euro-ix

IXP database and tools

ESNOG 19 2017

Barcelona, Spain

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/UCFyucVRAAMzxyJIsxnGwsjw

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:

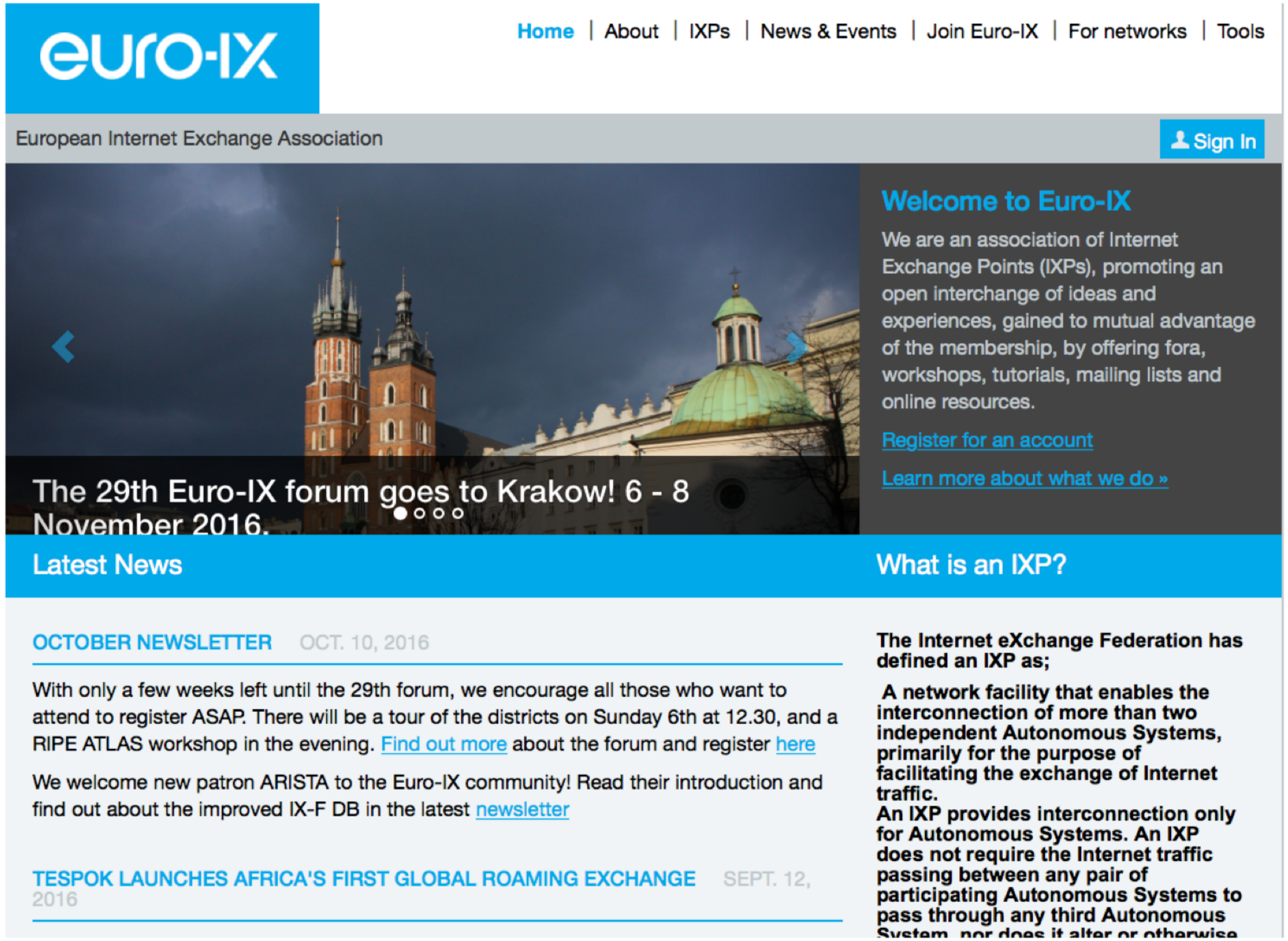
  Global-IX

  DataIX

Patrons

- **Arista**
- Brocade
- **Ciena**
- **Coriant**
- ECI Telecom
- Equinix I Telecity
- Extreme Networks
- Huawei
- Interxion
- Juniper Networks
- MRV
- Nokia
- Telehouse

Website


euro-IX
Home | About | IXPs | News & Events | Join Euro-IX | For networks | Tools
Sign In

European Internet Exchange Association

The 29th Euro-IX forum goes to Krakow! 6 - 8 November 2016.

Welcome to Euro-IX

We are an association of Internet Exchange Points (IXPs), promoting an open interchange of ideas and experiences, gained to mutual advantage of the membership, by offering fora, workshops, tutorials, mailing lists and online resources.

Register for an account

Learn more about what we do »

Latest News

OCTOBER NEWSLETTER OCT. 10, 2016

With only a few weeks left until the 29th forum, we encourage all those who want to attend to register ASAP. There will be a tour of the districts on Sunday 6th at 12.30, and a RIPE ATLAS workshop in the evening. Find out more about the forum and register here

We welcome new patron ARISTA to the Euro-IX community! Read their introduction and find out about the improved IX-F DB in the latest newsletter

TESPOK LAUNCHES AFRICA'S FIRST GLOBAL ROAMING EXCHANGE SEPT. 12, 2016

What is an IXP?

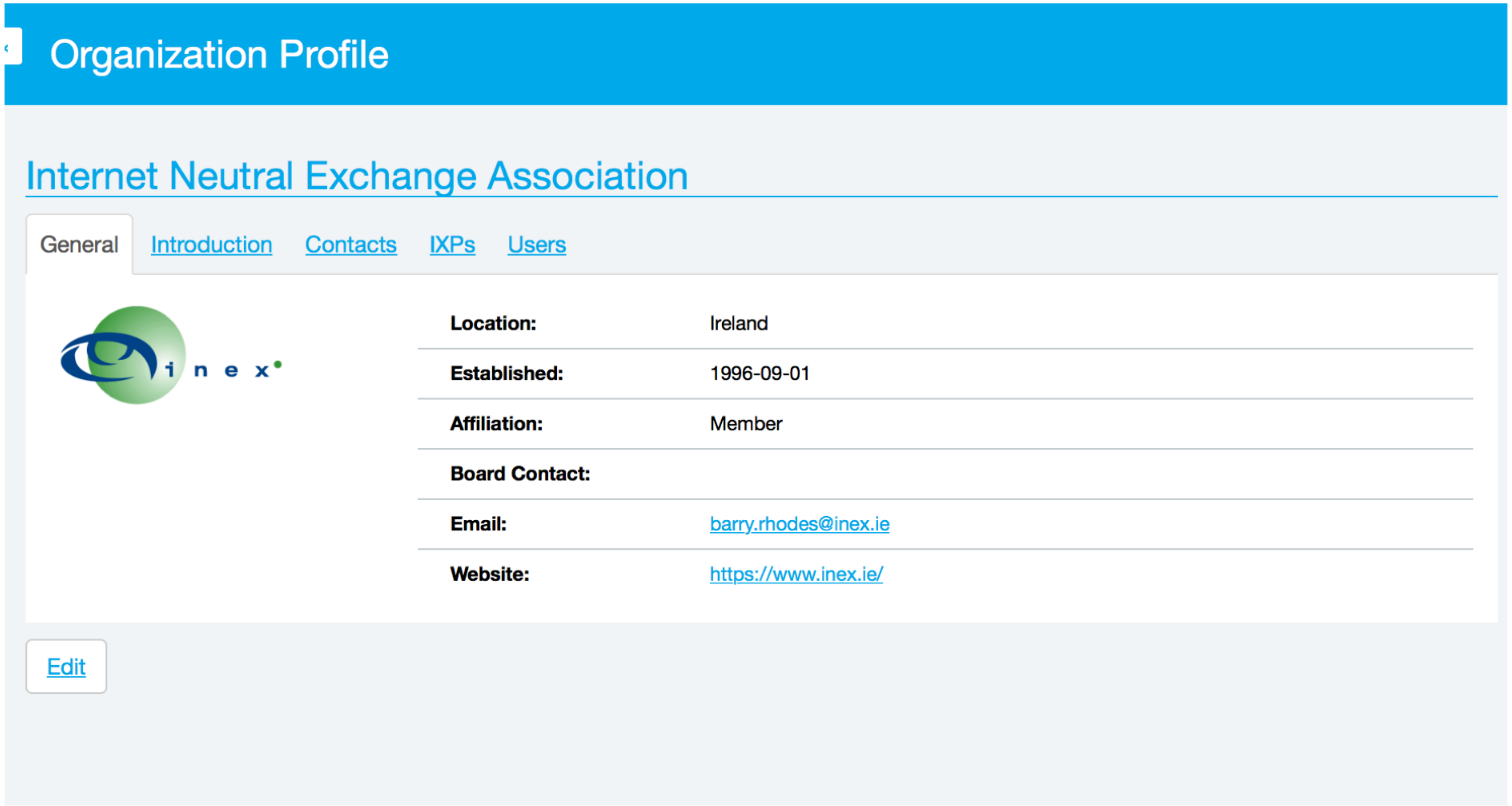
The Internet eXchange Federation has defined an IXP as;

