IX-F database and tool

APRICOT 2017

Ho Chi Minh City, Vietnam
What do we do?

• Two fora per year
• Maintain and develop the website, database and tools
• Annual European IXP Report
• Mentor-IX programme
• Fellowship programme
• Benchmarking Club (BMC)
Talk to us and each other

• Mailing lists
• Newsletter – Subscribe here:
  • euro-ix.net/news-and-events/newsletter/
• Working Groups
• Social Media
  • Twitter @euroix
  • Facebook fb.me/maineuroix
  • YouTube youtube.com/channel/UCFyucVRAAMzxyJlsxnGwsjw
Association of IXPs

82 affiliated IXPs:
• 56 IXPs in the Euro-IX Region 49 Countries, operating over 100 Peering LANs
• 26 IXPs from the rest of the world
• Newest Members:
  Global-IX
  DataIX
Patrons

- Arista
- Brocade
- Ciena
- Coriant
- ECI Telecom
- Equinix I Telecity
- Extreme Networks
- Huawei
- Interxion
- Juniper Networks
- MRV
- Nokia
- Telehouse
Website – Top Improvements!

1. ASN Automation
2. Switch Database
3. Route Server Database
4. Edit your own profile
5. Edit your organisation and team members
6. Peering matrix, service matrix and ASN database all working
7. Database quality improvements
Organization Profile

Internet Neutral Exchange Association

Location: Ireland
Established: 1996-09-01
Affiliation: Member
Board Contact:
Email: barry.rhodes@inex.ie
Website: https://www.inex.ie/
IXP Database
## IXP Database

### ASN Database

<table>
<thead>
<tr>
<th>IXP Participants</th>
<th>IPv6</th>
<th>Unique ASNs</th>
</tr>
</thead>
<tbody>
<tr>
<td>EURO-IX</td>
<td>8644</td>
<td>5420</td>
</tr>
<tr>
<td>APIX</td>
<td>1511</td>
<td>444</td>
</tr>
<tr>
<td>AF-IX</td>
<td>302</td>
<td>60</td>
</tr>
<tr>
<td>LAC-IX</td>
<td>1703</td>
<td>1092</td>
</tr>
<tr>
<td>NORTH AMERICA</td>
<td>2192</td>
<td>524</td>
</tr>
<tr>
<td>GLOBAL</td>
<td>14352</td>
<td>7540</td>
</tr>
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</table>
## IXP Database

### ASN Database

<table>
<thead>
<tr>
<th>AS#</th>
<th>COMPANY</th>
<th>PRESENT AT</th>
<th>IPV6</th>
</tr>
</thead>
<tbody>
<tr>
<td>6939</td>
<td>Hurricane Electric</td>
<td>80</td>
<td></td>
</tr>
<tr>
<td>20940</td>
<td>Akamai International B.V.</td>
<td>78</td>
<td></td>
</tr>
<tr>
<td>15169</td>
<td>Google Inc</td>
<td>69</td>
<td></td>
</tr>
<tr>
<td>3856</td>
<td>PCH</td>
<td>62</td>
<td></td>
</tr>
<tr>
<td>42</td>
<td>WoodyNet</td>
<td>56</td>
<td></td>
</tr>
<tr>
<td>8075</td>
<td>Microsoft RUS LLC</td>
<td>52</td>
<td></td>
</tr>
<tr>
<td>22822</td>
<td>Limelight</td>
<td>49</td>
<td></td>
</tr>
<tr>
<td>10310</td>
<td>Yahoo Inc. (B)</td>
<td>35</td>
<td></td>
</tr>
<tr>
<td>13335</td>
<td>CloudFlare Inc.</td>
<td>29</td>
<td></td>
</tr>
</tbody>
</table>

**IXPs**

- AMS-IX
- AMS-IX Bay Area
- AMS-IX Chicago
- AMS-IX Hong Kong
- AMS-IX New York
- BBIX - Tokyo
- BCIX
- BIX.BG
- BIX
- Big APE
- CATNIX
- CoreSite - Any2 Denver / RIXI Denver
- CoreSite - Any2 Los Angeles
- DE-CIX Frankfurt
# IXP Database

