Coordinator

Remco van Mook, RIPE84, May 2021

You're negotiating with a computer - how does that make you feel?



Peering Evolution The disappearing craft of the peering coordinator

Large scale consolidation

- Job openings either at new companies or at strategic levels
- The number of people involved hasn't grown with traffic
- Interconnection decisions at a higher level
 - "Hey we're both on exchange X, let's peer" turning into "please give us space and power across your footprint for our cache node"
- Google hasn't had a 'peering coordinator' position for about 5 years



The Tragedy of Least Cost Interconnection as a cost centre

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- Only the largest access networks make money on interconnection
- The SLA of your transit provider mostly covers availability & congestion
 - Most are solving for traffic volume, much less for performance



Real Time is Here ..And COVID kicked it forward

Traffic Volume is mostly a solved problem - and usually cheap Online collaboration is NOT about traffic volume Caching is not a valid approach Consumers are now Producers, upstream quality suddenly important Traffic moving from 'observable' protocols to low-latency, encrypted protocols 50 ms round-trip criteria are commonplace, sub-20 ms is coming



The Internet of Services **Cloud, Serverless & Backend Latency**

Identifying what interconnection is underperforming is getting harder

Diversity of interconnection locations is increasing

End user experience only partly determined by the initial traffic destination

A shocking amount of application backends live in AWS US East 1!



How Much Do You Know.. ..about your network?

- Your Network Monitoring
- Flow Analysis
- Interface Statistics
- Top talkers (in volume)



How Much Do You Know.. ..about destination networks?

- Which direction you're sending traffic for them
- From where you're receiving traffic from them
- Beyond that, not a whole lot



What Goals Do You Have?

Shift from a volume based approach to a value based approach

"Having great Netflix is nice, but if Teams breaks I have a problem" "My Social Media team blows up if Roblox doesn't work" "My enterprise customers will walk away Oracle is slow"



What Goals Do You Have?

But what does the *business* want the network to deliver?, i.e.

"I want direct adjacencies for 80% of my traffic AND 80% of key applications"

"The top 10 of Cloud/laaS providers need to be reachable under 50ms"

"End to end packet loss needs to be under 0.01%"



1. Latency & Jitter Round trip time, Variance & Black holes 2. Path **BGP** and **Trace** 3. DNS Time to First Answer, Black holes (again), Recursive Servers

The Trifecta of Performance





The Look of Latency

Traffic percentiles/time

50% of performance is fine25% of performance is ok10% of performance is 'ehh'



•	50th percentile of	R
•	75th percentile of	R
•	90th percentile of	R
•	50th percentile of	R
	75th percentile of	R
•	90th percentile of	R





The DNS "cloud" From Geoff Huston's presentation at RIPE83





Why is this Important?

- DNS has become the 'service' directory
- * The success rate of a well-configured DNS setup is only 98%
- * "Wrong" answers can nullify any efforts made in network optimisation
- DNS caching is a double-edged sword
- * End users with external DNS providers are a pain to optimise (even for CDNs)

DNS outcomes vary based on which DNS resolver gets used



Conclusions



Conclusions

Interconnection is no longer just about volume and next hop Applications moving to cloud settings require a different approach Automation is the only scalable way forward The things you're currently measuring aren't telling the whole story You need high fidelity, large scale network measurements to automate



remco@lynkstate.com www.lynkstate.com www.trackbgp.com

X LYNKSTATE

Questions?