

LISP for the Satellite Network

draft-farinacci-lisp-satellite-network-01

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High-Level Goals

- The LISP overlay can run over any IP packet delivery underlay
- If a satellite network can deliver IP packets, we can have a LISP overlay run over it
- Very much like how LISP runs over the (capital-I) Internet, the 3GPP network, the ICAO network

How it Works

- There is no **EID** state in the satellite network underlay
- The satellite network is unaware of the LISP overlay running over it
- The overlay requires the underlay to deliver packets to **RLOC** addresses the underlay can route to
- The underlay network can transport **IPv4** or **IPv6** packets and can be dual-stack
- When path optimization in the underlay is available, an **RLOC**-record can be a **source-route** of satellite node hops

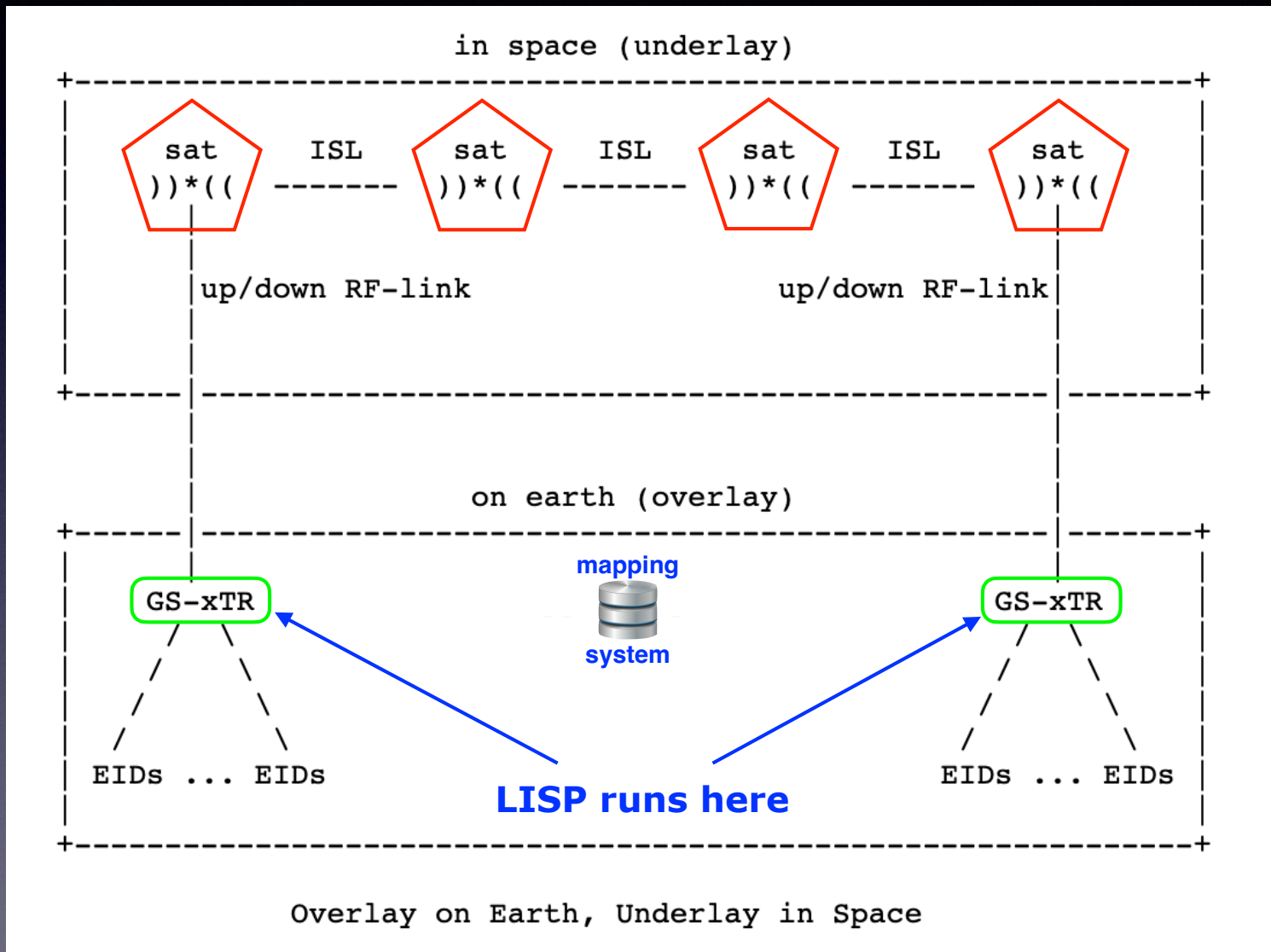
EID addresses in green

satellite network **doesn't** know about

RLOC addresses in red

satellite network **does** know about

How it Works



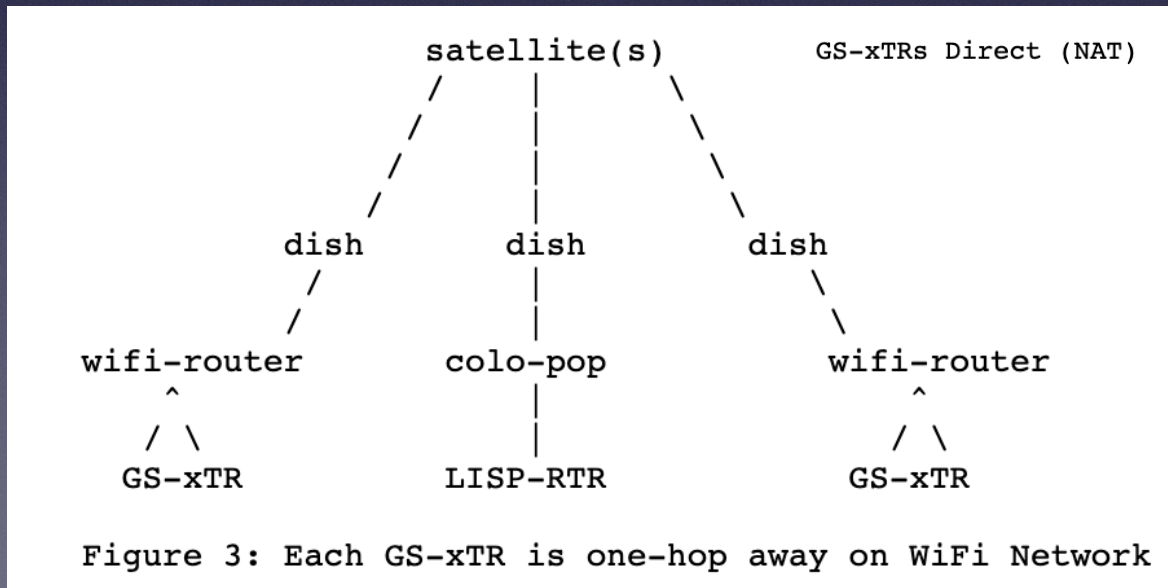
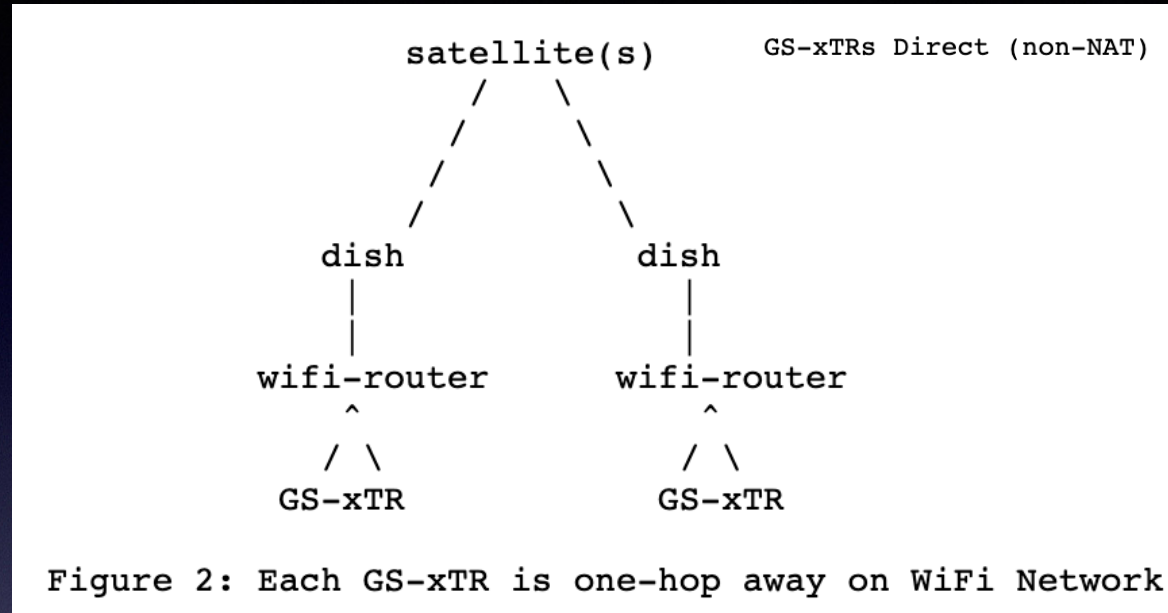
Features

