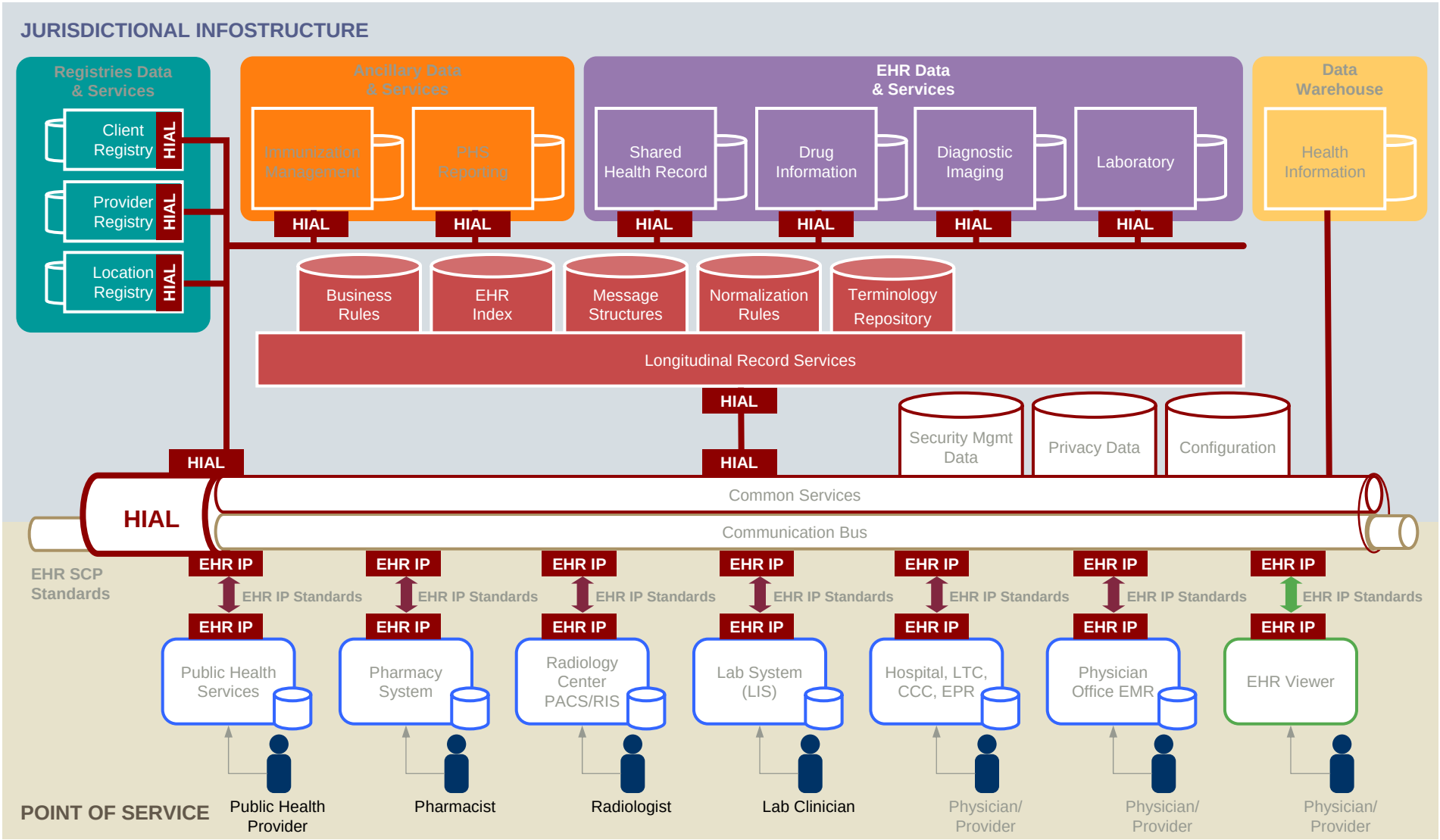
EHR Infostructure: Standards Based Connectivity



