draft-tsou-stateless-nat44-00

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BEHAVE interim meeting

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Purpose of this presentation

- Gauge interest
- Solicit feedback
- Try to figure out how to progress the draft
Problem

- Stateful NAT44 in CGN
  - Fragile
  - Complex
  - Hard to scale up
  - Hard to log mappings
  - Doesn't like asymmetric routing
  - Etc.
Solution overview

- Each subscriber gets part of an external address (port set)
- The external address and port set are encoded in the internal address that is assigned to the CPE.
- The CPE restricts itself to its allowed port set.
- The stateless NAT44 only translates addresses, extracting the needed information from the address itself.
Address formats

<table>
<thead>
<tr>
<th>0</th>
<th>a</th>
<th>32</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal Prefix</td>
<td>External Suffix</td>
<td>Port Set ID</td>
</tr>
</tbody>
</table>

Figure 2: Internal Address format

<table>
<thead>
<tr>
<th>0</th>
<th>b</th>
<th>32</th>
</tr>
</thead>
<tbody>
<tr>
<td>External Prefix</td>
<td>External Suffix</td>
<td></td>
</tr>
</tbody>
</table>

Figure 3: External Address format
Fragment handling

- Address translation depends on L4 port number, therefore fragments need to be reassembled
- Same considerations as NAT64, text adapted from RFC 6146
Non-contiguous port sets

- Optionally, non-contiguous port sets can be used.
- Requires provisioning a port set **mask** to the CPE.

```
|0 0 1 0 1 1 1 1| Port Set ID (length n = 8 bits)
+-+++-+-+--
|0 0 1 1 1 1 1 1| Port Set Mask
+-+++-+-+--
| | | | | | | |
V V V V V V V V
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|x x 1 0 1 1 1 x x x x x x x x x x| Port Set = 12032-12287, 28416-28671, 44800-45055, 61184-61439
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|0                                |16
```
Advantages

• Stateless CGN
  • No logging
  • Robust, scalable, etc.
  • Allows asymmetric routing (careful with fragments)
• Minimal modifications to CPE
  • A vanilla Linux home router can do this today.
• Fits into existing infrastructure and operational practices
• Very flexible port set definition
Next steps

- Would behave be interested in this draft?
- If not, where else should it be discussed?