



IX-F Database & JSON Schema Automation

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What is the IX-F?

➤ What is the IX-F?

- Collection of Internet Exchange Point Associations (IXPAs)
 - AFIX
 - APIX
 - Euro-IX
 - LAC-IX

What is IX-F?



➤ What is the IX-F?

- MOU signed by APIX, Euro-IX & LAC-IX to form the IX-F in November 2012 - www.ix-f.net
- AFIX signed the MOU to join in 2014
- Plan to work on Global projects -
 - IGF Best Practices
 - ITU IXP Consultation
 - IX-F Database
 - Other Projects related to IXPs

> What is the IX-F?

- **AFIX**

Nishal Goburdhan – JINX (South Africa)

Kyle Spencer – UIXP (Uganda)

- **APIX**

Gaurab Raj Upadhaya - NPIX (Nepal)

Katsuyasu Toyama - JPNAP (Japan)

- **Euro-IX**

Arnold Nipper - DE-CIX (Germany)

John Souter - LINX (United Kingdom)

- **LAC-IX**

Ariel Graizer - NAP CABase (Argentina)

Milton Kashiwakura - PTT.br (Brazil)

IX-F Database

> IXP Database Project

- There are many IXP Databases...

The screenshot shows a search interface for "Search Public Exchange Points". It includes fields for "Exchange Name/Long Name", "IP Block", "Country", "Continental Region", and "Media Type". Below the search bar is a table titled "List of Public Exchange Points" containing 15 rows of data, each with columns for "Name/Peer", "Exchange Name/Long Name", "Country/Region", "Country/Continental Region", "Media Type", and "Participants".

Name/Peer	Exchange Name/Long Name	Country/Region	Country/Continental Region	Media Type	Participants
APG	Afghanistan Internet Exchange	Kabul	All	Ethernet	0
ACIX	ACIX Internet Exchange	Caracas, MCY	All	Ethernet	12
AFIX		Venezuela	All	Ethernet	0
AMIX	AMIX - Amica International University/CDMX	Mexico City	CA	Point-to-Point	0
ANIX	Amsterdam Internet Exchange	Hans	US	Point-to-Point	0
APIS	Amsterdam Internet Exchange	Amsterdam	NL	Ethernet	1,239
APIS-21	Amsterdam Internet Exchange	Caribbean	CA	Point-to-Point	0
APIS-21-HongKong	Amsterdam Internet Exchange Hong Kong	Hong Kong	HK	Asia Pacific	37
APIS-21-NY	APIS-21 New York	New York	US	Point-to-Point	14
APIS-21-JP	Angola Internet Exchange point	Luanda	All	Ethernet	0
APIS	Auckland Internet Exchange	Auckland	All	Asia Pacific	56
APIX	Amsterdam Internet Exchange	Amsterdam	CA	Ethernet	0
APIXS	Academy Science Internet Exchange-8	Taipei	PA	Point-to-Point	1
APIXS2000	ingle APIXS2000	Taipei, Taiwan, China	PA	Point-to-Point	0
APIX	Arizona Internet Exchange	Phoenix, Arizona	US	Point-to-Point	10
APIX	Bahrain Internet Exchange	Safra	ME	Ethernet	13

The screenshot shows a world map with green dots representing Internet Exchange Points (IXPs). A sidebar on the right provides information about IXPs, including a section on how to safely avoid overpaying for bandwidth and a "TRUSTED SERVER HOSTING SINCE 1994" advertisement.

The screenshot shows a world map with green dots representing Internet Exchange Points. To the right is a table titled "Internet Exchange Points Directory" with columns for "Region", "Country", "City", "Internet Exchange Name", "Participants", "Traffic", "Latency", and "Availability".

Region	Country	City	Internet Exchange Name	Participants	Traffic	Latency	Availability
Africa	Algiers	Algiers	Algiers Internet Exchange	0	0	0	2012-07
Angola	Luanda	Luanda	Angola Internet Exchange	0	0	0	2012-07
Latin America	Argentina (Buenos Aires)	Buenos Aires	SEIP Internet Business Area	0	0	0	2012-07
	Argentina (Buenos Aires)	Buenos Aires	SEIP Internet Business Area	0	7,000	100	Aug 2012-07
	Greece		SEIP Chalkida Corfu	0	0	0	Aug 2012-07

The screenshot shows a world map with green dots representing Internet Exchange Points. To the right is a table titled "Internet Exchange Points" with columns for "Region", "Country", "City", "Internet Exchange Name", "Participants", "Traffic", "Latency", and "Availability".

Region	Country	City	Internet Exchange Name	Participants	Traffic	Latency	Availability
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Latin America	Argentina (Buenos Aires)	Buenos Aires	SEIP Internet Business Area	0	0	0	2012-07
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➤ Existing database issues

- No single trusted data source
- Poor quality & no or very little APIs / automation
- “We’ll only peer with you, if you’re in PeeringDB”
- Databases are updated manually
- We’re moving into a world of automation
- ...IXPs hold accurate information but lack automation

> Historical Problem



PeeringDB - Database for networks and data centres

➤ IX-F Database

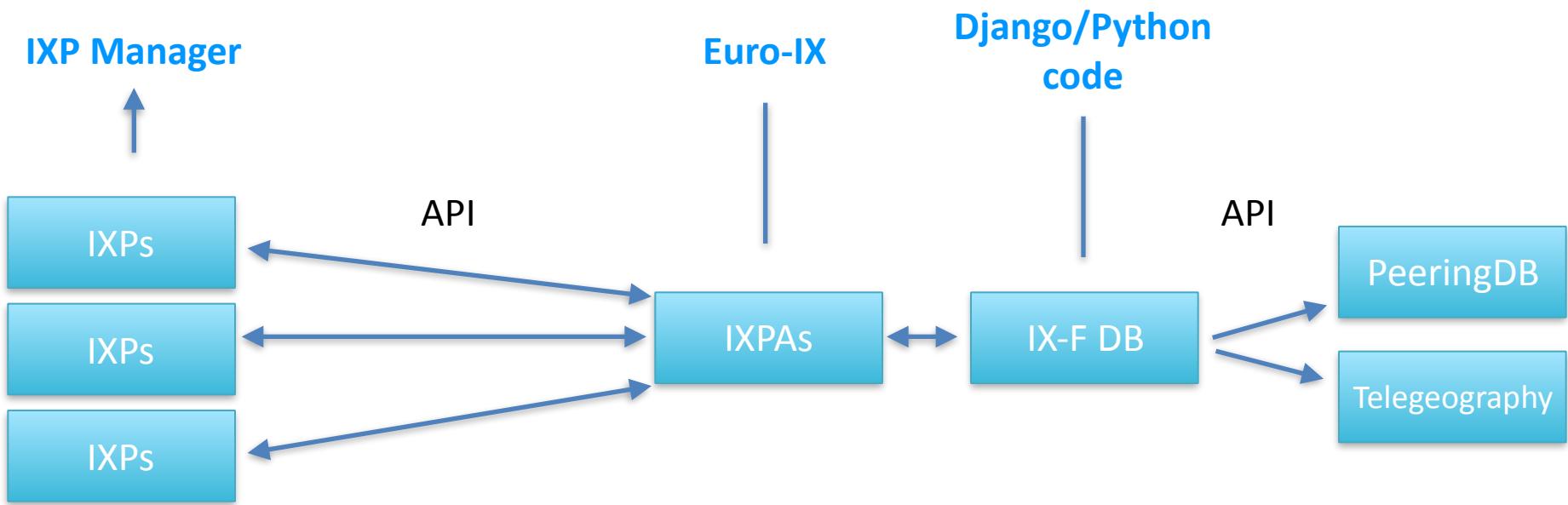
IX-F DB API server written using Python / Django,
which can:

- 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.
- <https://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>

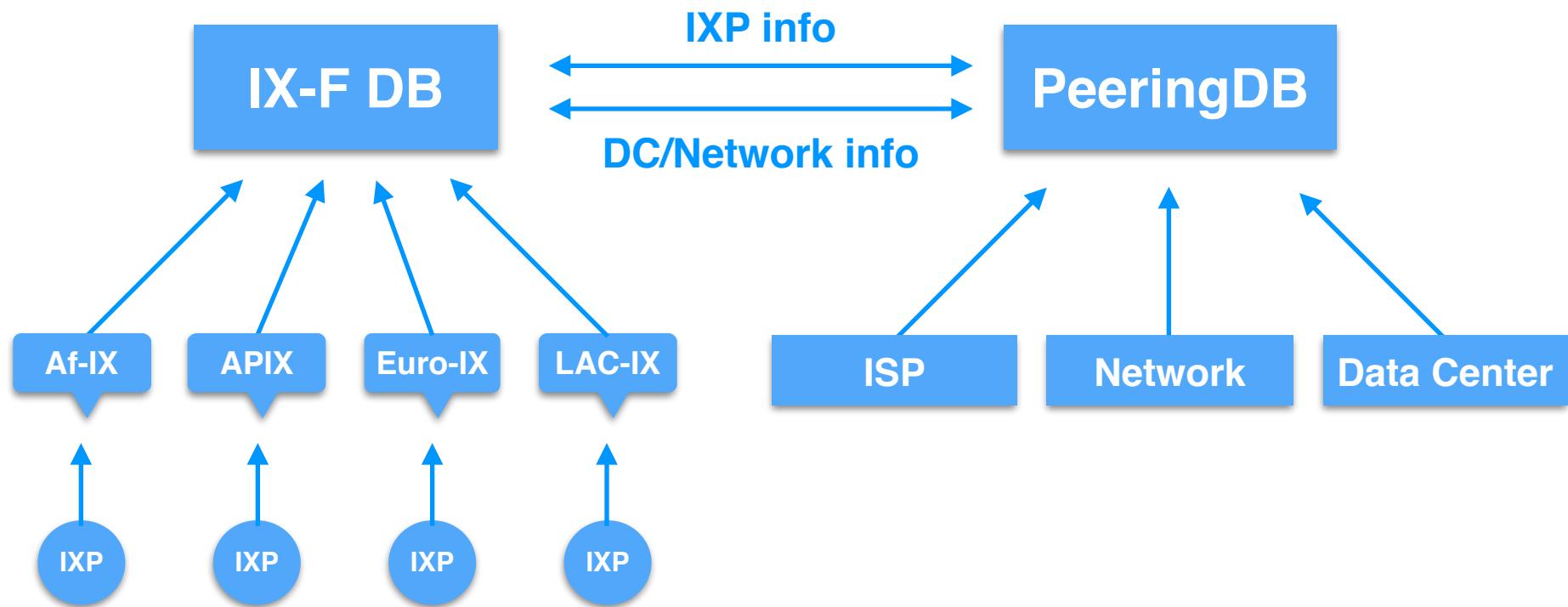
Where we are...



➤ 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..



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.afiliias.info",  
            "asnum": 12041,  
            "name": "Afiliias"  
        },  
        {  
            "url": "http://www.akamai.com",  
            "asnum": 20940,  
            "name": "Akamai Technologies"  
        },  
        {  
            "url": "http://www.alentus.com",  
            "asnum": 21321,  
            "name": "Alentus UK Ltd"  
        },  
        {  
            "url": "http://www.2connectbahrain.com/",  
            "asnum": 51406,  
            "name": "2Connect"  
        }  
    ]  
}
```

```
newP Switc Ports ports impo ports admin Circu circui VXCn instan db_sc apiwe switc test_a

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.

Thank you!

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