Sky IPv6 Update

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Fast Growth from 2006

5.75m Broadband Subscribers

~20% of UK households
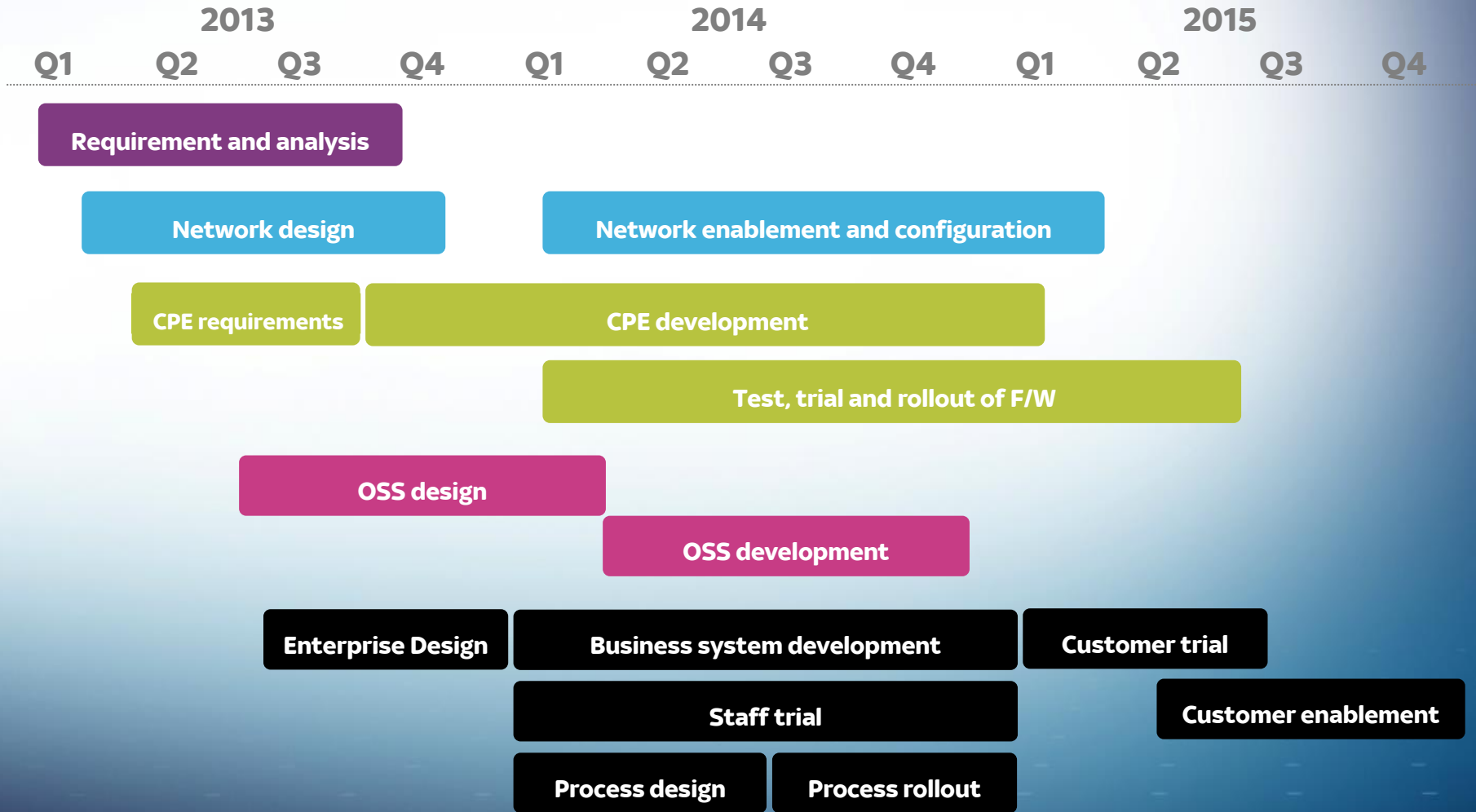
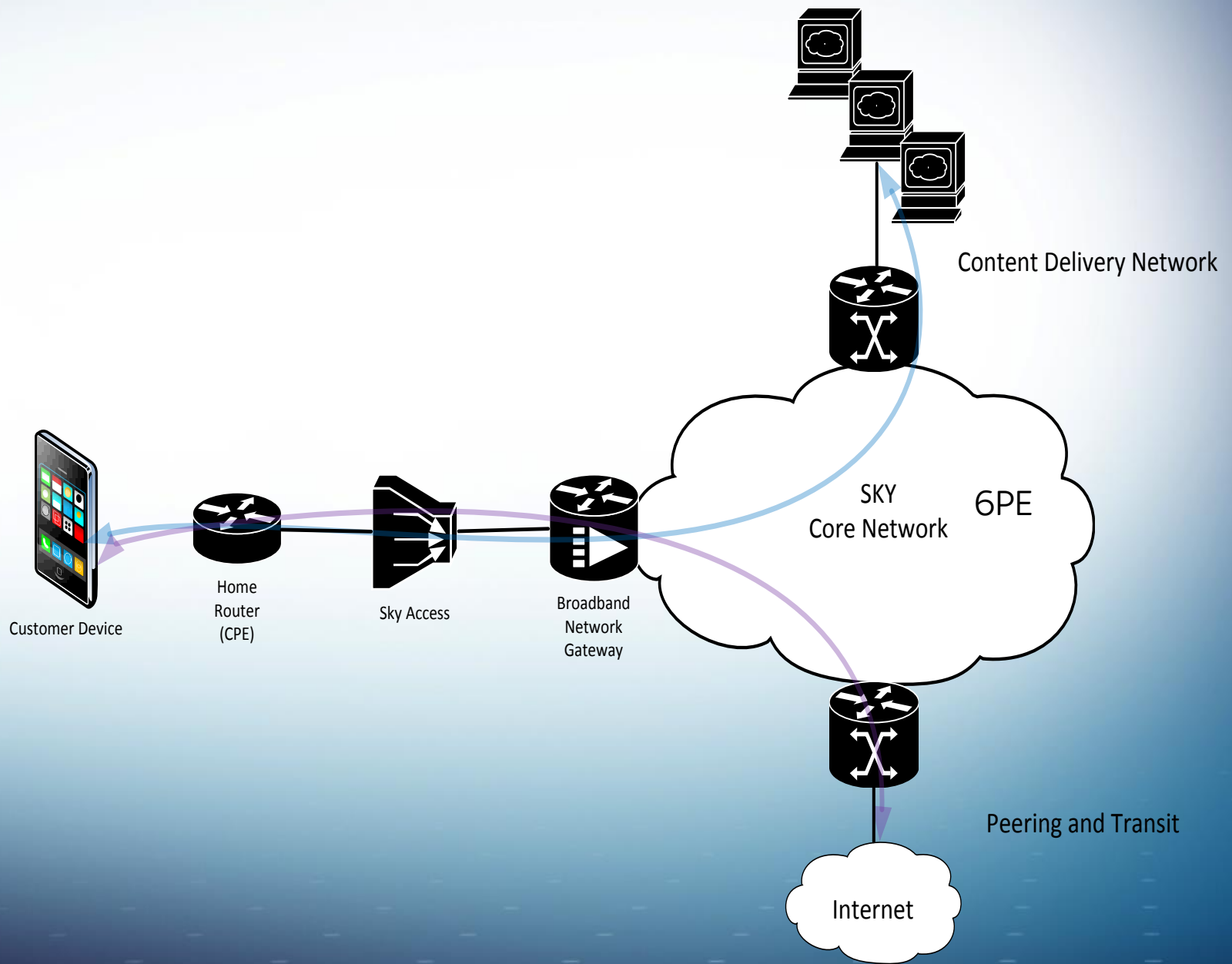Dec 06   Dec 07   Dec 08   Dec 09   Dec 10   Dec 11   Dec 12   Dec 13   Dec 14   Dec 15

