IXP Manager Update

Barry O'Donovan

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INTERCONNECTING NETWORKS AND PEOPLE FOR OVER 25 YEARS

INEX

INEX

- Peering point for the island of Ireland, member owned, cost recovery basis, founded in 1996.

- ~110 members (~95% of eyeballs)

- 1 Tbps exceeded in Dec 2022

- Dual infrastructure, 8 PoPs, own DF

- Opened INEX Cork in 2016

- Home of IXP Manager

IXP MANAGER

The most trusted IXP platform worldwide.

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Free & Open Source Software Platform for IXPs

IXP Manager - A Software Platform for IXPs

Single source of truth (SSoT)

Teaches and implements best practice

Do more with less / Don't repeat, automate

Route server configuration (and more)

MANRS Compliant, public APIs

New Features & Updates

New Features & Updates (1/2)

- Login with PeeringDB

- IXP Manager v6 Released

- IX-F Member Export Schema v1.0

- 2FA and Session Management

- Document Store

New Features & Updates (2/2)

- Core Bundles support

- Database change logging

- Route server optimisation

Iteration	Generation Time	Memory Usage (Real)
v6.0.0	99.5 secs	1,362 MB (1,551 MB)
1st Pass - Query Optimisation	32.0 secs	501 MB (576 MB)
2nd Pass - Add Caching	1.3 secs	210 MB (212 MB)

Route Servers & Filtering

The Need for Route Server Filtering

- You are essentially "outsourcing" your routing policy
  - Usually fine - most networks peer openly at an IXP

- "I want to peer with everyone except X"
  - Route servers need some knobs to allow this

- Mostly standardised BGP community schema provides this
  - https://github.com/euro-ix/rs-workshop-july-2017/wiki/Route-Server-BGP-Community-usage

- Certainly standardised at over 200 exchanges using IXP Manager

(Large) Community Based Filtering

Action	Community
Prevent announcement of a prefix to a peer	`43760:0:peer-as`
Announce a route to a certain peer	`43760:1:peer-as`
Prevent announcement of a prefix to all peers	`43760:0:0`
Announce a prefix to all peers *(default)*	`43760:1:0`

NAMESPACE : ACTION : TARGET

Community Based Filtering in Practice

- Difficult at both ends of the network-size scale:
  - Small networks rarely touch their border routers
  - Large networks need cumbersome change control procedures

- Very complicated in a pinch
  - Community filtering is only half the story!
    - Still need to filter the routes you learn from the route servers

- DDoS events of Q2 2021
  - INEX Operations implemented route server filtering on an emergency basis for a number of members.

NEW: UI Based Filtering in IXP Manager

- Move the complexity from member router to route server (RS)

- Mechanism is unchanged - just "where it happens" moves:
  - RS tags your routes in ingress rather than you doing it on egress
  - RS filters routes to be advertised to you on egress rather than you on ingress

- Solve for 90% of use-cases

UI Based Filtering in IXP Manager

Route Server Filtering for **AS112 Reverse DNS**

✔ **Your filters are in sync with our production configuration.**

Peer	LAN	Protocol	Advertised Prefix	Advertise Action	Received Prefix	Receive Action	Enabled	Order	Actions
AwkwardNet	All	IPv6	*	Do Not Advertise	*	Do Not Receive (Drop)	Yes	1	👁 ✏ ⊗ 🗑 ⬆ ⬇

UI Based Filtering in IXP Manager

> ❗ **Your filters are not in sync with our production configuration. You can continue editing or:** **Revert** **Commit**

Staged Rules (Deploy via Commit above)

Peer	LAN	Protocol	Advertised Prefix	Advertise Action	Received Prefix	Receive Action	Enabled	Order	Actions
AwkwardNet	All	IPv4	*	Do Not Advertise	*	Do Not Receive (Drop)	Yes	1	👁 ✏ ⊗ 🗑 ⬆ ⬇

