SNS COLLEGE OF TECHNOLOGY

Coimbatore-35
An Autonomous Institution

Department of Information Technology

Course Name – 19IT302 Internet of Things

III Year / V Semester

Unit 4 – IPv6 TECHNOLOGIES FOR THE IOT

Topic 6 - Correspondent Node Operation, HA Node Operation

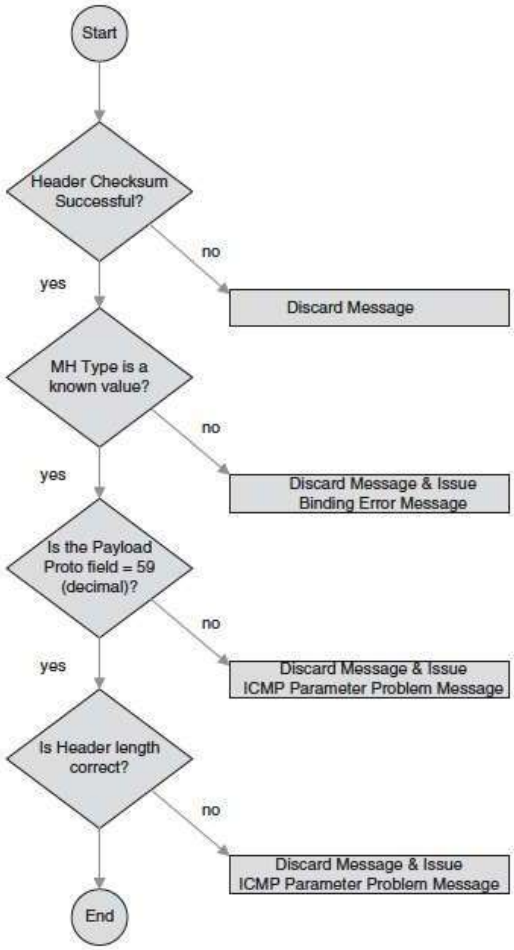
Correspondent Node Operation

CNs are required to support the following functionality:

- Processing mobility headers
- Packet processing
- Return-routability procedure
- Processing bindings
- Cache replacement policy

Correspondent Node Operation

Processing mobility headers



Correspondent Node Operation

Packet processing
Packet processing covers the following sub-activities:

- Receiving packets with home address option

- Sending packets to an MN
  - Before sending any packet, the sending node should examine its binding cache for an entry for the destination address to which the packet is being sent.
  - If, on the other hand, the sending node has no binding cache entry for the destination address to which the packet is being sent, the sending node simply sends the packet normally, with no routing header.

- Sending binding error messages

- Receiving ICMP error messages
  - When the CN has a binding cache entry for an MN, all traffic destined to the MN goes directly to the current CoA of the MN using a routing header.
  - On the other hand, if the CN has no binding cache entry for the MN, the packet will be routed through the MN's home link.

Correspondent Node Operation

Return-Routability Procedure

Action	Description
Receiving HoTi messages	Upon receiving a HoTi message, the CN verifies that the packet does not include a home address destination option. Any packet carrying a HoTi message that fails to satisfy all of these tests must be silently ignored. Otherwise, in preparation for sending the corresponding HoT message, the CN checks that it has the necessary material to engage in a return-routability procedure. The CN must have a secret Kcn and a nonce; it does not have this material yet, it must produce it before continuing with the return-routability procedure
Receiving care-of test init messages	Upon receiving a HoTi message, the CN verifies that the packet does not include a home address destination option. Any packet carrying a care-of test init message that fails to satisfy all of these tests must be silently ignored. Otherwise, in preparation for sending the corresponding care-of test message, the CN checks that it has the necessary material to engage in a return-routability procedure
Sending HoT messages	The CN creates a home keygen token and uses the current nonce index as the home nonce index; it then creates a HoT message and sends it to the MN at the latter's home address
Sending care-of test messages	The CN creates a care-of keygen token and uses the current nonce index as the care-of nonce index; it then creates a care-of test message and sends it to the MN at the latter's CoA

Correspondent Node Operation

Processing Bindings

- Receiving BU – To validate BU, ensure it contains Unicast routable home address, Sequence number of BU is greater than previous BU Seq.No
- Requests to cache a binding
- Requests to delete a binding
- Sending BA's – A BA may be sent to indicate receipt of a BU. If the node accepts the BU, the status field in the BA must be set to a value less than 128 otherwise status field is set to greater than or equal to 128
- Sending binding refresh requests (BRRs) - If a binding cache entry being deleted is still in active use when sending packets to an MN, then the next packet sent to the MN will be routed normally to the MN's home link. Communication with the MN continues, but the tunneling from the home network creates additional overhead and latency in delivering packets to the MN. If the sender is aware that the binding cache entry is still in active use, it may send a BRR message to the MN in an attempt to avoid this overhead and latency due to deleting and recreating the binding cache entry. This message is always sent to the home address of the MN.

Correspondent Node Operation

Cache Replacement Policy

- A node may maintain a separate timer for each entry in its binding cache.
- When creating or updating a binding cache entry in response to a received and accepted BU, the node sets the timer for this entry to the specified lifetime period;
- entries in a node's binding cache are deleted after the expiration of the lifetime specified in the BU from which the entry was created or last updated.
- A node may also opt to drop any entry already in its binding cache in order to make space for a new entry.

Home Agent Node Operation

HA operations entail the following functions:
Maintaining the binding cache and the HA list

Processing mobility headers

Processing bindings
- Primary CoA registration
- Primary CoA de-registration

Packet processing
- Intercepting packets for an MN
- Processing intercepted packets
- Multicast membership control
- Stateful Address autoconfiguration
- Handling reverse tunneled packets
- Protecting return-routability packets

Dynamic HAAD
Sending prefix information to the MN

THANK YOU