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PMIPv6 Extension for Multicast

draft-asaeda-multimob-pmip6-extension-05

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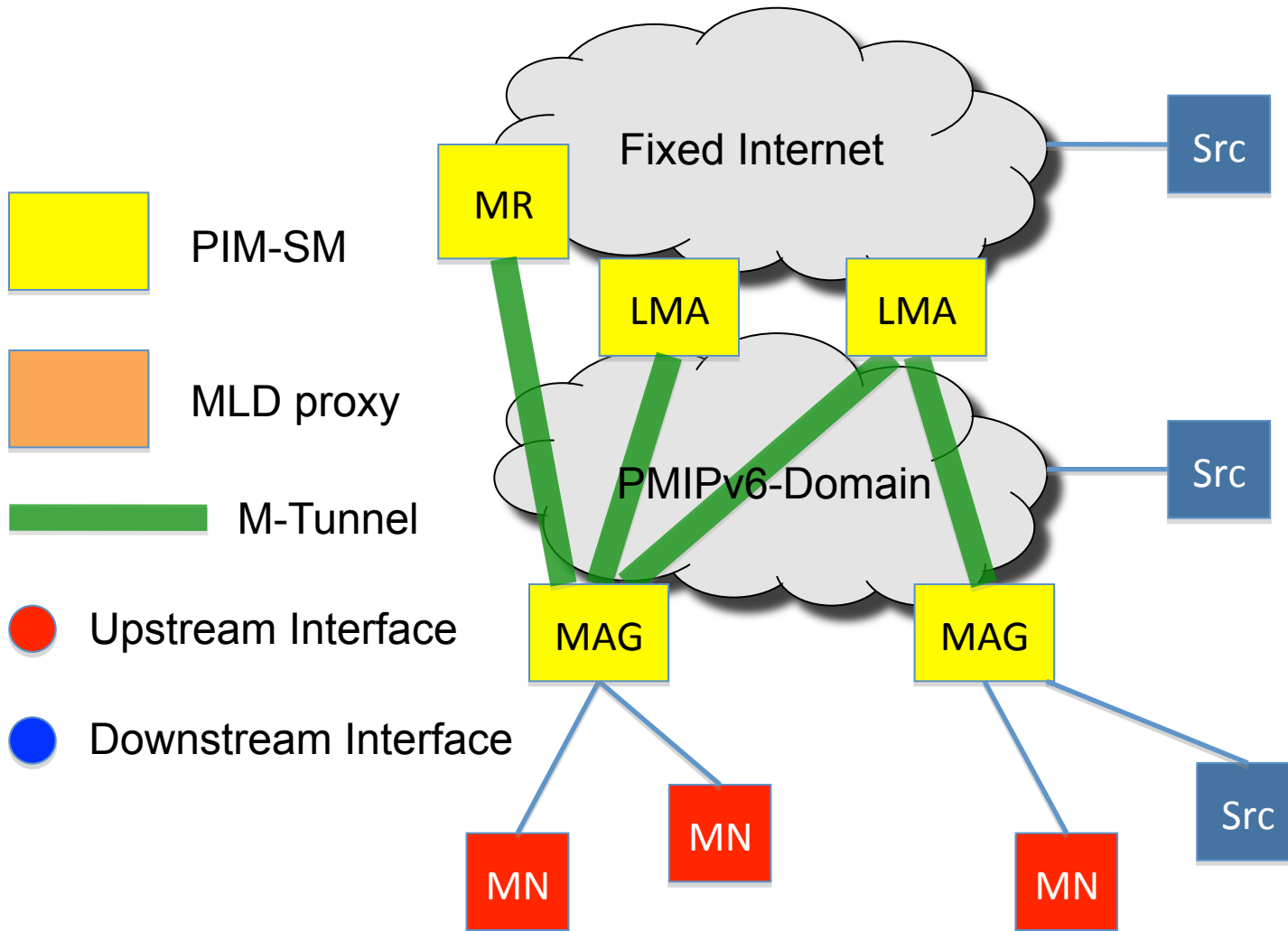
Protocol Extensions

- Traffic aggregation
 - Set up a bi-directional tunnel link (**M-Tunnel**) between LMA and MAG for traffic aggregation
 - M-tunnels are dedicated to multicast data and message transmission between LMA and MAG and shared by all MNs at the MAG
- Seamless handover
 - PBU with multicast extension (**PBU-M**) message
 - Compliant with **M-CTD** with COTP [RFC4067] or Policy Profile
- No multicast protocol changes

