



# Pakistan Telecom vs. YouTube

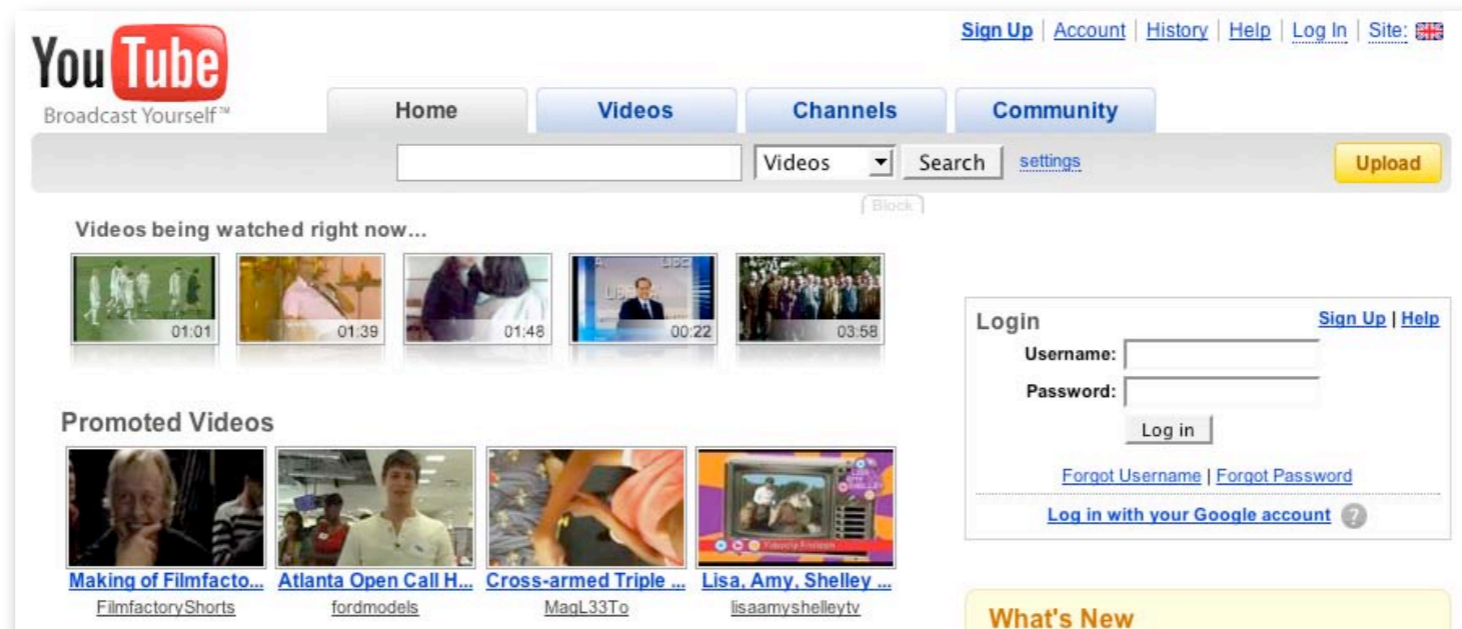


**vs**



*“a RIS with a view”*

# Introduction

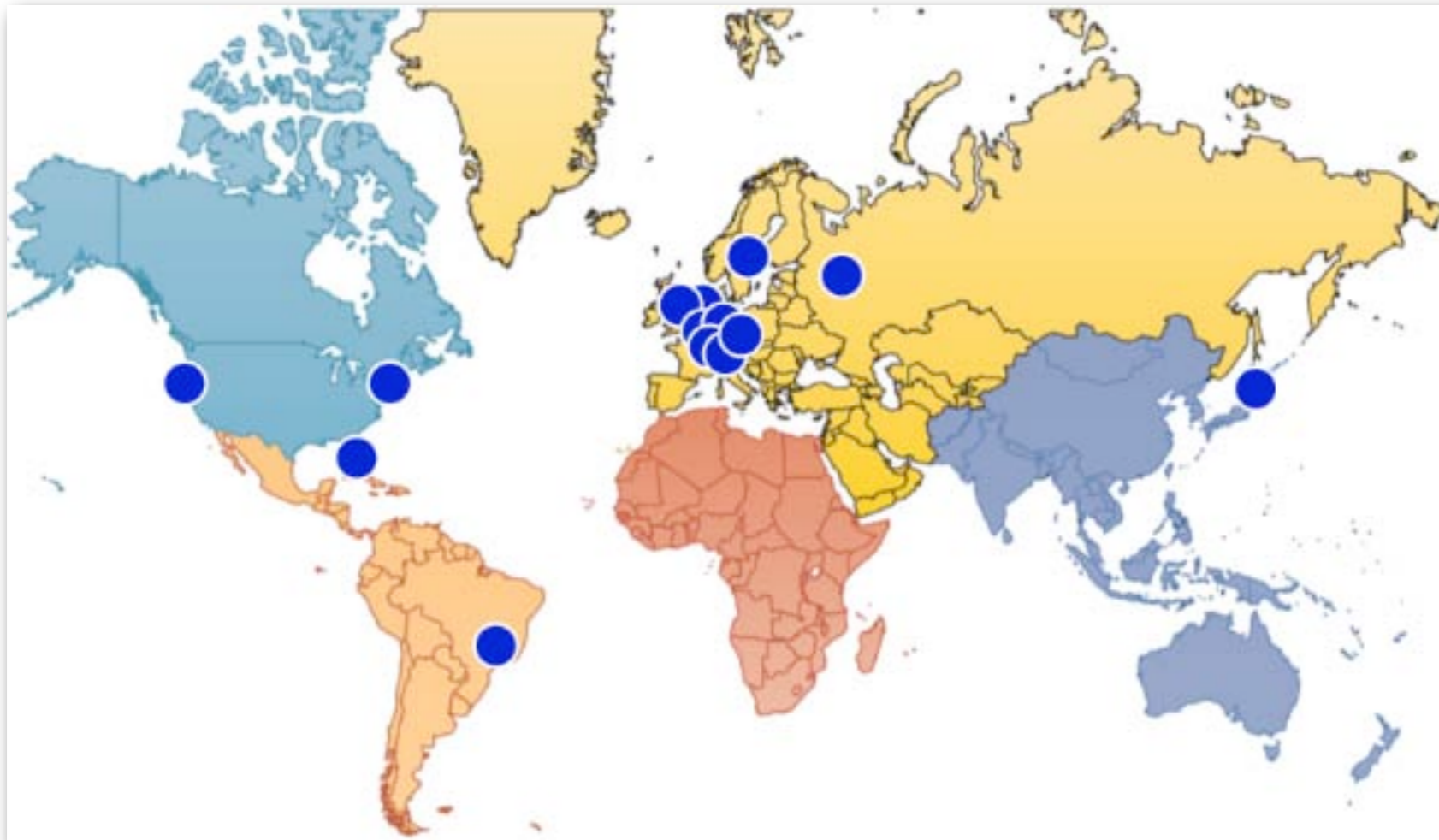


```
ncc$ host www.youtube.com
www.youtube.com has address 208.65.153.253
www.youtube.com has address 208.65.153.238
www.youtube.com has address 208.65.153.251
```

## Sunday 24th February:

- Pakistan Telecom (AS17557) announces 208.65.153.0/24
- PCCW Global (upstream, AS3491) forwards announcement
- YouTube goes off the air
- YouTube take steps to fix (announce more specific routes)

# Routing Information Service (RIS)



- Collects BGP data
- 600 peers
- 16 IXPs

<http://www.ripe.net/ris>



# RISwhois

<http://www.ripe.net/cgi-bin/riswhois.cgi>



Address or Prefix

All more specific matches
  All less specific matches

Exact match only

Short fast output
  Return primary keys only



```

route:      208.65.152.0/22
origin:     AS36561
descr:     YOUTUBE - YouTube, Inc.
lastupd-frst: 2008-02-10 15:47Z 200.160.0.130@rrc15
lastupd-last: 2008-04-09 13:59Z 192.65.185.243@rrc04
seen-at:    rrc00,rrc01,rrc02,rrc03,rrc04,rrc05,rrc06,rrc07,rrc10,rrc11,rrc12,rrc13,rrc14,rrc15,rrc16
num-rispeers: 116
source:     RISWHOIS
  
```

```

route:      208.65.153.0/24
origin:     AS36561
descr:     YOUTUBE - YouTube, Inc.
lastupd-frst: 2008-03-21 06:16Z 198.32.176.177@rrc14
lastupd-last: 2008-04-09 09:30Z 80.81.192.242@rrc12
seen-at:    rrc12,rrc14
num-rispeers: 2
source:     RISWHOIS
  
```



# PrefixInUse

<http://www.ris.ripe.net/perl-risapp/prefixinuse.html>



Prefix	208.65.153.128/25	Less specific ▾
