PW VCCV – Inband CC using offset

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Problem Statement

› Multi-path is essential for load-balancing and redundancy but requires flow-label which may not be available
  – Additionally, in-band OAM using CC Type-1 requires CW which may not be available

› TTL Expiry VCCV (without CW) is not inband even though it is a MUST (especially for MS-PW)

› Need a CC that is inband for any “flow” of the PW that needs OAM – Must not depend on “flow-label & CW”
Considerations

› Looking beyond label stack to do multipath is widely deployed

› IP header can be used to do multi-path by not using CW. This helps to utilize the true end-to-end flow info that is already present.
Solution

› Extend an existing CC type rather than define a new one

› CC Type3 is extended since it is required for MS-PW anyways

› Start the VCCV CC at a fixed offset from the PW label

› The bytes between the PW label and the CC are set according to the flow for which OAM is required
  - These bytes are referred to as pseudo flow header
Solution (contd)

› The **pseudo flow header** is a fixed size entity that typically consists of the packet header of the flow for which OAM is desired.

› A fixed size of 64 is chosen since in almost all applications that is enough to accommodate the header of any protocol. It is also easy to implement in hardware/firmware.

› Intermediate nodes forward the CC packet as if it is a real packet by looking at the label stack and beyond that into the **(pseudo) flow header** for forwarding decisions.
Packet format

<table>
<thead>
<tr>
<th>LSP Label</th>
</tr>
</thead>
<tbody>
<tr>
<td>PW Label (TTL=1)</td>
</tr>
<tr>
<td>64 bytes</td>
</tr>
<tr>
<td>Pseudo flow header</td>
</tr>
<tr>
<td>OAM message</td>
</tr>
</tbody>
</table>
Packet format for PPW-EIM

› Say OAM for the flow src-addr=192.168.1.1,dst-addr=192.168.1.2, protocol-type=TCP, source-port=80, dst-port = 20000

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IPv4/TCP header

OAM message
e.g. PW-ping

64 bytes
The END

COMMENTS ?