.br technical overview

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.br brief history and numbers

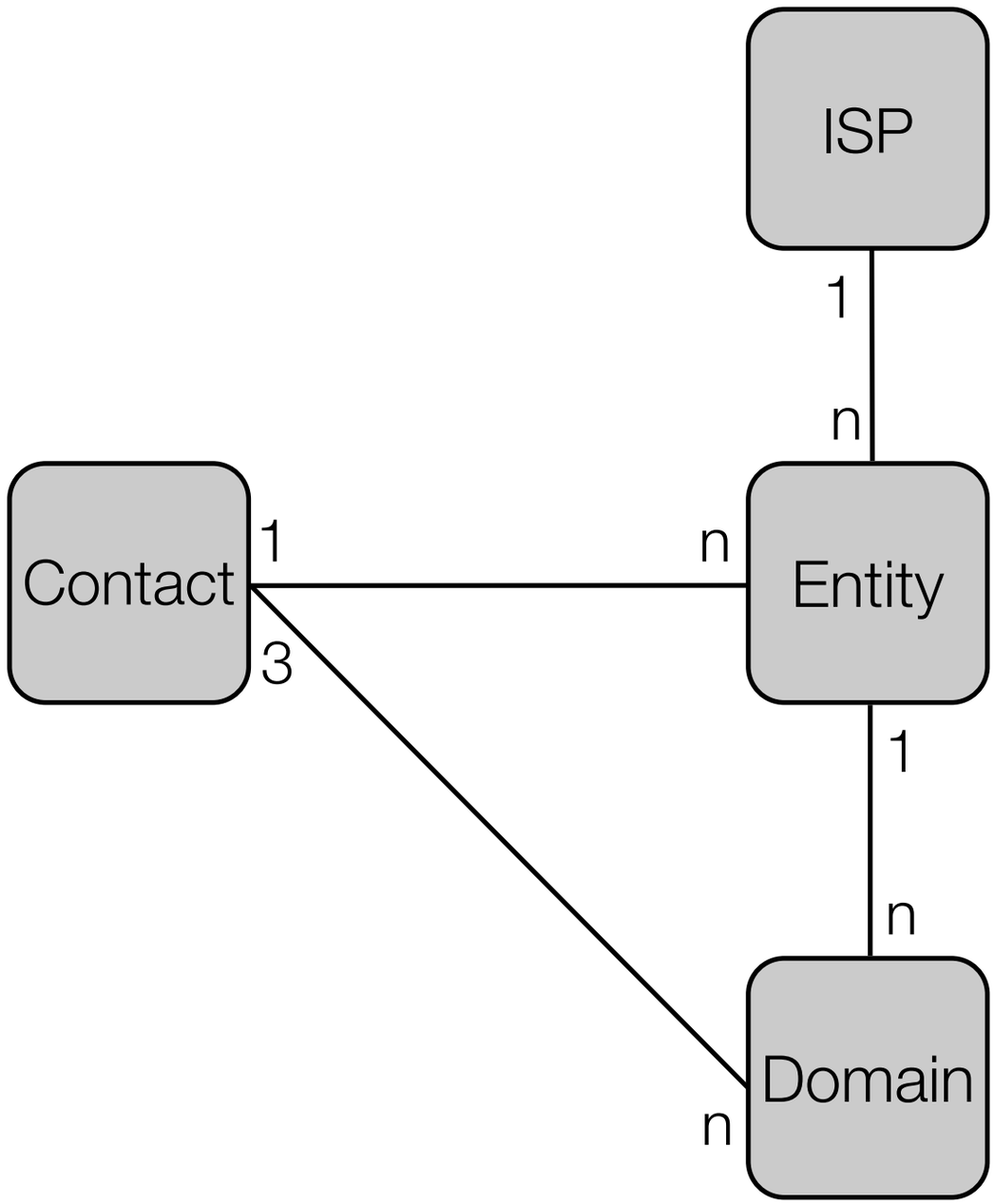
- Started public registration in 1996 with the commercial Internet in Brazil
- In 1998 with 30k domains changed to a completely automated registration system with a 100% re-registration phase (took 8 months)
- Today 1M domains distributed on 800k owners
- Net grow ~170k year (last 3 years)
- 26 people working directly with the registry (12 cs, 7 eng, 7 noc)
- Daily updated stats at: http://registro.br/estatisticas.html

Foundation

- 100% Based on Free Software and Open Standards
- OO technology
- Persistence using RDB

- Solid base - evolved in the last 8 years still maintaining fundamental design principals. Biggest changes were:
  - IP distribution system; IPv6; IDN; EPP and a myriad of registration rules (release process, etc)

