



Australian Government

Australian Digital Health Agency

Secure Messaging Industry Offer

FHIR R4

Webinar 5

4 September 2019

Agenda

- Welcome
- Project Management
- Challenges, Journey & Value
- FHIR R4
 - Part 1 - Big Picture: FHIR R4 is here
 - Part 2 - Value add refinements
- Next Steps
- Contact Us



Project Management

- Last webinar – request for information
- Based on dates received, we are expecting:
 - Need for support will peak between Nov 2019 – Jan 2020
 - Majority of Offer completed by mid April 2020
- This is what we are planning for!
- Please submit your information – reminder email after webinar.





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Challenges, Journey & Value

Secure messaging – the vision and benefits

By enabling the secure exchange of health information, the following will be delivered by 2022:

- Every healthcare provider will have the ability to communicate with other professionals and their patients via secure digital channels if they so choose. This will end dependence on paper-based correspondence and the fax machine or post.
- From within their chosen system, healthcare providers will be able to search for other healthcare providers in a single directory, and easily and securely share clinical correspondence.
- Patients will be able to communicate with their healthcare providers using these digital channels.
- Patients' health data will be safeguarded and able to be shared securely at their discretion. They will spend less time having to retell their story, and their healthcare providers will be able to work together more effectively to provide coordinated care.



Secure messaging – challenges to overcome

There are many impediments to the vision of secure messaging in the Australian healthcare industry:

- Message payloads not standardised for commonly used communications
- Directories and provider data not discoverable across repositories
- Data quality problems – inconsistent and lack of validated identifiers
- Acknowledgements of messages not received
- Lack of conformance with standards – or a process to enforce conformance
- Business model/commercial impediments



Key steps on the secure messaging journey

Secure Messaging Industry Offer (SMIO)

Secure Messaging Proof of Concept

STEP 1

STEP 2

STEP 3

Recipient discovery & message addressing

Develop solution for finding message recipients and retrieving addressing information to support message delivery.

Provider Directory Service

Message payload standardisation

Develop standard message formats that can be sent, received and understood by all information systems.

Message Format Agreement & Conformance Profiler Tool

Improve data quality & ease data management burden

Enable providers to maintain their information in one location. Quality check it and broadcast it to authorised subscribers.

Service Registration Assistant



How do the three journey steps address our challenges?

Challenge	Addressed By	How?
Non standardised message payloads	STEP 2	Addressed by TWG agreement on message formats and conformance profiler tool.
Provider data not discoverable across repositories	STEP 1	Addressed through the development of standardised FHIR-compliant directories.
Data quality – inconsistent and lack of validated identifiers	STEP 3	Addressed by the Service Registration Assistant.
Acknowledgements of messages not received	STEP 2	Addressed by adoption of Australian Standard ATS-5822 as the basis for message exchange.
Lack of conformance with standards – or a process to enforce conformance	All steps	Addressed by agreements achieved through the TWG and through agency tools built to assist in conformance testing the industry offer components.
Business model/commercial impediments	All steps	Addressed by industry working together in partnership with the agency.





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FHIR R4

Technical

- Part 1 - Big Picture: FHIR R4 is here
 - Why should we adopt FHIR R4?
 - What has changed from FHIR R3 to R4?
 - Documentation and tools
 - Q & A
- Part 2 - Value add refinements
 - Release of HL7 v2 conformance profiler toolkit
 - Enhancement of artefacts to remove ambiguity and provide clarity
 - Q & A



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Part 1 - Big Picture: FHIR R4 is here



Big picture – FHIR R4 is here!

- The Provider Directory Service will align with the Fast Healthcare Interoperability (FHIR) standard.
- The previous version of FHIR, Standard for Trial Use 3 (R3 aka “STU3”), has been superseded by a new version, FHIR Release 4 (R4).
- Differences between R3 and R4 that are relevant to our secure messaging work are very minor.
- The Agency proposes to use R4 and will be seeking formal acceptance on this from the TWG.

NB: The Agency has provided both R3 and R4 endpoints in its test environments.



KEY POINT: The impact of adopting R4 is small!

If you have not started coding the FHIR part of your solution...

...the proposal to use R4 requires no change or re-work.

Just use R4!

If you have started coding your solution with R3...

...the proposal to use R4 may impact you...

...but the changes and impact will be VERY small.



IMPORTANT

FHIR R4 offers significant benefits over FHIR R3

- R4 is current
R3 has been superseded by R4.
- R4 is more mature
R4 incorporates all the hard "lessons learned".
- R4 is more stable
R4 offers stability – it is the first "normative" version of FHIR.
Remember....R3 is "STU3" which stands for "Standard **for trial use**"!
- Future versions of FHIR will be backwards compatible with R4
Not so with R3.



