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Design of an Operational Mobility Support Model in Next-Generation Mobile Internet

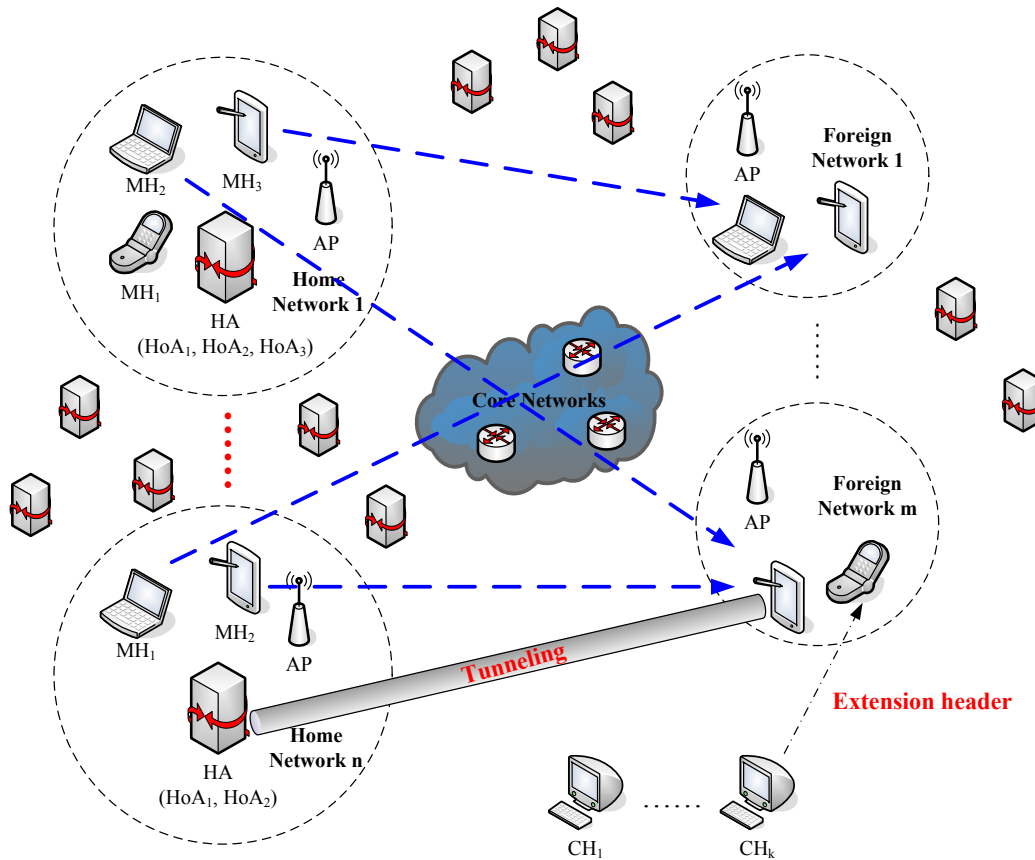
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1 Motivation



Enormous HAs are located discretely over the world, which makes them **unmanageable**, **lacks of business model** and is **hard for billing statistics**.

Due to the **selfish** nature of ARs, MH which moves to a new sub-network is hard to have its packets forwarded.

Extension header is used during the communication between the MH and CH.

Data packets received by the HA need to be **encapsulated** and **tunneled** to the MH.

2 Methodologies

ID/Locator split architecture has demonstrated its significant predominance in next-generation mobile networks.

