201905 PingER Team Meeting

Time & date

This meeting: May June 25 10 pm Pacific time; a day later 10:00 am Pakistan time; 10:30 am India time; 1:00 pm Malaysian & Guangzhou time; 12:00 pm Thailand time; 7:00 am Jordan and 6:00am Turkey.

Doodle poll invites sent 5/6/2019.

Format

New items and updates are in boldface.

Coordinates of team members:

Mailing list: pinger-my@googlegroups.com for membership see https://groups.google.com.

Attendees

Invitees:

Wajahat Hussain (SEECS), Saqib (GZHU); Johari (UNIMAS); Adib (Turkey); Dr. Charnsak Srisawatsakul (Ubru), Eyad Ayoubi (Jordan), Baraa Muslmani (Jordan), Dr. Shadi Jawarneh (Jordan), Bebo White, Umar Kalim, Les Cottrell

- + Responded via Doodle can attend; - Responded, but unable to attend on this date; ? extra email sent asking if attending
- Email addresses (all the following are in pinger-my).
    - cottrell@slac.stanford.edu; wajahat.hussain@seecs.edu.pk; saqibutm@outlook.com; johari.abdullah@gmail.com; adibhabbal@karabuk.edu.tr; charnsak.s@ubru.ac.th; eyadayoubi@gmail.com; b.muslmani@yahoo.com; shadi.jawarneh@yahoo.com; bebo@slac.stanford.edu; umar.kalim@gmail.com; xsaifahmadx@gmail.com

Actual Attendees

Wajahat, Saqib, Umar, Bebo, Les

Others

Administration

- **Dr. Umar Kalim has left SLAC to join Amazon. He will continue to be involved in the PingER project. He will not be able to keep his SLAC account.**
- **This meeting was scheduled with the aid of a Doodle poll. Due to Ramadan, and various persons' availability, we will now try for the 3rd week of June.**

Use of Zoom

IMPORTANT NOTE: The meeting is set up to record automatically. By joining the meeting you are agreeing to be recorded (see details)

What: PingER Standing Meeting
When: Apr 25, 2019 10:00 PM Pacific Time (US and Canada)

Where: Join from PC, Mac, Linux, iOS or Android: https://stanford.zoom.us/j/304935571

How to set up and use Zoom:

To use the software, you would have to download the Zoom client (and installed if prompted). The instructions to do so are listed here: https://zoom.us/download#client_4meeting

The instructions about setting up the software are listed at the URL below. You may want to create an account if you do not have one already. If you are invited to a meeting (i.e., you are not hosting the meeting), you are not required to create an account; you can simply join the meeting using the meeting ID.

https://support.zoom.us/hc/en-us/articles/201362033-Getting-Started-on-PC-and-Mac

Jordan (Updated 4/25/2019)

- Baraa is interested in monitoring other Jordanian hosts.
    - There are 4 other existing targets in Jordan.
        - http://www.slac.stanford.edu/cgi-wrap/dbprac.pl?alias=JO.EDU.GJU.WWW&monalias=EDU.SLAC.STANFORD.PINGER
        - http://www.slac.stanford.edu/cgi-wrap/dbprac.pl?alias=JO.GOV.CBJ.WWW.N1&monalias=EDU.SLAC.STANFORD.PINGER
        - http://www.slac.stanford.edu/cgi-wrap/dbprac.pl?alias=JO.JUST.EDU.N1&monalias=EDU.SLAC.STANFORD.PINGER

        - http://www.slac.stanford.edu/cgi-wrap/dbprac.pl?alias=JO.NEXT.WWW&monalias=EDU.SLAC.STANFORD.PINGER
        - If there are other sites in Jordan that should be monitored from say SLAC and Jordan please let me know the details and you can add them to the PingER Oracle NODEDETAILS database, so they are monitored from SLAC. If they are to be monitored from Telephoenics then they will need to be added to the <HostList>stanza of the Telephoenics pinger.xml.
        - Sent email 4/18/2019: *E.g. say you wanted to add alias=JO.EDU.GJU.WWW then click on the above link and you will get information like:*
            - `NODENAME: www.gju.edu.jo IPADDRESS: 87.236.233.242 SITENAME: gju.edu.jo NICKNAME: JO.EDU.GJU.WWW FULLNAME: German Jordanian University LOCATION: German Jordanian University, Amman Madaba Street, Amman, Jordan COUNTRY: Jordan CONTINENT: Middle East LATANDLONG: 31.7769 35.8 PROJECTTYPE: NOT-SET PINGSERVER: NOT-SET TRACESERVER: NOT-SET DATASERVER: NOT-SET URL: http://www.gju.edu.jo/ CONTACTS: Google COMMENTS: Add by Cottrell 5/17/2018.`

              Following this information you will need to edit pinger.xml to add a stanza in <HostList></HostList> of the form:
              <HostList>

<Host>	
	<EnableDNSCache>false</EnableDNSCache>
	<IP>87.236.233.242</IP>
	<Name>www.gju.edu.jo</Name>
</Host>	

              </HostList>
        - Baraa responded 4/18/2019: *"Sorry for this delay we have finished our mid term exams, I gathered a set of host and will filter them according to the given criteria by this weekend. In Jordan the weekend is Friday and Saturday."*
    - Baraa asked what the criteria are for choosing targets, emailed him (4/4/2019) about Finding PingER Hosts.
    - Baraa provided details of 4 sites apparently in Jordan. However, only two had RTTs of > 80ms as seen from SLAC. Thus the others are probably proxies in North America. Unfortunately, the remaining two have RTTs from Jordan of 80ms which probably means they are proxies in Europe.

Turkey (Updated 4/25/2019)

Email from Eyad Ayoubi 3/16/2019.
"I'm almost settled, and waiting for my residency ID. ...
For installing Pinger MA in Turkey, I will do it soon, but first I need a PC for this purpose and I, unfortunately, don't have an extra one, however, I do my best to find a cheap PC to use, and then I might need some help during installation and I will contact you and Baraa". A possibility might be to send him the Raspberry Pi that we used to run a PingER MA on at SLAC for a couple of years. Bebo's guess is that Raspberry Pi is definitely too old and that shipping it would cost more than it's worth.
Les sent email 4/3/2019. Response 4/4/2019: *"I am asking about the process of having public IP address because I understood that we need public IP for the agent"*. Email (4/18/2019) from Les confirming need for IP address, plus a registered DNS name also simplifies things.
Eyad responded: *"I have gathered some information about how to have a public IP address and it seems it is not complicated, just a subscription with the ISP, I will discuss in the next meeting"*

We also received an unsolicited email:
" We are employing PingER in Hasan Kalyoncu University, in Turkey, for the purpose of conducting researches on the Internet performance in Turkey. Actually, we have collected data in our node, so we would like our collected data to be retrieved by the archival site at SLAC. Below are the details information on our monitoring node.

- *DNS: pinger.hku*
- *Public IP: 10.15.2.146*
- *Node Coordinates*
- *Latitude: 37.014764 Longitude: 37.205743*
- *Node Location: ahinbey Mahallesi, Havaliman Yolu 8.Km, 27000 ahinbey/Gaziantep*
- *Contact Person:*
- *Name: Mohammed Madi*
- *Designation: Assistant Professor in Computer Engineering Department*
- *Contact Number: 00905537717593*
- *Email address: mohammed.madi@hku.edu.tr*

Thank you in advance, looking forward to hearing from you"
Unfortunately, this appears to be a private IP address so is not accessible. Les sent an email 4/19/2019 to Mohammed. Mohammed provided a public IP address (95.0.84.5), however, it is not pingable and the URL does not respond. Sent another email 4/24/2019, 4/28/2019.
Also sent email to Adib (who is in Turkey) and Eyad in case they know the person or site. Adib responded 4/20/2019: "*Yes, I know Mohammed, he graduated from UUM (Malaysia), and we worked together at the same department. He is a good researcher. I think, he can contribute to PingER project."*

Amity (Updated 4/25/2019).

Amity team photo:

Android progress:

- Instructions from Aayush to load the application are at ePingER Functional prototype (for Androids only)
    - They sent a new copy of the app 4/6/2019, see ePingER Functional prototype
        - The information has been passed to Topher, who plans to install on an Android. The ball is now in our court
        - There is a discussion between Les and Aayush on how to format the raw data records, in particular with respect to the lat/long. Sent a reminder 4/18/2019.
        - We (SLAC) an email to Aayush asking how we gather the raw data from the cloud. Sent reminder 4/18/2019.
            - Aayish responded 4/18/2019:
              Yes, we have modified the app to write the semi-colon to the file as a separator.
              However, at this point we suggest you to not make any changes to the pinger project yet.

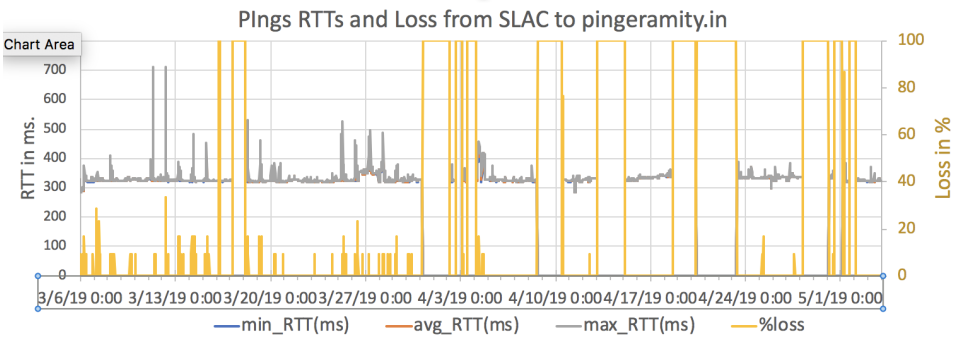
              Let us see and run in this parallel to what is already setup at Amity MA. This will allow us to compare the quality of results by both the systems – one at present which does not utilize the app, and the new one which requires an app for data collection.
              We send the data from the app to the firebase cloud service as JSON objects via a REST API.
              On the cloud-server side, we intend to build a compute-service that automatically converts the json data to a txt format, for consumption by data researcher team at amity (because they are already used to running analysis on the txt files; but seem to be open to working with JSON data as well). [For the SLAC gatherer we would at least initially prefer the data to be retrieved/available in txt form. This way the changes to the gatherer are minimized and more consistent with current practice.]

              So once the team finds that the results are significant enough, then we can formally propose to include lat/long data in the Pinger gathering, archiving and analysis.
              For now, it would be best that we do not disturb the current Amity MA, and that the android project runs parallel to this."

- Topher is back, Bebo is contacting him. Bebo's thoughts were that:PingER will need a fixed name for each Android MA. Since the Android may be mobile the IP address may be dynamic. There is a DNS name to dynamic IP address service that may be useful. Maybe there is another unique fixed identifier in an Android that could be used such as a serial number or SIM ID.
    - If the Amity app is robust (i.e. it does not noticeably impact the other services, power, networking, security etc) make it part of the standard Rainforest installation;
    - Topher's package knows the GPS location, so it should be available to PingER for recording.
    - **Topher's Rainforest project is a grantee of Google's AI for Social Good program, which launched the Google AI Impact Challenge, see https://www.blog.google/outreach-initiatives/google-org/ai-impact-challenge-grantees/?fbclid=IwAR0_APkJ6UTLUFGOVMxRW5qU_u1QYRKZXYS1jf6wyHJ-y9RLcz0VcEuy4zk. This will further limit the time Topher can devote the Amity PingER/Android project. Bebo put it well: "We think that PingER software on the Android operating system (and Android devices) can play a valuable role in the collection of PingER data and open up new possibilities for the analysis of that data. However, given the level of expertise and status of support at SLAC and other PingER collaborators now and in the future, it will be necessary for Amity to fully take the lead on this research, development/testing, and support."**
- **Access to the Measurement Agent (MA) pingeramity.in appears to be very unstable. Les noticed this by looking at https://www-iepm.slac.stanford.edu/monitoring/checkdata/Apr.html and seeing how often we were unable to gather any data.**

  For more detail, Les looked at the data for pinging pingeramity.in from SLAC from March 19 2019 to May 3, 2019 using http://www-wanmon.slac.stanford.edu/cgi-wrap/ping_data_plot.pl?monitor=pinger.slac.stanford.edu&sites=pingeramity.in&begin_day=5&begin_month=3&begin_year=2019&end_day=4&end_month=5&end_year=2019&data. See the attached spreadsheet, in particular, the %loss. The %loss shows multiple periods where the loss is 100%. See yellow lines below for loss (100% means

unreachable).



Just to check Les looked at http://www-wanmon.slac.stanford.edu/cgi-wrap/ping_data_plot.pl?monitor=pinger.slac.stanford.edu&sites=www.mitpune.com&begin_day=5&begin_month=3&begin_year=2019&end_day=4&end_month=5&end_year=2019&data wher e there are no losses. Email sent to Amity folks.