- **EIDs** can roam among GS-xTRs and keep connections up per `draft-ietf-lisp-eid-mobility` and could get zero-packet loss roaming per `draft-ietf-lisp-predictive-rlocs`
- GS-xTRs can load-split traffic across different **RLOCs** on the satellite network (or across **RLOCs** in space and terrestrial **RLOC** links)
- All packets encapsulated over satellite network are encrypted per `draft-ietf-lisp-crypto` [RFC 8061]
- GS-xTRs can be used as alternate paths per `draft-ietf-lisp-te` when ISLs are not available:
 - (**xTR-up** -> **sat** -> **ISL** -> **sat** -> **down-xTR**)
 - (**xTR-up** -> **sat** -> **down-RTR-up** -> **sat** -> **down-xTR**)
- GS-xTRs can do telemetry measurements on the satellite network underlay per `draft-farinacci-lisp-telemetry`
- GS-xTRs can offer an **EID** multicast service by doing head-end-replication or using any underlay multicast service per `draft-ietf-lisp-signal-free-multicast` [RFC 8378]
- **EIDs** can talk to non-EIDs via `draft-ietf-lisp-interworking` [RFC 6832] when either non-EIDs are reachable via the satellite network of the terrestrial network

Changes to -01

- Clarify the mapping system can run on the ground when a GS-xTR has no terrestrial links
- Added test scenarios

