nehta | THE AUSTRALIAN E-HEALTH RESEARCH CENTRE

eHealth

FHIR® works with SNOMED CT

Implementing a Federated National Terminology Service

SNOMED CT Expo 2015

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Strategic Directions 2015-2020

1. Demonstrate successful large scale implementations of SNOMED CT.
2. Remove barriers to adoption for our customers and stakeholders.
3. Enable continuous development of our product to meet customer requirements.
4. Provide scalable products and services that drive SNOMED CT adoption.
5. Set new trends and shape new technologies that increase the overall use of SNOMED CT.

Challenges

Challenge	Solution
Some terminologies rich, hence complex	Services that use richness, abstract complexity
Rules for handling code systems can be subtle	Services that abstract and encode these rules
Many code sets, formats, release cycles - often differ across sites	Services that provide common interaction for a variety of code systems
Hard to manage/align code systems across many systems	Centralised services to manage code systems across enterprise systems

Challenges

Challenge	Solution
Multiple sources for code systems with different release cycles	“One stop shop” for all national and enterprise code systems
Limited tooling to support localisation	Localisation and authoring tooling that suitably abstracts complexity
Hard to discover/share work	Registry to help discover, share, reuse and collaborate
Duplicated effort at many levels - vendors, implementers, enterprises	Tools, services and processes to address and reduce duplication

Delivery through partnership

Partnership between

- National E-Health Transition Authority (NEHTA)
- CSIRO through the Australian e-Health Research Centre (AEHRC)

Leverage knowledge, experience and technology of each organisation

- Ontoserver, Shrimp, Snapper and implementation experience
- Lingo and terminology authoring experience
- Shared understanding and close working relationship

Conceptual overview

Implementation teams

Terminology teams/centres

National Clinical Terminology Service

Localisation

Authoring

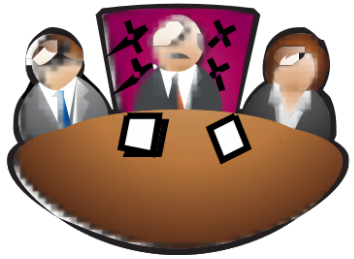
Shared Registry

NCTS team

Runtime Services

Design time Services

Federated distribution



Governance

Applications

Implementers

Vendors

Components

Distribution and access services

- One stop shop for terminologies and code sets with a common API
- Extract and download or runtime services

Authoring and localisation services

- Authoring SNOMED CT-AU/AMT extensions (incl. synonyms/preferred)
- Creating/maintaining value sets and maps

Shared registry

- Registration of available artefacts – value sets, maps, extensions…

Request submission services

- Structured and unstructured request submission and tracking/notification

Web portal

Distribution and access services

National server with a federated set of servers

- designed to aid implementation of terminologies in Australia

Central national server - in production

- response to demand for simple “design time” downloads

Greater functionality under development for

- the national server design time services
- local server runtime services
- synchronisation for “child” servers

Based on FHIR® terminology subsystem using Ontoserver

Why federated servers?

Scalability, performance and availability

Allows for localisation

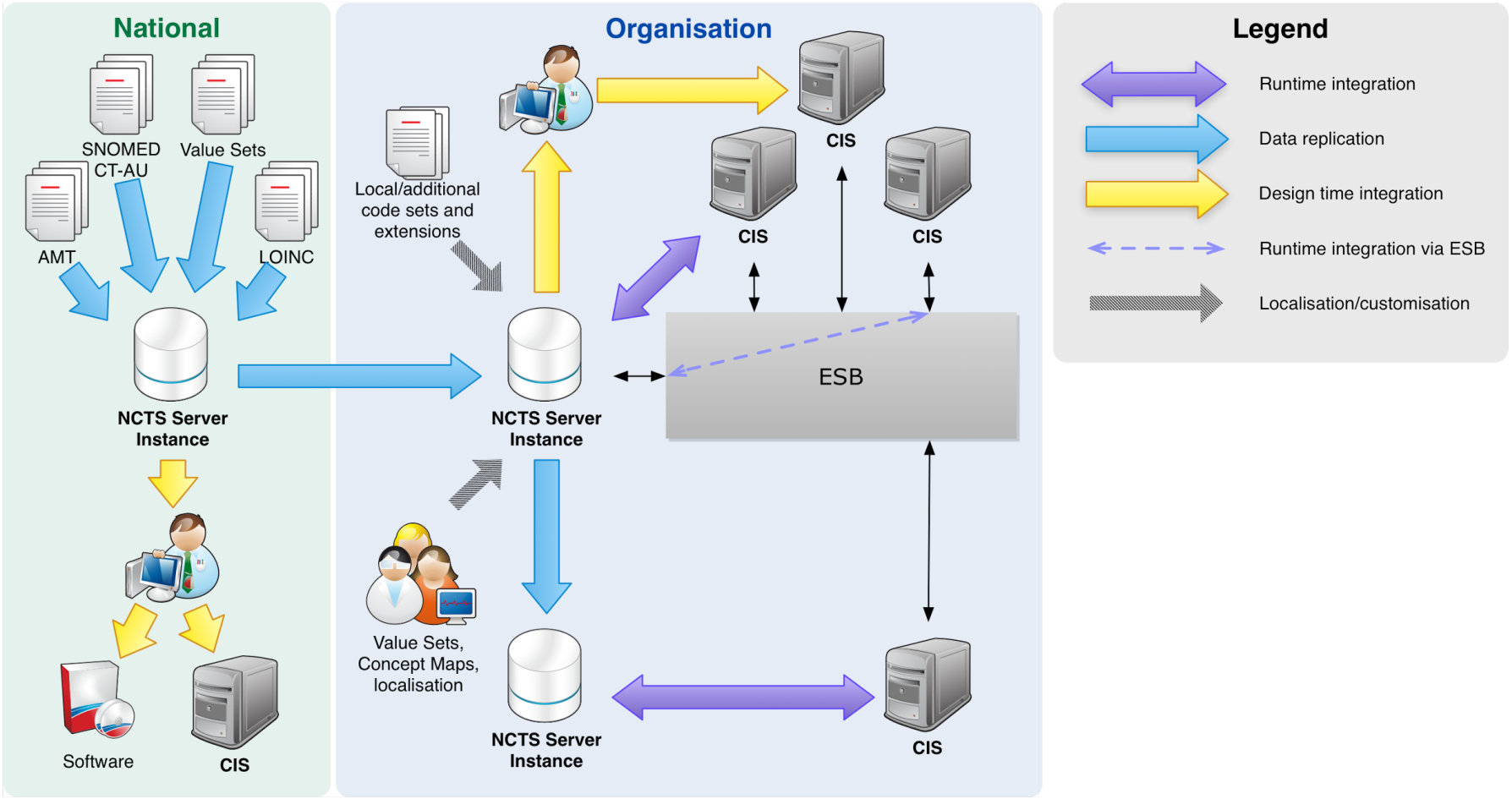
- Value sets (including alternative descriptions for concepts)
- Mappings
- Local and additional terminologies/code sets