Adib (Updated 3/3/2019)

- Adib is wondering about
  1. *Journal of Computer Information Systems*https://www.tandfonline.com/action/journalInformation?show=aimsScope&journalCode=ucis20
  2. *The Information Society*https://www.tandfonline.com/action/journalInformation?show=aimsScope&journalCode=utis20

Bebo reviewed and responded to Adib suggesting the second one is a better choice. Adib submitted it to the 2nd journal. He sent email 4/20/2019: " *we received an unfavorable response from the information society. So sad that this paper does not get enough attention from journal editors. But I will keep trying, let's pray for the best."*

NUST (Updated 4/25/2019)

Wajahat suggested a letter to the higher-ups at NUST about PingER would assist. Les worked with Wajahat to craft such a letter. It was sent to Wajahat by email 4/3/2019. It was sent by paper mail 4/4/2019 to Principal SEECS.

- Wajahat said the letter has been received and a written response is being drafted.
- They (NUST) would also be interested in other collaborations with SLAC
  - Since Les is no longer an employee of SLAC but rather an emeritus this may complicate things.
  - A possibility might be in high-speed data transfer. It would need a champion from NUST, and a plan and funding to provide access to 100Gbps

IPv6 host at NUST:

Wajahat has requested Hasan to install PingER on an IPv6 host at NUST, Saqib has contacted Hasan to tell him where to find and upload the code. There is not a host name for the MA yet. Hopefully, this will be available by next month's meeting.

Wajahat has 2 students, he will propose some PingER related projects to them.

Wajahat said that contacts at some sites are not very interested in PingER and wonder why there are so many pings. Thus he believes we need new sites representing the regions of Pakistan that have willing collaborators. Thus we should give up on sites such as CAE and ISRA that have not had any data to gather for a year or so. Les has since disabled these sites.

UAF (University of Agriculture, Faisalabad)/GHZU (Updated 3/3/2019)

Saqib joined the University of Agriculture in Faisalabad. He plans to pursue the blockchain paper.

Thailand, Charnsak

Charnsak is looking at a host in Champasak University, Chan Parsa province in Laos as a potential site for a PingER MA. Charnsak just got approved to make contact with the Champasak University. He expects to set up the MA in the next 4-5 months (say towards end 2018). It also depends on the partner university, and there may be a lot of paperwork. 4/9/2019 Charnsak said we need to drop this.

UNIMAS

Need to add Umar Kalim to http://pinger.unimas.my/pinger/contact.php. From the 7/5/2018 meeting: Johari can't ssh into the server so he will go to it on Monday. He will also upload the new UNIMAS PingER website next week.

Email from Johari 4/21/2019: I am still very much interested in the project but I have to manage my time better. Will try to join the next meeting and probably get someone from my side to monitor the equipment and make use of the data collected

SLAC (Updated 4/25/2019)

Umar fixed up the PingER deployment map at http://wanmon.slac.stanford.edu/wan-mon/viper/pinger-coverage-gmap.html by updating the Google map key.

State of MAs.

Host	State	last seen	Status
pinger-host.fnal.gov	**Being moved to a new VM, meanwhile pinger-host.fnal.gov is working fine. There will be a cutover when the new host is ready.**	Still working	
pingeramity.in	**Is very unstable with days-long periods where it is not pingable and data is not gatherable. Email sent 5/4/2019.**	**4/30/2019**	
pinger.uum.edu.my	**Unable to gather data or ping MA from SLAC, there may not be a contact now Adib moved to Turkey. Sent email to Adib 5/4/2019. Adib will talk to Prof Suhaidi.**	**5/1/2019**	
telephoenic.com.jo	**Unable to gather data or ping MA from SLAC, sent email 5/4/2019. Baraa Muslmani responded 5/4/2019 that he will look at it. They blocked pings which caused gathering to fail. Added a special case for this MA to go ahead with gather even if host not pingable by name or address.**	**4/27/2019**	Fixed 5/5/2019
pinger.nchc.org.tw	**Unable to gather data or ping MA from SLAC, sent email 5/4/2019**	**4/30/2019**	Fixed 5/5/2019/
rainbow.inp.nsk.su	**Unable to gather data starting 4/19/2019, also cannot ping the host. Sent email 4/25/2019. Contact (Sergey Belov) has moved on to another job, hardware is old, needs replacing and a new contact. It goes back to December 2000 when it had a 128Kbps link via KEK to the rest of the world.**	**April 17, 2019**	**Disabled 5/8/20129.**
brunsvigia.tenet.ac.za	**It was successfully moved to a VM, with same name.**	**April 17, 2019**	**Successfully moved to a VM 5/3/2019**
netmon.physics.carleton.ca	Unable to gather data, host is pingable and http://netmon.physics.carleton.ca/cgi-bin/ping_data.pl? responds. It appears the pinger.xml file is corrupted. Email sent 4/28/2019	April 23, 2019	Fixed April 29, 2019
maggie1.seecs.edu.pk	Unable to gather data since March 26, 2019	March 26, 2019	