50% Compound Annual Growth Rate

~4.5Tbps

Dec 06   Dec 07   Dec 08   Dec 09   Dec 10   Dec 11   Dec 12   Dec 13   Dec 14   Dec 15

sky What we deployed

One of our longer rollout projects

2013				2014				2015		
Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4

Requirement and analysis

Network design

Network enablement and configuration

CPE requirements

CPE development

Test, trial and rollout of F/W

OSS design

OSS development

Enterprise Design

Business system development

Customer trial

Staff trial

Customer enablement

Process design

Process rollout

Content Delivery Network

SKY
Core Network 6PE

Home
Router
(CPE)

Sky Access

Broadband
Network
Gateway

Customer Device

Peering and Transit

Internet

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:

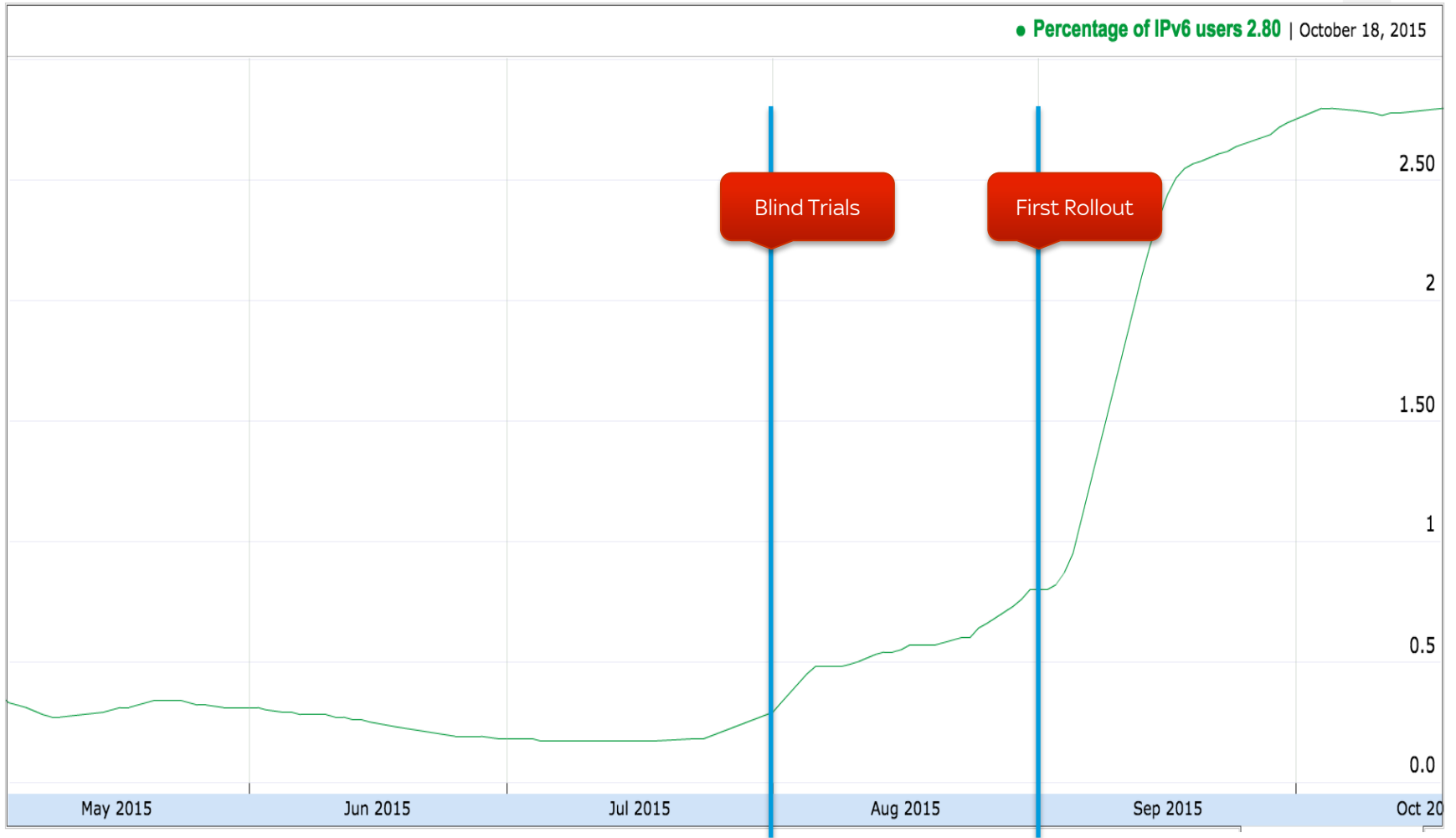 – PIES = private, internal, external, subscriber

BCP38 is for IPv6 too!

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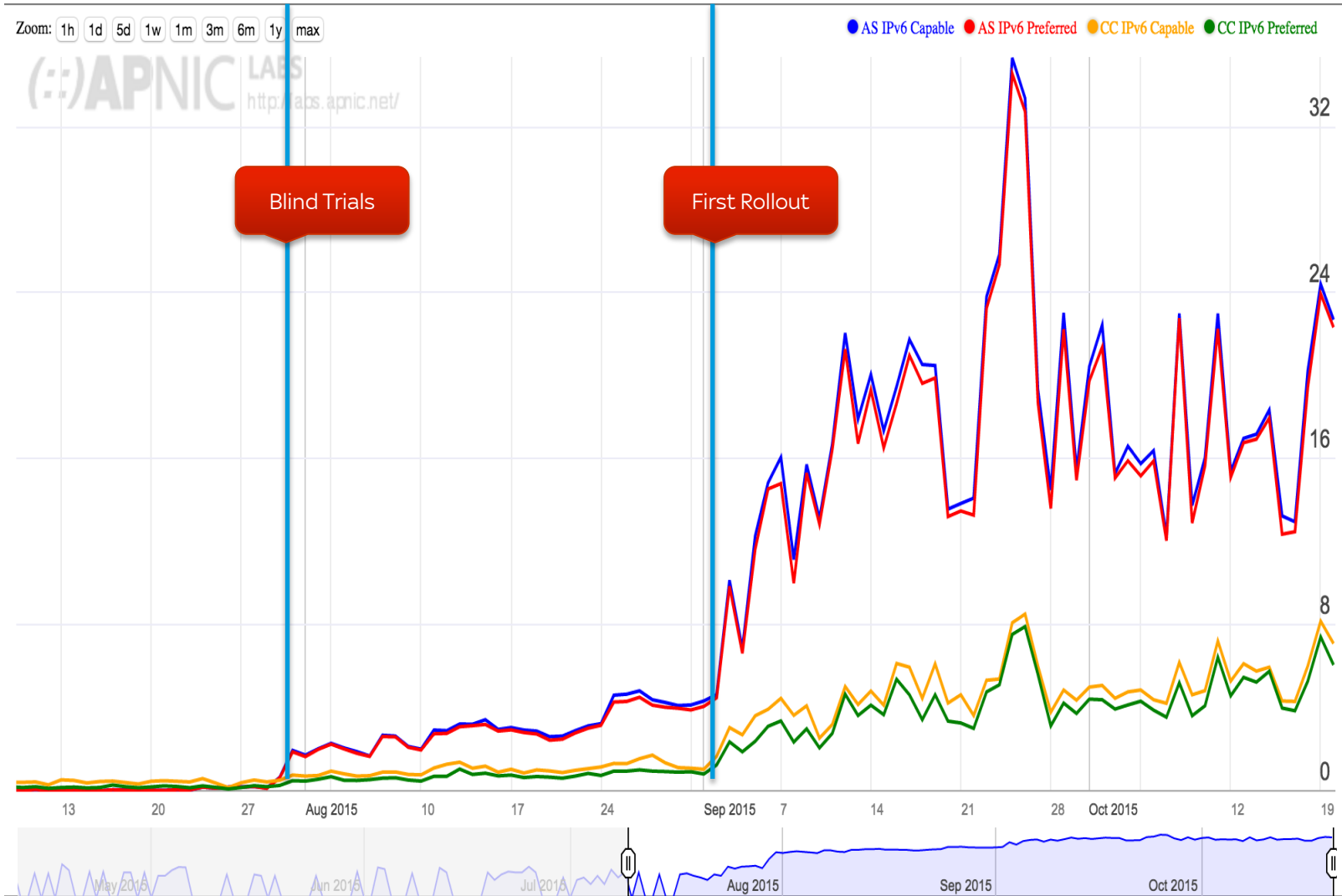
- (and do this for IPv4 if you haven't already!)

https://www.routingmanifesto.org/

UK IPv6 User Count (from 6lab.cisco.com)

