Nepal Earthquake 2015

The earthquake occurred on Saturday at 11:56 April 25th, 2015 NPT or 6:11 UTC (see http://en.wikipedia.org/wiki/April_2015_Nepal_earthquake) N.b. NPT is UTC + 5:45.

> *Internet service was disrupted after the earthquake hit near the capital city of Kathmandu on Saturday and cloud services provider Akamai said its traffic to the country saw a steep decline just after 6:00 UTC.*
>
> *Nepal Telecom survived the earthquake while smaller Internet service providers experienced outages, Internet performance monitoring company Dyn said. It had earlier reported that the earthquake had rattled the Internet in the country. From http://www. itworld.com/article/2914975/internet-steady-in-nepal-after-earthquake-but-lastmile-connectivity-an-issue.html*

Impact on NREN Web site access

The impact on PingER measurements is seen below for measurements from SLAC to the Web site for the Nepal National Research and Education Network in Khatmandu. It is seen that there is 100% loss from after 7:39 soon after the earthquake (Spreadsheet) until 11:29. It is interesting to see that the connectivity stayed up for at least 1 hour 28 minutes after the earthquake.

Ping RTT & loss from SLAC to www.nren.net.np In Khatmandu
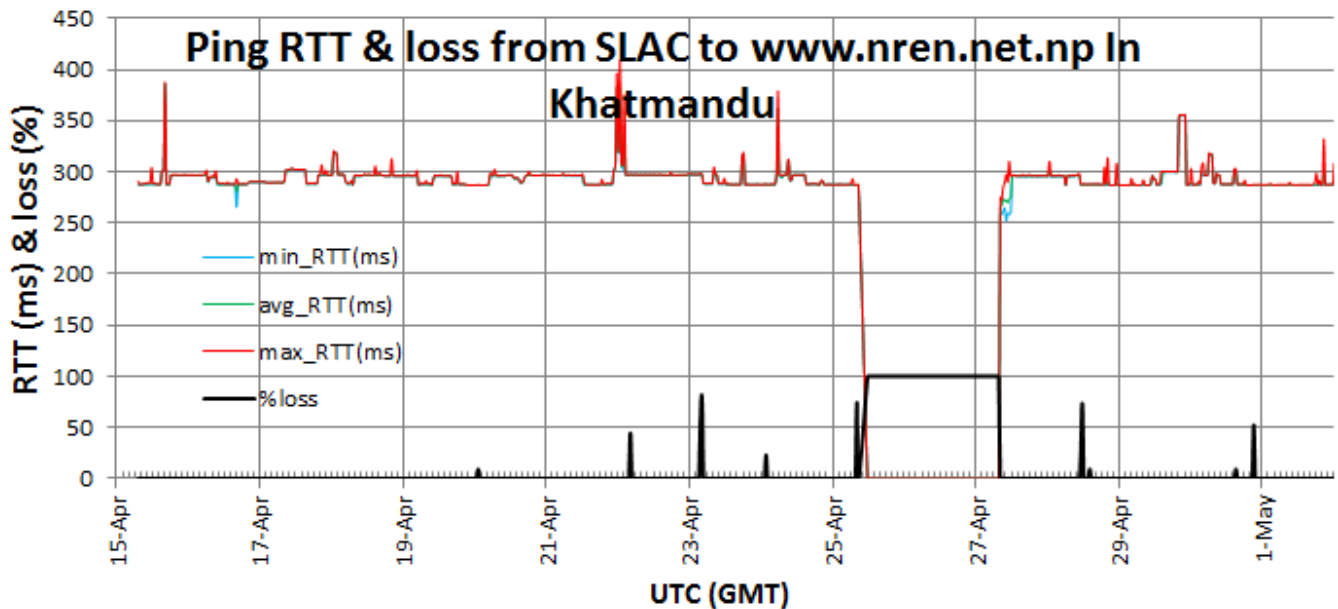
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Executing exec(traceroute -m 30 -q 1 -w 3 -A 202.52.0.2 140)
traceroute to 202.52.0.2 (202.52.0.2), 30 hops max, 140 byte packets
 1  rtr-servcore1-serv01-webserv.slac.stanford.edu (134.79.197.130) [AS3671]  0.483 ms
 2  rtr-core1-p2p-serv01-02.slac.stanford.edu (134.79.253.253) [AS3671]  0.355 ms