Service Oriented Architecture as an Enabler

Application of SOA in EHRi Solutions

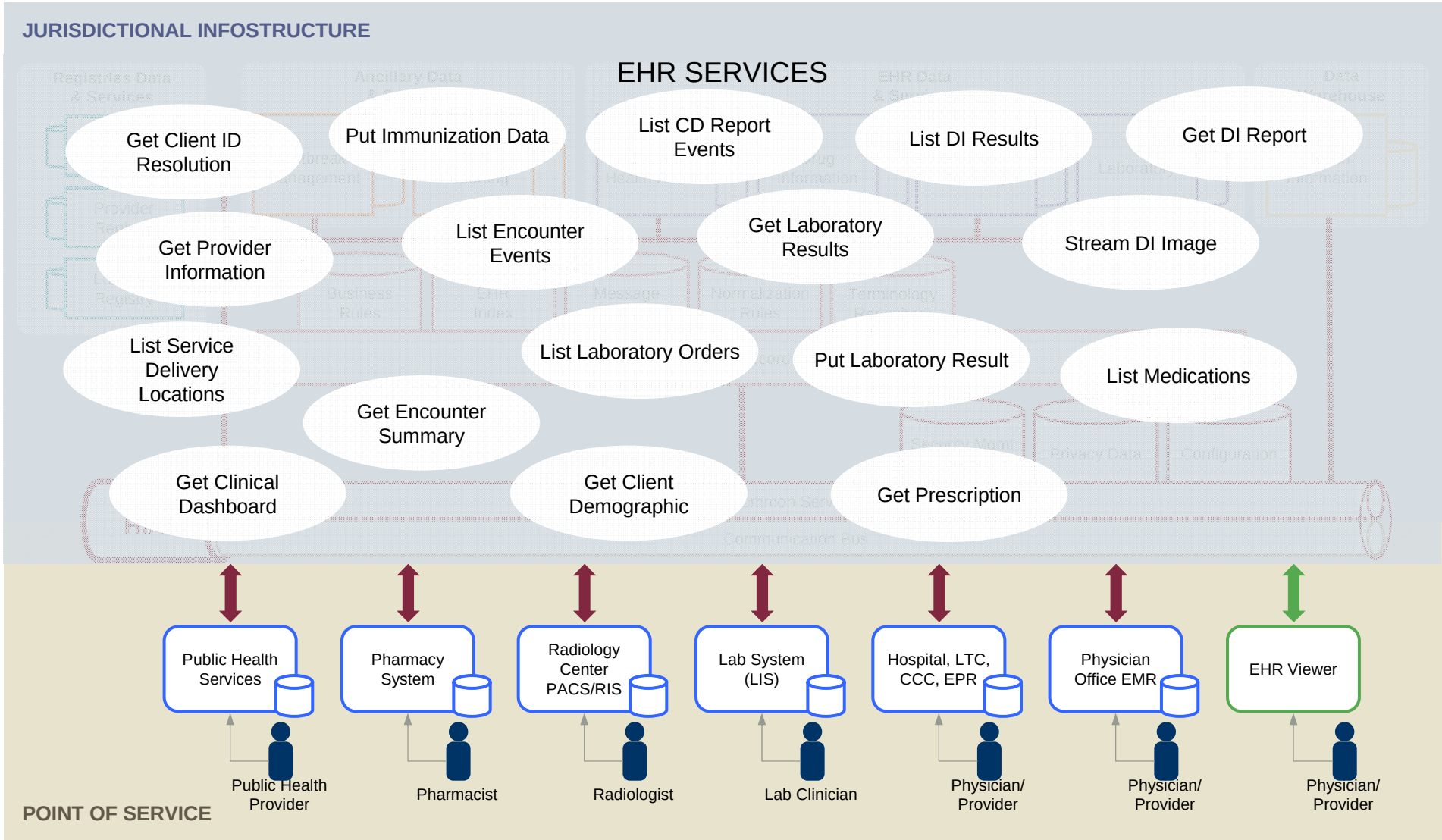
- Repurposed legacy applications to offer services as part of SOA-based EHR Infostructure
- New breed of services to enable coordinated transactions in an EHR Infostructure (e.g. Longitudinal Record Services)
- Use of commercially available solutions to enable components of EHR Infostructure

