



Quality measurements in streaming
media

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Quality measurements

- Legacy SNMP monitors net elements like links and cpu
- Netflow monitors volume of bytes and packets
- Ping monitors monitoring packets
- What is the actual quality to the customer QoE ?

QoE

- Ask the user - MOS
 - ◆ Tedious, sporadic
- Instrument clients (web)
 - ◆ Complex - need control
- Qflow passive measurements
 - ◆ Costly, high speed
- Active tailored testing
 - ◆ Low entry - Statistical probing

Tools

- Qstream - analyze media streams for quality
 - ◆ RTP, MPEG-TS, RTMP
- Sipshaman - measure SIP service quality
 - ◆ Signalling and streaming
- Qflow - passive extended qos flow analysis(netflow, ipfix)
- Stager a tool for statistical aggregation and presentation
- Ssampling/asmping is testing infrastructure

Qflow - per flow stats

- measure the gap, jitter and timing and sequencing errors and peak load (10, 100, 1000 ms)
- passive measurements - sees all traffic
- generate flow records (Ipfix, NetFlow v5/v9)
- Used with previous FPGA-cards

Qstream what

- Analyze a media stream for flow quality
- Intensity – throughput, bursts
- Jitter, sequence and loss (MOS)
- RTP, MPEG TS, RTMP
- Use for multicast TV, SIP service, SDP announcements, video streaming

Qstream use

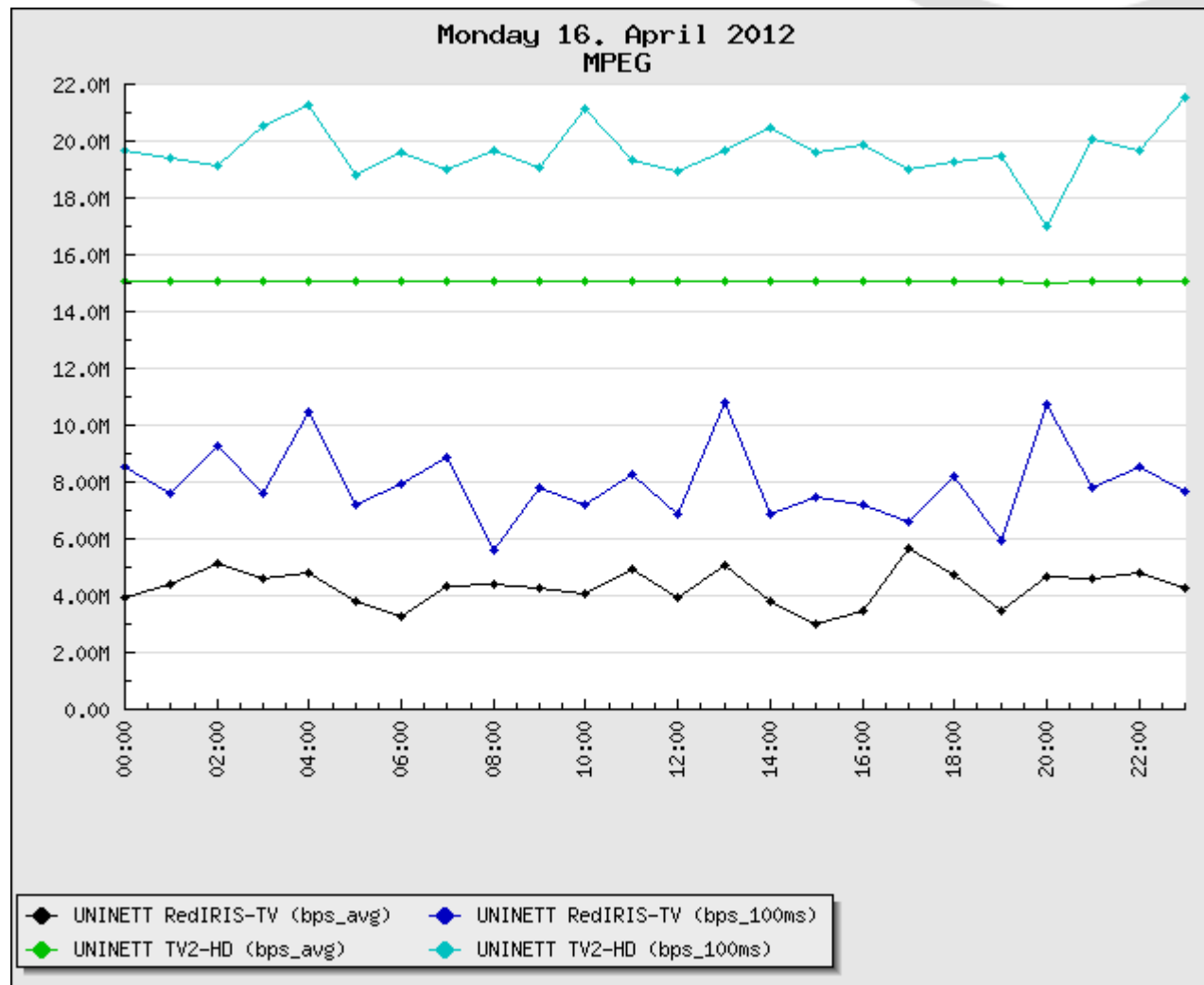
```
Eterm Font Background Terminal ? X
mi6:~> bin/qstream -h | head -12
Usage:
  usage="$0 [option]... [file...|ip|:port]..."

  -list list flows in files
  -dump dump data part to file
  -format [full|pretty] print full numbers foror short pretty numbers
  -net open network stream rather than file(s)
  -ipv6 Listen to Ipv6 connections, Port needs to be defined with -p
  -p Set port.
  -crude the log is from crude
  -bins bins for gaps in ms : b1,b2,,,
  -itime log gaps longer than 1 (use with crude)
mi6:~> bin/qstream -last 10 -period 2 -mpeg -net udp:224.4.0.10:1234
```

