EAI Readiness Self-Certification Guide

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EAI Readiness Self-Certification Guide

Introduction:

This document's main objective is to guide mail service providers, software vendors, and developers about the functionalities required to self-certify the readiness of their email systems, tools, and utilities for Email Address Internationalization (EAI).

It provides IT and procurement managers the necessary information about EAI readiness levels that may help them in selecting or purchasing email services and tools. Levels are categorized by the words “Platinum”, “Gold” and “Silver”. These categories make the information easier to understand.

EAI support is an important element of the Universal Acceptance (UA) of domain names and email addresses, it means that tools and systems can accept, validate, process, store and display all domain names and email addresses equally. This guide content is based on the Universal Acceptance Steering Group (UASG) issued UA and EAI readiness framework (UASG026 Report).

This guide applies to all kinds of software which stores or processes email messages or email addresses. This includes not only the obvious components like email servers, but also components which store email addresses, like contact lists, or which send email messages, like calendars.

Universal Acceptance of domain names and email addresses is a foundational requirement for a truly multilingual Internet, one in which users around the world can navigate entirely in all available domain names and in local languages. It is also the key to unlocking the potential of new generic top-level domains (gTLDs) to foster competition, consumer choice and innovation in the domain name industry. To achieve Universal Acceptance, Internet applications and systems must treat all TLDs in a consistent manner, including new gTLDs and internationalized TLDs. Specifically, they must accept, validate, store, process and display all domain names, as explained in more details in UASG026 - Universal Acceptance Readiness Framework.

The Universal Acceptance Steering Group is a community-based team working to share this vision for the Internet of the future with those who construct this space: technology developers as well as system and email administrators. The group's primary objective is to help these stakeholders understand how to update their systems to keep pace with an evolving domain name system (DNS).

EAI Readiness Levels

Level	Functionality
Platinum	1. Meets all Gold requirements listed below 2. Supports all UASG Best Practices guidelines [see **References and UASG Guidelines**, below] 3. Hosting functionality for internationalized mailboxes is enabled by default [to the user and administrator] 4. May also include “aspirational” extra features which improve user experience, also listed below 5. Documentation clearly explains how to set up, use and administer Platinum-level features 6. All integrated tools or utilities should be EAI enabled as well
Gold	1. Meets all Silver requirements listed below 2. Hosting functionality for internationalized mailboxes is available but not enabled by default 3. Marketing materials and public messaging promote globally inclusive email systems and features 4. Documentation clearly explains how to set up and use Gold-level features 5. Functionality which processes email addresses rather than messages, for example address books, can create and store Unicode email addresses
Silver	1. Enables its users to process email messages from [EAI][Unicode][TBD new term] mailboxes but does not host such mailboxes 2. Functionality which processes email addresses rather than messages, for example address books, need not create or store Unicode email addresses

Other recommendations

We have some recommendations which are desirable in email products and tools, but are not matters of Email Address Internationalization (EAI). We include them in this section as commentary rather than normative requirements.

Products must follow all UASG best practices related to email products. This includes UASG 028 *Considerations for Naming Internationalized Email Mailboxes*.

As an example, a product must support any ASCII-only email address compliant with email RFCs. See especially RFC 5322. Such support includes:

- Do not modify case
- Do not add, remove, or reject “+” or “.” in addresses
- Do attempt to normalize

Ratings of systems based on ratings of components

Email systems are generally made up of multiple components. The guide permits rating of individual components and rating of systems.

Typically, high rated systems will be composed of high rated components. But this is not always the case. The rating of a system is based on the overall behaviour of the system. So, a system may have a high rating even if the components have no rating or a lower rating.

- For example, in an IMAP server, the standard legacy character set is sufficient to enable a fully functioning EAI system. However, one which supports Unicode would have a higher rating.

Note: This guide is intended to certify EAI conformance and is not intended to be a generic rating system for email components and systems. Ratings are based on how well EAI features are supported and integrated within the user experience, but not on the completeness of the email feature set.

- For example, if an MUA does not support contact lists or address books (see 1.1 below) it would not be a very convenient experience to a modern email user, but that would be a separate issue from its EAI-readiness. (You can’t give an EAI-readiness score to a feature that doesn’t exist).
- If a Description contains text such as “If the software supports…”, it means that the score is given to ensure feature parity between EAI functionality and existing legacy functionality. To earn the score, the software must support EAI email addresses with the same functionality as — not less than — Limited Latin email addresses.

Self-Certification Technical Requirements (evaluation Criteria)

Email System Components

1) EAI-Ready Mail User Agent (MUA) and EAI-Ready Webmail clients

NOTE: There is substantial overlap between stand-alone MUAs and webmail clients. For example, webmail clients are usually not expected to support IMAP or POP, but MUAs usually do support IMAP or POP.

NOTE: This guide depends on the concept of "feature parity" for its guidance. If a Description contains text such as "If the software supports…", it means that the score is given to ensure feature parity between EAI functionality and existing legacy functionality; it is not meant to indicate that new base functionality must be added.

Item	Function	Status/Level of Support	Description
MUA.1	EAI addresses can be saved to address book	MUST have for GOLD or higher	If the software supports or includes an "address book" (a mechanism through which contact details can be saved and later recalled), the feature should allow EAI addresses to be saved. The details of how the address is stored are unimportant for this test case, only that it can be done.
MUA.2	EAI addresses in address book display address local part as Unicode	MUST have for GOLD or higher	If the software allows viewing items in the address book, it should display the local parts of EAI addresses in Unicode form.
MUA.3	EAI addresses in address book display address domain part as Unicode	MUST have for GOLD or higher	If the software allows viewing items in the address book, it should display the domain parts of EAI addresses in U-label form.

MUA.5	EAI addresses recalled from address book display address local part as Unicode	MUST have for GOLD or higher	If the software allows destination address fields to be populated from the address book (typically through an autocompletion or search feature in the composition interface), the local part of EAI addresses inserted into destination address fields should be displayed as Unicode. This applies to the “To”, “Cc”, and “Bcc” fields.
MUA.6	EAI addresses recalled from address book display address domain part as Unicode	MUST have for GOLD or higher	If the software allows destination address fields to be populated from the address book (typically through an autocompletion or search feature in the composition interface), the domain part of EAI addresses inserted into destination address fields should be displayed in U-label form. This applies to the “To”, “Cc”, and “Bcc” fields.
MUA.7	Address book search supports Unicode	MUST have for GOLD or higher	If the software supports textual search for values in the address book, then it should be possible to search for an address using its U-label form. For this test case, <Email> excludes punycode-equivalent rows.
MUA.8	Address book search supports Unicode and Punycode	MUST have for PLATINUM	Same as 1.7, but it’s easy to see when punycoded addresses are equivalent to Unicode addresses
MUA.9	Originator fields accept EAI addresses	MUST have for GOLD or higher	In cases where the software allows the user to override the source address for a given message, it should allow them to enter EAI addresses in U-label form. This applies to the “From” and “Reply-to” message fields.
MUA.10	Originator fields display EAI address local part as Unicode	MUST have for GOLD or higher	The software should display the local parts of EAI addresses as Unicode. This applies to the “From” and “Reply-to” message fields.
MUA.11	Originator fields display EAI address domain part as Unicode	MUST have for GOLD or higher	The software should display the domain parts of EAI addresses in U-label form. This applies to the “From” and “Reply-to” message fields.
MUA.12	Destination address fields accept EAI addresses	MUST have for GOLD or higher	The user should be able to enter EAI destination addresses in U-label form when composing a message. This applies to the “To”, “Cc”, and “Bcc” fields.

