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# IGMP and MLD Requirements for Mobility Support

draft-liu-multimob-igmp-ml-d-mobility-req-00

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# IGMP/MLD for Mobility Support

- Requirement draft
  - draft-liu-multimob-igmp-mld-mobility-req-00
- Extension draft
  - draft-asaeda-multimob-igmp-mld-mobility-extension-00
- Target
  - IGMP/MLD protocol requirements and extensions for mobile hosts and routers
  - Independent on mobile protocols (e.g. MIP, MIP6, PMIP, NEMO)
    - IGMP/MLD context transfer between routers or other entities will be discussed in a separate draft

# Background

- “Host-and-router” communication for joining and leaving IP multicast sessions
  - IGMP (IPv4) and MLD (IPv6) are the standard protocols
- Properties
  - Network
    - Wireless networks
  - Mobile host
    - Limited resources
      - Low CPU power, low battery power
  - Router (may or may not be a “mobile” router)
    - Relatively general resources (in our assumption)

# Discussions

Other than excessive signaling, what are the key problems?

- Dormant mode operation
  - Support low battery power or low CPU power hosts
  - Limit or minimize IGMP/MLD message flooding over wireless link
- Simple and effective implementation
  - Clarify required functions and discuss how they could be implemented simply and effectively

# Requirement Draft

- IGMP/MLD specifications and requirements
- Required functions for mobility support
- Possibility of supporting a wireless link or a large number of point-to-point links
  - Standard IGMP/MLD support both a wireless link and a P-to-P link, but need the protocol tuning

# IGMP/MLD Query

What are mobility-specific problems?

- Condition
  - Soft-state protocols
  - Exchanging query and report messages creates host-and-router communication
- Concern
  - The number of transmitted query messages must be reduced or minimized for mobility support
  - Excessive IGMP/MLD message transmission over wireless link is bad, because;
    - Periodical message transmission highly consumes network resources
    - Superfluous IGMP/MLD messages keep up mobile hosts in sleeping mode

# SSM Support

- Condition
  - SSM supported by IGMPv3 and MLDv2
  - SSM is a requirement for scalable IP multicast
- Concern
  - Bad effects by coexistence of INCLUDE and EXCLUDE filter modes
  - Both host and router need to take complex state transition, have complex implementations, require a large amount of CPU/memory resources
  - Shortest-path tree (SPT) must be re-constructed whenever the router receives EXCLUDE mode join from a downstream host

# Conclusion

- IGMP and MLD are necessary protocols in IP multicast
- For mobility support;
  - Optimization of IGMP/MLD query/report transmission is required
  - SSM support is mandatory
  - Protocol changes should be minimized