

# Introduction to FHIR

Rik Smithies, NProgram Ltd., UK



Amsterdam, 14-16 November | @HL7 @FirelyTeam | #fhirdevdays18 | [www.fhirdevdays.com](http://www.fhirdevdays.com)

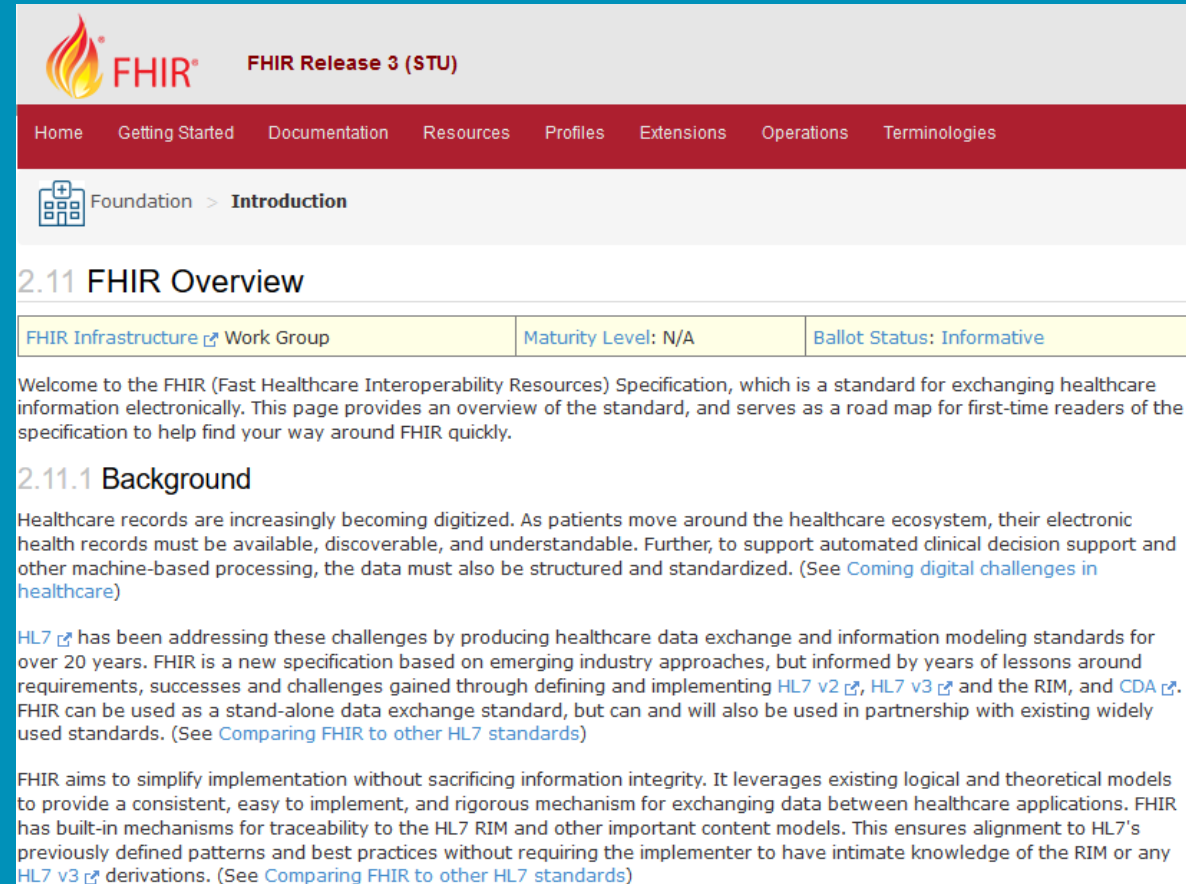
# Who am I?

- Rik Smithies
- Independent Consultant (NProgram Ltd., UK)
- Technical Chair HL7 UK
- FHIR trainer @ HL7 International
- Programmer, (Data) Architect, in health for 20+ years
- [rik@nprogram.co.uk](mailto:rik@nprogram.co.uk)



# What is FHIR?

- The latest HL7 standard for exchanging electronic healthcare information
- Defines a simplified approach to implementation w/o sacrificing information integrity
- Defines “Resource” as the basic building block of all exchangeable content
- [hl7.org/fhir](http://hl7.org/fhir)



The screenshot shows the FHIR Release 3 (STU) website. The header includes the FHIR logo and the text "FHIR Release 3 (STU)". Below the header is a navigation bar with links: Home, Getting Started, Documentation, Resources, Profiles, Extensions, Operations, and Terminologies. The main content area shows the breadcrumb "Foundation > Introduction" and the section "2.11 FHIR Overview". A table below this section provides details about the FHIR Infrastructure Work Group, its maturity level (N/A), and its ballot status (Informative). The text below the table welcomes users to the FHIR (Fast Healthcare Interoperability Resources) Specification, which is a standard for exchanging healthcare information electronically. It also provides an overview of the standard and serves as a road map for first-time readers. The section "2.11.1 Background" follows, explaining that healthcare records are increasingly becoming digitized and that FHIR is a new specification based on emerging industry approaches, informed by years of lessons around requirements, successes, and challenges gained through defining and implementing HL7 v2, HL7 v3, and the RIM, and CDA. FHIR can be used as a stand-alone data exchange standard, but can and will also be used in partnership with existing widely used standards. The text concludes by stating that FHIR aims to simplify implementation without sacrificing information integrity, leveraging existing logical and theoretical models to provide a consistent, easy to implement, and rigorous mechanism for exchanging data between healthcare applications. FHIR has built-in mechanisms for traceability to the HL7 RIM and other important content models, ensuring alignment to HL7's previously defined patterns and best practices without requiring the implementer to have intimate knowledge of the RIM or any HL7 v3 derivations.

FHIR Infrastructure <a href="#">Work Group</a>	Maturity Level: N/A	Ballot Status: Informative
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Welcome to the FHIR (Fast Healthcare Interoperability Resources) Specification, which is a standard for exchanging healthcare information electronically. This page provides an overview of the standard, and serves as a road map for first-time readers of the specification to help find your way around FHIR quickly.

