

# IP-interconnection, charging mechanisms and net neutrality: a perspective from BEREC

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Body of European Regulators  
for Electronic Communications

**BEREC**

The logo for BEREC (Body of European Regulators for Electronic Communications) features the word "BEREC" in a bold, sans-serif font. The letters "B", "E", "R", and "E" are blue, while the "C" is maroon. A blue curved line starts under the "R" and sweeps under the "C".

## Extensive BEREC work on interconnection and net neutrality

- 2007: “[Report on IP Interconnection](#)” (ERG (07) 09)
- 2008: “[ERG Common Statement on Regulatory Principles of IP-IC](#)” (ERG (08) 26 final)
- 2010: “[BEREC Common Statement on NGN Future Charging mechanisms/Long Term Termination Issues](#)” (BoR (10) 24 Rev. 1)
- 2010: “[BEREC Response to the European Commission’s consultation on the open Internet and net neutrality in Europe](#)” (BoR (10) 42)
- 2012: “[BEREC’s comments on the ETNO proposal for ITU/WCIT or similar initiatives along these lines](#)” (BoR (12) rev. 1)
- BEREC Workshops on IP-Interconnection in cooperation with the OECD 2011 and [2012](#), [2016](#)
- 2012: “[BEREC Report: An assessment of IP interconnection in the context of net neutrality](#)” (BoR (12) 130)
- 2017: “[BEREC Report on IP-interconnection practices in the Context of Net Neutrality](#)” (BoR (17) 184)

## Main issues:

- Charging mechanisms for Interconnection:
  - Differences between the “telephony world” and the “Internet world”
  - Implications
- Transit, (paid) peering
- WCIT (2012) ETNO’s proposal
- IC disputes in practice

### Retail: **Calling Party Pays (CPP)**

- User A calls user B: user A prime beneficiary and cost-causer
- Users in Europe familiar with CPP – but positive usage externalities not internalized

### Wholesale: **Calling Party's Network Pays (CPNP)**

- Corresponding to CPP but wholesale level
  - Problem: **termination monopoly** of User B's telephony provider
    - Reason: Terminating operator **entitled to receive a payment** out of his position
    - **Need for regulation** → ex ante cost regulation
- **Payment flow = call flow**

## Retail: **Receiving Party Pays (RPP)**

- User paying for Internet access and the potential **receiving *and* sending** data

## Wholesale:

- **B&K** for the terminating segment
- **Peering / transit** applied upstream in backbones

- Definition: „*B&K is a **wholesale** billing regime under which each network bears the costs of terminating traffic coming from other carriers. Therefore, under B&K the terminating access network operator does **not receive payments at the wholesale level for the termination** provided. Instead, it recovers its net costs incurred for termination -- and any payments for upstream connectivity – in other ways, e.g. by **billing** them to **its end customers**“*
- Where does B&K apply: **terminating segment** (Internet access networks)
- ...regardless of whether peering or transit
- B&K emerged in the market / not imposed by NRAs
- Does not mean “zero price”
  - Network A’s traffic is terminated by network B
  - No wholesale payment A → B
  - Costs incurred by A: providing network capacities for terminating B’s traffic

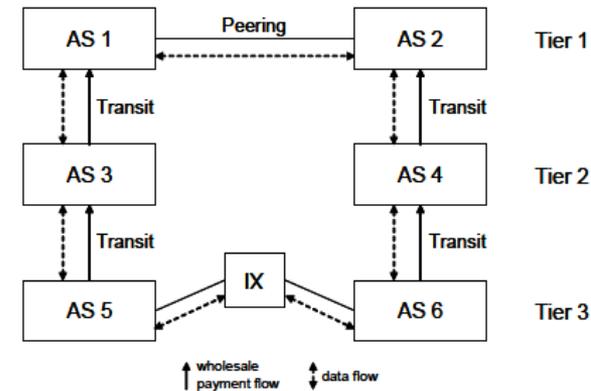
## Characteristics:

- **No exploitation** of the physical termination monopoly
- **No need for regulation**, as long as two conditions are fulfilled
  - *The **broadband access market is sufficiently competitive** so that access providers are under competitive pressures to be prevented from establishing abusive mark-ups on retail prices*
  - *The **transit market on IP-backbones is sufficiently competitive** to exert competitive pressures on IP-backbone providers. With an oligopoly of Tier 1 providers allowing choice of transit provider this condition has so far been considered to be fulfilled.*
- No need to determine “correct” termination rates
  - Saving transaction costs

## Transit

- Transit wholesale product
  - Internet access service providers **pays upstream for traffic flows in both directions**
  - Provides **full connectivity**
- **Payment flow ≠ data flow**

Payment and data flows in IP-based networks



## Peering

- Bilateral agreement between ISPs to carry traffic for each other and for their respective customers → non-transitive relationship
- Peering does **not provide full connectivity**
- Open / selective / restrictive / no peering
- **Peering requirements:** e.g. traffic ratio, traffic volumes/capacity, geographic reach
- Settlement free peering: transaction costs ↓

**2012: +99% of all peering agreement on „handshake“ basis**

**... but paid peering gaining importance**

- Where traffic imbalances exceed a certain threshold.
- **Gaining** relevance due to increasingly asymmetric traffic flows → **streaming**
- Bargaining power may play a role in practice
- Often involving **larger Internet access service providers**
- Some large eyeballs IAS providers **prefer bilateral paid peering over multilateral peerings at IXPs**
- In some cases paid peering **resulted from disputes on congested peering links** (e.g. Netflix/Comcast)
- Percentage of paid peering in terms of traffic volumes **significantly** greater as in terms of number of peering agreements

## The whole picture

- B&K for terminating segment → **no exploitation of the termination monopoly**
- Transit / peering → **not regulated**
- European **Net Neutrality Regulation** applying for Internet access services – not for transit/peering
- BEREC Guidelines:
  - „*NRAs may take into account the interconnection policies and practices of ISPs in so far as they have the effect of limiting the exercise of end-user rights under Article 3(1). For example, this may be relevant in some cases, such as if the interconnection is implemented in a way which **seeks to circumvent the Regulation***“

ETNO proposed to include in the ITRs:

- Reference to IC charging mechanism Sending Party’s Network Pays (SPNP)
- End-to end QoS

BEREC heavily criticised these proposals:

- Transfer of telco billing mechanisms to the Internet
- Risk of **shifting the balance of negotiating leverage** between market participant.
- Abuse of termination monopoly → **inducing need for regulation!**
- Widespread adoption of connection based practices on the global Internet could unravel benefits of connection-less packet switched networks based on decentralisation and simplicity.
- **Users cause traffic** (= request content)– not the CAPs – and pay for it
- **No evidence for free riding**
- **Mutual interdependence:** CAPs – eyeball ISPs

## A generic look at IP-IC disputes in practice

- **Traffic asymmetries** a major factor
- Mutual recriminations between parties involved
- **Economic/strategic considerations** of the providers.”
- Challenging to identify its exact location of congestion ...and even more who is **responsible**
- Disputes **typically solved in the market** without regulatory intervention (also due to retail competition) - NRAs should carefully monitor whether this continues to be the case
- Do CAPs depend more on eyeball ISPs or vice versa?

Thank you!