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Nameserver Performance Testing

BIND and NSD

Introduction

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- New lab network.
- To test new technology - hardware, software, protocol etc.
- Mostly AMD based blade servers. Some SPARC.
- Solaris 10, FreeBSD and Linux.
- DNS performance testing is the first stage before more “interesting” investigations.
- Have tested BIND 9.4 and NSD 3 (authoritative).
- Zone signing with T2000
- Plan to test PowerDNS and recursive servers.

Lab Network

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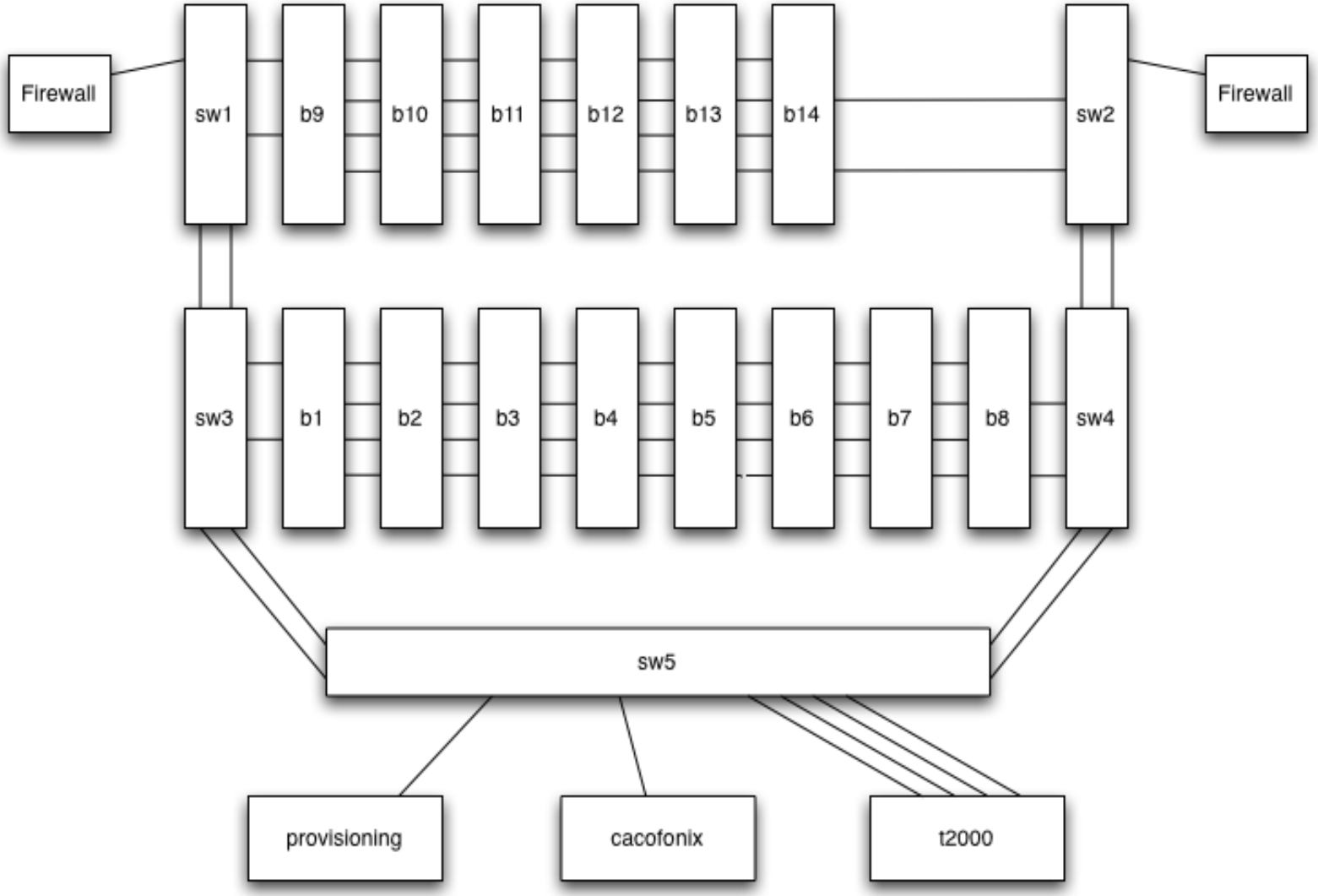

