Peering traffic trends and responses from the perspective of Telco Operators

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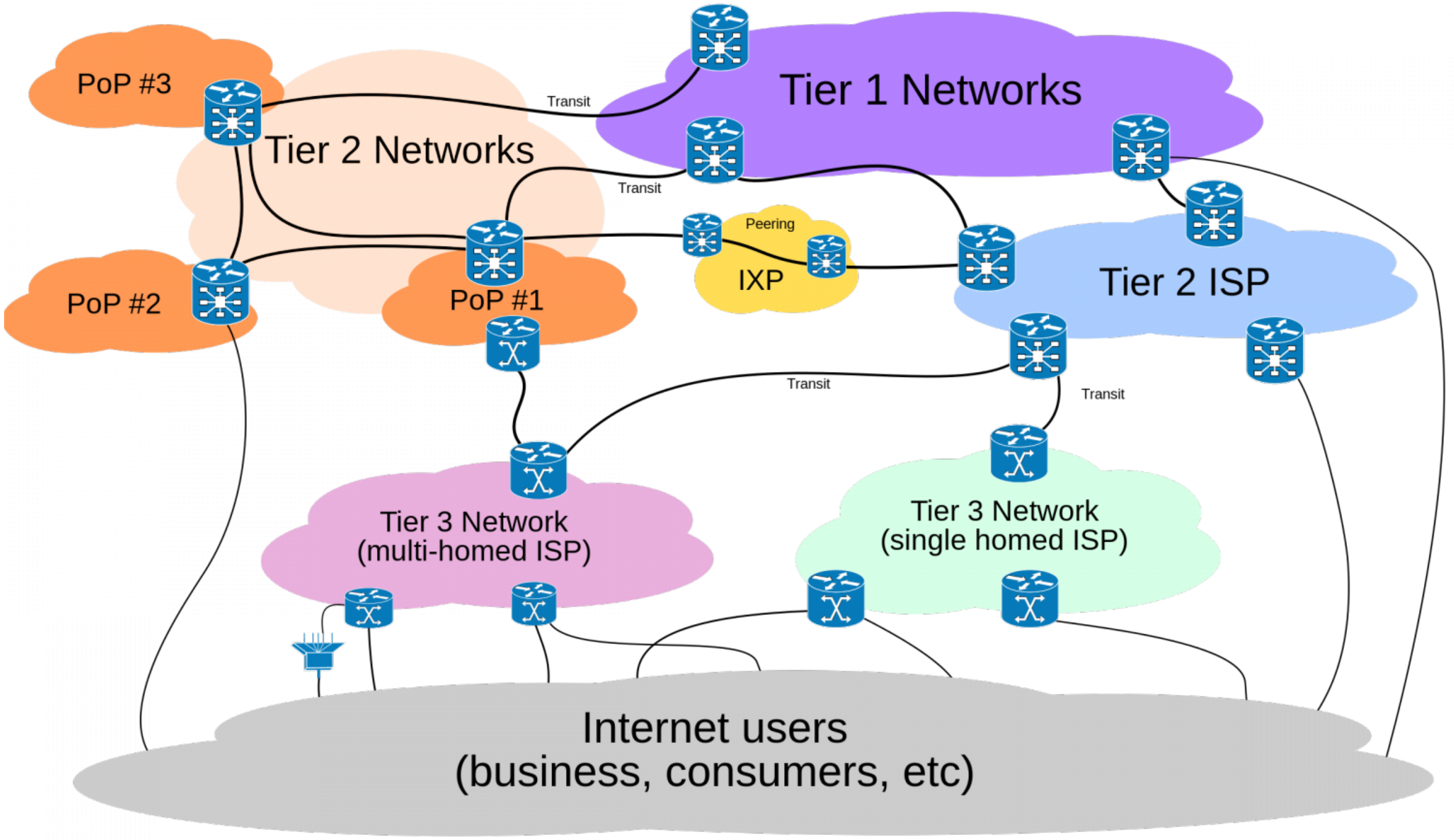
Catchup – Internet, peering



