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GLobal Unique Enterprise (GLUE) Identifiers
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Abstract

This specification establishes a URN namespace for GLobal Unique Enterprise (GLUE) Identifiers. This enables URN identifiers to be used for businesses and organizations. It enables organizational identities from existing authorities to be represented within this URN namespace.

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://ietf-wg-spice.github.io/draft-ietf-spice-glue-id/draft-ietf-spice-glue-id.html. Status information for this document may be found at https://datatracker.ietf.org/doc/draft-ietf-spice-glue-id/.

Discussion of this document takes place on the Secure Patterns for Internet CrEdentials Working Group mailing list (mailto:spice@ietf.org), which is archived at https://mailarchive.ietf.org/arch/browse/spice/. Subscribe at https://www.ietf.org/mailman/listinfo/spice/.

Source for this draft and an issue tracker can be found at https://github.com/ietf-wg-spice/draft-ietf-spice-glue-id.

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

There are myriad entity identifier types for businesses and organizations. With the increasing use of digital credentials, there is a need for a common methodology for expressing these identifiers such that claims about and by such entities can be made in a consistent and interoperable manner.

This specification establishes a URN namespace that standardizes the expression of existing organizational entity identifiers by providing a common representation format. It also establishes a registry for managing how existing organizational entity identification mechanisms relate to this namespace.

Any organizational entity identifier whose identification mechanism has been registered as an Authority Identifier in the registry may be represented as a GLUE URI.

1.1. Requirements Notation and Conventions

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.

1.2. Terminology

This specification uses the following terms:

GLUE URI: a URI that uses the GLUE URN namespace established in this specification.

External Authority: an organization that allocates External Identifiers for GLUE URIs using the Authority Identifier(s) over which they have jurisdiction.

Authority Identifier: identifier for the External Authority responsible for assigning the External Identifier used in GLUE URIs.

External Identifier: identifier assigned by an External Authority to identify a particular organization within GLUE URNs over which it has jurisdiction.

2. Core Concepts

Every GLUE URI MUST contain the following components:

* The Authority Identifier

* The External Identifier

2.1. Uniqueness and Namespacing

Each GLUE URI MUST be globally unique.

A business entity can be identified by multiple GLUE URIs, but each GLUE URI can only refer to a single business entity.

It is assumed that most registered organizational entity identification schemes already handle any necessary namespacing as part of the External Identifier. However, if collisions are possible within the set of possible external identifiers for an Authority Identifier scheme, then further namespacing is necessary at the GLUE URI level. Such namespacing MUST be done on the Authority Identifier. The combination of the namespacing and the authority MUST result in a unique Authority Identifier.

For example, assume there is an External Authority FEA that provides identifiers for organizations in Singapore and South Korea. The identifiers issued in Singapore are unique within Singapore, and the identifiers issued in South Korea are unique within South Korea, but there is no guarantee that an organization in Singapore will not be assigned the same identifier as an organization in South Korea. Upon registration of FEA as an Authority Identifier, it would be necessary to separately register two different Authority Identifiers (e.g., FEA-SG and FEA-KR) to provide differentiation between the two sets of External Identifiers.

3. GLUE URIs

GLUE URIs comply with [RFC3986]. They begin with urn:glue: and are followed by an Authority Identifier, a colon character (":"), and the External Identifier allocated by the authority.

Authority Identifiers consist of a sequence of characters beginning with a letter or digit and followed by any combination of letters, digits, plus ("+"), hyphen ("-"), or period (".") . Although Authority Identifiers are case-insensitive, the canonical form is lowercase and documents that specify Authority Identifiers must do so with lowercase letters. An implementation should accept uppercase letters as equivalent to lowercase in Authority Identifier names

(e.g., allow "EXAMPLE" as well as "example") for the sake of robustness but should only produce lowercase Authority Identifier names for consistency. There is a limit of 50 characters for the length of an Authority Identifier. The ABNF [RFC5234] for Authority Identifiers is:

```
authority-identifier = (ALPHA/DIGIT) *49( ALPHA / DIGIT / "+" / "-" /
"." )
```

