

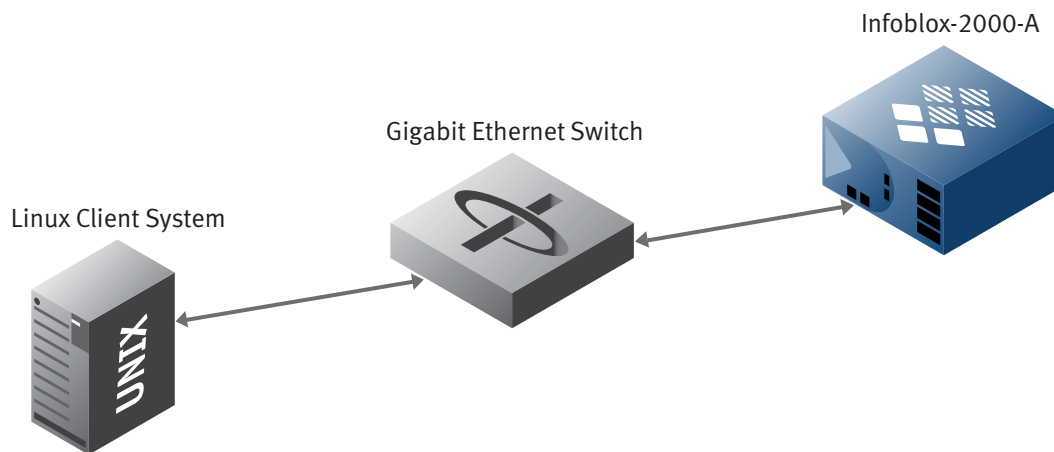
SOLUTION NOTE

The Infoblox-155X-A and Infoblox-2000-A are high performance DNS and DHCP server platforms that can support at least 36,000 to over 75,000 DNS Queries Per Second (QPS). At very high DNS query rates, the performance test bed must be configured to overcome hardware and software limitations that exist in the freeware testing tool *Queryperf* which is a utility provided in the BIND distribution. Selection and configuration of the testing client to run the *Queryperf* performance test and the actual network used for testing are critical elements of the process. Underpowered client platforms or running a single *Queryperf* process cannot generate enough test traffic to saturate an Infoblox-155X-A or Infoblox-2000-A to capacity. The resultant DNS query performance results can be understated on the Infoblox-2000-A by as much as 30% to 40%. This tech note describes how to configure a test bed to accurately test the Infoblox-2000-A or other high performance DNS server.

This test procedure is designed to remove all factors that could yield inconsistent results. It tests raw cached performance of a DNS server with little chance for variation.

The Infoblox “Host” Record

Infoblox supports standard A, PTR, CNAME, etc. resource records. In addition, another form of record called a “host object” is also available. The host object maintains logical links that combine traditional DNS resource records into a single object that can serve several purposes. For example, if you have a reverse zone setup for a forward zone, the reverse zone records are automatically created. If host records are used in place of the traditional A or PTR records for performance tests, there can be a 50% reduction in DNS QPS performance. If maximum DNS query performance is required, then separate A and PTR records should be configured. If very high performance is not required, the Infoblox Host record greatly simplifies resource record management.



The Infoblox DNS Query Test File and Database

When we test for DNS QPS, we use a file that contains 500 zones with a total of 50,000 resource records (25,000 forward and 25,000 reverse resource records). Note that it must be tailored for the network environment in use. Infoblox SEs can run the *DBCVT.pl* utility to modify the database file to match the test lab configuration. The files we use for testing are available from an Infoblox SE.

The test target must have a minimum of 64 resource records for forward and reverse zones to achieve an accurate result. Testing with a single resource record will produce results that are artificially low. The *Queryperf* configuration must query for all resource records as well.

SOLUTION NOTE

Configuring the Test Bed

The test bed requires three components: a client to run Queryperf, a Gigabit Ethernet switch, and the Infoblox Infoblox-155X-A or Infoblox-2000-A. The Infoblox devices to be tested are connected to the client through the Gigabit Ethernet switch.

A dedicated Gigabit Ethernet switch is important for the accuracy and consistency of the tests. There can be as much as a 15% variance in performance results if a busy production switch is used and the traffic is isolated on a VLAN. A 100 Mbps switch does not have adequate bandwidth and higher latencies that will skew the performance results negatively.

Test Client Requirements

The test client must be a high-performance server device, preferably with a multi-core CPU such as an Intel Xeon, PentiumD, Core2 Duo, or an AMD X2 architecture (Opteron or Athelon) with at least 1 GB of RAM and a Gigabit Ethernet NIC.

Configuring the Client

The client should be running a recent version of Linux (2.6.18+ kernel) such as Red Hat, Fedora Core, Ubuntu, etc. Only required processes should be running on this device to maximize CPU.

Make sure you compile Queryperf with default options. Queryperf can be found on any BIND source distribution in the `/bind-9.x.x/contrib/queryperf` folder. If you are a Red Hat user, an RPM exists as well.

To build *Queryperf*, just do the following on the client device:

```
sh configure
make
```

The *Queryperf* input file should have a large number of zones and resource records to assure the test reflects the real world.

Setting Up the Target Device

If you are testing an Infoblox device, you can get an integrated set of test configurations and a oneDB database (oneDB.xml) configured with 500 forward zones, 500 reverse zones, and 50 A and PTR records for each zone (total of 50,000 objects).

Configure the Infoblox device as a standalone unit using default parameters except set the LAN Speed to "1000" and LAN Duplex to "Full".

Running the Performance Tests

The most critical aspect of the performance test is making sure several *Queryperf* processes are run simultaneously for the test. *Queryperf* introduces latency waiting for a response from the server and writing results, artificially reducing the actual throughput. Running and aggregating the results of six *Queryperf* processes running simultaneously assures the most accurate result.

There are three configuration parameters *Queryperf* needs to run: the number of seconds to run the test; the test file with the DNS queries to run against the target; and the IP address of the target.

SOLUTION NOTE

Below is a sample shell script that runs six processes:

```
#!/b in/sh
SECS=5

INPUT=qp.forward.master.cached
SERVER=10.34.31.2

# SECS is number of seconds to run test
# INPUT is input file
# SERVER is server IP

queryperf -s $SERVER -d $INPUT -l $SECS > out1 2>&1 &
queryperf -s $SERVER -d $INPUT -l $SECS > out2 2>&1 &
queryperf -s $SERVER -d $INPUT -l $SECS > out3 2>&1 &
queryperf -s $SERVER -d $INPUT -l $SECS > out4 2>&1 &
queryperf -s $SERVER -d $INPUT -l $SECS > out5 2>&1 &
queryperf -s $SERVER -d $INPUT -l $SECS > out6 2>&1 &
wait
grep 'Queries per' out? | awk 'BEGIN { sum=0;}{ sum += $5;}
END {printf("Total: %.1f qps\n", sum);}'
```

The result of the test script is displayed on the console and is an aggregate of the six processes and the most accurate result for a high-performance platform.

A second script should be written that calls the above script several times to provide several test runs. These runs should be averaged to provide a final test result.

Expected Results

The following table provides a summary of results usually seen with the configuration described.

Test Name	Infoblox-2000-A	Infoblox-1550-A
Cached Record Queries, Forward Zone, 15 Second Test (queries/sec)	78,843	38,370
Cached Record Queries, Reverse Zone, 15 Second Test (queries/sec)	77,576	36,215
Cached Host Record Queries, 15 seconds (queries/sec)	29,021	16,081
Recursive Forwarding, 50000 records (queries/sec)	86,394	49,241

Infoblox Product Warranty and Services

The standard hardware warranty is for a period of one year. The system software has a 90-day warranty that will meet published specifications. Optional service products are also available that extend the hardware and software warranty. These products are recommended to ensure the appliance is kept updated with the latest software enhancements and to ensure the security and availability of the system. Professional services and training courses are also available from Infoblox. Information in this document is subject to change without notice. Infoblox Inc. assumes no responsibility for errors that appear in this document.