



# IPv6 over WLAN in a Conference

## Measurements Lessons Learned

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# Objectives

Ultra Thin Deployment Team (2 people)

3000+ Attendees with little IPv6 Experience

IPv6 was not made public

What can be measured?

What was measured?

# Comparison of Address Type Syntax (CATS)

## IPv4 Address



HOST: 156.50.20.1

NET: 156.50.0.0/16

## IPv6 Address



FE80::20B:60FF:FEA7:D81A

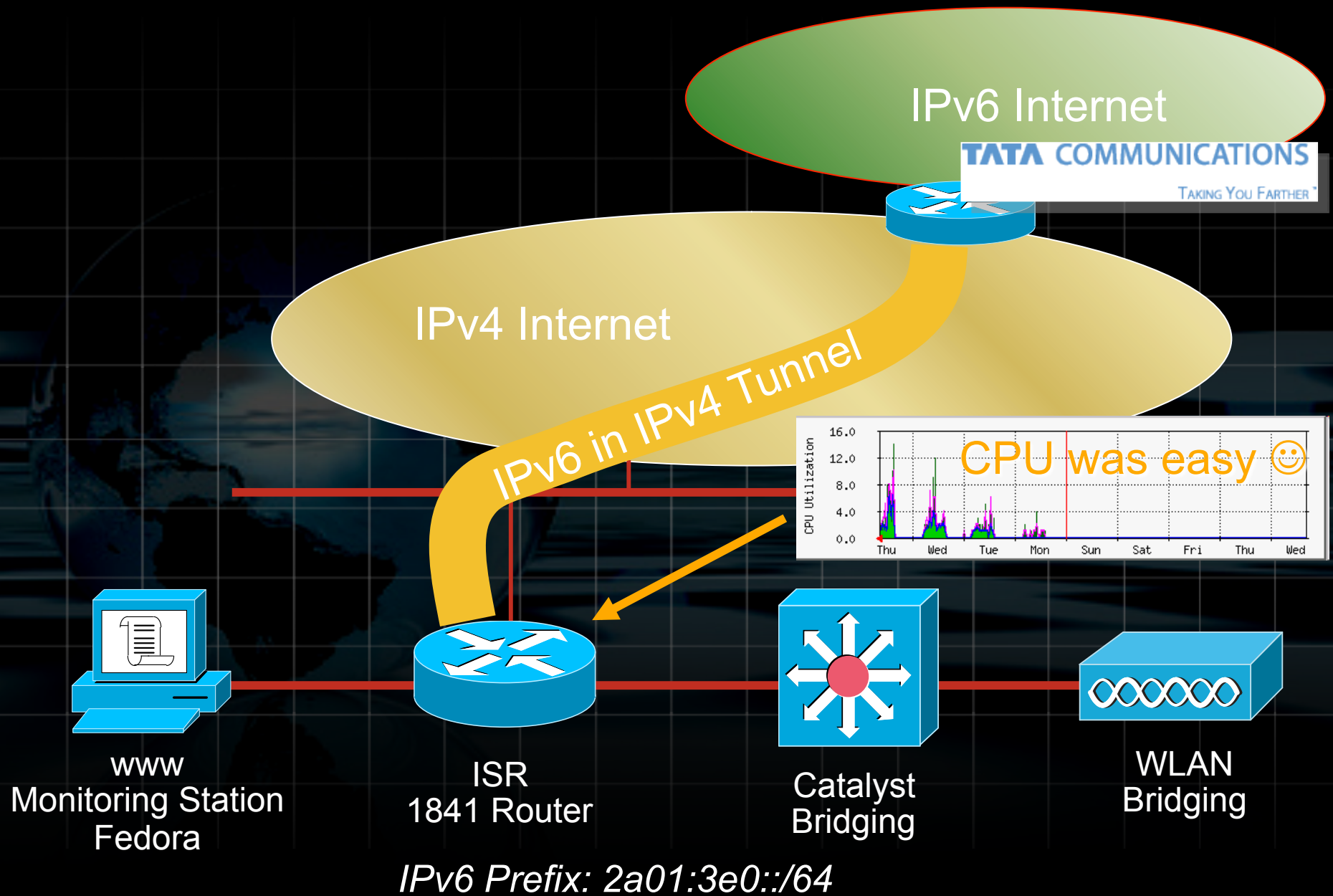
2001:0:0:A1::/64

## The "NOC" Look



I need some Catnip...