RRC Box	rrc00, RIPE NCC ▾	
Sort results	by time ▾	
Time interval	3 months ▾	
Output type	<input checked="" type="radio"/> HTML <input type="radio"/> Text	



**3 entries found for 208.65.153.128/25**

Prefix	Last announced	Origin AS
<a href="#">208.65.152.0/22</a>	2008-04-12 08:00:05 UTC	<a href="#">36561</a>
<a href="#">208.65.153.0/24</a>	2008-03-14 00:09:51 UTC	<a href="#">36561</a>
<a href="#">208.65.153.128/25</a>	2008-03-14 00:08:49 UTC	<a href="#">36561</a>



# RIS Search

<http://www.ripe.net/perl-risapp/risearch.html>



Prefix/AS number	<input type="text" value="208.65.153.238"/>	<input type="button" value="Less specific"/>	<input type="button" value="IPv4"/>
From	<input type="text" value="20080224"/> <input type="text" value="18"/> <input type="text" value="00"/> <input type="text" value="00"/>		
To	<input type="text" value="20080225"/> <input type="text" value="01"/> <input type="text" value="00"/> <input type="text" value="00"/>		
RRC Box	<input type="button" value="rrc01, LINX"/>	<input type="button" value="ALL"/>	
Update type	<input checked="" type="radio"/> All <input type="radio"/> Announcements <input type="radio"/> Withdrawals		
Output type	<input checked="" type="radio"/> HTML <input type="radio"/> Text <input type="radio"/> Graphical		
Summarize updates	<input checked="" type="radio"/> Yes <input type="radio"/> No		
Plot orientation	<input checked="" type="radio"/> West <input type="radio"/> North <input type="radio"/> East <input type="radio"/> South		
	Maximum Rank	<input type="button" value="Unlimited"/>	
	Maximum Size	<input type="button" value="Unlimited"/>	



## Summary of Update entries

- + [3303](#) origin AS : 1 event(s)
- + [17557](#) origin AS : 5 event(s)
- + [36561](#) origin AS : 3 event(s)



# RIS Search

⊕ **3303** origin AS : 1 event(s)

⊖ **17557** origin AS : 5 event(s)

⊕ Announcement of prefix [208.65.153.0/24](#) : Seen between **2008-02-24 18:47:54 UTC** and 2008-02-24 18:49:01 UTC , through 1 of AS**17557** neighbours.

⊖ Announcement of prefix [208.65.153.0/24](#) : Seen between 2008-02-24 20:52:18 UTC and 2008-02-24 20:52:49 UTC , through 2 of AS**17557** neighbours.

⊖ Neighbour AS**3491** : 5 update message(s)

Type	Prefix	Last update time	Peer	Next HOP	MED	Origin	ASpath	Community	RRC
A	<a href="#">208.65.153.0/24</a>	2008-02-24 20:52:18 UTC	195.66.224.99	<a href="#">195.66.224.99</a>	0	IGP	<a href="#">13237 3491 17557</a>	13237:40049 13237:46067	LINX
A	<a href="#">208.65.153.0/24</a>	2008-02-24 20:52:19 UTC	195.66.224.151	<a href="#">195.66.224.151</a>	0	IGP	<a href="#">8468 3491 17557</a>	-	LINX
A	<a href="#">208.65.153.0/24</a>	2008-02-24 20:52:36 UTC	195.66.224.99	<a href="#">195.66.224.99</a>	0	IGP	<a href="#">13237 3491 17557</a>	13237:40049 13237:46068	LINX
A	<a href="#">208.65.153.0/24</a>	2008-02-24 20:52:36 UTC	195.66.224.99	<a href="#">195.66.224.99</a>	0	IGP	<a href="#">13237 3491 17557</a>	13237:40049 13237:46067	LINX
A	<a href="#">208.65.153.0/24</a>	2008-02-24 20:52:37 UTC	195.66.224.54	<a href="#">195.66.224.54</a>	0	IGP	<a href="#">286 3491 17557</a>	-	LINX

⊕ Neighbour AS**17557** : 8 update message(s)

⊕ Withdrawal of prefix [208.65.153.0/24](#) : Seen between **2008-02-24 20:52:18 UTC** and 2008-02-24 20:52:18 UTC

⊕ Withdrawal of prefix [208.65.153.0/24](#) : Seen between 2008-02-24 21:01:21 UTC and 2008-02-24 21:01:21 UTC

⊕ Announcement of prefix [208.65.153.0/24](#) : Seen between 2008-02-24 21:01:22 UTC and 2008-02-24 21:01:22 UTC , through 1 of AS**17557** neighbours.

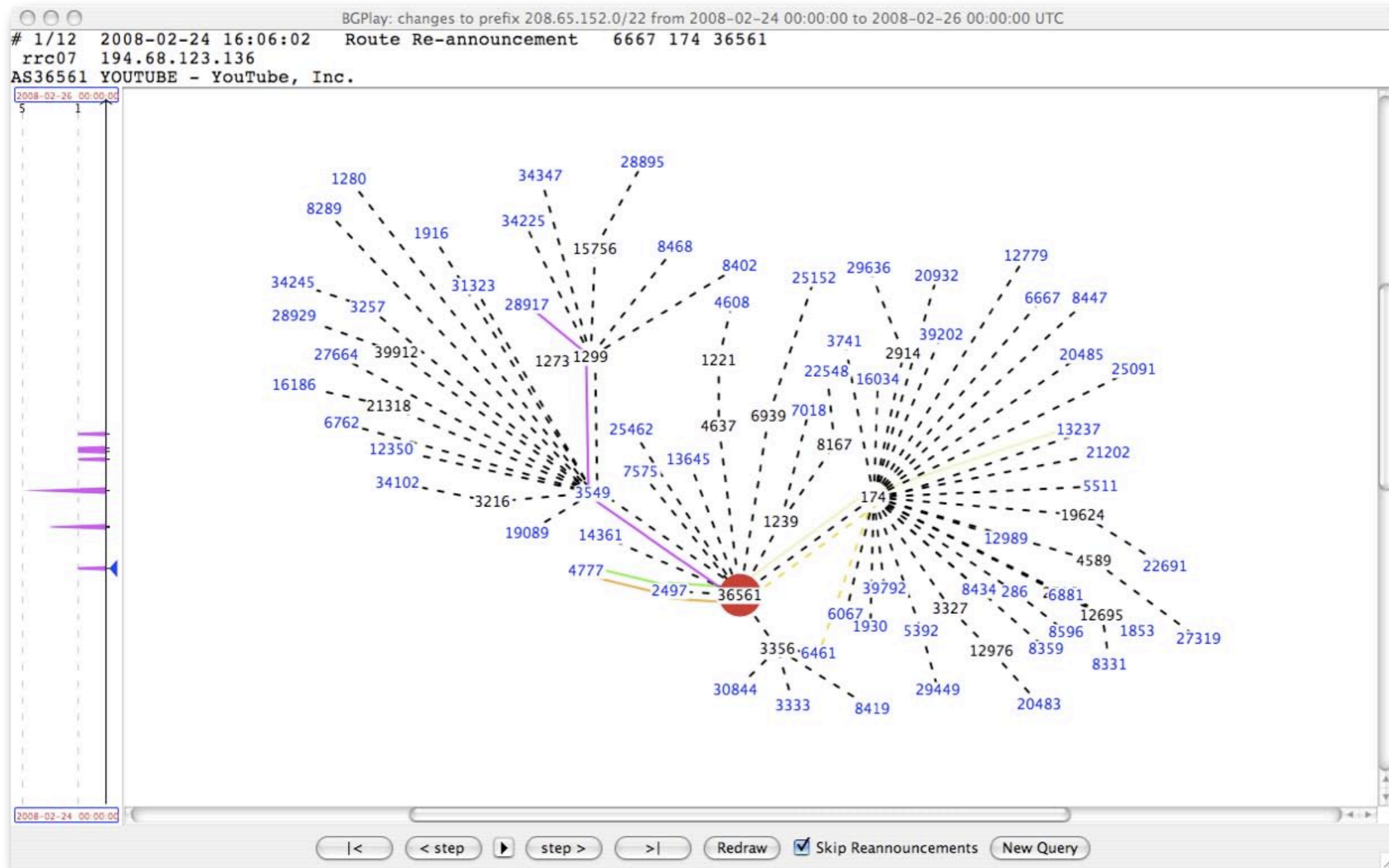
⊖ **36561** origin AS : 3 event(s)

