

# IPv6 ND Optimization for Energy-aware Devices

[draft-chakrabarti-nordmark-energy-aware-nd-00.txt](#)

[Samita.chakrabarti@ericsson.com](mailto:Samita.chakrabarti@ericsson.com)

[Erik Nordmark nordmark@cisco.com](mailto:Erik.Nordmark@cisco.com)

# Motivation and Background

- Internet Of Things and IPv6
  - Large number( ~billions) of connected ipv6 devices are expected in the future
- Energy Awareness and Carbon footprint
  - Research shows that energy consumption of a networked device is heavily influenced by the number of connected devices in the network [ source: LBL]
- IAB IOT Workshop in March, 2011
  - Margaret Wasserman expressed a need for a generalized document for IPv6 Neighbor Discovery for ‘sleepy’ nodes
  - IOT workshop report
    - <http://www.ietf.org/internet-drafts/draft-iab-smart-object-workshop-01.txt>

# The 00-draft

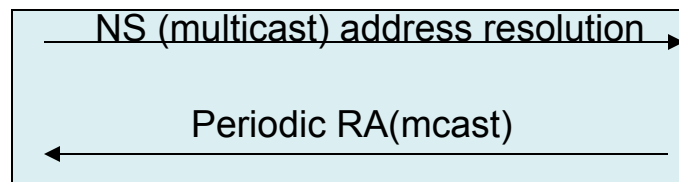
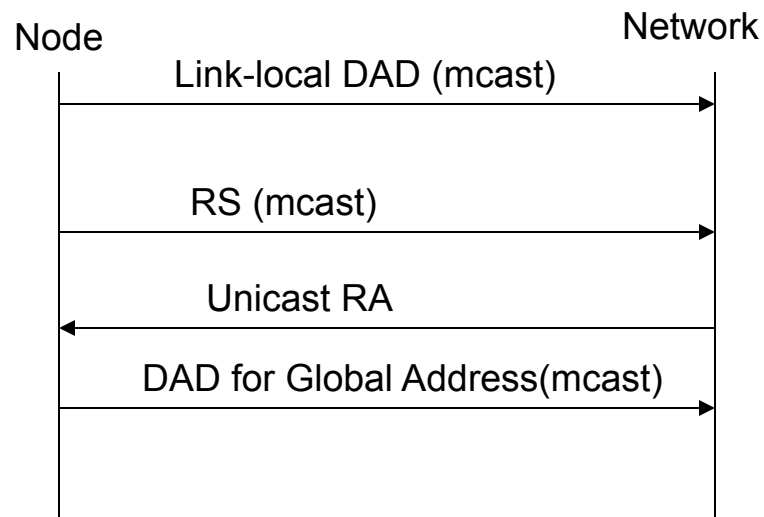
- Current Scope
  - Neighbor Discovery Communication Patterns
  - Wired and wireless nodes that require to save energy in processing and network i/o
  - Using subset of draft-ietf-6lowpan-nd that are applicable to sleepy nodes, low-power and radio nodes in general

# Neighbor Discovery optimizations

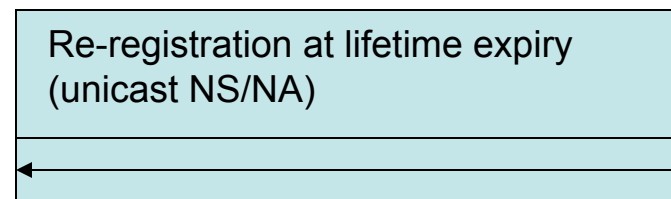
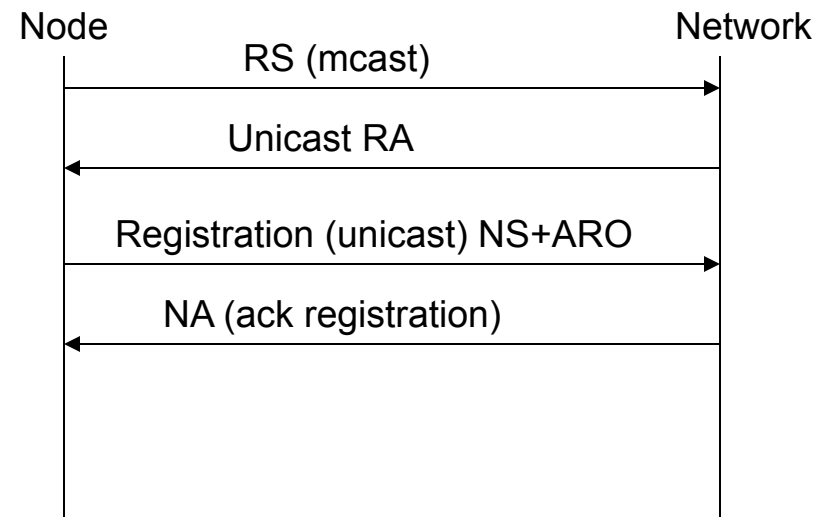
- Turn interaction around
  - Host requests information before expiry, instead of periodic Router Advertisements
  - Allows for sleeping hosts
- Reduce use of multicast
  - Means unrelated hosts don't need to process
- Address Registration Option (ARO)
  - Router knows all IPv6 addresses on link
  - Never a need to multicast NS

# Resulting Behavior

## RFC 4861 ND



## Proposed Optimizations





# Open Issues

- Current optimization assumes all nodes on link use it
  - Need to work out interaction if some nodes use base RFC 4861 and others optimized ND

# Way Forward

- Finding a home
  - 6man?
  - An input to RECIPE?
- Determining a useful and practical scope of applicability
- Draft-ietf-6lowpan-nd-17.txt is the base of this document but it is using the part that is generally applicable to IPv6 – Will 6man be interested in this type of work?



**Comments are welcome!**