



# NETWORK MONITORING & MANAGEMENT MEASURING DELAY WITH SMOKEPING

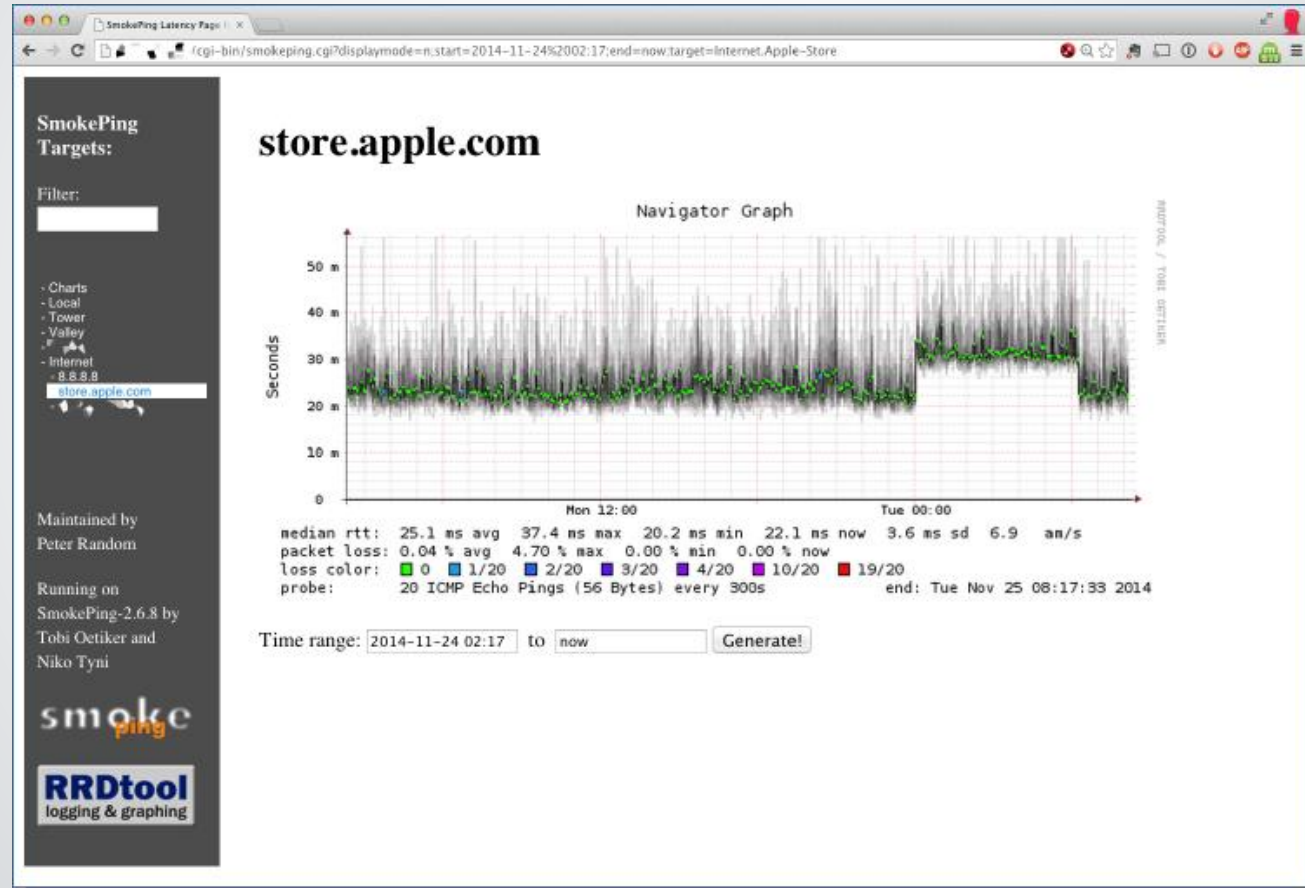


# INTRODUCTION

- 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.



# SMOKEPING INSTALLATION

## 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, ++ = 2<sup>nd</sup> level, +++ = 3<sup>rd</sup> level...)

RRD filename on disk: UO.rrd  
Must not contain spaces!

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

Label in left-side menu

Label at top of screen

The actual hostname (or IP address) to test



# CONFIGURATION: TARGETS EXAMPLE

Targets file below produces the following default SmokePing page:

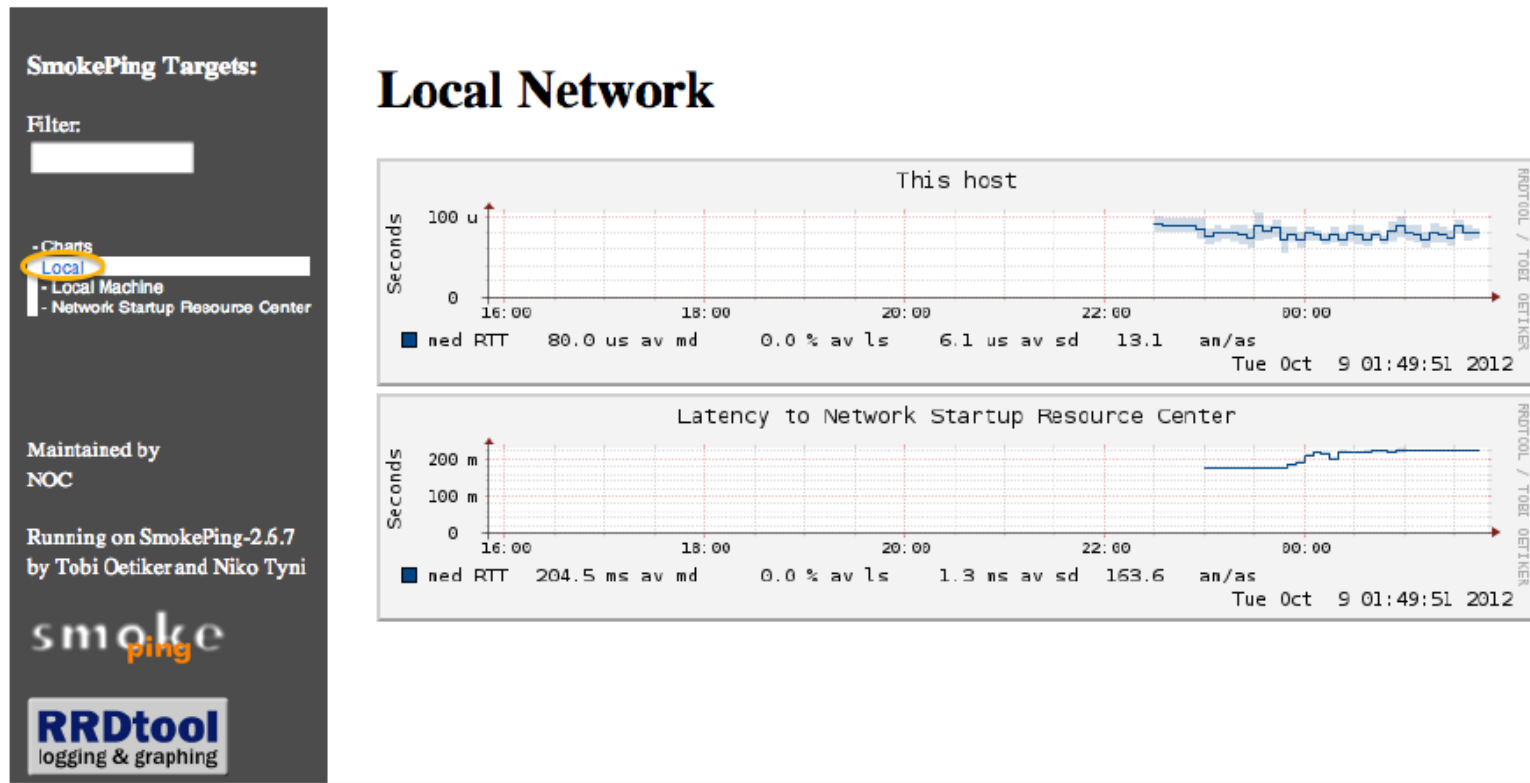
```
*** Targets ***  
  
probe = FPing  
  
menu = Top  
title = Network Latency Grapher  
remark = SmokePing Latency Monitoring \  
        Network Monitoring and Management Workshop  
  
+ Local  
  
menu = Local  
title = Local Network  
  
++ LocalMachine  
  
menu = Local Machine  
title = This host  
host = localhost
```

The screenshot shows the SmokePing web interface for a target named 'Local'. The page title is 'Network Latency Grapher', which is circled in orange. Below the title is the subtitle 'SmokePing Latency Monitoring Network Monitoring and Management Workshop'. The interface includes a 'Filter' input field, a 'Charts' menu with 'Local' selected (circled in orange), and a 'smoke ping' logo. At the bottom, it states 'Maintained by NOC' and 'Running on SmokePing-2.6.7 by Tobi Oetiker and Niko Tyni'. A logo for 'RRDtool logging & graphing' is also visible.



# 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:

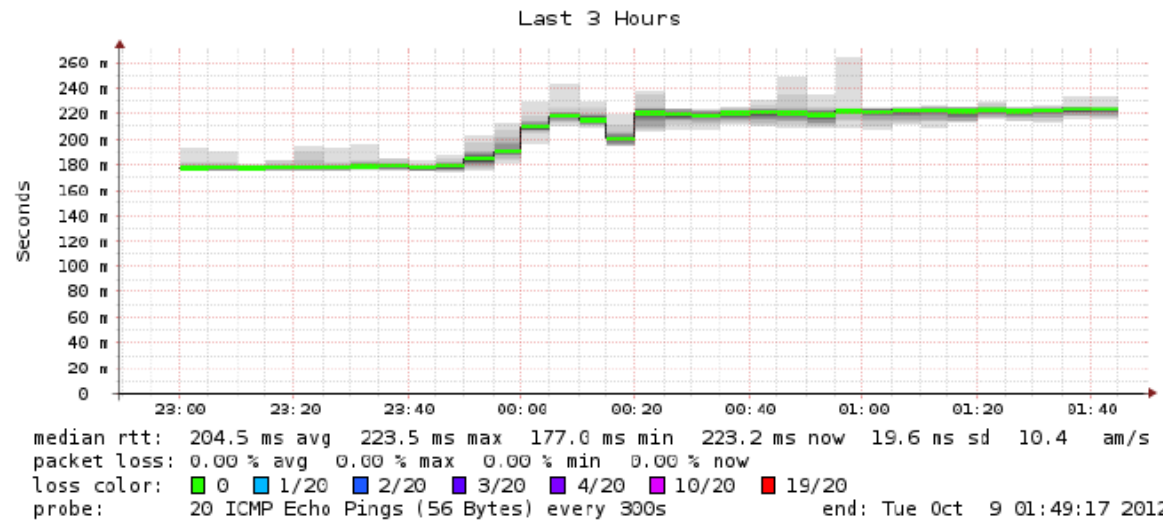
**SmokePing Targets:**

Filter:

- Charts
- Local
- Local Machine
- Network Startup Resource Center**

## Latency to Network Startup Resource Center





# 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

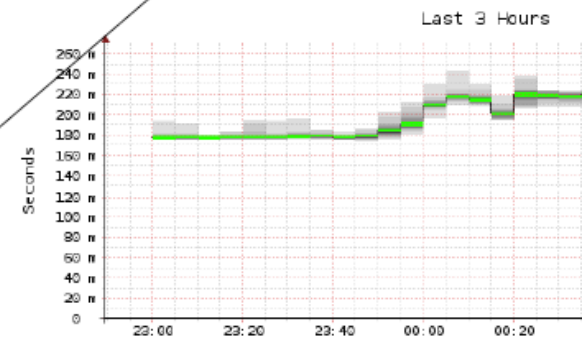
2nd level

SmokePing Targets:

Filter:

- Chans
- Local
- Local Machine
- Network Startup Resource Center

## Latency to Network Startup Resource Center



- + 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 = /

+ EchoPingSntp
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
```

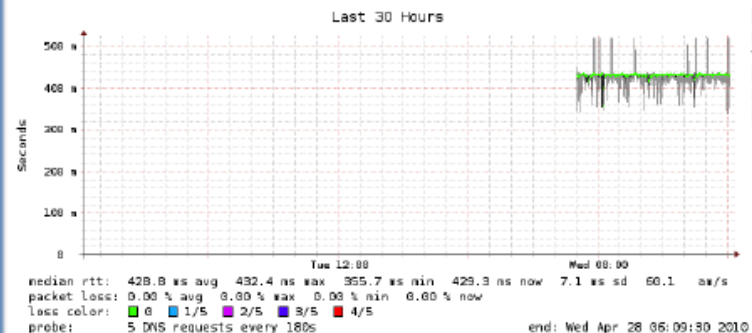
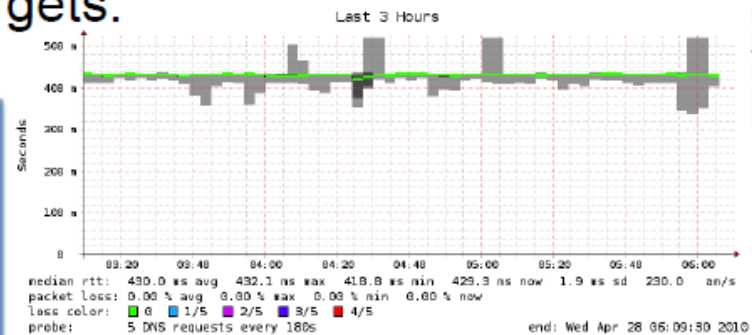
```
title = DNS Latency
```

```
+++ GoogleA
```

```
menu = 8.8.8.8
```

```
Title = DNS Latency GoogleA
```

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





# 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](http://oss.oetiker.ch/smokeping/doc/smokeping_examples.en.html)



THANK YOU