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Diameter Support for Proxy Mobile IPv6 Localized Routing
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Abstract

In Proxy Mobile IPv6, packets received from a Mobile Node (MN) by the Mobile Access Gateway (MAG) to which it is attached are typically tunneled to a Local Mobility Anchor (LMA) for routing. The term "localized routing" refers to a method by which packets are routed directly between an MN's MAG and the MAG of its Correspondent Node (CN) without involving any LMA. In order to establish a localized routing session between two Mobile Access Gateways in a Proxy Mobile IPv6 domain, two tasks must be accomplished:

1. The usage of localized routing must be authorized for both MAGs and

2. The address of the MAG to which the Correspondent Node (CN) is attached must be ascertained

This document specifies how to accomplish these tasks using the Diameter protocol.

Status of this Memo

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1. Introduction

Proxy Mobile IPv6 (PMIPv6) [RFC5213] allows the Mobility Access Gateway to optimize media delivery by locally routing packets from a Mobile Node to a Correspondent Node that is locally attached to an access link connected to itself, avoiding tunneling them to the Mobile Node's Local Mobility Anchor. This is referred to as "local routing" in RFC 5213. However, this mechanism is not applicable to the typical scenarios in which the MN and CN are connected to different MAGs and are registered to the same LMA or different LMAs. In these scenarios (as described in [RFC6279]), the relevant information needed to set up a localized routing path (e.g., the addresses of the Mobile Access Gateways to which the MN and CN are respectively attached) is distributed between their respective Local Mobility Anchors. This may complicate the setup and maintenance of localized routing.

Therefore, in order to establish a localized routing path between the two Mobile Access Gateways, the Mobile Node's MAG must identify the LMA that is managing the Correspondent Node's traffic and then obtain the address of the Correspondent Node's MAG from that LMA. In Proxy Mobile IPv6, the LMA to be assigned to the CN may be maintained as a configured entry in the Correspondent Node's policy profile located on an Authentication, Authorization and Accounting (AAA) server. However, there is no relevant work discussing how AAA-based mechanisms can be used by the Mobile Node's LMA to discover the address of the Correspondent Node's LMA during the setup of localized routing. The method by which the Mobile Node's MAG or LMA interacts with the Correspondent Node's LMA to identify the Correspondent Node's MAG is also unspecified.

This document describes AAA support for the authorization and discovery of PMIPv6 mobility entities during localized routing. In LMA discovery, Diameter [I-D.ietf-dime-rfc3588bis] is used to authorize the localized routing service and provide the Mobile Node's MAG/LMA with information regarding the Correspondent Node's LMA. In MAG discovery, AAA is used to determine whether Mobile Node's MAG is allowed to fetch the address of the Correspondent Node's MAG from the Correspondent Node's LMA. If MAG discovery is successful, the Correspondent Node's LMA will respond to the Mobile Node's MAG with the address of the Correspondent Node's MAG.

2. 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 RFC 2119 [RFC2119].

3. Solution Overview

MAG/LMA discovery is a prerequisite to the establishment of a direct routing path between MAG1 and MAG2 (associated with MN1 and MN2 respectively). This document addresses how to resolve the destination MN's MAG by means of interaction between the LMA and the AAA server. Figure 1 shows the reference architecture for Localized Routing Service Authorization. This reference architecture assumes

- o MN1 and MN2 belong to different LMAs or the same LMA. If MN1 and MN2 belong to the same LMA, the LMA1 and LMA2 to which MN1 and MN2 are anchored in Figure 1 should be the same LMA. If MN1 and MN2 belong to different LMAs, LMA1 and LMA2 in Figure 1 are in the same provider domain (as described in [RFC6279]).

