IPv6 Statistics on Vyncke.org

An overview

Eric Vyncke

evyncke@cisco.com

eric@vyncke.org eric.vyncke@ipv6council.be @evyncke

"It is a capital mistake to theorize before one has data."

Sherlock Holmes, "A Study in Scarlett" (Arthur Conan Doyle)

What to Measure?
Which data sources?

Type of Data

- How many IPv6 Internet users?
  - In app measurement => requires a specific app, app bias
  - Browser measurement => no specific requirements

- How many IPv6 ISP worldwide?
  - How many prefix allocated by Regional Internet Registries
  - How many IPv6 routes in global routing table?
  - How important are those ISP? Tier one, tier two...

- How much IPv6 contents?
  - How many web servers can be reached over IPv6 access?

- How much IPv6 traffic over the Internet ?
  - Internet Exchange Points ?

Data Sources

- Browser data => need to have big site and make data public
  - Thank you Google, APNIC

- Allocated IPv6 prefix => easy thank you RIPE, ARIN, ...

- Global Routing Table => easy thank you routeview.org

- Content, get the list from Alexa, then query DNS and issue real HTTP requests

- Traffic: AMS-IX does not see Google, Facebook, Netflix traffic ...
  - Little information from ISP

Even for Content, not so easy

- Free Alexa top 1-million global view not per country
  - Manual process to assign the .com, .net, .org to countries
  - With too many false positives for .cd, .to, .io, ... Or even youtu.be !
  - Attempt to measure the content SERVED by the country

- Pay Alexa a fee to get the top-500 per country
  - Nearly no false information
  - Measuring the content SEEN by the country

- Possible bias because Alexa is a voluntary plugin mainly on desktop

Difference for the Netherlands
Content in country <-> Content seen

- Booking.com

- Wetransfer.com

- Usenet.nl

- Ero-advertising.com

- Dumpert.nl

- Markplaats.nl

- Tweakers.net

- Ing.nl

- Google.nl

- Youtube.com

- Google.com

- Vk.com

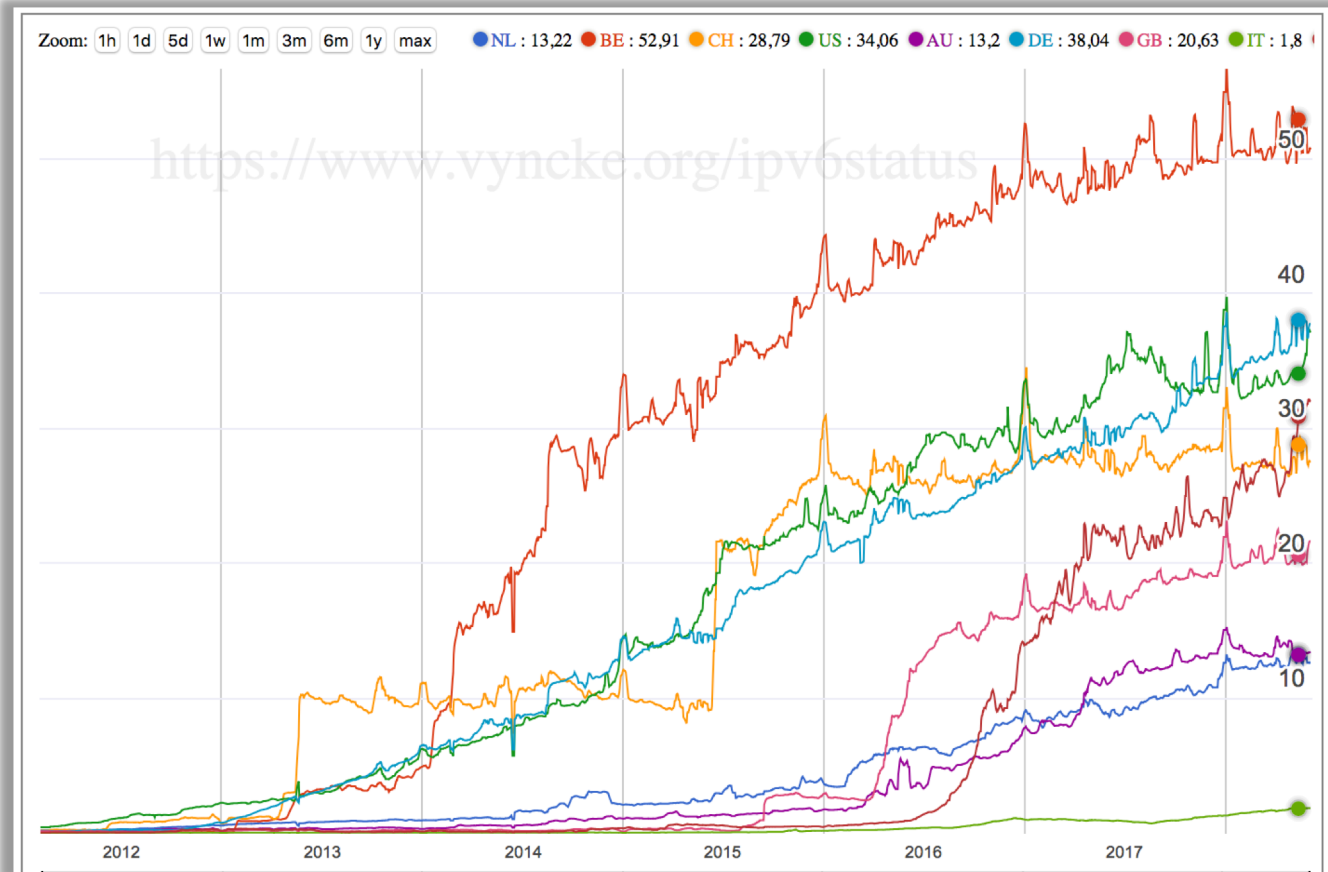- Facebook.com

- Wikipedia.org

- Reddit.com

- Ok.ru

Let's Start Showing Data
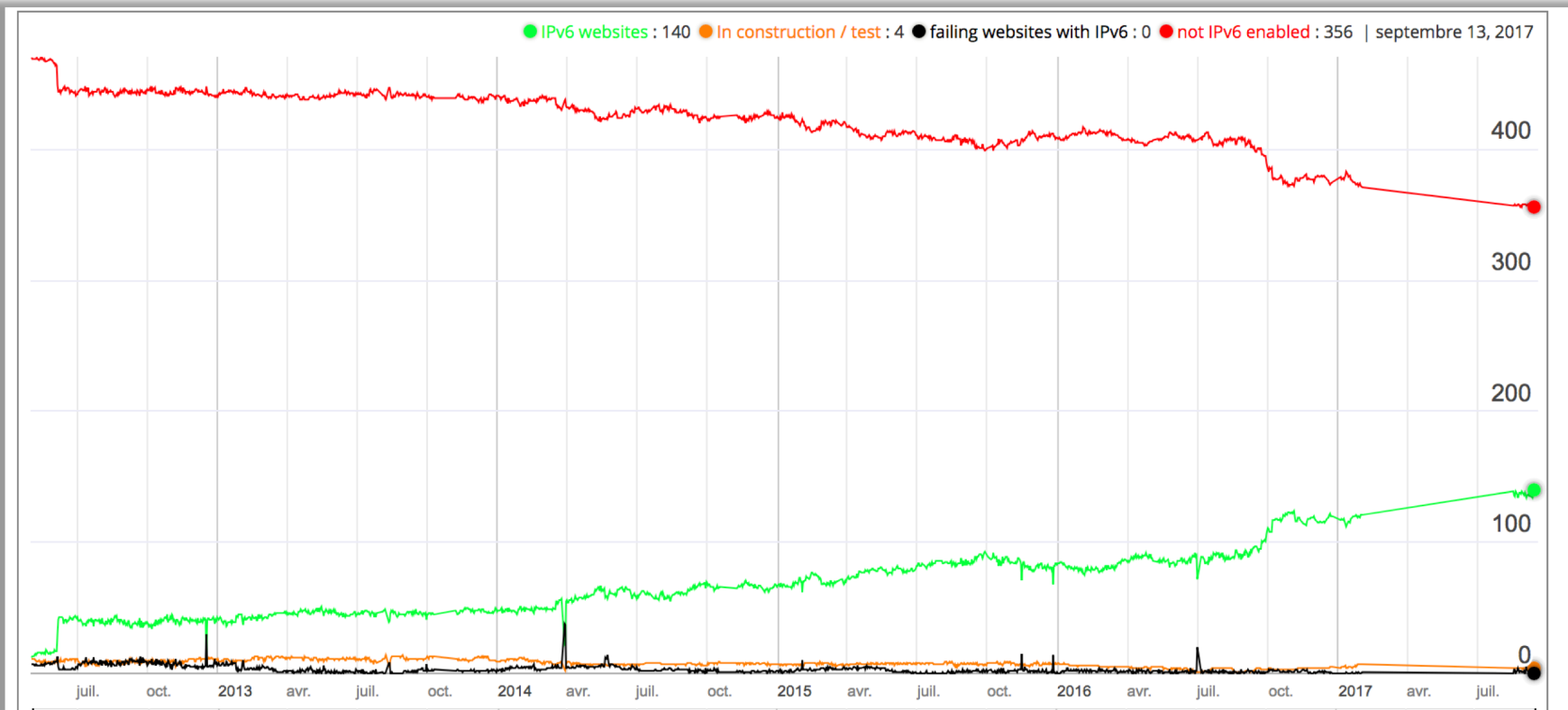
One Country Users by Google: Netherlands

