Measuring Delay with ping

Network Design and Operations
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Introduction

- Based on RRDTool (the same author)
- Measures ICMP delay and can measure status of services such as HTTP, DNS, SMTP, SSH, LDAP, etc.
- Allows you to define ranges on statistics and generate alarms.
- Written in Perl for portability
- Relatively easy to install. In Debian it's very simple.
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.
The “Smoke” and the “Pings”

Oregon Institute of Marine Biology

Navigator Graph

Median Ping RTT (04.5 ms avg)
Packet Loss: 0.00 % average 100.00 % maximum 100.00 % current
Probe: 20 ICMP Echo Pings (56 bytes) every 300 seconds

Time range: 2006-07-10 13:29 to now

Created on Mon Jul 10 15:29:37 2006

nsrc@summer workshop
eugene, oregon
Another Examples

African Network Operators Group

Last 3 Hours

median rtt: 235.5 ms avg 242.9 ms max 228.7 ms min 242.4 ms now 5.0 ms sd 46.7 am/s
packet loss: 0.00 % avg 0.00 % max 0.00 % min 0.00 % now
loss color: 0 1/20 2/20 3/20 4/20 10/20 19/20
probe: 20 ICMP Echo Pings (56 Bytes) every 300s
end: Sun Jun 1 14:56:30 2008
Requirements

- The following packages are needed or recommended:
  - rrdtool http://oss.oetiker.ch/rrdtool/
  - fping http://www.fping.com/
  - echoping http://echoping.sourceforge.net/
  - speedyCGI http://www.daemoninc.com/SpeedyCGI/
  - Apache http://httpd.apache.org
  - Perl
Smokeping: Installation

FreeBSD:

- `portinstall -PP smokeping`
- Configure `/usr/local/etc/smokeping/config.d/*`
- Change Smokeping's appearance here:
  - `/usr/local/etc/smokeping/basepage.html`
- Restart the service:
  - `/usr/local/etc/init.d/smokeping restart`
  - `/usr/local/etc/init.d/smokeprpring reload`
Smokeping: Installation

Debian/Ubuntu:

• `apt-get install smokeping`
• Configure `/etc/smokeping/config.d/*`
• Change Smokeping's appearance here:
  - `/etc/smokeping/basepage.html`
• Restart the service:
  - `/etc/init.d/smokeping restart`
  - `/etc/init.d/smokeprring reload`
Smokeping: Installation

You will find Smokeping running here:

http://hostname/cgi-bin/smokeping.cgi
Configuration

• The Smokeping configuration file: /usr/local/etc/smokeping/config

• It contains:
  − The locations of directories and components
  − Configuration of the probes used
  − Destination nodes and the format of the hierarchical Smokeping menu.
    • Each '+' adds a level to the hierarchy

• In addition /etc/smokeping/basepage.html allows you to change the look and feel of the initial Smokeping web page.
Configuration: Alerts

*** Alerts ***
to = netmanage@localhost
from = smokealert@noc.mgmt.conference.apricot.net

+bigloss
type = loss
# in percent
pattern = ==0%,==0%,==0%,==0%,>0%,>0%,>0%
comment = suddenly there is packet loss

+someloss
type = loss
# in percent
pattern = >0%,*12*,>0%,*12*,>0%
comment = loss 3 times in a row
Configuration: Database

*** Database ***

step  = 300
pings = 20

# consfn mrhb steps total

AVERAGE  0.5   1   1008
AVERAGE  0.5  12   4320
  MIN  0.5  12   4320
  MAX  0.5  12   4320
AVERAGE  0.5 144   720
  MAX  0.5 144   720
  MIN  0.5 144   720
Configuration: General

*** General ***

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

# Please edit this to suit your installation
owner    = netmanage@noc.mgmt.conference.apricot.net
contact  = netmanage@localhost
cgiurl   = http://noc/cgi-bin/smokeping.cgi
mailhost = localhost
# specify this to get syslog logging
syslogfacility = local0
# each probe is now run in its own process
# disable this to revert to the old behaviour
# concurrentprobes = no
Configuration: pathnames

You generally do not need to edit this part of the config file near the top:

```
sendmail = /usr/sbin/sendmail
imgcache = /usr/local/smokeping/htdocs/img
imgurl   = img
datadir  = /usr/local/var/smokeping
piddir   = /usr/local/var/smokeping
cgiurl   = http://localhost/smokeping/cgi-bin
smokemail = /usr/local/etc/smokeping/smokemail
tmail = /usr/local/etc/smokeping/tmail
# specify this to get syslog logging
syslogfacility = local0
```
Configuration: Presentation

```plaintext
*** Presentation ***

template = /etc/smokeping/basepage.html

+ charts

menu = Charts
title = The most interesting destinations

++ stddev
sorter = StdDev(entries=>4)
title = Top Standard Deviation
menu = Std Deviation
format = Standard Deviation %f

++ max
sorter = Max(entries=>5)
title = Top Max Roundtrip Time
menu = by Max
format = Max Roundtrip Time %f seconds
```
*** Probes ***

+ **FPing**
  
  binary = /usr/sbin/fping

+ **DNS**
  
  binary = /usr/bin/dig
  
  lookup = www.uoregon.edu
  
  pings = 5
  
  step = 180

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

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

+ **EchoPingSmtp**
  
  binary = /usr/bin/echoping
  
  forks = 5
Configuration: Slaves

# *** Slaves ***
#
## make sure this is not world-readable!
## secrets=/etc/smokeping/slave-secrets
#
# +slave1
# display_name=slave_name
# color=0000ff
Configuration: Targets

We will look at a sample configuration file that we use for the server

http://nsrc.org/

```plaintext
*** Targets ***

probe = FPing

menu = Top
title = Network Latency Grapher

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

+ UTE
menu = UTE
title = Universidad Tecnologica Equinoccial

++ HTTP
menu = HTTP
probe = EchoPingHttp

+++ www
menu = UTE web
host = www.ute.edu.ec

++ DNS
menu = DNS
probe = DNS

+++ dns
menu = UTE DNS
host = www.ute.edu.ec
```
Default Probe: Ping

• Probing for delay and jitter (ping)
• Performance and availability probe of a server:

**Latency**

+++ LocalMachine

menu = NOC
title = The NOC@netmanage
host = localhost
alerts = startloss,someloss,bigloss,rttdetect,hostdown
Another Type of Probe

• Performance and Availability

++ NOCsquid
menu = Squid on the NOC
title = www-cache / HTTP for noc@mgmt.conference.apricot.net
probe = EchoPingHttp
host = localhost
port = 8080
url = http://localhost/
More Types of Probes

More information available here:

A few more probes...

- DNS
- HTTP(S)
- LDAP
- Whois
- SMTP
- CiscoRTTMonDNS
- CiscoRTTMonTcpCon
- Tacacs
- WebProxyFilter
- WWW-Cache
- Radius
- IOS
- FPing6
- Etc.
References

• Smokeping website:
  http://oss.oetiker.ch/smokeping/

• Sample site:
  http://fushizen.net/cgi-bin/smokeping.cgi

• Good examples: