Euro-IX Project Application for The Internet Exchange Point Database (IXPDB)

Name / Organisation of Applicant

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With support from, Kyle Spencer Uganda IXP / AFIX and the IXPDB admin team.

What is your role in the project?

The IXPDB is a Euro-IX / IX-F (Internet Exchange Point Federation) initiative, I am the Project Co-ordinator and I represent Euro-IX.

What is the key outcome of the project?

The Internet Exchange Point Database (IXPDB) is an authoritative and fully comprehensive set of data on Internet eXchange points (IXPs). It helps IXPs, network operators, researchers, and other interested parties to make informed decisions related to the global internet interconnection ecosystem.

Now that the backend database is operational and we have 245 IXPs exporting data to it via an API, the next stage in this project is to secure and improve the API, improve the web-interface and increase the number of IXPs exporting to it.

Please provide a brief Description of the Project

Note: The IX-F JSON schema is a community written template that allows IXPs to report their data in a standard automated fashion. The IX-F JSON schema includes data sets on the IXP participants, locations, switches and route servers used at IXPs.

The IXPDB imports the IX-F JSON schema directly from IXPs through an automated collection system and can interact with IXP management system and other tools such as IXP Manager / IXP inhouse systems. This authoritative high-quality data provides a single comprehensive and graphical view of the global internet ecosystem, which will be available via the IXPDB website and API.

If sufficient funding is received our two-year outlook includes;

- An increased focus on encouraging IXPs to provide a complete dataset using the IX-F JSON version 1.
- Additions to the website to show data visualisations of ASNs / IXPs via an interactive map and dashboard.
- Further automation and visualisations for example, traffic & IXP Looking glass functionality.
- Technical support for IXPs wanting to adopt the IX-F JSON.

- The production of training materials on implementation of the IX-F JSON and how to navigate the database and tools.
- Training and IXPDB integration workshops that will help to promote use of the system and encourage the application of best common practices (BCPs).

More specifically, some of the data visualisations we want to present, includes;

<u>Phase 1 - in year one</u>

- Dashboard: Global, Regional, Country, City
    - Interactive map
        - Show name of IXP next to icon if zoomed in
        - Show IXPs that have API enabled only
        - Zoom in/out + panning
        - Hover over an IXP to show basic data + link to more details
        - Highlight IXPs that belong to an IXPA by showing them in a different colour
        - Highlight IXPs that have made changes in their records in the last 24 hours
    - Traffic levels (w/ historical data as far back as we can)
    - Latest connections (ASN + which IXP it connected to)
        - Chart showing total connections over time
    - Newest IXPs
        - Determine this either by "date added to IXPDB" or by ranking by the third oldest network connection (i.e. when it became an IXP)
    - Largest IXPs by traffic
    - Largest IXPs by connected networks
    - Hardware vendors for IXPs + connected networks
    - Peering networks (comparable)
    - Show Unique ASNs per IXP, city, country
    - TIME SLIDER (adjust to show data based on time) – advanced, year 2

<u>Phase 2 – in year one</u>

- IXP dashboard
    - Map of location
    - List of other PoPs
    - Nearby IXPs (within X kilometers, maybe user configurable value)
    - Traffic levels (w/ historical data as far back as we can)
    - Connected networks
        - Chart showing total connections over time
    - Hardware platform (hide this for public)
    - Services
    - Link to website
    - TIME SLIDER (adjust to show data based on time) – advanced, year 2

<u>Phase 3 – in year two</u>

- Other tools
    - Select & compare individual IXPs, cities, countries, and regions
    - MAC address search tool
    - Integration of other map data sources e.g. Telegeography

    - IXP Looking Glasses

How will the project benefit from Euro-IX support?

It will bring further awareness of the project, showcase the community as leaders in automation and best practice, and gain sponsors so that we can continue to develop the IXPDB and tools.

Funding for the project will go towards:

- Software development
- Developing data visualisations and analytics
- Technical project management
- Support & training/tutorial material

This funding allocation/approach aims to drive adoption of the IX-F JSON schema at IXPs to improve the data quality and quantity across the Euro-IX region and globally allowing for an greater and richer dataset.

Some of these datasets will provide direct input into Euro-IX / AFIX / APIX & LAC-IX reports for example Benchmarking and the Euro-IX IXP Report. The IXPDB will allow the community to access real-time data which they can use to analyse peering requests / trends / gaps, all via the tools which will be developed along-side the IXPDB.

Who are the beneficiaries of the project and what value does it bring to them?

The IXPDB will benefit:

- IXPs by:
    - Facilitating new interconnections by providing network operators with a comprehensive and trusted source of data on IXPs and participating networks.
    - Providing insight into regional trends and enhancements. This is especially useful for new and developing IXPs.
    - Simplifying and encouraging increased interaction between IXPs and others in the interconnection ecosystem. For example, the Switch Database, when an IXP had a software bug, they were able to get direct support from other IXPs using the same software by finding them in the Switch Database.
- Network operators by:
    - Facilitating access to trusted real-time data which can be used directly or via other systems to make informed network strategy decisions, generate configurations for routers, and be used for other purposes related to peering and network management.
    - Automation and Innovation.
- IXPAs by:

    - Giving them an opportunity to provide additional value to their members and simplifying the process of surveying and reporting statistics to their region.
    - Helping them identify and address gaps in their respective regions and react swiftly to attain parity.
    - Encouraging IXPs to follow Best Common Practises (BCPs) through global trainings and workshops focused on implementation and utilization.
- The IX-F by:
    - Giving it an opportunity to provide additional value to IXPAs.
    - Having the ability to globally survey participating IXPs and IXPAs to provide useful reports to the community and other interested parties.
    - Encouraging IXPs to follow Best Common Practises (BCPs) through global trainings and workshops focused on implementation and utilization.
- Researchers and other interested parties by:
    - Providing access to a unique, neutral, up-to-date, authoritative source of data on IXPs and the global network interconnection ecosystem.
    - Offering stable, accessible, well-documented APIs to facilitate research and other third-party projects that rely on IXPDB data.

Estimation of the resources to implement the project (include financial, time and human resource)

An estimated breakdown of the project costs is as follows:

- Technical Project Management part time / contractor: approx. €40,000 / year
- Software development: approx. €60,000 / year
- Data Visualisations and analytics: approx. €50,000

Outputs/deliverables/impact expected:

An enhanced and scalable version of the IXPDB back-end, web front-end data visualisations and analytics as described above, and a public API.

A new set of tools that will allow sophisticated analysis which will allow users of the database to make informed decisions related to the global internet interconnection ecosystem.

We will provide regular reports to show progress made for Sponsors.