Service Oriented Architecture as an Enabler

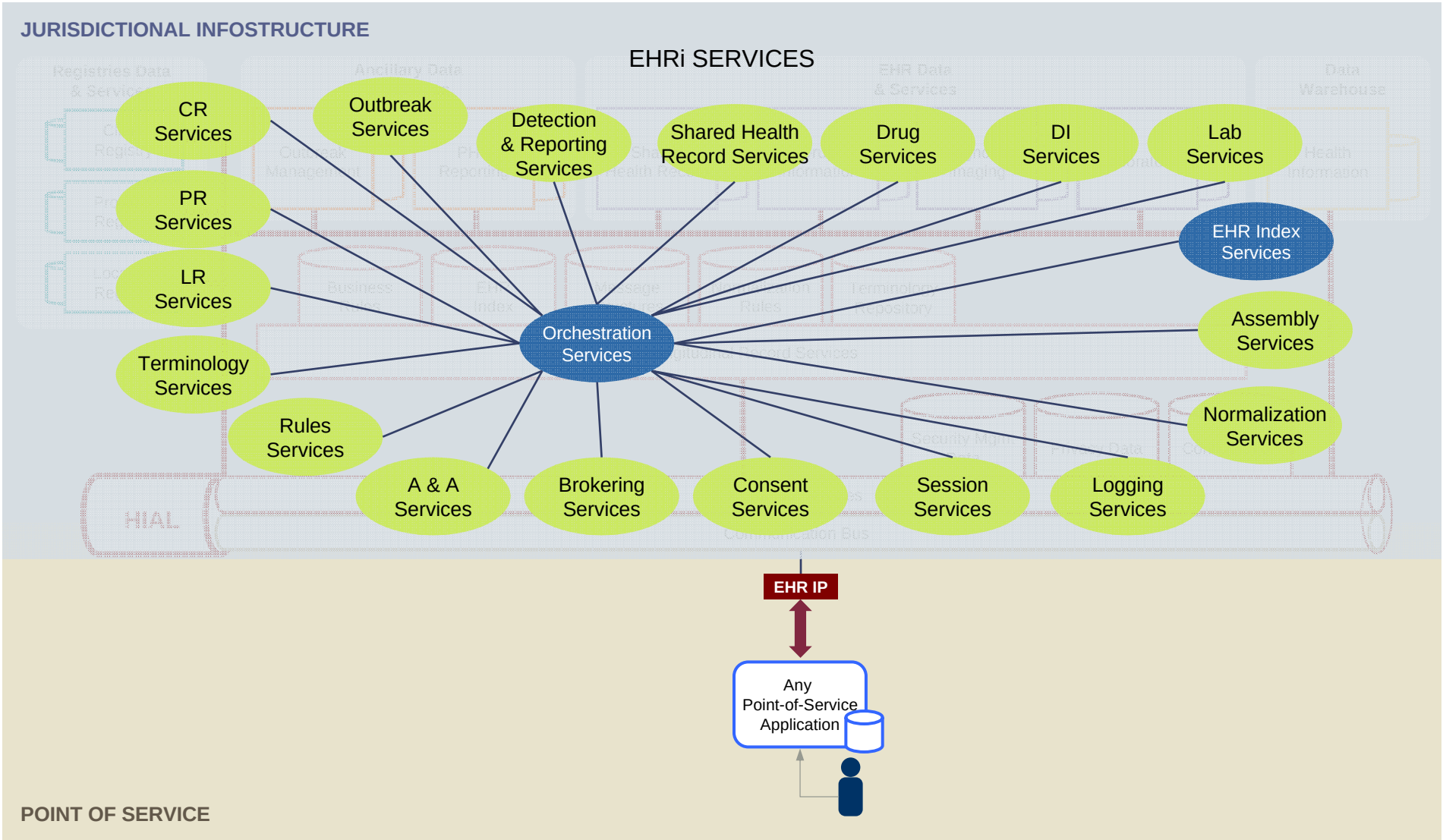
The HIAL as an Application Abstract Layer

- Each jurisdictional HIAL deployed will have different
  - Physical deployment model
  - Some interfaces which are unique to that implementation
- HIAL acts as an abstraction of the EHR such that applications see the EHR in a consistent way across EHR implementations
- Services exposed outside of an EHRi in the form of supported EHR Interoperability Profiles for an entire Infostructure perceived as a single system with transactional services
- Services within an EHR Infostructure to optimize scalability, maintainability and functional flexibility
  - Interfaces not necessarily exposed or standardized

First Type of Abstraction: The EHR as Services



Second Type of Abstraction: Generic Application



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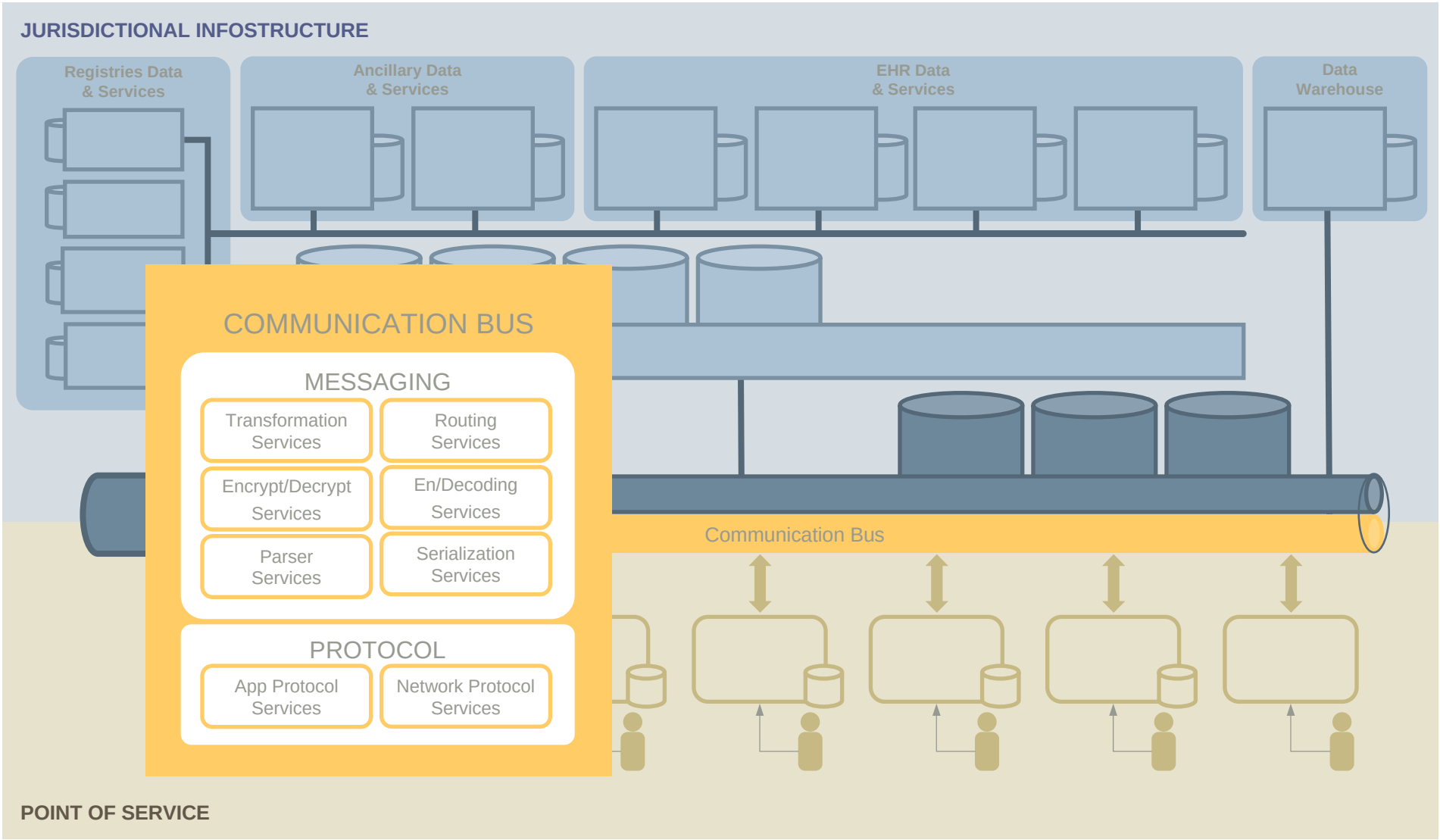
EHR Infostructure: Communication Bus



