

Distributed Mobility Management (DMM) WG

DMM Work Item:  
Forwarding Path & Signaling Management

2014-10-07

# General objectives of this WI

- ❑ Elaboration of a policy-based network control solution for distributed mobility management
  - ❑ Support of various deployment models; flexible deployment of C-/D-Plane functions
  - ❑ Centralized vs decentralized C-Plane / D-Plane, D-Plane associated with network edge or correspondent service
  - ❑ Option to adopt virtualization technology
- ❑ This work item is about the **specification of the C-/D-Plane reference interface and semantics** without being specific to a particular protocol
  - ❑ Generic description of protocol interface preferred
  - ❑ Level of detail and description 'language' currently being discussed
  - ❑ Functional scope should support all DMM scenarios which have been discussed so far
- ❑ Mapping of generic description to concrete protocol extensions should follow this WI's specification(s)
  - ❑ Open Flow, Netconf, ForCES, BGP, ReST, XML, vendor-specific
  - ❑ Associated WGs may provide suitable platform for the specification of extensions

# Adopted work procedure

- ❑ Initial technical work space formed by consolidating input from WG participants who contributed to the discussion of that work item so far
  - ❑ Sri Gundavelli, Pierrick Seite, Georgios Karagiannis, Marco Liebsch
  - ❑ Forms starting point for further discussion
  - ❑ More contributions welcome
  - ❑ WI-specific call next week; doodle will help to find a suitable day
  
- ❑ Individual draft skeleton being compiled, meant as base for a structured discussion
  
- ❑ Publish basic -00 version of individual draft on IETF repository in October
  - ❑ So far we can target a single document
  - ❑ Options to have parallel tracks for multiple drafts in this work item can be discussed
  
- ❑ Update initial draft according to comments and further contributions

# Current status from past discussion

Scope; Converged on ..

- .. technical scope and procedure
- .. functional reference architecture
- .. target reference points / interfaces
- .. on out-of-scope items
  - Policy orchestration and logic, protocol particularities (e.g. Open Flow or BGP constraints), interface between multiple controllers

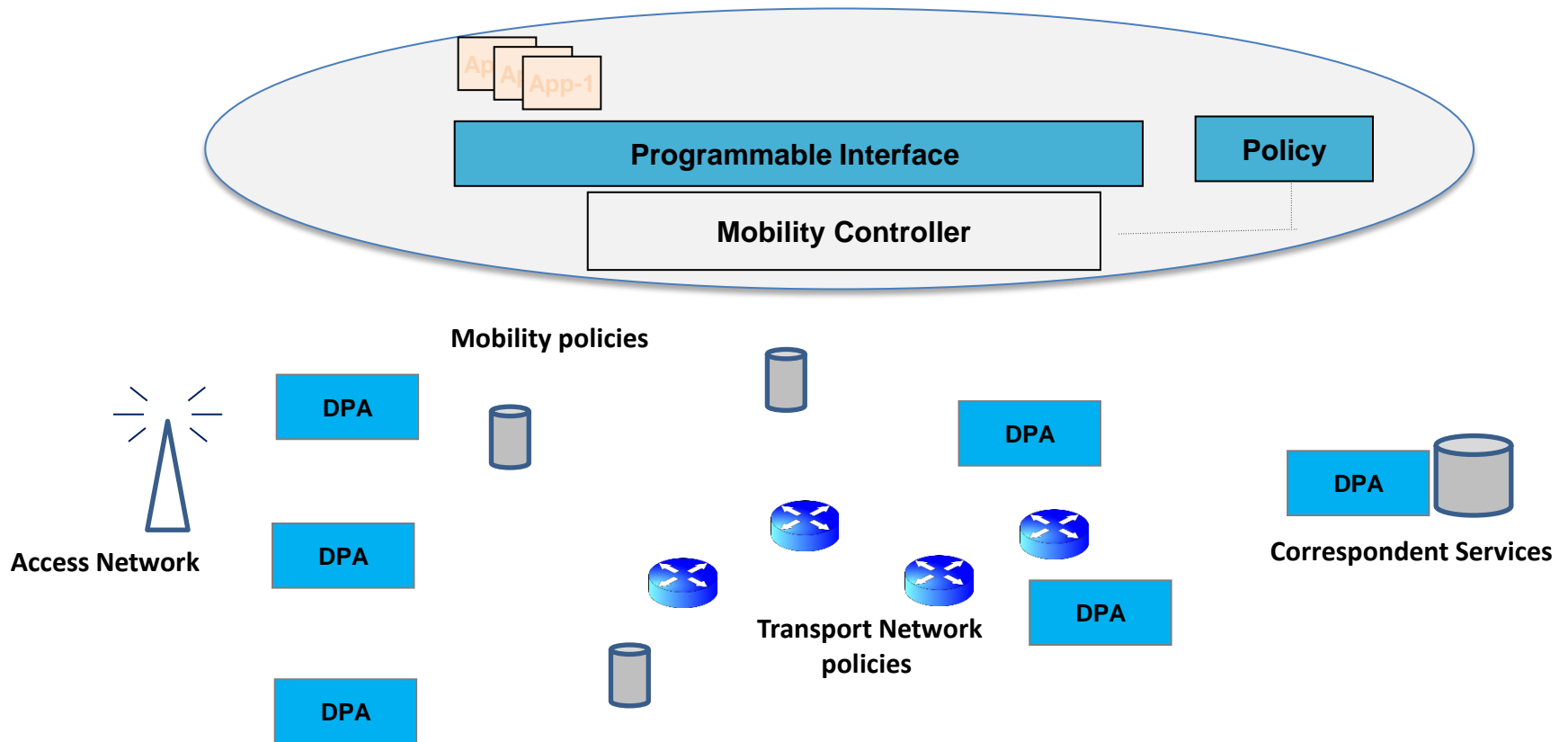
Specification

- Converged on a first set of control categories

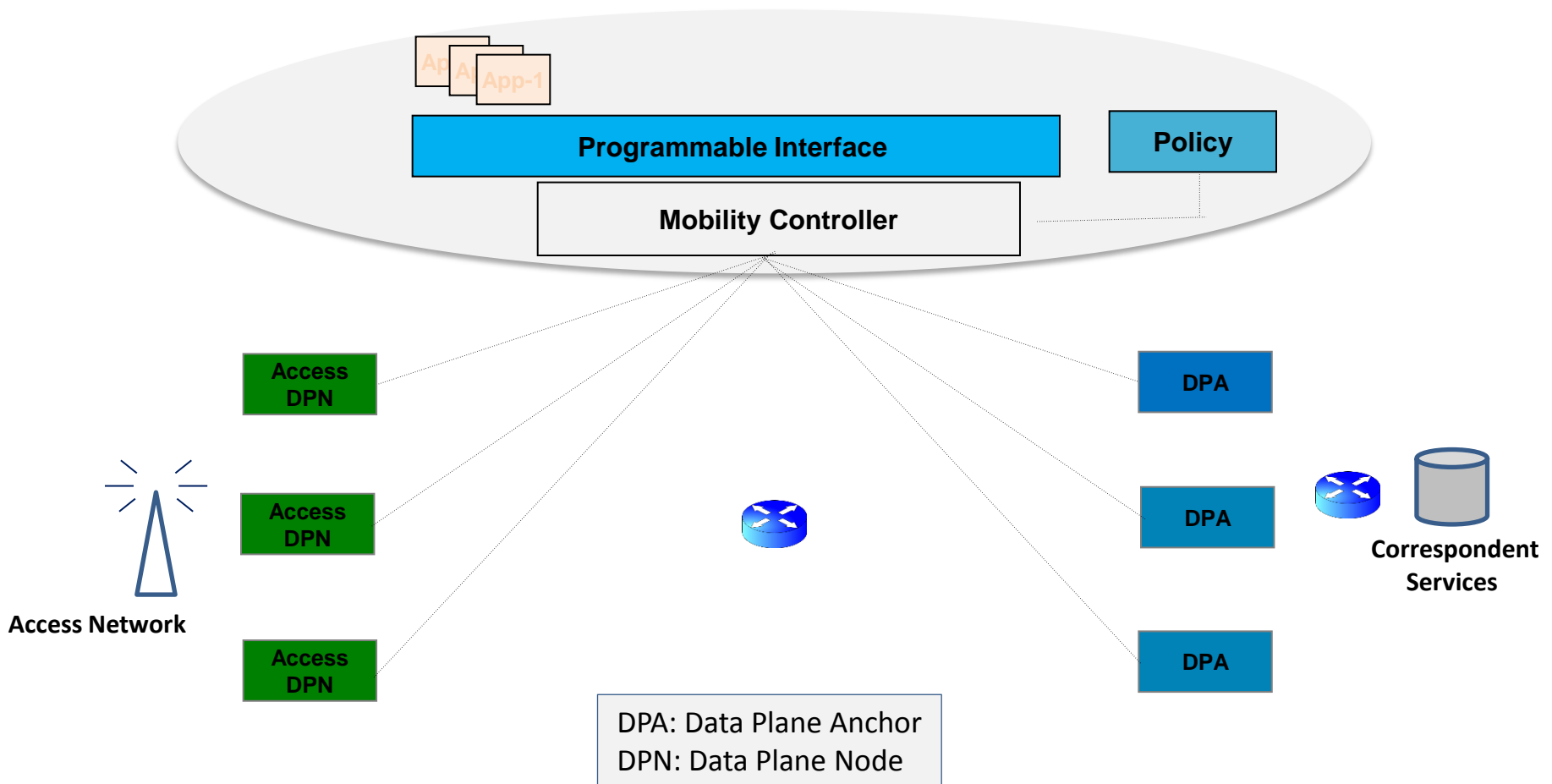
Currently open

- Description by **message** (commands, attributes) or by **function** (API) ?
- Adoption of proven description/modeling language ?

