

# Impact of sender pay rule: Internet fragmentation

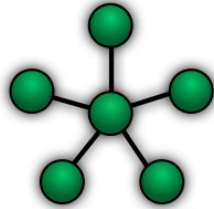
Kyung Sin Park

Korea University, Open Net

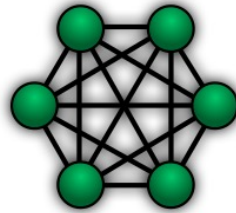
[kyungsinpark@korea.ac.kr](mailto:kyungsinpark@korea.ac.kr)

# Internet as ultimate crowdsourcer

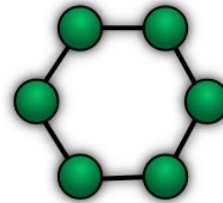
- Pre-internet: \$2/min for international phone call
- Post-internet: 100 ppl on Zoom call for hours for practically free
- How is this possible? **Crowdsourcing data delivery cost**



Star



Fully Connected

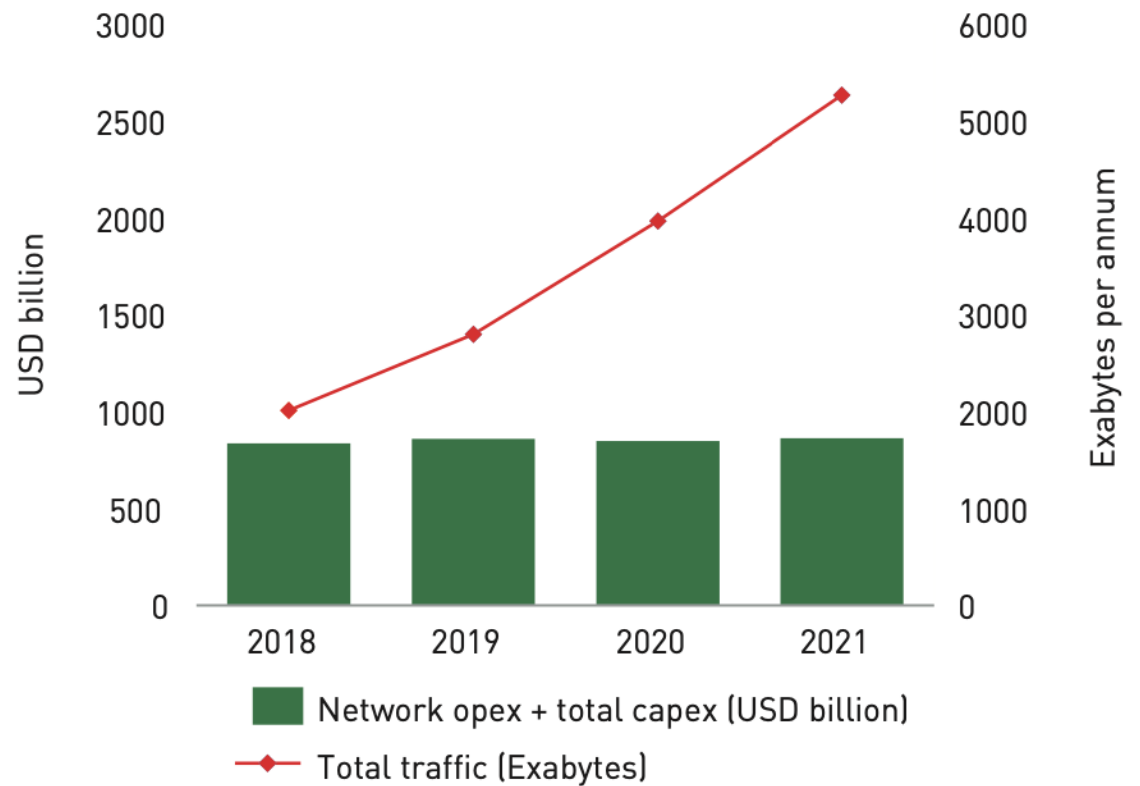
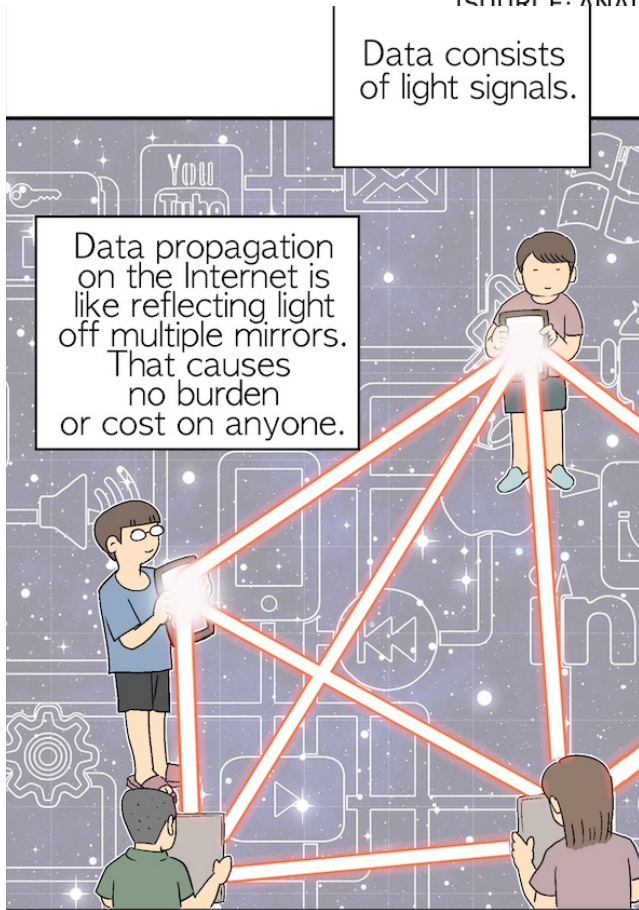


