HIP extensions for object to object communications <draft-lee-hip-object-01.txt>

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Scope

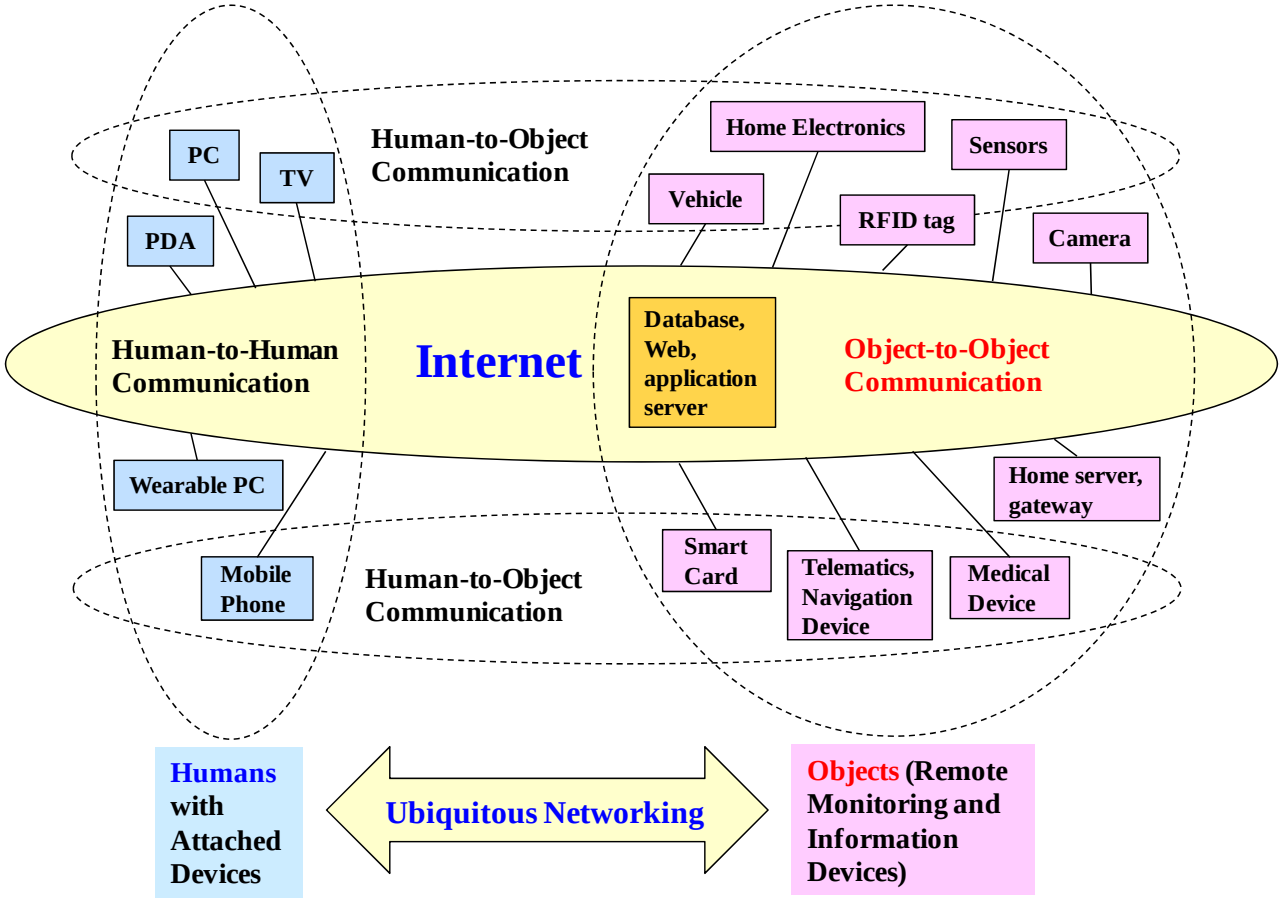
- **This document**
  - explains the concept of object to object communications and specifies naming and addressing issues for object identification.
  - provides the extended architecture of HIP according to mapping relationships between host and object(s) in order to use Host Identity Protocol (HIP) for object to object communications
  - packet formats and considerations for HIP extensions concerning object are specified.

