

A Simple BGP-based Mobile Routing System for the Aeronautical Telecommunications Network

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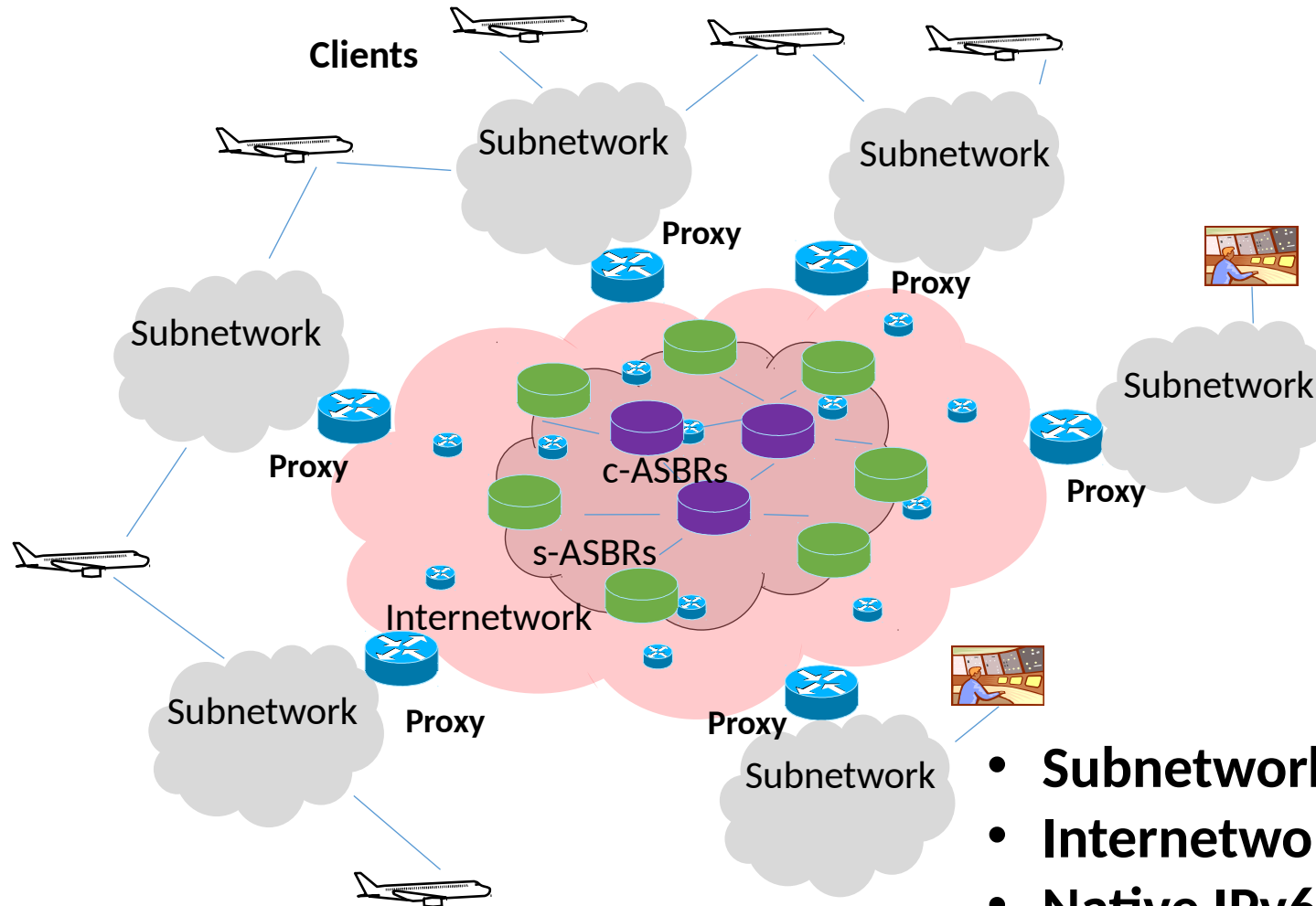
Background

- International Civil Aviation Organization (ICAO) building an IP-based networking system for worldwide Air Traffic Management (ATM)
- Developing the Aeronautical Telecommunications Network with Internet Protocol Services (ATN/IPS)
- Under development in ICAO Working Group I (WG-I)
- IPv6-based; mobility capable
- Accommodates aircraft with multiple data links
 - SATCOM
 - LDACS
 - VHF
 - etc.

ICAO Mobility Subgroup Solution Discussion

- Looking at three candidate mobility solutions:
 - MIPv6/PMIPv6
 - Ground-based LISP
 - BGP-based overlay (subject of this document)
- “A Simple BGP-Based Mobile Routing System for the Aeronautical Telecommunications Network”
- BGP overlay network – separate from the global public Internet BGP routing system
- Based on a “hub and spokes” arrangement with regionally distributed stub ASBRs and centrally located core ASBRs
- s-ASBRs advertise; withdraw airplane Mobile Network Prefixes (MNPs)
- c-ASBRs in a hub AS forward packets between s-ASBRs
- Proxys connect data link subnetworks to the overlay
- Clients are aircraft that may connect to multiple subnetworks
- Route optimization removes ASBRs from path

ATN/IPS With BGP

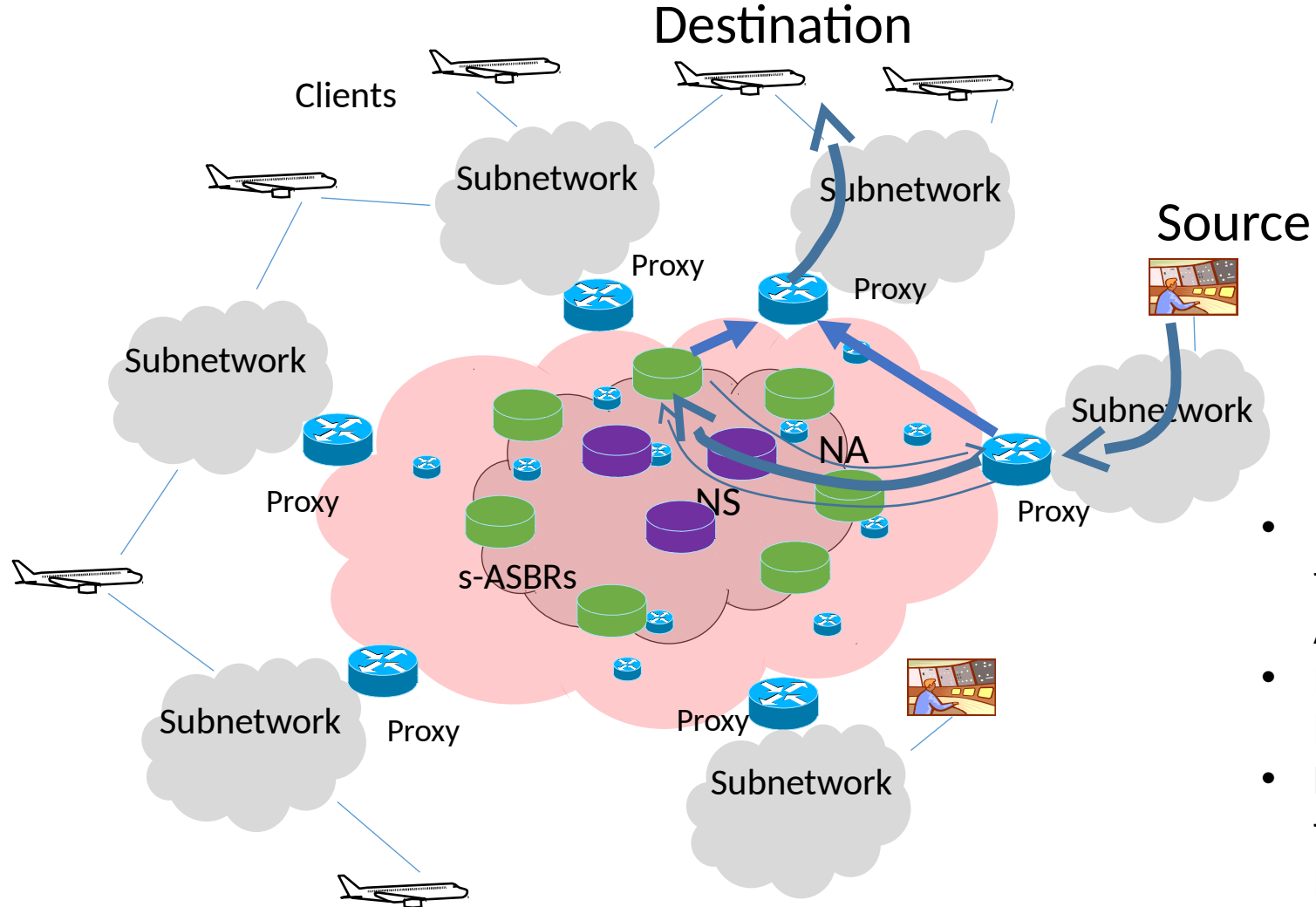


- **Subnetworks** connect airplanes
- **Internetnetwork** conn. subnetworks
- **Native IPv6** within subnetwork
- **Tunneled IPv6** across Internetnetwork

BGP Details

- Each s-ASBR is a stub AS unto itself
- All c-ASBRs members of the same core AS
- s-ASBRs advertise their associated MNPs to c-ASBRs using eBGP
- c-ASBRs originate “default”, but DO NOT advertise any MNPs to s-ASBRs
- c-ASBRs discover all MNPs in the system using iBGP
- c-ASBRs can connect the overlay to the global public Internet, in which case they would advertise short and unchanging aggregates (e.g., 2001:db8::/32) instead of dynamically changing more-specifics (e.g., 2001:db8:1:2::/64)

Route Optimization



- Initial packets go from Proxy through source and target s-ASBRs as well as any c-ASBRs
- Proxy sends NS to get an NA back from the target s-ASBR
- Future packets go directly from source Proxy to target Proxy

Draft Status

- <https://datatracker.ietf.org/doc/html/draft-templin-atn-bgp>
- Draft presented at ICAO WG-I mobility subgroup; under active consideration there as mobility solution candidate
- Identify IETF working group
- Questions?