NSRC

Network Startup Resource Center

Network Management & Monitoring

NfSen

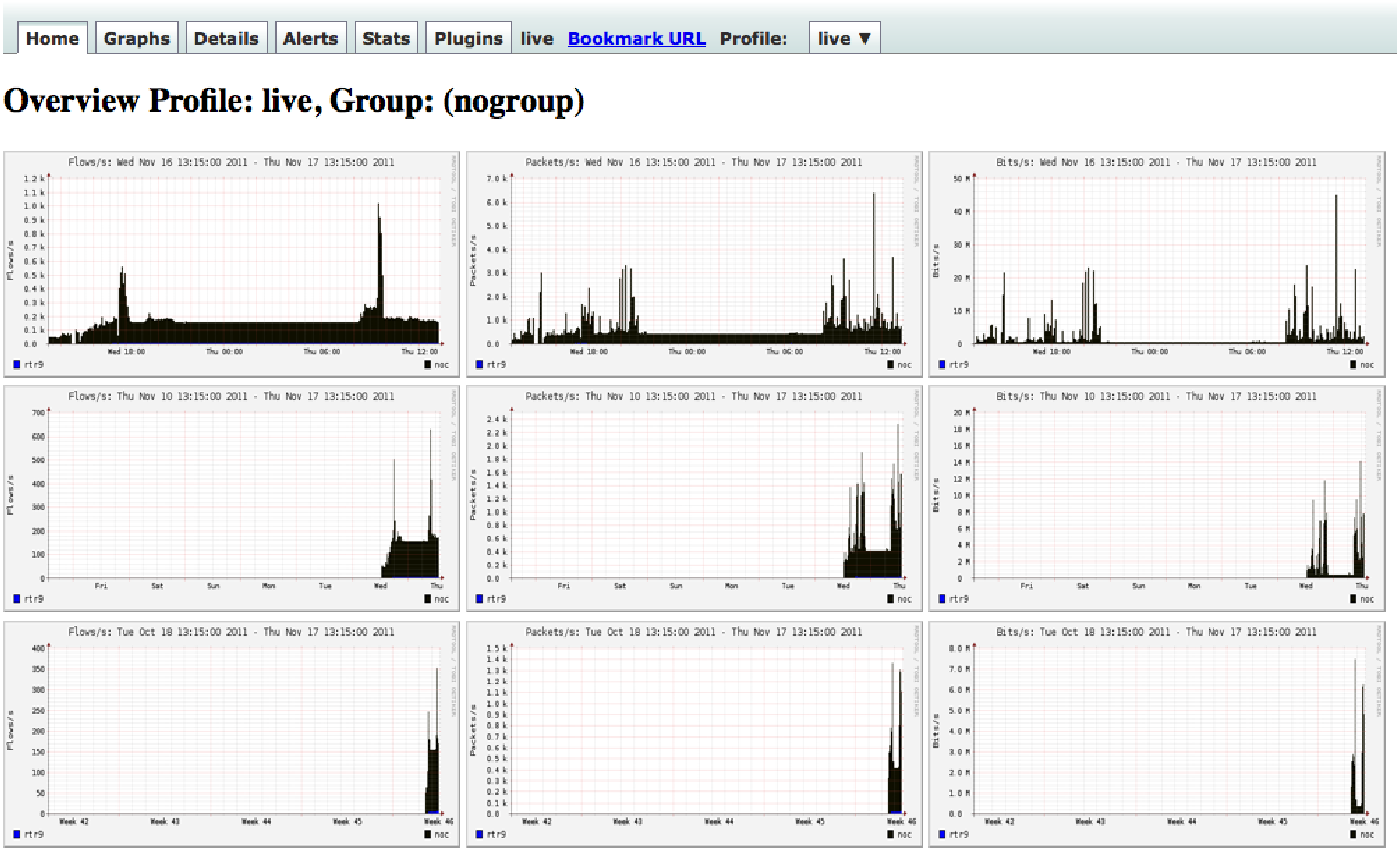
What is NfSen

- Is a graphical (Web Based) front end to NfDump
- NfDump tools collect and process netflow data on the command line
- NfSen allows you to:
  - Easily navigate through the netflow data.
  - Process the netflow data within the specified time span.
  - Create history as well as continuous profiles.
  - Set alerts, based on various conditions.
  - Write your own plugins to process netflow data on a regular interval.

NfSen structure

- Configuration file - nfsen.conf
- NfDump files – Netflow files containing collected flows stored in ‘profiles-data’ directory
  - NB: It is possible for other programs to read NFdump files but don’t store them for too long as they can fill up your drive
- Actual graphs – stored in ‘profiles-stat’ directory

NfSen Home Screen


Home
Graphs
Details
Alerts
Stats
Plugins
live
Bookmark URL
Profile:
live ▼

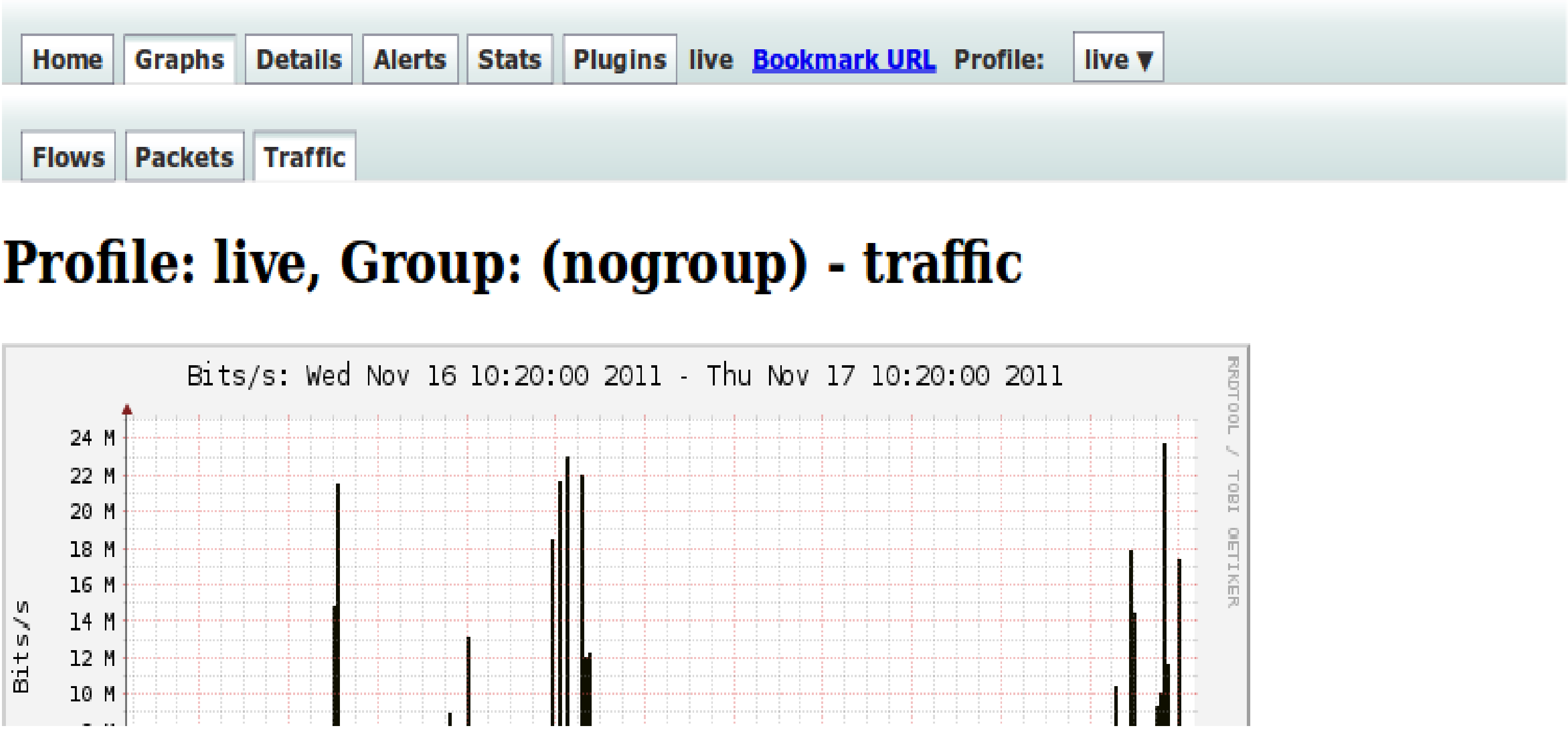
Overview Profile: live, Group: (nogroup)