 3  rtr-fwcore1-trust-p2p-core1.slac.stanford.edu (134.79.254.134) [AS3671]  0.744 ms
 4  rtr-core2-p2p-fwcore2-untrust.slac.stanford.edu (134.79.254.149) [AS3671]  0.856 ms
 5  *
 6  sunncr5-ip-c-slac.slac.stanford.edu (192.68.191.233) [AS3671]  1.697 ms
 7  transpac-1-is-jmb-780.lsanca.pacificwave.net (207.231.246.136) [*]  8.930 ms
 8  tokyo-losa-tp2.transpac.org (192.203.116.146) [*]  124.473 ms
 9  kote-dc-gm1-xe2-2-1-4005.jp.apan.net (203.181.248.249) [AS7660]  124.522 ms
```

10 sg-xe-01-v4.bb.tein3.net (202.179.249.77) [AS24489] 193.449 ms AS24489 TEIN2-NORTH-AP Trans-Eurasia Information Network (TEIN2) - North,CN

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11  mb-so-01-v4.bb.tein3.net (202.179.249.54) [AS24489]  251.349 ms
12  np-pr-v4.bb.tein3.net (202.179.249.126) [AS24489]  296.617 ms
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13 gw-vlan224.nren.net.np (202.52.1.33) [AS38217/AS45170] 296.894 ms AS45170 NREN-AS-NP Nepal Research and Education Network,NP

14 ns.nren.net.np (202.52.0.2) [AS38217/AS45170] 296.968 ms AS38217 DS-AS-NP Dataspace Pvt. Ltd.,NP

```
traceroute -m 30 -q 1 -w 3 -A 202.52.0.2 140 took 4secs. Total time=4secs.
```

Impact on Government web site

It is seen in the plot below that no measurements were available after 7:39 and before 11:09 on April 25th, 2015 UTC (Nepal is 5:45 hours ahead of UTC).

Ping RTT (ms) and loss (%) from SLAC to www.most.gov.np
First earthquake Apr 25, 2015 6:11 UTC
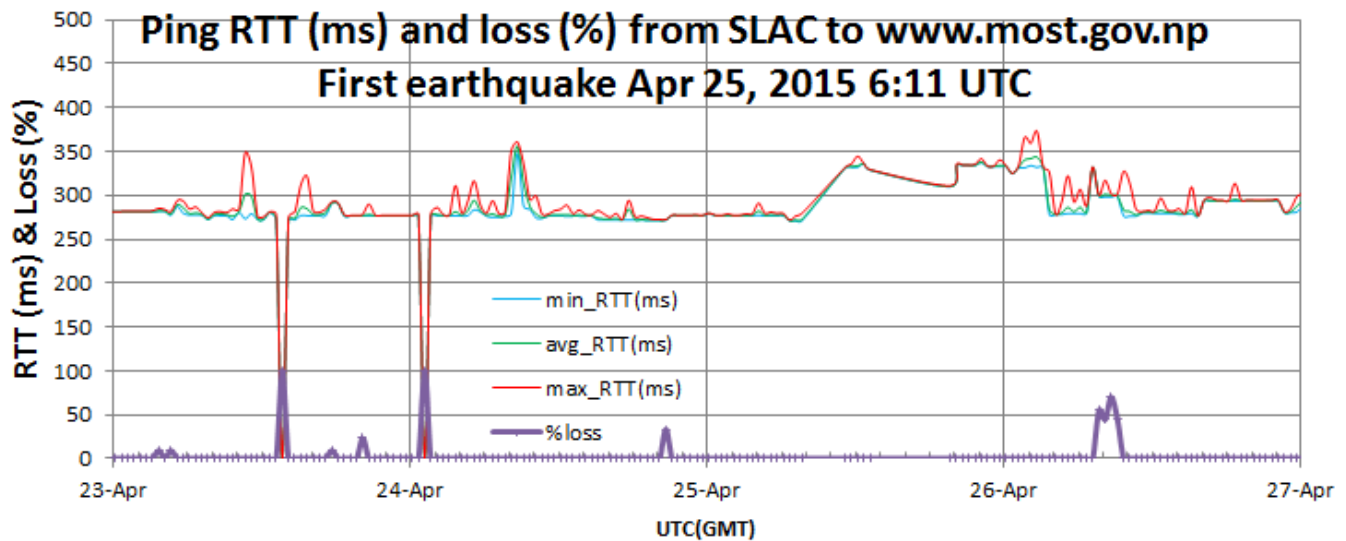
The impact of the aftershock on May 12/2015 at 7:16am UTC is seen below to be much smaller than that for the initial earthquake (i.e. 100% loss at the 9: 30am measurement).

