An Interplanetary DNS Model for a Solar System Internet

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Interplanetary DNS

- Likely development of IP networks off-world, leveraging massive existing application codebase.
- Discrete DNS networks per world to support world-local DNS operations.
- Discrete Top Level Domains per world preferable, but not strictly necessary for interoperability.
- IPN DNS Resource Record Type (RRTYPE)

  https://www.iana.org/assignments/dns-parameters/dns-parameters.xhtml#dns-parameters-4

Interplanetary DNS

- Discrete DNS networks per world support world-local DNS operations, meaning no data exchange between DNS systems, i.e. zone transfer is required, while each world enjoys robust local DNS service.
- Interplanetary network service interoperability is provided by an IP--BP ALG (Application Layer Gateway) architecture.
- Distributed, multi-root DNS model overcomes delay/disruption by keeping queries world-local, directing off-world traffic to service appropriate ALG for processing and entry to the BP network.

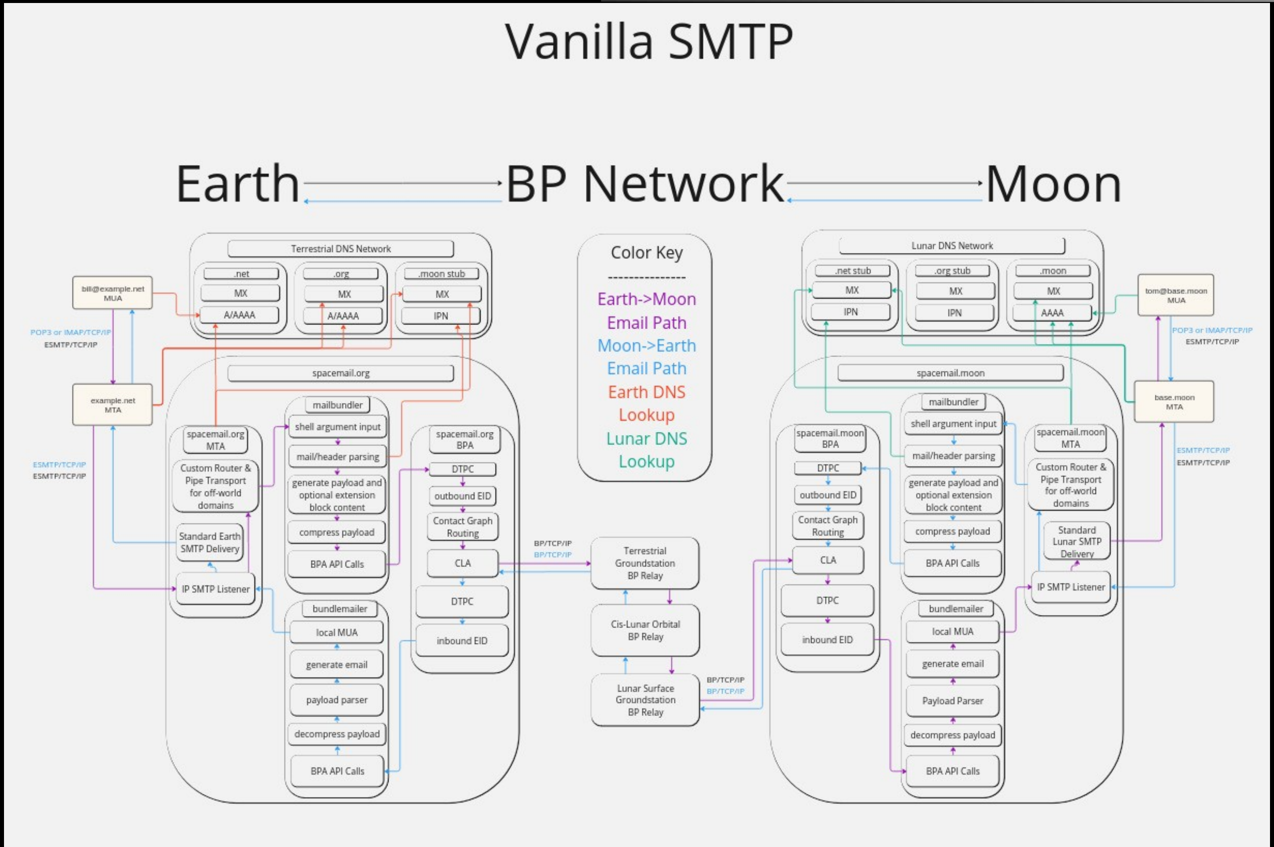
Interplanetary DNS

- Discrete DNS networks per world means discrete root zones/networks. TLDs are identical, but contents vary by locality.
- “Stub” zones serve non-world-local domains with MX, CNAME, NS, IPN, or TXT records, but _not_ A or AAAA records.
- A logical naming convention places all Lunar networks, for example, under one or more dedicated Lunar TLDs.
- While 2nd or 3rd level domains from existing TLDs can be employed   to name off-world resources, this could cause ambiguity in quick differentiation, and would require greater operator burden regarding setup, configuration, and maintenance.

IPN RRTYPE

- IPN Records enable naming of any BP network resource. These include, but are not limited to, free ranging spacecraft, remote ALG hosts, remote BP enabled edge nodes, or (extra)terrestrial overlay participant host/nodes.
- Meant to contain, as a DNS record, the node_nbr or allocator_id.node_nbr components of an IPN EID.
- Definition needs updating, presently considers only two-element EID encoding. This has been implemented and successfully tested with the same functionality as a TXT record, which can support both two-element and three-element EID encoding. Can be accomplished with standards action, as WG product, or by updating individual draft which created the RRTYPE.

Sample use in context of SMTP ALG.



Help E.T. phone home?

Requesting WG adoption...

https://datatracker.ietf.org/doc/draft-johnson-dtn-interplanetary-dns/