Flows/s: Wed Nov 16 13:15:00 2011 - Thu Nov 17 13:15:00 2011
Flows/s
Wed 18:00
Thu 00:00
Thu 06:00
Thu 12:00
rtr9
noc
Packets/s: Wed Nov 16 13:15:00 2011 - Thu Nov 17 13:15:00 2011
Packets/s
Wed 18:00
Thu 00:00
Thu 06:00
Thu 12:00
rtr9
noc
Bits/s: Wed Nov 16 13:15:00 2011 - Thu Nov 17 13:15:00 2011
Bits/s
Wed 18:00
Thu 00:00
Thu 06:00
Thu 12:00
rtr9
noc
Flows/s: Thu Nov 10 13:15:00 2011 - Thu Nov 17 13:15:00 2011
Flows/s
Fri
Sat
Sun
Mon
Tue
Wed
Thu
rtr9
noc
Packets/s: Thu Nov 10 13:15:00 2011 - Thu Nov 17 13:15:00 2011
Packets/s
Fri
Sat
Sun
Mon
Tue
Wed
Thu
rtr9
noc
Bits/s: Thu Nov 10 13:15:00 2011 - Thu Nov 17 13:15:00 2011
Bits/s
Fri
Sat
Sun
Mon
Tue
Wed
Thu
rtr9
noc
Flows/s: Tue Oct 18 13:15:00 2011 - Thu Nov 17 13:15:00 2011
Flows/s
Week 42
Week 43
Week 44
Week 45
Week 46
rtr9
noc
Packets/s: Tue Oct 18 13:15:00 2011 - Thu Nov 17 13:15:00 2011
Packets/s
Week 42
Week 43
Week 44
Week 45
Week 46
rtr9
noc
Bits/s: Tue Oct 18 13:15:00 2011 - Thu Nov 17 13:15:00 2011
Bits/s
Week 42
Week 43
Week 44
Week 45
Week 46
rtr9
noc

Graphs Tab

Graphs of flows, packets and traffic based on interface with netflow activated

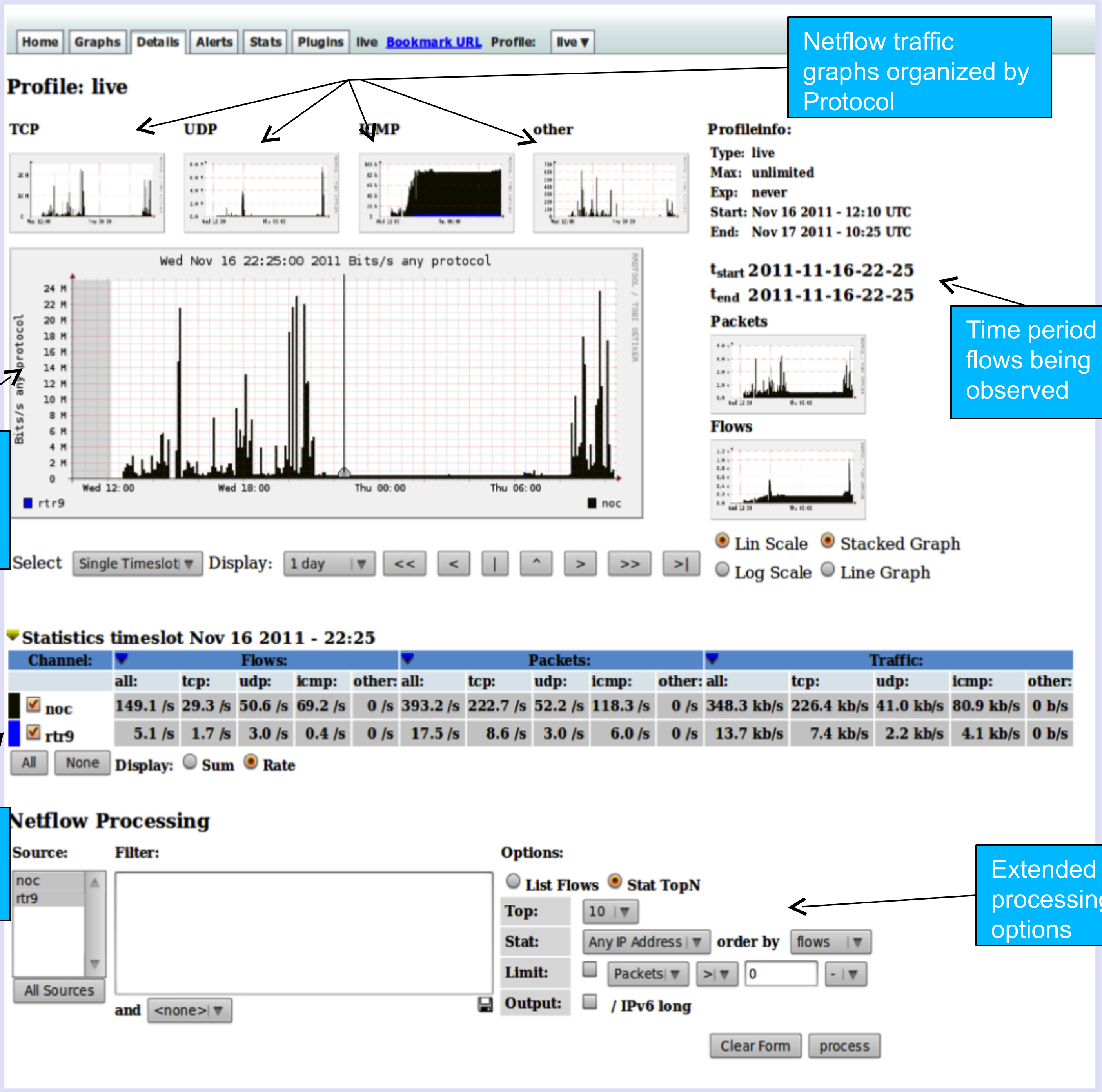
NB: What is seen under Traffic should closely match what is under Cacti for the same interface



