Per-AS traffic stats
for BGP Traffic Engineering

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Background

• Monzoon ended up with 4 different IP transit links
  – not all with the same CIR
  – suboptimal traffic distribution

• BGP Traffic Engineering called for
  – but what to change?
  – “stabbing in the dark”

• need for insight into traffic per origin/destination AS
What it is

**AS15169: GOOGLE**
~ 25.86 GB in / 1.43 GB out in the last 24 hours

**AS21494: green.ch AG, Brugg, Switzerland**
~ 6.85 GB in / 20.10 GB out in the last 24 hours

**AS36561: YOUTUBE**
~ 25.44 GB in / 753.50 MB out in the last 24 hours

**AS22822: LLNW**
~ 20.64 GB in / 640.65 MB out in the last 24 hours
What it is
What it is

- no black magic – just a few hundred lines of Perl & PHP
- designed to run on most flavours of UNIX
  - we use FreeBSD
What it is good for

- BGP Traffic Engineering
- finding out who you should (try to) peer with
- knowing what's going on in your network
- planning for future expansion
How it works

- Perl
- RRDtool
  - maintain an .rrd file for each AS
  - two data sources per link (in & out)
- NetFlow
  - AS aggregation records
Prerequisites

• Perl 5.8

• RRDtool 1.2
  – with Perl “RRDs” library

• web server with PHP 5

• one or more routers that can generate NetFlow v8
  AS aggregation records
The big picture

NetFlow v8 records

RRD files (one per AS)

Web frontend

Cron job

asstats_day.txt

netflow-asstatd.pl

rrd-extractstats.pl
How to install it – the “known links” file

<table>
<thead>
<tr>
<th>#</th>
<th>Router IP</th>
<th>SNMP ifindex</th>
<th>tag</th>
<th>description</th>
<th>color</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>192.0.2.1</td>
<td>15</td>
<td>uplink1</td>
<td>Uplink 1</td>
<td>D41C0E</td>
</tr>
<tr>
<td>2</td>
<td>192.0.2.1</td>
<td>23</td>
<td>uplink2</td>
<td>Uplink 2</td>
<td>E45605</td>
</tr>
<tr>
<td>3</td>
<td>192.0.2.2</td>
<td>4</td>
<td>uplink3</td>
<td>Uplink 3</td>
<td>FECF12</td>
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<tr>
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<td>192.0.2.3</td>
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<td>Uplink 4</td>
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<td>peering1</td>
<td>IXP 1</td>
<td>0A4484</td>
</tr>
<tr>
<td>6</td>
<td>192.0.2.2</td>
<td>45</td>
<td>peering2</td>
<td>IXP 2</td>
<td>0A7484</td>
</tr>
<tr>
<td>7</td>
<td>192.0.2.3</td>
<td>6</td>
<td>peering3</td>
<td>IXP 3</td>
<td>4CB4C4</td>
</tr>
</tbody>
</table>

router# show snmp mib ifmib ifindex
How to install it – router configuration

```
ip flow-cache timeout active 5
int Gi0/x.y
ip flow ingress

ip flow-export source <source interface>
ip flow-export version 5 origin-as
ip flow-aggregation cache as
  cache timeout active 5
export destination <IP address of server running AS stats> 9000
enabled
```

for “smooth” graphs

on all relevant subinterfaces, or “ip route-cache flow”
v5 even though the AS aggregation records are actually v8
Adding a new link

- new link = two new data sources in each .rrd
- RRDtool lacks command to add data source to existing .rrd :
- simple Perl script provided to do it using XML dump/restore
sFlow?

• no aggregation on router
  – collector has to do it
  – should be possible given src/dst IP address and a full BGP table to map IP address → ASN

• take into account sampling rate
  – scale factor

• → maybe, if there’s enough interest...
Live demonstration
Where to get it

http://neon1.net/as-stats
Questions?

http://neon1.net/as-stats
Thank you

Thank you for your attention!