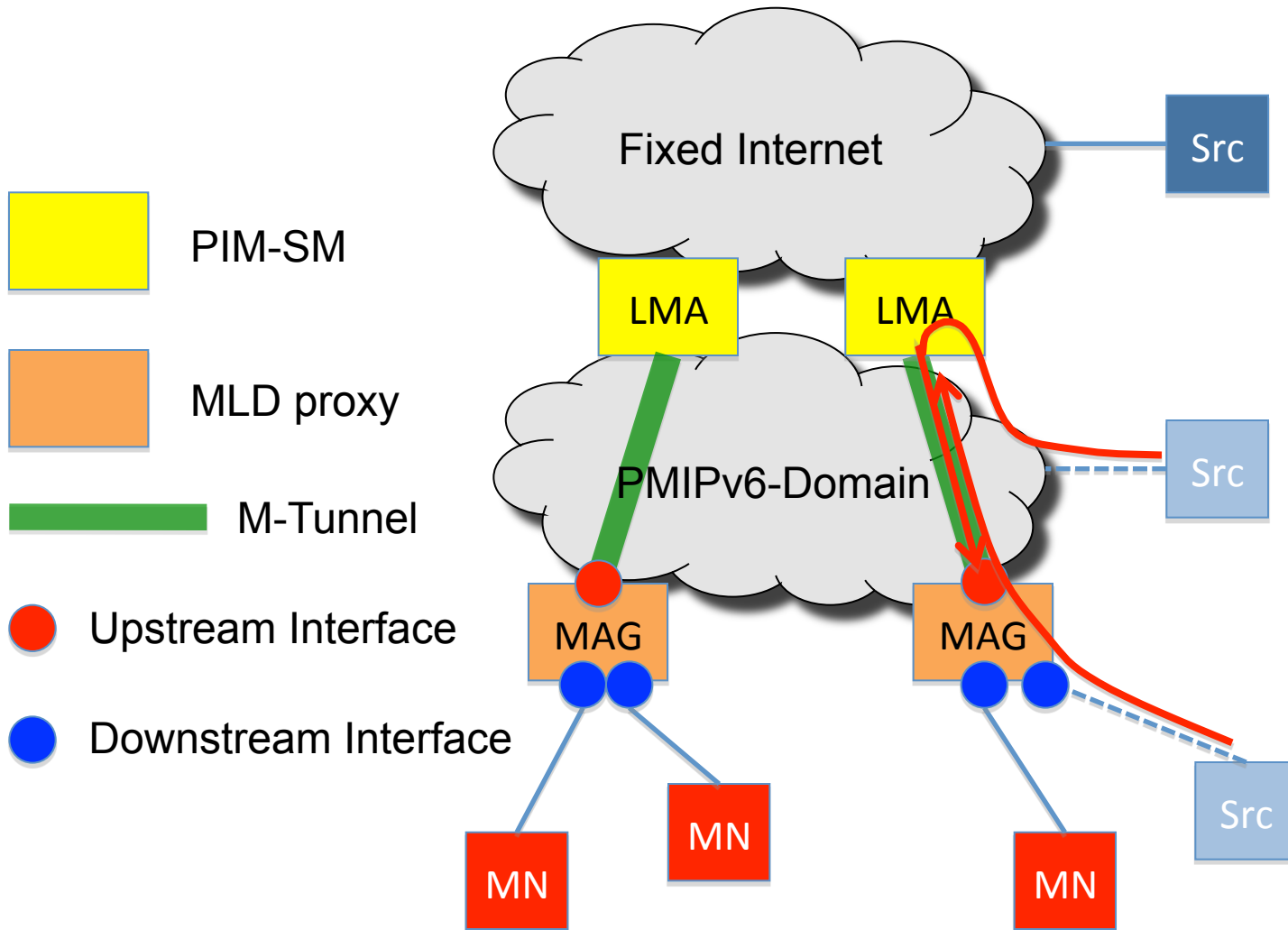
Supported Functions

- Provide flexibility with various scenarios
 - LMA can be a PIM-SM router / MLD proxy
 - MAG can be a PIM-SM router / MLD proxy
 - No changes for mobile nodes
- Support local routing (when MAG acts as a PIM router)
- Address tunnel convergence problem (when MAG acts as a PIM router)
- Not discussed in this document
 - Source mobility
 - Possible, when MAG acts as a PIM router
 - Dual-stack support
 - Possible, if some external function is used
 - Dual-mode MAG/LMA (e.g., MAG operating both PIM and MLD proxy)
 - Avoid its complexity

