

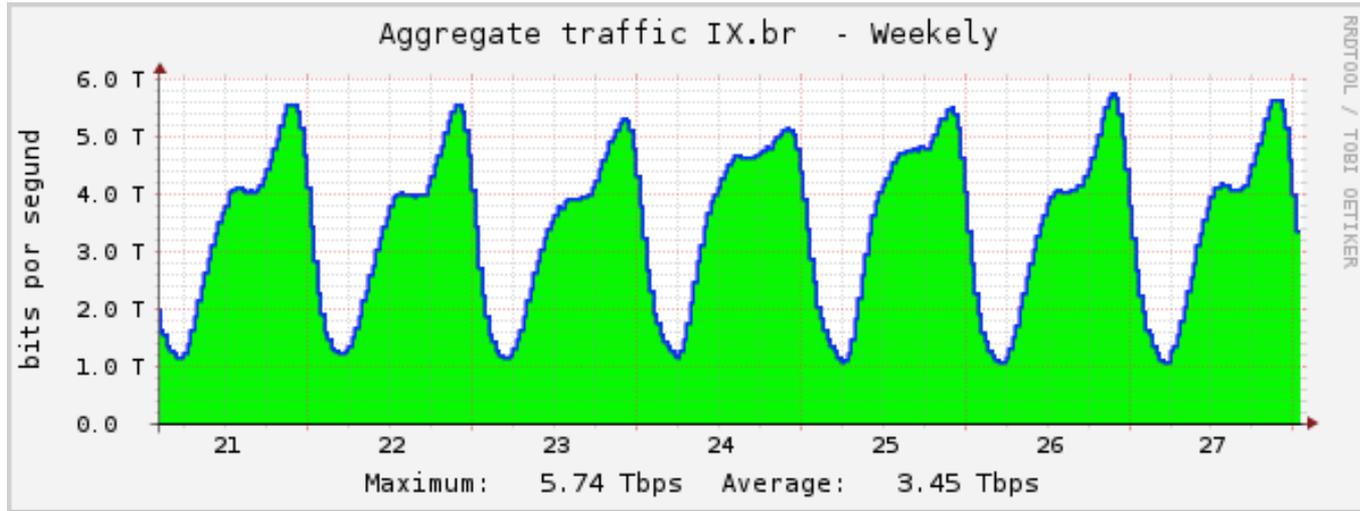


Race to the Edge:

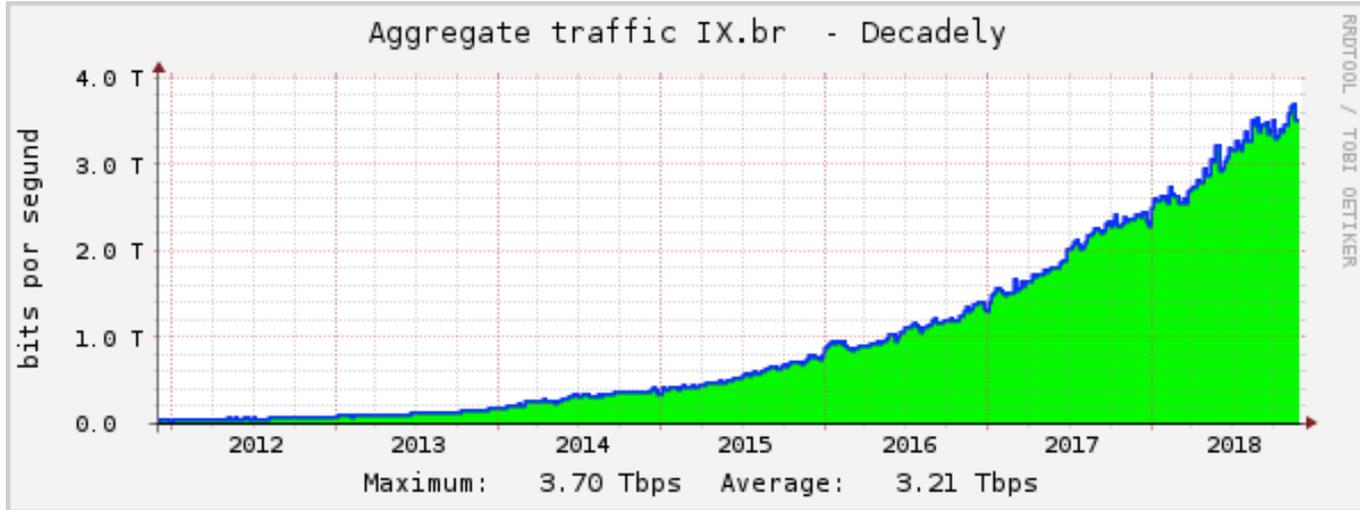
Staying Relevant in a Changing Environment

