

# FHIR® Version History and Maturity

HL7® FHIR® has evolved through four releases since its initial presentation in May 2012. It has grown from a true draft standard with 49 Resources to its current 145 and continues to expand. In that time the standard has improved and changed to meet the needs of the health information technology community.

## Draft Standard for Trial Use 1 (DSTU1)

FHIR's first publication in September 2013 showed a new way forward for health care data exchange. Draft Standard for Trial Use 1 had 49 resources and focused on two use cases, creating a Personal Health Record on a mobile device and the retrieval of documents, such as encounter or discharge notes, to a mobile device. This initial release sparked the community's interest in expanding FHIR to cover a wider variety of health care and health IT needs.

## Draft Standard for Trial Use 2 (DSTU2)

FHIR grew in market acceptance with the publication of the Draft Standard for Trial Use 2 in 2015. Efforts including the Argonaut Project developed Implementation Guides (IGs) and other technologies to support FHIR adoption by EHR developers and other health IT entities. The structure of Resources was adjusted to make creating extensions easier, allowing for more use cases to be covered without changes to the core standard. New Resources were also added to support non-clinical data, including claims and benefits processing.

The publication of FHIR DSTU2 included the creation of the FHIR Maturity Model (FMM). When new Resources are created, they are not immediately ready for use in live settings; they must be refined and tested for a variety of uses and settings. The FHIR Maturity Model established a set of levels that progressively measure technical advancement, known as maturity. Resource maturity as defined by the FMM begins with an initial draft and achieves final status with implementation in multiple settings. Since the maturity of the FHIR standard overall is not tied to the maturity of Resources, Resources can move up the maturity ladder between FHIR releases. The FMM, which is also applied to other components of the FHIR standard, defines Resource stability with six levels:

- **FMM0 (Draft)** – The resource is still in early development but has been accepted into the FHIR standard.
- **FMM1** – The Resource has no current technical errors and is believed to address all design goals.
- **FMM2** – The Resource has been tested and approved at a FHIR Connectathon with multiple FHIR-enabled computer systems tested.
- **FMM3** – The Resource passed all quality checks and an HL7 community ballot that determines if it is ready for trial use.
- **FMM4** – The Resource has been tested for functionality for all intended purposes, has been published in a formal HL7 publication, and is operating in at least one prototype system.
- **FMM5** – The Resource is in use in at least five distinct production systems operating in at least two countries.

Substantive changes at the FMM4 or FMM5 levels that would change usage from those already established or would break compatibility with existing implementations would require significant justification to be accepted and to move forward. After FMM5, a Resource reaches “normative”<sup>1</sup> level; at this level, future changes must be backwards compatible so that applications that implement those Resources aren't at risk of being broken as the FHIR standard changes.

## Standard for Trial Use 3 (STU 3)

FHIR Standard for Trial Use 3 was released in 2017 with improvements to the core Clinical, Administrative, and Financial Resources, improvements to the Clinical Decision Support and Clinical Quality Measure Resources and a new framework for workflow and task management. Additionally, tools were introduced that made FHIR IG creation and publication to the web easier, faster, and more unified.

## Release 4 (R4)

As the first release with normative content, the 2019 release of FHIR Release 4 left behind the Trial Use name. Two key clinical Resources, Patient and Observation, were released as normative, along with the RESTful API, the XML and JSON formats, and nine additional Resources.

In 2020, ONC published the Final Rule for the 21<sup>st</sup> Century Cures Act, establishing FHIR R4 as the standard required for Health IT Certification.

## Looking ahead to Release 5 (R5)

FHIR Release 5 will see increased normative content, with over 30 Resources having been nominated by their HL7 Workgroups to be matured to that status. In addition, the community will continue to develop the supportive specifications to FHIR, such as the authorization framework SMART, Clinical Decision Support Hooks (CDS Hooks), and the Bulk Data Transfer specification, which will help implementers create a complete FHIR-based exchange of health care data.

With the maturing of the FHIR IG tools and templates, better integration with public health, imaging, financial management, genomics and other fields will keep FHIR at the forefront of health IT.

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1. Normative, in this context, is defined as content that has been accepted by the American National Standards Institute (ANSI) as an American National Standard.

## Interested in learning more about FHIR?

See more of our Fact Sheet series at:

<https://www.healthit.gov/topic/standards-technology/standards/fhir-fact-sheets>.

ONC's FHIR Fact Sheets are a collaborative effort with HL7 to help educate and demystify FHIR for federal employees. These fact sheets summarize the key technical concepts that make up the foundation of FHIR, how it is developed in an open and public process, and why FHIR adoption has become the focus of the health IT standards world. Full details and developer documentation can be found at HL7's FHIR website.