Ring

- Every participant delivering everyone else's data without \$/ without condition
- Data delivery cost =0. Everyone pays only to connect **to the existing Internet** → **capacity-based internet access fees**
- \$ for Transit (internet access fee) + Free peering → **Information Revolution!**

**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

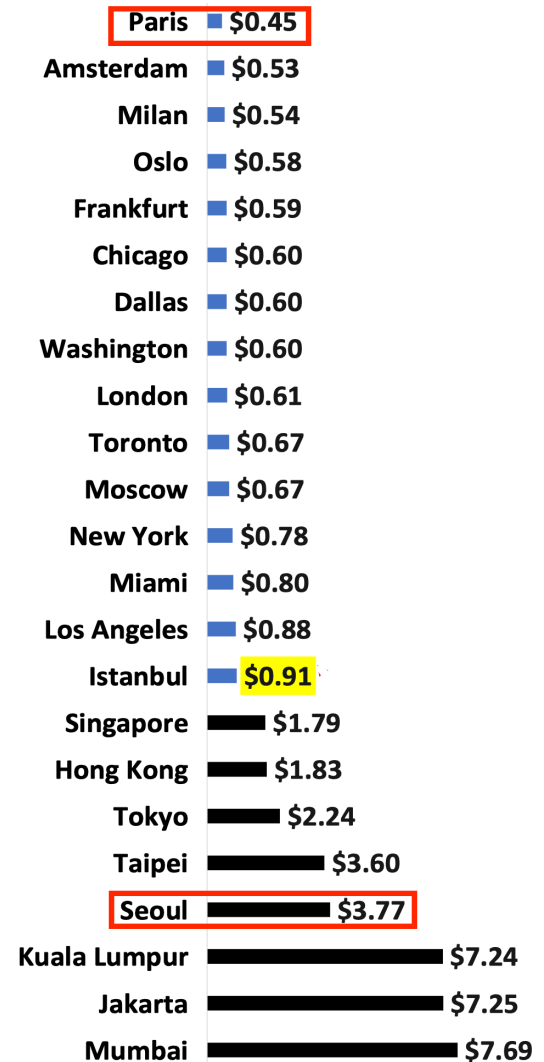
(SOURCE: ANALYSYS MASON RESEARCH, ANALYSYS MASON, 2022)



- **New threats: 1. Paid peering 2. Sender pay**
- European Union tinkering with paid peering or sender pay.
- South Korea the only country to mandate sender pay. Sending data is financially penalized. → Result?

# Seoul IP Transit Fees right after SPNP instituted in 2016

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



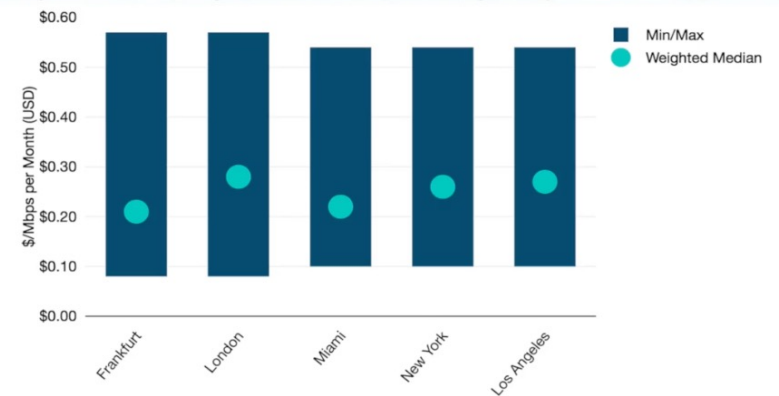
TeleGeography's annual bandwidth pricing review from 2021, especially slide 17, available

here: <https://blog.telegeography.com/2021-global-pricing-trends-in-20-minutes>.