External Identifiers consist of a sequence of characters beginning with a letter or digit or hyphen ("-") and followed by any combination of letters, digits, plus ("+"), hyphen ("-"), or period (".". A digit or hyphen is allowed as the first character to permit the case where the External Identifier is the representation of a number. It is specific to the Authority Identifier whether the External Identifiers are case-insensitive or case-sensitive. When they are case-insensitive, the canonical form is lowercase and documents that specify External Identifiers must do so with lowercase letters. There is a limit of 1000 characters for an External Identifier. The ABNF [RFC5234] for External Identifiers is:

```
external-identifier = ( ALPHA / DIGIT / "-" ) *999( ALPHA / DIGIT /
"+" / "-" / "." )
```

Combining these, the ABNF [RFC5234] for a GLUE URI is:

```
glue-uri = "urn:glue:" authority-identifier ":" external-identifier
```

For example, the following is a GLUE URI using the Authority Identifier "pen" and the External Identifier "32473":

```
urn:glue:pen:32473
```

A GLUE URI is defined over the restricted US-ASCII syntax specified in this section. Percent-encoding is not permitted. Consequently, GLUE URIs do not support representation of External Identifiers whose canonical form includes non-ASCII characters. This specification is therefore limited to identifier systems whose canonical representations are fully within the permitted character set.

The Authority Identifier MUST be registered in the GLUE URI Authority Identifier registry defined in Section 7.1. The External Identifier MUST be the identifier assigned to the organization by the External Authority.

4. GLUE Authority Identifiers

This section defines the following GLUE Authority Identifiers.

Organization	Authority Identifier	External Authority Specification
GS1	gln	https://www.gs1.org/standards/id-keys/gln
GLEIF	lei	https://www.iso.org/standard/78829.html
Dun & Bradstreet	duns	https://www.dnb.com/duns.html
Private Enterprise Numbers	pen	https://www.iana.org/assignments/enterprise-numbers
ISO/IEC 6523	iso6523	https://www.iso.org/standard/82246.html

Table 1

They are registered in the GLUE Authority Identifier URN Registry in Section 7.1.

4.1. Equivalence to Similar URIs

A GLUE URI is an identifier in a distinct URN namespace. By default, a GLUE URI is not equivalent to any other URI, including a URI defined by the referenced authority's own namespace. Equivalence between a GLUE URI and a non-GLUE URI exists only when explicitly specified for a given Authority Identifier. Implementations and relying parties MUST NOT assume equivalence between GLUE URIs and non-GLUE URIs unless such equivalence is explicitly defined by the authority or documented in the relevant registry entry.

4.1.1. LEI URNs

[LEI-IANA] registers a URN namespace for LEIs. This means that LEIs can be represented as URNs in at least two ways. Therefore there is an equivalence between a GLUE URI with an "lei" Authority Identifier and an LEI URN, provided the 20-digit LEI Code of the LEI URN is identifical to the External Identifier of the GLUE URI. For example, "urn:lei:INR2EJN1ERAN0W5ZP974" is equivalent to "urn:glue:lei:INR2EJN1ERAN0W5ZP974".

5. Security Considerations

There are no additional security considerations beyond those already inherent to using URNs. Security considerations for URNs can be found in [RFC2141].

6. Privacy Considerations

6.1. Private Identifiers as Corporate Identifiers

There are some corporate identifiers that make use of personal identifiers. For example, this is the case for some registered sole-proprietor businesses in the United States, where the Tax ID may be the same as the Social Security Number (SSN) of the business owner. Where the Tax ID uniquely identifies the business, the SSN uniquely identifies an individual.

It is possible for such business identifiers to be represented as GLUE URIs. An identifier’s expression as a GLUE URI does not change the privacy characteristics of that identifier. The same cautions and concerns need to be taken with the GLUE URI representation as with the original identifier.

Implementers storing or evaluating GLUE URIs are encouraged to be aware the privacy characteristics of each identification scheme represented by an Authority Identifier and to appropriately handle any GLUE URI which violates privacy policies.

