Quick Guide to
Email Address Internationalization (EAI)

Background

Universal Acceptance (UA) is the state where all domain names and email addresses are accepted, validated, stored, processed and displayed correctly and consistently by all applications, devices and systems.

Due to the rapidly changing domain name landscape, many systems do not recognize or appropriately process new domain names, primarily because the Top Level Domain may be new, more than three characters in length or in a non-ASCII format (Internationalised Domain Names or IDNs). The same is true for email addresses that incorporate these new domain names or use Unicode in the Local parts of mailbox names.

The Universal Acceptance Steering Group (UASG), supported by Internet Corporation for Assigned Names and Numbers (ICANN), is a community-led initiative working on creating awareness and identifying and resolving problems associated with the universal acceptance. The purpose of these efforts is to help ensure a consistent and positive experience for Internet users globally.

For more information on the UASG and recent developments, visit www.uasg.tech.

This Quick Guide to EAI (Email Address Internationalisation) is an introductory document for providers of email software and services to consider when planning to make their offerings EAI Ready.

EAI

EAI is the protocol that allows email addresses with IDNs in the domain part and/or Unicode (non-ASCII) characters in the Local part of the Mailbox name.   Email software and services need to make specific changes to support EAI, since EAI mail is conceptually a separate mail stream from legacy ASCII mail.

Example of Internationalized Email Addresses

测试 5 @ 遍接受-测试.世界

Günte @ Bücher.berlin

Local part

Domain Name

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Items for Email Software Developers to Consider

Email software developers need to take the following items into consideration as they make their products EAI-ready:

Client Software (MUA – Mail User Agent)
* Store and display the local part and domain name in Unicode
* Check that the MTA (Mail Transport Agent) handles EAI, i.e., advertises the SMTPUTF8 feature, when sending EAI mail
* Follow good practice guides for Linkification within the body of the email (see UASG 010 – Quick Guide to Linkification)
* Follow good practice guides for validation of domain name. (See UASG 007 – Introduction to Universal Acceptance.)

Server Software (MTA – Mail Transport Agent)
* When receiving mail, advertise the SMTPUTF8 feature.
* When sending mail, check for the SMTPUTF8 feature on the remote mail server, use the SMTPUTF8 option when sending mail.
* Do not send EAI mail to remote servers that do not support it; provide readable error reports when users attempt to do so.
* Accept both U-label and A-label versions of domain names in e-mail addresses.
* Allow "fuzzy" matching of local parts in incoming addresses, analogous to allowing upper or lower case when matching ASCII names.

Items for Email Service Providers to consider

* Consider offering an ASCII mailbox name to users in addition to an EAI mailbox name[1]
  * If both names deliver to the same mailbox, users will find it easier to share addresses with other users whose mail systems don't support EAI.
  * Once the ASCII address is initially shared, a user can decide whether to add the EAI address to their address book.

* To avoid addresses that can confuse users, offer Unicode mailbox names that conform to best practices.
  * Follow the domain name label generation rules for the selected script, or
  * Follow the identifier rules in Unicode UTS#39, or
  * Use the IETF PRECIS UsernameCaseMapped identifier profile.

[1] A provider can assign ASCII and EAI mailbox names in any way that makes sense for the provider, since there is no mechanical way to convert an EAI address to an ASCII address. In particular the methods for converting between U-labels and A-labels in domain names do not apply to mailbox local parts.

Challenges during transition

Until all email software deployed is EAI-ready, there will be some challenging situations that arise in the sending and receiving of emails.

*   IDNs may display in their ASCII (A-Label) form. While undesirable, this should not stop messages from being delivered.

*   Unicode in the Mailbox name of an email address may cause unexpected and undesirable results, including:

- Rejection or Non-delivery of messages
- Messages received by some recipients in a multi-recipient message but not received by others.
- Inconsistency between sending messages to multiple recipients and Reply-All to those same recipients
- Inconsistency or failure in error-message creation and delivery.

*   How to ensure delivery to non-EAI ready mail systems

- Provide alternative ASCII addresses for users
- Provide a way to use ASCII addresses on mail to non-EAI mail systems

Relevant RFCs

EAI developments should conform to the relevant RFCs:

Internationalized Domain Names for Applications (IDNA): Definitions and Document Framework	https://tools.ietf.org/html/rfc5890
Overview and Framework for Internationalized Email	https://tools.ietf.org/html/rfc6530
SMTP Extension for Internationalized Email	https://tools.ietf.org/html/rfc6531
Internationalized Email Headers	https://tools.ietf.org/html/rfc6857
Internationalized Delivery Status and Disposition Notifications	https://tools.ietf.org/html/rfc6858
IMAP Support for UTF-8	https://tools.ietf.org/html/rfc6855
Post Office Protocol Version 3 (POP3) Support for UTF-8	https://tools.ietf.org/html/rfc6856

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Relevant RFCs (continued)

Post-Delivery Message Downgrading for Internationalized Email Messages	https://tools.ietf.org/html/rfc6857
Simplified POP and IMAP Downgrading for Internationalized Email	https://tools.ietf.org/html/rfc6858
PRECIS framework overview	https://tools.ietf.org/html/rfc8264
PRECIS usernames and passwords	https://tools.ietf.org/html/rfc8265
Unicode security mechanisms UTS#39	http://unicode.org/reports/tr39/

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