# PingER on a Virtual Machine at SLAC

## Introduction

We wanted to verify whether the sharing created by running on a virtual machine made any significant statistical difference to the PingER results. Thus we compare the results from PinGER running on a bare metal machine (pinger.slac.stanford.edu) vs running on a VM.

## Installation of PingER Measurement Agent (MA pinger2.pl)

Spin up the virtual machine.

- Its nickname is pingervm
- It is called dhcp-nebula-124.26.slac.stanford.edu (134.79.124.66)
- Install Apache
    - yum install -y httpd

Install pinger2.pl

- You need a writeable /usr/local (SLAC uses AFS
    - Get root access (sudo -s)
    - Set usrlocal=local in /etc/taylor.opts
    - sudo taylor everything to make the change take effect (example)
    - Install lynx (example), XML::Simple (example)
        - It also needs ping (usually pre-installed in /bin/ping), ping6 (usually pre-installed in /bin/ping6), dig (usually pre-installed in /usr /bin/dig), and mail (usually pre-installed in /bin/mail)

- Follow the instructions at: Installation Overview
    - tar xzf pinger-2.0.3.tar.gz
    - cd pinger-2.0.3
    - ./configure (example)
    - make test_prereqs
    - make (example)
- Then
    - make install (example)
    - make install_cron (example). Following this one has to move the line added at the end to above where Taylor makes changes to the file ( example).

Verify installation

- To see if the cronjob is running look at the dates on the files /usr/local/share/pinger/pingerCronStat.stdout and /usr/local/share/pinger /pingerCronStat.stderr, they should be within the last 30 mins (example)
- Examine the above files (in particular the stderr file) to verify pinger2.pl is properly configured (an example of a typical error in the stderr file). If all is well then the stderr file will be empty. Example of a normal stdout file.
- Look at the latest file in /usr/local/share/pinger/data/ and look at the most recent data (example).

## Installation of traceroute.pl and ping_data.pl

These are CGI scripts to enable a reverse traceroute and ping server (traceroute.pl), and to enable the gathering of data (ping_data.pl) from the archive sites. The two scripts were installed in the standard CGI script location /var/www/cgi-bin as defined in /etc/httpd/conf/http.conf. They are accessible from within SLAC as: http://dhcp-nebula-124-66.slac.stanford.edu/cgi-bin/ping_data.pl and http://dhcp-nebula-124-66.slac.stanford.edu/cgi-bin/traceroute.pl. Since they are on port 80 there is no access to the web server from offiste.

To ensure the web server (Apache) restarts after a reboot I also had to issue:

```
[cottrell@dhcp-nebula-priv-52-7 ~]$ sudo -s

[sudo] password for cottrell:

[root@dhcp-nebula-priv-52-7 cottrell]# /sbin/chkconfig httpd on

[root@dhcp-nebula-priv-52-7 cottrell]# /etc/init.d/httpd restart

Stopping httpd:                                            [FAILED]

Starting httpd:                                            [  OK  ]
[root@dhcp-nebula-priv-52-7 cottrell]# ps -efl | grep httpd

1 S root      3056     1  0  80   0 - 46710 poll_s 07:42 ?        00:00:00 /usr/sbin/httpd

5 S apache    3058  3056  0  80   0 - 46710 inet_c 07:42 ?        00:00:00 /usr/sbin/httpd

5 S apache    3059  3056  0  80   0 - 46710 inet_c 07:42 ?        00:00:00 /usr/sbin/httpd

5 S apache    3060  3056  0  80   0 - 46710 inet_c 07:42 ?        00:00:00 /usr/sbin/httpd

5 S apache    3061  3056  0  80   0 - 46710 inet_c 07:42 ?        00:00:00 /usr/sbin/httpd

5 S apache    3062  3056  0  80   0 - 46710 inet_c 07:42 ?        00:00:00 /usr/sbin/httpd

5 S apache    3063  3056  0  80   0 - 46710 inet_c 07:42 ?        00:00:00 /usr/sbin/httpd

5 S apache    3064  3056  0  80   0 - 46710 inet_c 07:42 ?        00:00:00 /usr/sbin/httpd

5 S apache    3065  3056  0  80   0 - 46710 inet_c 07:42 ?        00:00:00 /usr/sbin/httpd

0 S root      3083  3029  0  80   0 - 26328 pipe_w 07:46 pts/0    00:00:00 grep httpd
```

### Analysis of Floating address Results

See here

### Fixed IP address

On March 6, 2015 around 6:30pm, Yee reconfigured the VM to use a fixed address. The IP address is now 172.23.52.7. This host can only be seen from SLAC.

I changed:

- the SLAC beacons list this host points to so it only monitors pinger.slac.stanford.edu.
- the /usr/local/share/pinger/pinger.xml file:
  - to only ping the single beacon pinger.slac.stanford.edu,
  - to point to the above beacon list at http://www-iepm.slac.stanford.edu/pinger/beacons-pingervm.txt
  - and the <SrcName>172.23.52.7</SrcName>
- I changed the file /afs/slac.stanford.edu/package/pinger/pinger2/share/pinger/pinger.xml from pointing to here to pointing to here in the <HostList>

I created another NODE_DETAILS record for 172.23.52.7 and disabled dhcp-nebula-124-66.slac.stanford.edu. The new services are now at:

- http://172.23.52.7/cgi-bin/ping_data.pl
- http://172.23.52.7/cgi-bin/traceroute.pl
- http://172.23.52.7/cgi-bin/traceroute.pl?function=ping

Traceroutes from pinger to pingervm and from pingervm to pinger.

Analysis of Fixed address results

Analysis of measurements from March 10, 2015 16:30 through March 13, 2015 23:45,  i.e. approximately 3000 pings, showed a difference  (pinger>pingervmfix - pingervmfix>pingert) in minimum RTT of  of ~ 0.045 +- 0.02 ms

Spreadsheet.

## Logging in

```
176cottrell@pinger:~$ssh 172.23.52.7
================================================================================
                                NOTICE TO USERS
This is a Federal computer system and is the property of the United States
...
stated in this warning.
================================================================================
RHEL Server 6.7 (Santiago) 2.6.32-504.16.2.el6.x86_64 (1x2099MHz OpenStack Nova)
================================================================================
WINSTART: Undefined variable.
169cottrell@dhcp-nebula-priv-52-7:~$
```