

Programmin Assignemt4

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1.1)

The total number of prefixes is: 525483

The total number of Ases is: 48119

The number of Ases are lesser than the number of prefixes because:

1. An AS can own multiple prefixes of same prefix length i.e. an AS can have two /24 prefixes.

2. An AS can announce prefixes of multiple length to implement certain policies.

i.e. it may announce two /25 prefixes and also a /24 prefix for same range at two different sessions.

1.2)

A very small fraction of prefixes see the updates of announcement or withdrawl.

The exact count is

Number of prefixes seeing updates:17147

Total number of prefixes: 525483

Fraction= 0.03263

Also seeing the update that has occured large number of times for a few prefixes.

The largest number of times update found was for 112.215.16.0/24. It was for 1239 times.

It had withdrawl for 2 times of 1239 times of announcement.

For the prefix 202.70.64.0/21 the number of times update happened was 728.

On observation we see most of them are announcements and only 20 repeats are there.

And also after withdrawing route, the next set of routes announced is the same set of routes that were announced before. So atleast in this prefix case we may consider that, updates are not due to any change in the network structure, but due to very slow response of the BGP server at the prefix. It may be due to loss of packets or due to the server/ BGP session that is responding slowly.

Same is the case with routing updates of 191.37.36.0/24.

There around 8 withdrawl announcentns and 92 announcements. And follow similar trend as explained for previous prefix.

Also I guess the prefix are announced for large number of times when the BGP sessions that run in path to a particular prefix are restarted.. which updates routes to all its neighbors to be added in the RIB table.

1.3) After writing script to extract IITB and MIT routes, we see that there are many common points in between. Also if there is a route announced then it means that they are willing to carry the traffic to such destination. Thus any route having a common AS in both MIT and IITB's AS path list can be used.

So one of the route from MIT to IITB is 3 --> 174-->577--> --> 4755--> 132423

Another route is 3--> 3356--> 3561--> 6453--> 4755--> 132423.

The same route can be used to traverse back from IITB to MIT

2.1)

Script is written to generate degree of all the Ases and is attached with the assignment.

I have used Bash (along with awk) to do it and does it in approximately an hour of time.

2.2) Tracing the 2nd path that we chose from MIT to IIT writing down degree of each AS

AS	Degree	Whois
3	96551	MIT
3356	4075	Level 3 Communications(provider in USA)
3561	342	SAVVIS (Provider in USA)
6453	632	TATA Comm. America
4755	396	TATA comm.
132423	4	IITB

Here as we see, there is a downhill from tata comm. America to IIT Bombay establishing provider customer relationships.

Since it is MIT at the other end.. which has a lot of providers , the same relationship is not obvious the other half of AS path.

Tracing another AS Path

AS	Degree	Whois
3	96551	MIT
174	4928	cogent telecom.
577	826	Bellcanada
6453	632	TATA Comm. America
4755	396	TATA comm.
132423	4	IITB

Here also there is continuous downhill from MIT to IITB.

Where as only the downhill must have started at a provider (say possibly cogent).

Thus , for a few exceptions like MIT which has a very high degree, the relationship establishment using the degree heuristic isnt accurate.