UDP Options

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Recent changes

• Option changes
  – Echo options
    • 9, 10
  – OCS integrates CCO
    • 16-bit negative of option area Internet cksum + length delta
    • Byte-swapped if not sum field isn’t word-aligned

• Text extended
  – Rules for extending options
    • See next slide…
  – Inclusion and processing rules
    • ALWAYS: Drop options if OCS fails, but still deliver the body
    • RECEIVER DECIDES: Whether to require ANY option
Design principles
(per inclusion/processing rules)

• Who decides what?
  – Senders decide what to add
  – Receivers decide what to require
  – Soft-state helps coordinate safe use of content-modifying options, e.g., AE
  – Ensures default is consistent with legacy
Design principles
(per inclusion/processing rules)

• These are options, not encapsulations
  – Add to body, but not modify or depend on it
    • Exceptions include only LITE, AE, ACS
  – Do not depend on each other
    • Exceptions include only OCS, AE
  – Cannot declare the order of options
    • Process in the order that they occur
    • EXCEPT:
      – LITE always first if present
      – Then OCS (if present)
Other issues raised (1)

• **FRAG+LITE**
  – Use UDP CS=0 to traverse misbehaving middleboxes
  – Copy UDP CS “style” in reassembly CS ‘style’ (honoring user configuration)
  – Reassembled payload has its own checksum (which can also be zero if desired)
  – This should affect UDP statistics as expected (act like one UDP packet in/out)
  – These are admittedly known to potentially affect legacy receivers packet counts badly
  – Reassembled packet already has the potential for UDP options after reassembly
  – LITE as specified avoids the need for scatter-gather within UDP payloads during reassembly

• **LITE (without FRAG)**
  – May not traverse misbehaving middleboxes unless UDP CS=0 (but then the whole payload is LITE anyway)
  – OCS of the LITE area undermines “light” properties of the LITE area as separate
  – LITE as specified avoids need for scatter-gather within the payload for zero-copy
Other issues raised (2)

• Require/ignore flag
  – Legacy receivers already ignore all anyway, so ‘require’ is meaningless without soft-state
  – Given soft-state, no flags are needed

• Other uses of the surplus area
  – Currently allow this to be used if not defined as an option
  – But then ALL BETS ARE OFF (we don’t ensure middlebox traversal, protect, etc.) – nor should we (they’re not ours)

• Other proposals have been considered before
  – Fixed header (all options are optional)
  – Lack of a required OCS (UDP CS=0 is valid, so should OCS=0, but without wasting space)
  – Surplus area indicators are redundant with EOL
  – Attempts to provide a UDP header checksum (NAT would undermine)
Pending changes

• Typos:
  – TLV description
    • OCS, NOP, EOL have implicit, predefined L
  – Option section numbering
    • 6 should be 5.11
    • 6.1 should be 5.12
  – OCS detail
    • Length now is 3 bytes; 1 byte T, 2 byte V

• Middlebox traversal in Sec 12
  – Update to explain that new OCS works only when the remaining surplus is zero length (but this is user choice)

• Update LITE+FRAG discussion
  – Force CS=0 even if user doesn’t ask
  – User choice of CS=0/not should follow in use of reassembly CS
For the future

• Cookie option
  – A separate draft, if desired