



# Quick Guide to: Email Address Internationalization (EAI)

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## ■ 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 (Internationalized Domain Names, or IDNs). The same is true for email addresses that incorporate these new domain names or use Unicode in the 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 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](http://www.uasg.tech).

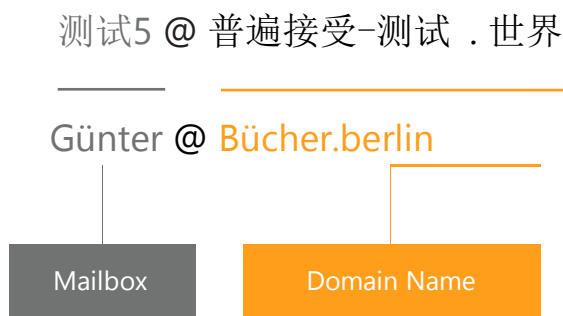
This Quick Guide to EAI (Email Address Internationalization) is an introductory document for providers of email software and services to consider when planning to make their offerings EAI Ready.

## ■ EAI

EAI is the protocol that allows email addresses with IDNs in the domain part and/or Unicode



(non-ASCII) characters in the Mailbox name to function within the traditional email environment. Email software and services need to make specific changes to support EAI. Example of Internationalized Email Address:



### ■ 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)

- ▶ Should display the domain name in Unicode.
- ▶ May pass the domain name to the MTA (Mail Transport Agent) in A-Label format (RFC 5890).
- ▶ Should store and display the Mailbox name in Unicode.
- ▶ Should follow good practice guides for Linkification within the body of the email (see UASG 010 – Quick Guide to Linkification).
- ▶ Should follow good practice guides for validation of domain name (see UASG 007 – Introduction to Universal Acceptance).

#### Server Software (MTA – Mail Transport Agent)

- ▶ \* Should confirm EAI-readiness (e.g. advertise SMTPUTF8 support) when making a connection to another MTA.

### ■ Items for Email Service Providers to Consider

- ▶ Don't enforce case-sensitivity of local-part mailbox names.



- Allow the user to enter the email address in any combination of upper-and-lowercase characters so long as the script is correct.
- ▶ Don't issue mailbox names which will duplicate other mailbox names which have the same characters but different cases (e.g. "user@example.tld") and "uSer@example.tld").
- ▶ Consider offering an all-ASCII mailbox name to the user when they are issued an EAI-compatible mailbox name.
  - If both names alias to the same mailbox (i.e. can be used interchangeably) users will find it easier to initially share addresses with other users who use a different script.
  - Once the ASCII address is initially shared, a user can decide whether to also add the EAI-compatible address to their address book.

## ■ Challenges During Transition

Until all the 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 Punycoded (A-Label) form (RFC5890). 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:
  - 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:
  - Creating aliases by applying Punycode to the Mailbox name.
  - Normalizing mailbox names in non-ASCII scripts.

## ■ Relevant RFCs

EAI developments should conform to the relevant RFCs:

<b>Internationalized Domain Names for Applications</b>	<a href="https://tools.ietf.org/html/rfc5890">https://tools.ietf.org/html/rfc5890</a> <a href="https://tools.ietf.org/html/rfc5890">https://tools.ietf.org/html/rfc5890</a>
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<b>(IDNA): Definitions and Document Framework</b>	
<b>Overview and Framework for Internationalized Email</b>	<a href="https://tools.ietf.org/html/rfc6530">https://tools.ietf.org/html/rfc6530</a>
<b>SMTP Extension for Internationalized Email</b>	<a href="https://tools.ietf.org/html/rfc6531">https://tools.ietf.org/html/rfc6531</a>
<b>Internationalized Email Headers</b>	<a href="https://tools.ietf.org/html/rfc6532">https://tools.ietf.org/html/rfc6532</a>
<b>Internationalized Delivery Status and Disposition Notifications</b>	<a href="https://tools.ietf.org/html/rfc6533">https://tools.ietf.org/html/rfc6533</a>
<b>IMAP Support for UTF-8</b>	<a href="https://tools.ietf.org/html/rfc6855">https://tools.ietf.org/html/rfc6855</a>
<b>Post Office Protocol Version 3 (POP3) Support for UTF-8</b>	<a href="https://tools.ietf.org/html/rfc6856">https://tools.ietf.org/html/rfc6856</a>
<b>Post-Delivery Message Downgrading for Internationalized Email Messages</b>	<a href="https://tools.ietf.org/html/rfc6857">https://tools.ietf.org/html/rfc6857</a>
<b>Simplified POP and IMAP Downgrading for Internationalized Email</b>	<a href="https://tools.ietf.org/html/rfc6858">https://tools.ietf.org/html/rfc6858</a>
<b>Punycode Conversion Algorithm</b>	<a href="https://tools.ietf.org/html/rfc3492">https://tools.ietf.org/html/rfc3492</a>

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