Euro-IX Update

DATE 2016

NAME
EMAIL at ORG.net
Twitter: @euroix

What do we do?

- 2 forums per year
- Maintaining the website, database and tools
- Mailing Lists
- Newsletter – Subscribe here: euro-ix.net/news-and-events/newsletter/
- Working Groups
- Working with IEEE Ethernet Study Group
- Annual European IXP Report
- Mentor-IX Program
- Benchmarking

Why do we do it? Good of the community!

Association of IXPs

80 affiliated IXP Operators:

- 55 in the Euro-IX Region
- 25 from the rest of the world
- From 49 Countries, operating over 100 Peering LANs
- Newest Members:
  Dataline-IX(Russia), Cas-IX (Morocco)

Association of IXPs

15 Patrons

- ADVA Optical Networking
- Brocade
- BTI Systems
- Coriant
- ECI Telecom
- Equinix Telecity
- Extreme Networks
- FlexOptix
- Huawei
- Interxion
- Juniper Networks
- MRV
- Nokia
- NTT AT
- Telehouse

CEE Region – 8 IXPs

euro-IX

IX-F Database

Historical Problem

PeeringDB - Database for networks and data centres

IX-F Database

IX-F DB API server written using Python / Django,
which can:

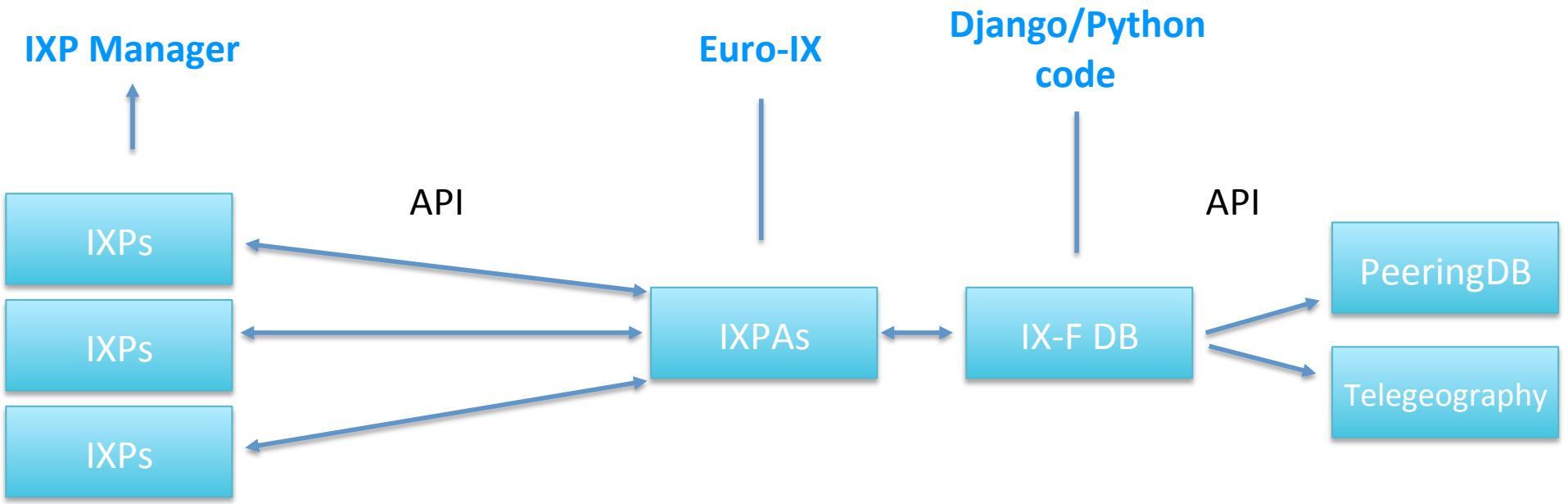
- get / create / update / delete IXP, organisation, IP addressing and network information
- all interaction is JSON
- all non-sensitive information will be publicly available
- Members of IXPAs will be able to create, update and delete IXPs from the databases.
- http://db.ix-f.net/api/ixp

IX-F Database

- We have a proof of concept client to interact with this database in Python including unit test code at: **https://github.com/euro-ix/ixf-client-py**

- The PHP version of this with unit tests also available at: **https://github.com/euro-ix/ixf-client-php**

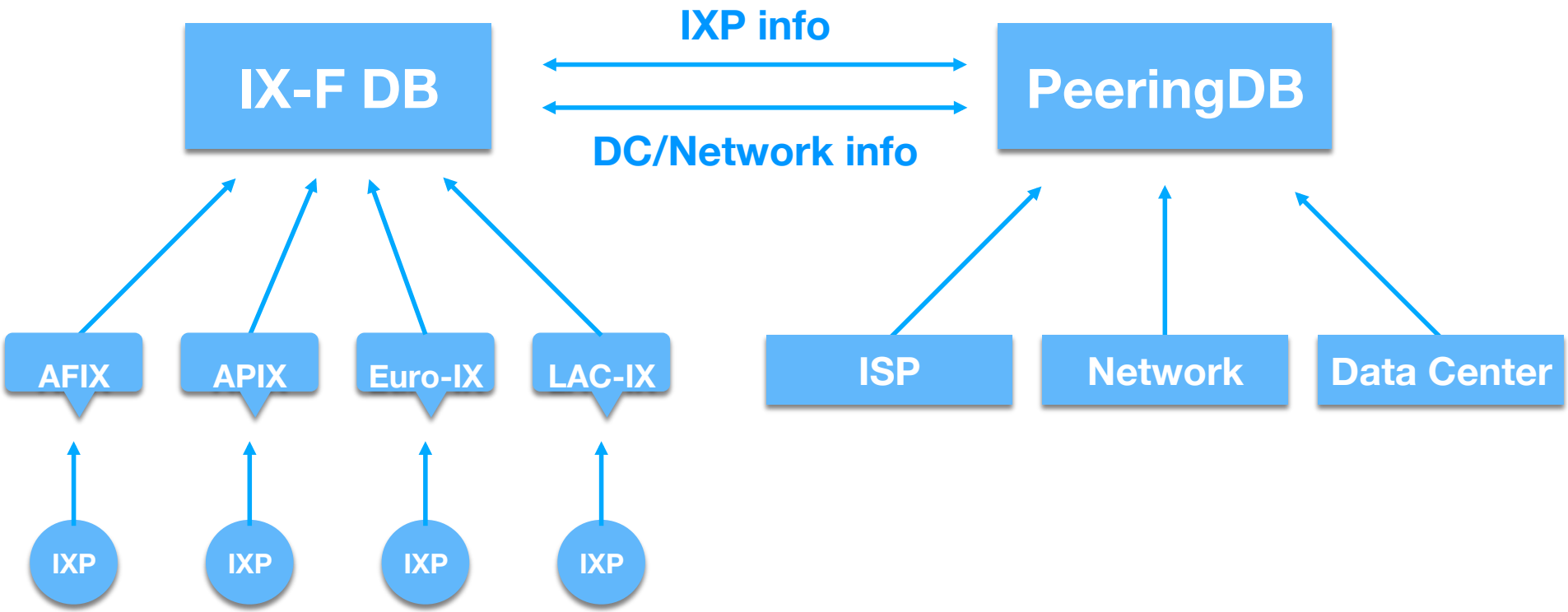
Where we are…


IXP Manager
Euro-IX
Django/Python code
API
API
IXPs
IXPs
IXPs
IXPAs
IX-F DB
PeeringDB
Telegeography

IX-F Database

Where are we..

- Designed for IXPs to export (push) data with minimal intervention
- Simple modifications can be used for IXP to IXPA or to PeeringDB
- At present Euro-IX is the only IXPA interface ready to talk with PeeringDB - we encourage **ALL** IXPs to use the Euro-IX website while others are being worked on.
- APIX started work, LAC-IX and AFIX to come..


IX-F DB
IXP info
DC/Network info
PeeringDB
AFIX
APIX
Euro-IX
LAC-IX
ISP
Network
Data Center
IXP
IXP
IXP
IXP

Euro-IX projects

Projects

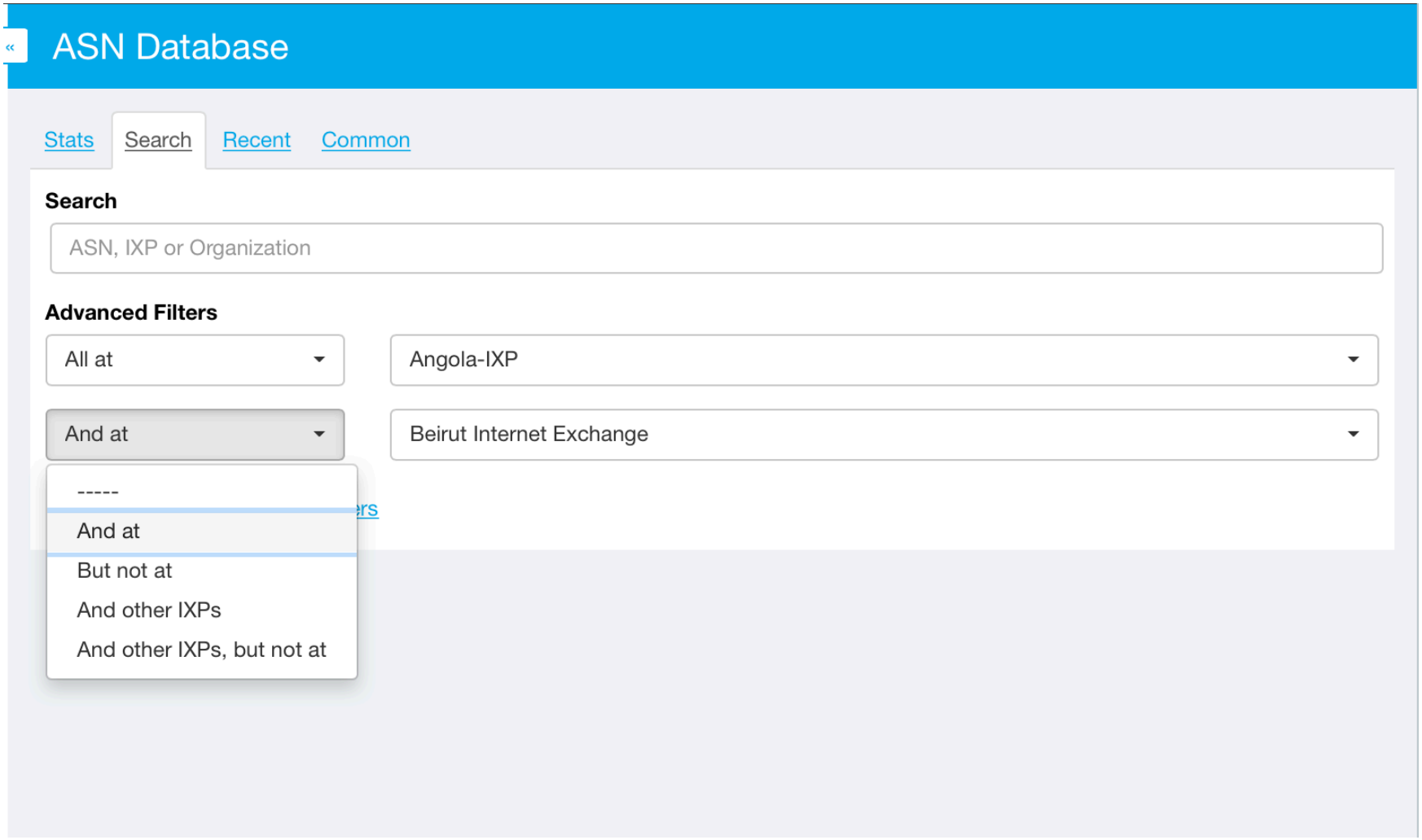
- IXP BCOPs updated - https://www.euro-ix.net/euro-ix-bcp
- IXP Bogon list Project with Team Cymru - http://www.team-cymru.org/ixp
- Work done by the Data TF is being implemented, thanks to Elisa and Nick - https://www.euro-ix.net/euro-ix-bcp we now have an IXP Member list JSON Scheme

