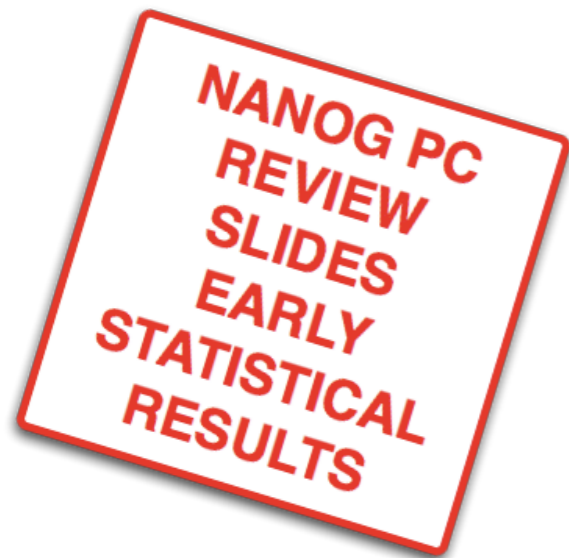


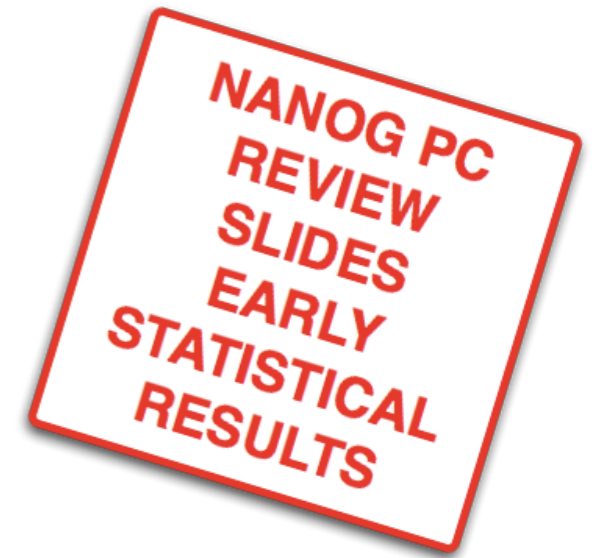
# Trying to measure the use of unallocated address space

Leo Vegoda

Manager, Number Resources - IANA



# Overview



- What's the problem?
- What does this technique attempt to measure?
- What does it not measure?
- What are the results?
- What else?

# What's the problem?

- All unallocated unicast space will be allocated
- Some networks and services already use this space
- <http://www.nanog.org/mtg-0710/presentations/Vegoda-lightning.pdf>

**NANOG PC  
REVIEW  
SLIDES  
EARLY  
STATISTICAL  
RESULTS**

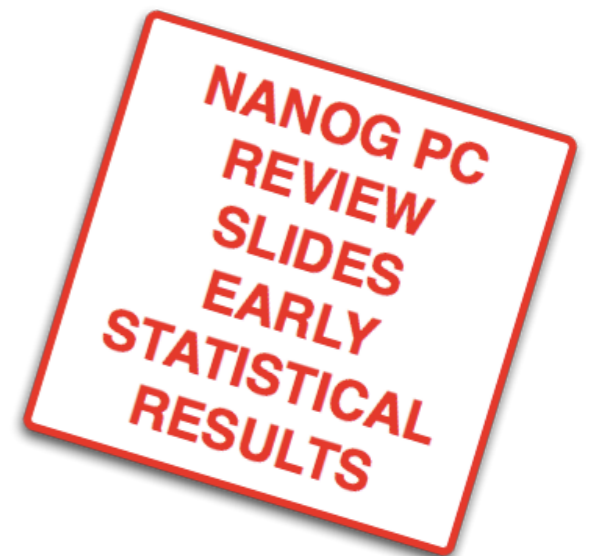
# What does this technique attempt to

- PTR queries received at root DNS servers where the IPv4 address is not part of an allocated /8



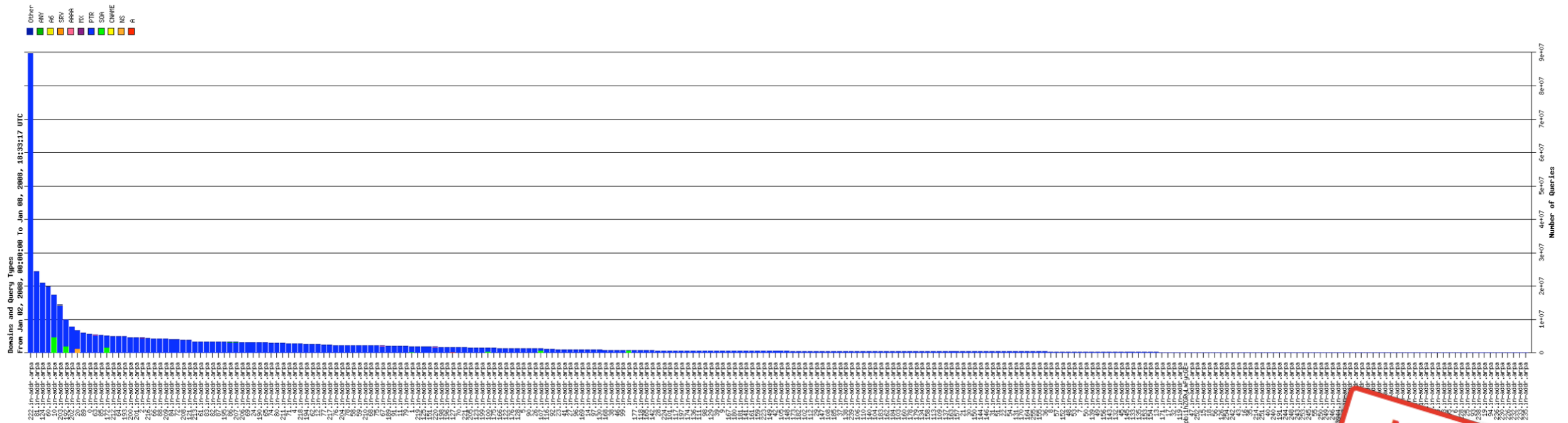
# What does it not measure?

- Usage by otherwise well run sites using unallocated space
- Split-horizon DNS
- Egress filters



