LACTLD's Anycast Cloud

Tech Day at ICANN79

Fred Neves

Monday, March 4, 2024

LACNIC FRIDA Award 2020
Internet Stability and Security

"The LACTLD Anycast Cloud is **regional, collaborative and not-for-profit**. This initiative has strengthened the infrastructure and stability of the Cloud's clients and nodes as well as the entire regional network in terms of resilience, robustness, traffic load management, speed and availability. It is also worth noting that this is the **first project of its kind in this industry, a highly sustainable platform with low participation costs and significant benefits for all participants involved**".

https://programafrida.net/en/archivos/project/lactld-anycast-cloud

How does the DNS work in a ccTLD?

- There are multiple “authoritative servers”.
- Typically, one of them is the primary server (distributor) and the others are the secondary servers.
- This allows for:
  - load balancing,
  - proximity to clients,
  - robustness and resilience.
- We have seen cooperation in the DNS since the early days: the ccTLDs would voluntarily “share” their secondary in an informal way.
- This sharing mechanism is hardly scalable.

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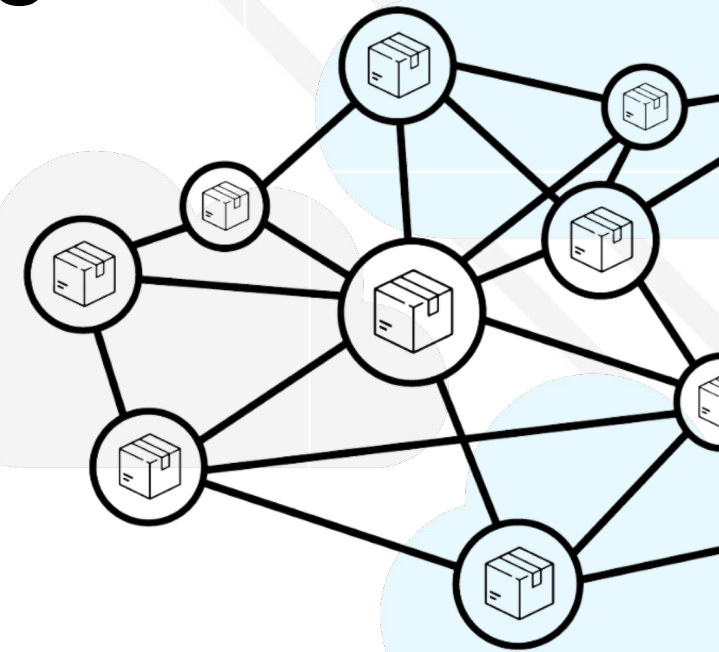
Upgrade: Anycast Service

- Anycast is an addressing technology that enables optimal and efficient use of networks.
- The “anycast” technology is the evolution of the secondary server service.
- A server “hides” multiple nodes within a “Cloud”.
- It is highly scalable.
- It is more efficient when nodes go down.
- It provides better response to DoS attacks.



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LACTLD's Anycast Cloud

Free service for LACTLD members.

LACTLD ccTLD members can make use of the Anycast Cloud as clients.

LACTLD ccTLD members can cooperate hosting one or more nodes.

External organizations (IXP) can also host nodes.

The Anycast Cloud administration is shared among ccTLD members. (We leverage the expertise of each organization)

Cooperation agreements with LACTLD.

Success story

Our Anycast Cloud has been in operation since 2015

Managers: .br, .cl and LACNIC

19 ccTLDs (61% of LACTLD ccTLD members)

- .ai, .ar, .cr, .do, .ec, .gp, .gt, .gy, .hn, .ht, .ms, .pa, .pe, .pr, .py, .sv, .tt, .uy, .ve

LACNIC Reverses:

- 177.in-addr.arpa, 179.in-addr.arpa, 181.in-addr.arpa, [186-191].in-addr.arpa
- [200-201].in-addr.arpa, 2.1.1.0.0.2.ip6.arpa, 3.1.1.0.0.2.ip6.arpa, 0.8.2.ip6.arpa

