

# Distributed Mobility Management Framework

## draft-chan-dmm-framework

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# DMM framework

- ◆ Numerous approaches to centralized as well as distributed mobility management exist.
- ◆ A view to look at the commonalities between different approaches in mobility management
  - from centralized to distributed mobility management
  - from host-based to network-based mobility management
- ◆ A common class of logical functions can be reconfigured to achieve different DMM solutions.

# Mobility management logical functions

- ◆ Session identifier management function
- ◆ Location management function
- ◆ Mobility/Modified router function

# Session identifier management function

- ◆ management of a session identifier which an MN may use to enable session continuity during handover. A separate IP address different from the routing IP address is used like a session identifier, which is then the HoA or its IP prefix. This function is then tied to the anchor point which allocates the home network IP prefix. In addition, an MN may be using multiple prefix's by multiple applications. This function is able to associate each prefix with the applications actively using the prefix and will release the prefix when no application needs to use it anymore.

# Internetwork location management function

- ◆ managing and keeping track of the MN's internetwork location, i.e., the current IP routing address (CoA) in a client-based mobility protocol or the address of MN's access router (proxy CoA) in a network-based mobility protocol. The LM function in the network includes a mapping of the session identifier (e.g., HoA) to the current routing address. The LM function in the MN knows the link-layer address of its access router.
- ◆ In a client-server model, there is also a Location Update (LU) function between the client and the server to provision the MN location information to the LM function. .

# Mobility(Modified) Router (MR) function:

- ◆ packets interception and forwarding to/from the MN HoA based on the internetwork location information, either to the destination or to some other network element that knows how to forward the packets to their destination;

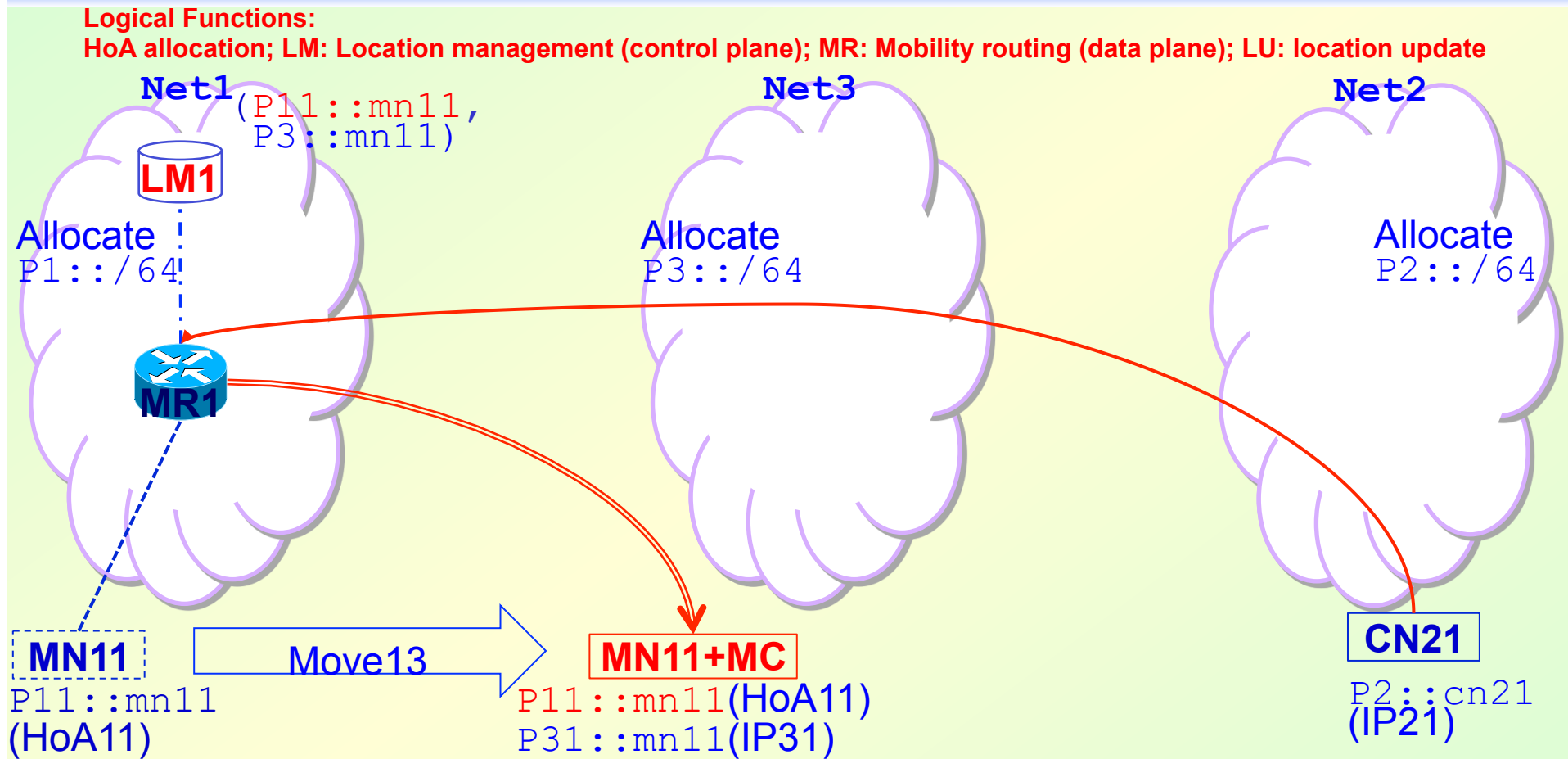
# Mobility Management Framework

## Logical Functions:

1. Session identifier (HoA) management
2. LM: Location management (control plane)
3. MR: Mobility routing (data plane)

- ◆ Architecture: Configure the logical functions
- ◆ Protocol: Messages
- ◆ Construct one step at a time: MIPv6, PMIPv6, HMIPv6, Distributing mobility anchors, dynamic mobility, DMM

