Existing Peering Infrastructure

- PIE
- Peering between PIE and TWA
- Peering at Cybernet Karachi
- Peering at Nayatel Islamabad
- Peering at Brain Tel Lahore
Introductory Session by APNIC and ISOC, at PTA H/Qs Islamabad

IXP Introductory session by Mr. Srinivas Chendi APNIC

Remote participation from Ms Jane Coffin, Director ISOC

Confirmation of support for Pakistan IXP by ISOC

Commitment from Chairman PTA to support Pakistan IXP
Initial Stakeholders in Pakistan

- All ISPs
- Cellular Mobile Phone Operators
- Regulator (PTA) / Government
- Bandwidth Providers (PTCL + TWA)
- Academia
Follow up Meeting with Stakeholders

- Participation from all stakeholders
- Consensus to establish Pakistan IXP
- Five Working Groups formed
- Call for Volunteers
## Volunteer Working Groups

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Working Group</th>
<th>Title</th>
<th>Headed by</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>WG-1</td>
<td>Assessment of establishing IXP and way forward for establishing IXP</td>
<td>Dr. Amir Qayyum (MAJU)</td>
</tr>
<tr>
<td>2.</td>
<td>WG-2</td>
<td>Identifying the benefits of IXP, and making recommendations for the respective public/private organizations to achieve these benefits</td>
<td>Dr. Ihsan Qazi (LUMS)</td>
</tr>
<tr>
<td>3.</td>
<td>WG-3</td>
<td>Analyze commercial aspects of small and large ISPs</td>
<td>Dr. Saad Qaiser (NUST)</td>
</tr>
<tr>
<td>4.</td>
<td>WG-4</td>
<td>Selection of acceptable venue</td>
<td>Mr. Wasi Ullah Khan DG(Coord) PTA</td>
</tr>
<tr>
<td>5.</td>
<td>WG-5</td>
<td>Relevant data collection through concerned organizations</td>
<td>Dr. Zartash Uzmi (LUMS)</td>
</tr>
</tbody>
</table>
Recommendations by Working Groups

- Independent Board of governors
- HEC as neutral venue for IXP
- IXP at Islamabad, Karachi and Lahore
- Fee charging mechanism
- Mirrors of Pakistani popular sites at Pakistan
Benefits of IXP

- Cost Savings
- Lower Latency and Better User Experience
- Local Content Hosting and Content Generation
- Improved Security
- Availability of Services in case of Disruption in International bandwidth
# Interim Board Of Governors

<table>
<thead>
<tr>
<th>Category</th>
<th>Member</th>
<th>Organization</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISPs</td>
<td>Mr. Maroof Shahani</td>
<td>Cybernet</td>
</tr>
<tr>
<td>Bandwidth Providers</td>
<td>Mr. Amer Tufail</td>
<td>PTCL</td>
</tr>
<tr>
<td>Regulator</td>
<td>Mr. Wasi Ullah Khan</td>
<td>PTA</td>
</tr>
<tr>
<td>Academia</td>
<td>Dr. Zartash Uzmi</td>
<td>LUMS</td>
</tr>
<tr>
<td>Hosting Site</td>
<td>Dr. Arshad Ali</td>
<td>HEC</td>
</tr>
<tr>
<td>Cellular Mobile Operators</td>
<td>Mr. Rehan Siddiq</td>
<td>Zong</td>
</tr>
<tr>
<td>ISOC Islamabad Chapter</td>
<td>Dr. Amir Qayyum</td>
<td>CUST/ MAJU</td>
</tr>
</tbody>
</table>
Selection of venue for Pakistan IXP

- Higher Education Commission (HEC)
- Neutral
- Convenient
- Acceptable
- Vast experience of managing PERN
Pakistan IXP: Proposed Locations

Islamabad

Karachi

Lahore
Information Sharing with Stakeholders at all steps

- Global IXP Toolkit by ISOC, including case studies
- IXP Business models by ISOC
- Presentations by ISOC and APNIC
- Minutes of meetings
- Report by Working Groups
Supporting Organizations

- ISOC
- APNIC
- Cisco Pakistan
- Huawei Pakistan
Pakistan IXP Workshop 2016

Ms Jane Coffin - ISOC

Mr. Philip Smith - NSRC

Pakistan Telecom Authority (PTA)
# Summary of Kenya and Nigeria IXP

<table>
<thead>
<tr>
<th>Benefit</th>
<th>KIXP</th>
<th>IXPN</th>
<th>Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Latency</td>
<td>Reduced from 200-600 ms to 2-10 ms</td>
<td>Reduced from 200-400 ms to 2-10 ms</td>
<td>Noticeable increase in performance for end users</td>
</tr>
<tr>
<td>Local traffic exchange</td>
<td>1 Gbit/s peak</td>
<td>300 Mbit/s peak</td>
<td>Savings on international transit of over $1 million per year in each country</td>
</tr>
<tr>
<td>Content</td>
<td>Google network present locally, along with rehoming of domestic content</td>
<td>Same as in Kenya</td>
<td>Increase in usage and corresponding revenues for mobile data traffic</td>
</tr>
<tr>
<td>E-government</td>
<td>Kenya Revenue Authority gathers taxes online</td>
<td>Usage by education and research networks</td>
<td>Social benefits from e-government access to IXPs</td>
</tr>
<tr>
<td>Other benefits</td>
<td>An increasing amount of regional traffic exchanged at KIXP</td>
<td>Financial platforms hosted locally</td>
<td>Further economic benefits resulting from IXPs</td>
</tr>
</tbody>
</table>

Source: Analysis Mason 2012
<table>
<thead>
<tr>
<th>S. No.</th>
<th>Country</th>
<th>No. of IXP</th>
<th>No. of participants</th>
<th>Average Traffic</th>
<th>Year of operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>India</td>
<td>7</td>
<td>100</td>
<td>44 Gbps</td>
<td>2003</td>
</tr>
<tr>
<td>2.</td>
<td>Bangladesh</td>
<td>1, planning for 2\textsuperscript{nd}</td>
<td>65</td>
<td>5.2 Gbps</td>
<td>2004</td>
</tr>
<tr>
<td>3.</td>
<td>Nepal</td>
<td>1</td>
<td>26</td>
<td>600 Mbps</td>
<td>2002</td>
</tr>
<tr>
<td>4.</td>
<td>UAE</td>
<td>1</td>
<td>30</td>
<td>30 Gbps</td>
<td>2013</td>
</tr>
<tr>
<td>5.</td>
<td>Sri Lanka</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>Work under progress</td>
</tr>
</tbody>
</table>
Current Status of traffic
Current Status of Volume of traffic per day

Custom Chart - Network Wide Total Bytes Transferred

All Interfaces on All Nodes
Oct 11 2016, 5:36 am - Nov 5 2016, 12:00 am

Total Bytes: 14.0 TB
Total Bytes Trend: 13.1 TB
Total Bytes Percentile 95%: 13.8 TB