HEX is a curse...

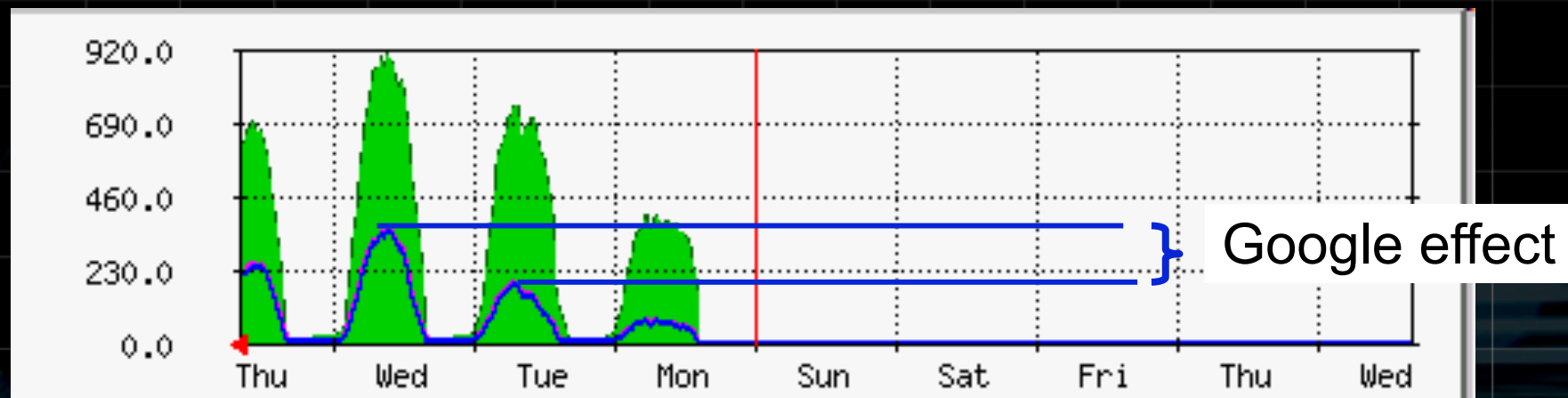




# Measurements

- Sheer bandwidth: SNMP & MRTG
- RTT to google.com over IPv4 vs. IPv6
- DNS traffic: BIND & MRTG  
IPv4 vs. IPv6 resolution
- IPv6 router neighbor cache  
Link-local: amount of RS/RA  
Global address: amount of PC actually using IPv6
- IPv6 flows: protocols and destinations
- Impact of AAAA for google.com

