NAT-PT Replacement Comparison

Based on
draft-wing-nat-pt-replacement-comparison-02
by Dan Wing, David Ward, Alain Durand

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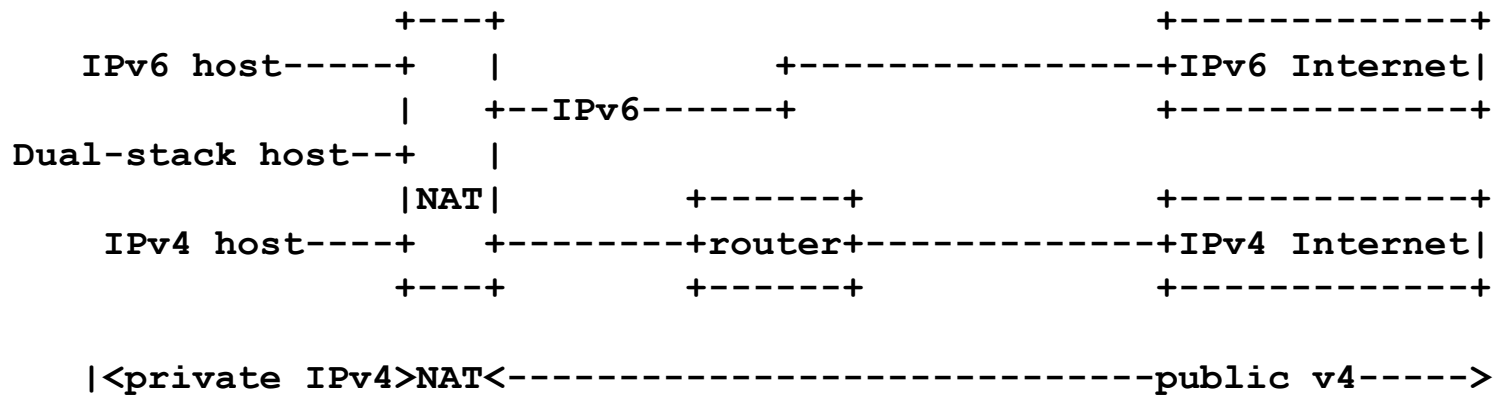
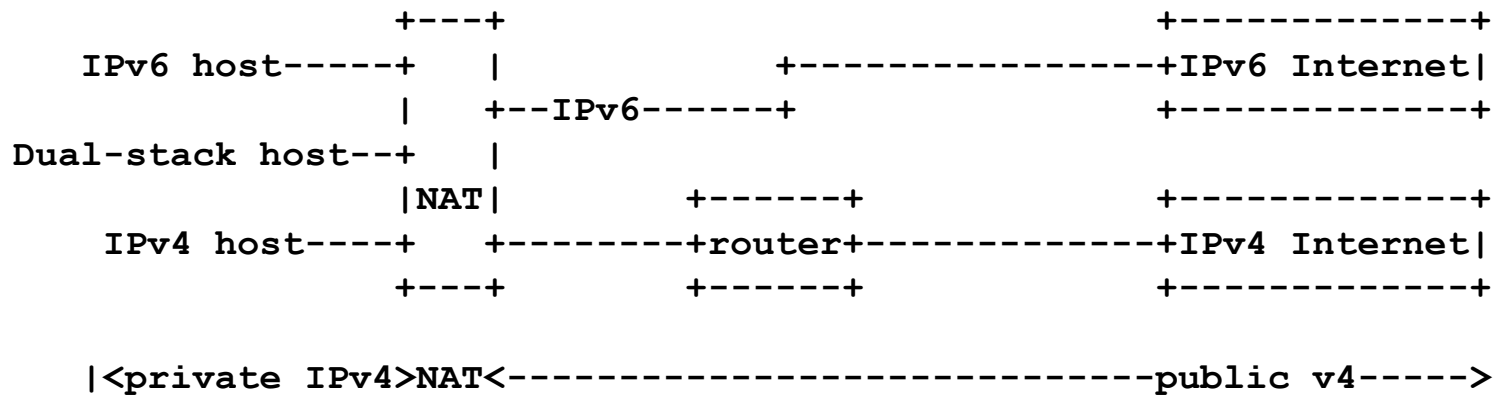
Agenda, October 1