- o The MAG and LMA support Diameter client functionality.

```
                                   +---------+
                        LMA2?      |  AAA &  |
                           +------>| Policy  |<----------+
                           |       | Profile |           |
                       Diameter    +---------+       Diameter
                       (Step a)                      (Step b)
                           |                             |
                           |                             |
                           |                             |
                  LMA2? +--V-+            +----+         |
               +------->|LMA1|            |LMA2|<-------+
               |        +----+            +----+
               |          |                 |
               |         //                 \\
              PMIP      //                   \\
               |       //                     \\
               |       |                       |
               |     +----+  MAG2?          +----+
               +---->|MAG1|<--------        |MAG2|
                     +----+                 +----+
                        :                      :
                     +---+                   +---+
                     |MN1|                   |MN2|
                     +---+                   +---+
```

Figure 1: Localized Routing Service Authorization Reference Architecture

The interaction of the MAG and LMA with the AAA server according to the extension specified in this document considers the follows

features:

a. The interaction of LMA1 with the AAA server is used to authorize the localized routing service and, if necessary, fetch the IP address of LMA2 (Step a in Figure 1)

b. LMA2 interaction with the AAA server is used to determine whether MAG1 or LMA1 is allowed to obtain the IP address of MAG2 (Step b in Figure 1)

Note that if MN1 and MN2 are connected to different MAGs but share the same LMA, the interaction between LMA1 and the AAA server should be exactly the same as the case where MNs belong to MAGs under different LMAs.

4. Attribute Value Pair Definitions

This section describes Attribute Value Pairs (AVPs) defined by this specification or re-used from existing specifications in a PMIPv6-specific way.

4.1. MIP6-Agent-Info AVP

The MIP6-Agent-Info grouped AVP (AVP Code 486) is defined in [RFC5447] and extended in [RFC5779]. This AVP is used to carry LMA addressing in the AA-Answer (AAA) message [I-D.ietf-dime-rfc4005bis].

4.2. PMIP6-IPv4-Home-Address AVP

The PMIP6-IPv4-Home-Address AVP (AVP Code 505) is defined in [RFC5779]. This AVP is used to carry the IPv4-MN-HoA (Mobile Node's IPv4 home address)[RFC5844] in the AA-Request (AAR) message [I-D.ietf-dime-rfc4005bis] from the LMA to the home AAA server (HAAA).

4.3. MIP6-Home-Link-Prefix AVP

The MIP6-Home-Link-Prefix AVP (AVP Code 125) is defined in [RFC5779]. This AVP is used to carry the MN-HNP (Mobile Node's home network prefix) in the AAR from the LMA to the HAAA.

4.4. MIP6-Feature-Vector AVP

The MIP6-Feature-Vector AVP is defined in [RFC5447]. This document allocates a new capability flag bit according to the IANA rules in RFC 5447.

INTER_MAG_ROUTING_SUPPORTED (TBD)

Direct routing of IP packets between MNs anchored to different MAGs without involving any LMA is supported. This bit is used with MN-HNP or IPv4-MN-HoA. When a LMA sets this bit in the MIP6-Feature-Vector and MN-HNP or IPv4-MN-HoA corresponding to the Correspondent Node is carried with this bit, it indicates to the HAAA that the Mobile Node associated with this LMA is allowed to use localized routing but the LMA needs to know from the HAAA if the Correspondent Node is allowed to use localized routing. If the MN-HNPs or IPv4-MN-HoAs corresponding to both the Mobile Node and the Correspondent Node are carried with this bit, it indicates that both the MN and CN are allowed to use localized routing. Note that localized routing related signaling is required prior to localized routing. If this bit is cleared in the returned MIP6-Feature-Vector AVP, the HAAA does not authorize direct routing of packets between MNs anchored to the different MAG. The LMA MUST support this policy feature on a per-MN and per-subscription basis.

5. Example Signaling flows

5.1. Localized Routing Service Authorization

Localized Routing Service Authorization also can happen during the network access authentication procedure [RFC5779], i.e., before localized routing is initialized. In this case, the preauthorized pairs of LMA/prefix sets can be downloaded to Proxy Mobile IPv6 entities during the RFC5779 procedure. Localized routing can be initiated once the destination of a received packet matches one or more of the prefixes received during RFC5779 procedure.