IX.br Forum 12 | São Paulo, Brasil
Ivan Sanz & Nate Garr
2018 December

IX.br Traffic (Weekly View)



IX.br Traffic (Decade View)

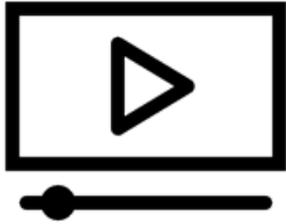


This growth is sure to continue, yes?

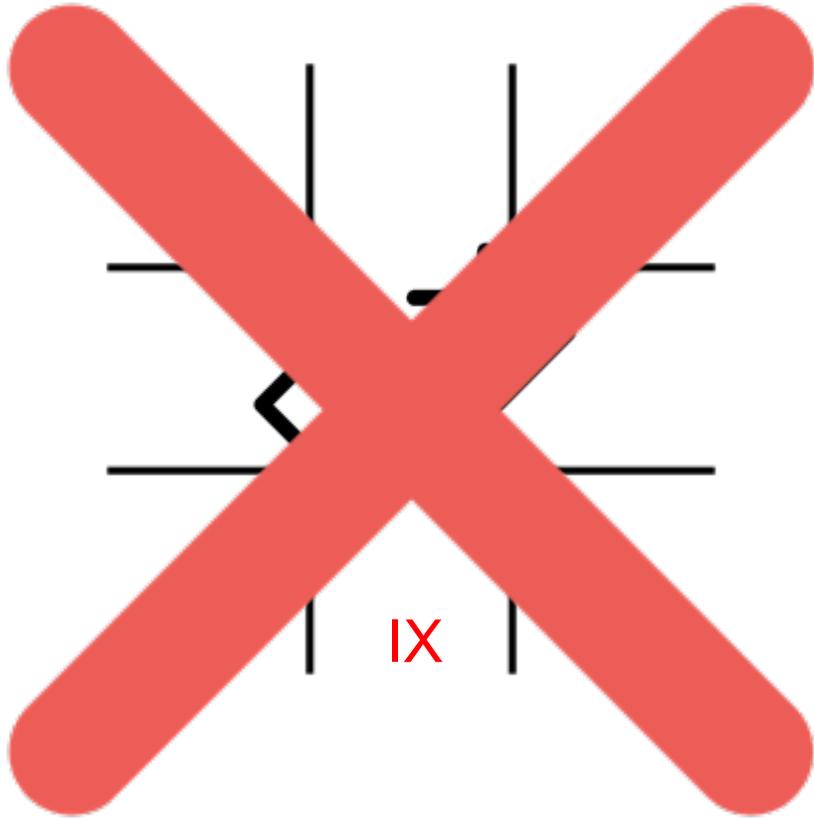


What if we suggest traffic exchanged on IXs could **stagnate** or maybe even **decrease**?