Zoom: 1h 1d 5d 1w 1m 3m 6m 1y max

● Netherlands : 12,92 l mai 28, 2018

https://www.vyncke.org/ipv6status

2012 2013 2014 2015 2016 2017

Multiple Countries Users by Google

IPv6 Content Served by Netherlands (top-50)

IPv6 Content Seen by Netherlands (top-100)

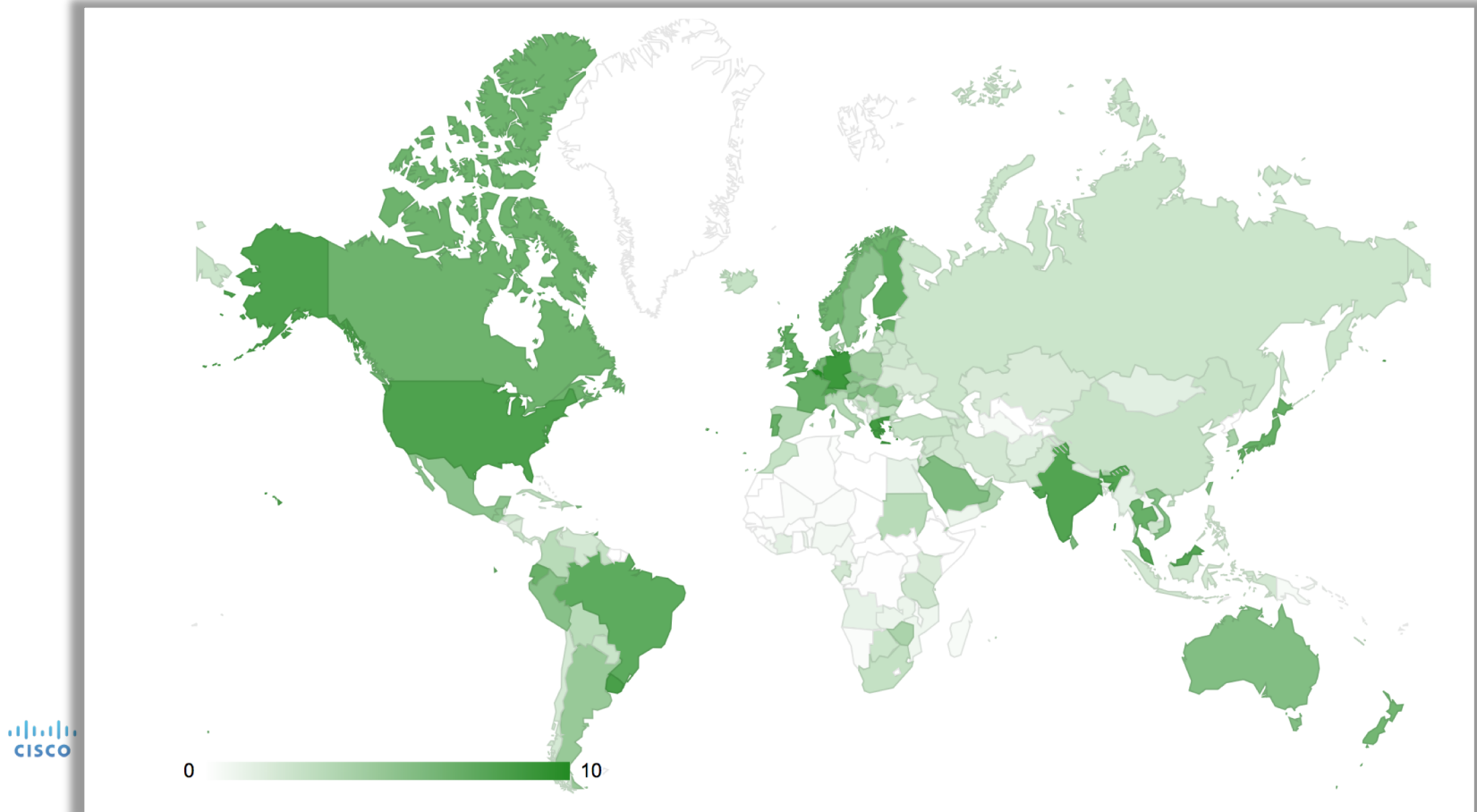http://6lab.cisco.com/stats/cible.php?country=NL&option=content

