

IP interconnection – Competing in a dynamic market

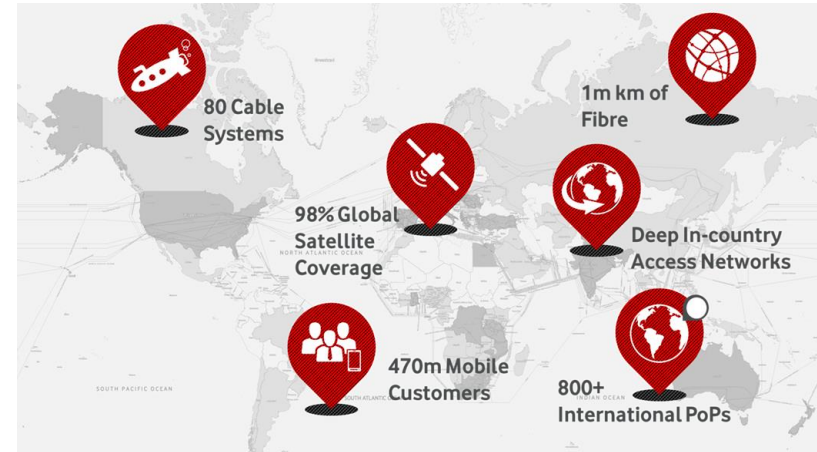
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Vodafone offers a wide range of IP related services through Vodafone Carrier Services

- ✓ Global reach and scale
- ✓ In-country networks and local access
- ✓ Breadth of capability and quality across fixed & mobile
- ✓ In-country sales, support and technical expertise in fixed & mobile







“Vodafone Carrier Services has emerged as a leading provider of consistent and reliable wholesale services across a broad global footprint.”

“On the Radar”: Vodafone Carrier Services, Ovum July 2014



Global market developments & trends

- Growing broadband penetration in developing markets, higher broadband access rates, and bandwidth-intensive applications will continue to fuel strong Internet traffic growth.
- While end-user traffic requirements will continue to rise, not all of this demand will translate directly into the need for new long-haul capacity.

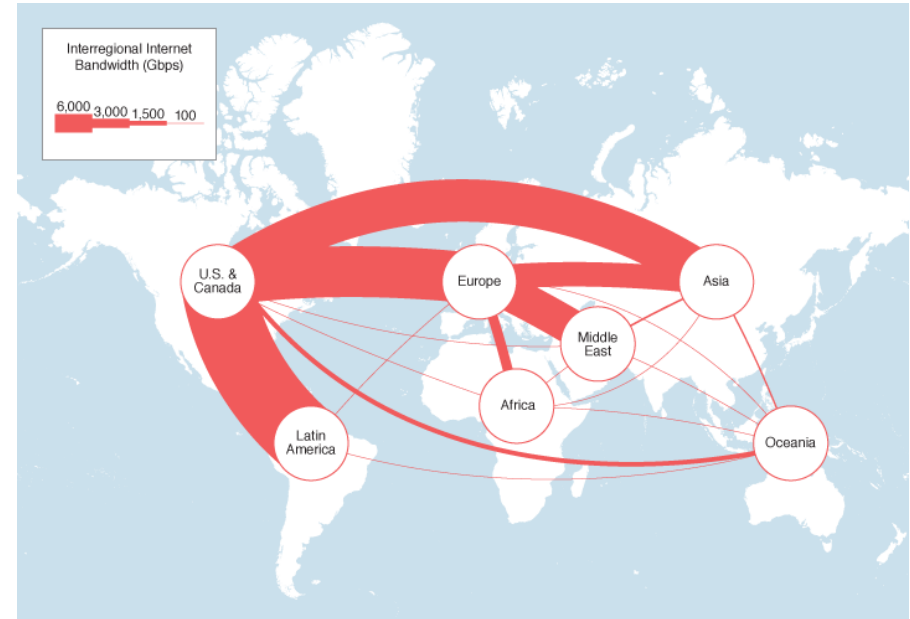
		2015	2020
More Internet Users		3.0 Billion	4.1 Billion
More Devices and Connections		16.3 Billion	26.3 Billion
Faster Broadband Speeds		24.7 Mbps	47.7 Mbps
More Video Viewing		70% of Traffic	82% of Traffic

