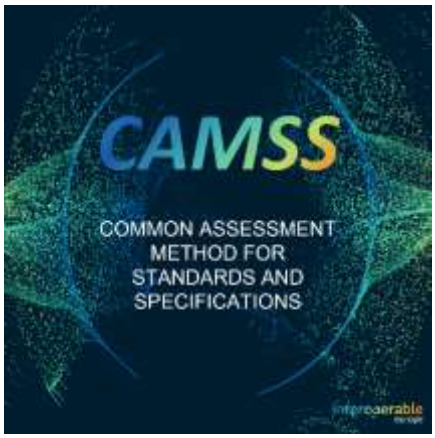

ASSESSMENT SUMMARY v1.0.0

Hypertext Transfer Protocol (HTTP/1.1)[1]

Internet Engineering Task Force (IETF)[2]

[1] HTTP/1.1 specification: https://www.rfc-editor.org/rfc/rfc2616.html

[2] IETF organisation: https://www.ietf.org/

Change Control

Modification	Details
Version 1.0.0	
Initial version	

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1. INTRODUCTION

The present document is a summary of the assessment of the **HTTP/1.1** carried out by CAMSS using the CAMSS Assessment EIF scenario[3]. The purpose of this scenario is to assess the compliance of a standard or specification with the European Interoperability Framework (EIF)[4].

2. ASSESSMENT SUMMARY

The Hypertext Transfer Protocol (HTTP) is an application-level protocol for distributed, collaborative, hypermedia information systems. HTTP has been in use by the World-Wide Web global information initiative since 1990. The first version of HTTP, referred to as HTTP/0.9[5], was a simple protocol for raw data transfer across the Internet. HTTP/1.0, as defined by RFC 1945[6], improved the protocol by allowing messages to be in the format of MIME-like messages, containing metainformation about the data transferred and modifiers on the request/response semantics.

The HTTP protocol is a request/response protocol. A client sends a request to the server in the form of a request method, URI, and protocol version, followed by a MIME-like message containing request modifiers, client information, and possible body content over a connection with a server. The server responds with a status line, including the message's protocol version and a success or error code, followed by a MIME-like message containing server information, entity metainformation, and possible entity-body content.

HTTP/1.1 has more stringent requirements than HTTP/1.0 in order to ensure reliable implementation of its features. Practical information systems require more functionality than simple retrieval, including search, front-end update, and annotation. HTTP allows an open-ended set of methods and headers that indicate the purpose of a request, it also used as a generic protocol for communication between user agents and proxies/gateways to other Internet systems, including those supported by the SMTP[7], NNTP[8], FTP [9] and Gopher[10] protocols. In this way, HTTP allows basic hypermedia access to resources available from diverse applications.

[3] CAMSS Assessment EIF Scenario: https://ec.europa.eu/eusurvey/runner/CAMSSAssessmentEIFScenario6

[4] Isa2 programme website: https://ec.europa.eu/isa2/eif_en

[5] HTTP/0.9 https://everything.curl.dev/http/versions/http09.html

[6] HTTP 1.0 (RFC 1945) reference: https://www.rfc-editor.org/rfc/rfc1945.html

[7] SMTP reference: https://www.rfc-editor.org/rfc/rfc5321.html

[8] NNTP reference: https://www.w3.org/Protocols/rfc977/rfc977

[9] FTP reference: https://www.rfc-editor.org/rfc/rfc959.html

[10] Gopher reference: https://www.rfc-editor.org/rfc/rfc1436.html

***The specification supports the principles setting context for EU actions on interoperability*:**

- **Subsidiarity and proportionality**
  HTTP is included in 12 national catalogues. The Member States that includes the specification are Bulgaria, Croatia, Cyprus, Finland, France, Germany, Greece, Netherlands, Norway, Portugal, Spain and Sweden They belong to Member States which comply with at least 4 out of 5 sections of the EIF according to the NIFO factsheets[11].

***The specification supports the principles setting context for EU actions on interoperability*:**

- **Openness**
  The HTTP specification is maintained and developed by IETF which is an international community developing open standards developing open standards. Thus, like all the IETF standards, this specification is a free and open technical specification, built on IETF standards and licenses from the Open Web Foundation[12]. In addition, the IETF is a consensus-based group, and authority to act on behalf of the community requires a high degree of consensus and the continued consent of the community.