Figure 2 shows an example scenario where MAG1 acts as a Diameter client, processing the data packet from MN1 to MN2 and requesting authorization of localized routing. In this example scenario, MN1 and MN2 are anchored to LMA1 and LMA2 respectively if MN1 and MN2 belong to different LMAs; otherwise, the LMA to which MN1 and MN2 are anchored should be the same LMA, i.e., either LMA1 or LMA2. In the case where MNs belong to different LMAs, in order to setup a localized routing path with MAG2, MAG1 must first locate the entity that maintains the data required to setup the path (i.e., LMA2) by sending a Request message to LMA1. Note that the discovery of LMA2 is only done once; the request message is the Localized Routing Initialization (LRI) message in Figure 2 and belongs to the Initial phase of the localized routing. Once LMA1 has obtained the address of LMA2 from the AAA server, LMA1 may associate the address of LMA2 with the Mobile Node's cached data for future use (e.g., in case of a

handover). The Diameter client in LMA1 sends an AAR message to the Diameter server. The message contains an instance of the MIP6-Feature-Vector (MFV) AVP ([RFC5447], Section 4.2.5) with the INTER_MAG_ROUTING_SUPPORTED bit (Section 4.4) set and an instance of the MIP6-Home-Link-Prefix AVP ([RFC5779], Section 5.3) or an instance of the PMIP6-IPv4-Home-Address AVP ([RFC5779], Section 5.2) containing the IP address/HNP of MN2.

The Diameter server authorizes localized routing service by checking if MN2 is allowed to use localized routing and if LMA2 and LMA1 are in the same provider domain. If so, the Diameter server responds with an AAA message encapsulating an instance of the MIP6-Agent-Info AVP [RFC5779] containing the IP address and/or Fully Qualified Domain Name (FQDN) of LMA2 and an instance of the MIP6-Feature-Vector (MFV) AVP ([RFC5447], Section 4.2.5) with the INTER_MAG_ROUTING_SUPPORTED bit (Section 4.4) set indicating Direct routing of IP packets between MNs anchored to different MAGs is supported. LMA1 then determines the IP address of LMA2 using the data returned in the MIP6-Agent-Info AVP and responds to MAG1 with the address of LMA2 in the Localized Routing Acknowledge message (LRA in the Figure 2). If MAG1 knows that MN1 and MN2 belong to the same LMA, it requests the address of MAG2 from LMA2 and uses that address to setup the localized routing path between itself and MAG2 via a Proxy Binding Update (PBU)/Proxy Binding Acknowledgement (PBA) message exchange [RFC5213]. Note that whether MN1 and MN2 belong to the same LMA can be verified by looking up the binding cache entries corresponding to MN1 and MN2 and comparing the addresses of LMA1 and LMA2.

In the case where MNs share the same LMA, the MAG1 should send a request message (LRI in the Figure 2) to the LMA for localized routing which includes the IP address of MN2. The subsequent interaction between LMA1 and the AAA should be exactly the same as the case where the MNs belong to different LMAs. If authorization is successful, the LMA may look up the address of MAG2 directly based on IP address of MN2 and send a message to MAG1 with IP address of MAG2 included.

```
+---+    +-----+   +-----+    +---+    +-----+ +-----+  +---+
|MN1|    |MAG1|   |LMA1|    |AAA|    |LMA2| |MAG2|  |MN2|
+-+-+    +-+---+   +-+---+    +-+-+    +-+---+ +-+---+  +-+-+
  |        |         |          |        |       |        |
  |     Anchored     |          |        |    Anchored    |
  o------------------o          |        o-------+--------o
Data[MN1->MN2]       |          |        |       |        |
  |------->| LRI(MN2)|          |        |       |        |
  |        |-------->|          |        |       |        |
  |        |         |AAR(MFV, MN2)      |       |        |
  |        |         |--------->|        |       |        |
  |        |         |AAA(MFV, LMA2)     |       |        |
  |      LRA([LMA2]) |<---------|        |       |        |
  |        |<--------|          |        |       |        |
  |                  |          |        |       |        |
```

Figure 2: MAG-initiated Localized Routing Authorization

Figure 3 shows another example scenario, in which the LMA1 acts as a Diameter client, processing the data packet from MN2 to MN1 and requesting the authorization of localized routing. In this example scenario, MN1 and MN2 are anchored to LMA1 and LMA2 respectively. In contrast with the signaling flow of Figure 2, it is LMA1 instead of MAG1 which initiates the setup of the localized routing path.