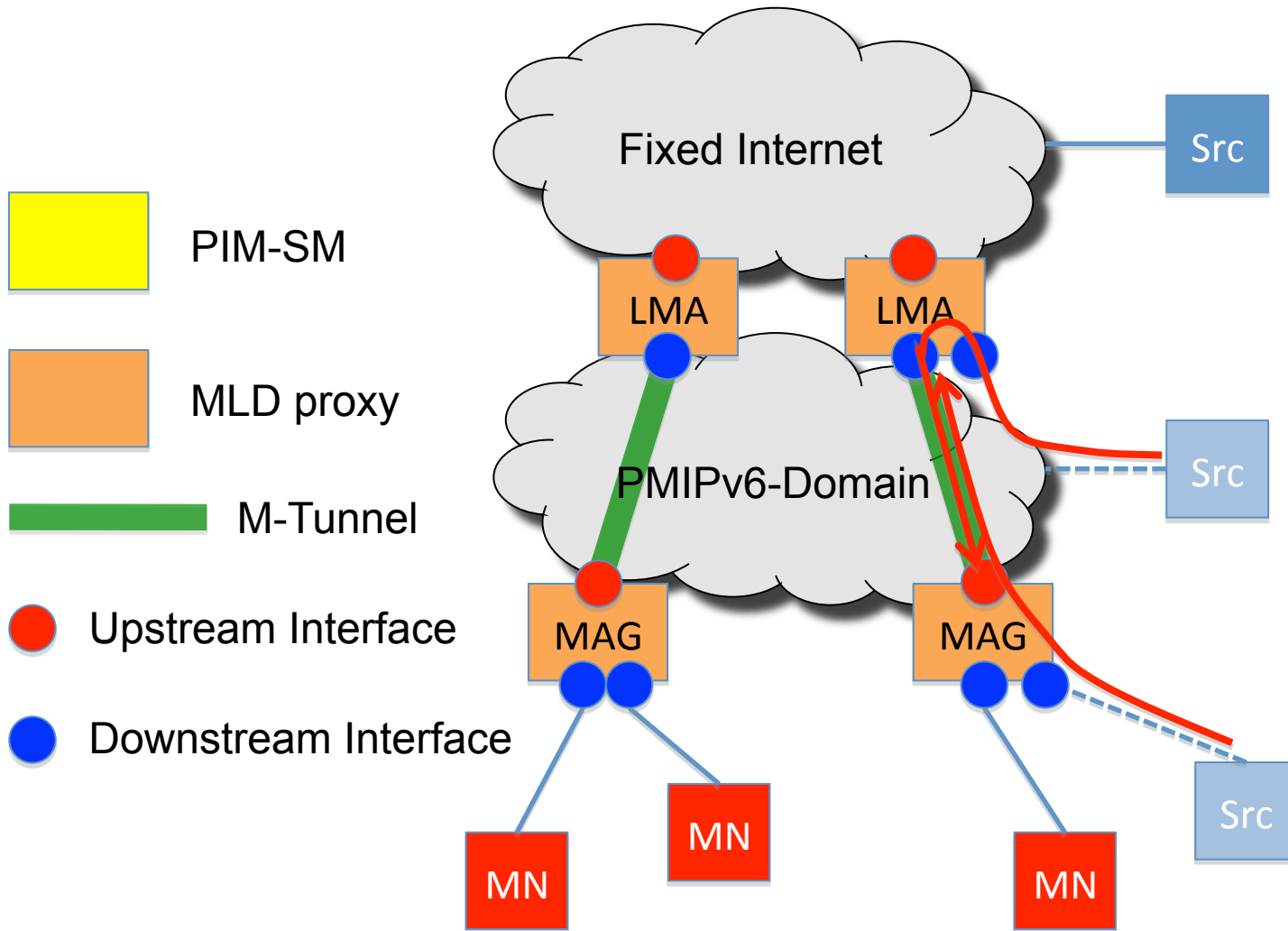
Scenario – 1



Scenario – 2

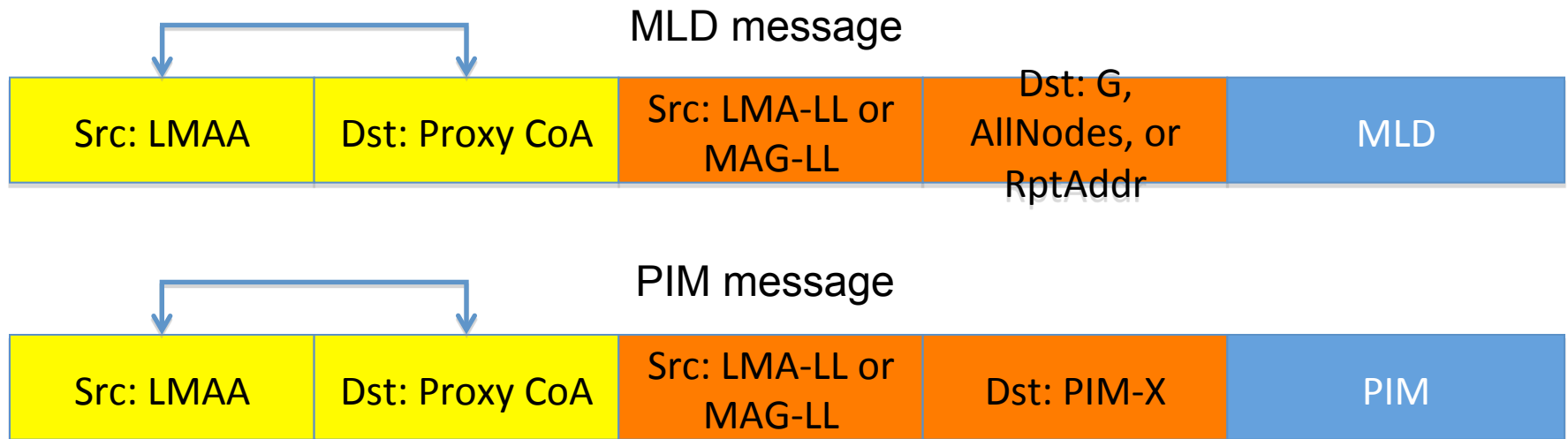


Scenario – 3



Multicast Tunnel (M-Tunnel)

- Bi-directional IPv6-in-IPv6 tunnel for MLD and PIM message transmissions between LMA and MAG



LMAA: LMA global address

LMA-LL: LMA link-local address

RptAddr: MLDv2 Report address

Proxy-CoA: MAG global address

MAG-LL: MAG link-local address

PIM-X: All-PIM-Rtr, PIM RP, etc.

Multicast Tunnel (M-Tunnel)

- Bi-directional IPv6-in-IPv6 tunnel for IP multicast data transmissions between LMA and MAG
 - Source mobility can be supported in our infrastructure, while the detail discussion is out of scope of this document



LMAA: LMA global address

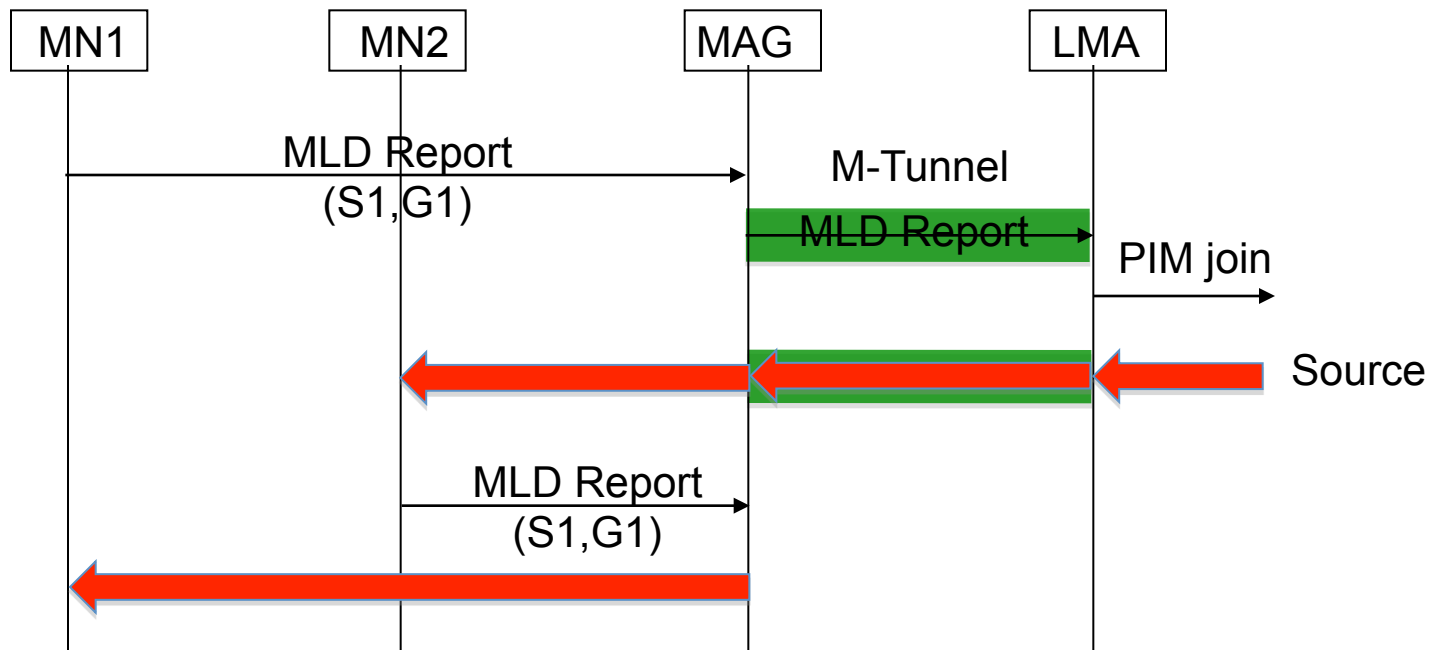
Proxy-CoA: MAG global address

S: source address

G: multicast (group) address

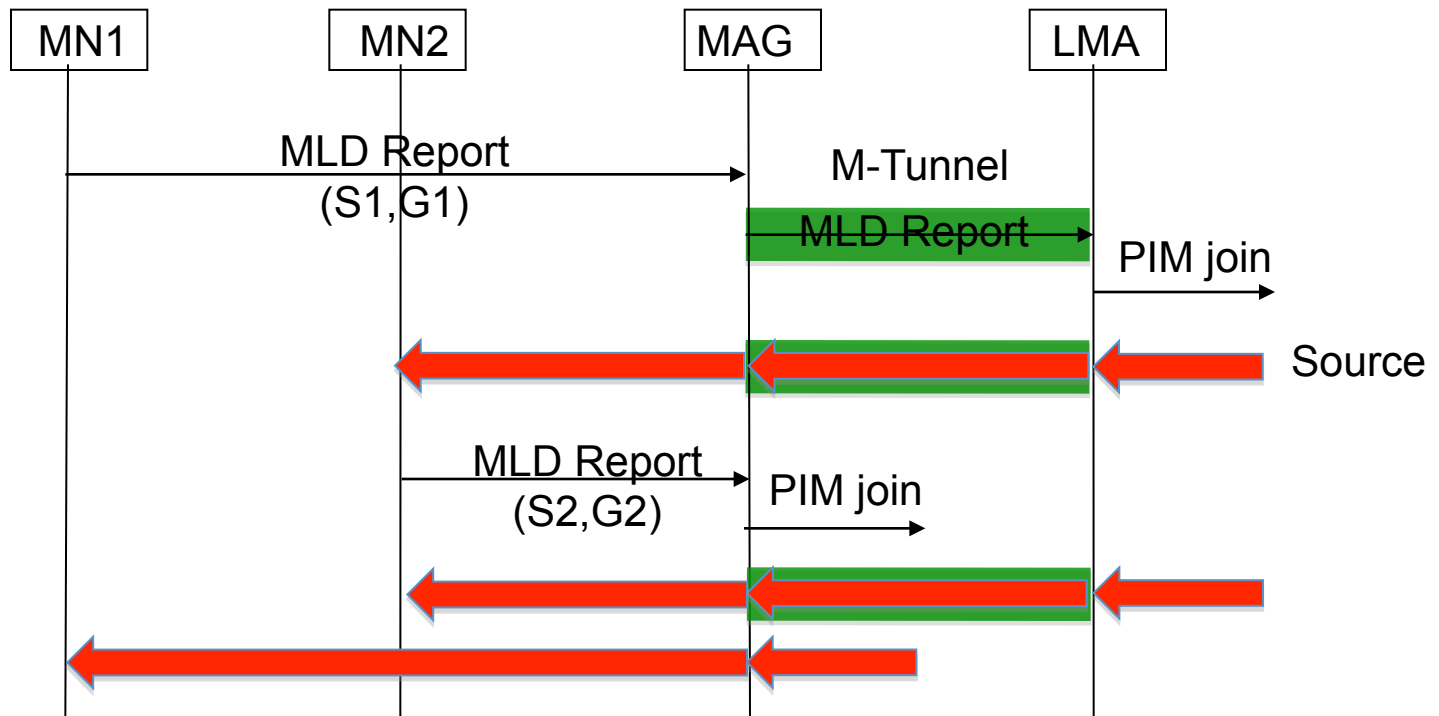
Basic Data Flow – Ex.1

- MAG acts as an MLD proxy, and LMA acts as a PIM-SM router



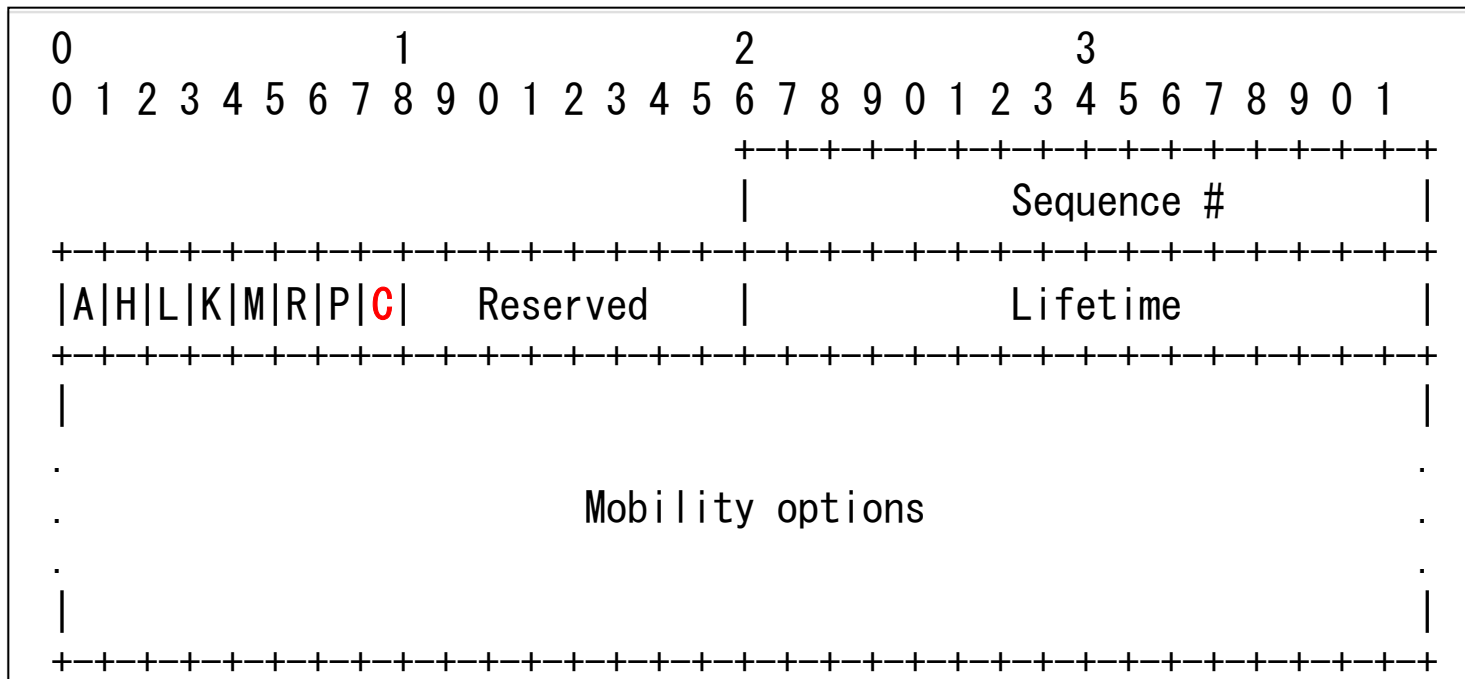
Basic Data Flow – Ex.2

- Both MAG and LMA act as PIM-SM routers