Hardware

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- Evaluated a Sun T2000 and a AMD based HP blade server
- T2000
  - Single physical processor with 8 cores and each core can handle 4 threads. 32 virtual processors
  - Each virtual processor is slow on its own
  - Each core has its own crypto processor. Claims a total of 12000 rsa1024 sig/sec
- AMD
  - Dual processor dual core

Hardware

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- Wanted to really load test the servers so...
- Both servers were connected to the network with 4 Gigabit interfaces each with a separate IP address.
- Each of the 4 clients queried 1 address
- T2000
  - Each IP on same subnet
  - IPMP to spread replies over all 4 interfaces
- AMD
  - Each IP on different subnet/vlan

Software

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- Servers
  - BIND 9.4b2
  - NSD 3.0.1
  - Solaris 10 (T2000)
  - Linux CentOS 4.3 (AMD)

Software

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- Clients
  - Queries from a tcpdump containing about 1000000 queries to ns1.nic.uk
  - Ran on 4 client machines simultaneously
  - Queryperf (from BIND 9.4)
    - Used queries extracted from the tcpdump.
    - Fast as possible while always receiving a reply to every query.
    - In all the results shown here queryperf reported no lost replies.

Software

- Tcpreplay
  - To double check numbers from queryperf
  - Replayed the queries as increasing packet rates while monitoring number of reply packets using tcpdump.
  - Watched for point at which there were fewer replies than queries.
- FreeBSD 6.0
  - (6.1 has issues with UDP performance.)

BIND performance

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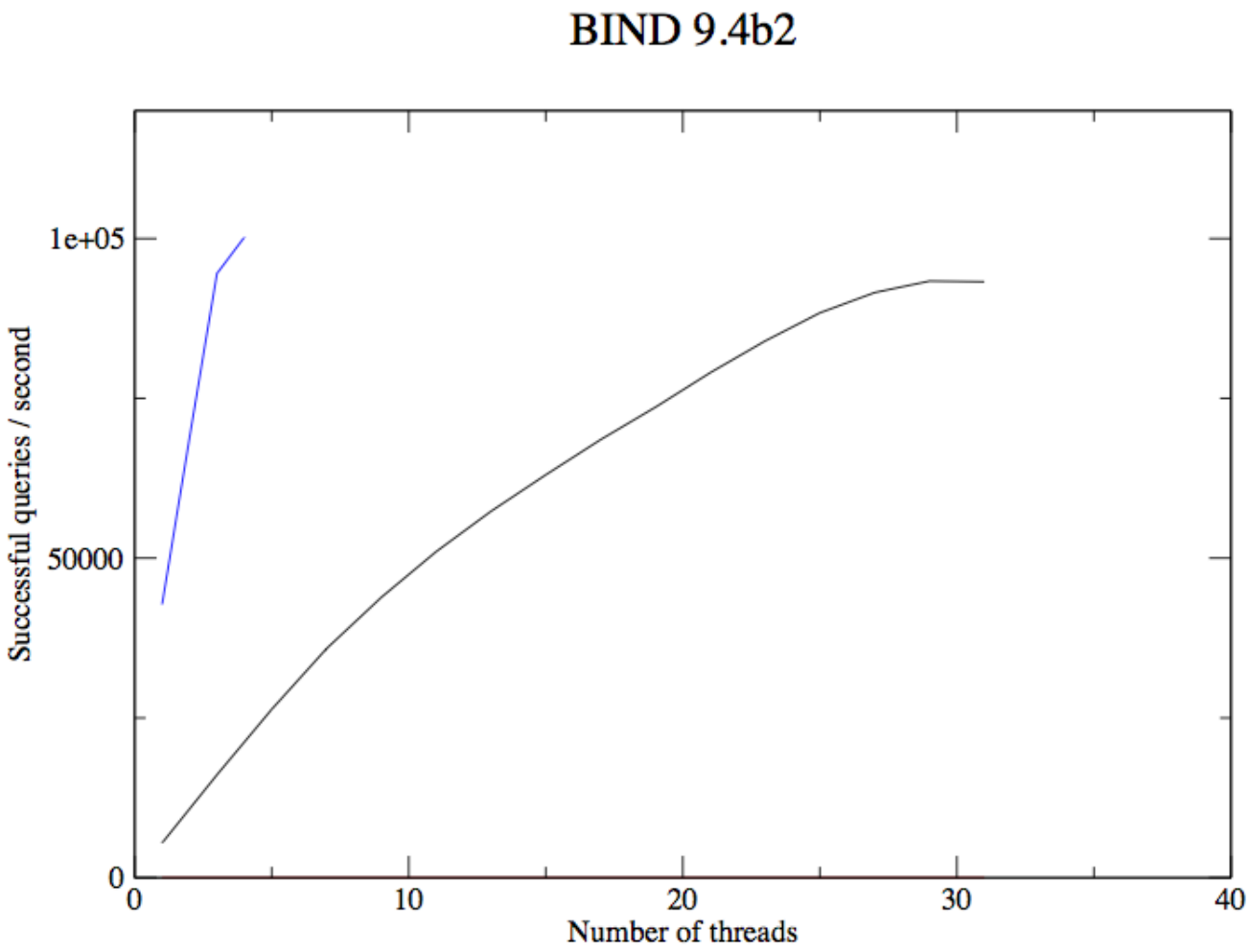