Mobility Management



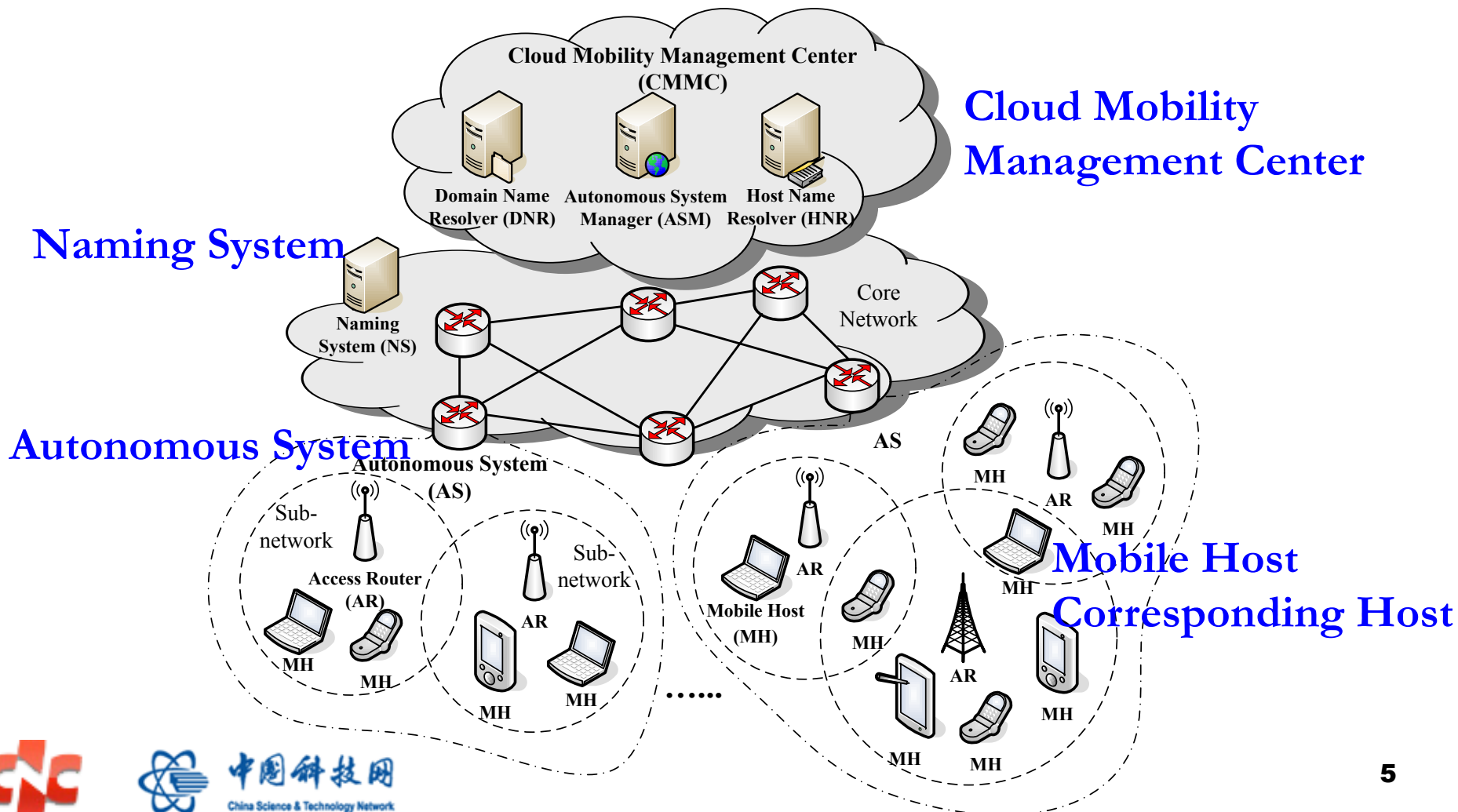
Cloud Computing is a promising technique for enabling ubiquitous, convenient, on-demand network access, particularly suitable for the case of increasingly large volume users and high computing capabilities.

Objective of this research

- ➡ Design a new **OPERATIONAL** mobility support model for next-generation mobile Internet based on the idea of Cloud Computing and ID/Locator split architecture.