Profile: live, Group: (nogroup) - traffic

Details Page

- Most interesting page
- Can view present flow information or stored flow information
- Can view detailed Netflow information such as
  - AS Numbers (more useful if you have full routing table exported on your router)
  - Src hosts/ports, destination hosts and ports
  - Unidirectional or Bi-directional flows
  - Flows on specific interfaces
  - Protocols and TOS



Profile: live

Profileinfo:

Type: live
Max: unlimited
Exp: never
Start: Nov 16 2011 - 12:10 UTC
End: Nov 17 2011 - 10:25 UTC

t_{start} 2011-11-16-22-25
t_{end} 2011-11-16-22-25

Select: Single Timeslot ▼ Display: 1 day ▼ << < | ^ > >> >|

● Lin Scale ● Stacked Graph
○ Log Scale ○ Line Graph

Statistics timeslot Nov 16 2011 - 22:25

Channel:	Flows:					Packets:					Traffic:				
	all:	tcp:	udp:	icmp:	other:	all:	tcp:	udp:	icmp:	other:	all:	tcp:	udp:	icmp:	other:
■ ☑ noc	149.1 /s	29.3 /s	50.6 /s	69.2 /s	0 /s	393.2 /s	222.7 /s	52.2 /s	118.3 /s	0 /s	348.3 kb/s	226.4 kb/s	41.0 kb/s	80.9 kb/s	0 b/s
■ ☑ rtr9	5.1 /s	1.7 /s	3.0 /s	0.4 /s	0 /s	17.5 /s	8.6 /s	3.0 /s	6.0 /s	0 /s	13.7 kb/s	7.4 kb/s	2.2 kb/s	4.1 kb/s	0 b/s

All None Display: ○ Sum ● Rate

Netflow Processing

Source: noc, rtr9 — All Sources

Filter:

and <none> ▼

Options:

○ List Flows ● Stat TopN

Top: 10 ▼

Stat: Any IP Address ▼ order by flows ▼

Limit: □ Packets ▼ > ▼ 0 - ▼

Output: □ / IPv6 long

Clear Form process

Netflow traffic graphs organized by Protocol

Time period for flows being observed

Graph of Netflow traffic for all Protocols

Routers being monitored

Extended Netflow processing options

Alerts and Stats

Alerts Page

- Can create alerts based on set thresholds eg, increase or decrease of traffic
- Emails can be sent once alarm is triggered

Stats page

- Can create graphs based on specific information
  - ASNs,
  - Host/Destination IPs/Ports
  - In/Out interfaces
  - Among others

