

Network Monitoring & Management

Measuring Delay with Smokeping

Network Startup Resource Center
www.nsrc.org



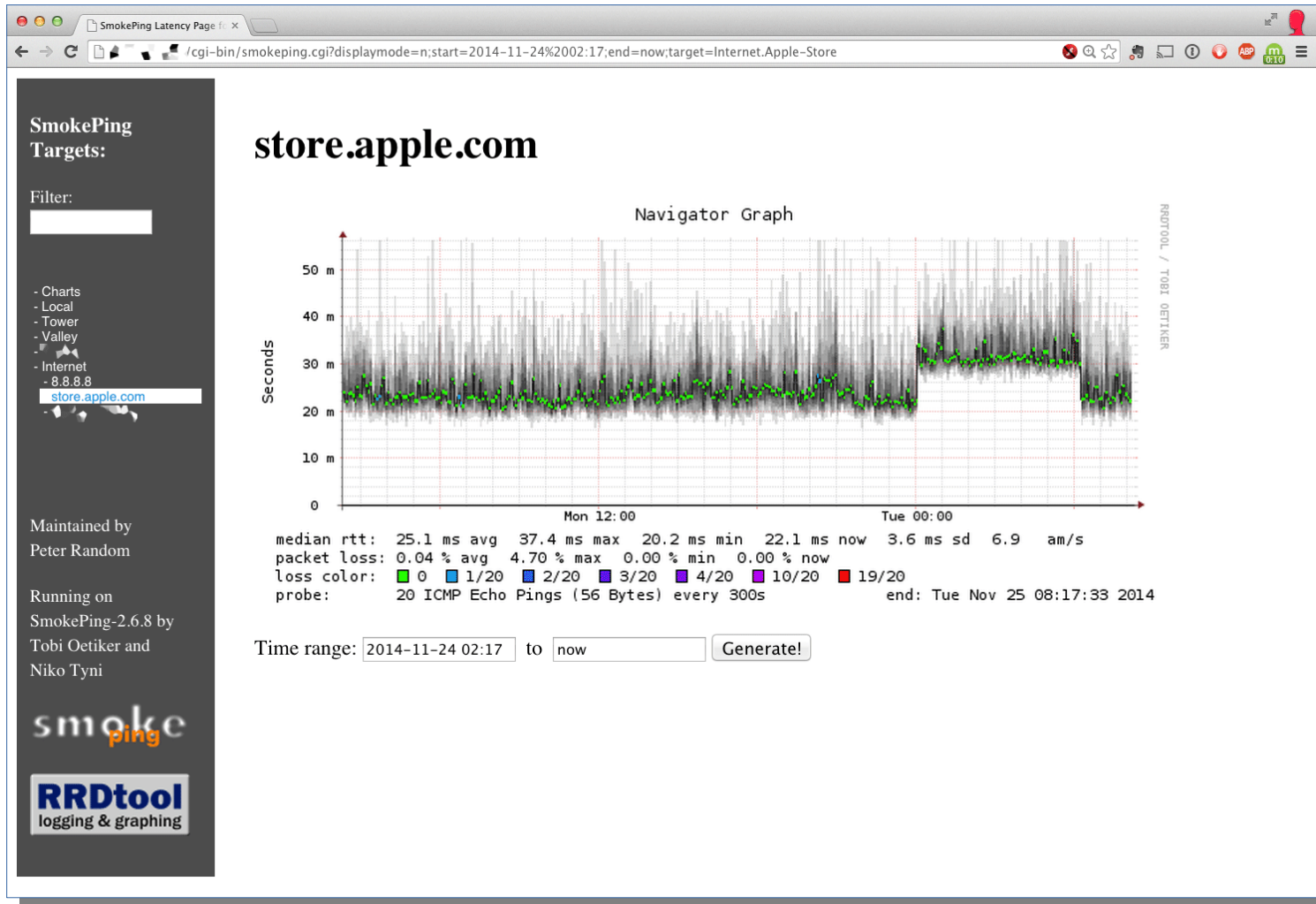
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Introduction

