ASSESSMENT SUMMARY v1.0.0

IEEE 802.3-2022 - IEEE Standard for Ethernet[1]

Institute of Electrical and Electronics Engineers (IEEE)[2]

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[1] IEEE 802.3-2022 reference link: https://ieeexplore.ieee.org/document/9844436

[2] IEEE webpage: https://standards.ieee.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 **IEEE 802.3-2022 - IEEE Standard for Ethernet** 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 **IEEE 802.3-2022** standard, commonly known as Ethernet, is the cornerstone of modern wired local area networks (LANs). It defines the physical and media access control (MAC) layers of Ethernet, outlining how data is transmitted over various physical media types such as copper cables and optical fibres.

The IEEE 802.3 standard is developed by the IEEE 802.3 Working Group[5], a subcommittee of the IEEE 802 Standards Committee. The IEEE Standards Association (IEEE SA) oversees the development and promotion of IEEE standards, ensuring their quality, relevance, and global adoption.

The standard plays a crucial role in driving innovation and ensuring the reliable and efficient operation of wired networks. Its advancements have enabled the creation of high-performance, flexible, and scalable LANs, supporting a wide range of applications across various industries.

EIF Interoperability Principles

Interoperability principles are fundamental behavioural aspects that drive interoperability actions. They are relevant to the process of establishing interoperable European public services. They describe the context in which European public services are designed and implemented.

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

Subsidiarity and proportionality

IEEE std 802.3-2022 is included in one national catalogue of recommended specifications. This catalogue is Malta. The National Interoperability Framework of Malta[6] is fully aligned with the 3 sections of the European Interoperability Framework (EIF) according to the National Interoperability Framework Observatory (NIFO)[7] factsheets.

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

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

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

[5] IEEE 802.3 Working group: https://www.ieee802.org/3

[6] Malta List of Standards: https://www.mccaa.org.mt/Section/Content?contentId=1243

[7] NIFO Factsheets in Joinup: https://joinup.ec.europa.eu/collection/national-interoperability-framework-observatory-nifo/nifo-factsheets

- **Openness**
IEEE 802.3 standard is primarily focused on wired Ethernet networks, enabling LAN and WAN connections for internet access. Despite being publicly available (though with potential licensing costs), its widespread adoption, compatibility, interoperability and continuous updates, solidifies its critical role in modern networking.

  Furthermore, the IEEE's commitment to FRAND principles ensures fairness and transparency in patent licensing, by preventing unfair competition by having low cost for the patents related to the standard.

- **Transparency**
IEEE Std 802.3-2022 focus is technical specifications with standardised protocols and extensive documentation, it promotes interoperability across equipment, which can benefit administrative procedures and data management.

- **Reusability**
IEEE Std 802.3-2022 is highly usable beyond the business-specific domain, enabling its application across various sectors due to multiple key factors. The specification offers a versatile and reliable foundation for networking needs across multiple domains, enhancing its usability and effectiveness in diverse settings.

- **Technological neutrality and data portability**
IEEE Std 802.3-2022 standard is highly versatile, being technology-agnostic and supporting a wide range of physical media and hardware platforms. Its layered architecture ensures interoperability, and its modularity design allows for partial implementations to specific needs. This flexibility also accommodates future advancements, as the standard is designed to evolve with new technologies.

  While the standard itself does not directly address data portability, its flexibility and scalability can promote data sharing for European public services. However, successful implementation requires consideration of factors like network design, system availability, and configuration.

The specification partially support the principles related to generic user needs and expectations:

- **User-centricity**
IEEE Std 802.3-2022 does not directly address data reuse, but its design indirectly supports it by enabling communication between different systems. This lays the groundwork for data exchange, which is an essential first step for information reuse. However, to fully implement the Once-Only Principle, additional measures related to data semantics and access control are needed.

- **Inclusion and accessibility**

  IEEE Std 802.3-2022 primarily focuses on the physical and data link layers for Ethernet networks, and while it does not directly address e-accessibility. Although Ethernet plays a crucial role in supporting the infrastructure that enables accessible digital services, this criterion is not applicable to this specification.

- **Privacy**

  While IEEE Std 802.3-2022 does not directly define data protection policies, it lays the groundwork for secure communication through protocols enabling encryption. However, access control and privacy aspects fall under separate regulations like GDPR. Nonetheless, its reliability and performance make it a recommended choice for EU public administrations' ICT infrastructure[8].