BIND performance

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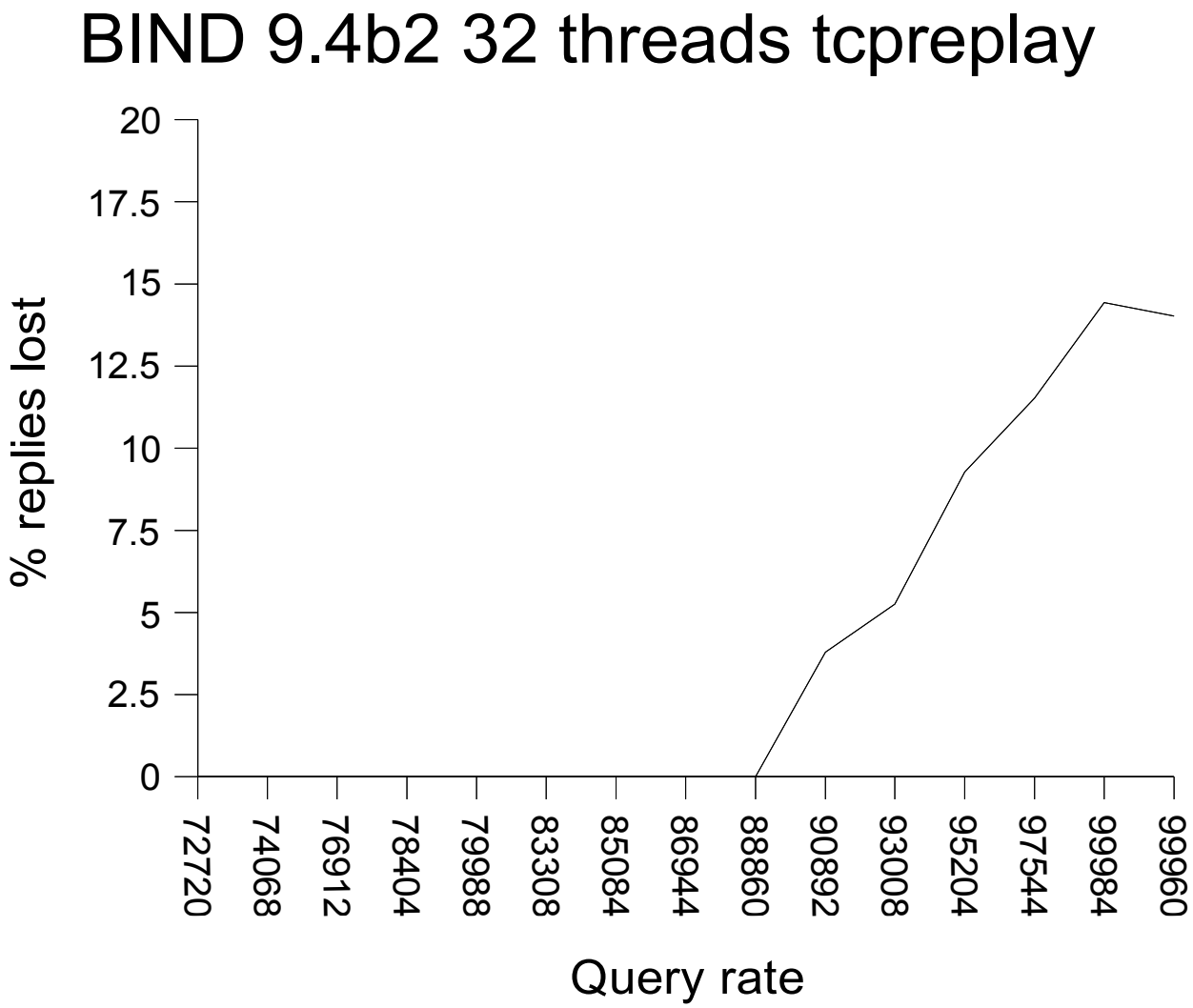