BIG benefit of R4 - normative content – this brings stability

- Normative (R4) = "This content has been subject to review and production implementation in a wide variety of environments. The content is considered to be stable and has been 'locked', subjecting it to FHIR Inter-version Compatibility Rules. While changes are possible, they are expected to be infrequent and are tightly constrained."
- Trial Use (R3/STU3) = "This content has been well reviewed and is considered by the authors to be ready for use in production systems. It has been subjected to ballot and approved as an official standard. However, it has not yet seen widespread use in production across the full spectrum of environments it is intended to be used in. In some cases, there may be documented known issues that require implementation experience to determine appropriate resolutions for. **Future versions of FHIR may make significant changes to Trial Use content that are not compatible with previously published content.**"

"The most significant change in R4 is that the base platform of the standard has passed a normative ballot and will be submitted to the American National Standards Institute (ANSI) as a normative standard."

-- Pulse IT, <https://www.pulseitmagazine.com.au/news/australian-ehealth/4737-h17-publishes-fhir-release-4>



Examples of stability that come with "normative"

- the names, path and meaning of previously existing data elements will not be changed
- the allowed list of data types will not be added, removed or changed
- minimum element cardinalities will not be changed
- value sets with an enumerated list of codes (and 'fixed' binding) may have additional codes added, but will never have codes removed



Summary - types of changes that have been made in R4

- Same resources – no change
- A few new fields added to resources
- A few fields deleted from resources
- A few changes to the types of fields
- A few changes to cardinality of relationships
- A few new values added to Value Sets

IMPORTANT: The changes made by HL7 in moving from R3 to R4 are very modest.
Less than 2% of the FHIR specification has changed.



Example R4 change - new field added to a resource

Structure

Name	Flags	Card.	Type	Description & Constraints
HealthcareService	TU		DomainResource	The details of a healthcare service available at a location Elements defined in Ancestors: id, meta, implicitRules, language, tx External identifiers for this item
identifier	Σ	0..*	Identifier	
active	?! Σ	0..1	boolean	Whether this HealthcareService record is in active use
providedBy	Σ	0..1	Reference(Organization)	Organization that provides this service
category	Σ	0..*	CodeableConcept	Broad category of service being performed or delivered Service category (Example)
type	Σ	0..*	CodeableConcept	Type of service that may be delivered or performed Service type (Example)
specialty	Σ	0..*	CodeableConcept	Specialties handled by the HealthcareService Practice Setting Code Value Set (Preferred)
location	Σ	0..*	Reference(Location)	Location(s) where service may be provided
name	Σ	0..1	string	Description of service as presented to a consumer while searching
comment	Σ	0..1	string	Additional description and/or any specific issues not covered elsew
extraDetails		0..1	markdown	Extra details about the service that can't be placed in the other fiel
photo	Σ	0..1	Attachment	Facilitates quick identification of the service
telecom		0..*	ContactPoint	Contacts related to the healthcare service
coverageArea		0..*	Reference(Location)	Location(s) service is intended for/available to
serviceProvisionCode		0..*	CodeableConcept	Conditions under which service is available/offered ServiceProvisionConditions (Example)
eligibility		0..*	BackboneElement	Specific eligibility requirements required to use the service
code		0..1	CodeableConcept	Coded value for the eligibility
comment		0..1	markdown	Describes the eligibility conditions for the service
program		0..*	CodeableConcept	Programs that this service is applicable to Program (Example)
characteristic		0..*	CodeableConcept	Collection of characteristics (attributes)
communication		0..*	CodeableConcept	The language that this service is offered in Common Language (Preferred, but limited to all resources)

Summary	A new field is added to a resource.
Example	HealthcareService resource now has a program field (HealthcareService.program). It shows the programs that this HealthcareService is a part of.
Impact	Low. New field in response can be used by consuming system, if desired.



