Fast Growth from 2006

5.75m Broadband Subscribers
~20% of UK households
50% Compound Annual Growth Rate

~4.5 Tbps
What we deployed
One of our longer rollout projects

2013
Q1 Requirement and analysis
Q2 Network design
Q3 CPE requirements
Q4 Test, trial and rollout of F/W

2014
Q1 Network enablement and configuration
Q2 CPE development
Q3 OSS design
Q4 OSS development

2015
Q1 Enterprise Design
Q2 Business system development
Q3 Staff trial
Q4 Process design

Q1 Customer trial
Q2 Process rollout
Q3 Customer enablement
Residential Service

- Native Dual-stack service
- PPPoE and IPoE, with link-local WAN addressing only
- Single /56 allocated to CPE via DHCPv6 PD
- SLAAC running on CPE LAN for address assignment
- Stateless DHCPv6 for DNS info
- IPv6 firewall (RFC 6092)
Core Deployment

- Peering & Transit Native Dual-stack
- MPLS using 6PE
- CDN caches
- BNG commissioned with /39 for subscriber pool
- uRPF
- iACLs driven by addressing plan:
  - PIES = private, internal, external, subscriber
BCP38 is for IPv6 too!

- Deploy anti-spoof for IPv6 on day one
- (and do this for IPv4 if you haven’t already!)

https://www.routingmanifesto.org/
Current Status
UK IPv6 User Count (from 6lab.cisco.com)

- Blind Trials
- First Rollout
Sky IPv6 User Count (from APNIC)
Sky IPv6 Traffic (from Facebook)