Source: Cisco VNI Global IP Traffic Forecast, 2015–2020



Global market developments & trends

- Aggregate international capacity and traffic growth rates are slowing as the global Internet matures
- Variety of factors will shape the global internet:
 - Transport costs
 - Continued pricing pressure on IP transit
 - Use of private network capacity
 - Video demand driving localisation of traffic

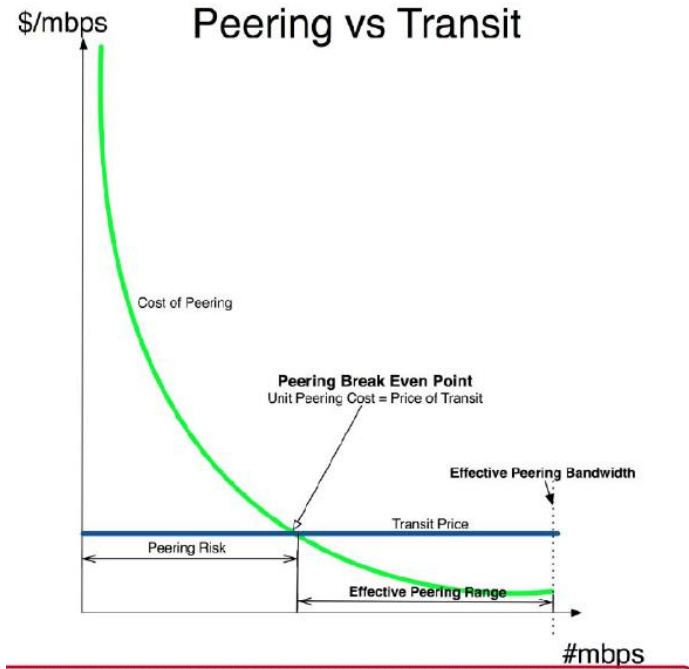


Source: Telegraphics



The economics of the interconnection ecosystem will continue to drive market evolution

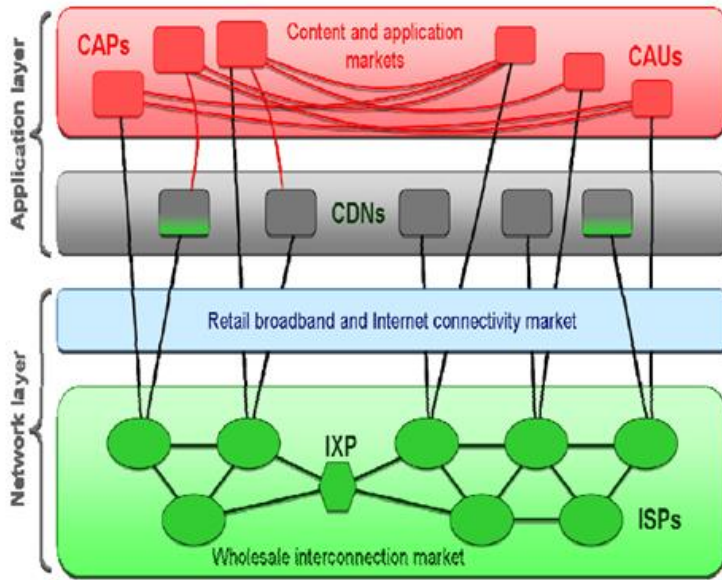
- Every network operator will continue to rely to some extent on others to reach parts of the Internet not served by themselves.
- Economic trade-offs between peering and transit arrangement exists and competitive pressure will continue to force flexible responses driven by economic factors (peering is not free)



Source: OFCOM



Competitive market dynamics



Source: BEREC, 2012

- Continued technological evolution
- Intense competition for transit business (transit price declines)
- Increased CDN competition (CDN price declines)
- Upgrades of peering and on-net only connections (10 GBps to 100 Gbps)

→ Very dynamic market



Summary

- The market will continue to evolve triggered by a variety of demand factors that require a flexible and economic response from all players across the internet value chain
- Market dynamics illustrate that there is no case for market failure that would warrant ex-ante intervention
- Where ISP disputes arise, competition law mechanisms are best placed to resolve the issue as precedent illustrates