- Summary of today's proposals – IPv4 subscribers
  - Address + Port (A+P)
  - Stateless Address Mapping (SAM)
  - Dual-Stack Lite (DS-Lite)
  - (NAT444)
- Changed Network Elements

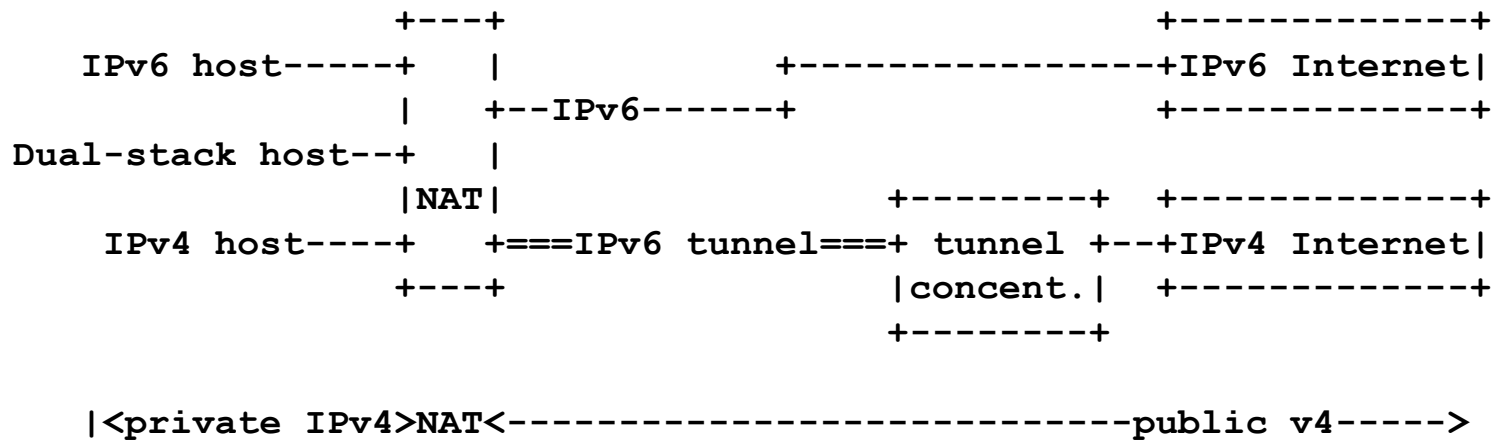
Address + Port (A+P): IPv4 ISP



Address + Port (A+P): IPv6 ISP



Address + Port (A+P): IPv4 ISP



Stateful Address Mapping: SAM

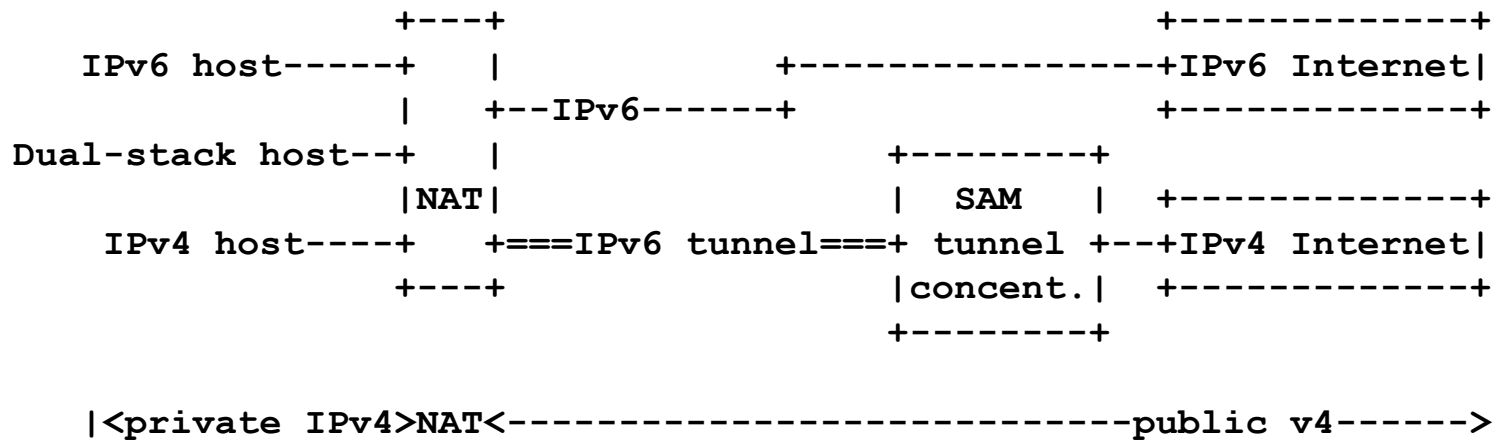
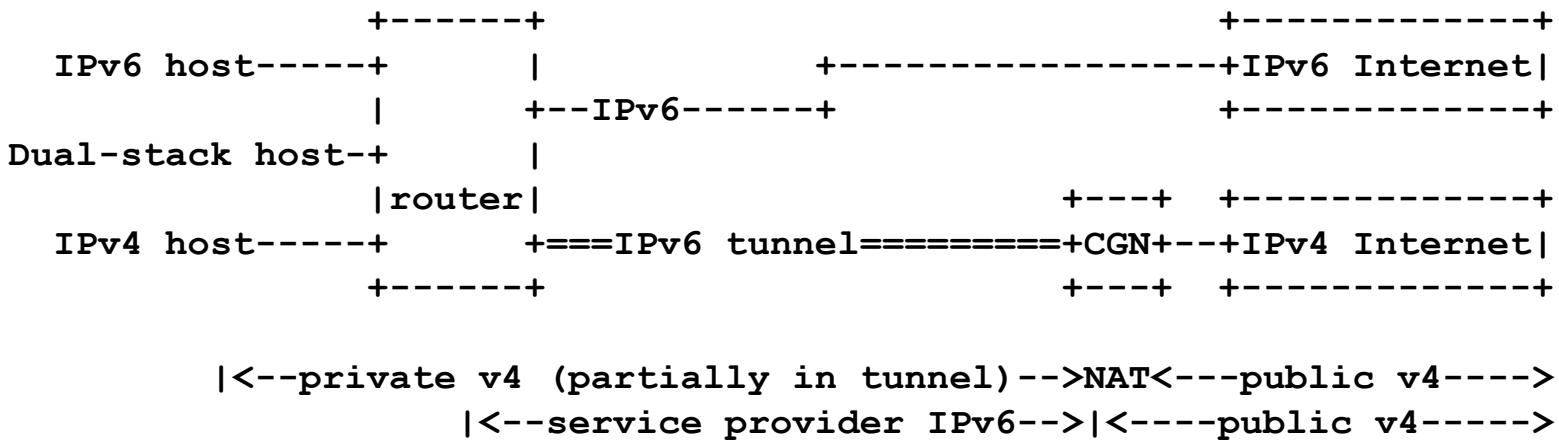


Figure 3: SAM-CPE, tunnel between CPE and tunnel concentrator

Dual-Stack Lite (DS-Lite)



Network Element Changes

Proposal	Subscriber hosts w/CPE	Subscriber hosts w/o CPE	CPE router	ISP Network
A+P-v4	Dual-stack	No change[1]	A+P support	destination port routing
A+P-v6	Dual-stack	No change[1]	A+P support	tunnel concentrator
SAM-CPE	Dual-stack	N/A	SAM support	tunnel concentrator
NAT444	IPv4	No change	No change	CGN (NAT44)
DS-Lite router	Dual-stack	N/A	DS-Lite support	CGN with tunnel concentrator

[1] if CPE doesn't do A+P, ISP would need CGN

v6 hosts accessing v4 Internet

Proposal	ISP's Internal Network	DNS Impact	NAT location
A+P-v4	IPv4 destination port routing	No change	Subscriber (NAT44)[1]
A+P-v6	IPv4/IPv6 tunnel	No change	Subscriber (NAT44)[1]
SAM-CPE	IPv4/IPv6 tunnel	No change	
NAT444	No change	No change	CGN (NAT44)
DS-Lite router	IPv4/IPv6 tunnel	No change	CGN (NAT44)

