DE·CIX
Where networks meet

Interconnecting IXPs: pros and cons

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Where networks meet **DE·CIX**

Agenda

• Motivation

• Definition of an IXP

• Examples of Interconnections

• Reseller Programs

• Summary

Motivation

- Reseller Programs at IXP are a hype nowadays

- Panel discussion at 19th Euro-IX forum in October 2011 in Lyon

- Start a discussion on the nature of IXP

Definition of an IXP

- (distributed) Layer 2 infrastructure under a single administrative and technical control

- Purpose is to facilitate (settlement free) peering between ISPs (in a broadest sense. I.e. everyone that does have an ASN)

- The diameter (direct reach with own equipment) depends on the geographic location of the IXP
  - LINX e.g. 50km
  - MSK-IX e.g. 30km
  - DE-CIX e.g. 15km
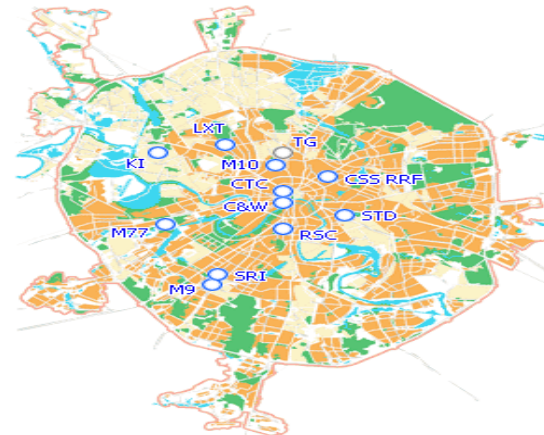
Value of an IXP / Critical mass / Gravity

- Assumptions
  - next best alternative for peering is buying transit
  - Transit prices range from 1€/Mbps - 5€/Mbps
  - Simplified model (only IXP fees vs. transit)
- $Cost_{IXP} = sum (P_i * C_i)$
  - P_i is the number of Ports of Speed i
  - C_i is the cost of a Port of Speed i
  - $Cost_{DE-CIX}$ is ~ 1.3 Mio €
- $Value_{IXP}$ = Peaktraffic * Cost of Transit
  - $Value_{DE-CIX}$ is ~ 3.5 Mio €
- Value/Cost ratio: ValueIXP/CostIXP
  - DE-CIX: 2.7

Value of an IXP / critical mass / gravity

| IXP	#customer	Traffic (Gbps)	Traffic/customer
DE-CIX	408	1700	4.17
AMS-IX	466	1405	3.02
LINX	403	1132	2.81
MSK-IX	344	785	2.28
PLIX	193	167	0.87
France-IX	121	80	0.66
NL-ix	263	143	0.54
SwissIX	140	35	0.25

Source: https://www.euro-ix.net/ixp-matrix

Value of an IXP /critical mass /gravity

- Each IXP tries to increase the critical mass / value according to its own metrics
  - Amount of traffic
  - Number of customers
  - Number of prefixes

- The better the gravity the more customers

- Like a party: the more guests there are, the more will come
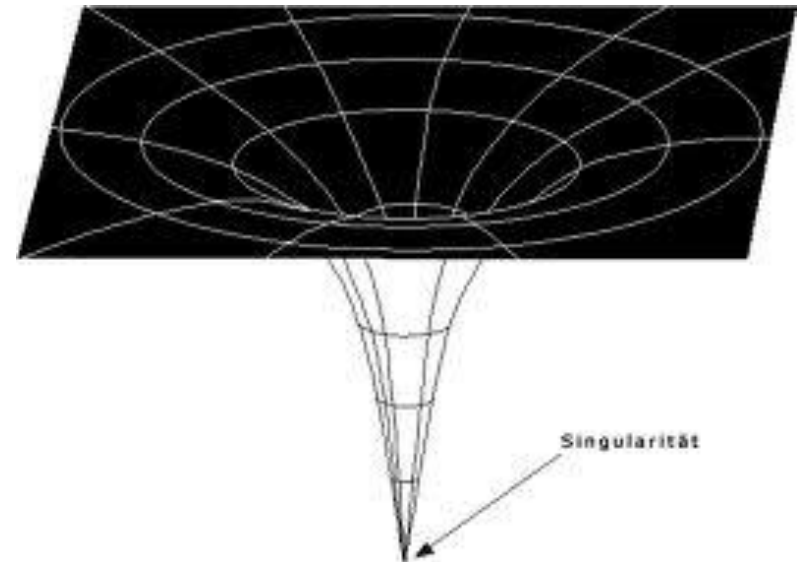
Singularität

Technically interconnecting IXPs

- Simplest approach is to create a single broadcast domain
  - Being under single administration or not

- Customers on IXP_1 is able to peer with all customers at IXP_2 and vice versa

- If under different administration IXP_1 and IXP_2 have to agree on clear interfaces between the bigger IXP and create common procedures to resolve issues

Technically interconnecting IXPs

- Only using customer base at each IXP

- Using VPLS or Vlan technologies to hand off each customer on a single "adminstrative" port though using bigger pipes to interconnect

- VPLS interconnection became attractive recently when IXPs moved to VPLS for the own infrastructure

- Vlan interconnect is around for years
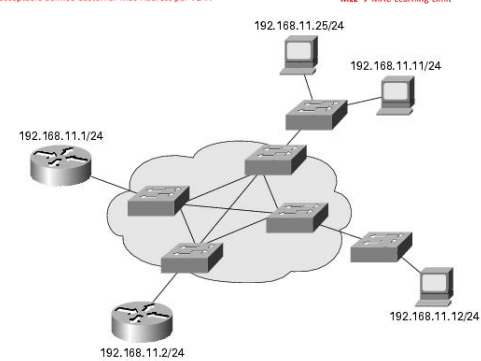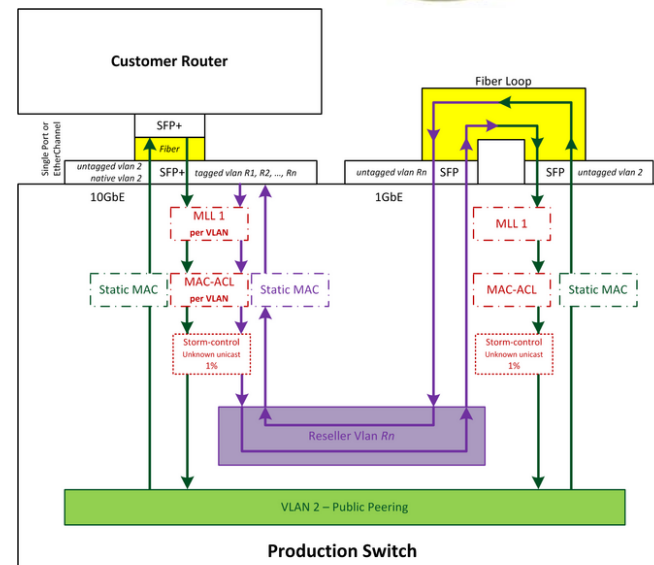
Examples of Interconnections (Lyonix – Topix)

- Lyonix (Lyon, France) and Topix (Turin, Italy) are fully interconnected to each other (1Gbps)

- Costs are shared among each other

- Purpose is also to develop the region

- Each customer of Lyonix is able to become a customer of Topix and vice versa

- No price reductions

Examples of Interconnections (InterLAN – BalkanIX)

- BalkanIX (Sofia, Bulgaria) is connected to InterLAN (Bucharest, Romania) via 10Gbps

- Technically BalkanIX is putting a switch in a colocation facility in Bucharest

- BalkanIX customers are not paying for using InterLAN services

Examples of Interconnecctions (France-IX – SFINX)

- France-IX (Paris, France) and SFINX (Paris, France) are interconnected

- Located in some same colocation in Paris (i.e. local loops only)

- Free of charge, but limited to a certain bandwidth

- If more bandwidth is needed you have to join the other IXP

Reseller Programs

- Using VPLS in the IXP network facilitates reseller programs
  - Use one 10Gbps port to connect lots of (small) customers

- Other (smaller?) IXP seem to be partners of first choice
  - Do have customer relation already
  - Connection to IXP is physically established
  - But is this win/win?

- Business for carriers who are connected to lots of IXP

Don't do!

- Leave your home turf (i.e. go beyond your diameter)
  - Your customer carriers will lose revenue on local backhaul

- If you run several IXP, don't interconnect them
  - You turn from an IXP to carrier / ISP

Summary

- Reseller/partner programs does not really mean interconnecting IXP but using synergies

- Interconnecting **smaller IXP** can make sense to gain more critical mass / better gravity

- The "P" in IXP stands for "point" ☺

Thank you

Join DE-CIX now!

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