

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 offsite.

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 $\sim 0.045 \pm 0.02$ ms

[Spreadsheet.](#)

Logging in

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