⊖ Announcement of prefix [208.65.153.0/24](#) : Seen between 2008-02-24 20:07:25 UTC and 2008-02-24 20:07:54 UTC , through 1 of AS**36561** neighbours.

⊖ Neighbour AS**3549** : 3 update message(s)

Type	Prefix	Last update time	Peer	Next HOP	MED	Origin	ASpath	Community	RRC
A	<a href="#">208.65.153.0/24</a>	2008-02-24 20:07:25 UTC	195.66.224.83	<a href="#">195.66.224.83</a>	0	IGP	<a href="#">5511 3549 36561</a>	5511:666 5511:710	LINX
A	<a href="#">208.65.153.0/24</a>	2008-02-24 20:07:32 UTC	195.66.224.83	<a href="#">195.66.224.83</a>	0	IGP	<a href="#">5511 3549 36561</a>	5511:666 5511:710	LINX
A	<a href="#">208.65.153.0/24</a>	2008-02-24 20:07:54 UTC	195.66.224.153	<a href="#">195.66.224.153</a>	0	IGP	<a href="#">6762 3549 36561</a>	-	LINX

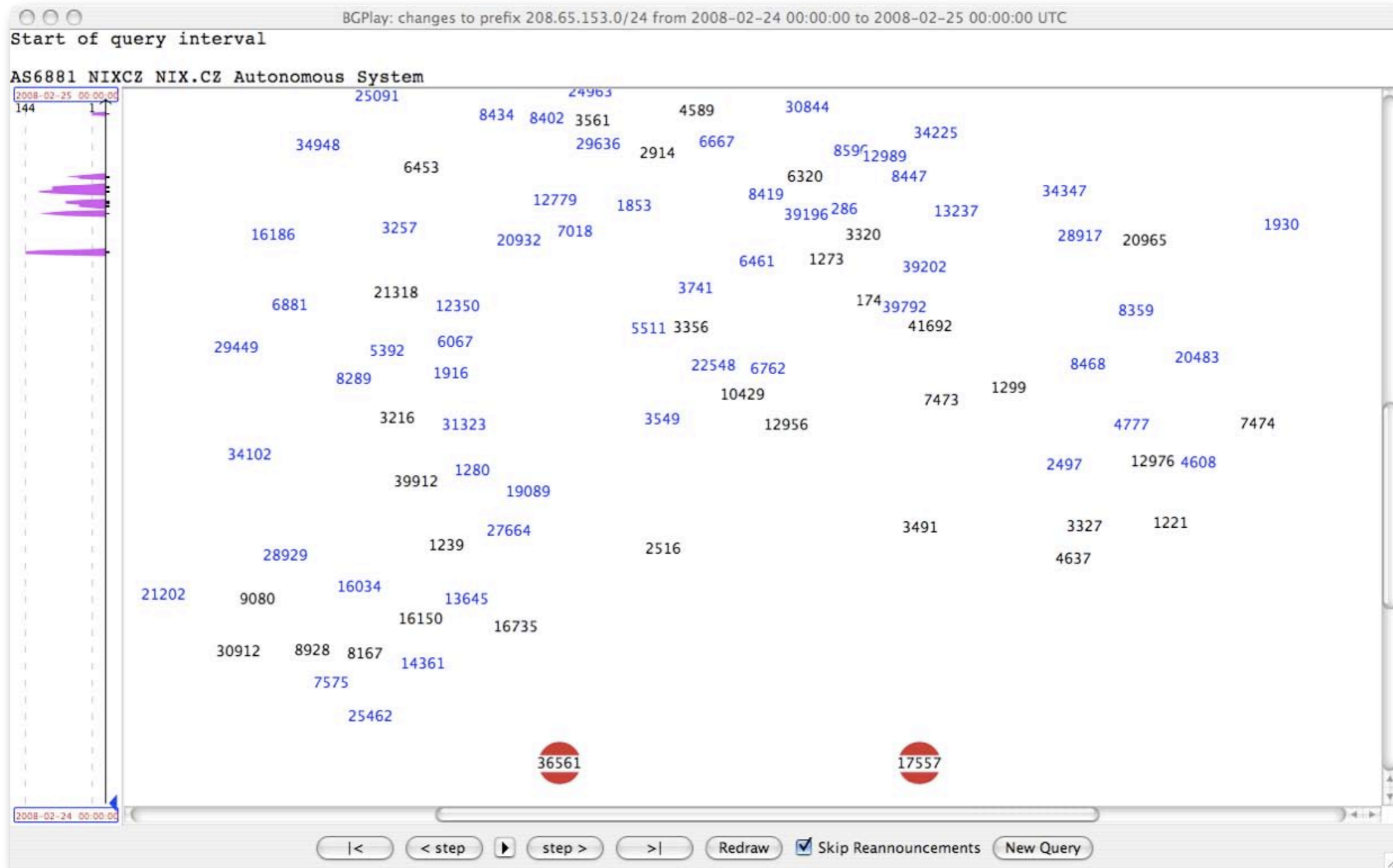
# Before the hijack



- AS36561 (YouTube) announce 208.65.152.0/22
- Connectivity barely changes (dotted lines)

