amsix
amsterdam internet exchange

AMS-IX Performance Measurements

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AMS-IX

- layer-2 Internet exchange
- star infrastructure
- active and backup infrastructure
- 4 locations
  - WCW NIKHEF
  - WCW SARA
  - GlobalSwitch
  - Telecity 2

RIPE TTM

- Independent measurements performed by RIPE NCC
- Dedicated measurement device (FreeBSD based test-box)
- Measure key parameters of the connectivity to other parts of the Internet
- Time synchronization using GPS
- ~100 boxes deployed

RIPE TTM

- metrics:
  - Packet loss
  - One way delay
  - Jitter
- e-mail / syslog notifications
- access to raw test-data
- stratum-1 NTP server
- root and TLD name server monitoring
- trend analysis

AMS-IX quality statement

- AMS-IX publishes a quality statement
- Statement on the exchange
  - service delivery
  - network & service availability
  - service quality
- Need a benchmark for this statement

Ripe TTM @ AMS-IX

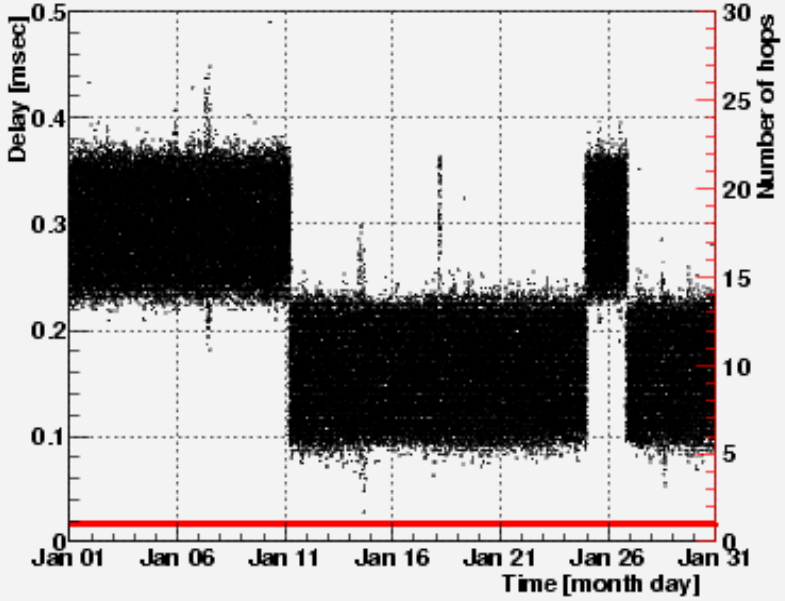
- 4 boxes connected to local edge switches at each AMS-IX location
- Values are used for:
  - measuring compliance with the AMS-IX quality statement
  - notice and debug problems in the AMS-IX network

Performance statistics

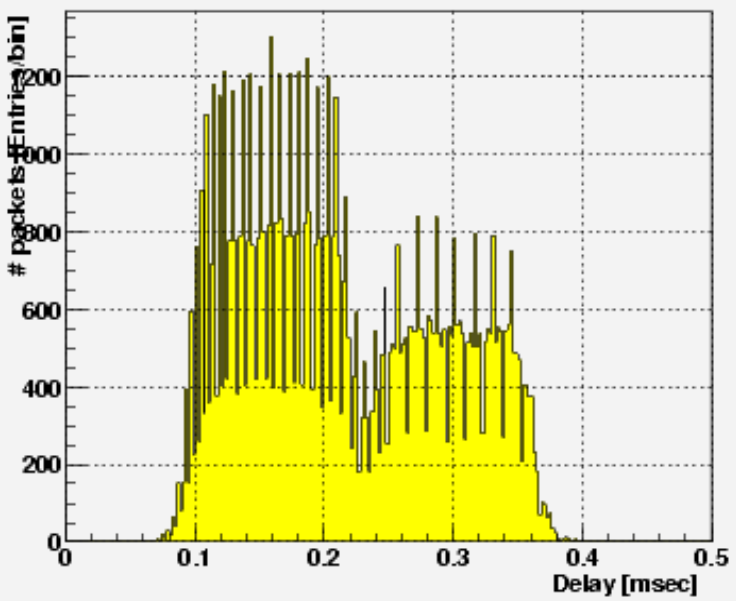
- AMS-IX monthly report
  - RIPE TTM graphs
- Real-time matrix view
  - Built from a real-time raw datastream derived from each test-box

