DMM Framework and Analysis based on Functional Elements

draft-liebsch-dmm-framework-analysis

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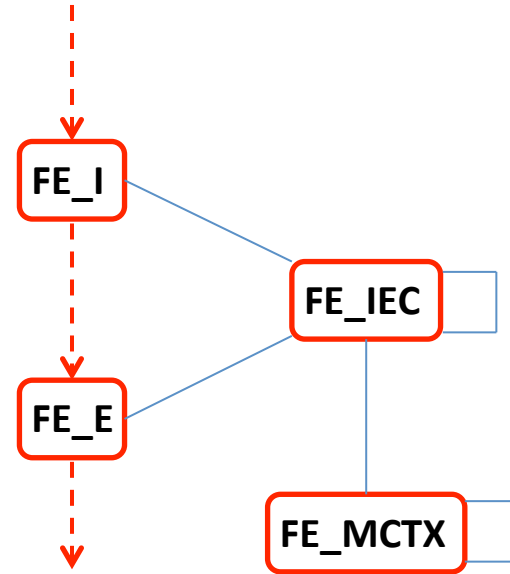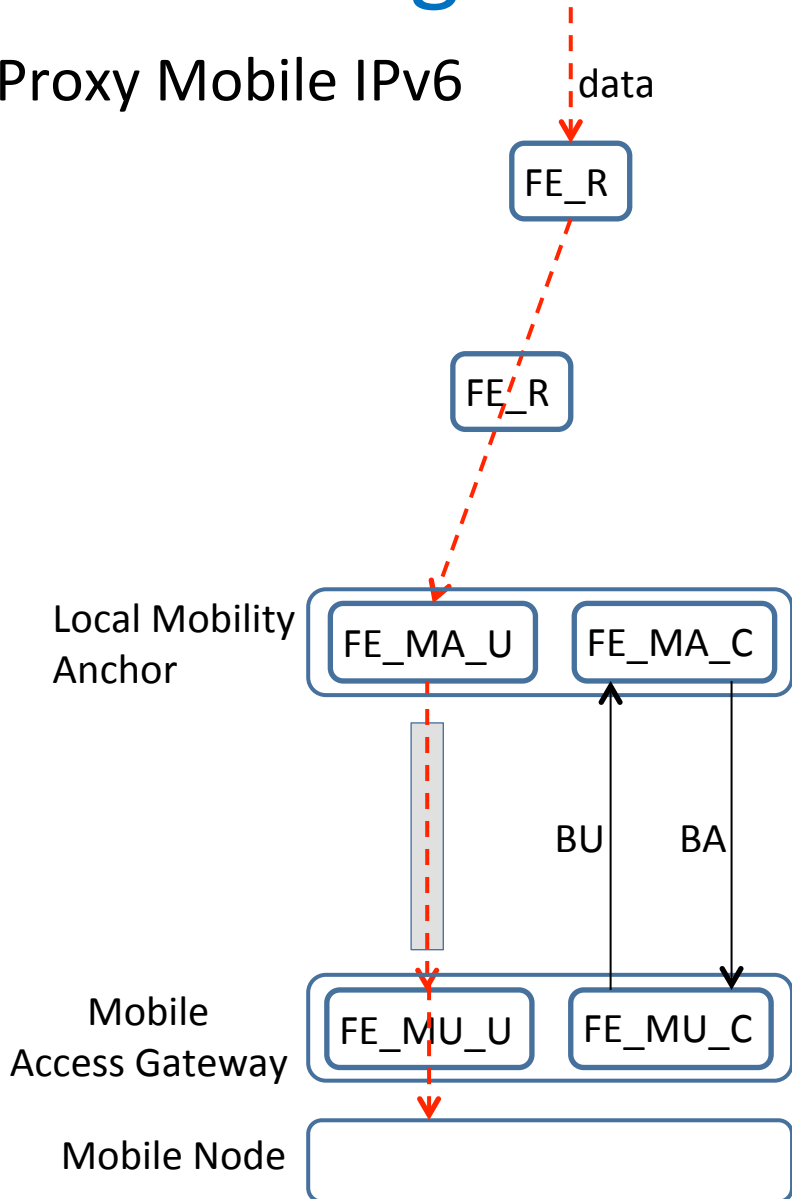
DMM WG
08th November 2012

