

Local and Indirect Registration for Anchoring Handoffs

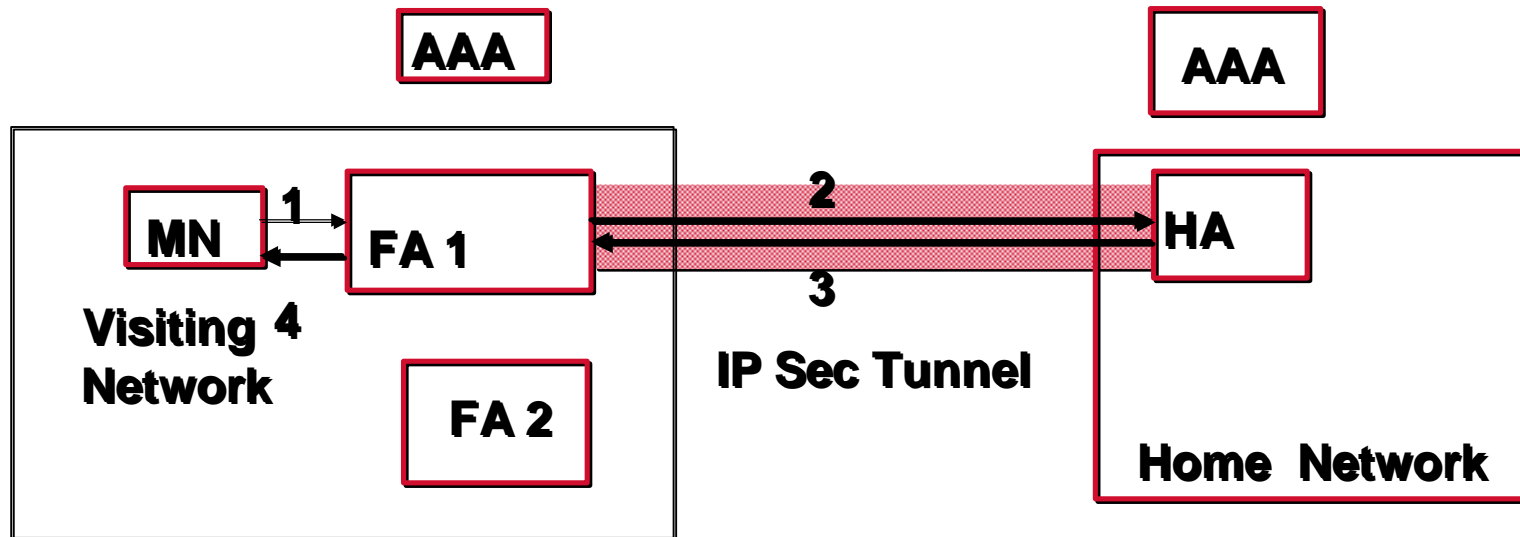
draft-dommety-mobileip-anchor-handoff-00.txt

