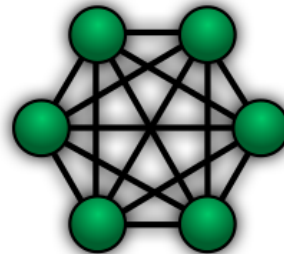www.opennetkorea.org

Kyung Sin "KS" Park

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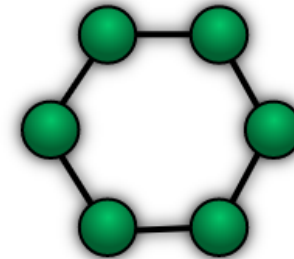**Fundamentals: Remember the invention of the Internet:**

Full Connectivity Without Being Fully Connected
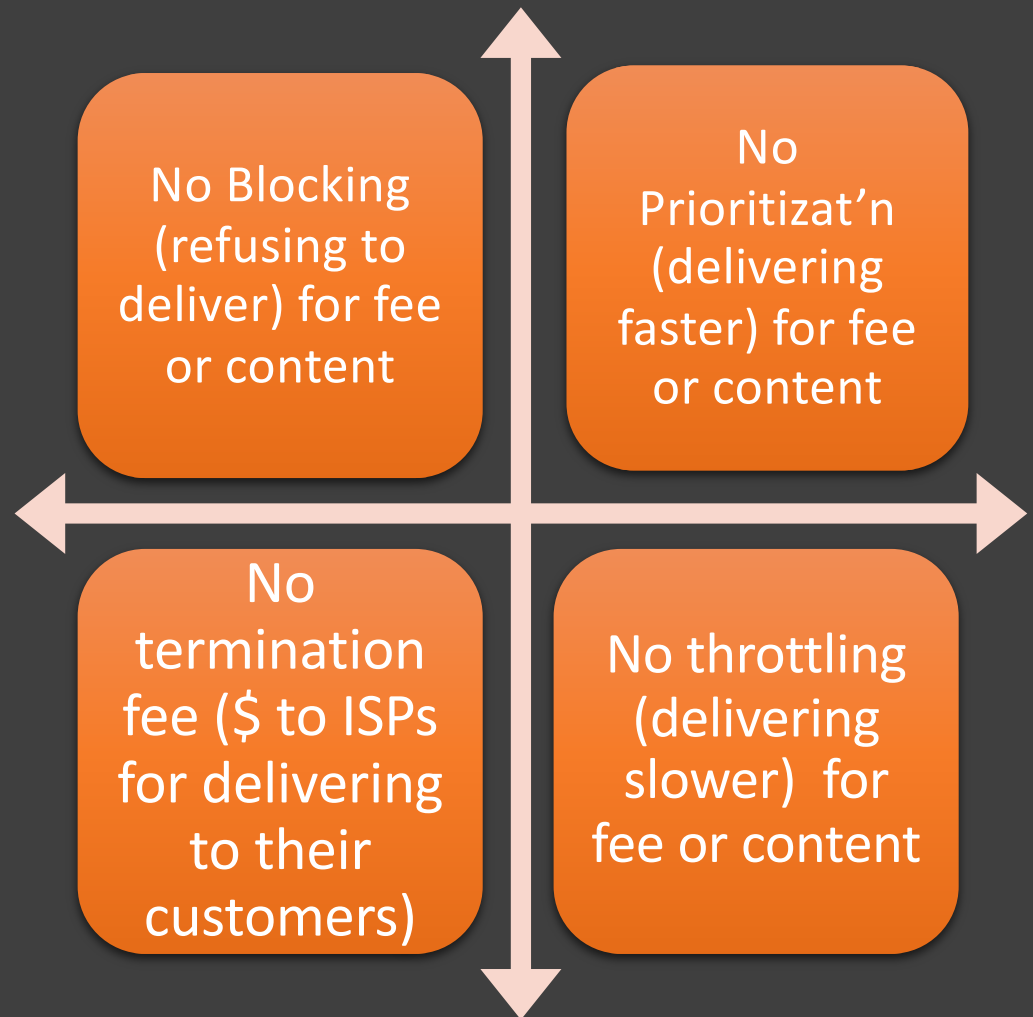

Star   Fully Connected   Ring

How? All routers delivering packets sent or received by all other routers, not all the way to destinations but just taking from one immediate neighbor to another immediate neighbor closer to the destination

Getting for paid for passing to immediate neighbor? → Transactional cost too much → Let's just make it free for everyone. We are all delivering to only to our "next neighbors" anyway → Information Revolution where powerless individuals are given the power of mass communication previously available only to the powerfuls and the legacy media serving them.