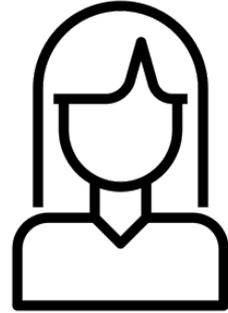




CONTENT



IX



USER

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

About Us

Infrastructure
Acquisition Managers



Ivan



Nate

We Source

Colocation
IP Transit & Transport
Peering & Internet Exchange Access

Fastly Edge Cloud Platform

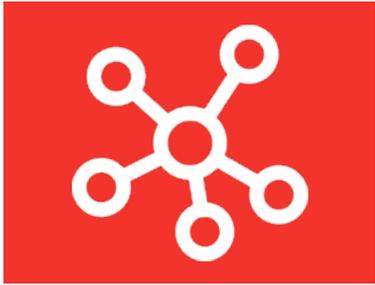


Because we build for a CDN, this is a very edge-oriented perspective...

“...**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



Without an Edge Platform / CDN



~ 6700km
35ms



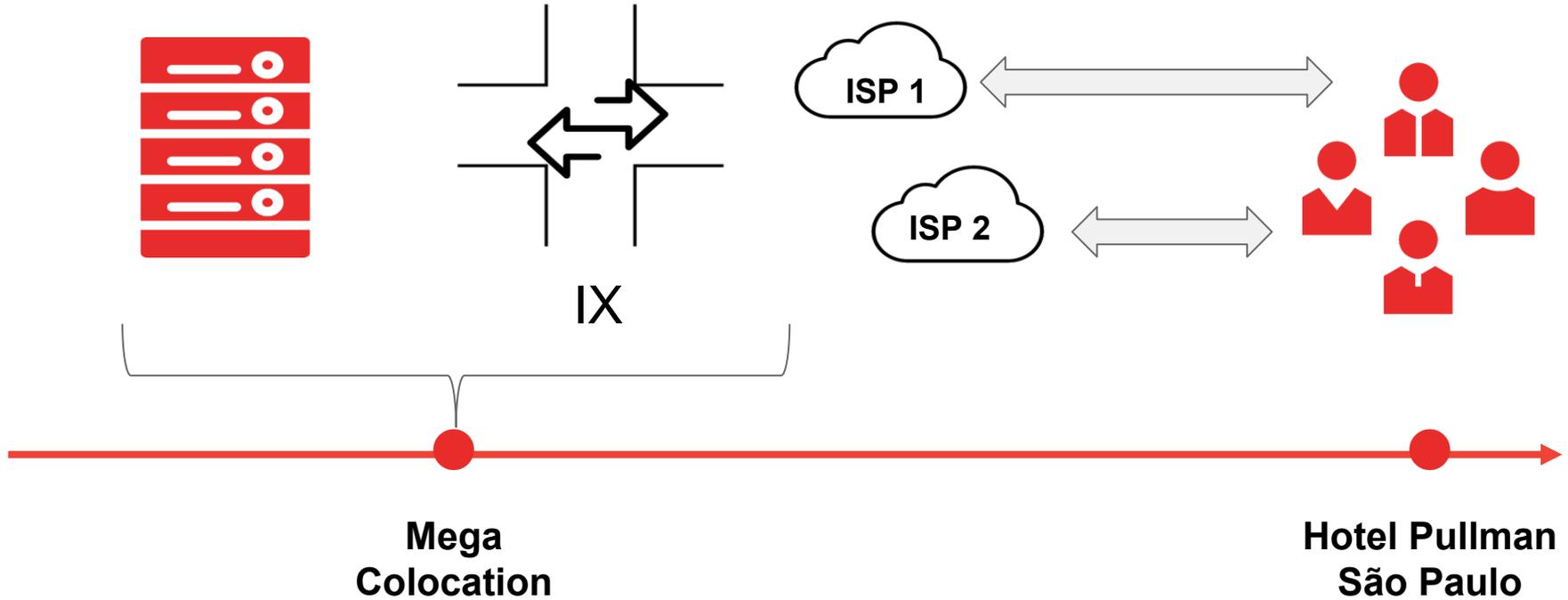
Miami
(origin
)