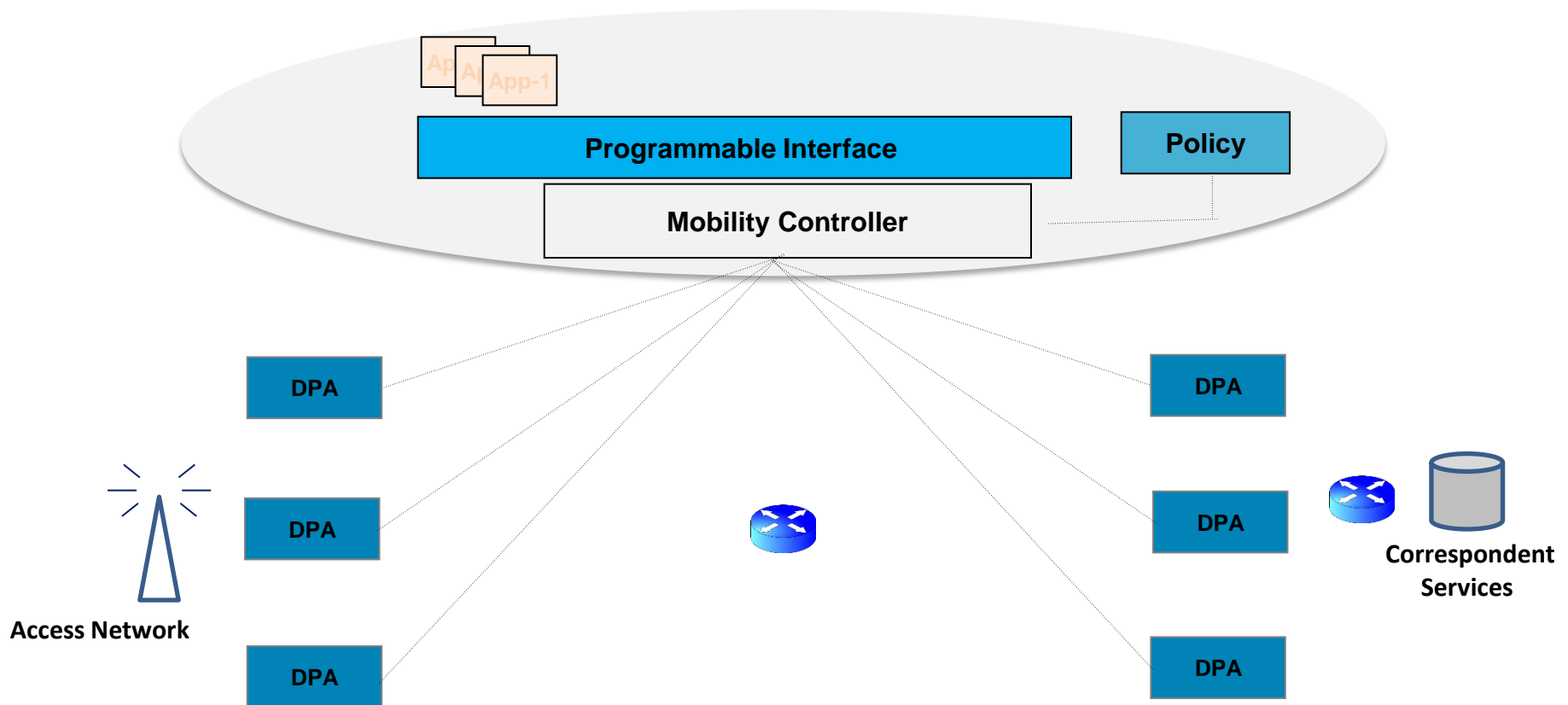
# Overview of Functional Reference Architecture – Unified Controller



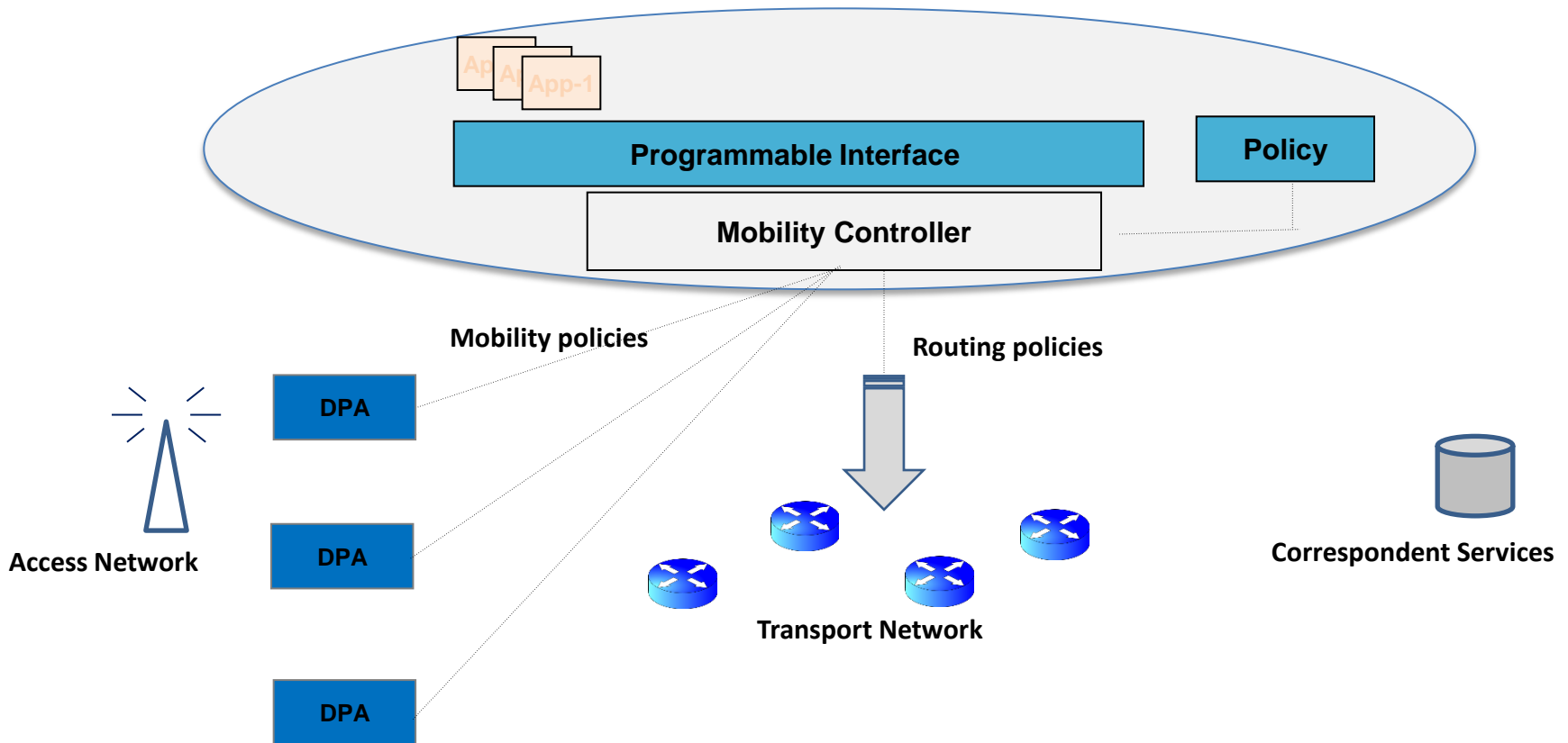
# Overview of Functional Reference Architecture – Separated **D-Plane Anchor** and **Access Node**



# Overview of Functional Reference Architecture – Flat Architecture with **D-Plane Anchor**



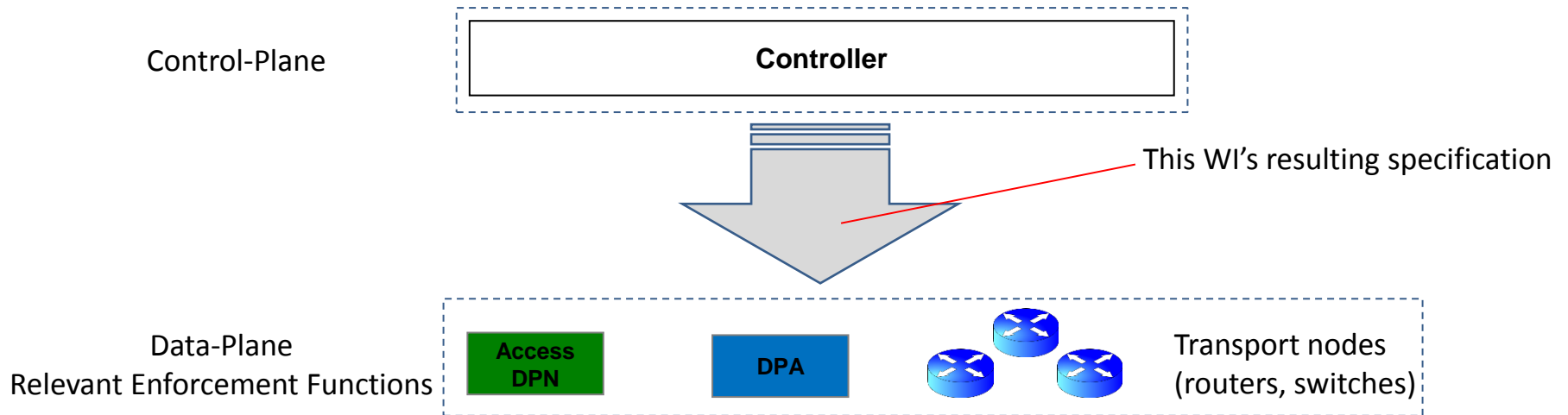
# Converged Mobility Controller – Configuration of DPAs and Transport Network nodes





