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On-demand DMM control plane orchestration
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Abstract

This document describes the required functionalities of mobility controller in the management and orchestration perspective for the on-demand DMM service.

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Table of Contents

1.	Introduction	2
2.	Terminologies	3
3.	DMM Service Management by Mobility Controller	3
3.1.	DMM Service Instantiation	3
3.2.	DMM Service Modification	3
3.3.	DMM Service Release	5
4.	DMM Service Orchestration by Mobility Controller	5
4.1.	DMM Service Description	5
4.2.	CP/DP Selection	5
4.3.	DMM Service Monitoring	5
5.	Security Considerations	6
6.	IANA Considerations	6
7.	References	6
7.1.	Normative References	6
7.2.	Informative References	6
8.	Acknowledgments	6

[1. Introduction](#)

The DMM deployment models draft presents available DMM deployment models and architectural considerations [I-D.ietf-dmm-deployment-models]. One of the deployment models is with the on-demand control plane orchestration mode, which allows control-plane agent/node, i.e., CPA/CPN to be assigned and selected on demand. The potential of the on-demand control plane orchestration mode is to facilitate DMM-as-a-Service (DMMaaS) that meets diverse needs of service operators and enterprise, not being limited to the provision of uniform DMM Services.

The main component in the on-demand control plane orchestration mode is the Mobility Controller, which is in charge of determining and assigning appropriate control plane nodes while orchestrating them by taking into consideration mobility-centric control plane requirements and issues.

In this draft, we specify the functionality of Mobility Controller, in the management and orchestration perspective. In the management, the requirements for DMM Service initiation, DMM Service modification, DMM Service release are described. In the orchestration, the requirements for DMM Service description, CP/DP selection for DMM Service and DMM Service monitoring are described.

2. Terminologies

This document is based on terminologies defined in [\[I-D.ietf-dmm-deployment-models\]](#), [\[I-D.ietf-dmm-fpc-cpdp\]](#). In addition, following term is defined as follows.

DMM Service: Description of the relationship between DMM control plane and data plane components and configurations for providing mobility service to specific user group or tenant network. DMM service functions can be implemented stand-alone service or combined with other functions (e.g. gateway functions which is not related to mobility). Multiple DMM Service can be deployed in a network domain.

3. DMM Service Management by Mobility Controller

This section describes DMM Service management in terms of DMM Service instantiation, DMM Service modification, DMM Service release, based on an operational procedure shown in Fig. 1.

3.1. DMM Service Instantiation

Once Mobility Controller launches a DMM Service, it should determine necessary control plane functions for the requested DMM Service and let them get ready for running the operation. The control plane functions should be newly instantiated or chosen with already running ones. For the service instantiation, several steps should be checked and determined. First, an interface between Home-CPA and Access-CPN should be determined, i.e., choosing what control plane protocol to be used. It can be determined based on a DMM Service template chosen from a DMM Service description repository. Suppose that the Home-CPA and Access-CPN are with the FPC interface as a FPC client, defined in [\[I-D.ietf-dmm-fpc-cpdp\]](#). The Home-CPA and Access-CPN configure the Home-DPN and Access-DPN via Routing Controller working as a FPC agent.

3.2. DMM Service Modification

While DMM Service runs, Mobility Controller should be able to modify the topology or connectivity between control plane functions. One of the DMM Service modification examples is anchor switching, which can be called CPA switching, replacing a failed Home-CPA or a Home-CPA with a long routing distance from the mobile node (MN). Once Mobility Controller detects a failure of Home-CPA, it should be able to allocate a new Home-CPA function, which should then able to

retrieve mobility binding information and configuration parameters from the previous Home-CPA. After the anchor switching procedure is complete, interfacing the new Home-CPA with other CP and DP functions (e.g. Access-CPN, Home-DPA) is required.