MUA.13	Destination address fields display EAI address local part as Unicode	MUST have for GOLD or higher	The software should display the local parts of EAI addresses as Unicode. This applies to the “To”, “Cc”, and “Bcc” fields.
MUA.14	Destination address fields display EAI address domain part as Unicode	MUST have for GOLD or higher	The software should display the domain parts of EAI addresses in U-label form. This applies to the “To”, “Cc”, and “Bcc” fields.
MUA.15	Unstructured header fields accept Unicode		The user should be able to enter Unicode strings as the values for unstructured text headers such as the “Subject” header. (The Subject header is an unstructured header that most software allows the user to change easily.)
MUA.16	EAI mailto link targets are supported	MUST have for GOLD or higher	If the software supports opening “mailto:” links, it should be possible to open “mailto:” links that target EAI addresses. The result of opening such a link will vary between applications, so this test case only verifies that a links to EAI addresses can be opened and that the standard behavior of the application is triggered successfully.
MUA.17	Message text linkifies EAI values	MUST have for GOLD or higher	If the software linkifies addresses, EAI addresses should be linked in the same way as conventional (non-EAI) addresses. The exact action of the link may vary. For example, some software may create a “mailto” link from the address, or it may become possible to Right-click the address and choose an action from a menu. This applies to the editable body text of the message composition interface.
MUA.18	SMTP server address may be IDN	MUST have for SILVER or higher	If the software supports SMTP, it should allow a target server with an IDN address.. Accepting an A-Label is sufficient for this requirement. For a U-Label name, see next requirement.

MUA.19	SMTP server address can be specified by U-label	MUST have for GOLD or higher	If the software supports SMTP, it should allow a target server with an IDN address to be specified in U-label form.
MUA.20	SMTP server address displayed as Unicode	MUST have for GOLD or higher	If the software supports SMTP, then when a target server with an IDN address is specified by the user by U-label, that label should then be displayed to the user in U-label form.
MUA.21	Connection to SMTP server at IDN address is supported	MUST have for Silver or higher	If the software supports SMTP, then when a target server with an IDN address is used, the application should correctly resolve the IDN label and connect to the server. A successful login is a good way to test this.
MUA.22	Username can be provided as Unicode	MUST have for GOLD or higher	If the software supports SMTP, it must be possible for the user to specify the username to be used for authenticating the SMTP connection in Unicode.
MUA.23	Username displayed as Unicode	MUST have for GOLD or higher	If the software supports SMTP, then when a username is specified by the user in Unicode, it should also be displayed to the user in Unicode.
MUA.24	EAI originator header values are transmitted to SMTPUTF8 server	MUST have for Silver or higher	If a message includes an originator header value containing Unicode, and if the software submits the message to an SMTP server offering the SMTPUTF8 extension, then the software must deliver the content of the originator header. It may do so as Unicode or re-encoded using an ASCII representation. This applies to the “From” and “Reply-to” fields. Because the software may use either representation, this test simply verifies that it will correctly submit messages to an SMTPUTF8-capable server, but does not test the specific representation used for the message header values.
MUA.25	EAI destination address header values are transmitted to SMTPUTF8 server	MUST have for Silver or higher	If a message includes a destination header value containing Unicode, and if the software submits the message to an SMTP server offering the SMTPUTF8 extension, then the software must deliver the content

			of the destination header. It may do so as Unicode or re-encoded using an ASCII representation. This applies to the “To”, “Cc”, and “Bcc” fields. Because the software may use either representation, this test simply verifies that it will correctly transmit messages to an SMTPUTF8-capable server, but does not test the specific representation used for the message header values.
MUA.26	Unicode unstructured header values are transmitted to SMTPUTF8 server	MUST have for Silver or higher	If a message includes an unstructured header field containing a Unicode value and if the software submits to an SMTP server offering the SMTPUTF8 extension then it must send headers encoded in UTF-8 instead of using an alternative encoding for non-ASCII content. (The Subject header is an unstructured header that most software allows the user to change easily.) Because the software may still choose to use an alternative ASCII representation, this test simply verifies that it will correctly transmit messages to an SMTPUTF8-capable server, but does not test the specific representation used for the unstructured header values.Regardless of representation, the encoding must be UTF8.
MUA.27	EAI originator header values are transmitted to non-SMTPUTF8 server as ASCII	MUST have for Silver or higher	Messages submitted to an SMTP server that does not offer the SMTPUTF8 extension should encode EAI addresses in originator headers in A-label form. This applies to the “From” and “Reply-to” fields. This test case excludes <Email> Use Cases with a non-ASCII local part.
MUA.28	EAI destination address header values are transmitted to non-SMTPUTF8 server as ASCII	MUST have for Silver or higher	Messages submitted to an SMTP server that does not offer the SMTPUTF8 extension should encode EAI addresses in destination address headers in A-label

			form. This applies to the “To”, “Cc” and “Bcc” headers. This test case excludes <Email> Use Cases with a non-ASCII local part.
MUA.29	Unicode unstructured header values are transmitted to non-SMTPUTF8 server as ASCII	MUST have for Silver or higher	Messages submitted to an SMTP server that does not offer the SMTPUTF8 extension should encode unstructured header values containing UTF-8 values using an ASCII representation (for example, using quoted-words). The “Subject” header is used as an indicative test case for this behavior.
MUA.30	Message-ID of EAI message submitted to non-SMTPUTF8 server is ASCII-only	MUST have for Silver or higher	If the software assigns Message-ID header values to the messages it generates, messages submitted to an SMTP server that does not offer the SMTPUTF8 extension must be assigned ASCII-only Message-ID values (or the application must encode Message-ID values containing UTF-8 using an ASCII representation). Because it is common for Message-ID generation algorithms to include the domain part of the originator’s address of Message-Ids, this test case should send a message “From” an EAI address.
MUA.31	SMTPUTF8 parameter is provided with MAIL command for EAI messages	MUST have for Silver or higher	When submitting an EAI message with the MAIL command the SMTPUTF8 parameter must be included. For this test case, the EAI message should be one with non-ASCII text in the local part of the originator or destination address header value, since that is not subject to reencoding (for example, by conversion to Punycode). In other words, this test case applies only to <Email> Use Cases with an non-ASCII local part.
MUA.32	SMTPUTF8 parameter is not provided with MAIL command for non-EAI messages	MUST have for Silver or higher	When submitting a non-EAI message with the MAIL command the SMTPUTF8 parameter must not be included. For this test case, a non-EAI message is one composed entirely of ASCII-only header values and body content.

MUA.33	Multipart MIME message parts of type message/global are recognized	MUST have for Gold or higher	If the software is MIME-aware, multipart message parts of type message/global should be recognized and displayed in a manner similar or equivalent to message/rfc822.
MUA.34	Local part of EAI values in atoms are displayed as Unicode	MUST have for Gold or higher	If the software allows message headers to be viewed, atomic values containing Unicode are displayed as Unicode. The local parts of addresses appearing in “Received” header values should be used as a test for this behavior, since that header’s “for” clauses will contain destination address (unlike “Message-ID”, which may have an ASCII-encoded value). Refer to RFC 5321 for details about the structure of the “Received” header.
MUA.35	Domain part of EAI values in atoms are displayed as Unicode	MUST have for Silver or higher	If the software allows message headers to be viewed, atomic values containing Unicode are displayed as Unicode. The domain parts of addresses appearing in “Reply To” header values should be used as a test for this behavior, since that header’s “for” clauses will contain destination address (unlike “Message-ID”, which may have an ASCII-encoded value). Refer to RFC 5321 for details about the structure of the “Received” header.
MUA.36	Message lines longer than 998 characters are limited to 998 octets	MUST have for Silver or higher	Messages generated by the software must not contain lines longer than 998 octets or 8-bit bytes (as opposed to “characters”, which in Unicode may consist of multiple 8-bit bytes). What the software does with the line is unimportant for this test (for example, it may truncate the line, or encode the message in a way that avoids exceeding the 998 octet line length restriction). Note that this test is not conclusive since software may generate messages whose content does not correspond one-to-one with the message entered by the user (for example, by introducing HTML markup for text/html messages). However, the software’s handling of messages of type text/plain is considered indicative of

			its overall behavior with regards to message line length limitations.
MUA.37	Can retrieve messages from EAI mailbox	MUST have for Gold or higher	When connected to a MDA which hosts EAI mailboxes, the MUA can retrieve messages from that EAI mailbox. This must be supported whether the domain name of the MDA is ASCII or Unicode.
MUA.38	User can send and receive messages from EAI mailboxes	MUST have for Gold or higher	When connected to an MDA which hosts EAI mailboxes, the MUA can author email messages listed as from an EAI mailbox name, and the MUA can receive email messages addressed to an EAI mailbox name. This must be supported whether the domain name of the MDA is ASCII or Unicode.

2) EAI-Ready Mail User Agent (MUA) and EAI-Ready Webmail clients which support IMAP

In IMAP spec terms, “mailbox” means a user-created folder to sort messages within the collection of messages of a single email address. Email clients may use the word “folder” for what the IMAP spec calls “Mailbox”. Experienced readers will recall that “mailbox” is also a term defined elsewhere in other UASG documents.

Item	Function	Status/Level of Support	Description
IMAP.1	Server address can be specified by A-label	MUST have for SILVER or higher - here	If the software supports IMAP, it must allow servers with IDN addresses to be specified in A-label form.
IMAP.2	Server address can be specified by U-label	MUST have for GOLD or higher	If the software supports IMAP, it should allow servers with IDN addresses to be specified in U-label form.
IMAP.3	Server address displayed as Unicode	MUST have for GOLD or higher	If the software supports IMAP, then when an IMAP server with an IDN address is specified by the user by U-label, that label should then be displayed to the user in U-label form.
IMAP.4	Connection to IMAP server at IDN address is supported	MUST have for SILVER or higher	If the software supports IMAP, then when an IMAP server with an IDN address is used, the application should correctly resolve the IDN label and connect to

			the server. Testing may use successful login as a proxy determinant for correct domain resolution and connectivity.
IMAP.5	Username can be provided as Unicode	MUST have for SILVER or higher	If the software supports IMAP, it must be possible for the user to specify the *mailbox or a* username to be used for authenticating the IMAP connection in Unicode.
IMAP.6	Username displayed as Unicode	MUST have for SILVER or higher	If the software supports IMAP, then when a username is specified by the user in Unicode, it should also be displayed to the user in Unicode.
IMAP.7	AUTHENTICATE command is used for authentication	MUST have for SILVER or higher	If the software supports IMAP, it should support use of the AUTHENTICATE command for authentication to the server, rather than LOGIN. This allows the user to authenticate with usernames containing Unicode via a secure channel.
IMAP.8	UTF8=ACCEPT is enabled	MUST have for SILVER or higher	If the software supports IMAP, it should send the ENABLE command with UTF8=ACCEPT to advertise EAI support to a server that offers the UTF8=ACCEPT or UTF8=ONLY capability (as accessed by the CAPABILITY command).
IMAP.9	SEARCH command does not specify charset	MUST have for GOLD or higher	If the software supports IMAP, it should not include a charset specification when sending SEARCH commands to IMAP servers that support UTF8=ACCEPT (or equivalent).
IMAP.10	APPEND command uses UTF8 extension	MUST have for GOLD or higher	If the software supports IMAP, it should use the UTF8 extension with any APPEND commands used to transmit messages containing Unicode header values to servers supporting UTF8=ACCEPT (or equivalent). For this test case, the “Subject” header is used to ensure that the message contains Unicode values. This applies equally to cases where the client makes use of the CATENATE extension with APPEND commands.
IMAP.11	Mailbox with UTF-8 name can be created	MUST have for GOLD or higher	If the software supports IMAP, then it should allow the user to create mailboxes with names containing UTF-8.

IMAP.12	UTF-8 mailbox names can be accessed	MUST have for SILVER or higher	If the software supports IMAP, then it should be possible to list and subscribe to mailboxes with UTF-8 names. For this test, a mailbox with UTF-8 characters in its name should exist on the IMAP server.
IMAP.13	Unicode mailbox names display as Unicode	MUST have for SILVER or higher	If the software supports IMAP, then any mailbox names that are represented in the application should be displayed as Unicode. For this test, a mailbox with Unicode characters in its name should exist on the IMAP server.
IMAP.14	Messages in mailbox with Unicode name can be retrieved	MUST have for SILVER or higher	If the software supports IMAP, then it should be able to retrieve messages from mailboxes with Unicode names. For this test, a mailbox with Unicode characters in its name should exist on the IMAP server.
IMAP.15	Message with EAI address in originator header is accessible	MUST have for SILVER or higher	If the software supports IMAP, it should be able to access messages with EAI values in the originator header. This applies to the “From” and “Reply-To” headers. For this test case, the header values should be Unicode strings rather than in an ASCII encoding such as quoted-words.
IMAP.16	Message with EAI address in destination address header is accessible	MUST have for SILVER or higher	If the software supports IMAP, it should be able to access messages with EAI values in destination address headers. This applies to the “To”, “Cc”, and “Bcc” headers. For this test case, the header values should be Unicode strings rather than in an ASCII encoding such as quoted-words.
IMAP.17	Message with Unicode value in unstructured text header is accessible	MUST have for SILVER or higher	If the software supports IMAP, it should be able to access messages with Unicode values in unstructured text headers. For this test case, the “Subject” header is used as an indicative example, and header values should be Unicode strings rather than in an ASCII encoding such as quoted-words.
IMAP.18	Messages can be stored in mailbox with Unicode name	MUST have for SILVER or higher	If the software supports IMAP, it should be able to store messages in mailboxes with Unicode names. For this test, a mailbox with Unicode characters in its name

			should exist on the IMAP server. NOTE: IMAP "mailboxes" might be represented as "folders" in other contexts
IMAP.19	Message with EAI address in originator header can be stored	MUST have for SILVER or higher	If the software supports IMAP, it should be able to access messages with EAI values in the originator header. This applies to the "From" and "Reply-To" headers. For this test case, the header values should be Unicode strings rather than in an ASCII encoding such as quoted-words.
IMAP.20	Message with EAI address in destination address header can be stored	MUST have for SILVER or higher	If the software supports IMAP, it should be able to access messages with EAI values in destination address headers. This applies to the "To", "Cc", and "Bcc" headers. For this test case, the header values should be Unicode strings rather than in an ASCII encoding such as quoted-words.
IMAP.21	Message with Unicode value in unstructured text header can be stored	MUST have for SILVER or higher	If the software supports IMAP, it should be able to access messages with Unicode values in unstructured text headers. For this test case, the "Subject" header is used as an indicative example, and header values should be Unicode strings rather than in an ASCII encoding such as quoted-words.

3) EAI-Ready Mail User Agent (MUA) and EAI-Ready Webmail clients which support POP

Item	Function	Status/Level of Support	Description
POP.1	Server address can be specified by A-label	MUST have for SILVER or higher	If the software supports POP, it should allow servers with IDN addresses to be specified in A-label form.
POP.2	Server address can be specified by U-label	MUST have for GOLD or higher	If the software supports POP, it should allow servers with IDN addresses to be specified in U-label form.
POP.3	Server address displayed as Unicode	MUST have for GOLD or higher	If the software supports POP, then when a server with an IDN address is specified by the user by U-label, that

			label should then be displayed to the user in U-label form.
POP.4	Connection to POP server at IDN address is supported	MUST have for SILVER or higher	If the software supports POP, then when a server with an IDN address is used, the application should correctly resolve the IDN label and connect to the server. This test case uses successful login as a proxy for correct domain resolution and connectivity.
POP.5	Username can be provided as Unicode	MUST have for SILVER or higher	If the software supports POP, it must be possible for the user to specify the username to be used for authenticating the POP connection in Unicode.
POP.6	Username displayed as Unicode	MUST have for SILVER or higher	If the software supports POP, then when a username is specified by the user in Unicode, it should also be displayed to the user in Unicode.
POP.7	Connection to server with Unicode username is supported	MUST have for GOLD or higher	If the software supports POP, it should correctly transmit Unicode usernames to the server when authenticating with the USER command.
POP.8	UTF8 mode is enabled	MUST have for SILVER or higher	If the software supports POP, it should enable UTF8 mode when the capability is offered by the server.
POP.9	STLS command is not used in UTF8 mode	MUST have for SILVER or higher	If the software supports POP, then once the software has enabled UTF8 mode in a connection it must not issue an STLS command. It is expected that servers will reject the command in this situation, but it is an error for clients to request it.
POP.10	Message with EAI address in originator header is accessible	MUST have for SILVER or higher	If the software supports POP, it should be able to access messages with EAI values in originator headers. This applies to the “From” and “Reply-To” headers. For this test case, the header values should be Unicode strings rather than in an ASCII encoding such as quoted-words.
POP.11	Message with EAI address in destination address header is accessible	MUST have for SILVER or higher	If the software supports POP, it should be able to access messages with EAI values in destination address headers. This applies to the “To”, “Cc”, and “Bcc” headers. For this test case, the header values should be Unicode strings rather than in an ASCII encoding such as quoted-words.

