



euro-IX

# IXP database and tools

TOP-IX Meeting September 2017

Turin, Italy

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# About Euro-IX

- Formed in May 2001
- To improve, develop and strengthen the IXP community
- Representing neutrally the member IXPs at industry events around the world
- Promote an open interchange of ideas and experiences

# ➤ 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/](http://euro-ix.net/news-and-events/newsletter/)
- Working Groups
- Social Media
  - Twitter @euroix
  - Facebook [fb.me/maineuroix](https://fb.me/maineuroix)
  - YouTube [youtube.com/channel/UCFyucVRAAMzxyJIsxnGwsjw](https://youtube.com/channel/UCFyucVRAAMzxyJIsxnGwsjw)

# ➤ Association of IXPs

## 84 affiliated IXPs:

- 56 IXPs in the Euro-IX Region in 49 Countries, operating over 100 Peering LANs
- 28 IXPs from the rest of the world
- Newest Members:
  - Peering.cz
  - Beirut-IX
  - CASIX

# Patrons

## 13 Patrons

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



# IXP Database

# ➤ IXP Database

## Organization Profile

### Torino Piemonte Exchange Point

General

[Introduction](#)

[Contacts](#)

[IXPs](#)

[Users](#)



**Location:** Italy

**Established:**

**Affiliation:** Member

**Board Contact:**

**Email:**

**Website:** <http://www.top-ix.org>



# IXP Database

## Organization Profile

### Torino Piemonte Exchange Point

[General](#) [Introduction](#) [Contacts](#) [IXPs](#) [Users](#)

NAME

COUNTRY

[Torino Piemonte Exchange Point](#)


Italy

# IXP Database

## IXP Profile

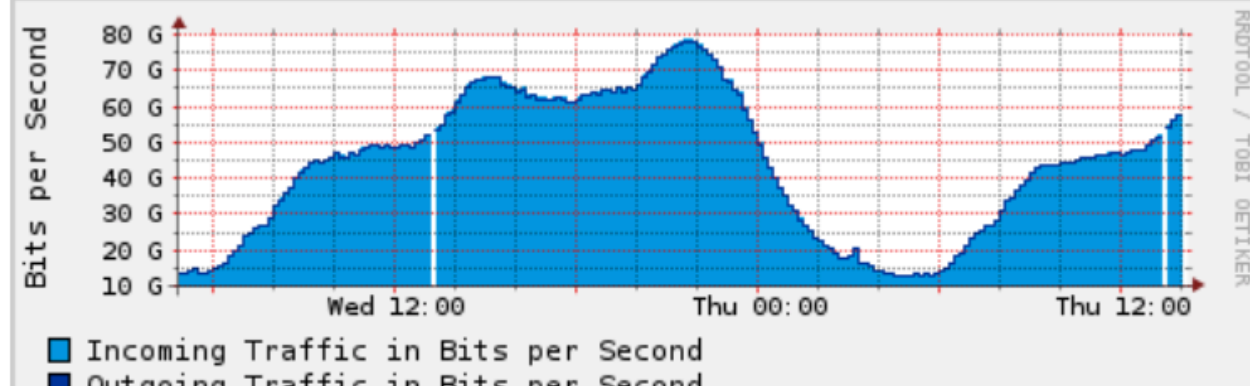
### Torino Piemonte Exchange Point

Profile Network Switches Route Servers Services Pricing Tree ASNs Users



<b>Organization:</b>	<a href="#">Torino Piemonte Exchange Point</a>
<b>Number of members:</b>	79
<b>Number of sites:</b>	15
<b>Joining requirements:</b>	Autonomous System Legal entity
<b>Characteristics:</b>	Not-for-profit Consortium, formed by public entities and main private Internet operators in Italy. Geographically distributed Internet Exchange Point, strongly oriented towards innovative technologies (multicast and Ipv6) to foster development of new generation services.
<b>Non-profit:</b>	Y
<b>Reseller program:</b>	Y
<b>Application Form:</b>	<a href="http://www.top-ix.org/en/internet-exchange/il-servizio/riciesta-attivazione-servizi/">http://www.top-ix.org/en/internet-exchange/il-servizio/riciesta-attivazione-servizi/</a>
<b>Official Voter:</b>	<a href="#">Luca Cicchelli</a>
<b>Contact:</b>	<a href="#">Luca Cicchelli</a>
<b>Technical Contact:</b>	<a href="#">Massimo Durando</a>