Example R4 change – field deleted from a resource

Structure

Name	Flags	Card.	Type	Description & Constraints
HealthcareService	TU		DomainResource	The details of a healthcare service available at a location Elements defined in Ancestors: id, meta, implicitRules, language, te External identifiers for this item
identifier	Σ	0..*	Identifier	
active	? Σ	0..1	boolean	Whether this HealthcareService record is in active use
providedBy	Σ	0..1	Reference(Organization)	Organization that provides this service
category	Σ	0..*	CodeableConcept	Broad category of service being performed or delivered Service category (Example)
type	Σ	0..*	CodeableConcept	Type of service that may be delivered or performed Service type (Example)
specialty	Σ	0..*	CodeableConcept	Specialties handled by the HealthcareService Practice Setting Code Value Set (Preferred)
location	Σ	0..*	Reference(Location)	Location(s) where service may be provided
name	Σ	0..1	string	Description of service as presented to a consumer while searching
comment	Σ	0..1	string	Additional description and/or any specific issues not covered elsew
extraDetails		0..1	markdown	Extra details about the service that can't be placed in the other field
photos	Σ	0..*	Attachment	Facilitates quick identification of the service
telecom		0..*	ContactPoint	Contacts related to the healthcare service
coverageArea		0..*	Reference(Location)	Location(s) service is intended for/available to
serviceProvisionCode		0..*	CodeableConcept	Conditions under which service is available/offered ServiceProvisionConditions (Example)
eligibility		0..*	BackboneElement	Specific eligibility requirements required to use the service
code		0..1	CodeableConcept	Coded value for the eligibility
comment		0..1	markdown	Describes the eligibility conditions for the service
program		0..*	CodeableConcept	Programs that this service is applicable to Program (Example)
characteristic		0..*	CodeableConcept	Collection of characteristics (attributes)
communication		0..*	CodeableConcept	The language that this service is offered in Common Language (Preferred, but limited to All resources)

Summary

A field is deleted from a resource.

Example

eligibilityNote field has been removed from HealthcareService (ie. there is no longer a field HealthcareService.eligibilityNote).

Impact

Small change required. Consuming code must be updated so it no longer uses this field.



Example R4 change – type of a field changes

Structure

Name	Flags	Card.	Type	Description & Constraints
HealthcareService	TU		DomainResource	The details of a healthcare service available at a location Elements defined in Ancestors: id, meta, implicitRules, language, etc External identifiers for this item
identifier	Σ	0..*	Identifier	
active	?! Σ	0..1	boolean	Whether this HealthcareService record is in active use
providedBy	Σ	0..1	Reference(Organization)	Organization that provides this service
category	Σ	0..*	CodeableConcept	Broad category of service being performed or delivered Service category (Example)
type	Σ	0..*	CodeableConcept	Type of service that may be delivered or performed Service type (Example)
specialty	Σ	0..*	CodeableConcept	Specialties handled by the HealthcareService Practice Setting Code Value Set (Preferred)
location	Σ	0..*	Reference(Location)	Location(s) where service may be provided
name	Σ	0..1	string	Description of service as presented to a consumer while searching
comment	Σ	0..1	string	Additional description and/or any specific issues not covered elsewhere
extraDetails		0..1	markdown	Extra details about the service that can't be placed in the other fields
photo	Σ	0..1	Attachment	Facilitates quick identification of the service
telecom		0..*	ContactPoint	Contacts related to the healthcare service
coverageArea		0..*	Reference(Location)	Location(s) service is intended for/available to
serviceProvisionCode		0..*	CodeableConcept	Conditions under which service is available/offered ServiceProvisionConditions (Example)
eligibility		0..*	BackboneElement	Specific eligibility requirements required to use the service
code		0..1	CodeableConcept	Coded value for the eligibility
comment		0..1	markdown	Describes the eligibility conditions for the service
program		0..*	CodeableConcept	Programs that this service is applicable to Program (Example)
characteristic		0..*	CodeableConcept	Collection of characteristics (attributes)
communication		0..*	CodeableConcept	The language that this service is offered in Common Languages (Preferred, but limited to All resources)

Summary	The type of a resource's field changes.
Example	HealthcareService.extraDetails was a "string" in R3. In R4, it has type "markdown" (a string that may contain markdown syntax for optional processing by a markdown presentation engine).
Impact	Modest impact. Consuming code should be updated to take advantage of the new type of information returned.