### 2.11.1 Background

Healthcare records are increasingly becoming digitized. As patients move around the healthcare ecosystem, their electronic health records must be available, discoverable, and understandable. Further, to support automated clinical decision support and other machine-based processing, the data must also be structured and standardized. (See [Coming digital challenges in healthcare](#))

HL7 [has](#) been addressing these challenges by producing healthcare data exchange and information modeling standards for over 20 years. FHIR is a new specification based on emerging industry approaches, but informed by years of lessons around requirements, successes and challenges gained through defining and implementing [HL7 v2](#), [HL7 v3](#) and the RIM, and [CDA](#). FHIR can be used as a stand-alone data exchange standard, but can and will also be used in partnership with existing widely used standards. (See [Comparing FHIR to other HL7 standards](#))

FHIR aims to simplify implementation without sacrificing information integrity. It leverages existing logical and theoretical models to provide a consistent, easy to implement, and rigorous mechanism for exchanging data between healthcare applications. FHIR has built-in mechanisms for traceability to the HL7 RIM and other important content models. This ensures alignment to HL7's previously defined patterns and best practices without requiring the implementer to have intimate knowledge of the RIM or any HL7 v3 [derivations](#). (See [Comparing FHIR to other HL7 standards](#))

# The Acronym

- F – Fast (to design and to implement)
  - Relative – No technology can make implementation as fast we like
- H – Healthcare
  - That's why we're here
- I – Interoperable
  - Ditto
- R – Resources
  - Building blocks (our next focus)

# The Goals of FHIR

- **Implementer Focus**
- Target the **80%** (common stuff)
- Use today's **web technologies**
- Support **human readability**
- Paradigm & architecturally **agnostic**
- **Open Source**

# Implementer Focus

- Specification is written for one target audience...

## Implementers

- Rationale, modeling approaches, etc. kept elsewhere
- Make the resources **simple** and easy to understand and use
- Multiple Implementation tools to help get you started from day 1
  - Publicly available test servers
  - Starter APIs published with spec
    - C#, Java, Pascal, ObjectiveC, Javascript
- Lots and lots of examples (and they're valid too)

## Support the 80%

- Focus on scenarios that the implementers ask for
- Decision to include content into the core specification:
  - “We only include data elements if we are confident that most normal implementations using that resource will make use of the element” (80% rule)
- Other content is included through creation of Profiles and Extensions

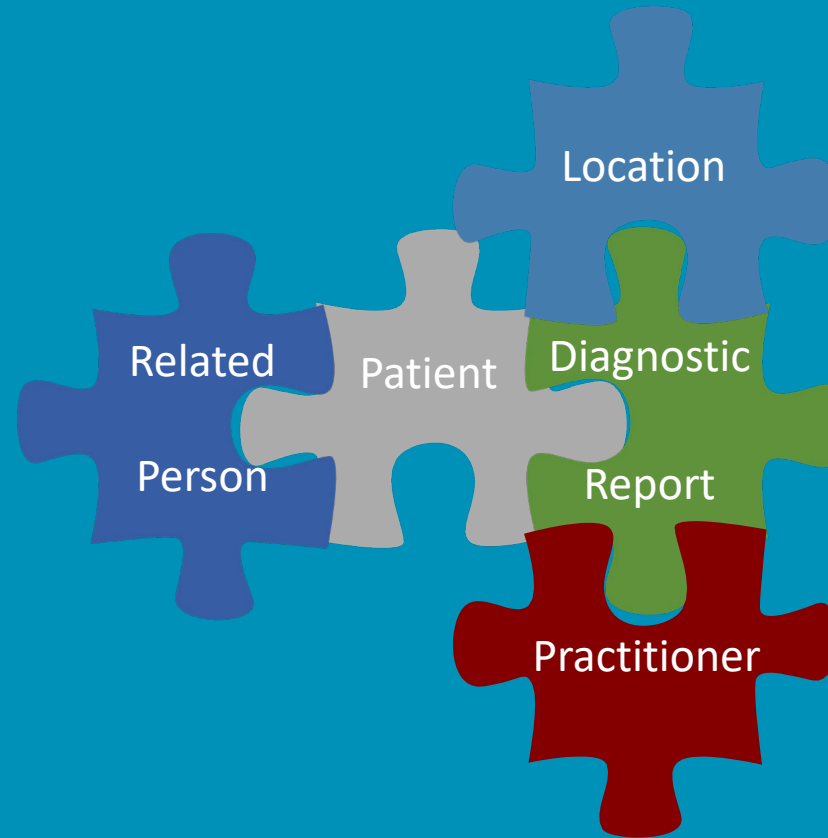
# Web Technologies

- Same technologies that drive Google, Facebook, Twitter
  - HTTP
  - REST API
  - XML, JSON, RDF
  - Datatypes are W3C compliant
  - HTTPS, OAuth, etc. for security functions



# It's all about the Resources...

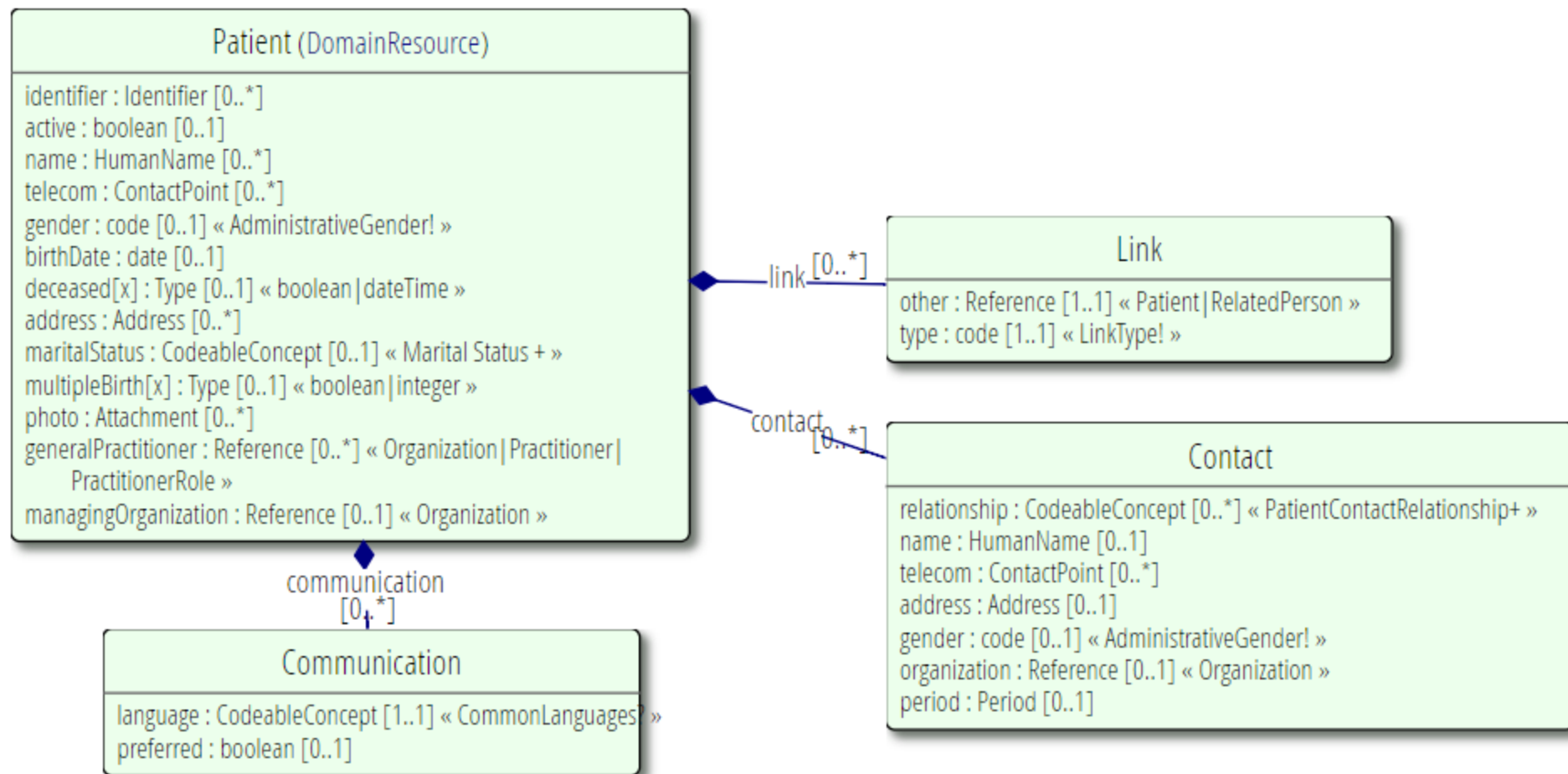
- Building blocks...



# Resources: What are they?

- The Content model
- The Thing that is exchanged
  - Via REST (FHIR Restful API), Messages, Documents
- Informed by much past work, inside and outside of HL7
  - HL7: version 2, version 3 (RIM), CDA
  - Other SDOs: openEHR, CIMI, ISO 13606, IHE, DICOM
- Can be represented in multiple syntaxes: JSON, XML, Turtle
- May include Human-Readable Narrative (XHTML)
- Allow for extensions, and can be profiled

# Resource Definitions



# What is a Resource?

## FHIR Resources

### Administrative

Patient, Practitioner, Organization,  
Location, Group

### Clinical Concepts

AllergyIntolerance, Condition,  
Encounter, Medication

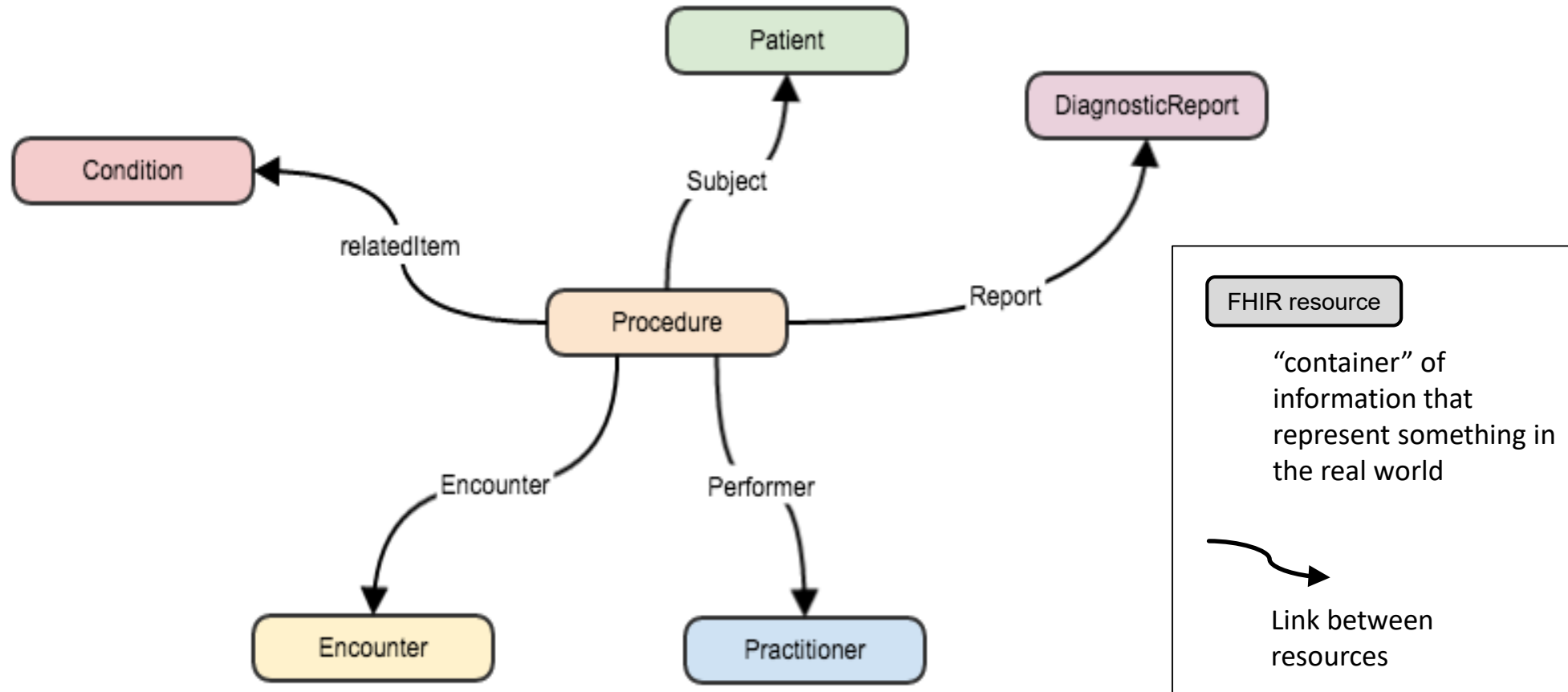
### Infrastructure/Conformance

Composition, MessageHeader,  
CapabilityStatement

## Not FHIR Resources

- Gender  
Too small
- Electronic Health Record  
Too big
- Blood Pressure  
Too specific

# Connecting Resources



```
<Patient xmlns="http://hl7.org/fhir">
  <id value="1234"/>
  <meta>
    <lastUpdated value="2017-01-14T09:14:33Z"/>
  </meta>

  <text>
    <status value="generated"/>
    <div xmlns="http://www.w3.org/1999/xhtml">
      <p>Henry Levin the 7th</p>
    </div>
  </text>

  <extension url="http://hl7.org/fhir/StructureDefinition/us-core-birthsex">
    <valueCode value="M"/>
  </extension>

  <identifier>
    <use value="usual"/>
    <system value="urn:oid:1.2.36.146.595.217.0.1"/>
    <value value="12345"/>
  </identifier>
  <active value="true"/>
  <name>
    <use value="official"/>
    <family value="Levin"/>
    <given value="Henry"/>
    <suffix value="the 7th"/>
  </name>
  <gender value="male"/>
  <birthDate value="1974-12-25"/>
  <managingOrganization>
    <reference value="Organization/example"/>
  </managingOrganization>
</Patient>
```

FHIR id & metadata

Human Readable Summary

Extension with reference  
to its definition

Standard Data Content:

- Patient Identity
- Name
- Gender
- Date of Birth
- Provider

```
{
  "resourceType": "Patient",
  "id": "1234",
  "meta": {
    "versionId": "1",
    "lastUpdated": "2017-01-03T16:05:00.792Z"
  },
  "text": {
    "status": "generated",
    "div": "<div xmlns=\\"http://www.w3.org/1999/xhtml\\"><p>Henry Levin the 7th</p></div>"
  },
  "extension": [
    {
      "url": "http://hl7.org/fhir/StructureDefinition/us-core-birthsex",
      "valueCode": "M"
    }
  ],
  "identifier": [
    {
      "use": "usual",
      "system": "urn:oid:1.2.36.146.595.217.0.1",
      "value": "12345"
    }
  ],
  "active": true,
  "name": [
    {
      "use": "official",
      "family": "Levin",
      "given": [ "Henry" ],
      "suffix": [ "the 7th" ]
    }
  ],
  "gender": "male",
  "birthDate": "1974-12-25",
  "managingOrganization": {
    "reference": "Organization/example"
  }
}
```

FHIR id & metadata

Human Readable Summary

Extension with reference to its definition

Standard Data Content:

- Patient Identity
- Name
- Gender
- Date of Birth
- Provider

# REST – Data at a location - a resource's ID

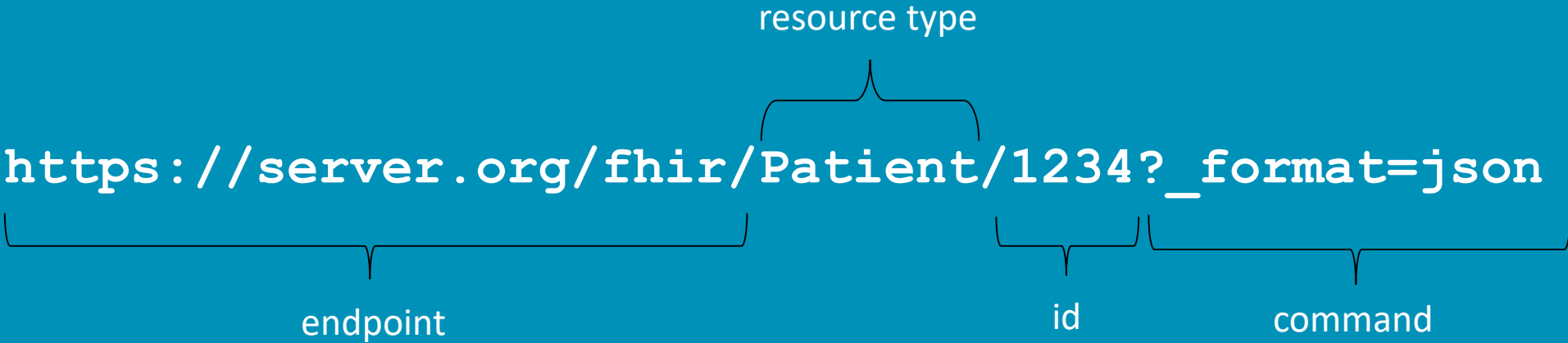


Note: This URL resolves to the current version of a resource  
It's also specific to a server.  
May give XML, or JSON, depending on server default



# REST: JSON

`https://server.org/fhir/Patient/1234?_format=json`



The diagram illustrates the components of the URL `https://server.org/fhir/Patient/1234?_format=json` using curly braces and labels:

- endpoint**: A brace under `https://server.org/fhir/` points to the label "endpoint".
- resource type**: A brace over `Patient` points to the label "resource type".
- id**: A brace under `1234` points to the label "id".
- command**: A brace under `?_format=json` points to the label "command".

Gets the same patient but returns as JSON instead

# REST: Search

`https://server.org/fhir/Patient?name=smith`



The diagram illustrates the components of the REST search URL `https://server.org/fhir/Patient?name=smith`. Brackets are used to group parts of the URL and label them: a bracket under `https://server.org/fhir/` is labeled 'endpoint'; a bracket over `Patient` is labeled 'resource type'; and a bracket under `?name=smith` is labeled 'search term'.

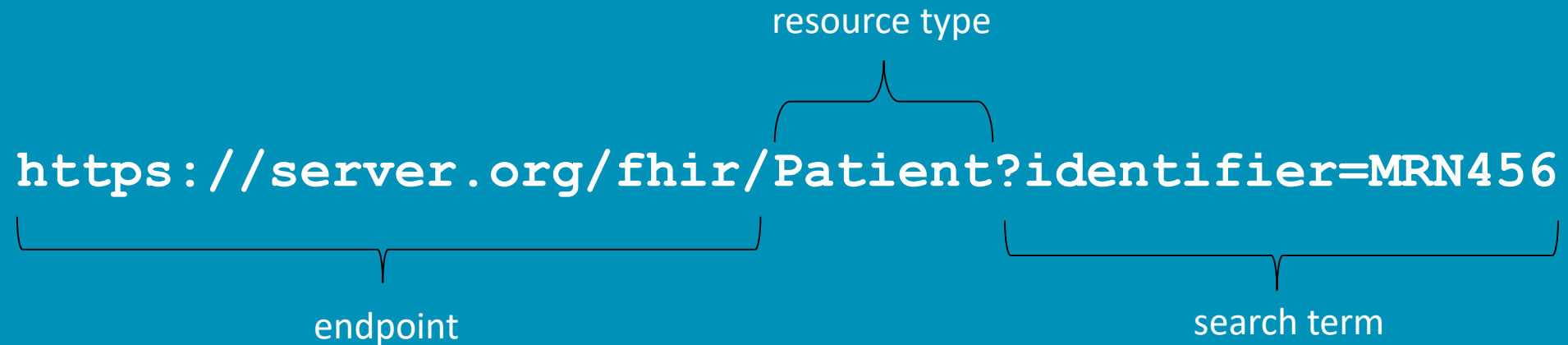
Note – no id specified.  
Search terms are pre-defined, for each resource type

# Resource Identifiers

- 2 different ‘sorts’ of identity
  - “Id” identifies a resource on a (REST) server
    - Is Metadata
    - Will change between servers
  - Identifier
    - Business identifier
    - Is an element in the (core) resource

# REST: Search, by identifier

`https://server.org/fhir/Patient?identifier=MRN456`



The diagram illustrates the components of the REST search URL `https://server.org/fhir/Patient?identifier=MRN456`. Brackets are used to group parts of the URL and label them: a bracket under `https://server.org/fhir/` is labeled "endpoint"; a bracket under `Patient` is labeled "resource type"; and a bracket under `?identifier=MRN456` is labeled "search term".