Peering - Connect to content & customers

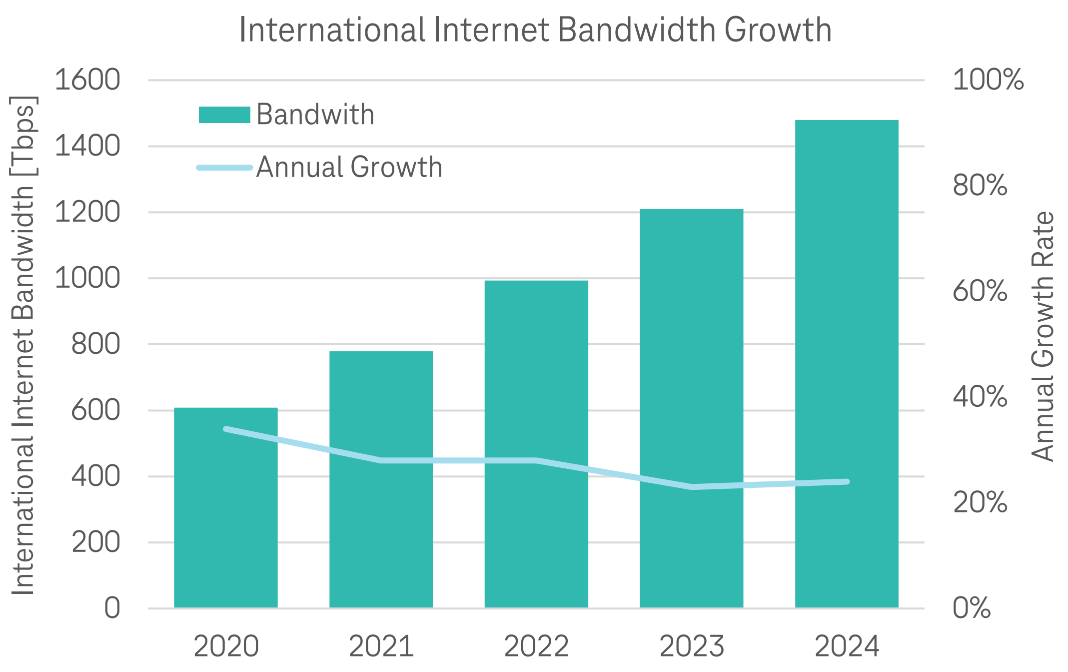
Social

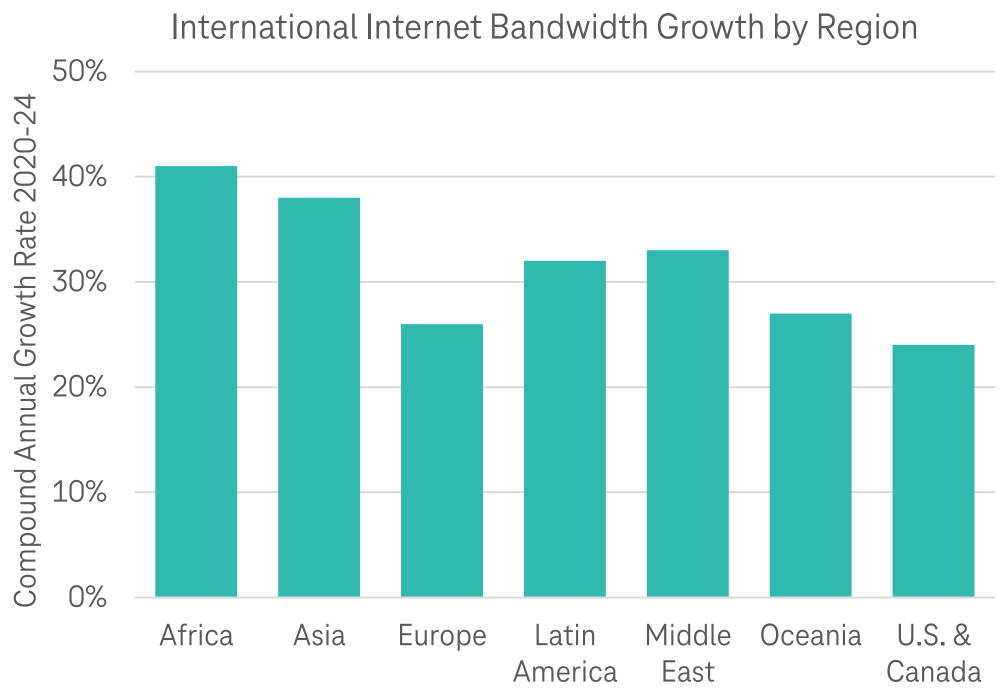
Other

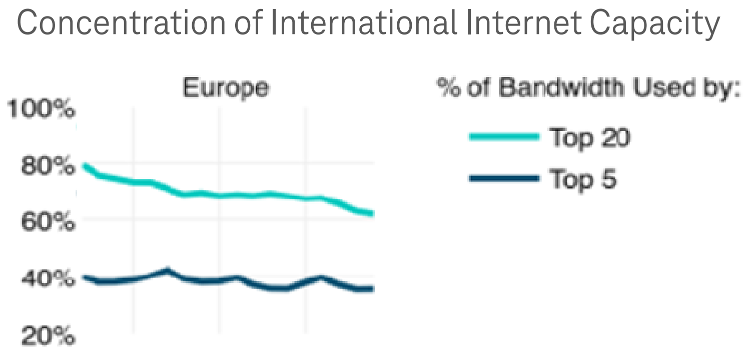
Stream

Gaming

Global capacity trends







Source: TeleGeography

Global international traffic trends

Global International Internet Traffic [Tbps]

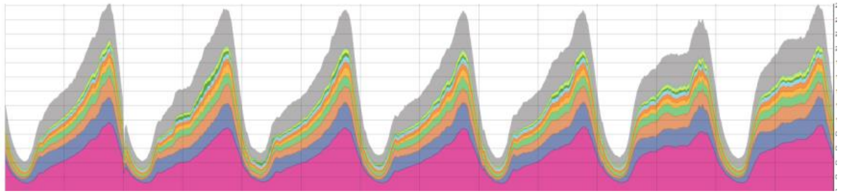
	2019	2020	2021	2022	2023	2024	Change 2019-20	Change 2020-21	Change 2021-22	Change 2022-23	Change 2023-24
Internet BW	452	605	776	990	1216	1479	34%	28%	28%	23%	22%
Average Traffic	113	165	202	260	320	393	46%	22%	28%	23%	23%
Peak Traffic	190	276	348	445	539	676	45%	26%	28%	21%	26%

Note

- The above figures include international traffic only
- If local peering traffic is included, the increase in total peering traffic is higher than the above percentage

