

Tussle in address space:  
conflicting requirements,  
partial solutions  
*(quick, dirty, incomplete talk)*

Brian Carpenter  
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15 seconds

# RFC 2101, IAB, February 1997

- “As far as temporal uniqueness (identifier-like behaviour) is concerned, the IPv6 model is very similar to the current state of the IPv4 model, only more so...IPv6 will amplify the existing problem of finding stable identifiers to be used for end-to-end security and for session bindings such as TCP state.”
- Could have been written this week

# Requirements (routing view)

- Minimize number of routing table entries
  - need a  $\log(n)$  scaling property
- Minimize BGP convergence time
  - at worst a  $\log(n)$  scaling property
- Allow packet switching at  $>10$  Gbps
  - including load balancing
  - potentially including QOS based scheduling
- Support site multihoming
- Support mobility

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# Requirements (enterprise view)

- Enterprise address administration independent of ISPs
  - site renumbering considered repulsive
  - capture by ISPs considered harmful
  - intermittently connected networks
- Support
  - host multihoming
  - server virtualization
  - server load balancing
- Effective traffic isolation at security domain boundaries
  - RFC1918 + SOCKS or NAT is widely viewed as enhancing traffic isolation
- Inter-enterprise VPNs, and network mergers, without ambiguous addressing and/or renumbering

# Requirements (middleware view)

- Ensure valid e2e identifiers for security associations
- Choose the right address pair
  - to guarantee reachability
  - to stay within tightest available administrative & security boundary
- Support address-agile transport and applications protocols
- Support 3<sup>rd</sup> party references to “addresses” across space and time
  - is it an address, an identifier, or a thingie?
- Must not care whether network is IPv4, IPv6, or mixed

# Some solutions that don't meet all requirements simultaneously

- Provider based addressing
- Provider independent global addressing
- Ambiguous site local addressing (10/8, FEC0::/10)
- Multihoming using existing routing mechanisms
- Multihoming using multiple global addresses per host
- SCTP
- Mobile IP
- HIP
- ~9 other drafts discussed in multi6 today
- NAT and NAT/PT

➔ We still need new thinking

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