Note – no id specified, but instead a query, by identifier.

Also possible (not shown here) to specify what *type* of identifier it is.

# Public FHIR Servers for Testing

[http://wiki.hl7.org/index.php?title=Publicly Available FHIR Servers for testing](http://wiki.hl7.org/index.php?title=Publicly_Available_FHIR_Servers_for_testing)

- More than a dozen publicly available test servers (and clients)
- Support for multiple FHIR versions (DSTU2, STU3, and current R4 draft/CI)
- Maintained and supported by the FHIR community

## Publicly Available FHIR Servers for testing

[Back to FHIR home page](#)

### Introduction

This page lists FHIR servers that are publicly available for testing. In order to avoid spam etc, the servers are generally password protected. A

BTW: List of publically available test data (some of these test servers preload some of this data):

- [\[Base: What is in the specification\]](#)
- [\[Smart on FHIR test data\]](#)

### Servers

Note that these servers are testing servers. They may be sporadically unavailable, and as the FHIR specification is a moving target, they may

- <http://test.fhir.org/r2>, <http://test.fhir.org/r3> and [test.fhir.org/r4](http://test.fhir.org/r4) - Grahame's test server
  - Supports all resource types, all operations, xml + json
  - implementation details: open source - see [\[\[1\]\]](#)
  - supports Smart on FHIR
- HSPC Sandbox
  - <http://sandbox.hspconsortium.org>
  - Free DSTU2 and STU3 open sandboxes with tools for managing data. Both personal and team sandboxes available.
  - Supports both open and SMART on FHIR OAuth2 access
  - Supports app registration for SMART on FHIR apps
  - Supports all resource types, all operations
  - <http://hspconsortium.org/#/>
  - <https://healthservices.atlassian.net/wiki/display/HSPC/Healthcare+Services+Platform+Consortium>
- Vonk
  - <http://vonk.fuore.com>
  - Supports STU3
  - Generic FHIR Server, for all types of resources, all search parameters, xml + json
  - Supports validation (for example: POST /Patient/\$validate, with a Patient resource in the body).
  - This test instance runs on MongoDB and therefore can do batch but not transaction. (Transactions are supported on SQL Server.)

# Paradigms

FHIR supports four  
interoperability  
paradigms



# REST



- Simple, out-of-the-box interoperability
- Leverages HTTP methods: GET, POST, etc.
- Pre-defined operations
  - Create, Read, Update, Delete
  - Also: History, Read Version, Search, Patch, Validate, Capabilities, Batch & Transaction
- Works best where control resides on client side and a trust relationship exists

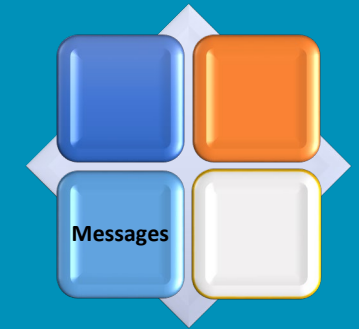
# Documents

- Similar to CDA
- Collection of resources bound together
  - Root is a “Composition” resource
  - Just like CDA header
- Sent as a Bundle (FHIR Resource)
- Single context
- Can be signed, authenticated, etc.





# Messages



- Similar to v2 and v3 messaging
- Also a collection of resources in a Bundle (FHIR Resource)
  - Root is a “MessageHeader” resource
- Allows request/response behavior for both request and response payloads
- Event-driven
  - e.g. Send lab order request, get back result
- Can be asynchronous
  - Requires agreement between partners on protocols and responsibilities

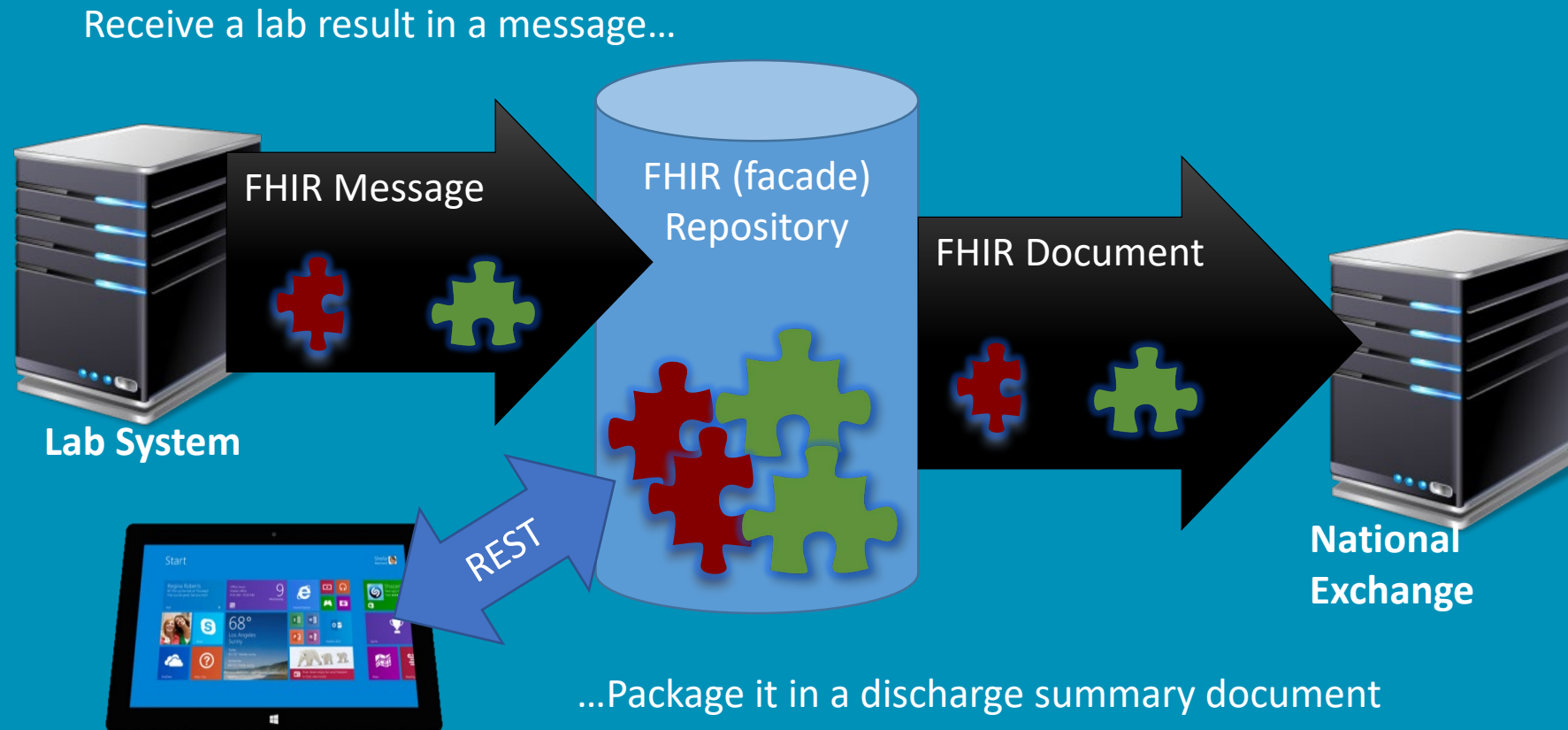
# Service Oriented Architecture (SOA)