7. IANA Considerations

This section establishes a registry and populates it with its initial contents.

Values are registered on a Specification Required [RFC8126] basis after a two-week review period on the spice-ext-review@ietf.org mailing list, on the advice of one or more Designated Experts. However, to allow for the allocation of values prior to publication of the final version of a specification, the Designated Experts may

approve registration once they are satisfied that the specification will be completed and published. However, if the specification is not completed and published in a timely manner, as determined by the Designated Experts, the Designated Experts may request that IANA withdraw the registration.

Registration requests sent to the mailing list for review should use an appropriate subject (e.g., "Request to register URN urn:glue:example").

Within the review period, the Designated Experts will either approve or deny the registration request, communicating this decision to the review list and IANA. The Designated Experts verify that a specification exists. Experts are encouraged to be biased towards approving registrations unless they are abusive, frivolous, or actively harmful (not merely aesthetically displeasing or architecturally dubious).

Denials should include an explanation and, if applicable, suggestions as to how to make the request successful. If the designated experts are not responsive, the registration requesters should contact IANA to escalate the process.

Criteria that should be applied by the Designated Experts includes determining whether the proposed registration duplicates existing functionality, determining whether it is likely to be of general applicability or whether it is useful only for a single application, and whether the registration makes sense.

IANA must only accept registry updates from the Designated Experts and should direct all requests for registration to the review mailing list.

It is suggested that multiple Designated Experts be appointed who are able to represent the perspectives of different applications using this specification, in order to enable broadly-informed review of registration decisions. In cases where a registration decision could be perceived as creating a conflict of interest for a particular Expert, that Expert should defer to the judgment of the other Experts.

The reason for the use of the mailing list is to enable public review of registration requests, enabling both Designated Experts and other interested parties to provide feedback on proposed registrations. The reason to allow the Designated Experts to allocate values prior to publication as a final specification is to enable giving authors of specifications proposing registrations the benefit of review by the Designated Experts before the specification is completely done, so that if problems are identified, the authors can iterate and fix them before publication of the final specification.

7.1. GLUE Authority Identifier URN Registry

This specification establishes the IANA "GLUE Authority Identifier URN" registry creating a URN namespace for Authority Identifiers for GLobal Unique Enterprise (GLUE) Identifiers.

Each entry registers the URN for an Authority Identifier within the "urn:glue:" namespace. The organization responsible for the Authority Identifier is recorded.

IANA is requested to create the "GLobal Unique Enterprise (GLUE) Identifiers" registry group located at https://www.iana.org/assignments/glue-identifiers/ and place this registry there.

7.1.1. Registration Template

Authority Identifier: identifier for the External Authority responsible for assigning the External Identifier used in GLUE URIs. This identifier is not case sensitive and any letters MUST be expressed in lowercase characters. It MUST consist of a sequence of characters with a mazimum length of 50, beginning with a letter and followed by any combination of letters, digits, plus ("+"), period ("."), or hyphen ("-").

URN: The URN within the "urn:glue:" namespace consisting of "urn:glue:" followed by the Authority Identifier.

Organization: The organization responsible for the Authority Identifier.

Change Controller: For IETF stream RFCs, use "IETF". For others, give the name of the responsible party. Other details (e.g., postal address, e-mail address, home page URI) may also be included.

Specification Document(s): Reference to the document or documents

that specify the Authority Identifier to be registered, preferably including URLs that can be used to retrieve the documents. An indication of the relevant sections may also be included, but is not required.

