Controlling Traffic Offloading Using Neighbor Discovery Protocol

IETF#82 Mif WG, November 15th, 2011

draft-korhonen-mif-ra-offload-03

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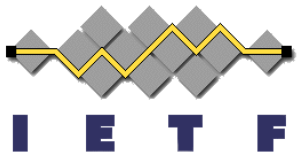
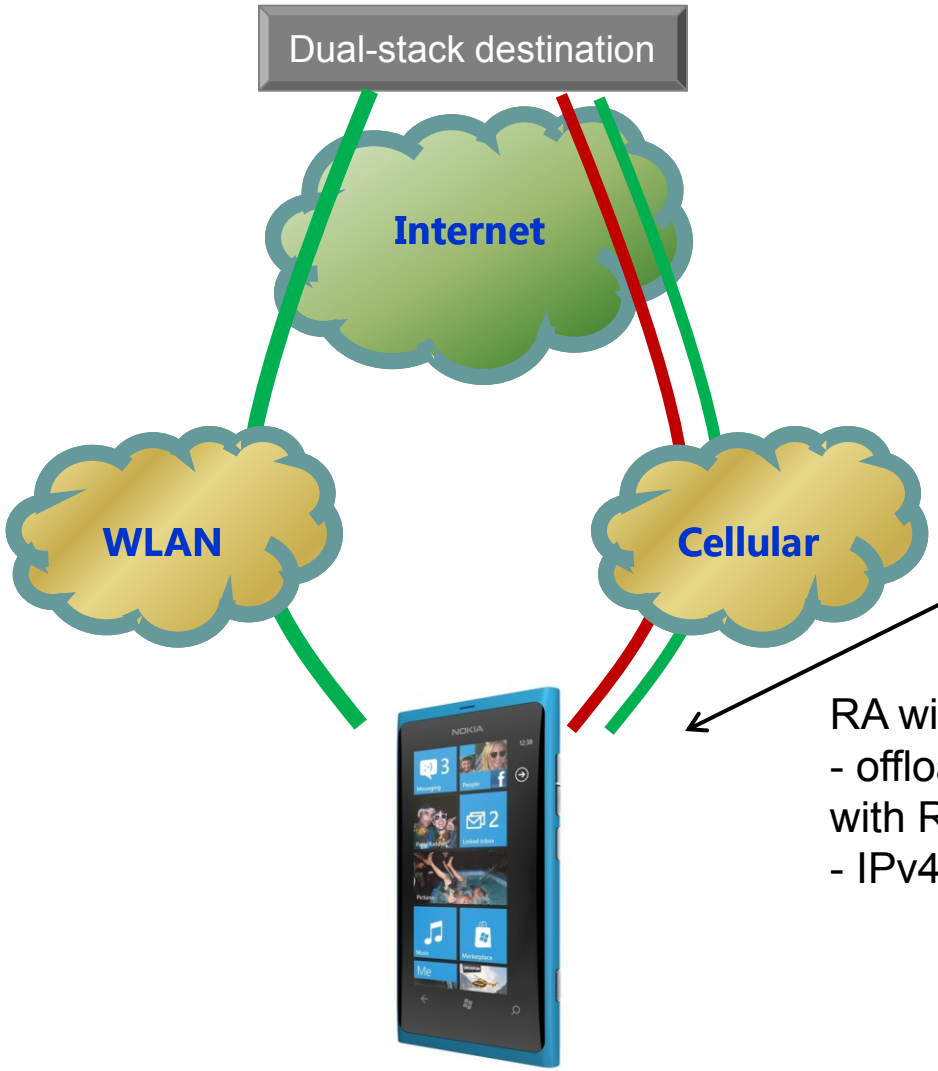


Background

- A MIF host may have alternative access (e.g. WLAN) to cellular access available at the same time.
- There is a need for a network managed solution to “guide” MIF hosts to prefer faster access, or prefer ‘cheaper’ access over ‘expensive’ one. (ANDSF,SIPTO)
- DHCPv6 is not always preferred or available, thus utilizing Neighbor Discovery Protocol as a ‘command channel’.
- RFC4191 supports IPv6 offloading. Route Information option could potentially be used also for IPv4 offloading.

