

IXP FilterCheck

A New Route Analysis Tool for IXPs

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Unique Role of IXPs to Help Routing Security

- Improving global BGP routing hygiene is a notoriously difficult task.
 - Incremental improvements are possible!
- IXP Route Servers offer an opportunity to filter inappropriate BGP messages
 - Based on best practice filters (RPKI/IRR invalids, bogons, etc.)
 - A value to their IXP members and for the good of the internet.

MANRS IXP Program(me)

The IXP Programme Action Set

Action 1. Prevent propagation of incorrect routing information. (Mandatory)

The IXP implements filtering of route announcements at the Route Server based on routing information data (IRR and/or RPKI). Based on the outcome of the validation process, the invalid announcements are filtered in accordance with the IXP published policy.

IXPs using a Route Server to facilitate multilateral peerings should use it to validate received route announcements from a peer and subsequently filter them to other peers. Special purpose cases, such as research projects, are out of scope for this requirement.

Validation is usually done by checking BGP announcements against IRR data (by resolving the AS-SET object) or RPKI data (ROA objects or a validated cache). It is also common to check the announcements against “bogons” or “martians” (IP prefixes as defined in RFC1918, RFC5735, and RFC6598; ASNs in the AS-PATH as defined by RFC5398, RFC6793, RFC6996, RFC7300, RFC7607).

<https://www.manrs.org/ixps/#actions>

Can we measure this?

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Measurement could offer:

- Technical verification of MANRS IXP compliance

- Feedback for IXPs to ensure proper filtering

To do it we'll need route collection from IXP route servers!

Route collection from IXP route servers.

PCH publishes MRT files collected at from 180 IXPs around the world.

These MRT files include PCH's peering sessions at these IXPs including with the route servers.



- PCH publishes 1 MRT file **every minute** for each IXP (**1440 files/day/IXP**).
- We're downloading quarter million files per day to learn about routes passed from these IXP route servers.
- The PCH MRT data offers **filtered** sessions with route servers.
 - *Thank you PCH!*

Route collection from IXP route servers.

What can we do with route collection from 180 IXP route servers?

- Can't positively confirm what was filtered (filtered view)
- But **can** flag anything that didn't get filtered **but should have**

