

IPNE Service

With Release 18, the MME supports IP Network Enabler (IPNE).

Important This feature, with its CLI commands, counters, and statistics, are all under development for future use and the information listed here is recommended for testing and lab use only. When the feature is ready for deployment then additional information will be added to this chapter.

- Feature Description, on page 1
- How It Works, on page 2
- Configuring MME Use of IPNE, on page 2
- Monitoring and Troubleshooting the IPNE Service, on page 3

Feature Description

IP Network Enabler (IPNE) is a Mobile and IP Network Enabler (MINE) client component that collects and distributes session and network information to MINE servers. The MINE cloud service provides a central portal for wireless operators and partners to share and exchange session and network information to realize intelligent services.

The information is shared between the MINE server and IPNE service in the form of XML data. The core object in the IPNE service is the XMPP protocol engine. There is one XMPP protocol engine instance for each configured MINE server peer. The engine implements the XMPP protocol using FSM.

All information that is shared is derived from the context at that instance in time. An IPNE service level scheduler is also implemented to rate-control the feed and notification activities on all the handles to avoid overload which would affect call processing and data path performance.

With support of the IPNE interface and IPNE Service, the MME is able to export the following information to the CSB (Cisco Service Bus):

- UE Location Information
- UE Mobility Information

The ability to export to the CSB makes it possible for operators to design and/or implement solutions and services for network optimization, congestion, troubleshooting and monetization with the information exported from the MME.

IPNE is a licensed Cisco feature. Contact your Cisco account representative for information on licensing requirements. For information on installing and verifying licenses, refer to the *Managing License Keys* section in the *System Administration Guide.*

How It Works

IPNE

When the MME service is associated with an IPNE service, then the MME service communicates with the IPNE service through the Session Manager over a SINE interface. The IPNE service communicates with CSB over XMPP protocol.

Information is exchanged between the modules in the form of clp handles. For each session one IPNE handle is created.

Configuring MME Use of IPNE

There are multiple components that need to be configured to enable the MME to utilize the IPNE service:

- IPNE service
- IPNE endpoint
- association with MME service

Configuring IPNE Service

The IPNE service is a separate service configuration.



Important We recommend that you configure the IPNE service in the same context in which the MME service has been configured.

```
config
   context context_name
     ipne-service ipne_svce_name
     end
```

Notes:

- *ipne_service* - Enter 1 to 63 alphanumeric characters to create a *unique* IPNE service name within the context and to enter the IPNE Service configuration mode. Entering the mode provides access to the commands, such as **ipne-endpoint**, needed to configure the IPNE service parameters.
- **no** - As a prefix of the command disables the feature when it has been enabled with this command and removes the IPNE service definition from the MME's configuration. If an IPNE service is to be removed and the service has actives handles, then the handles are deleted using a timer-based approach and then the IPNE service is removed.

Configuring the IPNE Endpoint

After the IPNE service is created, the IPNE endpoint definition should be added to the configuration. An IPNE endpoint is a combination of a local IP address, a peer address and, optionally, a port. Entering the **ipne-endpoint** command also provides access to the commands in the IPNE Endpoint configuration mode that are used to define the operational parameters required by the endpoint.

```
config
  context context_name
    ipne-service ipne_svce_name
      ipne-endpoint
        bind { ipv4-address | ipv6 address } ip_address
        peer { ipv4-address | ipv6 address } ip_address
        end
        no { bind | peer }
```

Notes:

- **{ ipv4-address | ipv6-address }** *ip_address*: Identify the type of IP address - either IPv4 or IPv6 - and then enter either an IPv4 dotted-decimal or an IPv6 colon-separated hexadecimal notation.
- As part of the **bind** command, the IP address identifies the IPNE client socket as the local address.
- As part of the **peer** command, the IP address identifies the MINE server as the peer address.
- **no** - Include as a prefix of either the **bind** or **peer** command to remove the bind address or the peer address from the IPNE endpoint configuration.

Configuring the Association with MME Service

A special **ipne-service** keyword has been added to the **associate** CLI to associate the created IPNE service with the MME service:

```
configure
  context context_name
    mme-service mme_srvc_name
      associate ipne-service ipne_srvc_name
      no associate ipne-service
      end
```

Notes:

- *ipne_srvc_name* - Enter 1 to 63 alphanumeric characters to identify the *unique* IPNE service name that is within the same context as the MME service configuration.
- **no**- Include as a prefix of the command to disassociate the IPNE service definition from the MMEs service configuration.

Monitoring and Troubleshooting the IPNE Service

Show Command(s) and/or Outputs

This section provides information regarding show commands and/or their outputs in support of using the IPNE service on the MME.

show ipne peers { all | service | summary }

This command generates a display of information for the IPNE service(s) and the TCP connection status for associated Session Manager(s). The following are sample displays:

```
show ipne peers all
SESSMGR :  1
Service Name: ipne-service         Contex id: 3
Version : n/a
Local Address  : 192.168.120.1:45161
Peer Address : 192.168.120.7:5222    State : [OPEN 0/1] [TCP]
```

```
show ipne peers summary
Service Name: ipne-service Contex id: 3
Version : n/a
Local Address : 192.168.120.1:45161
Peer Address : 192.168.120.7:5222 State : [OPEN 144/144] [TCP]
```

Notes:

- **all** - Lists all of the peers of each IPNE service and the state of the TCP connections for every SessMgr. This command with **all** option is part of the support details (SSD) procedure.
- **service** - Requires the inclusion of an IPNE service name and displays information only for that service.
- **summary** - Generates a display similar to the **all** display but provides only summary TCP connection information for the SessMgrs.

show ipne statistics { all | service | summary }

This command generates a display of information regarding the number of IPNE handles of each IPNE service and count information for query/response/subscription/feed messages for the SessMgrs. The command generates a display similar to the following:

```
show ipne statistics all
SESSMGR :  1
Service Name: ipne-service         Context id: 3
Total handles: 0
Local Address  : 192.168.120.1:0
Peer Address : 192.168.120.7:5222
Total query          : 0
Total query response : 0            Success : 0            Failure : 0
Total update         : 0
Total update response: 0            Success : 0            Failure : 0
Total subscription   : 0            Add     : 0            Delete  : 0
Total feed           : 0            Add     : 0            Delete  : 0
Total notification   : 0
Total XML parser error: 0
IPNE messages discarded on tx queue:
Total discards       : 0
 Total Feed           : 0            Notify  : 0            Response :0
```

```
show ipne statistics summary
 Service Name: ipne-service Context id: 3
 Total handles: 0
 Local Address : 192.168.120.1:0
 Peer Address : 192.168.120.7:5222
 Total query : 0
 Total query response : 0      Success : 0      Failure : 0
 Total update : 0
 Total update response: 0      Success : 0      Failure : 0
 Total subscription : 0        Add : 0          Delete : 0
 Total feed : 0                Add : 0          Delete : 0
 Total notification : 0
 Total XML parser error: 0
```

```
IPNE messages discarded on tx queue:
Total discards : 0
Total Feed : 0      Notify : 0      Response : 0
```

Notes:

- **all** - Lists all of the peers of each IPNE service and the state of the TCP connections for every SessMgr. This command with the **all** option is part of support details (SSD) procedure.
- **service** - Requires the inclusion of an IPNE service name and displays information only for that service.
- **summary** - Generates a display similar to the **all** display but provides only summary TCP connection information for the SessMgrs.

show bulkstats variables mme

Entering this command causes the system to display all of the bulk statistic variables in the MME schema. The 6 bulk statistic variables listed below have been added to the MME schema to enable the operator to track messaging related to IPNE-paging. For descriptions of the bulk statistic variables, refer to the *Statistics and Counters Reference* for StarOS Release 18 or higher.

- signaling-ipne-paging-init-events-attempted
- signaling-ipne-paging-init-events-success
- signaling-ipne-paging-init-events-failures
- signaling-ipne-paging-last-enb-success
- signaling-ipne-paging-last-tai-success
- signaling-ipne-paging-tai-list-success