 - RPF IF for (S1,G1) is MAG's M-Tunnel IF
 - RPF IF for (S2,G2) is MAG's physical IF



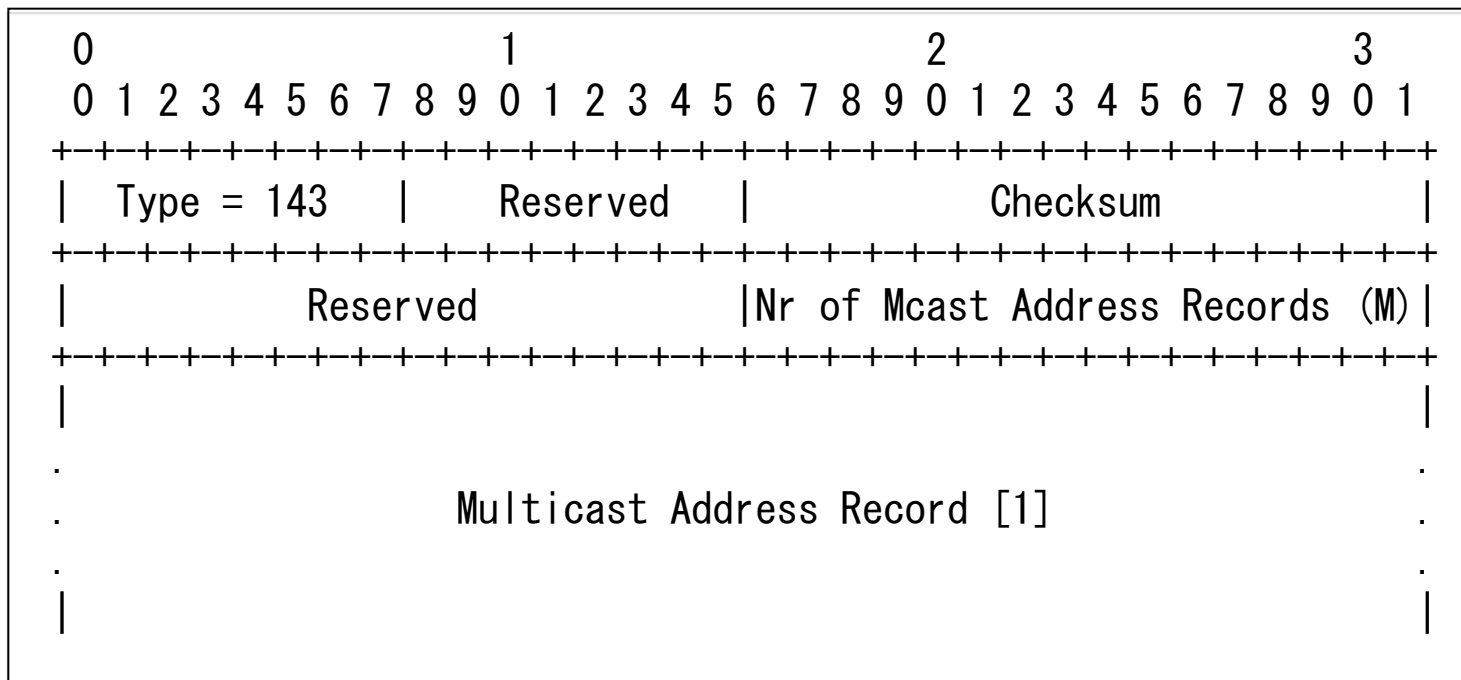
Proxy Binding Update with Multicast Extension (PBU-M)

