



[www.opennetkorea.org](http://www.opennetkorea.org)

Kyung Sin "KS" Park

[kyungsinpark@korea.ac.kr](mailto:kyungsinpark@korea.ac.kr)

Professor, Korea University Law School

Director, Open Net (Korea)

Presentation for Brazil

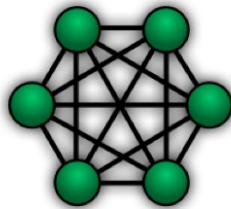
April 28-29, 2024

## Internet as ultimate crowdsourcer: Crowdsourcing connections



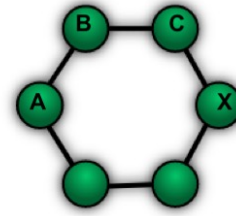
**Star**

Need 5 lines



**Fully Connected**

Need 15 lines



**Ring**

Need 6 lines

Pre-internet: \$20 for 10min for international phone call with one person, to reach 1 million people, you had to pay 1 million USD on postage or phone bill

Post-internet: 100 ppl on video call for hours for practically free, can reach 1 billion people practically free of charge.

How is this magic possible? By **Crowdsourcing “connections” just like people crowdsourcing friends (See diagram)**

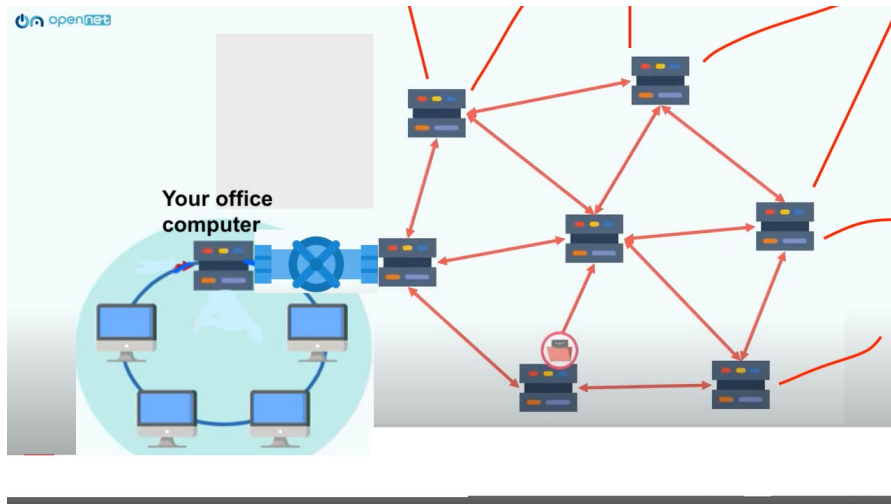
Assume there are only 6 computers in the whole world. best way to allow each one to talk to others? “Fully Connected”, right? too expensive? Need 1billionX1billion connections.

How about Ring? When A wants to send to X, B and C delivers one notch closer to destination X

If everyone keeps this promise, of delivering to its immediate neighbor one notch closer to destination, everyone can talk to one another freely.

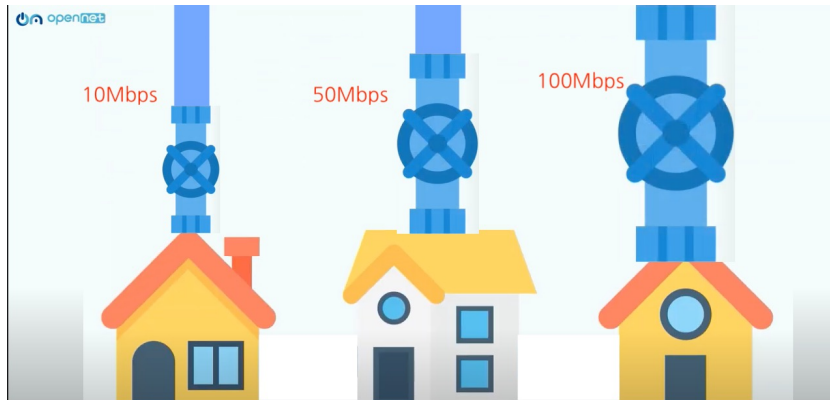
The key is one should not charge each other for data delivery. Otherwise, billing one another create more traffic → Transaction cost. Or gatekeep one another. Passage condition → resolution cost. (net neutrality as practice or voluntary norm even before the term existed)

You still need to pay to connect. How much?



So is internet free? No, even in Ring, you need to build 6 lines. If anyone wants to join the Ring, he or she has to pay to connect. By how much? Depending on capacity of connection by which you connect