3 Design of OMIPv6

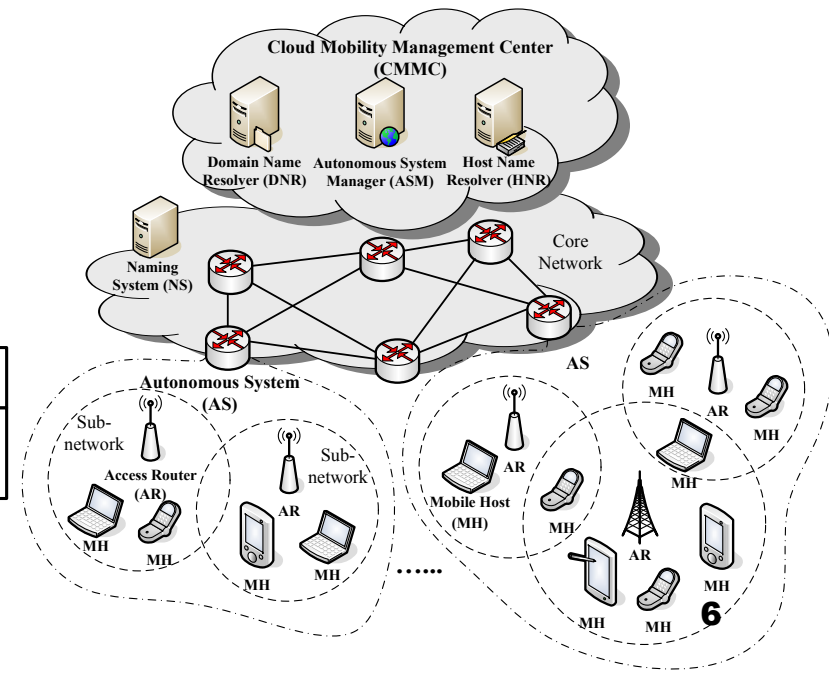
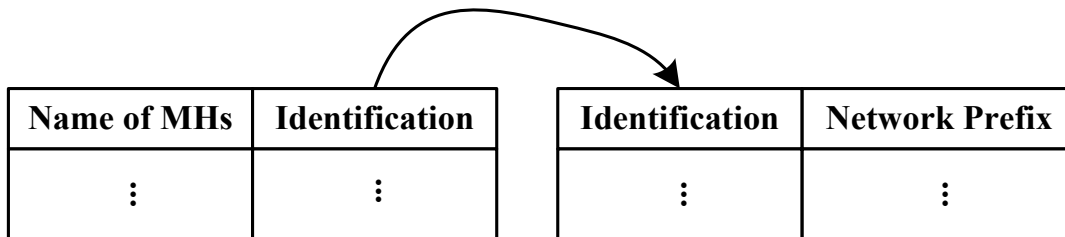
- The architecture of OMIPv6



3.1 The principles of OMIPv6

- Give each MH a name
- Register MH's information at the CMMC
- Update MH's information at the CMMC
- Acquire the information, e.g., address, of the MH from the CMMC and start data communication

The principles of the CMMC



3.2 The implementation of OMIPv6

- Functionality of CMMC
- Communication processes of OMIPv6 protocol

3.2.1 Cloud mobility management center (CMMC)

- The naming mechanism gives the host full name (HFN) to the MH, e.g., host@domain.
- The name resolution mechanism consists of

- Domain name resolver (DNR)

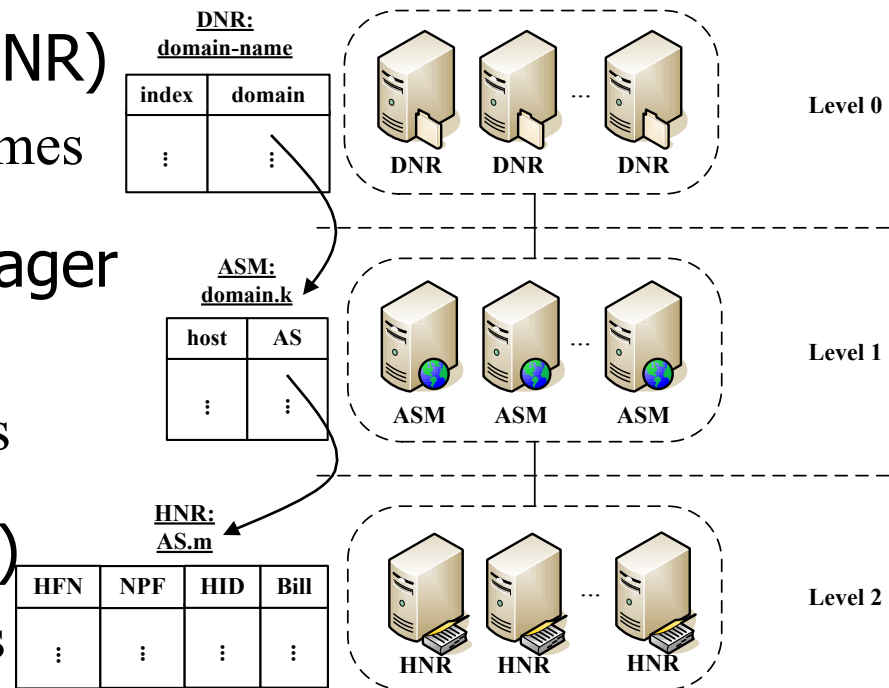
- maintaining the domain names

- Autonomous system manager (ASM)