- Extension for PMIPv6 [RFC5213]
- New “multicast subscription flag (C)”



Mobility Options in PBU-M

- Same format of MLD report and multicast address record defined in MLDv2 [RFC3810]

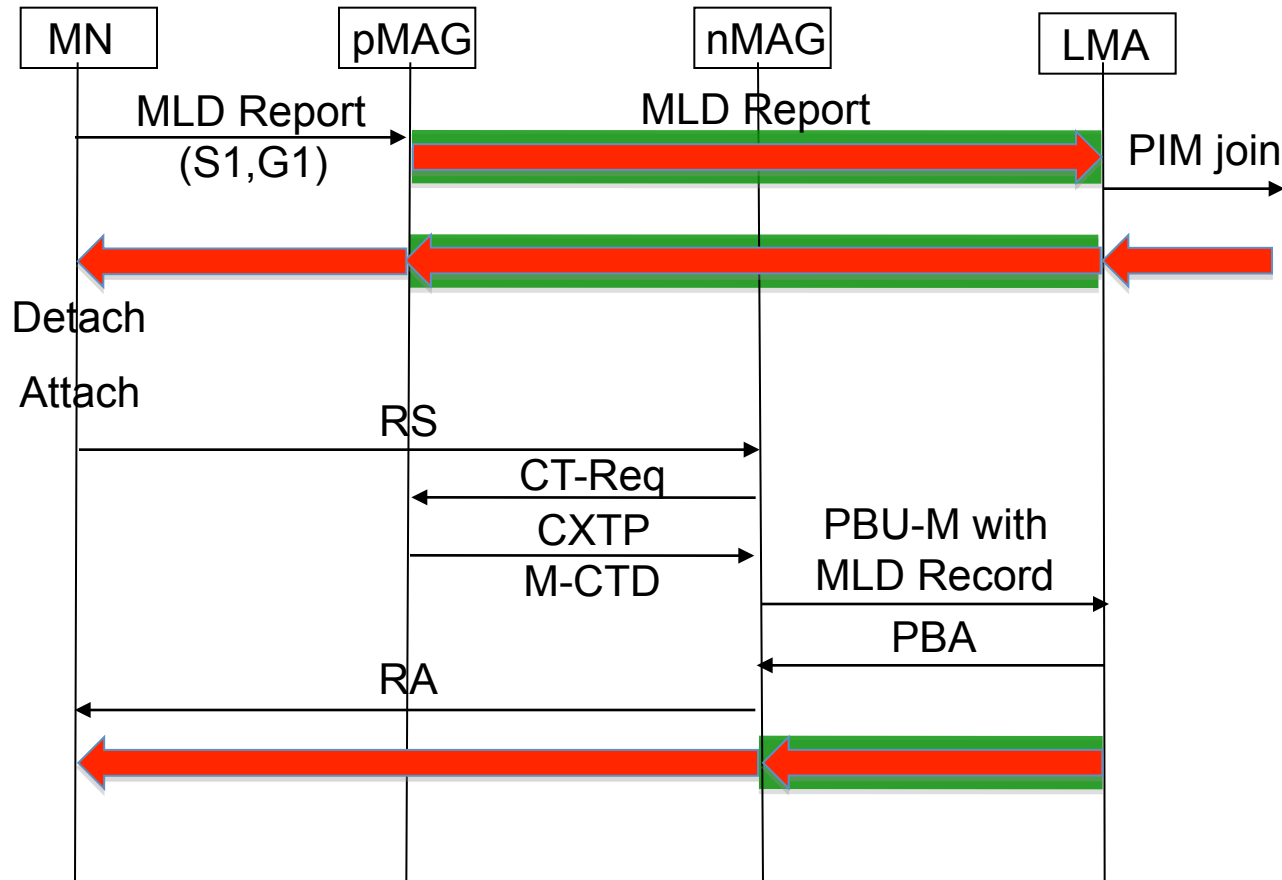


Multicast Context Transfer Data (M-CTD)