Umar compare ICMP and TCP Ping

Umar is looking at the scamper project from CAIDA, see https://www.caida.org/tools/measurement/scamper/. Les will put Umar in contact with the scamper folks (email sent 4/28/2019)

Unfortunately, for the IPv4 vs IPv6 comparison, there is insufficient data (i.e. only about targets)

Next Meeting

Next meeting: There will be a Doodle poll, May week 20th-23rd or June 5th-6th or June 10-13 at 10 pm Pacific time; a day later 10:00 am Pakistan time; 10:30 am India time; 1:00 pm Malaysian & Guangzhou time; 2:00 pm Thailand time; 7:00 am Jordan time. 6:00am Turkey time. May conflicts with Ramadan, so Umar cannot make it then. Ramadan begins May 5th and ends June 4th. Also Bebo is away the week of May 13th.

Old information

Umar moved here 4/28/2019

Umar Compare ICMP and TCP ping

No update to the following 3/14/2019.

Context:

Is there any statistical difference between ICMP and TCP Ping? The context here is the Internet (not data center). This is important because the network stack is different (e.g., MPI over infiniband) and latencies are significantly less.

Questions:

Why should we focus on minimum RTT instead of average RTT

Min RTT essentially reflects fixed delay, while average RTT subsumes variations and path load

Link to raw results with minRTT results:

https://drive.google.com/open?id=1ZPgljFCDFcsVUxEFA6NYMjhayoqYtMYi

Are the R plots generated using minRTT?

Averages and computed. Min RTT is available. Scripts need to be updated to use minRTT.

What is the breakdown of latency between endpoints? If there is a difference, is it because of the type or location of the source? What if the source of traffic was not SLAC? Is there a correlation with the distance between the endpoints?

Latency for an echo packet to travel up the stack and back down is about 3.75 micro seconds (see StackMap https://www.usenix.org/conference/atc16/technical-sessions/presentation/yasukata). As expected, this is negligible when considered with milli second latencies.The remaining components would be propagation and queuing delay. As we can not breakdown the two in a public network without using an active look like

To replicate use system tap. See: https://unix.stackexchange.com/questions/419449/how-can-i-determine-if-a-latency-is-due-to-a-driver-or-the-scheduler

pathchirp etc, we'll continue to consider these as a single component.

Are the differences limited to a particular region? How do we determine/understand if traffic prioritization is implemented? Test in a controlled environment to avoid variables such as traffic prioritization, queuing delay due to cross traffic. Review the time series of latencies for both ICMP and TCP ping, instead of averages?Is there a difference between IPv4 measurements vs. IPv6.

It may be that end hosts which are farther away have larger variances and thus the pronounced differences.

Saqib moved here 4/28/2019

Bebo sent email, see below. Saqib will follow up.

Not sure whether this would be relevant for PingER work - maybe Saqib's blockchain paper? I'm not sure that there has been much discussion re: PingER security - thoughts? The submission is due May 24th
Bebo

From: Security and Communication Networks <scn@journals.hindawi.com>

Sent: Monday, February 25, 2019 11:58 PM
To: White, Bebo
Subject: Special Issue: "Cryptography and Security Tools and Techniques for Networked Embedded Systems"

Dear Dr. White, We are currently accepting submissions for our upcoming Special Issue titled
"Cryptography and Security Tools and Techniques for Networked Embedded Systems," which will
be published in Security and Communication Networks in October 2019. The Special Issue is open to both
original research articles and review articles, and the deadline for submission is May 24, 2019.
You can find the Call for Papers at https://www.hindawi.com/journals/scn/si/136986/cfp/.
Security and Communication Networks is a peer-reviewed journal published by Hindawi
as part of a publishing collaboration with John Wiley & Sons (https://www.hindawi.com/wiley.hindawi/).
Starting January 2017, the journal has been converted to a fully open access publication, which
means that anyone can access it online without a subscription and authors retain the copyright of their work.
The most recent Impact Factor for Security and Communication Networks is 0.904 according to Clarivate Analytics' l
atest Journal Citation Reports. The journal's most recent CiteScore is 1.36 according to the latest
CiteScore metrics released by Scopus. Please read over the journal's author guidelines at
https://www.hindawi.com/journals/scn/guidelines/ for more information on the journal's policies and
the submission process. Manuscripts should be submitted online to the Special Issue at
https://mts.hindawi.com/submit/journals/scn/adcsc/.
Please do not hesitate to contact me if you have any questions. Best regards, Rana Khaled

Adib moved here 4/20/2019

Adib moved to Karabuk University in Turkey where he is an Associate Professor.

