



HURRICANE ELECTRIC  
INTERNET SERVICES

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# Global view of Internet Peering

Internet Peering from a global networks point of view

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RIPE SEE2 – Regional Meeting

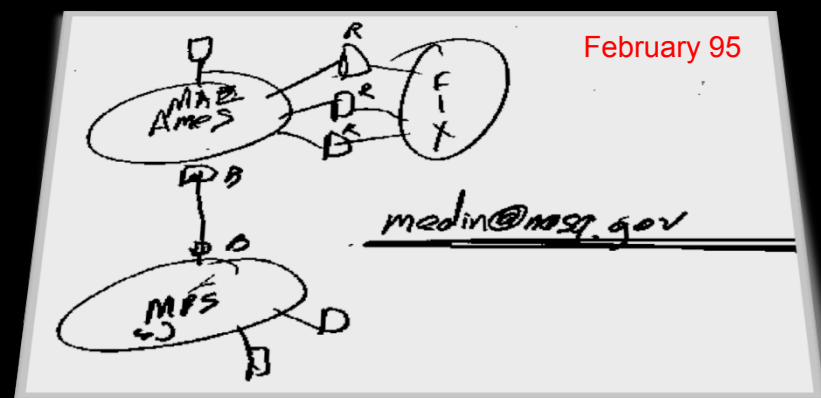
Skopje Macedonia

22<sup>nd</sup> April 2013

Martin J. Levy, Director IPv6 Strategy

Hurricane Electric

# INTERNET EXCHANGE POINTS



IXPs can start from very simple beginnings



# Overview

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- The generic Internet Exchange Point pitch ...
  - Internet Exchange Points (IXPs) are a good idea
  - Peering is a good idea
  - Local regional self-reliance is a good idea
  - Critical services (DNS, NTP, etc) are a good idea
  - The Internet is not going away; in fact it's growing
- The global Internet Exchange Point pitch ...
  - Every IXP (regional, national or international) has improved Internet services locally
  - IXPs get cities (or regions) onto the mindset map when it comes to telecom infrastructure builds
  - Some networks (especially networks like ours) actively look for peering exchanges as a sign of mature cities



# A quick reminder – how routing works

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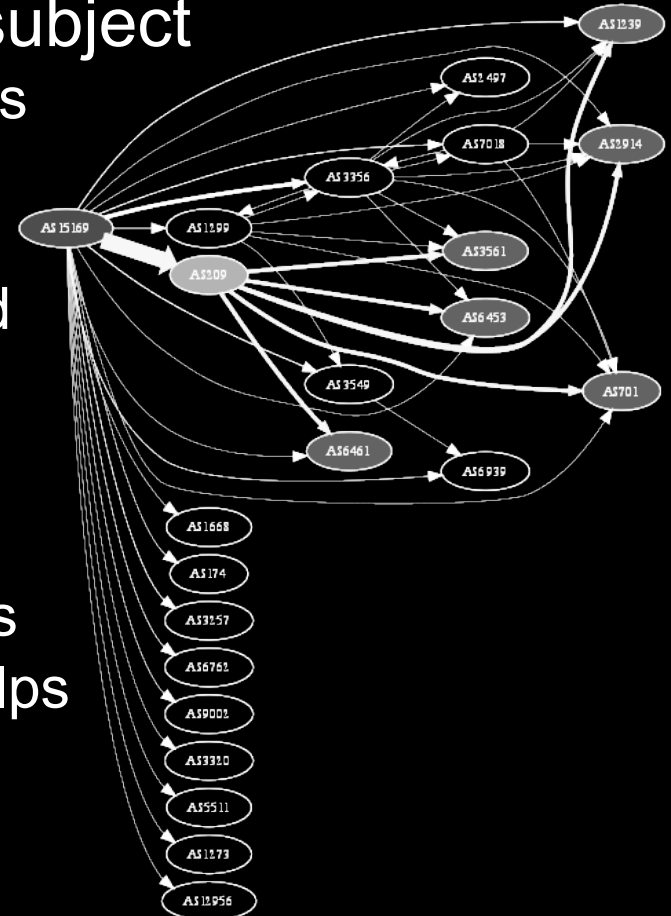
- Technically – it's a very complex subject

- The Internet is a collection of networks
- No network stands alone
- Interconnections are required
- Efficient interconnections are required

- Robustness can be created

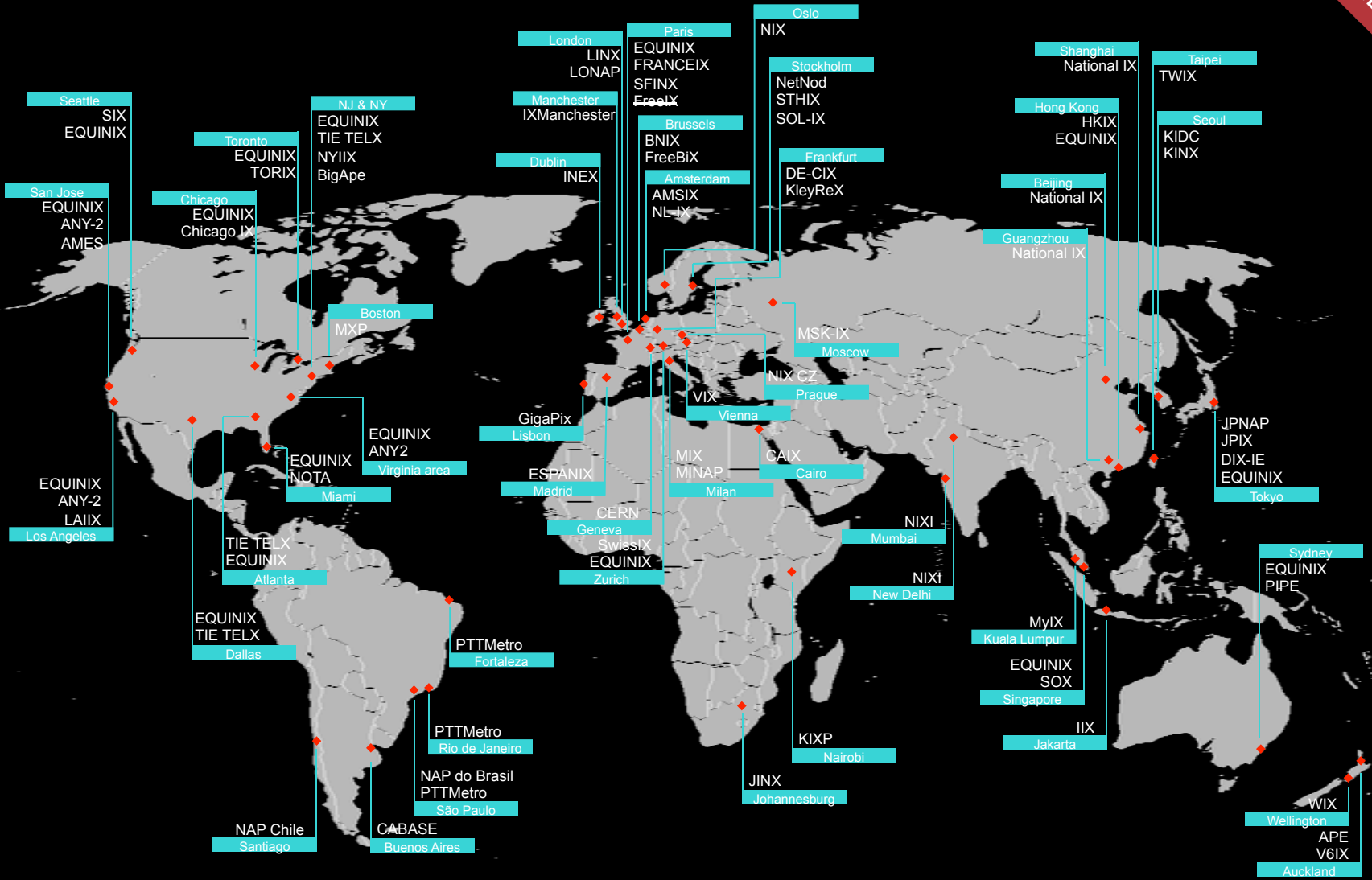
- Multi-homing (more than one transit)
- Peering between “like” networks helps
- Diversity (physical & logical) really helps

- Nothing is static!



# IXPs (Internet peering points) globally

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Major IXs/NAPs represented; plenty more exist



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# PICTURING THE SOUTH EAST EUROPEAN INTERNET

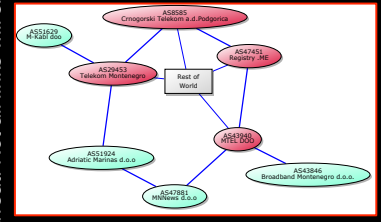
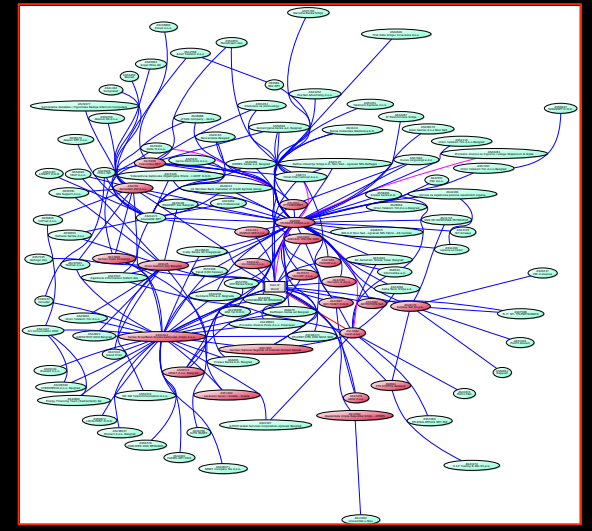
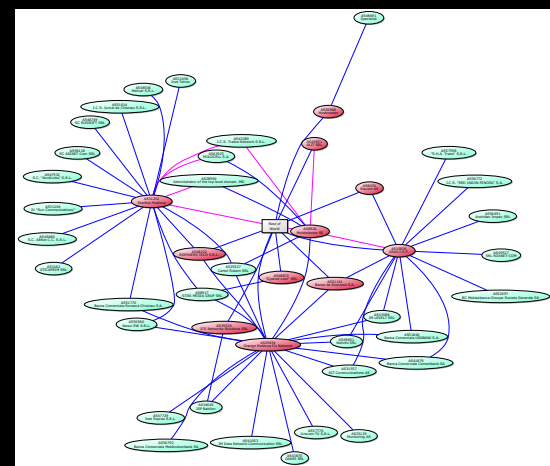
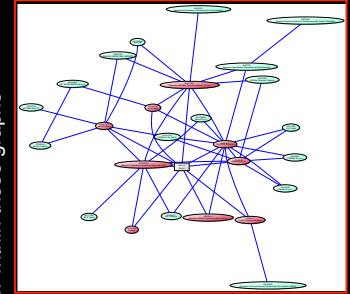
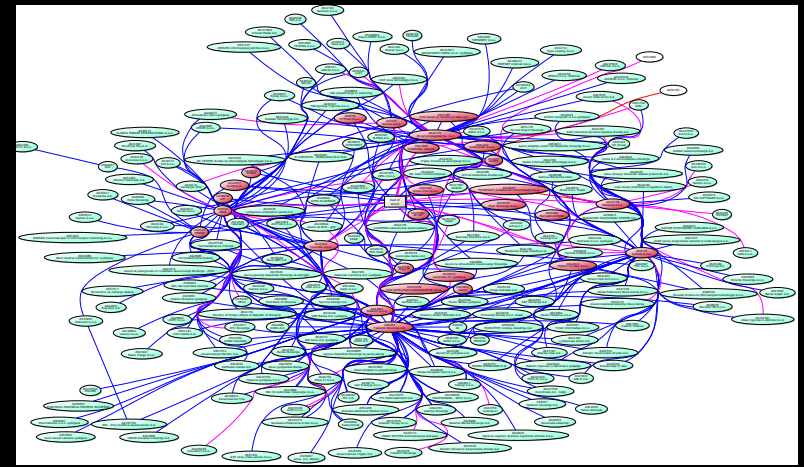
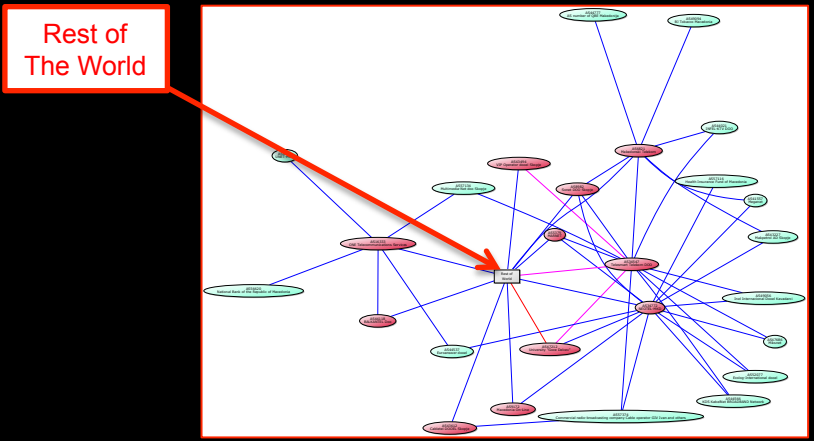
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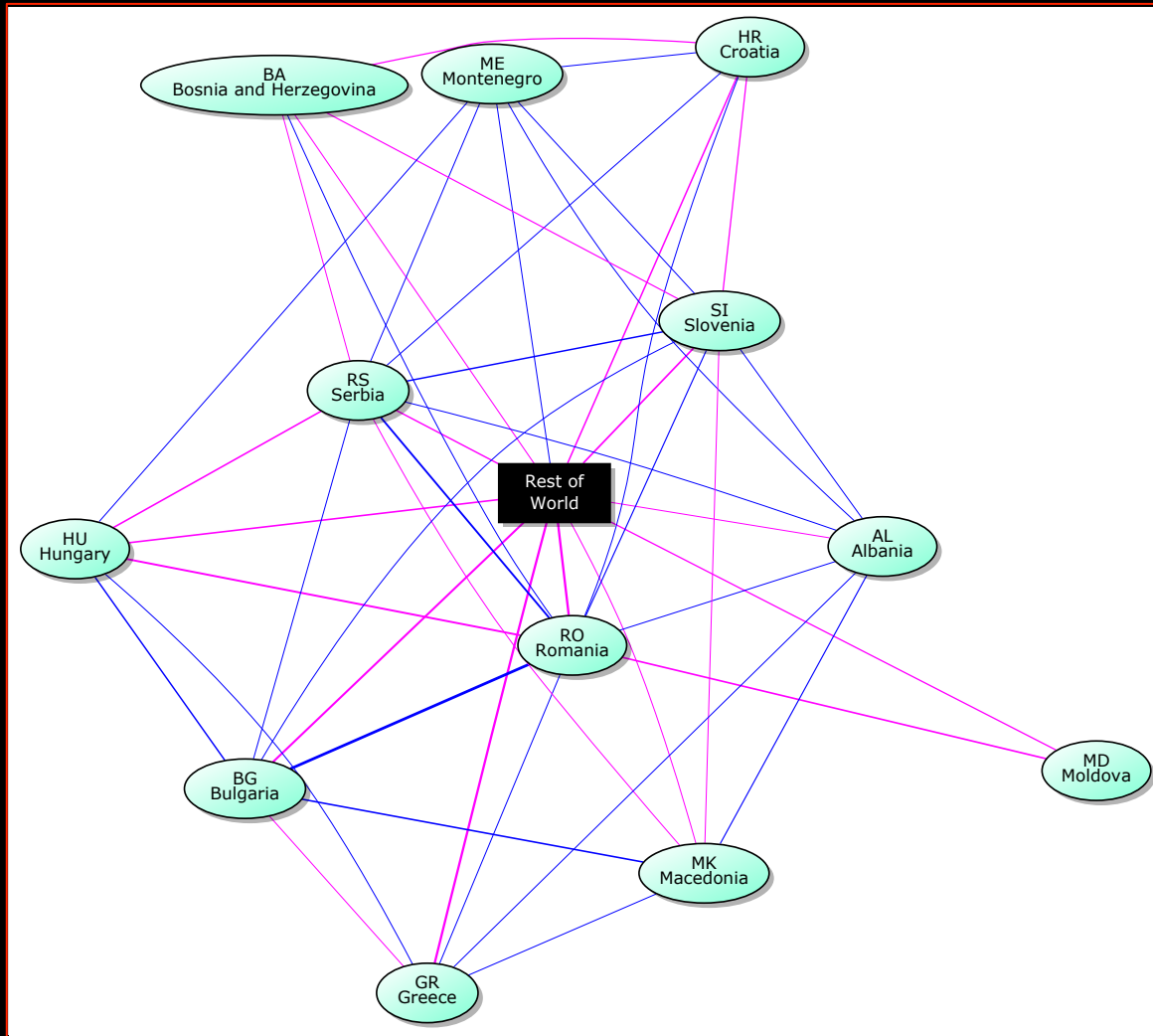
# Visualizing IP routing within "SEE"



Caveat: Not all links will show within these graphs

# Visualizing IP routing within South East Europe

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Caveat: Not all links will show within these graphs



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# WHO IS HURRICANE ELECTRIC?

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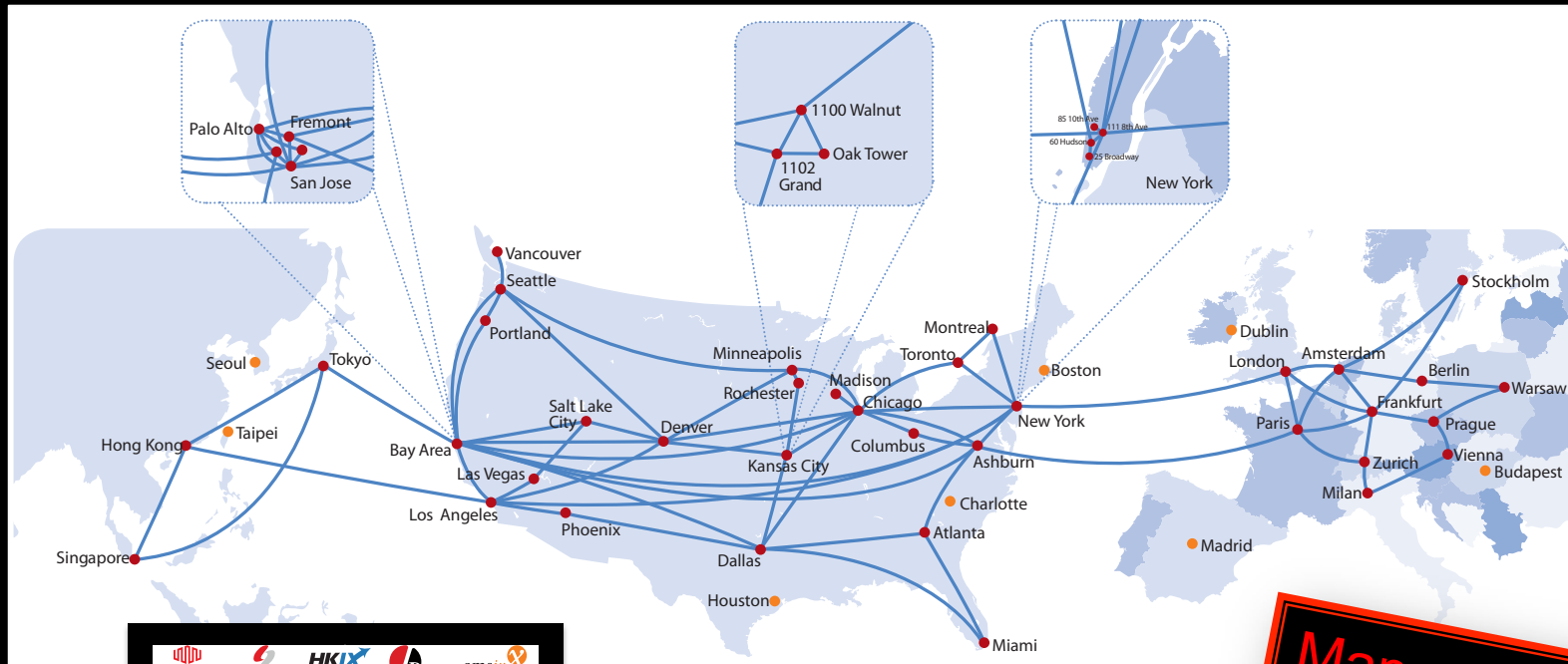
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# Hurricane Electric – an IP Network at 59 IXPs

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**Map outdated**

IPv6 peering at all major peering points in US, Europe & Asia. Private and public peering capacity at 10Gbps and above.



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# ADDITIONAL READING



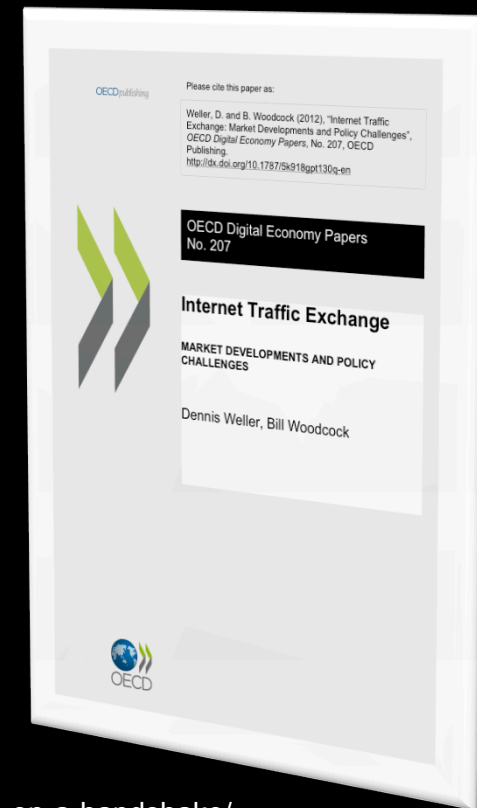
# The OECD report

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Weller, D. and B. Woodcock (2012), "Internet Traffic Exchange: Market Developments and Policy Challenges", OECD Digital Economy Papers, No. 207, OECD Publishing.

<http://dx.doi.org/10.1787/5k918gpt130q-en>

- **OECD**
  - An International Treaty Organization
  
- **Authored**
  - 2012 edition by:
    - Dennis Weller – Navigant Economics
    - Bill Woodcock – PCH
  
- **Published**
  - October 2012
  - Part of a series, published every five years
  
- **Audience**
  - Policy Makers, Regulators, Lawmakers, Economists, etc



A total of 99 pages, 108 references. Plenty of Internet peering stats

<http://oecdinsights.org/2012/10/22/internet-traffic-exchange-2-billion-users-and-its-done-on-a-handshake/>

# Why peering helps grow the local IP market

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- Report Takeaway ...
  - Peering and IXPs work (this is obvious)
  - Very good results with little regulation
  
- Peering improves traffic flows and reduces costs
  - Traffic flowing with less hops or latency is more efficient
  - Networks that peer can reduce transit expenditure
  - Networks that peer see local content or local eyeballs easier
  
- Peering reduces transit revenue from major players
  - Reduced revenue is a short term effect (but it's there)
  - As customer experience improves; network dependence grows
  - Peering never replaces 100% of transit needs



# SUMMARY



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