Registry Update

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Nominet UK

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Registry Update

- What Nominet does
- Recent technical changes and future plans

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What Nominet does

- UK Domain Name Registry
- Delegated to provide name resolution for .uk
- Three stakeholder groups:
  - Members and Tag holders
  - Registrants
  - Internet Community.

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Domain Name Service (DNS)

- Provide DNS for .uk
- Allow registrations under several SLDs:
  - co.uk, org.uk, me.uk, net.uk
  - ltd.uk, plc.uk, sch.uk
- Delegate other SLDs:
  - ac.uk, mod.uk, gov.uk, etc.

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Monthly Registration Statistics for .uk Domain Names (2005)

	.co.uk	.me.uk	.org.uk	.ltd.uk	.plc.uk	.net.uk	.sch.uk	Total
April	103776	2110	6713	236	3	2	29	112869
March	107900	2423	7216	259	3	2	17	117820
February	106382	2018	6821	326	3	1	21	115572
January	97547	2023	6651	322	2	0	22	106567

Total registrations+ in the .uk database as of
30th April 2005: 4,108,068

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Domains

- nominet.org.uk
  - Our internal network
- nic.uk
  - UK nameservers
    - 7 NSs running BIND 9 and service from UltraDNS for two anycasted servers (UltraDaemon).
    - Located in London, Manchester, Amsterdam and Reading (coming soon).
  - Whois, DAC
  - Automaton

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Recent Changes

- Dynamic Updates
- Clustered Automaton and Real Application Cluster (RAC) for Automaton Database
- Became ‘our own ISP’.

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Dynamic Updates: Background

- Complete zone builds took a very long time to do and propagate. (3.5m DNs, 9m RRs, 250MB biggest zone file, 2.5 hr build/propagation).
- BIND goes silent while reload zone after AXFR
- Wanted to reduce the support load by people who make a mistake and cannot wait until next full build to have it corrected.
- Can receive up to 300,000 updates per day.

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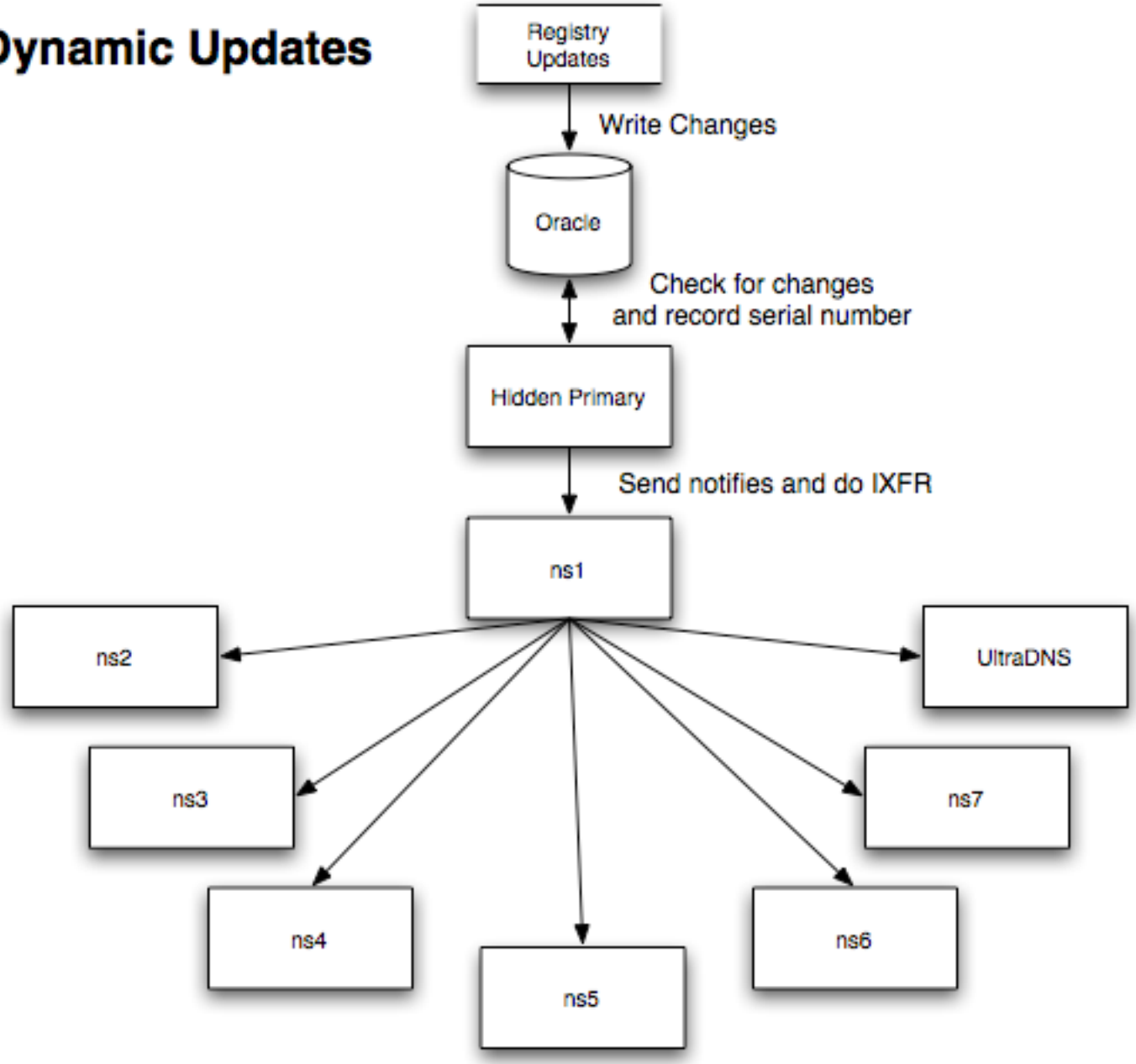
Dynamic Updates



