# Membership Association of IXPs

## Events

- Two Membership events per year hosted by our Members
- Workshops & hackathons
- Online/ virtual workshops

## Services

- Reports
- Newsletters
- Mailing list
- Community Building

## Tools & Community Projects

- Internet eXchange Point Database – IXP{DB}
- Peering Toolbox
- Fellowship & Mentor-IX
- Route Server Large BGP Communities list

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# The Internet eXchange Federation – IX-F

# The IXP{DB}

- Allows IXPs to report their data in a standard format
- It includes data sets on:
    - The IXP participants
    - IXP locations
    - Hardware used at IXPs
    - Port Prices
    - Route Servers
- The data sets have been agreed by the community

# IXP {DB} Key Features

- Automated data collection
  - Organisational
  - Infrastructure
    - IXPs & facility locations
    - Peering LAN prefix(es)
    - Hardware
  - Connected networks
    - Ports and speeds
    - MAC & IP address(es)
    - Port prices
  - Traffic

- Easy integration
  - Standardised JSON template
  - Automatic export from IXP Manager / Asteroid

- Incorporates third party data sources
  - MANRS
  - PeeringDB
  - Telegeography (coming soon)

- Web-based GUI
  - Search interface
  - Data tables & visualisations
  - Comparison tools for IXPs & ASNs

- API
  - Available that contains all the data

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# Number of listed ASNs in the IXP{DB}

| IXP | Sep-22 | IXP | Jun-23 |
|---|---|---|---|
| 1 IX.br Sao Paulo | 2413 | IX.br Sao Paulo | 2439 |
| 2 DE-CIX Frankfurt | 1065 | DE-CIX Frankfurt | 1075 |
| 3 AMS-IX | 868 | AMS-IX | 874 |
| 4 LINX | 811 | LINX | 842 |
| 5 EPIX | 561 | EPIX | 569 |
| 6 NAPAfrica | 502 | NAPAfrica | 544 |
| 7 EPIX Warsaw | 475 | DataIX | 542 |
| 8 IX.br Rio de Janeiro | 474 | NL-ix | 525 |
| 9 IX.br Rio de Janeiro | 470 | EPIX Warsaw | 491 |
| 10 DataIX | 467 | KleyRex Frankfurt | 472 |