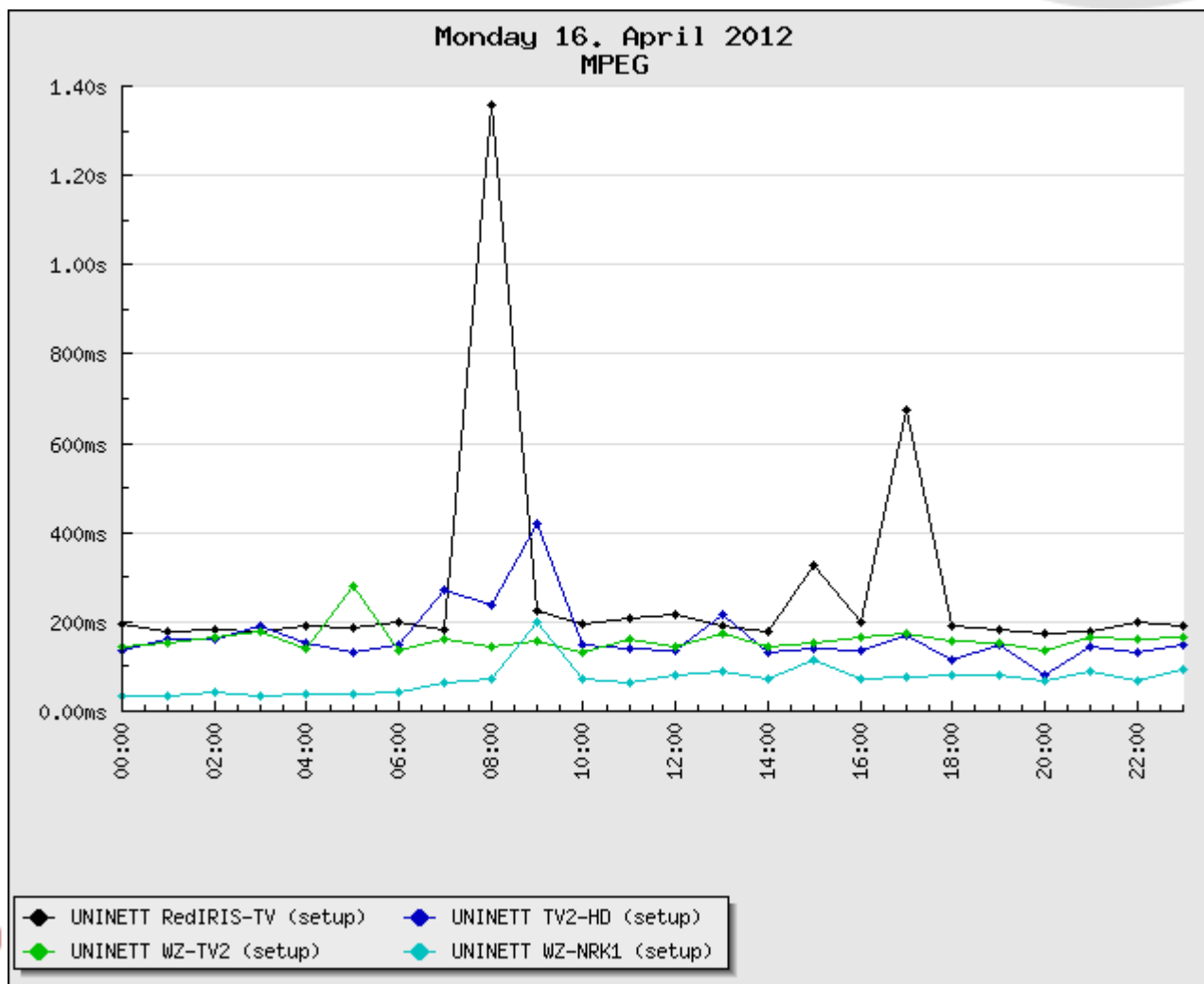
| Date | 2012-04-18 | packet | pcrjit(ms) | dwll (ms) | thrust(bps) | source | | | | | | |
|----------|------------|--------|------------|-----------|-------------|--------|-----|-----|------|------|-------|--------------------------------------|
| time | numb | dup | late | lost | avg | sdv | avg | sdv | avg | 1s | 100ms | host:port |
| 10:53:10 | 601 | 0 | 0 | 0 | 1,7 | 1,5 | 0,0 | 0 | 3,2M | 7,9M | 12,4M | 130,206,3,133;46399->224,4,0,10:1234 |
| 10:53:12 | 426 | 0 | 0 | 0 | 2,1 | 2,0 | 0,0 | 0 | 2,3M | 2,1M | 9,2M | 130,206,3,133;46399->224,4,0,10:1234 |
| 10:53:14 | 416 | 0 | 0 | 0 | 2,5 | 2,2 | 0,0 | 0 | 2,2M | 1,3M | 9,6M | 130,206,3,133;46399->224,4,0,10:1234 |
| 10:53:16 | 473 | 0 | 0 | 0 | 2,4 | 2,1 | 0,0 | 0 | 2,5M | 906K | 11,2M | 130,206,3,133;46399->224,4,0,10:1234 |
| 10:53:18 | 517 | 0 | 0 | 0 | 2,1 | 2,1 | 0,0 | 0 | 3,0M | 548K | 9,3M | 130,206,3,133;46399->224,4,0,10:1234 |

```
mi6:~>
```


