

NOMINET

Running A Highly Scaled Registry DNS Platform ICANN 55 Tech Day – Anycast Panel Chris Griffiths - chris.griffiths@nominet.uk



About Nominet

- We have millions of businesses and consumers that use our domains on a daily basis We need to provide a highly resilient and stable service for our ccTLD and gTLDs
- WE ARE AN INTERNATIONAL INTERNET COMPANY DELIVERING PUBLIC BENEFIT As an operator of one of the largest Registries on the planet, our DNS just needs to work







So Why Anycast?

Anycast enables us to offer one IP from multiple geo-redundant locations for our name servers

- Provides significantly more resiliency than Unicast -
- regions
- outage to a specific name server

Enables reduced latency and better speed to sites since we can localize traffic to specific

Reduces downtime from maintenance since we can take sites offline without causing an

Helps with attack mitigation since it can increase surface area of your network to attacks





Anycast Deployments <u>Are Not Trivial</u>

Like any good service, Anycast requires a thoughtful design

- It is significantly more complex to deploy and operate than a unicast network
- Depending on your network design, you may need multiple transit and/or peering connections to make it work well
- You need to measure and monitor your services with good network monitoring -Oh and you need to plan for when things go wrong





So When Things Go Wrong...DDoS



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makeameme.org





What does an attack look like?

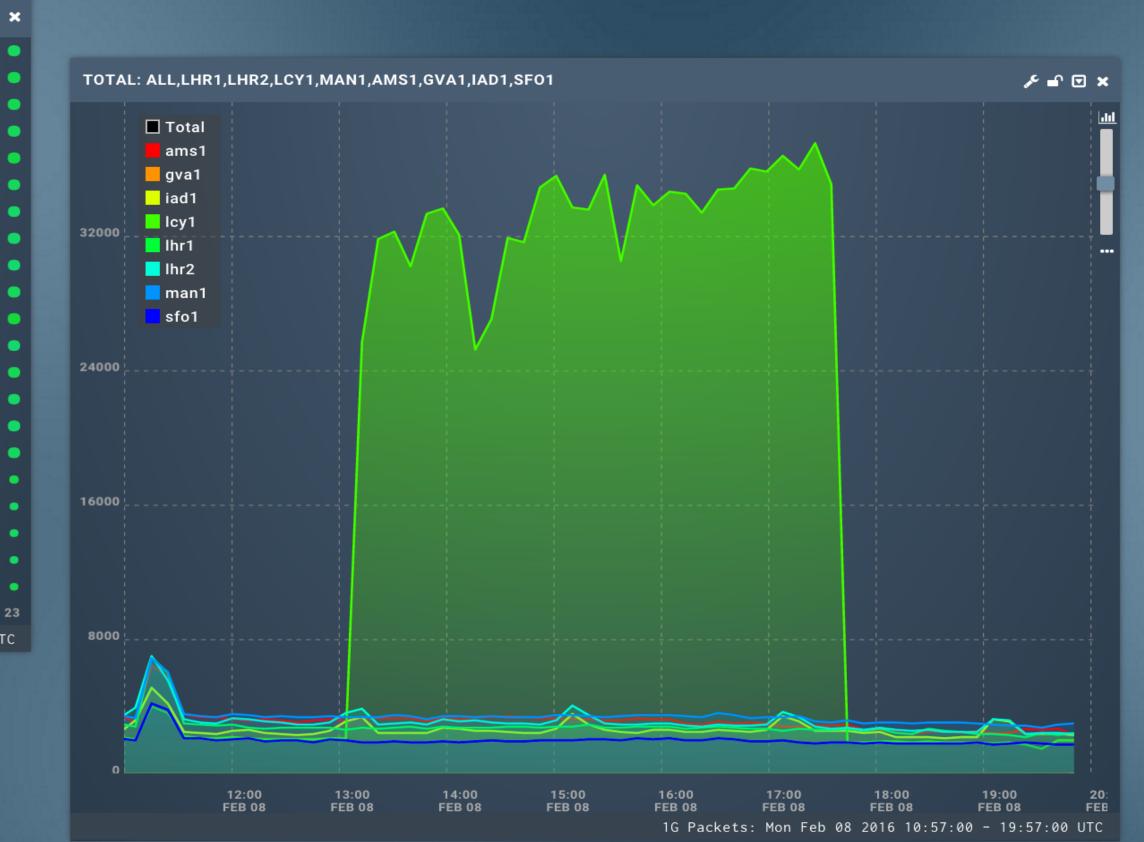
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So Where To Put All Of That Traffic