7.1.2. Initial Registry Contents

7.1.2.1. gln

* Authority Identifier: gln
* URN: urn:glue:gln
* Organization: GS1
* Change Controller: IETF
* Specification Document(s): Section 4 of this specification, [GLN]

7.1.2.2. lei

* Authority Identifier: lei
* URN: urn:glue:lei
* Organization: GLEIF
* Change Controller: IETF
* Specification Document(s): Section 4 of this specification, [LEI], [LEI-IANA]

7.1.2.3. duns

* Authority Identifier: duns
* URN: urn:glue:duns
* Organization: Dun & Bradstreet
* Change Controller: IETF
* Specification Document(s): Section 4 of this specification, [DUNS]

7.1.2.4. pen

* Authority Identifier: pen

* URN: urn:glue:pen

* Organization: Private Enterprise Numbers

* Change Controller: IETF

* Specification Document(s): Section 4 of this specification, [PEN], [RFC9371]

7.1.2.5. iso6523

* Authority Identifier: iso6523

* URN: urn:glue:iso6523

* Organization: ISO/IEC 6523

* Change Controller: IETF

* Specification Document(s): Section 4 of this specification, [ISO6523]

8. References

8.1. Normative References

[DUNS] "D-U-N-S Numbers", n.d., <https://www.dnb.com/duns.html>.

[GLN] "Global Location Nymber (GLN)", n.d., <https://www.gs1.org/standards/id-keys/gln>.

[ISO6523] "ISO/IEC 6523-1:2023. Information technology — Structure for the identification of organizations and organization parts, Part 1: Identification of organization identification schemes", 2023, <https://www.iso.org/standard/82246.html>.

[LEI] "Legal Entity Identifier (LEI)", 2020, <https://www.iso.org/standard/78829.html>.

[LEI-IANA] "LEI Namespace Identifier", n.d., <https://www.iana.org/assignments/urn-formal/lei>.

[PEN] "Private Enterprise Numbers", n.d., <https://www.iana.org/assignments/enterprise-numbers>.

[RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", BCP 14, RFC 2119, DOI 10.17487/RFC2119, March 1997, <https://www.rfc-editor.org/rfc/rfc2119>.

[RFC3986] Berners-Lee, T., Fielding, R., and L. Masinter, "Uniform Resource Identifier (URI): Generic Syntax", STD 66, RFC 3986, DOI 10.17487/RFC3986, January 2005, <https://www.rfc-editor.org/rfc/rfc3986>.

[RFC8174] Leiba, B., "Ambiguity of Uppercase vs Lowercase in RFC 2119 Key Words", BCP 14, RFC 8174, DOI 10.17487/RFC8174, May 2017, <https://www.rfc-editor.org/rfc/rfc8174>.

8.2. Informative References

[RFC2141] Moats, R., "URN Syntax", RFC 2141, DOI 10.17487/RFC2141, May 1997, <https://www.rfc-editor.org/rfc/rfc2141>.

[RFC5234] Crocker, D., Ed. and P. Overell, "Augmented BNF for Syntax Specifications: ABNF", STD 68, RFC 5234, DOI 10.17487/RFC5234, January 2008, <https://www.rfc-editor.org/rfc/rfc5234>.

[RFC8126] Cotton, M., Leiba, B., and T. Narten, "Guidelines for Writing an IANA Considerations Section in RFCs", BCP 26, RFC 8126, DOI 10.17487/RFC8126, June 2017, <https://www.rfc-editor.org/rfc/rfc8126>.

[RFC9371] Baber, A. and P. Hoffman, "Registration Procedures for Private Enterprise Numbers (PENs)", RFC 9371, DOI 10.17487/RFC9371, March 2023, <https://www.rfc-editor.org/rfc/rfc9371>.

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Document History

-05

* Added ISO/IEC 6523 identifiers.

* The first character of the Authority Identifier may be a digit.

* Fixed wording in IANA Considerations.

* Limited character set to US-ASCII.

* Fixed multiple nits from WGLC.

-04

* Applied review suggestions from Martin Thomson, specifically:

  - Added references for each registered Authority Identifier.

  - Added size limits for Authority Identifiers and External Identifiers.

  - Added a note about LEI URNs.

-03

* Use the urn:glue URN namespace and delete the urn:ietf:spice URN namespace.

* Addressed early IANA feedback.

-02

* Improved several descriptions in the specification.

-01

* Updated Brent’s affiliation.

-00

* Initial working group draft, based on draft-zundel-spice-glue-id-02

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