- SmokePing keeps track of your network latency:
- Best of breed latency visualization.
- Interactive graph explorer.
- Wide range of latency measurement plugins.
- Master/Slave System for distributed measurement.
- Highly configurable alerting system.
- Live Latency Charts with the most 'interesting' graphs.
- Free and OpenSource Software written in Perl written by Tobi Oetiker, the creator of MRTG and RRDtool



The Smoke & The Pings

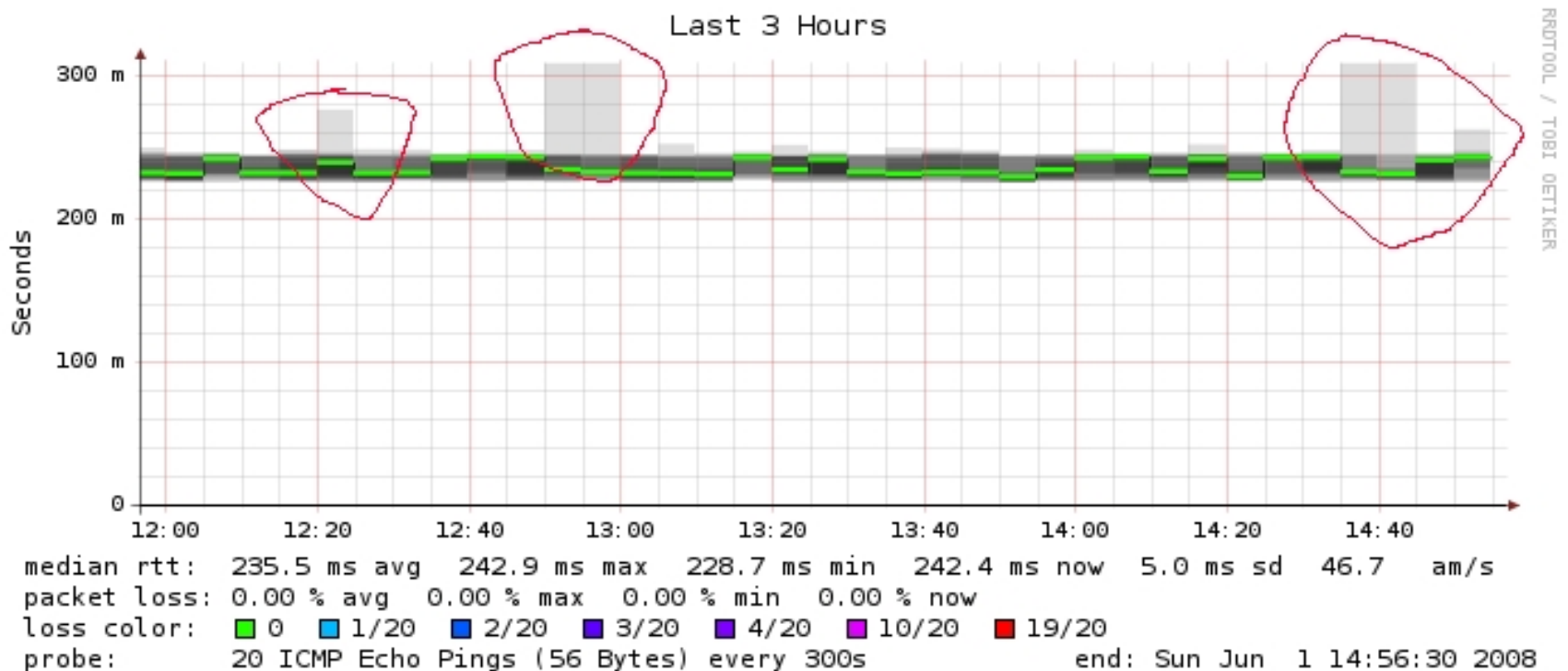


How To Read Smokeping Graphs

- Smokeping sends multiples tests (pings), makes note of RTT, orders these and selects the median.
- The different values of RTT are shown graphically as lighter and darker shades of grey (the “smoke”). This conveys the idea of variable round trip times or *jitter*.
- The number of lost packets (if any) changes the color of the horizontal line across the graph.