Euro-IX Tools

Euro-IX Tools

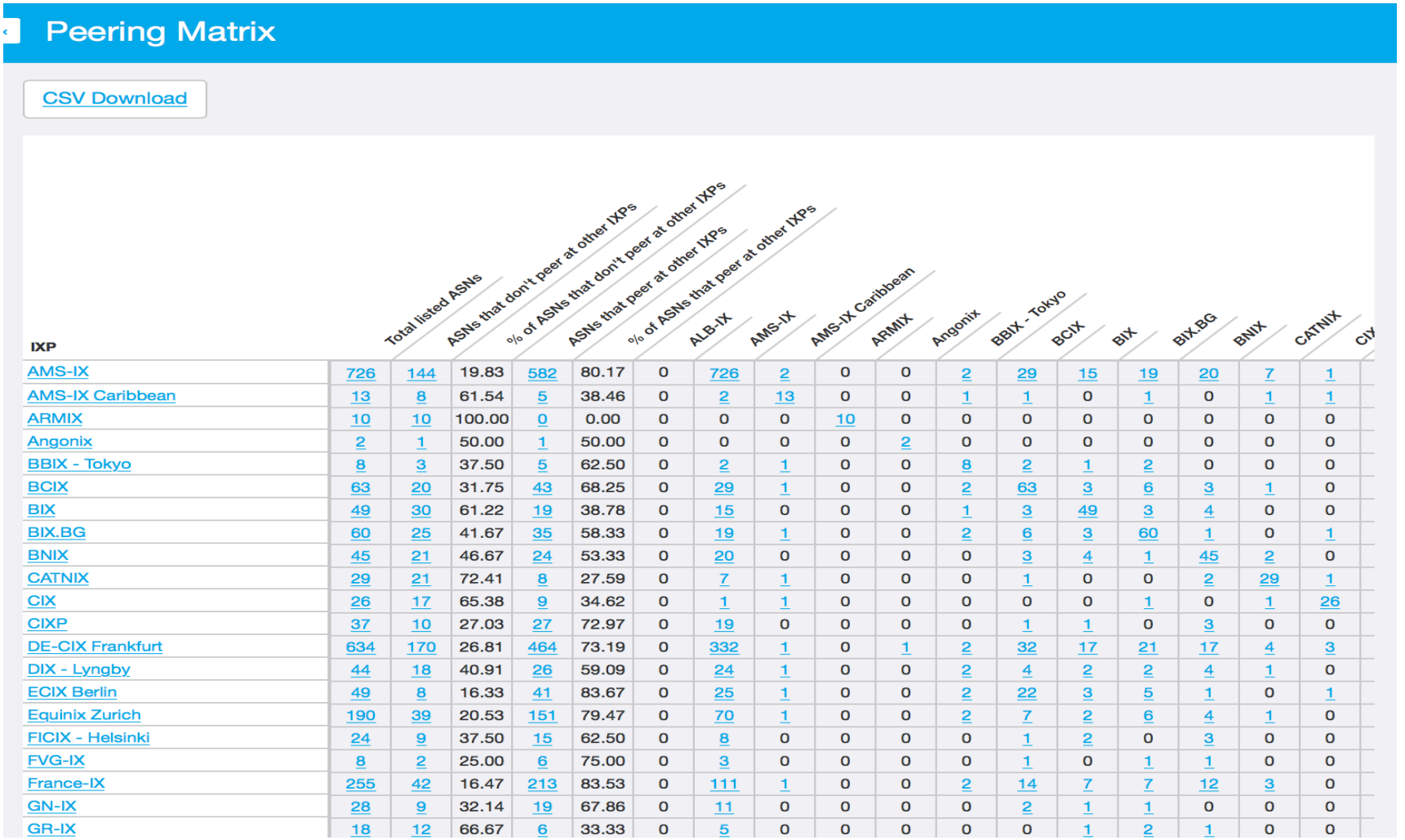
- IXP Service Matrix - **https://www.euro-ix.net/tools/ixp-service-matrix/**
- Peering Matrix - **https://www.euro-ix.net/tools/peering-matrix/**
- ASN Search - **https://www.euro-ix.net/tools/asn-database/?tool=search**
- Newest ASN entries - **https://www.euro-ix.net/tools/asn-database/?tool=recent**
- Most common ASNs - **https://www.euro-ix.net/tools/asn-database/?tool=common**

ASN Filter


ASN Database
Stats
Search
Recent
Common
Search
ASN, IXP or Organization
Advanced Filters
All at
Angola-IXP
And at
Beirut Internet Exchange