Rules in Production

Peer	LAN	Protocol	Advertised Prefix	Advertise Action	Received Prefix	Receive Action	Enabled	Order
AwkwardNet	All	IPv6	*	Do Not Advertise	*	Do Not Receive (Drop)	Yes	1

15

lies, damn lies and …

Statistics

World's Largest IXP Platform

INEX

9,520	196Tb	13,281
Connected Networks	Connected Capacity	Connected Ports

There are at least 208 IXPs Powering Peering using IXP Manager around the world to connect 9,520 networks of which 5,749 are unique. The edge peering capacity of these networks is 196Tb over 13,281 connected ports. We aggregate traffic statistics from 130 IXP Manager platforms which show us that the peak traffic exchanged is 64.73 Tbps.
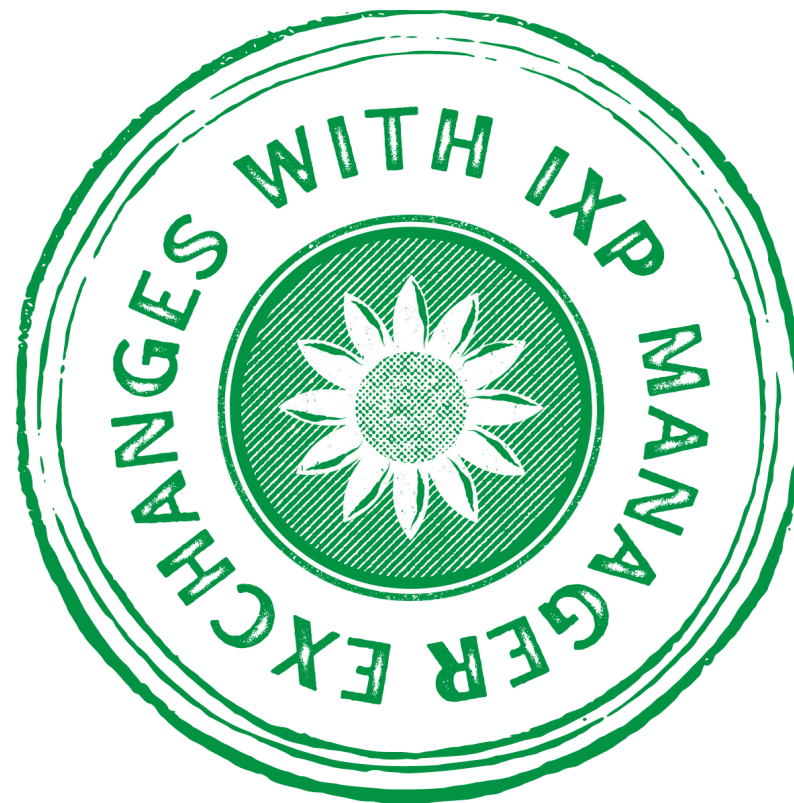
"Most Connected Networks"

1. ...?

"Most Connected Networks"

1. Packet Clearing House (AS3856 AS42) - 73 IXs

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2. Hurricane Electric (AS6939) - 71 IXs

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3. Cloudflare (AS13335) - 70 IXs

"Most Connected Networks"

1. Packet Clearing House (AS3856 AS42) - 73 IXs

2. Hurricane Electric (AS6939) - 71 IXs

3. Cloudflare (AS13335) - 70 IXs

4. Akamai (AS20940) - 53 IXs

"Most Connected Networks"

5. Microsoft (AS8075) - 44 IXs

6. Google (AS15169) - 43 IXs

7. Meta - (AS32934) - 41 IXs

8. Amazon - (AS16509) - 40 IXs

Port Breakdown

1,253 100Gb

6,661 10Gb

2,472 1Gb

2,953 Other

Port Breakdown

Mar 2023

1,253	6,661	2,472	2,953
100Gb	10Gb	1Gb	Other

Oct 2020

368	4,232	2,230	1,196
100Gb	10Gb	1Gb	Other

Source: https://www.ixpmanager.org/community/statistics

Thank you

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