Routing & Forwarding of Site Local Addresses

IPv6 WG, 55th IETF

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Target Network 1



Target Network 2



Test Platform

Original Bay Networks IPv6 stack

- Software-based v6 router
- RIPng

Inter-connected with ethernet and PPP

Some interfaces configured with a global prefix and site-local others with just site-local

Modifications

Zone ID support in RIB/FIB

- Monolithic with zone ID index
- Separate table per zone ID

RIPng

- Read/Write from/to correct table
- Change to route exchange messages
- Forwarding plane
 - Correct forwarding table lookup
 - Destination & Source address checks

Test Scenario

Reachability tested with ping6 Throughput tested with ftp FreeBSD workstations dumped route tables and snooped route advertisements

Observed Results

From 10K feet, looks like VPN support

- Differs with sharing the global prefix RIB/FIB

Performance hit in forwarding

- Going to 3 sites caused ~20% system performance drop (software forwarding)
- Most of the hit was in forwarding (e.g. extra lookups to get ingress and egress zone ids)
- Scope check on destination & source addresses
- Site specific FIBs in hardware would help

Random Comments

- This was routing/forwarding only
 - No app testing
 - No DNS
- RIPng is fairly straightforward
- Link-state will be more difficult
- Site boundaries should not be arbitrary
 - IGP/EGP
 - OSPF area boundaries

Random Thoughts

Site-border routers can work

How often will a router have to support more than one or two sites???

Routing/Forwarding is not the hardest part of site-local support

Not all routers would be multi-sited

– Today's VPN boxes are a good model