MEDIEVAL

MULTIMEDIA TRANSPORT for MOBILE VIDEO APPLICATIONS

SCALING NEXT GENERATION MOBILE VIDEO DELIVERY

KEY CONCEPTS & BENEFITS

DYNAMIC & DISTRIBUTED MOBILITY MANAGEMENT (DMM):

- Flat architecture for mobile networks
- "Anchors to the edge": deployed in the default gateway of the MN
- Unified management for both 3GPP and non-3GPP accesses

DMM TACKLES IP MOBILITY TAKING INTO ACCOUNT USERS' MOBILITY AND IP FLOW CHARACTERISTICS:

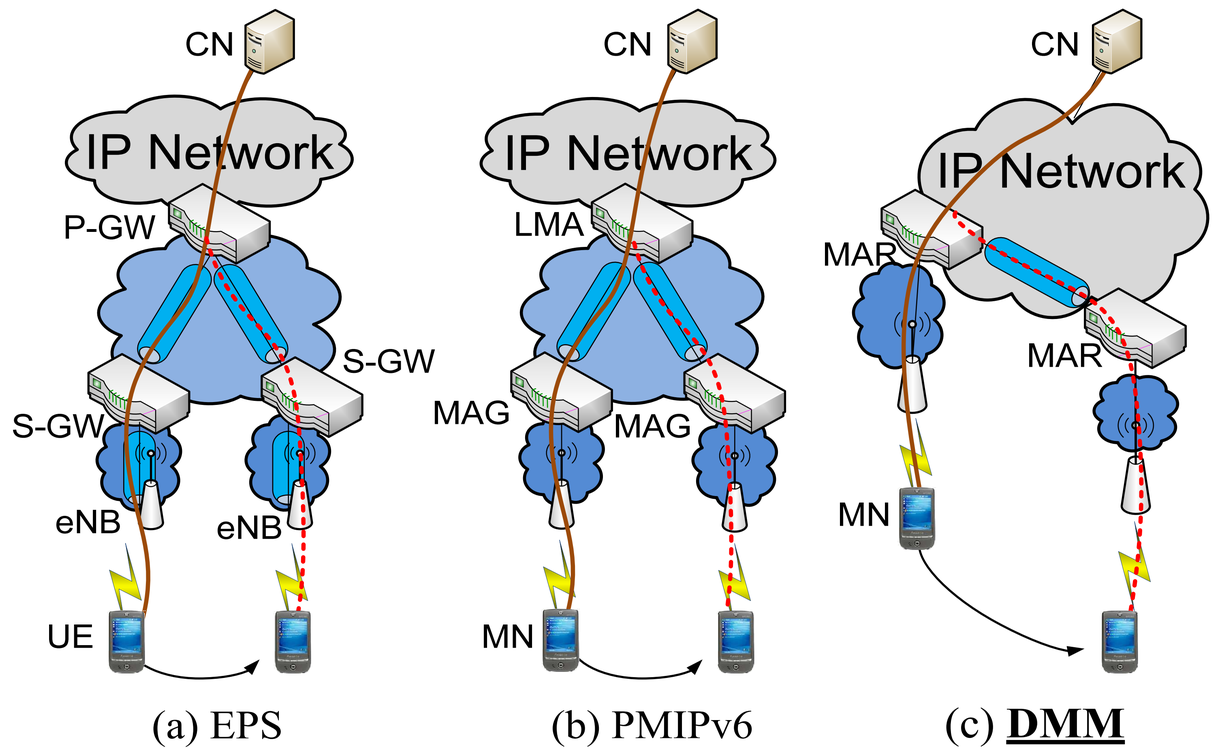
- In GTP and PMIP all IP flows traverse a tunnel even if mobility is not required (e.g., HTTP sessions)
- The anchor in current architectures leads in general to suboptimal paths

HETEROGENEOUS RADIO ACCESSES:

- IEEE 802.21 as cross-layer solution for mobility optimization
- Logical Interface at the MN: the radio interfaces are grouped under a single virtual network interface seen by upper layers

DMM GRANTS ENHANCED DATA DELIVERY TO SUBSCRIBERS:

- Routing optimization
- Minimum delay for connections between two hosts connected to the same gateway
- Savings on gateway and link dimensioning
- Truly Fixed-Mobile convergence



P-GW: Packet Data Network Gateway
S-GW: Serving Gateway
eNB: eNodeB
UE: User Equipment
CN: Correspondent Node

LMA: Local Mobility Anchor
MAG: Mobile Access Gateway
MN: Mobile Node
MAR: Mobility Access Router