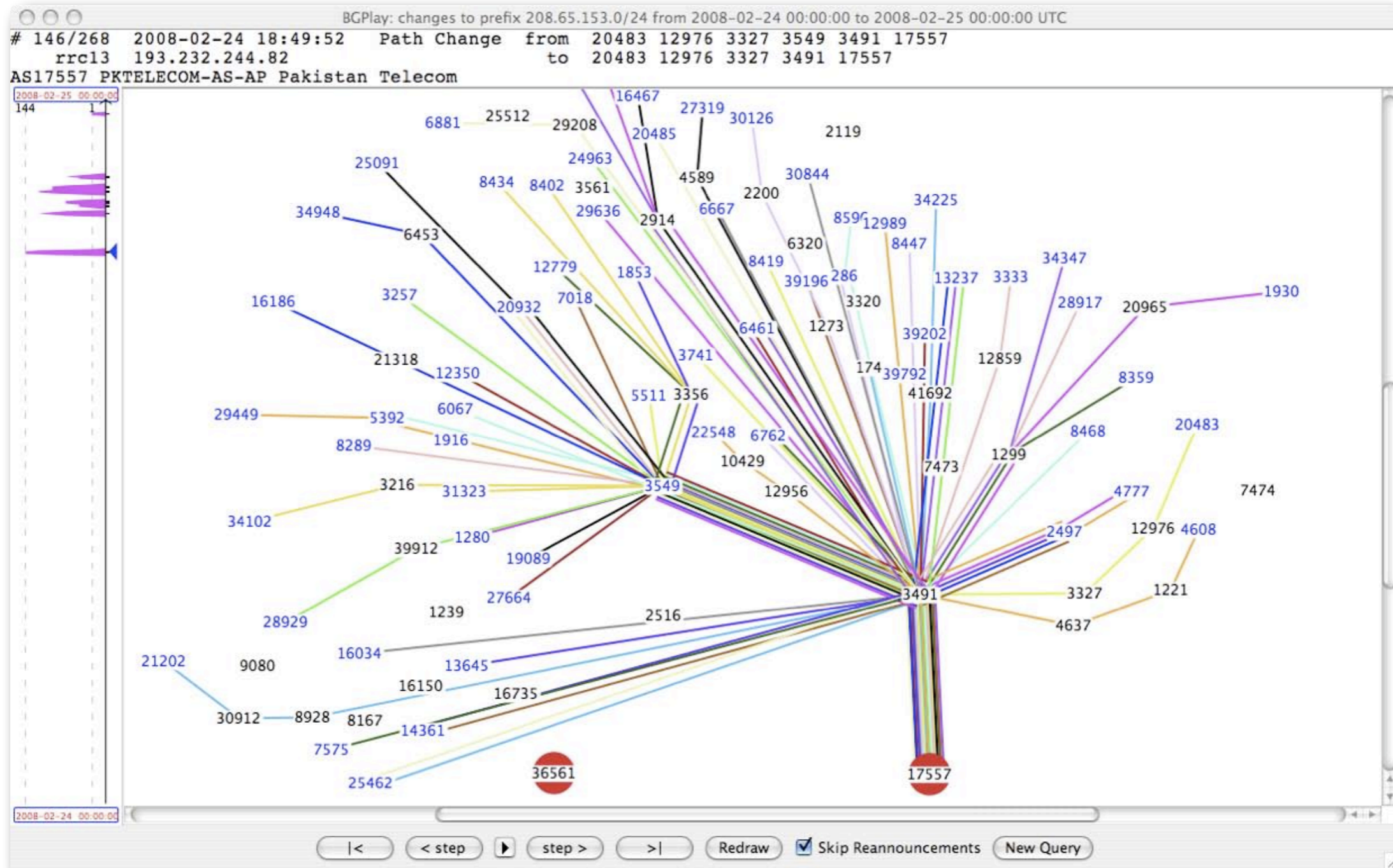


# Hijack



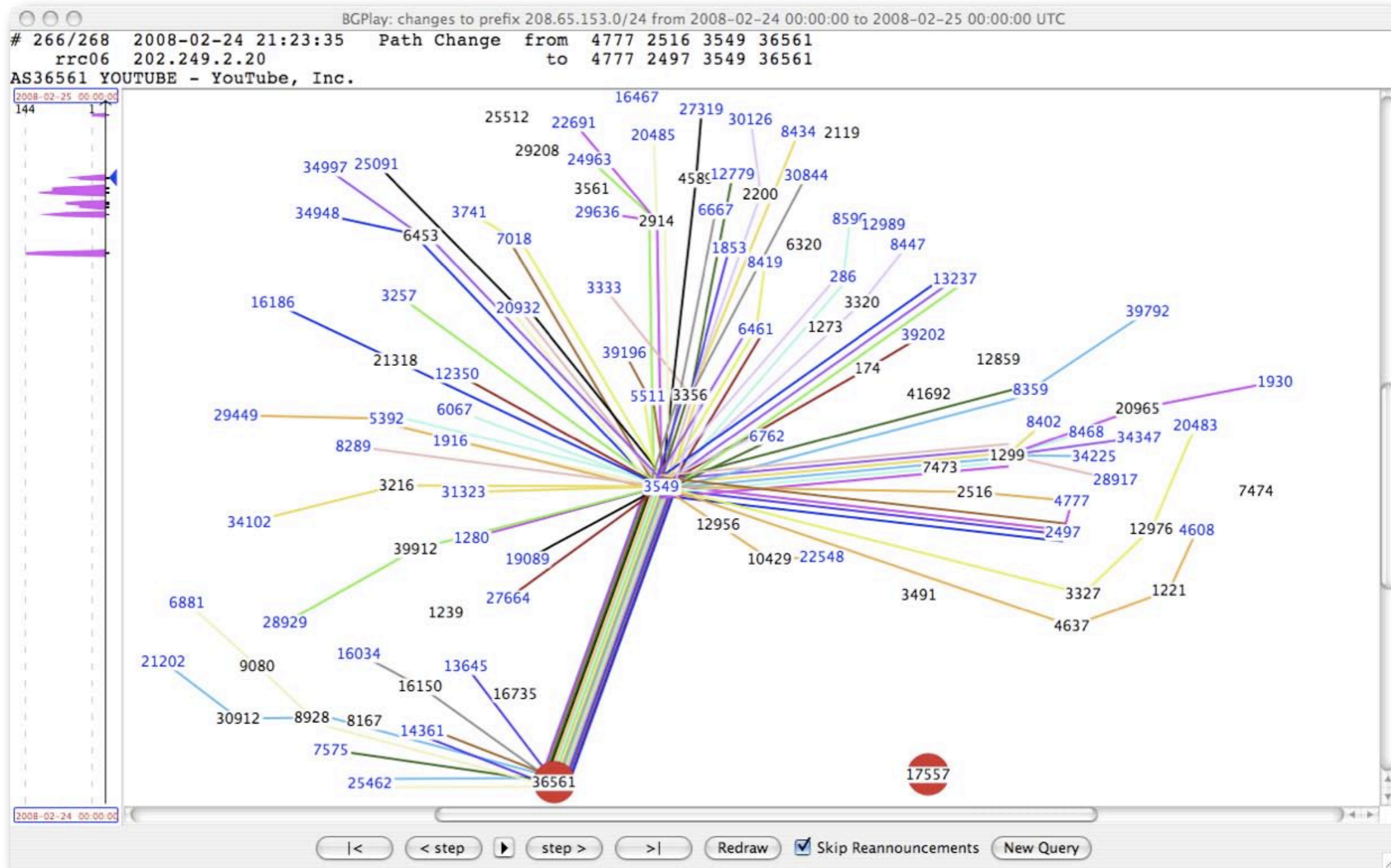
- 208.65.153.0/24 is not announced before the event

# Hijack



- Pakistan Telecom has been announcing 208.65.153.0/24 for 2 mins
- RIS peers receive the update, and traffic is redirected to Pakistan

# After the hijack



- YouTube announce 208.65.153.0/24 since 20:07
- RIS peers now only have routes to YouTube's AS6561