# Existing protocol: MIPv6

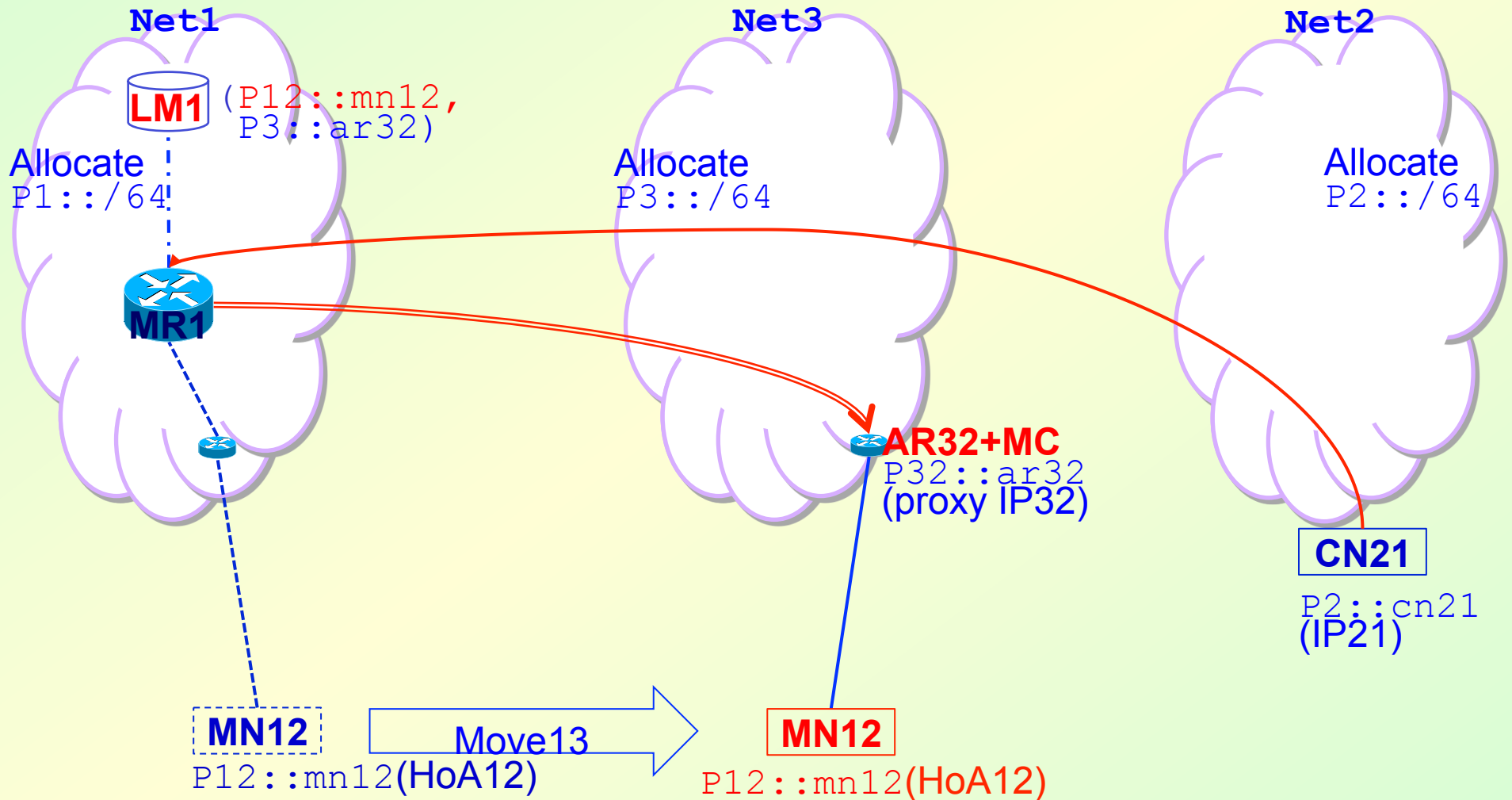




# Existing protocol: PMIPv6

## Logical Functions:

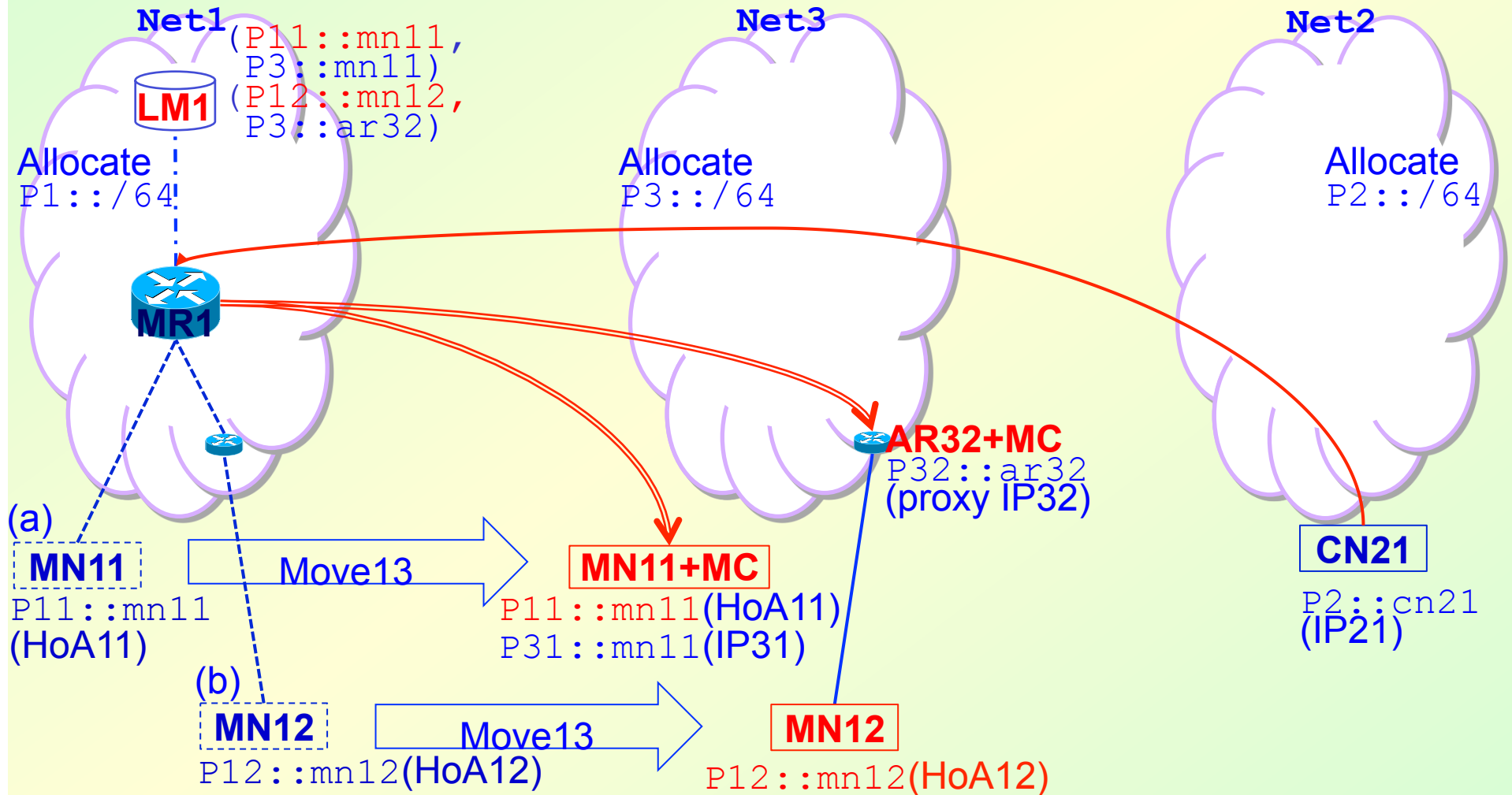
HoA allocation; LM: Location management (control plane); MR: Mobility routing (data plane); LU: location update



# MIPv6/PMIPv6

## Logical Functions:

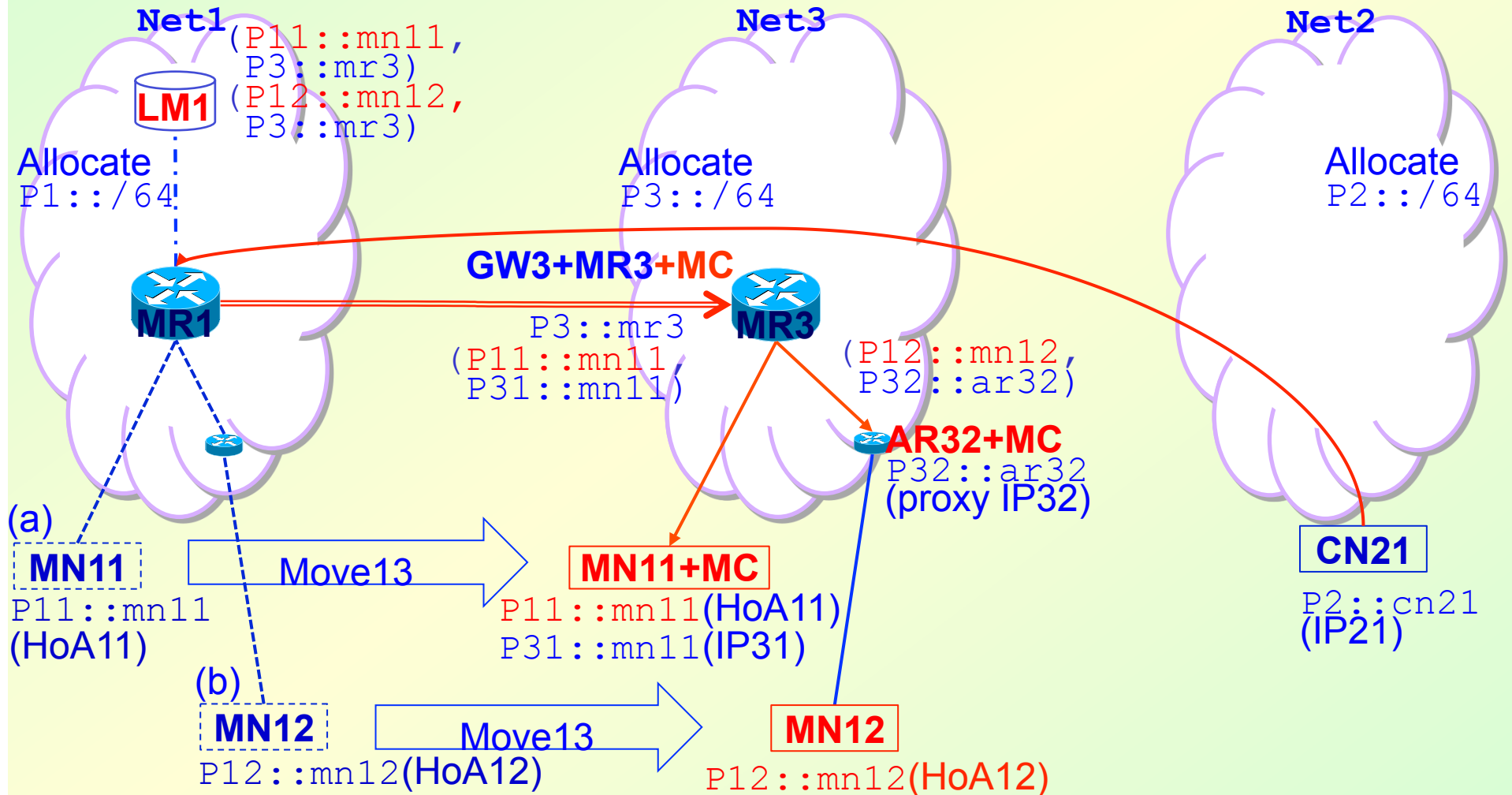
HoA allocation; LM: Location management (control plane); MR: Mobility routing (data plane); LU: location update



