

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

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IETF102 Routing Working Group (rtgwg)

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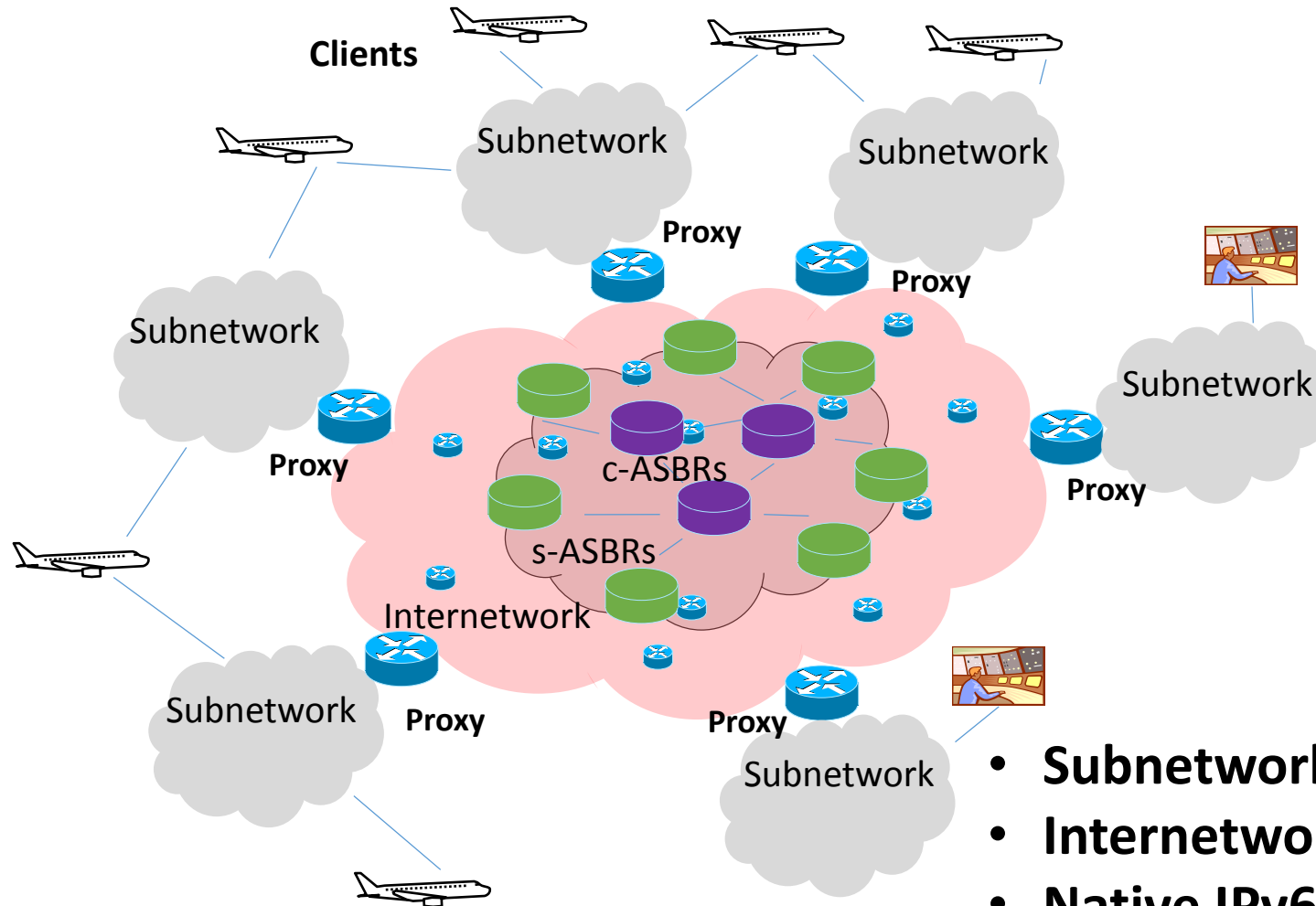
# Background

- 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 International Civil Aviation Organization (ICAO) Communications Panel (CP) Working Group I (WG-I)
- IPv6-based; mobility capable
- Accommodates aircraft with multiple data links
  - SATCOM
  - LDACS
  - VHF
  - etc.