Illustration of typical setup

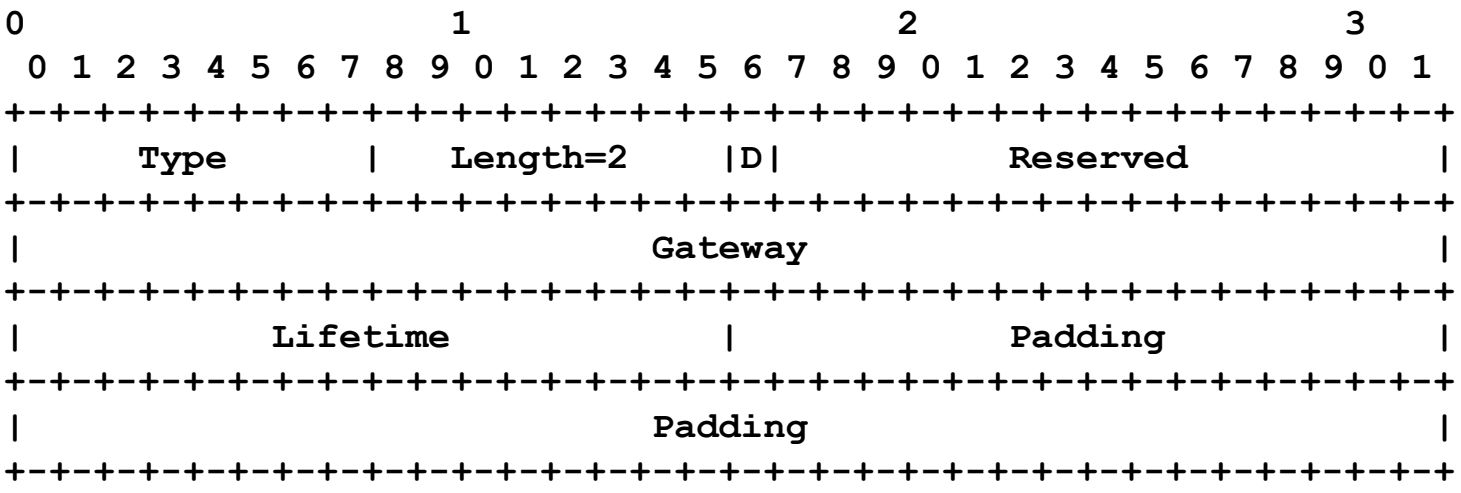


Router (e.g. PDN GW)

RA with Offload option:
- offloading to specific IPv4 routes, with Route Information option
- IPv4 gateway preference