Example R4 change - change to the cardinality of a relationship

Name	Flags	Card.	Type	Description & Constraints
HealthcareService	TU		DomainResource	The details of a healthcare service available at a location Elements defined in Ancestors: <i>id</i> , <i>meta</i> , <i>implicitRules</i> , <i>language</i> , <i>tx</i> External identifiers for this item
identifier	Σ	0..*	Identifier	
active	? Σ	0..1	boolean	Whether this HealthcareService record is in active use
providedBy	Σ	0..1	Reference(Organization)	Organization that provides this service
category	Σ	0..*	CodeableConcept	Broad category of service being performed or delivered <i>Service category (Example)</i>
type	Σ	0..*	CodeableConcept	Type of service that may be delivered or performed <i>Service type (Example)</i>
specialty	Σ	0..*	CodeableConcept	Specialties handled by the HealthcareService <i>Practice Setting Code Value Set (Preferred)</i>
location	Σ	0..*	Reference(Location)	Location(s) where service may be provided
name	Σ	0..1	string	Description of service as presented to a consumer while searching
comment	Σ	0..1	string	Additional description and/or any specific issues not covered elsew
extraDetails		0..1	markdown	Extra details about the service that can't be placed in the other field
photo	Σ	0..1	Attachment	Facilitates quick identification of the service
telecom		0..*	ContactPoint	Contacts related to the healthcare service
coverageArea		0..*	Reference(Location)	Location(s) service is intended for/available to
serviceProvisionCode		0..*	CodeableConcept	Conditions under which service is available/offered <i>ServiceProvisionConditions (Example)</i>
eligibility		0..*	BackboneElement	Specific eligibility requirements required to use the service
code		0..1	CodeableConcept	Coded value for the eligibility
comment		0..1	markdown	Describes the eligibility conditions for the service
program		0..*	CodeableConcept	Programs that this service is applicable to <i>Program (Example)</i>
characteristic		0..*	CodeableConcept	Collection of characteristics (attributes)
communication		0..*	CodeableConcept	The language that this service is offered in <i>Common Languages (Preferred but limited to All languages)</i>

Summary	The cardinality of a relationship changes.
Example	HealthcareService.eligibility specifies the eligibility requirements to use the service. In R3, a maximum of one eligibility criteria could be specified (0:1). In R4, multiple can be specified (0:M).
Impact	Small impact. Consuming code must be updated to receive and display multiple eligibility criteria to end users.



Example R4 change – new value added to a Value Set

Name	Flags	Card.	Type	Description & Constraints
OperationOutcome	Σ N		DomainResource	Information about the success/failure of an action Elements defined in Ancestors: id, meta, implicitRules, langu
issue	Σ	1..*	BackboneElement	A single issue associated with the action
severity	Σ	1..1	code	fatal error warning information IssueSeverity (Required)
code	Σ	1..1	code	Error or warning code IssueType (Required)
details	Σ	0..1	CodeableConcept	Additional details about the error Operation Outcome Codes (Example)
diagnostics	Σ	0..1	string	Additional diagnostic information about the issue
location	Σ XD	0..*	string	Deprecated: Path of element(s) related to issue
expression	Σ	0..*	string	FHIRPath of element(s) related to issue

? Documentation for this format

Summary	New values are added to the Value Set for a coded value.
Example	Two new values have been added to the OperationOutcome.issue.code Value Set.
Impact	Low or no impact. Unlikely to necessitate any changes to consuming clients.



Documentation and tools

- The FHIR web site has excellent documentation on:
 - A comprehensive list of the differences between R3 and R4
 - formal documentation of the relationship between the resource structures in R3 and R4
 - “transforms” that can be used to convert between the R3 and R4 formats automatically



For more information....

- FHIR R4 Snapshot (<http://hl7.org.au/fhir/pd/pd2/>)
- Comparing FHIR R3 with FHIR R4 (<https://www.hl7.org/fhir/history.html>)
- FHIR maps (<https://hl7.org/fhir/r3maps.html>)
- FHIR version management policy (defines draft, STU, normative, etc) (<http://hl7.org/fhir/R4/versions.html#std-process>)
- FHIR version compatibility rules (<http://hl7.org/fhir/R4/versions.html#change>)



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Next steps....

- Work through any outstanding questions or concerns.
- Seek formal endorsement from SMIO participants on the use of FHIR R4 as a baseline.



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Part 2 - Value add refinements



HL7 v2 Message payload conformance profiler

- Technical XML profile specification detailing message structure and allowed codes
- Released on Agency's github page:

<https://github.com/AuDigitalHealth/hl7-v2-conformance-profiler>

- No need to build or compile any source
 - just requires a Java runtime

```
$ java ConformanceProfiler [hl7.<version>.<message-type>.<event-type>]
```



Value add refinements

- New versions of artefacts
 - PDS-MP Developer Guide v1.4
 - PDS-MP Tester Guide v1.1
- Additions and modifications of diagrams to better reflect narrative
- Recognition that requirements PDS-4 and PDS-6, PDS-5 and PDS-7 are mutually exclusive respectively
- Additional explicit comments to provide a better understanding of Agency requirements
- Updates to unresolved URL links





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Questions?

Next Steps

- Email – Contract Contact - Confirm acceptance of FHIR R4
- Email – SMIO Contacts – Links, Request for Information
- Recording & Slide Pack on developer website



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