## Capacity-based access fee, NO traffic-based transmission fee

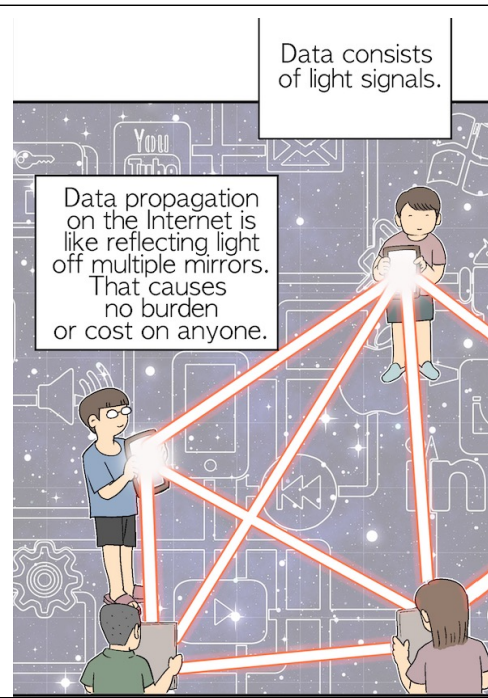


No matter how much you use, you pay exactly the same monthly fee

That means you don't pay by how much data you used. No matter how much you use the internet, you pay the same price per month if you traffic comes through the same size pipeline. Once you made that connection, since all the computers connected to the internet are bound by this promise – to deliver one another's data to immediate neighbor closer to the destination, you can talk to everyone free of data delivery cost. So you pay exactly the same amount each month.



**Anyone can be hit by fire. So, let's help each other.**  
 → Anyone can be a sender of traffic, let's not charge each other.  
 → **End result:**  
**Everyone pays to Connect,**  
**So No One pays to Send!**



So Appreciate the Spirit of Mutual Cooperation. Any house can be hit by fire. So whenever there is fire everyone comes out to put out fire by forming a line to deliver buckets of water from a reservoir to the burning house. So anyone can be a sender of traffic, let's not charge each other. End result: As long as everyone pays to connect, no one pays to send.

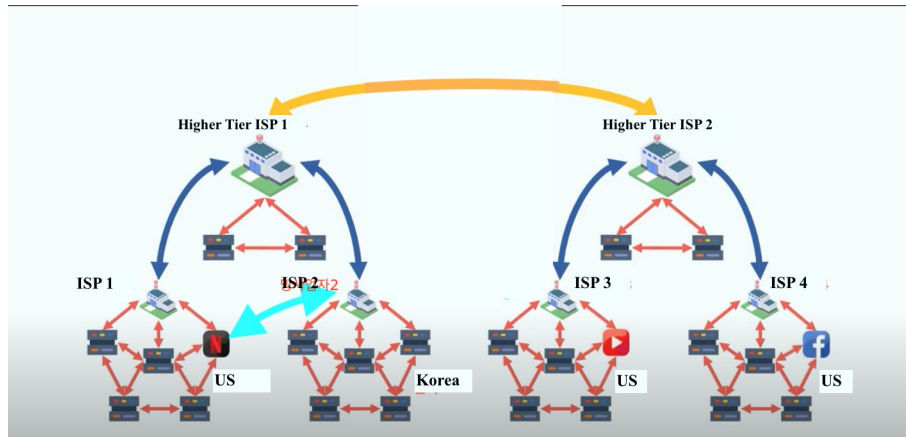
How about Moral Hazard of someone sending more data?

We are blinded by this metaphor is that data is commodity, and data transfer is a service. e.g., Data is new oil.

But even now, as I am looking at the audience, very high resolution video is coming into my eyes with no cost to anyone. Same thing. When you watch free-to-air TV, you don't pay more just because you watch TV more hours. Even Cable TV, you don't pay more because you watch more.

Internet is like a set of mirrors reflecting light off one another's mirrors, at no cost to anyone.

## Role of ISP: Meaning of Selling “Internet”



Light Blue line: Not a connection to the internet but only with each other

Dark Blue line: Local ISPs need to buy their own internet access to sell “Internet” to end users.

Usually, there is an ISP who makes money by connecting new members to the internet because not everyone has technical knowledge to make that connection to the internet. When they receive money, they promise access to all the computers around the world to each of its customers. Since they don't have the connections to all of them, they have to connect to the internet also. ISPs have to obtain or purchase internet access themselves from higher tier ISPs. Their payment is also in proportion to the size of the pipeline.

Some do not want data to travel over that many computers. In that case they make shortcut connection, i.e., peering. That connection is different from internet access. You are not really connecting to the internet but only with the other partner. No promise to propagate outside it. So usually, free.

---

## End result: Promise + Science → Information revolution



### Political consequence:

**Everyone has chance to spread his or her messages to everyone else without having to worry about costs and risks of data delivery.**

**Fight for NN is fight to continue information revolution and progress or to regress to the world of telephony or postage**

---

Information was possible because promise (to deliver for one another free of charge) and science (cost of data propagation is nearly zero) allowed everyone to send data for free as long as everyone is paying to build connection for a fixed cost.

This information revolution had political consequences. Now, Everyone has chance to spread his or her messages to everyone else without having to worry about costs and risks of data delivery.

