Network Startup Resource Center

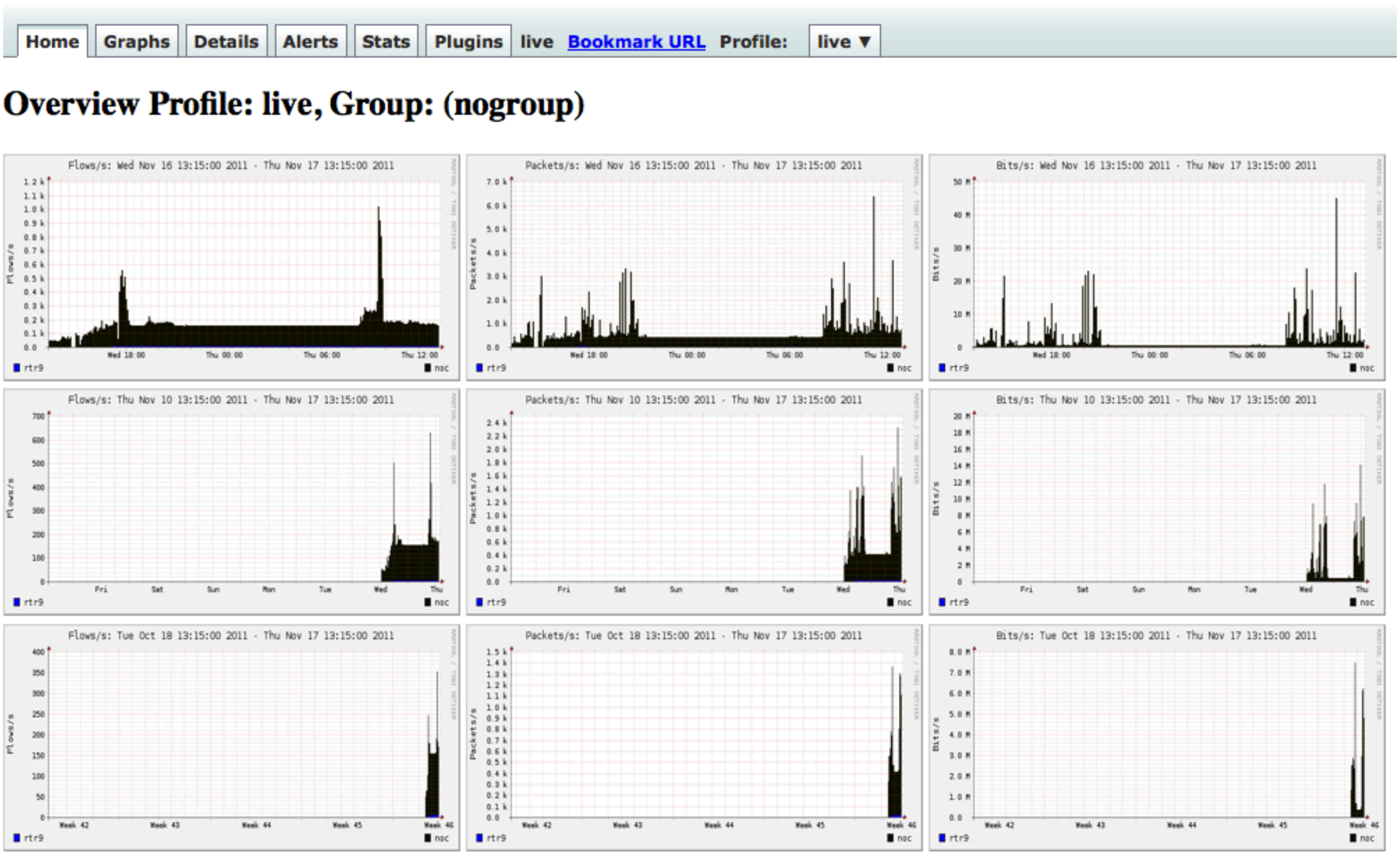
Network Management & Monitoring

NfSen

What is NfSen

- Is a graphical 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 Home Screen



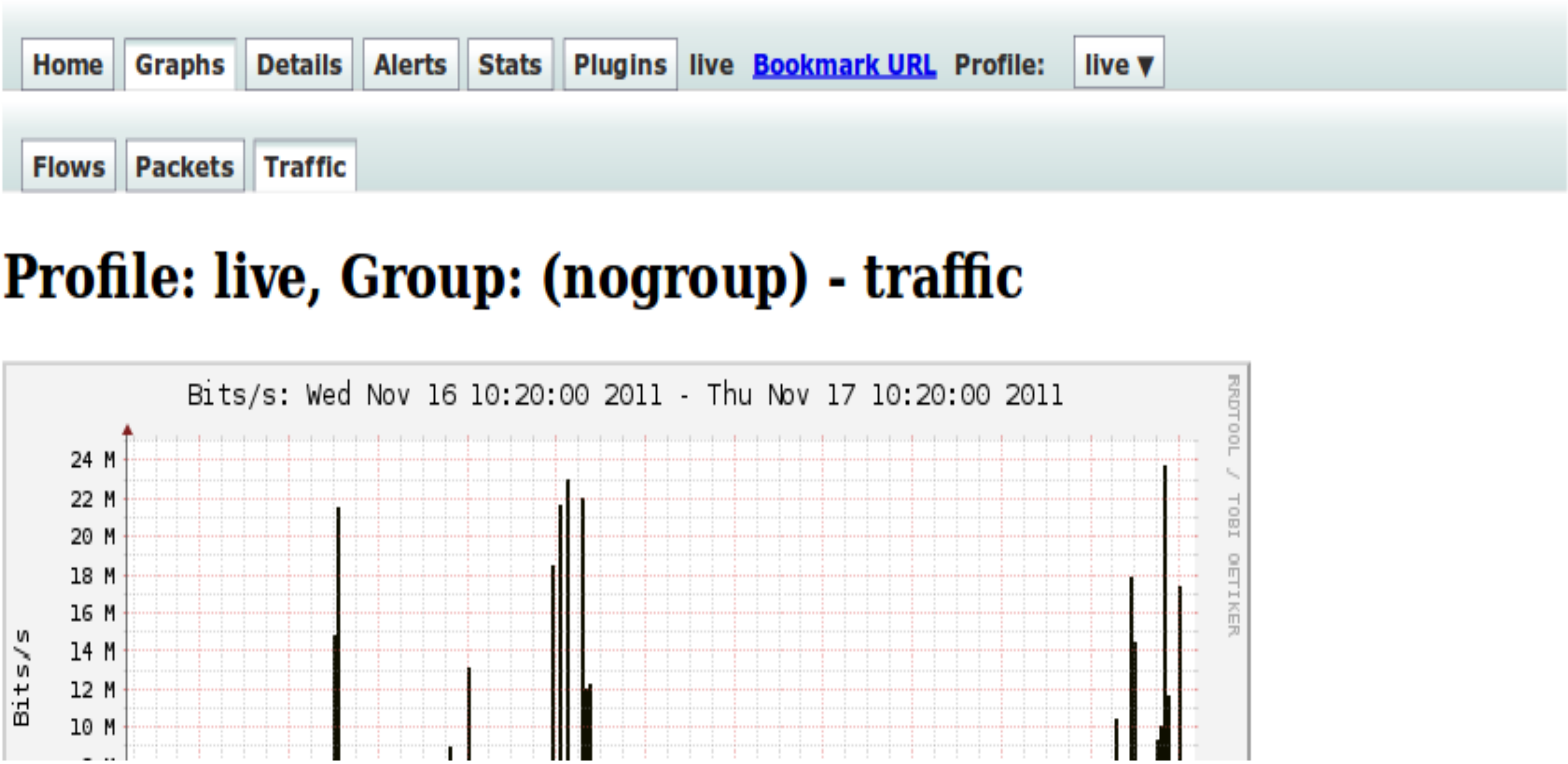
Home | Graphs | Details | Alerts | Stats | Plugins | live | Bookmark URL | Profile: live ▼

Overview Profile: live, Group: (nogroup)

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

Graphs Tab

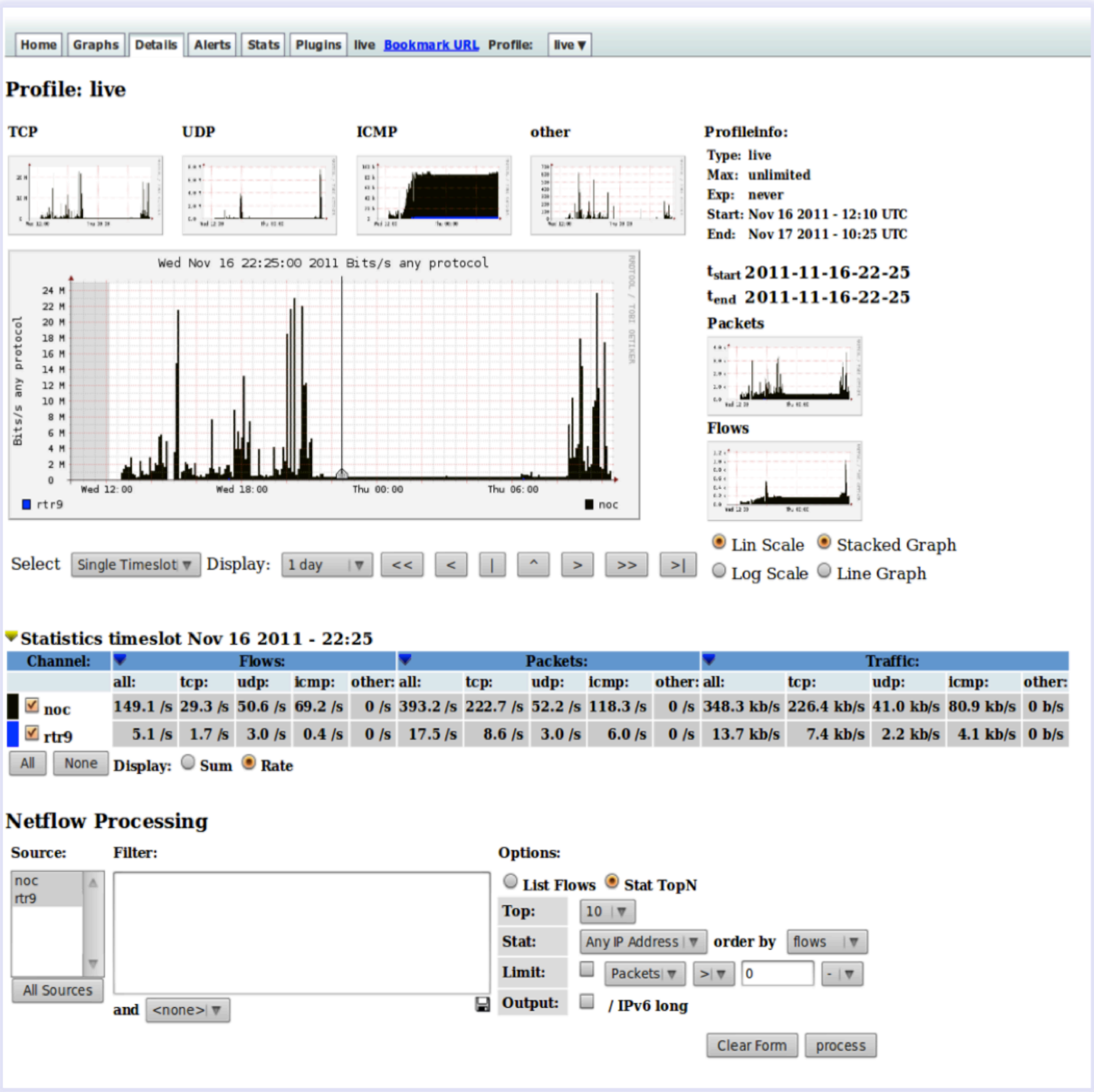
Graphs of flows, packets and traffic based on interface with netflow activated



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

● 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

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

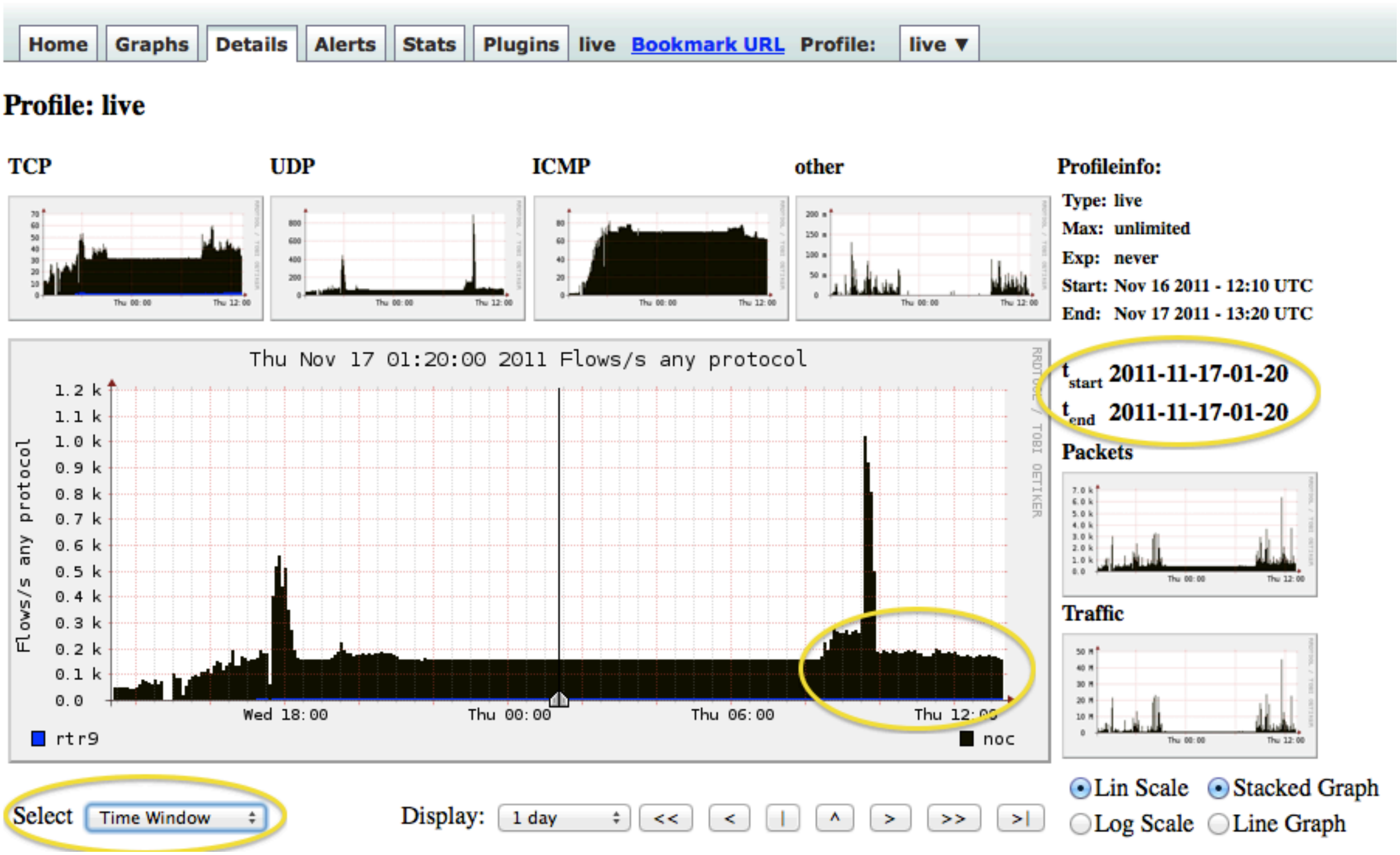
Stats page

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

History/Past Flows

- Can be used for forensic work
- Displays flow transactions based on specific time, time selected by working with time window graph
- Can view unidirectional or bidirectional flows
- Can sort by top flows, src AS, dst port among many other options

