# Using PCP To Coordinate Between the CGN and Home Gateway Via Port Allocation

draft-tsou-pcp-natcoord-09

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#### Context Reminder

- The requirement on CGN processing capability grows with increasing subscribers;
- Delegating NAT function to the Home Gateway will offload the burden on CGN.

- In this case, the Home Gateway would need the external address and restricted port-set
  - Given, PCP is already used to instruct individual mappings and PCP provides a flexible means for port set management, we need to extend PCP with the ability to reserve port sets instead of individual mappings

#### Why do we need PCP extension?

- PCP based extension is more suitable for the following situation:
  - Operators who do not have existing DHCPv4 server.
  - PPP extension can only be used when TC is deployed in BRAS, but not for higher layer.
  - Dynamic port-set allocation when one subscriber needs multiple port-sets when necessary.
  - Operators planning to migrate the DS-Lite AFTR to behave as a port range router
- A new Opcode is defined
  - Avoid overloading MAP
  - Ease separating the port-range function from the handling of individual mappings

# Changes since -07

- Update the PORT\_SET\_Nonce field to 96 bit
- Encode the port-set in contiguous port mask, and remove the Cryptographically\_Random\_Port\_Range option
- Add coexistence with MAP
  - Normally, the PCP server for MAP\_PORT\_SET will not run NAT.
    So the PCP server will not usually run MAP and
    MAP\_PORT\_SET OpCode for the same subscriber.
  - In case the PCP server keeps the NAT bindings for some special-purpose applications, the external address and the port allocated to the subscriber should be consistent with the ones in MAP\_PORT\_SET response.

# Changes since -07 (cont')

- Add security consideration
  - The same security considerations discussed in [I-D.ietf-pcp-base] have to be taken into account.
- Add failover consideration
  - Section 14 in [I-D.ietf-pcp-base] and [I-D.boucadair-pcp-failure] can be applied.
  - The amount of Mapping entries in MAP\_PORT\_SET PCP server is much less than MAP. Therefore, the cost of state synchronization has been greatly reduced in MAP\_PORT\_SET.
- Ensure that the PCP server will not allocate overlap port-set and only assign individual port-set mapping.
- Remove the sentence indicating no-NAT a special feature of MAP\_PORT\_SET in PCP-controlled device.

#### Comments from ML/Vancouver

- The sentence indicating no-NAT a special feature of MAP\_PORT\_SET in PCP-controlled device is not accurate.
  - Solved => section 1
- How does pcp-natcoord ensure the subscriber's equipment and the service provider equipment have the same configuration?
  - Indicate PCP server uses Internal address as an index and only non-overlap port-set mappings can be allocated. => section 3.3
- The Client MUST use a different Mapping Nonce for different MAP\_PORT\_SET requests. What breaks?
  - Explained in ML
- Which UDP port does the CPE send that PCP request, if it does not yet already know the port range assigned to the CPE?
  - Explained in ML. MAP\_PORT\_SET can be sent over either address family when Internal address is different.
- PCP server should not support multiple port-set mappings for one subscriber.
  - RECOMMENDED to configure the server to assign the maximum allowed port set in a single response. => Section 3.3

#### Running Code/Implementation

- Running code
  - <u>http://sourceforge.net/projects/pcpportsetdemo/</u>
- Implementation
  - China Telecom
  - France Telecom
  - Huawei
  - Fiberhome
  - Broadcom
  - GreenNet
  - Yamaha
- We already have run field trial/test in China Telecom





# Interop Test

 We have run an Interop test among 5 participants. **Test Function** 

- PCP Clients– PCP Server

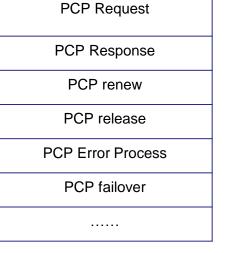
Huawei

- Huawei
- YamahaXBII

BII

GreenNet

- Fiberhome
- GreenNet
- The test result is quite good, and it is simple to implement.



### Next Steps

- We have solved all the technical problems.
- We have running code/implementers/Interop/ Field Trial.

Adopt the document as WG item?