Hotel
Pullman
São Paulo

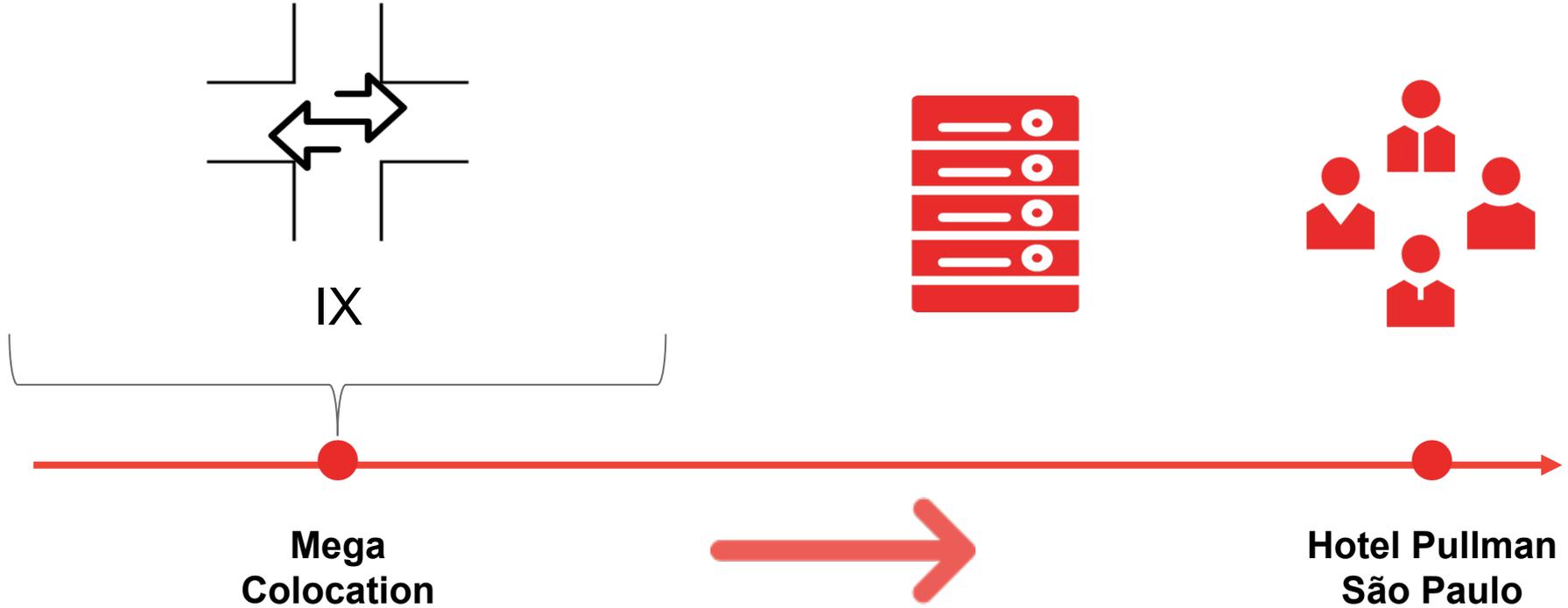
With an Edge Platform / CDN



Content Offload via IX



Getting Closer to End User



Trends in Edge & Telecom

1. Users are consuming more **bandwidth**

GLOBAL APPLICATION TRAFFIC SHARE

1	NETFLIX	14.97% ↓	2.92% ↑
2	HTTP MEDIA STREAM	13.07% ↓	4.84% ↑
3	YOUTUBE	11.35% ↓	3.03% ↑
4	RAW MPEG-TS	4.39% ↓	4.11% ↑
5	HTTP (TLS)	4.06% ↓	2.06% ↑
6	QUIC	3.87% ↓	1.43% ↑
7	AMAZON PRIME	3.69% ↓	0.87% ↑
8	HTTP DOWNLOAD	3.69% ↓	1.45% ↑
9	HTTP	3.22% ↓	4.80% ↑
10	PLAYSTATION DOWNLOAD	2.67% ↓	0.45% ↑

