

# **BCP 145 Recap**

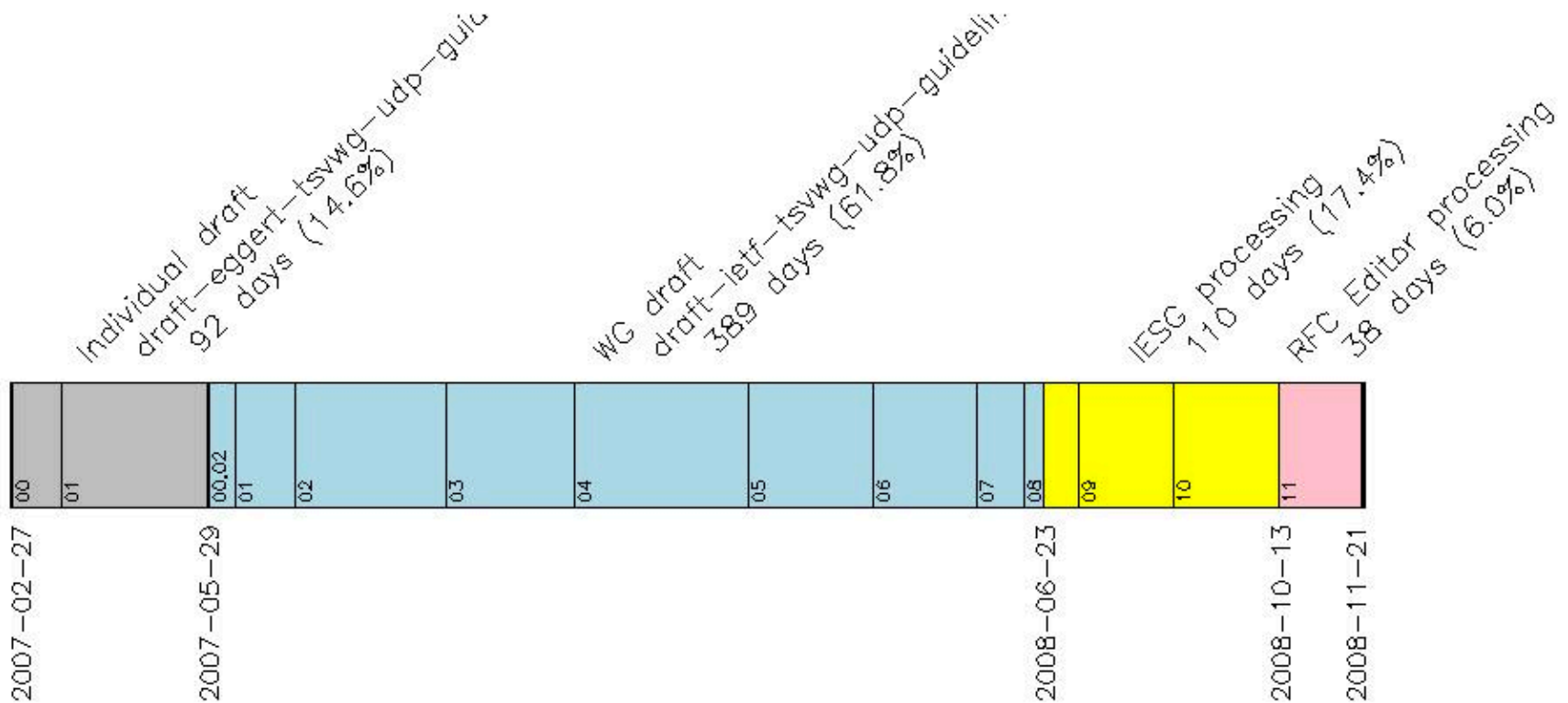
## **Unicast UDP Usage Guidelines for Application Designers**

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# 11 revisions in 1.75 years



# History & motivation

- Written during 2<sup>nd</sup> term as AD
- Saw many I-Ds in IESG Review with issues
- Often needed to rehash previous discussions
- Idea: document best practices for using UDP
  
- Few MUSTs in the document, mostly SHOULDs
- SHOULD = MUST, unless really good documented reason

# Contents

- Congestion control guidelines
- Message size guidelines
- Reliability guidelines
- Checksum guidelines
- Middlebox traversal guidelines
- Programming guidelines
- ICMP guidelines

# Guideline summary

Taken from BCP145, Table 1:  
“Summary of recommendations”

# General

## (Section 3)

- **MUST** tolerate a wide range of Internet path conditions
- **SHOULD** use a full-featured transport (TCP, SCTP, DCCP)

# Congestion control

(Section 3.1)

- **SHOULD** control rate of transmission
- **SHOULD** perform congestion control over all traffic

# Bulk transfer applications

(Section 3.1.1)

- For bulk transfers,
  - **SHOULD** consider implementing TFRC
  - Else, **SHOULD** in other ways use bandwidth similar to TCP



# Low data-volume applications

## (Section 3.1.2)

- For non-bulk transfers
  - **SHOULD** measure RTT and transmit max. 1 datagram/RTT
  - Else, **SHOULD** send at most 1 datagram every 3 seconds
  - **SHOULD** back-off retransmission timers following loss

# UDP tunnels

(Section 3.1.3)

- For tunnels carrying IP Traffic, **SHOULD NOT** perform congestion control
- For non-IP tunnels or rate not determined by traffic, **SHOULD** perform congestion control

# Message size guidelines

## (Section 3.2)

- **SHOULD NOT** send datagrams that exceed the PMTU, i.e.,
- **SHOULD** discover PMTU or send datagrams  $<$  minimum PMTU

# Reliability guidelines

(Section 3.3)

- **SHOULD** handle datagram loss, duplication, reordering
- **SHOULD** be robust to delivery delays up to 2 minutes

# Checksum guidelines

## (Section 3.4)

- **SHOULD** enable IPv4 UDP checksum
- **MUST** enable IPv6 UDP checksum\*
- Else, **MAY** use UDP-Lite  
with suitable checksum coverage

\* Since BCP 145 (RFC 5405) predates RFC 6935

# Middlebox traversal guidelines

(Section 3.5)

- **SHOULD NOT** always send middlebox keepalives
- **MAY** use keepalives when needed (min. interval 15 sec)

# Programming guidelines

(Section 3.6)

- **MUST** check IP source address
- And, for client/server applications, **SHOULD** send responses from source address matching the request

# ICMP Guidelines\*

(Section 3.7)

- **SHOULD** validate that an inbound ICMP is for a datagram the app actually sent

\* Omitted from Table 1



# Security considerations

## (Section 4)

- **SHOULD** use standard IETF security protocols when needed