Ping RTT (ms) and loss (%) from SLAC to www.most.gov.np
Aftershock May 12th, 2015 7:16 UTC
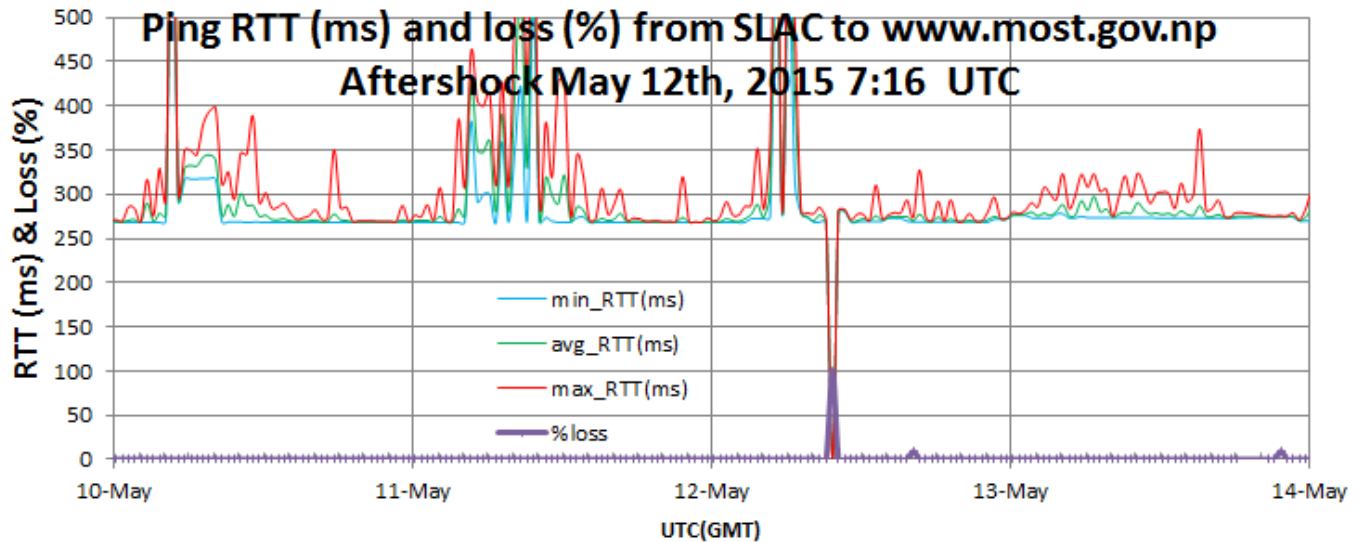
In the plot below it is seen that following the initial earthquake the performance degraded (i.e. longer RTTs). The lack of measurements on May 5 and 6 is since the monitoring host at SLAC was being upgraded and did not make any measurements.