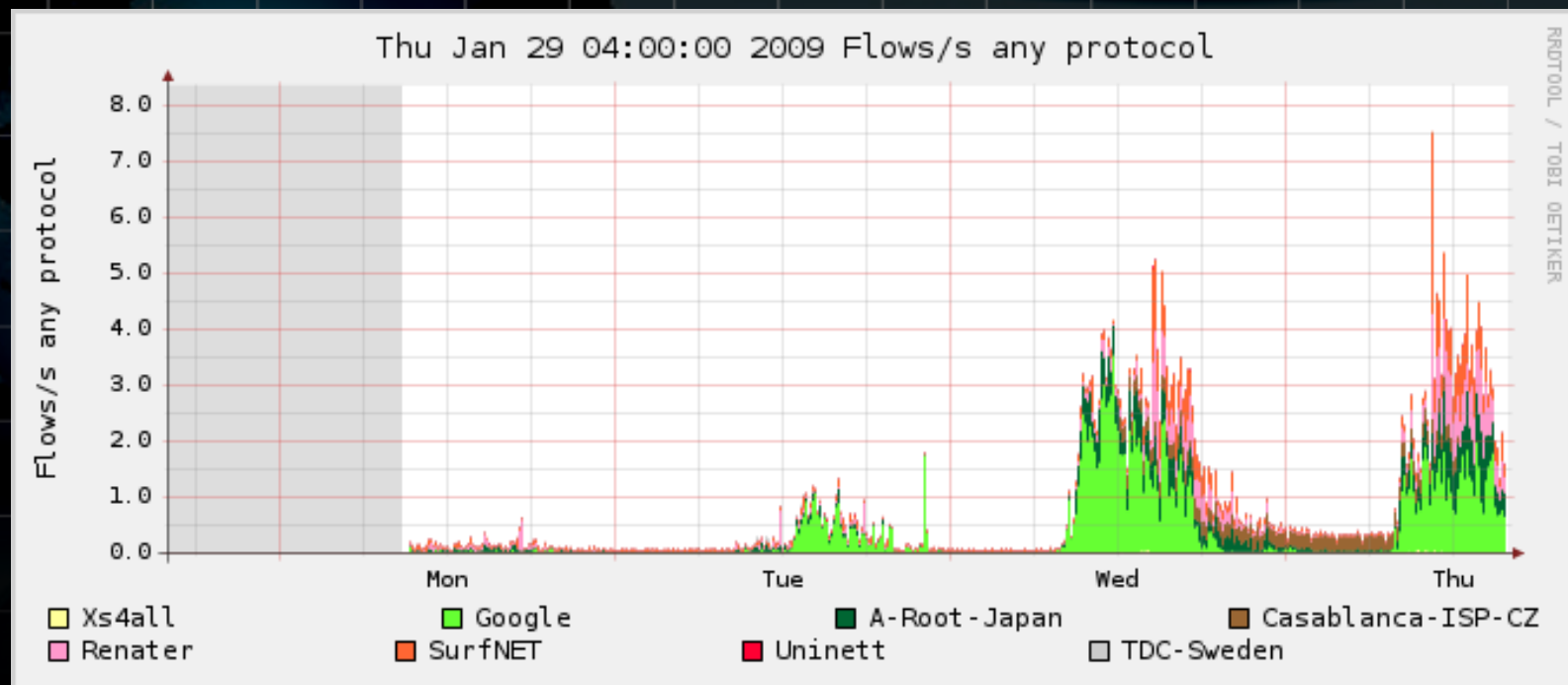
# AAAA and Google



- Erik & Lorenzo were kind enough to turn on AAAA on Wednesday morning:
  - Measurable impact on actual IPv6 usage
  - Neighbor cache on router from 180 -> 358
  - 3000 attendees but not 3000 laptops active over WLAN (different population than IETF)