# Hierarchical

## Logical Functions:

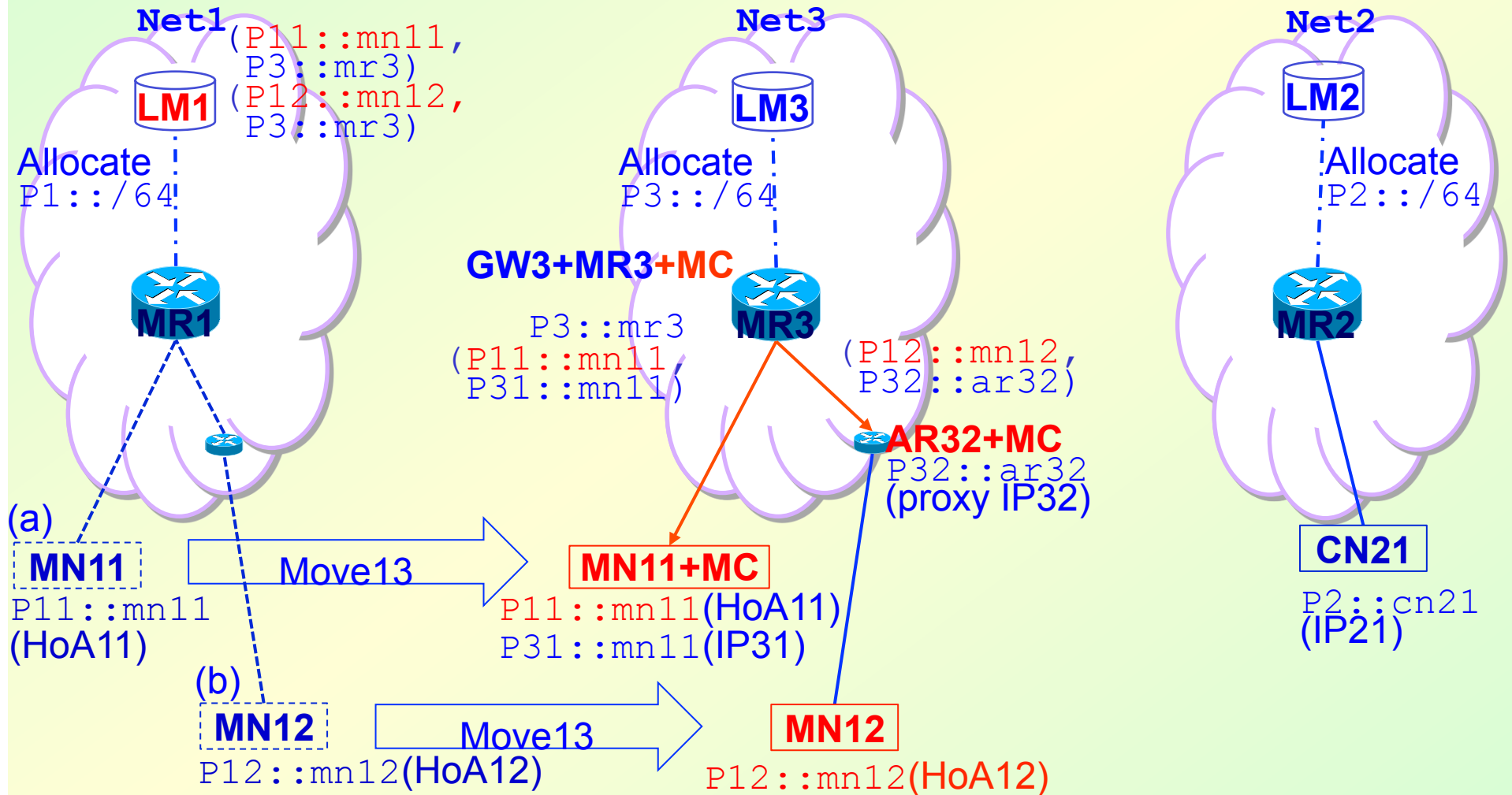
HoA allocation; LM: Location management (control plane); MR: Mobility routing (data plane); LU: location update