# 151/262 2008-02-24 20:07:26 Path Change from 7018 3549 3491 17557

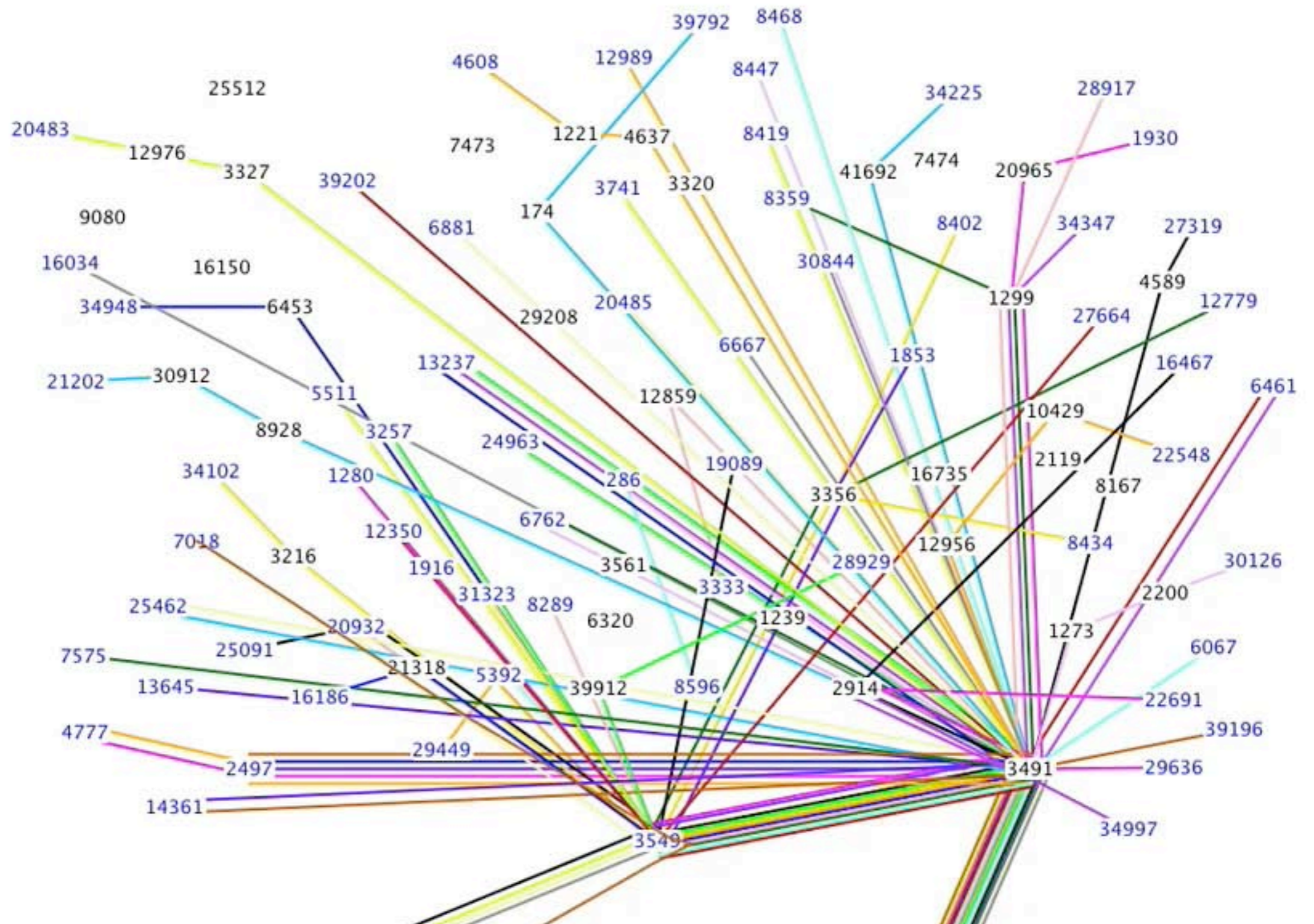
rrc00 12.0.1.63

to 7018 3549 36561

AS16150 PORT80-GLOBALTRANSIT Port80 AB, Sweden

2008-02-24 21:05:00

82



YouTube Inc. 36561

Pakistan Telecom 17557

2008-02-24 18:46:00



## Manage Alarms

You are logged in as [YouTube] and you are editing 36561

[MyASN](#) » - Manage Alarms

Showing  alarms in  group.  | [Manage alarm groups...](#) | [Add an alarm...](#)

ID	Group	Prefix	Type	Details	MinED	MinEC	ADW
4950	<input type="text" value="YouTube"/>	208.65.152.0/22	origin	My AS#: 36561	<input type="text" value="1m"/>	<input type="text" value="1"/>	<input type="text" value="1h"/> <input type="button" value="Update"/>

[disable](#) | [edit](#) | [delete](#) | [reset](#) | [show pending events](#) | [retromatch](#)

From: MyASN Notifications <ris@ripe.net>  
 Date: February 24, 2008 18:48:22  
 To: alerts@youtube.com  
 Subject: New MyASN alarms for 36561

Dear MyASN contact,

New alarms were detected for 36561. Please find the details below.  
 Depending on your detail level settings you might not see all the events.

Please use the web interface for further details:  
<http://www.ris.ripe.net/myasn/>

If you have any questions, don't hesitate to contact us at:  
[ris@ripe.net](mailto:ris@ripe.net)

## View Alarm Events

You are logged in as [YouTube] and y

[MyASN](#) » - [View Alarms](#) » - View Alarm Ev

### Alarm 2 events

Showing data from

Displaying results 1 - 2 out of total 2.

RRC	Prefix	AS Path	Conflict AS	Peer	First seen
<a href="#">rrc00</a>	<a href="#">208.65.153.0/24</a>	<a href="#">3333 6320 3549 3491 17557</a>	17557	<a href="#">193.203.0.124</a>	Sun Feb 24 18:47:32 2008

RRC	ID	Prefix	Aspath	Peer	First Seen	Last Seen	#	State
<a href="#">rrc00</a>	19665547	<a href="#">208.65.153.0/24</a>	<a href="#">3333</a> <a href="#">6320</a> <a href="#">3549</a> <a href="#">3491</a> <a href="#">17557</a>	193.136.5.1	Sun Feb 24 18:47:32 2008	Sun Feb 24 20:52:15 2008	2	sent
<a href="#">rrc00</a>	19665549	<a href="#">208.65.153.0/24</a>	<a href="#">3333</a> <a href="#">12859</a> <a href="#">3491</a> <a href="#">17557</a>	193.136.5.1	Sun Feb 24 18:48:02 2008	Sun Feb 24 20:51:48 2008	2	sent

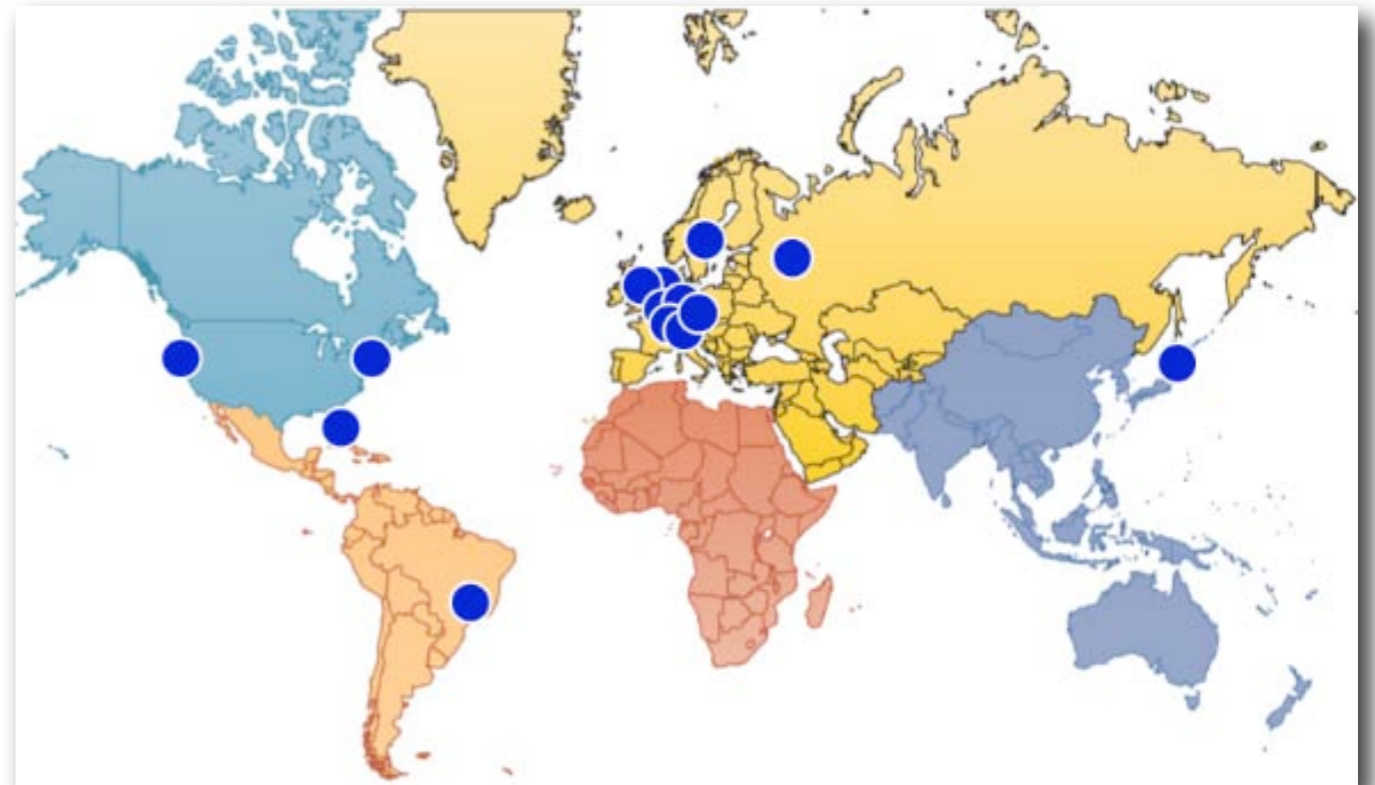
Displaying results 1 - 4 out of total 4.



# Credits

- Routing Information Service (RIS)

- <http://www.ripe.net/ris>



- RIPE NCC Information Services

- <http://is-portal.ripe.net>

- Full analysis

- <http://www.ripe.net/news/study-youtube-hijacking.html>

# Questions?