- managing the sub-networks

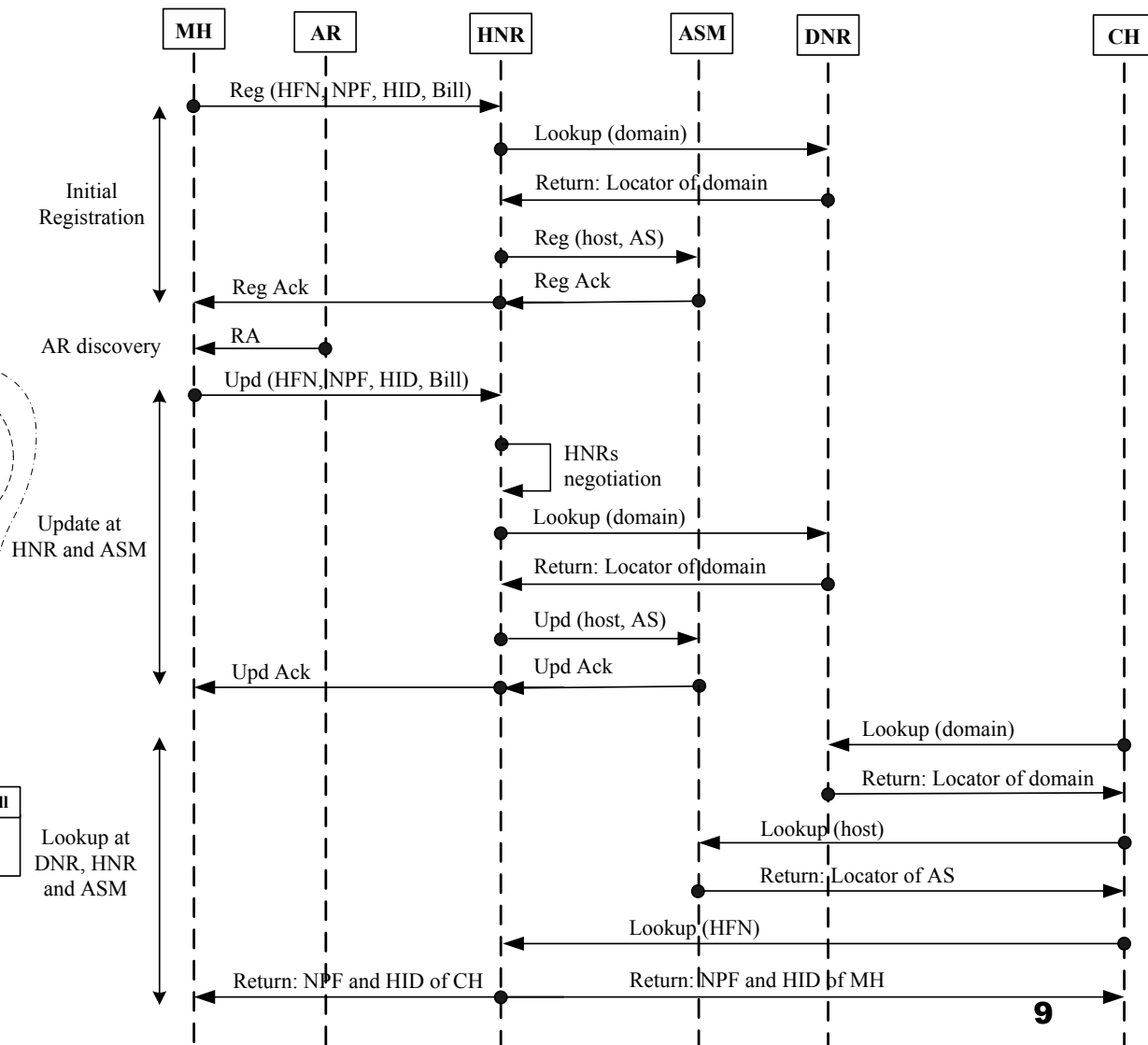
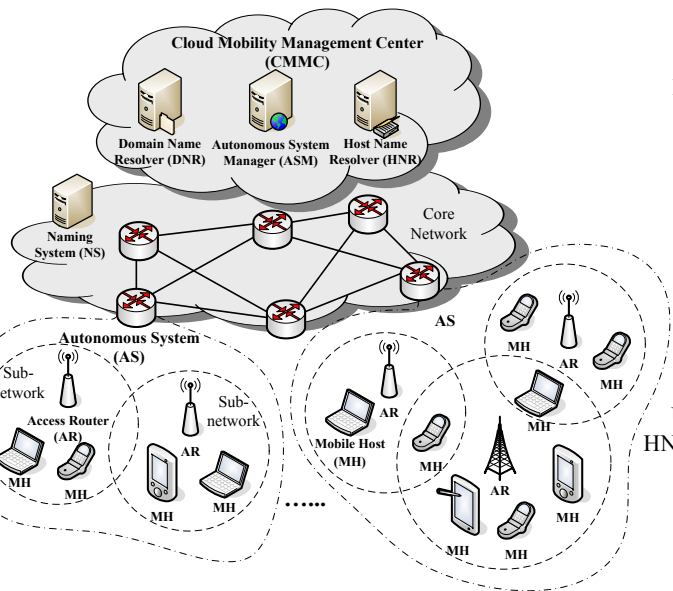
- Host name resolver (HNR)