The time difference would probably require a change in meeting time (e.g. 10:00 pm SLAC = 6:00 am Turkey)

He will discuss with the department head about installing a PingER MA there.

Regarding the paper, it has been submitted to Journal: Computer Communications

Title: Socio-economic Development Indices and Their Reflection on Internet Performance in ASEAN Countries

Corresponding Author: Adib Habbal

Co-Authors: Les Cottrell, Emmanuel Mkpojiogu, Bebo White, Suhaidi Hassan, Faisal Zulhumadi

Unfortunately, it was rejected.
Adib, Bebo and Les are looking for another journal, some possibilities include: https://webscience-journal.net/webscience,

https://www.journals.elsevier.com/business-horizons, https://www.journals.elsevier.com/government-information-quarterly

NUST moved here 4/18/2019

Wajahat raised the topic: We also need to formulate some research problems that have the potential of appearing in some well-known places. This might help in attracting NUST students which is getting harder these days. I need your help in this regard.

Discussion . (Wajahat was this useful? Is there something else? Email sent 3/15/2019):

There is a web page at Future PingER Projects which was last updated July 2018. Topics that currently stand out include:

Applying Blockchain to PingER data, see the paper by Saqib, here.

Graphical traceroute maps. Note currently when one looks up the location of a router, it usually gives the location of the home site that is managing the routers, e.g. ESnet routers in the US and Europe are all identified as being at LBL. Using ping minimum RTTs to a router from multiple sites (e.g. the perfSONAR traceroute servers in the US, Canada, and Europe, see http://www.slac.stanford.edu/comp/net/wan-mon/viper/tulipmap.html) one can use trilateration to identify the location of the router. Earlier work on this can be found at http://www.slac.stanford.edu/comp/net/tulip/

Deploying Android/Pinger devices, understand how their low cost (cheap enough to be disposable), low power (e.g. use of solar power) and potential mobility may be used, i.e. the risks, mitigations, and benefits.

Linked Open Data applied to PingER data.

Using PingER data as a source of big data to search anomalies, trends etc.

Case studies, e.g. can one identify the impact on networking of social unrest such as the current Venezuala difficulties, or of other events such as earthquakes or Tsunamis.

I have increased the number of working Venezuelan target hosts monitored from SLAC from 3 to 8, to possibly assist in this.

Another interesting case study would be to look at the impact of hurricanes on Internet connectivity in say the Caribbean, see for example Hurricanes Irma and Maria 2017.

Compare and contrast IPv6 with IPv4 behavior, identify outliers and understand - Umar, Les, and Saqib are looking at this.

Also, see PingER Papers and Presentations for some topics that have recently resulted in papers.

Are any of these of interest?

Amity moved here 4/18/2019

The following are the data analysis projects:

Title (tentative): Correlation Analysis between network performance and GDP of a country using PingER data. Abstract (tentative):
This paper aims towards finding the correlation between Gross domestic product (GDP) of a country and it's network performance (ping analysis) using PingER data. Email ID: Naman Madan, naman.madan25@gmail.com

Title (tentative): Comparison of network performance of India and Pakistan using PingER data. Abstract (tentative):
This paper aims at comparing the network performance of India and Pakistan using the PingER network performance data of 2-3 years of both the countries and applying clustering to the year-wise data. Comparing the number of components in each cluster will help in concluding the quality of the network performance. More the number of the components, with the least average RTT, better the performance. Email ID: Vishwani Sati, vishwani.sati@gmail.com

Title (tentative): Data packets loss prediction due to environmental factors.
Abstract (tentative): Pinger data losses during certain environmental factors like – Earthquakes, heavy rainfalls, Tsunamis etc, are a major concern for the big companies, delay of few seconds will lead to huge customer breakdown. To deal with this situation, we will analyze the data losses trend with respect to the external environmental factors and will predict the data losses beforehand so that company will have upper hand if some crises stricks in future. We will analyze the Pinger data and environmental conditions attributes and will make an algorithm that will predict the losses in pinger data. Email: Gurpreet Singh, gurpreetn92@gmail.com.