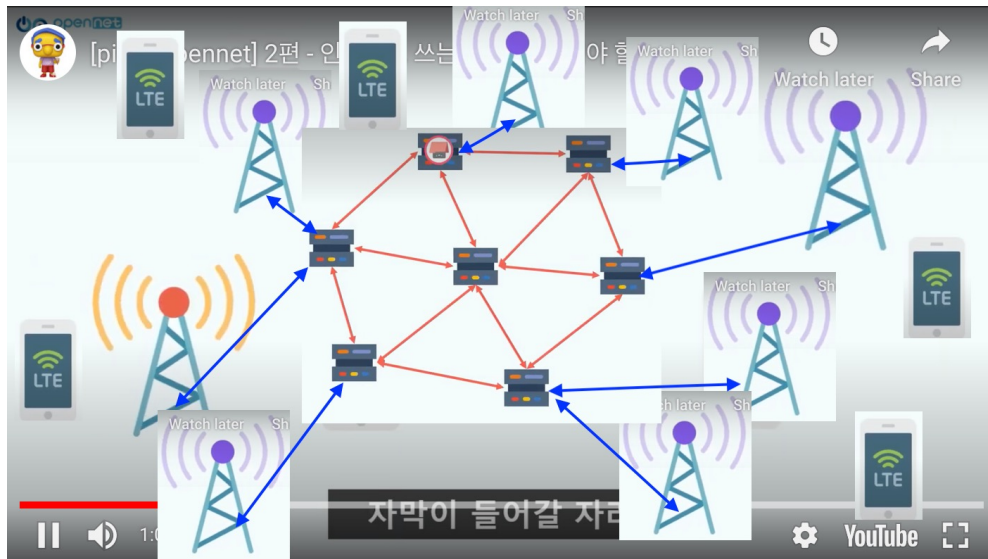
Look at democracy fighters of 1980s manually copying protest flyers. They will now have to risk their lives to distribute to the masses, avoiding the eyes of the police.

They don't have money to make 1 million phone calls or buy 1 million postages!

Internet, civilizational significance, Nobel Peace Prize: free expression cannot be performed without space. Internet allows it.

Fight to defend Net Neutrality is Fight to preserve democracy by avoiding regress back to the age of telephony or postage.

## How about data caps or traffic-based payments on mobile? – computers moving around



1. Data caps are charges to receive data, not send. Does not penalize online speech.
2. Connection can always suffer congestion because computers move around to connect through different connection points, e.g., cell towers
3. These cell towers are owned by one ISP separately, so there cannot be crowdsourcing.
4. Trend is to develop technology that can predict localized demands and meet them  
→ more or more no-data-cap plans.
5. Trend is also to crowdsource among ISPs. T-mobile allows free data roaming in all countries without separate charges.



## 2011-2012 Korean telcos' first talk of "network usage" fee

- Directed at big domestic content providers such as NAVER, DAUM (later KAKAO)
- Talks of "**free rides**" synchronized with ETNO's proposal of termination fees to ITU
- However, domestic CPs are already paying transit fees to obtain internet access, i.e., there is no free ride.
- Other actions trying to condition delivery on payment:
  - KT - Samsung Smart TV blocking – withdrawn after Korea Communication Commissions intervened
  - KT/SKT - Kakao Talk voice call blocking – withdrawn after Open Net filed a mass lawsuit
  - SKT – zero-rating its own affiliate online shopping mall –implicitly daring other shopping malls to
- Ultimately withdrawn BUT. . .

After lobbying by telcos, Sending Party Network Pays Rule (2016 SPNP)

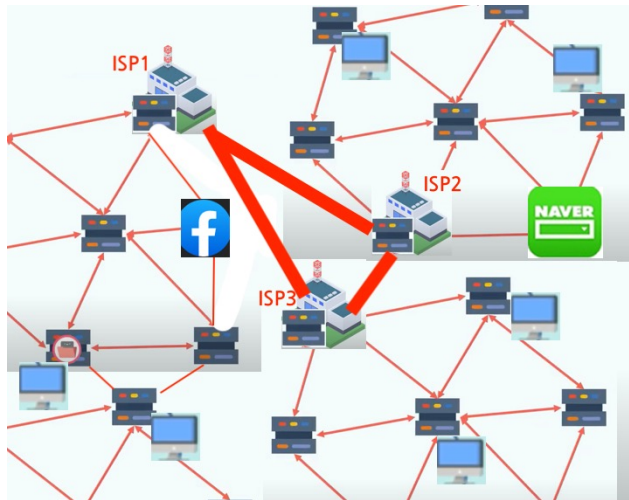
**If one ISP sends more traffic to another ISP than it receives, that ISP (i.e., sending party network) must pay for the cumulative net traffic SENT to the receiving ISP at the government-set rate.**

10

**Why?**

- (1) "Increasing internet usage through mobile internet, which is charged by traffic volume"
- (2) "applicable only among ISPs, therefore not affect CPs"

## Sender Pay Rule Removes Competition among Big ISPs



**Result:** Hosting popular contents has become financially burdensome

→ (1) No competition among ISPs – cartelization

→ (2) ISPs shifting the volume-based burdens to CPs, e.g. Afreeca TV paying volume-based transit fee

→ Extraordinarily high transit fees or volume-based fees

→ Although not legally applicable to CPs, already impacting CPs

# Transit prices in 2017

## Seoul 1 Mbps per USD 3.77

<https://www.unescap.org/sites/default/files/Breaking%20the%20barriers%20of%20Broadband%20in%20Asia-Pacific%2C%20LIRNEasia.pdf> (December 2017)

- 8.3 times Paris
- 6.2 times London
- 4.8 times New York
- 4.3 times LA
- 2.1 times Singapore
- 1.7 times Tokyo

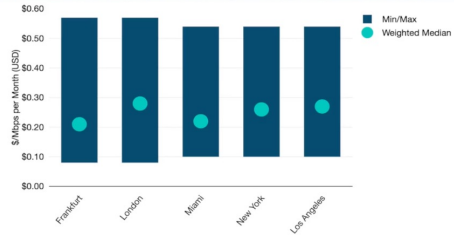


## 2021 IP Transit Fees: Seoul - 8 times London - 10 times Frankfurt

TeleGeography's annual bandwidth pricing review from 2021, especially slide 17, available here: <https://blog.telegeography.com/2021-global-pricing-trends-in-20-minutes>.