- maintaining the host names

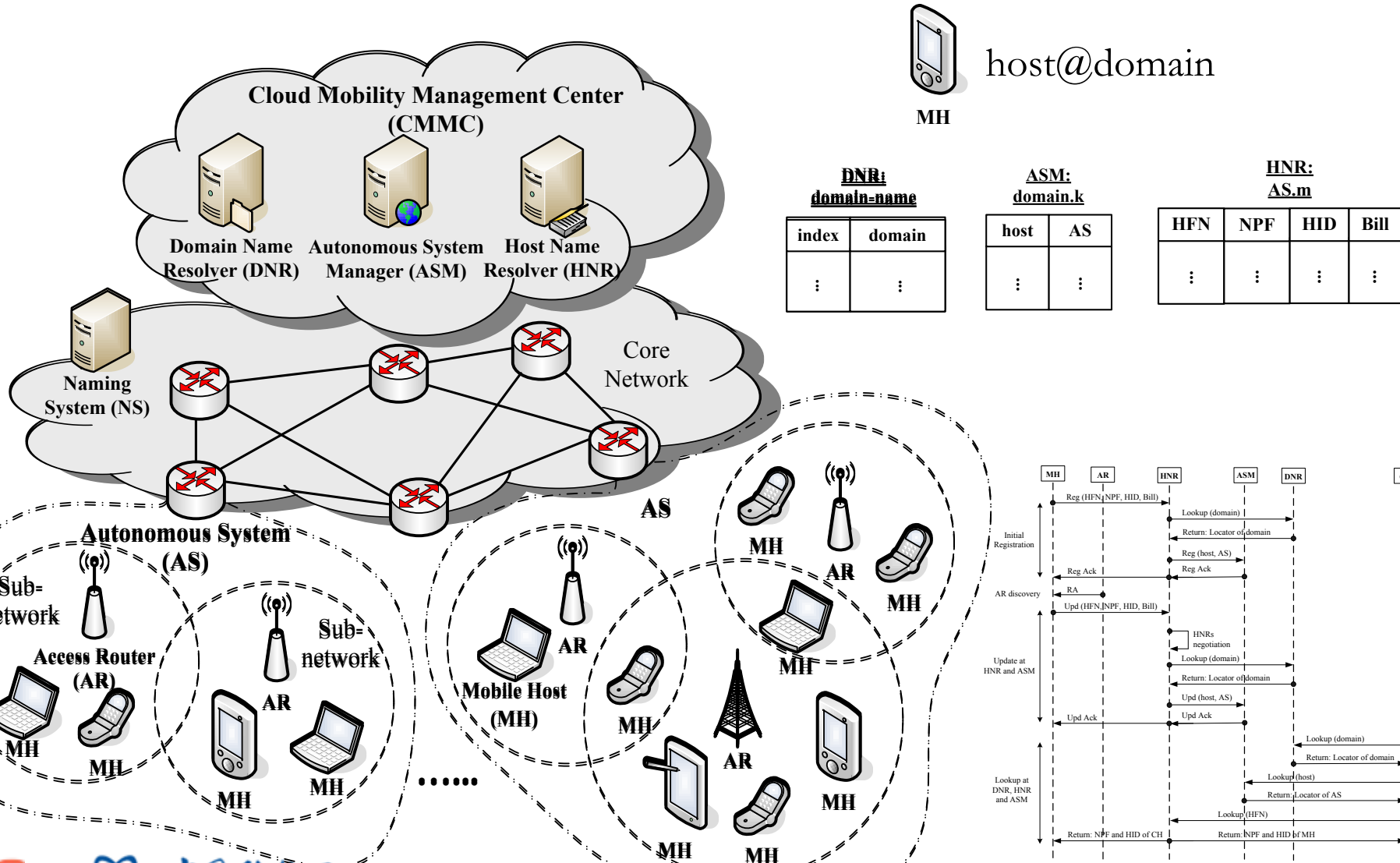


3.2.2 Operation process of OMIPv6