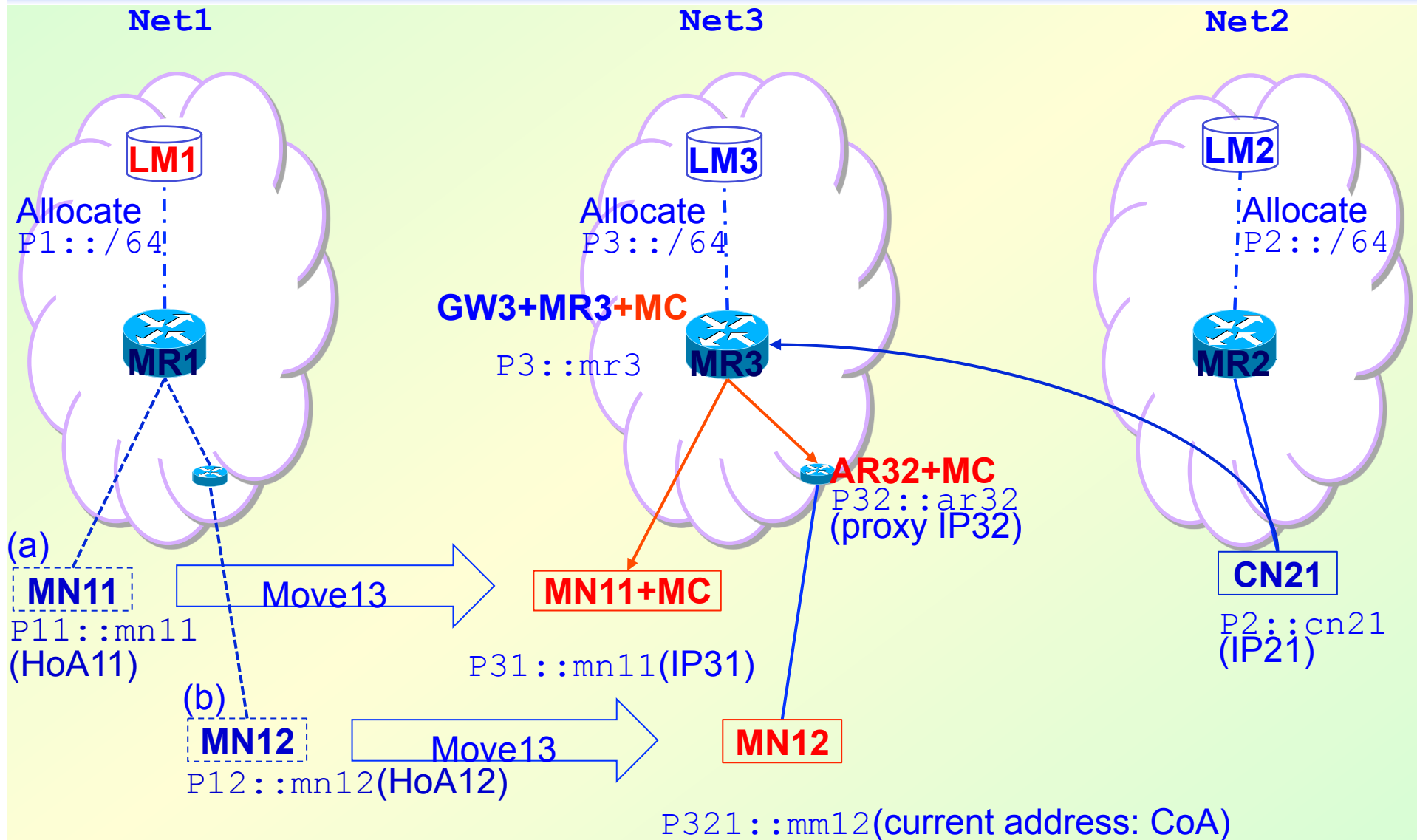
# Deploying in all networks

## Logical Functions:

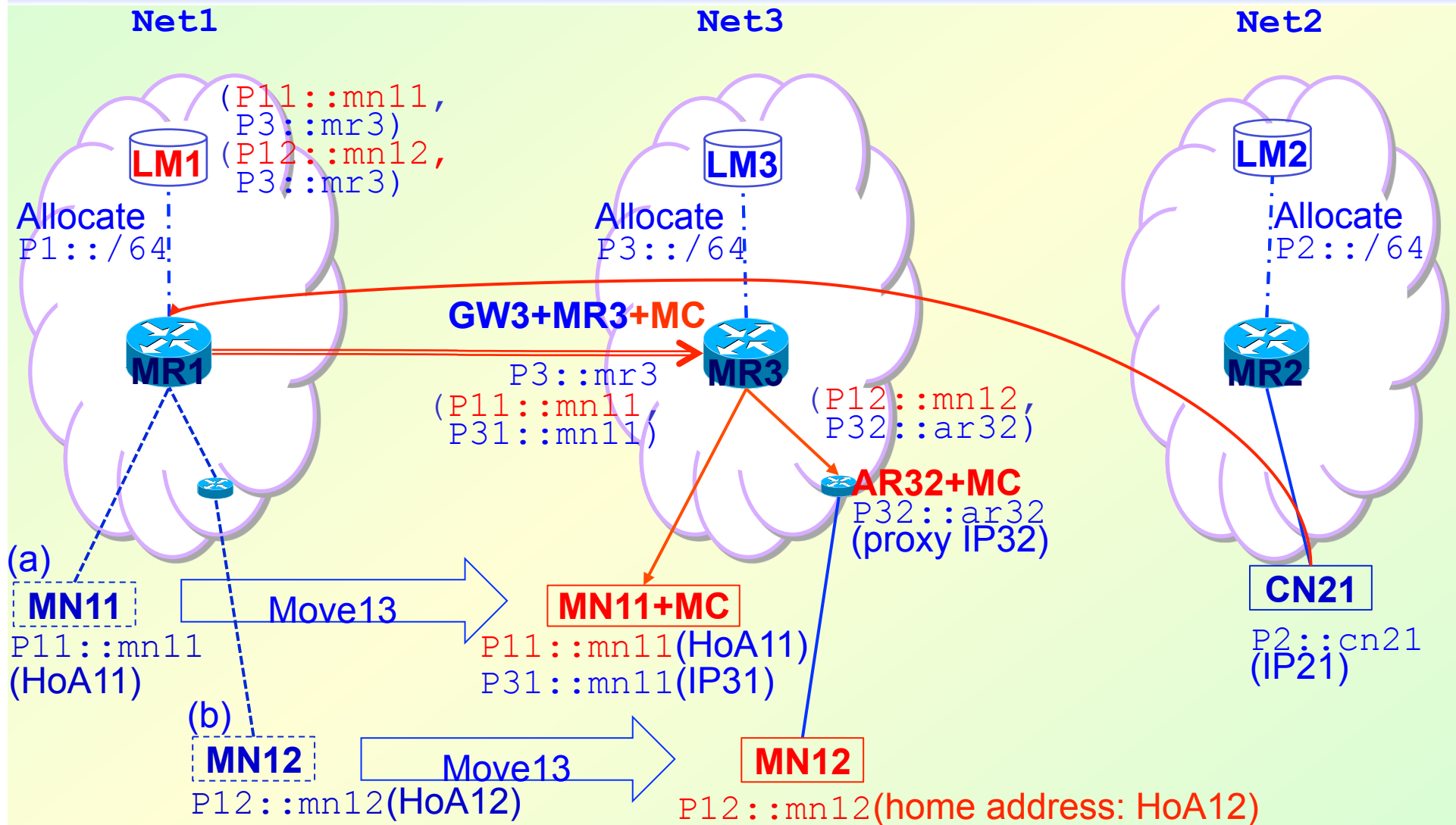