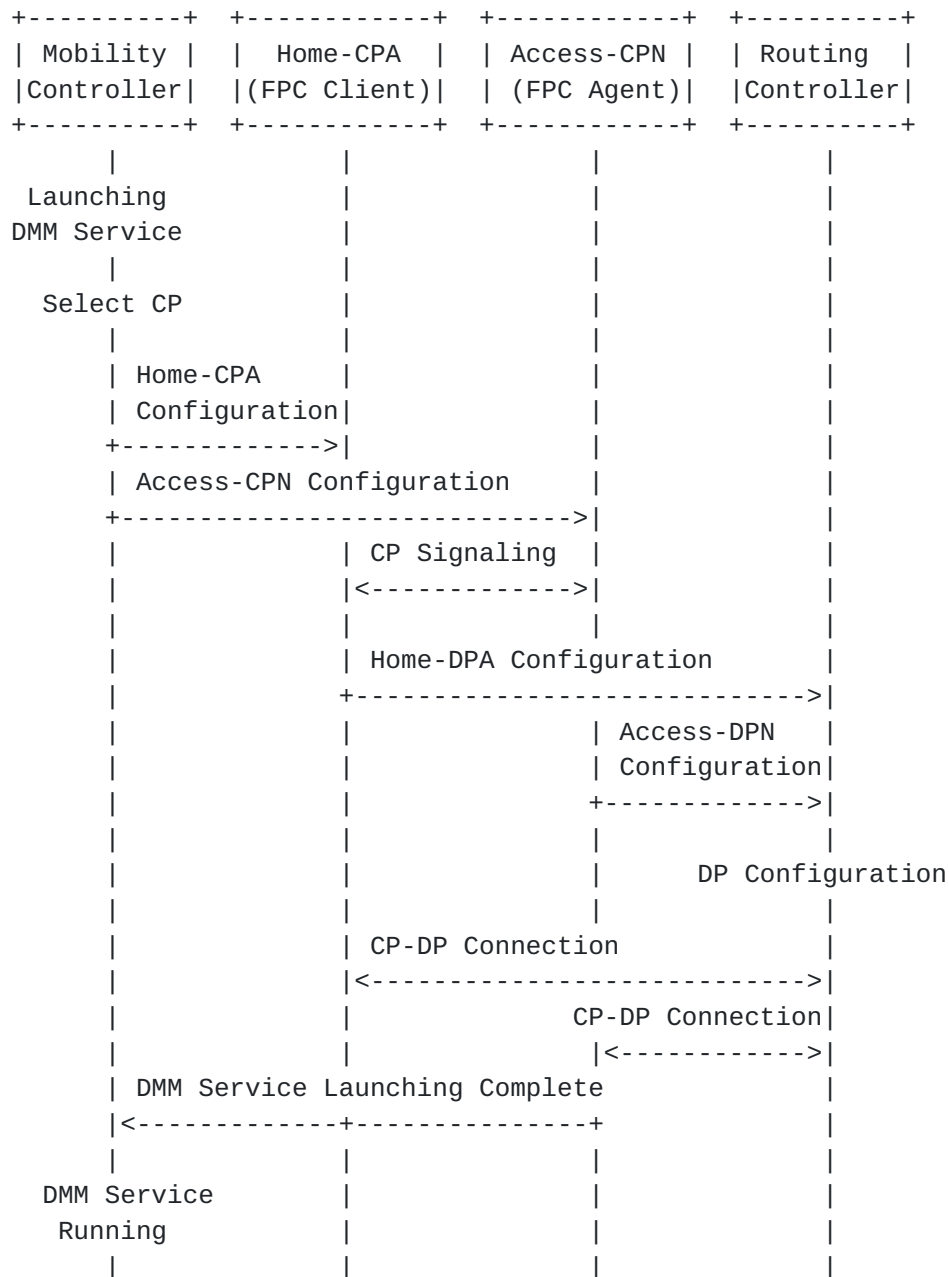


Figure 1. DMM Service Instantiation Procedure

3.3. DMM Service Release

For the DMM Service release, the Mobility Controller should request the release of functional resource of the relevant DMM entities while cleaning the information and parameters configured on them for the DMM Service. Once the release request is received by the Mobility Controller, the Home-CPA is required to stop location tracking of the mobility sessions served and delete the information related to MNs and IP sessions. Access-CPN is required to delete the information related to MNs and IP sessions served. For the service release of data plane nodes, the Mobility Controller is required to request the initialization of forwarding state on the data plane nodes such as Home-DPN and Access-DPN(s) to the Routing Controller.

4. DMM Service Orchestration by Mobility Controller

This section describes DMM Service orchestration in terms of DMM Service description, CP/DP selection, DMM Service monitoring.

4.1. DMM Service Description

For the DMM service description, number of Home-CPA and Access-CPN, DMM Service topology, protocols between control plane nodes should be described in the chosen DMM service template. The Mobility Controller should be able to understand a given DMM Service description and translate it for the DMM Service configuration. For example, DMM service description can be specified depended on types of DP protocol(e.g. SRv6, ILA, etc.) or CP protocol(MIP, PMIP, etc.)

4.2. CP/DP Selection

The Mobility Controller is required to select appropriate CP/DP functions, based on a requested DMM Service. The selection can be based on an capabilities(e.g. protocol), operator's policy, optimal path computation, handover performance such as lower latency, lower packet loss, and so on. The current load information of CP/DP nodes can also be considered for load balancing of the nodes.

4.3. DMM Service Monitoring

For the reliable DMM Service support, DMM Service monitoring is essentially required. The monitoring includes the current routing path whether it is optimized or not. Depending on determination of

routing path optimality, the Mobility Controller may be required to reselect or relocate Home-CPA and Home-DPN functions, by an appropriate measure, e.g., anchor switching procedure as described in [Section 3.2](#).

[5. Security Considerations](#)

TBD

[6. IANA Considerations](#)

TBD

[7. References](#)

[7.1. Normative References](#)

[I-D.ietf-dmm-deployment-models] Gundavelli, S. and Jeon, S., "DMM Deployment Models and Architectural Considerations", [draft-ietf-dmm-deployment-models-04](#), May 2018.

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[7.2. Informative References](#)

[8. Acknowledgments](#)

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