Source: TeleGeography

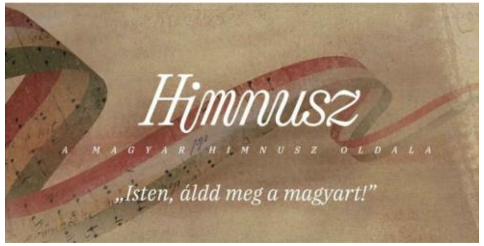
Central EU traffic trends

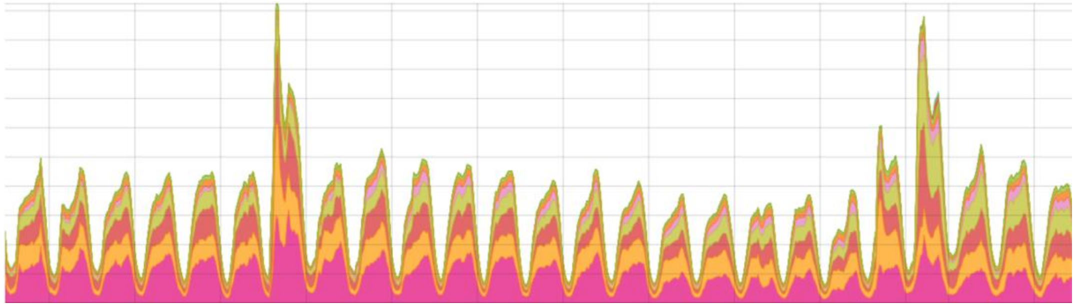


Daily traffic pattern

Yearly traffic pattern

Reasons for traffic peaks





Market consolidation, big new players

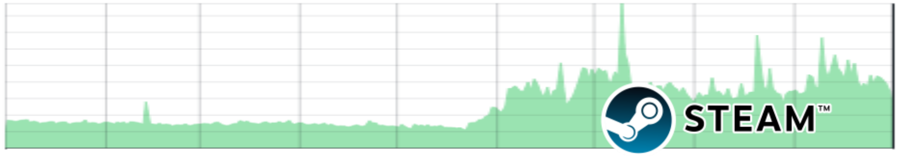
LUMEN → Akamai, colt

HIGHWINDS
A StackPath Company → Akamai

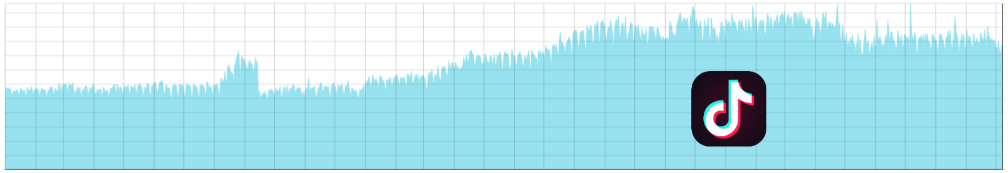
Limelight + edgecast

Edgio

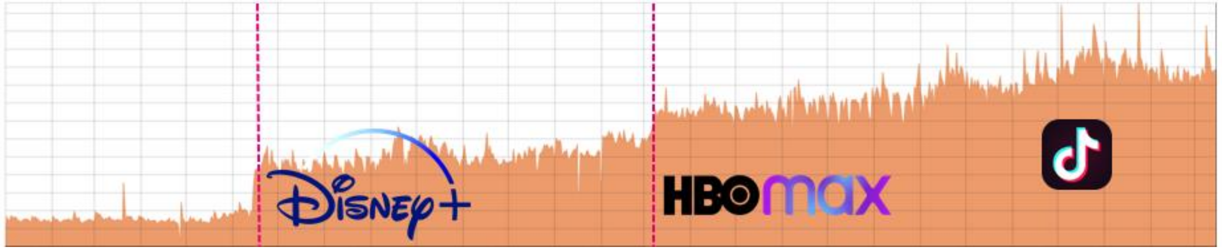
CORE



