Project2

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Motivation

Internet became the part of the humans life in these years. People buy clothes online, pay the bill online even order taxi online. So the importance of the Internet path stability is obvious. Then the measures are guaranteed for the stability of the Internet path. People can find out the situation of the path by the measures.

Methodology

I use 10 nodes. Two of them are in Asian. One is in Europe. One is in Canada. One is in Brazil. Others are all in US.
1 A planetlab1.ie.cuhk.edu.hk
  B planetlab1.cs.uoregon.edu
2 A planetlab4.inf.ethz.ch
  B planetlab1.cs.unc.edu
3 A planetlab1.pop-mg.rnp.br
  B planetlab1.cs.purdue.edu
4 A pl1.rcc.uottawa.ca
  B pl3.cs.unm.edu
5 A planet1.pnl.nitech.ac.jp
  B planetlab2.cs.uml.edu

The period between two measures is 1800s.
I uploaded daemon on the UAlbany sever. All shell files are in the document “trace” and “ping”. In these daemon, data were stored in the node. I copied them to the UAlbany server every several days. The file used to copy is scp.bash in document “scp”.
Then I used the FileZilla to download the data from the server.

Analysis

section1
The path length is related with the geography distance. The longer distance between the two nodes, the more hops they need. Meanwhile, the package loss and the latency are also related with the geography distance.

1

node	min	max	average	standard deviation
1A	14	16	14.0059	0.0987435

1B	11	17	11.0471	0.529281
2A	12	12	12	0
2B	11	12	11.325	0.468375
3A	16	18	16.0079	0.125121
3B	14	20	14.0196	0.293356
4A	10	10	10	0
4B	12	12	12	0
5A	14	15	14.0198	0.139319
5B	14	17	14.0059	0.132712

Yes, the number of hops changes in the different paths.
The network is not stability. And sometimes it congested.

2
There are 32819 outages in 32819+165442= 198261 tests. So the fraction is32819/198261.
a
10640/32819 of the failures are temporary.Yes. In some failure, the other two test is finish, it means the network is bad. The reason for outages is time out. There is a congestion at that time.

Some failure happens in each trace route, and it can reach the final site. The reason should be this router just never send the response package back.

b
22179/32819 of the failures are long-term outages. The trace route can not be finished. The reason is this PlanetLab node failed.

3
There are 4102 outages happens in the nodes. So the percentage is 4102/32819.

4
the latency

node	min	max	average	standard deviation
1A	174.706	252	227.518	3.88016
2A	105.810	126	118.834	5.49258
2B	105.811	123	116.324	7.20292
3A	173.468	468	192.975	26.8983
4A	0	9	8.44538	4.96935

5A	152.868	800	188.719	31.6812

According to the figure in question1, and the figure above. We found that the reliability of continental links(US<->Canada) is great. The latency is short and stable. While the other links between continents are less stability.