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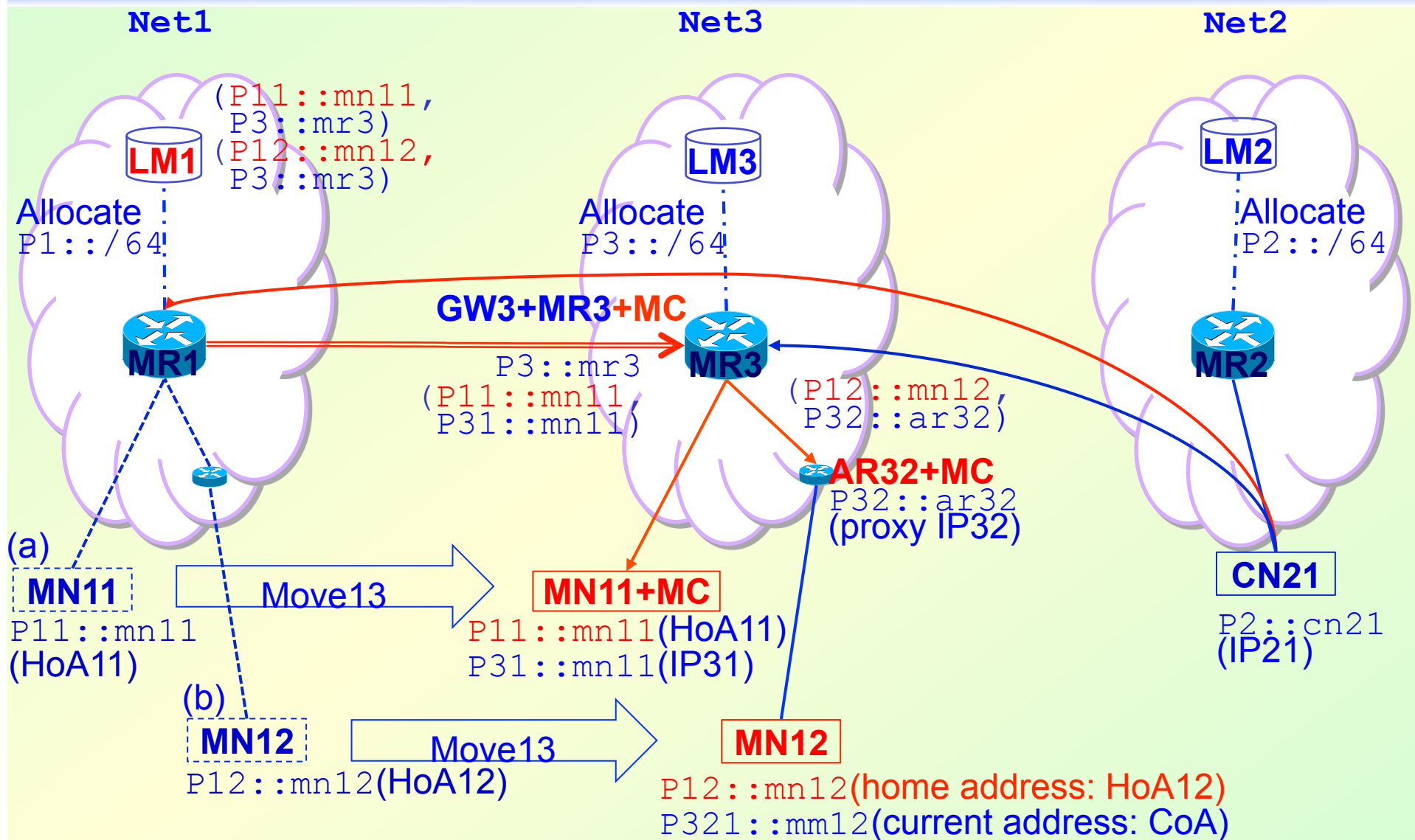
# Selective mobility management without ongoing application requiring session continuity



