Routeviews Update
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Agenda Overview

- What is it
- History
- Current efforts
- New efforts
- Participation

What is Routeviews

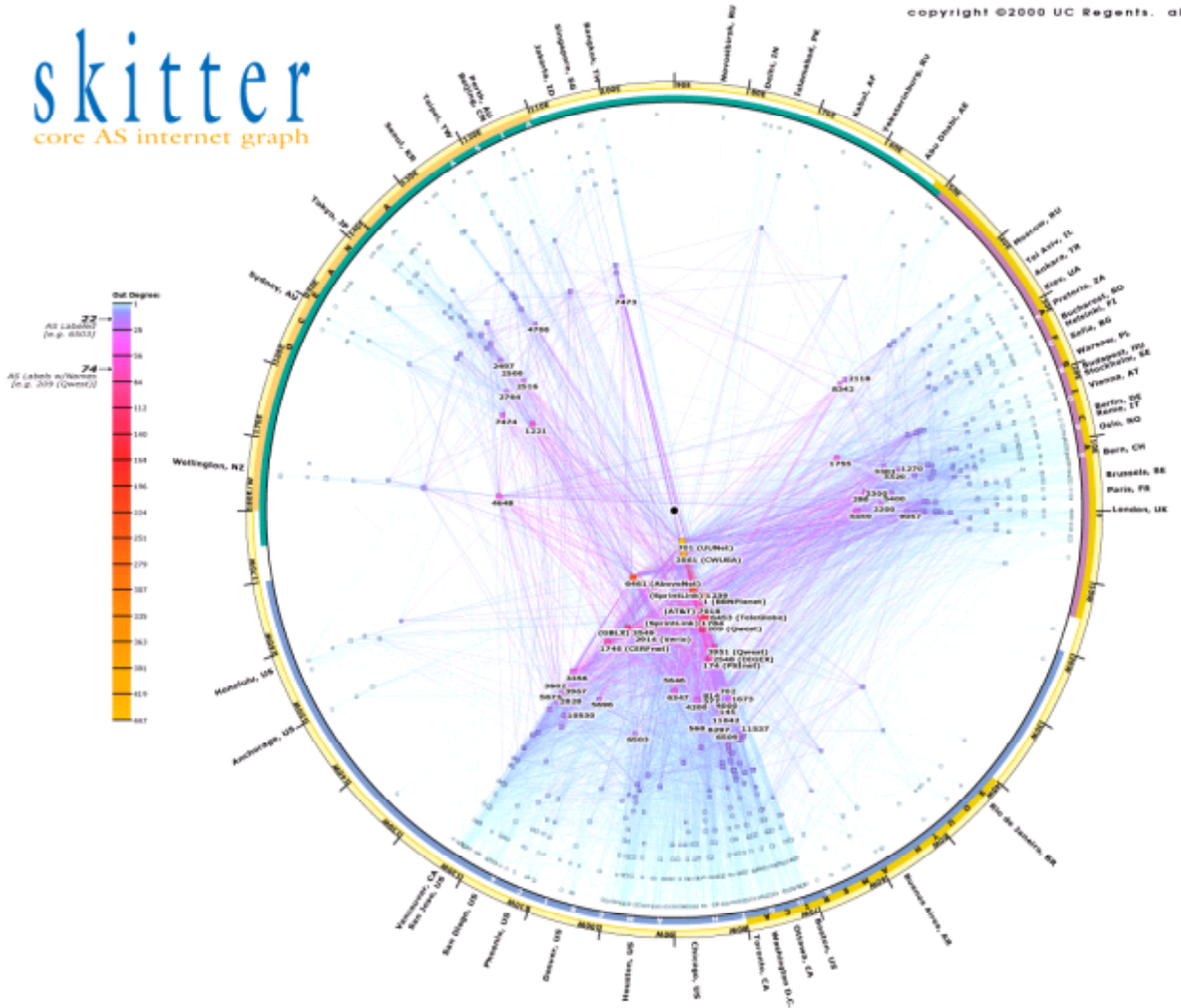
- 8 routers That collect realtime information about the global routing systems through BGP sessions.
- A repository of historical data on the state of global routing going back to 1997.
- A research tool.

History

- 1995 route-views.oregon-ix.net is born.
- Routeviews began as a purely operational tool.
  - We needed a way to look at how providers saw our routes.
  - Looking Glasses were still in the future.
- Randy Bush (RAINET) gave us a view from MAE-WEST
- People started using it and contributing views.
- November 1997 NLANR/MOAT project begins archiving data by dumping output of `show ip bgp` at daily intervals.
- People started to use the data for really interesting applications.

skitter

core AS internet graph



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History

- By mid-2000 scalablity problems began to affect the stability of existing Routeviews router (7200VXR NPE-400 512MB) which was accepting 50+ multi-hop BGP feeds and around 5000 interactive logins a day
- At the same time it was becoming obvious that researchers, and some operators had needs that were not being met by any existing data collection methods.
- In march of 2001 the Routeviews project began collecting `show ip bgp` dumps at 2 hour intervals, an effort that continues to this day.
- October 2001 route-views2.oregon-ix.net is born. route-views2 is Zebra BGPD running on Linux.