POP.12	Message with Unicode value in unstructured text header is accessible	MUST have for SILVER or higher	If the software supports POP, it should be able to access messages with Unicode values in unstructured text headers. For this test case, the “Subject” header is used as an indicative example, and header values should be Unicode strings rather than in an ASCII encoding such as quoted-words.

4) EAI-Mail Submission Agent (MSA)

NOTE: MSAs and MTAs are almost always combined. These tests are shown separately for convenience but may be duplicative.

Item	Function	Status/Level of Support	Description
MSA.1	SMTPUTF8 capability is advertised	MUST have for SILVER or higher	When a client connects to the server (with the EHLO command), the listing of capabilities returned by the server must include SMTPUTF8 to indicate EAI support.
MSA.2	8BITMIME capability is advertised	MUST have for SILVER or higher	When a client connects to the server (with the EHLO command), the listing of capabilities returned by the server must include 8BITMIME to indicate the ability to handle 8-bit data.
MSA.3	EHLO command argument is transmitted as ASCII	MUST have for SILVER or higher	When the software connects to another SMTP server as a client, it must provide the domain argument to the EHLO command in A-label form. For this test, the software must be configured to identify itself with all non-ASCII <Domain>.
MSA.4	SMTPUTF8 parameter is provided with MAIL command for EAI messages	MUST have for SILVER or higher	When transmitting an EAI message with the MAIL command to an SMTPUTF8-capable server, the SMTPUTF8 parameter must be included. For this test case, the EAI message should be one with Unicode text in the local part of a originator or destination address header value, since that part is not subject to

			reencoding (for example, by conversion to Punycode). In other words, this test case applies only to <Email> Use Cases with an non-ASCII local part. *NOTE: This feature is related to mail body and is therefore crucial to an EAI user experience but is orthogonal to EAI RFIs.*
MSA.5	EAI reverse path values are transmitted to SMTPUTF8 server	MUST have for SILVER or higher	Connections to an SMTP server offering the SMTPUTF8 extension may submit envelopes with addresses in either A-label or U-label form. This applies to the reverse-path of the MAIL command. Because the software may use either representation, this test simply verifies that it will correctly transmit messages to an SMTPUTF8-capable server, but does not test the specific representation used for the command arguments - either representation is acceptable.
MSA.6	EAI forward path values are transmitted to SMTPUTF8 server	MUST have for SILVER or higher	Connections to an SMTP server offering the SMTPUTF8 extension may submit envelopes with addresses in either A-label or U-label form. This applies to the forward-path of the RCPT command. Because the software may use either representation, this test simply verifies that it will correctly transmit messages to an SMTPUTF8-capable server, but does not test the specific representation used for the command arguments - either representation is acceptable.
MSA.7	EAI originator header values are transmitted to SMTPUTF8 server	MUST have for SILVER or higher	Messages transmitted to an SMTP server offering the SMTPUTF8 extension may send addresses as either A-label or U-label form. This applies to the “From” and “Reply-to” fields. Because the software may use either representation, this test simply verifies that it will correctly transmit messages to an SMTPUTF8-capable server, but does not test the specific representation used for the message header values - either representation is acceptable.

MSA.8	EAI destination address header values are transmitted to SMTPUTF8 server	MUST have for SILVER or higher	Messages transmitted to an SMTP server offering the SMTPUTF8 extension may send addresses as either A-label or U-label form. This applies to the “To”, “Cc”, and “Bcc” fields. Because the software may use either representation, this test simply verifies that it will correctly transmit messages to an SMTPUTF8-capable server, but does not test the specific representation used for the message header values - either representation is acceptable.
MSA.9	Unicode unstructured header values are transmitted to SMTPUTF8 server	MUST have for SILVER or higher	Messages transmitted to an SMTP server offering the SMTPUTF8 extension may send headers containing UTF-8 values, instead of using an alternative encoding for non-ASCII content. The “Subject” header is used as an indicative test case for this behavior. Because the software may still choose to use an alternative encoding, this test simply verifies that it will correctly transmit messages to an SMTPUTF8-capable server, but does not test the specific representation used for the message header values - either representation is acceptable.
MSA.10	SMTPUTF8 parameter is not provided for non-EAI messages	MUST have for GOLD or higher	When transmitting a non-EAI message with the MAIL command to an SMTPUTF8-capable server, the SMTPUTF8 parameter should not be included. For this test case, a non-EAI message is one composed entirely of ASCII headers and body content.
MSA.11	EAI messages sent to non-SMTPUTF8 server are rejected or transformed	MUST have for SILVER or higher	When transmitting an EAI message to a non-SMTPUTF8-capable server, the message must either be rejected or transformed into a non-EAI form. Because the software can choose either of these two options and there are many possibilities for transformation, this test case just ensures that the software does not submit EAI mail to a non-SMTPUTF8-capable channel in a way that requires SMTPUTF8 features. NOTE: We are confused by the word “rejected” and must review RFC to clarify

MSA.12	EAI reverse path values are transmitted to non-SMTPUTF8 server as ASCII	MUST have for SILVER or higher	If the software transforms EAI messages for transmission to non-EAI servers (rather than rejecting them), envelopes submitted to an SMTP server that does not offer the SMTPUTF8 extension should encode EAI addresses in message envelopes in A-label form. This applies to the reverse-path of the MAIL command. This test case excludes <Email> Use Cases with a non-ASCII local part.
MSA.13	EAI forward path values are transmitted to non-SMTPUTF8 server as ASCII	MUST have for SILVER or higher	If the software transforms EAI messages for transmission to non-EAI servers (rather than rejecting them), envelopes submitted to an SMTP server that does not offer the SMTPUTF8 extension should encode EAI addresses in message envelopes in A-label form. This applies to forward-path of the RCPT command. This test case excludes <Email> Use Cases with a non-ASCII local part.
MSA.14	EAI originator header values are transmitted to non-SMTPUTF8 server as ASCII	MUST have for SILVER or higher	If the software transforms EAI messages for transmission to non-EAI servers (rather than rejecting them), messages transmitted to an SMTP server that does not offer the SMTPUTF8 extension should encode EAI addresses in originator headers in A-label form. This applies to the “From” and “Reply-to” fields. This test case excludes <Email> Use Cases with a non-ASCII local part.
MSA.15	EAI destination address header values are transmitted to non-SMTPUTF8 server as ASCII	MUST have for SILVER or higher	If the software transforms EAI messages for transmission to non-EAI servers (rather than rejecting them), messages transmitted to an SMTP server that does not offer the SMTPUTF8 extension should encode EAI addresses in destination address headers in A-label form. This applies to the “To”, “Cc” and “Bcc” headers. This test case excludes <Email> Use Cases with a non-ASCII local part.

MSA.16	Unicode unstructured header values are transmitted to non-SMTPUTF8 server as ASCII	MUST have for SILVER or higher	If the software transforms EAI messages for transmission to non-EAI servers (rather than rejecting them), messages transmitted to an SMTP server that does not offer the SMTPUTF8 extension should encode unstructured header values containing UTF-8 values using an ASCII representation (for example, using quoted-words). The “Subject” header is used as an indicative test case for this behavior.
MSA.17	Message-ID of EAI message transmitted to non-SMTPUTF8 server is ASCII-only	MUST have for SILVER or higher	If the software transforms EAI messages for transmission to non-EAI servers (rather than rejecting them) and assigns Message-ID header values to the messages it transmits, messages transmitted to an SMTP server that does not offer the SMTPUTF8 extension should be assigned ASCII-only Message-ID values (or the application should encode Message-ID values containing UTF-8 using an ASCII representation). Because it is common for Message-ID generation algorithms to include the domain part of the originator’s address of Message-Ids, this test case should send a message “From” an EAI address.