### Traffic



Bits per Second











80 G  
70 G  
60 G  
50 G  
40 G  
30 G  
20 G  
10 G

Wed 12:00 Thu 00:00 Thu 12:00

■ Incoming Traffic in Bits per Second  
■ Outgoing Traffic in Bits per Second

RRDTOOL / TOBI OETIKER

# IXP Database

IXP Profile		
Torino Piemonte Exchange Point		
<a href="#">Profile</a>	<a href="#">Network</a>	<a href="#">Switches</a>
<a href="#">Route Servers</a>	<a href="#">Services</a>	<a href="#">Pricing</a>
<a href="#">Tree</a>	<a href="#">ASNs</a>	<a href="#">Users</a>
<b>Automation Link</b>		
AS #	COMPANY	IPV6
<a href="#">16073</a>	Accelance MSP	
<a href="#">43142</a>	Adeli	
<a href="#">39636</a>	AEMNET	
<a href="#">2484</a>	AFNIC	
<a href="#">199125</a>	Alliance-réseaux	
<a href="#">28929</a>	ASDASD srl	
<a href="#">2686</a>	AT&T Global Network Services (UK) BV - Branch	
<a href="#">47353</a>	BAKECA.IT	
<a href="#">34606</a>	BBBell	
<a href="#">8565</a>	Bluegix	

# IXP Database

ASN Database

[Stats](#) [Search](#) [Recent](#) [Common](#)

**Search**

ASN, IXP or Organization

[Filter](#) [Toggle Advanced Filters](#)

Showing ASNs peering at 'Torino Piemonte Exchange Point'

IXP	AS#	COMPANY	LAST UPDATED	IPV6
<a href="#">TOP-IX</a>	<a href="#">2595</a>	<a href="#">CSP</a>	Aug. 16, 2011	<span>Y</span>
<a href="#">TOP-IX</a>	<a href="#">3356</a>	<a href="#">Level 3 Communications, Inc.</a>	Aug. 16, 2011	<span>N</span>
<a href="#">TOP-IX</a>	<a href="#">29598</a>	<a href="#">Regione Valle d'Aosta</a>	Aug. 16, 2011	<span>N</span>
<a href="#">TOP-IX</a>	<a href="#">2594</a>	<a href="#">CSI Piemonte</a>	Aug. 16, 2011	<span>Y</span>
<a href="#">TOP-IX</a>	<a href="#">8220</a>	<a href="#">COLT Telecom Group plc</a>	Aug. 16, 2011	<span>N</span>
<a href="#">TOP-IX</a>	<a href="#">12874</a>	<a href="#">Fastweb</a>	Aug. 16, 2011	<span>N</span>
<a href="#">TOP-IX</a>	<a href="#">20942</a>	<a href="#">Intesa San Paolo</a>	Aug. 16, 2011	<span>N</span>
<a href="#">TOP-IX</a>	<a href="#">2686</a>	<a href="#">AT&amp;T Global Network Services (UK) BV - Branch</a>	Aug. 16, 2011	<span>N</span>
<a href="#">TOP-IX</a>	<a href="#">8968</a>	<a href="#">BT Italia</a>	Aug. 16, 2011	<span>N</span>
<a href="#">TOP-IX</a>	<a href="#">15589</a>	<a href="#">Cloudfitalia</a>	Aug. 16, 2011	<span>N</span>