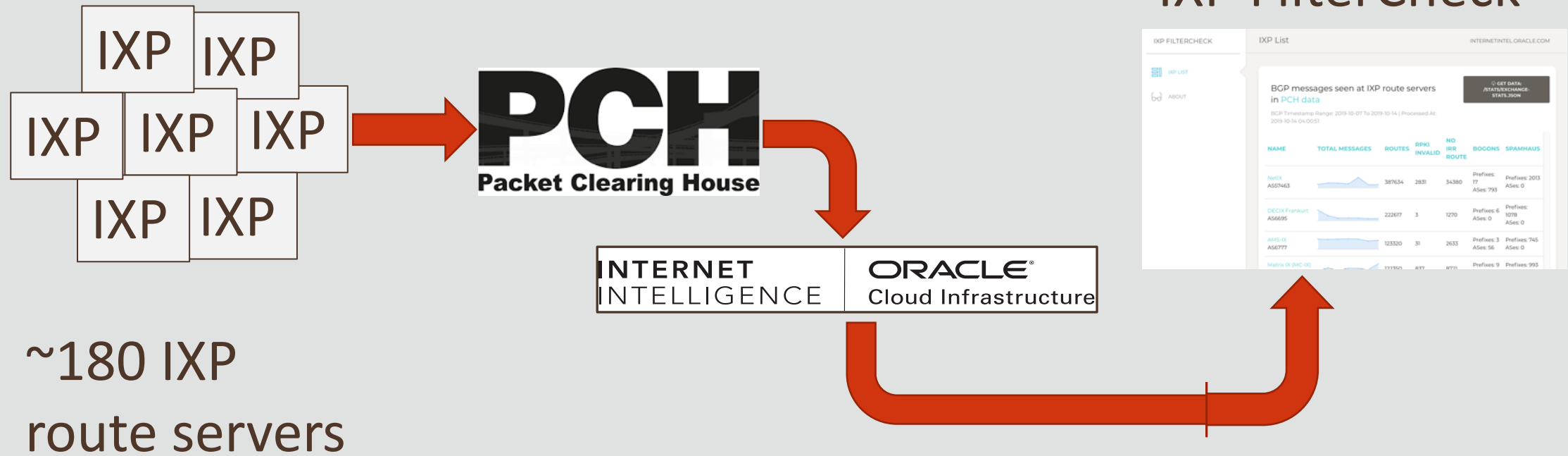
Things like

- RPKI invalids (exception added for invalid length on :666 messages)
- IRR unknowns (simple origin validation, not recursive resolving of AS-sets)
- Bogons (ASNs, prefixes based on Team Cymru lists)

Also things like

- Spamhaus Droplists (*Not MANRS requirement*)