First Notes

- This draft is NAFGAD
  (Not Another Framework and Gap Analysis Draft)

- Draft is based on discussion from Vancouver IETF84

- Draft proposes Functional Entities to enable DMM use cases
  - Can apply to solutions that are solely based on existing IP mobility protocols
  - Can apply to solutions which get support from non-mobility protocols

Methodology

- Define a set of Functional Entities that enable DMM use cases and IP address continuity
  - Enable <u>level of indirection</u> and associated control
  - Enable <u>establishment of MN's mobility context</u> at MN's new anchor
- Keep these functions decoupled from IP mobility management protocols, but complementary
- Apply DMM Functional Entities to architecture components of existing architectures & associated protocols
  - Mobility protocols, Routing plane in transport network, ..
- Analyze, if a DMM function can be accomplished by existing protocol
- Identify gap and protocol component to extend

Existing vs. DMM Functional Entities

Proxy Mobile IPv6

data

FE_R

FE_R

FE_I

FE_IEC

FE_E

FE_MCTX

Local Mobility
Anchor

FE_MA_U   FE_MA_C

BU   BA

Mobile
Access Gateway

FE_MU_U   FE_MU_C

Mobile Node

FE_I: Ingress for DMM indirection
FE_E: DMM Egress Function
FE_IEC: Control to establish states for
               DMM indirection

FE_MCTX: Function to establish
               existing MN context in new
               mobility anchor

               Interface between FEs

Existing vs. DMM Functional Entities

Mobile IPv6
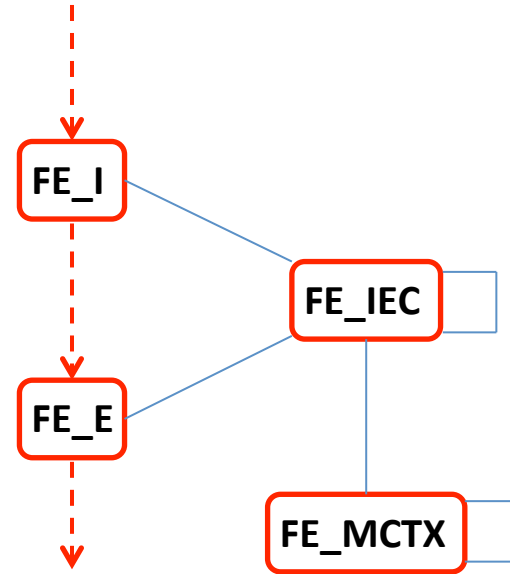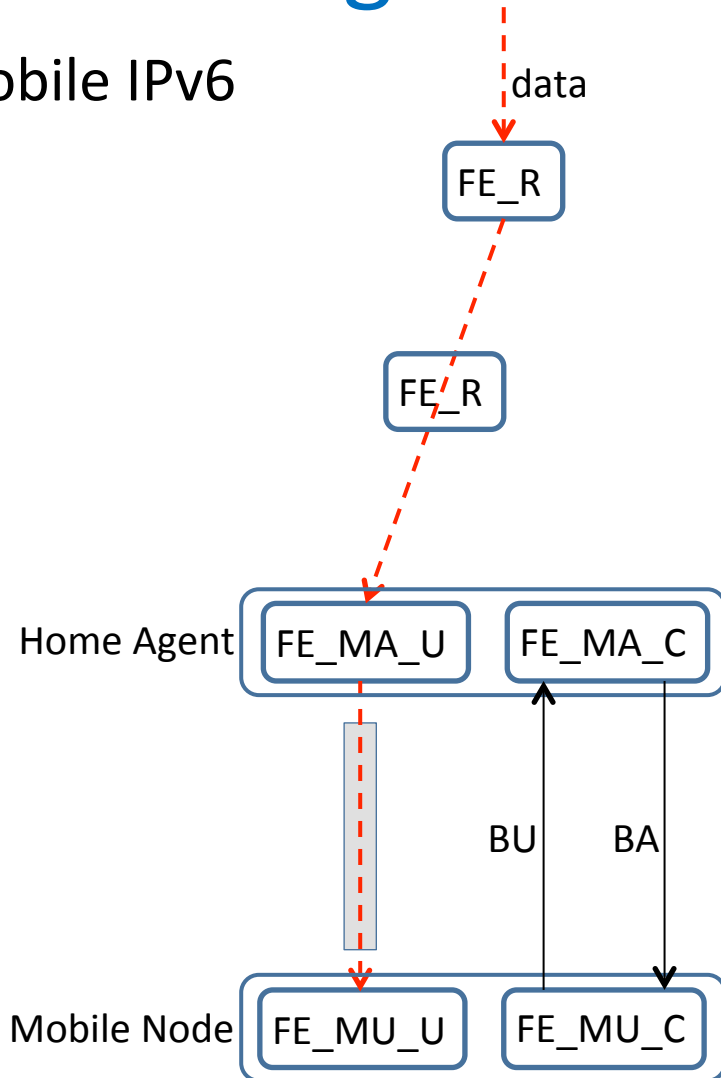
FE_I: Ingress for DMM indirection

FE_E: DMM Egress Function

FE_IEC: Control to establish states for DMM indirection

FE_MCTX: Function to establish existing MN context in new mobility anchor
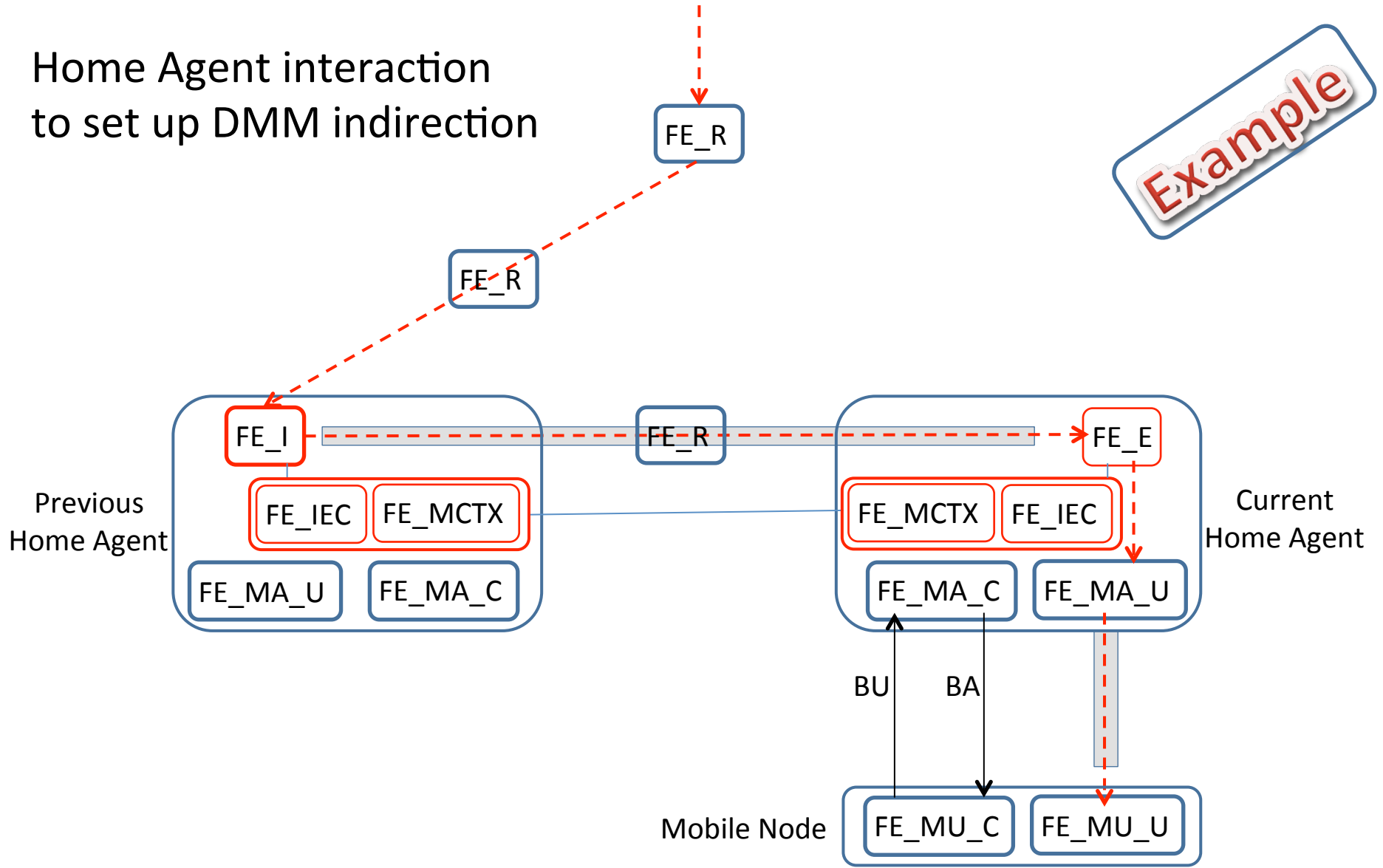
—— Interface between FEs

