Extensions to PCP

draft-boucadair-pcp-extensions
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Scope

• This document defines several extensions to PCP
  – Presented as PCP Options
  – But some of them can be promoted to be defined as PCP OpCodes
**DESCRIPTION Option**

The PCP Server limits the length of the description text and returns the stored description data to the PCP Client in the PCP Response.

### Excerpt of the mapping table

<table>
<thead>
<tr>
<th>Internal IP Address</th>
<th>Internal Port</th>
<th>External IP address</th>
<th>External Port</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.1.2.6</td>
<td>5060</td>
<td>1.2.3.4</td>
<td>41556</td>
<td>My SIP Server</td>
</tr>
<tr>
<td>10.1.2.11</td>
<td>15426</td>
<td>1.2.3.4</td>
<td>12451</td>
<td>Game</td>
</tr>
<tr>
<td>10.1.2.3</td>
<td>15685</td>
<td>1.2.3.4</td>
<td>16597</td>
<td>To access my WebCam from outside</td>
</tr>
</tbody>
</table>

**Associate a free description text with a mapping**

The PCP Server limits the length of the description text and returns the stored description data to the PCP Client in the PCP Response.
**DSCP Marking Policy**

**MAP Request** (DSCP POLICY:
DSCP_in=DSCP1
DSCP_out=DSCP2
Direction=Both )

**MAP Response** (DSCP POLICY:
DSCP_in=DSCP1
DSCP_out=DSCP2
Direction=Both )

<table>
<thead>
<tr>
<th>Internal IP Address</th>
<th>Internal Port</th>
<th>External IP address</th>
<th>External Port</th>
<th>DSCP_IN</th>
<th>DSCP_OUT</th>
<th>Direction</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.1.2.3</td>
<td>5060</td>
<td>1.2.3.4</td>
<td>16597</td>
<td>DSCP1</td>
<td>DSCP2</td>
<td>Both</td>
</tr>
</tbody>
</table>

The mapping is applied by the CGN only if the DSCP matches a mapping entry.

The packet is discarded because it does not match an existing DSCP marking policy.

The packet is redirected.
How the PCP Client is aware of the capabilities of each PCP Server so that it can tweak the PCP request(s)?

Capabilities: The Issue

H2
PCP Client

CPE

PCP Server
IPv6 FW

NPT66
PCP Server

NAT64+IPv4 FW
PCP Server

Port Range NAT64
PCP Server

SP
Network

NPT66
PCP Server
### GET_CAPABILITY

**GET_CAPABILITY Request**

**GET_CAPABILITY Response**

<table>
<thead>
<tr>
<th>Position</th>
<th>Name</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>From (F)</td>
<td>0=from IPv4, 1=from IPv6</td>
</tr>
<tr>
<td>2</td>
<td>To (T)</td>
<td>0=to IPv4, 1=to IPv6</td>
</tr>
<tr>
<td>3</td>
<td>Port-Xlate (P)</td>
<td>1=translated, 0=not translated</td>
</tr>
<tr>
<td>4</td>
<td>Addr-Xlate (A)</td>
<td>1=translated, 0=not translated</td>
</tr>
<tr>
<td>5</td>
<td>Port-Set (S)</td>
<td>1=enabled, 0=not supported</td>
</tr>
<tr>
<td>6</td>
<td>Packet-Control (C)</td>
<td>1=enabled, 0=not supported</td>
</tr>
<tr>
<td>7</td>
<td>Direction-Out (I)</td>
<td>1=enabled, 0=disabled</td>
</tr>
<tr>
<td>8</td>
<td>Direction-In (O)</td>
<td>1=enabled, 0=disabled</td>
</tr>
</tbody>
</table>

A NAT44 would be characterized as:

- From=0 (IPv4)
- To=0 (IPv4)
- Port-Xlate=1 (Yes)
- Addr-Xlate=1 (Yes)
- Port-Set=0 (No)
- Packet-control=0 (No)
- Direction-out=0 (No)
- Direction-In=0 (No)
Persistent PCP Identifier during CPE reboot or IP address change

1. Avoid stale mapping entries in the PCP Server
2. Allows to refresh the mapping when a new IP prefix/address is assigned
3. Avoid accidental delete-all when several PCP clients are located behind the same CPE

**CLIENT_IDENTIFIER**

<table>
<thead>
<tr>
<th>Client-ID</th>
<th>Internal IP Address</th>
<th>Internal Port</th>
<th>External IP address</th>
<th>External Port</th>
</tr>
</thead>
<tbody>
<tr>
<td>45767321397231</td>
<td>10.1.2.3</td>
<td>5060</td>
<td>1.2.3.4</td>
<td>16597</td>
</tr>
</tbody>
</table>

Excerpt of the mapping table
Next Steps

• What is the next step for this I-D?
  – Should we define each Option/OpCode in individual documents?