# Illustration of WI scope

- ❑ Specification is agnostic to the type and the number of controllers
  - ❑ Interface between different types of controllers out of scope



# For discussion

- ❑ Description of protocol semantics; current options
  - ❑ Function Calls
  - ❑ Messages and Attributes; use of proven description languages?
  - ❑ Both must come with clarifying description (issuing entity, expected result)
  
- ❑ Documentation of use cases behind certain C-/D-Plane operation
  - ❑ Use cases section in the WI draft(s); or
  - ❑ Part of the (open) WG document about *DMM Deployment Models and Scenarios*
  
- ❑ Converge on Terminology

# Identified categories

## For discussion

Each category has one or multiple functions associated

- Tunnel Management
  - Create, Modify, Tear-Down
  - Different attributes
- Routing Policy Management
  - Aggregated routes
  - Host routes
- Traffic Steering Policies
  - Traffic/Flow identification
  - Actions
- QoS Policies
  - Traffic/Flow identification
  - Treatment
- Queries
  - Requesting attributes
- Notifications
  - Attach, address-in-use

# Description option I: Message & Attributes

Messages: Controller → Data-plane

- Add** : Set up routing policy for MN's Routing Address (HoA/HNP) to deliver packets towards Routing Locator (DPA)
- Modify** : ..
- Delete** : ..

Messages: Data-plane → Controller

- Query** : Request Routing Locator (e.g. DPA/DPN address) for given MN Routing Address (HoA/HNP)
- Notify** : Inform about expiration of soft-states; notification of downlink traffic in case of missing states; notification of HNP being in use by a MN; notification of new attachment

# Description option I: Message & Attributes

## Attributes

- MN\_RID : Routing Identifier – MN stable Identifier
- MN\_RADDR : Routing Address – HoA, HNP
- MN\_TRLOC\_ID: Identifier of topologically correct locator, e.g. DPA name
- MN\_TRLOC\_ADDR : Topologically correct address of Routing Locator, e.g. Anchor IP address, Tunnel IP address
- MN\_TRNET\_ID : Topologically correct name of the network providing locator/anchor
- MN\_TRNET\_ADDR : Topologically correct network address/prefix of the network, which matches the locator/anchor
- Lifetime : lifetime of policy rule

# Description option II: Function Calls

Interface Name	Action	Parameters
Tunnel State	<ul style="list-style-type: none"><li>• Add/Modify/Delete Tunnel</li></ul>	<ul style="list-style-type: none"><li>• Source IP Address, Destination IP Address, SPORT, DPORT, Encapsulation Mode, UL-GRE-Key, DL-GRE-Key, Tunnel Identifier</li></ul>
Forwarding State	<ul style="list-style-type: none"><li>• Add/Modify/Delete PBR Route</li><li>• Add/Modify/Delete IP Route</li><li>• Add/Modify/Delete Flow Ta</li></ul>	<ul style="list-style-type: none"><li>• Traffic Flow Template for IP flow identification</li><li>• Tunnel Identifier</li><li>• IP Route</li><li>• Flow Tag, GRE Key</li></ul>
QoS Policing	<ul style="list-style-type: none"><li>• Add/Modify/Delete GBR Bearer on Flow/Session/Application basis</li></ul>	<ul style="list-style-type: none"><li>• Traffic Flow Template for IP flow identification</li><li>• AMBR</li><li>• GBR</li><li>• Traffic Class</li></ul>