- 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#

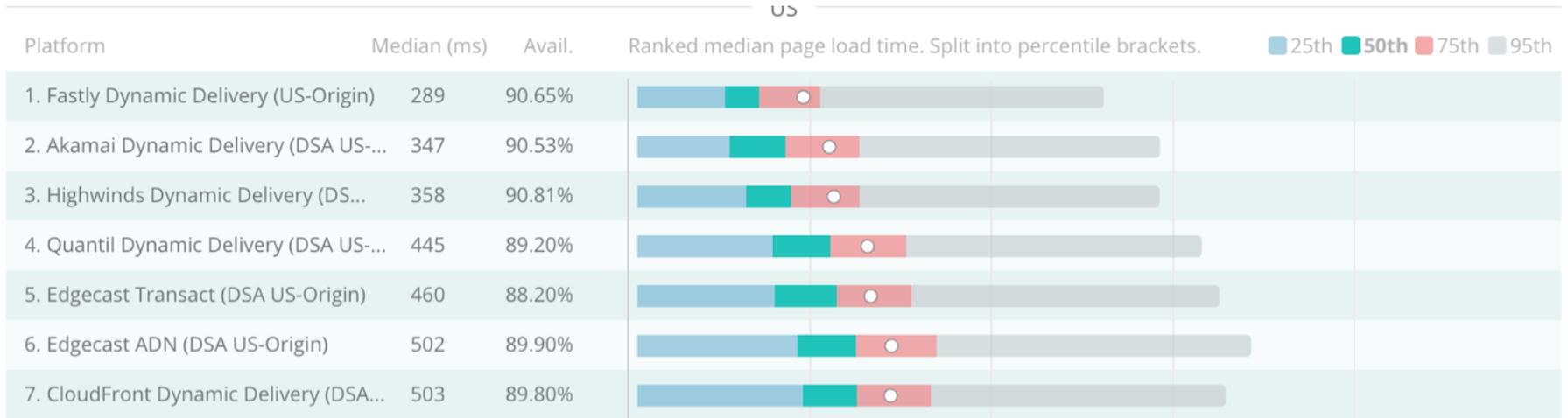
2. Users want less **latency**

“ 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)



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

A promotional graphic for Verizon's 5G Home service. The background is a light gray wall. On the right, a white cylindrical 5G home router sits on a white shelf. A red checkmark is visible on the front of the router. On the left, the text "It's here." is written in a large, bold, black font. Below it are two rounded rectangular buttons: "Check availability" and "Learn more". In the center-right, the text "Cut the cord. Go 5G Home." is written in a large, bold, black font.

It's here.

Check availability

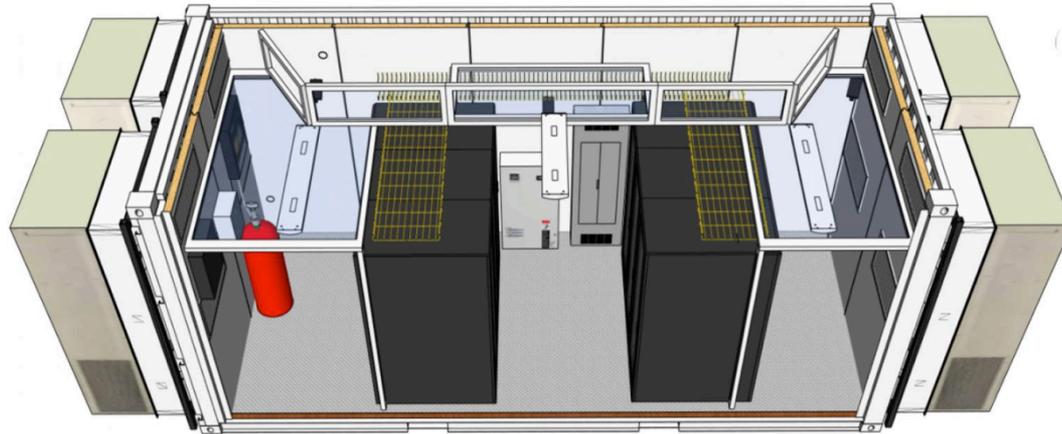
Learn more

**Cut the cord.
Go 5G Home.**

<https://www.verizon.com/about/our-company/5g>

5. Micro data centers **enable** it all

Micro Data Centers

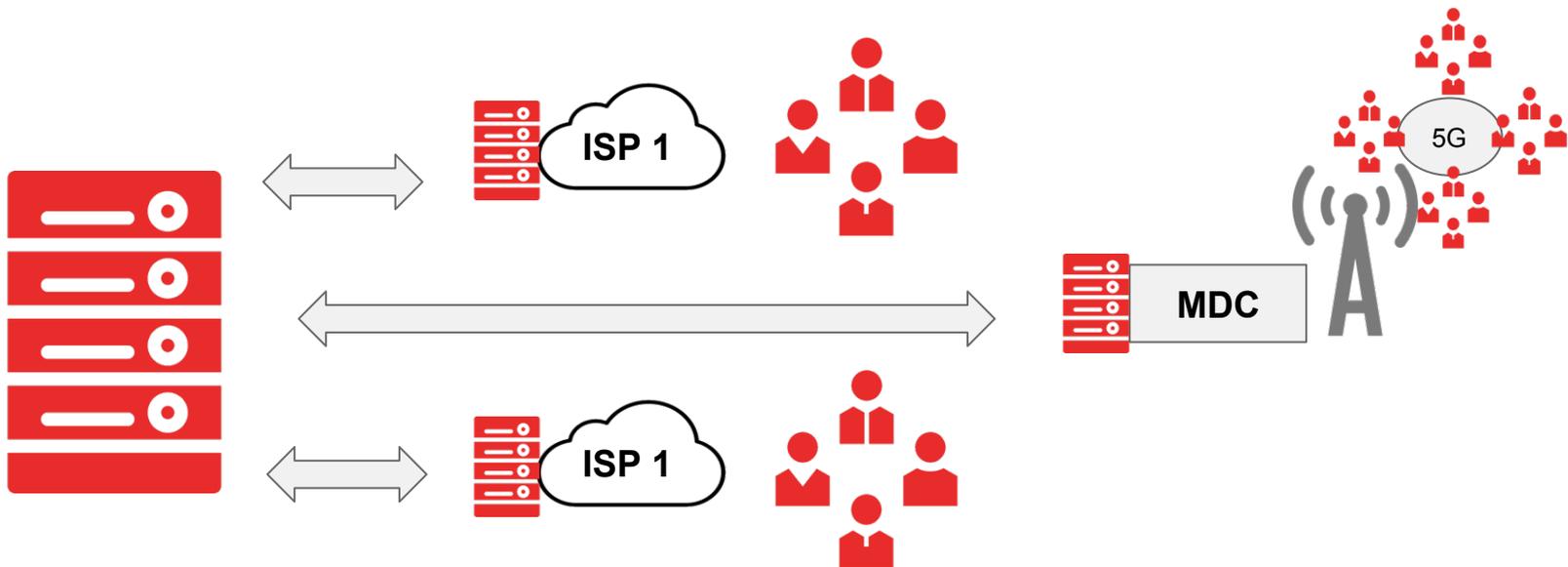


<https://www.datacenterknowledge.com/edge-computing/edgemicro-plots-disrupt-edge-colocation-48kw-time>

2018 Nov 24

Threat to the IX

Deep Edge



**Mega
Colocation**

Equinix Sao Paulo SP3

Equinix Sao Paulo SP2



Hotel Pullman



Quick Recap

- Users want **more** bandwidth, **less** latency
- Micro DCs and 5G make traffic at deep edge **possible**
- **Outside** of IX sphere of influence

Stay Relevant

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