Enhanced Port Forwarding functions with CGNAT

draft-chan-tsvwg-eipf-cgnat-00.txt

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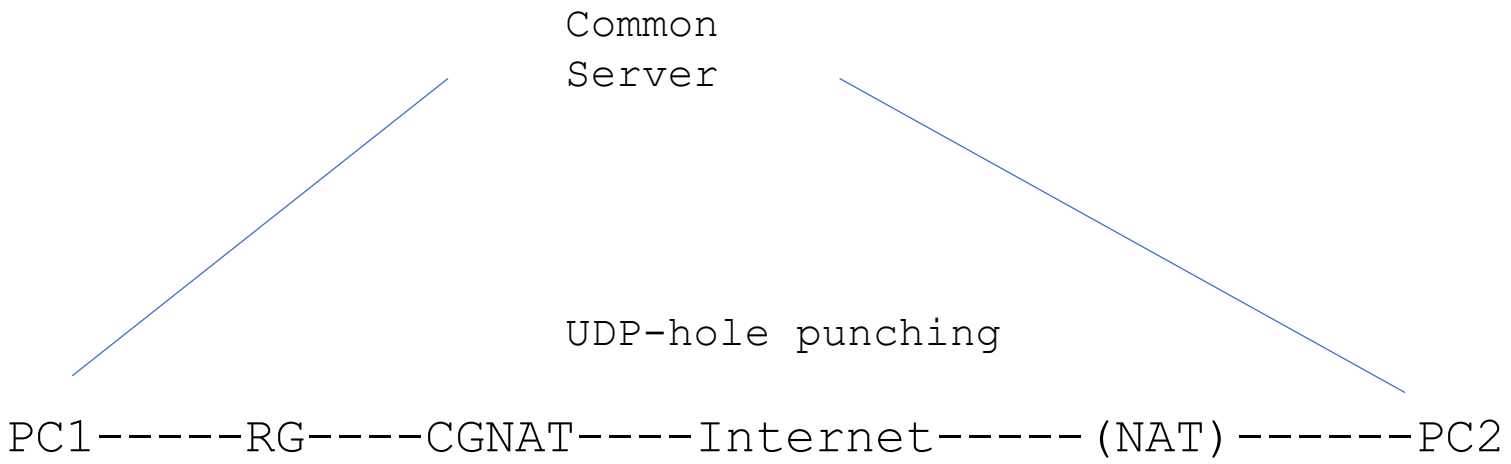
Problem statement:

- RFC5128 provides methods for setting up P2P connection behind NAT44. However,
- Only works for UDP in live situation
- For TCP, it has low success rate.
  - e.g. Direct TCP connection for webcam does not work
- It hole punching method needs a common 3rd party server

- Need a solution working for TCP under CGNAT
  - Each party could run independently

UDP hole punching



UDP – High success rate

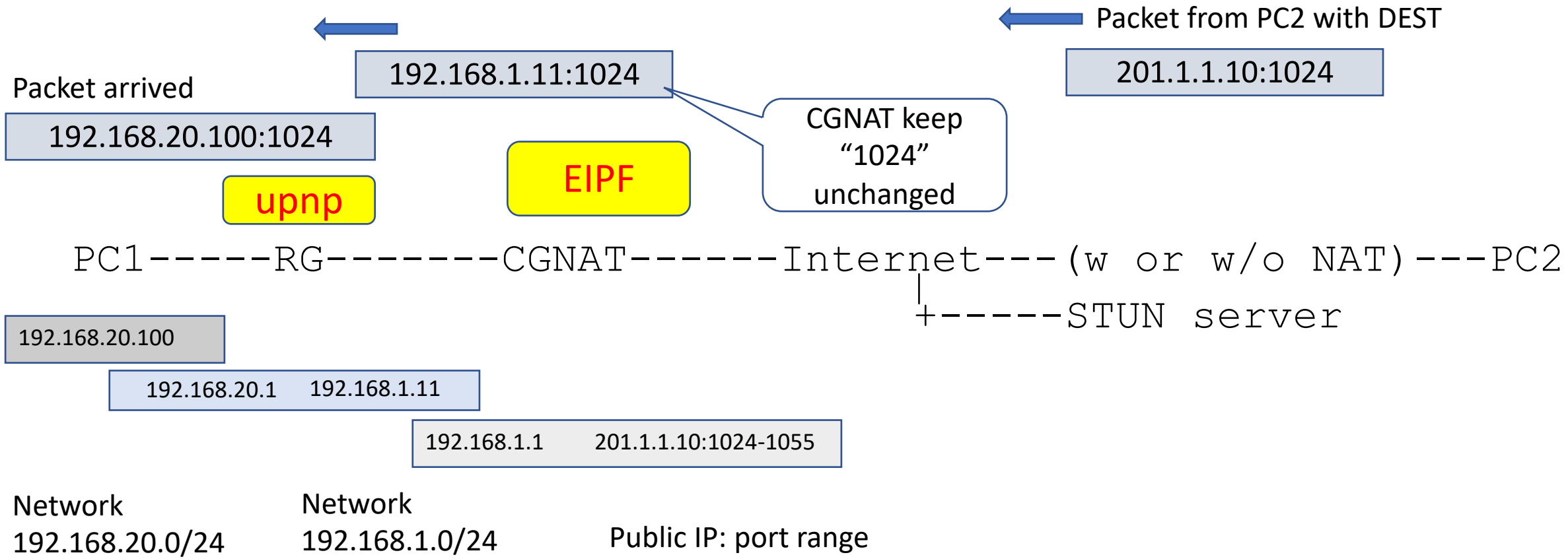
But a common 3rd party server is a must, and all runs software from same entity