A network facility that enables the interconnection of more than two independent Autonomous Systems, primarily for the purpose of facilitating the exchange of Internet traffic.
An IXP provides interconnection only for Autonomous Systems. An IXP does not require the Internet traffic passing between any pair of participating Autonomous Systems to pass through any third Autonomous System, nor does it alter or otherwise

Website – Top Improvements!

1. ASN Automation
2. Switch Database
3. Route Server Database
4. Peering matrix, service matrix and ASN
5. Database quality improvements
6. Edit your organisation and team members

IXP Database


Organization Profile

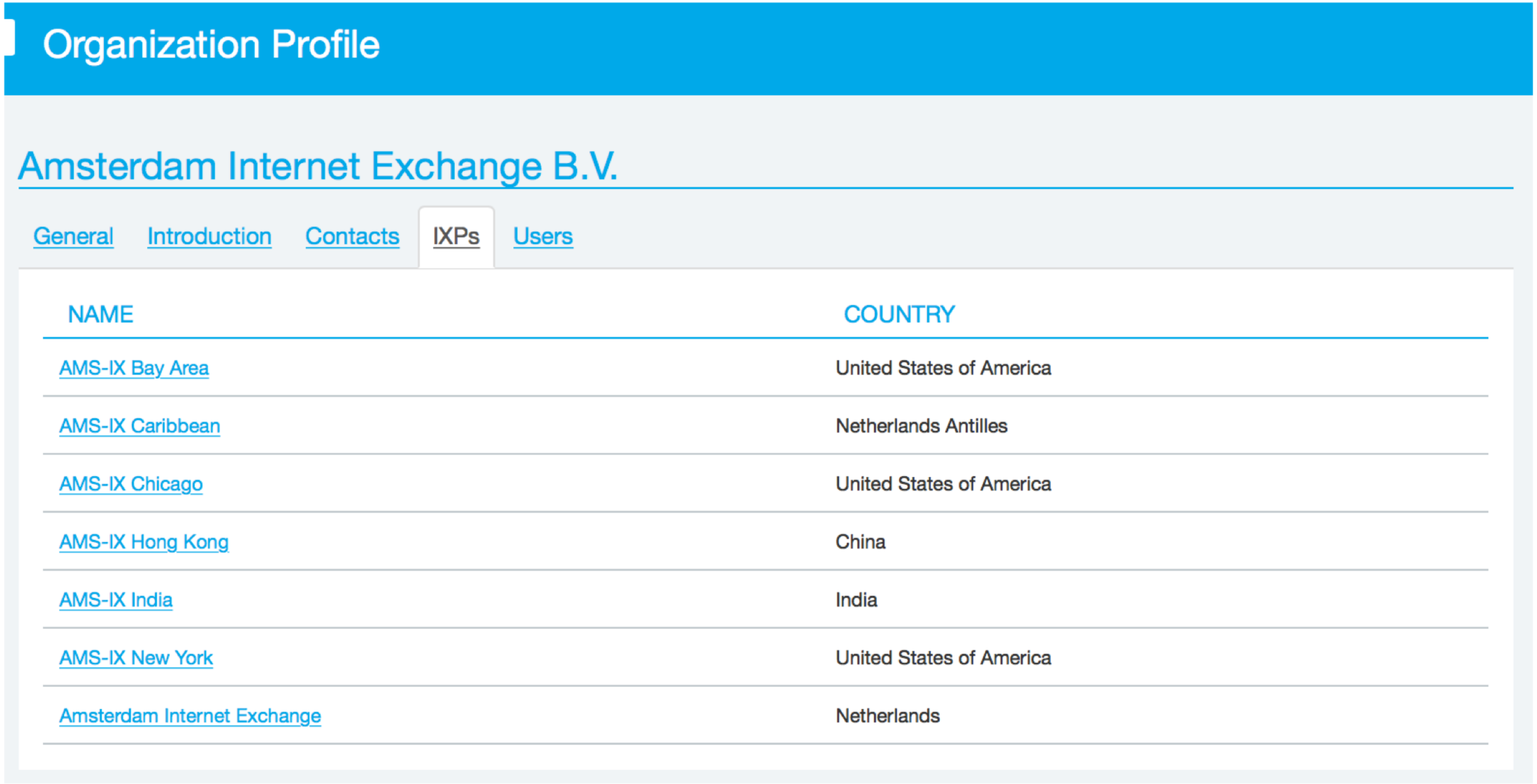
Internet Neutral Exchange Association

General
Introduction
Contacts
IXPs
Users

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

inex
Edit

IXP Database



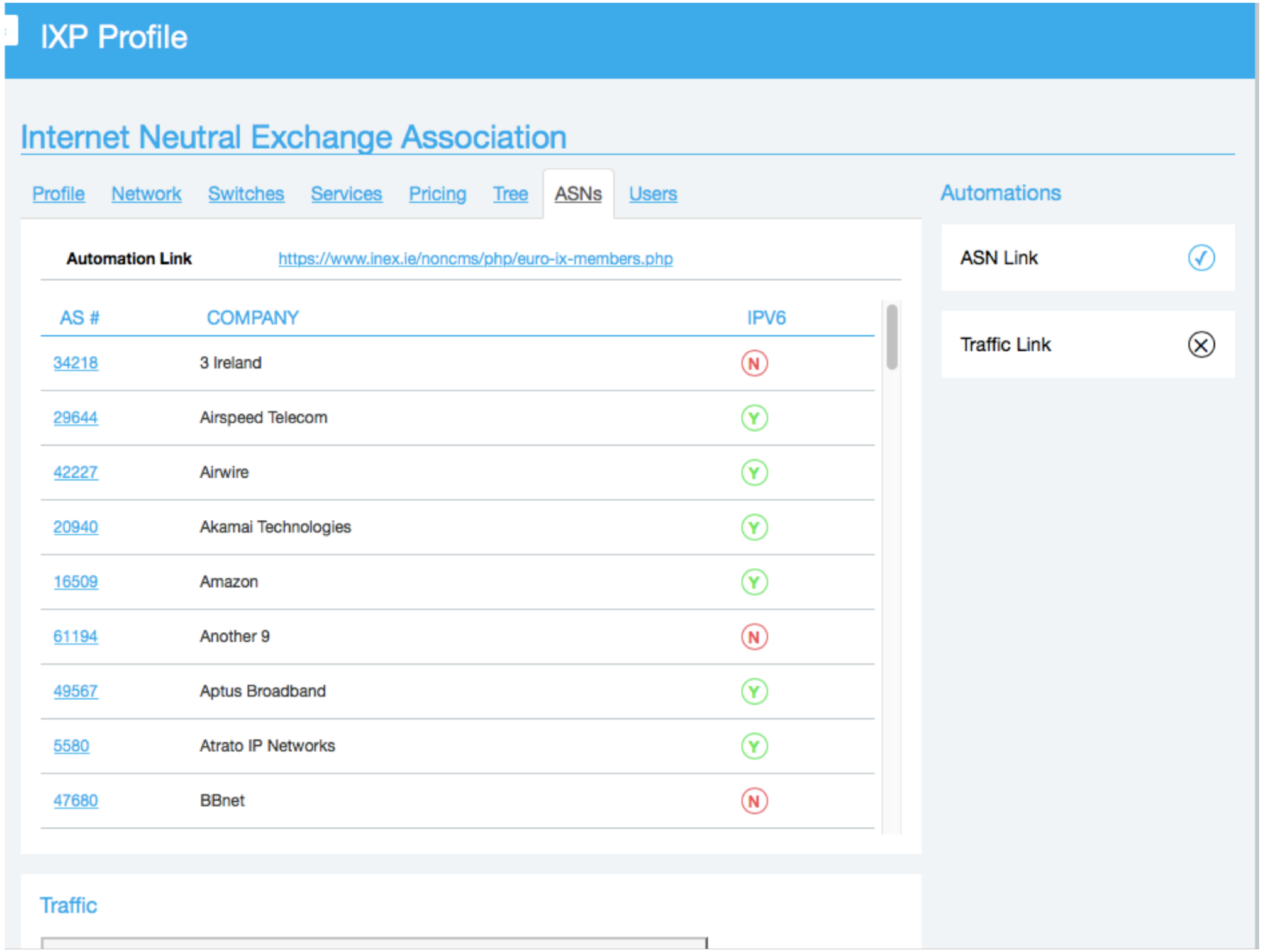
Organization Profile

Amsterdam Internet Exchange B.V.

General
Introduction
Contacts
IXPs
Users

NAME	COUNTRY
AMS-IX Bay Area	United States of America
AMS-IX Caribbean	Netherlands Antilles
AMS-IX Chicago	United States of America
AMS-IX Hong Kong	China
AMS-IX India	India
AMS-IX New York	United States of America
Amsterdam Internet Exchange	Netherlands

IXP Database



IXP Profile

Internet Neutral Exchange Association

Profile
Network
Switches
Services
Pricing
Tree
ASNs
Users

Automation Link https://www.inex.ie/noncms/php/euro-ix-members.php

AS #	COMPANY	IPV6
34218	3 Ireland	N
29644	Airspeed Telecom	Y
42227	Airwire	Y
20940	Akamai Technologies	Y
16509	Amazon	Y
61194	Another 9	N
49567	Aptus Broadband	Y
5580	Atrato IP Networks	Y
47680	BBnet	N

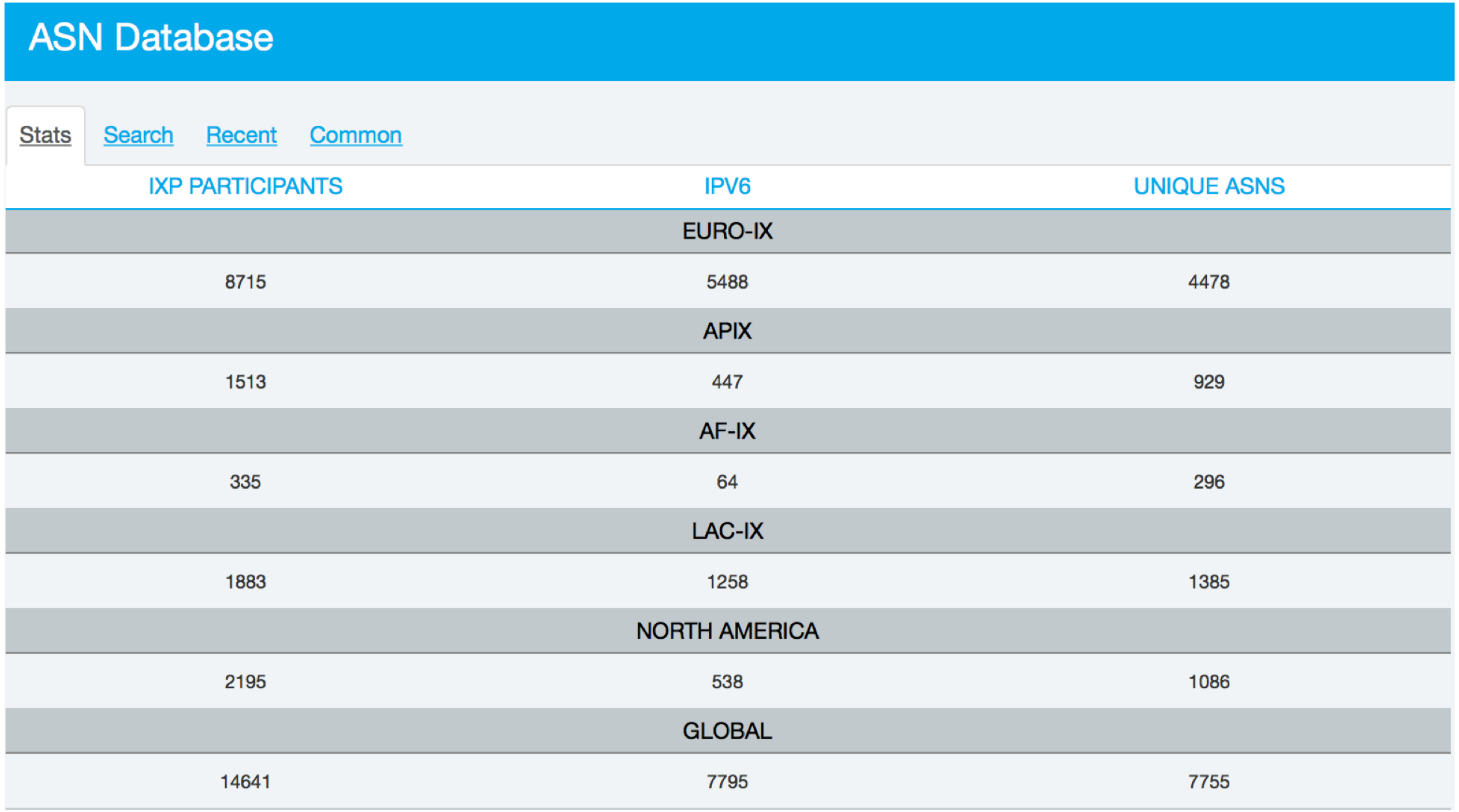
Automations

ASN Link ✓

Traffic Link ⊗

Traffic

IXP Database

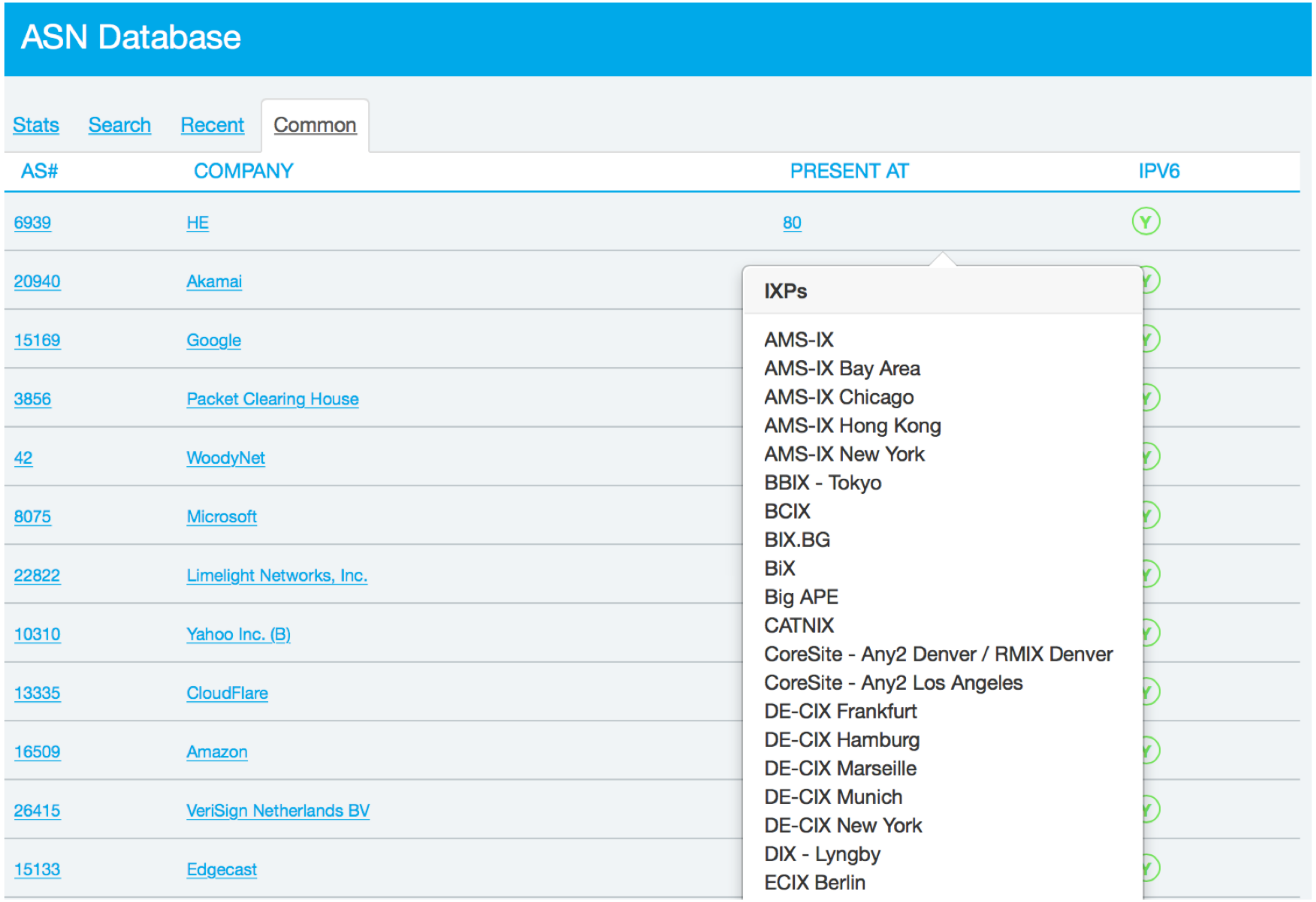


ASN Database

Stats
Search
Recent
Common

IXP PARTICIPANTS	IPV6	UNIQUE ASNS
EURO-IX		
8715	5488	4478
APIX		
1513	447	929
AF-IX		
335	64	296
LAC-IX		
1883	1258	1385
NORTH AMERICA		
2195	538	1086
GLOBAL		
14641	7795	7755

IXP Database



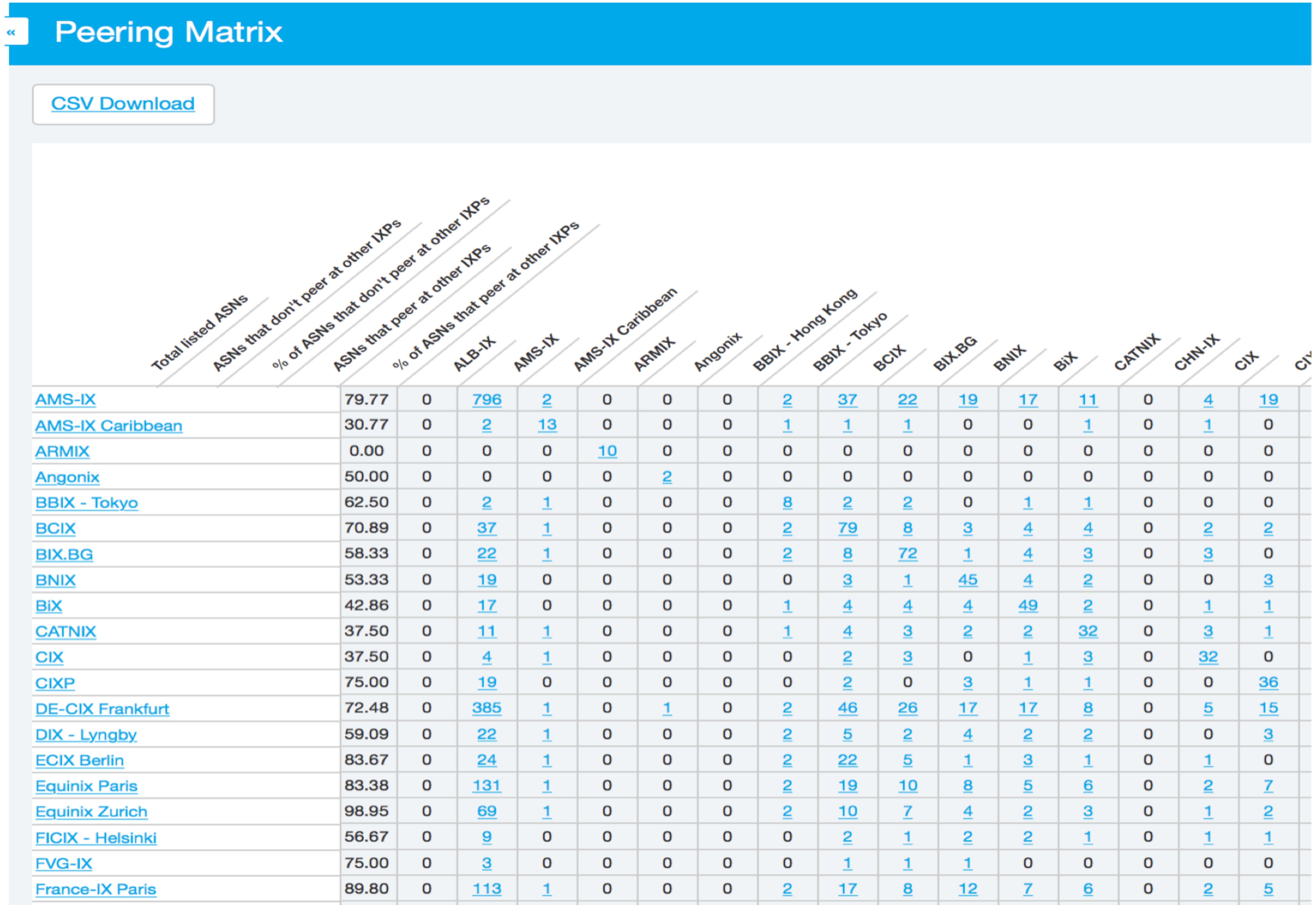
ASN Database

AS#	COMPANY	PRESENT AT	IPV6
6939	HE	80	Y
20940	Akamai		Y
15169	Google		Y
3856	Packet Clearing House		Y
42	WoodyNet		Y
8075	Microsoft		Y
22822	Limelight Networks, Inc.		Y
10310	Yahoo Inc. (B)		Y
13335	CloudFlare		Y
16509	Amazon		Y
26415	VeriSign Netherlands BV		Y
15133	Edgecast		Y

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 / RMIX Denver
CoreSite - Any2 Los Angeles
DE-CIX Frankfurt
DE-CIX Hamburg
DE-CIX Marseille
DE-CIX Munich
DE-CIX New York
DIX - Lyngby
ECIX Berlin

