Shared Unicast for Secondary DNS

A more robust DNS service under .MX
The problem
The DNS is not redundant by itself!

NS.NIC.MX and secondaries

\[ \frac{1}{N} \text{ %} \] the level of impact on the TLD for every DNS that stops answering queries.


More vulnerability to DDoS attacks
The solution
To implement shared unicast

**Phase 1:**
- Mirror in primary
- Shared unicast in secondaries

**Phase 2:**
- Shared unicast in primary

Redundancy in 2 servers.
Domain Name resolution under .MX (current)

NS.NIC.MX
Triara(MTY)

YACATEUCTLI.NIC.MX
Verio(USA)
Alestra(GDL)
Avantel(MTY)

Next step: 06/2004
NIC-Mexico’s Implementation

- After complying with RFC 3258 we included the following features to our implementation:
  - DNS Zones are kept only in Memory File System (to reduce risk of stolen information when disk are uninstalled)
  - Routing service running in the same server allowing automatic server disconnection from the Internet should a problem prevents it to respond queries.
  - Statistics processing that allow us identify requesting networks that require more resources from our DNS system.
NIC-Mexico’s Implementation

- Two different DNS implementations (BIND 8 and 9).
- 7x24 contract for all the servers.
- Firewall and security measures on all the servers.
- Full zone transfer and reloading lower than 15 secs.
- Time synchronization in all servers.
- Full control of our DNS system (hardware and software).
- Easy to include one more server to the pool of secondaries (there is no need to request IANA update).
- Topological load balancing.
- Dynamic Updates/Update Notification/Incremental Zone Transfer.
NIC-Mexico’s Implementation

- We are able to provide a better availability of the critical DNS service.
- We became one of the first to develop and implement our own DNS secondaries Shared Unicast.
Growth of queries to secondaries

Oscar Robles
Growth of queries to secondaries

Queries received by secondaries in .MX

- Total queries

- 08/03
- 22/03
- 06/10/03
- 20/10/03
- 03/11/03
- 17/11/03
- 01/12/03
- 15/12/03
- 29/12/03
- 12/01/04
- 26/01/04
- 09/02/04
- 23/02/04
Type of answers

Answers of .MX secondary (GDL)
- Total Sum of ANSWER: 83.14%
- Total Sum of ERROR: 0.000%
- Total Sum of NXDOMAIN: 16.86%

Answers of .MX secondary (MTY)
- Total Sum of ANSWER: 84.23%
- Total Sum of ERROR: 0.290%
- Total Sum of NXDOMAIN: 15.48%

Answers of .MX secondary (SJC)
- Total Sum of ANSWER: 95.85%
- Total Sum of ERROR: 0.004%
- Total Sum of NXDOMAIN: 4.14%

Global answers of .MX secondaries
- Total Sum of ANSWER: 90.21%
- Total Sum of ERROR: 0.05%
- Total Sum of NXDOMAIN: 9.74%
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