

# Intelligent traceroute

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*Many performance problems in the current Internet are caused by misconfiguration, faulty components or exceeding link or node capacity in some specific point in a network path.*

- We often use traceroute when resolving such performance problems, but it is not always enough to discover the reason.
- We get a list of routers, but where is the problem and what is the cause?

Standard traceroute provides:

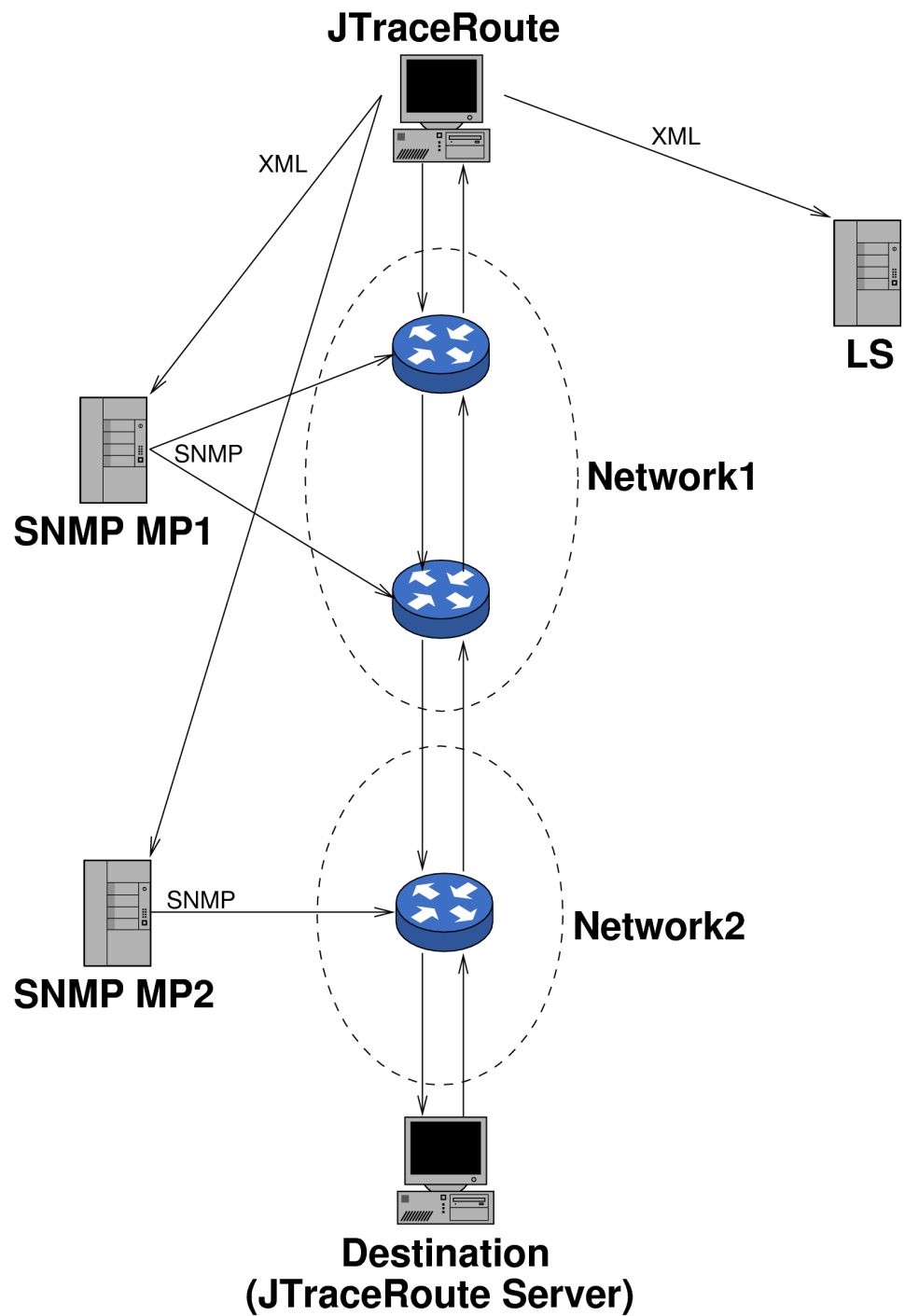
- reachability
- Round Trip Time (RTT)

“Intelligent traceroute” should provide performance information about nodes and links:

- installed capacity
- currently available or occupied capacity
- packet error rate (including reason)
- queue occupancy and utilisation on the hop
- more?

Jtraceroute = Java traceroute

- OS independent (needs to run at user PC)
- Java WebStart - to start from end host web browser



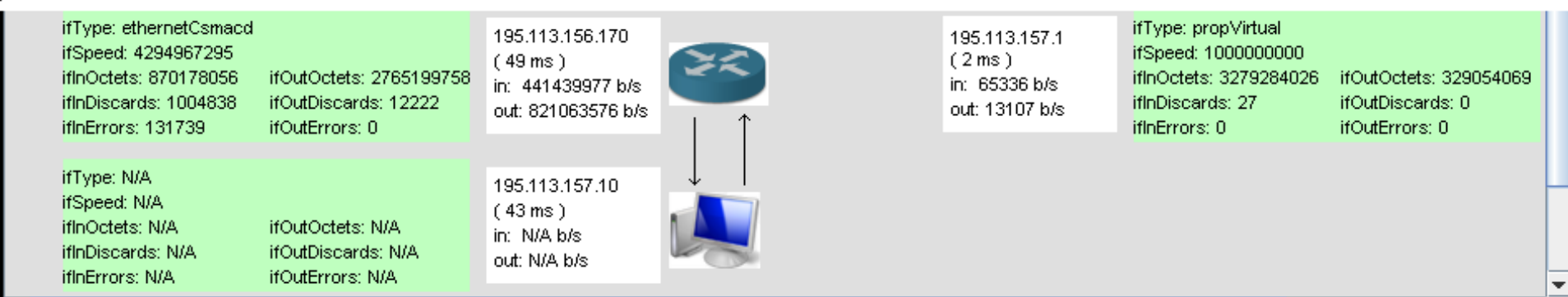
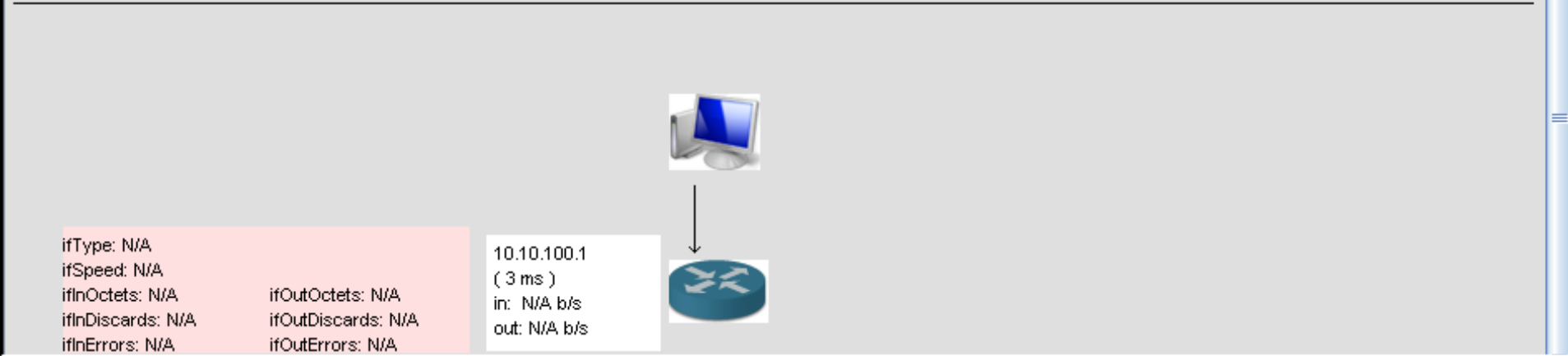
Main features of the jtracroute:

- forward traceroute
- backward traceroute (optionally), if it is a support at the remote side
- correlation of both directions, identification of asymmetries
- graphical representation
- stores results in XML files for possible later usage

Traceroute results visualization - perfmon-ostrava.cesnet.cz\_20091021-055000\_linux.traceroute\_f.xml

Traceroute Help

Front route	Back route
<b>Test name:</b> Linux system traceroute command	<b>Test name:</b> Linux system traceroute command
<b>Operating system:</b> Linux 2.6.30-tuxonice-r6	<b>Operating system:</b> Linux 2.6.17.8-web100
<b>Source IP address:</b> 10.10.100.104	<b>Source IP address:</b> 195.113.157.10
<b>Target IP address:</b> 195.113.157.10	<b>Target IP address:</b> 80.93.231.97
<b>Start time:</b> 21.10.2009 5:50:00	<b>Start time:</b> 21.10.2009 5:50:28
<b>End time:</b> 21.10.2009 5:50:00	<b>End time:</b> 21.10.2009 5:50:31



To get the performance data from routers, jtracertoute:

- queries LS
- queries SNMP MPs twice – to get value differences for calculation of rates / second
- provides results in a form of
  - absolute data received from network nodes
  - relative values for some data received from network nodes



- XML data representation

```
<ResultsProbe>
  <Index>... 1...
  <HopAddr> .... 192.168.1.2 ...
  <RoundTripTime>... 7 ...
  <DataHop>
    <Index>1...
    <HopAddr> .... 192.168.1.2 ... <portNum>174</portNum>
    <data name="IF-MIB::ifType.174">propVirtual</data>
    <data name="IF-MIB::ifSpeed.174">1000000000</data>
    <data name="IF-MIB::ifInOctets.174">2016187000</data>
    <data name="IF-MIB::ifOutOctets.174">3589331668</data>
    <data name="IF-MIB::ifInDiscards.174">4044</data>
    <data name="IF-MIB::ifOutDiscards.174">0</data>
    <data name="IF-MIB::ifInErrors.174">0</data>
    <data name="IF-MIB::ifOutErrors.174">0</data>
  </DataHop>
```

- SNMP MP can get values from any MIB objects
- two proxy mechanisms available:
  - through snmpget directly to routers
  - through G3 SNMP monitoring application
- authorisation can be specified as tuples <object ID, router IP>
- what MIB objects are most useful for performance issues?
  - rx / tx packet & byte counters
  - error counters
  - other ?

- SNMP MP needs to be installed at the desired domain
- is implemented in python, simple copy & paste installation; dependent packages *python* and *python-dev* must be installed
- needs to be configured to have an access to the routers (proxy mechanismus available)
- authorisation set (IP addresses, MIB objects)

- forward and backward traceroute
- identification of assymetries
- additional performance information from routers (SNMP)
- requires support in the target network
- graphical representation
- XML data operation

- User interface accessible from your web browser at:

<https://perfmon.cesnet.cz/jtraceroute>

username/password    jtraceroute/traceroute

- SNMP MP is deployed in CESNET and registered to LS
- Looking for other partners to install SNMP MP for distributed trial, volunteers?

**We are looking forward  
to your feedback!**