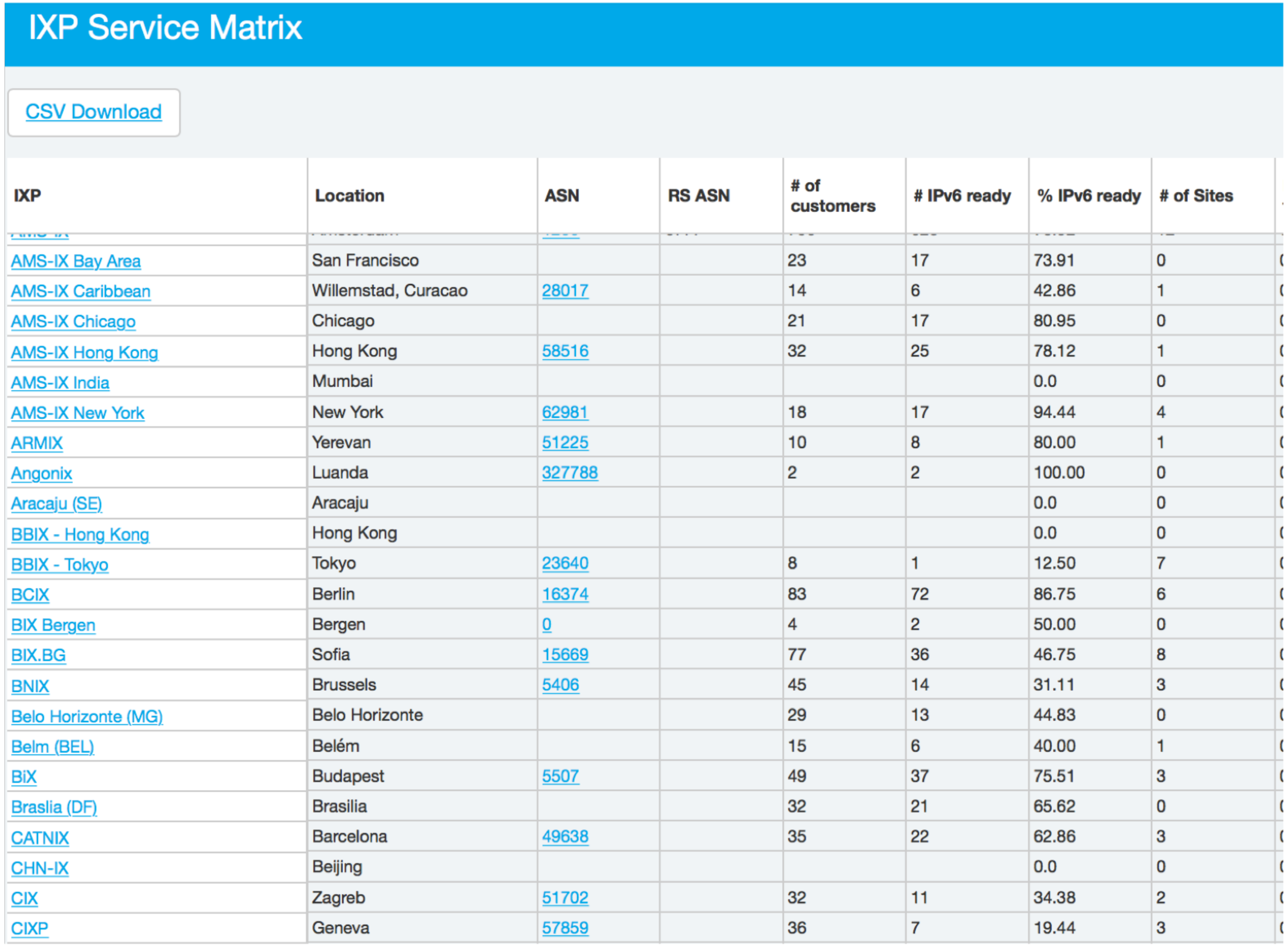
IXP Database



Peering Matrix

	Total listed ASNs	ASNs that don't peer at other IXPs	% of ASNs that don't peer at other IXPs	ASNs that peer at other IXPs	% of ASNs that peer at other IXPs	ALB-IX	AMS-IX	AMS-IX Caribbean	ARMIX	Angonix	BBIX - Hong Kong	BBIX - Tokyo	BCIX	BIX.BG	BNIX	BiX	CATNIX	CHN-IX	CIX	CI
AMS-IX					79.77	0	796	2	0	0	0	2	37	22	19	17	11	0	4	19
AMS-IX Caribbean					30.77	0	2	13	0	0	0	1	1	1	0	0	1	0	1	0
ARMIX					0.00	0	0	0	10	0	0	0	0	0	0	0	0	0	0	0
Angonix					50.00	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0
BBIX - Tokyo					62.50	0	2	1	0	0	0	8	2	2	0	1	1	0	0	0
BCIX					70.89	0	37	1	0	0	0	2	79	8	3	4	4	0	2	2
BIX.BG					58.33	0	22	1	0	0	0	2	8	72	1	4	3	0	3	0
BNIX					53.33	0	19	0	0	0	0	0	3	1	45	4	2	0	0	3
BiX					42.86	0	17	0	0	0	0	1	4	4	4	49	2	0	1	1
CATNIX					37.50	0	11	1	0	0	0	1	4	3	2	2	32	0	3	1
CIX					37.50	0	4	1	0	0	0	0	2	3	0	1	3	0	32	0
CIXP					75.00	0	19	0	0	0	0	0	2	0	3	1	1	0	0	36
DE-CIX Frankfurt					72.48	0	385	1	0	1	0	2	46	26	17	17	8	0	5	15
DIX - Lyngby					59.09	0	22	1	0	0	0	2	5	2	4	2	2	0	0	3
ECIX Berlin					83.67	0	24	1	0	0	0	2	22	5	1	3	1	0	1	0
Equinix Paris					83.38	0	131	1	0	0	0	2	19	10	8	5	6	0	2	7
Equinix Zurich					98.95	0	69	1	0	0	0	2	10	7	4	2	3	0	1	2
FICIX - Helsinki					56.67	0	9	0	0	0	0	0	2	1	2	2	1	0	1	1
FVG-IX					75.00	0	3	0	0	0	0	0	1	1	1	0	0	0	0	0
France-IX Paris					89.80	0	113	1	0	0	0	2	17	8	12	7	6	0	2	5