5
No. I didn't find.

6
Yes. According to the figure in question1. All the paths are different from the forward and reverse.

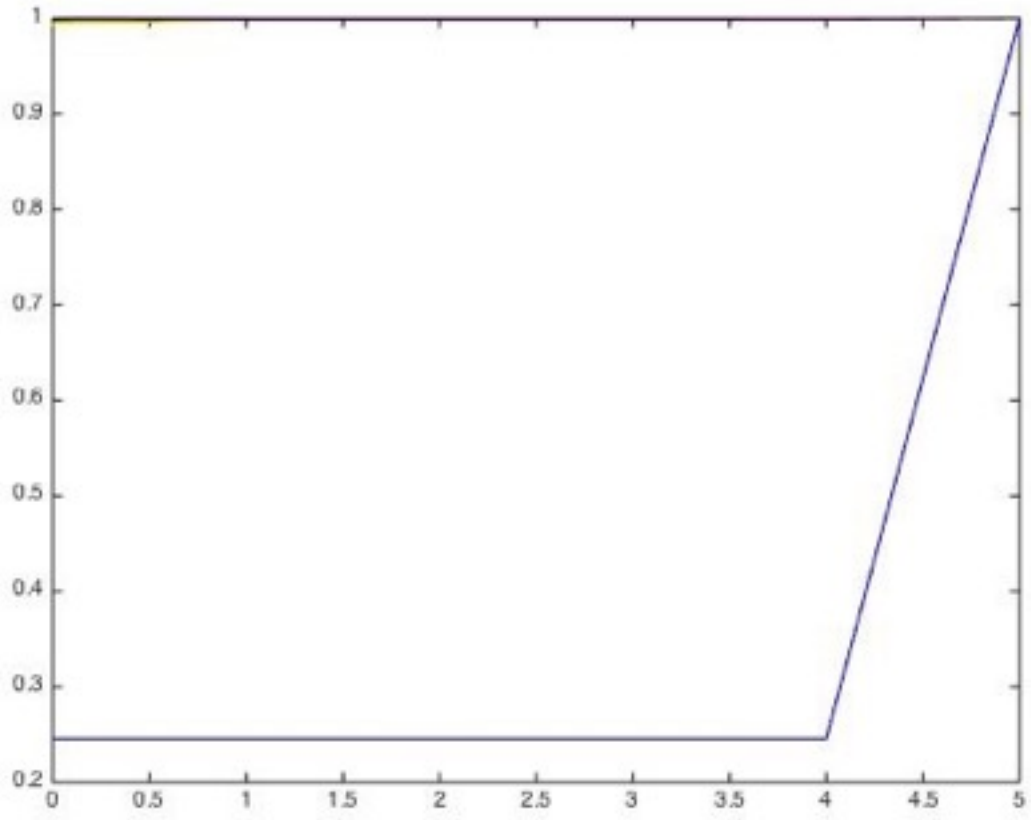
section2

The package loss and latencies occurs more possibly with the long distance in geography especially across the different continents.

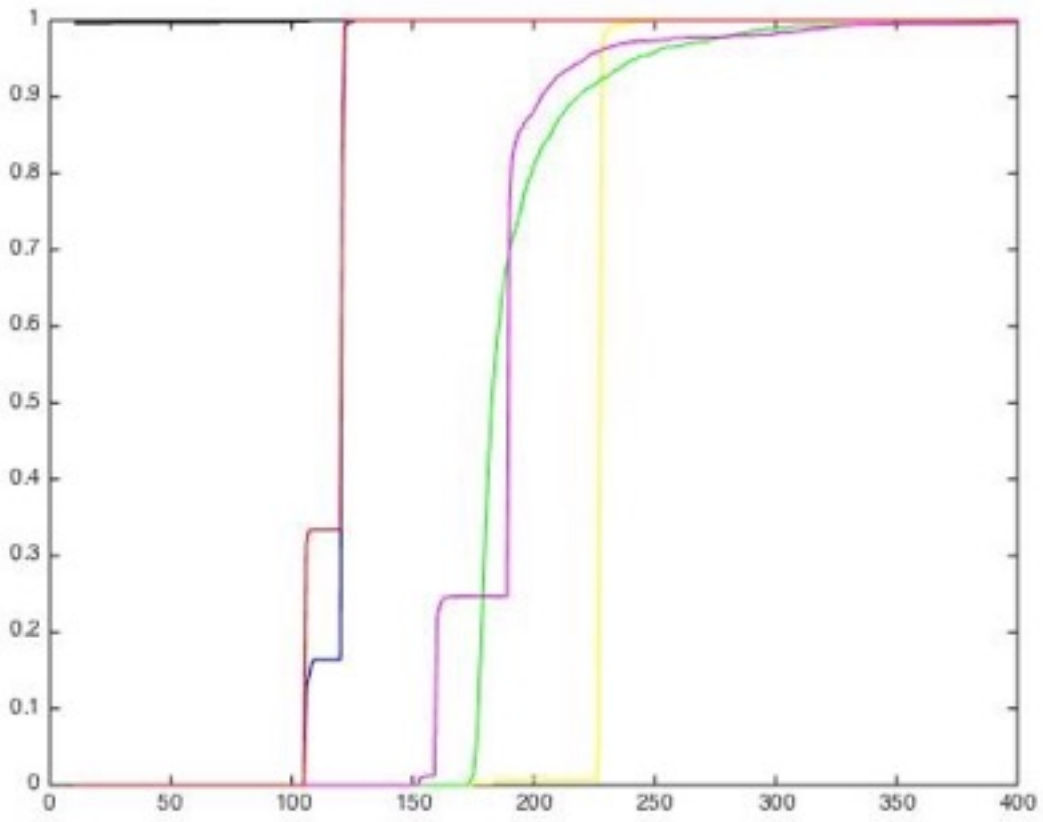
7
No.

Conclusion

There are only a few path between continents. So the latency and packages loss can not be void, since the paths are busy all the time. On the other hand, the paths in the same continent are quite stability. The loss and latency are rare.
8
the loss



the latency



9

In my opinion, the Internet routing instability has decreased. The loss of packages and the latency has improved in my measures than that in the paper.