# BGP-based Internetworking Design

- “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



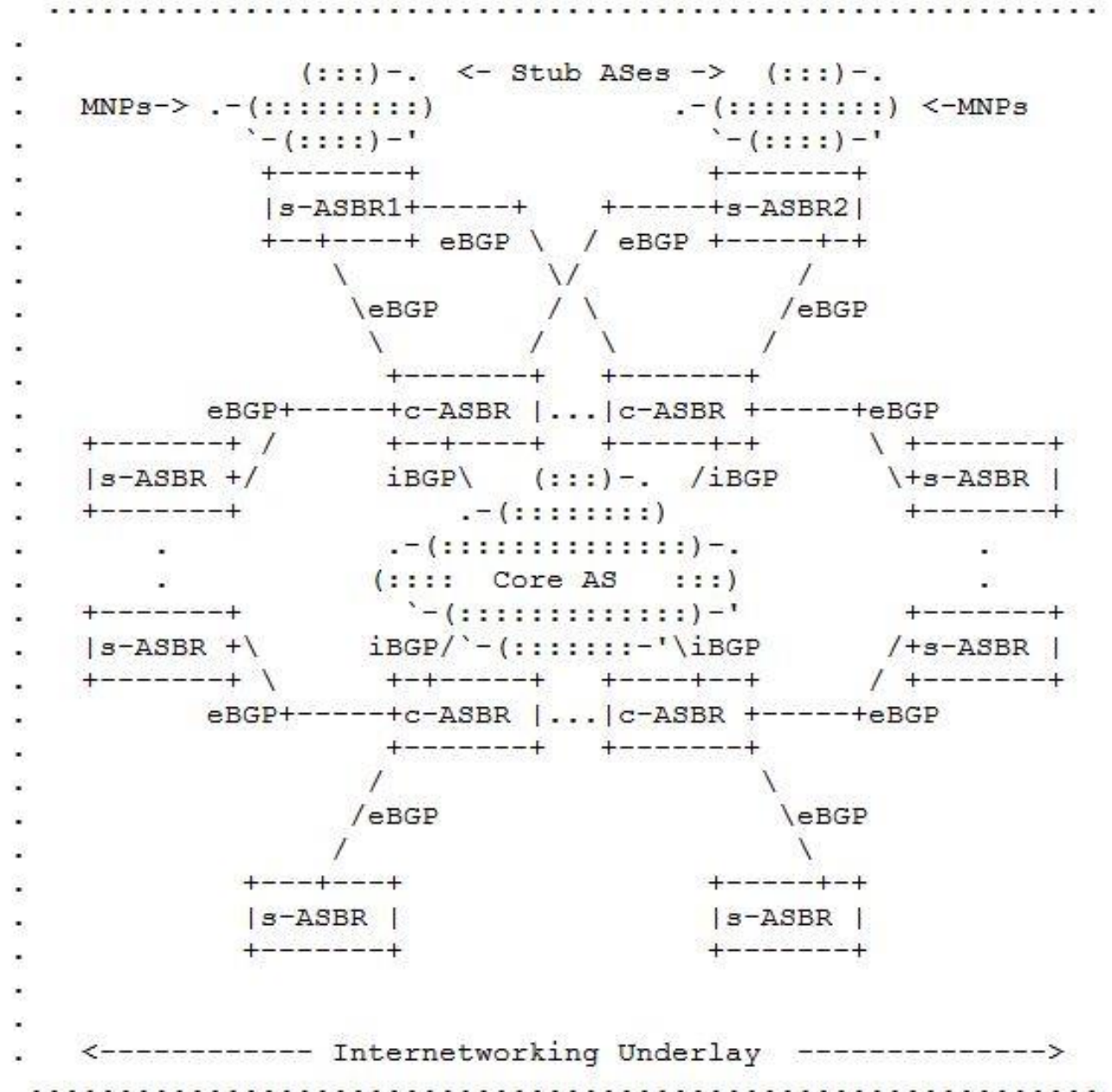
- **Subnetworks** connect airplanes
- **Internetwork** conn. subnetworks
- **Native IPv6** within subnetwork
- **Tunneled IPv6** across Internetwork

# 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)

# Hub-and-Spokes Model

- c-ASBRs in core AS – use iBGP
- s-ASBRs connect stub ASes
- s-ASBRs advertise client MNPs to c-ASBRs
- c-ASBRs originate “default” but do not advertise any MNPs to s-ASBRs
- Hub-and-spokes overlay manifested by tunneling



# Changes Since Last Version

- Removed discussion of route optimization and multilink/mobility - these items are covered under other drafts
- Focused document on the BGP topology and route interactions
- Emphasized that intra-AS mobility events and QoS updates are not propagated into the BGP routing system

# 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
- Draft presented in RTGWWG at IETF99 and IETF101 and also presented at LISP working group at IETF100 and IETF101
- Now offering draft as RTGWWG working group item
- Questions?