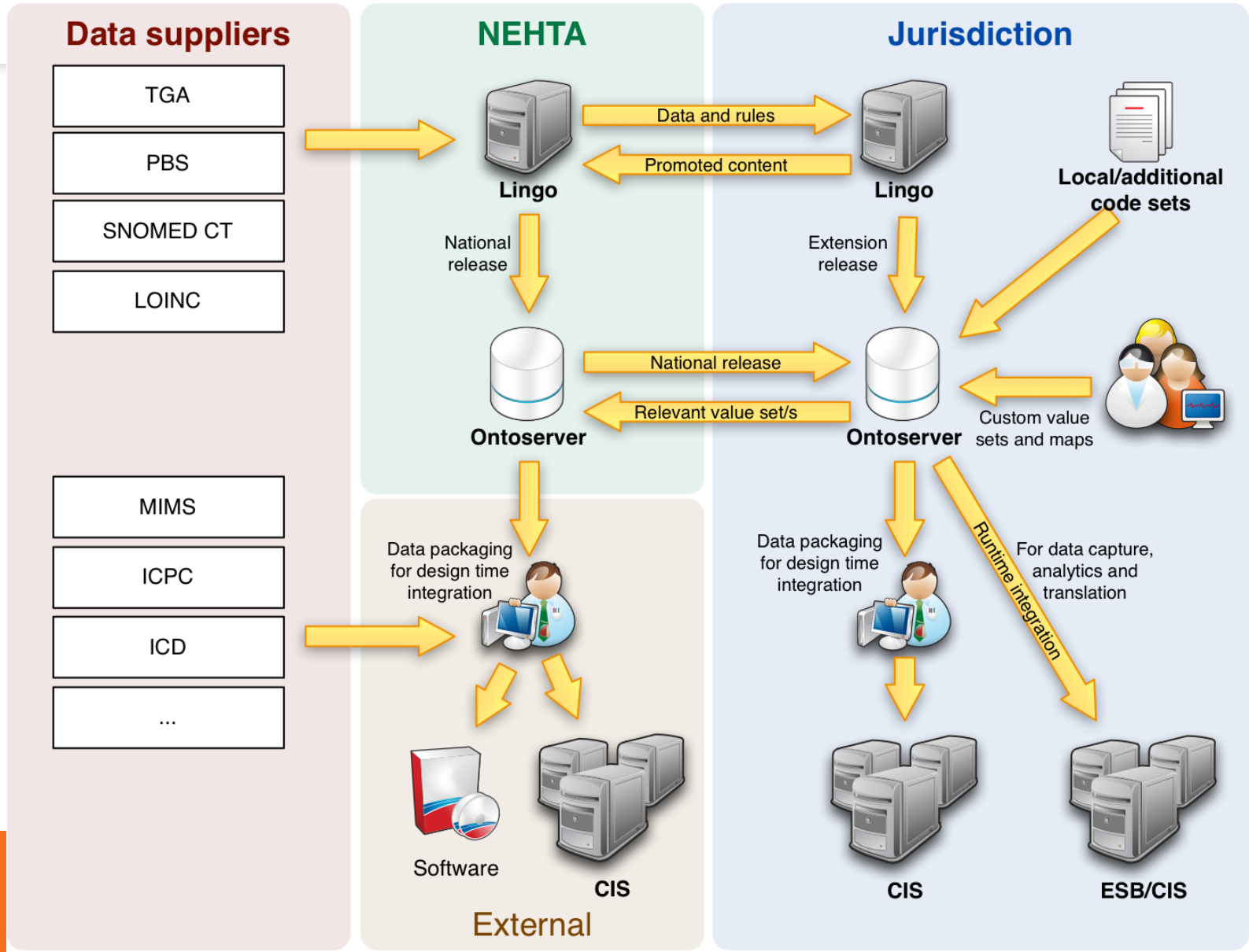
Operate disconnected, synchronise when connected