host@domain
MH

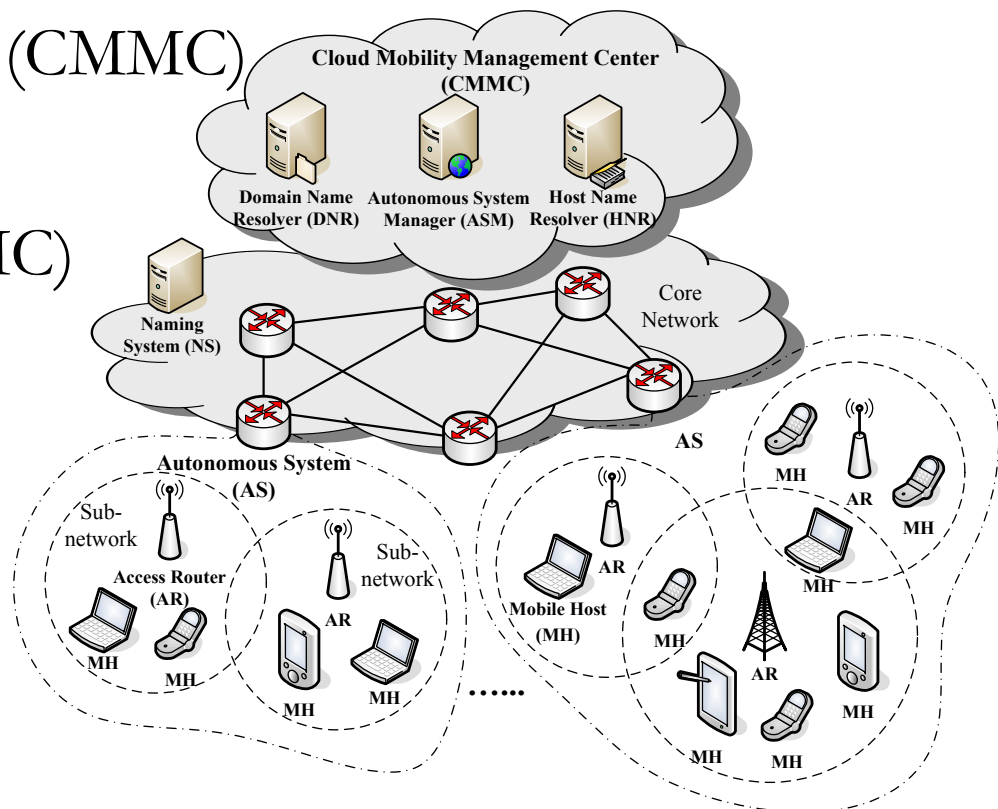
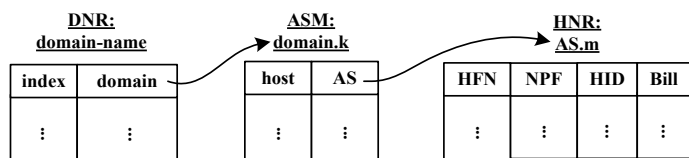