EHR Infostructure: Common Services

JURISDICTIONAL INFOSTRUCTURE

COMMON SERVICES

INTEROP
- Interoperability Services
- Search/Resolution Services

INTEGRATION
- Service Catalogue Services
- Broker Services
- Mapping Services
- Queuing Services

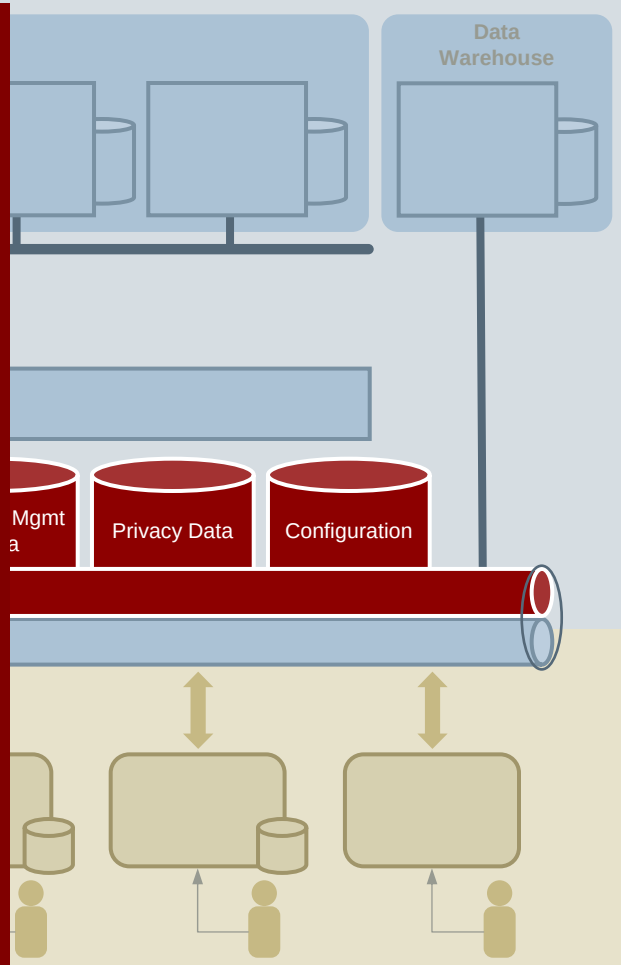
CONTEXT
- Caching Services
- Session Mgmt Services

PRIVACY & SECURITY
- Identity Protection Services
- Anonymization Services
- Consent Directives Mgmt Services
- Identity Mgmt Services
- User Authentication Services
- Encryption Services
- Access Control Services
- Secure Auditing Services
- Digital Signature Services
- General Security Services

SUBSCRIPTION
- Alert/Notification Services
- Pub/Sub Services

MANAGEMENT
- Management Services
- Configuration Services
- Policy Mgmt Services

GENERAL
- Auditing Services
- Log Mgmt Services
- Exception/Error Handling Services