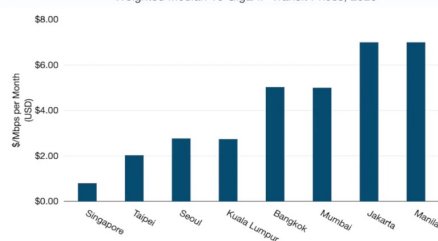
### <https://blog.telegeography.com/2021-global-pricing-trends-in-20-minutes> Similar IP transit prices on both sides of the Atlantic

Weighted Median 100 GigE IP Transit Price & Price Range in Key Global Hubs, 2020



### <https://blog.telegeography.com/2021-global-pricing-trends-in-20-minutes> Secondary markets retain a premium for IP transit, too

Weighted Median 10 GigE IP Transit Prices, 2020

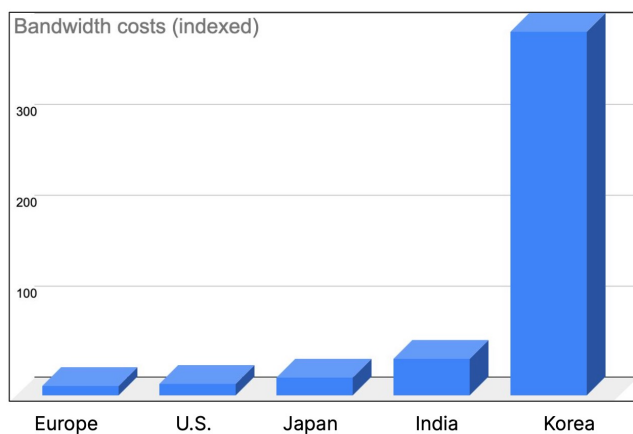


## Impact of existing SPNP:

- Local video services drop out of competition because high internet access fees prohibit high quality video
- Big CPs obtain volume discount. **It is domestic SME CPs that suffer most.**
- In 2017, **Afreeca TV** (biggest MCN other than Youtube) paying internet access fees equal to their profit ; 2021 **Watcha** (domestic video service) paying 10% of revenue as internet access fees; 2019-2021 **COVID-19 apps** not being able to meet demand because of high internet access fees
- No 'unicorn' in past decade since NAVER and Kakao
- Foreign CPs peering to avoid latency are charged equally high  
→ **Twitch** pulling out of Korea market, many contents served to Korea from outside → **Latency**

# Cloudflare's position

## Relative costs of bandwidth in different jurisdictions



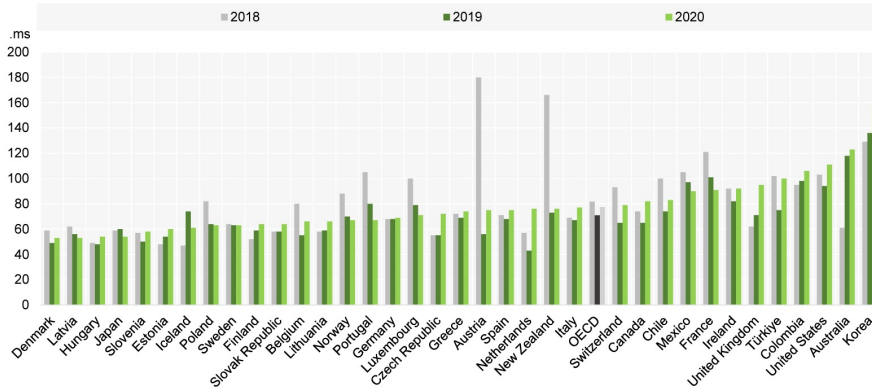
**Unlike other jurisdictions, bandwidth costs in Korea have not gone down.**

- Bandwidth costs **have not dropped in 6 years.**

**Bandwidth costs have an effect.**

- South Korea is the **only major world economy** where a substantial amount of Internet traffic is **served from outside** the country.

**Figure 16. SpeedChecker data on overall\* average latency experienced by users in OECD countries measured towards Cloudflare's CDN, 2019-20**



Notes: \*Overall measurement includes both foreign and local Points of Presence (POPs), and thus may differ from domestic (local) latency rates measured by OECD member countries. Slovak Republic and Slovenia do not have a local POPs in Cloudflare. See [Cloudflare network map](#). SpeedChecker latency measurements across countries may vary according to the location of POPs and the ratio of local POPs within the country.