Updates since -00 version

- **Author**
  - Seng Kyoun Jo from ETRI
- **ITU-T Draft Recommendations**
  - Newly start to develop recommendations for object-to-object communications (September 2008)
- **Minor updates from last meeting results**
  - Mapping/binding for communications between objects
    - Connecting to Anything
  - Common identifier
  - Specific user cases

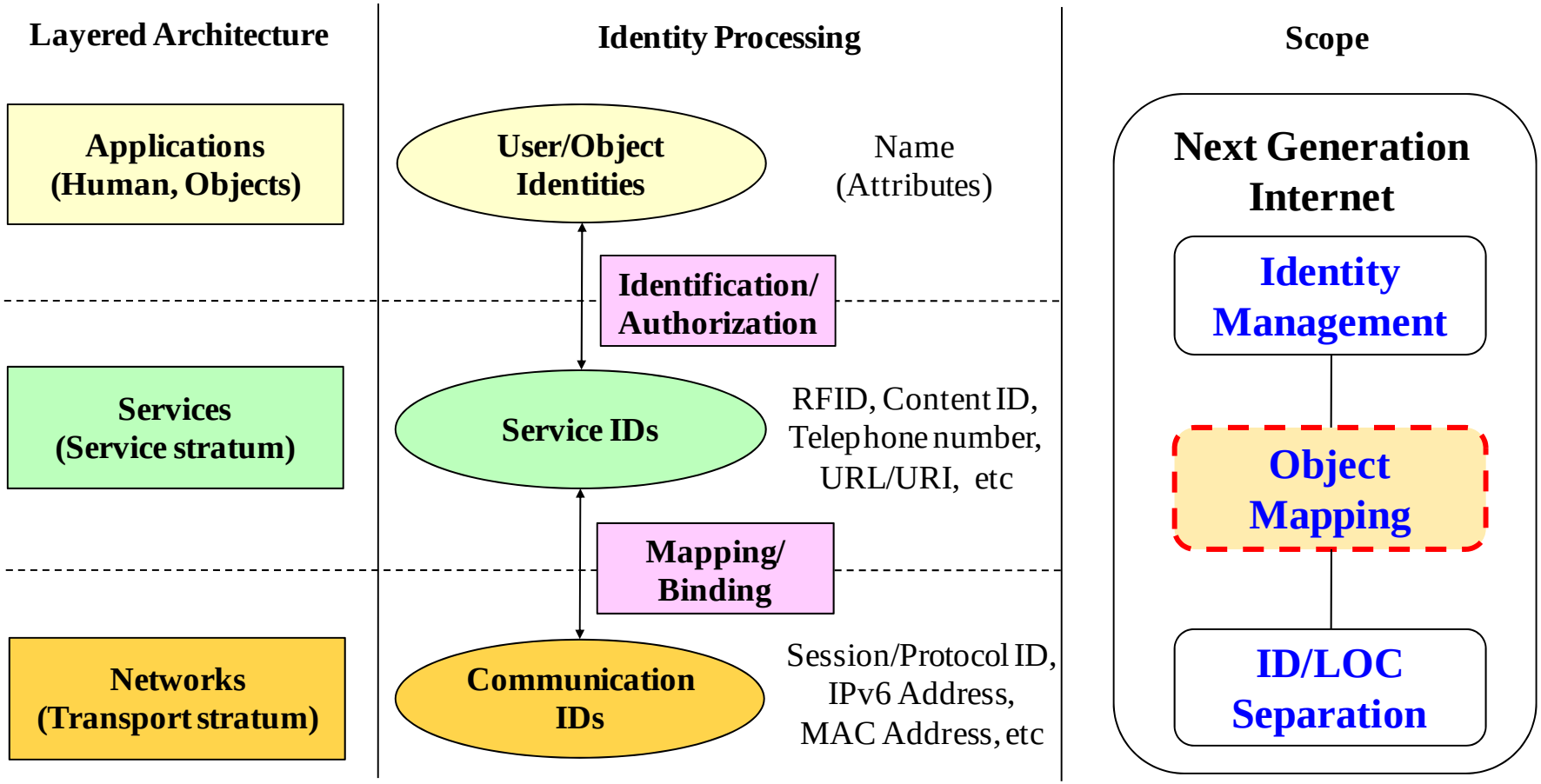
ITU-T Standardization Activities

❒ Y.NGN-UbiNet (Ubiquitous Networking)