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Problem

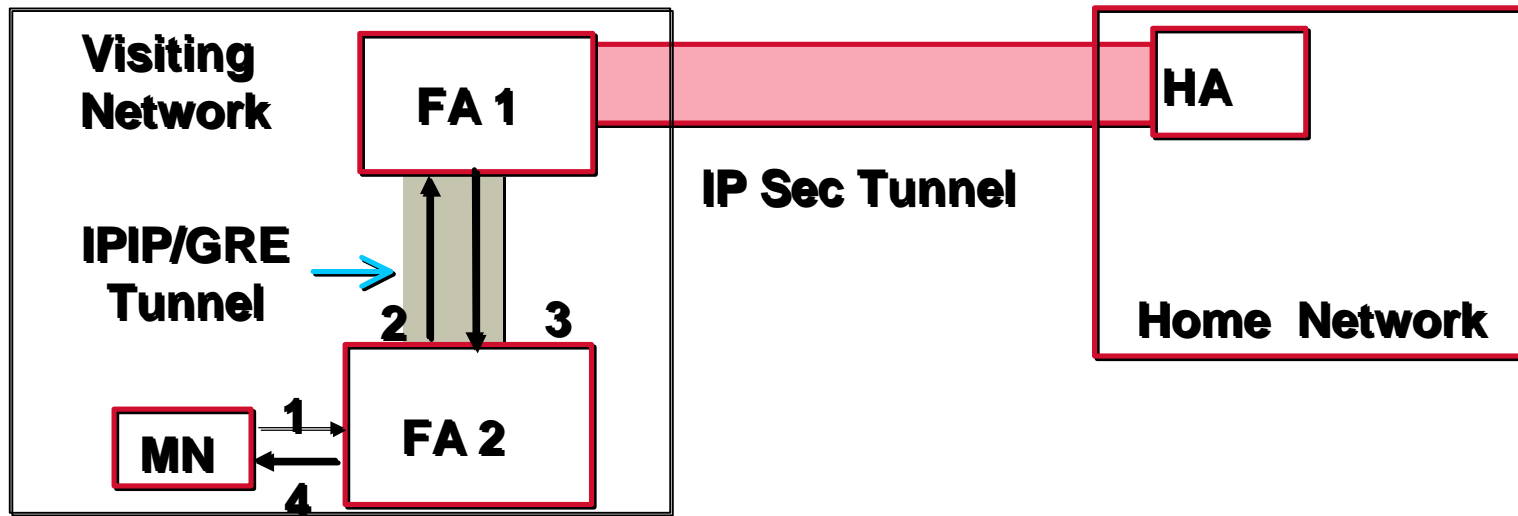
- **In wide area deployment, the handoff latencies could be high.**
- **Handoff Latency includes:**
 - 1. Message traversal between HA and FA**
 - 2. Establishment of Secure Tunnels (IKE/IPSec)**
 - 3. Establishment of Security Keys between HA and FA to be used during IKE or for Mobile IP Authentication**
- **Local and Indirect Registration**
- **Anchoring to reduce latency**

Registration (Global)



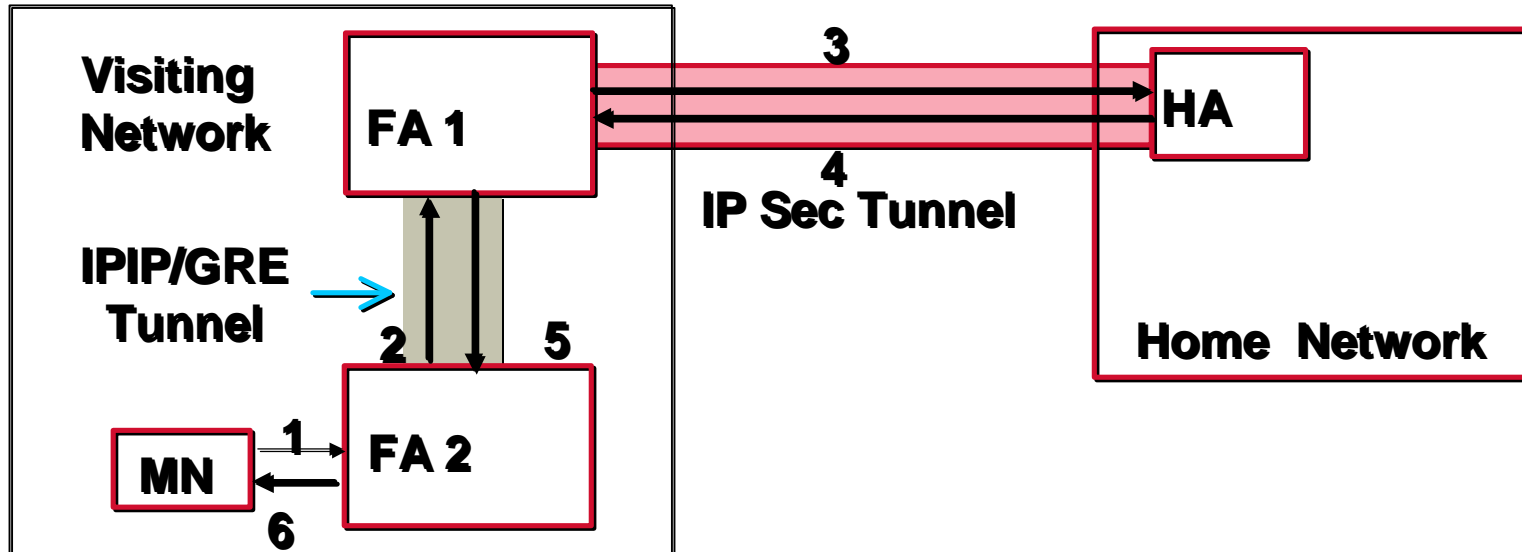
- **Authentication and Authorization** using AAA
- **Dynamic Key establishment** for IKE and/or Mobile IP (KDC, AAA)
- **Establishment of IP Sec tunnel** using IKE (Shared Key or PKI)
- FA where Global Registration is performed is the **Anchor FA**

Local Registration



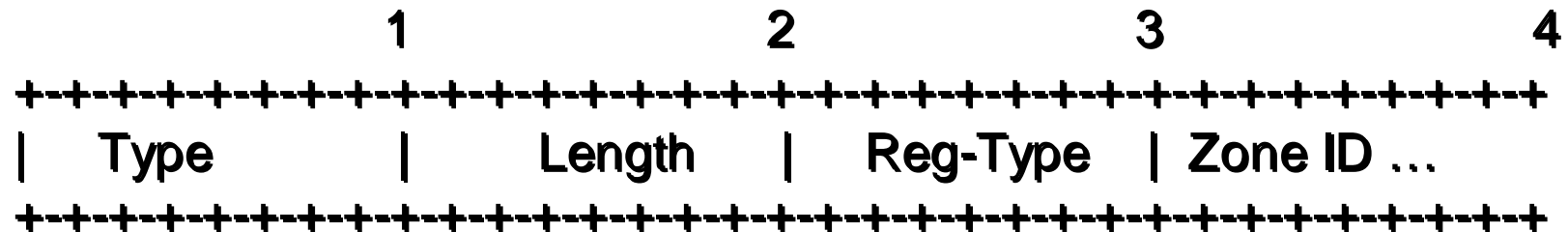
- Register with **Anchor FA** (FA 1)
- Avoid latencies due to latency components 1,2, and 3
- **Security Association** between FA1- MN and between FA1- FA2
- Lifetime of local reg has to be less than remaining global lifetime
- Can perform global registration to optimize the path

Global Indirect Registration



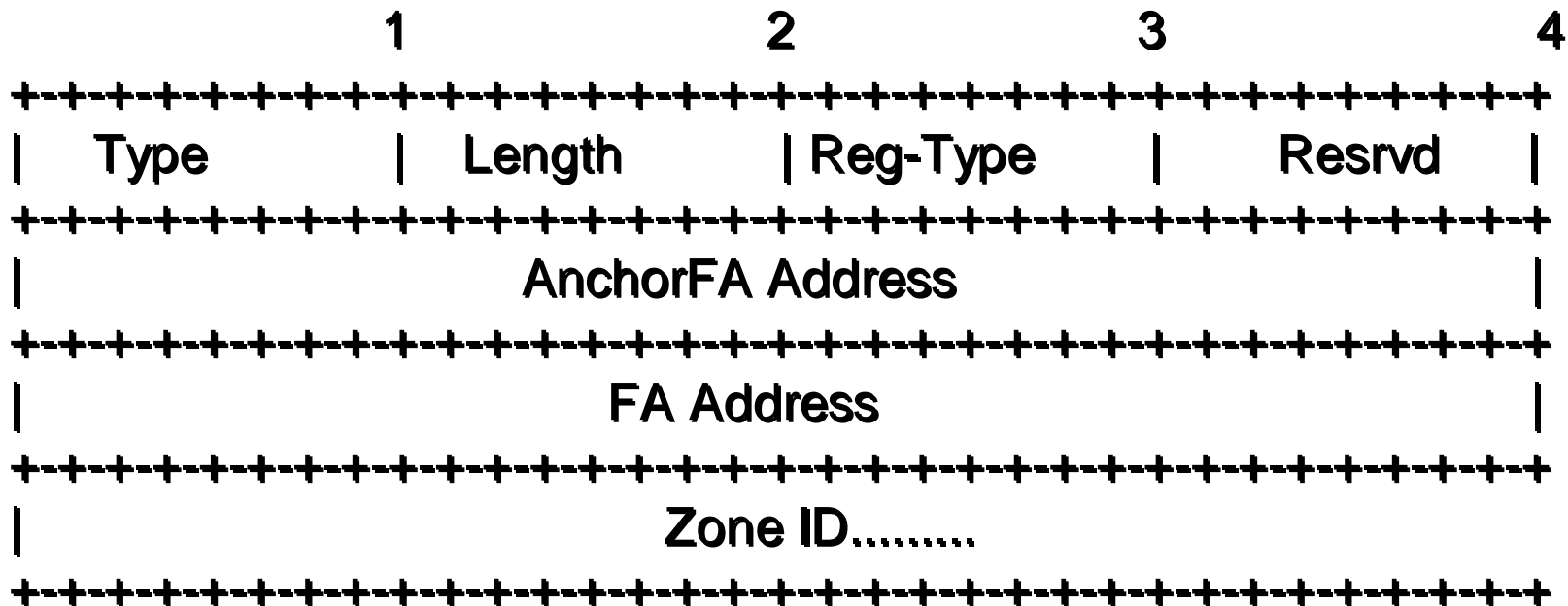
- Register with Anchor FA (FA 1) and HA
- Avoid latencies due to latency components 2, and 3
- A **Security Association** is assumed between FA1 and FA2
- **No Security Key** is assumed between FA1 and MN

Anchor Advertisement Extension

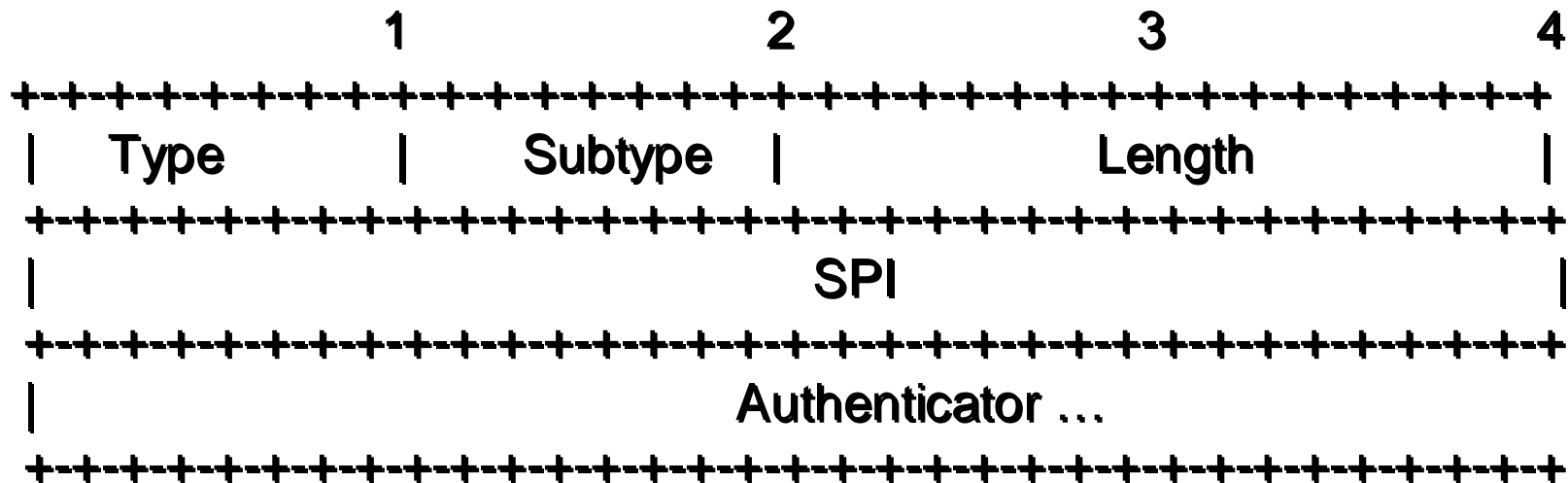


- Used by Mobile (MN) to determine if Zone change occurred.
- Extension to the Mobile IP IRDP message
- Reg-Type: Type of Registration Supported (Local, Indirect)
- Zone ID: A unique value used to identify the Zone (Realm?)
Can be extended with an additional field type of Zone ID type

Anchor Registration Extension



Authentication Extension



- Subtype
 - FA-AnchorFA
 - MN-AnchorFA

Local Registration (MN)

- Lifetime is set to the lesser of the remaining lifetime of the last global registration and the one advertised by this FA
- Currently only timestamp-based reply protection is supported (timestamp-based replay as specified in RFC 2002)
- CoA, Home Agent and Home Address are as in RFC 2002
- MN-AnchorFA AE (Authentication Extension) is mandatory and is used in place of MN-HA AE.
- Anchor Registration Extension is included before the MH-AnchorFA AE. The Reg_Type field is set to LOCAL_REG.

Local Registration (AnchorFA)

- Checks for Invalid Zone ID, Unsupported Reg Type, FA AE, MN AE, and previous Global registration.
- Registration Lifetime requested has to be less than the remaining global registration lifetime, otherwise the lifetime is field is updated to the remaining global registration lifetime.
- On successful registration the AnchorFA creates an appropriate tunnel to the CoA and sets up routing such that datagrams that arrive destined to this mobile from HA-AnchorFA tunnel is tunneled to the via the AnchorFA-FA tunnel.
- If reverse tunneling is set, then the datagrams that come from the FA-AnchorFA tunnel and generated by this mobile (source address of the Mobile) are tunneled to the HA.

Local Registration (FA)

- **Checks for Invalid Zone ID and Unsupported Reg Type.**
- **For Local Registration FA-AnchorFA AE is Mandatory. It is computed in place of the FA-HA AE.**
- **Sends the Registration Message to AnchorFA**
- **On receiving a successful Registration Reply from the AnchorFA, if the MN is using Foreign Agent CoA, the appropriate tunnel is created to the AnchorFA**

Indirect Registration (MN)

- **MN-HA AE is mandatory and AnchorFA-MN AE is optional**
- **Lifetime is chosen a recommended in RFC 2002.**
- **Both timestamp-based and nonce based reply protection is supported.**
- **Anchor Registration Extension is included before the MN-AnchorFA AE. The Reg_Type field is set to GLOBAL_INDIRECT_REG.**

Indirect Registration (FA/Anchor)

- **FA: Same as local Anchor**
- **Anchor FA: Processing similar to FA**
- **HA: Regular RFC 2002 processing**
- **Creates Tunnel between FA and Anchor FA**

Summary

- **Two enhancements to reduce the handoff latency in a wide area deployment**
- **Local and Global Indirect Registration**
- **Anchoring to reduce the latency**

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Comments and Suggestions

- **Local and Indirect Registration for Anchoring Handoffs**
 - **draft-dommety-mobileip-anchor-handoff-00.txt**

Comparison

- **Regionalized Tunnels**
- **New Draft**
- **Hawaii/THEMA and types**