Extension For Stateful PCE to allow Optional Processing of PCEP Objects

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INTRODUCTION

RFC 5440

- P Flag (Processing-Rule) in Common Object Header — the object must be taken into account by the PCE during path computation or is just optional.
- I Flag (Ignore) in Common Object Header — indicate if the optional object was taken into account.

RFC 8231

- The P and I flags of the PCEP objects defined in the current document MUST be set to 0 on transmission and SHOULD be ignored on receipt since they are exclusively related to path computation requests.
- The behavior for P and I flag in other objects was not specified.

This document

- Clarifies how the P and I flag could be used in the Stateful PCE model to identify optional objects in the PCRpt/PCUpd/PCInitiate messages.
- Updates the handling of unknown objects based on these flags!
**Usage Example**

The requirement was discussed in the WG mailing list where the relaxing of constraints would be useful to indicate in the context of Stateful PCE.

<table>
<thead>
<tr>
<th>Metric Object</th>
<th>Association Object</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Mark a Path delay variation bound metric as optional limiting constraint</td>
<td></td>
</tr>
<tr>
<td>• Indicate if the object was ignored or processed</td>
<td></td>
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<tr>
<td>• Diversity</td>
<td></td>
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<tr>
<td>• Mark the disjoint association as optional so that this constraint can be dropped by PCE if the disjoint path for the LSP cannot be found</td>
<td></td>
</tr>
</tbody>
</table>
EXTENSION

Capability Advertisement

Handling of P flag
- PCRpt
- PCUpd
- PCInitiate

Handling of I flag
- PCUpd
- PCRpt

Unknown Objects
**CAPABILITY**

PCEP Speaker indicates its ability to support handling of P/I flag in Stateful PCEP messages.

A new flag in **STATEFUL-PCE-CAPABILITY TLV**

| R (RELAX) bit – If set to 1, can send/receive PCEP objects with handling of P/I flags | Both peers needs to set the flag |
### P (PROCESSING-RULE) FLAG

<table>
<thead>
<tr>
<th>PCRpt</th>
<th>PCUdp / PCInitiate</th>
</tr>
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</table>
| • PCC to specify to PCE if the object must be taken into account by the PCE (during path computation or re-optimization) or is just optional.  
• When the P flag is set, the object MUST be taken into account by the PCE. Conversely, when the P flag is cleared, the object is optional and the PCE is free to ignore it. | • PCE to specify to PCC whether the object must be taken into account by the PCC (during path setup) or is just optional.  
• When the P flag is set, the object MUST be taken into account by the PCC. Conversely, when the P flag is cleared, the object is optional and the PCC is free to ignore it. |

**Mandatory Object always set P flag**
### I (IGNORE) FLAG

<table>
<thead>
<tr>
<th><strong>PCUpd</strong></th>
<th><strong>PCRpt</strong></th>
<th><strong>PCInitiate</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>• PCE to indicate to PCC whether or not an optional object was processed.</td>
<td>• PCC to indicate to PCE whether or not an optional object was processed in response to an PCUpd/PCInitiate.</td>
<td>• I flag has no meaning in this message.</td>
</tr>
</tbody>
</table>
UNKNOWN OBJECTS

• Handling of unknown objects based on the setting of P flag (similar to RFC 5440)
  • If a PCEP speaker does not understand an object with the P flag set or understands the object but decides to ignore the object, the entire stateful PCEP message MUST be rejected and the PCE MUST send a PCErr message with Error-Type="Unknown Object" or "Not supported Object".
  • In case the P flag is not set, the PCEP speaker is free to ignore the object and continue with the message processing as defined.

• RFC 8231 defined LSP Error Code TLV to be carried in PCRpt message in the LSP object to convey error information. This document does not change that procedure.
SUMMARY & NEXT STEPS

• Useful Problem to Solve?
• Is this the Right Approach?
• Comments?
THANKS!