

Deployment and Use of Email in Deep Space

[draft-many-tiptop-email](#)

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Context

- Sending email from Earth to deep space and back
- Network deployment plans:
 - IP and wifi/5G connected network on celestial body surface
 - might also include low orbit satellite relays
 - Deep space p2p links
- Email protocols: SMTP and IMAP/POP (and DNS) (and HTTPS)

Email Protocols

- SMTP
 - Used for email submission and between servers
 - Uses TCP
 - May use TLS
 - Chatty: EHLO, MAIL FROM, RCPT TO, DATA
 - multiple round trips, not suited for deep space
 - -> don't use SMTP on long delay deep space links
 - -> need another method
- IMAP/POP
 - Used by users to get their email
 - Uses TCP
 - May use TLS
 - -> don't use IMAP/POP on long delay deep space links.
 - -> use on celestial body surface networks to the local server

« SMTP » on Deep Space Links

- Flow:
 - SMTP on Internet as usual
 - last SMTP hop server on Earth
 - Converts email to Batch SMTP (BSMTP, RFC2442) MIME object
 - Send over HTTPS/profiled QUIC
 - First server on surface network receives BSMTP, and then forwards locally « as usual », aka SMTP
 - User read email by connecting IMAP over connected IP network on surface network

Discovering the Next Hop

- How does the last hop server on Earth know the endpoint URL to send BSMTP?
 - Static config (not that many so probably enough for quite some time)
 - Use URI DNS RR, which has similar functionality than MX records. Example:
 - `_bsmtp._https IN URI 10 1 "https://moonmailgateway1.spaceagency.int/inboundmail"`
 - `_bsmtp._https IN URI 20 1 "https://moonmailgateway2.spaceagency.int/inboundmail"`

Considerations

- DNS: local surface service as discussed in draft-many-tiptop-dns
- Anti-spam: needs to be strong before sending email to space.
- BSMTP means no capability negotiation in SMTP, so need agreed/configured capabilities between the two last hops
 - Typically:
 - supports 8BIT (fine)
 - STARTTLS (already using with HTTPS/QUIC so no need)

Conclusion

- Looking for comments
- [draft-many-tiptop-email](#)
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