And at
But not at
And other IXPs
And other IXPs, but not at

Peering Matrix



Peering Matrix

CSV Download

IXP	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 - Tokyo	BCIX	BIX	BIX.BG	BNIX	CATNIX	CIX
AMS-IX	726	144	19.83	582	80.17	0	726	2	0	0	2	29	15	19	20	7	1	
AMS-IX Caribbean	13	8	61.54	5	38.46	0	2	13	0	0	1	1	0	1	0	1	1	
ARMIX	10	10	100.00	0	0.00	0	0	0	10	0	0	0	0	0	0	0	0	
Angonix	2	1	50.00	1	50.00	0	0	0	0	2	0	0	0	0	0	0	0	
BBIX - Tokyo	8	3	37.50	5	62.50	0	2	1	0	0	8	2	1	2	0	0	0	
BCIX	63	20	31.75	43	68.25	0	29	1	0	0	2	63	3	6	3	1	0	
BIX	49	30	61.22	19	38.78	0	15	0	0	0	1	3	49	3	4	0	0	
BIX.BG	60	25	41.67	35	58.33	0	19	1	0	0	2	6	3	60	1	0	1	
BNIX	45	21	46.67	24	53.33	0	20	0	0	0	0	3	4	1	45	2	0	
CATNIX	29	21	72.41	8	27.59	0	7	1	0	0	0	1	0	0	2	29	1	
CIX	26	17	65.38	9	34.62	0	1	1	0	0	0	0	0	1	0	1	26	
CIXP	37	10	27.03	27	72.97	0	19	0	0	0	0	1	1	0	3	0	0	
DE-CIX Frankfurt	634	170	26.81	464	73.19	0	332	1	0	1	2	32	17	21	17	4	3	
DIX - Lyngby	44	18	40.91	26	59.09	0	24	1	0	0	2	4	2	2	4	1	0	
ECIX Berlin	49	8	16.33	41	83.67	0	25	1	0	0	2	22	3	5	1	0	1	
Equinix Zurich	190	39	20.53	151	79.47	0	70	1	0	0	2	7	2	6	4	1	0	
FICIX - Helsinki	24	9	37.50	15	62.50	0	8	0	0	0	0	1	2	0	3	0	0	
FVG-IX	8	2	25.00	6	75.00	0	3	0	0	0	0	1	0	1	1	0	0	
France-IX	255	42	16.47	213	83.53	0	111	1	0	0	2	14	7	7	12	3	0	
GN-IX	28	9	32.14	19	67.86	0	11	0	0	0	0	2	1	1	0	0	0	
GR-IX	18	12	66.67	6	33.33	0	5	0	0	0	0	0	1	2	1	0	0	