# IXP Database

ASN Database			
Stats Search Recent Common			
AS#	COMPANY	PRESENT AT	IPV6
<a href="#">6939</a>	<a href="#">HE</a>	<a href="#">85</a>	<span>Y</span>
<a href="#">20940</a>	<a href="#">Akamai</a>		
<a href="#">15169</a>	<a href="#">Google</a>		
<a href="#">3856</a>	<a href="#">Packet Clearing House (PCH)</a>		
<a href="#">42</a>	<a href="#">Woodynet</a>		
<a href="#">8075</a>	<a href="#">Microsoft</a>		
<a href="#">22822</a>	<a href="#">Limelight Networks</a>		
<a href="#">13335</a>	<a href="#">Cloudflare Inc.</a>		
<a href="#">10310</a>	<a href="#">Yahoo</a>		
<a href="#">16509</a>	<a href="#">Amazon</a>		
<a href="#">26415</a>	<a href="#">VeriSign Netherlands BV</a>		
<a href="#">15133</a>	<a href="#">EdgeCast Networks</a>		
<a href="#">32934</a>	<a href="#">Facebook UK Ltd</a>	<a href="#">31</a>	<span>Y</span>
<a href="#">43531</a>	<a href="#">Console Network Solutions Ltd</a>	<a href="#">28</a>	<span>Y</span>
<a href="#">8928</a>	<a href="#">Interoute Communications</a>	<a href="#">27</a>	<span>Y</span>

- 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
  - CIX
  - CoreSite - Any2 Denver / RMIX Den...
  - CoreSite - Any2 Los Angeles
  - DE-CIX Dallas
  - DE-CIX Frankfurt
  - DE-CIX Hamburg
  - DE-CIX Madrid
  - DE-CIX Marseille
  - DE-CIX Munich



# IXP Database

## IXP Service Matrix

[CSV Download](#)

IXP	Location	ASN	RS ASN	# of customers	# IPv6 ready	% IPv6 ready	# of Sites	La tra
<a href="#">AMS-IX</a>	Amsterdam	<a href="#">1200</a>	6777	796	625	78.52	12	0
<a href="#">AMS-IX Bay Area</a>	San Francisco			28	21	75.00	0	0
<a href="#">AMS-IX Caribbean</a>	Willemstad, Curacao	<a href="#">28017</a>		14	6	42.86	1	0
<a href="#">AMS-IX Chicago</a>	Chicago			24	18	75.00	0	0
<a href="#">AMS-IX Hong Kong</a>	Hong Kong	<a href="#">58516</a>		37	29	78.38	1	0
<a href="#">AMS-IX India</a>	Mumbai					0.0	0	0
<a href="#">AMS-IX New York</a>	New York	<a href="#">62981</a>		21	20	95.24	4	0
<a href="#">ARMIX</a>	Yerevan	<a href="#">51225</a>		10	8	80.00	1	0
<a href="#">Angonix</a>	Luanda	<a href="#">327788</a>		15	2	13.33	1	0
<a href="#">Aracaju (SE)</a>	Aracaju					0.0	0	0
<a href="#">BBIX - Hong Kong</a>	Hong Kong					0.0	0	0
<a href="#">BBIX - Tokyo</a>	Tokyo	<a href="#">23640</a>		8	1	12.50	7	0
<a href="#">BCIX</a>	Berlin	<a href="#">16374</a>		86	75	87.21	7	0
<a href="#">BIX Bergen</a>	Bergen	<a href="#">0</a>		4	2	50.00	0	0
<a href="#">BIX.BG</a>	Sofia	<a href="#">15669</a>		79	38	48.10	8	0
<a href="#">BNIX</a>	Brussels	<a href="#">5406</a>		45	14	31.11	3	0
<a href="#">Beirut-IX</a>	Beirut	<a href="#">0</a>		25	0	0.00	0	0
<a href="#">Belo Horizonte (MG)</a>	Belo Horizonte			29	13	44.83	0	0
<a href="#">Belém (BEL)</a>	Belém			15	6	40.00	1	0
<a href="#">BiX</a>	Budapest	<a href="#">5507</a>		49	37	75.51	3	0
<a href="#">Brasília (DF)</a>	Brasília			32	21	65.62	0	0
	Casablanca					0.0	1	0