## Peering Matrix

<table>
<thead>
<tr>
<th>IXP</th>
<th>Total IXP ASNs</th>
<th>Total IXP ASNs that don't peer at other IBXs</th>
<th>% of IXP ASNs that don't peer at other IBXs</th>
<th>% of IXP ASNs peer at other IBXs</th>
<th>% of IXP ASNs that peer at other IBXs that also peer at other IBXs</th>
<th>% of IXP ASNs that peer at other IBXs that don't peer at other IBXs</th>
</tr>
</thead>
<tbody>
<tr>
<td>AMS-IX</td>
<td>79.77</td>
<td>0</td>
<td>796</td>
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<tr>
<td>AMS-IX Caribbean</td>
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<td>13</td>
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<td>ARINX</td>
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<td>0</td>
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<td>0</td>
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<tr>
<td>Angonix</td>
<td>50.00</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<tr>
<td>BBIX - Tokyo</td>
<td>62.50</td>
<td>0</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>0</td>
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<tr>
<td>BCIX</td>
<td>70.89</td>
<td>0</td>
<td>37.1</td>
<td>1</td>
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<td>0</td>
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<tr>
<td>BIX.BG</td>
<td>58.33</td>
<td>0</td>
<td>23.1</td>
<td>1</td>
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<td>0</td>
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<tr>
<td>BIXX</td>
<td>53.33</td>
<td>0</td>
<td>19.0</td>
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<td>0</td>
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<tr>
<td>BIX</td>
<td>42.86</td>
<td>0</td>
<td>17.0</td>
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<tr>
<td>CATNIX</td>
<td>37.50</td>
<td>0</td>
<td>11.1</td>
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<td>0</td>
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<tr>
<td>CIX</td>
<td>37.50</td>
<td>0</td>
<td>4.1</td>
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<td>0</td>
<td>0</td>
</tr>
<tr>
<td>CIXP</td>
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<td>0</td>
<td>19.0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<tr>
<td>DE-IX Frankfurt</td>
<td>72.48</td>
<td>0</td>
<td>38.5</td>
<td>1</td>
<td>0</td>
<td>0</td>
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<tr>
<td>DX - Lynxay</td>
<td>59.09</td>
<td>0</td>
<td>22.1</td>
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<td>0</td>
<td>0</td>
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<tr>
<td>ECIK Berlin</td>
<td>83.67</td>
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<td>0</td>
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<td>Equinix Paris</td>
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<td>FICIX - Helsinki</td>
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<td>FVG-IX</td>
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<td>0</td>
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<td>0</td>
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<tr>
<td>France-IX Paris</td>
<td>89.80</td>
<td>0</td>
<td>113.1</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
IXP Database
# IXP Database

## Switch Database

<table>
<thead>
<tr>
<th>NAME</th>
<th>VENDOR</th>
<th>MODEL</th>
<th>IXP</th>
<th>SOFTWARE VERSION</th>
<th>CREATED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cremat</td>
<td>Arista</td>
<td>7280SE-72</td>
<td>CATNIX</td>
<td>4.15.3F</td>
<td>Sept. 28, 2016</td>
</tr>
<tr>
<td>Sucre</td>
<td>Arista</td>
<td>7280SE-72</td>
<td>CATNIX</td>
<td>4.15.3F</td>
<td>Sept. 28, 2016</td>
</tr>
<tr>
<td>CIX2</td>
<td>Force10</td>
<td>S4810</td>
<td>CIX</td>
<td>9.10(0.0)</td>
<td>Sept. 23, 2016</td>
</tr>
<tr>
<td>mix-zh4</td>
<td>Brocade</td>
<td>MLXe-16</td>
<td>SwissIX</td>
<td>5.7.0dT163</td>
<td>Aug. 02, 2016</td>
</tr>
<tr>
<td>mix-rue</td>
<td>Brocade</td>
<td>MLXe-16</td>
<td>SwissIX</td>
<td>5.7.0dT163</td>
<td>Aug. 02, 2016</td>
</tr>
<tr>
<td>switch26</td>
<td>Extreme</td>
<td>X480-24x(10G4X)</td>
<td>LINX LON2</td>
<td>15.4.1.3</td>
<td>Oct. 23, 2016</td>
</tr>
</tbody>
</table>
Database schema is in place for IXPs to record their information about themselves and the operators they serve.