## Combination of previous paradigms

- (based on SOA principles)
- Ultra complex workflows
- Ultra simple workflows
- Individual resources or collections (**in Bundle, contained resources or other formats**)
- Use HTTP or use something else
- Only constraint is that you're passing around FHIR resources in some way, manner, shape or form



# Regardless of **paradigm** the content is the same



# FHIR Specification (hl7.org/fhir)

Useful links: Resources, introductions, REST API

The screenshot shows the FHIR Release 3 (STU) website. A red navigation bar at the top contains links: Home, Getting Started, Documentation, Resources, Profiles, Extensions, Operations, and Terminologies. An arrow points to the 'Resources' link. Below the navigation bar, a yellow box states: 'This is the Current officially released version of FHIR, which is Release 3 (STU) with 1 technical errata. For a full list of available versions, see the Directory of published versions (link).'. Below this, a section titled 'Welcome to FHIR®' contains a 'First time here?' box with links to 'executive summary', 'developer's introduction', 'clinical introduction', 'architect's introduction', 'overview / roadmap & Timelines', 'open license', 'Table of Contents', and 'search this specification'. An arrow points to the 'developer's introduction' link. Below the welcome section, a 'Technical Corrections:' section lists 'Apr-19 2017: Corrections to invariants & generated conformance resources, and add note about isSummary'. The main content area is divided into 'Level 1 Basic framework on which the specification is built' and 'Level 2 Supporting Implementation, and binding to external specifications'. Under Level 1, there is a 'Foundation' box with a link to 'Base Documentation, XML, JSON, REST API + Search, Data Types, Extensions'. An arrow points to the 'REST API' link. Under Level 2, there are five boxes: 'Implementer Support' (Downloads, Common Use Cases, Testing), 'Security & Privacy' (Security, Consent, Provenance, AuditEvent), 'Conformance' (StructureDefinition, CapabilityStatement, ImplementationGuide, Profiling), 'Terminology' (CodeSystem, ValueSet, ConceptMap, Terminology Svc), and 'Linked Data' (RDF).

**FHIR Release 3 (STU)**

Home Getting Started Documentation **Resources** Profiles Extensions Operations Terminologies

**Home**

This is the Current officially released version of FHIR, which is Release 3 (STU) with 1 technical errata. For a full list of available versions, see the [Directory of published versions](#).

## Welcome to FHIR®

**First time here?**  
See the [executive summary](#), the [developer's introduction](#), [clinical introduction](#), or [architect's introduction](#), and then the FHIR overview / roadmap & Timelines. See also the [open license](#) (and don't miss the full Table of Contents or you can [search this specification](#)).

**Technical Corrections:**

- Apr-19 2017: Corrections to invariants & generated conformance resources, and add note about isSummary

**Level 1 Basic framework on which the specification is built**


<b>Foundation</b>	Base Documentation, XML, JSON, <b>REST API</b> + Search, Data Types, Extensions
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**Level 2 Supporting Implementation, and binding to external specifications**

<b>Implementer Support</b> Downloads, Common Use Cases, Testing	<b>Security &amp; Privacy</b> Security, Consent, Provenance, AuditEvent	<b>Conformance</b> StructureDefinition, CapabilityStatement, ImplementationGuide, Profiling	<b>Terminology</b> CodeSystem, ValueSet, ConceptMap, Terminology Svc	<b>Linked Data</b> RDF
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# FHIR Publication Directory

<http://hl7.org/fhir/directory.html>

 FHIR Publication Directory		
All Published Versions of FHIR		
This table provides a list of all the versions of FHIR (Fast Health Interoperability Resources) that are available. See also the directory of <a href="#">FHIR Implementation Guides</a> .		
Date	Version	Description
<b>Current Versions</b>		
<a href="#">Apr 19, 2017</a>	3.0.1	Current Official Published Version ( <i>Currently: Release 3 with 1 technical errata</i> )
(current)	(last commit)	Current Development build (about 30min behind version control, may be incoherent and change rapidly)
<b>R4 sequence</b>		
<a href="#">Aug 21, 2018</a>	3.5.0	R4 Ballot #2 : Mixed Normative/Trial use (Second Normative ballot + Baltimore Connectathon)
<a href="#">Apr 3, 2018</a>	3.3.0	R4 Ballot #1 : Mixed Normative/Trial use (First Normative ballot)
<a href="#">Dec 20, 2017</a>	3.2.0	Draft for comment / First Candidate Normative Content
<b>STU 3 sequence</b>		
<a href="#">Apr 19, 2017</a>	3.0.1	<b>FHIR Release 3</b> (STU) with 1 technical errata (Permanent Home) <i>Technical Errata Archive (zip): <a href="#">v3.0.0</a></i>
<a href="#">Dec 6, 2016</a>	1.8.0	FHIR STU3 Candidate + Connectathon 14 (San Antonio)

# RESTful API

<http://hl7.org/fhir/http.html>

- The Instance Level, Type Level and Whole System Interactions are listed at the top of the page.
- Clicking on any specific interaction will display the details of that interaction; e.g. **update** will show all of the FHIR requirements for updating resources.

## 2.21.0 RESTful API

FHIR Infrastructure [Work Group](#)

Maturity Level: 5

FHIR is described as a 'RESTful' specification based on common industry level use of the term REST as part of the core specification, though full Level 3 conformance is possible through the use of [extended](#) resource structures and interfaces. This may be considered a violation of REST principles but is known to be necessary.