# IXP Database

Switch Database					
NAME	VENDOR	MODEL	IXP	SOFTWARE VERSION	CREATED
<a href="/members/switches/switch/?id=828">/members/switches/switch/?id=828</a>	Juniper	QFX10002-72Q	<a href="#">GigaPix</a>		Sept. 15, 2017
<a href="/members/switches/switch/?id=827">/members/switches/switch/?id=827</a>	Cisco	WS-C4500X-32	<a href="#">GigaPix</a>		Sept. 15, 2017
<a href="#">gigapix-itc-2</a>	Cisco	WS-C4506-E	<a href="#">GigaPix</a>	cat4500e-universalk9.SPA.03.06.05.E.152-2.E5.bin	Sept. 14, 2017
<a href="#">gigapix-itc-1</a>	Cisco	4506-E	<a href="#">GigaPix</a>	cat4500e-universalk9.SPA.03.06.05.E.152-2.E5.bin	Sept. 14, 2017
<a href="#">10Gbps port switch</a>	Force10	ExaScale E1200i	<a href="#">NAP CABASE - Buenos Aires</a>	NA	May 28, 2017

Route Servers							
IXP	AT IXP	NAME	IN USE	DAEMON	VERSION	OS	CREATED
<a href="#">Mumbai IX</a>	<span style="color: green;">Y</span>	<a href="#">Mumbai IX route Server</a>	<span style="color: green;">Y</span>	BIRD		Centos	Aug. 14, 2017
<a href="#">MIXP</a>	<span style="color: green;">Y</span>	<a href="#">MIXP route server</a>	<span style="color: green;">Y</span>	BIRD			June 13, 2017
<a href="#">MIX-IT</a>	<span style="color: green;">Y</span>	<a href="#">rs1b-mix-it.net</a>	<span style="color: green;">Y</span>	BIRD	1.3.8	Linux	April 14, 2017
<a href="#">STHIX - Stockholm</a>	<span style="color: green;">Y</span>	<a href="#">RS1.GBG1</a>	<span style="color: green;">Y</span>	BIRD	1.6.2	Debian	April 10, 2017
<a href="#">STHIX - Stockholm</a>	<span style="color: green;">Y</span>	<a href="#">RS2.STH1</a>	<span style="color: green;">Y</span>	BIRD	1.6.2	Debian	April 10, 2017



# IXP Database

## ASN Database

[Stats](#) [Search](#) [Recent](#) [Common](#)

**Search**

**Advanced Filters**

-----	Nothing selected
-----	Nothing selected

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

# ➤ IXP Database – where are we?

Database schema is in place for IXPs to record their information about themselves and the operators they serve, we urge all IXPs to start using working with the IX-F to build the IXP database.

- IXP API is live - <https://db.ix-f.net/api/ixp>
- IXF Member List Directory - <http://ml.ix-f.net>

If you need support to implement then talk to me, we are looking to hold some workshops in the future to help IXPs.

# ➤ 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 circuli VXCn instar db_sc apiwe 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 – IXF Member List

- Contains both IXP data & IXP participant data
  - ASN (member list), locations, switch, RS, etc etc
- Open, consistent & a standard design
- Currently 24 IXP independent implementations

(API includes data from euro-ix portal entered manually or via .csv, more options available at [ml.ix-f.net](http://ml.ix-f.net))

- 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 – What's next?

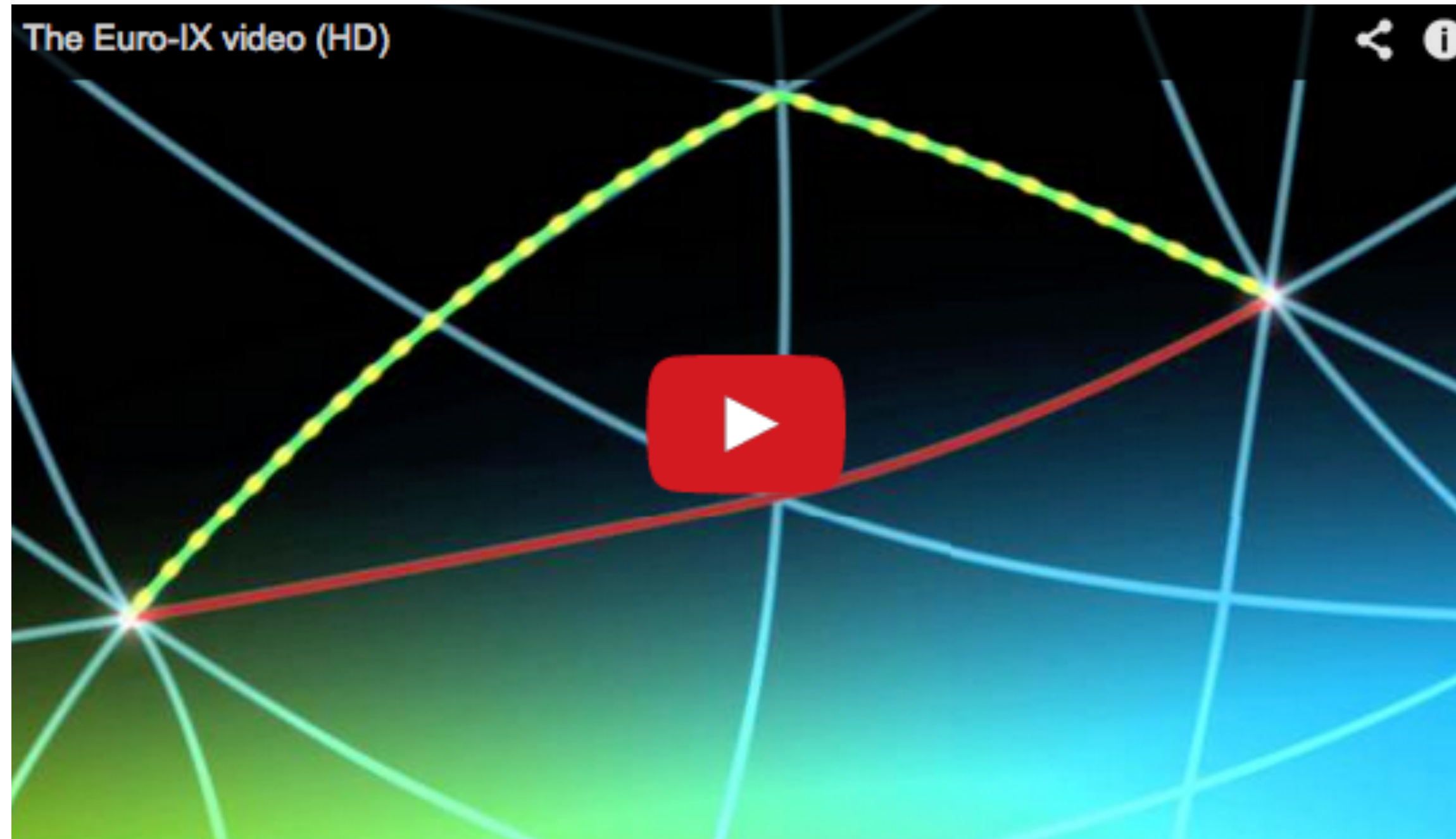
- Extend and internationalise the admin interface for all IXPs (APIX, LAC-IX and AF-IX)
- Create bespoke maintained APIs
- Future revisions to the database schema to capture more data

# IXP Database

## *In search of accurate information*

- Peering networks can go to multiple sources of data to guarantee accuracy
- Tools and portal available on the Euro-IX website, development for APIX, LAC-IX and AF-IX in 2018.
- IXPA's have regional reach to local IXPs
- The data is complementary to database services that the RIR/NIRs & PeeringDB provide

## ➤ Internet Revealed, a film about IXPs



<https://www.youtube.com/channel/UCFyucVRAAMzxyJIsxnGwsjw>

Available in French, German, Portuguese, Italian, Spanish, Romanian, Arabic, Russian, Czech, Greek and Mandarin!

Interested in translating the video in your Language? Contact us!



Questions?



# Thank You!

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