5) Mail Transfer Agent (MTA)

NOTE: MTAs and MSAs are almost always combined. These tests are shown separately for convenience but may be duplicative. ALSO NOTE differences between 1) the MTA and MSA of a Limited Latin email system, which wants to correspond with globally inclusive email systems, and 2) the MTA and MSA of a globally inclusive email system. A Limited Latin email system will have its local host name and mailbox names in Limited Latin, so will not need UTF8 support to represent them. It will however need UTF8 support for the other systems globally inclusive host name and mailbox names.

	Summary	Status/Support Level	Description
MTA.1	SMTPUTF8 capability is advertised	MUST have for SILVER or higher	When a client connects to the server (with the EHLO command), the listing of capabilities returned by the server must include SMTPUTF8 to indicate EAI support.

MTA.2	8BITMIME capability is advertised	MUST have for SILVER or higher	When a client connects to the server (with the EHLO command), the listing of capabilities returned by the server must include 8BITMIME to indicate the ability to handle 8-bit data.
MTA.3	EHLO command argument is transmitted as ASCII	MUST have for SILVER or higher	When the software connects to another SMTP server as a client, it must provide the domain argument to the EHLO command in A-label form.
MTA.4	SMTPUTF8 parameter is provided for EAI messages	MUST have for SILVER or higher	When transmitting an EAI message with the MAIL command to an SMTPUTF8-capable server, the SMTPUTF8 parameter must be included. For this test case, the EAI message should be one that is transmitted with Unicode text in the local part of the originator or destination address header value, since that is not subject to reencoding (for example, by conversion to Punycode).
MTA.5	Trace information includes domain in U-label form	MUST have for GOLD or higher	When the software adds a “Received” header to a message transmitted to an SMTPUTF8-capable server indicating the return path of the message, it should encode the domain of the host on which the server is running in U-label form.
MTA.6	Trace information indicates SMTPUTF8 protocol	MUST have for SILVER or higher	When the software adds a “Received” header to a message indicating the protocol used for transfer, which should be one of UTF8SMTP, UTF8SMTPS, UTF8SMTPA, or UTF8SMTPSA. This protocol is placed in the “with” position of the “Received” header value.
MTA.7	EAI reverse path values are transmitted to SMTPUTF8 server	MUST have for SILVER or higher	Connections to an SMTP server offering the SMTPUTF8 extension may submit envelopes with addresses in either A-label or U-label form. This applies to the reverse-path of the MAIL command. Because the software may use either representation, this test simply verifies that it will correctly transmit messages to an SMTPUTF8-capable server, but does not test the specific representation used for the command arguments.
MTA.8	EAI forward path values are transmitted to SMTPUTF8 server	MUST have for SILVER or higher	Connections to an SMTP server offering the SMTPUTF8 extension may submit envelopes with addresses in either A-label or U-label form. This applies to the forward-path of the RCPT command. Because the software may use either representation, this test simply verifies that it will correctly transmit messages to an SMTPUTF8-capable server, but does not test the specific

			representation used for the command arguments. (NOTE: This only applies to MTAs which are separate from an MSA , which is not typical.)
MTA.9	EAI originator header values are transmitted to SMTPUTF8 server	MUST have for SILVER or higher	Messages transmitted to an SMTP server offering the SMTPUTF8 extension may send mailbox parts in either A-label or U-label form. This applies to the “From” and “Reply-to” fields. Because the software may use either representation, this test simply verifies that it will correctly transmit messages to an SMTPUTF8-capable server, but does not test the specific representation used for the message header values. (NOTE: This only applies to MTAs which are separate from an MSA , which is not typical.)
MTA.10	EAI destination address header values are transmitted to SMTPUTF8 server	MUST have for SILVER or higher	Messages transmitted to an SMTP server offering the SMTPUTF8 extension may send mailbox parts in either A-label or U-label form. This applies to the “To”, “Cc”, and “Bcc” fields. Because the software may use either representation, this test simply verifies that it will correctly transmit messages to an SMTPUTF8-capable server, but does not test the specific representation used for the message header values. (NOTE: This only applies to MTAs which are separate from an MSA , which is not typical.)
MTA.11	Unicode unstructured header values are transmitted to SMTPUTF8 server	MUST have for SILVER or higher	Messages transmitted to an SMTP server offering the SMTPUTF8 extension may send headers containing UTF-8 values, instead of using an alternative encoding for non-ASCII content. The “Subject” header is used as an indicative test case for this behavior. Because the software may still choose to use an alternative encoding, this test simply verifies that it will correctly transmit messages to an SMTPUTF8-capable server, but does not test the specific representation used for the message header values. (NOTE: This only applies to MTAs which are separate from an MSA , which is not typical.)

MTA.12	SMTPUTF8 parameter is not provided for non-EAI messages	MUST have for SILVER or higher	When transmitting a non-EAI message with the MAIL command to an SMTPUTF8-capable server, the SMTPUTF8 parameter should not be included. For this test case, a non-EAI message is one composed entirely of ASCII headers and body content. (NOTE: This only applies to MTAs which are separate from an MSA , which is not typical.)
MTA.13	EAI messages sent to non-SMTPUTF8 server are rejected	MUST have for SILVER or higher	When transmitting an EAI message to a non-SMTPUTF8-capable server, the receiving MTA is expected to reject the message, and the sending MTA must detect that rejection. This test case excludes <Email> Use Cases with an ASCII local part, since the domain part of the address may legally be converted to A-label form. (NOTE: This only applies to MTAs which are separate from an MSA , which is not typical.)

6) Mail Delivery Agent (MDA)

** Also explain “IMAP mailbox” is defined differently than used elsewhere.
In IMAP spec terms, “mailbox” means a user-created folder to sort messages within the messages of a single email address. Email clients may use the word “folder” for what the IMAP spec calls “Mailbox”.

	Summary	Status/Support Level	Description
MDA.1	Mail server is capable of creating and hosting mailboxes with EAI mailbox names	MUST have for GOLD or higher	The software has the functionality available to create and host email boxes with EAI names, but it is not enabled by default.
MDA.1b	Mail server is configured by default to create and host	PLATINUM	The software has functionality, enabled by default, to create and host email boxes with EAI names.

	mailboxes with EAI mailbox names		
MDA.2	Trace information includes domain in U-label form	MUST have for GOLD or higher	If the software adds a “Received” header to a message transmitted to an SMTPUTF8-capable server indicating the return path of the message, it encodes the domain of the host on which the server is running in U-label form.
MDA.3	Trace information indicates SMTPUTF8 protocol	MUST have for SILVER or higher	If the software adds a “Received” header indicating the protocol used for transfer, it must be one of UTF8SMTP, UTF8SMTPS, UTF8SMTPA, or UTF8SMTPSA. This protocol is placed in the “with” position of the “Received” header value.
MDA.4	Message with EAI address in originator header is delivered	MUST have for SILVER or higher	The software must be able to deliver messages with EAI values in the originator header. This applies to the “From” and “Reply-To” headers. For this test case, the header values must be UTF-8 strings rather than in an ASCII encoding such as quoted-words.
MDA.5	Message with EAI address in destination address header is delivered	MUST have for SILVER or higher	The software must be able to deliver messages with EAI values in destination address headers. This applies to the “To”, “Cc”, and “Bcc” headers. For this test case, the header values must be UTF-8 strings rather than in an ASCII encoding such as quoted-words.
MDA.6	Message with UTF-8 value in unstructured header is delivered	MUST have for SILVER or higher	The software must be able to deliver messages with UTF-8 values in unstructured text headers. For this test case, the “Subject” header is used as an indicative example, and header values must be UTF-8 strings rather than in an ASCII encoding such as quoted-words.
MDA.7	MDA is capable of delivering messages to local EAI mailbox	MUST have for GOLD or higher	The software is able to deliver messages to the local mailbox with an EAI address. For this test case, the <Email> Use Case should be used as the local address to which the message is delivered. for this test case the