  HTTP specification facilitates the publication of data on the web. It provides the necessary mechanisms to create, access, manage, and efficiently distribute data in various formats, giving a diverse user base and ensuring data integrity and security.

  Since 1990, HTTP has been developed based on practical experience and extensive feedback from developers and organisations, demonstrating significant market acceptance. Major version releases, including HTTP/2 and HTTP/3, have been developed, each offering specific benefits and limitations depending on the context of use. All three major versions relies on the semantics defined by the original specification, and implementations are expected to choose the most appropriate transport and messaging syntax for their particular needs.

- **Transparency**
  The purpose of the specification is primarily designed to facilitate web communication by using request-response functions between servers and clients. While it effectively enables access to websites, it does not specify how to structure administrative data or functions for interfaces.

- **Reusability**
  HTTP specification is designed for universal use across diverse business domains and is not limited to business-specific applications. Its open-ended nature, support for diverse data types, content

[11] NIFO Factsheets: https://interoperable-europe.ec.europa.eu/collection/nifo/nifo-factsheets

[12] Open Web Foundation: https://www.openwebfoundation.org/?lang=en

negotiation capabilities, and efficient caching mechanisms make it a robust foundation for communication.

- **Technological neutrality and data portability**
  HTTP is a flexible and adaptable protocol designed to be technology and platform agnostic. This allows it to evolve with advancements in network infrastructure and connect diverse systems across the internet. The specification's use of terms like "MAY," "SHOULD," and "OPTIONAL" provides flexibility in implementation, enabling developers to tailor their solutions to specific needs.

  Additionally, HTTP's extensible nature allows for the introduction of new methods, status codes, and header fields, enriching its functionality and potential for future development. This foundation for communication over computer networks could be leveraged to enhance data exchange between systems supporting European public services.

***The specification supports the principles related to generic user needs and expectations*:**

- **User-centricity**
  HTTP includes features that promote information reuse, through caching and conditional requests. However, the specification also highlights limitations and scenarios where reuse is restricted or requires careful handling. For example, when requests involve authentication or shared caches, those accessible to multiple users, are generally prevented from reusing responses unless specific conditions are met.

- **Inclusion and accessibility**
  The purpose of HTTP is not related to e-accessibility. Therefore this criterion is considered not applicable to the specification.

- **Privacy**
  HTTP acknowledges the importance of protecting personal information and the potential risks associated with transferring sensitive data. It provides a framework for access control and authentication to enhance security. Additionally, ENISA[13], a European Union organisation focused on network and information security, works to improve the resilience[14] of European information infrastructure and networks, including the use of protocols like HTTP.

- **Security**
  HTTP contributes to data security, integrity, and authenticity by providing a foundation for implementing basic security measures. It offers mechanisms like Cache-Control directives to

[13] ENISA: https://www.enisa.europa.eu/

[14] Usage of HTTP at ENISA: https://www.enisa.europa.eu/publications/privacy-and-data-protection-by-design

restrict the storage of sensitive information, secure transport protocols (TLS)[15] to protect data during transmission, and authentication frameworks to verify the identity of agents involved in data transactions.

Additionally, HTTP's features for caching and invalidation, conditional requests, and message framing help to ensure the complete and unaltered transmission of data. However, it's important to note that HTTP alone does not provide a comprehensive framework for secure data processing. It requires additional security measures and best practices to be implemented at various layers of the application stack to achieve robust security.

- **Multilingualism**
  The purpose of HTTP is not related to the delivery of multilingual services. Therefore this criterion is not applicable to this specification.

The specification supports the foundation principles for cooperation among public administrations:

- **Administrative Simplification**
  HTTP plays a crucial role in facilitating digital communication and online services. By enabling efficient data transfer and reducing network usage, it contributes to faster and more reliable access to public service portals. Caching mechanisms further optimize performance by storing and reusing data, reducing server load and improving response times. HTTP also serves as a foundation for various digital channels, supporting diverse content types and enabling public services to deliver rich and engaging experiences.