IXP Database

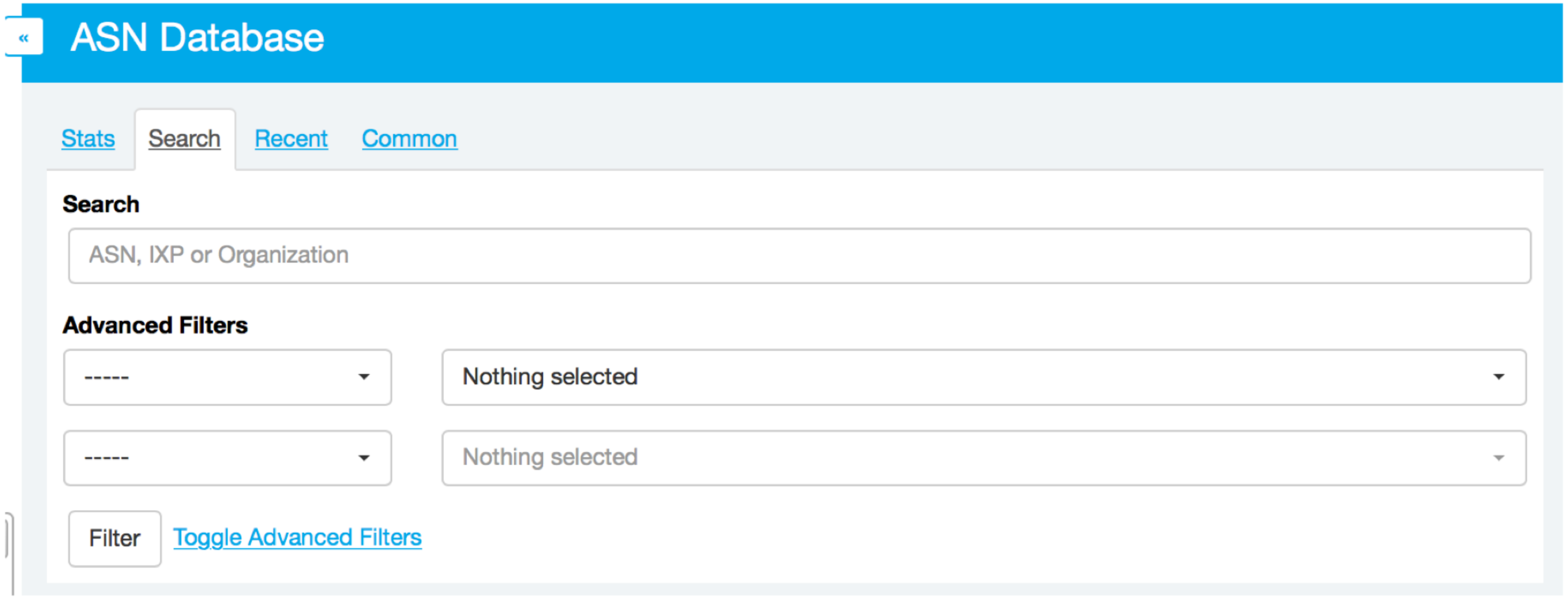


IXP Service Matrix

CSV Download

IXP	Location	ASN	RS ASN	# of customers	# IPv6 ready	% IPv6 ready	# of Sites
AMS-IX Bay Area	San Francisco			23	17	73.91	0
AMS-IX Caribbean	Willemstad, Curacao	28017		14	6	42.86	1
AMS-IX Chicago	Chicago			21	17	80.95	0
AMS-IX Hong Kong	Hong Kong	58516		32	25	78.12	1
AMS-IX India	Mumbai					0.0	0
AMS-IX New York	New York	62981		18	17	94.44	4
ARMIX	Yerevan	51225		10	8	80.00	1
Angonix	Luanda	327788		2	2	100.00	0
Aracaju (SE)	Aracaju					0.0	0
BBIX - Hong Kong	Hong Kong					0.0	0
BBIX - Tokyo	Tokyo	23640		8	1	12.50	7
BCIX	Berlin	16374		83	72	86.75	6
BIX Bergen	Bergen	0		4	2	50.00	0
BIX.BG	Sofia	15669		77	36	46.75	8
BNIX	Brussels	5406		45	14	31.11	3
Belo Horizonte (MG)	Belo Horizonte			29	13	44.83	0
Belm (BEL)	Belém			15	6	40.00	1
BiX	Budapest	5507		49	37	75.51	3
Braslia (DF)	Brasilia			32	21	65.62	0
CATNIX	Barcelona	49638		35	22	62.86	3
CHN-IX	Beijing					0.0	0
CIX	Zagreb	51702		32	11	34.38	2
CIXP	Geneva	57859		36	7	19.44	3

IXP Database



ASN Database

«
Stats
Search
Recent
Common

Search

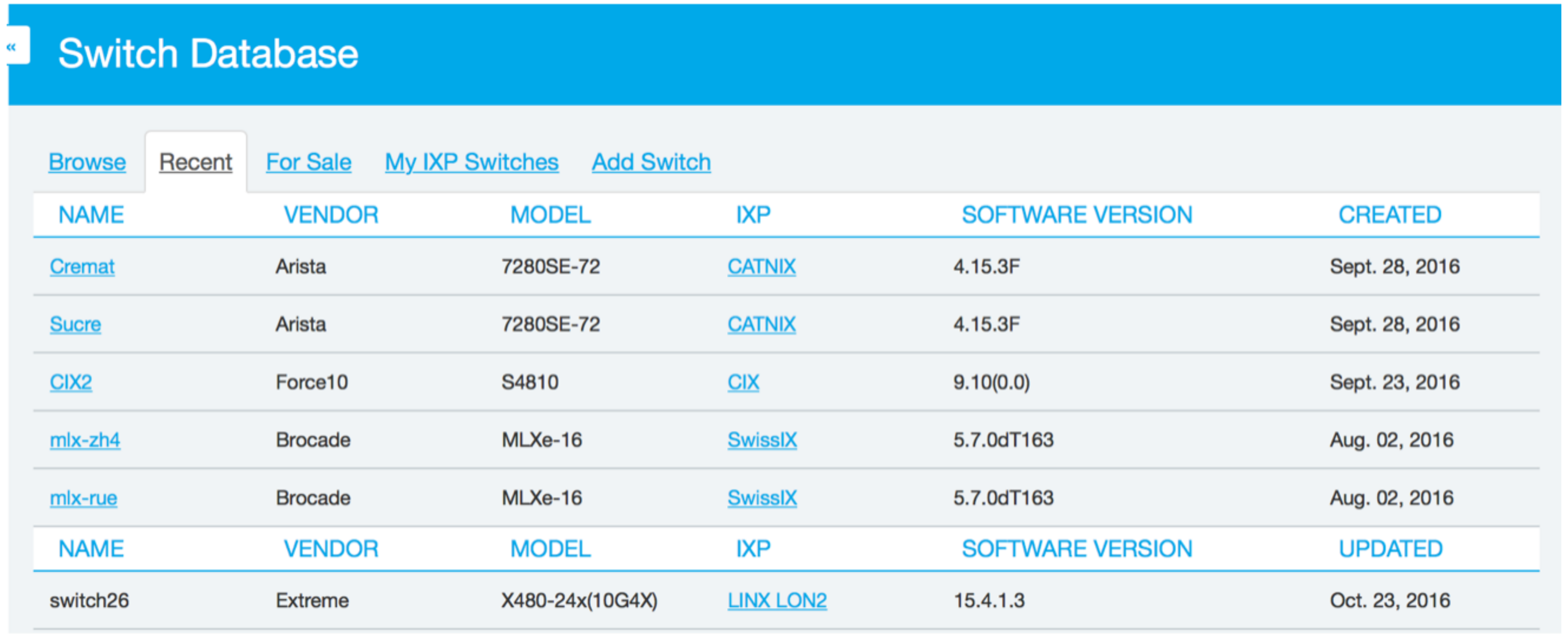
ASN, IXP or Organization

Advanced Filters

Nothing selected

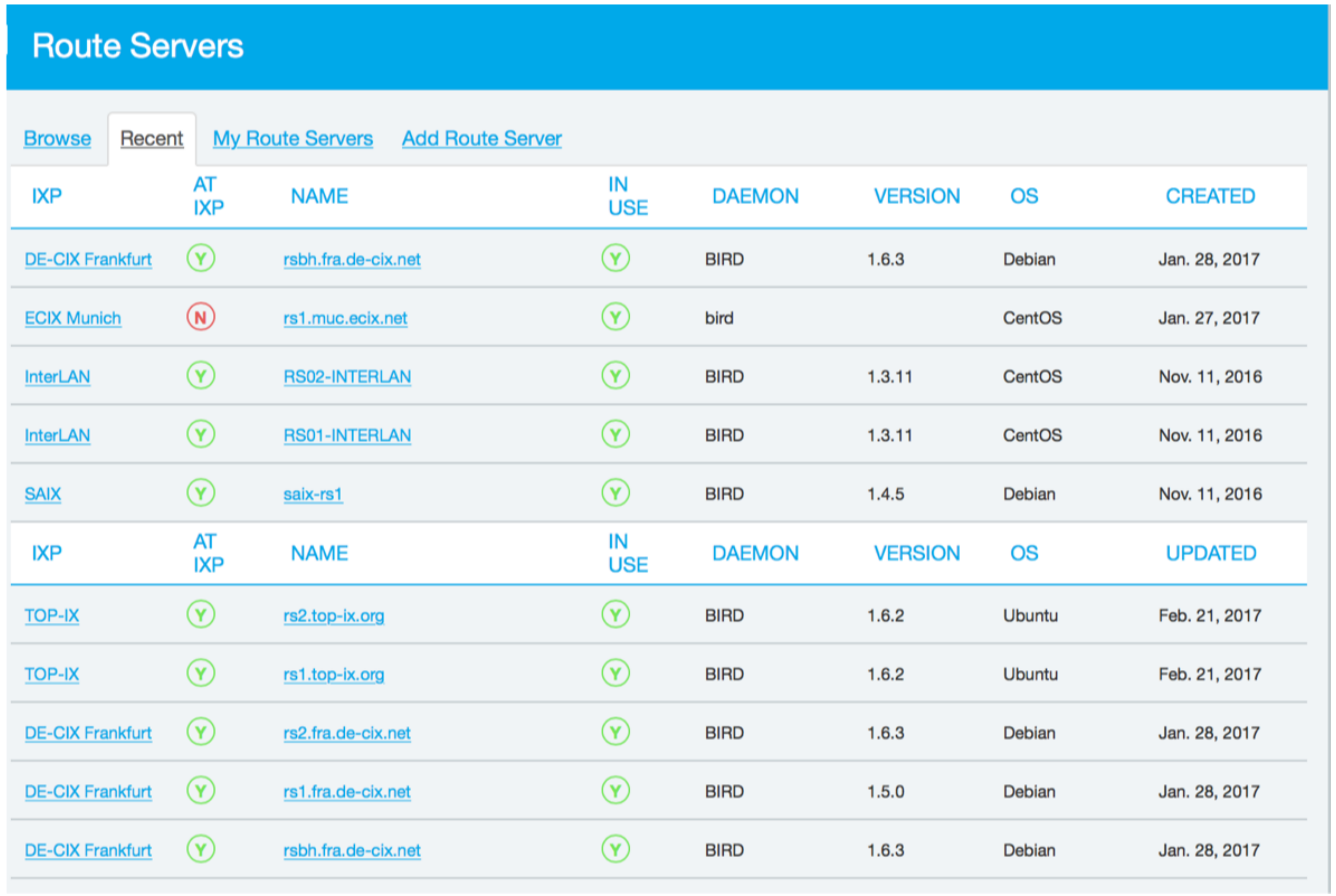
Nothing selected
Filter
Toggle Advanced Filters

