Use of Internationalized Email Addresses in EPP protocol

Abstract

This document describes an EPP extension that permits usage of
Internationalized Email Addresses in the EPP protocol and specifies
the terms when it can be used by EPP clients and servers. The
Extensible Provisioning Protocol (EPP), being developed before
appearing the standards for Internationalized Email Addresses (EAI),
does not support such email addresses.

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1. Introduction

[RFC6530] introduced the framework for Internationalized Email
Addresses. To make such addresses more widely accepted, the changes
to various protocols need to be introduced.

This document describes an Extensible Provisioning Protocol (EPP)
extension that permits usage of Internationalized Email Addresses in
the EPP protocol and specifies the terms when it can be used by EPP
clients and servers. A new form of EPP extension, referred to as a
Functional Extension, is defined and used to apply the rules for the
handling of email address elements in all of the [RFC5730]
extensions negotiated in the EPP session, which include the object
and command-responses extensions. The described mechanism can be
applied to any object or command-response extension that uses an
email address.

The Extensible Provisioning Protocol (EPP) specified in [RFC5730] is a base document for object management operations and an extensible framework that maps protocol operations to objects. The specifics of various objects managed via EPP is described in separate documents. This document is only referring to an email address as a property of a managed object, such as the <contact:email> element in the EPP contact mapping [RFC5733] or the <org:email> element in the EPP organization mapping [RFC8543], and command-response extensions applied to a managed object.

1.1. Conventions Used in This Document

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.

2. Migrating to Newer Versions of This Extension

Servers that implement this extension **SHOULD** provide a way for clients to progressively update their implementations when a new version of the extension is deployed. A newer version of the extension is expected to use an XML namespace with a higher version number than the prior versions.

3. Email Address Specification

Support of non-ASCII email address syntax is defined in RFC 6530 [RFC6530]. This mapping does not prescribe minimum or maximum lengths for character strings used to represent email addresses. The exact syntax of such addresses is described in Section 3.3 of [RFC6531]. The validation rules introduced in RFC 6531 are considered to be followed.

The definition of email address in the EPP RFCs, including Section 2.6 of [RFC5733] and Section 4.1.2, 4.2.1, and 4.2.5 of [RFC8543], references [RFC5322] for the email address syntax. The XML schema definition in Section 4 of [RFC5733] and Section 5 of [RFC8543] defines the "email" element using the type "eppcom:minTokenType", which is defined in Section 4.2 of [RFC5730] as an XML schema "token" type with minimal length of one. The XML schema "token" type will fully support the use of EAI addresses, so the primary application of the EAI extension is to apply the use of [RFC6531] instead of [RFC5322] for the email address syntax. Other EPP extensions may follow the formal syntax definition using the XML schema type "eppcom:minTokenType" and the [RFC5322] format specification, where this extension applies to all EPP extensions with the same or similar definitions.

The email address format is formally defined in Section 3.4.1 of
[RFC5322], which only consists of printable US-ASCII characters for
both the local-part and the domain ABNF rules. In [RFC6531], the
extends the Mailbox, Local-part and Domain ABNF rules in [RFC5321]
to support "UTF8-non-ascii", defined in Section 3.1 of [RFC6532],
for the local-part and U-label, defined in Section 2.3.2.1 of
[RFC5890], for the domain. By applying the syntax rules of
[RFC5322], the EPP extensions will change from supporting only ASCII
characters to supporting Internationailzed characters in the email
address local-part and domain-part.

4. Functional Extension

[RFC5730] defines three types of extensions at the protocol, object,
and command-response level, which impact the structure of the EPP
messages. A Functional Extension applies a functional capability to
an existing set of EPP extensions and properties. The scope of the
applicable EPP extensions and applicable extension properties are
defined in the Functional Extension along with the requirements for
the servers and clients that support it. The Functional Extension
needs to cover the expected behavior of the supporting client or
server when interfacing with an unsupporting client or server.
Negotiating support for a Functional Extension is handled using the
EPP Greeting and EPP Login services.

5. Internationalized Email Addresses (EAI) Functional Extension

5.1. Scope of Functional Extension

The functional extension applies to all object extensions and
command-response extensions negotiated in the EPP session that
include email address properties. Examples include the
<contact:email> element in the EPP contact mapping [RFC5733] or the
<org:email> element in the EPP organization mapping [RFC8543]. All
registry zones (e.g., top-level domains) authorized for the client
in the EPP session apply. There is no concept of a per-client, per-
zone, per-extension, or per-field setting that is used to indicate
support for EAI, but instead it's a global setting that applies to
the EPP session.

5.2. Signaling Client and Server Support

The client and the server can signal support for the functional
extension using a namespace URI in the login and greeting extension
services. The namespace URI "urn:ietf:params:xml:ns:epp:eai-0.2" is
used to signal support for the functional extension. The client
includes the namespace URI in an <svcExtension> <extURI> element of
the [RFC5730] <login> Command. The server includes the namespace URI
in an <svcExtension> <extURI> element of the [RFC5730] Greeting.