# Aggregated Traffic growth since 2010

# Top 10 Countries with the most IXP Traffic
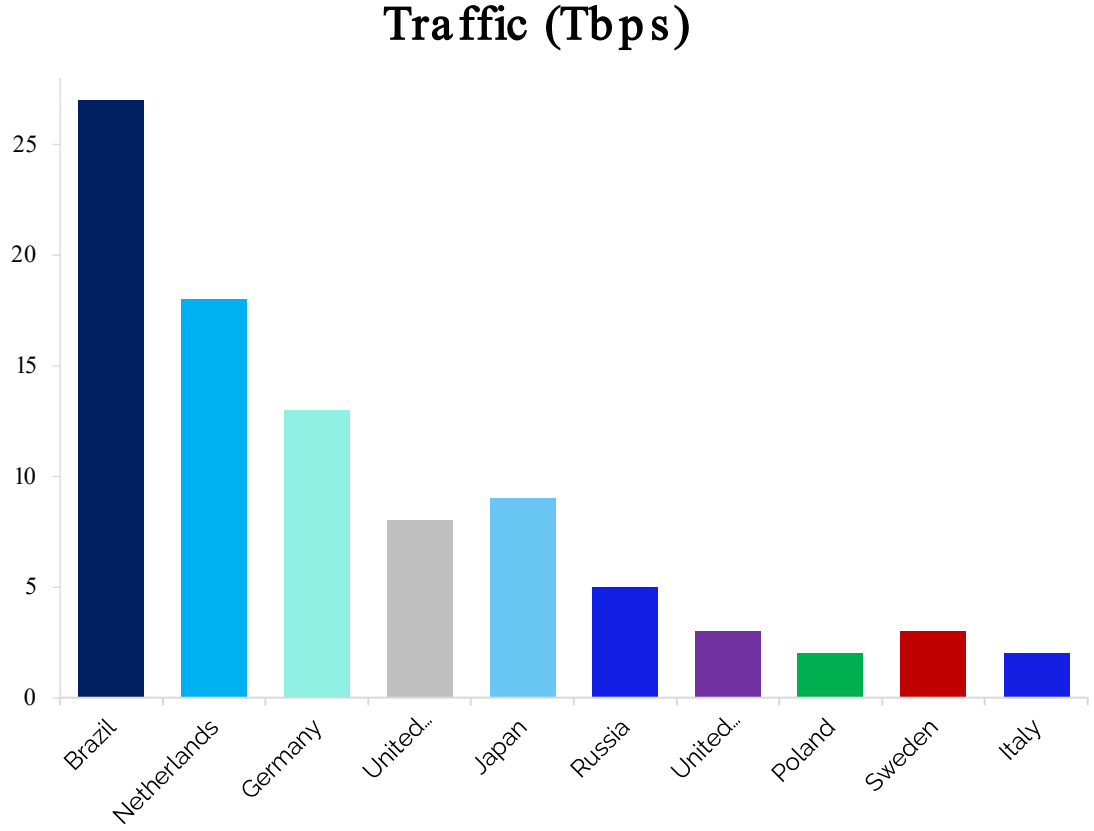
**Traffic (Tbps)**



| | Country | Traffic (Gbps) | Traffic (Tbps) |
|---|---|---|---|
| 1 | Brazil | 27187 | 27.0 |
| 2 | Netherlands | 18159 | 18.0 |
| 3 | Germany | 13340 | 13.0 |
| 4 | United Kingdom | 7868 | 8.0 |
