

# Updates to RFC 2461

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# Background and objective

- Several issues and bugs have been raised against the spec.
- Biggest issues related to mobility and security
- The aim of this work is to revise RFC 2461 and produce another DS RFC
- Most of the work is related to bug fixes and increase in clarity.
- Recycle into DS puts restrictions on the new functions that can be added.
- 18 issues raised so far and presented in the following slides.

# Miscellaneous issues

- Issue 1: Mixed host/router behaviour. It is possible that a node act as a router on one interface and a host on another.
  - An example can be seen in mobile routers (router on the ingress interface and host on the egress interface)
  - Suggestion: explicitly state that the the distinction between a host and a router is done per advertising interface (minor text addition to router specification)
- Issue 2: What to do when preferred lifetime > Valid lifetime in the prefix option?
  - Suggestion: Specify that a router **MUST NOT** send a prefix option containing preferred lifetime > valid lifetime

# Miscellaneous...cont

- Issue 3: Onlink assumption considered harmful for dual stack nodes when there is no IPv6 default router. 2461 states that in this scenario, all neighbours are assumed to be onlink.
  - Suggestion: Remove this assumption
- Issue 4: Router lifetime values “inconsistencies”. Does a lifetime of 18.2 hours violate the spec?
  - Suggestion: State in the definition of the router lifetime field that the receiver should accept any value in this field (up to 65,535). Do not change the sending behaviour specified in section 6.
- Issue 5: Clarify the use of the M and O flags in the context of DHCPv6.
  - Suggestion: Some text to be added to indicate that the “stateful” mechanism is RFC 3315 for address assignment. A similar reference needs to be made for the O flag.

# Miscellaneous...cont

- Issue 6: What happens if a host receives a prefix option with the prefix length field  $> 64$  ?
  - Suggestion: Ignore and assume a 64-bit prefix ?? Or, obey and “somehow” generate an iid in the remaining bits? COMMENTS??
- Issue 15: Do we have to mandate link local addresses to be used as src addresses in Router redirects?
  - Suggestion: Yes. Stick to the current specification. No changes required.

# Security issues - summary

- Issues 7, 8 and 9 deal with securing the protocol. The following needs to be done:
  - Add a new section to explain the context in which IPsec can be used to secure ND before introducing the message formats (I.e. manual configuration). In addition, need to refer to the SEND work for dynamically securing ND.
  - Expand the security considerations section to include a more elaborate list of threats based on draft-ietf-send-psreq
  - Expand the security section to have a more elaborate discussion manual Vs dynamic keying. Currently the spec is vague about the keying mechanism (I.e. if manual how and if dynamic how) .

# Mobility issues - summary

- Issue 13: Omission of prefix options considered harmful. RFC 2461 allows for such omission to save BW. This could be harmful for movement detection.
  - Suggestion: Issue to be handled with ND extensions for movement detection. Rejected from this update
- Issue 14: Introduce a new LinkID (globally unique) to be advertised by all routers onlink and aid with movement detection.
  - Suggestion: Issue to be handled with ND extensions for movement detection. Rejected from this update.
- Issue 10: Relax the requirement on the frequency of RAs to allow them to be advertised every 50 ms.
  - Suggestion: Modify ND to allow for this requirement.

# Mobility ...cont

- Issue 11: Eliminate random delays in MNs before sending router solicitation. MNs could send RS after handover. The random delay adds significant delays to the handover.
  - Suggestion: If a MN knew that a handover has taken place (I.e. not system startup or other scenarios) it should not delay the RS. Modification of section 6.3.7 is needed for this case.
- Issue 12: Eliminate random delays in routers before sending RAs. This introduces significant delays to handovers.
  - Suggestion: This can be solved as discussed in draft-mkhalil-ipv6-fastra-04. The draft allows a “designated” router to respond immediately to RSs without random delays. A counter is set each time an RA is sent immediately to avoid DoS. The counter is reset after a (scheduled) multicast RA is sent.



# Mobility ...cont.

- Issue 16: Eliminate the random delays before sending NS messages after a handover.
  - TBD on the alias
- Issue 18: Add the R and H flags to the prefix option and router advertisement, respectively.
  - Suggestion: Add the flags and their description according to MIPv6 specification.