5.3. Functional Extension Behavior

5.3.1. EAI Functional Extension Negotiated

If both client and server have indicated the support of the EAI
addresses during the session establishment, it implies possibility
to process the EAI address in any message having an email property
during the established EPP session. Below are the server and client
obligations when the EAI extension has been successfuly negotiated
in the EPP session.

The server MUST satisfy the following obligations when the EAI
extension has been negotiated:

  *Accept EAI compatible addresses for all email properties in the
   EPP session negotiated object extensions and command-response
   extensions. For example the <contact:email> element in [RFC5733]
   and the <org:email> element in [RFC8543].

  *Accept EAI compatible addresses for all registry zones (e.g.,
   top-level domains) authorized for the client in the EPP session.

  *Email address validation based on EAI validation rules defined in
   Section 3

  *Storage of email properties that supports internationalized
   characters.

  *Return EAI compatible addresses for all email properties in the
   EPP responses.

The server MUST satisfy the following obligations when THE EAI
extension has been negotiated:

  *Provide EAI compatible addresses for all e-mail properties in the
   EPP session negotiated object extensions and command-response
   extensions. For example the <contact:email> element in [RFC5733]
   and the <org:email> element in [RFC8543].

  *Provide EAI compatible addresses for all registry zones (e.g.,
   top-level domains) authorized for the client in the EPP session.

  *Accept EAI compatible addresses in the EPP responses for all
   email properties in the EPP session negotiated object extensions
   and command-response extensions.

5.3.2. EAI Functional Extension Not Negotiated

The lack of EAI support can cause data and functional issues, so an
EAI supporting client or server needs to handle cases where the

opposite party doesn't support EAI. Below are the server and client
obligations when the EAI extension is not negotiated due to the lack
of support by the opposite party.

The EAI supporting server MUST satisfy the following obligations
when the client does not support the EAI extension:

  *When the email property is required in the EPP extension command,
   the server SHOULD validate the email property by the client using
   the ASCII email validation rules.

  *When the email property is optional according the EPP extension
   command, if the client supplies the email property the server
   SHOULD validate the email property using the ASCII email
   validation rules.

  *When the email property is required in the EPP extension
   response, the server MUST validate whether the email property is
   an EAI address and if so return the predefined placeholder email
   TBD and otherwise return the email property that has been set.

  *When the email property is optional in the EPP extension
   response, the server MUST validate whether the email property is
   an EAI address and if so don't return the email property in the
   response and otherwise return the email property that has been
   set based on server policy.

The EAI supporting client MUST satisfy the following obligations
when the server does not support the EAI extension:

  *When the email property is required in the EPP extension command
   and the email property is an EAI address with no alternative
   ASCII address, the client MUST provide the predefined placeholder
   email address TBD.

  *When the email property is optional in the EPP extension command
   and the email property is an EAI address with no alternative
   ASCII address, the client SHOULD omit the email property.

6. Security Considerations

Registries **SHOULD** validate the domain names in the provided email
addresses. This can be done by validating all code points according
to IDNA2008 [RFC5892].

7. IANA Considerations

7.1. XML Namespace

This document uses URNs to describe XML namespaces and XML schemas conforming to a registry mechanism described in RFC 3688 [RFC3688]. The following URI assignment should be made by IANA:

Registration request for the eai namespace:

URI: urn:ietf:params:xml:ns:epp:eai-0.2
Registrant Contact: IESG
XML: None. Namespace URIs do not represent an XML specification.

Registration request for the eai XML Schema:

URI: urn:ietf:params:xml:schema:epp:eai-0.2
Registrant Contact: IESG
XML: See the "Formal Syntax" section of this document.

7.2. EPP Extension Registry

The EPP extension described in this document should be registered by IANA in the "Extensions for the Extensible Provisioning Protocol (EPP)" registry described in RFC 7451 [RFC7451]. The details of the registration are as follows:

Name of Extension: Use of Internationalized Email Addresses
                   in EPP protocol
Document status: Standards Track
Reference: TBA
Registrant Name and Email Address: IESG, <iesg@ietf.org>
Top-Level Domains(TLDs): Any
IPR Disclosure: None
Status: Active
Notes: None

8. Implementation Considerations

Registries MAY apply extra limitation to the email address syntax (e.g. the addresses can be limited to Left-to-Right scripts). These limitations are out of scope of this document.

9. References

9.1. Normative References

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9.2. Informative References

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Appendix A. Change History

A.1. Change from 00 to 01

1. Changed from update of RFC 5733 to use the "Placeholder Text and a New Email Element" EPP Extension approach.

A.2. Change from 01 to 02

1. Fixed the XML schema and the XML examples based on validating them.

2. Added James Gould as co-author.

3. Updated the language to apply to any EPP object mapping and to use the EPP contact mapping as an example.

4. Updated the structure of document to be consistent with the other Command-Response Extensions.

5. Replaced the use of "eppEAI" in the XML namespace and the XML namespace prefix with "eai".

6. Changed to use a pointed XML namespace with "0.2" instead of "1.0".

A.3. Change from 02 to 03

1. The approach has changed to use the concept of Functional EPP Extension.

2. The examples are removed

A.4. Change from 03 to 04

1. More detailed reference to email syntax is provided

2. The shortened eai namespace reference is removed

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