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

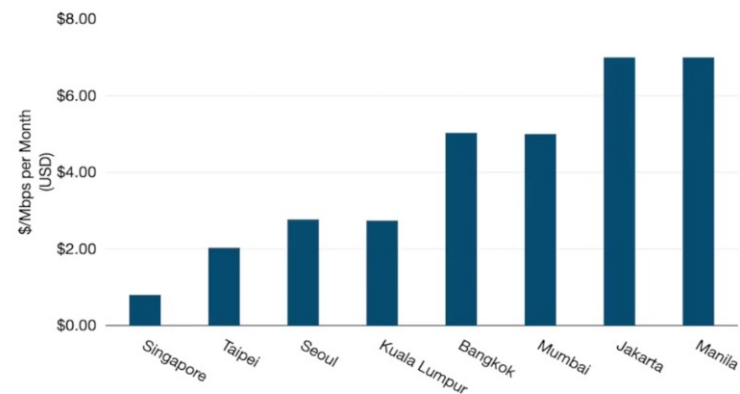
<https://blog.telegeography.com/2021-global-pricing-trends-in-20-minutes>  
**Similar IP transit prices on both sides of the Atlantic**

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



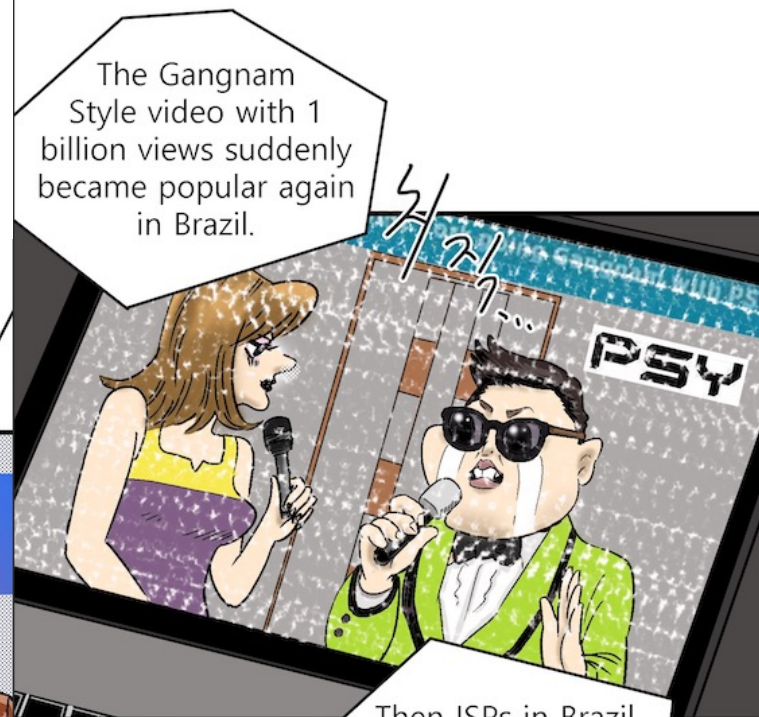
# Impact on End-Users and Eco-system



- Impact:

- 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; 2020 COVID location announcement system not fully functioning due to transit fees**
- Local video services drop out of competition against Youtube because of high internet access fees
  - No 'unicorn' since NAVER and Kakao. Big CPs obtain volume discount. It is SME CPs that suffer most.
- Small ISPs cannibalized by Big ISPs through high domestic transit fees
- Overseas CPs refusing to connect directly with Korean ISPs → Latency in Korea! (e.g., KT-Facebook controversy in 2018)
- Overseas CPs unwilling to carry/invest in Korea-eyeball-heavy contents or forced to charge or intentionally degrade Korea in-Korea services (e.g., Twitch in 2022) → fragmentation of internet

# Probable impact if generalized? “Squid Game 2 Cancelled”



Then ISPs in Brazil asked YouTube to pay a network usage fee.

So YouTube turned my account into a paid channel..so 1 or viewers have to pay Youtube

We reach out to many fans