Example: African Network Operators Group

African Network Operators Group



Smokeping Installation

- **Debian/Ubuntu:**

```
apt install smokeping
```

- Configure **/etc/smokeping/config.d/***
- Change Smokeping's appearance here:
 - **/etc/smokeping/basepage.html**
- Restart the service:

```
Systemctl {start|stop|restart|reload} smokeping
```

Configuration

Smokeping configuration files in Ubuntu:

```
/etc/smokeping/config.d/Alerts  
/etc/smokeping/config.d/Database  
/etc/smokeping/config.d/General  
/etc/smokeping/config.d/pathnames  
/etc/smokeping/config.d/Presentation  
/etc/smokeping/config.d/Probes  
/etc/smokeping/config.d/Slaves  
/etc/smokeping/config.d/Targets
```

Generally we spend most of our time in
Alerts, General, Probes and **Targets**.

Configuration: General

To be updated:

- owner Ⓟ NOC
- contact Ⓟ sysadm@hostX.campusY.ws.nsrc.org
- cgiurl Ⓟ <http://hostX.campusY.ws.nsrc.org/cgi-bin/smokeping.cgi>
- mailhost Ⓟ localhost
- syslogfacility Ⓟ local5

```
*** General ***

owner      = NOC
contact    = sysadm@hostN.campusN.ws.nsrc.org
mailhost   = localhost
# NOTE: do not put the Image Cache below cgi-bin
# since all files under cgi-bin will be executed ... this is not
# good for images.
cgiurl     = http://hostN.campusN.ws.nsrc.org/cgi-bin/smokeping.cgi
# specify this to get syslog logging
syslogfacility = local5
# each probe is now run in its own process
# disable this to revert to the old behaviour
# concurrentprobes = no

@include /etc/smokeping/config.d/pathnames
```


Configuration: Targets

- Where we spend most of our time configuring Smokeping.
- Web menu hierarchy defined by “+”, “++”, etc.
- Each new *probe* statement resets the default probe in use.
- Probes have defaults set in the Probes config file. These can be overridden in Targets.

```
*** Targets ***

probe = FPing

menu = Top
title = Network Latency Grapher

+ UO
menu = University of Oregon
title = UO webserver
host = www.uoregon.edu

+ NSRC
menu = NSRC
title = Network Startup Resource Center
host = www.nsrc.org

++ HTTP
menu = HTTP
probe = EchoPingHttp

+++ www
menu = NSRC web
host = www.nsrc.org

++ DNS
menu = DNS
probe = DNS

+++ dns
menu = NSRC DNS
host = www.nsrc.org
```

Target Entry

Submenu depth (+ = top level, ++ = 2nd level, +++ = 3rd level...)

RRD filename on disk: `UO.rrd`

Must not contain spaces!

Label in left-side menu

Label at top of screen

The actual hostname (or IP address) to test

```
+ UO
menu = University of Oregon
title = UO webserver
host = www.uoregon.edu
```

Configuration: Targets Example

Targets file below produces the following default SmokePing page:

```
*** Targets ***  
  
probe = FPing  
  
menu = Top  
title = Network Latency Grapher  
remark = SmokePing Latency Monitoring \  
        Network Monitoring and Management Workshop  
  
+ Local  
  
menu = Local  
title = Local Network  
  
++ LocalMachine  
  
menu = Local Machine  
title = This host  
host = localhost  
  
++ NSRC  
  
menu = Network Startup Resource Center  
title = Latency to Network Startup Resource Center  
host = nsrc.org
```

SmokePing Targets:

Filter:

- Charts
- Local

Maintained by
NOC

Running on
SmokePing-2.6.7 by
Tobi Oetiker and
Niko Tyni

smoke ping

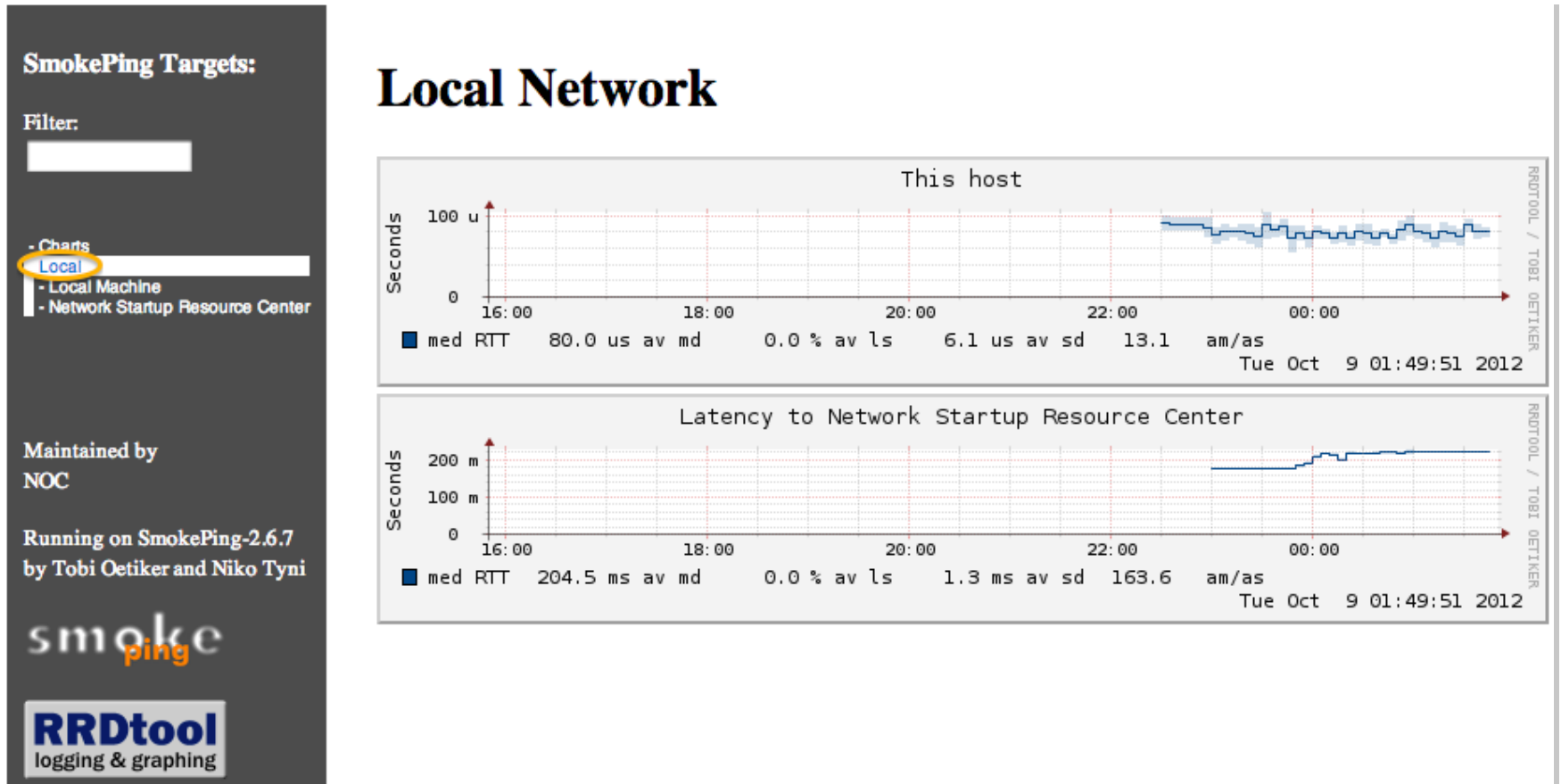
RRDtool
logging & graphing

Network Latency Grapher

SmokePing Latency Monitoring Network Monitoring and Management Workshop