# What are the results?

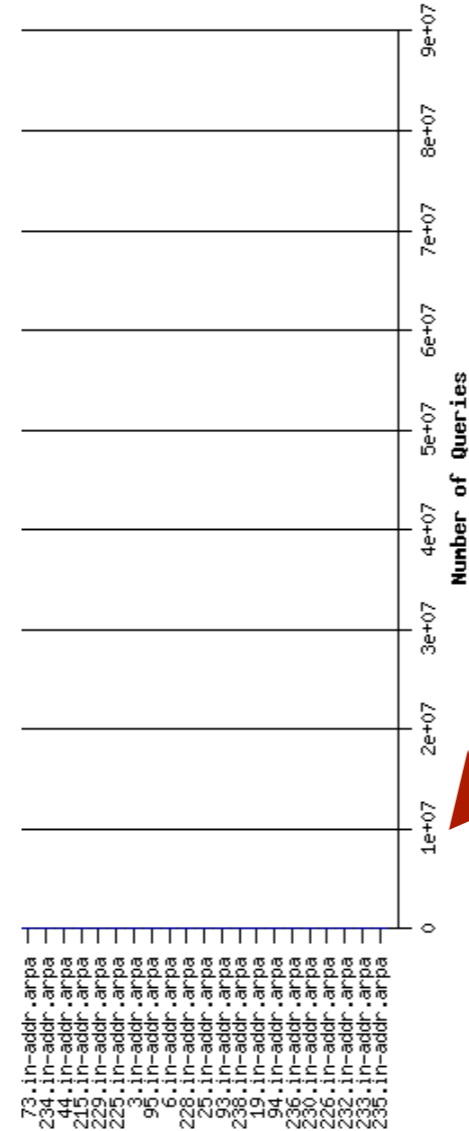
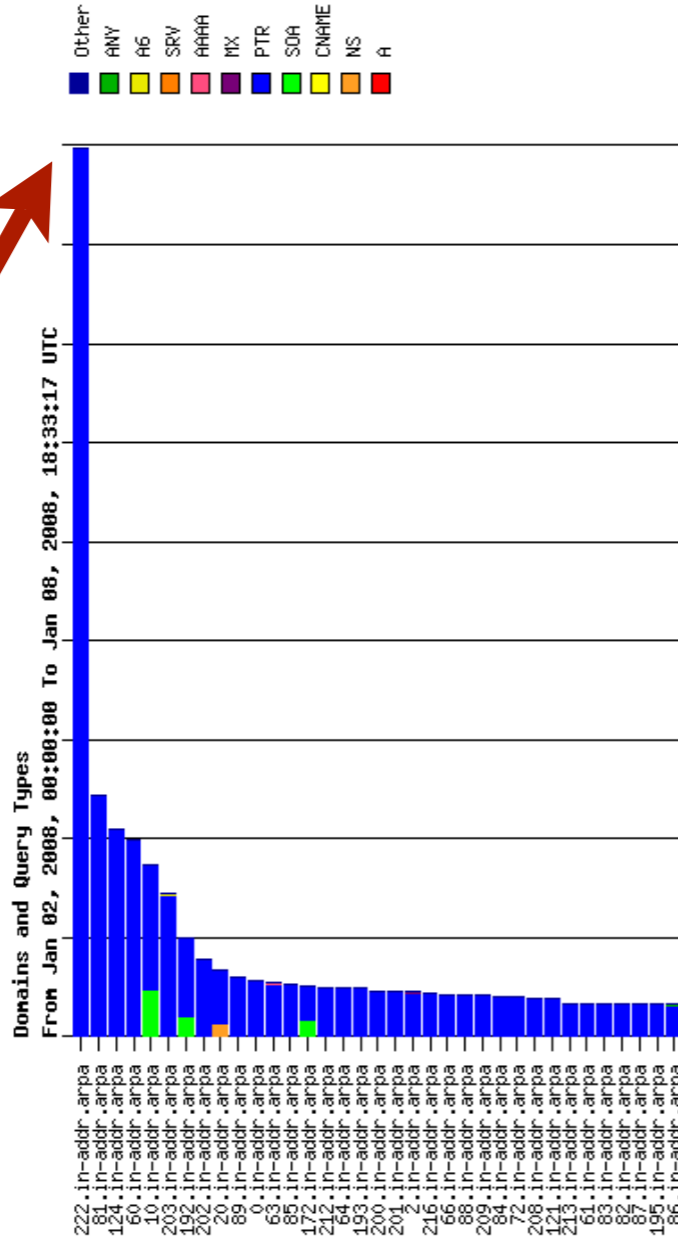
Let's look at the distribution for all /8s