Ping RTT (ms) and loss (%) from SLAC to www.most.gov.np
First earthquake Apr 25, 2015 6:11 UTC
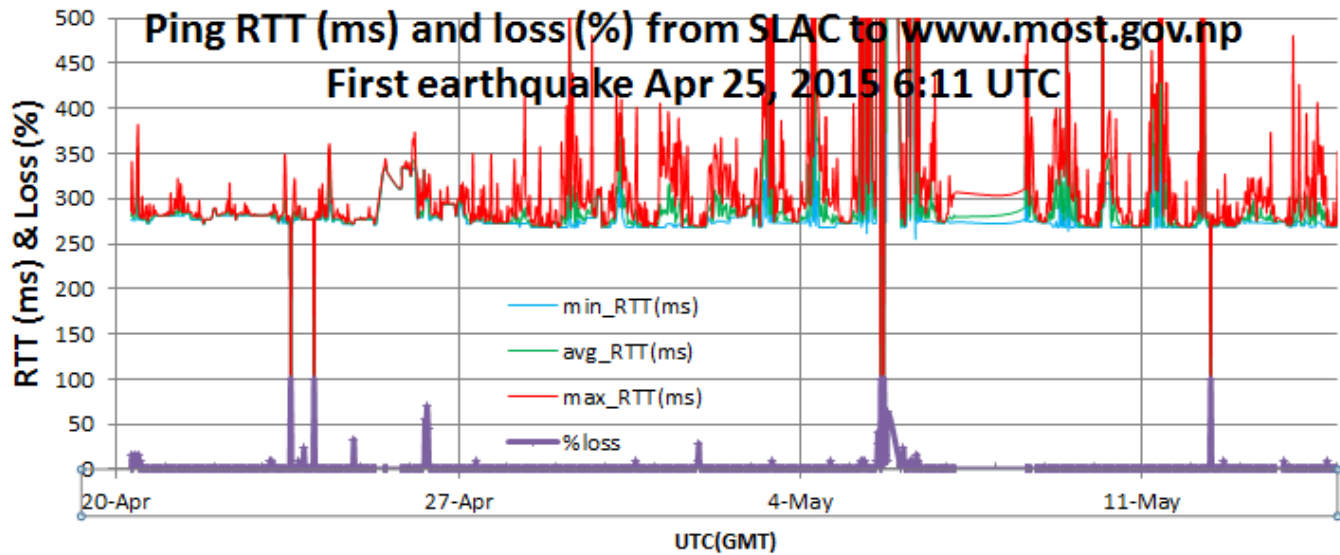
FAQ

Why is there no data from for www.nren.net.np from 0842-1143 on April 15th.

- The data gap from 08:42-11:43 is that the monitor at SLAC for each target sent up to 30 pings at roughly each half hour until it received 10 ping responses. However there were no ping responses (i.e. 100% loss). Thus the NNREN web site was not reachable (could be the host crashed, or the network was no longer forwarding the packets, more likely the former given other information you refer to) and ping reports 100% loss.

The event occurred at 0611UTC, and for 2.5 hours(!) the connectivity from SLAC to NNREN was maintained quite well, it seems.

- I agree it is very interesting/curious that the connectivity appeared to continue working for 2.5 hours, and then died. One would need to talk to the net and host admins. There are many possibilities e.g. maybe the network continued to work but a UPS on the host ran out of battery power, or the backup generator ran out of fuel, or people deliberately shut down power.
- It is interesting that the connectivity continued for an hour or so after the shock wave. Caltech points out that this could be important for projects measuring the impact of the initial shockwave.

There is a second gap in the www.most.gov.np on 25 April from 1309-1939UTC, for which a similar question arises about the gap source.

- The 25 April from 1309-1939UTC gap for www.most.gov.np is interesting in that the SLAC monitor was running fine based on measurements to the rest of the world. One would have expected it to have recorded 100% loss (i.e. unreachable), instead the software reports no measurement. This because the ping command itself failed to produce anything intelligible. I am not sure why. Unfortunately we do not retain the error logs that long.