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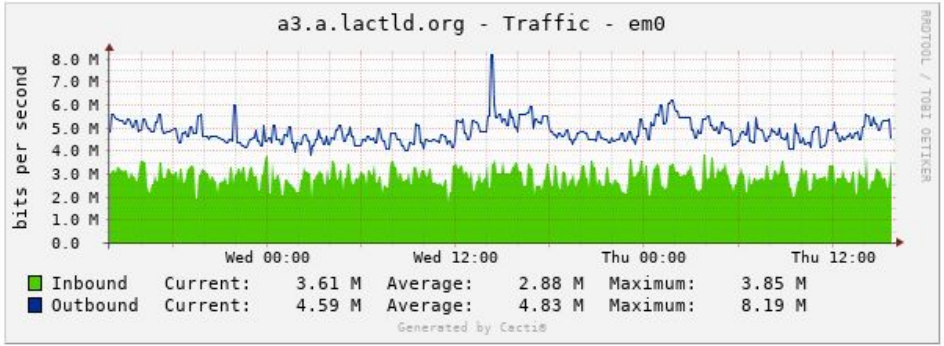
Nodes

- 18 Nodes in production:
  - Argentina, Brazil, Chile, Colombia, Costa Rica, Guatemala, Irlanda, México, Perú, Panamá, Paraguay, República Checa, Uruguay, USA.
  - ccTLDs, IXPs, Registrars, CDN.
- Current total traffic: ~20.000 qps, with peaks of ~30,000 qps



