Caching DNS Metrics

These Caching DNS metric elements are available in the dashboard:

DNS Queries Type

The DNS Queries Type dashboard element rendered as a line chart traces the number queries by type. The chart is available if you choose **Caching DNS Metrics: DNS Queries Type** in the Chart Selection list.

The resulting line chart plots the following trends:

- **A**—Number of A queries received.
- **AAAA**—Number of AAAA queries received.
- **CNAME**—Number of CNAME queries received.

How to Interpret the Data

This chart shows the number of incoming queries of type A, AAAA, CNAME, PTR, and others.

DNS Queries Responses

The CDNS Query Responses dashboard element rendered as line chart shows the number of responses with NOERROR, NODOMAIN, No Data, Other Errors, Secure, and Unsecure return codes. The display is available if you choose **Caching DNS Metrics: DNS Queries Responses** in the Chart Selection list.

The resulting line chart plots the following trends:

- **NOERROR**—Number of answers from cache or recursion that result in rcode of NOERROR being returned to client.

- **NXDOMAIN**—Number of answers from cache or recursion that result in rcode of NXDOMAIN being returned to client.
- **NODATA**—Number of answers that result in pseudo rcode of NODATA being returned to client.
- **Other Errors**—Other errors.
- **Secure**—Number of answers that correctly validated.
- **Unsecure**—Number of answers that did not correctly validate.

How to Interpret the Data

This chart shows the following:

- The number of answers to queries, from cache or from recursion, that had the return code NXDOMAIN.
- The number of answers to queries that had the pseudo return code NODATA. This means the actual return code was NOERROR, but additionally, no data was carried in the answer (making what is called a NOERROR/NODATA answer). These queries are also included in the NOERROR number. Common for AAAA lookups when an A record exists, and no AAAA.
- Number of answers that were secure. The answer validated correctly. The AD bit might have been set in some of these answers, where the client signalled (with DO or AD bit in the query) that they were ready to accept the AD bit in the answer.
- Number of answers that did not correctly validate.

In a normal scenario, NOERROR is the successful response code.

Troubleshooting Based on the Results

Check the CDNS server configuration if the errors are increasing.

DNS Incoming Queries

The CDNS Incoming queries by dashboard element rendered as a line chart traces the TCP, IPv6, DNSSSEC, EDNS and Total queries. The chart is available if you choose **Caching DNS Metrics: DNS Incoming Queries** in the Chart Selection list.

The resulting line chart plots the following trends:

- **TCP**—Total number of queries received over TCP by the CDNS Server.
- **IPv6**—Total number of queries received over IPv6 by the CDNS Server.
- **EDNS**—Number of queries with EDNS OPT RR present.
- **DNSSec**—Number of queries with EDNS OPT RR with DO (DNSSEC OK) bit set.
- **Total**—Total number of queries received by the CDNS Server.

How to Interpret the Data

This chart shows the number of queries that were made using TCP, IPv6, and DNSSEC towards the CDNS server, number of queries that had an EDNS OPT record present, and the total number of queries received.

DNS Recursive Query Time

The CDNS Queries by Type dashboard element rendered as a line chart traces the average time to complete a recursive query and the median time to complete a query. The table is available if you choose **Caching DNS Metrics: DNS Recursive Query Time** in the Chart Selection list.

The resulting line chart plots the following trends:

- **Average**—The average time to complete a recursive query.
- **Median**—The median time to complete a recursive query.

How to Interpret the Data

Average indicates the time the server took to answer queries that needed recursive processing. Note that the queries that were answered from the cache are not in this average.

Median time indicates the median of the time the server took to answer the queries that needed recursive processing. The median means that 50% of the user queries were answered in less than this time. Because of big outliers (usually queries to non responsive servers), the average can be bigger than the median.

Troubleshooting Based on the Results

Check the connectivity and configuration for the name servers as forwarders or exception lists for the increasing values of the average and median time.

DNS Caching

The DNS Caching dashboard element rendered as a line chart traces the cache hits and cache misses. The chart is available if you choose **Caching DNS Metrics: DNS Caching** in the Chart Selection list.

The resulting line chart plots the following trends:

- **Cache Hits**—The total number of queries that were answered from cache.
- **Cache Misses**—The total number of queries that were not found in the cache.

How to Interpret the Data

This chart indicates the number of queries that were successfully answered using a cache lookup against the number of queries that needed recursive processing.

Troubleshooting Based on the Results

If the cache misses are increasing exponentially, check the CDNS logs for errors. Increasing rates of cache misses can indicate that not enough space is available in memory to store the cached queries for more efficient responses.

Caching DNS General Indicators

The Caching DNS General Indicators dashboard element shows the server state, its last and startup reload time, and the total resource record (RR) count. The table is available if you choose **Caching DNS Metrics: Caching DNS General Indicators** in the Chart Selection list.

The resulting line chart plots the following trends-test:

- **Server State**—Up or Down (based on whether statistics are available), and how long the server has been in this state.
- **Last Reload**—How long since the last server reload.
- **Start Time**—Date and time of the last server process (Cisco Prime Network Registrar server agent) startup.

How to Interpret the Data

The data in this chart shows general server health and operational duration. The objective is to make decisions about the server, such as whether it might be time for another reload, perhaps warranted by the number of configured zones.

Troubleshooting Based on the Results

If the server state is Down, all the CDNS chart indicators show a red status box, so no data will be available. In the case of a server that is down, restart the server.

DNS Caching Server Queries Per Second

The DNS Caching Server Queries Per Second dashboard element, rendered as chart, displays queries per second for the Caching DNS server. This chart is available if you choose **CDNS Metrics: DNS Caching Server Queries Per Second** in the Chart Selection page.