

# Status on Initial Registry Contents Draft

Al Morton for the authors of  
draft-morton-ippm-initial-registry-03 and  
draft-morton-ippm-2330-stdform-typep-01

# Summary of Revisions (1)

- Current Proposed Registered Metrics indicate IPv4, but not IPv6 parameters!
  - Very likely IPv6 is needed.
  - So...

# **Updates for IPPM's Framework: Packets of Type-P and Standard-Formed Packets**

draft-morton-ippm-2330-stdform-typep-01

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# Motivation

- IPv6 deployment
  - Increasing use of IPv6
  - Extension headers
  - Header compression
- **Main trigger:** GEN-ART review of RFC 2679 bis  
Input by Brian Carpenter: **no IPv6 coverage**
  - Dedicated solution for RFC 2679-bis-only?
  - Generally applicable solution for IPPM Framework is a MUST
- Observations as part of earlier IPPM work
  - IPv6 did not fit into the context of RFC 7312, update postponed.

# Scope

- **High-level scope:**  
Highlight additional aspects of measurement packets and make them part of the IPPM performance metric framework.
- **Proposal (by AI): Update RFC 2330**
  - Two central concepts of RFC 2330 have explicit dependence on IPv4 and must be updated for IPv6:
    - a) Packet **Type-P** and b) **Standard-formed packet** concept
- **Technical Details:**
  - Expand Type-P examples in section 13 of [RFC2330]
  - Expands definition (in section 15 of [RFC2330]) of a standard- formed packet to include IPv6 header aspects and other features.

# RFC 2330 Update: Std-Formed Packet

- **IPv4 and IPv6** allowed
- Basic requirements (aggregated IPv4 and IPv6):
  - Valid IP header
  - Not an IP fragment.
  - Source and Destination addresses intended.
  - Transport header: valid checksum and valid fields
- Separate discussion of IPv4 and IPv6
  - IPv4 unchanged
- IPv6
  - Version field 6, total length including extension headers
  - Extension headers: none or correct types and correct order, extension header parameters conforming with IANA
  - Controversies: Intermediate nodes inspect/add/delete/change IPv6 extension headers

# Back to Initial Contents Draft

- Intro streamlined
- Major changes still in Section 4, RTT Delay
- “Raw” output is a separate Metric
- IPv6 Parameter Values added
- Clarified Tmax parameter
- All Run-time parameters revised (names, etc.)
  - Data formats reference RFC 3339 and RFC 6991 where possible
- Same for Results/Output Formats
  - 95th percentile now References RFC 2330 for exact definition.

# Additional summary of RFC 2330 Update Draft follows



# RFC 2330 Definitions: Type-P

## RFC 2330, Sec. 13:

- “A fundamental property of many Internet metrics is that the **value of the metric depends on the type of IP packet(s)** used to make the measurement...”
- ...“Whenever a metric's value depends on the type of the packets involved in the metric, the **metric's name will include either a specific type or a phrase such as "type-P"**.”
- ...**“Generic notion of a "packet of type P“**...
  - Fully defined (port-http-tcp-connectivity-50byte-payload)
  - Partially defined (UDP packet)
  - Generic
- **Type-P becomes part of any metric definition**
  - Example: Define "IP-Type-P-connectivity" metric instead of "IP- connectivity" metric

# RFC 2330 Update: Type-P

- Mention **special treatment of packets**
  - Diffserv, ECN, Router alert, Hop-by-hop extensions, ...
- Identify case when **Type-P changes along the path**
  - Type and length changes because of IPv4 <-> IPv6 translation, or IPv6 extension headers adding or removal
  - Modified values **SHOULD** be noted and reported with the results
- Discuss possible **impact of NAT** along path
  - Unpredictable impact on delay
  - Stateful NAT: state created on first packet: delay penalty
- RFC2330 Note: **class C equivalence** for path
  - ..."it would be very useful to know if a given Internet component treats equally a class C of different types of packets. If so, then any one of those types of packets can be used for subsequent measurement of the component. This suggests we devise a metric or suite of metrics that attempt to determine C."

# RFC 2330 Definition: Std-Formed Packet

RFC 2330, Sec. 14:

- “...all **metric definitions** ... include an **implicit assumption that the packet is \*standard formed\***”...
- “...a packet is standard formed if it meets all of the following **criteria**:...”
  - Length (IP header) = sizeof (IP header) + sizeof(payload)
  - Valid IP header: **version field is 4 (later, we will expand this to include 6);**
  - Header length  $\geq 5$ , checksum is correct, no IP fragment.
  - Src and dest addr. correspond to the hosts in question.
  - TTL sufficiently large or 255
  - No IP options unless explicitly noted.
  - If transport header is present: valid checksum and fields.
  - Length B:  $0 \leq B \leq 65535$  ...

# Next Steps

- **Urgent need to update IPPM for IPv6**
- Draft scope and structure is stable
- Feedback and Input requested
- Adopt as IPPM WG item?

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