3.2.2 Operation process of OMIPv6



4. A Cost Model for OMIPv6

- **Total_Cost** = Query_Cost (CMMC)
- + Lookup_Cost (CMMC)
- + Registration_Cost (CMMC)
- + Packet_Delivery_Cost



- **Overheads** = 1 - Packet_Delivery_Cost / Total_Cost

5. Performance Analysis

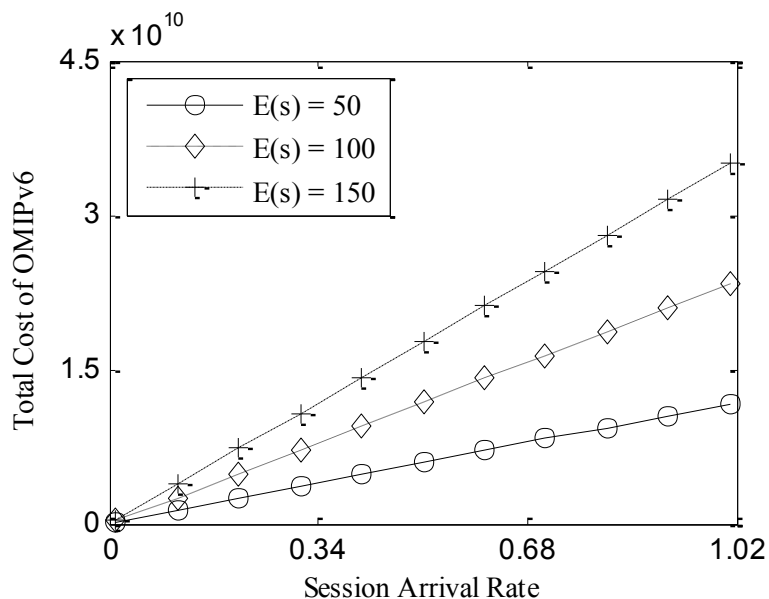


Figure 1: Total cost of OMIPv6 predicated by the cost analytical model with varying mean session length in packets

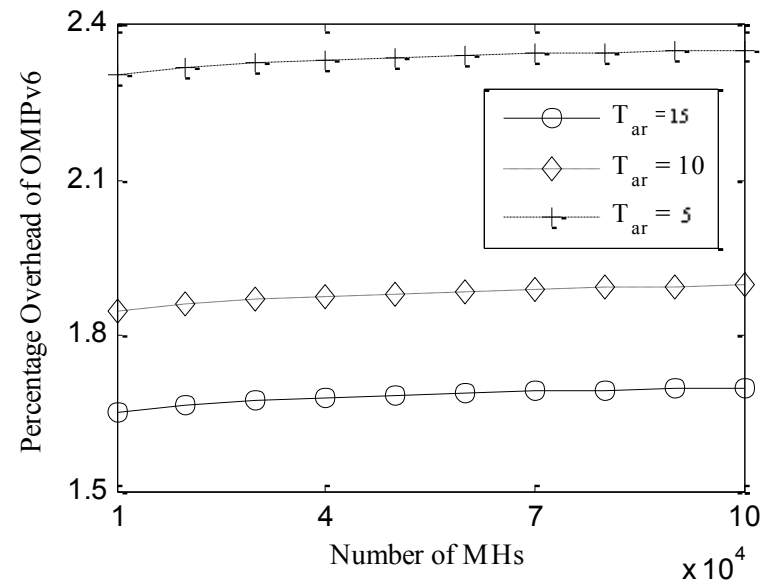


Figure 2: Percentage overhead of OMIPv6 predicated by the cost analytical model with varying subnet residence time

6. Conclusions

- This paper has developed a new **operational** mobility model over IPv6 (OMIPv6).
- The **cloud mobility management center** (CMMC) is adopted to be responsible for maintaining the ID and Locator mappings of mobile hosts, as well as providing the name resolution services to the mobile hosts.
- The CMMC has been designed in a **hierarchical manner** to relief the burden of domain-name resolvers, host-name resolvers, and autonomous system managers.
- An **analytical model** has been proposed to calculate all possible costs required for the operation of OMIPv6.
- The model has been adopted as a **cost-effective tool** to evaluate and analyse the performance of OMIPv6 protocol.

Thanks for your attention!

Questions?