Delays from tt121b to tt122b. Start: 2005-01-01 00:00 End: 2005-01-31 00:00 UTC

PacketDelay / Hopcount



PacketDelay



STATISTICS:

Delay & Hops:

Entries: 83965
Overflow: 6
Underflow: 0

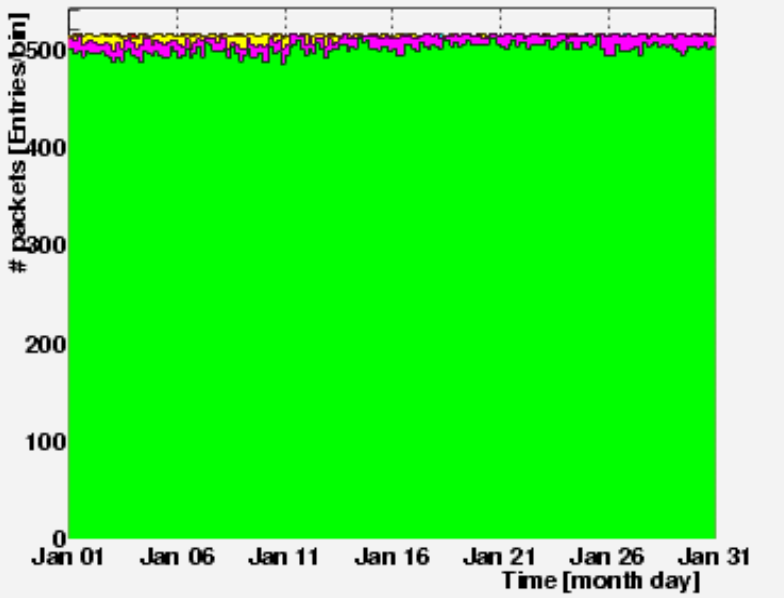
2.5 Perc:	0.1ms
Median:	0.2ms
97.5 Perc:	0.4ms
Mean:	0.2ms
RMS:	0.1ms

Min. hops: 1
Max. hops: 1

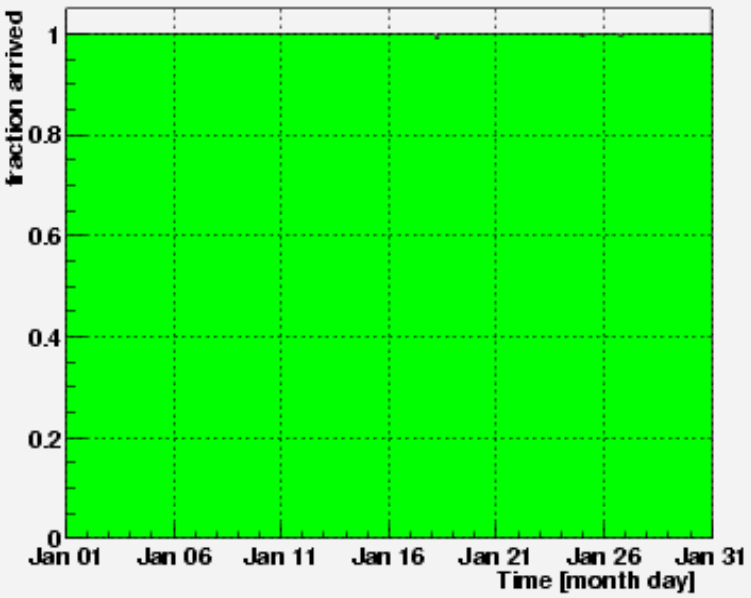
Packets sent/valid:

Total: 86400
Valid: 83965 = 97.2 %
Send bad: 1851 = 2.1 %
Recv bad: 542 = 0.63 %
2 Clocks bad: 37 = 0.043 %
Lost: 5 = 0.0058 %