IXP Service Matrix

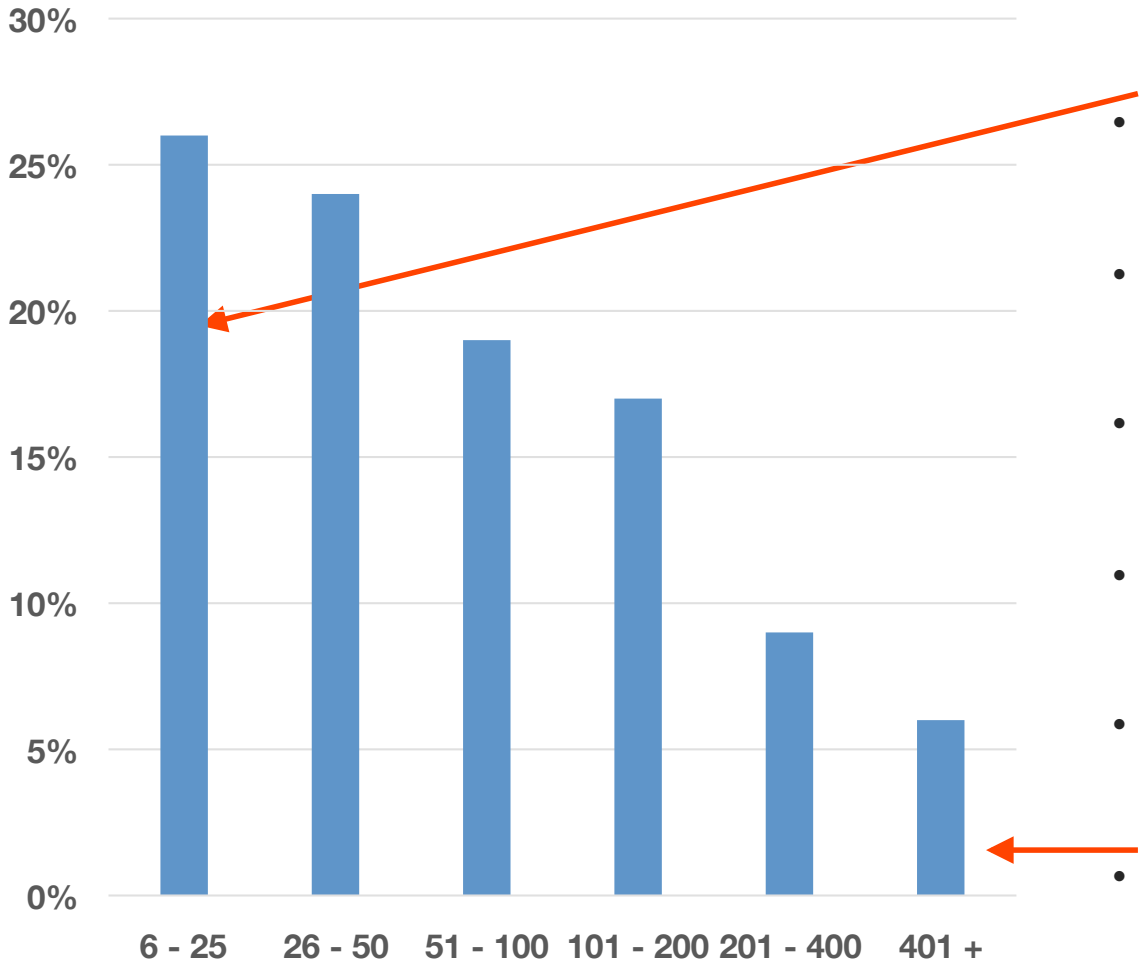
IXP Service Matrix

CSV Download

IXP	Location	ASN	RS ASN	# of customers	# IPv6 ready	% IPv6 ready	# of Sites	La tra
ALB-IX	Tirana					0.0		0
AMS-IX	Amsterdam	1200	6777	726	572	78.79	12	0
AMS-IX Caribbean	Willemstad, Curacao	28017		13	4	30.77	1	0
ARMIX	Yerevan	51225		10	8	80.00	1	0
Angonix	Luanda	327788		2	2	100.00		0
BBIX - Tokyo	Tokyo	23640		8	1	12.50	7	0
BCIX	Berlin	16374		63	49	77.78	6	0
BIX	Budapest	5507		49	37	75.51	3	0
BIX.BG	Sofia	15669		60	20	33.33	8	0
BNIX	Brussels	5406		45	14	31.11	3	0
CATNIX	Barcelona	49638		29	14	48.28	2	0
CIX	Zagreb	51702		26	9	34.62	1	0
CIXP	Geneva	57859		37	7	18.92	3	0
CyrusOne	Carrollton					0.0		0
DE-CIX Frankfurt	Frankfurt am Main	6695	6695	634	634	100.00	18	0
DIX - Lyngby	Lyngby	198391		44	32	72.73	3	0
ECIX Berlin	Berlin	9033		49	49	100.00	12	0
Equinix Zurich	Zurich	24115		190	183	96.32	4	0
FICIX - Helsinki	Helsinki	0		24	24	100.00	1	0
FVG-IX	Udine	51909		8	1	12.50	1	0
France-IX	Paris	57734		255	249	97.65	8	0
GN-IX	Groningen	24957		28	0	0.00	8	0
GR-IX	Athens	199399		18	13	72.22	2	0
GigaPix	Lisbon	12833		23	17	73.91	2	0

Euro-IX Database

Range of ASNs connected to Members



- 6 - 25 ASNs
  KINIX (Congo), FICIX (Finland)
- 26 - 50 ASNs
  SOX (Serbia), UAE-IX (UAE)
- 51 - 100 ASNs
  NaMeX (Italy), JPNAP (Japan)
- 101 - 200 ASNs
  UA-IX (Ukraine), LONAP (UK)
- 201 - 400 ASNs
  PLIX (Poland), MSK-IX (Russia)
- 401 - 704 ASNS
  PTT.br (Brazil), LINX (UK)

IXPs in Euro-IX Region

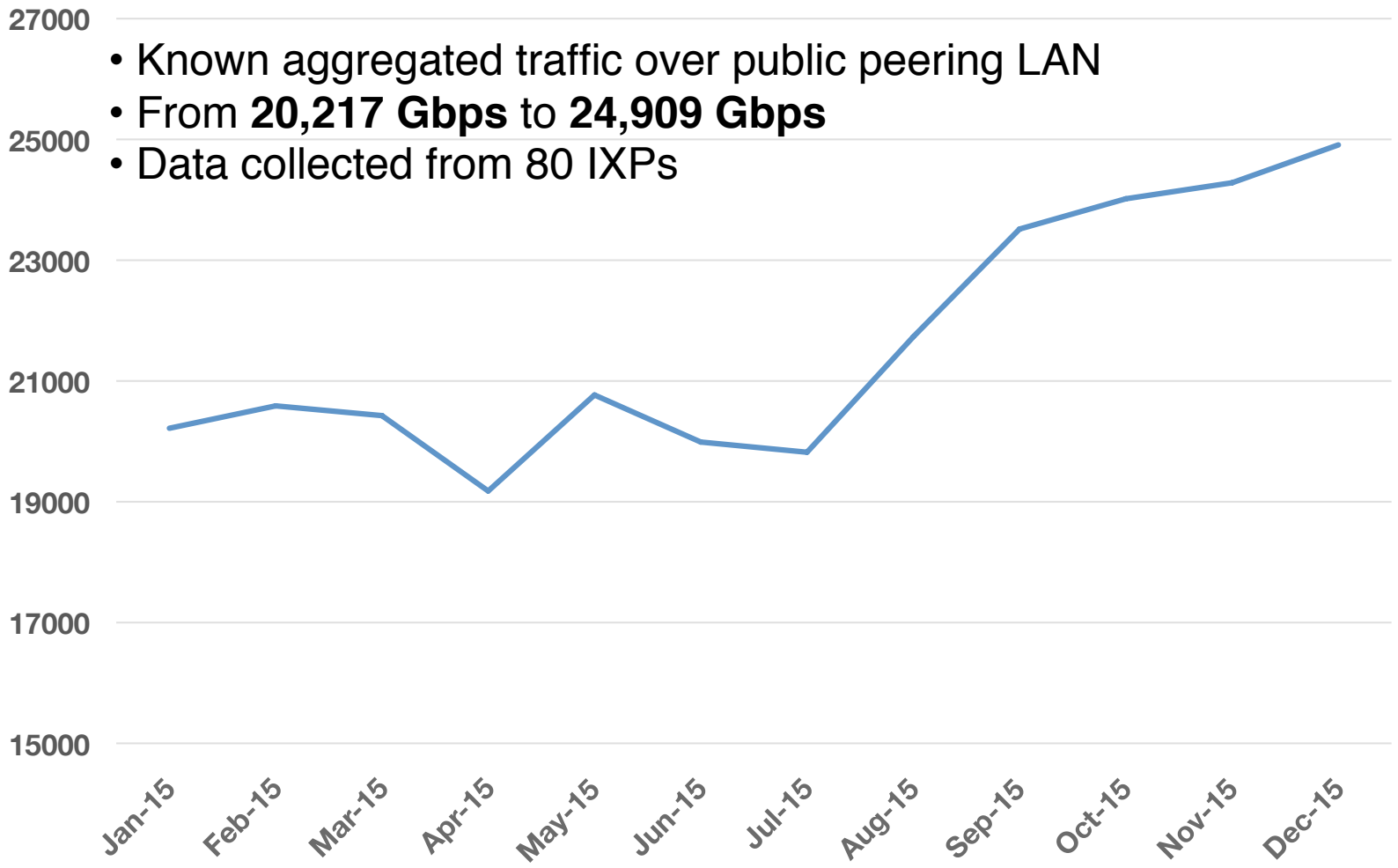
189 known IXPs

48 Countries

142 Cities

euro-ix.net/ixps/ixp-map/

Traffic Growth in Euro-IX Region



Internet Exchange Federation

Other IXPAs

Internet Exchange Federation (IX-F)