IXP Database


Switch Database
Browse
Recent
For Sale
My IXP Switches
Add Switch

NAME	VENDOR	MODEL	IXP	SOFTWARE VERSION	CREATED
Cremat	Arista	7280SE-72	CATNIX	4.15.3F	Sept. 28, 2016
Sucre	Arista	7280SE-72	CATNIX	4.15.3F	Sept. 28, 2016
CIX2	Force10	S4810	CIX	9.10(0.0)	Sept. 23, 2016
mlx-zh4	Brocade	MLXe-16	SwissIX	5.7.0dT163	Aug. 02, 2016
mlx-rue	Brocade	MLXe-16	SwissIX	5.7.0dT163	Aug. 02, 2016

NAME	VENDOR	MODEL	IXP	SOFTWARE VERSION	UPDATED
switch26	Extreme	X480-24x(10G4X)	LINX LON2	15.4.1.3	Oct. 23, 2016


Route Servers
Browse
Recent
My Route Servers
Add Route Server

IXP	AT IXP	NAME	IN USE	DAEMON	VERSION	OS	CREATED
DE-CIX Frankfurt	Y	rsbh.fra.de-cix.net	Y	BIRD	1.6.3	Debian	Jan. 28, 2017
ECIX Munich	N	rs1.muc.ecix.net	Y	bird		CentOS	Jan. 27, 2017
InterLAN	Y	RS02-INTERLAN	Y	BIRD	1.3.11	CentOS	Nov. 11, 2016
InterLAN	Y	RS01-INTERLAN	Y	BIRD	1.3.11	CentOS	Nov. 11, 2016
SAIX	Y	saix-rs1	Y	BIRD	1.4.5	Debian	Nov. 11, 2016

IXP	AT IXP	NAME	IN USE	DAEMON	VERSION	OS	UPDATED
TOP-IX	Y	rs2.top-ix.org	Y	BIRD	1.6.2	Ubuntu	Feb. 21, 2017
TOP-IX	Y	rs1.top-ix.org	Y	BIRD	1.6.2	Ubuntu	Feb. 21, 2017
DE-CIX Frankfurt	Y	rs2.fra.de-cix.net	Y	BIRD	1.6.3	Debian	Jan. 28, 2017
DE-CIX Frankfurt	Y	rs1.fra.de-cix.net	Y	BIRD	1.5.0	Debian	Jan. 28, 2017
DE-CIX Frankfurt	Y	rsbh.fra.de-cix.net	Y	BIRD	1.6.3	Debian	Jan. 28, 2017

IXP Database – where are we?

- 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

IXP Database – use case

Thanks to Andy Davidson for the example

“who am I not peering with at LONAP?”

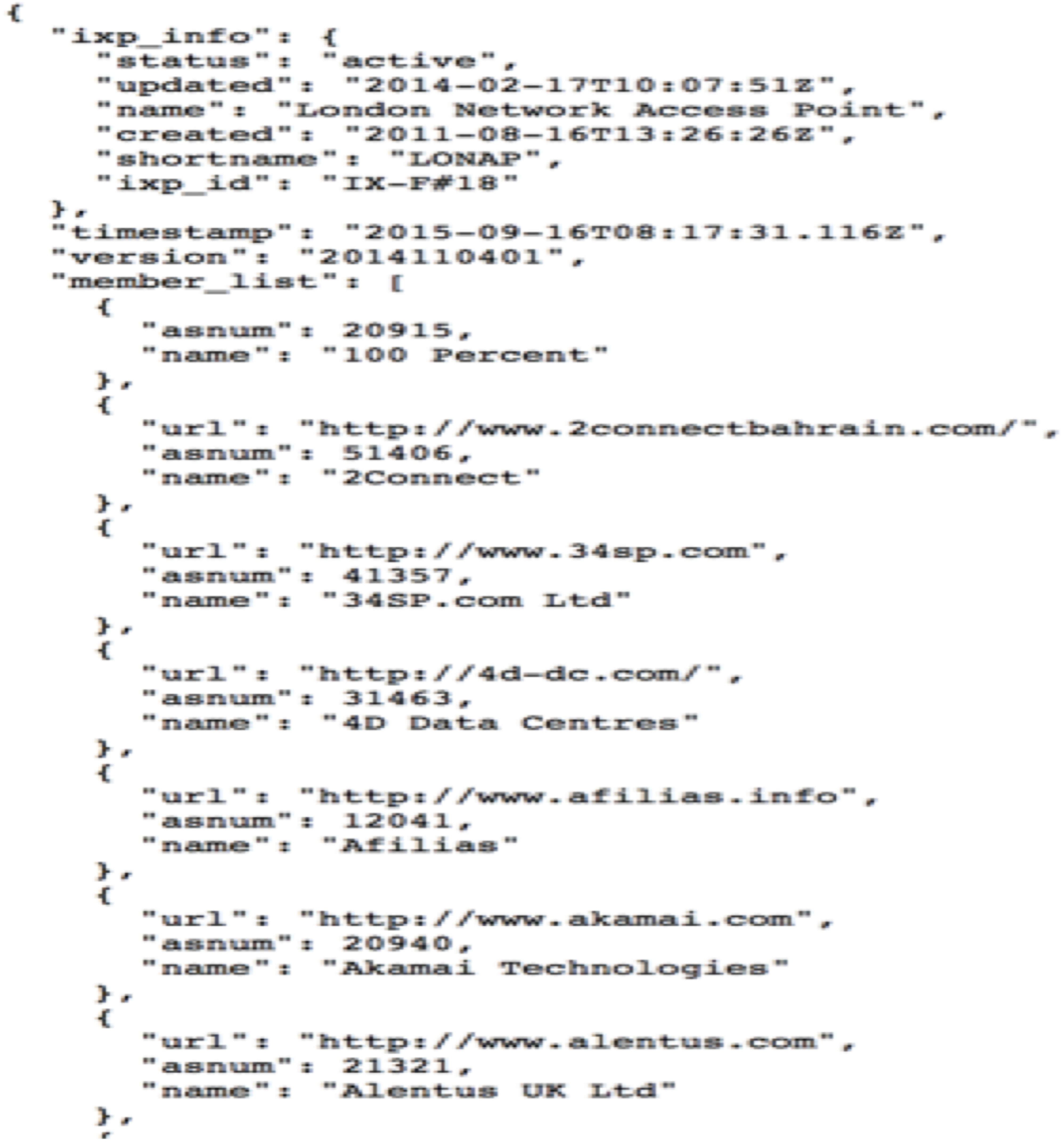
- You have a script which load direct adjacencies into an array
- You need a complete and canonical list of peers to compare differences