POINT OF SERVICE

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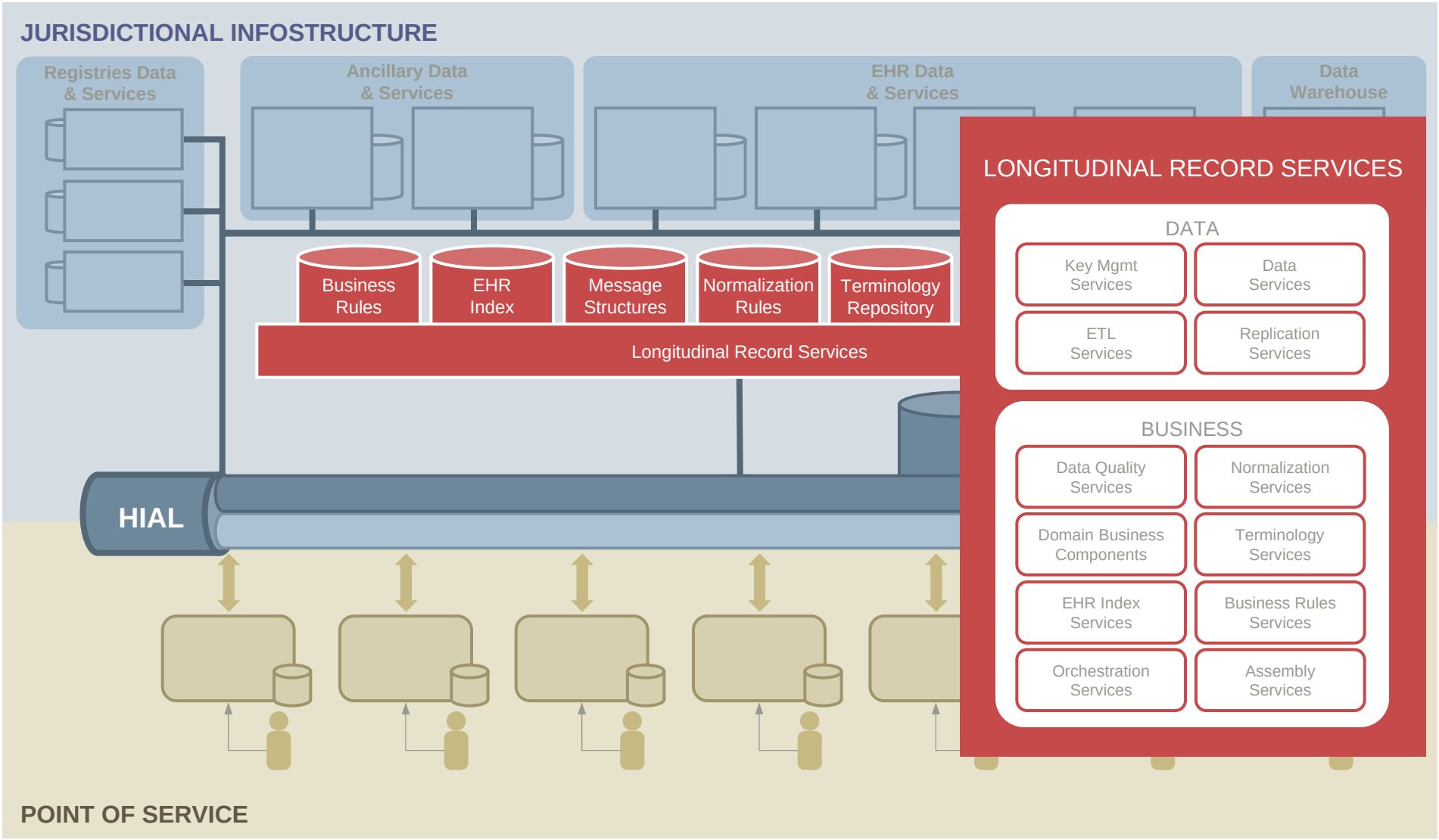
EHR Infostructure: Longitudinal Record Services



