

GCCS 2017 Runup Event: A Roundtable discussion on running a private INTERNET EXCHANGE POINT.

Venue: SIGMA IT PARK, Rabale, New Mumbai.

Date: 6 November, 2017.

The Internet has transformed the personal and professional lives of its users. Whether it is booking a cab or listening to music or watching an online television series or buying groceries or conducting financial transactions or working remotely, the Internet has become relevant to different tasks undertaken by us. By making Internet driven content available on the devices of their users, the Internet Service Providers (ISPs) play a critical role in enabling the Internet to be relevant.

To transfer Internet content from one end user to another, the ISPs and their networks (i.e. An Autonomous System) need to have an interconnection mechanism. Some of these interconnection mechanisms are direct wherein two networks directly interconnect with each other to exchange their traffic. However, most of these interconnection mechanisms are indirect wherein one or more intermediary networks agree to transport the content for other networks.

The economic arrangements that allow these networks to connect directly and indirectly are referred as peering and transit respectively. Compared to transit, the marginal costs of sending an additional bit of data over a peering arrangement is zero. When two networks realise that interconnecting directly or peering is cheaper than buying transit from each other, they will have an economic incentive to peer with each other.

It is important to note that peering can only take place at a location that is convenient for both the networks. Once two networks decide to peer at a certain location, then the location becomes favourable for other networks to peer as well. Over a period of time, more networks will have an economic incentive to peer at the same location.

To facilitate peering, Internet Exchange Points (IXPs) can then be set up at such locations. Indeed, an IXP increases the affordability and quality of connectivity in local communities. It also facilitates regionalisation of bandwidth which improves the accessibility to the Internet. To reduce colocation costs of Internet content and ensure adequate as well as reasonably priced IP transport infrastructure at an IXP, the primary infrastructure of these IXPs are located in connected data centers near their facilities.

One such private IXP and a Tier 4 data center was set up at Sigma IT Park near Mumbai in 2016. Generally, a Tier 4 data center is fault tolerant and can guarantee 99.99% uptime. Interestingly, an instance of ICANN operated L root server is also situated in this data center.

Representatives of ISOC India Mumbai Team were invited by Mumbai IX and Deutscher Commercial IX team to understand the nature of their work. Additionally, ISOC India Mumbai representatives were invited to deliberate on issues pertaining to international business and cyber diplomacy. *As a run up to the Global Conference on Cyberspace (GCCS) 2017 in New Delhi, this deliberation took place in form of a roundtable discussion.*

On early morning of 6th November 2017, ISOC India Mumbai representatives had to go through a series of physical inspections and identity checks to enter the data center facilities at Sigma IT Park. They were taken to a conference room wherein representatives of IX and data center team, i.e. Vinodh, Shravan and Vaibhav, were waiting for them.

The discussion started with each member elaborating on the nature of his work. Vinodh plays a key role in soliciting ISPs to peer at the IX. Shravan would then help ISPs to get their own AS number. Finally, Vaibhav would guide the ISPs over their peering infrastructure related decisions.

Apart from elaborating the economic benefits of peering, the trio elaborated a few critical issues facing private IXPs in India. As IXPs rely on telcos for provision of peering infrastructure, the telcos face an inherent principal agent problem i.e. telcos don't have sufficient economic incentives to make favourable economic decisions for their benefactors i.e. the IXPs. Rather than merely providing peering infrastructure to customers of an IXP, telcos can solicit an IXP's customers through better peering options or cheaper transit offerings.

Additionally, Content Delivery Networks of Internet content driven companies like Google, Facebook and Amazon have already been set up in India. This might have serious implications for net neutrality in the Indian Internet eco-system.

Further, a few larger ISPs are setting up their own private IXPs. Such misaligned economic interests might lead to a larger conflict of interest as a monopolistic ISP might not allow certain competitor ISP networks to peer at its IXP. Such a scenario might have undesirable implications on the openness of the Internet. This will eventually hamper the Internet's potential to empower dispersed and diverse communities to proactively participate in the international diplomacy and business arena.

How are a few private IXPs dealing with these business realities? As per our trio, private IXPs require more funding to sustain themselves and avoid the aforementioned issues. In absence of a government subsidy or favourable public policies to support indigenous private ISPs, joint ventures with foreign IXPs can be helpful. It is assumed that foreign IXPs can bring in

necessary processes and best practices to make indigenous ISPs more competitive by leveraging their network effect.

Cyber security issues of individual networks might get amplified at an IXP as different networks directly interconnect with each other and can exchange infected Internet traffic. Sharing of business intelligence among IXPs can equip indigenous IXPs to better deal with cyber security issues. For example, some global IXPs might be better equipped than other IXPs to implement solutions like Dark Holing which can thwart Distributed Denial of Service Attack (DDOS) attacks.

However, there is a caveat in this assumption that business collaborations with foreign IXPs will ameliorate an indigenous IX's business woes. Many countries including India have taken concrete steps to safeguard and protect their citizen's sensitive data. Business collaborations with foreign IXPs might raise important compliance questions and ethical dilemmas on customer data sovereignty and sharing of data pertaining to Internet traffic at an IXP.

Indigenous IXPs must ensure that their contractual arrangements with foreign IXPs should respect customer privacy of their citizens and the subsequent contractual terms must adhere to the provisions of the national laws. The achievement of this outcome will depend upon the soft power of the concerned nation states. Further, the nature of data collection pertaining to Internet traffic at IXP level on indicators of success as well as contribution to the local economy can serve as key tools to explain the significance and relevance of ISPs to other stakeholders in the Internet community.

Indeed, the efforts to establish an IXP can be used to demonstrate the existence of trust between different networks in an Internet Eco-system. More importantly, the ways in which Government's theorise and make sense of cyber security, international business and diplomacy at GCCS 2017 will be pivotal to address our understanding and live with these issues in an IXP. Rather than conceptualising these issues from the traditional fault lines of security studies, Governments at GCCS 2017 should deliberate on a consensual understanding of these issues from the viewpoint of other stakeholders as well. They can then work on harmonizing the regulations to ensure that private IXs can meaningfully partner with each other, comply with appropriate service levels and compete efficaciously. Only then can these IXPs unleash their true potential as enablers of aggregators of local private content in the Internet ecosystem.

Some photos from the event:-



Photo 1: Sneha, an ISOC India Mumbai Volunteer, is interacting with Shравan, Vaibhav and Vinodh to better understand the working of an Internet Exchange Point.



Photo 2: Our trio interacting with Prateek, an ISOC India Mumbai Volunteer, on need for better government regulations for private IXPs in India.