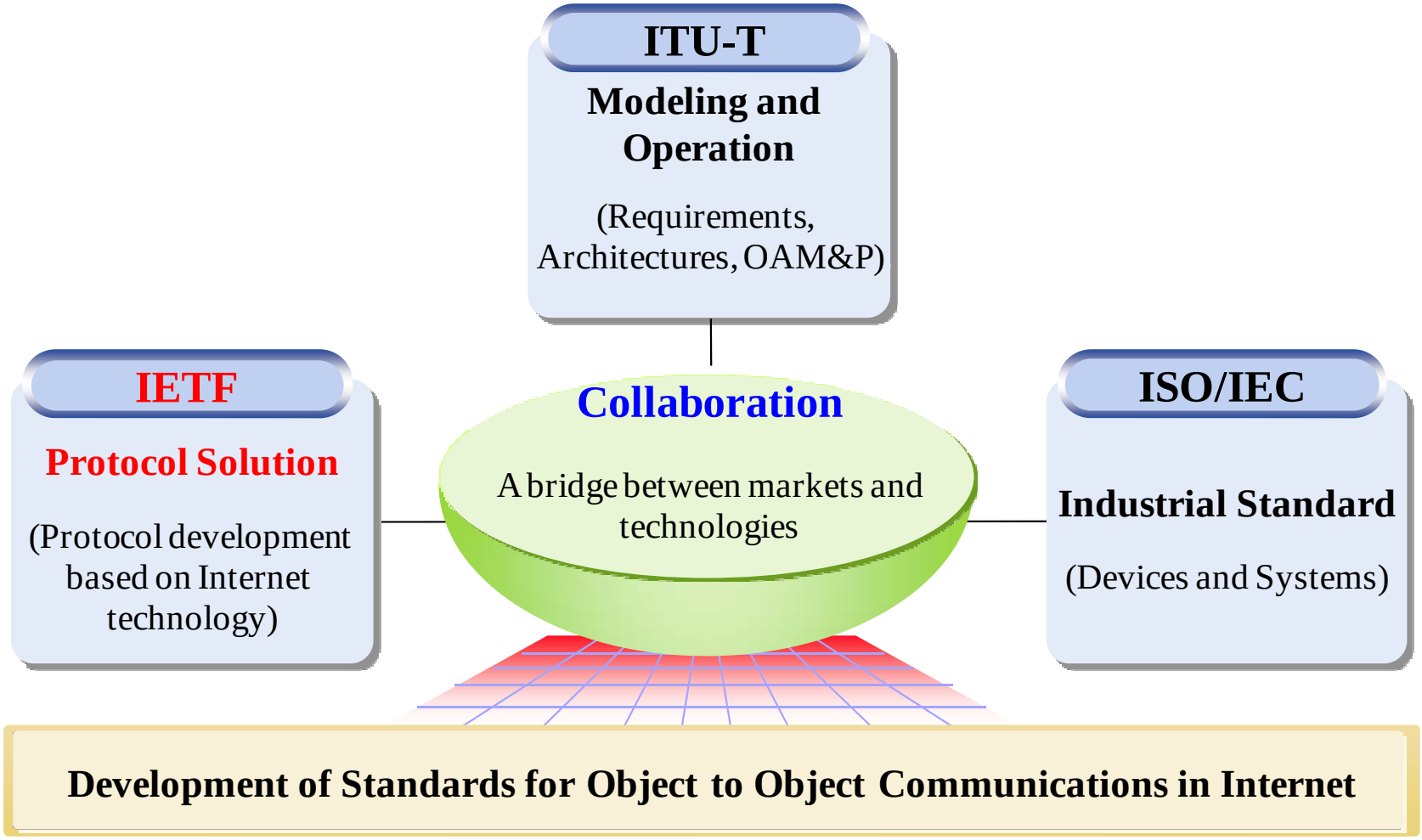


ITU-T Standardization Activities

❒ Y.ipv6-ID (object mapping)



Collaboration with other SDOs



Issues

- **Common identifier for object**
  - Most of identifiers for object specified with different format according to applications.
  - However, in order to contain information of all objects in HIP message and interoperate globally, it is required to specify common identifier and rules to accommodate all objects with unified format.
- **Some support from the existing infrastructure, including DNS, and HIP rendezvous server**
  - Define DNS resource records
    - Object identifiers, and object identity tags (OITs)

Proposals

- **Adopt as Research Group Item?**
  - Authors would like to propose this to become a research group item
    - The current idea already proposed to be used in ITU-T SG13
- **Next steps**
  - Feedbacks and comments are welcome
  - Request for contributors
    - Need your help
    - Need reviewers and great suggestions

Backup Slides (72nd meeting)

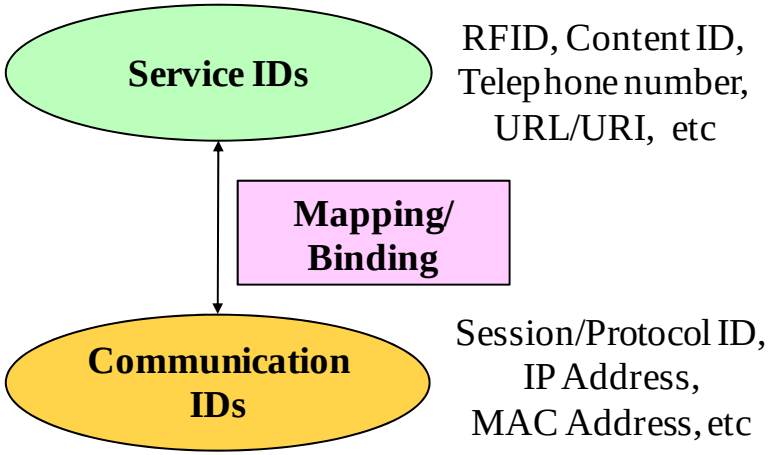
Object to object communications

- **New capabilities of future network**
  - Extension of networking functionalities to all objects
    - Ubiquitous networking
- **Object to object communications**
  - Many different kinds of devices connecting to the network
  - New concept of end points
    - not always humans but may be objects such as devices/machines, and then expanding to small objects and parts of objects
- **Problem statement**
  - There is no consideration for new type of objects (contents, RFID tags, sensors, etc) as end points
    - The concept of host should be extended to support all of objects

Requirement and objectives

Requirement

- Mapping/binding for naming and addressing



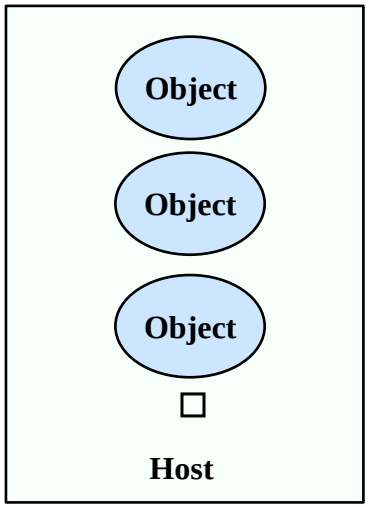
Objectives for protocol development

- Protection of object (including right management)
- Connecting to anything using object identification
- Service and location discovery

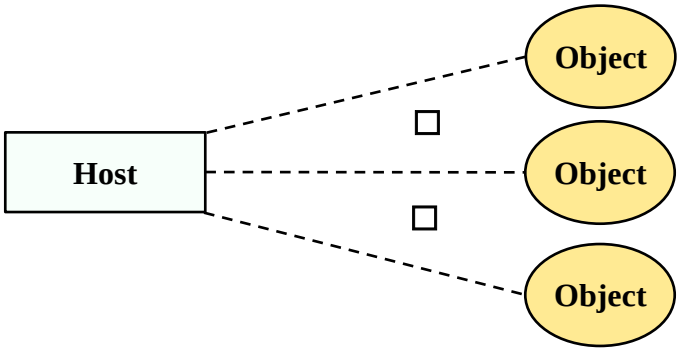
HIP architecture for object to object comm. – 1

❐ Mapping relationships between host and object(s)

- Host = object (one to one mapping)
  - Most of information devices such as PC, etc (telephone number)
- Host ≠ object(s) (one to many mapping)
  - Content server, RFID tags/Reader, etc (content ID, RFID code, etc)



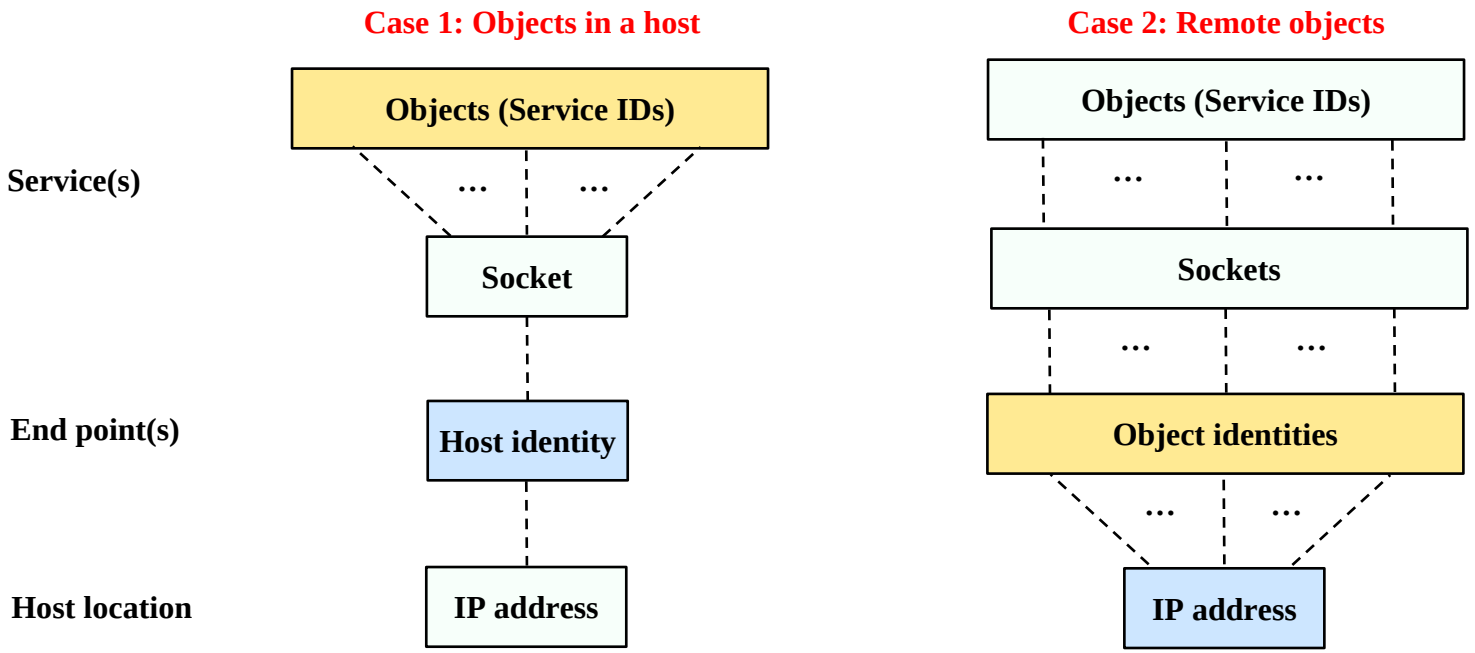
Host including objects



Host with remote objects

HIP architecture for object to object comm. – 2

- **Extension of stack architecture for one-to-many mapping**



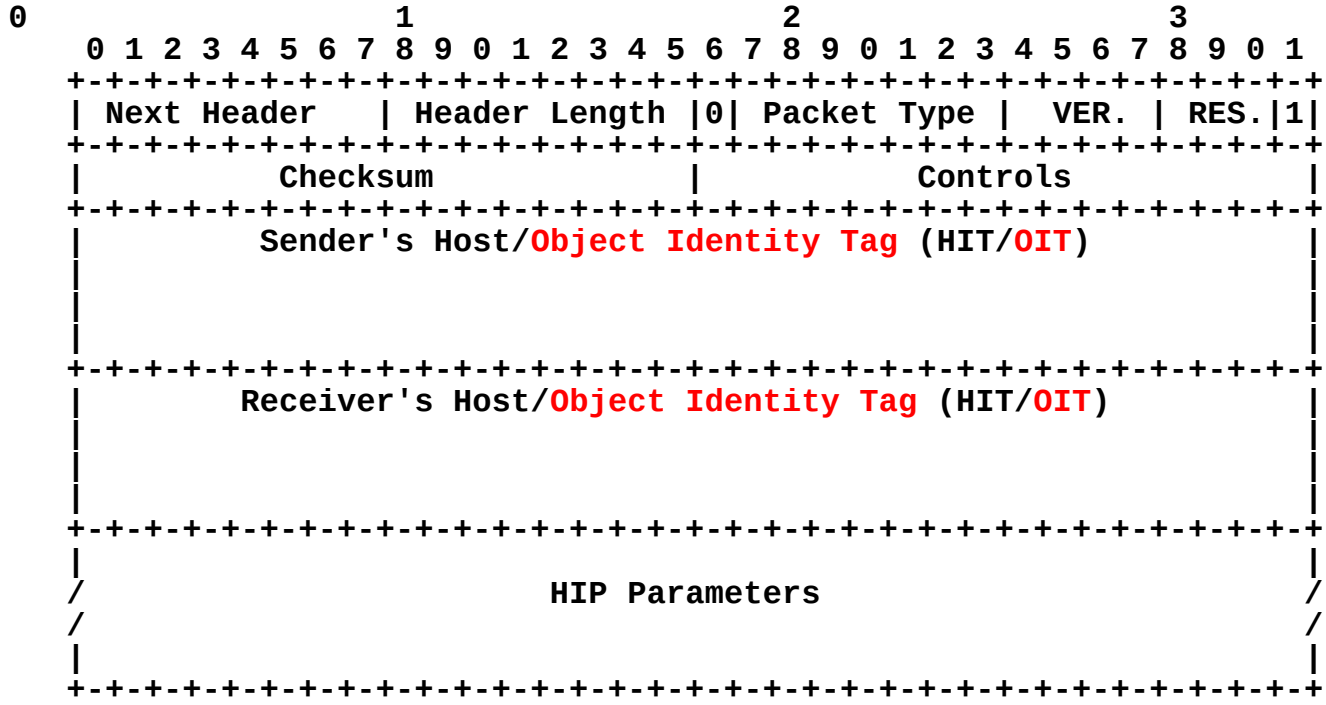
HIP extensions – 1

- **Case #1 (objects in a host)**
  - Mapping information between Host identity (HI) and Object identities (OIs)
  - HI + OI(s)
    - TLV
- **Case #2 (remote objects)**
  - Mapping information between IP address and Object identities
  - OI
    - OI typically identifies a services and can also identify end points