NSD on T2000

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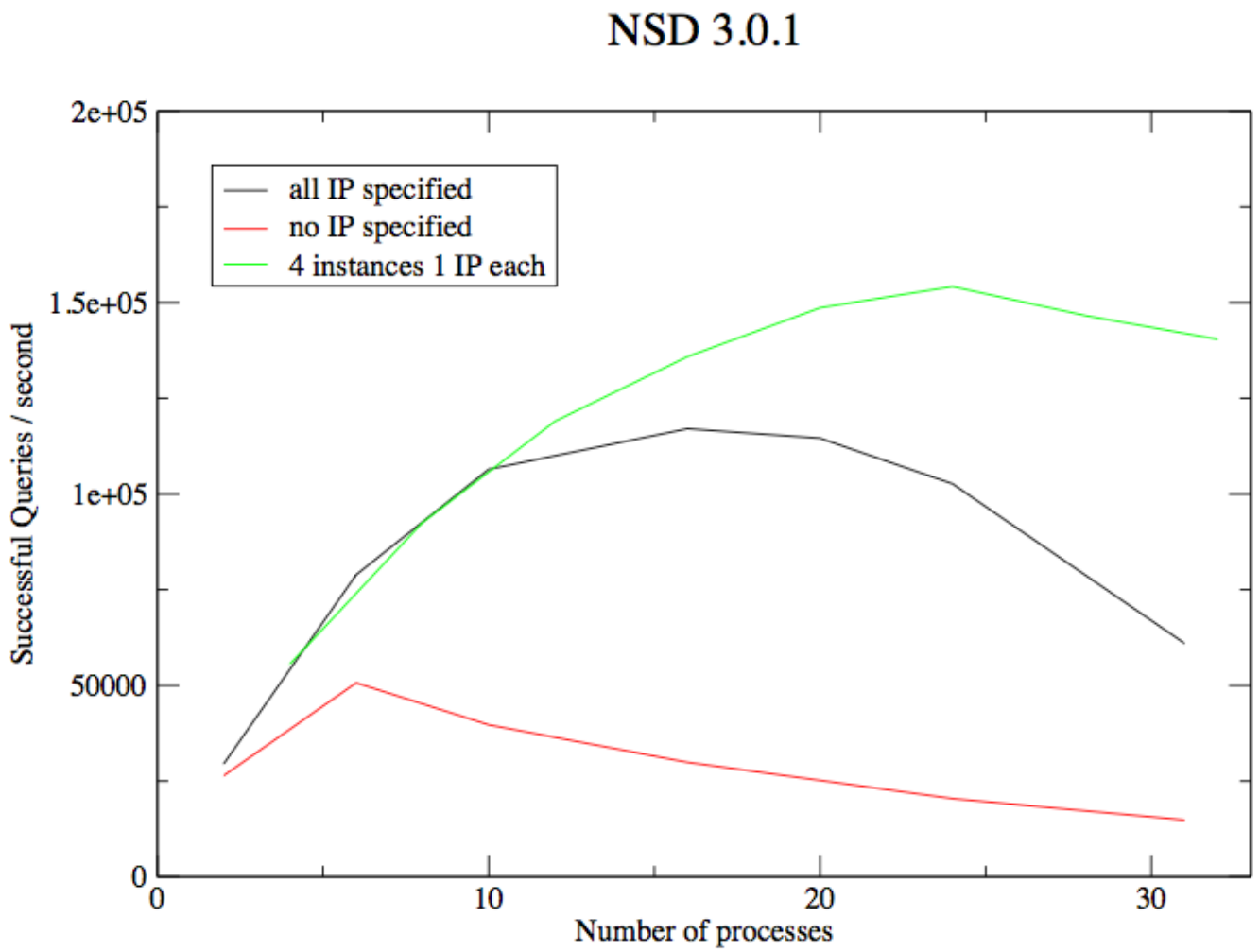