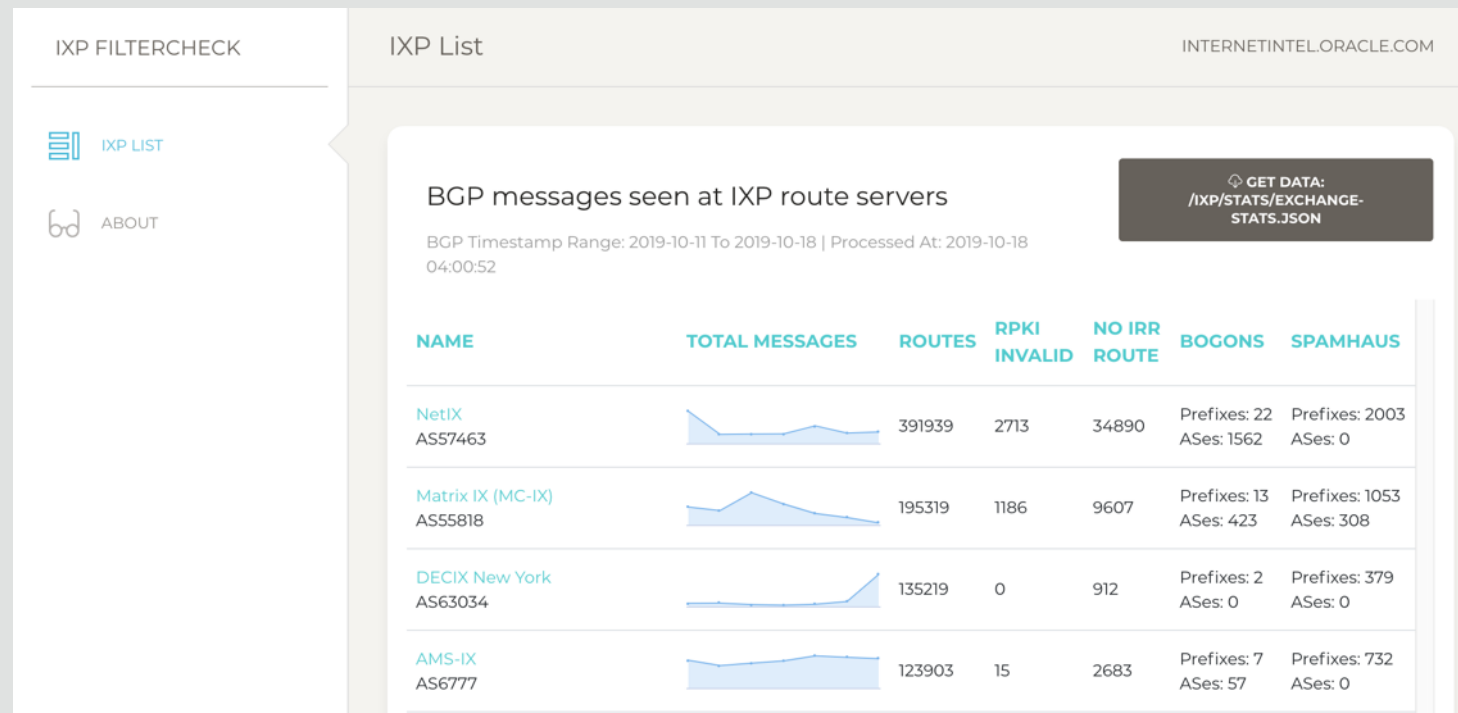
IXP FilterCheck Data Path



IXP FilterCheck UI

<http://map.internetintel.oracle.com/ixp>

Summary view



All data updated daily and available via json.

IXP FilterCheck UI

<http://map.internetintel.oracle.com/ixp>

IXP-level view

IXP FILTERCHECK

IXP LIST

ABOUT

IXP List

NetIX

2019-10-11 To 2019-10-18 | Processed At: 2019-10-18 04:00:52

ORIGIN	PREFIX	RPKI	IRR ROUTE	BOGON P...	BOGON
2	103.115.254.0/24	INVALID_AS	UNKNOWN	--	--
6	103.115.254.0/24	INVALID_AS	UNKNOWN	--	--
10	45.154.75.0/24	INVALID_AS	UNKNOWN	--	--
777	181.94.248.0/24	INVALID_AS	UNKNOWN	--	--
777	181.94.249.0/24	INVALID_AS	UNKNOWN	--	--
1680	209.88.172.0/22	INVALID_AS	VALID	--	--

Announcement Preview

ASN: AS2

Prefix: 103.115.254.0/24

Status: INVALID ASN

Relevant Validated ROAs

ASN	Prefix	Max Length	Source	URI	Status
137868	103.115.252.0/22	22	APNIC RPKI Root	link	INVALID ASN
8	103.115.254.0/24	24	APNIC RPKI Root	link	INVALID ASN
137868	103.115.254.0/24	24	APNIC RPKI Root	link	INVALID ASN



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Prefix: 103.115.254.0/24

Matching prefixes

prefix	bgp	apnic	rpki	advice
103.115.252.0/22		137868	137868	Not seen in BGP, but (legacy?) route-objects exist, consider clean-up
103.115.252.0/24	137868	137868	137868	Looks good: BGP origin consistent with AS in route-objects
103.115.253.0/24	137868	137868	137868	Looks good: BGP origin consistent with AS in route-objects
103.115.254.0/24	137868	137868,8	137868,8	Multiple route-object exist with different origins
103.115.255.0/24	137868	137868	137868	Looks good: BGP origin consistent with AS in route-objects