● **Percentage of IPv6 users 2.80** | October 18, 2015

Blind Trials

First Rollout

2.50

2

1.50

1

0.5

0.0

May 2015   Jun 2015   Jul 2015   Aug 2015   Sep 2015   Oct 20

Sky IPv6 User Count (from APNIC)

Sky IPv6 Traffic (from Facebook)

AS 5607 IPV6 Egress
BSkyB

Blind Trials

First Rollout

Friday, Jul, 31, 2015 12:00am
IPV6 gbps: 1.47

20

15

10

5

0

6. Jul   13. Jul   20. Jul   27. Jul   3. Aug   10. Aug   17. Aug   24. Aug   31. Aug   7. Sep   14. Sep   21. Sep   28. Sep

■ IPV6 gbps
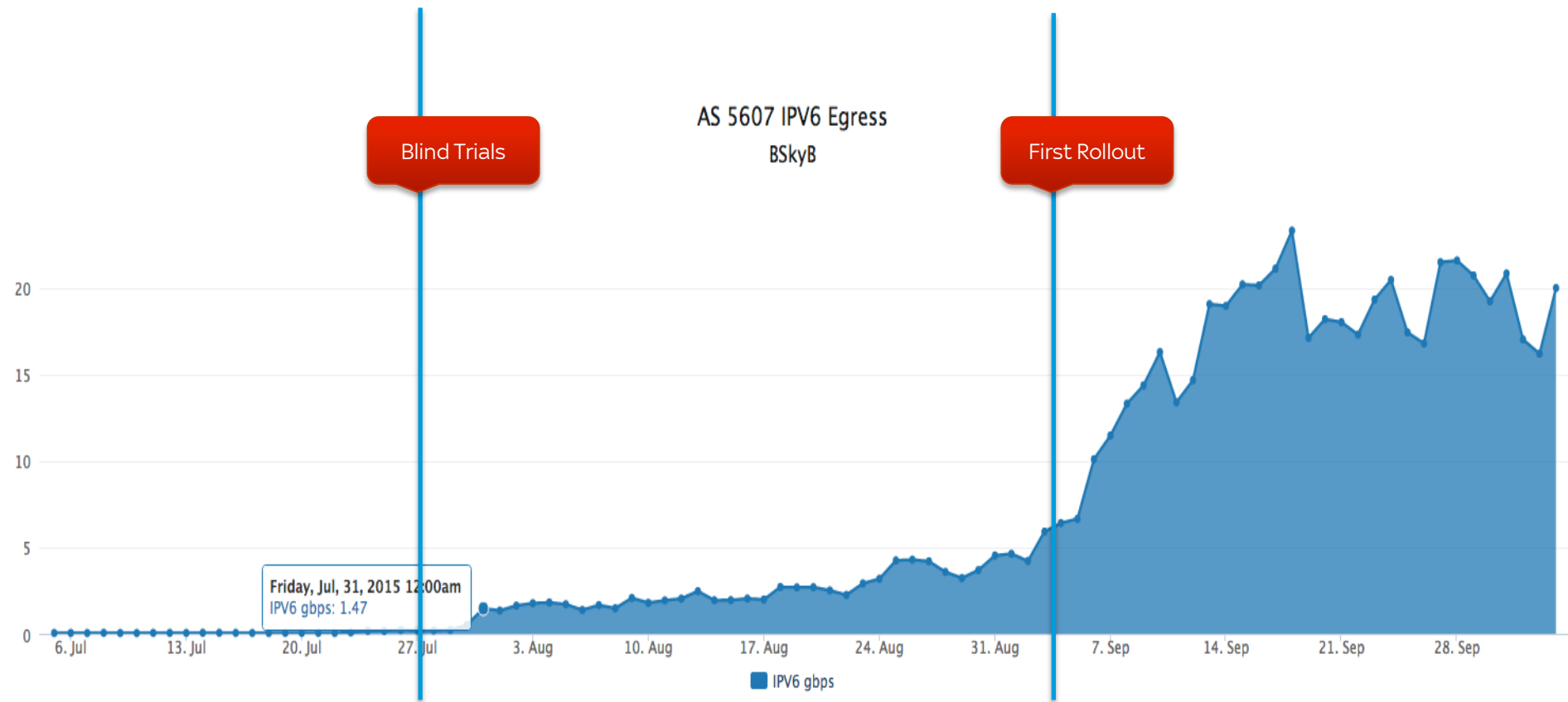
Sky IPv6 by device type (from APNIC)
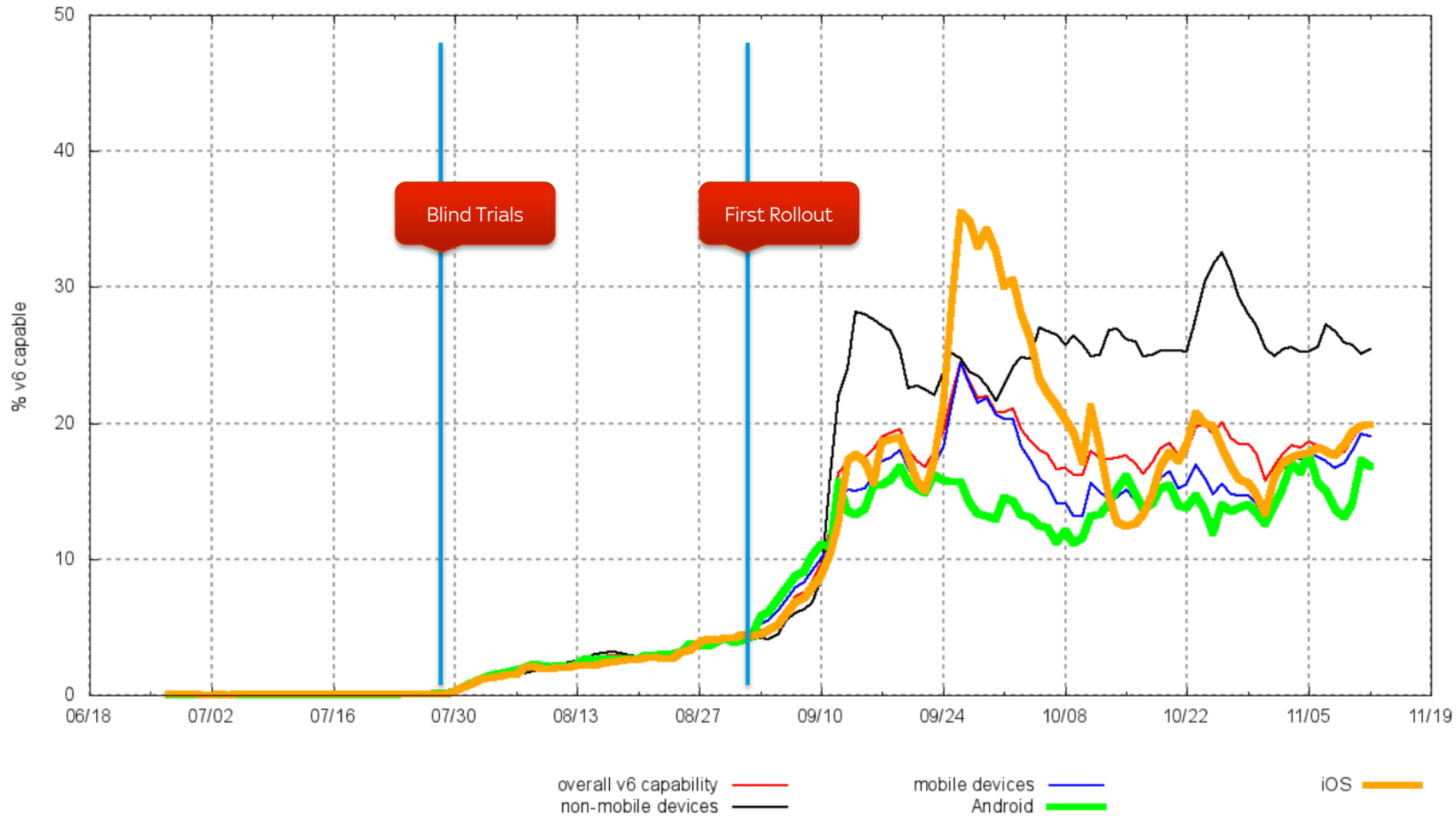
Top IPv6 ASNs by estimated population (from APNIC)