History

- Initially route-views2 is not a complete success
  - At the time zebra couldn't handle ~60 peers
  - The BGPD cli was slow enough that it proved to be unusable
- So... we solicited peers for route-views2 rather than replace the route-views service with it.
- Upgrade to route-views performed (NPE-1G)
- Zebra allowed for better collection methods.
  - MRT formatted dumps of the RIB could be performed locally every hour directly on route-views2.
  - BGP updates could be logged as they happened, again in MRT format.
- New service archive.routeviews.org is deployed to aggregate all existing routviews data collection in one place.

History

- As high-resolution data becomes available two more problems become apparent.
  - MRT has a 1 second resolution.
  - Researchers point out that some events in the data appear be the product of the multihop BGP sessions to routeviews routers, rather than the BGP speakers themselves.
- A new effort is started to place routeviews routers directly on Internet Exchange fabrics.
- The first of the new routeviews routers goes online July 2003 at dix-ie Otemachi thanks to the WIDE project.

History

- route-views.wide is followed by:
  - route-views.isc located at PAIX Palo Alto CA USA October 2003
  - route-views.linx located at LINX London GB March 2004
  - route-views.eqix located at Equinix Ashburn VA USA May 2004
- Early 2003 John Heasely takes 1 year sabbatical from Verio to become Routeviews' first full time employee.
- route-views6 begins accepting ipv6 BGP feeds May 2003.
- fall 2004 Zebra hacking continues with the addition of (limited) support for tcp-md5 (rfc2385) to routeviews collectors.

Current Efforts

- Mike Witt joins the the Routeviews project.
- Continued operation and maintenance of Routeviews collectors and archive
- Tool development.
  - BGPlay - http://bgplay.uoregon.edu
  - IP to ASN DNS Zones
- Collaboration with researchers