Packets sent/valid



Packets arrived/lost



Packets lost:

2.5 Perc:	0.0%
Median:	0.0%
97.5 Perc:	0.0%

Uptime: 100 %

Over-all statistic:

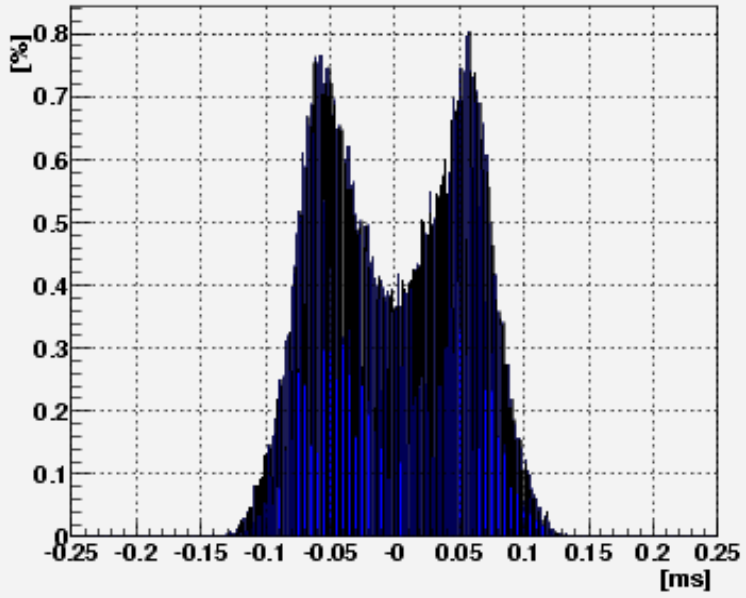
Time period: 30 days

Number of routing vectors: 1
flaps: 0

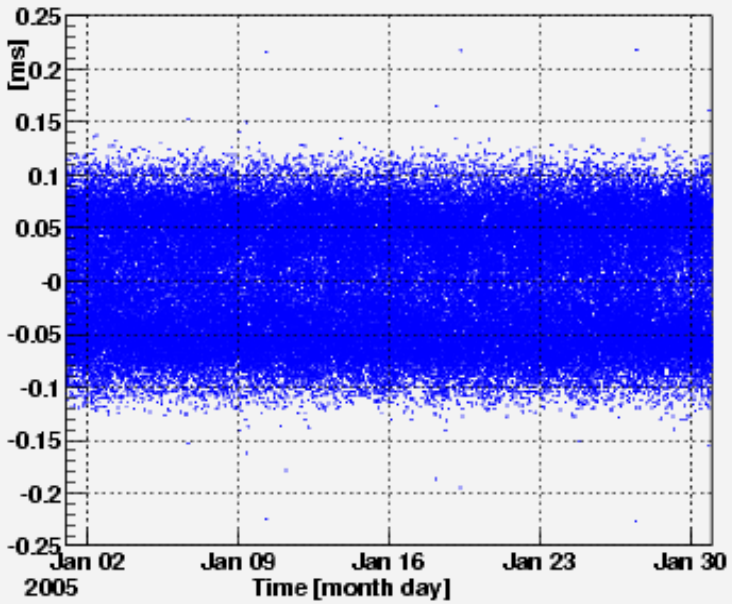
Number of bins: 168
Minutes/bin: 257

Delay Variations from tt121b to tt122b Start: 2005-Jan-01, 00:00 End: 2005-Jan-31, 00:00 UTC