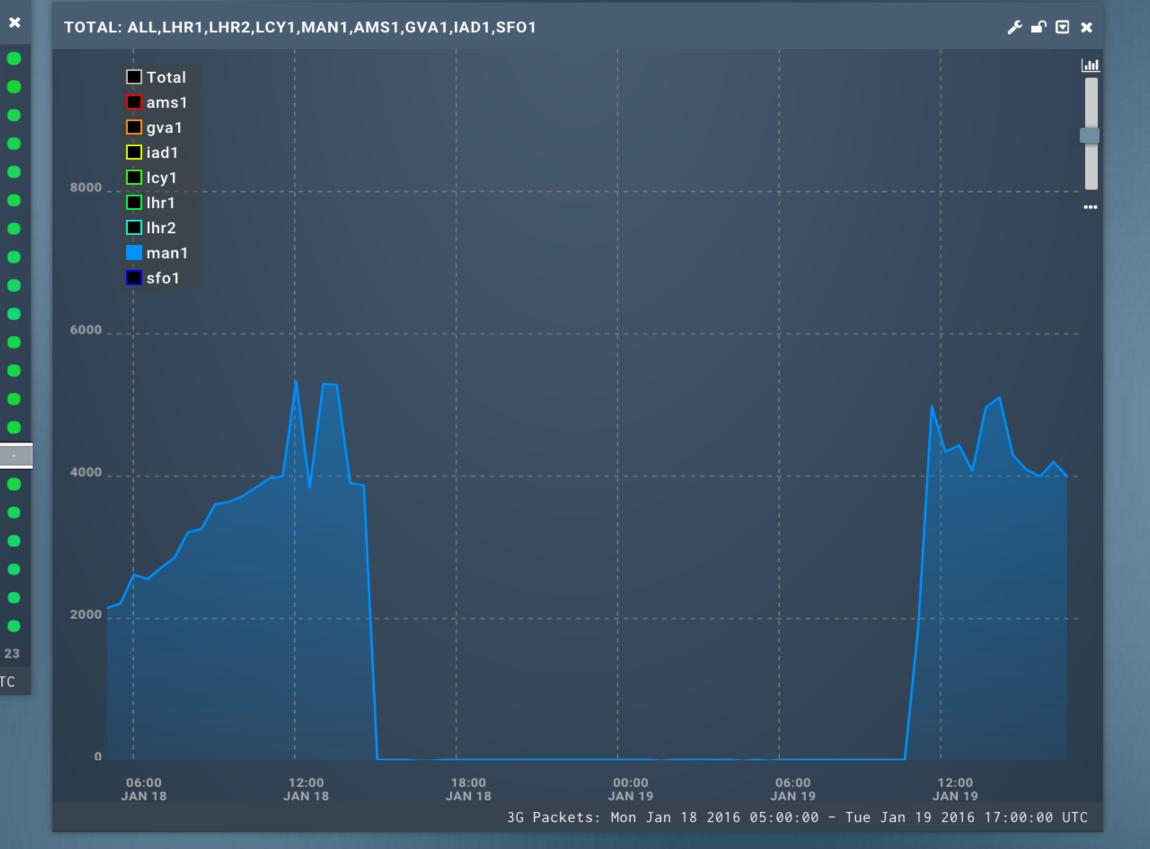
- You can sinkhole the traffic if you plan your network design and have good network monitoring
- Having access to scrubbing equipment either on your network or via a service provided by transit is a good practice
- Build in significant capacity into your network design
- Plan for failure because it will happen