# Which Destinations?

- Using Netflow & NFSEN  
Another google.com AAAA effect

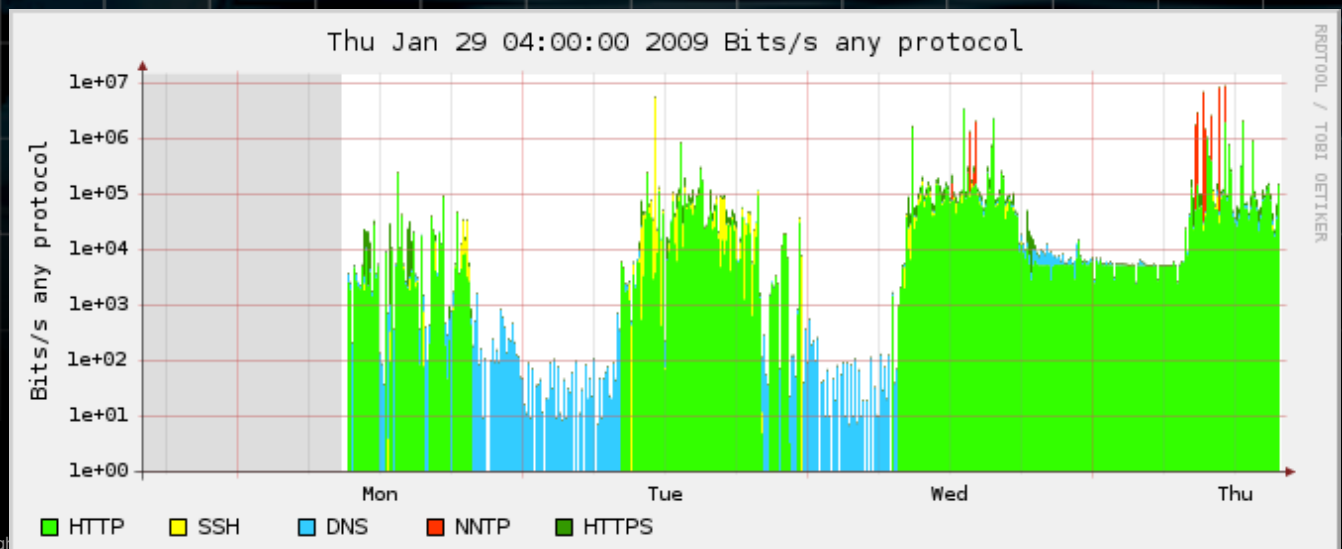
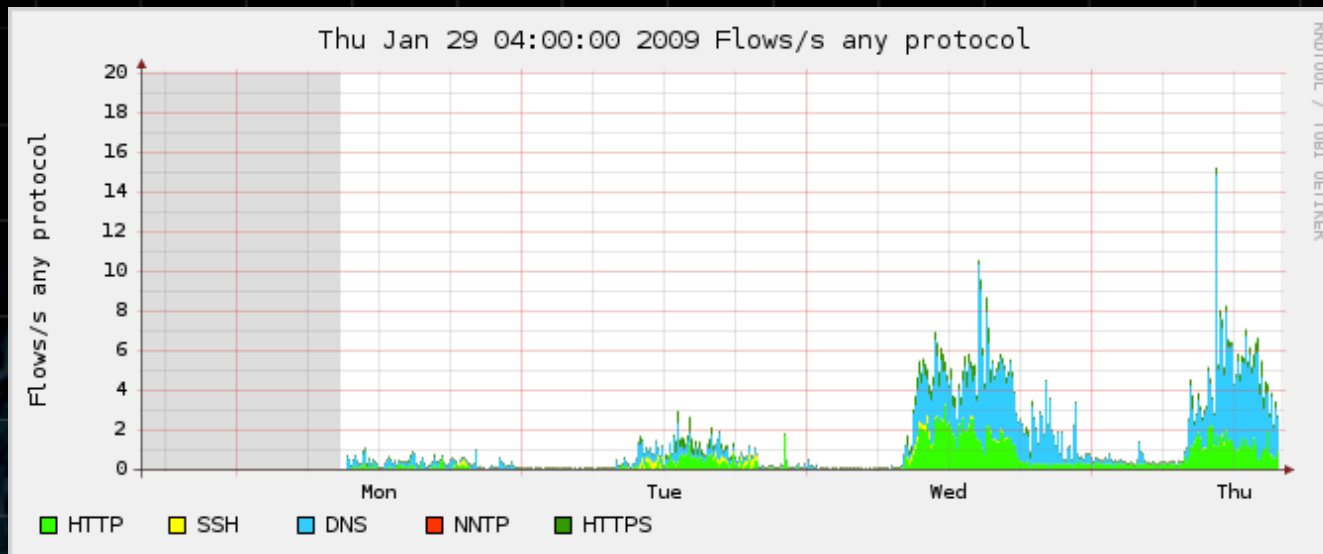


# Captive Portal & AAAA

- There was a captive portal for IPv4
  - For authentication
  - Triggered on the first IPv4 web access
- Several attendees had [www.google.com](http://www.google.com) as home page
  - Browser goes over IPv6 to [www.google.com](http://www.google.com)
  - Captive portal is not triggered
  - VPN does not start
  - ...
  - Scratching heads