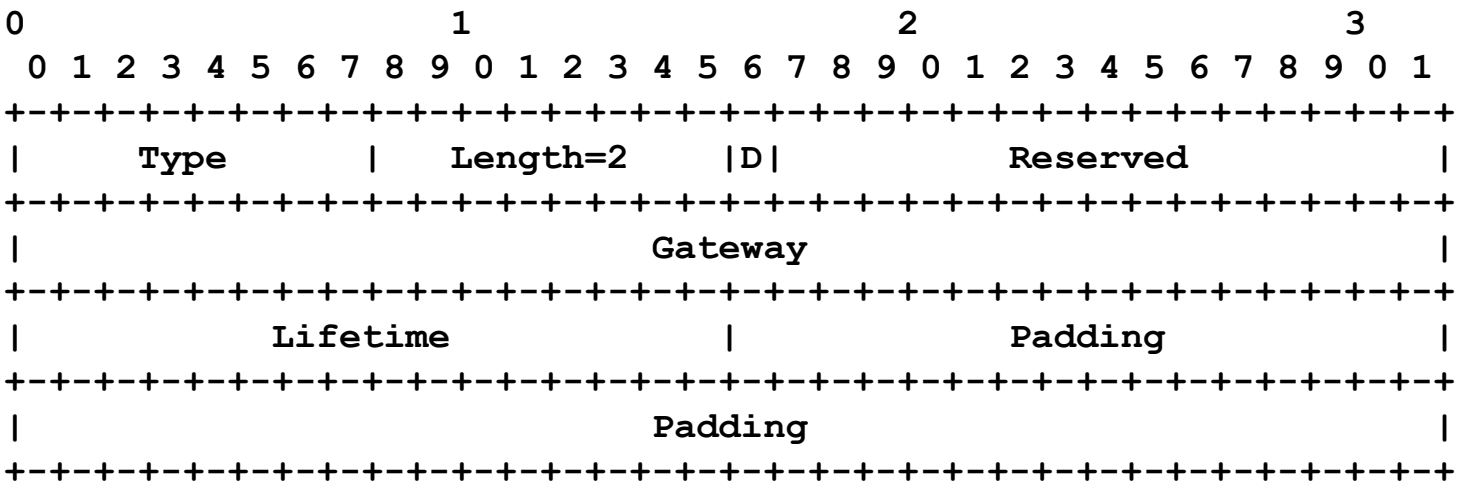
Proposal update

- Offload option in Router Advertisement:
  - Presented in IETF-80.
  - Support offloading of IPv4 traffic.
  - Coexists with RFC4191 on IPv6 offloading.
  - If present -> set offloading priorities; if absent -> not used and remove possible previous changes.



Proposal update

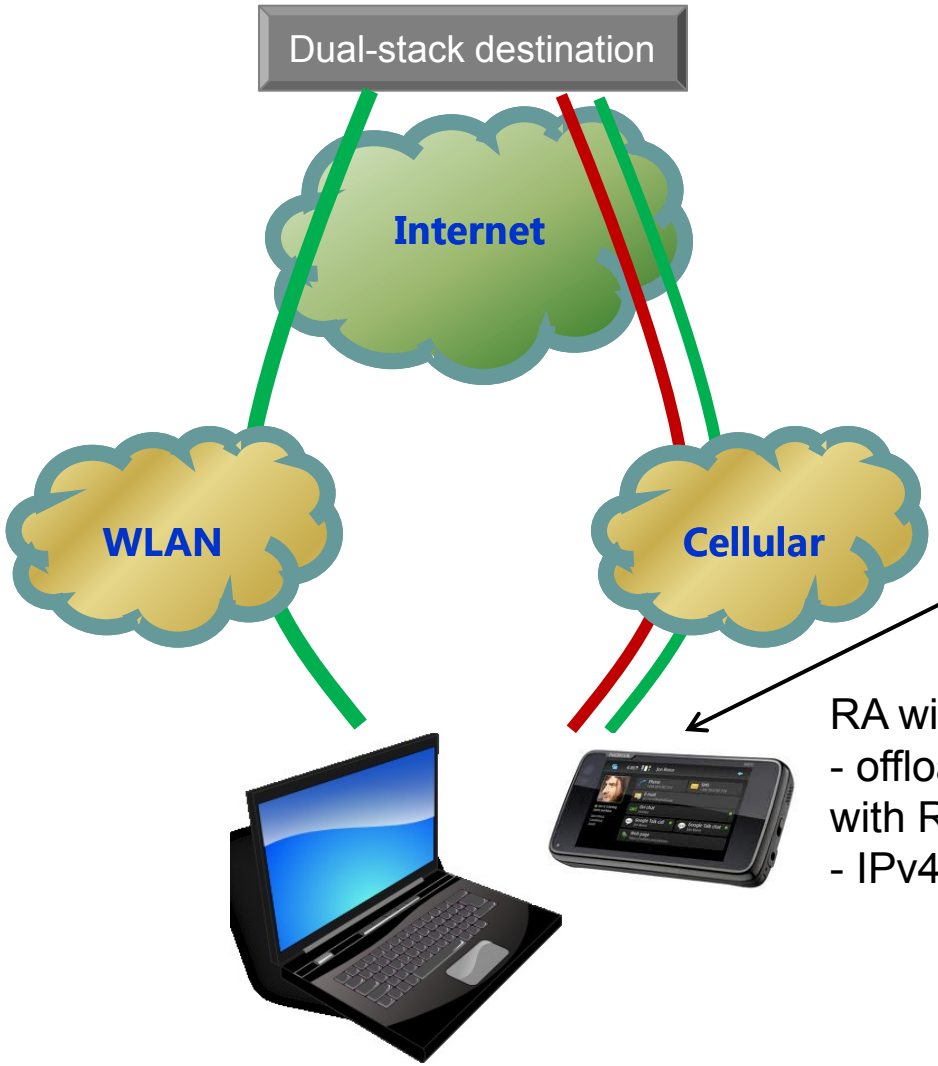
- Changes in draft:
  - ‘L’ bit is removed – to focus on IPv4 traffic offloading since IPv6 offloading works rather nicely already with RFC4191.
  - Lifetime for offloading.
  - Combine Route Information option in RFC4191.