2

NN: no financial or non-financial condition for 'passing to neighbors' → "no delivery fee" → Different permutations → → Network Neutrality as non-discrimination rule

No Blocking (refusing to deliver) for fee or content

No Prioritizat'n (delivering faster) for fee or content

No termination fee ($ to ISPs for delivering to their customers)

No throttling (delivering slower) for fee or content

California Network Neutrality Act (2018)- Amendment to California Civil Code

3101. (a) It shall be unlawful for a fixed Internet service provider, insofar as the provider is engaged in providing fixed broadband Internet access service, to engage in any of the following activities:

(1) Blocking lawful content, applications, services, or nonharmful devices, subject to reasonable network management.

(2) Impairing or degrading lawful Internet traffic on the basis of Internet content, application, or service, or use of a nonharmful device, subject to reasonable network management.

(3) Requiring consideration, monetary or otherwise, from an edge provider, including, but not limited to, in exchange for any of the following:

(A) Delivering Internet traffic to, and carrying Internet traffic from, the Internet service provider's end users.

(B) Avoiding having the edge provider's content, application, service, or nonharmful device blocked from reaching the Internet service provider's end users.
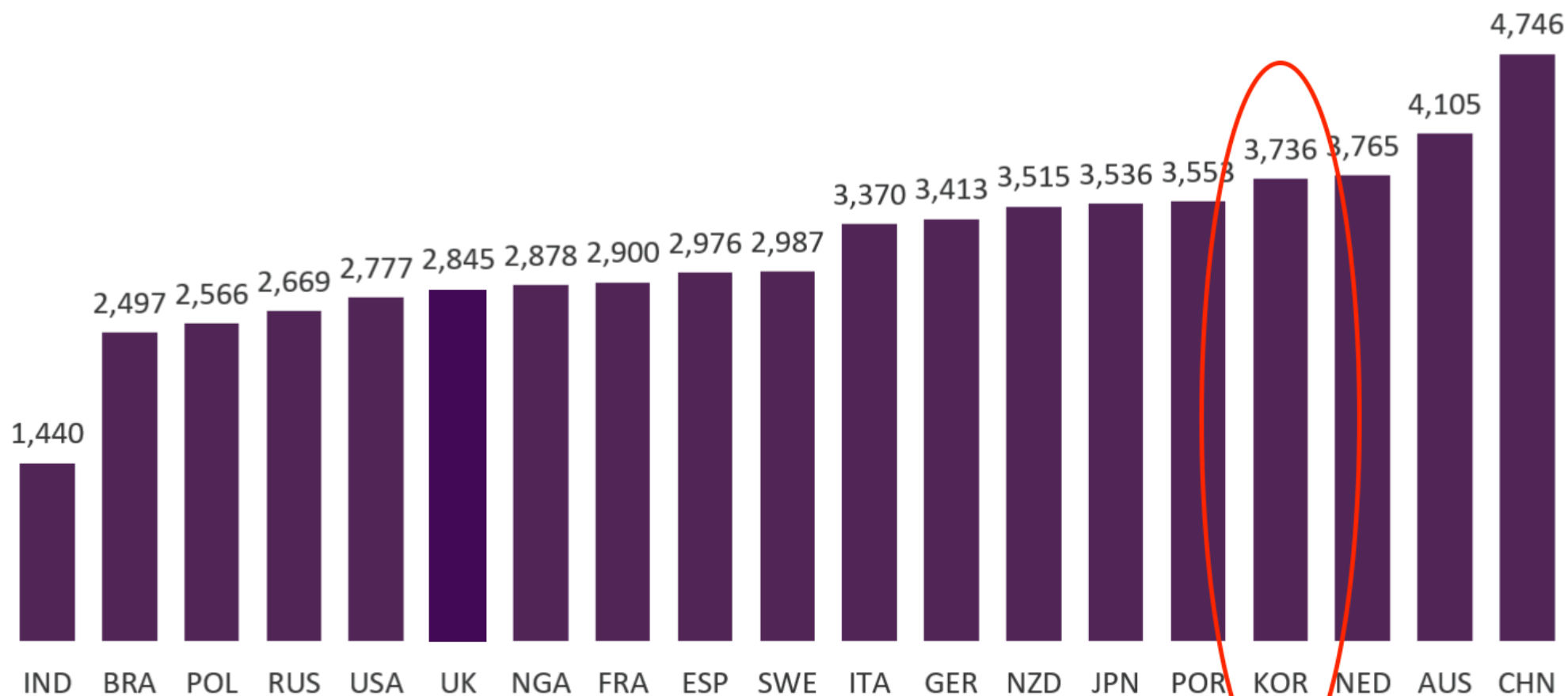
Internet access fees (not delivery fee)

- Fees for maintaining physical connection through which the FREE deliveries of data are made
- Normally proportional to the capacity of connection (i.e., width of the pipes)
- Makes sense because of nearly no marginal cost for electromagnetic signals to go through wires (i.e., just as HD signals coming through air do not cost anything, just as cable TV signals coming through cables do not cost anything)
- Even a single connection to a computer already connected to the Internet is equivalent to the access to the Internet.
- Connection is mutually beneficial, who pays the access fee? – Whoever wants to connect more. Usually, the less connected one pays the better connected **(Transit)**. Equally connected? **Peering.**
- What does it mean to be better connected? Connected to what?
- Tier 1, Tier2, Tier 3, ISP, Cache server, individual users

Korea Instituted Sending Party Network Pays Rule in January 2016

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. → violation of network neutrality b/c it is termination fee

- Result 1: Hosting popular contents has become financially burdensome → No competition for hosting content providers → Very high transit prices.

- Result 2: Hosting a cache server of popular foreign OTT also becomes financially burdensome → demand for "Network Usage Fee"

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

IND	BRA	POL	RUS	USA	UK	NGA	FRA	ESP	SWE	ITA	GER	NZD	JPN	POR	KOR	NED	AUS	CHN
1,440	2,497	2,566	2,669	2,777	2,845	2,878	2,900	2,976	2,987	3,370	3,413	3,515	3,536	3,553	3,736	3,765	4,105	4,746

Source: IHS Markit

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

Transit prices

Seoul 1 Mbps per USD3.77
- 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

Paris $0.45
Amsterdam $0.53
Milan $0.54
Oslo $0.58
Frankfurt $0.59
Chicago $0.60
Dallas $0.60
Washington $0.60
London $0.61
Toronto $0.67
Moscow $0.67
New York $0.78
Miami $0.80
Los Angeles $0.88
Istanbul $0.91
Singapore $1.79
Hong Kong $1.83
Tokyo $2.24
Taipei $3.60
Seoul $3.77
Kuala Lumpur $7.24
Jakarta $7.25
Mumbai $7.69
Bangkok $10.91

Weighted Median Monthly IP Transit Prices per Mbps:

Source: TeleGeography. Data derived from Q2 of 2017

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2. KT: "If we don't charge you for cache server, that will be **discrimination** against domestic CPs who are paying tons."
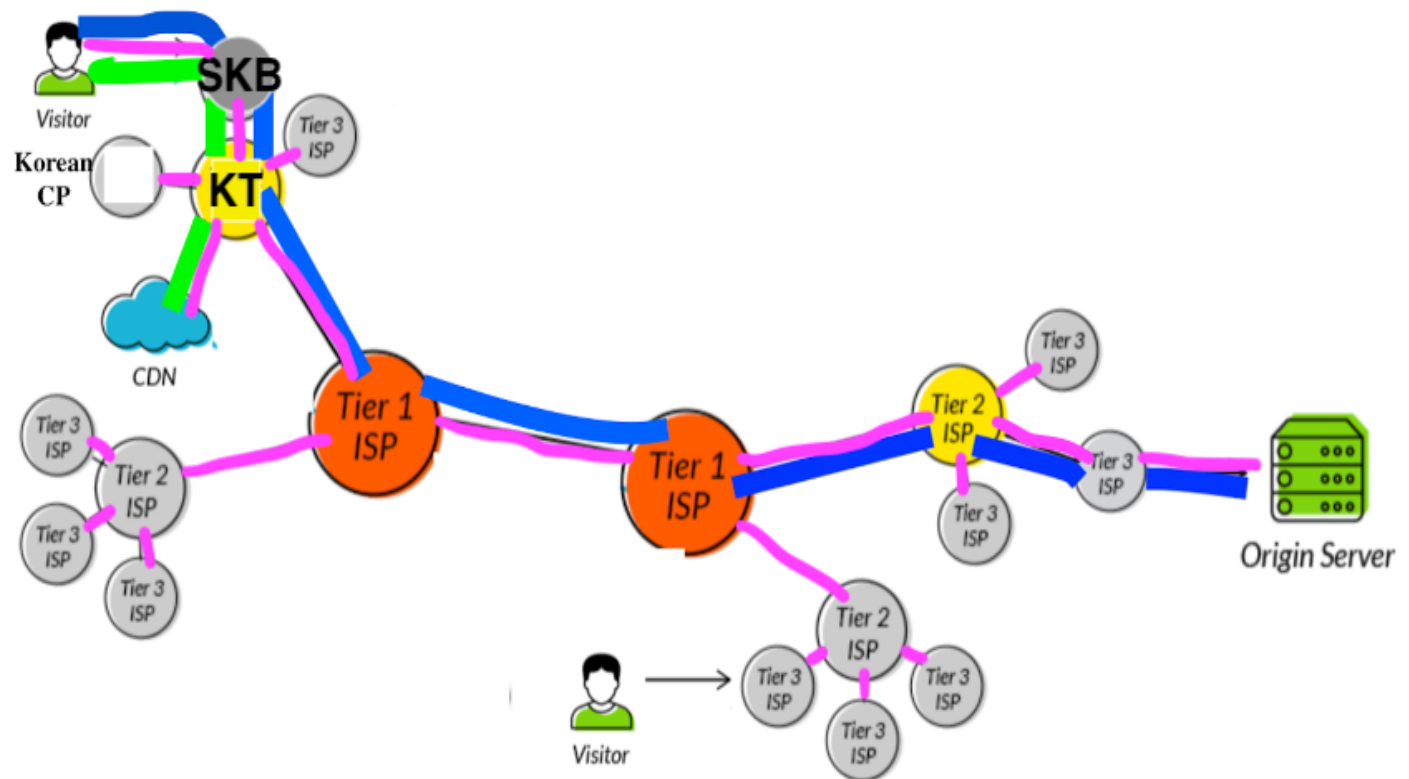
_____

- What Korean CPs are buying – the full connectivity (pink)

- What foreign OTT is getting – green ONLY

- Term "Network Usage Fee" – a new term to force comparison between the incomparable things.

1. **Pre-SPNP:** Cache server for free.
KT needed to save on transit, too.
→ **Post-SPNP:** KT now wants $ b/c of its SPNP payments to SKB for SKB user's access to FB
FB: "Ok. No cache server" → Traffic changed from green to blue (Slowed!) → SKG Fines FB!

Recent changes

- Korean government announces "Settlement under 1:1.8"
  - Problem 1: Still payment for throughput → Still disincentive for hosting popular content
  - Problem 2: Maybe most imbalance is under 1:1.8 because of SPNP rule!
- CP's Service Stabilization Law (passed May 2020)
  - "CPs above certain user number or traffic level shall install **service stabilization measures.**"
  - CPs made responsible for delivery in the last mile ➔

  Basically extending SPNP to CPs ➔ Increase transit fees?
  - **Imagine the world where content providers are charged by ISPs in different regions for termination fee in their respective regions**

  →**CPs made afraid of hosting killer contents, e.g., Gangnam Style video**

  →**Effectively, death of content diversity. Only ppl w/ $ will upload viral contents.**