# Selective mobility management with ongoing application requiring session continuity



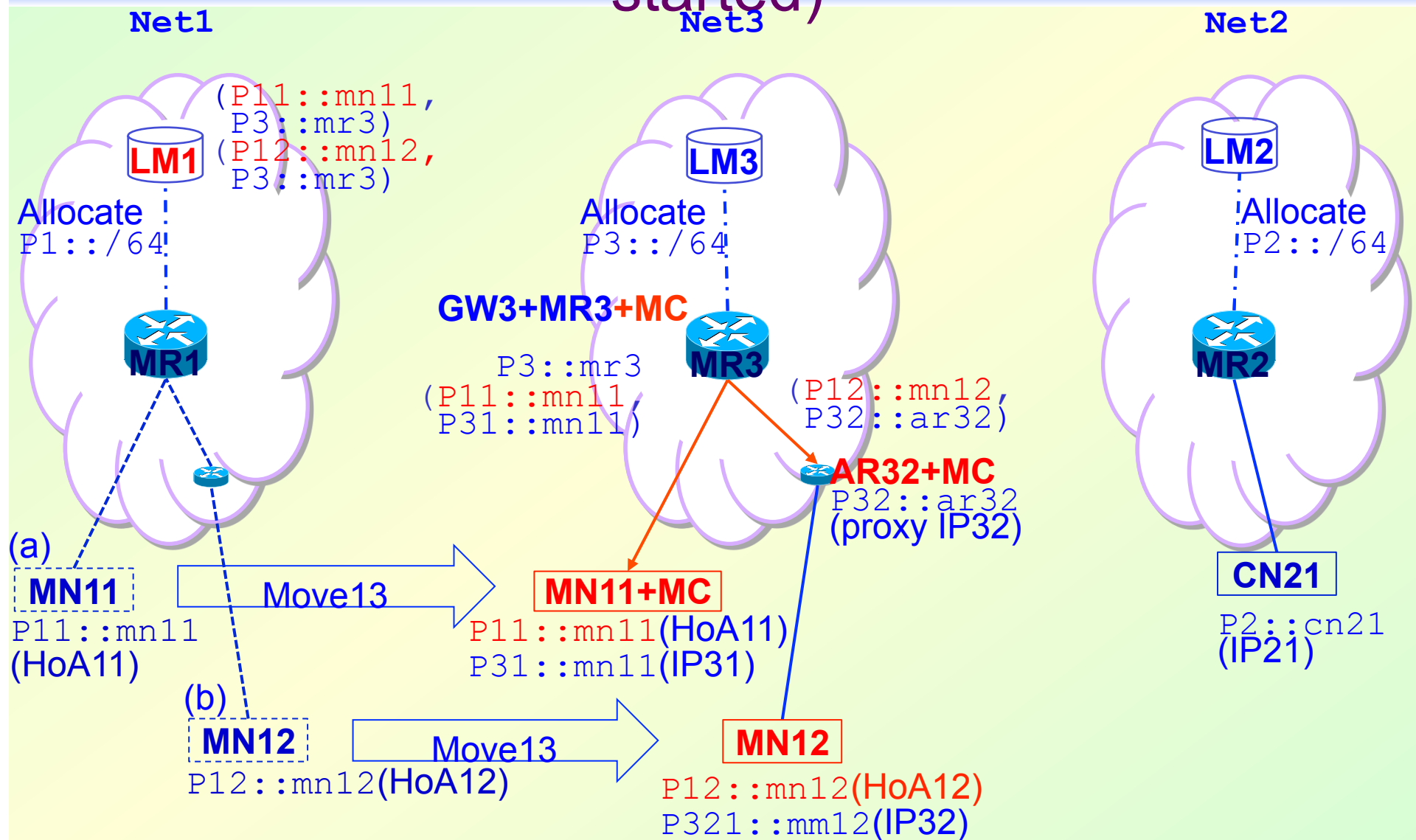
# Selective mobility management





# MOBILITY MANAGEMENT FRAMEWORK.

## HoA of application (in network where appl started)

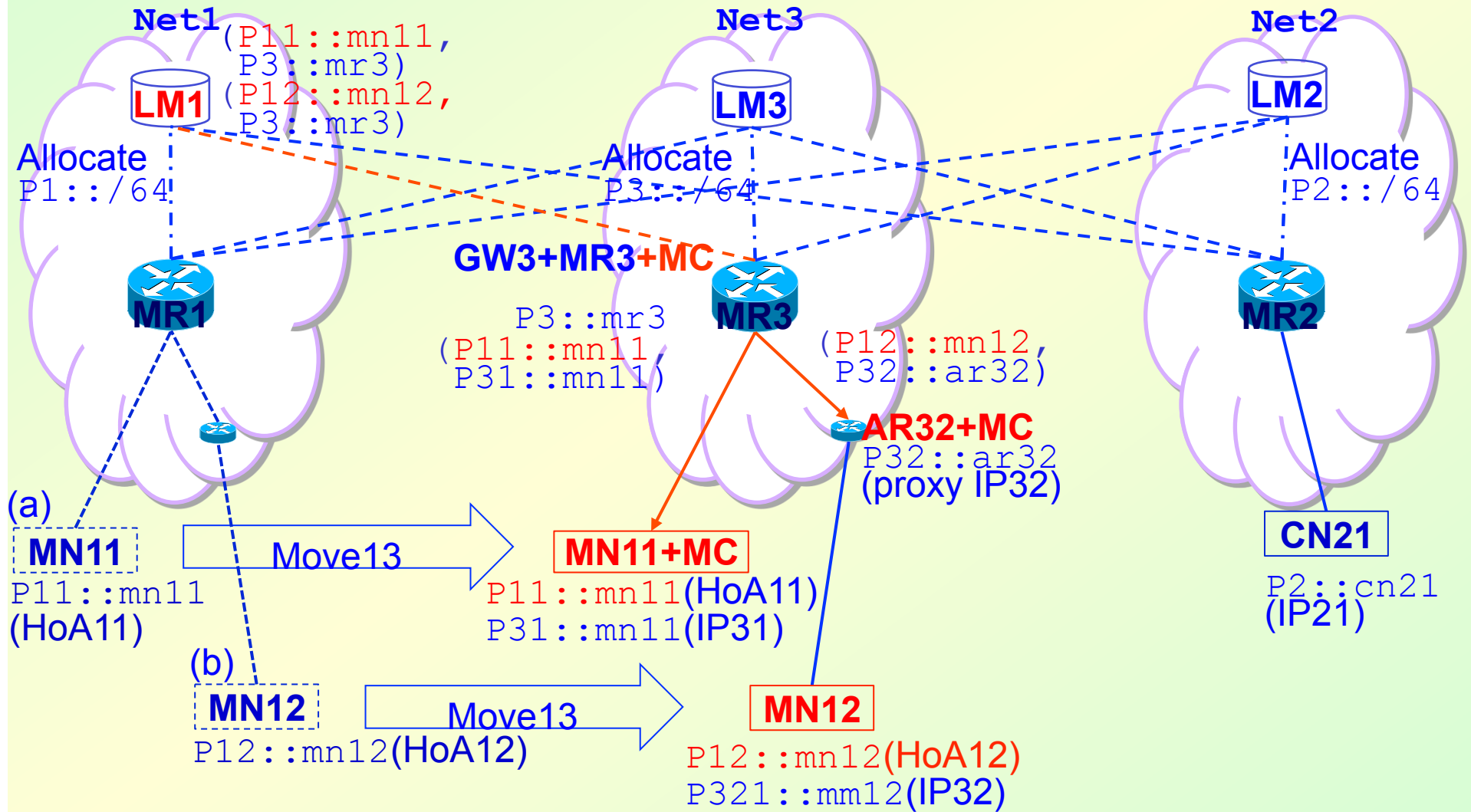




# DMM

## Logical Functions:

HoA allocation; LM: Location management (control plane); MR: Mobility routing (data plane); LU: location update



# Comparing framework against DMM requirements

# REQ1: Distributed processing

- ◆ The framework has defined a set of mm functions which can be implemented in a distributed fashion.
- ◆ As further evidence, the document explains how the mm functions can be used to implement in a distributed manner the major mm protocols (MIPv6, PMIPv6, HMIP, DMA, MHA).

## REQ2: Transparency to upper layers when needed

- ◆ In the framework, transparency depends on how the MR functions is implemented. This draft has already shown that using the framework one can express, for example, PMIP and DMA, which are transparent to the upper layers.

## REQ3: IPv6 deployment

- ◆ The framework is not tied to a particular IP version, and therefore supports IPv6 deployment..

## REQ4: Existing mobility protocols

- ◆ This draft has already described how to express the functionality of several mm protocols (MIPv6, PMIPv6, HMIP, DMA, MHA).
- ◆ More cases can be added as feedback from the WG is received.

## REQ5: Co-existence

- ◆ The framework enables the expression of existing protocols in functions that can be extended to provide distributed mobility support, and can be made backwards compatible with existing implementations.

## REQ6: Security considerations

- ◆ Security risks are associated with the particular DMM solution.
- ◆ The framework is flexible and does not restrict DMM solutions in a way that the DMM solution can increase security risks..



# REQ7: Multicast

- ◆ It appears possible to extend the framework by decomposing multimob solutions with the framework.

# Comments and suggestions are welcome

Thank you