IXP API is live - [https://db.ix-f.net/api/ixp](https://db.ix-f.net/api/ixp)
IXP Database – What’s next?

• Extend and internationalise the admin interface for all IXPAs (APIX, LAC-IX and AF-IX)
• Create bespoke maintained APIs
• Future revisions to the database schema to capture more data
Thanks to Andy Davidson for the example

“who am I not peering with at LONAP?”

• You have a script which load direct adjacencies into an array
• You need a complete and canonical list of peers to compare differences
IXP Database – use case

Using the IXP API

https://db.ix-f.net/api/ixp
IXP Database – use case

```json
{  
  "ixp_info": {  
    "status": "active",  
    "updated": "2014-02-17T00:07:51Z",  
    "name": "London Network Access Point",  
    "created": "2011-08-16T13:26:26Z",  
    "shortname": "LONAP",  
    "ixp_id": "IX-FA#18"
  },  
  "timestamp": "2015-09-16T08:17:31.116Z",  
  "version": "2014110001",  
  "member_list": [  
    {  
      "asnum": 20915,  
      "name": "100 Percent"
    },  
    {  
      "url": "http://www.2connectbahrain.com/",  
      "asnum": 51406,  
      "name": "2Connect"
    },  
    {  
      "url": "http://www.34sp.com",  
      "asnum": 41357,  
      "name": "34SP.com Ltd"
    },  
    {  
      "url": "http://4d-dc.com/",  
      "asnum": 31463,  
      "name": "4D Data Centres"
    },  
    {  
      "url": "http://www.afilias.info",  
      "asnum": 12041,  
      "name": "Afilias"
    },  
    {  
      "url": "http://www.akamai.com",  
      "asnum": 20940,  
      "name": "Akamai Technologies"
    },  
    {  
      "url": "http://www.alentus.com",  
      "asnum": 21321,  
      "name": "Alientus UK Ltd"
    }
  ]
}
```
IXP Database – use case

```python
import urllib, json

url = "http://db.ix-f.net/api/ixp-18/member-list"
response = urllib.urlopen(url)

ixpdata = json.loads(response.read())

my_peers = [8916, 20940, 20915, 51406, 41357, 31463, 12041, 21321, 12536, 16509, 20712, 33920, 4,

for member in ixpdata["member_list"]:
    if member["asnum"] not in my_peers:
        print "Get some peering with " + str(member["asnum"]) + " (" + member["name"] + ")"
```
IXP Database – use case

```
enigma:Desktop andy$ python ixp.py
Get some peering with 6871 (PlusNet)
Get some peering with 8689 (PowerGroup (Power Internet Ltd))
Get some peering with 8676 (PRT Systems)
Get some peering with 28792 (Public Internet Limited)
Get some peering with 31402 (Rank Interactive (Blue Square Limited))
Get some peering with 35662 (Redstation)
Get some peering with 5552 (Redstone Communications Ltd)
Get some peering with 5503 (RM Education Plc)
Get some peering with 51409 (Sectorsix)
Get some peering with 50056 (Advantage Interactive Ltd)
Get some peering with 29550 (Simply Transit Ltd.)
Get some peering with 48961 (Warwicknet Ltd)
Get some peering with 20738 (Webfusion)
Get some peering with 44444 (Websense Hosted R&D Ltd. (UK))
Get some peering with 49158 (Wifinity)
Get some peering with 13037 (Zen Internet)
enigma:Desktop andy$
```
Why not just use the IXPs own data?

- This gives you a single API for many IXPs
- Get the same format for all IXPs, its standard – wohoo!
- Data is fed from the IXP – IXPs have accurate data, they own it.
- Portable, supportable and scaleable!
IXP Database – IXP JSON Schema

- Contains both IXP data & IXP participant data
  - ASN (member list), locations, switch, RS, etc etc
- Open, consistent & an atomic design
- Currently 24 IXP independent implementations
- Open source implementation in IXP Manager
- Source available on GitHub;
  https://github.com/euro-ix/json-schemas
IXP Database

- Give network operators the choice of getting accurate information from either IXP Database or PeeringDB
- The data can be obtained using APIs
- Increase use of automation
  - Saves time, money & increases accuracy
Questions?
Thank You!

Bijal Sanghani
Bijal at euro-ix dot net
Twitter: @euroix