DNS Client KPI Enhancement

- Feature Summary and Revision History, on page 1
- Feature Description, on page 2
- Monitoring and Troubleshooting, on page 2

Feature Summary and Revision History

Feature Summary

Applicable Product or Functional Area	P-GW
Applicable Platforms	• ASR 5500 • VPC-DI • VPC-SI
Feature Default	Disabled - Configuration Required
Related Changes in This Release	Not Applicable
Related Documentation	• *Command Line Interface Reference* • *P-GW Administration Guide* • *Statistics and Counters Reference*

Revision History

Revision Details	Release
P-GW supports P-CSCF FQDN received over S6B interface.	21.25.4
First introduced.	21.25

Feature Description

The DNS client supports KPIs for PDN connections. The KPI tracks the number of attempts and failures for DNS queries. This enhancement considers P-CSCF as the network function. P-CSCF maintains the counters and statistics for all successful and failed DNS queries that occur during FQDN resolution. The supported show commands are used to check the details of the DNS KPIs and statistics of the P-CSCF network function. As part of this StarOS 21.25.4 release, support for P-CSCF FQDN received over S6b interface is added.

The rate limit is related to the Time to Live (TTL) value from the DNS server. All responses from the DNS server contain the server TTL value. If the server TTL value is 60 seconds lesser than the honor-low-ttl value configuration, the server TTL value is set to the configured honor-low-ttl value. However, if the server TTL value is less than the configured honor-low-ttl value, there is no change in the configured honor-low-ttl.

When the DNS server reaches the rate limit, all pending FQDN responses contain the default TTL value (60 seconds) as defined in the boxer configuration.

Monitoring and Troubleshooting

This section provides information to monitor and troubleshoot this feature using show commands and bulk statistics.

Show Commands and Outputs

This section provides information about the show commands and outputs for the various DNS statistics for the P-CSCF network function configured under emergency APN.

show dns-client statistics dns-query NF P-CSCF apn name *apn-name*

Table 1: show dns-client statistics dns-query NF P-CSCF apn name <apn-name> Command Output Descriptions

Field	Description
Total Queries Sent	The total number of queries.
Success Queries	The total number of attempted and successful DNS queries of a specific type.
Success Positive Cache Queries	The total number of successful queries from the DNS cache.
Domain Not Found	The total number of queries where the domain name is not found.
Query Timeouts	The total number of queries that timed out.
Socket Related Error	The total number of queries when the DNS Client encounters a socket.
Unable to Connect	The total number of unsuccessful queries when unable to connect to the DNS server.
Cache Corrupted	The total number of unsuccessful queries due to cache corruption.

Field	Description
Other Failures	The total number of queries failed due to other failure reasons.

Use the following command to clear the DNS statistics for P-CSCF network function, which is configured under emergency APN:

clear dns-query NF P-CSCF apn name *apn-name*

show dns-client statistics dns-query NF P-CSCF apn all

Table 2: show dns-client statistics dns-query NF P-CSCF apn all Command Output Descriptions

Field	Description
Total Queries Sent	The total number of queries.
Success Queries	The total number of attempted and successful DNS queries of a specific type.
Success Positive Cache Queries	The total number of successful queries from the DNS cache.
Domain Not Found	The total number of queries where the domain name is not found.
Query Timeouts	The total number of queries that timed out.
Socket Related Error	The total number of queries when the DNS Client encounters a socket.
Unable to Connect	The total number of unsuccessful queries when unable to connect to the DNS server.
Cache Corrupted	The total number of unsuccessful queries due to cache corruption.
Other Failures	The total number of queries failed due to other failure reasons..

Use the following command to clear the DNS statistics for P-CSCF network function, which is configured under emergency APN:

clear dns-query NF P-CSCF apn all

show dns-client log fqdn-limit-logs client *client-name*

The rate limit is related to the number of FQDNs configured through the following CLI:

cache honor-low-ttl *value* **fqdns-per-sec** *value*

Use the following command to check the details of the DNS client rate limit logging. This command shows the timestamp when the FQDN limit is reached.

show dns-client log fqdn-limit-logs client *client-name*

The following is a sample output of the command:

```
[ISP1]laas-setup# show dns-client logs fqdn-limit-logs client PGW_DNS
TimeStamp               FQDN Limit Details

Wed 2021-09-08 01:57:01 FQDN limit reached for DNS Server low ttl value
Wed 2021-09-08 02:01:17 FQDN limit cleared for DNS Server low ttl value
Wed 2021-09-08 02:01:17 FQDN limit reached for DNS Server low ttl value
Wed 2021-09-08 02:04:12 FQDN limit cleared for DNS Server low ttl value
Wed 2021-09-08 02:04:12 FQDN limit reached for DNS Server low ttl value
Wed 2021-09-08 02:06:44 FQDN limit cleared for DNS Server low ttl value
Wed 2021-09-08 02:14:15 FQDN limit reached for DNS Server low ttl value
[ISP1]laas-setup#
```

Use the following command to clear the details of the DNS client rate limit logging:

clear dns-client *client_name* log fqdn-limit logs

Bulk Statistics

The APN schema supports the following bulk statistics.

Table 3: Bulk Statistics Variables in the APN Schema

Bulk Statistics	Description
dns-nf-pcscf-total-queries-sent	The total number of queries sent.
dns-nf-pcscf-success-queries	The total number of successful queries from the DNS server.
dns-nf-pcscf-success-positive-cache-queries	The total number of queries from the DNS cache.
dns-nf-pcscf-domain-not-found	The total number of P-CSCF domain not found in the DNS server.
dns-nf-pcscf-query-timeouts	The total number of queries when the DNS server is not reachable.
dns-nf-pcscf-socket-errors	The total number of queries when the DNS server encounters socket error.
dns-nf-pcscf-unable-to-connect	The total number unsuccessful queries when unable to connect to the DNS server.
dns-nf-pcscf-cache-corrupted	The total number of unsuccessful queries on the DNS server due to cache corruption.
dns-nf-pcscf-other_failures	The total number of queries on the DNS server due to other failures.