Analysis of NAT64 Port Allocation Method
draft-chen-sunset4-cgn-port-allocation-01
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Motivations

• To fit into the work item in the charter
• To document operational scenarios of port assignment and relevant testing results
• To provide references for potential protocol extensions or the definition of new protocol
• To balance the considerations between log volume and port utilization

Division of Port Assignment methods

• NAT vs NAPT
• Dynamic vs Static port allocation
• Centralized vs Distributed assignment
NAT vs NAPT

• NAT64 may only do 1:1 mapping, which doesn't concern about port assignment
• Those 1:1 mappings can be done either stateful or stateless way
• The scenarios of 1:1 mapping seek better end-to-end transparency, e.g. inbound traffic could be guaranteed when there are IPv6 servers
• The merits of IP multiplexing are lost
Dynamic vs Static

- NAT64 normally do dynamic port allocation
- A port range could be statically assigned to reduce the concerns of huge log volume
- A testing is made with user capacity of 200,000 for 180-days long storage

<table>
<thead>
<tr>
<th>Duration</th>
<th>Dynamic</th>
<th>Static (2000 ports/user)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 second</td>
<td>8.6 M</td>
<td>7 K</td>
</tr>
<tr>
<td>5 minutes</td>
<td>2.5 G</td>
<td>3.2 M</td>
</tr>
<tr>
<td>1 day</td>
<td>0.7 T</td>
<td>1.8 G</td>
</tr>
<tr>
<td>60 days</td>
<td>42.5 T</td>
<td>40.6 G</td>
</tr>
<tr>
<td>180 days</td>
<td>127 T</td>
<td>148.3 G</td>
</tr>
</tbody>
</table>

The log volume using the static assignment could be compacted as 1/1000 as dynamic allocation
Centralized vs Distributed

• NAT64 could coordinate with downstream NAT box on port assignment
  – Centralized assignment: 464xlat
  – Distributed assignment: MAP-T/4rd
Discussions/Potential works

• There is always a tradeoff consideration between port utilization and log volume
  – Is it of value to gauge the tradeoff by providing statistic analysis?

• The draft didn’t provide new mechanism to port allocation
  – Is there any gap we should meet on port assignment?