Plugins

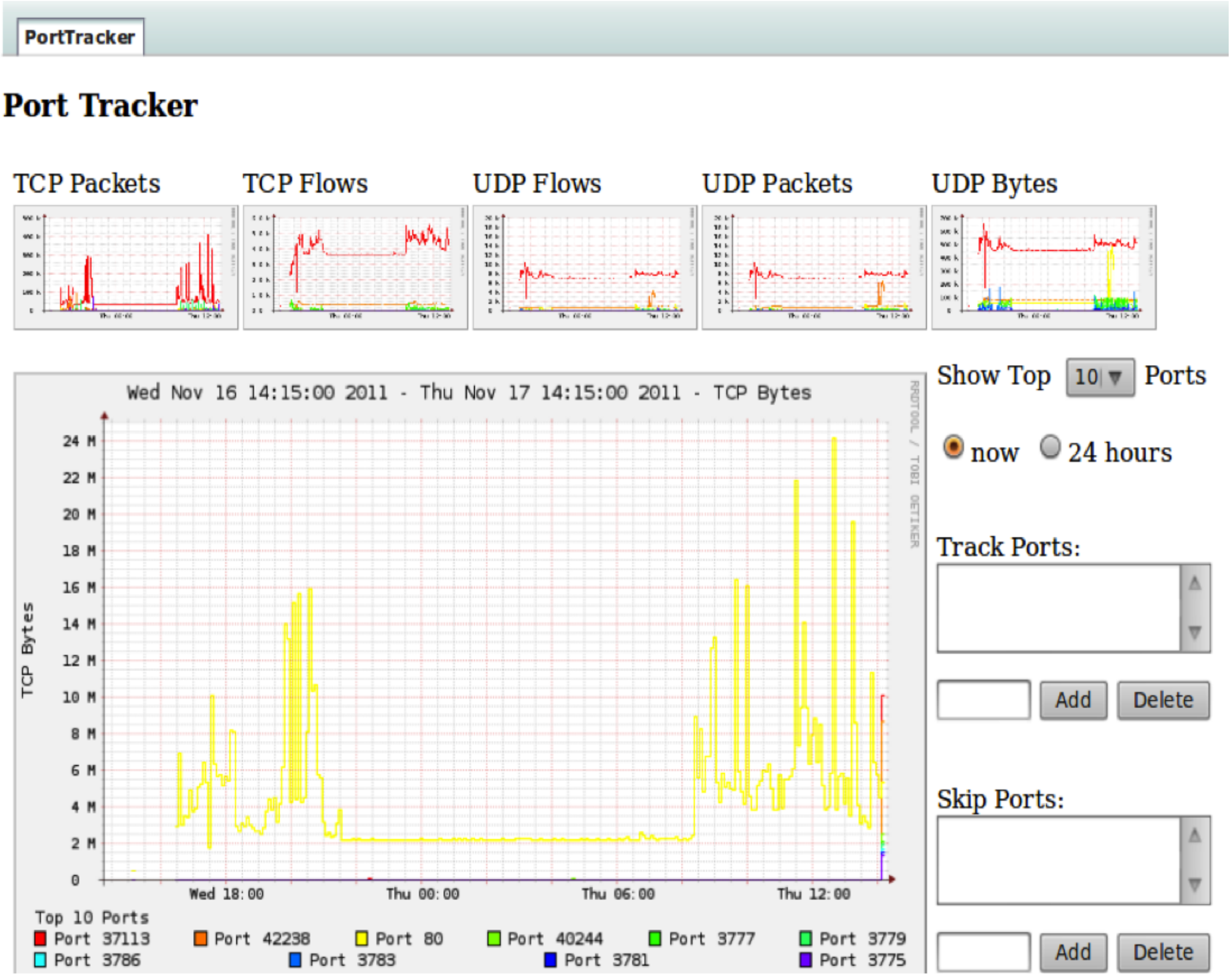
Several plugins available:

- **Portracker** tracks the top 10 most active ports and displays a graph
- **Surfmap** displays country based traffic based on a Geo-Locator

More plugins available here

