

Benchmarking tools: new features, old bugs

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Test tools

- They have bugs, too!
 - And no tests
 - Tests for tests
 - Tests for tests for tests
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 - Tests for tests for tests for tests for tests for tests
 - ...

Focus on

- dnssperf
- shotgun
- kxdpgun
- dumdumd
- dumdohd

"git log" summary

- January 2021 – October 2026
- About ~ 120 unique bugs
- DNS
- Transport
- Performance
- Load control
- ...

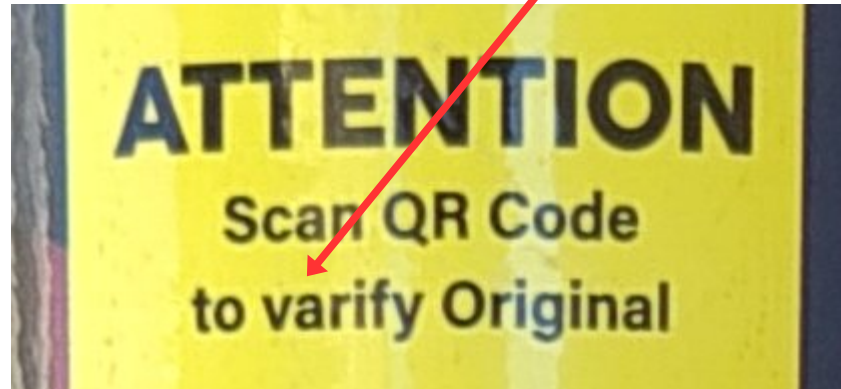
TC=1 ??

- Counted as timeout
- After fix
 - Still no TC=1 counter

```
;; opcode: QUERY, status: NOERROR  
;; flags: qr tc
```

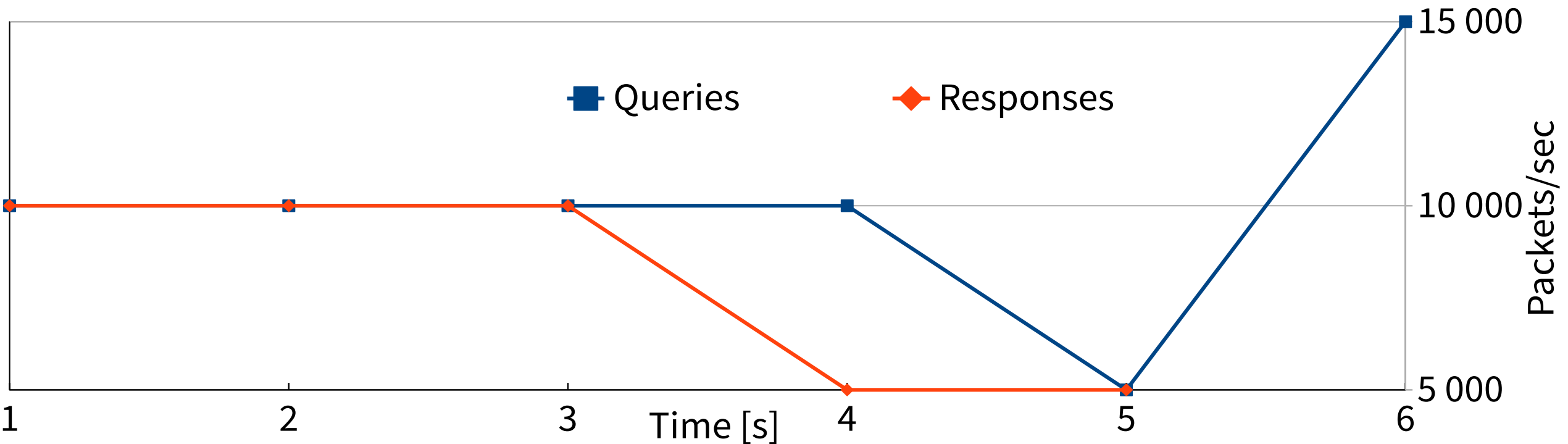
200% response rate ??

- Rate = QPS / Answers
 - QPS **this** second
 - Answers **this** second
 - Latency > 0 ms
 - Rate **this** second > 100 %



Costant QPS=10 000 ??

- Control averages over a long period
- Huge spikes after delay



Queries skipped

- During TLS handshake
 - Also on reconnect – mid test
- When queue is full
- Near the end
- With weird labels
- ...



BADCOOKIE – 23

- Seen as
 - YXRRSet – 7
- EDNS RCODE – no support at all
 - Code is there, but dead?
- Forget packet replays

Connection breaks

- One packet
 - DoH answers inside
 - TCP frame coalescing

DoH/DoQ flow control

- All streams busy once?
 - Stall all packets forever!



What do we do ?!

- Tests for tests
 - ~~Tests for tests for tests~~
 - ~~Tests for tests for tests for tests~~
 - ~~Tests for tests for tests for tests for tests~~
 - ~~Tests for tests for tests for tests for tests for tests~~
- For each tool ?!

Tests for test tools

- Unify tool output
- Mock DNS responder
- Write tests
 - For one tool
 - Make them reusable

Common output format

- No more regexes
- One result processing pipeline
- <https://gitlab.com/DNS-OARC/dns-metrics/dns-metrics>
 - Feedback welcome!

Common output format

```
{"since": 0, "until": 1000116,  
"queries": 28659, "responses": 28651,  
"timeouts": 8, "interrupted": 0, "unexpected": 4,  
"response_rcodes": { "NOERROR": 28648, "OTHER": 3 },  
"response_latency": { "avg": 312, "min": 1, "max": 5821,  
"stddev": 287, "bucket_counts": [ 2205, 2204, 2206, 2005,  
2405, 2305, 2105, 1905, 2505, 8806 ] },  
"transport": { "type": "udp", "udp_datagrams_sent": 100,  
"udp_datagrams_received": 100 } }
```

Tests for test tools

- Write tests
 - For one tool – DNS Shotgun
 - Make them reusable
 - Call with different tool parameters?
- Profit

Take away

- Use latest versions
- Trust, but verify
 - Then verify the verifier
- Interested in testing tools?
 - Talk to me!
 - pspacek@isc.org



Thank you!

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