- MOU signed by APIX, Euro-IX and LAC-IX to form the IX-F in November 2012 – www.ix-f.net
- Af-IX signed the MoU to join the IX-F
- Idea to have a Global IXP DB
- Global IXP BCPs
- Automate Data Collection from IXPs
- Plans to collaborate with other external Databases

IXPs outside Euro-IX Region

IXPs in APIX Region

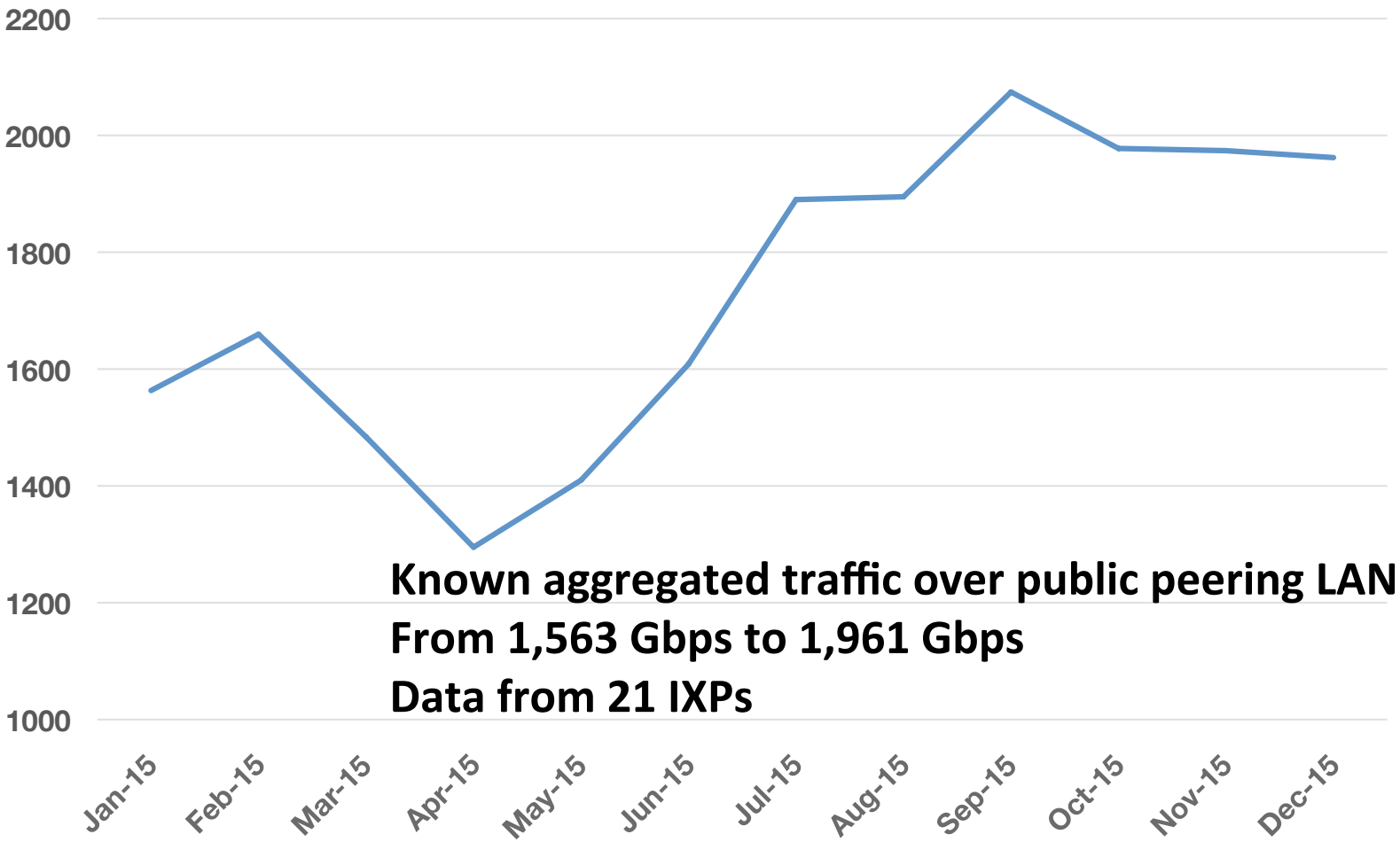
89 known IXPs

19 Countries

49 Cities

euro-ix.net/ixps/ixp-map/

Traffic Growth in APIX Region



