20121115 UNIMAS, UM, NUST, SLAC Project meeting notes

Introduction

This was a Skype meeting.

The attendees were Abdulah from UM, Nara and Johari from UNIMAS, Arshad and Anjum from NUST and Les from SLAC.

We first went round and each identified himself so we knew each others roles and also were familiar with each others voice.

Potential Project

During a recent visit to SLAC Arshad and Les discussed the how to take forward the NUST/SLAC collaboration. Funding for this originally came from a Pakistan/US research proposal and subsequently from the Pakistan Higher Education Commission (HEC). With the new government and HEC re-organization this funding was suddenly reduced. Despite this the collaboration is active and NUST has funding to send a graduate student as a visiting scientist to SLAC for a year to continue the collaboration. An idea is to extend the collaboration to include Malaysia and in particular to UNIMAS and UM Kuala Lumpur. The question then becomes how is this useful to Malaysia.

An initial project would be to put together an active end-to-end monitoring infrastructure for major Malaysian MYREN connected sites. This would be based on PingER and follow the recent deployment made of PERN connected sites in Pakistan. Les went over some of the major benefits obtained in Pakistan from analyzing the monitoring data.

- One was identifying that though the PERN backbone (155Mbps in 2006) was functioning well and lightly loaded, the last mile was typically heavily congested with thousands of users sharing an inadequate Mbps link. As a result the PERN upgrade featured higher capacity to the sites.
- More recently we were able to identify and quantify the unreliability of sites caused by power outages and lack of alternate power.
- Most recently connectivity between PERN connected and commercial ISP connected hosts since there is no neutral Internet Exchange Point in Pakistan so the peering goes through France. This not only increases International transit costs but led to long delays and poor performance.

A further major benefit is the provision of a repository of historical and current measurements of multiple metrics (e.g. round trip times, losses, jitter, unavailability, anomalies such as duplicate packet and our of order packets etc.) between a wide set of well known hosts. These can be mined and used to derive other metrics such as throughput, directness of connection, Mean Opinion Score (MOS). This is a rich source for research of issues such as statistical analysis identifying and reporting anomalies in performance, denial of service attacks etc.

Funding

There are potentially two levels of funding. At the Malaysian national level there are eScience projects. These are research based. There are also smaller grants from the universities themselves. Though PingER monitoring per se is not research, mining and statistically analyzing the wealth of data gathered on say the Malaysian Research and Education Network (managed by MYREN). Example of the type of research possible would be using sophisticated statistical techniques to;

- find performance anomalies on individual links using multiple metrics;
- correlate the simultaneous anomalous behavior across multiple links;
- filter the alerts and prioritize so as to automatically generate useful alerts

Such information and processes can be used to assist in identifying network (e.g. denial of service) attacks, network problems etc.

The and-to-end active monitoring can also be used to identify problems outside the backbone networks. Such problems include last mile congestion, unreliability for example due to power problems, the need for more direct peering or inappropriate routing, the impact of events such as earthquakes, tsunamis, cable cuts and the need for redundant paths. It can also be used to provide quantitative comparison of the quality of networking for different regions or sites.

Workshop

We agreed it would be extremely valuable for Anjum to attend the workshop as well as Kashif. Anjum will bring valuable upper level management input. Arshad agreed to fund Anjum's travel and Nara will cover his board. Arshad will need a letter inviting Anjum from UNIMAS for the workshop.

Kuala Lumpur

Anjum, Kashif and Les will come to the workshop through Kuching on Dec 11th. Also Abdullah is in Kuala Lumpur. Thus it would be valuable for us all to meet there. Nara will also come to Kuching.

Action Items

- Anjum
  - Anjum will gather together and share proposals and research papers concerning network monitoring, to assist in indicating gthe type of research that can be pursued. plus provide access to the NUST/SEECS reports to the Pakistan Higher Education Commission (HEC)
- Johari
  - Johari will review the various sources of Malaysian funding and put together a brief summary Some sources mentioned were the Malaysian Goverment transformation Plan. and an Economic plan.
- Nara
  - Invite representative(s) from MYREN to the workshop or at least set up a meeting between MYREN decision making folks and workshop representatives. For example the latter might include Anjum, Les, Nara and others. This will help get support from MYREN to any proposal we may submit, and we can learn from MYREN what would be most usefult to them.
  - Nara will arrange a meeting with Telecom Malaysia R&D folks who expressed interest in the PingER project to Anjum..

- Nara will provide a lettter of invitation for Anjum to attend the workshop.
- Abdullah will assist Nara in contacting MIMOS to set up a meeting with them in Kuala Lumpur on Dec 11th.
- Les will put together notes from the meeting.