

A Look at GSE

IAB Routing and Addressing workshop

Amsterdam, 18/19 october 2006

Iljitsch van Beijnum

Global, Site and End

- GSE draft (was: 8+8) 10 years ago
- Notion of 8192 or so "large structures" at the top of the routing hierarchy
- 48 "routing goop" bits, 16 subnet bits, 64 end system designator bits
- Routers rewrite routing goop
- Multihome: tunnels for when ISP link down

Problems with GSE

- Very much incompatible with regular IPv6
- Renumber when moving large structures
- No way to guarantee ESD uniqueness
- No security in routing goop - ESD relation
- No provisions for determining which paths work and which don't
- No mechanism to switch paths (state...)
- See [draft-ietf-ipngwg-esd-analysis-05.txt](#)

Security

- Not vulnerable to redirection attacks
- I can't spoof [Google][www.google]
- But I can spoof [Iljitsch][www.google]
 - which accomplishes much the same thing
- Fix with IPsec? (Not TLS, though)
 - sure, but also for your radio telescope array data stream @ 8 Gbps?

Multihoming

- Key ingredients: detect failures, repair them
- GSE proposes to do this only for link to ISP
 - (aside: see RFCs 2260 and 3178)
 - no full ISP independence as with BGP+PI
 - ISPs need to cooperate explicitly
 - doesn't help with complete ISP failure

The Emperor's Clothes

- What does GSE really buy us?
 - large structures help routing
 - TLA/NLA/SLA hierarchy bit the dust...
 - id/loc too limited (security, no id->loc mapping service) to provide real benefits
 - rewriting src address: not the problem!
- MIPv6/shim6 loc/id optimized differently...
- Does loc/id have value in and of itself?

Way Forward (?)

- Try to be more compatible with IPv6
- Having both locator and id in packet unnecessary: need to find/validate locator from identifier and/or other way around
- Mechanisms for failure detection/repair
- Revisit large structure idea?