AUTOCONF proposal

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Design goals of the proposed autoconfiguration algorithm

- It should correspond to the *address architecture model* in draft-ietf-autoconf-adhoc-addr-model
- The allocated prefixes should be easily *aggregatable* using CIDR
- Allocation of MANET-local prefixes *should not depend on link-local addresses*
- *Network overhead* should be reasonable low
Addresses to be configured: MANET-scope
Router configuration 1/5

- Two-step approach:
  - Acquire the MANET-prefix
  - Choose a tentative address and verify the uniqueness in the MANET

- First router in a MANET:

  Broadcast of Prefix Solicitation (PS) message to acquire the MANET prefix
Router configuration 2/5

- From second router on

1. Initiator node sends Prefix Advertisement (PA) message including:
   - Universally Unique Identifier (UUID) of the initiator node
   - Prefix \(d:p:\) of the MANET

2. The requesting router chooses a random \(s\)

3. Next the requesting router sends a Router Solicitation (RS) message to the initiator node via link-local multicast including:
   - UUID of the requesting router
   - Target UUID of the initiator router
   - Chosen router prefix \(s\)
4. The initiator router starts the so-called AC-Timer and forwards the RS message via multicast in the MANET
The conflicting router broadcasts a **Router Advertisement (RA)** message which will then be forwarded by the initiator node.
If no conflict occurs (i.e. no RA messages arrive at the initiator router), an **Autoconfiguration Confirmation (AC)** message is sent to the requesting router.
Summary of router configuration

- Routers verify their unique router prefix in the MANET
- Routers may be aggregated as they share a common first prefix part
- No routing protocol is necessary (only broadcasting is used)
- No link-local addresses are used (only UUIDs)
- All messages are using RFC5444 for the message format
Possible optimizations

- **Optimized broadcasting (e.g. MPR relaying):** Reducing the number of multiple packets

- **Proxying:** Caching prefixes already seen in RS messages

- **Jittering:** Random delay before sending any message

- **Unicast RA messages:** Sending RA messages back using unicast
Summary

- The proposed protocol correctly configures MANET routers in a coherent way

Conclusion

- Implementation and simulation tested the protocol in real-life environments
- Formal validation by way of model checker (UPPAAL) has proven the algorithm to be correct