IPDV



IPDV vs time



STATISTICS

Packets sent/valid

Total: 86395=100.00%

Valid: 83965=97.19%

Number of Routing flaps: 0

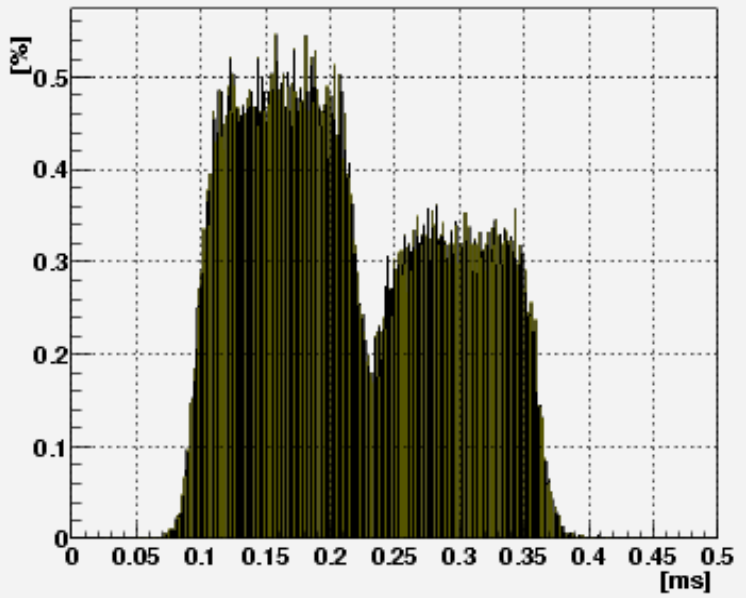
IPDV Percentiles

Mean:	0.00ms
RMS:	0.06ms
50% >	-0.1ms
50% <	0.1ms
85.0% >	-0.1ms
85.0% <	0.1ms
97.5% >	-0.1ms
97.5% <	0.1ms