    - Object Identity Tag (OIT)

HIP extensions – 2

❒ Packet format

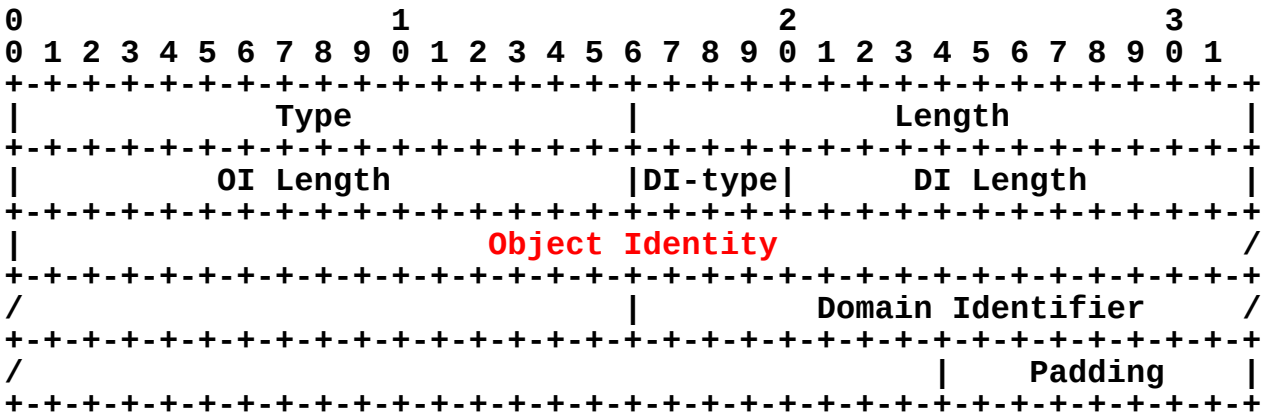
- HIP header (include OIT(object identity tag))



HIP extensions – 3

❒ Packet format

- New TLV: object_ID
  - Newly defined from HOST_ID of existing HIP
  - The Object Identity is generated from Service IDs defined for specific applications/services



Conclusion and future work

- **Proposal**
  - Include as the topic of HIP RG
- **I-D update**
  - Feedback and update of discussion results
  - Detailed considerations for HIP extensions
  - Collaboration with other HIP related experts