Nameserver Performance

NSD on AMD

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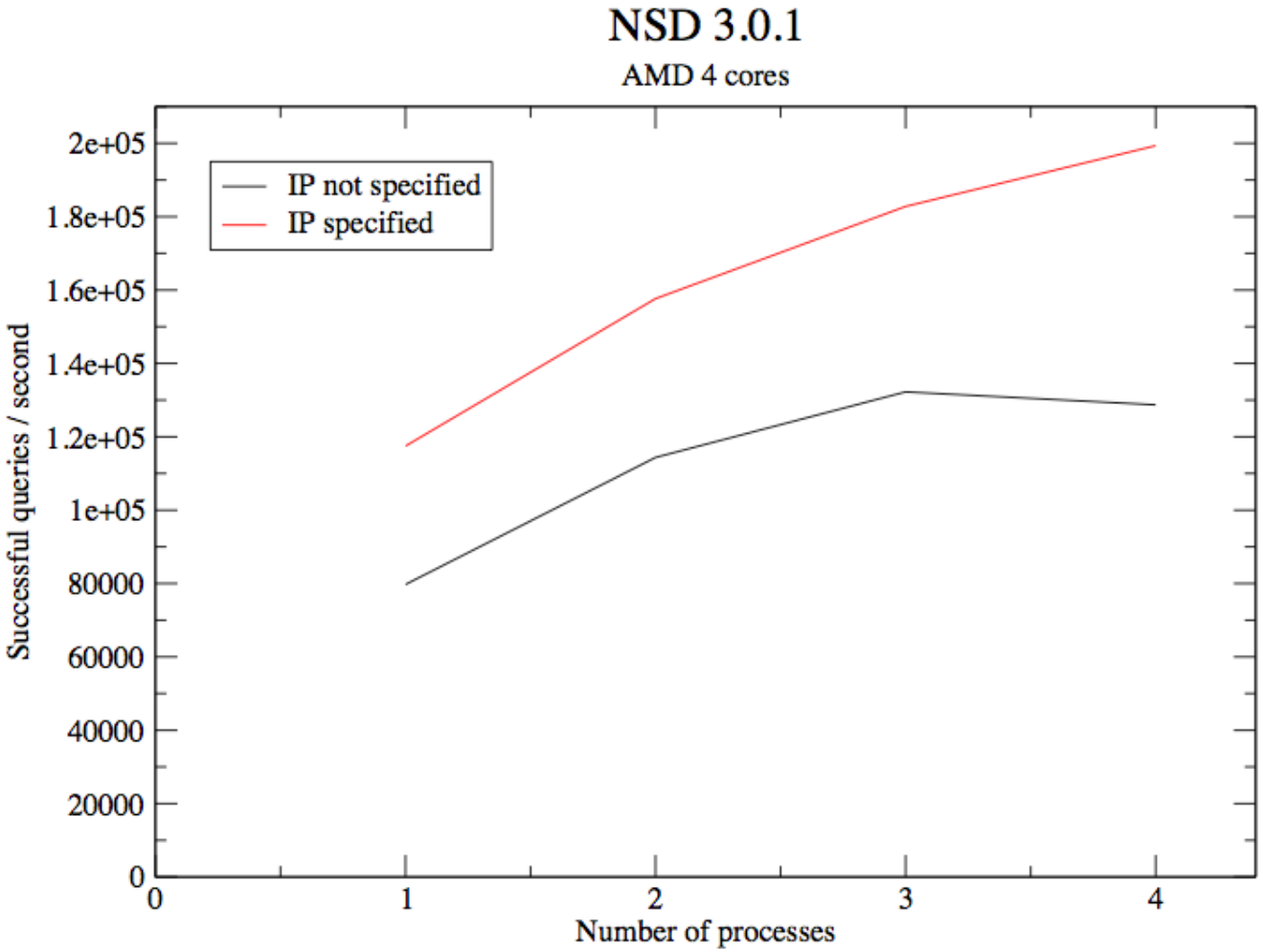

Microsoft DNS Server

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- 2003 Server SP2
- Don't know how to change processor affinity.
- Using all 4 processors
  - 88491 q/s