**NANO G PC  
REVIEW  
SLIDES  
EARLY  
STATISTICAL  
RESULTS**

# Let's take a closer look

222/8



10 million queries

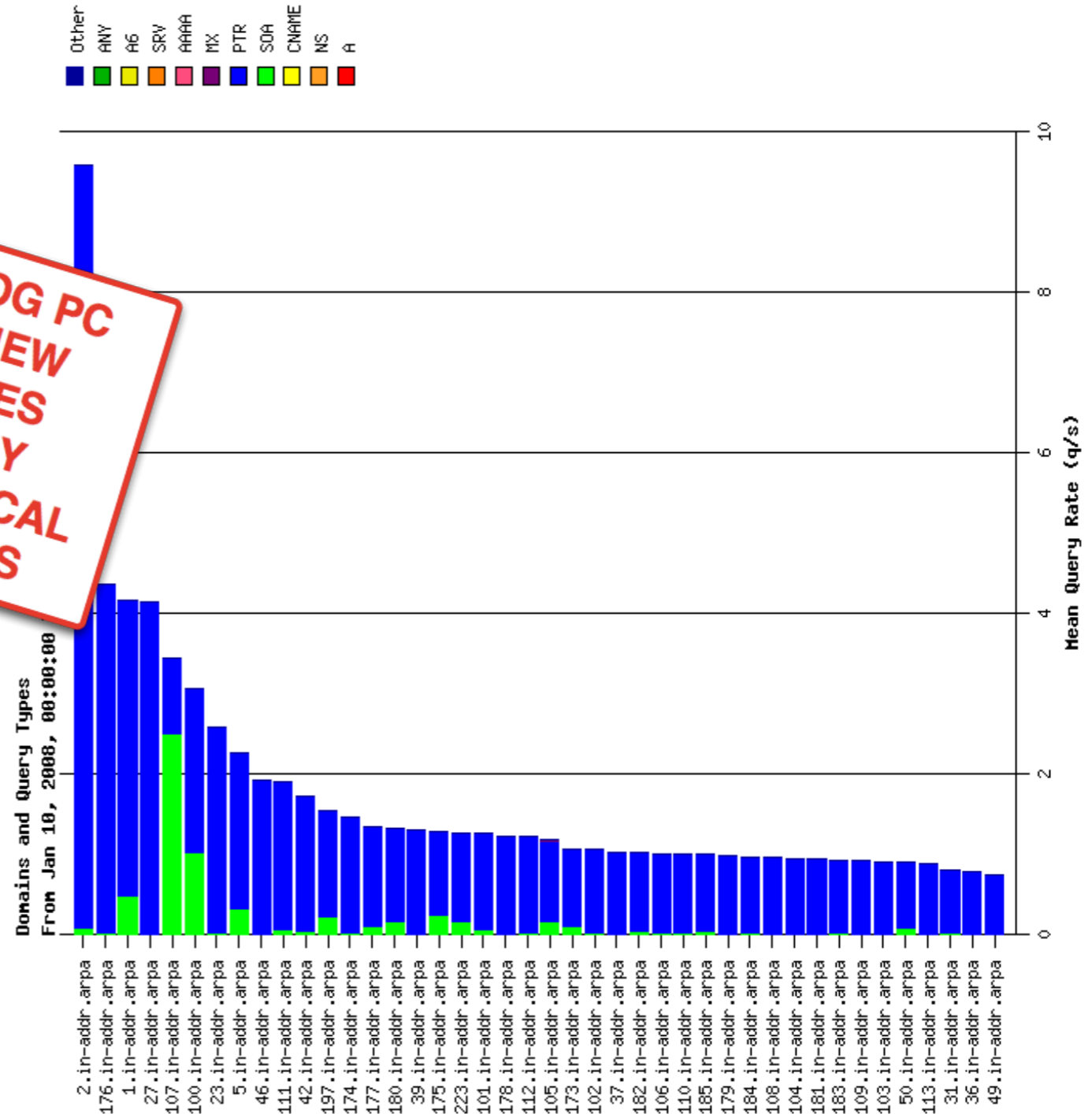
**NANO G PC  
 REVIEW  
 SLIDES  
 EARLY  
 STATISTICAL  
 RESULTS**

# Let's remove the allocated /8s and look at one day's QPS

## Top 10 Countdown

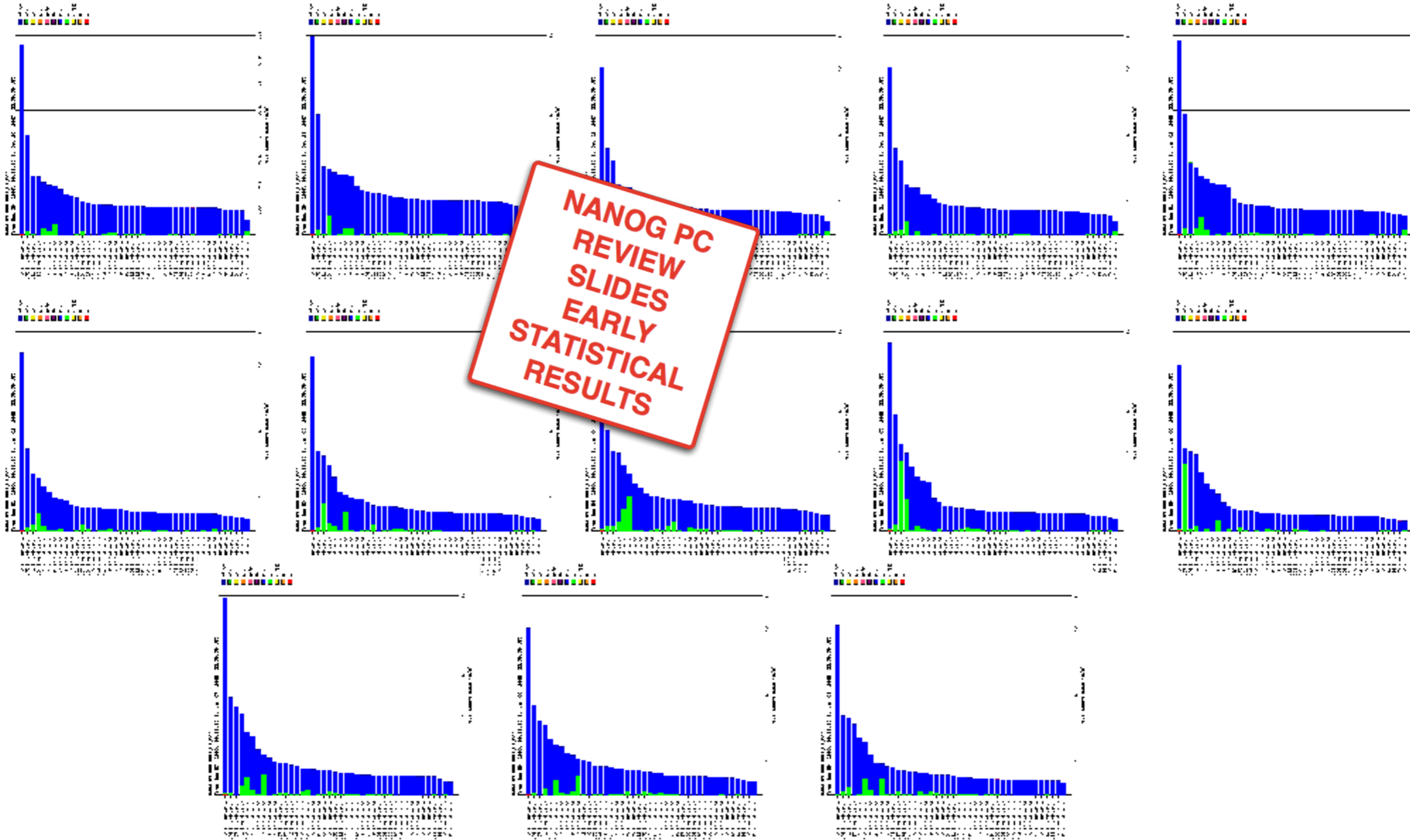
1. 2.in-addr.arpa
2. 176.in-addr.arpa
3. 1.in-addr.arpa
4. 27.in-addr.arpa
5. 107.in-addr.arpa