USE CASE: CDN NODES CO-LOCATED WITH MARs

DMM FLAT ARCHITECTURE: PARTIALLY DISTRIBUTED SOLUTION

- MARs interact with the Central Mobility Database (CMD) to create/update/retrieve the MNs' mobility session
- The MAR/CMD interface is based on the LMA/MAG one, using Proxy Binding Updates (PBU) and Proxy Binding Acknowledgements (PBA) as specified in PMIPv6

VIDEO CHARACTERISTICS

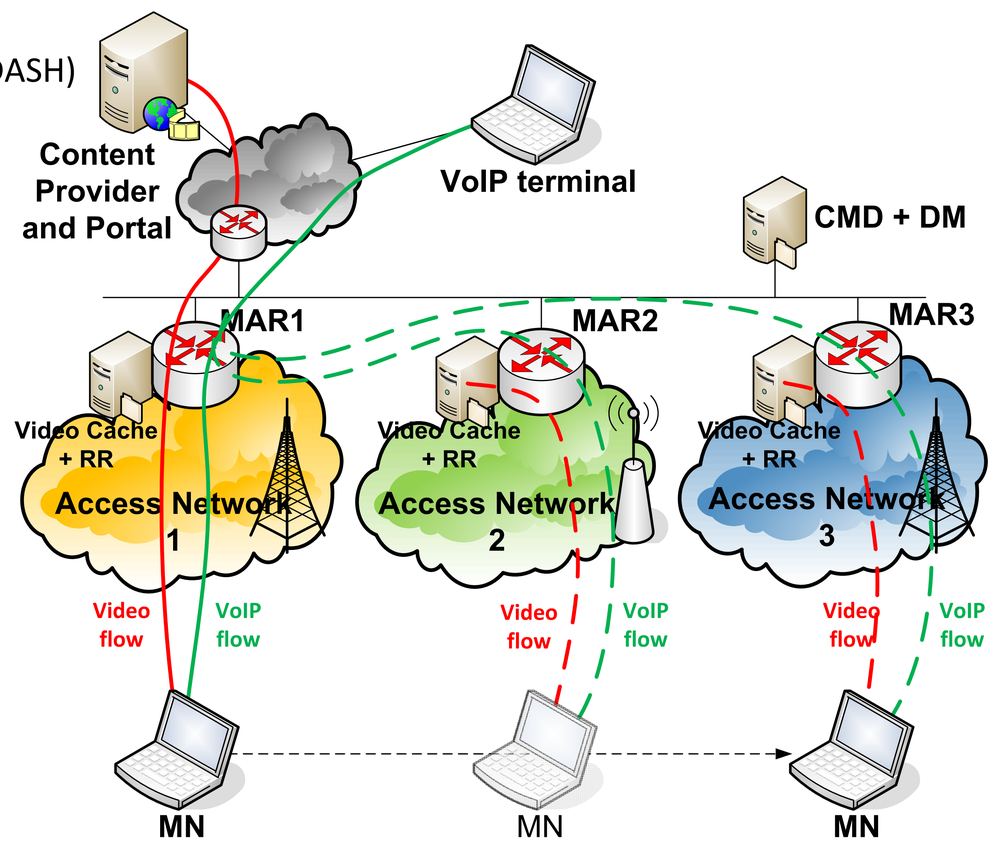
- Dynamic Adaptive Streaming over HTTP (DASH)
- The file is truncated in multiple segments (chunks) downloaded using HTTP

SOURCE SELECTION

- The Request Routing (RR) function within a MAR intercepts the HTTP requests and checks content availability
- If the content is present locally, the MAR sends it directly to the MN
- If the requested chunk is not in cache, the RR negotiates with the Decision Manager (DM) the best source (either a remote server or another MAR)

THE MN STARTS A VIDEO FLOW & A VoIP FLOW

- The video session is not anchored
- The VoIP call is anchored at the MAR where it was started



Sequence of the demo

1. MN attaches to MAR1 and starts/gets a VoIP flow
2. MN starts video application and gets video (from cache1 or Video Server)
3. MN moves to MAR2:
   - A. VoIP flow stays anchored to MAR1 (the traffic is tunnelled between the MAR anchoring the flow and the MAR serving the MN)
   - B. Video flow comes now from cache2
4. MN moves to MAR3
   - A. VoIP is still anchored to MAR1
   - B. The video flow comes from cache3

BUSINESS IMPACTS

- **Creation of a point of service at a MAR's site increases cost reduction**
- **Specific services can benefit from a distributed architecture (e.g., CDN, where caching nodes can offer better QoE and contribute to reduce transport costs)**
- **Large equipment and network links to support traffic gateways (e.g., P-GW and LMA) are no longer needed**
- **More flexibility for traffic engineering**
- **Distribution of virtualized instances of DMM MARs could be optimized according to SDN and NFV concepts**

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