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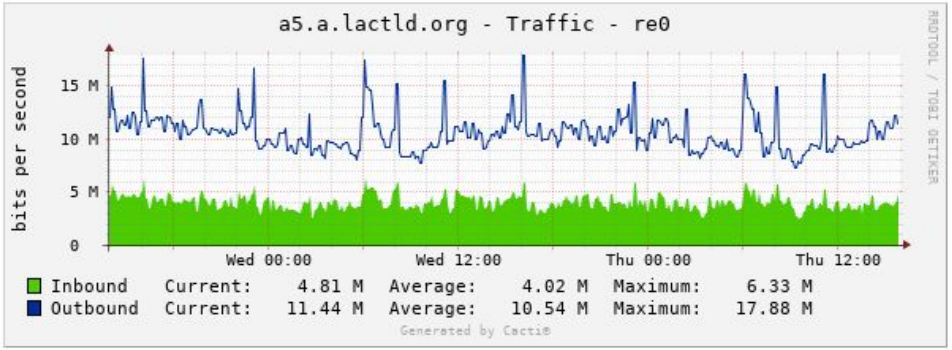
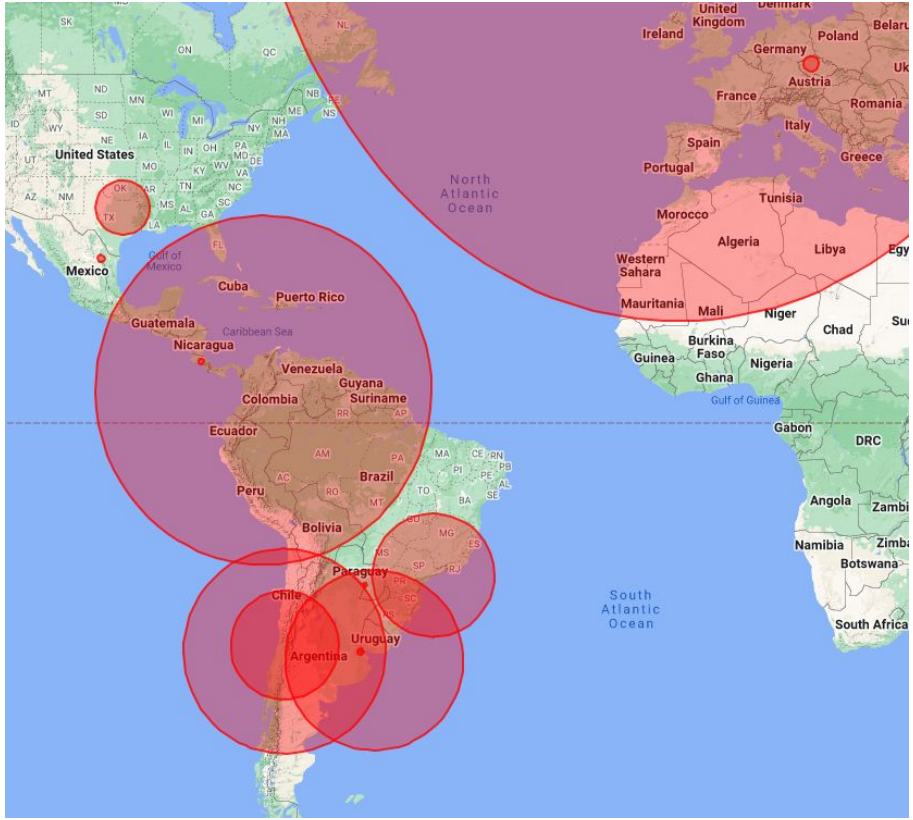
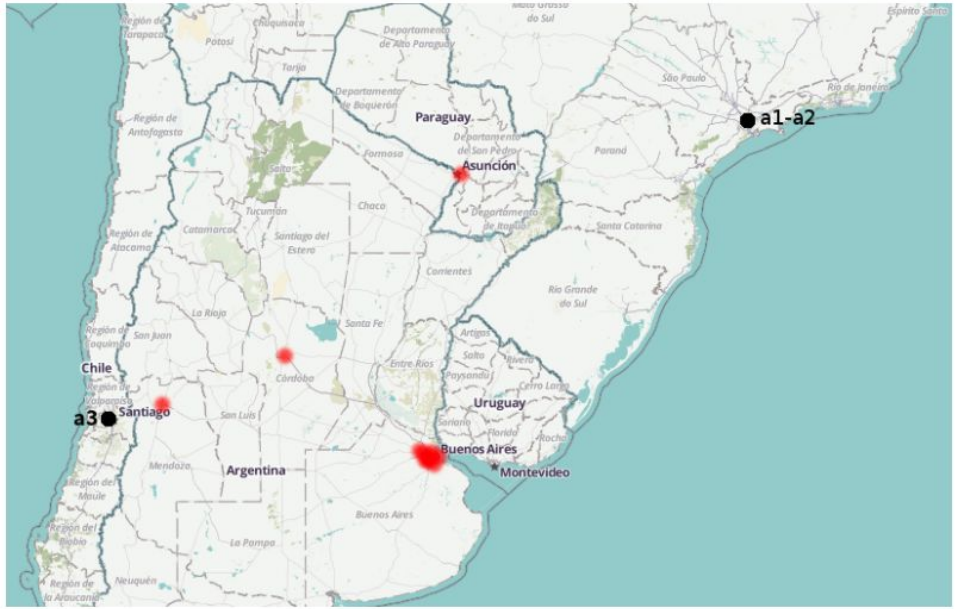


Nodes


United States
Mexico
Gulf of Mexico
Cuba
Puerto Rico
Guatemala
Caribbean Sea
Nicaragua
Venezuela
Guyana
Suriname
Colombia
Ecuador
Peru
Brazil
Bolivia
Paraguay
Chile
Uruguay
Argentina
North Atlantic Ocean
South Atlantic Ocean
Ireland
United Kingdom
Poland
Germany
Austria
France
Romania
Italy
Spain
Portugal
Greece
Tunisia
Morocco
Algeria
Libya
Western Sahara
Mauritania
Mali
Niger
Chad
Burkina Faso
Guinea
Nigeria
Ghana
Gulf of Guinea
Gabon
DRC
Angola
Namibia
Botswana
South Africa

