Race to the Edge: Staying Relevant in a Changing Environment

IX.br Forum 12 | São Paulo, Brasil
Ivan Sanz & Nate Garr
2018 December
IX.br Traffic (Weekly View)

Aggregate traffic IX.br - Weekly

Maximum: 5.74 Tbps  Average: 3.45 Tbps

http://ix.br/
24 Nov 2018
IX.br Traffic (Decade View)

http://ix.br/
24 Nov 2018
This growth is sure to continue, yes?
What if we suggest traffic exchanged on IXs could **stagnate** or maybe even **decrease**?
Purpose
Introduce trends and technologies that can shift where content and users meet
Spoiler alert:
it is **not** the internet exchange as we know it today
This is **not** a proclamation of the absolute end to exchanges
But a story of variables coming together to push traffic outside the scope of today’s exchanges
<table>
<thead>
<tr>
<th>Infrastructure Acquisition Managers</th>
<th>Ivan</th>
<th>Nate</th>
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</thead>
</table>

| We Source | Colocation IP Transit & Transport Peering & Internet Exchange Access |
Because we build for a CDN, this is a very edge-oriented perspective...
“...72% of all Internet traffic will cross CDNs by 2022...”

-Cisco Visual Networking Index: Forecast and Methodology, 2017–2022
Table of contents

- Role of IX in Content Delivery
- Trends in Edge & Telecom
- Threat to the IX
- Staying Relevant
Role of IX in Content Delivery
Edge Cloud Platform

- Global network of **caching** servers
- **Intermediary** between Users and Origin
- Users served from closest **edge** server

https://www.fastly.com/network-map
Without an Edge Platform / CDN

~ 6700km
35ms

Miami (origin)

Hotel Pullman São Paulo
With an Edge Platform / CDN

~ 30km
<1 ms

Miami (origin)
São Paulo Mega Colocation (edge)
Hotel Pullman São Paulo
Content Offload via IX

Mega Colocation

Hotel Pullman São Paulo
Getting Closer to End User

IX

Mega Colocation

Hotel Pullman São Paulo
Trends in Edge & Telecom
1. Users are consuming more bandwidth
● Video is ~58% of downstream traffic
  ○ 4K video on Netflix is ~ 7GB / hour

● Users are increasingly using the internet to shop and play games
  ○ Call of Duty: Black Ops 3 is 101GB
“In Brazil, busy hour Internet traffic… by 2022… will reach 91 Tb/s”

Cisco Visual Networking Index 2017-2022, Brazil Highlights Dec 2018

https://www.cisco.com/c/m/en_us/solutions/service-provider/vni-forecast-highlights.html#
2. Users want less latency
“79% of shoppers who are dissatisfied with site performance... [are] less likely to purchase from the same site again.”

Think with Google
July 2016

https://www.thinkwithgoogle.com/marketing-resources/experience-design/mobile-page-speed-load-time/
# Cedexis Country Report, Brazil (DSA)

<table>
<thead>
<tr>
<th>Platform</th>
<th>Median (ms)</th>
<th>Avail.</th>
<th>25th</th>
<th>50th</th>
<th>75th</th>
<th>95th</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Fastly Dynamic Delivery (US-Origin)</td>
<td>289</td>
<td>90.65%</td>
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<td>2. Akamai Dynamic Delivery (DSA US-Origin)</td>
<td>347</td>
<td>90.53%</td>
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<td>3. Highwinds Dynamic Delivery (DSA US-Origin)</td>
<td>358</td>
<td>90.81%</td>
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<td>4. Quantil Dynamic Delivery (DSA US-Origin)</td>
<td>445</td>
<td>89.20%</td>
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<tr>
<td>5. Edgecast Transact (DSA US-Origin)</td>
<td>460</td>
<td>88.20%</td>
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<tr>
<td>6. Edgecast ADN (DSA US-Origin)</td>
<td>502</td>
<td>89.90%</td>
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<tr>
<td>7. CloudFront Dynamic Delivery (DSA US-Origin)</td>
<td>503</td>
<td>89.80%</td>
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</tbody>
</table>

Source: https://www.cedexis.com/get-the-data/country-report/
24 Nov 2018
3. Access networks want content deeper into their networks
“Enterprises are using edge... to cut WAN costs by half, while improving resiliency and improving user experience by 200%”

Gartner Edge Trend Insight Report
Sept 2018

https://www.gartner.com/doc/3889058
4. 5G accelerates this demand
5G Competing with Fixed Broadband

https://www.verizon.com/about/our-company/5g
5. Micro data centers **enable** it all
Micro Data Centers

https://www.datacenterknowledge.com/edge-computing/
edgemicro-plots-disrupt-edge-colocation-48kw-time

2018 Nov 24
Threat to the IX
Quick Recap

- Users want more bandwidth, less latency

- Micro DCs and 5G make traffic at deep edge possible

- Outside of IX sphere of influence
How do you **enable** interconnection that goes beyond mega data center?
Deploy multilateral interconnection in micro data centers
Extend IX network out to deep edge for remote peering
Expand IX presence to less developed markets
Closing
Summary

- Content uses IXs today but trends are driving content **closer** to the user
- Micro DCs and 5G **enable** and **accelerate** this
- Keep an eye on trends and be **ready to act**
Obrigado