			message itself doesn't need to be an EAI message, just the recipient address .
MDA.8	UTF-8 username is accepted via IMAP	MUST have for GOLD or higher	If the software supports IMAP, then clients must be able to use a username containing UTF-8 text when authenticating to the server.
MDA.9	IMAP UTF8=ACCEPT or UTF8=ONLY capability is advertised	MUST have for GOLD or higher	If the software supports IMAP, then when a client requests a listing of server capabilities with the CAPABILITY command, the listing returned by the server must include either UTF8=ACCEPT or UTF8=ONLY.
MDA.10	IMAP AUTHENTICATE command is supported or LOGIN accepts UTF-8	MUST have for PLATINUM	If the software supports IMAP, it must support UTF-8 usernames and passwords, either with the AUTHENTICATE command or an extended version of LOGIN
MDA.11	IMAP ENABLE UTF8=ACCEPT command is accepted	MUST have for GOLD or higher	If the software supports IMAP, it must accept requests for the UTF8=ACCEPT extension, enable the extension as a result, and communicate that result to the client with an ENABLED message and OK response. (Otherwise use legacy character support)
MDA.12	IMAP SEARCH command with CHARSET specification is rejected	MUST have for GOLD or higher	If the software supports IMAP, then once EAI extensions have been enabled, any SEARCH command that specifies a character set with the CHARSET argument should be rejected and a BAD response should be sent to the client.
MDA.13	IMAP APPEND UTF8 command is accepted	MUST have for GOLD or higher	If the software supports IMAP, then once EAI extensions have been enabled, any APPEND UTF8 command that includes Unicode in any headers of the accompanying message literal should be accepted. This applies equally when the client uses the CATENATE extension.
MDA.14	IMAP APPEND preserves Unicode header values	MUST have for GOLD or higher	If the software supports IMAP, EAI messages added to a mailbox with the APPEND command should be preserved, including Unicode message headers. This test

			ensures that the message can be “round-tripped” from the client to the server and back again without corruption of Unicode header values. The precise command or commands used to retrieve the message are unimportant (for example, FETCH, RFC822, FULL, and others can be used to retrieve a message).
MDA.15	IMAP CREATE command with Unicode folder (IMAP "mailbox") name is accepted	[MUST have for GOLD or higher]	If the software supports IMAP, then, CREATE commands with Unicode mailbox name arguments should be accepted either as UTF-8 or legacy UTF-7.
MDA.16	IMAP SELECT command with Unicode folder (IMAP "mailbox") name is accepted	[MUST have for GOLD or higher]	If the software supports IMAP, then once EAI extensions have been enabled, SELECT commands with Unicode mailbox name arguments should be accepted, either as UTF-8 or legacy UTF-7. For this test, a mailbox with a Unicode name should exist on the server.
MDA.17	IMAP EXAMINE command with Unicode folder (IMAP "mailbox") name is accepted	[MUST have for GOLD or higher]	If the software supports IMAP, then once EAI extensions have been enabled, EXAMINE commands with Unicode mailbox name arguments should be accepted, either as UTF-8 or legacy UTF-7. For this test, a mailbox with a Unicode name should exist on the server.
MDA.18	IMAP SUBSCRIBE command with Unicode folder (IMAP "mailbox") name is accepted	[MUST have for GOLD or higher]	If the software supports IMAP, then once EAI extensions have been enabled, SUBSCRIBE commands with Unicode mailbox name arguments should be accepted, either as UTF-8 or legacy UTF-7. For this test, a mailbox with a Unicode name should exist on the server.
MDA.19	IMAP LIST response includes Unicode folder (IMAP "mailbox") name	[MUST have for GOLD or higher]	If the software supports IMAP, then once EAI extensions have been enabled, responses to LIST commands should include Unicode mailbox names. For this test, a mailbox with a Unicode name should exist on the server.
MDA.20	IMAP LSUB response includes Unicode folder (IMAP "mailbox") names	[MUST have for GOLD or higher]	If the software supports IMAP, then once EAI extensions have been enabled, responses to LSUB commands should include Unicode mailbox names. For this test, a

			mailbox with a Unicode name should exist on the server and the client’s subscription list (as specified by SUBSCRIBE) must include the mailbox.
MDA.21	Folder (IMAP "mailbox") with Unicode name can be created via IMAP	[MUST have for GOLD or higher]	If the software supports IMAP and allows clients to create new mailboxes, then it must allow mailbox names to specified as Unicode, either as UTF-8 or legacy UTF-7.
MDA.22	Folder (IMAP "mailbox") with Unicode name can be subscribed via IMAP	[MUST have for GOLD or higher]	If the software supports IMAP, then clients must be able to subscribe to mailboxes with Unicode mailbox names. For this test, a mailbox with a Unicode name must be present on the server.
MDA.23	Messages in folder (IMAP "mailbox") with Unicode name are accessible via IMAP	[MUST have for GOLD or higher]	If the software supports IMAP, then clients must be able to read the contents of mailboxes with Unicode mailbox names. For this test, a mailbox with a Unicode name must be present on the server.
MDA.24	Message with EAI address in originator header can be stored via IMAP	MUST have for SILVER or higher	If the software supports IMAP, then clients must be able to store messages with EAI values in originator headers. This applies to the “From” and “Reply-To” headers. For this test case, the header values must be Unicode strings rather than in an ASCII encoding such as quoted-words.
MDA.25	Message with EAI address in destination address header can be stored via IMAP	MUST have for SILVER or higher	If the software supports IMAP, then clients must be able to store messages with EAI values in destination address headers. This applies to the “To”, “Cc”, and “Bcc” headers. For this test case, the header values must be Unicode strings rather than in an ASCII encoding such as quoted-words.
MDA.26	Message with Unicode value in unstructured header can be stored via IMAP	MUST have for SILVER or higher	If the software supports IMAP, then clients must be able to store messages with Unicode values in unstructured text headers. For this test case, the “Subject” header is used as an indicative example, and the header value must be Unicode strings rather than in an ASCII encoding such as quoted-words.

MDA.27	Message with EAI address in originator header is accessible via IMAP	MUST have for SILVER or higher	If the software supports IMAP, then clients must be able to access messages with EAI values in originator headers. This applies to the “From” and “Reply-To” headers. For this test case, the header values must be Unicode strings rather than in an ASCII encoding such as quoted-words.
MDA.28	Message with EAI address in destination address header is accessible via IMAP	MUST have for SILVER or higher	If the software supports IMAP, then clients must be able to access messages with EAI values in destination address headers. This applies to the “To”, “Cc”, and “Bcc” headers. For this test case, the header values must be Unicode strings rather than in an ASCII encoding such as quoted-words.
MDA.29	Message with Unicode value in unstructured header is accessible via IMAP	MUST have for SILVER or higher	If the software supports IMAP, then clients must be able to access messages with Unicode values in unstructured text headers. For this test case, the header values must be Unicode strings rather than in an ASCII encoding such as quoted-words.
MDA.30	POP UTF8 USER capability is advertised	MUST have for SILVER or higher	If the software supports POP, then when a client requests a listing of server capabilities with the CAPA command, the listing returned by the server response must include UTF8 USER.
MDA.31	POP UTF8 command is accepted	MUST have for SILVER or higher	If the software supports POP, it should accept the UTF8 command and switch the active session to UTF-8 mode.
MDA.32	POP UTF8 USER command is accepted	MUST have for SILVER or higher	If the software supports POP, it should accept the UTF8 USER command and switch the active session to UTF-8 mode.
MDA.33	POP STLS command is rejected in UTF8 mode	MUST have for SILVER or higher	If the software supports POP, it should reject any STLS command after UTF8 mode is enabled (with the UTF8 command).