Optimization

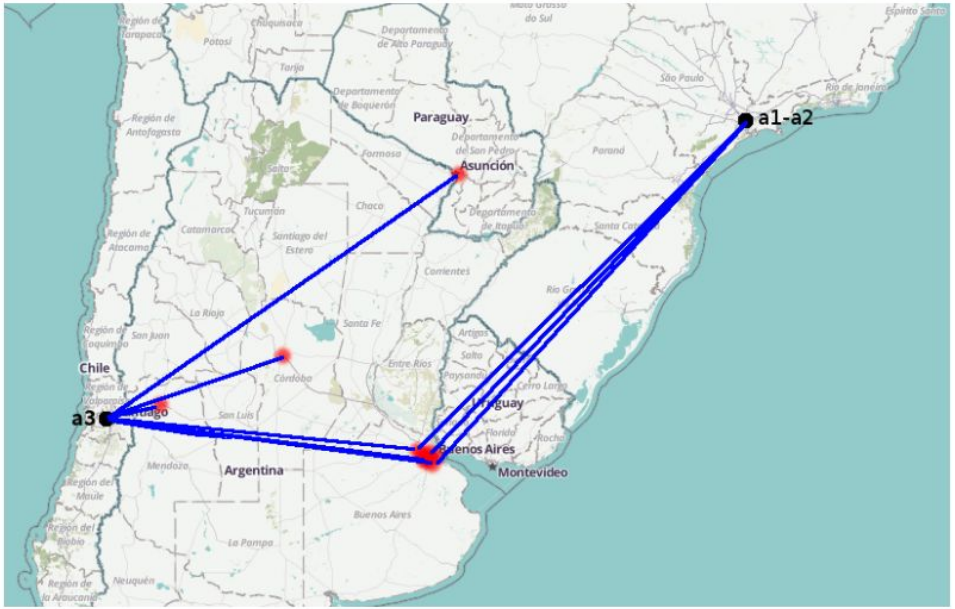
The installation of a new node improves the response time in its neighborhood for all ccTLDs that are clients of the Anycast Cloud.



Source: https://labs.ripe.net/Members/hugo_salgado/visualisation-of-a-new-node-in-lactld-anycast-service

Case study of the installation of a node in Buenos Aires.

Optimization



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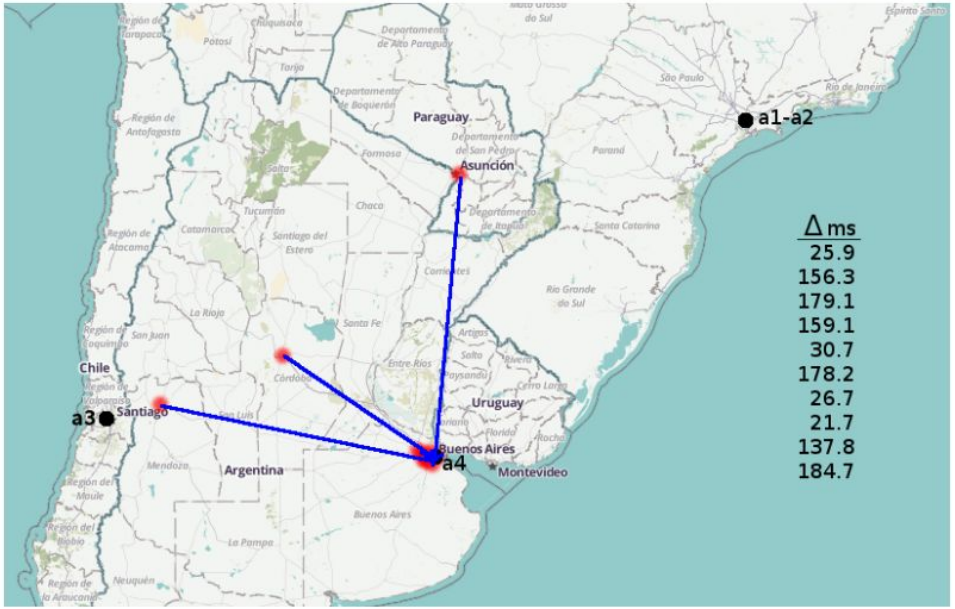
Optimization