The Diameter client in LMA1 sends an AA-Request message to the Diameter server. The message contains an instance of the MIP6-Feature-Vector AVP ([RFC5447], Section 4.2.5) with the INTER_MAG_ROUTING_SUPPORTED bit set and an instance of the MIP6-Home-Link-Prefix AVP ([RFC5779], Section 5.3) or an instance of the PMIP6-IPv4-Home-Address AVP ([RFC5779], Section 5.2) containing the IP address/HNP of MN2. The Diameter server authorizes localized routing service by checking if MN2 is allowed to use localized routing and if LMA2 and LMA1 are in the same domain. If so, the Diameter server responds with an AA-Answer message encapsulating an instance of the MIP6-Agent-Info AVP [RFC5779] containing the IP address and/or Fully Qualified Domain Name (FQDN) of LMA2 and an instance of the MIP6-Feature-Vector (MFV) AVP ([RFC5447], Section 4.2.5) with the INTER_MAG_ROUTING_SUPPORTED bit (Section 4.4) set indicating direct routing of IP packets between MNs anchored to different MAGs is supported. . LMA1 then determines the IP address of LMA2 using the data returned in the MIP6-Agent-Info AVP and responds to MAG1 with the address of LMA2.

In the case where MNs share the same LMA, the Diameter client in LMA1 sends an AA-Request message to the Diameter server. The interaction between LMA1 and the Diameter server should be exactly the same as the case where MNs belong to different LMAs. If authorization is

successful, the LMA may look up the address of MAG2 directly based on the IP address of MN2 and send a request message (LRI in Figure 3) to the MAG1 for localized routing with the IP address of MAG2 included. The MAG1 confirms the success of localized routing if a localized routing path can be setup.

```
          +---+    +----+  +----+     +---+      +----+  +----+   +---+
          |MN1|    |MAG1|  |LMA1|     |AAA|      |LMA2|  |MAG2|   |MN2|
          +-+-+    +-+--+  +-+--+     +-+-+      +-+--+  +-+--+   +-+-+
            |        |       |          |          |       |        |
            |     Anchored   |          |          |    Anchored    |
            o--------+-------o Data[MN2->MN1]      o-------+--------o
            |        |       |<-----    |          |       |        |
            |        |       |AAR(MFV,MN2)         |       |        |
            |        |       |--------->|          |       |        |
            |          LRI   |AAA(MFV,LMA2)        |       |        |
            |    (MN2,[LMA2])|<---------|          |       |        |
            |        |<------|          |          |       |        |
            |     LRA(Succ)  |          |          |       |        |
            |        |------>|          |          |       |        |
```

Figure 3: LMA-initiated Localized Routing Authorization

Figure 4 shows another example scenario, similar to the example scenario illustrated in Figure 3. In this case, however, LMA1 does not respond to MAG1 with the address of LMA2, instead initiating an exchange between LMA1 and LMA2 to trigger the corresponding LMA to setup binding entries on the corresponding MAG for localized routing and configuring MAG1 and MAG2 to use the same encapsulation mechanism as that being used for the PMIP tunnel between the MAG and LMA without special configuration or dynamic tunneling negotiation between MAGs. Alternatively, special configuration for other encapsulation mechanisms or dynamic tunneling negotiation may be used to override the default tunneling.

```
          +---+    +----+  +----+     +---+      +----+  +----+   +---+
          |MN1|    |MAG1|  |LMA1|     |AAA|      |LMA2|  |MAG2|   |MN2|
          +-+-+    +-+--+  +-+--+     +-+-+      +-+--+  +-+--+   +-+-+
            |        |       |          |          |       |        |
            |     Anchored   |          |          |    Anchored    |
            o--------+-------o Data[MN2->MN1]      o-------+--------o
            |        |       |<-----    |          |       |        |
            |        |       |AAR(MFV,MN2)         |       |        |
            |        |       |--------->|          |       |        |
            |        |       |AAA(MFV,LMA2)        |       |        |
            |        |       |<---------|          |       |        |
            |        |       Localized routing setup       |        |
            |        |       |<------------------->|       |        |
```