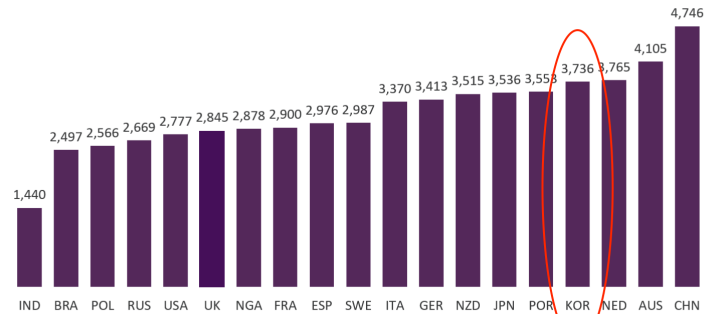
Source: SpeedChecker



- Wired internet – HHI: 3600 (revenue) 3200 (# of customers)
- Wireless internet – HHI: revenue/customers both 3600
- Big 3s – wireless 100%, landed 98% (revenue) 95% (# of customers)
- Use of LLU - non-existent in Korea
- IXP: connection market – Big telcos do not participate

## Why pass 2016 SPNP? Monopoly

Figure 39 Mobile market HHI, MNOs (including wholesale and hosted MVNOs): end 2016



Source: IHS Markit

Note: All figures have been rounded to the nearest whole number.

The real reason for SPNP?

# Korea's ISPs do not participate in IXPs

Name	Country	City	Network...
MylIX Malaysia Internet Exchange	MY	Kuala Lumpur	102
DE-CIX Johor Bahru <small>Platinum Sponsor</small>	MY	Johor Bahru	38
DE-CIX Johor Bahru / JBIX			
MYNAP Malaysia Network Access Point (MYNAI)	MY	Cyberjaya	3

All telco

## Peering Internet Exchanges (IX)

Name	Country	City	Network...
KINX Korean Internet Neutral Exchange	KR	Seoul	72
KRIX(sejong) Korea Internet Exchange	KR	Seoul	10
Equinix Seoul Equinix Internet Exchange Seoul	KR	Seoul	2

### HongKong

Name	Network...
HKIX Hong Kong Internet Exchange	277
Equinix Hong Kong Equinix Internet Exchange Hong K	173
AMS-IX Hong Kong <small>Silver Sponsor</small> Amsterdam Internet Exchange Hor	52

### Japan

Name	Network...
BBIX Tokyo <small>Silver Sponsor</small> BroadBand Internet eXchange Tokyo	227
JPIX TOKYO <small>Silver Sponsor</small> Japan Internet Exchange Tokyo	217
JPNAP Tokyo JPNAP Tokyo	177
Equinix Tokyo Equinix Internet Exchange Tokyo	102
JPIX OSAKA <small>Silver Sponsor</small> Japan Internet Exchange Osaka	79
BBIX Osaka <small>Silver Sponsor</small> BroadBand Internet eXchange Osaka	74
JPNAP Osaka JPNAP Osaka	70

Telekom Malaysia Berhad (TM) 4788	218.100.44.127 2001.de8:10:3b	10G Selective
Telekom Malaysia Berhad (TM) 4788	218.100.44.182 2001.de8:10:83	30G Selective
Telekom Malaysia Berhad (TM) 4788	218.100.44.227 2001.de8:10:57	10G Selective
Telekom Malaysia Berhad (TM) 4788	218.100.44.128 2001.de8:10:fd	200M Selective
Digi Telecommunications Malaysia 4818	218.100.44.70 2001.de8:10:6	100G Open
TIME DotCom Berhad 9930	218.100.44.112 2001.de8:10:2	100G Selective
TIME DotCom Berhad 9930	218.100.44.195 2001.de8:10:97	20G Selective
U Mobile Sdn. Bhd. 38466	218.100.44.86 2001.de8:10:14	60G Open

No telco

## Policy adjustment – half-baked

- **January 2020 no-settlement threshold** of up to 1:1.8 (monthly throughput) (MSIT: “most imbalances are below 1:1.5”)
- However, continuing Problems: **“Almost no CP benefits from the new threshold”** b/c:
  - (1) incentive not to compete is still there
  - (2) traffic already shaped by the pre-2020 rule: Already CPs censored themselves to reduce the data sent to avoid the higher internet access fees.

## It Gets Only Worse: 2020 “CP Service stabilization” Law and 2022 Network usage fee” bill

- Progression
  - 2016 SPNP: legally applicable only to ISPs but cause internet access fees on CPs to increase market-wise.
  - 2020 CP Service Stabilization: hold CPs responsible for maintaining connection (**when ISPs are the ones charging for connection!**)
  - 2022 “network usage fee” bills: legally force CPs to pay for data delivery

## 2022 Network Usage Fee bill and Big Techs

- **“network usage fee” as legal obligation**
  - Domestic CPs already paying high or volume-based fees
  - Foreign SME CPs – already paying high short-cut connection fees
- So Practical impact: charging foreign CPs currently not charged for connection, why?
- Argument 1: Free-riding
- Argument 2: Reverse Discrimination
- Argument 2: “Big Techs take up 40-50% of Traffic”

I can stop presentation here and that is enough advice for the Brazilian government not to adopt Network Usage Fee or any other plan to charge for sending.