DMM design constraints

- Given Fact:
  Design constraints have impact to the DMM solution
  - Transparency of DMM to MN
  - Simultaneous handling of multiple IP addresses at MN
  - Multiple vs. Single Mobility Anchor at a time
- Consequence:
  Not all identified DMM Functional Entities may be required

- So far two approaches exists for indirection
  - Forwarding/tunneling from previous anchor through new anchor
  - Indirection above anchor level

Anchor Centric Model – Mobile IPv6
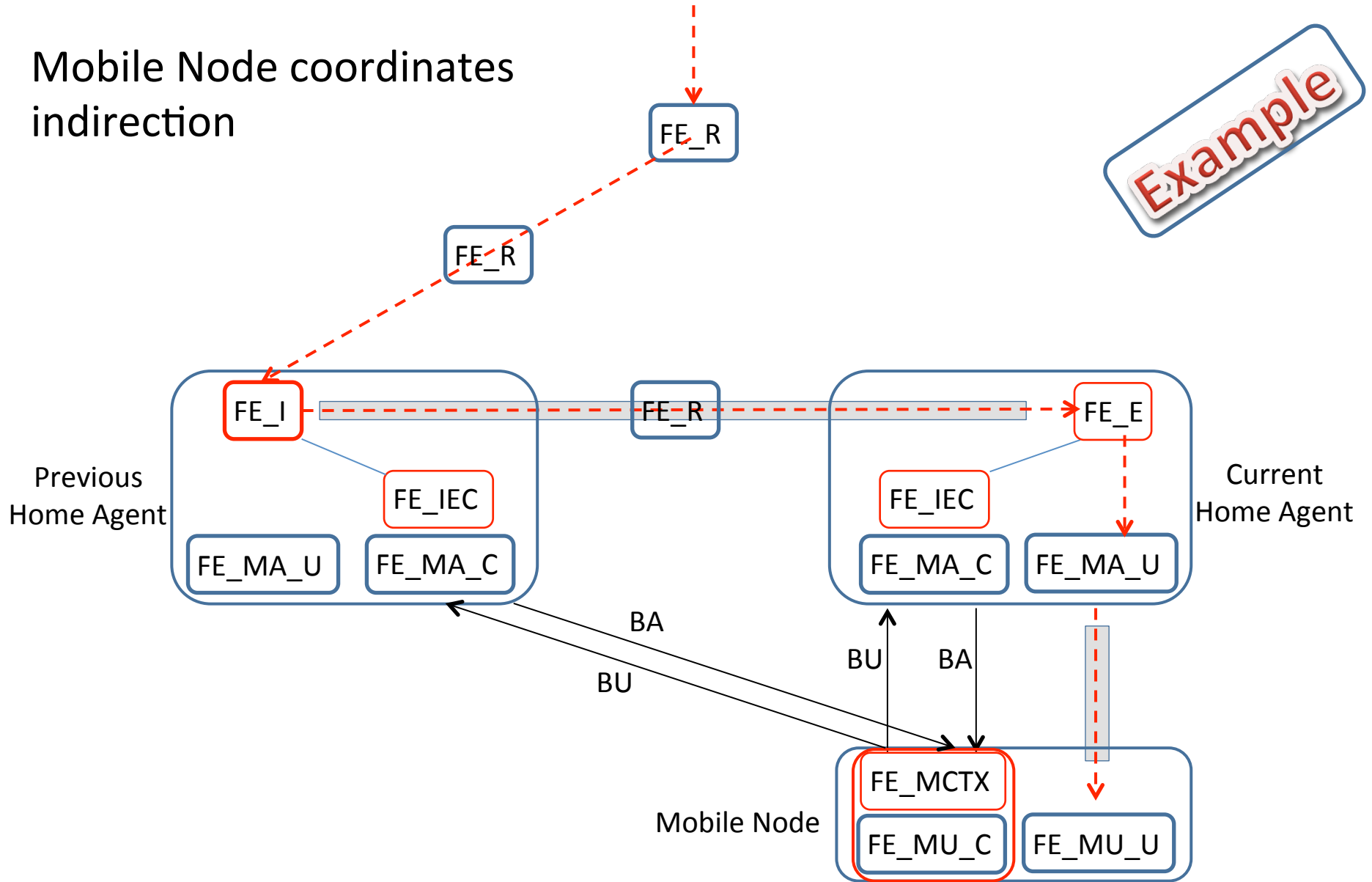
Home Agent interaction
to set up DMM indirection

