DMM
Internet-Draft
Intended status: Standards Track
Expires: January 8, 2017

Y. Kim
Soongsil University
S. Jeon
Sungkyunkwan University

July 07, 2016

Enhanced Mobility Anchoring in Distributed Mobility Management
draft-yhkim-dmm-enhanced-anchoring-05.txt

Abstract

This document presents a new perspective for the solution design of enhanced mobility anchoring over DMM deployment models described in [draft-sijeon-dmm-deployment-models].

Status of This Memo

This Internet-Draft is submitted in full conformance with the provisions of BCP 78 and BCP 79.

Internet-Drafts are working documents of the Internet Engineering Task Force (IETF). Note that other groups may also distribute working documents as Internet-Drafts. The list of current Internet-Drafts is at http://datatracker.ietf.org/drafts/current/.

Internet-Drafts are draft documents valid for a maximum of six months and may be updated, replaced, or obsoleted by other documents at any time. It is inappropriate to use Internet-Drafts as reference material or to cite them other than as "work in progress."

This Internet-Draft will expire on January 8, 2017.

Table of Contents

1. Introduction

This document aims to identify what should be enhanced for mobility anchoring and to provide possible approaches for enhanced mobility anchoring over deployment models presented in [draft-sijeon-dmm-deployment-models].

2. Conventions and Terminology

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL","SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in [RFC2119].

This document focuses on enhanced mobility anchoring based on the functional deployment models presented in [draft-sijeon-dmm-deployment-models], which describes deployment models with mobility management functions in [RFC7429].

Anchoring Function (AF) is defined as a combined control-plane and data-plane functions. For the control-plane function, it allocates an IP address, i.e., Home Address (HoA), or prefix, i.e., Home Network Prefix (HNP) a mobile node, topologically anchored by the advertising node. That is, the anchor node is able to advertise a connected route into the routing infrastructure for the allocated IP prefixes. It also takes a data-plane anchor point where packets destined to the IP address or IP prefix allocated by the anchor should pass through.

It can be deployed in a decoupled way, i.e. separated control plane and data plane. In that case, following two terms - AF Control Plane (AF-CP) and AF Data Plane (AF-DP) - are used. AF-CP is responsible of allocating the IP address and advertising a connected route for an associated terminal while AF-DP is responsible of anchoring received data packets destined to the IP address allocated by the anchor.

Internetwork Location Management (LM) is a control-plane function, which manages and keeps track of the internetwork location of an MN. The location information may be a binding of the advertised IP address/prefix, e.g., HoA or HNP, to the IP routing address of the MN, or it may be a binding of a node that can forward packets destined to the MN.

Note that the LM could belong to the AF-CP, as it is done in several solutions, i.e. Mobile IP (MIP) and Proxy Mobile IPv6 (PMIPv6). However, in this draft, each function is indicated distinctively, as those functions could be deployed in different locations to allow advanced control and smooth evolution for DMM.

Forwarding Management (FM) function performs packet interception and forwarding to/from the IP address/prefix assigned to the MN, 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.

Following the FM definition in [RFC7429], it may be split into the control plane (FM-CP) and data plane (FM-DP).

3. Enhanced Mobility Anchoring

We present enhanced mobility anchoring operations based on the three deployment models presented in [draft-sijeon-dmm-deployment-models]. For the details of the deployment models, check following draft [draft-sijeon-dmm-deployment-models].

3.1. Distributed AM, LM, and FM (with centralized LM) - All-in-One

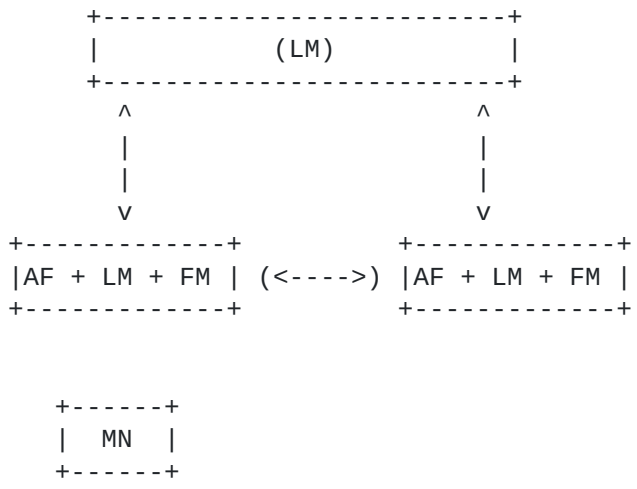

Figure 1. Distributed AM, LM, and FM functions (with centralized LM)

Fig. 1 shows AF is distributed with LM and FM at edge mobility routers. The AF allocates an IP address or IP prefix and advertises a connected route of the mobile terminal configured with the allocated IP address or IP prefix, when the terminal is attached at a mobility router. It takes a role of intercepting packets destined to the allocated IP address/prefix of the mobile terminal.