What Does Anycast Maintenance Look Like

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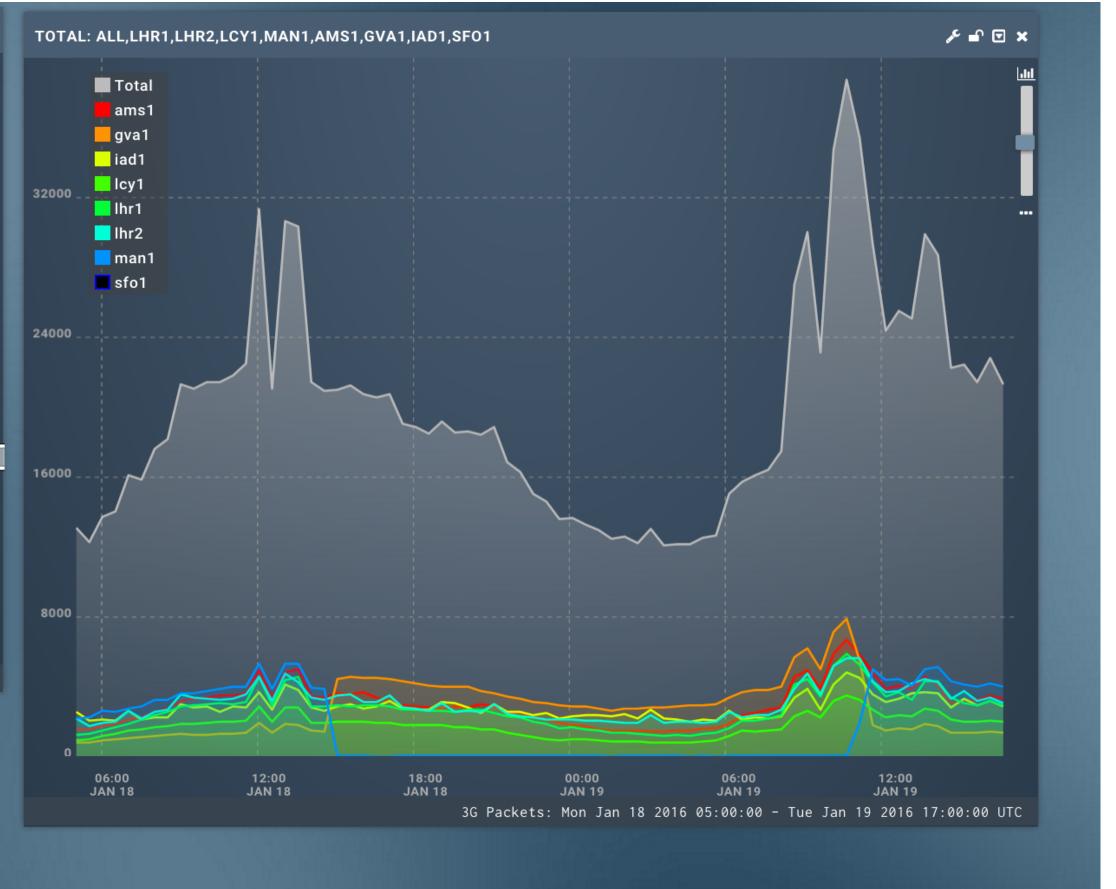


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Multiple Vendors = Diversity

- We use different transport providers across multiple sites -
- We announce only some of our prefixes out of different regions using different transport providers
- We standardize our hardware using two different vendors and alternate these at each of our sites to ensure diversity
- We have also standardized our DNS software on two different vendors and also alternate these per site







A Bit About Our Platform

Data Center	Prefix 1	Prefix 2	Prefix 3	Prefix 4				
LHR1	YES	YES	NO	NO				
LHR2	NO		YES	YES				
LCY1	NO		YES	YES				
MAN1	YES	YES	NO					
AMS1	NO		YES	YES				
GVA1	YES	YES						
IAD1	YES	YES						
SF01	NO	NO	YES	YES				

DNS Transit	Hardware	DNS Software
Provider 1	HW Provider 1	DNS Software 1
Provider 2	HW Provider 2	DNS Software 2
Provider 3	HW Provider 1	DNS Software 1
Provider 4	HW Provider 2	DNS Software 2
Provider 1	HW Provider 1	DNS Software 1
Provider 1	HW Provider 2	DNS Software 2
Provider 4	HW Provider 1	DNS Software 1
Provider 3	HW Provider 2	DNS Software 2





Further Distribute Your DNS Via Secondary

- Pick a good secondary DNS provider who can scale with you and supports your network needs
- Create an even larger surface area for your Anycast network
- For our Registry, we want it globally available and to have DNS resolution as close to end users as possible
- Make sure they have good designs and a well thought out security plan





THANK YOU!