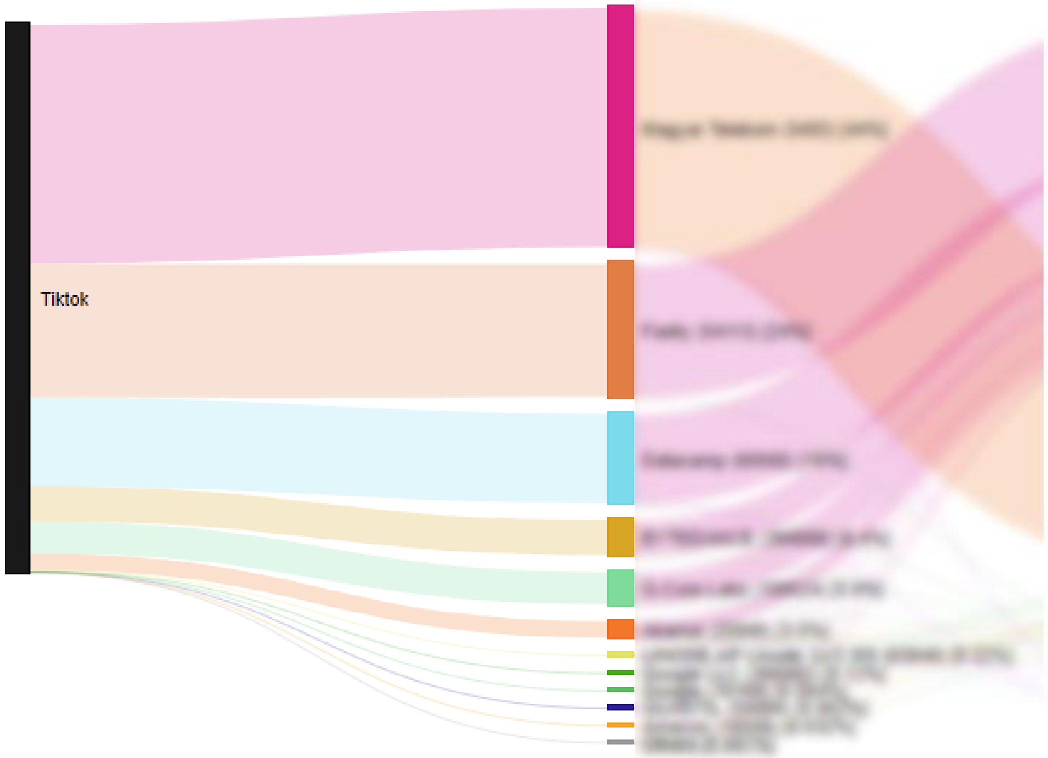
CDN77

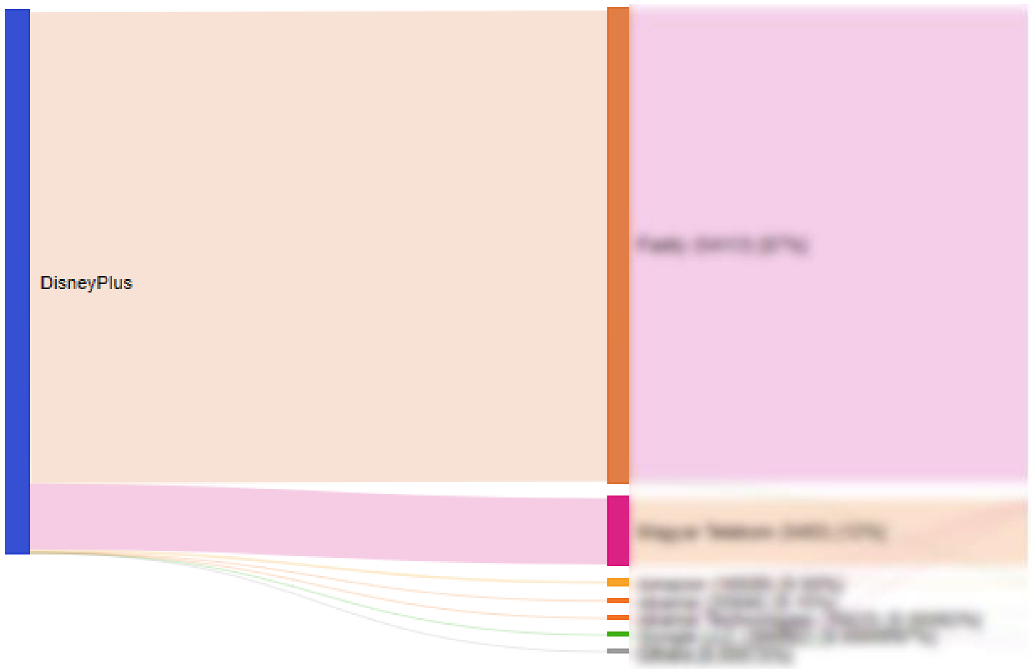


fastly

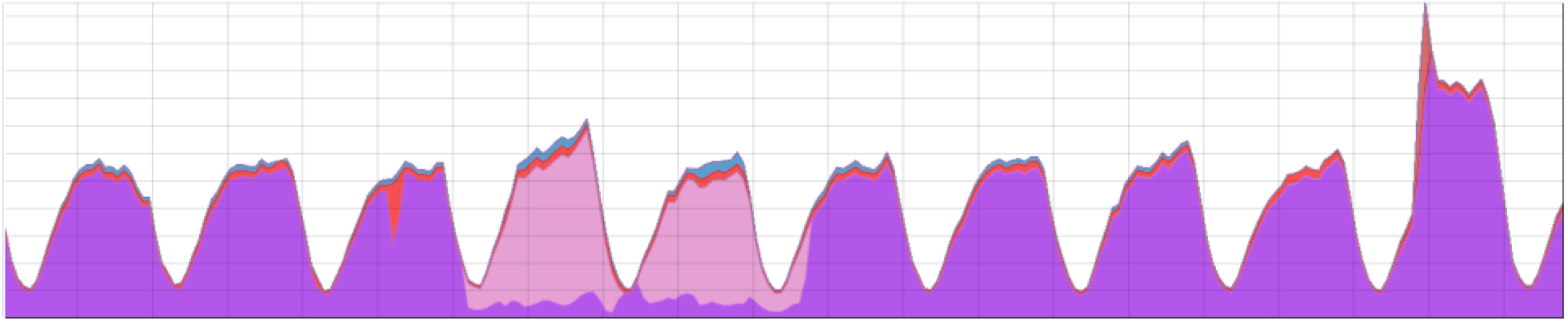


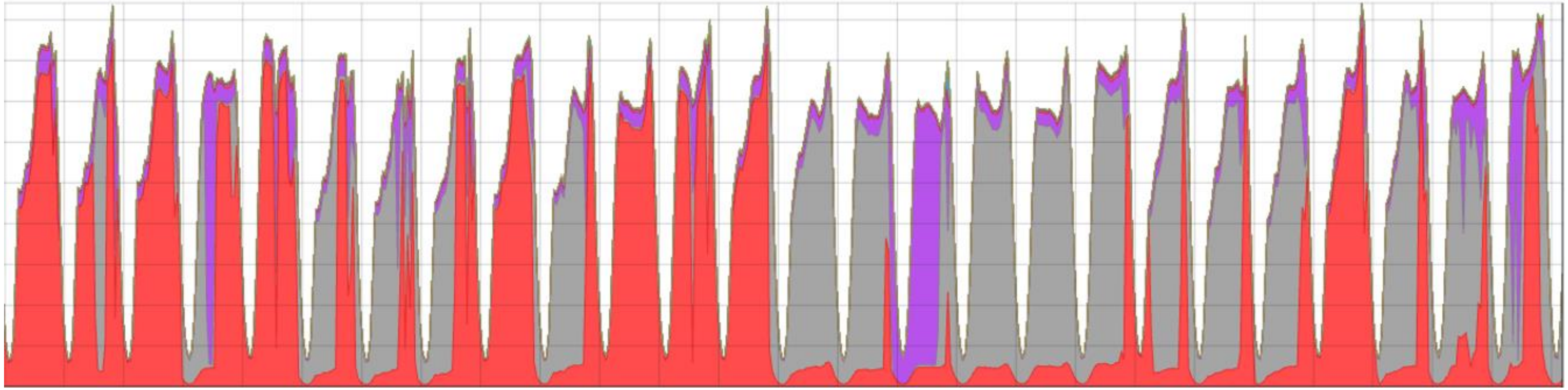
Multi CDN solutions



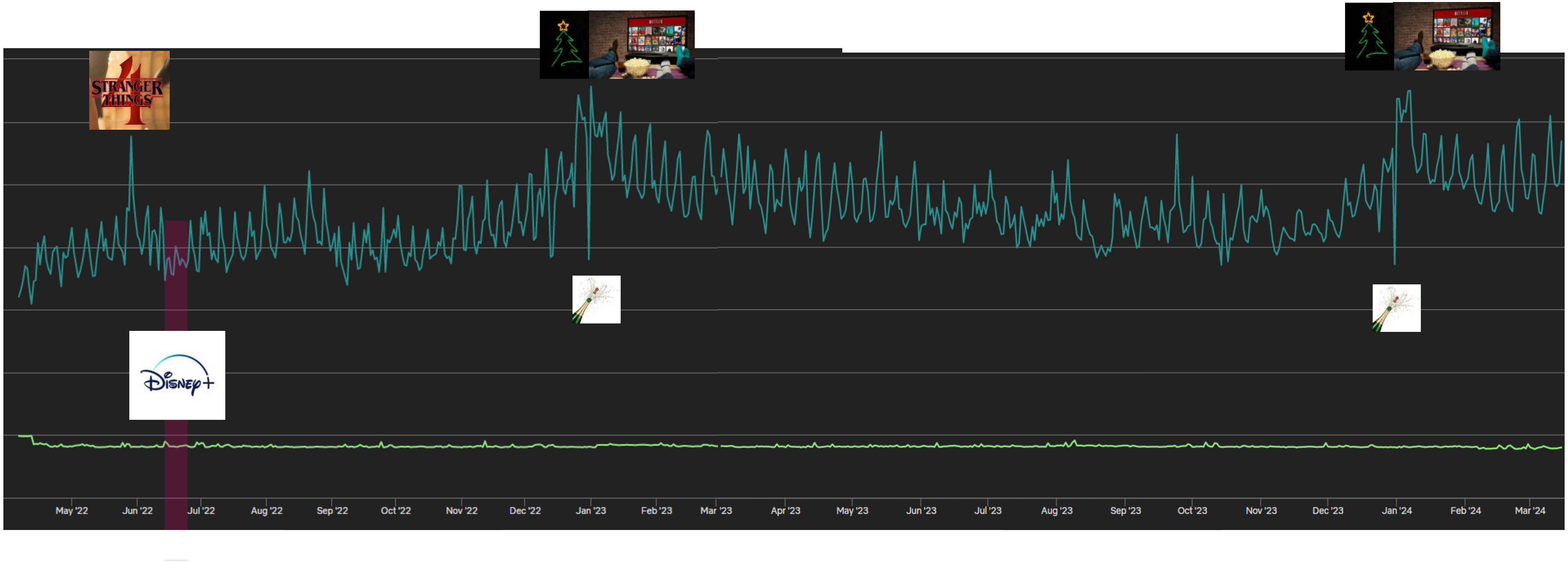


Traffic shifts between CDN & transport providers

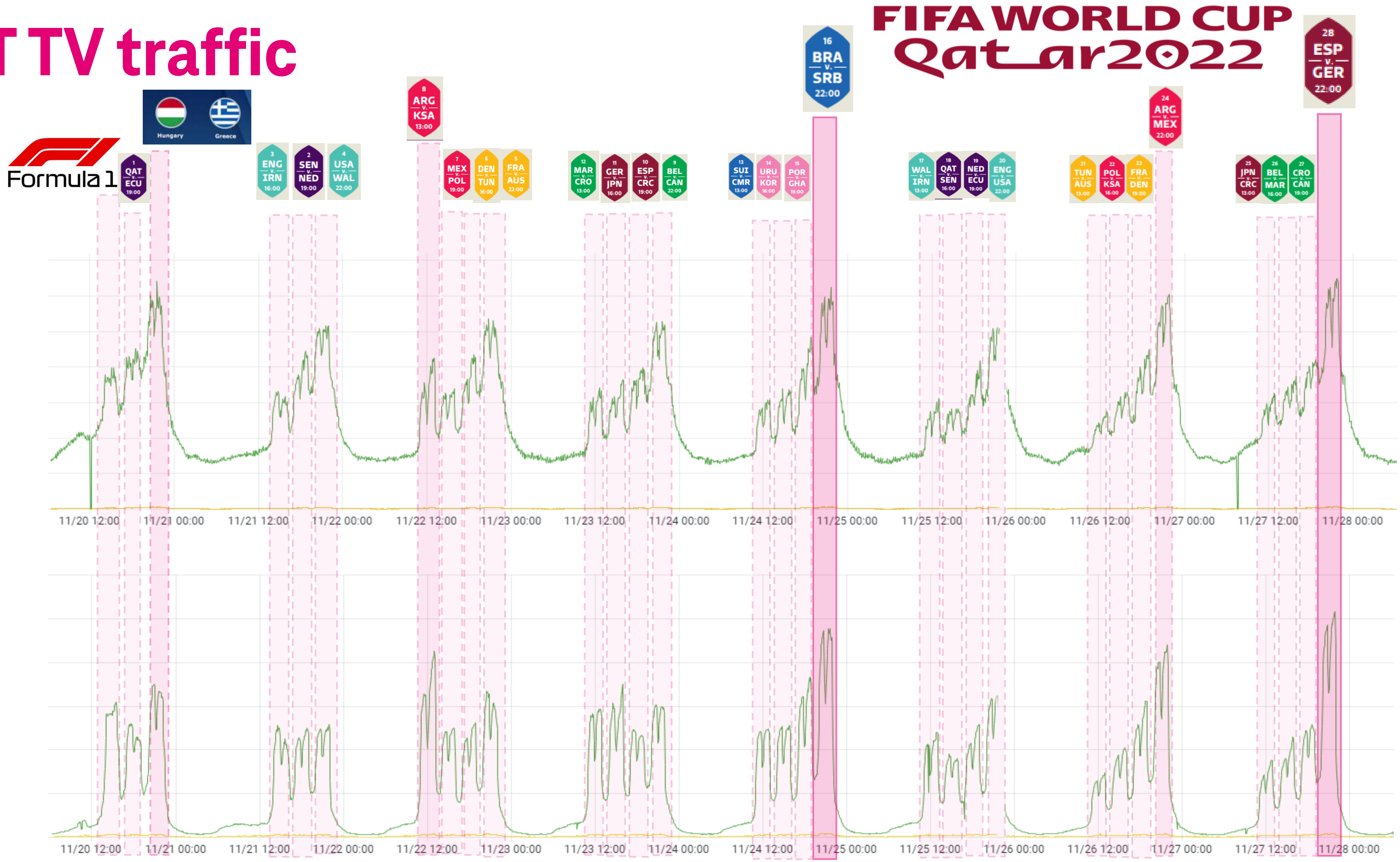




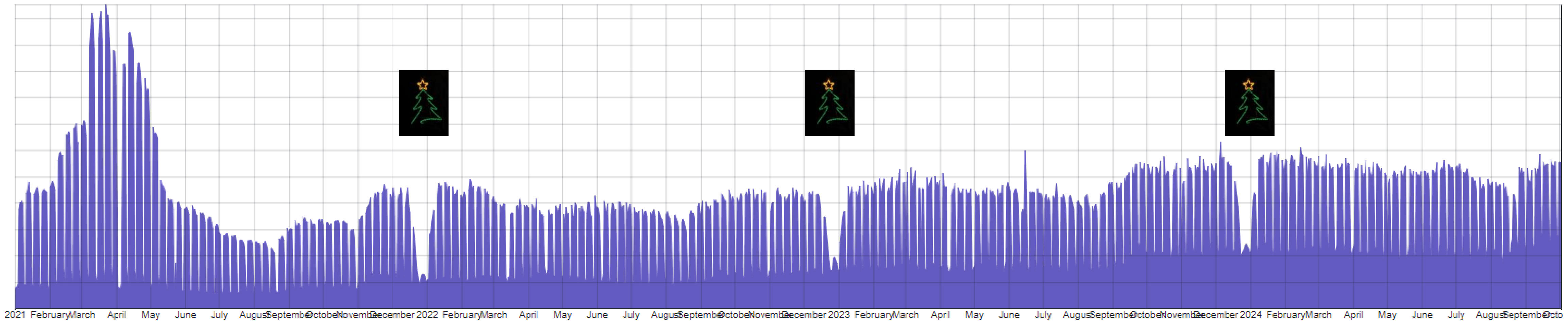
Streaming traffic

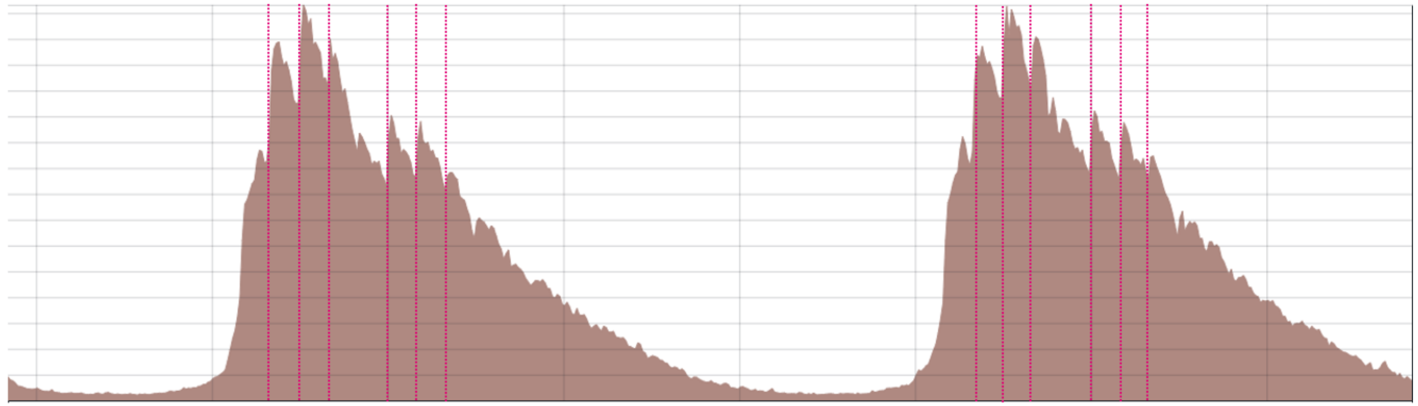


OTT TV traffic



Homeworking traffic



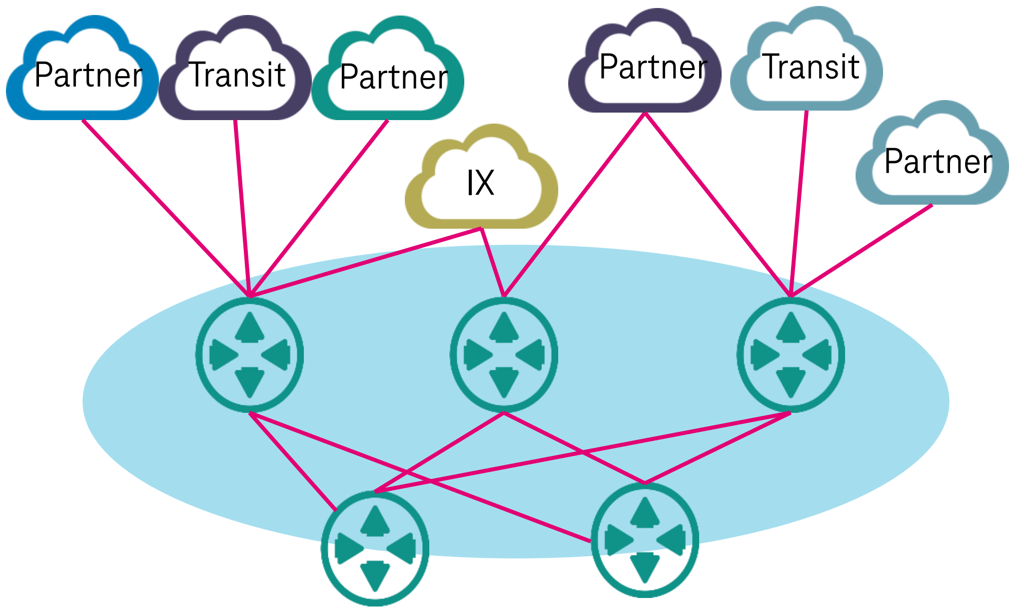


Network requirements for traffic growth

Peering segment routers

- the peering segment aggregates the highest traffic
- different feature required than other (edge) network planes
- high scale (traffic, flow, route)
- robust, high availability, redundant equipment
- capable of routing multiple 100/400GE interfaces
- 800GE (1.6T) capability also expected

- network renewal trends, guidelines also to be considered (which were the subject of our presentation last year)



