Unique IPv4-Mapped Addresses

draft-thaler-6man-unique-v4mapped-00.txt

Dave Thaler

dthaler@microsoft.com

IPv4-Mapped Addresses

- ::FFFF:x.y.x.w defined in IPv6 address architecture to hold IPv4 addresses
  - Used in APIs (e.g., RFC 3493, RFC 3542), e.g. to allow IP-version-agnostic apps to use same socket for both IPv4 and IPv6
- As implemented, addresses with this prefix tell TCP/IP to convert address to IPv4 and send to the IPv4 stack
- Supports all IPv4 addresses: global IPv4, RFC 1918 addresses, and link-local IPv4 (RFC 3927)

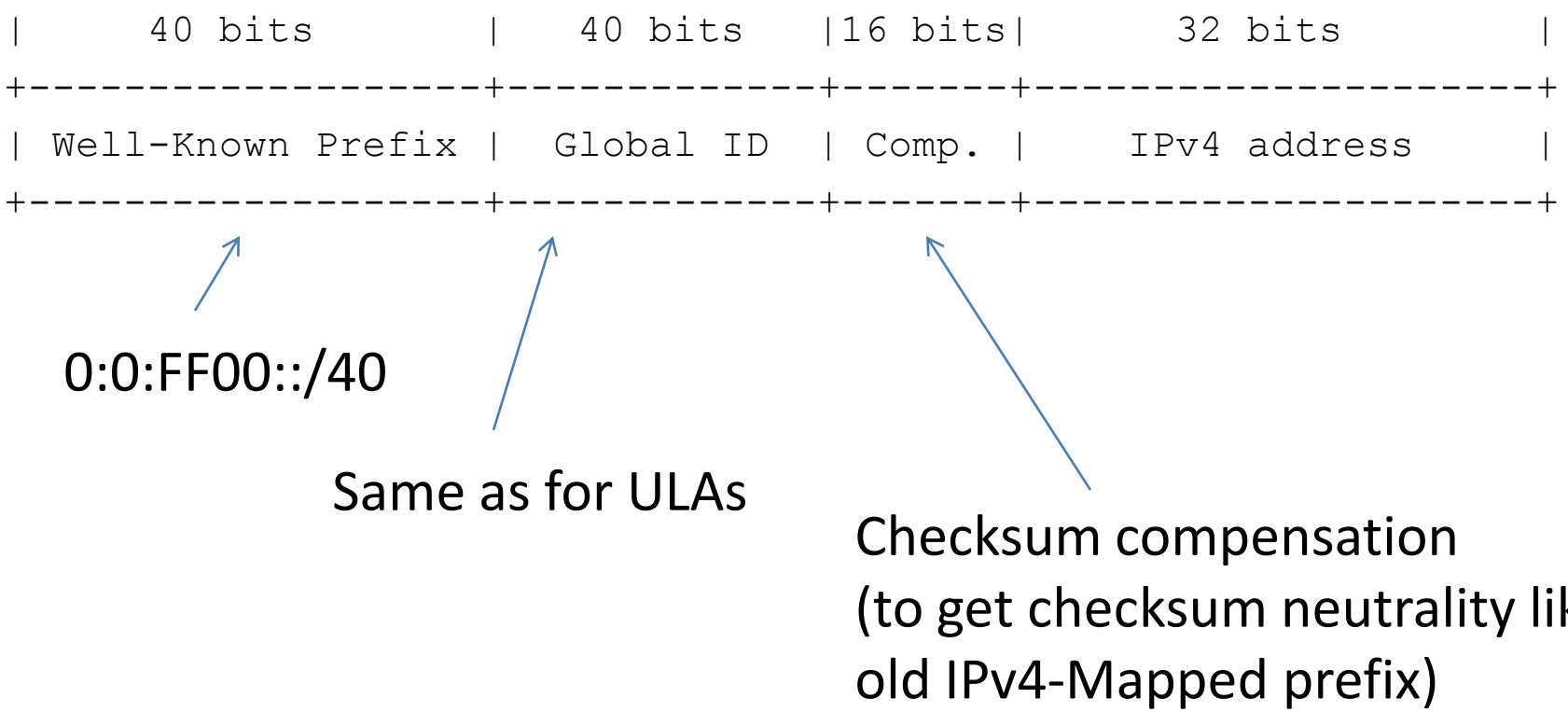
Scenario

- Non-global IPv4 addresses are ambiguous when you're multihomed
  - This will become much more common as IPv4 depletion progresses
  - Ambiguity in IPv4 never worked in IPv4 APIs before
- We already went through the IPv6 equivalent in the site-locals discussion
  - IPv6 APIs provide a scope ID, and so do IPv4-mapped addresses
  - So you might think "Hey, this provides an incentive for apps to change to use IPv6-capable APIs *even for IPv4 destinations!*"
  - But you'd be wrong, at least today…

Problems with IPv4-Mapped Addrs

- RFC 3484 requires IPv4-mapped addrs to be treated as globals (hence 0 scope id)
- Even if it were non-zero, same scope id problems arise that led to deprecation of site-locals
- Solution for site-locals was to deprecate and replace with Unique Local Addresses:
  - Embed the network id in the address, not the scope id

Unique IPv4-Mapped Addrs



Not yet covered in doc

- Impact on APIs that deal with IPv4-mapped addresses today
  - getaddrinfo() with AI_V4MAPPED
  - IPV6_V6ONLY sockopt
  - IN6_IS_ADDR_V4MAPPED() macro

- Open question: Should old format be deprecated or retained?