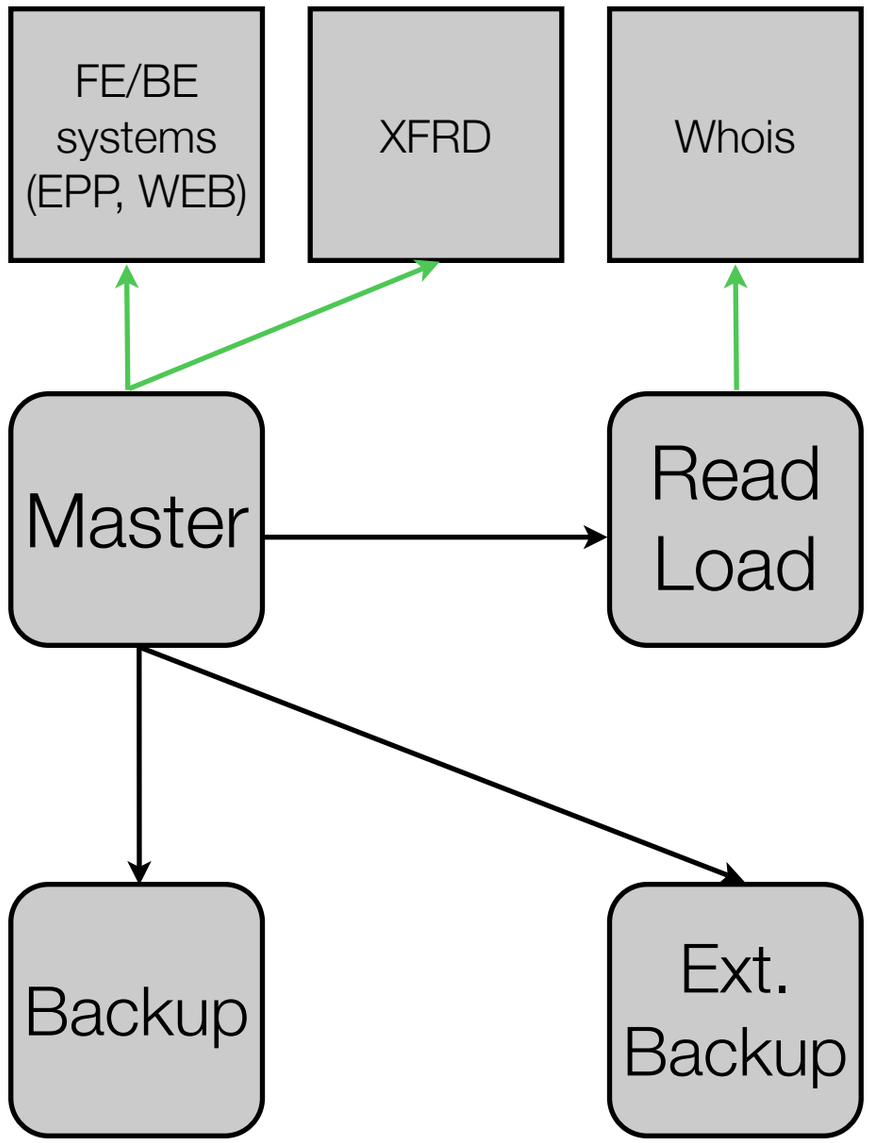
Object Model



Software Development

- Environment
    - SVN
    - EMACS
    - G++
    - STL, OpenSSL, GD, XERCES++, others

Data Replication Schema



.br EPP protocol extensions

- Extension for the Contact Mapping (RFC3733) to add a unique external ID (CNPJ/CPF), responsible, contact handle and attorney

- Extension for the Domain Mapping (RFC3731) to add subordination of domain names to Registrant object, ticket support, automatic renewal and the release process

- More info at:

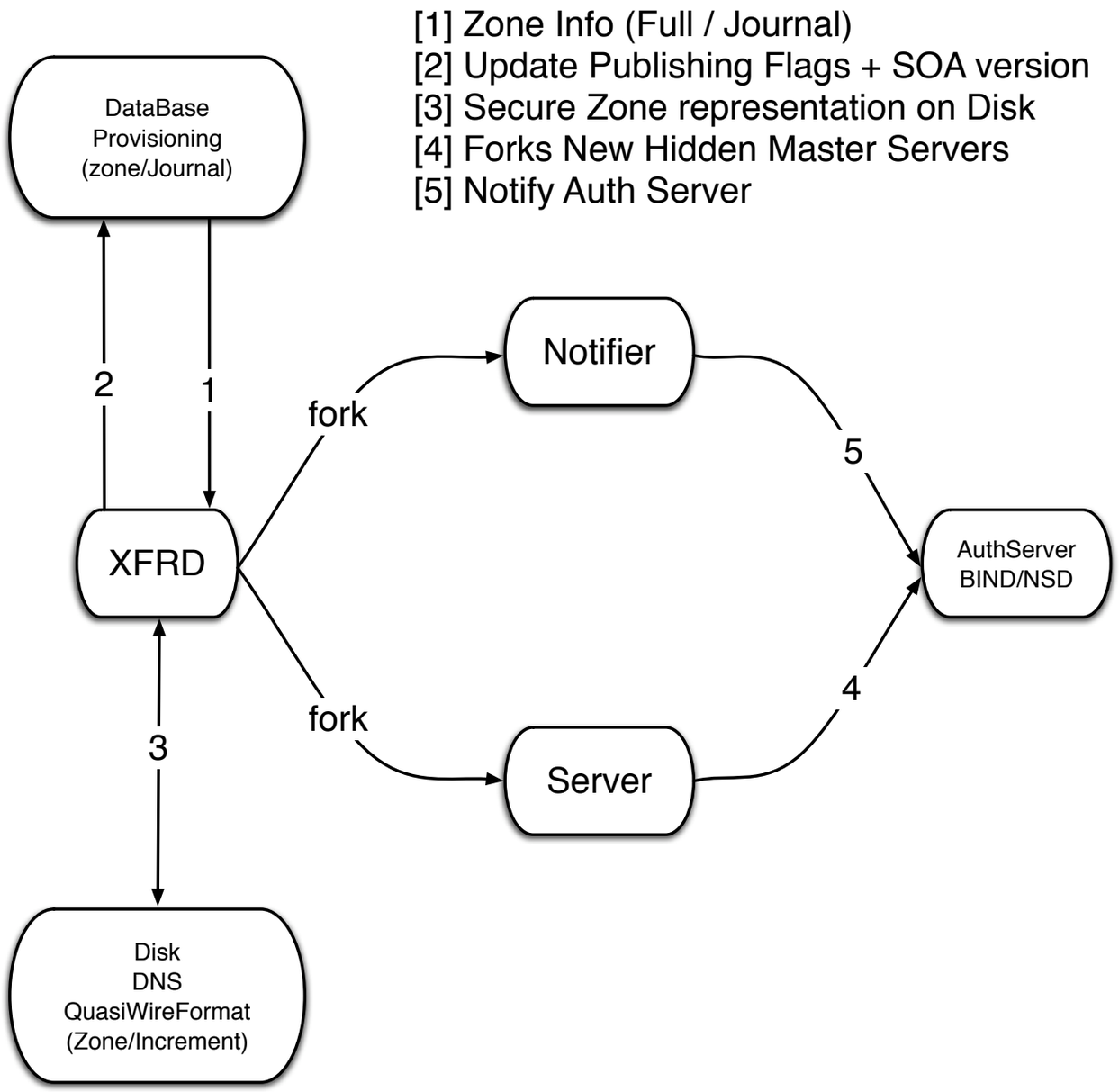
  - http://registro.br/epp/index-EN.html (protocol)

  - http://registro.br/info/epp/ (ISPs)

DNS QuasiOnLine Publication

- From 8 hours to 30 minutes
- XFRD server
  - A more efficient system (propagating only changes)
    - on a 24h period normally less then 1% of changes
  - Included journal of changes on the provisioning system
  - Journal read every 30’
  - Optimized for [AI]XFR
  - Designed for the future

XFRD design


[1] Zone Info (Full / Journal)
[2] Update Publishing Flags + SOA version
[3] Secure Zone representation on Disk
[4] Forks New Hidden Master Servers
[5] Notify Auth Server
DataBase
Provisioning
(zone/Journal)
2
1
Notifier
fork
5
XFRD
AuthServer
BIND/NSD
fork
4
3
Server
Disk
DNS
QuasiWireFormat
(Zone/Increment)

DNS publishing

- Aggregated of 35kq/s
- 5 delegated servers [a-e].dns.br
    - 3 inside the country (São Paulo, Rio de Janeiro e Brasília)
    - 2 outside (US, GR)
- Moving all of them to clusters of machines
    - Multiples Routers, Switches and Servers per cluster,Anycast “in the local” based on ECMP balancing
- 2 New sites entering in production
    - DENIC (substituting GR), KRNIC

Software Infrastructure

- OS FreeBSD/Linux/OpenBSD
- Basic Services - Apache, Postfix
- MUA Mutt with lisp software to deal with CS
- Monitoring - RRDTool , Nagios
- DNS - BIND e NSD
- Backup - Bacula

Physical Infrastructure

- 80m^2 data center (30 x 44U racks space)
- 1+1 (60kVA) UPSs
- 1 Power Generator (360kVA)
- 2+1 (45 TR) Cooling Systems
- CFTV + Proximity cards + Biometric
- Fire Suppress system
- Fire resistant safe for backups

Network Infrastructure

- Fully redundant L2 network
- 3 Transit provider
- 20+ Peering Agreements

Questions ?

Thank You !