

IXP Manager Update

V3.6.0



i n e x
internet neutral exchange

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IXP Manager – Quick Review

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- Customer and Admin Portal for IXPs
- Launched June 2010
- Open Source – GPLv2

- Frontend – F/LAMP Stack (PHP)
 - Zend Framework V1.12
 - Doctrine2
 - Smarty, Bootstrap, jQuery

- Backend
 - PHP / Perl scripts



Sample Admin Interface

IXP CUSTOMER ACTIONS

- Customers
- Interfaces
- Users
- Contacts
- Colocated Equipment
- Meetings

IXP ADMIN ACTIONS

- Locations
- Cabinets
- Switches
- IP Addressing
- MAC Addresses
- Vendors
- Console Server Connections
- VLANs
- IRRDB Configuration
- Route Server Prefixes

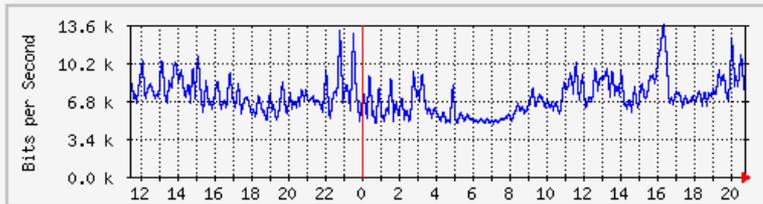
- IXP STATISTICS
- Member Statistics - Graphs
- Member Statistics - List
- League Table

AS112 Reverse DNS PROBONO MEMBER



- Overview **Ports** Users Contacts Notes RS Prefixes » P2P »

Aggregate Traffic Statistics



Corporate Site	http://www.as112.net/	Peering Email	peering@inex.ie
Status	Normal	Joined	2006-09-07
Type	Pro-bono	Left	
Peering Policy	open	ASN	112
PeeringDB		AS-SET	



Sample Member Interface

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INEX IXP Manager

Home

Member Information ▾

Peering ▾

Documentation ▾

Statistics ▾

Support

Profile

Switch Back

Overview

My Details

Ports

Prefixes »

Peering Manager »

Statistics »

Peer to Peer Traffic »

Connection 1

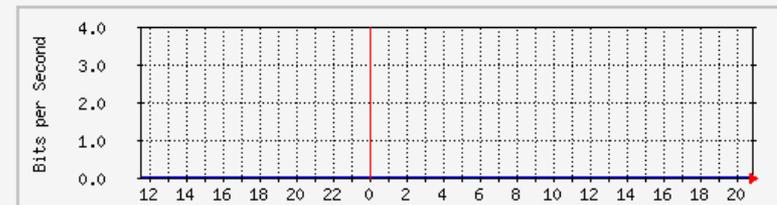
Infrastructure #1

Switch:	swi1-deg1-3.inex.ie	Switch Port:	GigabitEthernet44
Speed:	1000 Mbps	Duplex:	full
Location:	Telecity Kilcarbery	Colo Cabinet ID:	INEX-DEGK-1

Peering VLAN #1:

IPv6 Address:	IPv6 not enabled.	IPv4 Address:	193.242.111.6/25
Multicast Enabled:	No		
Route Server Client:	Yes	AS112 Client:	No

Day Graph for swi1-deg1-3 / GigabitEthernet44



Connection 2

Infrastructure #2



IXPs Using / Considering IXP Manager

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- INEX (of course!)
- LONAP and IIX (both sponsored work)

- BCIX
- GRNET
- WAIX
- NWAX
- IX Leeds
- SOX
- Giganet (Ukraine)
- Gambix IX (and others in Africa)
- Canadian IXPs via CIRA



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What's New?

- V3.0.0 released around EuroIX 21 (Nov 2012)
- Summary of changes from V3.0.0 to V3.6.0
 - *672 files modified*
 - *83k lines added / 52k lines removed (ex. third party)*
 - *1,170 commits*



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New Features

- Private VLAN Management
- Route Server Prefix Analysis Tool (*)
- PeeringDB *click-to-view* integration
- Customer Notes (with watchers, alerts)
- User / Contact Refactoring and Linking
- Add switch / view switch via SNMP polling
- Switch & port status updates via CLI
- Better member CRM features
- Record member MD5 preference / capability
- Using Git submodules for dependency mgmt



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New Features

- Further de-INEX-ification
- Add new IPv[46] addresses *dynamically*
- Record and show all user login history
- Contacts now have roles (admin/tech/billing/...)
- Contacts can be assigned to groups
- Reseller Support (*)
- Multi-IXP Support (*)
- Daily email report of ports with errors / discards
- Integrated MRTG configuration generation (*)
- Smokeping integration (& config generation) (*)



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New Features

- Integrated configuration generators for:
 - Route collector (*)
 - AS112 BGP
 - ARPA DNS zone generation
 - TACACS / RADIUS user authentication
 - Nagios
 - Route servers (*)
- IRRDB Prefixes via BGPQ3 (*)
- Major upgrade to sflow P2P graphing (*)
- First pass at an API interface (*)



Route Server Prefix Analysis Tool

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Route Server Prefix Analysis

[Advertised but Not Accepted \(1\)](#) [Advertised & Accepted \(24\)](#) [Not Advertised but Acceptable \(13\)](#) [Help](#)

Show entries

Search:

Prefix	Protocol	First Seen	Origin AS
2a01:4b0::/32	IPv6	2012-05-28 01:12:12	1213
77.72.72.0/21	IPv4	2012-05-28 01:11:25	42310
87.32.0.0/12	IPv4	2012-05-28 01:11:25	1213
91.123.224.0/20	IPv4	2012-05-28 01:11:25	1213

Showing 21 to 24 of 24 entries

[← Previous](#) [1](#) [2](#)



Reseller Support

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- Many IXPs introducing reseller programs
 - *Including INEX and LONAP (sponsors)*
- A customer can be both a reseller and a trafficking member; or just a reseller.
- Support for *fan out ports*.
 - *Resellers see their fanout ports*
 - *Resold members see their peering ports*
- No reduction in functionality for resold members.
- MRTG / P2P graphing all compatible
- API documented at: <http://git.io/he2RmQ>



Multi-IXP Support

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- Added for a commercial support customer
- Possibly a niche feature – defaults to single IXP
- Management of multiple isolated IXPs with shared customers
- Enabled with an *application.ini* switch
- Good opportunity for a code and security review



Skinning / Templating

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- Allows IXPs to replace any template file with their own
 - *Without changing / touching the original*
- Key feature for configuration generation.
- Changelog now includes list of changed templates per version.



MRTG Configuration

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- We use MRTG to create all traffic graphs:
 - *Individual member port graphs*
 - *Aggregate member graphs*
 - *Aggregate switch graphs*
 - *Inter-switch trunk graphs (*)*
 - *Aggregate infrastructure graphs*
 - *Overall peering graphs*
- Automated configuration of MRTG configuration file compatible with IXP Manager now integrated.



Smokeping Integration

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- Smokeping can be a useful diagnostic tool
- INEX has used Smokeping for years with:
 - *Standard Smokeping interface*
 - *Perl based configuration script*
- IXP Manager now includes:
 - *Built-in skinable Smokeping config generation*
 - *Integrated Smokeping graphs for admins and customers*



Route Collector Configuration

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- Route collectors are an essential IXP tool
 - *INEX has production and quarantine route collectors*
- IXP Manager will generate a standard configuration for Quagga...
 - *Adding more targets is really easy*
- Quagga / IOS config can be piped to RANCID
- Remember – fully skinnable:



Route Collector Conf Generation

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```
{foreach $v4ints as $int}
  neighbor {$int.address} remote-as {$int.autsys}
  neighbor {$int.address} peer-group pg-rc-v4
  neighbor {$int.address} description {$int.cshortname}
  neighbor {$int.address} maximum-prefix {$int.maxprefixes}
  {if $int.bgpmd5secret}
    neighbor {$int.address} password {$int.bgpmd5secret}
  {/if}
{/foreach}
```



Route Server Configuration

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- INEX - 2 servers - 2 locations - 2 daemons
- Currently planning a fork lift upgrade
- Integrated generators from Perl scripts
- Secure templates for Quagga and Bird
 - *Reflect our existing set-up*
 - *Will be reviewed and updated during upgrade*
 - *Strict prefix filtering*
 - *Standard communities*



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BGPQ3

- <http://snar.spb.ru/prog/bgpq3/>
- BGP filtering automation from RADB data
- First pass at IXP Manager integration:
 - *New database table*
 - *Prefix / protocol / first seen / last seen*
 - *Full run takes ~1.5mins*
 - *IRRToolSet took ~45mins.*
 - *Prefix updates decoupled from route server config generation. Transaction safe.*



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Peer to Peer Graphs

- sflow-based p2p graphs added early 2012
- Per protocol with bytes and packets
- Big upgrade just completed including:
 - *Switch from Virtual to VLAN Interface*
 - *rrdcached integration*
- Future work includes:
 - *Better ways to visualise p2p information*
 - *UI improvements*



API V1

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- New API interface introduced in V3.6.0
 - *Implemented as a Zend Module*
 - *Common UI / API / CLI functionality pushed to traits*
- Mailing list functions implemented as POC
- Per user API keys
- Planned functionality:
 - *Route collector / server / other configuration generation*
 - *Member access to graphs and statistics*



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Future Plans / Ideas

- Patch panel / cross connect management
- Highly customisable provisioning wizard
- Revamp member meeting features
- Collapse IPv4/6 functionality
- Split out protocol information from VLAN interface table
- Euro-IX / IX-F data export
- Split ASN and AS Macro to per protocol
- More end user functionality
- Support for static / hard coded MACs
- Easier upgrade process & documentation

Summary



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<https://github.com/inex/IXP-Manager>

Mailing list:

<https://www.inex.ie/mailman/listinfo/ixpmanager>