IXPs in Af-IX Region

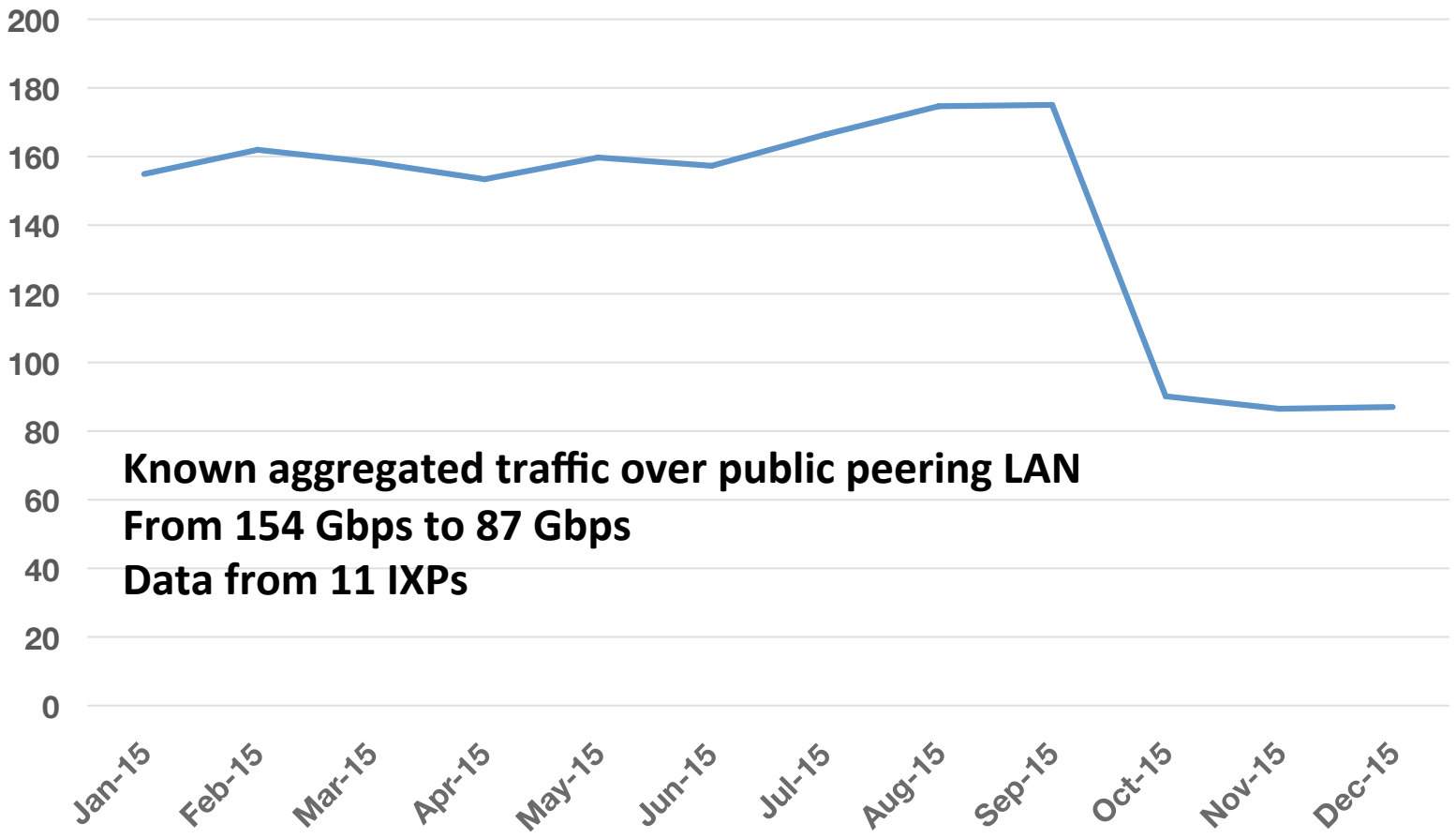
33 known IXPs

25 Countries

31 Cities

euro-ix.net/ixps/ixp-map/

Traffic Growth in AFIX Region



IXPs in LAC-IX Region

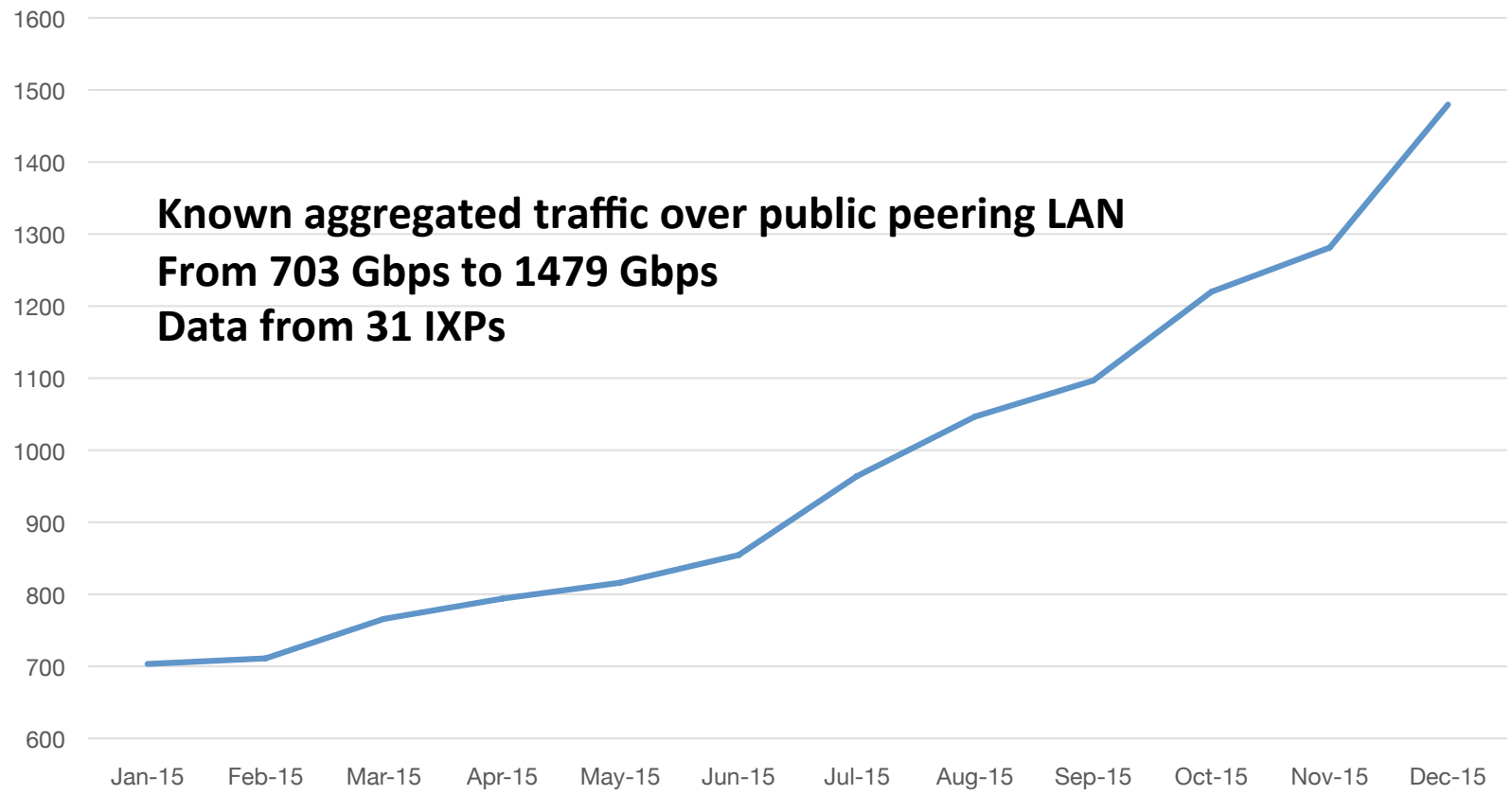
56 known IXPs

16 Countries

49 Cities

euro-ix.net/ixps/ixp-map/

Traffic Growth in LAC-IX Region



The Internet Revealed – IXP Movie

Now available in English, French, Turkish, Spanish, Romanian, Portuguese, Arabic and German more languages to come!