- Extension for CXTP [RFC4067]
- M-CTD format
 - Receiver address
 - Address of a host sending the Current-State Report
 - Filter mode
 - INCLUDE or EXCLUDE
 - (S,G) the receiver has joined
 - Null source address and multiple source addresses are allowed

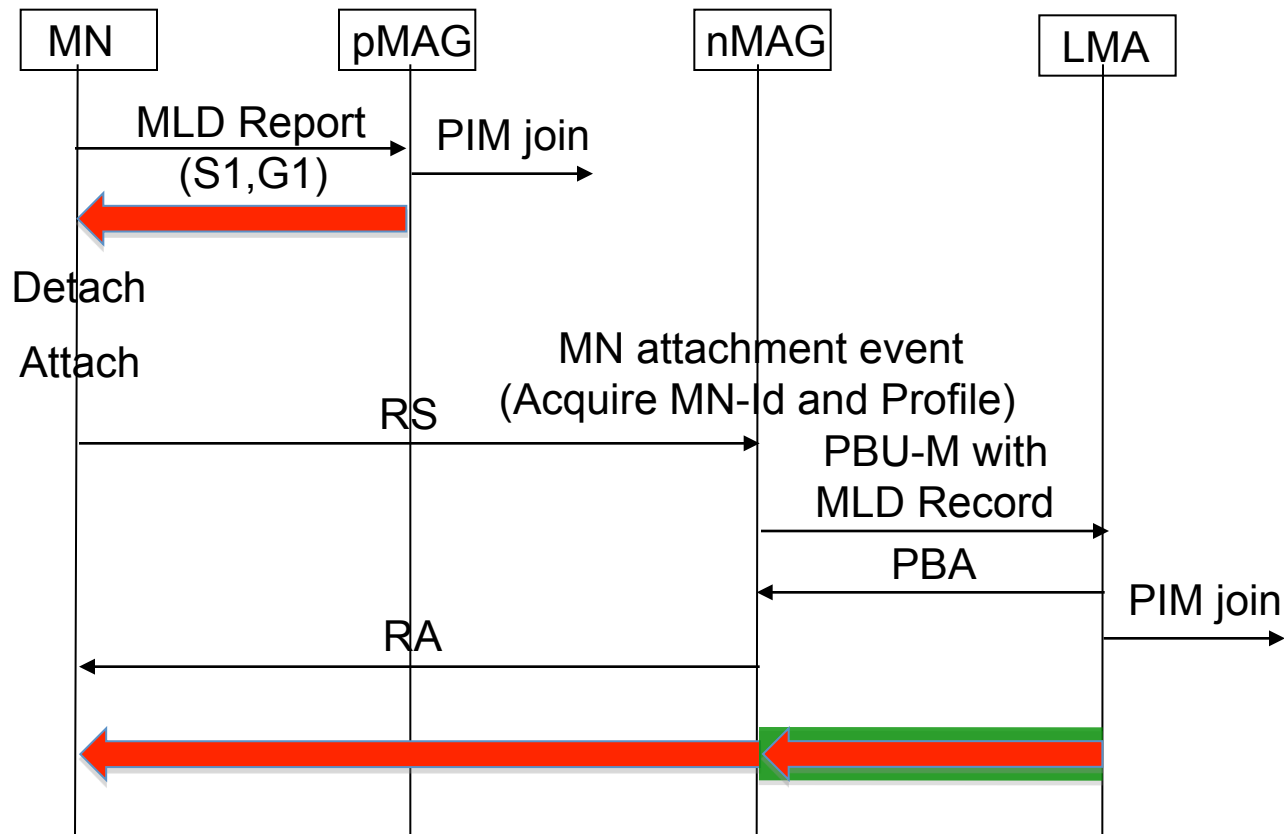
Basic Handover Scenario – Ex.1

- MAG acts as an MLD proxy, and LMA acts as a PIM-SM router
- Handover with CXTP



Basic Handover Scenario – Ex.2

- Both MAG and LMA acts as a PIM-SM router
 - RPF IF for (S1,G1) is pMAG's physical IF
 - RPF IF to (S1,G1) is nMAG's M-Tunnel IF
- Handover with Policy Profile (no CXTP)



Conclusion

- Specification for the PMIPv6 extension
- Simple but effective
- More improvement