http://sourceforge.net/apps/trac/nfsen-plugins/

PortTracker



PortTracker

Port Tracker

TCP Packets

TCP Flows

UDP Flows

UDP Packets

UDP Bytes

Show Top 10 ▼ Ports

● now ○ 24 hours

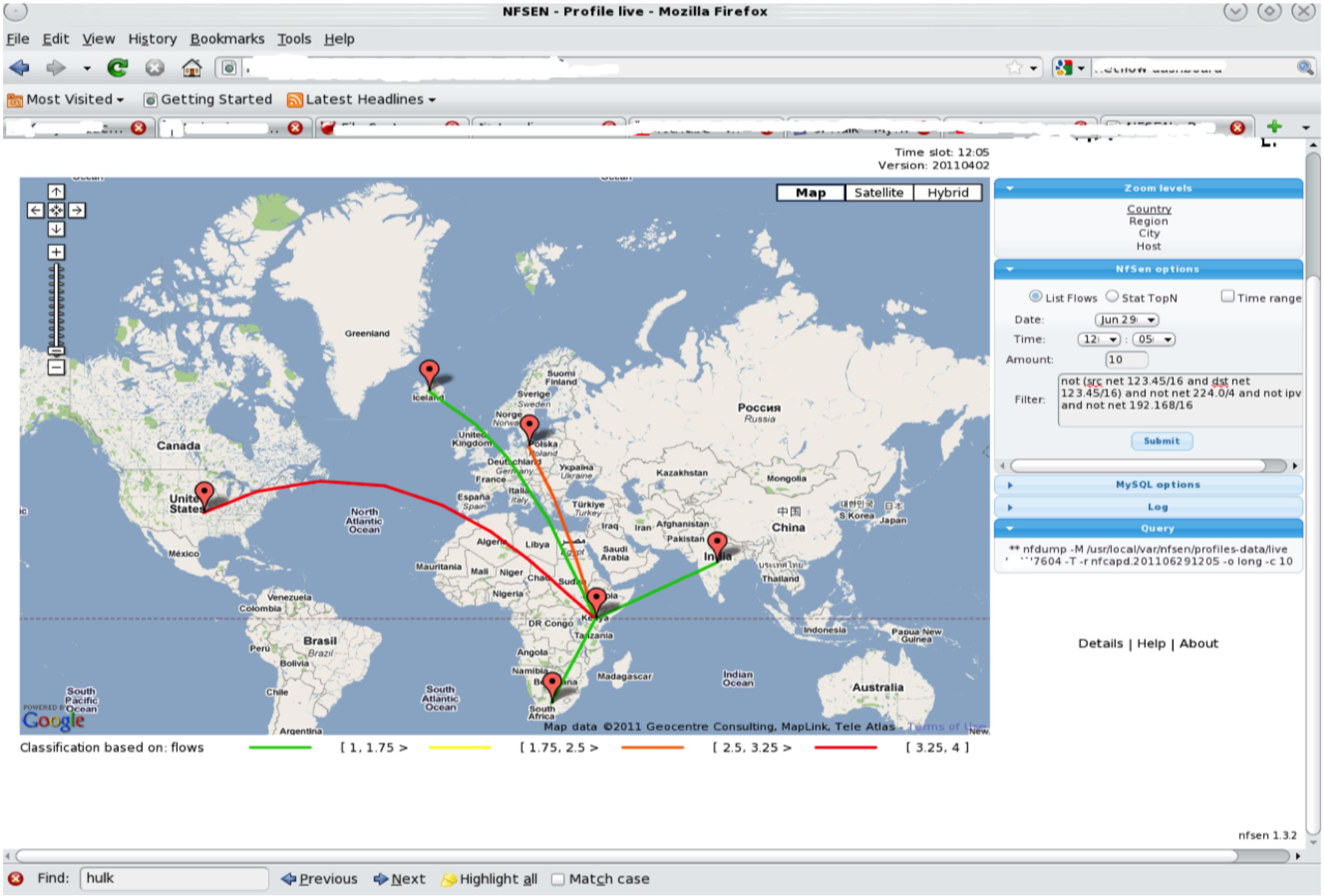
Track Ports:

Add Delete

Skip Ports:

Add Delete

SurfMap



NFSEN - Profile live - Mozilla Firefox

Time slot: 12:05
Version: 20110402

Zoom levels

Country
Region
City
Host

NfSen options

● List Flows ○ Stat TopN □ Time range

Date: Jun 29

Time: 12 : 05

Amount: 10

Filter: not (src net 123.45/16 and dst net 123.45/16) and not net 224.0/4 and not ipv and not net 192.168/16

Query

```
** nfdump -M /usr/local/var/nfsen/profiles-data/live
[redacted]'''7604 -T -r nfcapd.201106291205 -o long -c 10
```

Classification based on: flows 🟩 [1, 1.75 > 🟨 [1.75, 2.5 > 🟧 [2.5, 3.25 > 🟥 [3.25, 4]

Details | Help | About

nfsen 1.3.2

Find: hulk

When to use NfSen

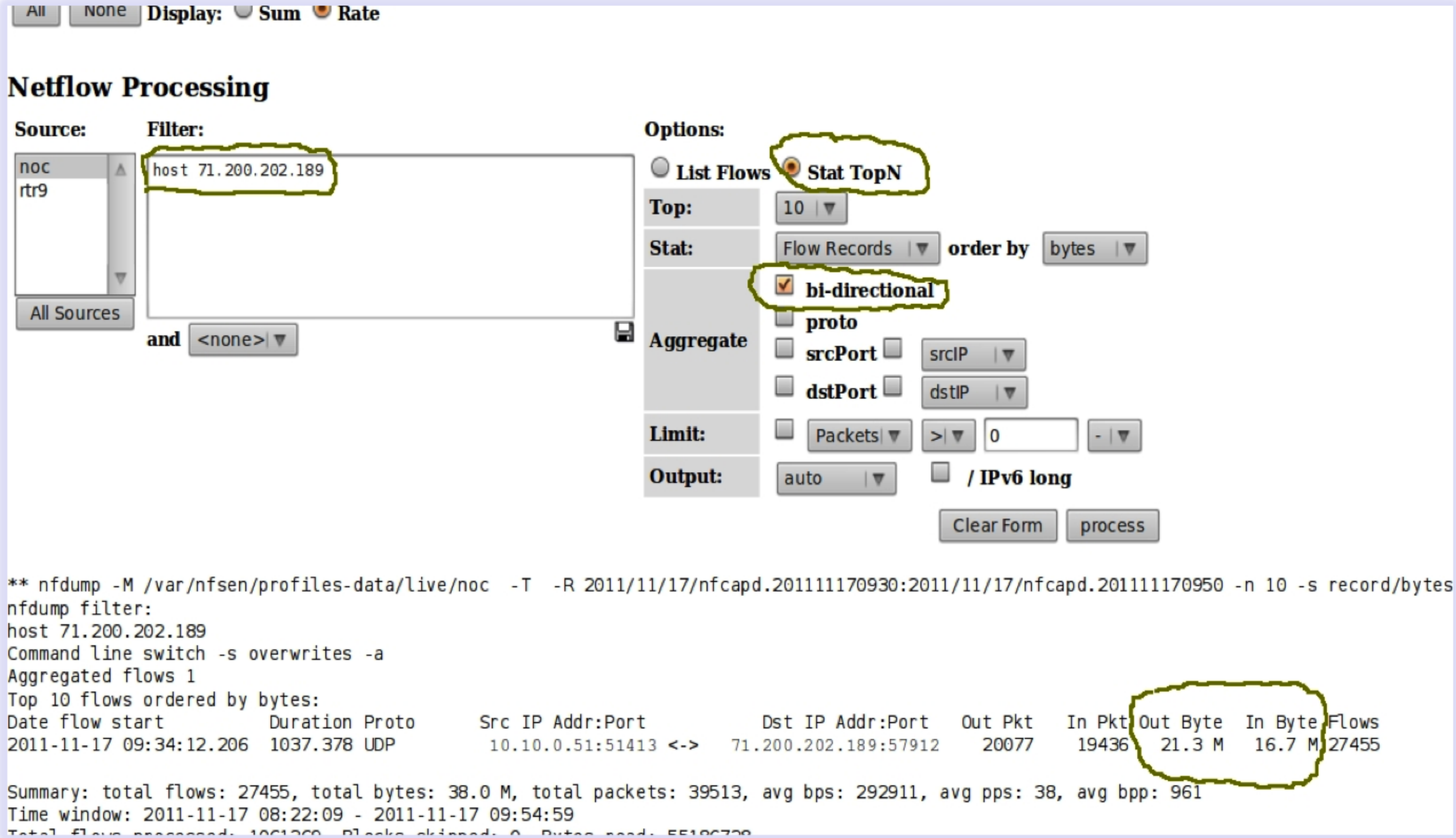
- Can be used for:
  - Forensic work: which hosts were active at a specific time
  - Viewing src/dst AS traffic, src/dst port/IP traffic among many other options
  - Identifying most active IPs or Protocols
- It is a tool to complement Cacti so that you can have more detailed info regarding the traffic
- With this information, you can make an informed decision eg:
  - You have a high amount of SMTP traffic, some machines could be sending out spam
  - 80% of your traffic is to ASN X. Perhaps its wise to connect directly with that network and save costs

Bidirectional vs Unidirectional traffic as seen via NfSen

Unidirectional and Bidirectional

- Unidirectional shows flows from host A to B and then host B to host A
- Bidirectional shows flows between Host A and B combined
- Can be used with any of the other filters (src port, src host plus many more)
- List of filters can be found here:
  - http://nfsen.sourceforge.net/#mozTocId652064

