

# Analysis of NAT64 Port Allocation Method

draft-chen-sunset4-cgn-port-allocation-02

**IETF 87- Berlin, July 2013**

Gang Chen @ China Mobile

Tina Tsou @ Huawei

# Status

- This work was presented at IETF#86
- The draft has been updated to integrate the comments from Lee Howard, Simon Perreault and Dan Wing
- The draft is targeted to meet the charter item
  - NAT64 port allocation and address sharing methods

# Overviews

- Category of port allocation methods
  - NAT vs NAPT
  - Dynamic vs Static
  - Centralized vs Distributed
- Considerations of port management (**new updates**)
  - Port Consumption on NAT64
  - Log Volume Reduction
  - Connectivity State Optimization
  - Port Randomization

# Investigations on Port Consumption of NAT64

- NAT64 consumes fewer ports than NAT44
- More services are IPv6-enable, less ports are consumed on NAT64
- To verify that:
  - We tested port consumptions on NAT64 and NAT44 when subscribers access Top100 websites(referring to Alexa statistics)
  - The port utilizations on NAT64 approximately take up 69% as NAT44 consumed

# Log Volume Optimization

- To analyze/demonstrate the trade-off between log volume reduction and port utilization ratio
- The log information was recoded with user capacity of 200,000 for 60-days

	Log volume	Port utilization rate
Dynamic port allocation	43.5 T	100%
Dynamic port-block allocation	40.6 G	75%(e.g. 400 ports)
Static port-block allocation	0	60% * 75%=45%

Note: 75% is evaluated for port utilization ratio.

60% is evaluated for the ratio of active subscribers

# Connectivity State Optimization

- We observed web-streaming, online-games and map search normally occupy a number of ports than other services
- Connectivity states optimization would help to increase the port utilization ratio
  - Reducing the TIME-WAIT state as draft-ietf-behave-requirements-update proposed
  - Using Address-Dependent Mapping or Address and Port-Dependent Mapping for specific services

# Port Randomization

- Port randomization should be supported in order to align with RFC6056
- Dynamic port allocation as per-session may get easy to support
- Port-block allocation may prefer a simple port allocation algorithm
- It could be considerable to enlarge the size of port range to alleviate security issues

# Complementary drafts

- draft-tsou-behave-natx4-log-reduction
  - It has a good description on dynamic port-block allocation
- draft-donley-behave-deterministic-cgn
  - It has a good description on static port-block allocation
- draft-chen-sunset4-cgn-port-allocation focus on descriptions of the uses of different methods and potential optimizations
- It maybe beneficial to polish the considerations of this draft from each solution perspective
- Welcome more contributors

# Next Step

- Request the wg adoption