# IPv6 Performance Comparison with IPv4

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# IPv6 Performance Tests: Why

- Problem statement
  - Happy Eyeballs Protocol (HE) may mask IPv6 issues in dual stack environment by simply selecting IPv4
  - IPv6 issues not identified/solved
- Proposal
  - Test to identify/solve remaining IPv6 issues
- Benefits
  - HE will use IPv6 more → IPv6 traffic > IPv4 → migrate to IPv6-only earlier

# What to Do & How to Help

- Proposed tests – open to discussion
  - DNS performance comparison
    - Is there a difference in success rate to obtain AAAA vs A record?
    - Is there a difference in latency to obtain AAAA vs A record?
      - Some DNS servers may return AAAA/A separately, so there is a possibility that the latency is different
    - Is there a difference in success rate or latency if the DNS queries are sent over IPv6 vs IPv4?
  - Connection success rate comparison
    - Is there a difference in TCP/http connection setup success rate for IPv6 vs IPv4 (e.g. between RIPE Atlas probes as sources and Alexa 100 as destinations)?
  - Connection speed comparison (when both IPv6 & IPv4 connections can be set up)
    - Is there a difference between IPv6 and IPv4 for connection setup time?
  - PLR comparison (when both IPv6 & IPv4 connections can be set up)
    - Is there a difference between IPv6 and IPv4 for packet loss rate (PLR) – the packets can be either sync/ack packets and data packets
  - Where are IPv6 packets dropped when connection failed
    - In source domain, transit network, or destination domain

- How to help
  - Design / review test cases
  - Write Python test scripts
  - Contribute test probes or credit
  - Conduct tests and report results
  - Analyze stats
  - Write report drafts