MDA.34	POP LIST command reports size of Unicode message as octet count	MUST have for SILVER or higher	If the software supports POP, when reporting the size of a message containing Unicode values, the size (as indicated by the LIST command) must be given as a count of octets or 8-bit bytes, as opposed to a count of characters in the message. For ASCII-only messages these values will be the same, but for Unicode messages containing multibyte characters these will be different. For this test, a message with a Unicode value in the “Subject” header is used as an example of a message containing Unicode.
MDA.35	Unicode username is accepted via POP	MUST have for Gold or higher	If the software supports POP, then clients must be able to use a username containing Unicode text when authenticating to the server. (While it is possible for username to be globally inclusive while the local part of the corresponding email address is limited Latin, we expect this combination to be unusual.)
MDA.36	Message with Unicode value in originator header is accessible via POP	MUST have for SILVER or higher	If the software supports POP, then clients must be able to access messages with EAI values in originator header. This applies to the “From” and “Reply-To” headers. For this test case, the header values should be Unicode strings rather than in an ASCII encoding such as quoted-words.
MDA.37	Message with Unicode value in destination address header is accessible via POP	MUST have for SILVER or higher	If the software supports POP, then clients must be able to access messages with EAI values in destination address headers. This applies to the “To”, “Cc”, and “Bcc” headers. For this test case, the header values should be Unicode strings rather than in an ASCII encoding such as quoted-words.
MDA.38	Message with Unicode value in unstructured header is accessible via POP	MUST have for SILVER or higher	If the software supports POP, then clients must be able to access messages with Unicode values in unstructured text headers. For this test case, the “Subject” header is

			used as an indicative example, and header values should be Unicode strings rather than in an ASCII encoding such as quoted-words.

7) EAI-Mail Service Provider (MSP)

Action item - add references and add to references. Or replace the term with “IMAP folder”, etc
Note: The term “mailbox” as used in this section refers to IMAP spec (add number here) and is different from how the term is used in other documents such as UASG (add doc number for mailbox naming).

	Summary	Status/Support Level	Description
MSP.1a	Local part of address containing Unicode can be configured	MUST have for GOLD or higher	The provider must allow the user who is setting up their own new mailbox on the service to specify a Unicode value as the local part of the assigned address.
MSP.1b	Local part of address containing Unicode is available by default	MUST have for PLATINUM	MSP offers functionality, enabled by default and clearly promoted and documented, to specify a Unicode value as the local part of the assigned address.
MSP.2a	Domain part of address containing Unicode can be configured	MUST have for GOLD or higher	If the provider allows the user to specify a domain or subdomain part for their account’s assigned address, it must allow a Unicode (U-label) value to be configured as the domain or subdomain of the assigned address.
MSP.2b	Domain part of address containing Unicode is available by default	MUST have for PLATINUM	If the provider allows the user to specify a domain or subdomain part for their account’s assigned address, it must offer functionality, enabled by default and clearly promoted and documented, for a Unicode (U-label) value to be provided as the domain or subdomain of the assigned address.
MSP.3	Email addresses containing Unicode are displayed as Unicode	MUST have for GOLD or higher	The provider’s software interface shall display both the local part and domain name of EAI addresses as Unicode. This applies to the user’s own email address as well as the email addresses of correspondents.

MSP.4	Supports provision of an ASCII-equivalent alias, for use with an EAI mailbox is provided	MUST have for PLATINUM	The provider must be able to, upon user request, provision an ASCII-only equivalent (i.e. an alias) of any address containing Unicode text in either or both the local and domain name parts, for use with legacy email systems. Exactly how the address is formed (for example by converting the non-ASCII local part to an ASCII-only version automatically, or converting a U-Label to an A-Label, or allowing the user to specify the alternative manually, and so on) and whether or not it is done automatically is not important for this test, just that a second, non-EAI alias can be provided to the user.
MSP.5	Address with ASCII equivalent of domain part containing Unicode is provided	MUST have for Platinum	If the provider allows the user to choose a domain or subdomain part for the assigned address, it should provision an ASCII-only (A-label) equivalent address of any address containing Unicode text in the domain part (for example, one with a Punycode-encoded version of the domain part) for use with legacy email systems. Exactly how the address is formed (for example by converting the non-ASCII domain to an ASCII-only version automatically, allowing the user to choose an alternative domain, and so on) and whether or not it is done automatically is not important for this test, just that a second, non-EAI address can be provided to the user.
MSP.6	Mailbox name containing Unicode is accepted	MUST have for GOLD or higher	If the provider allows the user to create or rename mailboxes, it must accept mailbox names as Unicode text.
MSP.7	Mailbox name containing Unicode is displayed as entered	MUST have for GOLD or higher	If the provider allows the user to create or rename mailboxes, its software interface must display mailbox names as Unicode.
MSP.8	Address with local part containing Unicode receives messages	MUST have for GOLD or higher	The provider must correctly receive EAI messages at assigned addresses with Unicode in the local part of the address. This verifies that the provider can not only generate an account with an EAI address, but that it correctly handles mail destined for that address as well.
MSP.9	Address with domain part containing Unicode receives messages	MUST have for GOLD or higher	If the provider allows a user to specify a domain or subdomain part for the assigned address, then it must correctly receive EAI messages at that address. This verifies that the provider can not only generate an account with an EAI address, but that it correctly handles mail destined for that address as well.
MSP.10	Address with local part containing Unicode sends messages	MUST have for GOLD or higher	The provider must correctly receive EAI messages at assigned addresses with Unicode in the local part of the address. This verifies that the provider can not only generate an account with an EAI address, but that it correctly handles mail sent by the user from that address as well. The test process should not only check that the provider's mail server accepts the message

			and reports that it has been transmitted, but also ensure that it has been received at its destination address.
MSP.11	Address with domain part containing Unicode sends messages	MUST have for GOLD or higher	If the provider allows a user to specify a domain or subdomain part for the assigned address, then it must correctly transmit EAI messages sent on behalf of the user from that address. This verifies that the provider can not only generate an account with an EAI address, but that it correctly handles mail sent by the user from that address as well. The test process should not only check that the provider's mail server accepts the message and reports that it has been transmitted, but also ensure that it has been received at its destination address.

~~8) Webmail Services - we decided to merge this section with MUA~~

~~Yes: Passed the test~~
~~No: Failed the test~~

	~~Functionality~~	~~Status~~
~~1~~	~~Client receives messages from EAIs *~~	
~~2~~	~~Client sends messages to EAIs *~~	
~~3~~	~~Unicode addresses displayed in Unicode (sent and received)~~	
~~4~~	~~Address book handles EAIs normally (save, send, search)~~	
~~5~~	~~Mailto links of EAIs handled normally (sent and received)~~	
~~6~~	~~Subject line can be Unicode~~	
~~7~~	~~Folders can be named with Unicode~~	

~~8~~	~~Message headers are Unicode where appropriate~~	
~~9~~	~~EAIs can be set up to receive and send mail using IMAP~~	
~~10~~	~~EAIs can be set up to receive and send mail using POP~~	
~~11~~	~~Username can be Unicode~~	
~~12~~	~~Server names and domains can be Unicode~~	
~~13~~	~~Server names and domains can be A-label~~	

Self-Certification of EAI Support of Email Utilities and Tools

Yes: Passed the test
No: Failed the test

Examples: Webforms for integrating with a website for managing customer contact information. Mailing list software (user sign-up; admin list management); many to everyone. Bulk mail systems like Mailchimp; one to many. Procmail, maildrop, sieve. External address book.

NOTE: vendor decides which section to use. Consider how to differentiate listservers from bulk mail services. If vendor offering is not covered by other sections, but is also not listed below, proceed as follows :TBD

1.1. More examples: Email Utilities and Tools
  1.1.1. Anti-Spam
  1.1.2. Calendars
  1.1.3. Contact list (Address book)

1.1.4. mailing-lists management
1.1.5. mail addresses as identifiers
    1.1.5.1. Including SSO
    1.1.5.2. Including Active Directory
    1.1.5.3. CRM software and other customer management
    1.1.5.4. Other databases which use “email address” datatypes
1.1.6. LDAP
1.1.7. Development tools libraries and APIs where not covered above
    1.1.7.1. Parsing and processing of email strings
    1.1.7.2. anything involved with HTML 5.x email datatype(s)

	Email Tools and Utilities Functions Summary	**Support Level**	**Description**
TOOL.1	Accepts email addresses and domain names from any writing system and displays the correct glyphs where applicable		Tool or utility lets user type or paste text in a language or writing system into text fields, including domain names and email address containing characters from that language or writing system ● ok to validate domain name syntax including idna ● generally not ok to reject mailbox syntax ● ok to provide admins with capability to reject any portion of an email address based on their own policies ● not ok to reject RFC-compliant email addresses except when overridden by local policy set by a user or admin

