



# NEMO-LMA Heartbeat

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## Feature Information

### Summary Data

<b>Status</b>	New Feature
<b>Introduced-In Release</b>	21.2
<b>Modified-In Release(s)</b>	Not Applicable
<b>Applicable Product(s)</b>	P-GW
<b>Applicable Platform(s)</b>	ASR 5500
<b>Default Setting</b>	Disabled
<b>Related CDETS ID(s)</b>	CSCuw08182
<b>Related Changes in This Release</b>	NEMO PMIPv6 Heartbeat on LMA (SAEGW)
<b>Related Documentation</b>	Command Line Interface Reference P-GW Administration Guide SAEGW Administration Guide

### Revision History



#### Important

Revision history details are not provided for features introduced before release 21.2.

Revision Details	Release	Release Date
New in this release.	21.2	April 27, 2017

## Feature Description

Path management mechanism through Heartbeat messages between the Mobile Router (MR) and Network Mobility-Local Mobility Anchor (NEMO-LMA) is important to know the availability of the peers, to detect failures, quickly inform peers if recovery from the node fails and allow a peer to take appropriate action.

## How It Works

The MR and the LMA exchange Heartbeat messages at regular intervals to detect the status of availability between them. The NEMO-LMA initiates a Heartbeat exchange with the MR, by sending a Heartbeat Request message, to check if the MR is reachable. The NEMO-LMA records the sequence number of the last Heartbeat Request message and is used to match the corresponding Heartbeat Response. The NEMO-LMA responds to a Heartbeat Request message with a Heartbeat Response message, irrespective of whether there is PMIPv6 session with the corresponding peer.

### Binding Error

When the Binding Error message, with status set to 2, is received in response to a Heartbeat Request message, the NEMO-LMA does not use Heartbeat messages further with the corresponding peer.

### Failure Detection

When the LMA node does not receive the Heartbeat response for the configurable parameter **max-heartbeat-retransmission** *<value>* **exceed-action drop-session**, the NEMO-LMA concludes that the peer is not reachable. As such, the Heartbeat request to the peer is stopped and clears the NEMO-LMA session without any traps.

### Restart Detection

If the restart counter value is different from the previous received value, then it assumes that the peer had crashed and recovered. And so, the existing NEMO-LMA sessions are cleared.

## License Requirements

Use of NEMO requires that a valid license key be installed. Contact your Cisco account or Support representative for information on how to obtain a license.

## Configuring NEMO-LMA Heartbeat

Use the following commands under LMA Service Configuration Mode to clear NEMO-LMA sessions without generating traps:

```

configure
  context context_name
    lma-service service_name
      heartbeat retransmission max number [ exceed-action drop-session ]
    end

```

**Notes:**

- **retransmission max**: The maximum number of heartbeat retransmissions allowed. The *number* must be an integer from 0 to 15. Default: 3
- **exceed-action**: Specifies the action to be taken after the maximum number of Heartbeat retransmissions is reached.
- **drop-session**: Used for dropping the session when path failure is detected.
- The **exceed-action** and **drop-session** keywords are valid only for NEMO-LMA sessions and takes effect if the Heartbeat feature is enabled.

## Monitoring and Troubleshooting the NEMO-LMA Heartbeat

The following sections describe commands available to monitor and troubleshoot the feature.

### monitor protocol

When using the **monitor protocol** command, enable option **48** to monitor the Heartbeat Request/Reply messages.

### show lma-service statistics

Use this command to see the statistics related to Heartbeat messages. The output generated appears similar to the following:

```

Total Disconnects:          1
  Lifetime expiry:         0
  Admin Drops:             0
  Other Reasons:           0
Deregistrations:          0
Path Failure Drops:       1

```

### show session disconnect-reasons

Use this command to see the call disconnected due to heartbeat path failure. The output generated appears similar to the following:

```

mme-guti_realloc_failed-detach(615)      0      0.00000
mme-pcscf-rest-detach(616)              0      0.00000
Reject-ho-old-tun-path-failure(617)      0      0.00000
mip-path-failure(618)                   0      0.00000

```

## Bulk Statistics

### LMA Schema

The following new bulk statistics variable is added to the LMA schema in support of this feature:

- `lma-pathfailsessionscleared` – If any path failures/restarted counter value changes for the NEMO-LMA Heartbeat feature, the sessions disconnection counter is incremented.