The following logical interactions are defined:

### Instance Level Interactions

<a href="#">read</a>	Read the current state of the resource
<a href="#">vread</a>	Read the state of a specific version of the resource
<a href="#">update</a>	Update an existing resource by its id (or create it if it is new)
<a href="#">patch</a>	Update an existing resource by posting a set of changes to it
<a href="#">delete</a>	

[hl7.org/fhir/http.html#update](http://hl7.org/fhir/http.html#update)

### 2.21.0.10 update

The **update** interaction creates a new current version for an existing resource or creates a new resource. The interaction is performed by an HTTP **PUT** command as shown:

```
PUT [base]/[type]/[id] {?_format=[mime-type]}
```

The request body SHALL be a **Resource** with an **id** element that has an identical value to the **id** in the URL. The server SHALL respond with an HTTP **400** error code, and SHOULD provide an **OperationOutcome** resource. Servers SHALL ignore the provided **versionId** and **lastUpdated** values. If the server supports **history**, it SHALL return the correct values. Servers are allowed to review and alter the other metadata values. If there is no support for updating past versions - see notes on the [history](#) interaction.

# Patient - Resource Content

<http://hl7.org/fhir/patient.html#resource>

- The **Structure** tab shows the element organization
- The **Card.** stands for cardinality and defines the min and max occurrences of an element
- The **Type** lists the FHIR data type; e.g. **name** is of type **HumanName**. Clicking on **HumanName** will show its structure

8.1.2 Resource Content

Structure UML XML JSON Turtle R2 Diff All

Structure

Name	Flags	Card.	Type	Description & Constraints
Patient			DomainResource	Information about an individual or an organization. Elements defined in Ancestors: id, meta, modifierExtension
identifier	Σ	0..*	Identifier	An identifier for this patient
active	?! Σ	0..1	boolean	Whether this patient's record is in active use
name	Σ	0..*	HumanName	A name associated with the patient
telecom	Σ	0..*	ContactPoint	A contact detail for the individual
gender	Σ	0..1	code	

Structure UML XML JSON Turtle R2 Diff All

Structure

Name	Flags	Card.	Type	Description
HumanName	Σ		Element	Name of a human. Elements defined in Ancestors: use, text, family
use	?! Σ	0..1	code	usual   official   temporary   nickname   NameUse (Reason for use)
text	Σ	0..1	string	Text representation of the name
family	Σ	0..1	string	Family name

# Data Types

<http://hl7.org/fhir/datatypes.html>

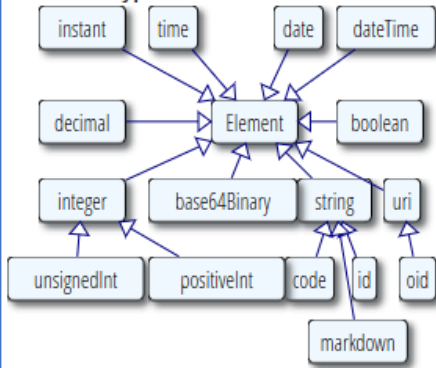
- The **Primitive** and **Complex Types** are displayed at the top of the page.
- Clicking on any specific data type will display the details of that type; e.g. **CodeableConcept** will show the structure of that data type.

## 2.26.0 Data Types

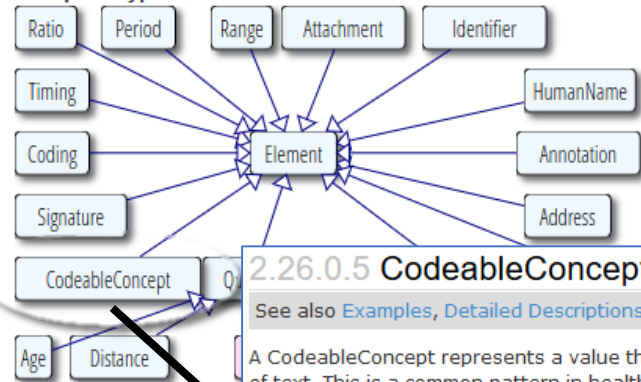
FHIR Infrastructure Work Group      Maturity Level: 4

The FHIR specification defines a set of data types that are used for the resource elements. There are four categories of

### Primitive Types



### Complex Types



### 2.26.0.5 CodeableConcept

See also [Examples](#), [Detailed Descriptions](#), [Mappings](#), [Profiles](#) & [Search](#)

A CodeableConcept represents a value that is usually supplied of text. This is a common pattern in healthcare data.

**Structure**    UML    XML    JSON    Turtle    R2 Diff

Name	Flags	Card.	Type	Description
CodeableConcept	Σ		Element	Concept - Elements
coding	Σ	0..*	Coding	Code def
text	Σ	0..1	string	Plain text



# FHIR Maturity Model

<http://hl7.org/fhir/versions.html#maturity>

0: Draft

1: + No build warnings

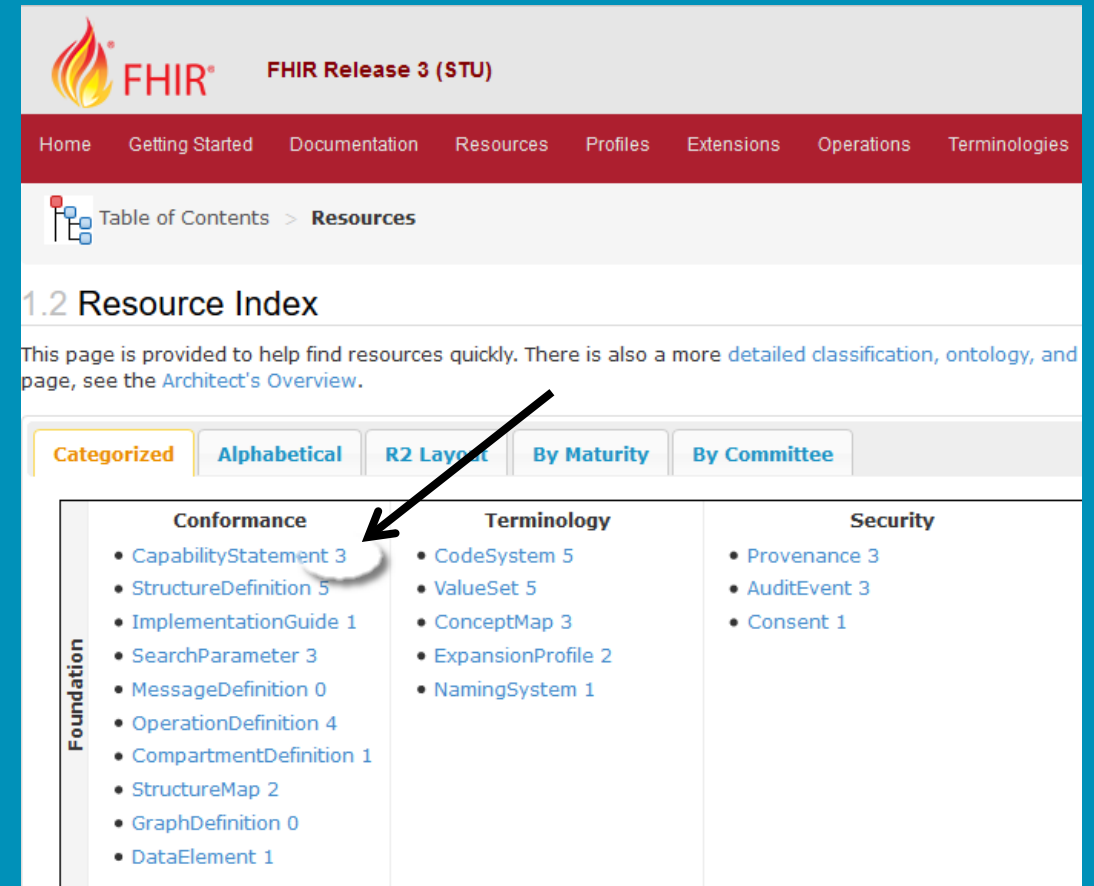
2: + Successfully exchanged/tested  
between 3 systems (Connectathon)