			• This requirement is limited to evaluations of Unicode strings; this guide does not have requirements for non-Unicode fonts • Further guidance regarding local mailbox names is provided in the best practices document UASG 028 https://uasg.tech/wp-content/uploads/documents/UASG028-en-digital.pdf **Consensus - rewrite the rows to more clearly differentiate the UA verbs; rows can be completely rewritten to prevent overlap between verbs**
TOOL.2	Product must always display email local parts, and domain names as UTF-8. For emphasis, domain names must be displayed as U-Labels.	**SILVER**	
TOOL.3	Product fully supports (stores, accepts, displays, etc) as Unicode in all appropriate email structures such as headers, addresses, and subject lines.	**GOLD**	• This is in addition to #2 • **Unicode must encoded as UTF-8** • **Any character restriction defined by applicable RFCs or UASG Best practices documents still apply (e.g. no emojis)**
TOOL.6	Product may send messages from international email addresses, and may receive messages at international	**SILVER**	**Some systems may use email addresses both as a unique identifier and also for communication to/from the email address user. For example, status messages and error alerts might be sent to the use by some products, but others (e.g.**

	email addresses, as appropriate for the product's functionality		address books) will not. Likewise, anti-spam services must be able to send messages to such addresses.
TOOL.7	If product functionality depends on assignment of a domain name, that domain name can be an international domain name	SILVER	Ideally, any domain name would be usable (including new gTLDs, brand domain names and long domain names). This has an implication to EAI whenever email addresses are derived from the assigned domain name.
TOOL.8	If product can be contacted by email, it can be contacted by internationalized email addresses.	SILVER	Email to fax, email to SMS, or products which can receive commands via email.
TOOL.9	If product hosts email mailboxes, it can host or be contacted by internationalized email addresses.	PLATINUM	all UA verbs
TOOL.10	Product localized to support languages with RTL scripts correctly displays email addresses in RTL scripts	SILVER	
TOOL.11	Product can receive messages from any valid international email addresses, and receive, store, and process that address without corruption	SILVER	Example: listserver

~~Note: Per RFC 5322, Product must support any ASCII-only email address compliant with email RFCs, including "+" and "%" in mailbox names. This is a general UA issue, not specific to EAI. Se also UASG best practices document # (find the number). Also:~~

- ~~Do not modify case~~
- ~~Do not add or remove "+" or "." in addresses~~
- ~~Do attempt to normalize~~

Self-Certification – User Documentation and Communication

EAI communication and messaging

Software vendors are encouraged to clearly indicate EAI support and mention EAI as a feature in their products, included in marketing materials.

	Summary	Status/Support Level	Description
DOC.1	Administrator and procurement marketing	MUST have for GOLD or higher	If marketed to system administrators or procurement officers, marketing materials promote globally inclusive email systems and features to system administrators and procurement officers
DOC.2	End user marketing	MUST have for GOLD or higher	If marketed to end users, marketing materials promote globally inclusive email systems and features to end users
DOC.3	Admin setup and use	MUST have for GOLD or higher	Administrator documentation explains how to set up and administer globally inclusive email features, mailboxes and tools where applicable; may include YouTube or other videos.
DOC.4	End user configuration and use	MUST have for GOLD or higher	End user experience (documentation and feature discoverability and demo materials) explains how to set up and use globally inclusive email features, mailboxes and tools where applicable; may include YouTube or other videos.
DOC.5	Promotion of Universal Acceptance	MUST have for PLATINUM	Public messaging promotes globally inclusive email systems and features to prospective end users, administrators and/or procurement officers
DOC.6	Promotion of Certification Scores online	MUST have for PLATINUM	Presence on web and/or social media promoting certification levels as determined by this guide and pointing to other resources

DOC.7	Marketing of Certification Scores	MUST have for PLATINUM	Marketing materials and public messaging indicate the level of support as determined by this guide
DOC.8	Promotion of this self-certification guide	MUST have for PLATINUM	Marketing materials and public messaging reference this self certification guide to prospective administrators and procurement officers
DOC.9	Promotion of this self-certification guide to end users	MUST have for PLATINUM	Marketing materials and public messaging reference this self certification guide to prospective end users
DOC.10	Logo and UASG tie-in	MUST have for PLATINUM	When certified, seek and get a logo + link to provider's website on UASG.tech
DOC.11	Support for UASG	MUST have for PLATINUM	Provider's materials point back to UASG.tech certification pages
DOC.12	Online Help videos	MUST have for PLATINUM	Help materials such as videos on YouTube
DOC.13	Use of language inclusive email addresses	MUST have for PLATINUM	Issue mailboxes to your own staff for use in sales, outreach and customer support

~~Self-Certification Process - move earlier?~~

1. ~~Step 1 - Visit www.uasg.tech website and take self certification test~~
    a. ~~If you have difficulties, reach out to UASG support~~
2. ~~Step 2 - submit your test results and get your score(s)~~
    a. ~~Allow on UASG.tech for manual entry of component and system scores to generate the overall score - can create custom composite scores~~
3. ~~Step 3 - decide if scores are suitable for promoting~~

a. ~~Posting results to UASG.tech (or other?) generates a score using a published algorithm - can create custom composite scores~~
b. ~~If Step 3 is YES, download certificate for your own materials and also are mandatorily published on UASG.tech~~
c. ~~If Step 3 is NO, update the offering and resubmit after improving level of support - nothing is published on UASG, and you don't get a certificate~~

~~NOTE: new work item to generate the algorithm~~
~~NOTE: new work item, provide support for #1a~~
~~NOTE: In Steps 1 + 2, it's OK to outsource your testing to a third party provider but that is separate from this guide~~

References and UASG Guidelines

- UASG026 *UA Readiness Framework*
- UASG004 *Test Cases for UA Readiness Evaluation*
- UASG004A *Test Cases for UA Readiness Evaluation – Data*
- UASG 028 *Considerations for Naming Internationalized Email Mailboxes*.
- RFC 5322 *Internet Message Format* <https://datatracker.ietf.org/doc/rfc5322/>
- adding email RFCs as references

Definitions and Glossary

Limited domain name: names made from ASCII-subset letters, digits, and hyphens only, following legacy DNS rules.

International domain name: names made from any characters in any language, subject to international domain name rules in the DNS. May use any top-level domain name, including new, long, and international

gTLDs and ccTLDs. Includes all limited domain names as a subset.

Limited email address: email address consisting of a mailbox part which includes only ASCII-compatible characters, and a limited domain name part, and which conforms to legacy rules for valid email addresses.

International email address: email address made from any characters in any language, subject to email address internationalization standards. Includes all limited email addresses as a subset.

Script: the collection of characters and rules which allows correct text in one or more languages. e.g. Latin script for many languages worldwide, Japanese script (combination of Chinese characters, hiragana, katakana, latin script) for writing Japanese.

Complex scripts: those scripts for which text display requires language-specific reordering of glyphs from original character sequence to display correctly. Most Indian scripts are complex scripts.

Right-to-left scripts: those scripts which are read from right to left in part, and which might have bidirectional text. Arabic is a right-to-left script.

Script-specific email address handling requirements: rules and best practices for handling email addresses in a specific script in a way that delights customers.

Atomic value: TODO fill in definition of “Atomic value” e.g. MUA.37 and MUA.38.

Mailbox name: TODO fill in definition from mailbox names best practices document

Appendix - Self-Certification Process - move earlier?

1. Familiarize yourself with this document
2. Using your preferred test methods, determine the level of support for each applicable attribute or feature
    a. Visit www.uasg.tech website for additional resources.
    b. If you have difficulties, reach out to UASG support at TBD-URL.UASG.TECH.
3. Submit your test results and proposed Certification Level (Silver, Gold or Platinum) to TBD-URL.UASG.TECH
    a. In complex cases, some follow-up may be required.
4. Promote your certification results on your site and in your own materials
5. Request UASG for promotion on UASG.TECH. If UASG agrees, we will promote.

NOTE: new work item to generate the algorithm
NOTE: new work item, provide support for TBD-URL.UASG.TECH and all its forms and email systems
NOTE: In Steps 1 + 2, it's OK to outsource your testing to a third party provider but that is separate from this guide

[End of document]