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

Duration	Dynamic	Static(2000 ports/user)
1 second	8.6 M	7 K
5 minutes	2.5 G	3.2 M
1 day	0.7 T	1.8 G
60 days	42.5 T	40.6 G
180 days	127 T	148.3 G

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?