FE_R

Example

FE_R

Previous
Home Agent

FE_I

FE_R

FE_E

FE_IEC | FE_MCTX

FE_MCTX | FE_IEC

Current
Home Agent

FE_MA_U | FE_MA_C

FE_MA_C | FE_MA_U

BU | BA

Mobile Node

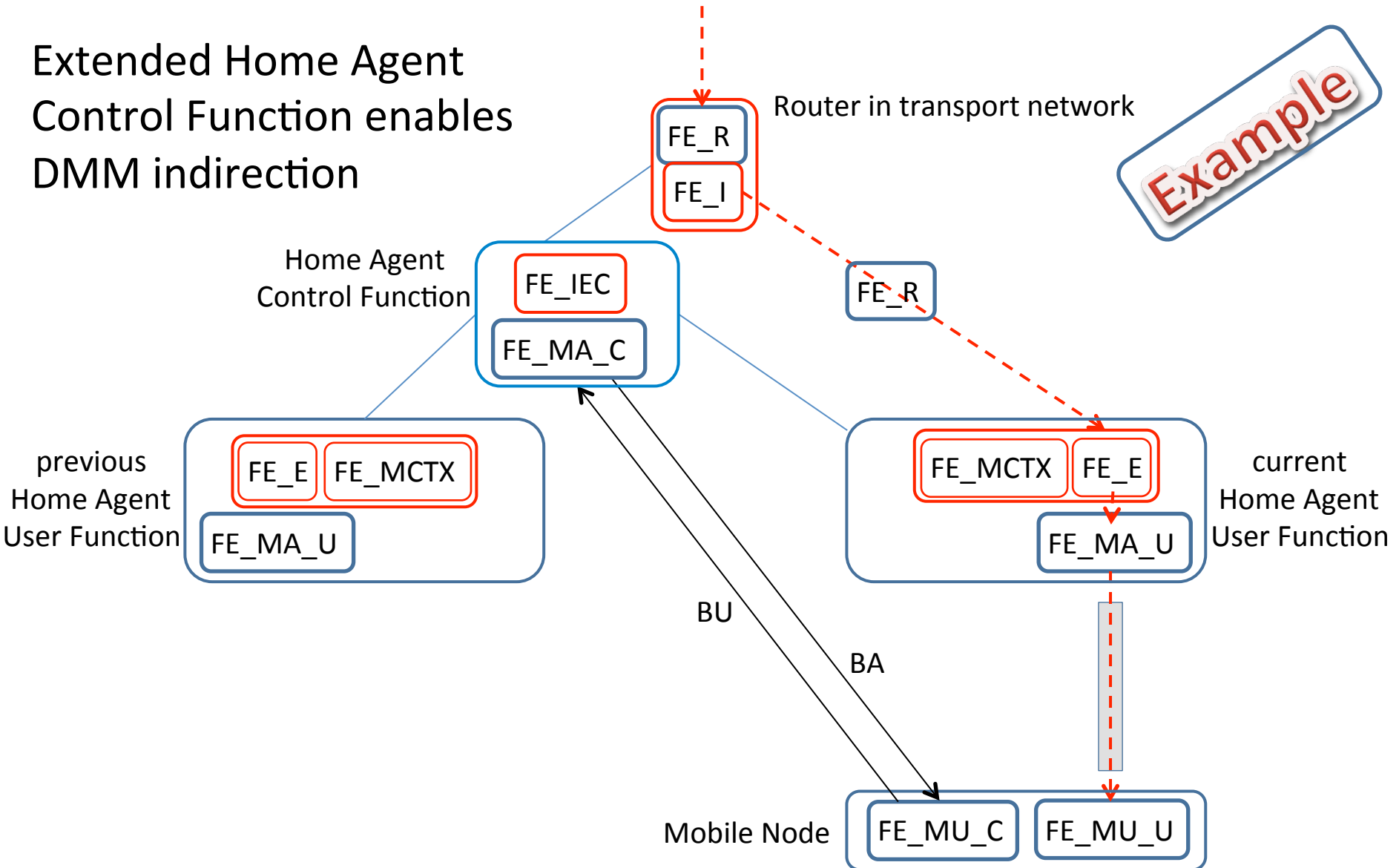FE_MU_C | FE_MU_U

MN Centric Model – Mobile IPv6

Mobile Node coordinates indirection

Example

Distributed Model – Mobile IPv6 U/C-Plane Split

Extended Home Agent
Control Function enables
DMM indirection

Router in transport network

Example

FE_R

FE_I

Home Agent
Control Function

FE_IEC

FE_MA_C

FE_R

previous
Home Agent
User Function

FE_E FE_MCTX

FE_MA_U

FE_MCTX FE_E

FE_MA_U

current
Home Agent
User Function

BU

BA

Mobile Node

FE_MU_C

FE_MU_U

Concluding & Next

- DMM analysis and specification of extensions should be done on a functional level

- Enables gap analysis and specification beyond mobility protocol level

- Applicable to current analysis drafts and their methodology
  - top-down / bottom-up

- If DMM WG concludes to focus solely on IP Mobility based solutions, consider hooks for external support according to these DMM Functional Entities and reference points
  - Keep DMM solution extensible
  - Keep DMM solution deployable