Test Scenarios - Direct



Test Scenarios - Sat to Earth

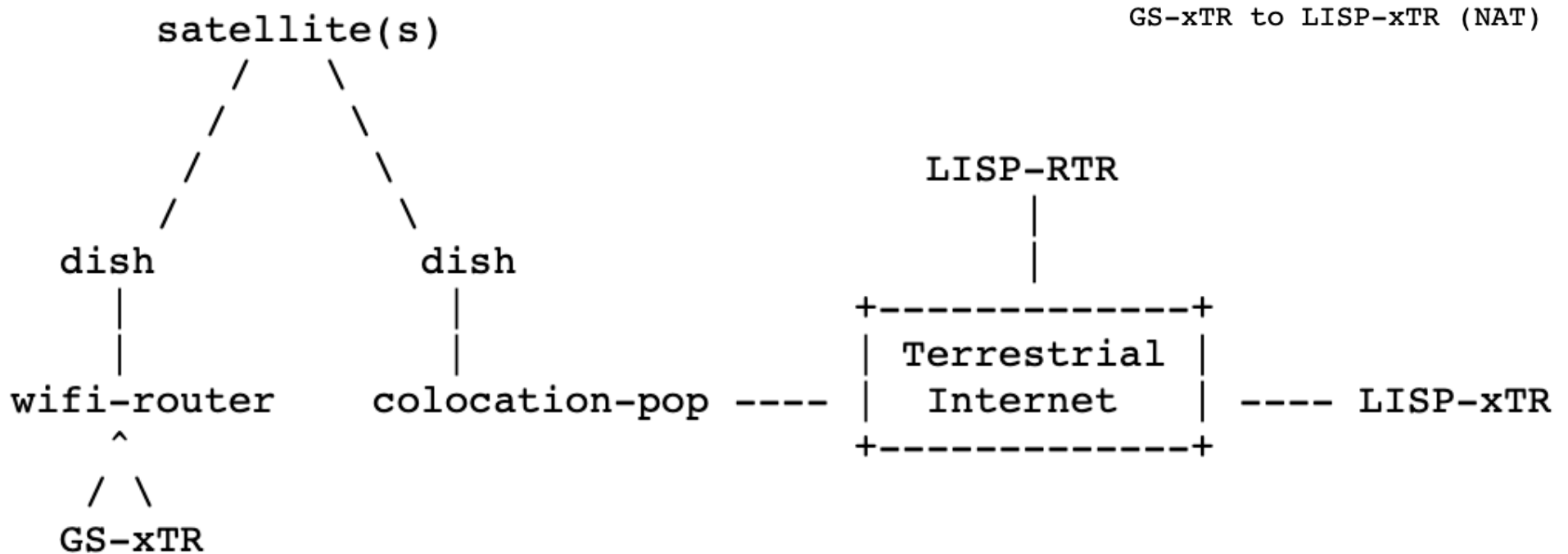
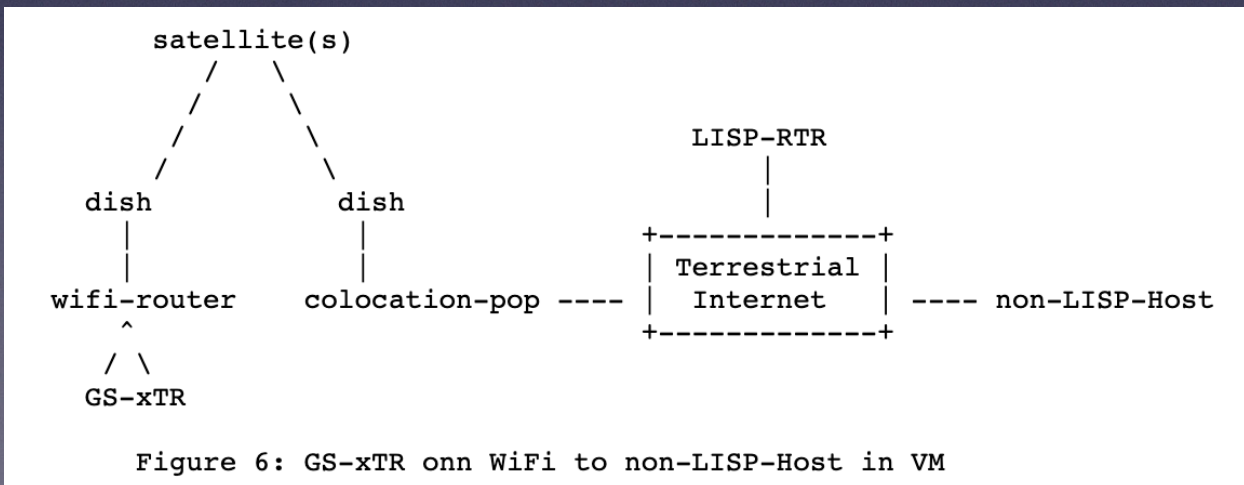
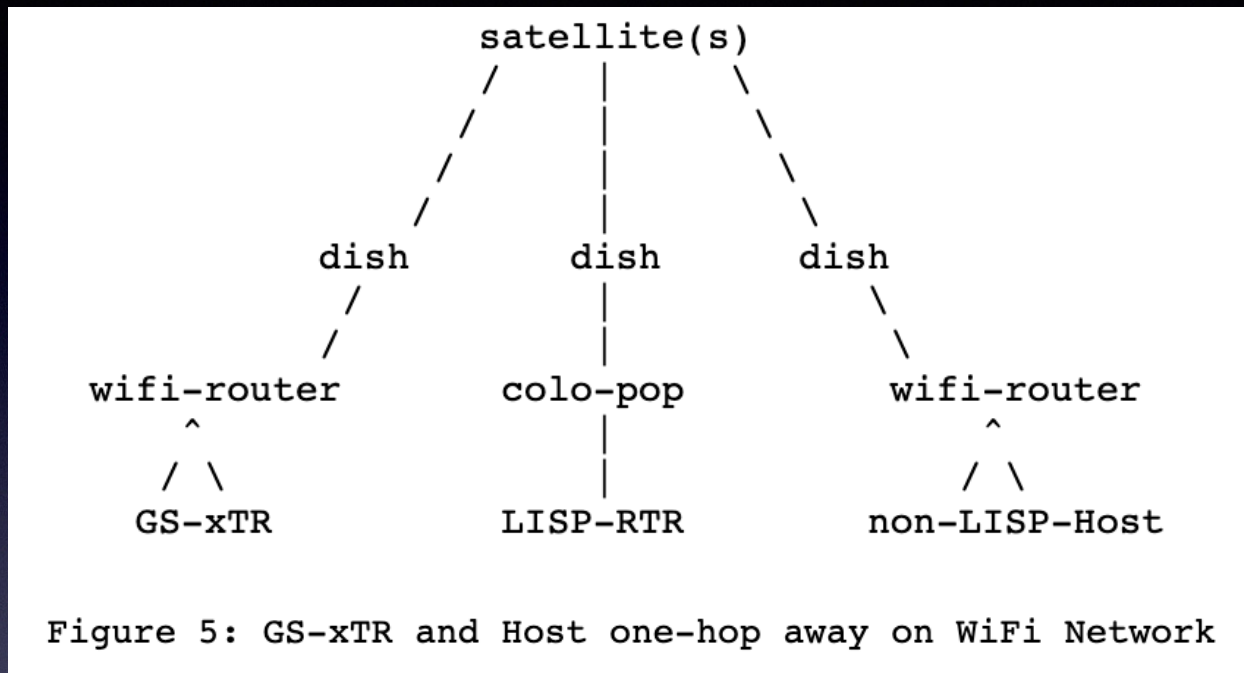