Rank	ASN	AS Name	CC	Users (est.)	Value	% of country	% of Internet	V6 Users ▼	% of AS	% of country	%of internet
4	AS7922	COMCAST-7922 - Comcast Cable Communications, Inc.	US	52503001	2831171825924	18.7	1.5919	30773214	58.61	38.05	18.75
10	AS7018	ATT-INTERNET4 - ATT Services, Inc.	US	29125229	1570548848596	10.38	0.8831	22190809	76.19	27.44	13.52
51	AS22394	CELLCO - Cellco Partnership DBA Verizon Wireless	US	10464477	564286457748	3.73	0.3173	9337609	89.23	11.55	5.69
18	AS2516	KDDI KDDI CORPORATION	JP	21159713	770044275496	18.47	0.6416	8298732	39.22	47.06	5.06
34	AS3320	DTAG Deutsche Telekom AG	DE	14155968	678665417856	20.35	0.4292	6012273	42.47	45.32	3.66
11	AS28573	CLARO S.A.	BR	28740587	322957976119	25.4	0.8714	4924223	17.13	51.44	3
16	AS17676	GIGAINFRA Softbank BB Corp.	JP	21440815	780274139480	18.72	0.6501	4433463	20.68	25.14	2.7
23	AS18881	Global Village Telecom	BR	18742019	210604067503	16.56	0.5683	3628897	19.36	37.91	2.21
79	AS21928	T-MOBILE-AS21928 - T-Mobile USA, Inc.	US	7266787	391854222188	2.59	0.2203	3394948	46.72	4.2	2.07
90	AS20001	ROADRUNNER-WEST - Time Warner Cable Internet LLC	US	6691823	360849863452	2.38	0.2029	2947325	44.04	3.64	1.8
46	AS5607	BSKYB-BROADBAND-AS Sky UK Limited	GB	11148491	513209634694	19.12	0.338	2572261	23.07	66.23	1.57
134	AS852	ASN852 - TELUS Communications Inc.	CA	4361937	215575650414	12.75	0.1323	2535353	58.12	92.08	1.54
61	AS12322	PROXAD Free SAS	FR	9547702	418523517170	17.76	0.2895	2456474	25.73	77.56	1.5
56	AS6147	Telefonica del Peru S.A.A.	PE	9881904	63372650352	75.02	0.2996	2357177	23.85	99.91	1.44
31	AS4788	TMNET-AS-AP TM Net, Internet Service Provider	MY	14643039	162025226535	71	0.444	2249088	15.36	99.56	1.37
178	AS3303	SWISSCOM Swisscom (Switzerland) Ltd	CH	3236840	272017559920	44.75	0.0981	2137967	66.05	89.56	1.3
177	AS31334	KABELDEUTSCHLAND-AS Vodafone Kabel Deutschland GmbH	DE	3238730	155271193660	4.66	0.0982	2040610	63.01	15.38	1.24
201	AS6848	TELENET-AS Telenet N.V.	BE	2887162	135353041722	30.98	0.0875	2027059	70.21	44.66	1.24
92	AS131222	MTS-INDIA-IN 334,Udyog Vihar	IN	6549536	10164879872	1.75	0.1986	2006889	30.64	84.51	1.22
129	AS11427	SCRR-11427 - Time Warner Cable Internet LLC	US	4509896	243191631904	1.61	0.1367	1790533	39.7	2.21	1.09
128	AS5432	BELGACOM-SKYNET-AS Proximus NV	BE	4520777	211938546537	48.51	0.1371	1723810	38.13	37.98	1.05
232	AS3243	MEO-RESIDENCIAL MEO - SERVICOS DE COMUNICACOES E MULTIMEDIA S.A.	PT	2514911	56047306546	39.22	0.0763	1681817	66.87	98.17	1.02

Get a badge!

from the IPv6 Forum...

I1-GB-00000504

...and be very visible in the World IPv6 Launch measurements

Show 25 ▼ entries		Search: 5607

Rank ▲	Participating Network ⇕	ASN(s) ⇕	IPv6 deployment ⇕
24	British Sky Broadcasting	5607	13.20%

Showing 1 to 1 of 1 entries (filtered from 191 total entries)

First   Previous   1   Next   Last

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