

Netflix / IPv6

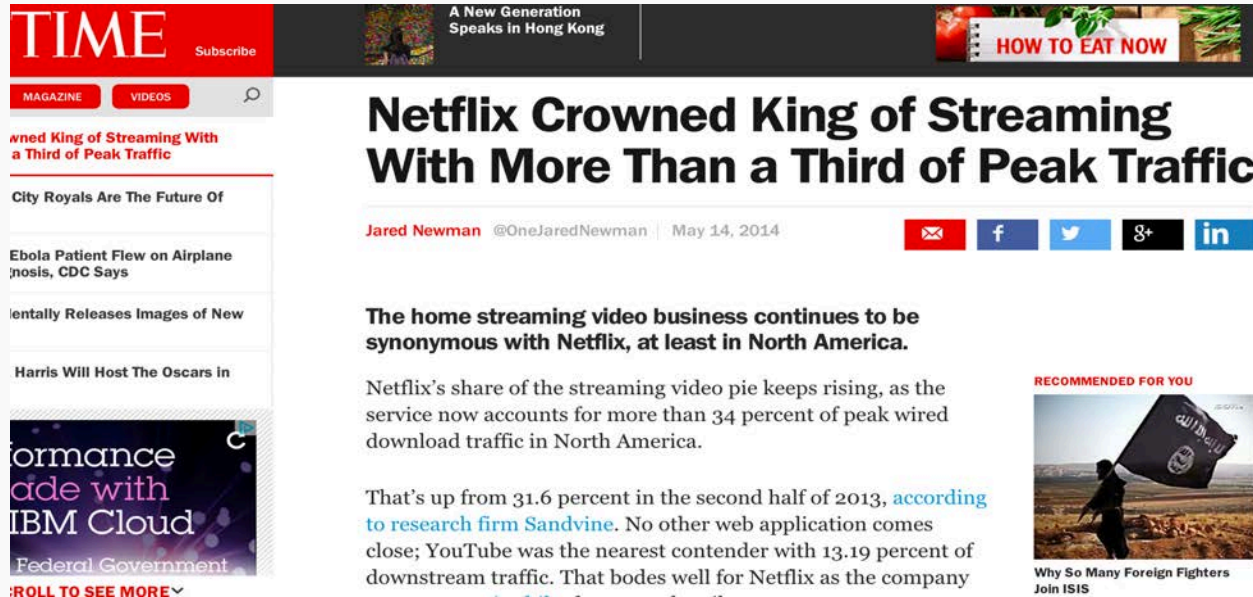
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Who are we...?

- **In the US... a DVD-by-mail / Internet Streaming Content Provider**
- **Outside US... an Internet Streaming Content Provider**
- **Service regions (as of now):**
USA, Canada, Mexico, LatAm, UK/IE, Nordics,
France, Germany, Switzerland, Austria,
Belgium, Luxembourg

Netflix for Net Nerds

- One of the largest sources of traffic on the Internet



The image shows a screenshot of a TIME magazine article. The top navigation bar includes the TIME logo, a 'Subscribe' button, and a search icon. Below the navigation, there are buttons for 'MAGAZINE' and 'VIDEOS'. The main headline reads 'Netflix Crowned King of Streaming With More Than a Third of Peak Traffic'. The author is Jared Newman (@OneJaredNewman) and the date is May 14, 2014. The article text states: 'The home streaming video business continues to be synonymous with Netflix, at least in North America. Netflix's share of the streaming video pie keeps rising, as the service now accounts for more than 34 percent of peak wired download traffic in North America. That's up from 31.6 percent in the second half of 2013, according to research firm Sandvine. No other web application comes close; YouTube was the nearest contender with 13.19 percent of downstream traffic. That bodes well for Netflix as the company'. A 'RECOMMENDED FOR YOU' section shows a video thumbnail titled 'Why So Many Foreign Fighters Join ISIS'. The left sidebar contains several article teasers: 'Crowned King of Streaming With a Third of Peak Traffic', 'City Royals Are The Future Of', 'Ebola Patient Flew on Airplane', 'mentally Releases Images of New', and 'Harris Will Host The Oscars in'. At the bottom left, there is an advertisement for IBM Cloud with the text 'Performance made with IBM Cloud' and 'Federal Government'. A 'ROLL TO SEE MORE' button is at the bottom left of the article content.

In-house CDN

3rd party CDNs phased out 2-3 months ago

- **100% of Netflix is now on Openconnect AS2906**
- **Openconnect is IPv6 enabled**

How to connect to NFLX CDN

3 ways to get direct access to Netflix
[in order increasing traffic volume]

- BGP session at a public IX
- Dedicated PNI between NFLX and ISP
- Embedded appliance

- Further details: <http://netflix.com/openconnect>

'Flash' Servers

- SSD storage
 - 40G NIC – can serve over 30Gbits/s per server
 - 14 x 960G SSDs - 13.4TB in 1U
 - 30 servers per rack
- TOTAL: 400TB SSD / >900 Gbits/s per rack**



'Spinning Disk' Servers

- Traditional Hard Disks
- 2 x 10G NICs (LACP) – can serve ~14G
- 36 x 6TB HDs per 4U server – 216TB
- 10 servers per rack

TOTAL: 130 Gbits/s / 2.16PB storage per rack

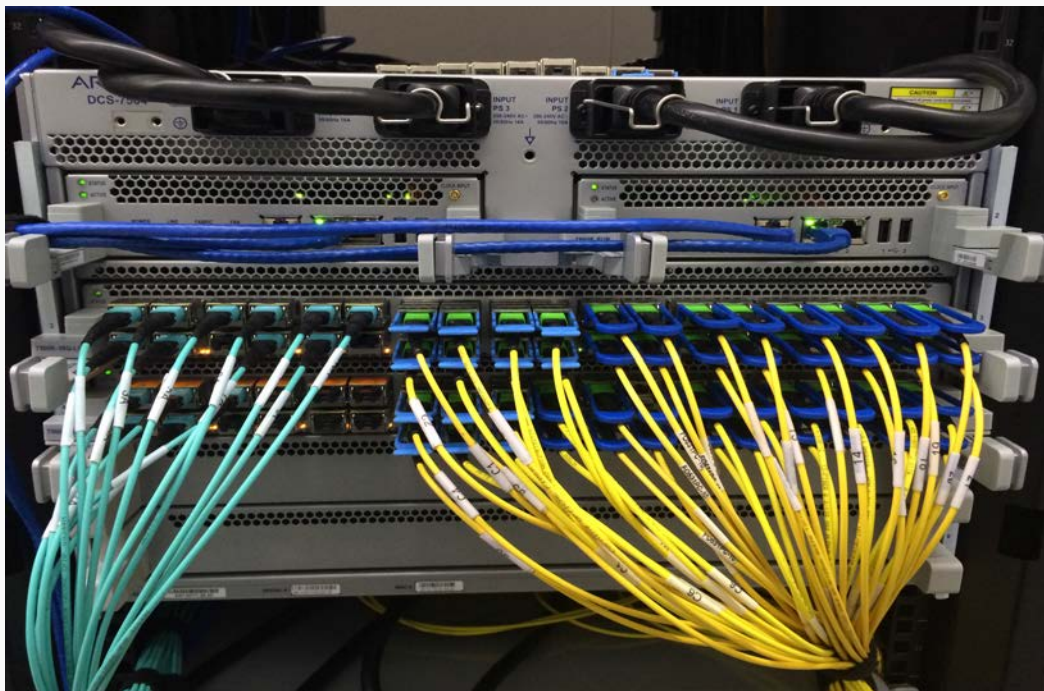


Network Gear

- Mixture of Arista, Cisco ASR9K and Juniper MX

Arista:

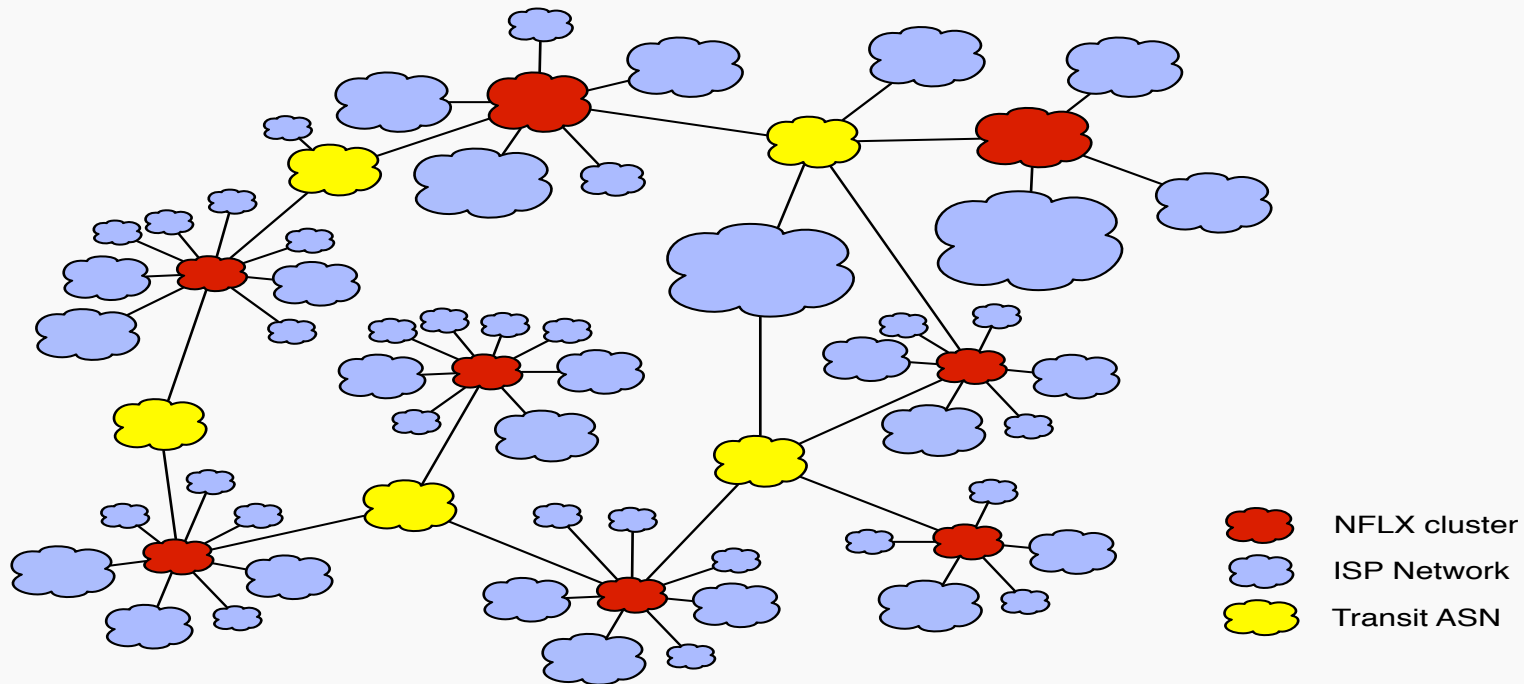
- 36 x 40G ports
- 1.44 Tbits/s per slot
- Limited FIB – Use Cisco / Juniper boxes for ‘long tail prefixes’



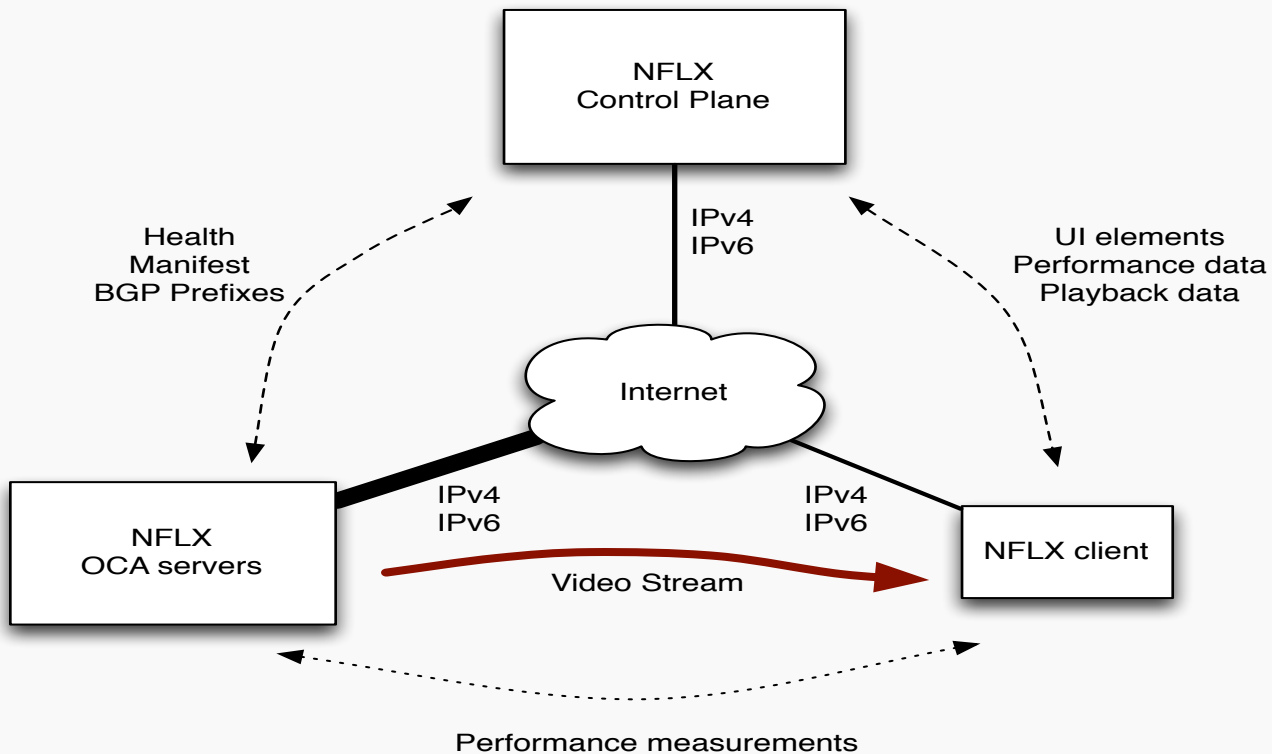
IPv6 – Technical Status

- All content on Netflix's Openconnect CDN is capable of being served over IPv6
- All Servers have v4 / v6 addresses
- All IX / PNI connectivity is dual-stacked – v4 / v6
- AWS hosted layer is IPv6 enabled
- Caveats...
 - Box-Art on 3rd party CDN
 - Not yet 100% client support – dev/test pending

CDN Topology



Site Logical Overview



Cloud 'magic'

- All BGP routes sent to CCS – v4 and v6
- CCS has centralised real-time overview of BGP within its region (US / EU)
- BGP data in CCS used for user site selection
- 2 CCS regions – US/LATAM and Europe

Getting your Netflix over IPv6

As long as there is:

1. IPv6 path between host \leftrightarrow OCA
2. IPv6 path between host \leftrightarrow AWS
3. NFLX client supports v6 – not 100% do

...the stream will attempt to be served over IPv6.

This means...

As long as the host can resolve the AAAA for the OCA URL, it should attempt HTTP over v6 first.

BGP signaling for IPv6

- **Please announce your IPv6 prefixes over your IPv6 peering**
- **CCS will use IPv6 prefixes in the path selection algorithm in the same way as IPv4 ones**
- **Announcing to IX or Embedded servers works the same way, though embedded v4 may be preferred over IX v6.**

Summary

- Netflix is IPv6 ready – v4 and v6 work the same way
- Once enabled fully, LOTS of traffic will be native IPv6
- Lack of IPv6 on major CE devices is an ongoing issue – this will improve as time goes on.

Questions?