Showing 1 to 5 of 5 entries

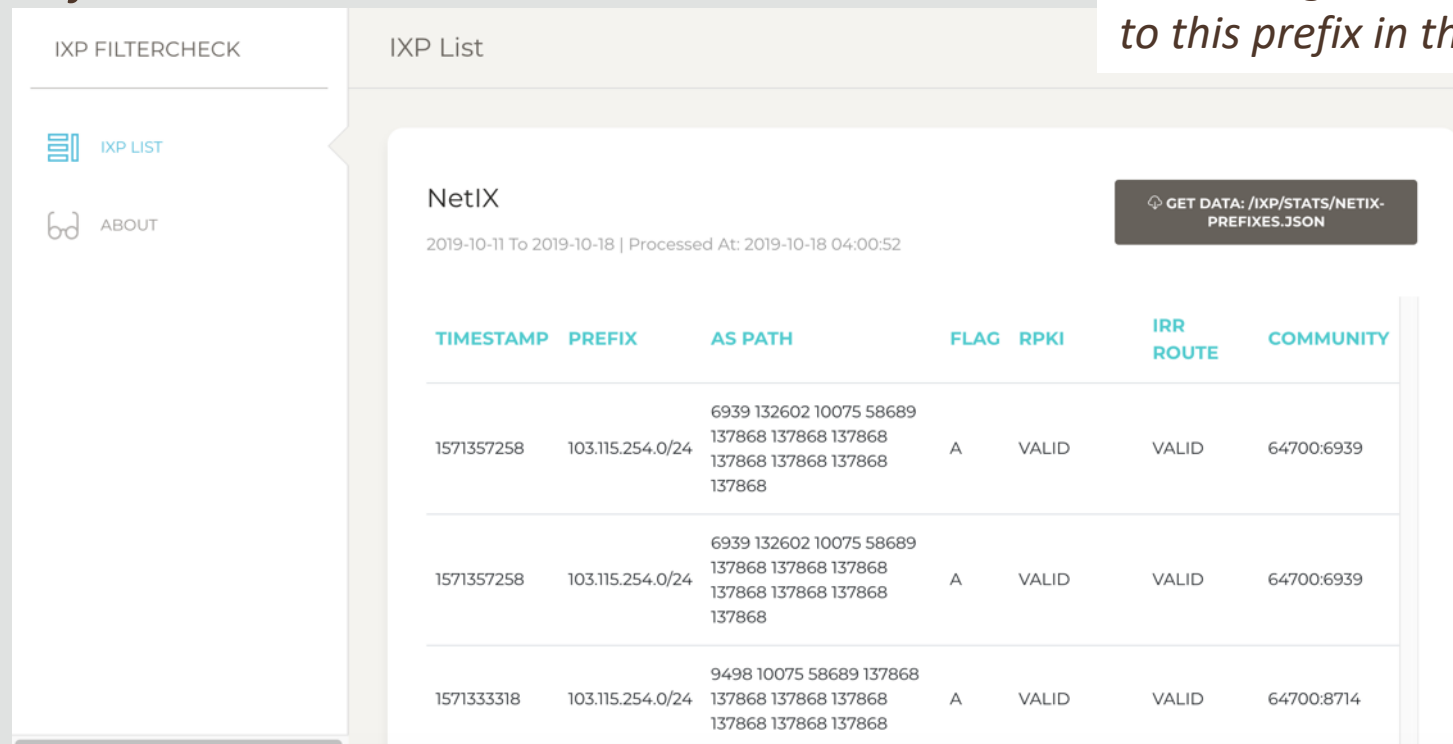
All data updated daily and available via json.

IXP FilterCheck UI

<http://map.internetintel.oracle.com/ixp>

IXP/Prefix-level view

All messages seen at this IXP pertaining to this prefix in the past week.



The screenshot displays the IXP FilterCheck UI. On the left is a sidebar with 'IXP FILTERCHECK' at the top, followed by 'IXP LIST' (selected) and 'ABOUT'. The main content area is titled 'IXP List' and shows details for 'NetIX'. It includes a date range '2019-10-11 To 2019-10-18' and a 'Processed At' timestamp of '2019-10-18 04:00:52'. A button labeled 'GET DATA: /IXP/STATS/NETIX-PREFIXES.JSON' is in the top right. Below is a table with columns: TIMESTAMP, PREFIX, AS PATH, FLAG, RPKI, IRR ROUTE, and COMMUNITY. The table contains three rows of data for the prefix 103.115.254.0/24.

TIMESTAMP	PREFIX	AS PATH	FLAG	RPKI	IRR ROUTE	COMMUNITY
1571357258	103.115.254.0/24	6939 132602 10075 58689 137868 137868 137868 137868 137868 137868 137868	A	VALID	VALID	64700:6939
1571357258	103.115.254.0/24	6939 132602 10075 58689 137868 137868 137868 137868 137868 137868 137868	A	VALID	VALID	64700:6939
1571333318	103.115.254.0/24	9498 10075 58689 137868 137868 137868 137868 137868 137868 137868	A	VALID	VALID	64700:8714

All data updated daily and available via json.

Big thanks to...

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Theo Baschak, MBIX

Andrei Robachevsky, ISOC



Thank you

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