Too Many Metrics ?

- Let's blend them !

$$RelativeMean = \frac{1}{4}\frac{\%TransitAS}{\max_{world}(\%TransitAS)} + \frac{3}{4}\frac{\sqrt{\%content \times \%user}}{\max_{world}\left(\sqrt{\%content \times \%user}\right)}$$
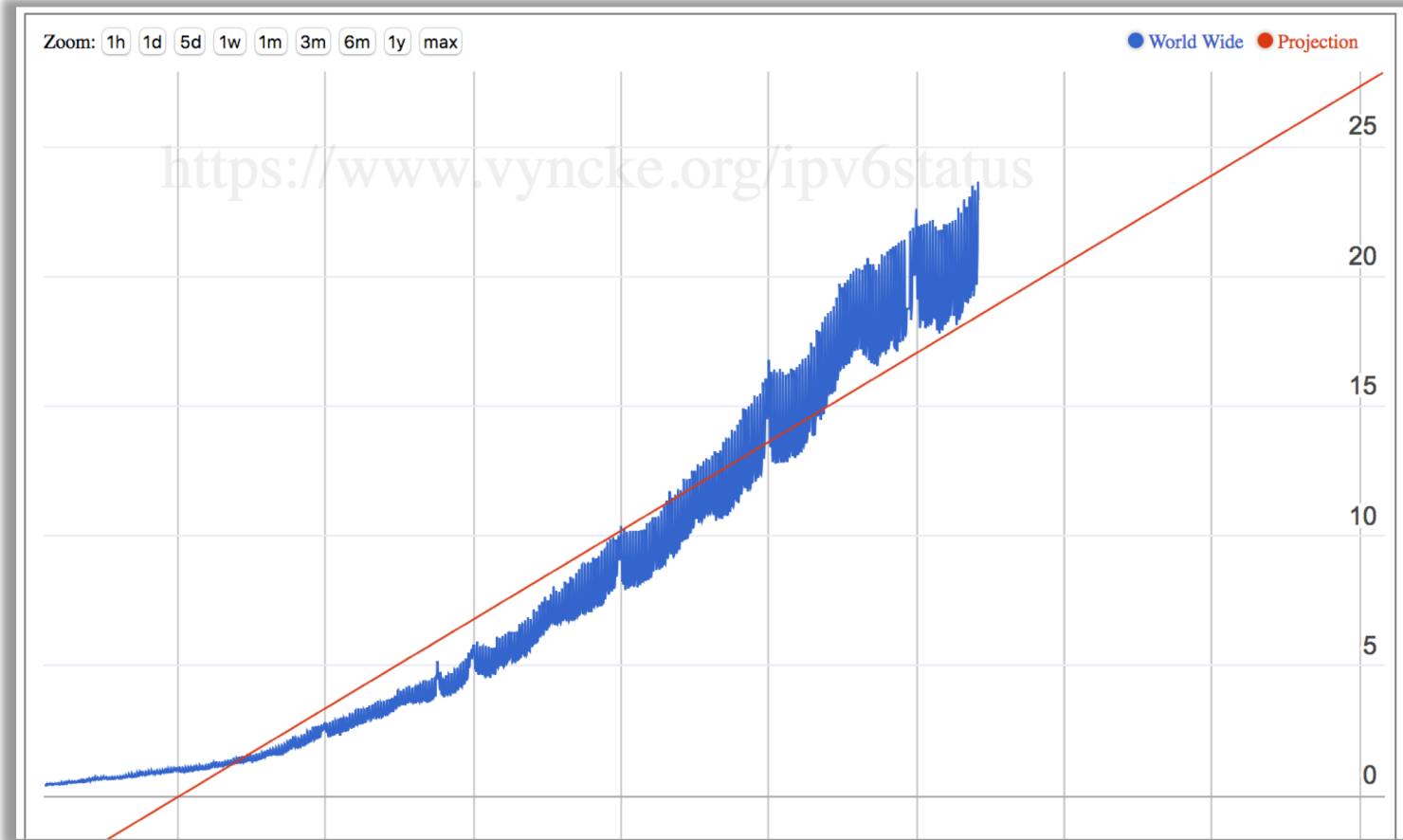
6lab.cisco.com