Figure 4: LMA-initiated Localized Routing Authorization

5.2. Diameter Server Authorizes MAG Location Query

Figure 5 shows an example scenario in which LMA2 acts as a Diameter client, receiving a MAG location request and requesting authorization for a MAG location query from the AAA server. In this example scenario, MN1 and MN2 may be anchored to LMA1 and LMA2 respectively or belong to the same LMA. In the case where MNs belong to different LMAs, MAG1 or LMA1 should already know that the recipient of localized routing is LMA2. If MAG1 initiates LR, MAG1 may take Option a in Figure 5 and solicit LMA2 to look up the IP address of the MAG to which MN2 is currently attached (in this case, MAG2) according to the IP addresses/HNPs of MN2. If LMA1 initiates LR, LMA1 may take Option b in Figure 5 and solicit LMA2 to look up the IP address of the MAG to which MN2 is currently attached. LMA2 validates the request (LRI in Figure 5) from MAG1 by sending an AAR to the Diameter server containing the IP address/HNP of MN1 (encapsulated in an instance of the MIP6-Home-Link-Prefix AVP or an instance of PMIP6-IPv4-Home-Address AVP) and an instance of the MIP6-Feature- Vector AVP ([RFC5779], Section 5.5) with the INTER_MAG_ROUTING_SUPPORTED bit set. If the authorization is successful, the Diameter server responds with an AA-Answer (AAA) message encapsulating an instance of the MIP6- Feature-Vector (MFV) AVP ([RFC5447], Section 4.2.5) with the INTER_MAG_ROUTING_SUPPORTED bit (Section 4.4) set indicating Direct routing of IP packets between MNs anchored to the different MAG is supported. LMA2 then looks up the IP address of MAG2 based on the IP address/HNP of MN2 and responds to MAG1 or LMA1 with the IP address of MAG2.

```
        +---+    +----+  +----+     +---+      +----+  +----+   +---+
        |MN1|    |MAG1|  |LMA1|     |AAA|      |LMA2|  |MAG2|   |MN2|
        +-+-+    +-+--+  +-+--+     +-+-+      +-+--+  +-+--+   +-+-+
          |        |       |          |          |       |        |
          |     Anchored   |          |          |    Anchored    |
          o----------------o          |          o-------+--------o
        Data[MN1->MN2]     |          |          |       |        |
          |------->|       |          |          |       |        |
          |        |    Location Query(MN1,MN2 ) |       |        |
          |        |-------+----------+--------->|\      |        |
          |        |       |          |          | |     |        |
          |        |       |         AAR(MFV,MN1)|Option a        |
          |        |       |          |<-------- | |     |        |
          |        |       |        AAA(MFV,LMA1)| |     |        |
          |        |       |          |--------->| |     |        |
          |        |   Location Query Ack(MAG2 ) | |     |        |
          |        |<--------------------------- |/      |        |
          |        |                             |       |        |
          |        |   Location Query(MN1,MN2)   |\      |        |
          |        |       +----------+--------->| |     |        |
          |        |       |         AAR(MFV,MN1)|Option b        |
          |        |       |          |<-------- | |     |        |
          |        |       |        AAA(MFV,LMA1)| |     |        |
          |        |       |          |--------->| |     |        |
          |        |   Location Query Ack(MAG2)  | |     |        |
          |        |       |<------------------- |/      |        |
          |        |       |                             |        |
          |        |      Localized routing setup        |        |
          |        |<------+---------------------------->|        |
          |        |===================================->|        |
          |        |       |          |          |       |------->|
          |        |       |          |          |    Data[MN2->MN1]
          |<------ |<-===================================|<-------|
          |        |       |          |          |       |        |
```

Figure 5: Diameter Server Authorizes MAG Location Query

In the case where MNs share the same LMA, LR should be initiated by LMA1 (i.e., LMA2) since only LMA1 knows that both MN1 and MN2 belong to itself by looking up the binding cache entries corresponding to MN1 and MN2. Unlike the case where MNs belong to different LMAs, the interaction between LMAs in Option b is omitted since LMA1 and LMA2 are the same entity. The interaction between LMA1 and the AAA should be exactly the same as the case where MNs belong to different LMAs.