I really hope that it does not happen.

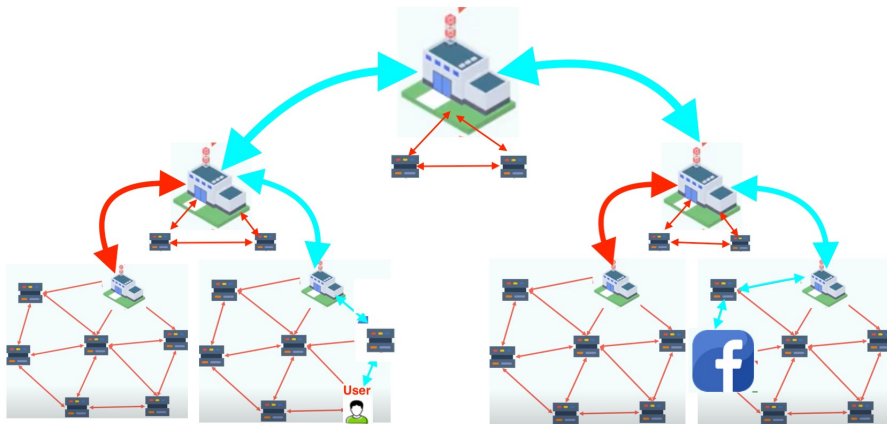
But what if the proposal is on the table just to charge foreign CPs?

We talked about how network usage fee bill impose legal \$ obligations

But even without law, ISPs are already charging internet access fees at very high rate on domestic CPs and charging short-cut connection fees to SME foreign contents.

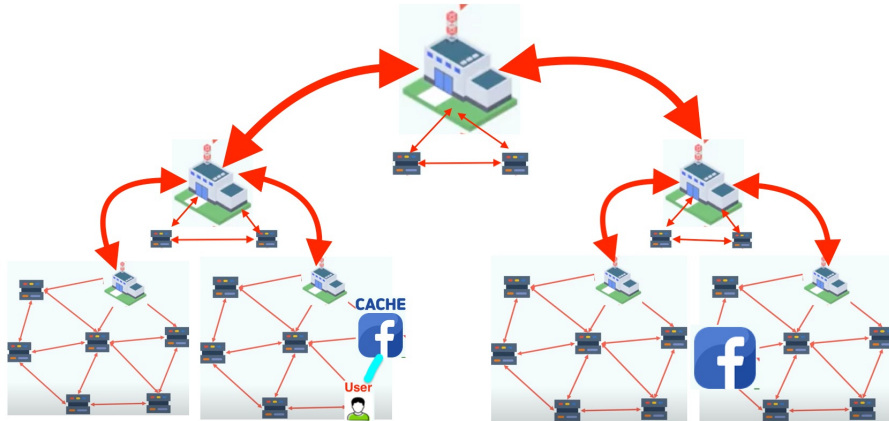
Practical impact will be to charge only big foreign CPs or Big Techs. There are 3 arguments for it.

Without short-cut connection, local ISPs must purchase internet access from higher tier ISP



Why not? Without Cache Server, local ISPs pay for internet access to accommodate foreign traffic

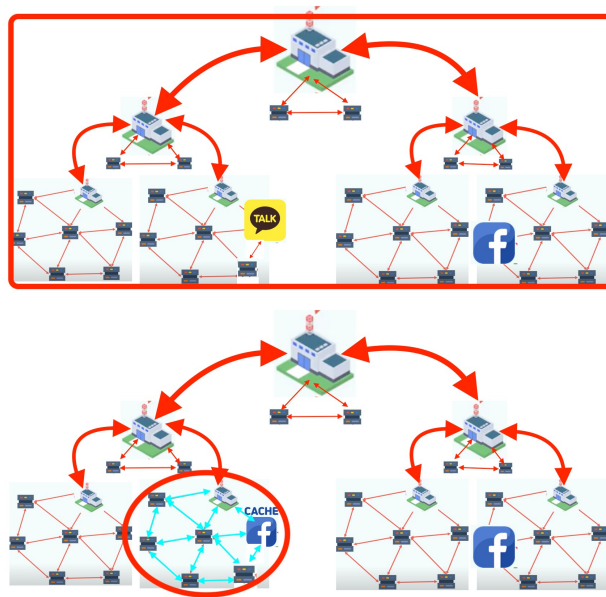
With shortcut connection, e.g., cache server



Save money for ISPs, cost money for Big Techs, e.g., subsea cable, private CDN

With Cache server in Korea, ISPs don't need to purchase a lot of internet access. Also, replenishing cache server requires money. Meta and Google build subsea cables to do that, Netflix build private CDNs to do. These things cost \$\$ on Big Techs but save \$\$\$ for ISPs.

## Reverse Discrimination against domestic CPs?



One argument is reverse discrimination, that local CPs are paying internet access fees but foreign CPs are not. But obviously foreign CPs are not getting internet access from local ISPs so obviously they do not need to pay internet access fees. It is like comparing apples and oranges. Do they have to pay anything?



