

Contribution to 2015 CWG-Internet: Online Open Consultation Questionnaire

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Introduction

We can observe the worldwide trend of Internet EXchanges (IXs) rapid growth. Because of low interconnection costs IXs are often seen as a remedy to different issues occurring in the present Internet.

On one hand, many Internet players could meet in one site and easily establish connectivity. It might be seen as a factor supporting the competition on the market.

On the other hand, the more players are present in the IX the more attractive this IX is for the newcomers. It means, the first IX will monopolize the market since everyone is going to connect to the largest IX offering the widest range of interconnection possibilities. It brings the following consequences:

- Small IXes (possibly newcomers) have no chance to grow big enough to compete effectively with the largest IX
- Small ISP located out of the location of the largest IX has to establish costly transmission to the largest IX. For many of them it is an entry barrier that they are not able to overcome
- Large incumbents (telcos) are not able to compete with IXes costwise thus, they establish private peerings with players of the similar size to bypass IXs

In the following part current situation of Orange Polska (OPL) and its standpoint in terms of IXes will be presented

Market context and use case

OPL is an incumbent on Polish market and the same time it runs its own Internet eXchange called TPIX for own customers.

OPL does not peer in TPIX with anybody willing to reach OPL's eyeballs. Poland is also untypical country since there are at least five competitive Internet eXchanges in the same country. In four of them are located in Warsaw, one in Katowice.

On Polish market there are around 500 ISPs, CSPs, IXPs etc. competing with numerous business strategies.

It gives to OPL a specific perspective to watch wholesale Internet development.

In Internet history we observe two stages of monopolization efforts: At first Tier-1's stand on position that everybody has to pay to this small group of companies.

At the same time big ISPs started to request money from CSP for eyeball access. It also reduced space for settlement free peering.

Development and wide implementation of Internet eXchanges changed this situation dramatically.

IXes reduced the share of Internet traffic traversing Tier-1's networks. This effect was multiplied by CDNs like GGC or Akamai hosted close to IXes.

IXes made also high quality pressure on incumbents reluctant to peering since peering based quality of Internet produced by smaller ISPs become much higher than quality offered by bigger, IX reluctant telcos.

After several years of IXes development new problem appeared: IX's tend to monopolize Internet more than Tier-1's in the past.

Reason came from IX business model. Their popularity among carriers is strictly based on the number of connected entities.

As a result bigger IXes cannibalize smaller ones. Even IXes in neighboring countries.

In practice there is no space for competition. End everybody pays to IX's - both CSPs and ISPs.

Despite there is at least four smaller IXes in Poland they are still smaller then leading PLIX.

Orange Polska Solution

Being an incumbent ISP we faced typical pressure from incumbent IX on Polish market.

We decided to start our own Internet eXchange (TPIX) and eventually face the monopolistic nature of IX business model. It is very hard to compete with incumbent IX.

We also found centralized nature of IX as inappropriate for big telco with distributed IP network for the following reasons:

- Number of customers (eyeballs) served by incumbents/telcos (100s of thousands or millions) generate enormous data streams that are concentrated in a single point of failure
- This huge data streams have to be transited to IX location over telco's network resulting in unnecessary network saturation and network cost increase.
- Every failure in IX infrastructure can potentially affect all these customers resulting in critical business impact
- Every unexpected peak of traffic (e.g. due to world championship football match,...) could saturate the resources of centralized IX architecture resulting not only in telco's customers service degradation but also degradation for other ISP's connected to this particular IX

- QoS mechanisms cannot be seen as a solution because they do not prevent from services degradation in case the entire box is overloaded

We prefer distributed peerings or distributed CDNs that help reduce our network cost and ensure better customer experience.

Smallest ISPs outside capital city face similar problem - centralized IXes are far from their locations and they need to buy transmission to centralized IXes. Lower quality of such solution (higher RTT, jitter etc.) impacts their competitive position.

We found some solutions for IX problems above that work on Polish IX market:

1. Our IX is VLAN based - we run our Open Peering as one of VLANs possible on customers' ports. It attracts ISPs that accept only private peering or sell their services on VLANs (including ourselves).
2. We developed technology to connect couple of IXes into one transparent Open Peering cloud - it prevents from IX market monopolization by leading IX in our country by increasing number of members in Open Peering cloud.
3. We expect future development of Internet to be more and more CDN based. We developed Content PoPs - small IX-like sites for hosting external CDNs - this will let us and other ISPs to reduce transmission and IP network expenses needed currently to reach centrally located Polish IXes. Distribution of CDN content will also improve quality of Internet for end users.

Conclusions

So as to summary: We don't find IXes as a solution for all Internet problems. They are ideal only as a meeting point for numerous small CSPs and small ISPs.

IXes don't answer the needs of big telcos - they need to design their own distributed peerings instead and save their costs both of IP network and buying IX ports. Because of the centralized nature of IXes major scalability problems may occur resulting in performance degradation and poor customer experience. Moreover, IXes have to be treated as a single point of failure thus, an alternative connectivity solution has to be developed to ensure business continuity.

IXes are also not in line with CDN technology since this technology lets distribute content much more than IXes can be distributed due to their centralized nature.

We propose to solve monopolistic nature of IXes by sponsoring small, distributed IXes dedicated to host CDNs and connected to other IXes by our technology of connecting Open peering clouds.

This technology needs standardization process, that will give to smaller IXes valuable tool to request this kind of connectivity from incumbent IXPs.

Distributed IXes may be interested also for big telcos that can support or build them.

This evolution finally will support better connectivity in growing Internet.
