Communicating Prefix Cost to Mobile Nodes

(draft-mccann-dmm-prefixcost-02)

IETF 94 Yokohama

Updates from version 1

1. What is the motivation – what costs are being optimized

   [network state plus transport resource cost;
   plus added entire chapter on Motivation]

2. Does this require additional signaling?

   [No additional signaling incurred - sub option of RA]

3. Does this impact L2 events?

   [Not responding to link layer /L2 events]

4. Is this addressing e2e aspects of flow, etc?

   [No e2e proposed; that is for MPTCP and others.]

5. What is host/application behavior when prefix cost changes?

   The updates provide some details on what can/should be done in the host. I think that detailed mechanisms should be addressed in a companion/other draft related to APIs, etc.

Introduction (1)

When an MN moves from one IP attachment point to another, it does not know about:

- amount of state in network on behalf of this prefix
- amount of transport resources to tunnel/route packets

The network does not know:

- the state of the connection flow (e.g., middle of download?)

If cost is communicated, the MN can make decisions about when to release old /acquire new addresses.

Introduction (2)

Cost should be communicated to the MN because:

(1) MN decides about allocating new addresses /releasing old ones

(2) Only the network has information about the cost of maintaining the prefix in a network-based mobility management scheme. (MN does not know the network topology)

Proposal in this draft:

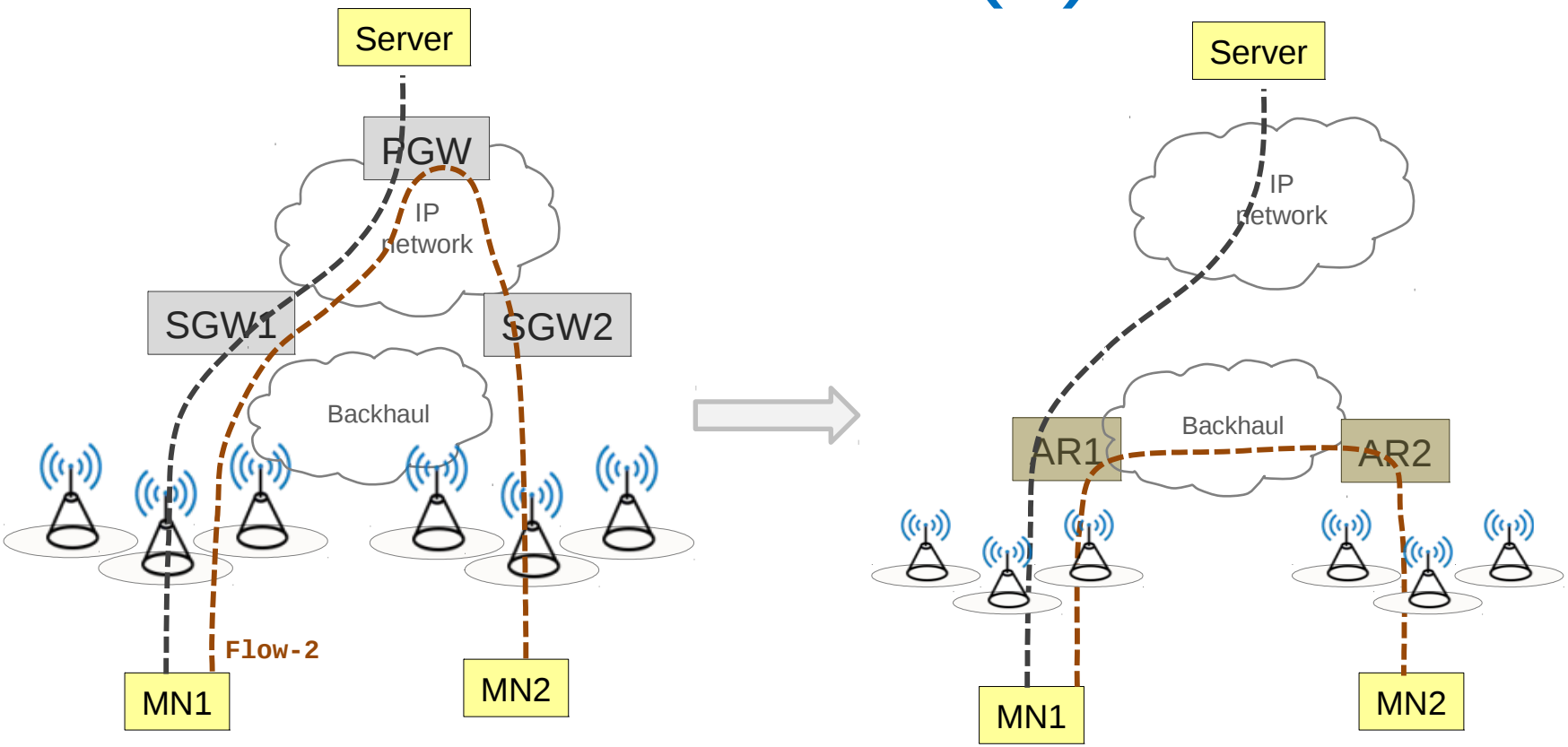
Network provides the “cost” of maintaining IP prefixes to the MN.

<u>Notes</u>

(a) Prefix-cost is not about e2e jitter or latency.

(b) Link layer changes do not affect prefix cost.

Motivation (1)



Example - current Mobile Network/ first router (PGW)

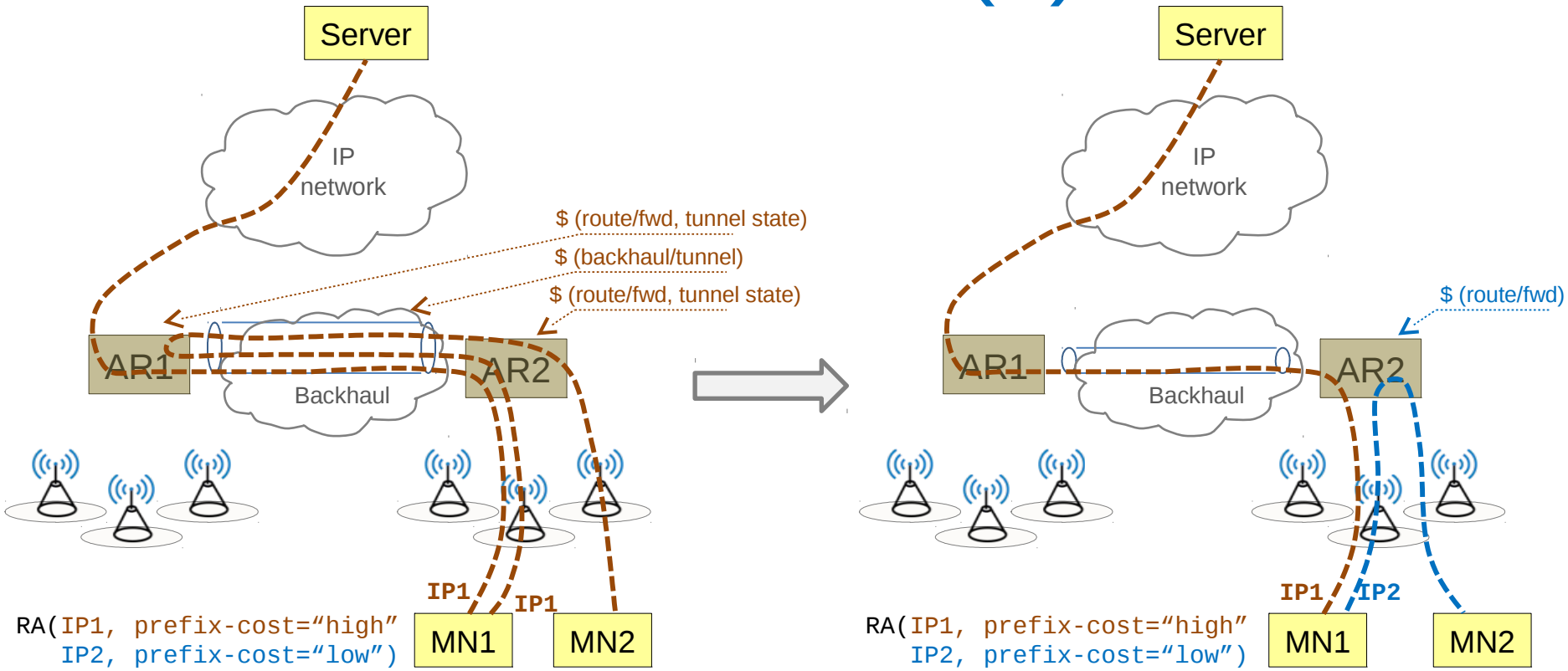
Optimally located AR

(1) Sub-optimal route with centralized gateway/anchor (PGW).
(2) Routers located closer to MN's point of attachment are more optimal .

However, when MN changes point of attachment, the cost of the prefix increases.

(state in gateways, tunnels – and suboptimal route)

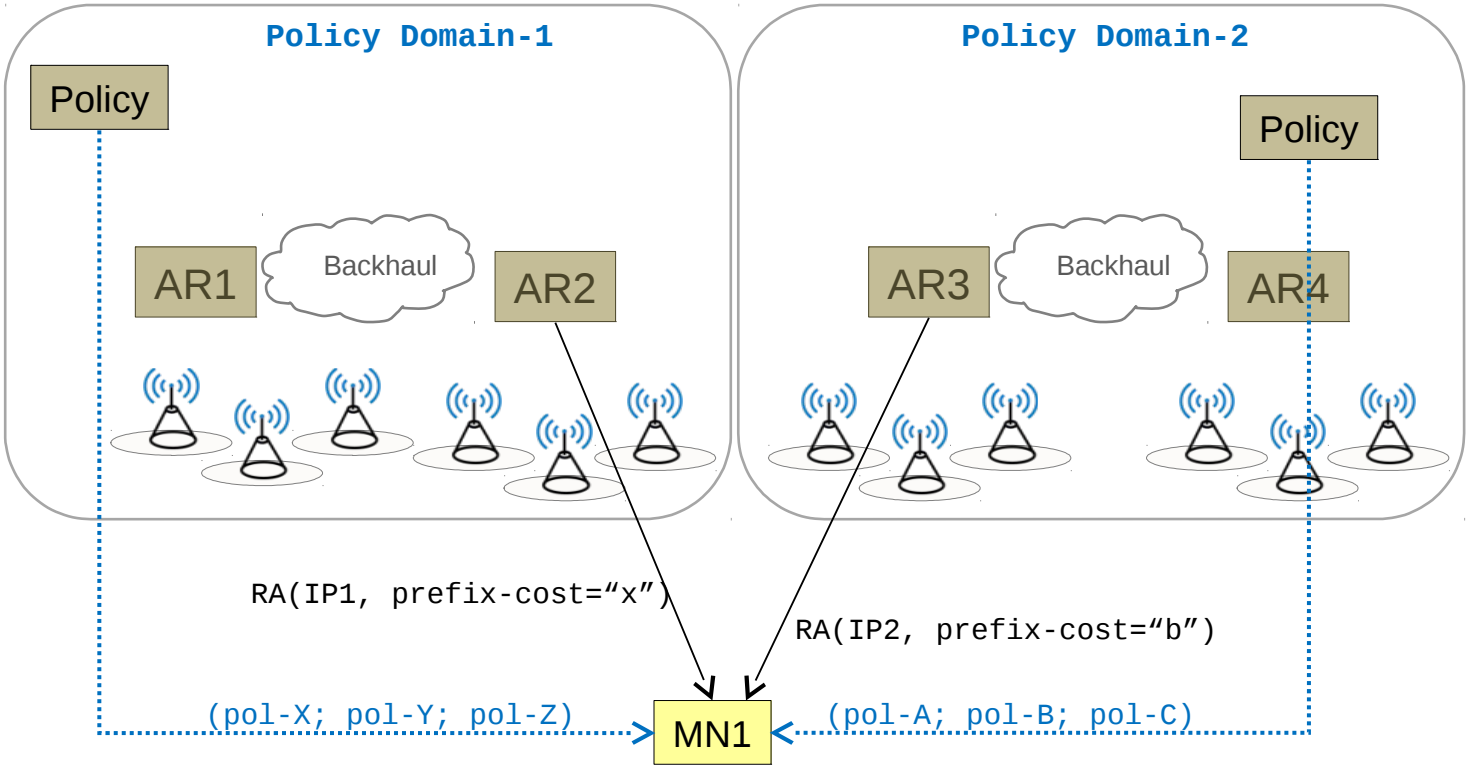
Motivation (2)



Network provides the cost of maintaining IP prefixes.

MN decides when to use new IP prefix.

Policy



The current network operator sets the cost values for each prefix that it advertises, and the MN implements an address allocation/use/release policy that can be set by the device owner or the home operator (e.g., OMA DM).

Prefix Cost Sub-option

(Router Advertisement)

```
 0                   1                   2                   3
 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
 |     TBD1      |        1      |C|         Reserved1           |
  +-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
   |           Prefix Cost         |           Reserved2           |
    +-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-
+
```

The prefix cost is carried as a 16-bit, unsigned number in network byte order. A higher number indicates an increased cost.

Uses: draft-korhonen-dmm-prefix-properties-04

IETF next steps

More reviews and suggestions welcom
e.

Next steps:

- review with 6man, mif.