Provides centralised management of content

Provides for local autonomy

Distribution & Access Services




Data suppliers
TGA
PBS
SNOMED CT
LOINC
MIMS
ICPC
ICD
...
NEHTA
Jurisdiction
Lingo
Data and rules
Promoted content
Lingo
Local/additional code sets
National release
Extension release
Ontoserver
National release
Relevant value set/s
Ontoserver
Custom value sets and maps
Data packaging for design time integration
Data packaging for design time integration
Runtime integration
For data capture, analytics and translation
Software
CIS
CIS
ESB/CIS
External

Distribution & access services API

Services provided via FHIR® terminology APIs to facilitate

- Data capture
- Translation
- Analytics
- Validation

National server to support “design time” services only

Local servers may support full “design or run time” integration

Supported content

Storage and indexing of the following types of content

- SNOMED CT-AU, AMT, and other local SNOMED CT extensions
- LOINC
- FHIR® Value Sets which may contain simple and hierarchical code systems
- FHIR® Concept Maps

Why FHIR® based services?

- A standards-based API
- Not many existing standards, many proprietary approaches
- Existing standards are large, complex and unapproachable
- FHIR® terminology subsystem relatively light and implementer/developer focused
- Generated libraries for FHIR® clients freely available
  - NCTS higher level library supplied above these libraries

FHIR® terminology subsystem

Value Sets

- Metadata – identity, version, publisher, description
- Content – rules for what codes are in the value set

Concept Maps

- Metadata – identity, version, publisher, description
- Content – source code, target code, relationship

Operations

- expansion, validation, translation

What is Ontoserver?

- "Turnkey" terminology service
  - lightweight to create a new instance and own/maintain
- Manages complexity of RF2 distributions & multiple versions
- Fast search with state-of-art ranking algorithms
- Integrated classifier (Snorocket) for local SNOMED extensions
- FHIR support
- Proven - developed to support Snapper as embedded server, now supports Shrimp in Cloud deployment

Ontoserver FHIR® demonstration via Shrimp

Shrimp browser built on Ontoserver

http://ontoserver.csiro.au/shrimp

Search functionality identical to value set expand with filter

Value set functionality

Shared Registry

To improve interoperability and increase the utility of the NCTS, a Shared Registry system will be built and made available. The Shared Registry will:

- Provide a *System of Record* of definitions of technical artifacts such as Value Sets and Concept Maps
- The Shared Registry will host definitions of all National artefacts and also allow stakeholders to upload and share their own
- Technical specifications may reference these artefacts
- Will initially be deployed as a web site and, in future may support integration with development tools through an API
- Ultimately, this will result in a stronger community of terminology users

NCTS Authoring and Localisation

- Lightweight tools for maps and value sets
- Template based authoring to abstract complex authoring
- Promotion of content to the national release/s
- Registry for content not promoted to national release
- Request submission management at national and enterprise levels

NCTS Authoring and Localisation

What is Lingo?

NEHTA's authoring, maintenance, release and integration tool. Used to develop and release SNOMED CT-AU and AMT since July 2014

- Standards based, central server architecture and rich web client
- SNOMED CT and extension focused
- Fast, continuous export and release processes with inbuilt QA
- Integrated classifier (using CSIRO's Snorocket)
- Designed to integrate:
  - "upstream" with data suppliers (IHTSDO, TGA etc)
  - "downstream" with clinical terminology implementers and users

Abstract complexity away from authors – more accessible

Engagement

Design and build collaboration with interested lead organisations

Connectathons to regularly work with increments and get feedback

Piloting services with lead organisations with identified projects

Incremental delivery and development approach based on service/feature prioritisation

Roadmap

Distribution and access services

- National server for design time use with FHIR API – Q1 2016
- Pilot “federated” child servers with synchronisation in – Q1 2016

Authoring and localisation services

- Extension authoring pilot with state health departments – Q1 2016
- Lightweight value set and mapping tools available – Q2 2016

Shared registry – Q3 2016

Request submission services – second phase

Summary

NCTS will provide coordinated services, systems and processes to

- ease consumption and use of terminologies
- automate usage feedback to help improve the terminology and services
- reduce duplicated effort and consequent risk - promote reuse
- abstract complexity - reduce effort for high quality implementations
- provide “one stop shop” for national terminologies
- simplify localisation/extension/management of code systems
- provide common and shared tooling
- enable discovery and reuse of work

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Thank you