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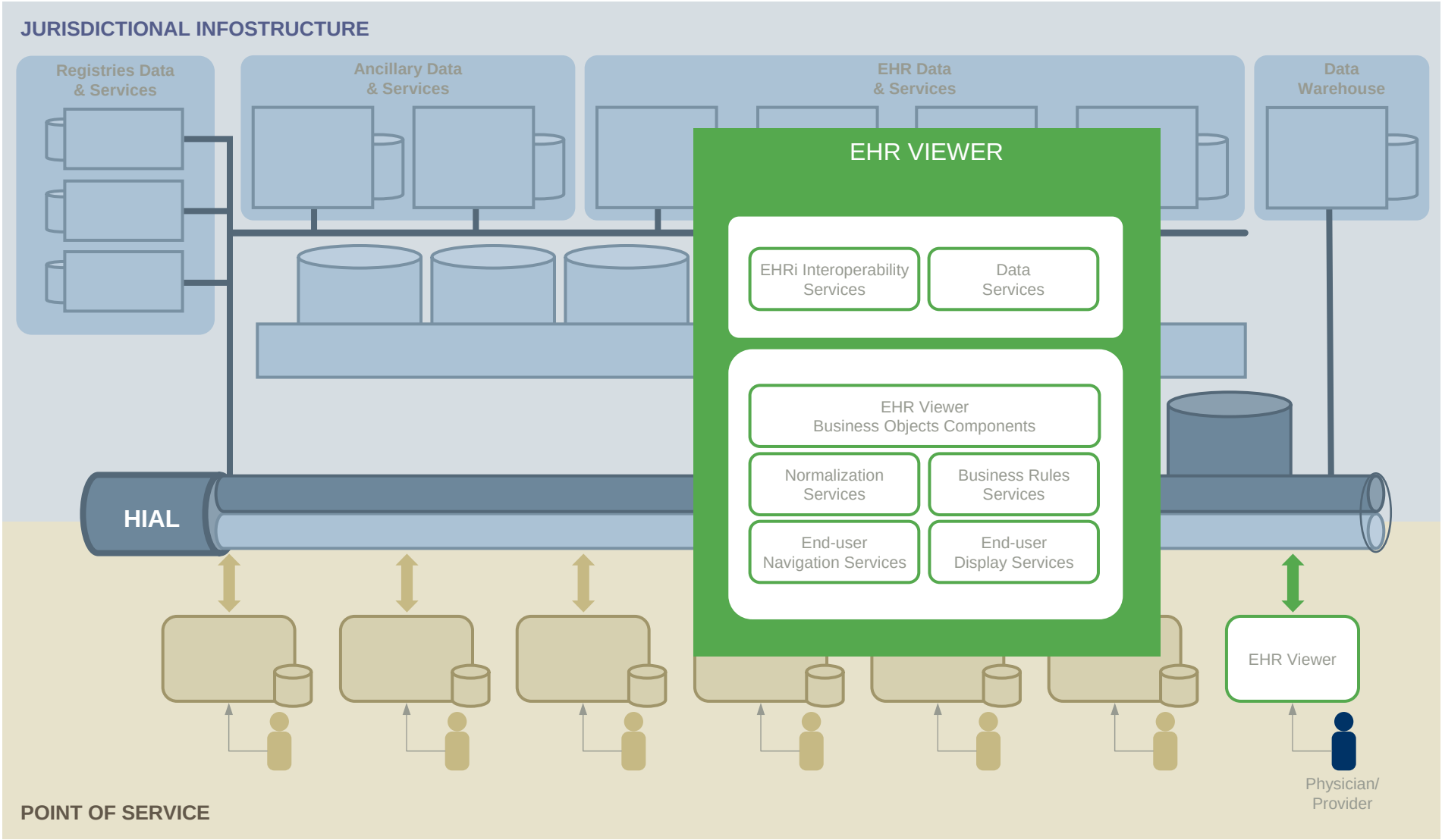

In Conclusion

Summary

Supporting Clinicians

- Provider adoption – Approach designed to support use cases across continuum of care with timely and accurate information for the clinician
- Mass customized views of data tailored to provider needs that is authoritative, reliable, responsive
- Semantic interoperability of health information across service delivery points

Summary

Health Care Information Solution Architecture

- Interoperability that is cost effective using a SOA approach
  - Standardized within a jurisdiction
  - Standardized to some degree for inter-jurisdictional interoperability
- Common model of integration, secure and private, scalable, extensible, preserves current investments – an application abstraction layer that provides a common integration view and EHR view across Canada
- Standards – common messages and nomenclatures adopted across Canada
- Enables high degree of flexibility in reconfiguration of health services delivery networks

Thank you!

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