- **Preservation of information**
  The purpose of HTTP involves storing copies of responses to reduce server load and improve response times by the catching method. While primarily intended for performance optimisation, caching can indirectly contribute to preservation by creating redundant copies of content, though not for long-term retention.

- **Assessment of effectiveness and efficiency**
  HTTP's effectiveness and efficiency have been demonstrated through its evolution into HTTP/3. By leveraging modern transport protocols, HTTP/3 addresses the limitations of earlier versions, improving speed and reliability. This ongoing adaptation to new technological and security demands showcases HTTP's enduring relevance and ability to meet the evolving needs of the digital landscape.

2.1. EIF Interoperability Layers

The interoperability model which is applicable to all digital public services includes:

- Four layers of interoperability: legal, organisational, semantic and technical;

[15] TLS: https://datatracker.ietf.org/doc/html/rfc8446

- A cross-cutting component of the four layers, 'integrated public service governance';
- A background layer, 'interoperability governance'.

The Specification supports the implementation of digital public services complying with the EIF interoperability model:

- **Interoperability governance**

  HTTP can be mapped to the EIRA Library of Interoperability Specifications (ELIS)[16] in the "Data Exchange" under the Technical Application View. HTTP also appears in Interoperable Europe Portal (also known before as Joinup) as one of the identified ICT specifications for procurement.

  HTTP is a key protocol used by the TESTA[17] network, which facilitates communication between government agencies. Tools exist to ensure proper implementation of HTTP protocols (Httplint[18]) which is crucial for smooth data exchange. This highlights HTTP's importance as a foundation for public sector digital communication.

- **Legal Interoperability**

  The Internet Engineering Task Force (IETF), a global, open standards organization not specific to any particular region or governmental body, developed HTTP. While not a European Standard, HTTP is used extensively across all Member States.

- **Organisational interoperability**

  HTTP specification does not address or provide any insights into the modelling of business processes. HTTP can provide a common language and set of rules for web communication between different systems or users and services. This standardization is important for the interoperability as it ensures that different implementations can exchange information effectively.

- **Semantic Interoperability**

  HTTP doesn't encourage community building, its features as an open standard can support the creation and sharing of data across various platforms, allowing collaboration and innovation among entities or platforms.

[16] EIRA Library of Interoperability Specifications (ELIS): https://joinup.ec.europa.eu/collection/common-assessment-method-standards-and-specifications-camss /solution/elis/release/v610

[17] TESTA Trans European Services for Telematics between Administrations: https://ec.europa.eu/isa2/solutions/testa_en/

[18] Httplint: http://zamez.org/httplint

3. ASSESSMENT RESULTS

This section presents an overview of the results of the CAMSS assessments for **HTTP**. The CAMSS "Strength" indicator measures the reliability of the assessment by calculating the number of answered (applicable) criteria. On the other hand, the number of favourable answers and the number of unfavourable ones is used to calculate the "Automated Score" per category and an "Overall Score".

Category	Automated Score	Assessment Strength	Compliance Level
EIF Principle setting the context for EU actions on interoperability	100/100 (100%)	100%	Seamless
Core interoperability principles	1540/1700 (91%)	100%	Seamless
Principles related to generic user needs and expectations	920/1200 (91%)	100%	Sustainable
Foundation principles for cooperation among public administrations	460/500 (64%)	100%	Seamless
Interoperability layers*	840/1000 (76%)	100%	Seamless
Overall Score	3260/3900 (84%)[19]	100%	

**The technical interoperability layer is covered by the criteria corresponding to the core interoperability principle ''Openness''.*

With an 100% of assessment strength, this assessment can be considered representative of the specification compliance with the EIF principles and recommendations.

The Overall Automated Score of 84% (32600/3900) demonstrates that the specification supports the European Interoperability Framework in the domains where it applies.

[19] See the "results interpretation" section of the CAMSS Assessment EIF Scenario Quick User Guide:

https://joinup.ec.europa.eu/collection/common-assessment-method-standards-and-specifications-camss/solution/camss-assessment-eif-scenario/results-visualisation-and-interpretation