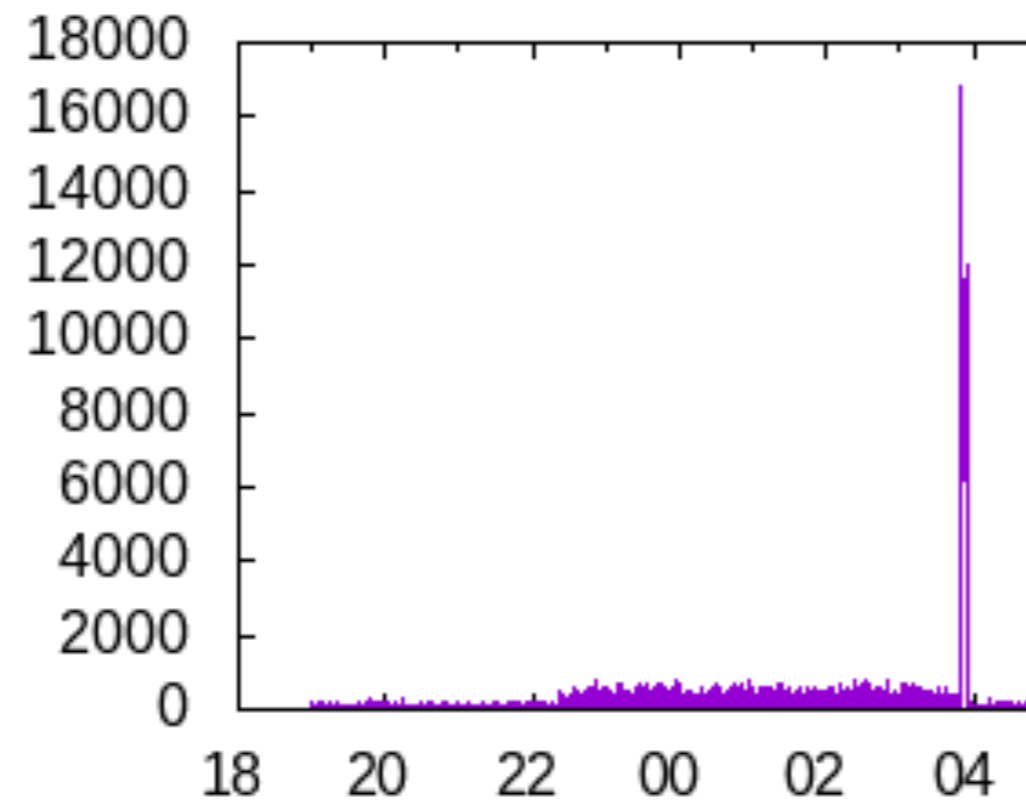
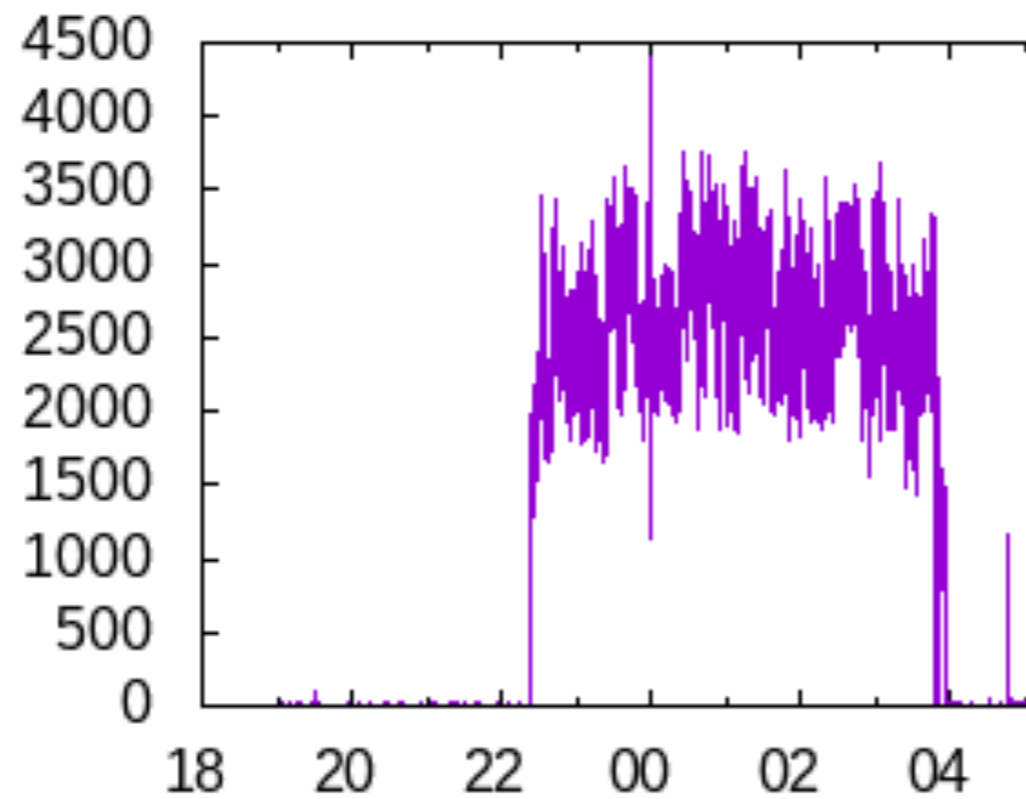


Survey Error Amplification

Viktor Dukhovni

Forwarding & Retries

- Chain of unbound forwarders
- Each layer retries some queries multiple times
- What could possibly go wrong???



Don't rely on REFUSED

- When 1st NS returns REFUSED, unbound tries 2nd, ...
- Its forwarder may do the same
- Don't return REFUSED when glue NS RRs in parent still point at your servers
- Wait for glue to go away or point elsewhere

Solutions?

- Avoid 2nd-chance retries of batches of just failed lookups
- Even a small batch can be amplified into a small storm
- Retries via forwarders should be limited, use the same ID and port facilitating dedup and late replies.
- Load-balancers could hash clients to same downstream by IP/port/ID and then dedup pending queries.
- Can REFUSED be cached?