TV load



TV zapping time



SAP

Tuesday 26. August 2014
UNINETT (in, 1/1)



Line plot ▾ Other Plot graph

| <input type="checkbox"/> | Group | | | Average statistics | | | |
|--------------------------|--------|-----------------|--------|--------------------|--|-----------|----------------------------------|
| | Select | Name | Src IP | # of tests | <input checked="" type="checkbox"/> Setup time | Packets/s | <input type="checkbox"/> Bitrate |
| <input type="checkbox"/> | sap | 193.35.52.32 | 14 | 1.89s | 2.39 | 3.87k | 418ms |
| <input type="checkbox"/> | sap | 194.177.211.2 | 14 | 445ms | 2 | 3.38k | 499ms |
| <input type="checkbox"/> | sap | 137.226.28.9 | 14 | 528ms | 1 | 2.21k | 1.00s |
| <input type="checkbox"/> | sap | 193.1.186.56 | 14 | 824ms | 1 | 1.98k | 1.00s |
| <input type="checkbox"/> | sap | 193.1.186.58 | 14 | 710ms | 1 | 2.05k | 1.00s |
| <input type="checkbox"/> | sap | 193.1.186.57 | 14 | 705ms | 1 | 2.05k | 1.00s |
| <input type="checkbox"/> | sap | 193.1.186.60 | 14 | 663ms | 1 | 2.15k | 1.00s |
| <input type="checkbox"/> | sap | 193.1.186.55 | 14 | 632ms | 1 | 1.98k | 1.00s |
| <input type="checkbox"/> | sap | 193.1.186.59 | 14 | 582ms | 1 | 2.15k | 1.00s |
| <input type="checkbox"/> | sap | 128.104.128.182 | 14 | 620ms | 0.999 | 2.13k | 1.00s |
| <input type="checkbox"/> | sap | 194.160.23.22 | 14 | 5.25s | 0.401 | 561 | 2.50s |
| <input type="checkbox"/> | sap | 147.175.67.201 | 14 | 2.11s | 0.4 | 837 | 2.50s |
| <input type="checkbox"/> | sap | 169.232.58.148 | 14 | 4.05s | 0.2 | 332 | 5.00s |
| <input type="checkbox"/> | sap | 130.206.3.133 | 91 | 25.4min | 0.202 | 473 | 5.00s |
| <input type="checkbox"/> | sap | 145.19.1.182 | 14 | 2.51s | 0.2 | 418 | 5.00s |
| <input type="checkbox"/> | sap | 140.254.37.206 | 14 | 3.04s | 0.2 | 292 | 5.01s |
| <input type="checkbox"/> | sap | 128.91.122.0 | 19 | 2.7min | 0.0999 | 3.50k | 9.76s |
| <input type="checkbox"/> | sap | 128.146.170.74 | 14 | 7.91s | 0.1 | 458 | 10.00s |
| <input type="checkbox"/> | sap | 141.163.58.110 | 14 | 3.85s | 0.1 | 468 | 10.00s |
| <input type="checkbox"/> | sap | 129.21.180.239 | 14 | 4.53s | 0.1 | 230 | 10.00s |

Stager 4.1, 2004-2010 © UNINETT AS

Processing the report took 231.71ms

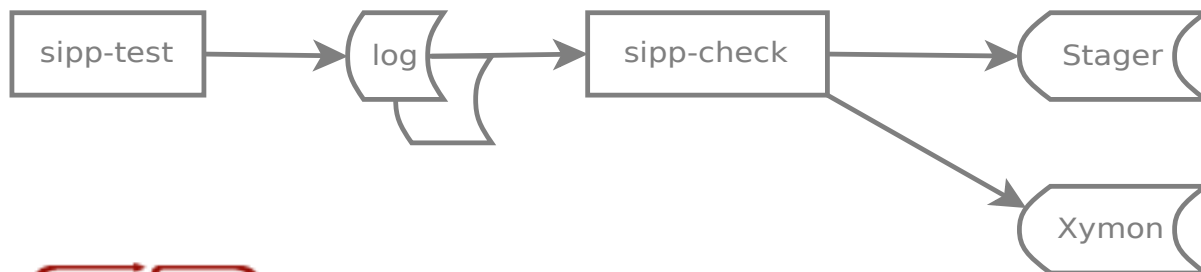
Qstream how

- Multicast – register to group and listen for packets
- Input from pcap or sockets, live or file, multicast or unicast
- Output XML or text
- Alarm feed to Xymon, Zabbix
- Hand tool or background script
- Perl – 5k lines, 50 options
-

SIPShaman

- Measure phone service quality
 - Availability;
 - Call Setup;
 - Audio/Video streaming quality.
- Configuration Test Tool
 - Are all systems properly configured in order to place successful calls
- Use Sipp, Qstream, Stager

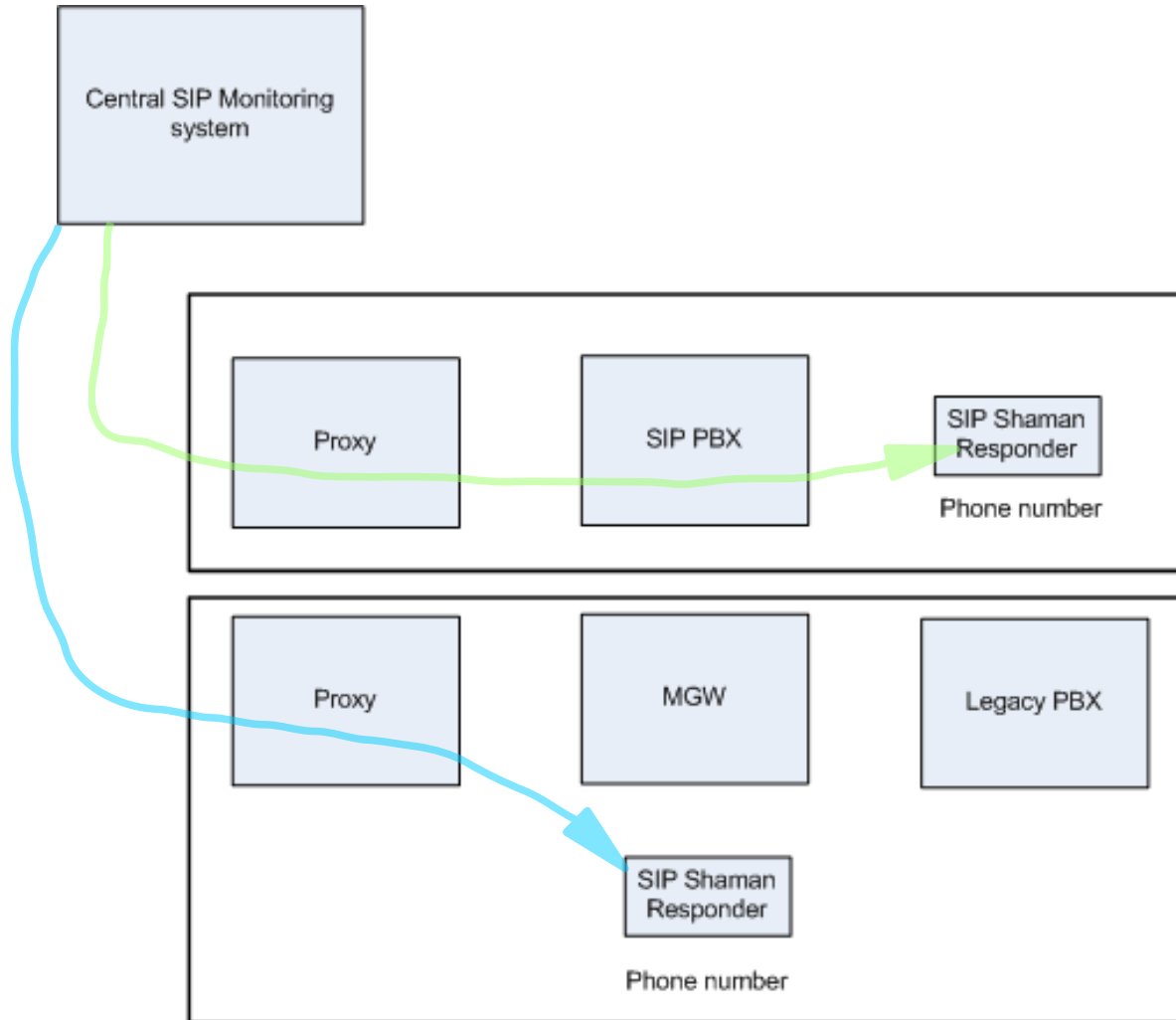
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Sipp

- SIP protocol and performance testing tool
- Open software by HP
- SIP protocol configuration in XML
- SIP signalling capacity testing
- Sends prerecorded streams
- Modified to support systematic logging

SIP Shaman



SIP Shaman

| HiALS (Alesund) | <u>C-PBX</u> | <u>C-PBX CLIENT</u> | <u>M-PBX</u> | <u>M-PBX CLIENT</u> |
|--------------------------|--------------|---------------------|--------------|---------------------|
| alesund-mgw.hials.no | ◆ | ◆ | ◆ | ◆ |
| alesund-mgw-ilo.hials.no | - | - | - | - |

[HISTORY](#)

2012-03-26 16:00:46 - 100 percent success (1/1)

| CurrentTime | ElapsedTime (C) | OutgoingCall (C) | SuccessfulCall (C) | FailedCall (C) | Retransmissions (C) |
|-------------|-----------------|------------------|--------------------|----------------|---------------------|
|-------------|-----------------|------------------|--------------------|----------------|---------------------|

[HISTORY](#)

2012-03-26 16:02:46 - 4.4

References

- <http://software.uninett.no>

Thank you !