Caching at the VIX

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Caching at the VIX

• Founding of the VIX in March 2013
• VIX founding members exploring what services could be hosted at the IX for common good
• Ideas included:
  – Root nameserver
  – Akamai content distribution network
  – Google Global Cache
  – Public FTP Server
Google Global Cache

• A lot of the Internet content is now “Google”, whether it is searching, documents, YouTube, embedded advertising, etc

• Which means for a network operator, a vast portion of your overall network traffic will be going to and coming from a Google server

• The closer this Google server is to your network, the faster the response, and hopefully the happier the client will be
Google Global Cache

• Google Cache was the “first line of business” for the new IXP

• Google’s normal operating guidelines mean that a cache would only be installed when there is over 1Gbps of traffic (order of magnitude more than the entire capacity into Vanuatu in 2013)

• But Google also supports infrastructure development, and agreed to install the GGC at the new VIX to benefit all ISPs in Vanuatu
Google Global Cache

- Three Dell servers arrived one month later
- The GGC team remotely directed the local VIX team how to install a basic image which allowed the cache to bootstrap itself and for the GGC team to complete the configuration to bring the node online
- ISPs at the VIX advertised their routes to the GGC node via BGP
  - And from then on the GGC began handling requests
VIX and GGC placement

![Diagram showing the placement of VIX and GGC in a network setup. The diagram includes nodes such as ISP A, ISP B, ISP C, ISP D, 7200 RS, Vanuatu IX, IX Services, AS65534, AS132797, and GGC LAN. There are IP addresses and AS numbers indicated throughout the diagram.](image)
Caching Experiences

• Initial misunderstanding about how the GGC would work
  – We believed the cache would receive local requests for content
  – And would respond if the content was local
  – If content was not local, the cache would forward the request onwards
  – Content would come in via each provider’s upstream link
Caching Experiences

• In reality, the GGC node operates more like a transparent proxy
  – The request goes to Google as normal, overseas
  – The request would be handed back to the local cache to be dealt with
  – If the content not available locally, it would be requested from overseas, using the cache’s transit provider link
Caching Experiences

• With only satellite links to Vanuatu, this was much slower than not using the GGC
  – Google content now comes over transit provider link, not the ISP link

• We removed our network from the local GGC so we could go direct
  – Restored “acceptable” performance for our customers
Caching Experiences

• GGC team disenchanted with the performance
  – Very little usage due to the satellite links
  – TVL yet to join the VIX
  – Digicel hadn’t yet completed their IX peering
  – Telsat had just withdrawn routes from the GGC
  – Suggestions of withdrawing the cache due to low usage

• A Plan B needed…
A new plan

• Telsat temporarily took over provision of transit to the GGC
  – Telsat customer routes readvertised to GGC
  – No performance disadvantage now
  – Performance benefits seen by end users
  – GGC team happier

• And then the submarine cable arrived in April 2014
  – Replacing all satellite connections (which now operate as backup only)
The submarine cable

- The difference is obvious
The submarine cable

- iGov link now providing transit to the GGC again
  - Significant improvement in responsiveness of various Google services
  - Content like YouTube loading much faster
Current situation

• Telsat now seeing average 10-25% of traffic being served by the GGC
  – This traffic responds in sub 10ms RTTs and frees up international links for other traffic
• VIX monitoring of the GGC node shows that it is handling approximately 280Gbytes per day
  – Average 25-30Mbps of data and growing
• Our next goal is to approach Akamai and get a set of their servers in Vanuatu as well
Conclusion

• Google Global Cache has brought great benefits to Vanuatu
  – Housed at VIX means benefits for all VIX members

• Feeding GGC via satellite links brings no benefit
  – Providers have small congested links already

• Submarine cable has made a huge difference to viability of caching in Vanuatu