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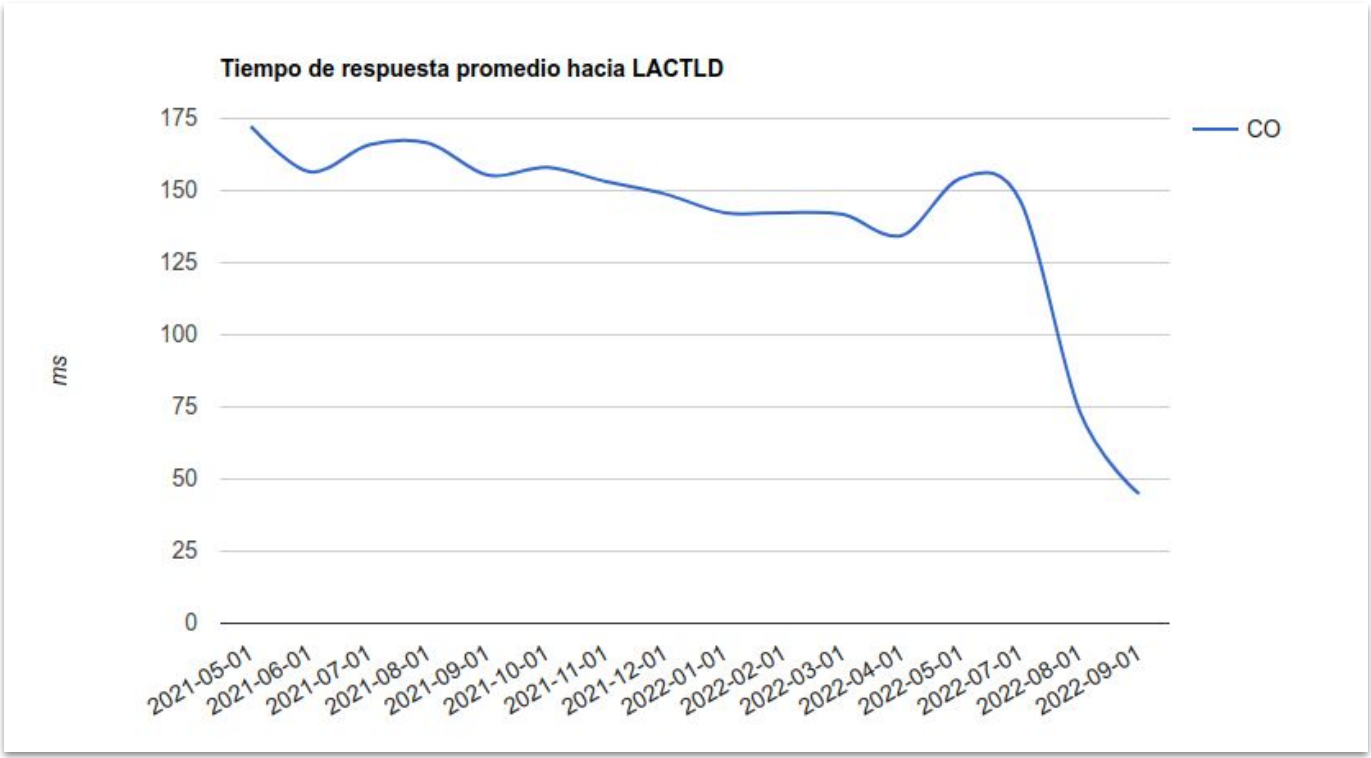
Optimization



Source: https://nsstats.labs.lacnic.net

Conclusions

- Case of regional collaboration.
- Technology developed and maintained in the region.
- Robustness and resilience for the DNS in Latin America and the Caribbean.
- Promotion of local traffic exchange.
- ccTLDs cooperating with regional infrastructure!

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THANK YOU

Tech Day at ICANN79
San Juan, Puerto Rico 2024

https://anycast.lactld.org