Time Window



Profile: live

Profileinfo:

Type: live

Max: unlimited

Exp: never

Start: Nov 16 2011 - 12:10 UTC

End: Nov 17 2011 - 13:20 UTC

t_{start} 2011-11-17-01-20

t_{end} 2011-11-17-01-20

Select: Time Window

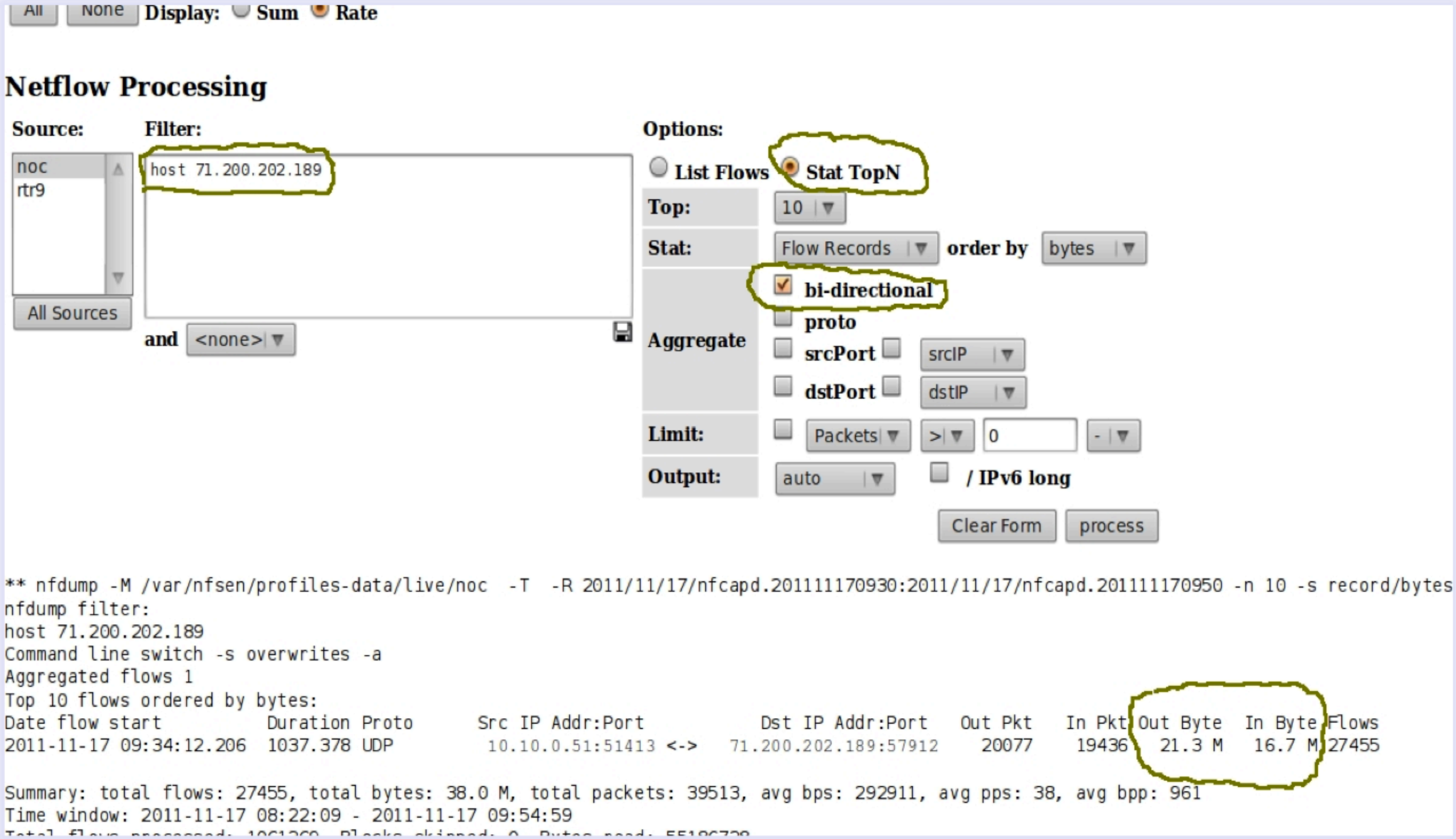
Display: 1 day

● Lin Scale ● Stacked Graph

○ Log Scale ○ Line Graph

Bidirectional vs Unidirectional

Bidirectional



Display: ○ Sum ● Rate

Netflow Processing

Source: noc, rtr9

Filter: host 71.200.202.189

Options: ○ List Flows ● Stat TopN

Top: 10

Stat: Flow Records order by bytes

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

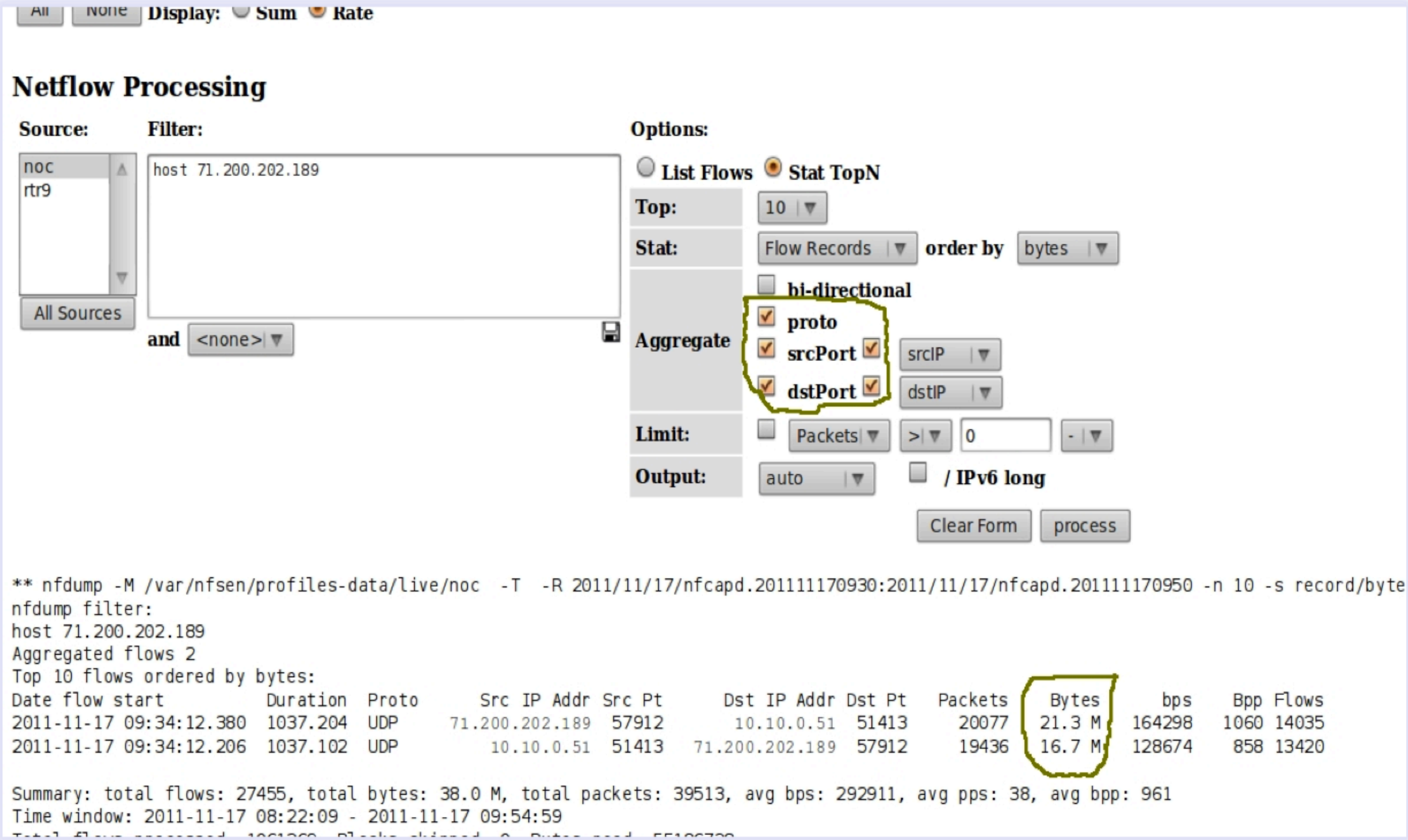
Limit: □ Packets > 0 -

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
```

Unidirectional



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/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
```

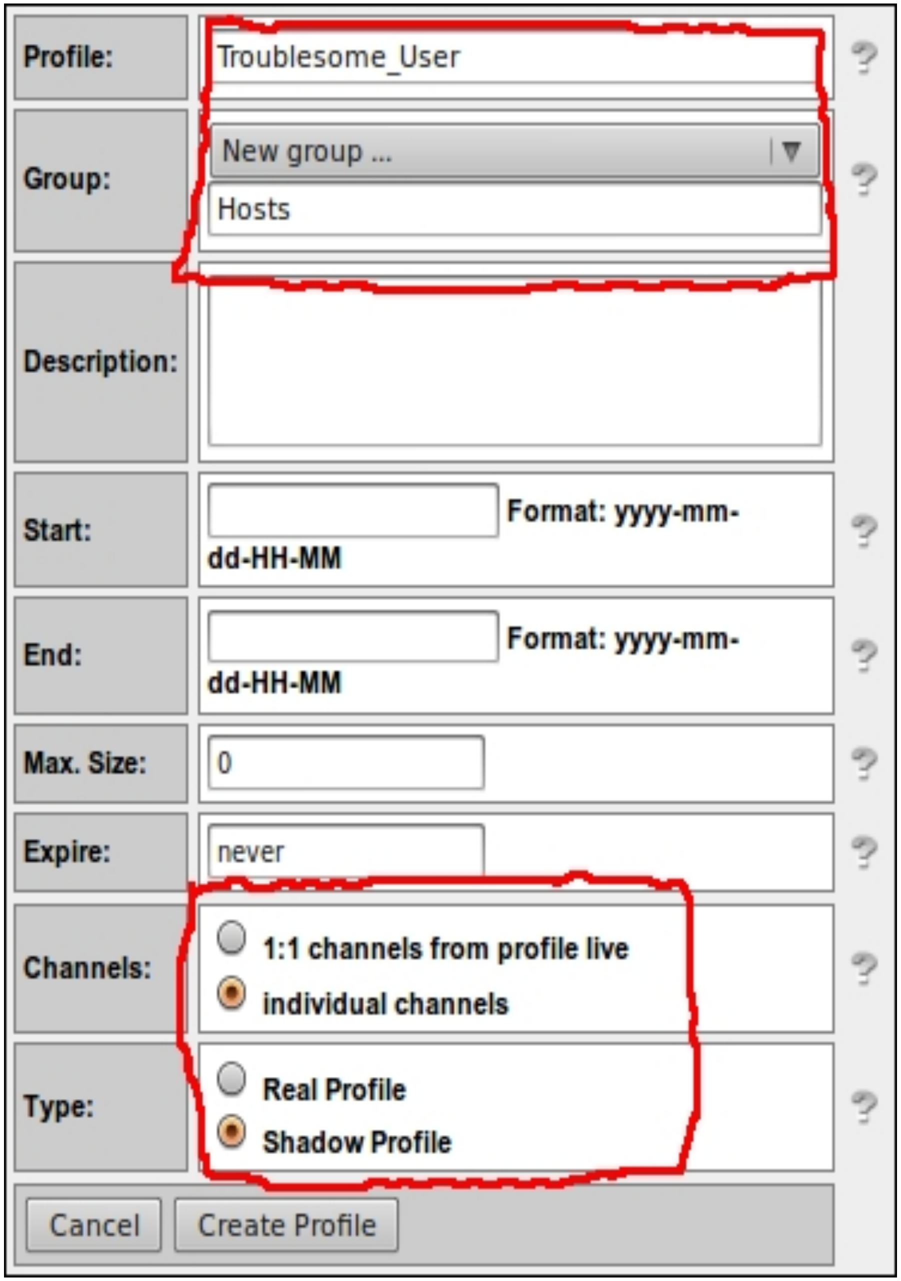
Unidirectional and Bidirectional

- 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

Graphing Specific Traffic Flows

Creating Stats

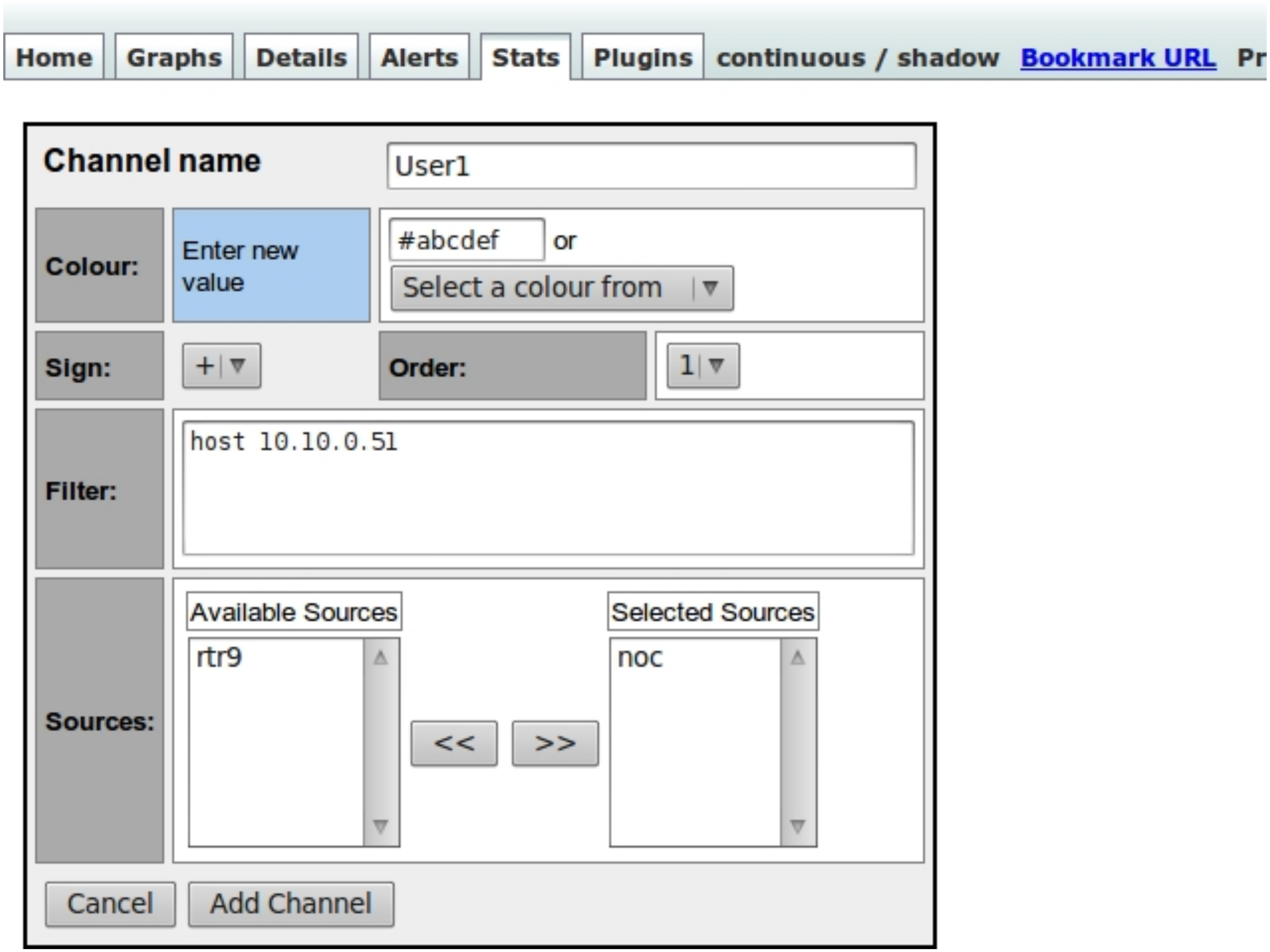
- Click on live on the top left and select new profile
- Enter a name for the profile and additionally create a new group
- Select individual channels and shadow profile.
  - Individual channel – can create channels with own filters
  - Shadow profile – save hard disk space by not creating new data but instead analyses already collected data



Profile:	Troublesome_User
Group:	New group ... ▼ Hosts
Description:	
Start:	Format: yyyy-mm-dd-HH-MM
End:	Format: yyyy-mm-dd-HH-MM
Max. Size:	0
Expire:	never
Channels:	○ 1:1 channels from profile live ● individual channels
Type:	○ Real Profile ● Shadow Profile

- When done click on 'Create Profile' at the bottom
- You will see a message “new profile created”
- Then click on the plus sign at the bottom to begin adding channels

Add a Channel



Channel name: User1

Colour: Enter new value: #abcdef or Select a colour from

Sign: +

Order: 1

Filter:

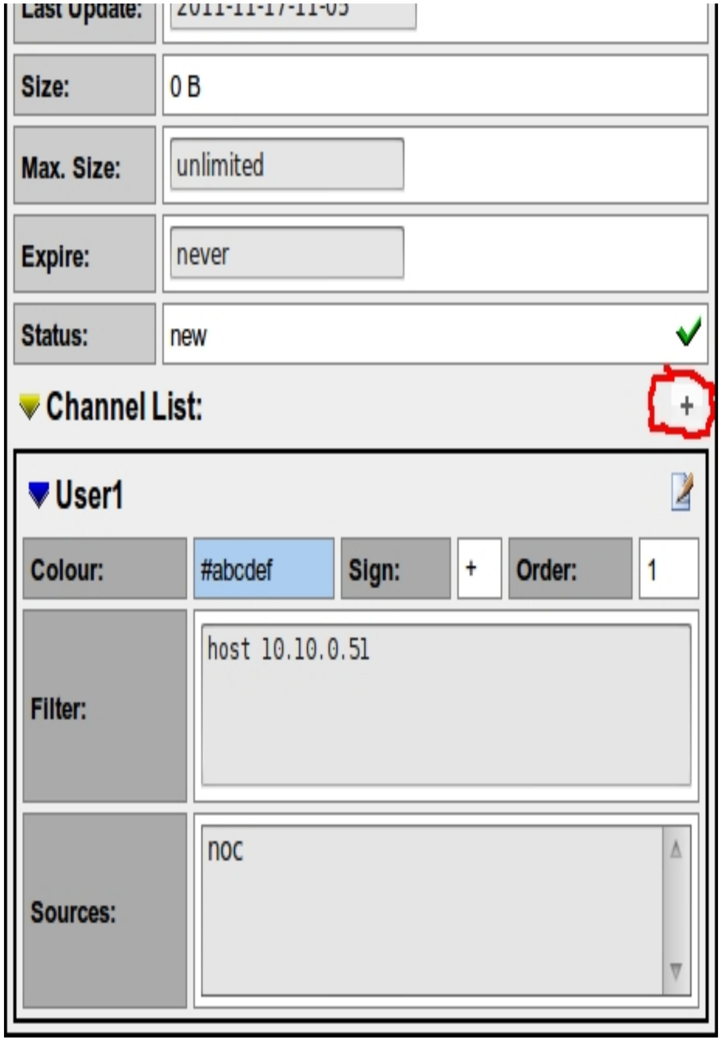
```
host 10.10.0.51
```

Sources:

Available Sources: rtr9

Selected Sources: noc

Add a second channel and start to accept



Last Update: 2011-11-17-11-05

Size: 0 B

Max. Size: unlimited

Expire: never

Status: new ✓

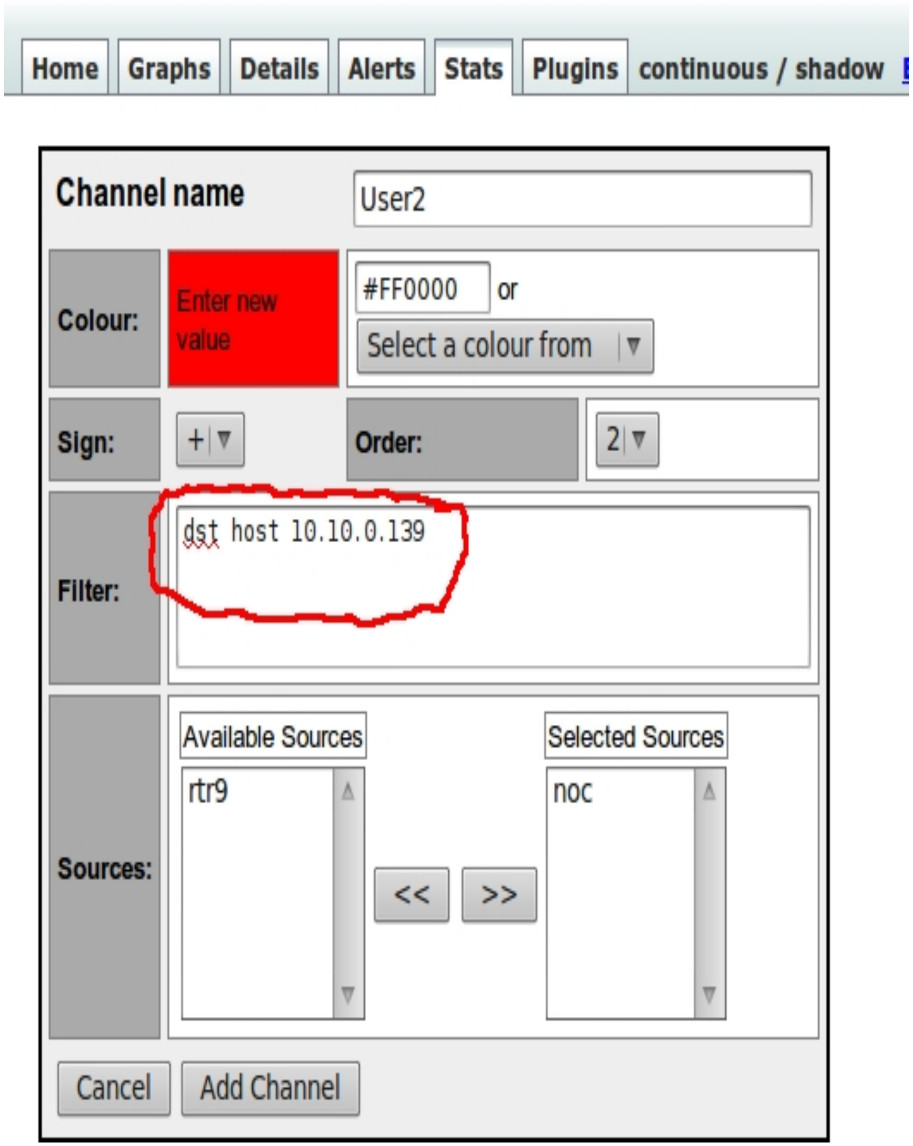
Channel List: +

User1

Colour: #abcdef Sign: + Order: 1

Filter: host 10.10.0.51

Sources: noc



Channel name: User2

Colour: Enter new value #FF0000 or Select a colour from ▼

Sign: + ▼

Order: 2 ▼

Filter: dst host 10.10.0.139

Sources:

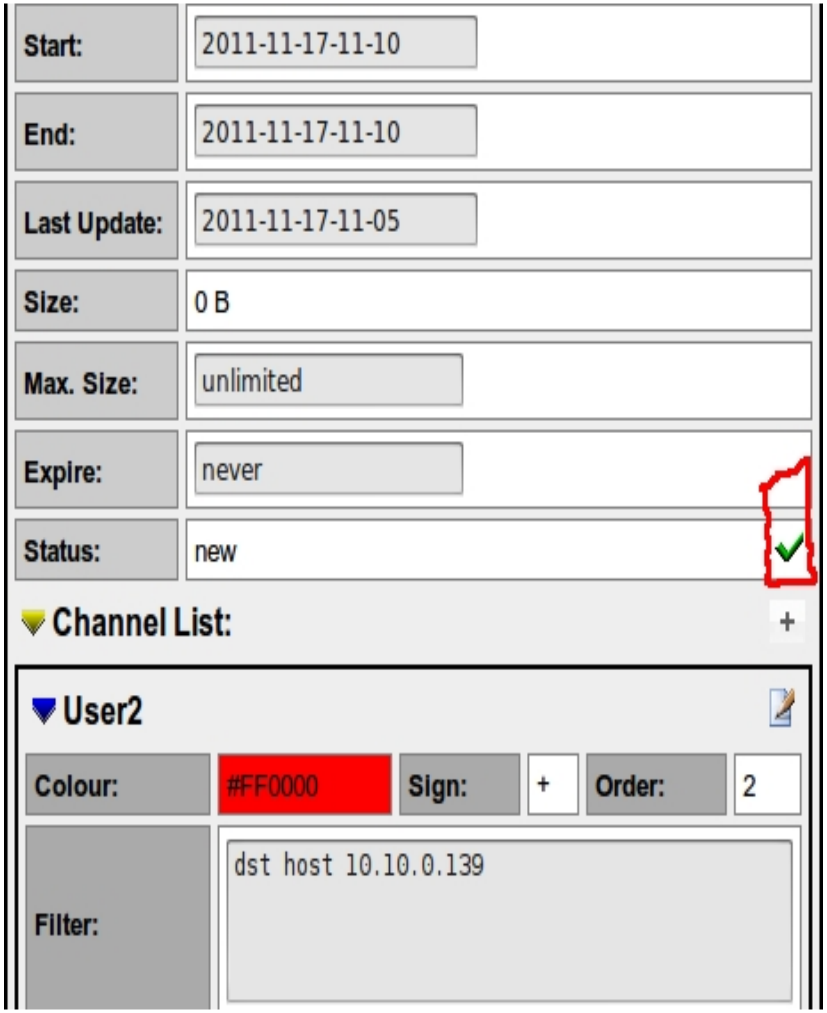
Available Sources: rtr9

Selected Sources: noc

Filters

- Select a different color for the second channel so that the graphs can be distinguished
- Note that the two filters are different
  - The first filter will capture any flows pertaining to host 10.10.0.51
  - The second filter will only capture flows where host 10.10.0.139 is the DESTINATION host
- More attributes can be added here like src AS, dst AS, src ports etc based on the NFSEN filter syntax

Activate the profile



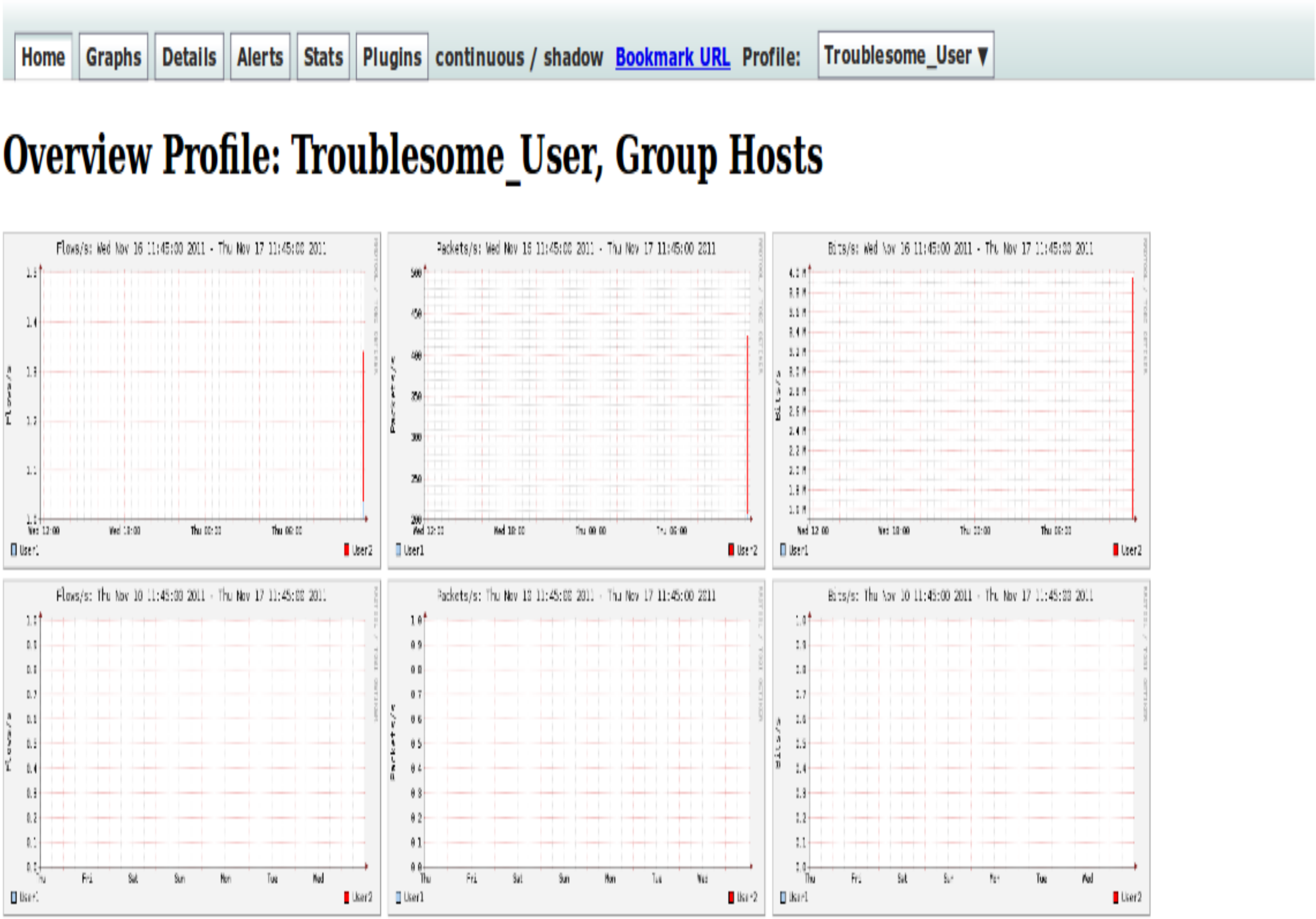
Start:	2011-11-17-11-10
End:	2011-11-17-11-10
Last Update:	2011-11-17-11-05
Size:	0 B
Max. Size:	unlimited
Expire:	never
Status:	new ✓

Channel List: +

User2

Colour:	#FF0000	Sign:	+	Order:	2
Filter:	dst host 10.10.0.139				

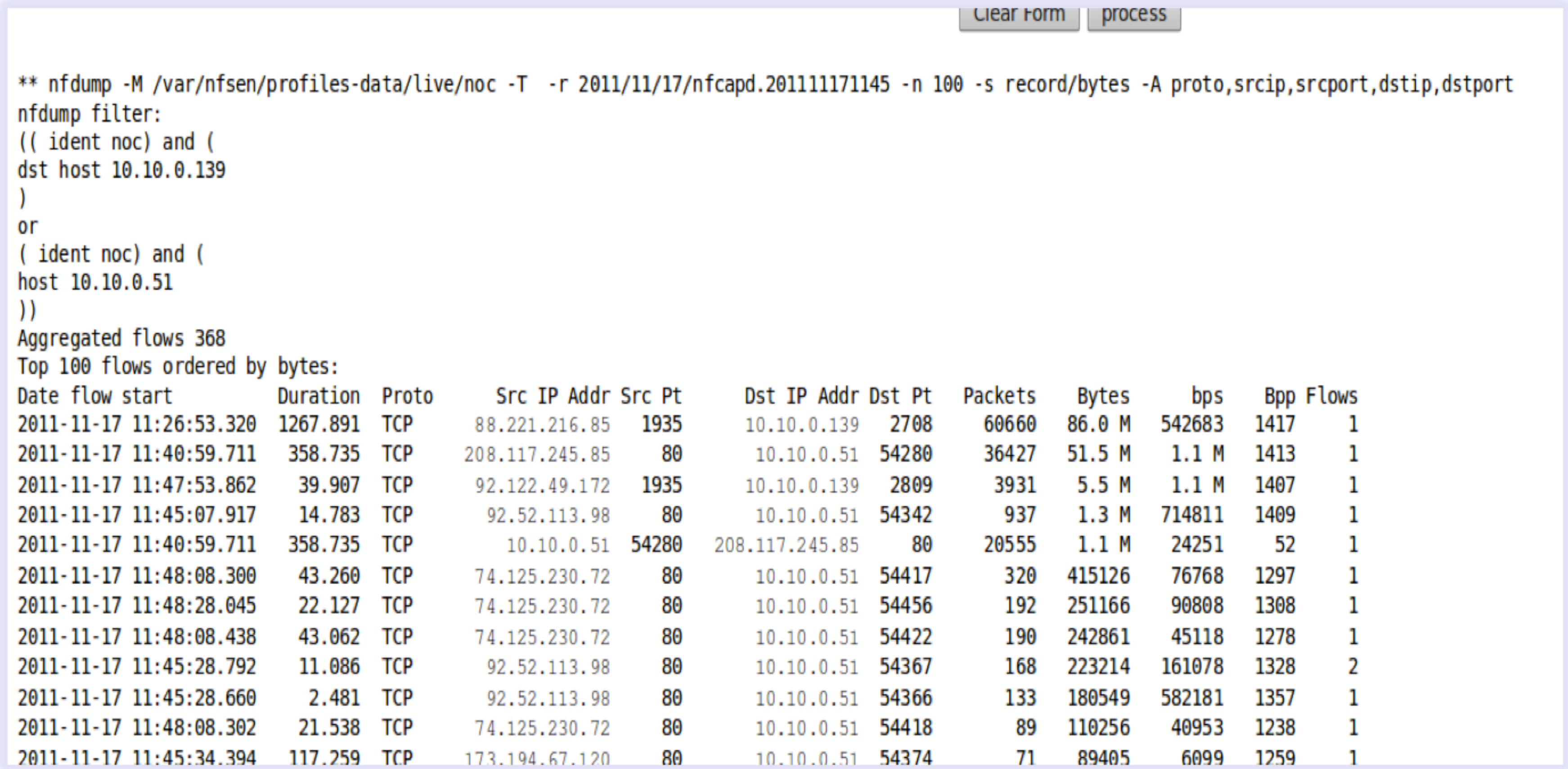
- Click the green tick to activate your new profile.
- It will display some data after a few minutes
- Click on Live then select the group you created and you will see your profile



Overview Profile: Troublesome_User, Group Hosts

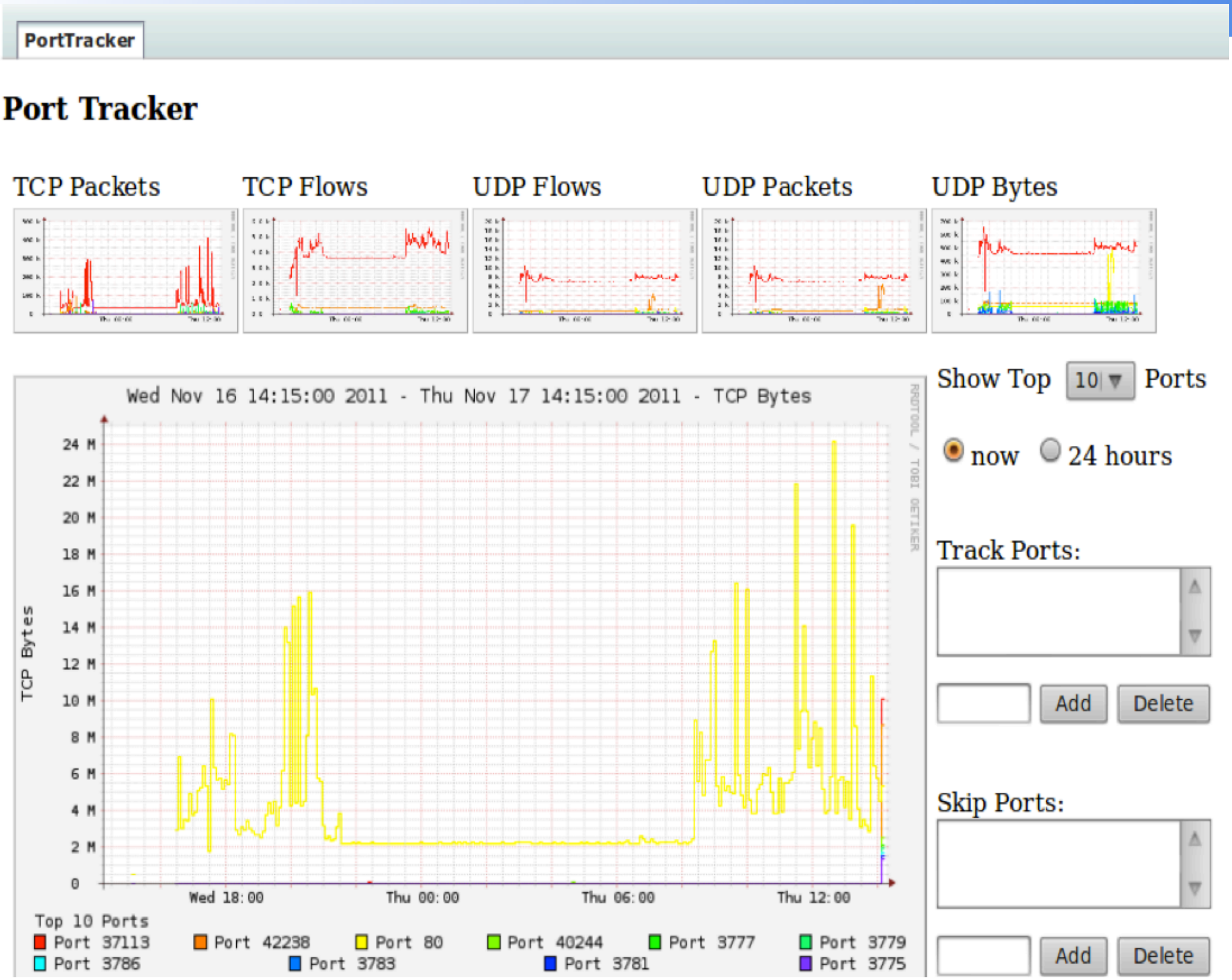
Details Page of New Profile

Only information on the channels is shown in new profile



```
** nfdump -M /var/nfsen/profiles-data/live/noc -T  -r 2011/11/17/nfcapd.201111171145 -n 100 -s record/bytes -A proto,srcip,srcport,dstip,dstport
nfdump filter:
(( ident noc) and (
dst host 10.10.0.139
)
or
( ident noc) and (
host 10.10.0.51
))
Aggregated flows 368
Top 100 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 11:26:53.320  1267.891 TCP       88.221.216.85  1935      10.10.0.139   2708     60660   86.0 M   542683  1417     1
2011-11-17 11:40:59.711   358.735 TCP      208.117.245.85    80       10.10.0.51  54280     36427   51.5 M    1.1 M  1413     1
2011-11-17 11:47:53.862    39.907 TCP       92.122.49.172  1935      10.10.0.139   2809      3931    5.5 M    1.1 M  1407     1
2011-11-17 11:45:07.917    14.783 TCP        92.52.113.98    80       10.10.0.51  54342       937    1.3 M   714811  1409     1
2011-11-17 11:40:59.711   358.735 TCP          10.10.0.51 54280   208.117.245.85     80     20555    1.1 M    24251    52     1
2011-11-17 11:48:08.300    43.260 TCP       74.125.230.72    80       10.10.0.51  54417       320   415126    76768  1297     1
2011-11-17 11:48:28.045    22.127 TCP       74.125.230.72    80       10.10.0.51  54456       192   251166    90808  1308     1
2011-11-17 11:48:08.438    43.062 TCP       74.125.230.72    80       10.10.0.51  54422       190   242861    45118  1278     1
2011-11-17 11:45:28.792    11.086 TCP        92.52.113.98    80       10.10.0.51  54367       168   223214   161078  1328     2
2011-11-17 11:45:28.660     2.481 TCP        92.52.113.98    80       10.10.0.51  54366       133   180549   582181  1357     1
2011-11-17 11:48:08.302    21.538 TCP       74.125.230.72    80       10.10.0.51  54418        89   110256    40953  1238     1
2011-11-17 11:45:34.394   117.259 TCP      173.194.67.120    80       10.10.0.51  54374        71    89405     6099  1259     1
```

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

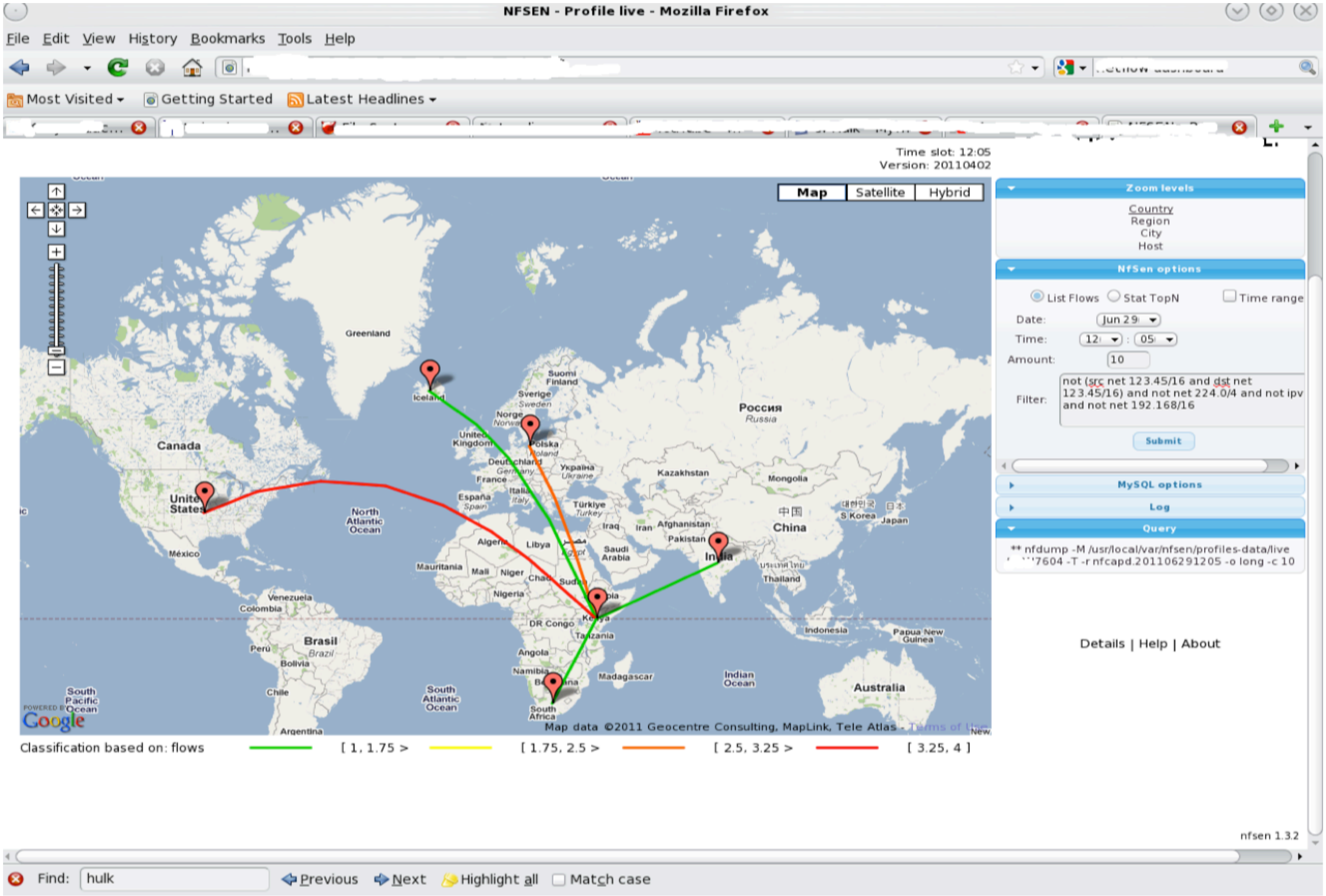
Plugins

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/

SurfMap



Time slot: 12:05
Version: 20110402

● 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

```
** 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]

References

NFSEN

http://nfsen.sourceforge.net

NFDUMP

http://nfdump.sourceforge.net/