IXP Database – use case

Using the IXP API

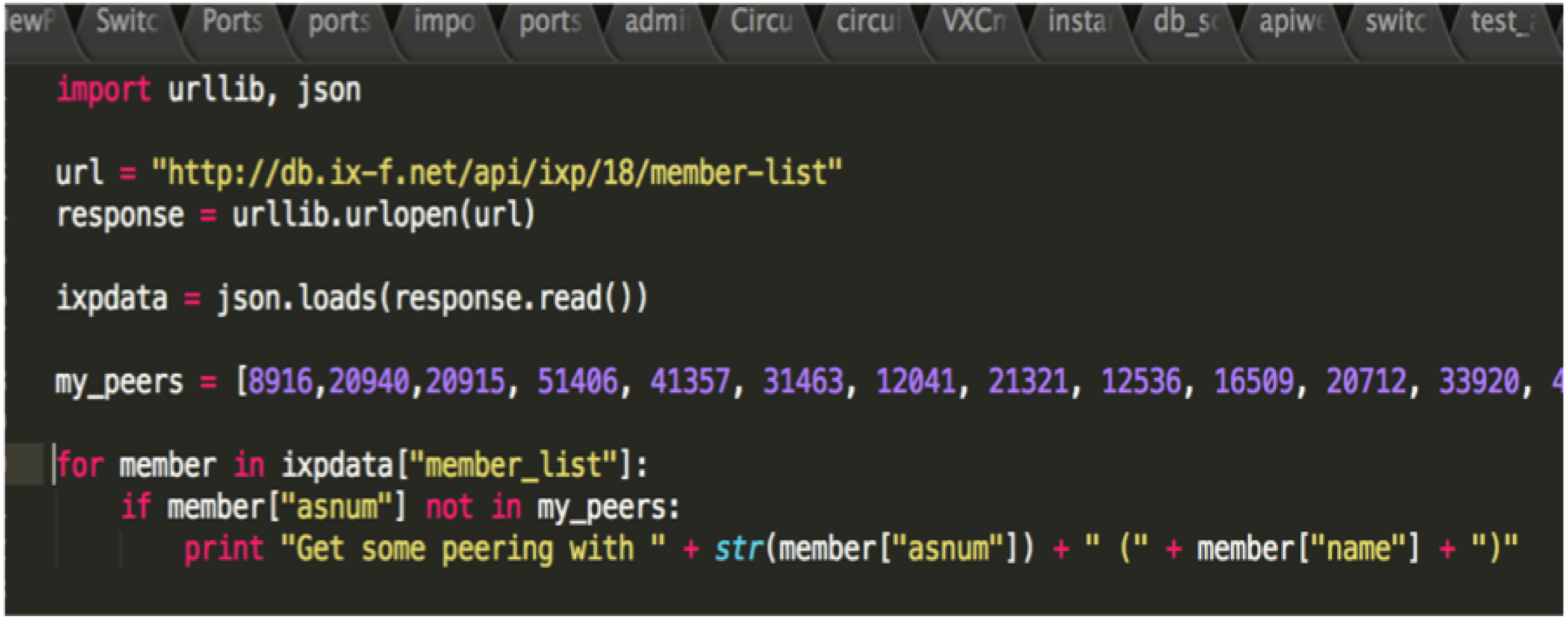
https://db.ix-f.net/api/ixp

IXP Database – use case



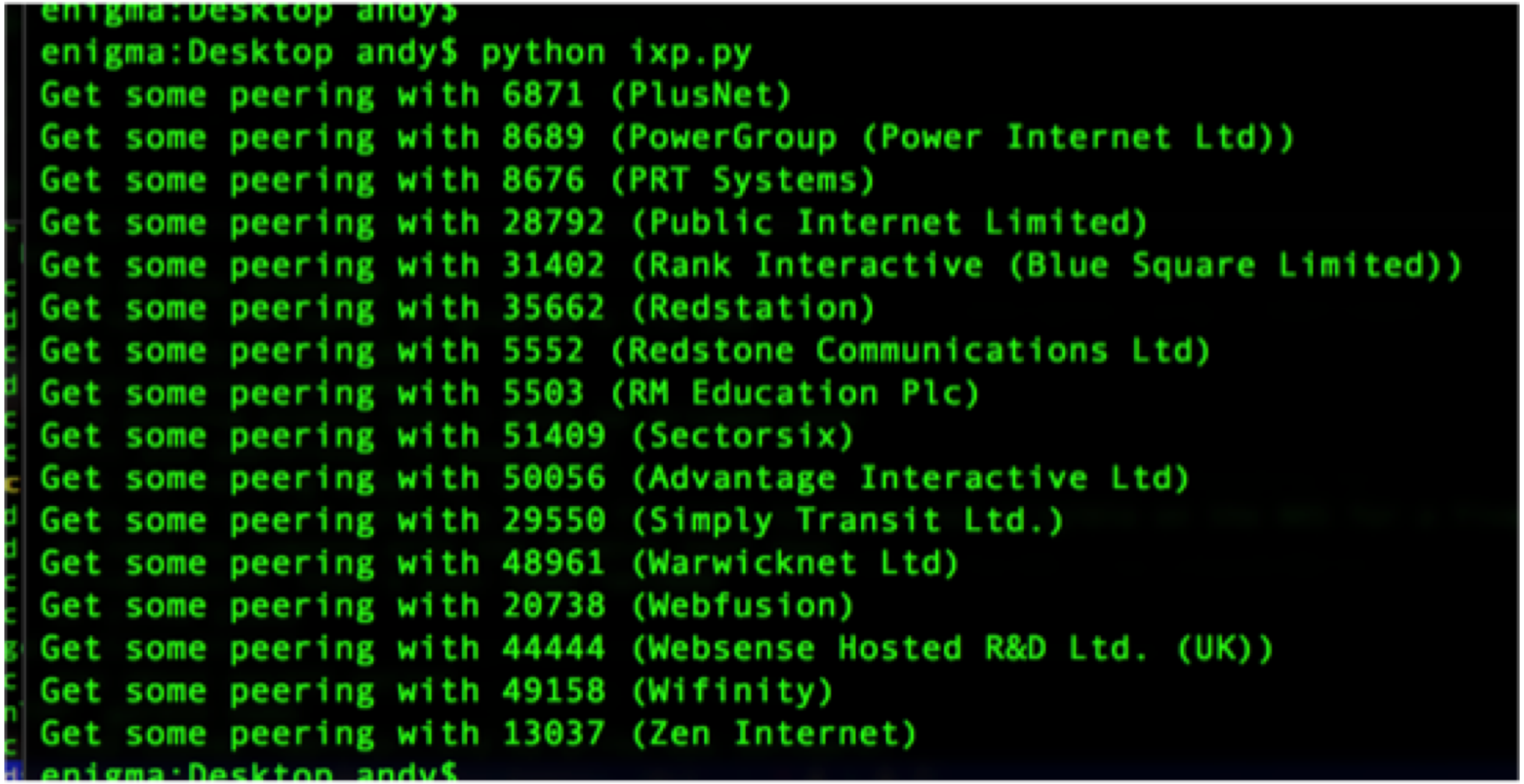
```
{
  "ixp_info": {
    "status": "active",
    "updated": "2014-02-17T10:07:51Z",
    "name": "London Network Access Point",
    "created": "2011-08-16T13:26:26Z",
    "shortname": "LONAP",
    "ixp_id": "IX-F#18"
  },
  "timestamp": "2015-09-16T08:17:31.116Z",
  "version": "2014110401",
  "member_list": [
    {
      "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": "Alentus UK Ltd"
    },
```

IXP Database – use case


ewP
Switc
Ports
ports
impo
ports
admi
Circu
circu
VXCn
insta
db_s
apiw
switc
test_

```
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$
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$
```

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

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

(API includes data from euro-ix portal entered manually or via .csv)

- Open source implementation in IXP Manager
- Source available on GitHub;

https://github.com/euro-ix/json-schemas

IXP Database – use case

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

In search of accurate information

- Peering networks can go to two sources of data to guarantee accuracy
- Tools and portal available on the Euro-IX website, future development for APIX, LAC-IX and AF-IX
- IXPAs have regional reach to local IXPs
- The data is complementary to database services that the RIR/NIRs & PeeringDB provide

Questions?

Thank You!

Rebecca Class-Peter
rebecca at euro-ix dot net
Twitter: @euroix