Analyzing the time dynamics in IXP datasets

Much of the interconnection between Autonomous Systems (ASes) in the Internet happens via *Internet Exchange Points* (IXPs). Still, IXPs have only recently caught the attention of networking researchers as well as network operators because of their important role in the Internet ecosystem. Notably, researchers have found that *(i)* the Internet topology is flattening on the AS level [8, 10], *(ii)* surprisingly many peerings exist in large IXPs [4], and *(iii)* end-to-end delays and path lengths are becoming smaller [5] due to IXP-traversing paths which bypass the old transit hierarchy [8, 12]. Besides, IXPs are even used as the cradles for hosting new technologies, e.g., Software Defined Networking paradigms that can evolve routing beyond BGP [11].

However, unlike the AS ecosystem of the Internet, for which measurement data, e.g., from RouteViews [3], have been thoroughly analysed both with respect to their artifacts and merits, the advantages and disadvantages of IXP datasets are still not well understood. Previous work [6, 13, 7] has explored primarily information from PeeringDB [2], a user-maintained IXP directory for AS administrators, to find and verify IXP member ASes. However, there are several additional sources of systematic information on IXPs: *The European Internet Exchange Association* (Euro-IX) maintains a list of IXPs [9], while *Packet Clearing House* (PCH) maintains a directory [1], which also includes many historical IXPs.

The goal of this thesis is to analyze the time dynamics in PeeringDB data. Your work includes:

1. Research and read literature on IXPs.
2. Adopt and extend our analysis framework for IXP datasets to perform time-series analysis of PeeringDB [2], and optionally other data sources. Analyze our body of data.
3. Write a report and give a presentation on your results.

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