- **Security**

  IEEE 802.3-2022 focuses on reliable data transmission and network performance, but it doesn't directly address security.

- **Multilingualism**

  IEEE Std 802.3-2022 primarily focuses on the physical and data link layers for Ethernet networks, and it does not directly address multilingualism.

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

- **Administrative Simplification**

  IEEE Std 802.3-2022 primarily focuses on the physical and data link layers of Ethernet networking, helping to build a more efficient infrastructure capable of supporting European public services. This is why it has been included in the ICT Rolling Plan.

- **Preservation of information**

  IEEE Std 802.3-2022 primarily focuses on the technical aspects of network communication, providing a reliable and efficient infrastructure for data transmission. While it does not directly address long-term data preservation, it lays the groundwork for data management practices that can contribute to effective preservation strategies.

- **Assessment of effectiveness and efficiency**

  The effectiveness and efficiency[9] of IEEE Std 802.3-2022 are evaluated through a multifaceted approach: industry feedback, rigorous testing within IEEE projects, ongoing research, and wide adoption rates. This continuous evaluation ensures the standard meets evolving needs and remains relevant. Additionally, its adaptability allows the working group to address new

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[8] Rolling Plan for ICT standardisation: https://joinup.ec.europa.eu/collection/rolling-plan-ict-standardisation

[9] IEEE 802.3 Working Group Projects: https://standards.ieee.org/ieee/802.3/10422

challenges and opportunities. As a testament to its effectiveness, numerous new projects are currently being developed to leverage the capabilities of this standard.

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;
- 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**
  IEEE Std 802.3-2022 plays a critical role in establishing a foundation for interoperable and efficient network infrastructure in Europe. Its significance is underscored by its inclusion in the ELIS (EIRA Library of Interoperability Specifications) *under "Local Area Network", "Physical Communication Infrastructure", "Firewall", "Physical Computing Infrastructure", "Physical Network Infrastructure"* and "Private subnetwork" within the "*Technical Infrastructure*" view.

  Although not explicitly mentioned in all projects, the standards is a vital element for interoperable and reliable network infrastructure in European public services and related initiatives. Notably, it's recommended by Malta and serves as a foundation for Smart City initiatives[10] that integrate traditional infrastructure with advanced digital solutions.

- **Legal Interoperability**
  IEEE Std 802.3-2022 standard, while originating in the United States, has gained widespread adoption and recognition within European frameworks. Its inclusion in the standICT[11] Catalog highlights its significance in the European technology landscape. This established standard plays a crucial role in ensuring compatibility and interoperability, making it an indispensable component of European network infrastructure.

- **Organisational interoperability**
  While IEEE Std 802.3-2022 focuses on the technical foundation for data transmission (physical and data link layers), its impact on organisational interoperability agreements is undeniable. By ensuring compatibility between devices and laying the groundwork for higher-level protocols, it facilitates discussions and agreements on data exchange between organisations. This standard acts as a cornerstone for effective collaboration and information sharing.

- **Semantic Interoperability**

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[10]IEEE 802.3-2022 Referenced in Smart Cities: https://climate-change.ieee.org/news/ieee-802/

[11] StandICT list: https://standict.eu/standards-repository/ieee-8023-2018-ieee-standard-ethernet

While the IEEE Working Group might not directly engage in community initiatives, its focus on collaboration and knowledge sharing through working groups and conferences can indirectly foster community building and open data initiatives. By promoting collaboration among stakeholders, the working group helps to create a supportive environment for the development and adoption of open technologies and standards. This, in turn, can facilitate the sharing of data and foster interoperability within the broader community.

3. ASSESSMENT RESULTS

This section presents an overview of the results of the CAMSS assessments for **IEEE std 802.3-2022**. 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 (90%)	88%	Seamless
Principles related to generic user needs and expectations	1140/1200 (95%)	58%	Seamless
Foundation principles for cooperation among public administrations	500/500 (100%)	80%	Seamless
Interoperability layers*	1000/1000 (100%)	100%	Seamless
Overall Score	3480/3700 (94%)[12]	82%	

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

The Overall Automated Score of 94% (3480/3700) demonstrates that the specification supports the European Interoperability Framework in the domains where it applies. With an 82% of assessment strength, this assessment can be considered representative of the specification compliance with the EIF principles and recommendations.

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[12] 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