Bidirectional



Display: ○ Sum ● Rate

Netflow Processing

Source: noc, rtr9

Filter: host 71.200.202.189

and <none>

Options: ○ List Flows ● Stat TopN

Top: 10

Stat: Flow Records order by bytes

Aggregate: ☑ bi-directional □ proto □ srcPort □ srcIP □ dstPort □ dstIP

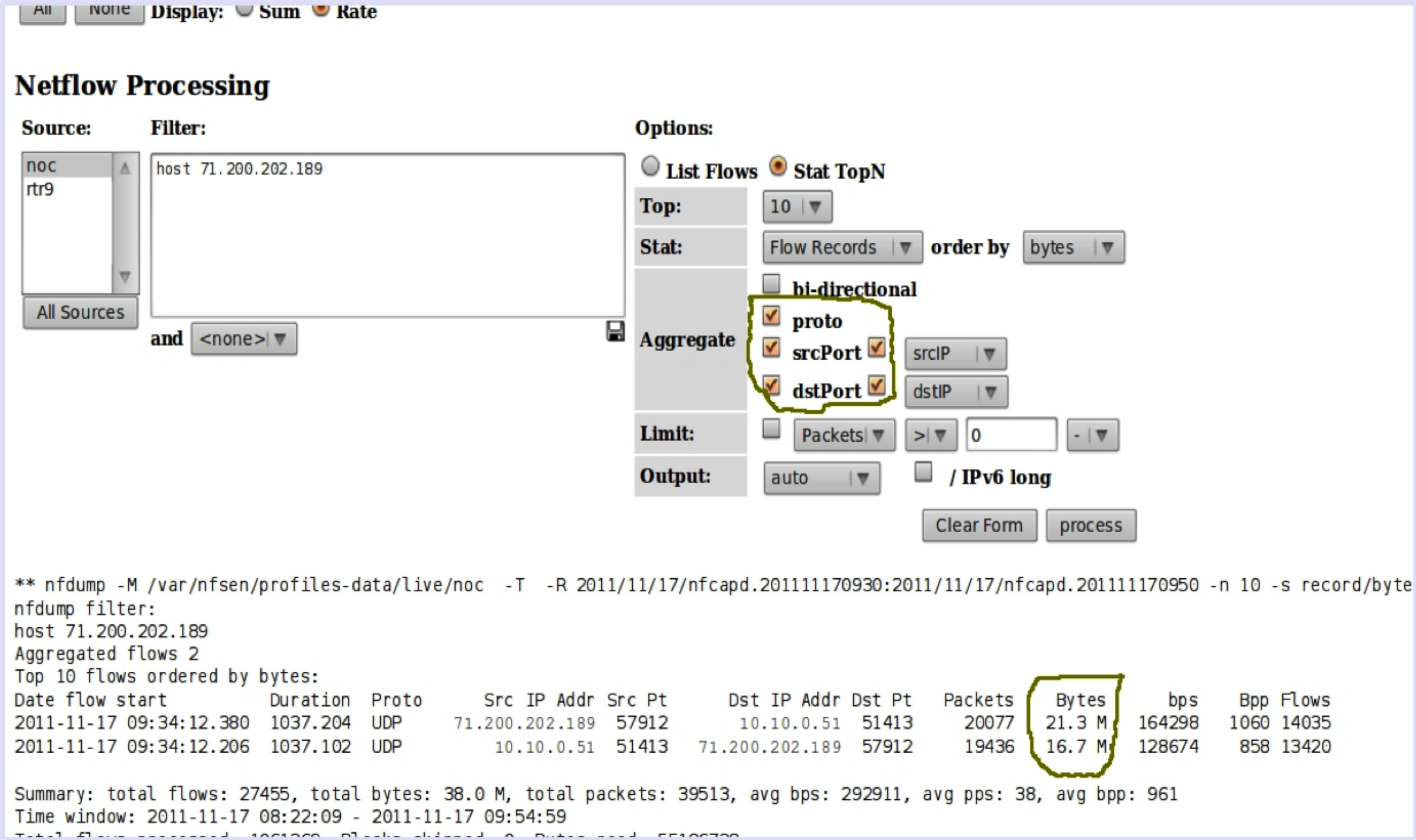
Limit: □ Packets > 0 -

Output: auto □ / IPv6 long

```
** nfdump -M /var/nfsen/profiles-data/live/noc  -T  -R 2011/11/17/nfcapd.201111170930:2011/11/17/nfcapd.201111170950 -n 10 -s record/bytes
nfdump filter:
host 71.200.202.189
Command line switch -s overwrites -a
Aggregated flows 1
Top 10 flows ordered by bytes:
Date flow start          Duration Proto      Src IP Addr:Port          Dst IP Addr:Port   Out Pkt   In Pkt Out Byte  In Byte Flows
2011-11-17 09:34:12.206  1037.378 UDP        10.10.0.51:51413 <->   71.200.202.189:57912   20077    19436   21.3 M   16.7 M 27455

Summary: total flows: 27455, total bytes: 38.0 M, total packets: 39513, avg bps: 292911, avg pps: 38, avg bpp: 961
Time window: 2011-11-17 08:22:09 - 2011-11-17 09:54:59
Total flows processed: 1061269, Blocks skipped: 0, Bytes read: 55186728
```

Unidirectional



Netflow Processing

Source: noc, rtr9

Filter: host 71.200.202.189

and <none>

Options: ○ List Flows ● Stat TopN

Top: 10

Stat: Flow Records order by bytes

Aggregate: □ bi-directional
☑ proto
☑ srcPort ☑ srcIP
☑ dstPort ☑ dstIP

Limit: □ Packets > 0 -

Output: auto □ / IPv6 long

```
** nfdump -M /var/nfsen/profiles-data/live/noc  -T  -R 2011/11/17/nfcapd.201111170930:2011/11/17/nfcapd.201111170950 -n 10 -s record/byte
nfdump filter:
host 71.200.202.189
Aggregated flows 2
Top 10 flows ordered by bytes:
Date flow start          Duration Proto      Src IP Addr Src Pt      Dst IP Addr Dst Pt   Packets    Bytes      bps    Bpp Flows
2011-11-17 09:34:12.380  1037.204 UDP     71.200.202.189  57912      10.10.0.51  51413     20077   21.3 M   164298   1060 14035
2011-11-17 09:34:12.206  1037.102 UDP         10.10.0.51  51413  71.200.202.189  57912     19436   16.7 M   128674    858 13420

Summary: total flows: 27455, total bytes: 38.0 M, total packets: 39513, avg bps: 292911, avg pps: 38, avg bpp: 961
Time window: 2011-11-17 08:22:09 - 2011-11-17 09:54:59
```

References

NfSen

- http://nfsen.sourceforge.net

NfDump

- http://nfdump.sourceforge.net/

Exercises