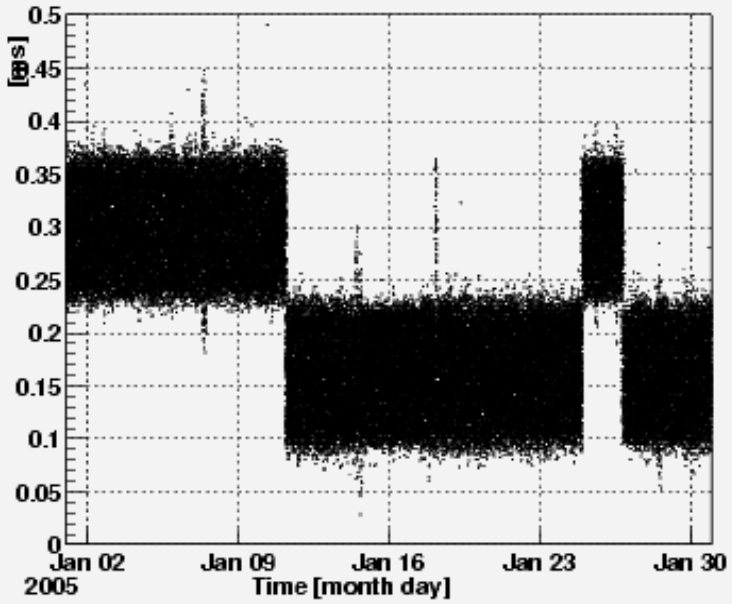
Delay Distribution

Mean:	0.22ms
RMS:	0.08ms

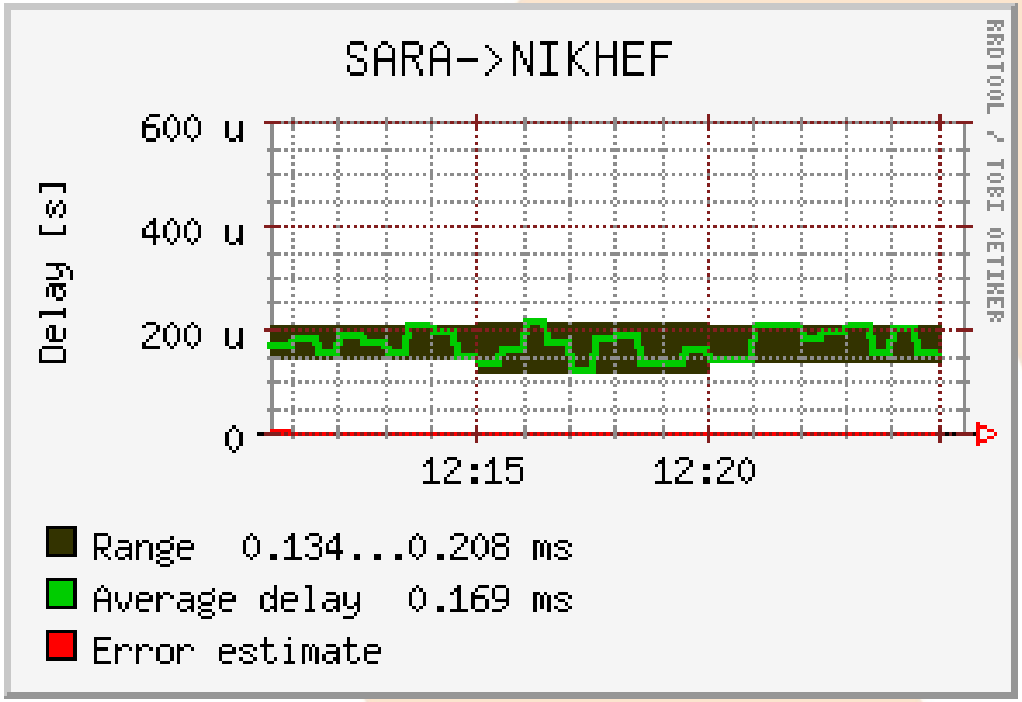
PacketDelay



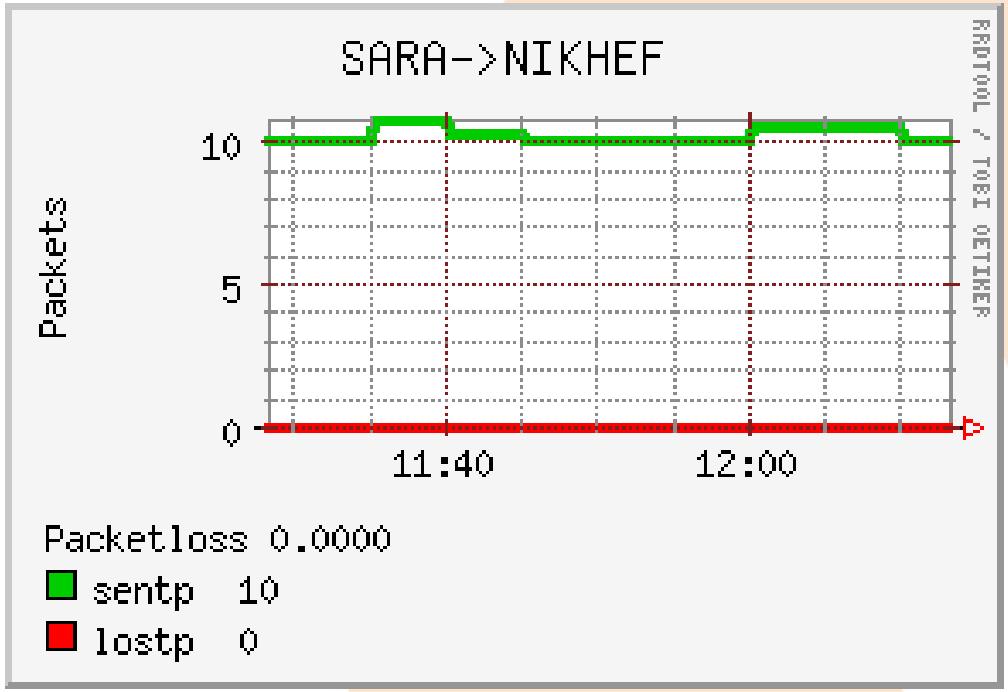
delay (black) and hops*10 (red)



Real-time view; delay



Real-time view; packetloss



Problems

- Resolution of tests
  - ~130 microseconds
  - RIPE NCC is working on improving this
    - Kernel level improvements
    - Endace DAG card timestamping

Possible improvements

- layer 2 tests
  - Makes full mesh testing possible
    - 1 testbox connected to multiple switches
- Test at a much higher rate

Reference

- TTM real-time view:
  - http://www.ams-ix.net/ttm/stats.php
- Monthly report:
  - https://www.ams-ix.net/members/tools/mr/
- Quality statement
  - https://www.ams-ix.net/technical/quality_statement.html