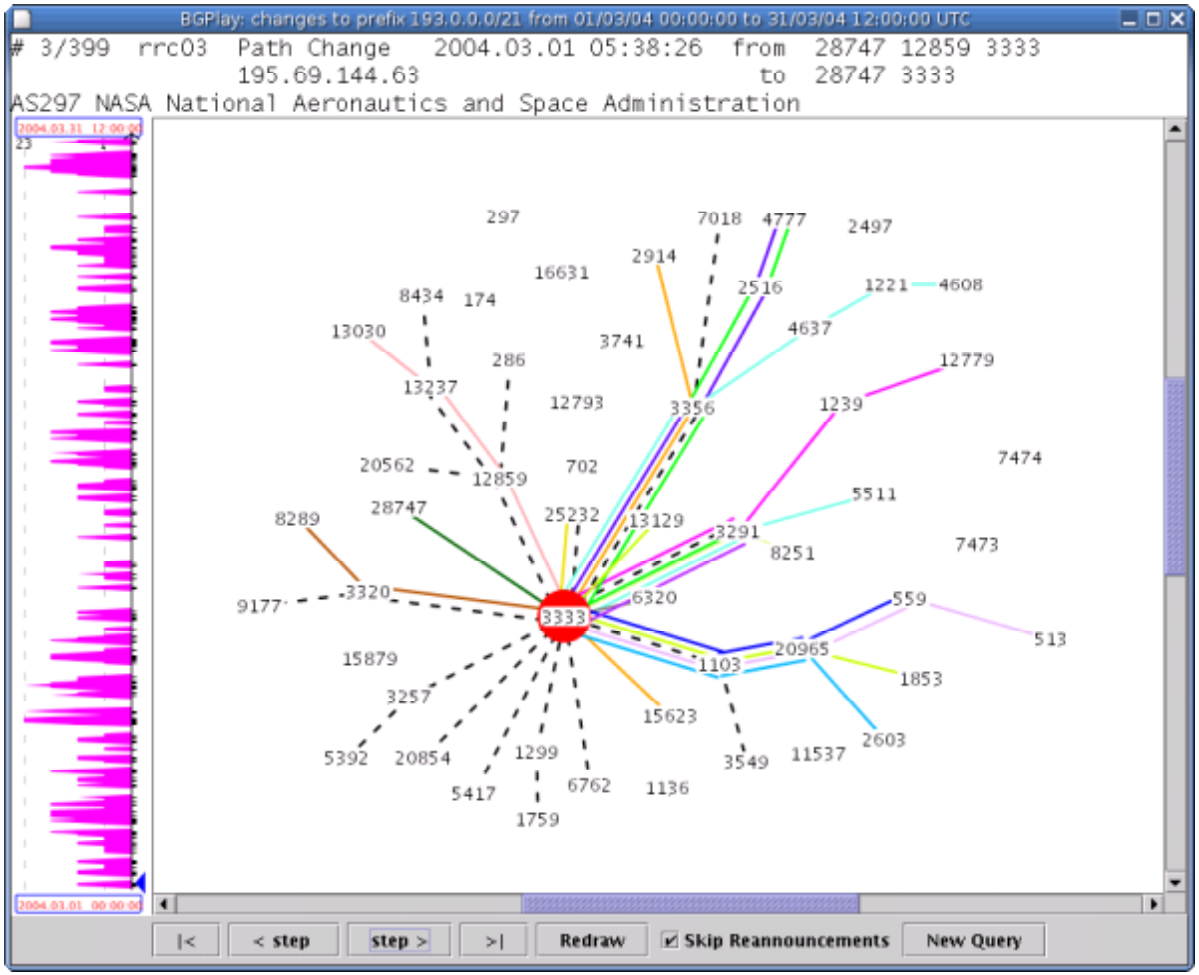
BGPlay

BGPlay is a Java application which displays animated graphs of the routing activity of a certain prefix within a specified time interval. Its graphical nature makes it much easier to understand how BGP updates affect the routing of a specific prefix than by analyzing the updates themselves.

The BGPlay database stores the last 10 days of data provided by the Route Views project data archive.

BGPlay was designed and written by the Computer Networks Research Group at Roma Tre University. Contributors, in alphabetical order, are Lorenzo Colitti, Giuseppe Di Battista, Ilaria De Marinis, Federico Mariani, Maurizio Pizzonia, and Maurizio Patrignani.

BGPlay


BGPlay: changes to prefix 193.0.0.0/21 from 01/03/04 00:00:00 to 31/03/04 12:00:00 UTC
3/399 rrc03 Path Change 2004.03.01 05:38:26 from 28747 12859 3333
195.69.144.63 to 28747 3333
AS297 NASA National Aeronautics and Space Administration
297
7018
4777
2497
2914
16631
2516
1221
4608
8434
174
13030
3741
4637
286
12779
13237
12793
3356
1239
20562
12859
702
7474
5511
28747
25232
13129
3291
8289
8251
7473
3320
9177
6320
559
513
3333
15879
20965
1103
1853
3257
15623
2603
5392
20854
1299
3549
11537
5417
6762
1136
1759
|<
< step
step >
>|
Redraw
Skip Reannouncements
New Query

DNS - IP to ASN/ASPATH

- There are two queryable subdomains of TXT records in routeviews.org
  - asn.routeviews.org - resolves a reversed ipv4 address or prefix to the origin AS prefix and prefix lengthof the best route as seen by route-views2.routeviews.org
  - aspath.routeviews.org - same idea, but resolves to the full AS path
- example:
  - `host -t txt 35.32.223.128.asn.routeviews.org 35.32.223.128.asn.routeviews.org text "3582" "128.223.0.0" "16"`
- Zone Files are reconstituted twice daily and are available for download.

Current Efforts

Routeviews peer counts

Router	Platform	Peers
route-views.routeviews.org	Cisco	70
route-views2.routeviews.org	zebra	45
route-views3.routeviews.org	juniper	36
route-views6.routeviews.org	zebra	13
route-views.eqix.routeviews.org	zebra	5
route-views.isc.routeviews.org	zebra	14
route-views.linx.routeviews.org	zebra	23
route-views.wide.routeviews.org	zebra	10

Future Efforts

- Deployment of additional regional collectors.
- More tool development.
- Local computing resources and storage for researchers.

Partcipation

- Bring a view to routeviews.
  - We're really looking for single hop views at the IXes we're already at.
  - Send mail to help@routeviews.org.
  - Send us a default full table.
- Host a collector.
  - We're looking to build out 3-5 new collectors over the next year.
- Use as an operational or research tool.

Who We Are

- John Heasly (emeritus) - heas@shrubbery.net
- Lucy Lynch - llynch@uoregon.edu
- Joel Jaeggli - joelja@twin.uoregon.edu
- Dave Meyer (Project Lead) - dmm@maoz.com
- Mike Witt - mike@uoregon.edu

Bibliography

- Oregon Routeviews Project - http://www.routeviews.org
- BGPlay@routeviews - http://bgplay.routeviews.org/bgplay/
- BGPlay creators - http://www.dia.uniroma3.it/~Ecompunet/
- CAIDA - http://www.caida.org
- Routeviews Bibliography - http://www.routeviews.org/papers/

Slide Note 1:

Slide Note 2:

Slide Note 3:

Slide Note 4:

Slide Note 5:

Slide Note 6:
220,533 IP addresses, 374,013 IP links, 154,104 destinations, 5,107 ASes (7% of ASes present in RouteViews BGP tables on January 16, 2000)

Slide Note 7:

Slide Note 8:

Slide Note 9:

Slide Note 10:

Slide Note 11:

Slide Note 12:

Slide Note 13:

Slide Note 14:

Slide Note 15:

Slide Note 16:

Slide Note 17:

Slide Note 18:

Slide Note 19: