
# Deployment Workshop

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# Agenda

1. Introduction to IXP Manager
   a. Overview & Requirements
2. Installation & Configuration
   a. Quick-install step-by-step tutorial
   b. Adding locations, racks, switches, and IP address ranges
   c. Adding customers and ports
3. Advanced Concepts
   a. Route Server (BIRD)
   b. Integrations: Looking Glass, Reverse DNS, Nagios, AS112, etc
4. Getting support & ways to contribute

# Introduction to IXP Manager

IXP Manager is an open-source full stack management system for Internet eXchange Points (IXPs) which includes an administration and customer portal; provides end to end provisioning; and both teaches and implements best practice.

Created by the Irish Neutral Exchange Association 


Development currently sponsored by ISOC, Netflix, and SwissIX. Past sponsors include GR-IX, NIX, SwissIX, STH-IX, Interlan, LONAP, and DE-CIX. More funding and support is always welcome!

IXP Manager requires a physical or virtual server environment with at least 5GB of storage space, 1GB of RAM, and Ubuntu 16.04 LTS

https://www.ixpmanager.org/

Everyone should have a piece of paper with a VM IP and username/password.

You will need this to connect to the CLI via SSH

# Installation Process

1. Log into your Demo VM via SSH and run the following commands:
   a. *sudo apt-get dist-upgrade; sudo apt-get install bgpq3 language-pack-en*
   b. *export LC_ALL=en_US.UTF-8; export LANG=en_US.UTF-8*
   c. *cd ~*
   d. *git clone https://github.com/inex/ixp-manager*
   e. *cd ixp-manager/tools/installers*
   f. *sudo ./ubuntu-lts-1604-ixp-manager-v4.sh*

2. Fill in all values as requested by the installation script
   a. Ignore any warnings about Apache (this is specific to the demo environment)
   b. Note the username and password when the installation script finishes

3. Review /srv/ixpmanager/.env configuration file
   a. *nano /srv/ixpmanager/.env*
   b. Add this line: *IXP_IRRDB_BGPQ3_PATH=/usr/bin/bgpq3*

# Enable MRTG Graphing (1/2)

MRTG can be deployed on a separate server, but for this demo we will use the same server as IXP Manager. Follow these steps:

1. Run the following commands on the server:
   - *sudo apt-get install rrdtool mrtg*
   - *sudo mkdir -p /srv/mrtg*
   - *sudo mkdir -p /var/www/mrtg*
   - *sudo chmod 777 /srv/ixpmanager/database/Proxies*

2. Edit .env file: *nano /srv/ixpmanager/.env*
   - Delete this line: *GRAPHER_BACKENDS=”dummy”* line
   - Add the following lines:
     *GRAPHER_BACKENDS="mrtg"*
     *GRAPHER_CACHE_ENABLED=true*
     *GRAPHER_BACKEND_MRTG_DBTYPE="log”*
     *GRAPHER_BACKEND_MRTG_WORKDIR=”/srv/mrtg”*
     *GRAPHER_BACKEND_MRTG_LOGDIR="/srv/mrtg”*
   - Fix any quotes (“) that got copied badly in the process

# Enable MRTG Graphing (2/2)

1. Create an MRTG init script from the IXP Manager template file:
   - sudo cp /srv/ixpmanager/tools/runtime/mrtg/ubuntu-mrtg-initd /etc/init.d/mrtg
   - sudo chmod +x /etc/init.d/mrtg
   - sudo update-rc.d mrtg defaults

2. Modify the MRTG init script:
   - *sudo nano /etc/init.d/mrtg*
   - Change the *CONFFILE* variable to */etc/$NAME.cfg*
   - *sudo systemctl daemon-reload*

3. Start the MRTG service
   - sudo /etc/init.d/mrtg restart

4. Deploy a cron script to update the MRTG configuration as needed
   - *sudo nano /srv/mrtg-cron.sh*
   - Paste the cron script code from: https://docs.ixpmanager.org/features/grapher/
   - Add this line at the end of the file: */etc/init.d/mrtg restart*
   - *sudo chmod +x /srv/mrtg-cron.sh*

# Configure Crontab

- Edit the root crontab by typing *sudo crontab -e* and add the following lines:

```
# PATH VARIABLES
SHELL=/bin/sh
PATH=/usr/local/sbin:/usr/local/bin:/sbin:/bin:/usr/sbin:/usr/bin

# Update MRTG Config
* * * * * /srv/mrtg-cron.sh

# Update IXP Manager Database w/ MRTG Data
0 * * * * /srv/ixpmanager/artisan grapher:upload-stats-to-db

# Update IXP Manager IRRDB Databases
0 1 * * * php /srv/ixpmanager/artisan irrdb:update-prefix-db --quiet
0 0 * * * php /srv/ixpmanager/artisan irrdb:update-asn-db --quiet

# Update IXP Manager Switch Data via SNMP
*/30 * * * * /srv/ixpmanager/bin/ixptool.php -a switch-cli.snmp-poll
```

Visit http://185.6.38.X

X = your demo VM IP

Use the username and password from the installation script

# Basic Configuration via Web Interface

1. Create a datacenter using the Facilities menu
2. Create a cabinet (rack)
3. Add a switch via SNMP (Hostname: 185.6.38.4 - SNMP: foobar)
4. Configure the ports (make a few peering & core)
5. Create a Peering VLAN (200) and run: *sudo service memcached restart*
6. Add an IPv4 address range for the Peering LAN (192.168.0.0/24)
7. Add an IPv6 address range for the Peering LAN (2001:db8::/120)
8. Once again run: *sudo service memcached restart*

# Adding Customers

- Click Customers, then click + at the top right side to add a new customer
- Fill in key customer details
  - Name: Internet Widgets (use your imagination)
  - Type: Full
  - Short Name: internetwidgets (use your imagination)
  - Date Joined: Today's date
  - Status: Normal
  - MD5 Support: Yes
- Fill in Peering Details
  - AS Number: 2128
  - Max Prefixes: 10000
  - Peering Policy: Open
  - IRRDB Source: Pick any (e.g. RIPE)
- Click Add

# Adding Ports

1. Select the customer in IXP Manager

2. Click on the top-right gear icon and select “Provision New Port...”
   - VLAN: Peering VLAN 01
   - Switch: ixpswitch.example.com
   - Switch Port: Port 1 (Peering)
   - Status: Connected
   - Speed: 10G
   - Check “Route Server Client”
   - Check “Apply IRRDB Filtering”
   - Check “AS112 Client”

# Adding Ports

1. Click “IPv6 Enabled”
    - IPv6 Address: 2001:db8::10
    - IPv6 hostname: internetwidgets6.example.com
    - IPv6 MD5: Click on icon to generate random password
2. Click “IPv4 Enabled”
    - IPv4 Address: 192.168.0.10
    - IPv4 hostname: internetwidgets4.example.com
    - IPv4 MD5: Click on icon to generate random password
3. Click “Save Changes”

# Adding Route Servers

1. Click on the Routers menu item and then + to add a route server
   - Handle: rs1-lan1-ipv4
   - VLAN: *<YOUR PEERING VLAN>*
   - Protocol: IPv4
   - Type: Route Server
   - Name: IXP Route Server #1
   - Short Name: RS1 - VLAN01 - IPv4
   - Router ID: 192.168.0.2
   - Peering IP: 192.168.0.2
   - ASN: 37386 (should be 16 bit ASN)
   - Software: BIRD
   - Management Host: 10.10.0.2
   - Select “BGP LC” to enable BGP Large Community support
   - Template: api/v4/router/server/bird/standard

2. Click the paper icon to see the generated configuration
   - Can also visit: http://185.6.38.X/api/v4/router/gen-config/rs1-lan1-ipv4
     - This configuration can be pulled regularly via crontab on a BIRD route server
     - See here: https://docs.ixpmanager.org/features/routers/

# Advanced Concepts

1. Looking Glass (BirdsEye)
   a. https://docs.ixpmanager.org/features/looking-glass/
   b. https://github.com/inex/birdseye/blob/master/README.md

2. Reverse DNS (BIND)
   a. Pulls config from IXP Manager
   b. https://docs.ixpmanager.org/features/dns-arpa/

3. Nagios
   a. Pulls config from IXP Manager
   b. https://docs.ixpmanager.org/features/nagios/

4. Mailman
   a. Pulls subscriber list from IXP Manager
   b. https://docs.ixpmanager.org/features/mailing-lists/

5. Others (read the docs!)

# How to Get Support & Contribute?

General support page: https://www.ixpmanager.org/support.php

Documentation: https://docs.ixpmanager.org/

Mailing list: https://www.inex.ie/mailman/listinfo/ixpmanager

GitHub issues: https://github.com/inex/IXP-Manager/issues

Sponsorship: https://www.ixpmanager.org/sponsorship.php