3: + Verified by WG; formally balloted

4: + Scope tested; formal publication;  
multiple projects

5: + Published 2+ release cycles; 5+  
independent production deployments

6: Normative



**FHIR Release 3 (STU)**

Home Getting Started Documentation Resources Profiles Extensions Operations Terminologies

Table of Contents > Resources

## 1.2 Resource Index

This page is provided to help find resources quickly. There is also a more [detailed classification, ontology, and page](#), see the [Architect's Overview](#).

**Categorized** Alphabetical R2 Layout By Maturity By Committee

	Conformance	Terminology	Security
Foundation	• <a href="#">CapabilityStatement</a> 3	• <a href="#">CodeSystem</a> 5	• <a href="#">Provenance</a> 3
	• <a href="#">StructureDefinition</a> 5	• <a href="#">ValueSet</a> 5	• <a href="#">AuditEvent</a> 3
	• <a href="#">ImplementationGuide</a> 1	• <a href="#">ConceptMap</a> 3	• <a href="#">Consent</a> 1
	• <a href="#">SearchParameter</a> 3	• <a href="#">ExpansionProfile</a> 2	
	• <a href="#">MessageDefinition</a> 0	• <a href="#">NamingSystem</a> 1	
	• <a href="#">OperationDefinition</a> 4		
	• <a href="#">CompartmentDefinition</a> 1		
	• <a href="#">StructureMap</a> 2		
	• <a href="#">GraphDefinition</a> 0		
	• <a href="#">DataElement</a> 1		

# CapabilityStatement

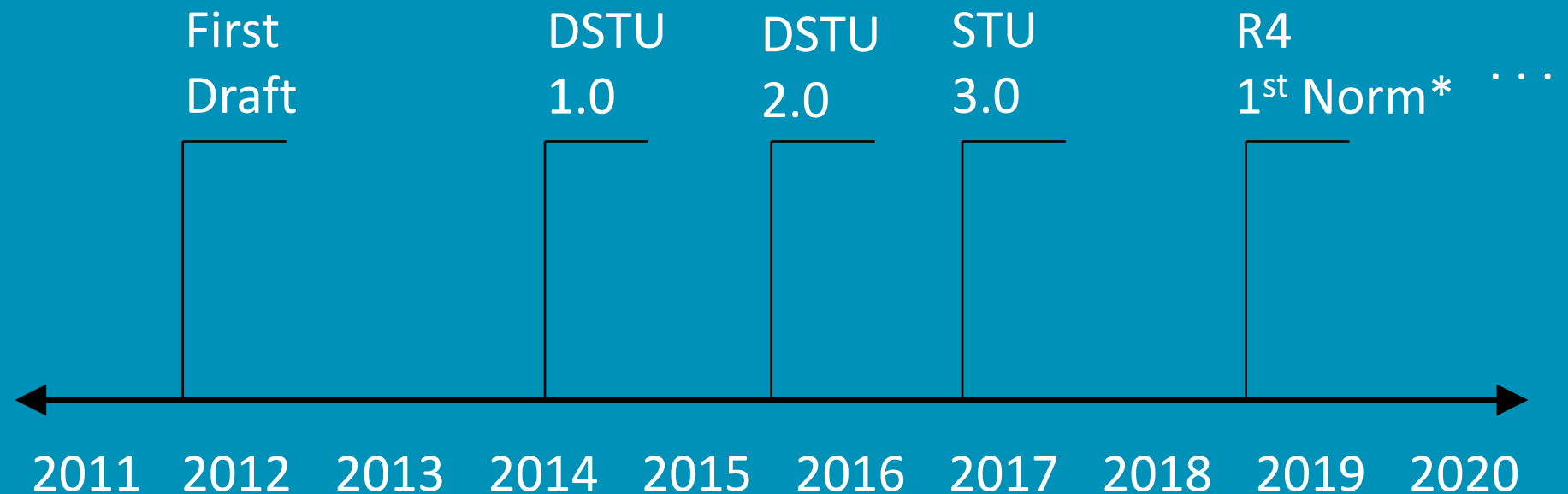
- Documents the capabilities of a FHIR client and server
- A client should examine the CapabilityStatement of a server to determine its supported behavior
- The CapabilityStatement:
  - is a key part of the FHIR conformance framework
  - is a statement of the features, rules and behaviors of a FHIR system
  - may be used for system compatibility testing, code generation, or as the basis for conformance testing
- To declare themselves “FHIR Conformant”, a system **MUST** publish a CapabilityStatement: <http://hl7.org/fhir/STU3/http.html#capabilities>

# StructureDefinition

- A resource that describes a structured set of data element definitions and their associated rules of usage
  - how resource elements and/or data types are used or not used
  - resource or data type extensions
  - Value Set references that specify the content of coded elements
- Describes (Profiles) the base content defined in the specification
- Describes (Profiles) how these structures are utilized in implementation guides

# FHIR Timeline

- The first normative content is scheduled for FHIR R4 this year (2018).



# Recap: What Does FHIR provide?

- Resources (building blocks)
- Extensions (embrace these :-)
- Methodology: Bundles, Profiles
- Syntax: XML, JSON, RDF(Turtle)
- Human Readability
- CapabilityStatement, StructureDefinition
- Multiple Paradigms: REST, Messaging, Documents, Services
- Extensive online documentation

## Discussion (Q & A)



Thank you!



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