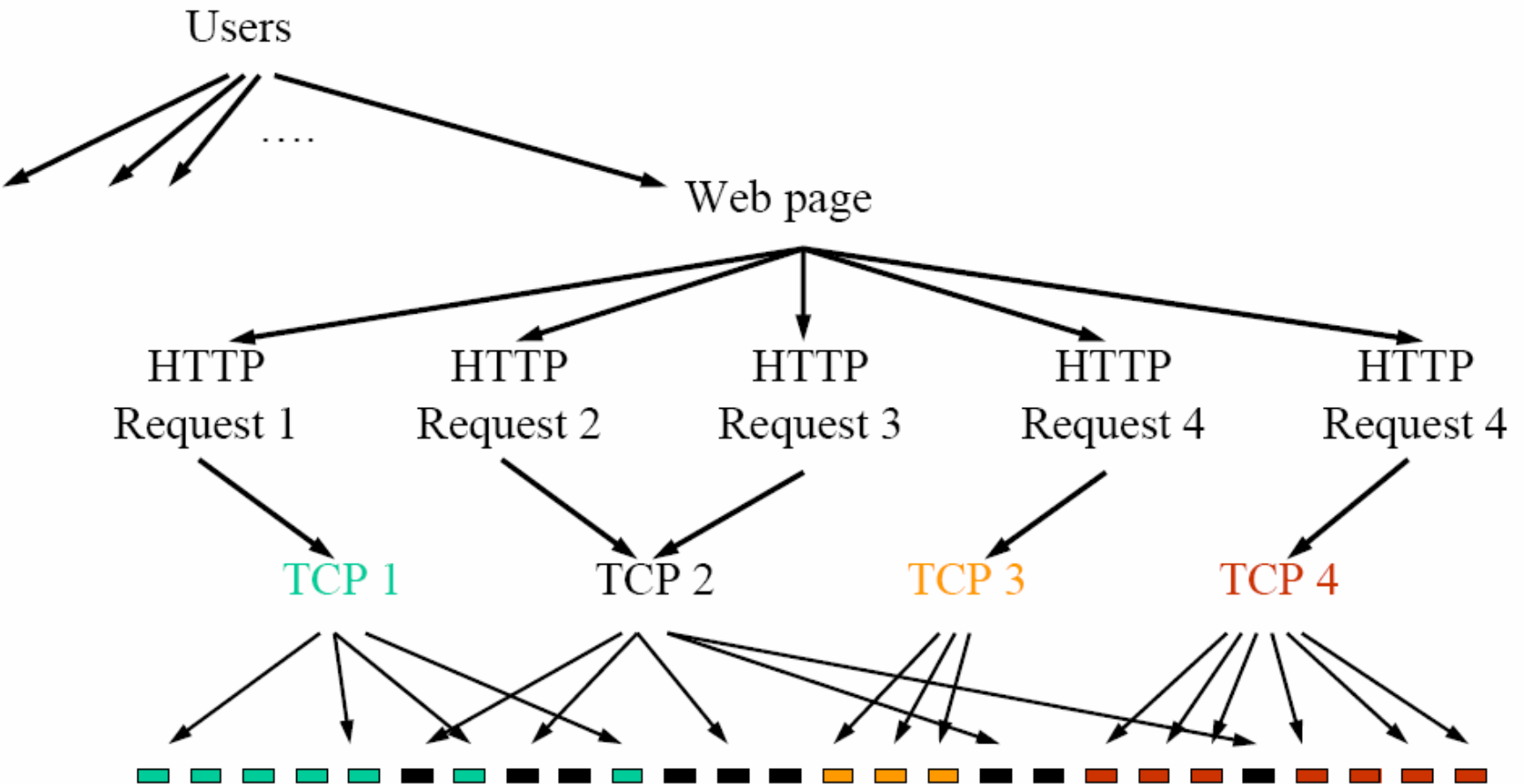


Tutorial worksheet 09

Work Load Generation and Monitoring.

- You have so far configured
 - Routing protocols with in the backbone network.
 - PPPoE at access network.
 - Firewall policies on linux.
- To test network we need to generate traffic with similar characteristics that we see in the real internet. This is called representative web workload.

But how does Web traffic look like



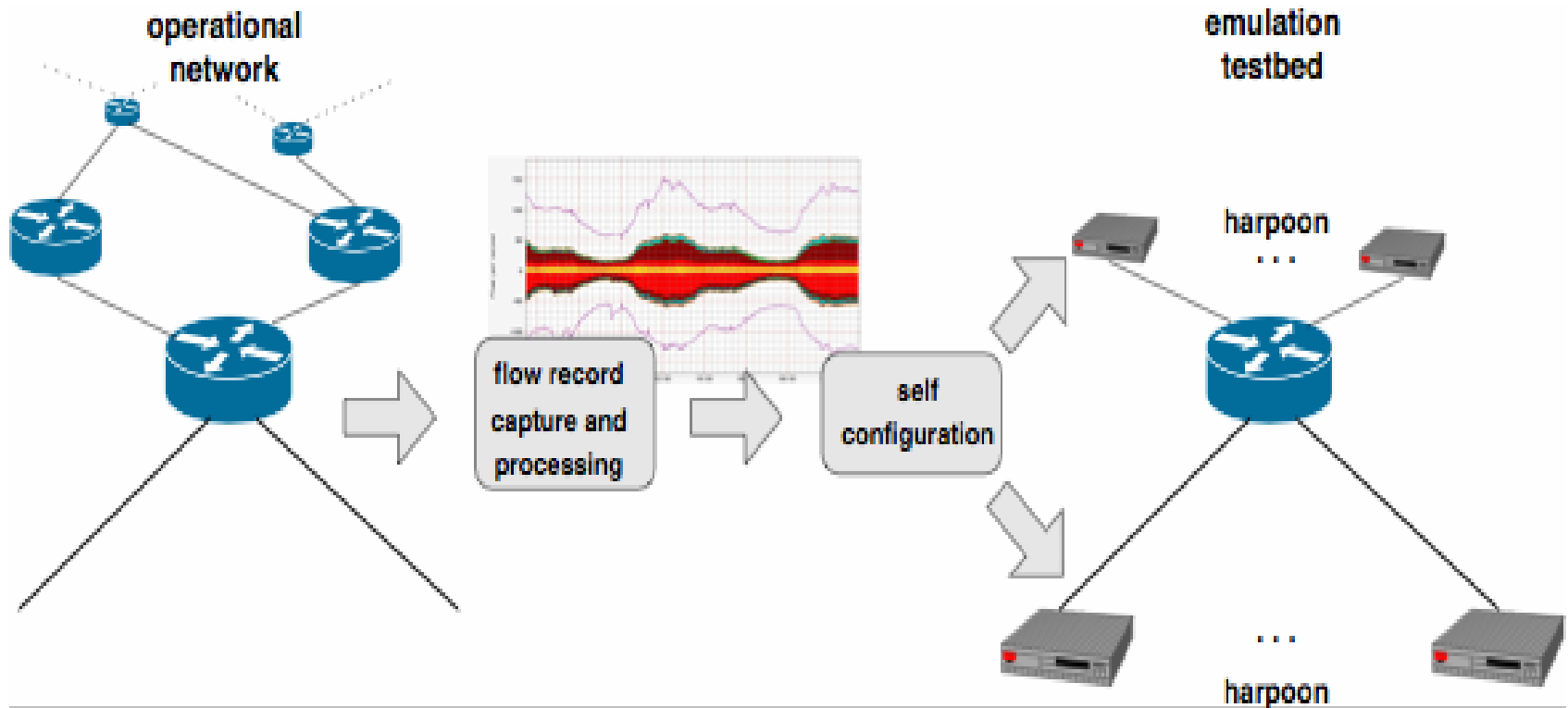
Web traffic generation-Tools

- Iperf
- SURGE
- Harpoon: A Flow-level Traffic Generator

Harpoon Traffic Generator

- The design objectives of Harpoon are
 - to scalably generate application-independent network traffic at the IP flow level
 - to be easily parameterized to create traffic that is statistically identical to traffic measured at a given vantage point in the Internet.

Harpoon usage



Parameters

- File size distributions at server side
- Inter-connection time distributions at client side.
- Other factors (see worksheet 09)

NETFLOW

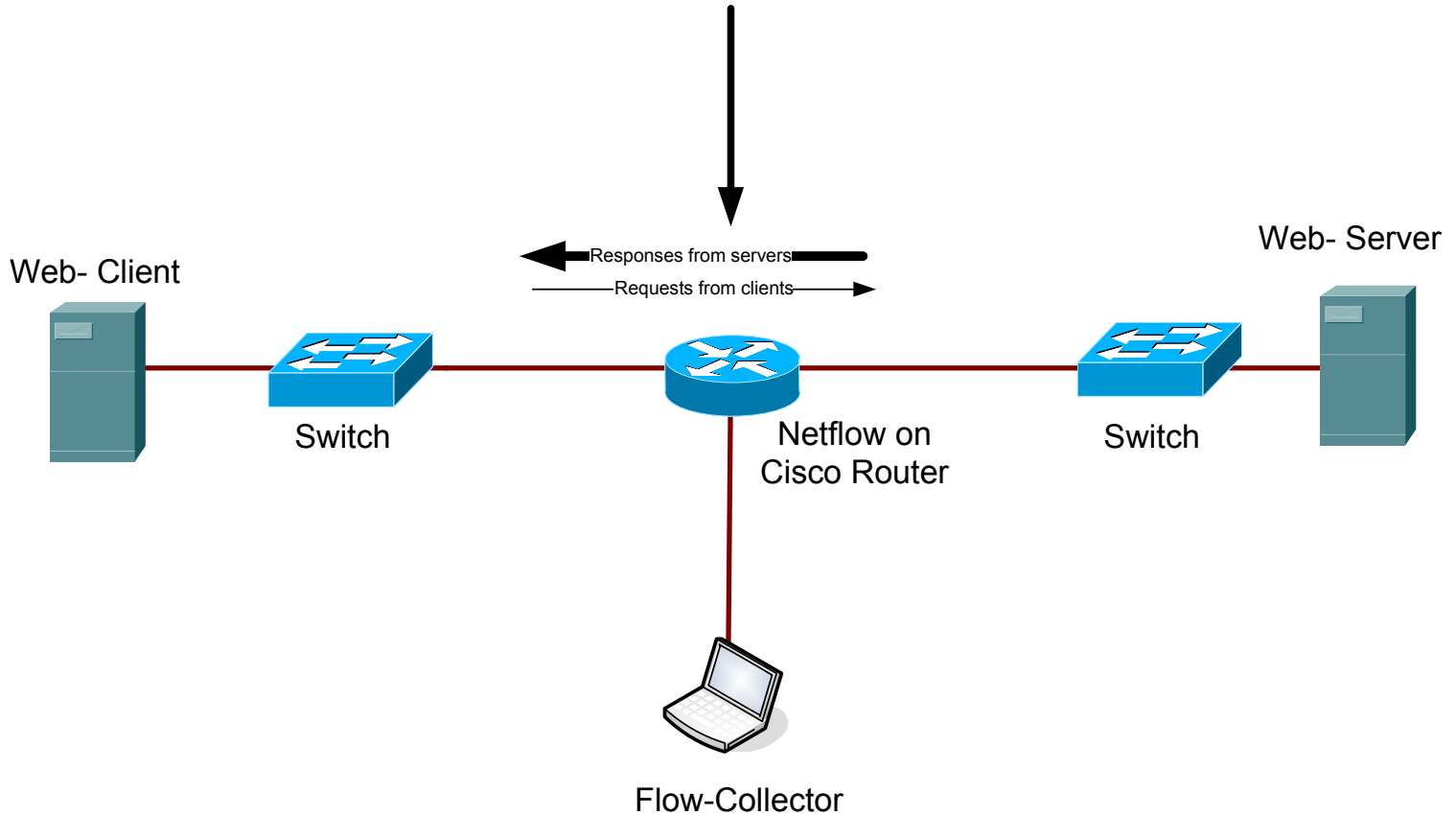
- A Tool to get aggregated information from routers regarding volume of traffic.
- Cisco uses five tuple flow
 - Source ip
 - Source port
 - Destination ip
 - Destination port
 - Protocol

NETFLOW

- TCP Flows
 - Unidirectional.
 - One TCP connection has two flows.
 - They are exported on every FIN or RST
- UDP flows
 - Exported after some time.

Basic Setup

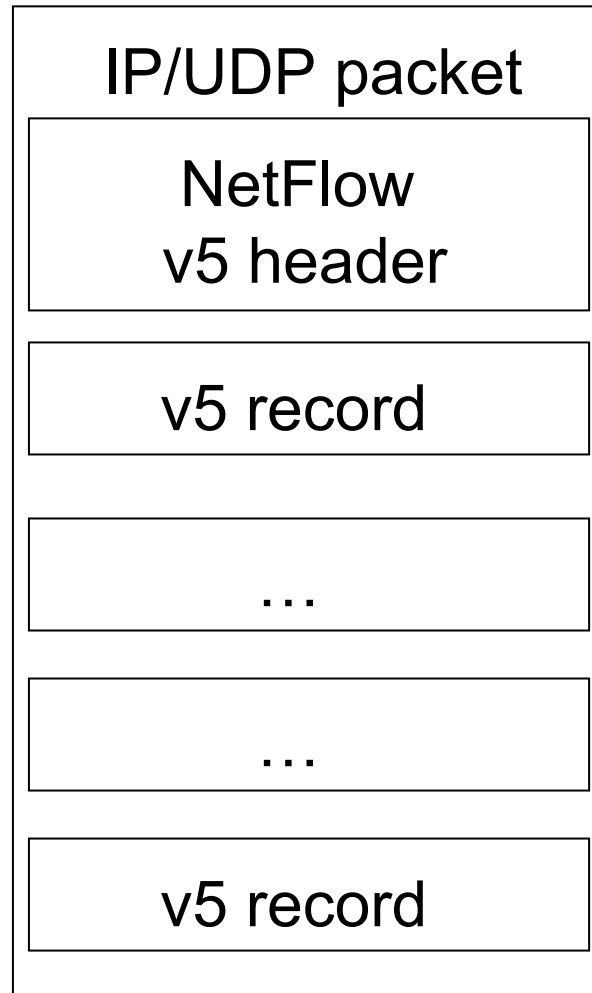
Traffic Measured at Cisco Router has same characteristics as in real internet



Analysis of Netflow data

- Use linux utility *flow-tools*
- Flow-tools utilities
 - flow-capture
 - flow-report

NetFlow v5 Packet Example



flow-print

- Formatted output of flow files.

```
ngl:% flow-print < ft-v05.2002-01-21.093345-0500 | head -15
```

srcIP	dstIP	prot	srcPort	dstPort	octets	packets
31.238.205.199	194.210.13.1	6	6346	40355	221	5
92.5.110.20	128.195.186.5	17	57040	33468	40	1
28.146.1.7	194.85.127.69	17	53	53	64	1
93.170.62.114	132.235.156.242	6	1453	1214	192	4
34.243.5.160	192.129.25.10	6	80	3360	654	7
32.235.156.242	193.170.62.114	6	1214	1453	160	4
30.206.43.51	130.101.99.107	6	3226	80	96	2
06.244.141.3	128.163.62.17	6	35593	80	739	10
06.244.141.3	128.163.62.17	6	35594	80	577	6
12.33.84.160	132.235.152.47	6	1447	1214	192	4
32.235.157.187	164.58.150.166	6	1214	56938	81	2
29.1.246.97	152.94.20.214	6	4541	6346	912	10
32.235.152.47	212.33.84.160	6	1214	1447	160	4
30.237.131.52	130.101.9.20	6	1246	80	902	15