0 ▬▬▬▬▬ 10

What about tomorrow?

Can past predict the future?

https://www.vyncke.org/ipv6status/project.php?metric=p
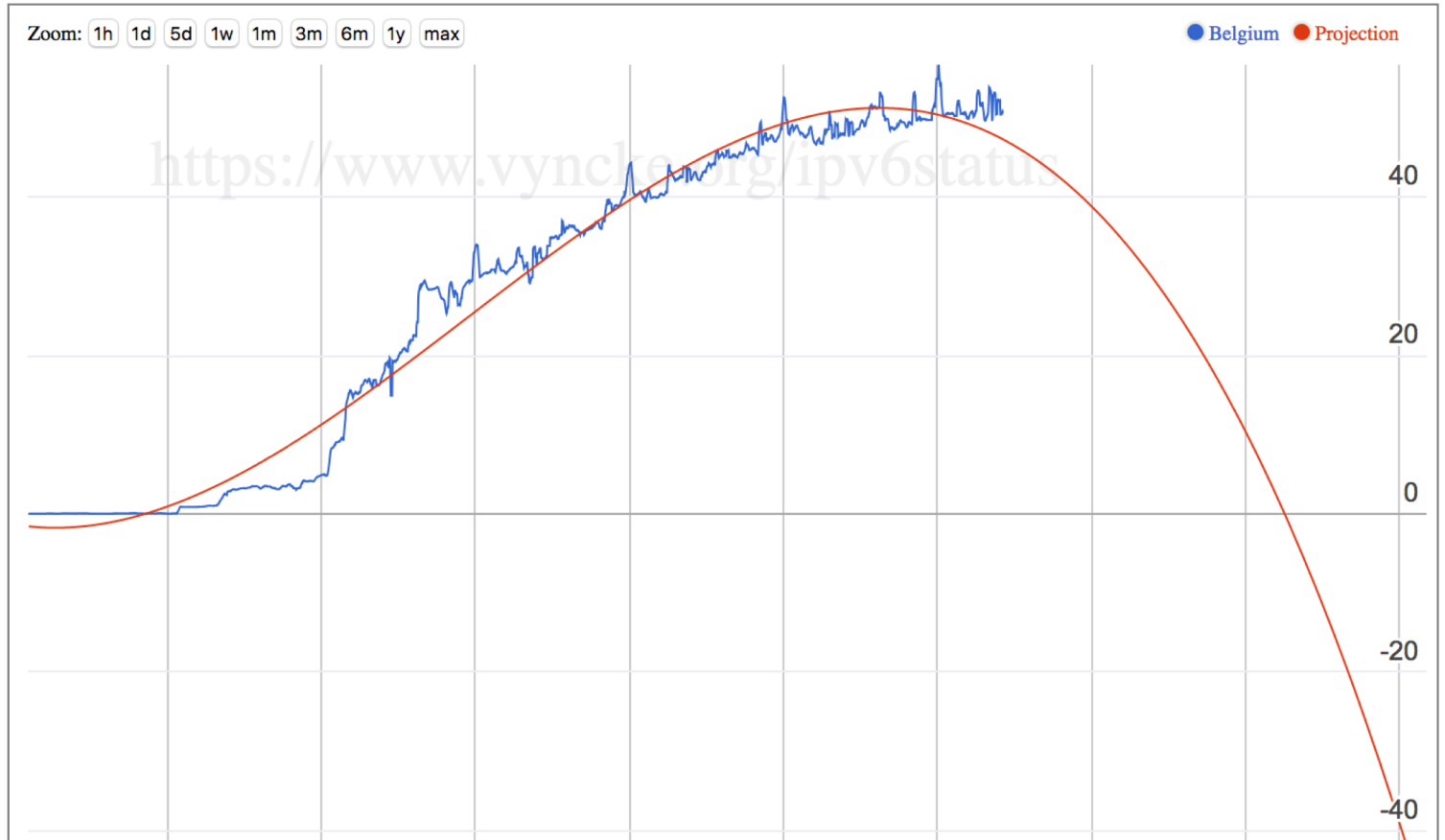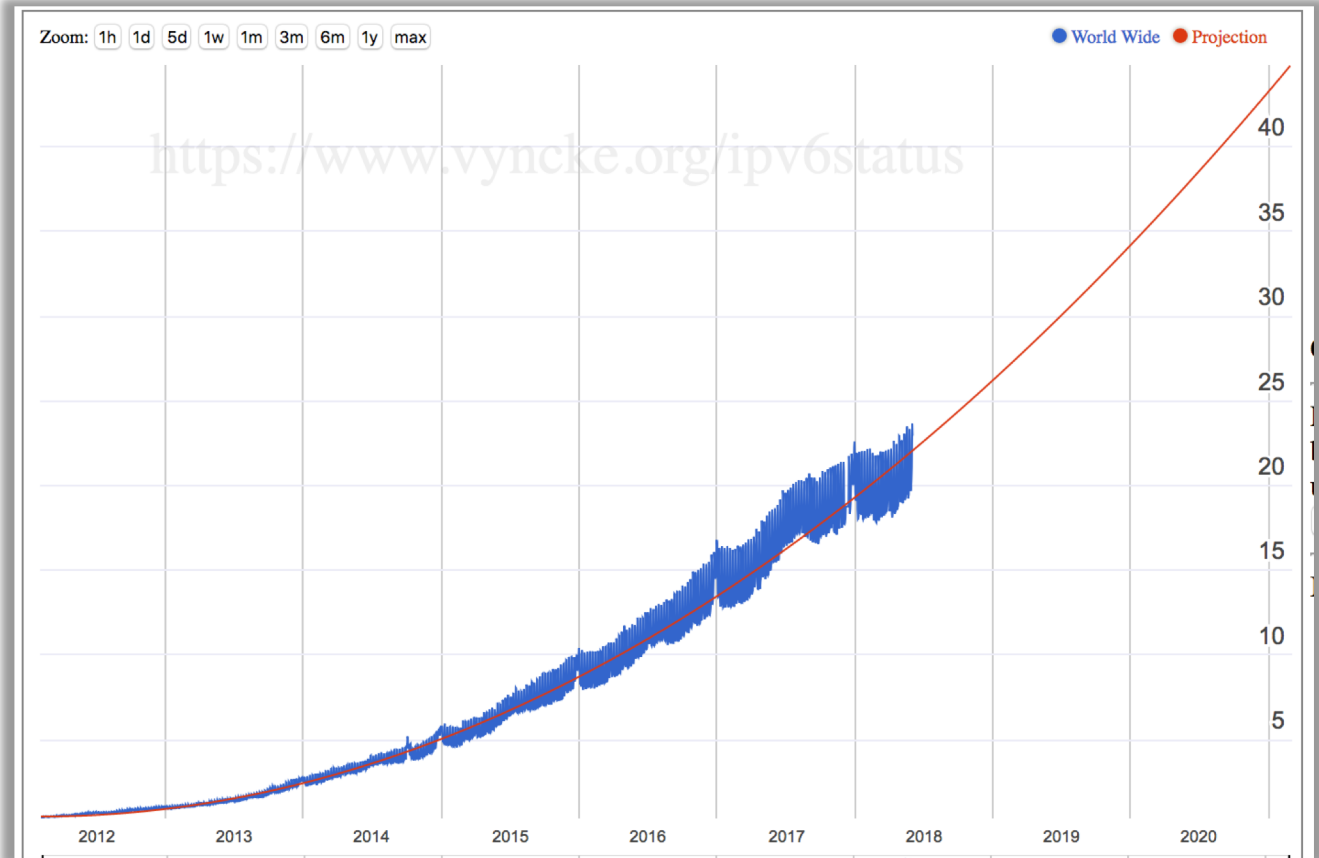
Using Google Users Data: linear regression

Using Google Users Data: quadratic

3rd Order Regression is strange...

Logistic Curve 'S-curve' is probably the most sensible

"Do not forget that data can be biased, manipulated, shown on a specific light, ..."