Figure 4: GS-xTR on WiFi Network to LISP-xTR in VM

Test Scenarios - Interworking



Test Scenarios - EID Mobility

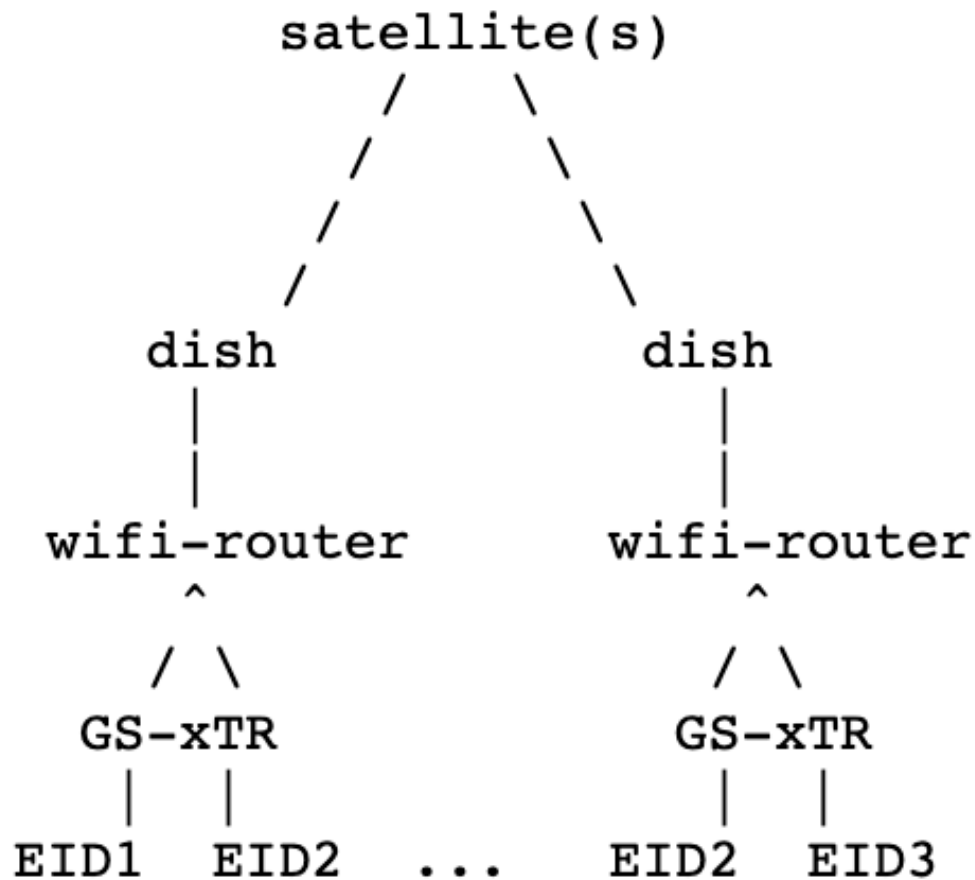


Figure 7: Each GS-xTR is one-hop away on WiFi Network

Document Status

Network Working Group
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Abstract

This specification describes how the LISP architecture and protocols can be used over satellite network systems. The LISP overlay runs on earth using the satellite network system in space as the underlay.

Should we make draft a Working Group document?