| 5 | Japan | 8774 | 9.0 |
| 6 | Russia | 5000 | 5.0 |
| 7 | United States | 2769 | 3.0 |
| 8 | Poland | 2200 | 2.0 |
| 9 | Sweden | 3000 | 3.0 |
| 10 | Italy | 2139 | 2.0 |

# Switches in IXP Networks – IXP{DB}
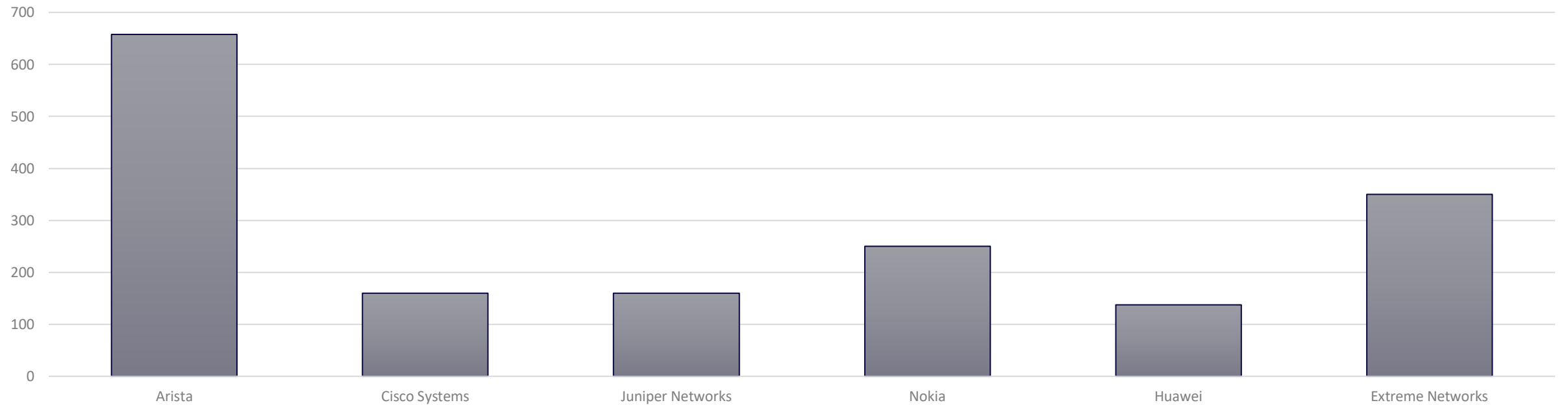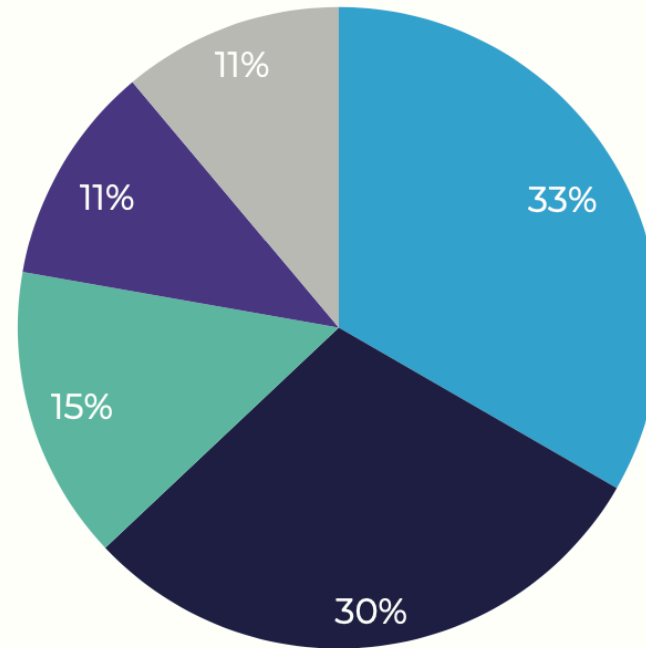
# Euro-IX Benchmarking