Proposal update

- **D**efault IPv4 Gateway Preference.
  - ‘D’ set to 1, use other interface for IPv4 traffic, if just available.
  - ‘D’ set to 0, use this interface for IPv4 traffic, when possible.
- Offloading to specific routes.
  - Route Information option.
  - Preference value in RI.
  - ‘D’ bit and Lifetime.
- Offloading preference on default gateway.
  - ‘D’ bit and Lifetime.

Proposal update



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RA with Offload option:
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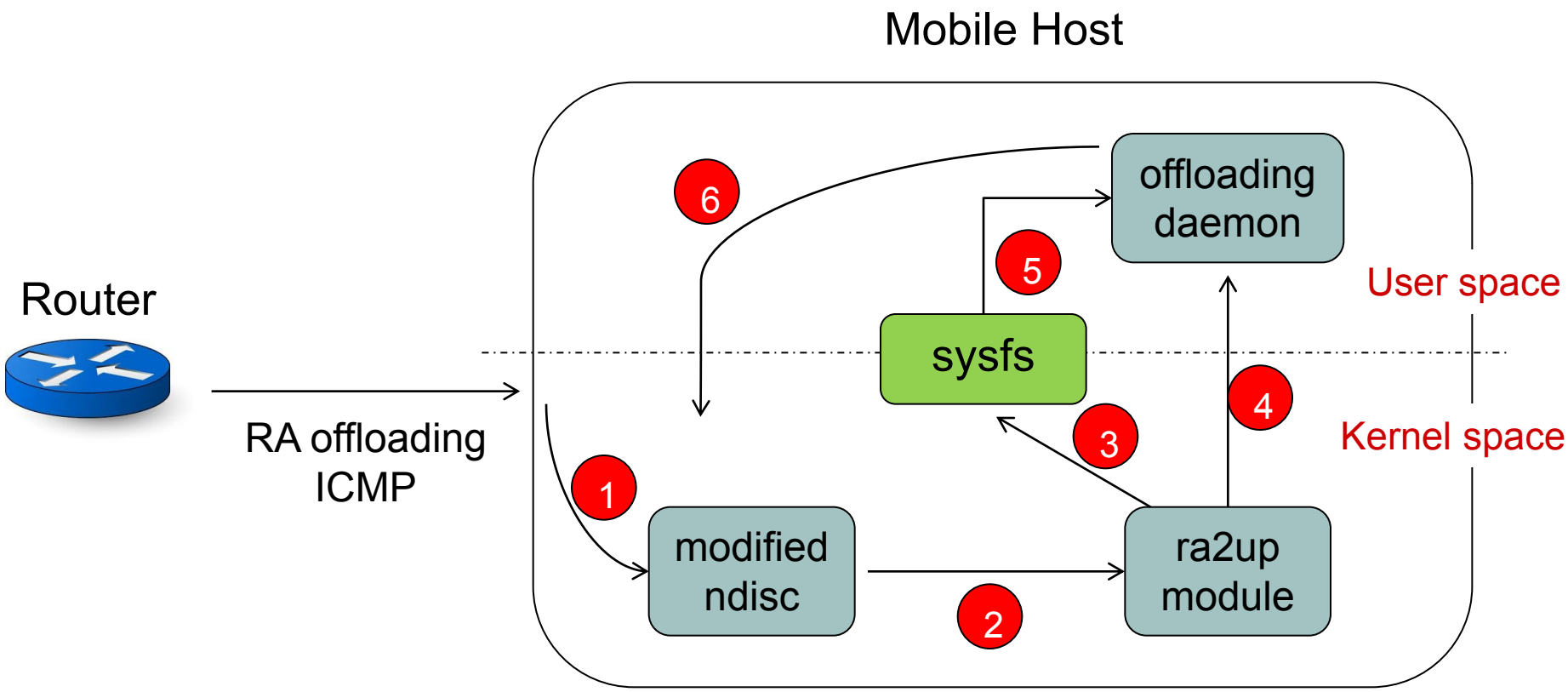
Current status and summary

- Prototype implementation on Linux.
  - Test & Demo
  - on request
- Light-weight, on-demand offloading from network side.
  - 3G as commanding channel
- Offloading test and verification to do.
  - Live network

Appendix


Mobile Host
Router
RA offloading
ICMP
offloading
daemon
sysfs
modified
ndisc
ra2up
module
User space
Kernel space
1
2
3
4
5
6