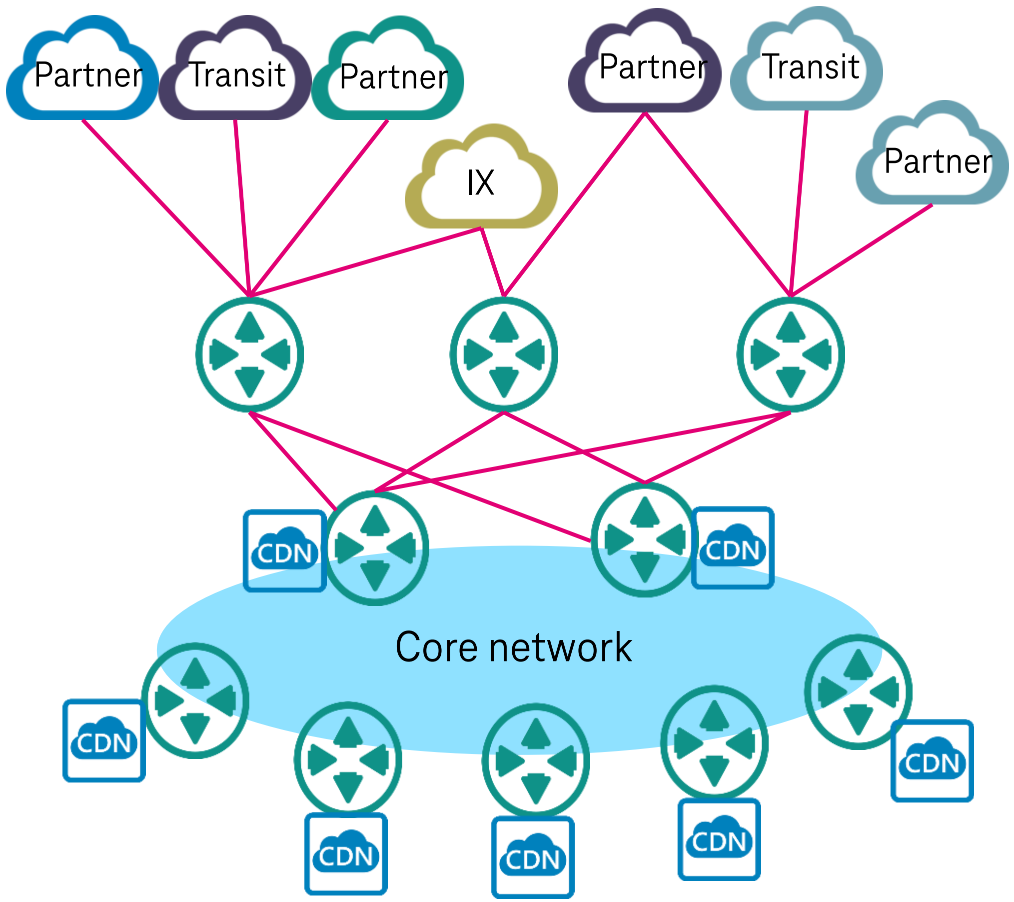
Designing optimal peering architecture

Telcos are looking for solutions to the following challenges:

- Traffic growth
- Quality improvement
- High reliability
- Traffic redistribution
- Cost reduction

Elements of an optimal peering structure:

- Uplink/transit
- Local Private Network Interconnects, Private Peerings
- Local Caches
- Internet eXchange



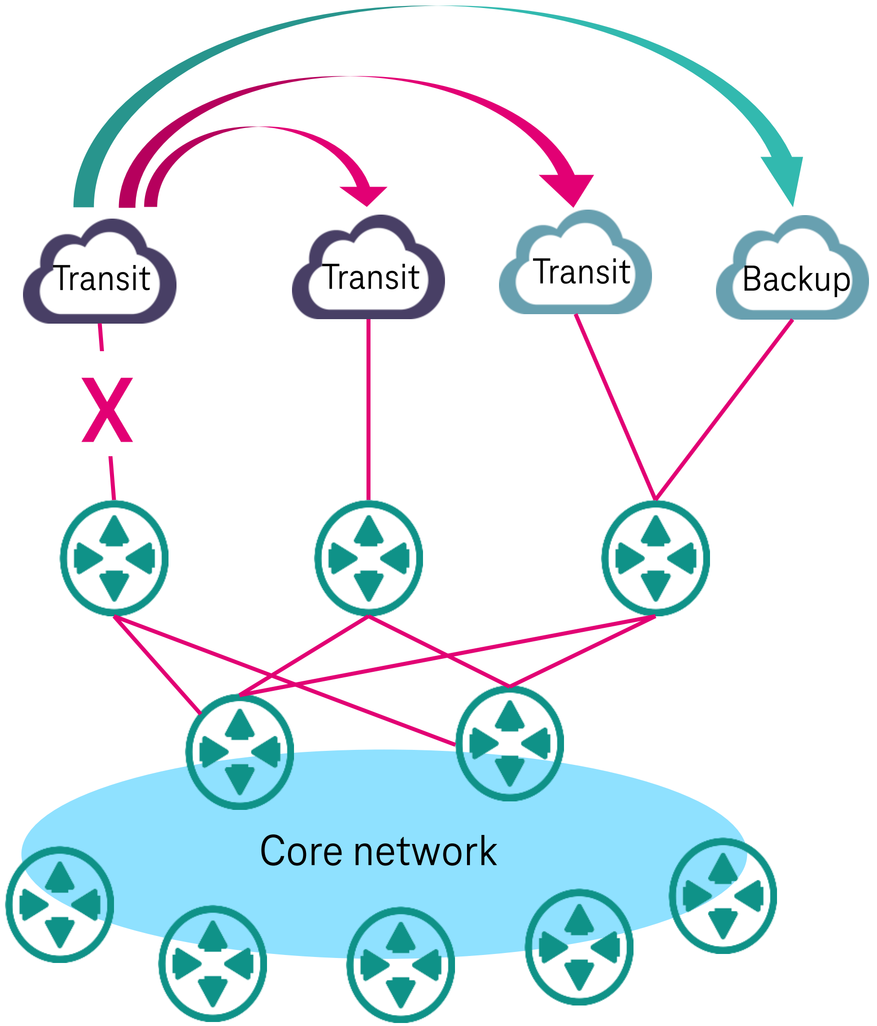
Peering architecture – transit

Internet uplink/transit connections:

- redundancy is mandatory
- main + backup 
- distributed, multiple providers 

Benefits and considerations:

- wide range of providers represented
- automatic traffic switching (main to backup, tansit to transit)
- traffic distribution requires constant attention



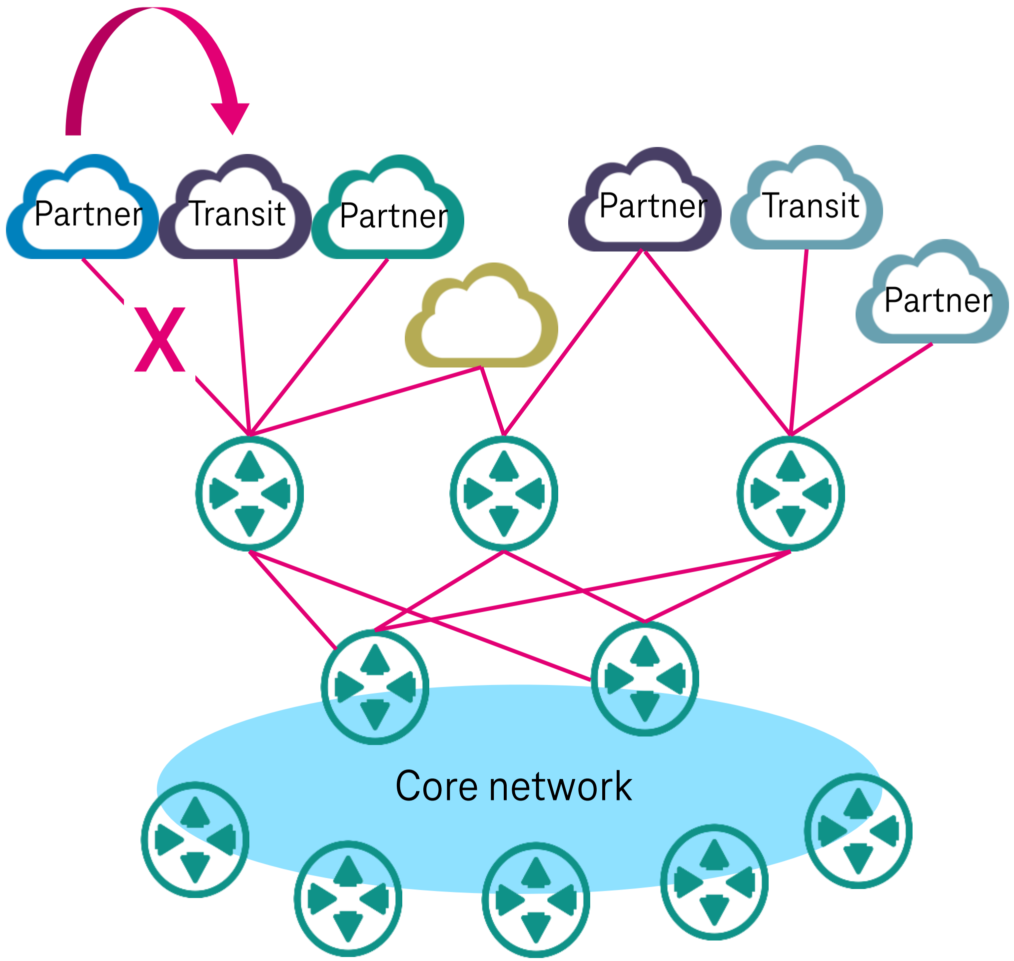
Peering architecture – PNI & PP

Building relationships with local content providers, large peering partners

- Private Network Interfaces
- Private Peering

Benefits and considerations:

- traffic reception redistribution
- transit capacity savings
- but: issue of ensuring redundancy



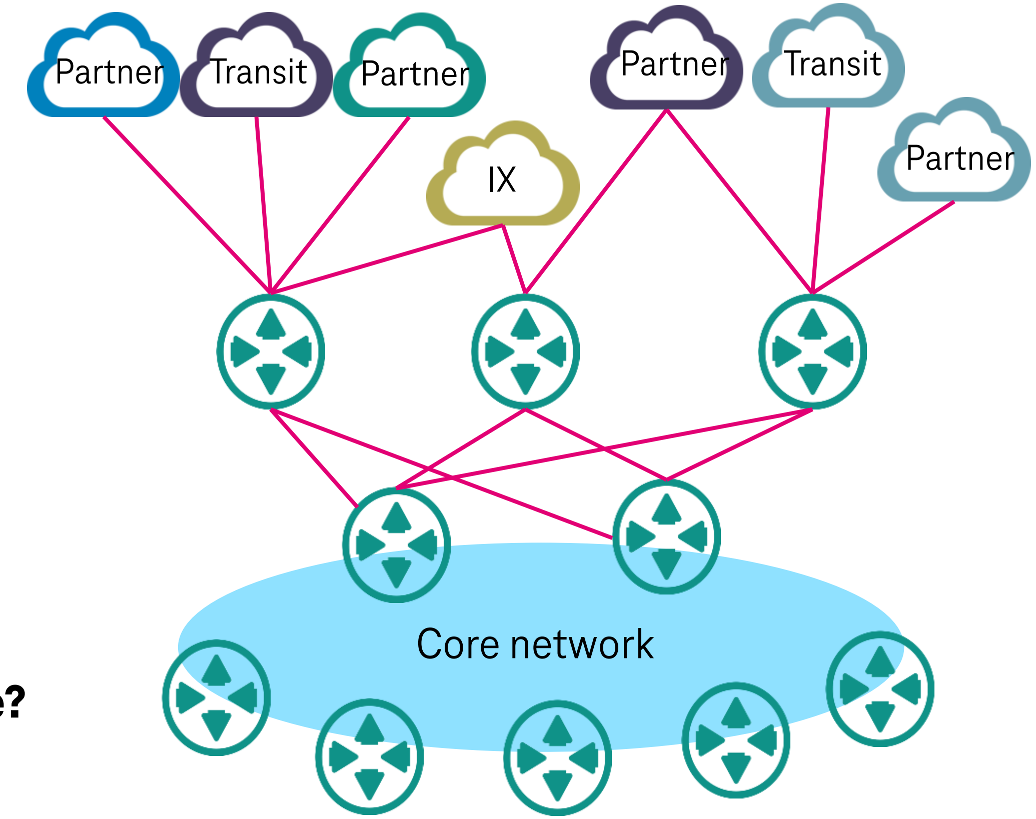
Peering architecture – IX

Benefits and considerations:

- Big players on IXs move to „selective”
- Telcos' peering policies can affect their IX relationships
- Direct peering with large partners may reduce the importance of IX relationships (quality, cost considerations)
- Peering with smaller local service providers and authorities will continue
- International non-profit service providers

What can an IX give a large telco, especially if it is territorially extensive?

- The possibility of transport links between non-local partners and service providers
- Backup connectivity with large partners in case of local PoP outages



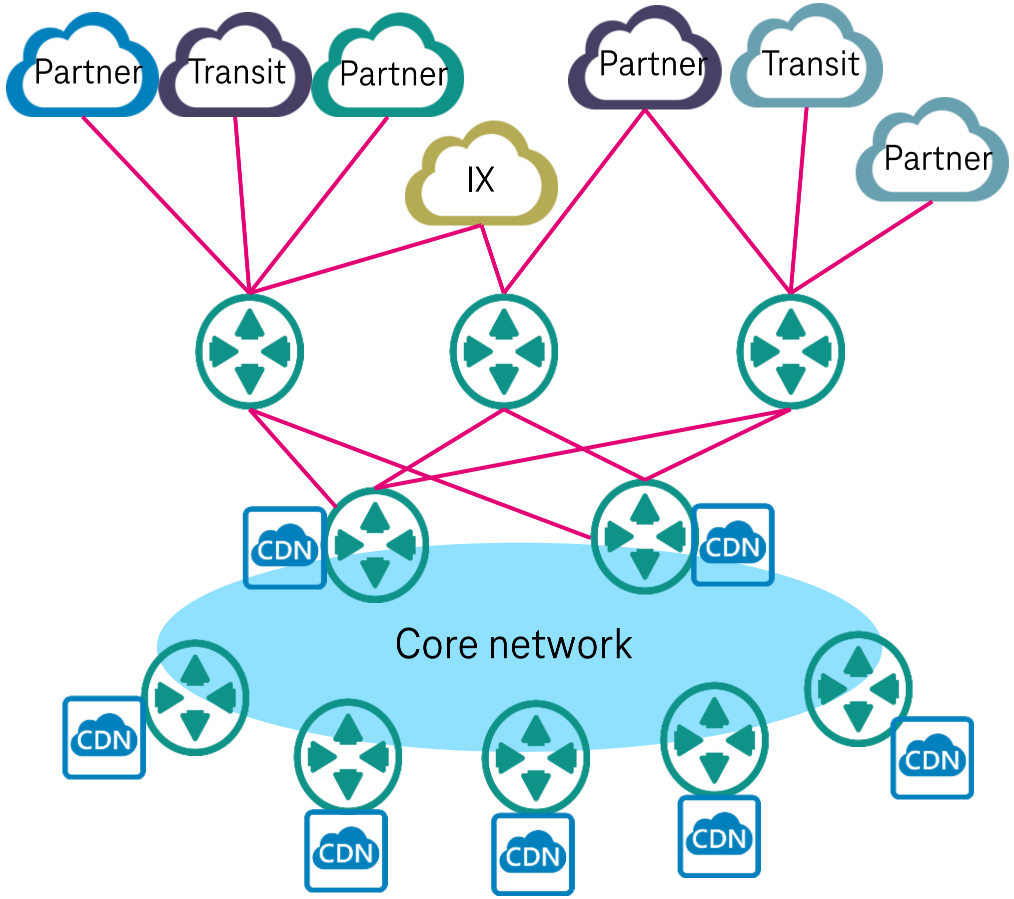
Peering architecture – local caching

Local cache

- Increasing importance of content that can be served from CDNs - generating more and more traffic
- Big players in the market