Dynamic Updates: Testing

- Used four months of data, which was 1.1 million changes. Takes about 4 hours to process.
- Built a subset of a our live network, with just three NSs, using identical hardware and software.
- Basic methodology was to apply changes to known zone file and compare product to second known zone file.
- Finally tested failure modes: pulled out cables, switched off machines, etc.

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Dynamic Updates: Conclusion

- Very successful.
- Technology was actually quite simple.
- Surprised by how fast it propagates.

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Clustered Automaton and Database: Background

- Automaton and database were SPOF. We had spare systems but there would have been significant downtime.
- Load very high on automaton server. There was lots of IO–wait.
- Receives about 60,000 PGP signed requests for domains every day
- Sends a PGP signed email reply for every request

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Clustered Automaton and Database: Technology

- Technologies
  - Veritas cluster server and filesystem
  - Shared EMC Clarion disk array
  - Oracle 10g with RAC
  - Sun V480 Servers
- Benefits
  - Automatic failover
  - Increased performance
  - Lower IO wait

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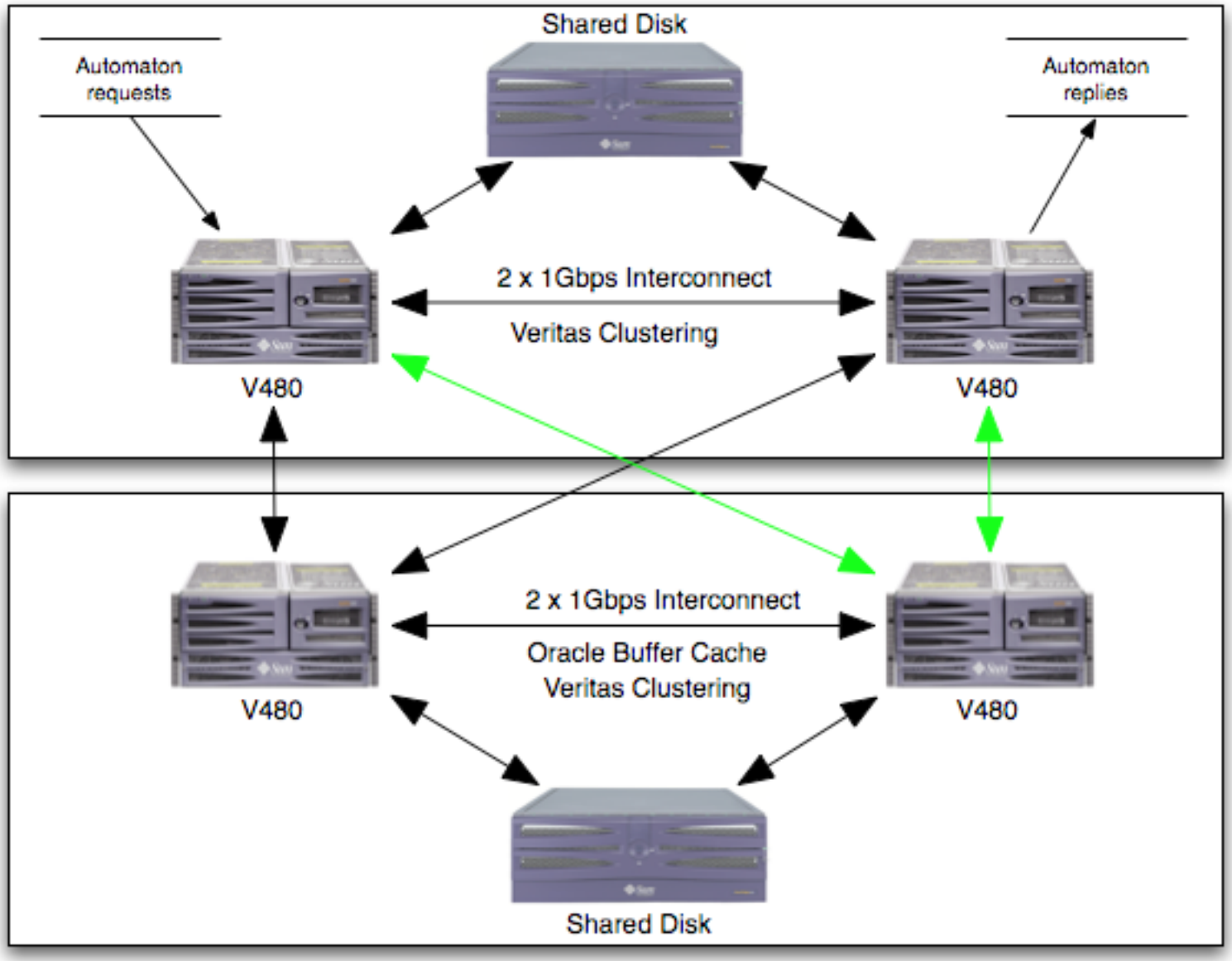
Clustered Automaton and Database



Clustered Automaton and Database: Conclusion

- Very successful
- Very stable.
- Complex to setup. There were lots of new technologies to learn.
- Multi-vendor solution can make debugging complex. However is considered best of breed.

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Nominet as its own ISP

- Not an ISP
  - No customers
  - One prefix: 213.248.192/18
- Why become our own ISP?
  - Policy reasons
  - Technical reasons

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Why become our own ISP?

- Policy
  - Autonomy
  - Avoid conflict with Members
  - Member experience
- Technical
  - Redundant connections
    - 2 transit providers
    - 100+ peers
  - Globally routable IP block
  - Network infrastructure.

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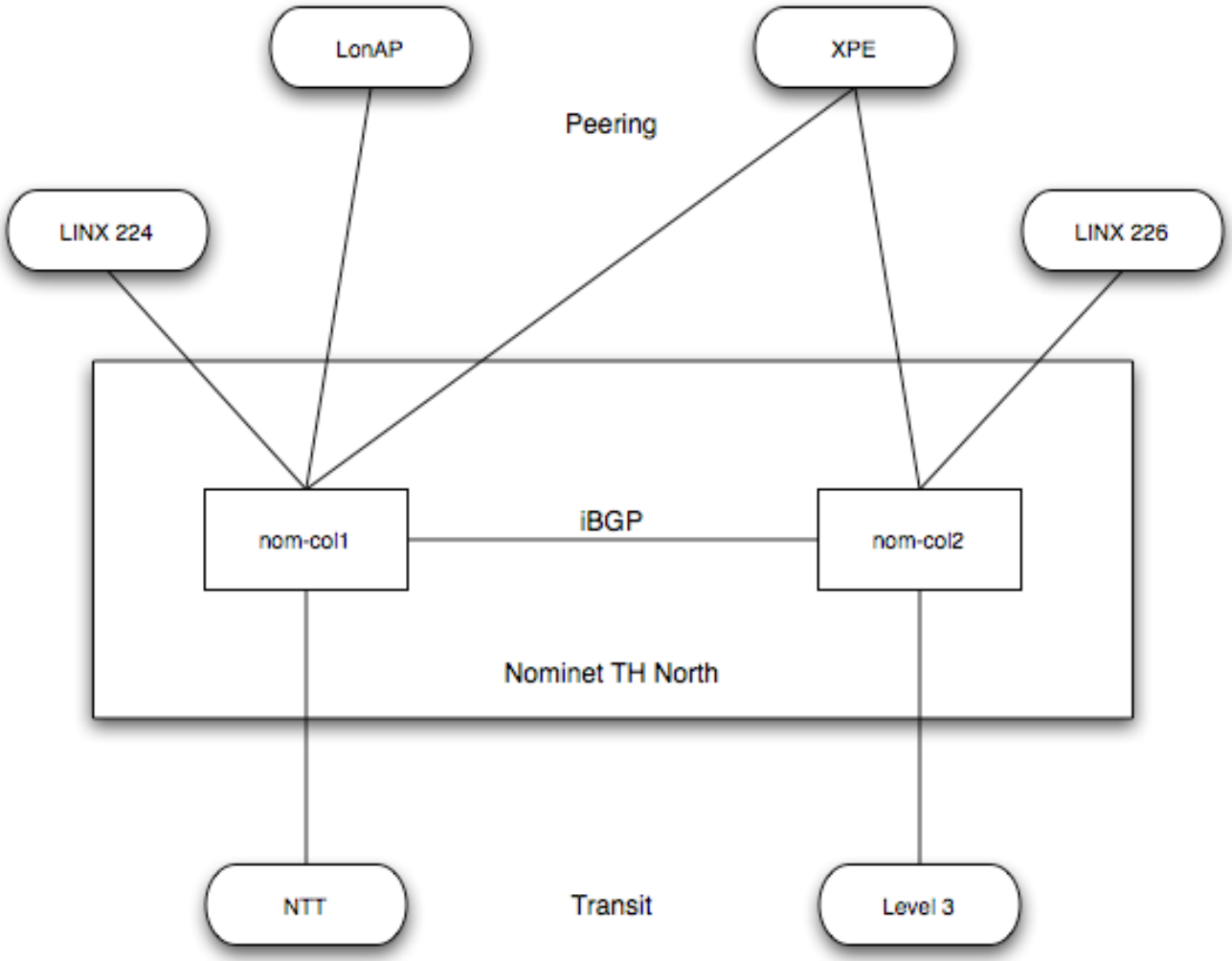
Peering Connections



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Peering with Nominet

- What's in AS8683:
  - Automaton
  - Website
  - Mailing list server
- What's not:
  - No .uk nameservers
  - No Whois
- Contact peering@nominet.org.uk to peer with Nominet.

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Future Plans

- Different nameserver software
- DAC
- Oracle Replication
- Network Monitoring
- Early adopter of new technologies
- Developing Internet Standards.

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Nameserver Software

- Currently using BIND
- We want a heterogeneous network
- Investigating alternatives
  - e.g. ANS, NSD
- Requirements
  - Load large zones
  - Dynamic updates, IXFR and notifies
  - DNSSEC
  - Performance
  - Reliability

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Domain Availability Checker

- The old whois is under heavy load
- DAC will be used for high volume queries.
- Returns less data and connections are persistent
- Currently in beta
- Will be available to tag holders who are also members
- Having some problems with Oracle replication and the DAC process
- Working hard to resolve them

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Oracle Replication

- Currently, Whois data is 5 mins behind real time
- Need to improve reliability and performance.
- Whois and DAC will have an Oracle backend
- Use Oracle DataGuard to replicate the Oracle cluster (Logical standby)
- Also planned for backups and disaster recovery (Physical standby).
- When working correctly data is replicated in a few seconds.
- We have been having problems due to various Oracle bugs causing the application of replicated data to freeze. We are working with Oracle to get this fixed.

Network Monitoring

- We have a internally developed network monitoring system.
- It is very stable and works well but is not very flexible or good at reporting.
- Currently investigating alternatives (e.g. nagios)
- Interested in tying it into better log file analysis and security systems (IDS etc)
- Interested to hear suggestions/ideas from others

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New technologies and Standards

- Securing DNS (DNSSEC)
- Internationalised Domain Names (IDN)
- Extensible Provisioning Protocol (EPP)
- IPv6.

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Summary

- What Nominet does
- Recent changes, future plans
- Peering with Nominet.

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Questions ?

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