OLSR Workshop
OLSR for IPv6

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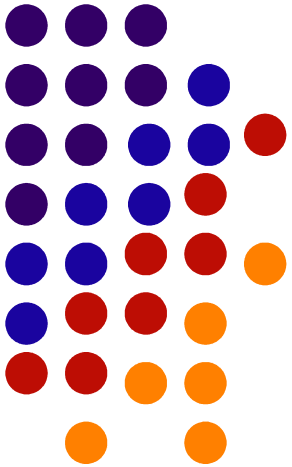

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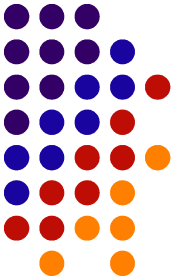
Why OLSR6



- RFC 3626 Experimental RFC
  - Focus on IPv4
- Ad-hoc network requires many addresses
  - Personal Area Network
  - Vehicles
- Supporting IPv6 is urgent
  - Routing messages are changed to IPv6 address length
  - NDP interaction
  - Address Assignments
  - Global Connectivity

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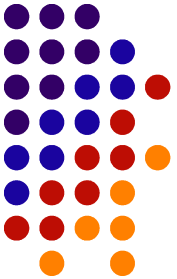
Messages Changes



- Address fields are changed to store IPv6 address space (already stated in RFC3626)
  - Packet format
  - TC message
  - HID message
- Network address fields are changed to store IPv6 prefix address and its length
  - HNA message

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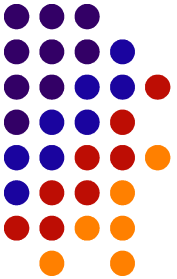
Address Assignments



- IPv6 has 3 different scope for IPv6 addresses
  - global scope
    - optional, only nodes who needs global connectivity
  - link-local scope
    - mandate, to all IPv6 nodes
  - site-local scope (deprecated)
- IPv6 allows to assign multiple addresses on an interface
  - ex. link local address x 1, global address x 2
- Which IPv6 address is used for
  - limited Broadcast address
  - main address

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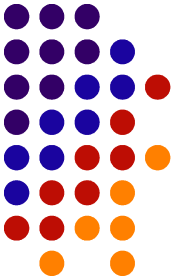
Limited Broadcast Address



- Limited broadcast address on IPv6 is
  - all-node multicast address (ff02::1)
  - All IPv6 nodes joins to ff02::1 the link
  - Link local address can not be used to transmit packets over multi-hop. Routers can not forward packets sent to/from link-local address.

- OLSR simply uses ff02::1 as the limited broadcast address
  - source address: olsr node's link local address
  - destination address: ff02::1

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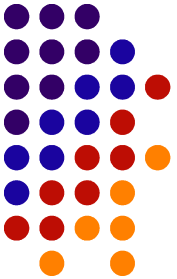
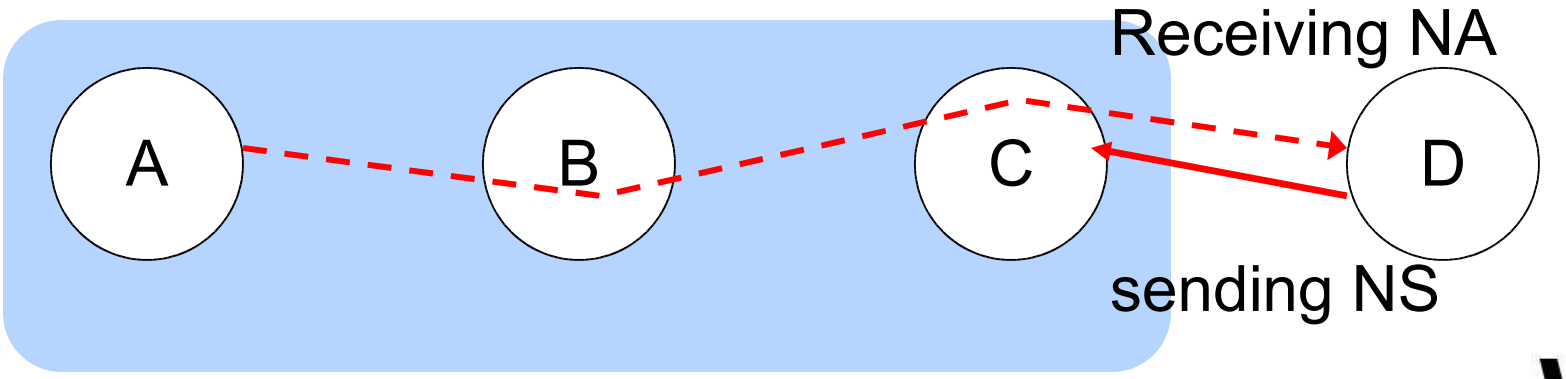
Main address