Benefits and considerations:

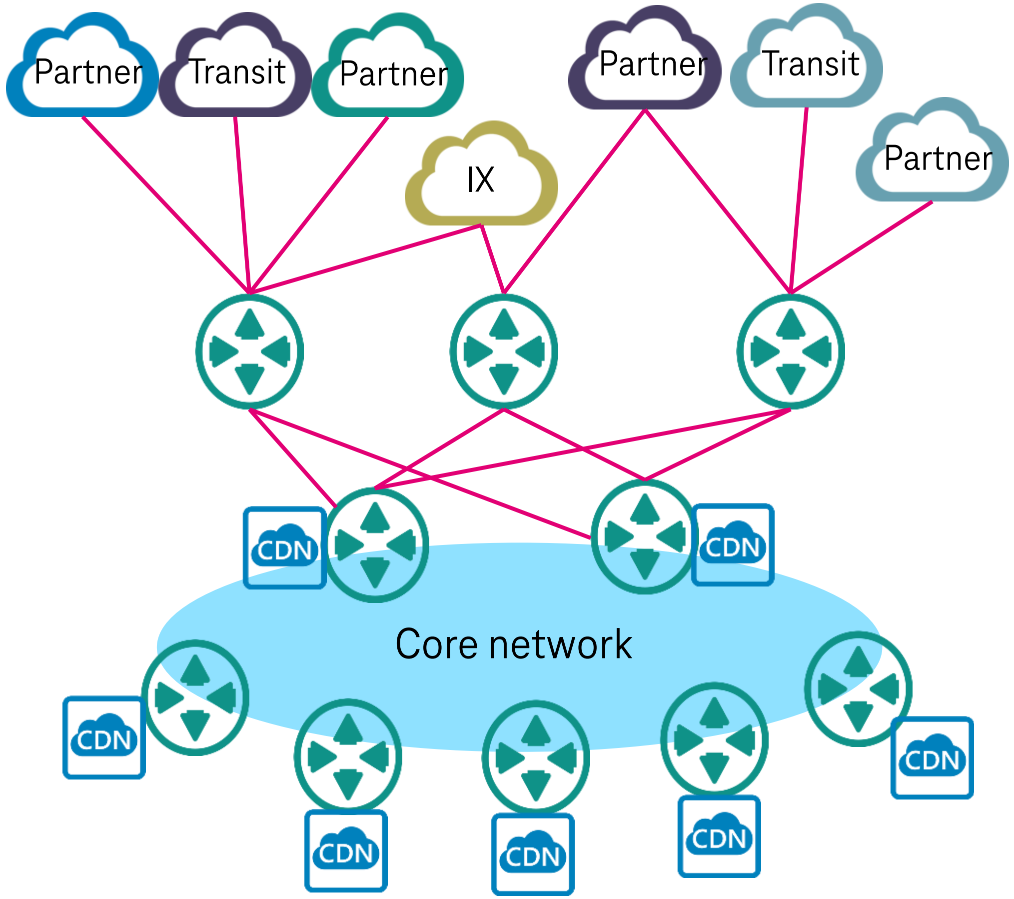
- Usability depends on the distributed availability of content across network points
- Transit & core network capacity savings
- Redundancy can be „solved” for distributed caches
- Transit or PNI connection to provide non-cacheable content and cache-filling traffic
- Excellent content access / customer experience
- But: power consumption!



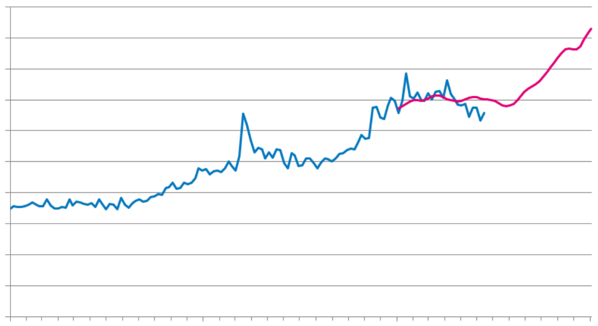
Peering architecture – best practice

Best solution for more local distributed PNIs / caches & PPs

- This can significantly reduce transit capacity
- Provides distributed traffic serving, which also gives greater reliability
- Distributed cache/PNI solution saves capacity both at the peering layer and at the core network layer
- Provide a very good customer experience by localising content, accessing it quickly



Conditions for peering network operation in the face of increasing traffic



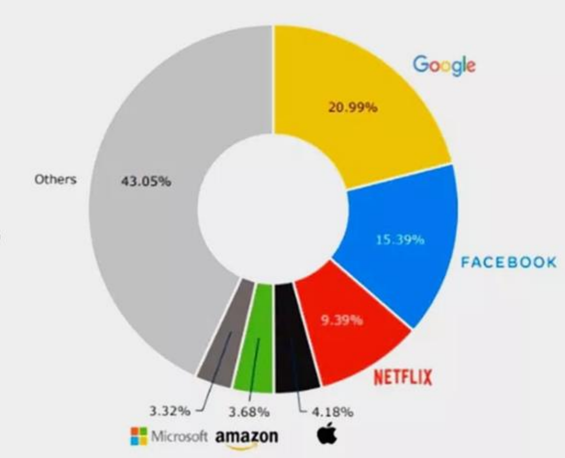
- Network-wide traffic monitoring, international traffic SLA measurements
- Appropriate traffic forecasts - from historical data (even going back several years) - very good solutions already exist
- Network development, transit, PNI, PP, cache development tasks
- Automation tools
- RPKI, LG, BGP tool, RIPE Atlas, RIPE BGPlay

- Flow analyser and visualisation tool can help
  - plan peering capacities,
  - see what is "going on" around us,
  - it is good to have an application view also available,
  - anomaly detection

Fair contribution to telco network rollout

An initiative that OTTs should make a **fair and proportionate contribution** to the costs of the services provided by EU telco operators for the burden of OTT traffic on EU telco operators' networks

- The cost of data generated by OTTs on the side of the telco sector is huge: 8 - 10 billion € fixed & 28 - 30 billion € for mobile networks*
- Draghi report on the state of European competitiveness – digital & telco markets highlighted



Global traffic share of OTTs, 2021 Source: Axon Partners Group (May 2022). Europe's internet ecosystem: socio-economic benefits of a fairer balance between tech giants and telecom operators.

DT - Meta case:

- Meta stopped paying for DT according to their peering agreement & DT turned to court
- Cologne Regional Court ruling in May 2024: Meta must pay for the use of the network
- Meta has decided to route its data traffic via a transit provider to DT's network instead of direct route

A fair contribution system should entail a dispute resolution mechanism whereby issues around fair contribution could be settled

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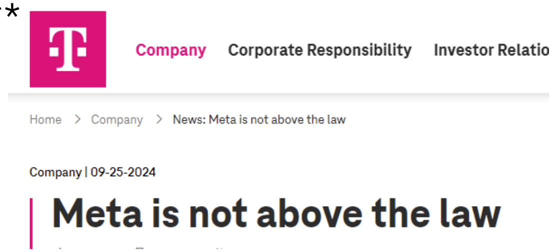

* ESTIMATING OTT TRAFFIC RELATED COSTS ON EUROPEAN TELECOMMUNICATIONS NETWORKS by Frontier Economics https://www.telefonica.com/es/wp-content/uploads/sites/4/2022/05/2022-03-30-Frontier_Fair-Share_FINAL-REPORT.pdf
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Q & A

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