## “Big techs take up 40-50% of traffic”

- This is complete underestimation of the crowdsourcing model of the internet. Everybody is involved in helping everyone else talk to everyone else.
- Samsung takes up 90% of smart phones in Korea. Should Samsung be responsible for paying some money going through Samsung’s traffic? Actually, Samsung’s market capitalization is 20% of Korea’s entire stock market. Should Samsung pay some surcharges because of that? When did association become a reason for payment?
- Right Question: Does Big Techs’ traffic burden Network?

Another argument is that Big Techs take up 40-50% of traffic.

## Traffic Causes Congestion?

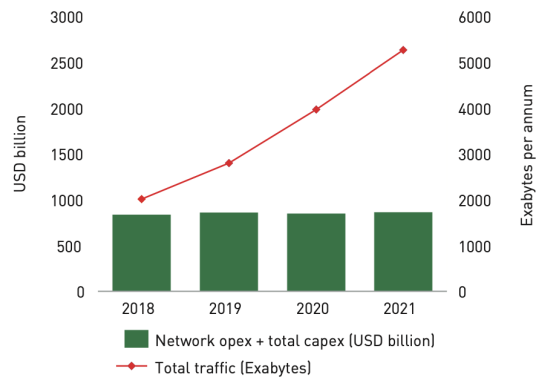


No matter how much you use Netflix as opposed to local OTT, you are not causing congestion. Because you cannot bring more data into your house than the pipe allows. Once ISPs sell 100 mbps internet to your home, you have absolute right to receive 100mbps at all times but never more. It means that there cannot be congestion. What really causes congestion is overselling of the network. ISPs should be allowed to oversell because people don't use the internet simultaneously. But if there is underestimation (meaning too much oversell), who is responsible for that?

# Truth: Abundance of Network Capacity for the Connected World!

- BEREC: no congestion upstream. Thanks to CDNs and also ISPs. Congestion is in the last mile.
- Korea: only 40-50% of the peak capacity used during pandemic (1/2 of pop live in 5% of country, half live in high rise apartments)
- Now, the last mile is exactly where ISPs should be responsible for.

FIGURE 0.2: GROWTH IN TRAFFIC DELIVERED OVER FIXED AND MOBILE ACCESS NETWORKS, AND EVOLUTION OF NETWORK-RELATED TELECOM OPERATOR COSTS FROM 2018 TO 2021  
[SOURCE: ANALYSYS MASON RESEARCH, ANALYSYS MASON, 2022]



## Netflix v SKB

- SKB 1: Give me money because your traffic accounts for 15-20% of all our traffic.
- Netflix: Does it cost you anything? Netflix takes up 5 Mbps. You already provide at average 200 Mbps, allowing 40 different apps run simultaneously.
- SKB 2: Give me money for peering with you in Hong Kong. I am spending at least 5-6 million USD in pulling from HK to Seoul
- Netflix: Other ISPs accept our data in Seoul, so not cost. Why are you accepting it in HK?
- Suit: Netflix: "Please declare I don't owe SKB anything"
- Court: "Network is not free." "Cannot force another to accept your data" → Netflix lost? No. "can pay in kind by CDN"

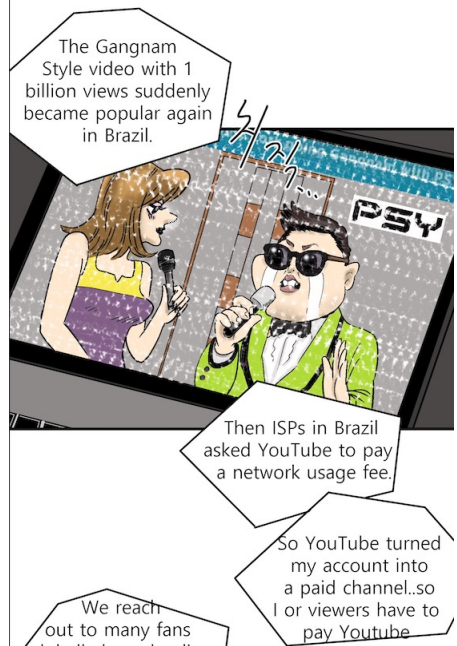
## Why should we care about Big Techs \$?

- Big Techs are platforming Korean creators! Costs trickling down and causing the same impact as on domestic CPs.
- Overseas CPs refusing shortcut connections with Korean ISPs → latency (already happened in 2017 Facebook)

