MANET Autoconfiguration

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Goals

• Automatically configure addresses, prefixes and other information
• Avoid address duplication
• Avoid multilink subnet issues (‘draft-iab-multilink-subnet-issues’)
• Use existing mechanisms
Virtual Ethernet

- Each MR connects to an imaginary shared link (i.e., a “virtual ethernet”) that connects all MRs in the MANET
- Each MR configures a virtual ethernet interface over its (underlying) MANET interfaces
Virtual Ethernet
Virtual Ethernet Interface “Portals”

• enhanced portal (i.e., IP-in-IP encaps):
  – MANET appears as a unified link
  – TTL not decremented
  – all MRs are neighbors
  – standard ND works as-normal

• unenhanced portal (i.e., non-encaps)
  – MANET appears as a multilink site
  – TTL decremented
  – multiple IP hops between MRs
  – need a “site-scoped” equivalent of ND
Virutal Ethernet Output Routine

```plaintext
+-----------------------------------------+ | ip_output() |
+-----------------------------------------+ | virtual_ethernet_output() |

- unenhanced portal ___ ___ enhanced portal ___ p |
- MANET intf already ___ select MANET intf ___ c |
- selected by ULP ___ encapsulate in IP ___ k |
- insert routing hdr ___ send to MANET intf ___ e |
- (if necessary) ___ via ip_output() ___ t |
- send directly to ___ +---------------------------+ s |
- MANET intf ___ ip_output() ___ |
+-----------------------------------------+ |
| MANET Intf 0 | MANET Intf 1 | ... | MANET Intf n |
| (MLA 0) | (MLA 1) | ... | (MLA n) |
+---------------------------+---------------------------+ v
```
Virutal Ethernet input routine

```c
ip_input()
virtual_ethernet_input()

- unenhanced portal ___ ___ enhanced portal ___

- submit to ip_input() - decapsulate packet
  - submit to ip_input()

+-----------------------------+ +-----------------------------+
| MANET Intf 0 | MANET Intf 1 | ... | MANET Intf n |
| (MLA 0)     | (MLA 1)     | ... | (MLA n)     |
+-----------------------------+ +-----------------------------+
MR Autoconfiguration Procedure

• configure MANET Local Addresses (MLAs) on each MANET interface
• configure a virtual ethernet interface over underlying MANET interfaces
• engage in the MANET routing protocol
• discover MANET Border Routers (MBRs) (FQDN, routing protocol info, etc.)
• perform RS/RA exchange with MBR(s)
MR Autoconfig Procedure (2)

• send DHCP request to MBR to get global address/prefix delegations
• assign addresses/prefixes to internal virtual interfaces and/or downstream-attached physical interfaces
• MR can now send packets with global source addresses using RFC4191 router selection
Operation with Multiple MBRs

• RFC4191 ("Default Router Preferences and More Specific Routes")

• Further discussion on multiple MBRs in draft sections 3.1 and section 4
MLA DAD Considerations

- MLAs assigned to MANET interfaces should be statistically unique so MANET-wide *pre-service DAD* not needed
- Passive *in-service DAD* to detect other MRs using the same MLA
Global Address DAD Considerations

• No DAD needed for DHCP prefix delegation because each MR receives a unique prefix

• Could use SLAAC and passive in-service DAD – but, multilink subnet and DAD issues
Drafts

• The combined draft:
  – draft-templin-autoconf-dhcp
• The all-tunneling draft:
  – draft-templin-autoconf-virtual
• The non-tunneling draft:
  – draft-templin-autoconf-multilink