3.2. Distributed AF-DP, LM and FM with centralized AF-CP (+ LM)

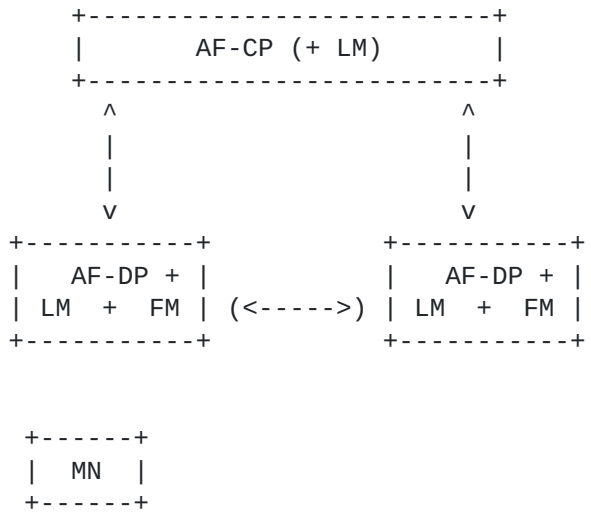

Figure 2. Distributed AF-DP, LM and FM functions with centralized AF-CP (+ LM)

The deployment model in Fig. 2 shows that AF-DP is distributed with LM and FM into deployed mobility routers while AF-CP is centralized in a single entity. Allocating an IP address/prefix is provided by AF-CP, while packet interception is supported by AF-DP. As the control plane and data plane of AF is separated, flexible AF-DP selection can be enabled for load balancing or network management, as an enhanced mobility anchoring aspect. Based on the separated AF-CP and AF-DP architecture, switching of AF-DP can be supported under the control of AF-CP.

3.3. Distributed AF-DP and FM-DP with centralized AF-CP, LM, and FM-CP

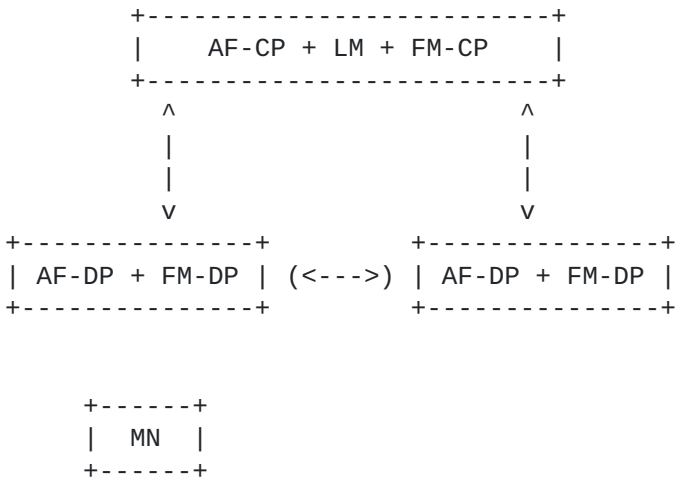

Figure 3. Distributed AF-DP and FM-DP with centralized AF-CP, LM, and FM-CP

In the function deployment model shown in Fig. 3, separation of FM-CP and FM-DP is implemented with the separation of AF-CP and AF-DP. The LM is located at the central entity. Comparing deployment models described in Fig. 3 and Fig. 2, this deployment model facilitates management and optimization of forwarding path, even in the mid-session, between the AF-DP of an allocated IP address and a current serving router where the terminal is attached. Moreover, it enables supporting a flexible selection of forwarding data path well as supporting a flexible AF-DP selection by AF-CP.

4. IANA Considerations

This document makes no request of IANA.

5. Security Considerations

T.B.D.

6. Acknowledgements

7. References

7.1. Normative References

[RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", BCP 14, RFC 2119, DOI 10.17487/RFC2119, March 1997, <http://www.rfc-editor.org/info/rfc2119>.

7.2. Informative References

[I-D.sijeon-dmm-deployment-models] Jeon, S. and Y. Kim, "Deployment Models for Distributed Mobility Management", draft-sijeon-dmm-deployment-models-02 (work in progress), March 2016.

[RFC7429] Liu, D., Ed., Zuniga, JC., Ed., Seite, P., Chan, H., and CJ. Bernardos, "Distributed Mobility Management: Current Practices and Gap Analysis", RFC 7429, DOI 10.17487/RFC7429, January 2015, <http://www.rfc-editor.org/info/rfc7429>.

Authors' Addresses

Younghan Kim
Soongsil University
369, Sangdo-ro, Dongjak-gu
Seoul 156-743
Korea

Email: younghak@ssu.ac.kr

Seil Jeon
Sungkyunkwan University
2066 Seobu-ro, Jangan-gu
Suwon, Gyeonggi-do
Korea

Email: seiljeon@skku.edu