AS 5607 IPv6 Egress
BSkyB

First Rollout

Blind Trials

IPv6 gbps

Friday, Jul 31, 2015 12:00am
IPv6 gbps: 1.47

0 5 10 15 20
Sky IPv6 by device type (from APNIC)
<table>
<thead>
<tr>
<th>Rank</th>
<th>ASN</th>
<th>AS Name</th>
<th>CC</th>
<th>Users (est.)</th>
<th>Value</th>
<th>% of country</th>
<th>% of Internet</th>
<th>V6 Users</th>
<th>% of AS</th>
<th>% of country</th>
<th>% of internet</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>AS7922</td>
<td>Comcast Cable Communications, Inc.</td>
<td>US</td>
<td>52503001</td>
<td>2831171825924</td>
<td>18.7</td>
<td>1.5919</td>
<td>30773214</td>
<td>58.61</td>
<td>38.05</td>
<td>18.75</td>
</tr>
<tr>
<td>10</td>
<td>AS7018</td>
<td>AIT-INTERNET4 - AIT Services, Inc.</td>
<td>US</td>
<td>29125229</td>
<td>1570548484596</td>
<td>10.38</td>
<td>0.8831</td>
<td>22190809</td>
<td>76.19</td>
<td>27.44</td>
<td>13.52</td>
</tr>
<tr>
<td>51</td>
<td>AS22394</td>
<td>Celco Partnership DBA Verizon Wireless</td>
<td>US</td>
<td>10464477</td>
<td>564286457748</td>
<td>3.73</td>
<td>0.3173</td>
<td>9337609</td>
<td>89.23</td>
<td>11.55</td>
<td>5.69</td>
</tr>
<tr>
<td>18</td>
<td>AS2516</td>
<td>KDDI KDDI CORPORATION</td>
<td>JP</td>
<td>21159713</td>
<td>77004275496</td>
<td>18.47</td>
<td>0.6416</td>
<td>8298732</td>
<td>39.22</td>
<td>47.06</td>
<td>5.06</td>
</tr>
<tr>
<td>34</td>
<td>AS3320</td>
<td>DTAG Deutsche Telekom AG</td>
<td>DE</td>
<td>14155968</td>
<td>678665417856</td>
<td>20.35</td>
<td>0.4292</td>
<td>6012273</td>
<td>42.47</td>
<td>45.32</td>
<td>3.66</td>
</tr>
<tr>
<td>11</td>
<td>AS28573</td>
<td>CLARO S.A.</td>
<td>BR</td>
<td>28740587</td>
<td>322967976119</td>
<td>25.4</td>
<td>0.8714</td>
<td>4924223</td>
<td>17.13</td>
<td>51.44</td>
<td>3</td>
</tr>
<tr>
<td>16</td>
<td>AS17676</td>
<td>GIGAINFRA Softbank BB Corp.</td>
<td>JP</td>
<td>21440815</td>
<td>780274139480</td>
<td>18.72</td>
<td>0.6501</td>
<td>4433463</td>
<td>20.68</td>
<td>25.14</td>
<td>2.7</td>
</tr>
<tr>
<td>23</td>
<td>AS18801</td>
<td>Global Village Telecom</td>
<td>BR</td>
<td>18742019</td>
<td>210604067503</td>
<td>16.56</td>
<td>0.5603</td>
<td>3628897</td>
<td>19.36</td>
<td>37.91</td>
<td>2.21</td>
</tr>
<tr>
<td>79</td>
<td>AS21928</td>
<td>T-MOBILE-AS21928 - T-Mobile USA, Inc.</td>
<td>US</td>
<td>7266787</td>
<td>39185422188</td>
<td>2.59</td>
<td>0.2203</td>
<td>3394948</td>
<td>46.72</td>
<td>4</td>
<td>2.07</td>
</tr>
<tr>
<td>90</td>
<td>AS20001</td>
<td>ROADRUNNER-WEST - Time Warner Cable Internet LLC</td>
<td>US</td>
<td>6691823</td>
<td>368049863462</td>
<td>2.38</td>
<td>0.2029</td>
<td>2947326</td>
<td>44.04</td>
<td>3.64</td>
<td>1.8</td>
</tr>
<tr>
<td>46</td>
<td>AS5607</td>
<td>BSkyB-BROADBAND-AS Sky UK Limited</td>
<td>GB</td>
<td>11148491</td>
<td>513209634694</td>
<td>19.12</td>
<td>0.338</td>
<td>2572261</td>
<td>23.07</td>
<td>66.23</td>
<td>1.57</td>
</tr>
<tr>
<td>134</td>
<td>AS852</td>
<td>AS852 - TELUS Communications Inc.</td>
<td>CA</td>
<td>4361937</td>
<td>215575650414</td>
<td>12.75</td>
<td>0.1323</td>
<td>2535353</td>
<td>58.12</td>
<td>92.08</td>
<td>1.54</td>
</tr>
<tr>
<td>61</td>
<td>AS12322</td>
<td>PROXAD Free SAS</td>
<td>FR</td>
<td>9547702</td>
<td>418523517170</td>
<td>17.76</td>
<td>0.2895</td>
<td>2456474</td>
<td>25.73</td>
<td>77.56</td>
<td>1.5</td>
</tr>
<tr>
<td>56</td>
<td>AS6147</td>
<td>Telefonica del Peru S.A.A.</td>
<td>PE</td>
<td>9881904</td>
<td>6337260532</td>
<td>75.02</td>
<td>0.2996</td>
<td>2357177</td>
<td>23.85</td>
<td>99.91</td>
<td>1.44</td>
</tr>
<tr>
<td>31</td>
<td>AS4788</td>
<td>TMNET-AS-AP TM Net, Internet Service Provider</td>
<td>MY</td>
<td>14643039</td>
<td>162025226535</td>
<td>71</td>
<td>0.444</td>
<td>2249088</td>
<td>15.36</td>
<td>99.56</td>
<td>1.37</td>
</tr>
<tr>
<td>178</td>
<td>AS3303</td>
<td>SWISSCOM Swisscom (Switzerland) Ltd</td>
<td>CH</td>
<td>3236840</td>
<td>272017559920</td>
<td>44.75</td>
<td>0.0981</td>
<td>2137967</td>
<td>66.05</td>
<td>89.56</td>
<td>1.3</td>
</tr>
<tr>
<td>177</td>
<td>AS31334</td>
<td>KABELDEUTSCHLAND-AS Vodafone Kabel</td>
<td>DE</td>
<td>3238730</td>
<td>155271193660</td>
<td>4.66</td>
<td>0.0982</td>
<td>2040610</td>
<td>63.01</td>
<td>15.38</td>
<td>1.24</td>
</tr>
<tr>
<td>201</td>
<td>AS6848</td>
<td>TELNET-AS Telenet N.V.</td>
<td>BE</td>
<td>2887162</td>
<td>135353041722</td>
<td>30.98</td>
<td>0.0875</td>
<td>2027059</td>
<td>70.21</td>
<td>44.66</td>
<td>1.24</td>
</tr>
<tr>
<td>92</td>
<td>AS113222</td>
<td>MTS-INDIA-Ain 334, Udyog Vihar</td>
<td>IN</td>
<td>6549536</td>
<td>10149789782</td>
<td>1.75</td>
<td>0.1986</td>
<td>2066809</td>
<td>30.64</td>
<td>84.51</td>
<td>1.22</td>
</tr>
<tr>
<td>129</td>
<td>AS11427</td>
<td>SCRR-11427 - Time Warner Cable Internet LLC</td>
<td>US</td>
<td>4509896</td>
<td>243191631904</td>
<td>1.61</td>
<td>0.1367</td>
<td>1790533</td>
<td>39.7</td>
<td>2.21</td>
<td>1.09</td>
</tr>
<tr>
<td>128</td>
<td>AS5432</td>
<td>BELGACOM-SKYNET-AS Proximus NV</td>
<td>BE</td>
<td>4520777</td>
<td>211938546537</td>
<td>48.51</td>
<td>0.1371</td>
<td>1723810</td>
<td>38.13</td>
<td>37.98</td>
<td>1.05</td>
</tr>
<tr>
<td>232</td>
<td>AS3243</td>
<td>MEO-RESIDENCIAL MEO - SERVICOS DE</td>
<td>PT</td>
<td>2514911</td>
<td>55047306546</td>
<td>39.22</td>
<td>0.0763</td>
<td>1681817</td>
<td>66.87</td>
<td>98.17</td>
<td>1.02</td>
</tr>
</tbody>
</table>
Get a badge!

from the IPv6 Forum...

...and be very visible in the World IPv6 Launch measurements
What Next?
Q1 Deliverables

- Some tasks expected to complete during Q1CY2016
  - Additional assurance features
  - Additional abuse features
  - Additional recursive DNS capacity
  - Final CPE firmware rollouts
Q2 Enablement

- Default-On for new customer provides
- Bulk enablement for existing customers
Expected Outcome

- 92% IPv6 target for H1CY2016
  - Will improve with time, but will exceed 5m subscribers
  - More than 1.5Tbps IPv6 traffic delivered to subscribers
- 3% CPE too old
  - Normal hardware replacement and churn will fix this
- 3% technology problems
  - Old platforms will be retired
- 2% on non-Sky CPE
  - Not officially supported, though some proven to work
Questions?