6. Localized Routing Service Authorization in Networks with Multiple AAA Servers

```
                      +------------------------------------+
                      (                      AAA           )
                      (     +--------+     Backend         )
                      (     |Redirect|                     )
                      (     | Agent  |                     )
                      (     +--------+                     )
                      (         ^                          )
                      (         |                          )
                      (         |                          )
                      (         v                          )
                      (  +---------+          +---------+  )
                   +---->| AAA1 &  |          | AAA2 &  |<---+
                   |  (  | Policy  |<-------->| Policy  |  ) |
                   |  (  | Profile |          | Profile |  ) |
                   |  (  +---------+          +---------+  ) |
                   |  (      ^                      ^      ) |
                   |  +----- | ------------------- |-------+ |
                   |         A1                     A2       |
                   |         |                      |        |
                   |         |                      |        |
                Diameter     v                      v     Diameter
                   B1       +----+  LMA2 ?     +----+        B2
                   |        |LMA1| ------>     |LMA2|        |
                   |        +----+             +----+        |
                   |          |                  |           |
                   |         //                  \\          |
                   |        //                    \\         |
                   |       //                      \\        |
                   |       |                        |        |
                   |     +----+                  +----+      |
                   +---->|MAG1|                  |MAG2|<-----+
                         +----+                  +----+
                            :                       :
                         +---+                    +---+
                         |MN1|                    |MN2|
                         +---+                    +---+
```

      Figure 6: Use of a Diameter Redirect Agent to Support Localized
    Routing Service Authorization in Networks with Multiple AAA servers

Referring to an architecture with multiple AAA servers (as illustrated in Figure 6), AAA1 may not maintain the LMA to be assigned to MN2 as a configured entry in the Correspondent Node's Policy profile, as AAA2 holds this information in its policy store. In such a case, AAA1 contacts a Diameter redirect agent

[I-D.ietf-dime-rfc3588bis] to request the AAA server being responsible for maintaining MN2's policy profile. AAA2 checks if MN2 is allowed to use localized routing and if so, responds with the IP address of LMA2 corresponding to MN2 and sends the results back to LMA1 via AAA1. Details about the use of redirect agents in this context are beyond scope of this document.

7. Security Considerations

The security considerations for the Diameter NASREQ [I-D.ietf-dime-rfc4005bis] and Diameter Proxy Mobile IPv6 [RFC5779] applications are also applicable to this document.

The service authorization solicited by the MAG or the LMA relies upon the existing trust relationship between the MAG/LMA and the AAA server.

An authorised MAG could in principle track the movement of any participating CNs at the level of the MAG to which they are anchored. If such a MAG were compromised, or under the control of a bad-actor, then such tracking could represent a privacy breach for the set of tracked CNs. In such a case, the traffic pattern from the compromised MAG might be notable so monitoring for e.g. excessive queries from MAGs might be worthwhile.

8. IANA Considerations

This specification defines a new value in the Mobility Capability registry [RFC5447] for use with the MIP6-Feature-Vector AVP: INTER_MAG_ROUTING_SUPPORTED (see Section 4.4).

9. Contributors

Paulo Loureiro, Jinwei Xia and Yungui Wang all contributed to early versions of this document.

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11. References

11.1. Normative References

[I-D.ietf-dime-rfc3588bis]
Fajardo, V., Arkko, J., Loughney, J., and G. Zorn, "Diameter Base Protocol", draft-ietf-dime-rfc3588bis-29 (work in progress), August 2011.

[I-D.ietf-dime-rfc4005bis]
Zorn, G., "Diameter Network Access Server Application", draft-ietf-dime-rfc4005bis-07 (work in progress), February 2012.

[RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", BCP 14, RFC 2119, March 1997.

[RFC5213] Gundavelli, S., Leung, K., Devarapalli, V., Chowdhury, K., and B. Patil, "Proxy Mobile IPv6", RFC 5213, August 2008.

[RFC5447] Korhonen, J., Bournelle, J., Tschofenig, H., Perkins, C., and K. Chowdhury, "Diameter Mobile IPv6: Support for Network Access Server to Diameter Server Interaction", RFC 5447, February 2009.

[RFC5779] Korhonen, J., Bournelle, J., Chowdhury, K., Muhanna, A., and U. Meyer, "Diameter Proxy Mobile IPv6: Mobile Access Gateway and Local Mobility Anchor Interaction with Diameter Server", RFC 5779, February 2010.

[RFC5844] Wakikawa, R. and S. Gundavelli, "IPv4 Support for Proxy Mobile IPv6", RFC 5844, May 2010.

11.2. Informative References

[RFC6279] Liebsch, M., Jeong, S., and Q. Wu, "Proxy Mobile IPv6 (PMIPv6) Localized Routing Problem Statement", RFC 6279, June 2011.

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