# IXP Benchmarking Club

- Since 2004 – now in round 18
- Three sections
  - Operational
    - Staff
    - Traffic
    - Tools
    - Infrastructure
  - Commercial
    - Organisation types
    - Services offered
    - KPIs used
    - Growth
    - Types of members
  - Finance
    - Port prices
    - Fees
    - Annual Turnover
    - Cost spend details

# Kind of organisation managing IXPs



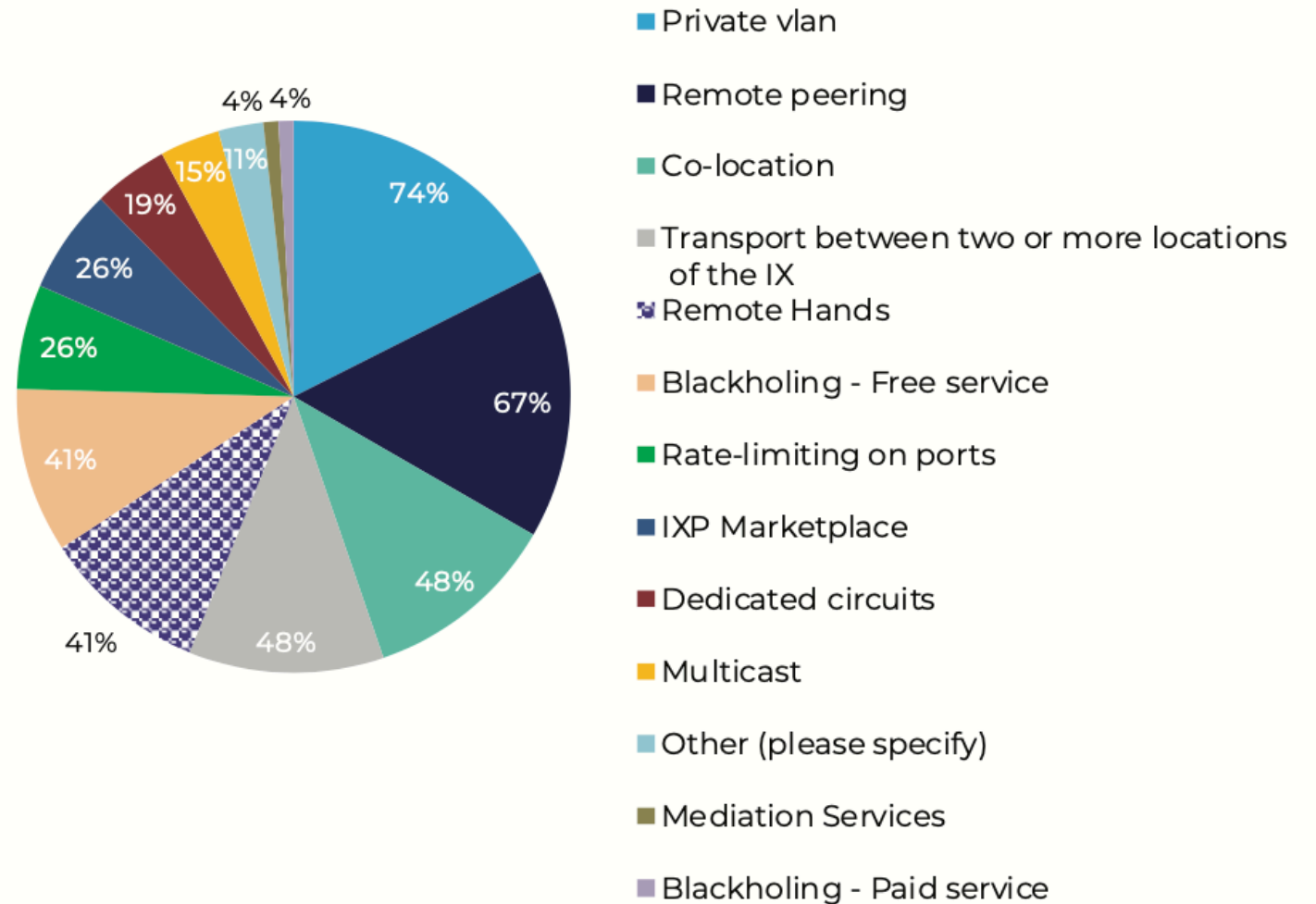- Membership-based IXP (i.e. where the members own the IXP)
- IXPs hosted in academic institutions or academic service organisations (such as national academic or research networks)
- A commercially owned IXP
- IXPs operated by commercial data centre organisations
- Other types of not-for-profit IXPs (e.g. those owned by trusts or other industry associations)