6. 100.in-addr.arpa
7. 23.in-addr.arpa
8. 5.in-addr.arpa
9. 46.in-addr.arpa
10. 111.in-addr.arpa

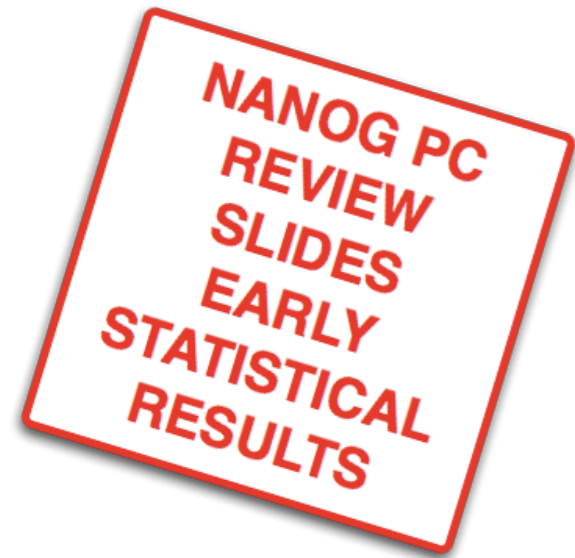
**NANOg PC REVIEW SLIDES EARLY STATISTICAL RESULTS**





# How typical was that day?





# What else?

- IPv6 deployment measurement
  - Same technique using OARC data
  - Measure NTP queries coming over IPv6 transport

# Questions & Answers



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