- main address is used to create routes for a node
- 4 options
  - link-local scope address as a main address
  - global scope address as a main address
  - Any scope address as a main address (ignore scope)
  - manet address

Link-local as main address

- all nodes have link-local scope address
- Even when a node-A gets a route (more than one hop away) for a node-B. it can not route packets with the route
  - packets meant for a Link Local scope address can not be routed on intermediate nodes
  - Node D may route NS for NodeA using the route
    - NDP relies on link-local scope
    - NDP is stateful complicated protocol



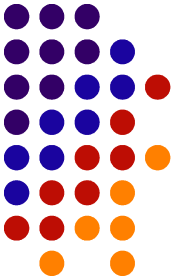
Global as main address

- All nodes do not have a global address
- Two different global addresses
  - Home Address which is not topologically correct address
  - Global address which is assigned by AR and is topologically correct address

- OLSR node needs to get a global address to exchange routing messages
  - Need route to get a global address from a Gateway

Any scope as main address

- same issues when link-local scope is used as a main address



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Manet address as main address

- New address block for manet
  - new manet scope
  - new manet address block from global scope (ex. 2001:x:/16)

- Concept of manet address
  - all nodes have a manet address generated by similar approach of LL address
  - The manet address is only valid within manet
    - This address's packet MUST NOT be leaked to the Internet
  - Each node exchanges routing messages using the manet address and creates routes for manet nodes using the manet address.
    - The manet address can be used communication within manet, but it is better to use global scope address if available
  - All manet node multicast address may be defined if necessary

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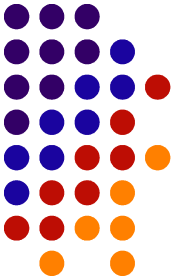
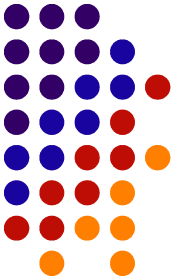
OLSR6 Address Assignment



- Link local address is an interface address of each OLSR node and is used to exchange OLSR messages (src/dst address of IP header)
- Manet address is a main address of each OLSR node
- global address is transmitted by MID messages and is used as communication

Scope	*Validity*	*Protocol*	*Communication*
Link Local	on-link	NDP	on-link
Manet address	within MANET	OLSR6	on-link, within manet
Global	Internet	(Global6)	Any

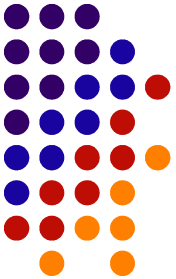
Global Connectivity



- The Use of HNA message or New Defined message to exchange gateway information

- Address generation is similar to Address Autoconfiguration (RFC2462)
  - stateless address assignment

Route Setup towards IGW



- Current implementations behavior when receiving Router Advertisements
  - BSD has default router list. Pick one for default route
  - Linux set all access routers as default routes

- How to configure routes toward IGW is up to manet nodes
  - if a manet node often communicates with a lot of nodes located on the Internet, better to utilize the default route
  - Otherwise, it can configure either host or network routes towards IGW

Conclusion

- many possible issues when manet supporting IPv6
  - Adapting message with IPv6 Address length is not sufficient
- Provide possible messages' formats for OLSR6
- Supporting global6 on OLSR6

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