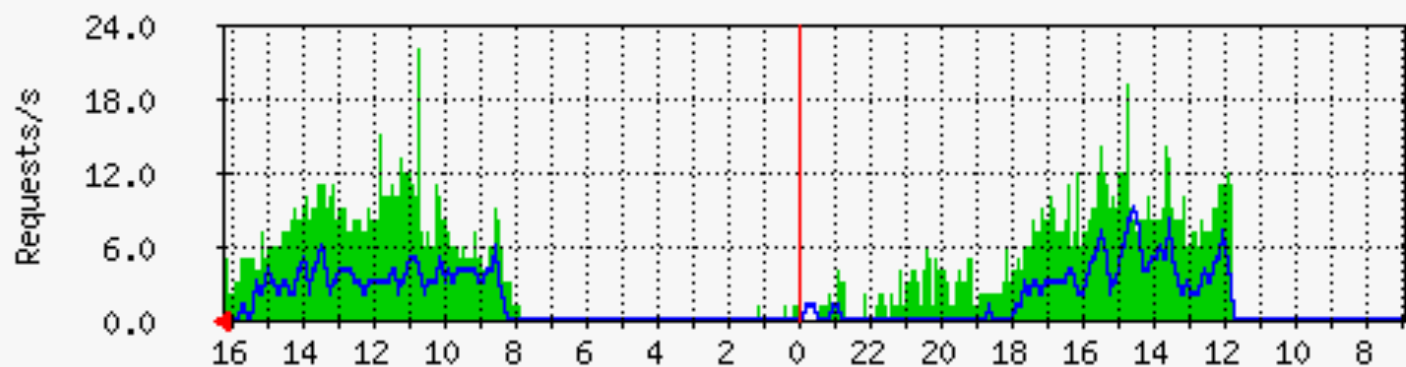


# Which IPv6 Protocols?

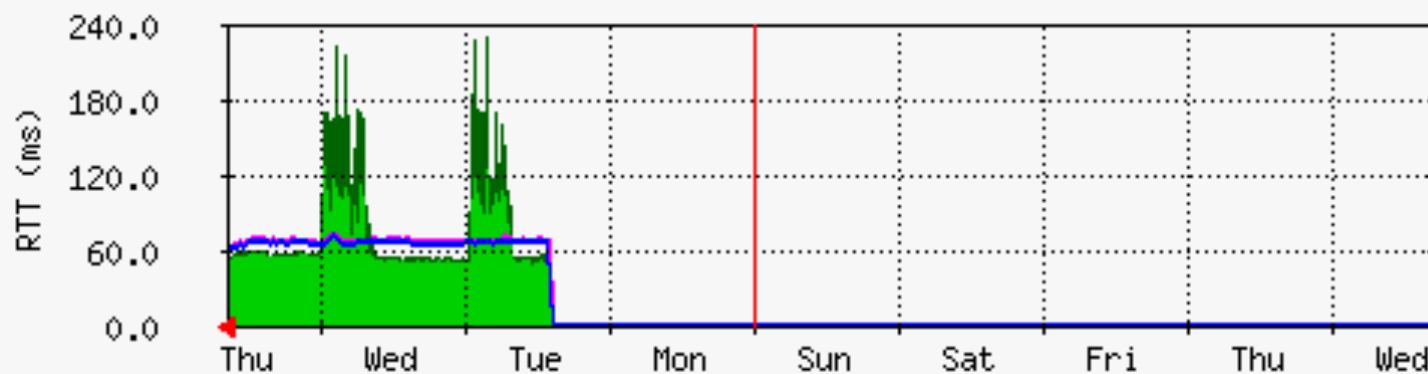


# Less Interesting Stats

- DNSv4 vs DNSv6

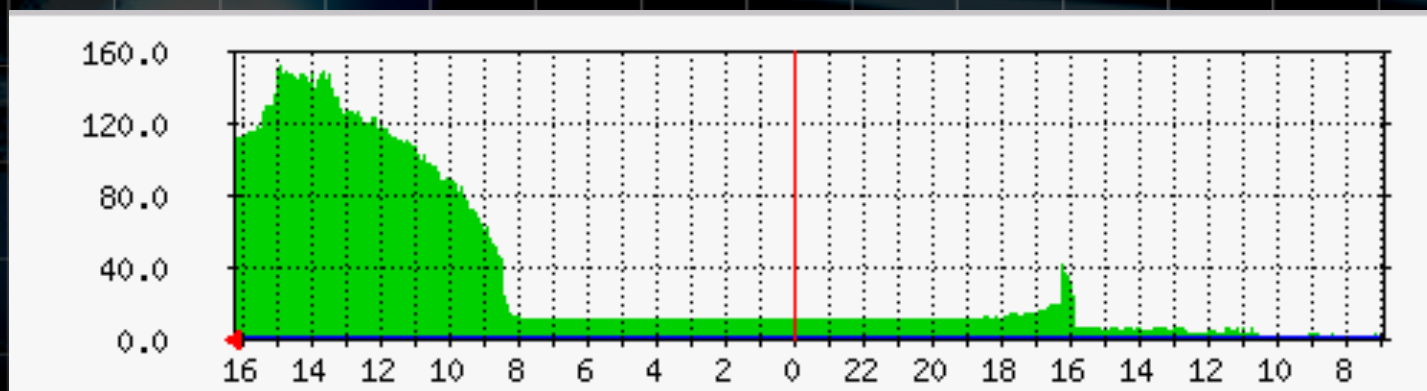


- RTT to Google.com IPv4 and IPv6



# FYI: DHCPv6

- DHCPv6-IA was enabled on Thursday  
151 clients (Vista?) out of 600 IPv6 hosts



# Conclusion

- Very easy and risk less to turn IPv6 on
  - Even without learning
  - Only problem: captive portal
- AAAA for Google has a real impact
- Passive measurements includes
  - SNMP & MRTG
  - IP Flow
  - User-Agent
- More info [www.cisconetworkers6.com](http://www.cisconetworkers6.com)

