

ROUTEVIEWS EVOLVES: Modernizing the BGP Collector for Today's Researcher



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ROUTEVIEWS

A collaborative router looking glass to share BGP views among network operators and researchers.

RouteViews was founded at the University of Oregon's Advanced Network Technology Center (ANTC) in 1995. Data archives began in 1997 and amount to 22TBs (compressed) today.

The group is currently led by the network engineering team at the University of Oregon with assistance from the Network Startup Resource Center (NSRC) group.

NSRC

NSRC supports the growth of global Internet infrastructure by providing engineering assistance, collaborative technical workshops, training, and other resources to university, research & education networks worldwide. NSRC is partially funded by the IRNC program of the NSF and Google with other contributions from public and private organizations.

UNIVERSITY OF OREGON

The University of Oregon is a public research institution in Eugene, Oregon, USA founded in 1876. UO is renowned for its research prowess and commitment to teaching. Both NSRC and RouteViews are based at the UO.

FOOTPRINT

COLLECTOR LOCATIONS

- ✓ Atlanta (digital realty)
- ✓ Chicago (equinx)
- ✓ Chile
- ✓ DC (eqix)
- ✓ Eugene (Multi-hop)
- ✓ Johannesburg (JINX, NAPAfrica)
- ✓ London (LINX)
- ✓ Miami (FLIX)
- ✓ Nairobi (kixp)
- ✓ Palo Alto (PAIX)
- ✓ Perth (WAIX)
- ✓ Portland (NWAX)
- ✓ Sao Paulo (IX.br)
- ✓ San Francisco (sfmix)
- ✓ Singapore (Equinix SG)
- ✓ Serbia (sox)
- ✓ Sydney (equinix)
- ✓ Tokyo (DIX-IE)
- ✓ Cape Town

FOOTPRINT

NEW LOCATIONS 2019

- ✓ Brazil (Rio)
- ✓ Brazil (Fortaleza)
- ✓ Guam (GOREX)
- ✓ Ghana (GIXA)
- ✓ Bangkok (BKNIX)
- ✓ St. Petersburg (SPB)
- ✓ Philippines (PHOIX)
- ✓ Amsterdam (AMSIX)
- ✓ Indianapolis (MWIX)

BGP DATA DISTRIBUTION

1st

Generation Characteristics (current)

- File-Based storage, MRT data format
- Asynchronous
- Manual retrieval, sequencing, and consolidation
- No post-processing
- Centralized model

BGP DATA DISTRIBUTION

2nd

Generation Characteristics (coming soon)

- “Message-based” data distribution (Kafka)
 - per-message timestamps, with meta-data
 - Real-time streaming telemetry
 - Middle-layer abstraction, multi-client access (facilitates analysis and services)
 - Automated consolidating and sequencing
- RPKI validation and archival
- Interactive collector map

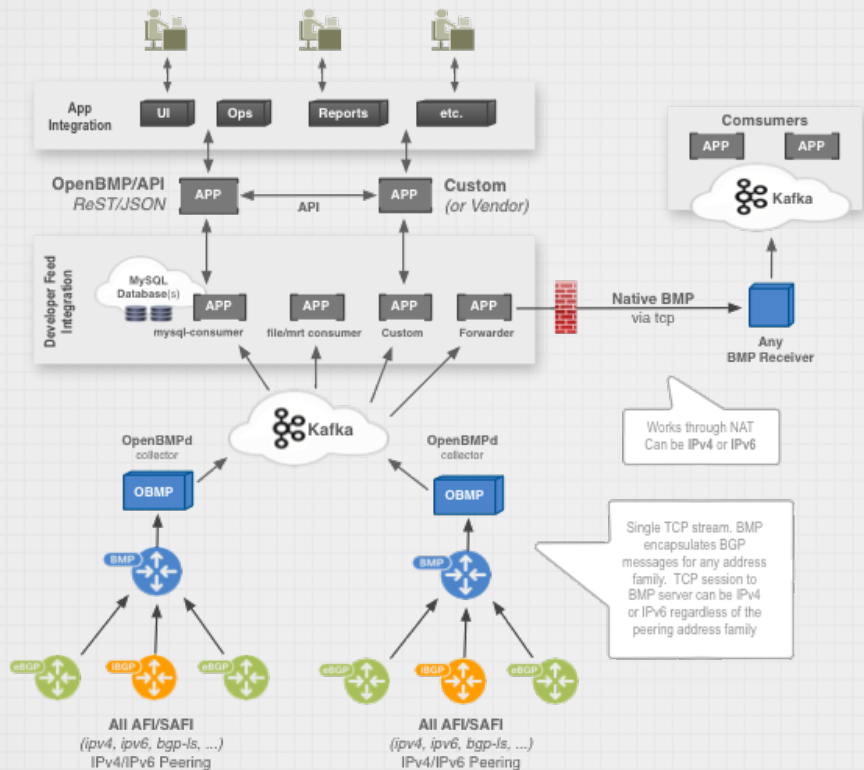
BMP & OpenBMP

- BGP Monitoring Protocol (BMP) is an IETF standard
 - Available now - (Cisco, Juniper, Arista & FRR)
- OpenBMP is OpenSource (under the Linux Foundation)
 - Consolidates peers/collectors
 - Splits collector, peer and update messages into separate streams

Apache Kafka

- Apache Kafka comprises the message bus for openBMP
 - Proven to scale
 - Mature client API
 - Clients in 16 different programming languages

OpenBMP ARCHITECTURE



<https://github.com/OpenBMP/openbmp/blob/master/docs/images/openbmp-flow.png>

THANK YOU

Questions?

MORE INFORMATION



Tools

- <https://bgpstream.caida.org/>

Languages:

- <https://cwiki.apache.org/confluence/display/KAFKA/Clients>

Research

- ~500 research publications have used RouteViews data
- More info: <http://www.routeviews.org/routeviews/index.php/papers/>