33%
30%
15%
11%
11%

# Types of Networks that connect to IXPs
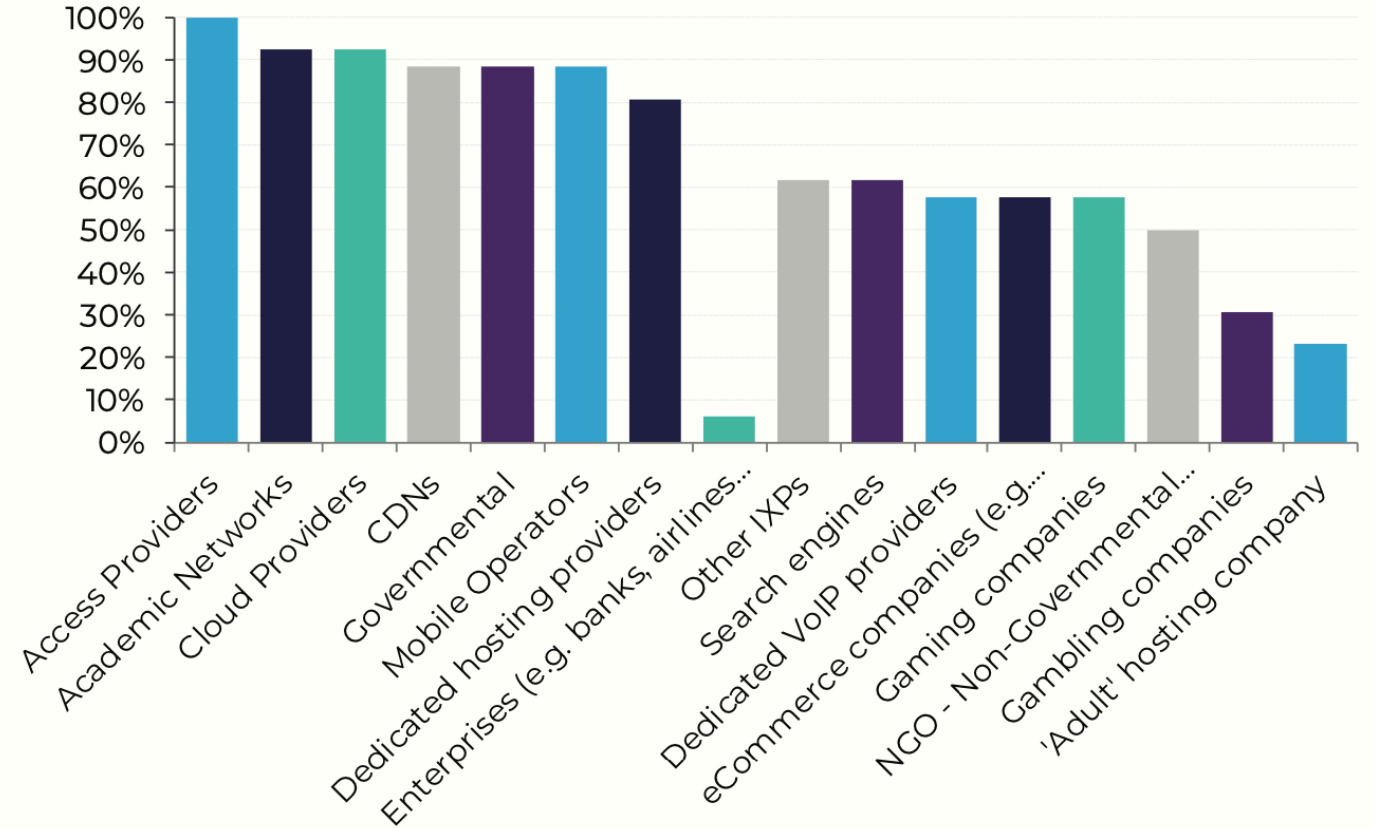
# Extended Services Offered at IXPs



Pie chart legend:
- Private vlan — 74%
- Remote peering — 67%
- Co-location — 48%
- Transport between two or more locations of the IX — 48%
- Remote Hands — 41%
- Blackholing - Free service — 41%
- Rate-limiting on ports — 26%
- IXP Marketplace — 26%
- Dedicated circuits — 19%
- Multicast — 15%
- Other (please specify) — 11%
- Mediation Services — 4%
- Blackholing - Paid service — 4%

# Port prices at IXPs in 2022 vs 2018

| Port Size | Responses | Min € | Max € | Average |
|---|---|---|---|---|
| 1G | 15 | €31.68 | €306.98 | €156 |
| 2.5G | 2 | €238.00 | €400 | €319 |
| 5G | 5 | €304.00 | €750 | €568 |
| 10G | 24 | €89.70 | €1,000 | €414 |
| 25G | 4 | €376.46 | €1,250 | €767 |
| 40G | 6 | €528.00 | €3,200 | €1,901 |
| 100G | 23 | €358.81 | €4,500 | €1,867 |
| 400G | 8 | €771.62 | €6,800 | €1,890 |

| Port Size[3] | Responses | Min € | Max € | Average |
|---|---|---|---|---|
| 100Mb | 7[1] | €100 | €200 | €155 |
| 1GigE | 15[2] | €76 | €520 | €226 |
| 1GigE trunked | 7 | €189 | €800 | €376 |
| 10GigE | 17 | €350 | €1,300 | €614 |
| 10GigE trunked | 8 | €366 | €1,238 | €906 |
| 40GigE | 2 | €1500 | €1800 | €1660 |
| 100GigE | 12 | €1900 | €6835 | €3322 |

# Conclusions

- Collecting and reporting statistics from Internet Exchange Points is feasible and can be done by:
  - Engaging directly with IXPs
  - Working with the regional IXP associations or the IX-F
  - Using the IXP{DB}

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# IXP {DB} Sponsors

Contact secretariat@ix-f.net if you'd like to find out more or sponsor us!

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# Other Information

**Euro-IX Website / reports -** https://www.euro-ix.net/en/services/euro-ix-reports/

**IXP {DB} Website -** https://ixpdb.euro-ix.net/en/

**IXP {DB) API -** https://api.ixpdb.net

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