Zone signing

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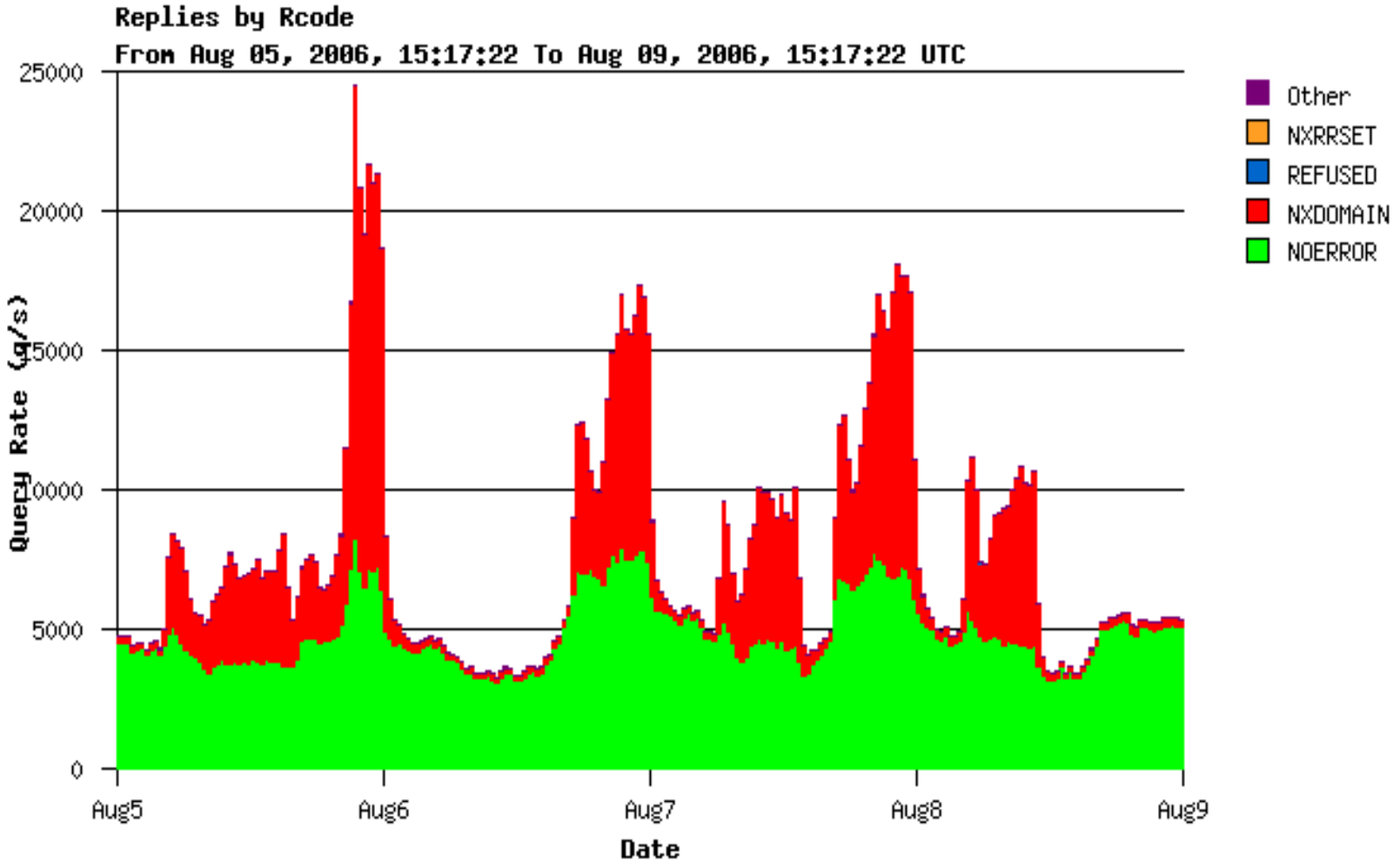
- Signed co.uk
  - Using dnssec-signzone from BIND 9.4b1
    - Patched to use openssl engine
    - RAW zone output.
    - Key size: ZSK 1024, KSK 1400
  - 4.4 million signatures in 17 minutes.
  - This time includes reading and writing the zone files.

Traffic to UK nameservers



Traffic to UK nameservers

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- Traffic from lots of known resolvers in ISP's all over the world
- Queries
  - MX for {word}.co.uk
  - A for mx1, mxs, relay, gate, smtp, mail, mail1.{word}.co.uk
- The words look random, but appear to be valid domains in other tld's
- This is the signature of W32/MyDoom-J worm