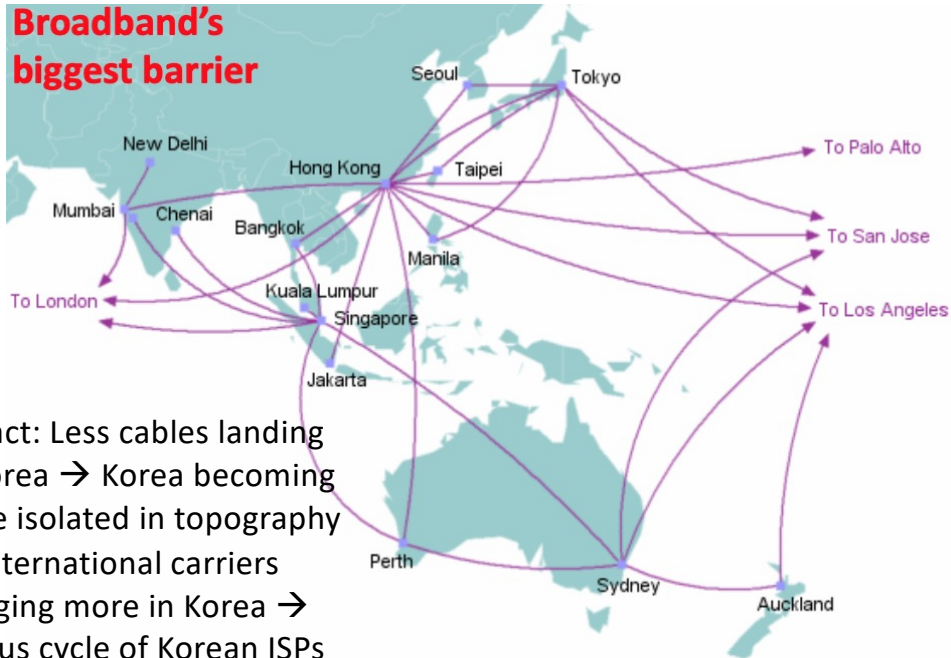
# Probable impact? "Squid Game 2 Cancelled", BTS, Gangnam-Style all canceled



Korea-eyeball-heavy content becoming burdensome to carry → investment in K-contents reduced



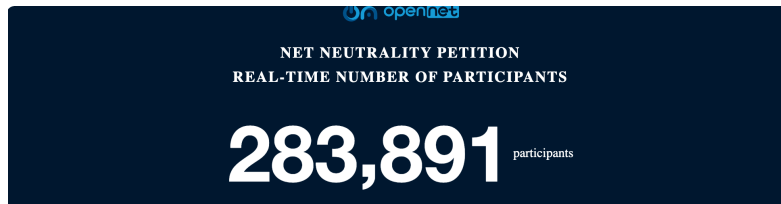
## Broadband's biggest barrier



Impact: Less cables landing in Korea → Korea becoming more isolated in topography → International carriers charging more in Korea → vicious cycle of Korean ISPs

having to charge more to defray their own transit fees → **Domestic CPs suffer even more.**

## Civil Society Rise up. . .



- Response: 280K sign against the bill in 2022, why? Shortcut connection fee is likely to be traffic-based → trickling down of costs - → impact on **100K Youtubers living off of foreign platforms.**
- Response: Domestic CPs also oppose network usage fee bill, why? Solidifying the violation of net neutrality by the partial SPNP
- Response: Consumer organizations demand “opex” of telcos
- Response: Youtubers complain about quality of bandwidth



## Two-sided Market Theory & Nature of Internet

- CSO: “Network usage fee is charging twice. ISPs already charge end users for making available contents, and cannot charge content providers for that”
- ISP: “ISPs can charge twice bc of 2-sided Market”
- Answer: **ISPs cannot. ISPs already charged twice when they sold Internet both to CPs and Users.** Network usage fee charges separate fee on top of that. It is the **3<sup>rd</sup> charge.**
- Also, two-sided market theory works only when one ISP can serve both sides. On Internet, no single ISP can do that. ISPs must work together to provide internet. Korean ISP may have power to charge only Korean users/CPs, and American ISP has power to charge only
- No economic justification to mandate it.

“ISP can charge twice, charge CPs for sending data to end users and charge End Users for receiving data, which is the single act. In two-sided market, VISA can choose to charge users for purchasing on credit and vendors for selling on credit, which is the single act. Airbnb also does the same on hosts and guests for the single act of lodging/ being lodged”

Problem: ISPs cannot do that. ISPs already sold this product called the internet. Once they sold it to end users, they have to make all CPs available as sources to users, and all users available as destinations to CPs. For that, they are charging money to each side already. Network fee works like this in VISA metaphor. Internet currently is charged for connection, not for traffic. So Airbnb charges single fees per month and then charges a separate fee on the guest for the amount of time that he or she spends.

It is not the two-sided market theory that is a problem. The problem is that you are charging per-traffic fee on top of access fee. This is where the clash happens, and this is what we mean when we say telcos are trying to charge twice.

Also, the reason that VISA can charge both is because VISA owns the entire network. On Internet, nobody owns such network. It does not have power to charge artificially increased prices.

## Issues to discuss

- Fare Share Proposal is anti-Net-Neutrality Law: Not only allows a NN violation but requires it.
- Are there other ways to raise money to include the Unconnected? Yes, tax the rich more. Tax the companies more. **But never make tax proportional to the amount of free speech that ppl exercise. SPNP is exactly that.**

## References

- [International human rights orgs send letter to President Moon: Stop 'paid prioritization' bill](#)
- [Korea's Challenge to the Standard Internet Interconnection Model](#)
- [\*\*\[WEBTOON 1\] Rise of Guardian of Net Neutrality\*\*](#)  
[\*\*\[WEBTOON 2\] Return of the Guardian of Net Neutrality\*\*](#)
- [\[Video\] Net Neutrality Explained v.1: How Internet Works](#)
- [\[Video\] Net Neutrality Explained 2: Why Internet is not charged](#)
- [\[Video\] Net Neutrality Explained v3: How Charging Senders can be unfair](#)