TCP – Low success rate. Practically, it is not deployed.

Endpoint Independent port forwarding (EIPF) Enhancement

- Allow TCP/UDP incoming connection through CGNAT WITHOUT changing the DEST port
  - DEST port is actually allocated from CGNAT as outgoing source port per private IP
- Allow chain of forwarding of the same DEST port from CGNAT, RG and hence to the end device

Example: incoming TCP session for NAT444

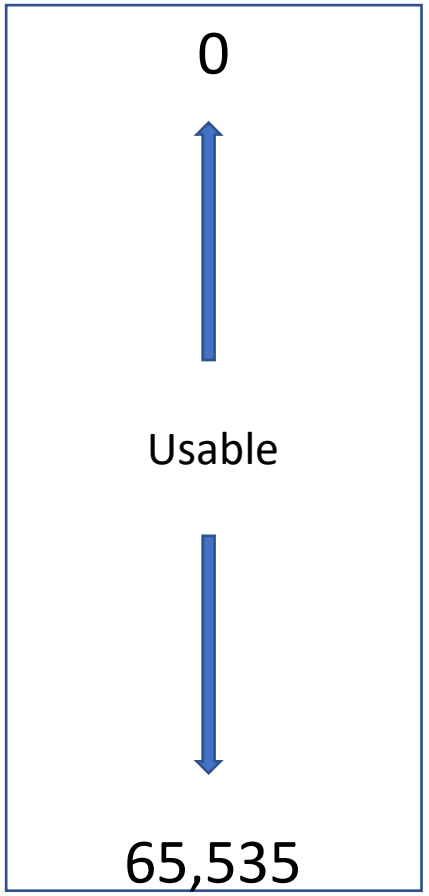


1. Use STUN server to discover opening port
2. Use UPNP to enable port forwarding at RG
3. UDP/TCP services allowed

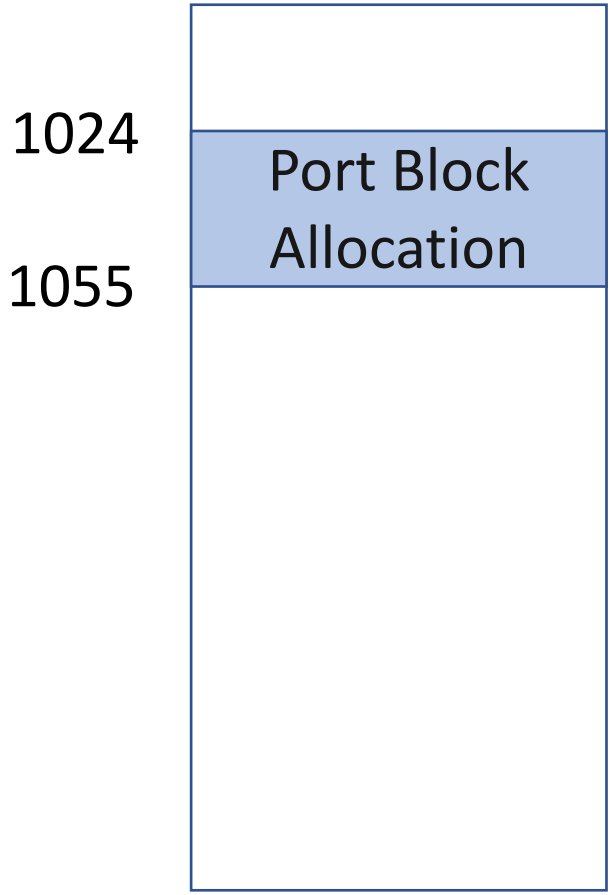
Works for both TCP and UDP

TCP/UDP port usable

RG assigned with public IP



RG assigned with private IP w/ CGNAT



Need to detect
- Public IP
- Usable port

Other

- Use URI to retrieve port mapping from Service provider
  - URI /ipport/
    - E.g. 100.1.1.1:1040
  - URI /ipportrange/
    - E.g. 100.1.1.1:1024:1031