Check out ourYouTube channel:
https://www.youtube.com/channel/UCFyucVRAAMzxyJIsxnGwsjw

Thank you!

NAME
NAME at DOMAIN
Twitter: @euroix

ADDITIONAL SLIDES

Euro-IX IXP JSON Schema

A real life example..

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

IX-F Database

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

Very very easy mate

```
{
  "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"
    },
```

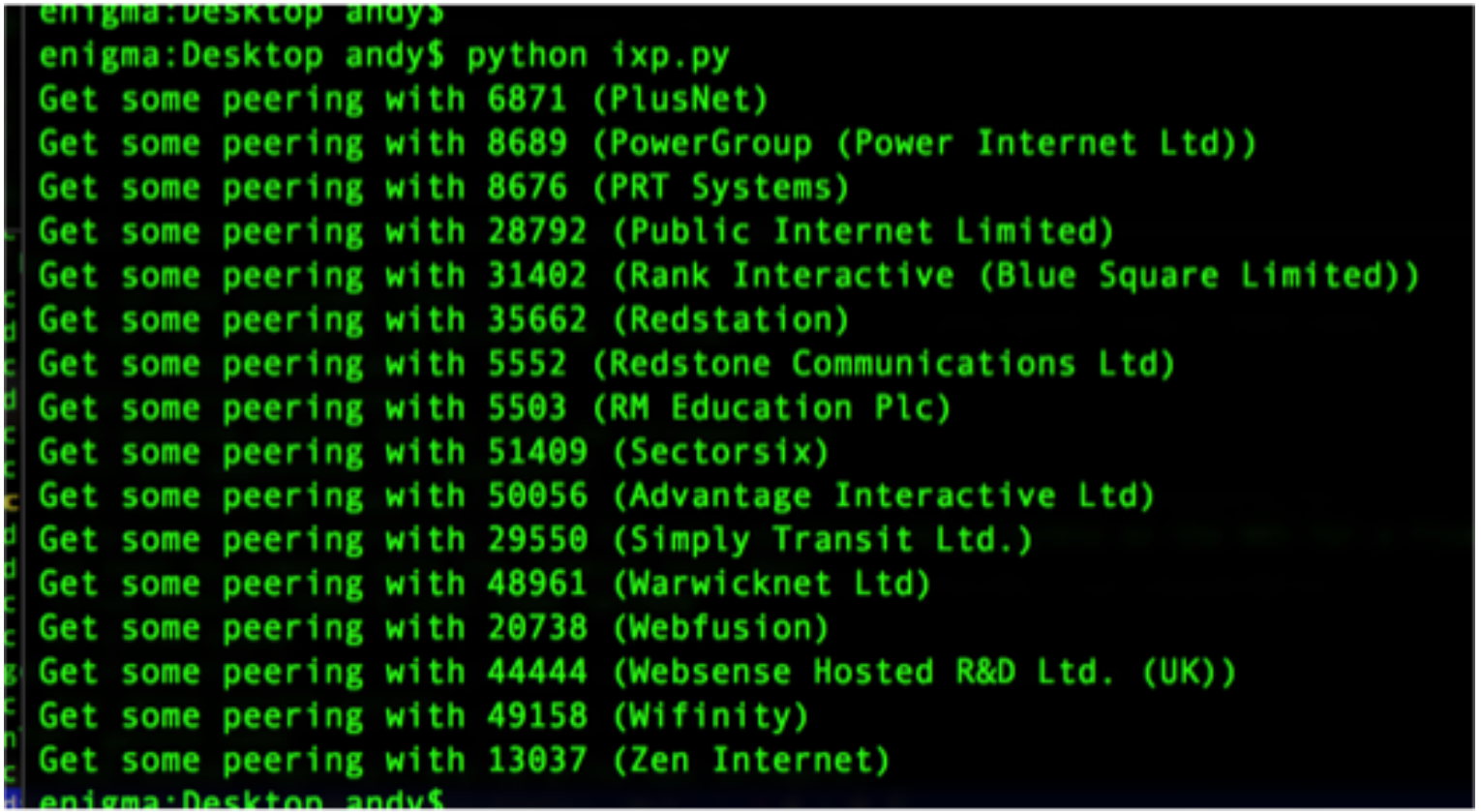
```
import urllib, json

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"] + ")"
```


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$

Why not just use the IXPs own data?

- This gives you a single API for many IXPs
- Get the same format for all IXPs, it's standard - wohoo!
- Data is fed from the IXP - IXPs have accurate data!
- Portable, supportable and scaleable!

Euro-IX IXP JSON Schema

- Contains both IXP data & IXP Participant data
  - ASN (member list), locations, switch, IXP info
- Open, consistent & an atomic design
- Currently 12 IXP independent implementation
- Open source implementation in IXP Manager
- Source available on github: https://github.com/euro-ix/json-schemas

In search of accurate information

- Give network operators the choice of getting accurate information from either IX-F or PeeringDB
- This data can be obtained using APIs
  - PeeringDB & Telegeography
- Increases use of automation
  - saves time, saves money, increases accuracy.