

Digital Emblems
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DIEM Use Cases and Requirements
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Abstract

The Digital Emblems (DIEM) working group (WG) will define an architecture and discovery mechanism to present and validate digital emblems. This document lists use cases for the current and future scope of the DIEM WG and their associated requirements.

About This Document

This note is to be removed before publishing as an RFC.

The latest revision of this draft can be found at <https://felixlinker.github.io/diem-requirements/draft-linker-diem-requirements.html>. Status information for this document may be found at <https://datatracker.ietf.org/doc/draft-linker-diem-requirements/>.

Discussion of this document takes place on the Digital Emblems Working Group mailing list (<mailto:diem@ietf.org>), which is archived at <https://mailarchive.ietf.org/arch/browse/diem>. Subscribe at <https://www.ietf.org/mailman/listinfo/diem/>.

Source for this draft and an issue tracker can be found at <https://github.com/felixlinker/diem-requirements>.

Status of This Memo

This Internet-Draft is submitted in full conformance with the provisions of BCP 78 and BCP 79.

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1. Introduction

The Digital Emblems (DIEM) working group (WG) will define an architecture and discovery mechanism to present and validate digital emblems. Digital emblems extend the range of existing, identifying marks (for examples, see the use cases below) from the physical (visual and tactile) to the digital realm. This document lists use cases for the current and future scope of the DIEM WG and their associated requirements. As of writing, the DIEM has an initial scope that limits WG work to digital emblems that can be discovered using the DNS and that identify their bearer by a Fully Qualified Domain Name (FQDN). The WG intends to address use cases presented in Section 3 within the WG's initial scope, and presents use cases in Section 4 for future WG work and reference.

2. Conventions and Definitions

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "NOT RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in BCP 14 [RFC2119] [RFC8174] when, and only when, they appear in all capitals, as shown here.

3. Use Cases and Requirements for Initial Scope

Below listed use cases are intended to be addressed within the DIEM WG's initial scope (as chartered as of writing). Every use case lists its associated requirements, which are specified in Section 5.

3.1. Digital Emblems under International Humanitarian Law

The Geneva Conventions and their Additional Protocols constitute the core of International Humanitarian Law (IHL) and establish legal rules on the conduct of armed conflict. Some assets enjoy certain specific protections under IHL, including that they must not be attacked, and IHL codifies four types of protective emblems for armed conflict, which inform other parties that marked assets benefit from one or several of these specific protections. Note that assets enjoy these protections irrespective of whether they are marked with the respective emblem. The emblem only serves to inform others of these protections.

- * The emblems of the Red Cross, Red Crescent, and Red Crystal are applied to assets of the medical services as well as the assets of certain humanitarian operations.
- * The Blue Shield emblem is applied to cultural property.
- * The emblem for the protection of civil defense is applied to certain assets for the protection of the civilian population against the dangers of hostilities or disasters.
- * The dangerous forces emblem is applied to works or installations containing dangerous forces, i.e., dams, dikes, and nuclear generating facilities.

Digital emblems under IHL will be borne by network-connected and network-addressable assets that enjoy aforementioned specific protections under IHL and whose disruption would violate these protections.

3.1.1. Requirements

Digital emblems under IHL MUST identify the issuing party and MUST provide a means for authorization by third parties. Additionally, this use case has the following requirements:

- * Authenticity
- * Authorization and Decentralized Authorization
- * Accountability
- * Revocation
- * Undetectable Validation

3.2. Marking of the Press

TODO

3.3. The Ramsar Convention

TODO

4. Other Use Cases and Requirements

The initial DIEM efforts do not include the following use cases. They are listed here for documentation and future reference. The requirements of these use cases are not complete and would need to be investigated further when addressing the use cases.

4.1. Marking of Hazardous Materials

The Organization for the Prohibition of Chemical Weapons (OPCW), the International Atomic Energy Agency (IAEA), and the Basel Convention require that certain, dangerous materials are marked during shipment. Concretely:

- * The OPCW requires marking of Schedule 1 chemicals.
- * The IAEA administers several treaties related to the shipment of atomic fuels and wasters across borders.
- * The Basel Convention regulates the trans-boundary movement of hazardous wastes.

An emblem **MUST** provide a description, location, date, and quantity. The description **MUST** be accessible only by authorized parties, e.g., customs agencies or material handlers.

4.2. Marking of Brand-Associated Shipments

World Intellectual Property Organization (WIPO) administers treaties, in particular the Madrid Protocol, that allow brands to mark their shipments with an emblem so that customs agents can identify legitimate products.

An emblem **MUST** identify the copyright/brand image, provide a textual description of the shipment, and a chain-of-custody/provenance.

4.3. Marking of Civil Aviation Flights

The International Civil Aviation Organization (ICAO) requires that civil aviation flights are protected and that one can verify them to not be dual-use, e.g., not carrying military cargo.

An emblem **MUST** carry a geographic description of the flight plan, its current location, and a textual description of the flight including its manifest, identifying characteristics, e.g., tail number. An emblem may need to also reference a flight manifest.

5. Requirements

5.1. Authenticity

Validators MUST be able to verify that an emblem was issued for the respective bearer, issued by the claimed issuer (where applicable), and that none of its associated data was changed.

5.2. Authorization

Validators MUST be able to verify that an emblem issuer was authorized to issue the emblem. Authorizing parties MAY limit what emblems an issuer can issue, e.g., they MAY limit issuance to certain bearers.

5.2.1. Decentralized Authorization

Anyone MUST be able to authorize an issuer.

5.3. Accountability

Emblem issuance and authorization of issuers (where applicable) MUST be attributable to issuers and authorizing parties. Authorizing parties and emblem issuers MUST NOT be able to repudiate that they issued an emblem or authorization.

5.4. Revocation

Emblems and authorizations (where applicable) MUST be revokable within reasonable windows of time. Depending on the design, it may suffice to rely on expiration of short-lived emblems and authorization effectively as a revocation mechanism.

5.5. Undetectable Validation

Bearers MUST NOT be able to detect whether someone is requesting or validating emblems issued for them.

5.6. Visual

An emblem MUST be capable of carrying a visual representation of the physical emblem it represents.

5.7. Law Carrying

An emblem MUST carry an unambiguous indication of the international law or laws conferring the semantics of the emblem.

5.8. Proximity-Based Distribution

An emblem MUST be presentable using an in-band, proximity-based protocol such as a QR code or RFID.

5.9. Physical Binding

An emblem MUST be possible to associate with physical assets, e.g., buildings, vehicles, or containers.

5.9.1. Quantifiable

An emblem MUST be possible to associate with a range or specific quantity of associated, physical assets.

5.9.2. Geographic

An emblem MUST be restrictable by geographic scope.

5.10. Identity Binding

An emblem MUST be possible to associate with a person or group of people.

5.11. Human-Readable Validation Data

An emblem MUST be capable of providing additional relevant information (e.g., photographs, unique identifiers) which can be used to corroborate the association of the digital emblem with the entity bearing it.

6. Security Considerations

TODO Security

7. IANA Considerations

This document has no IANA actions.

8. Contributors

Parts of this document are based on [I-D.draft-haberman-digital-emblem-ps-03] and [I-D.draft-linker-digital-emblem-02]. As part of that, Brian Haberman (brian@innovationslab.net), Tommy Jensen (tojens@microsoft.com), and Bill Woodcock (woody@pch.net) contributed to writing this document. Furthermore, Rohan Mahy (rohan.ietf@gmail.com) provided valuable feedback on contents and

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9. References

9.1. Normative References

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9.2. Informative References

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