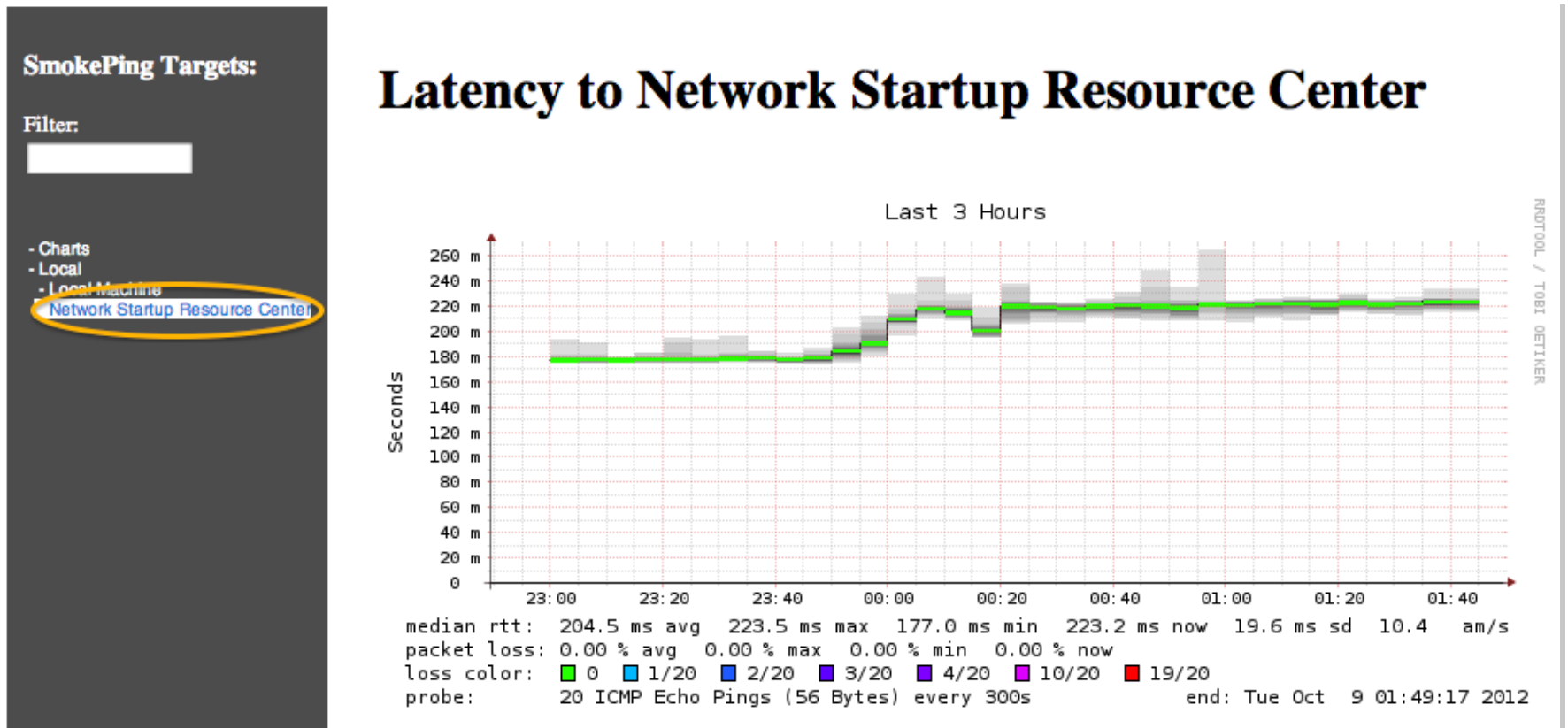
Configuration: Targets Example

Clicking on "Local" in the previous slide gives us:



Configuration: Targets Example

Clicking “Network Startup Resource Center” in the previous slides gives us:



Hierarchy in Targets File → Web UI

```

*** Targets ***

probe = FPing

menu = Top
title = Network Latency Grapher
remark = SmokePing Latency Monitor... \
        Network Monitoring and Mana...

+ Local
    menu = Local
    title = Local Network

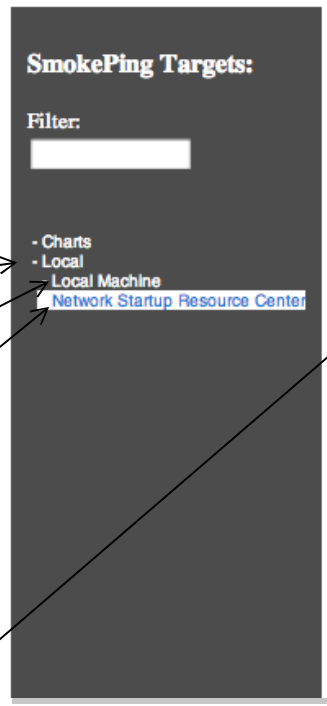
++ LocalMachine
    menu = Local Machine
    title = This host
    host = localhost

++ NSRC
    menu = Network Startup Resource Center
    title = Latency to Network Startup Re...
    host = nsrc.org
    
```

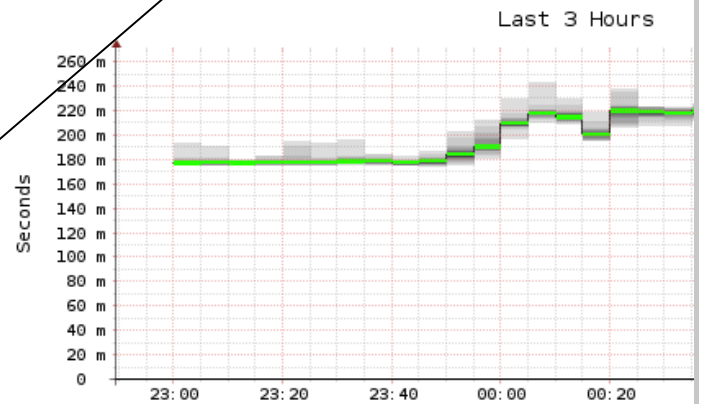
1st level

2nd level

2nd level



Latency to Network Startup Resource Center



median rtt: 204.5 ms avg 223.5 ms max 177.0 ms min 22
 packet loss: 0.00 % avg 0.00 % max 0.00 % min 0.00 % n
 loss color: 0 1/20 2/20 3/20 4/20 10/20
 probe: 20 ICMP Echo Pings (56 Bytes) every 300s

- + Local ☾ /var/lib/smokeping/Local
- ++ LocalMachine ☾ /var/lib/smokeping/Local/LocalMachine.rrd
- ++ NSRC ☾ /var/lib/smokeping/Local/NSRC.rrd

Configuration: Probes

Smokeping installs a series of additional probes. However, you need to specify them here – including their default behavior.

```
*** Probes ***

+ FPing
binary = /usr/sbin/fping

+ DNS
binary = /usr/bin/dig
lookup = nsrc.org
pings = 5
step = 180

+ EchoPingHttp
binary = /usr/bin/echoping
ignore_cache = yes
pings = 5
url = /

+ EchoPingHttps
binary = /usr/bin/echoping
pings = 5
url = /

+ EchoPingSmtip
binary = /usr/bin/echoping
forks = 5
```

Utilize the DNS probe to verify that services are available and responding as expected.

We'll use "nsrc.org" as the example name to resolve to verify if DNS is working.

Note: By default the **Probes** file only has FPing defined.

Default Probe: fping

**Probing for delay and jitter (ping)
Entry belongs in the Targets file**

Network Latency

```
probe = FPing
```

```
...
```

```
++ LocalMachine
```

```
menu = localhost
```

```
title = This host
```

```
host = localhost
```


Probe: DNS Check

In /etc/smokeping/config.d/Targets:

DNS Latency

++ DNS

probe = DNS

menu = External DNS Check

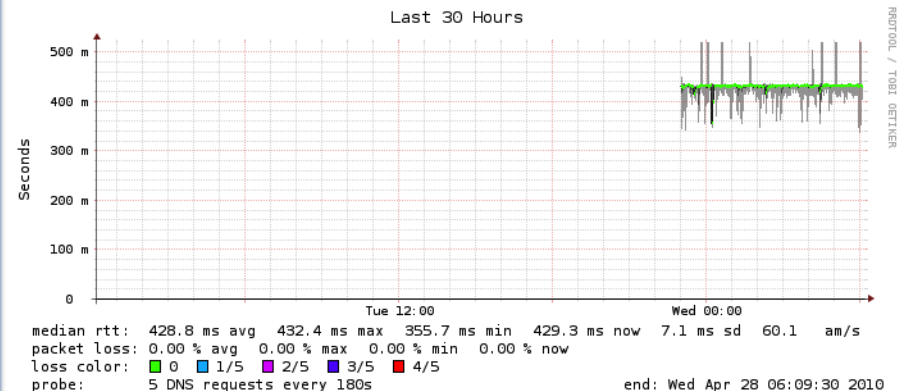
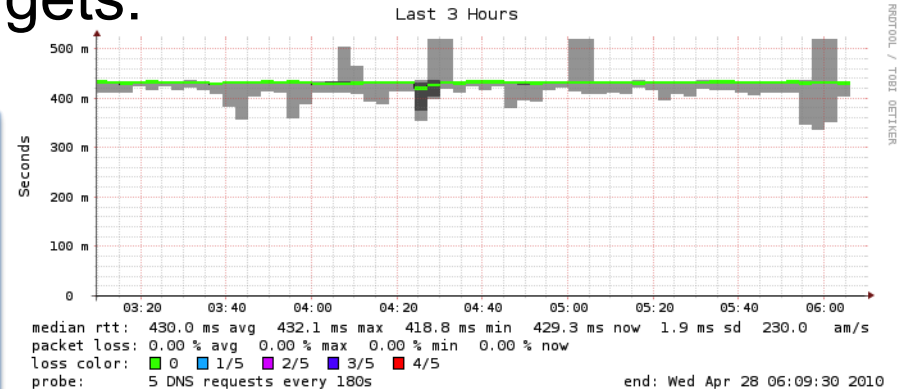
title = DNS Latency

+++ GoogleA

menu = 8.8.8.8

Title = DNS Latency GoogleA

host = google-public-dns-
a.google.com



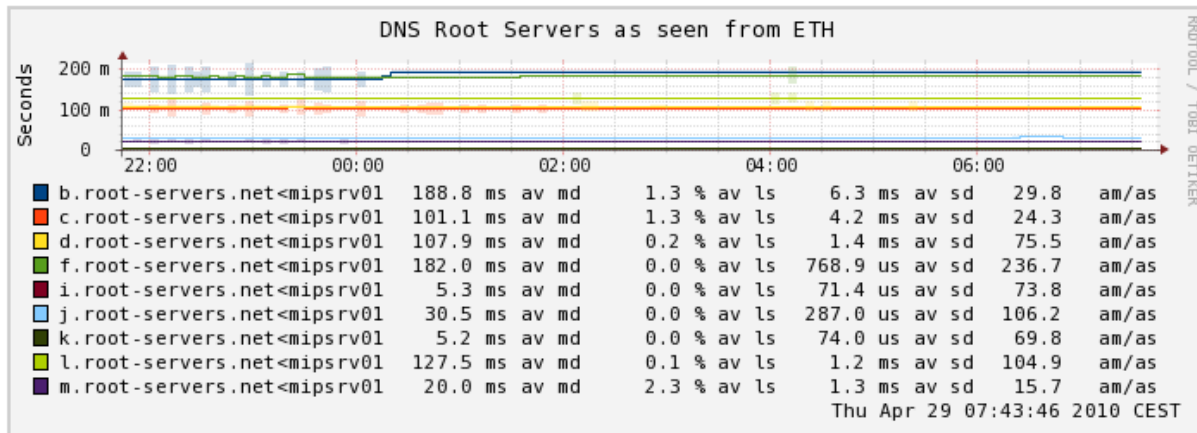
Multi-Host Graphing

Solve the issue of multiple hosts, one probe and missing differences in the Y axis (time):

http://oss.oetiker.ch/smokeping/doc/smokeping_examples.en.html

```
+++MultihostRouters
menu = MutihostRouters
title = Combined Router Results
host = /Local/Routers/gw /Local/Routers/rtr1
      /Local/Routers/rtr2
```

Sample configuration



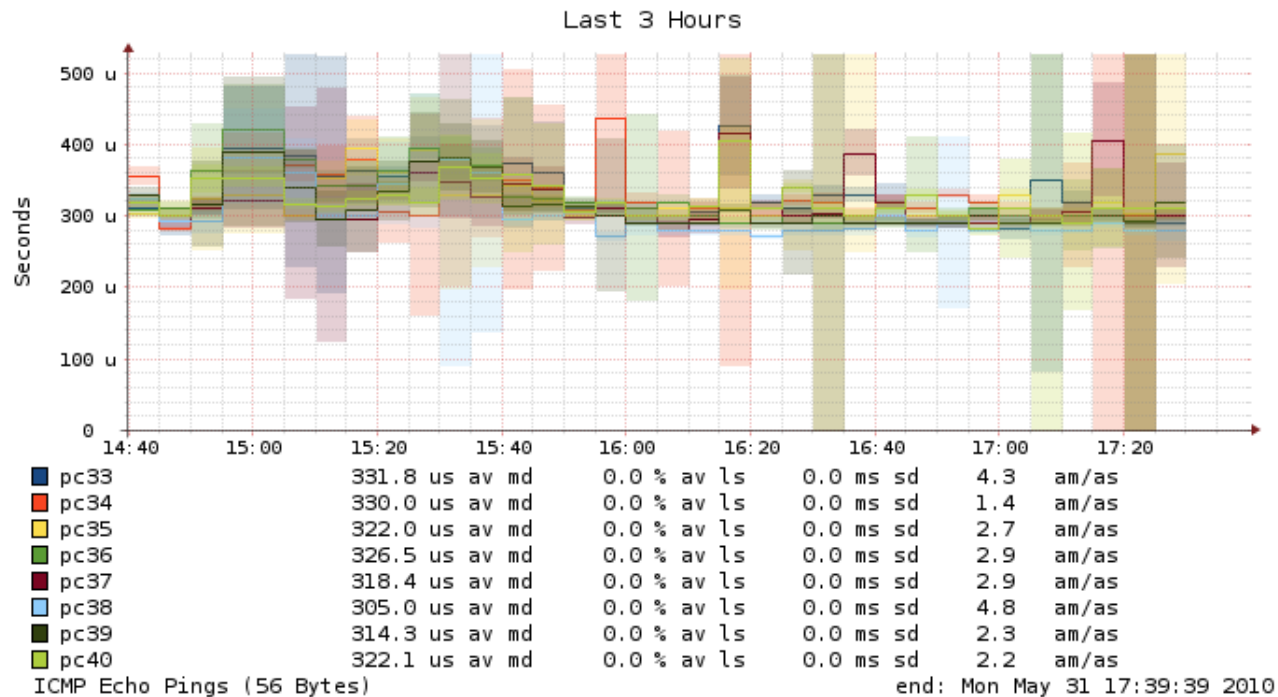
Example: Multi-Host Graph

SmokePing Targets:

Filter:

- Charts
- Local
- Ping Check Tutorial
- Web Check Tutorial
- Router Ping Check
- Switch Ping Check
- MultiHost Ping Row1
- MultiHost Ping Row2
- DNS Check Tutorial

Consolidated Ping Response Time



RRDTOOL / TOBI OETIKER

Smokeping Summary

- Simple but powerful network monitoring
- Monitor machines, services and link health
- Distributed instances for external views – often a paid-for service
- Easy to configure and customize, but very extensible.
- Use with Ticketing Systems to automate alerts
- Very small disk and CPU footprint

References

- **Smokeping website:**
 - <http://oss.oetiker.ch/smokeping/>
- **Smokeping Demo:**
 - <http://oss.oetiker.ch/smokeping-demo/?target=Customers.OP>
- **Examples:**
 - http://oss.oetiker.ch/smokeping/doc/smokeping_examples.en.html

Questions?