Shared Unicast for Secondary DNS

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

1/N \% 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.
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

- GDL
- MTY
- SJC
Growth of queries to secondaries

Queries received by secondaries in .MX

- Total queries

08/03 - 23/04

- 10,000,000
- 20,000,000
- 30,000,000
- 40,000,000
- 50,000,000
- 60,000,000
- 70,000,000
- 80,000,000
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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