[1] if CPE doesn't do A+P, ISP would need CGN

v4 hosts accessing v4 Internet

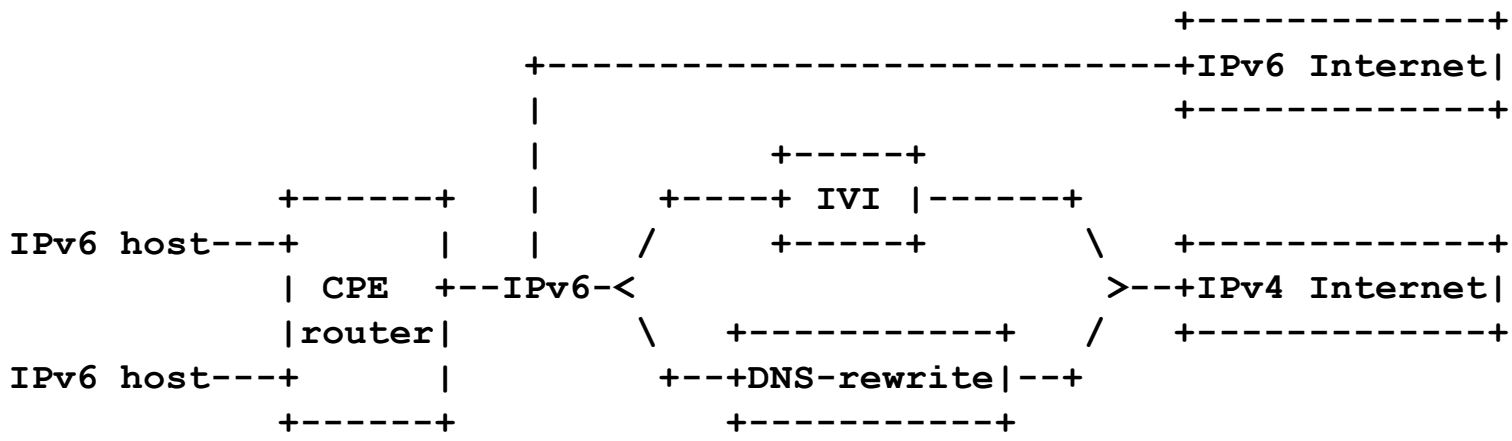
Proposal	CPE router	ISP's Internal Network	Service Provider Equipment
A+P-v4	IPv6 support + A+P NAT44	IPv4 and IPv6	Destination port routing
A+P-v6	IPv6 support + IPv4/IPv6 tunnel + A+P NAT44	IPv6	IPv6 tunnel termination
SAM-CPE	IPv6 support + IPv4/IPv6 tunnel + NAT44	IPv6	IPv6 tunnel termination
NAT444	No change	Multi-realm IPv4	CGN (NAT44)
DS-Lite router	IPv6 support + IPv4/IPv6 tunnel	IPv6	IPv6 tunnel termination, CGN (NAT44)

End

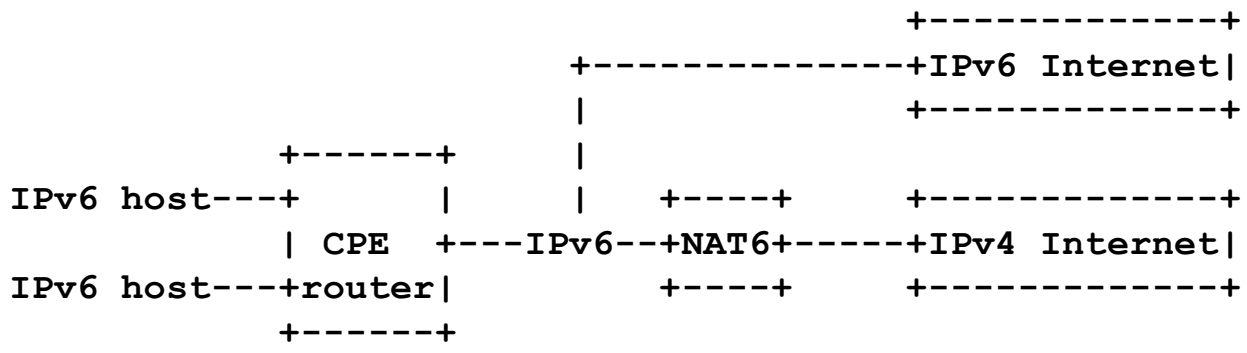
Agenda, October 2

- Summary of Proposals – IPv6 subscribers
  - IVI
  - NAT6
  - NAT64
  - (NAT-PT)
  - sNAT-PT
- Changed Network Elements

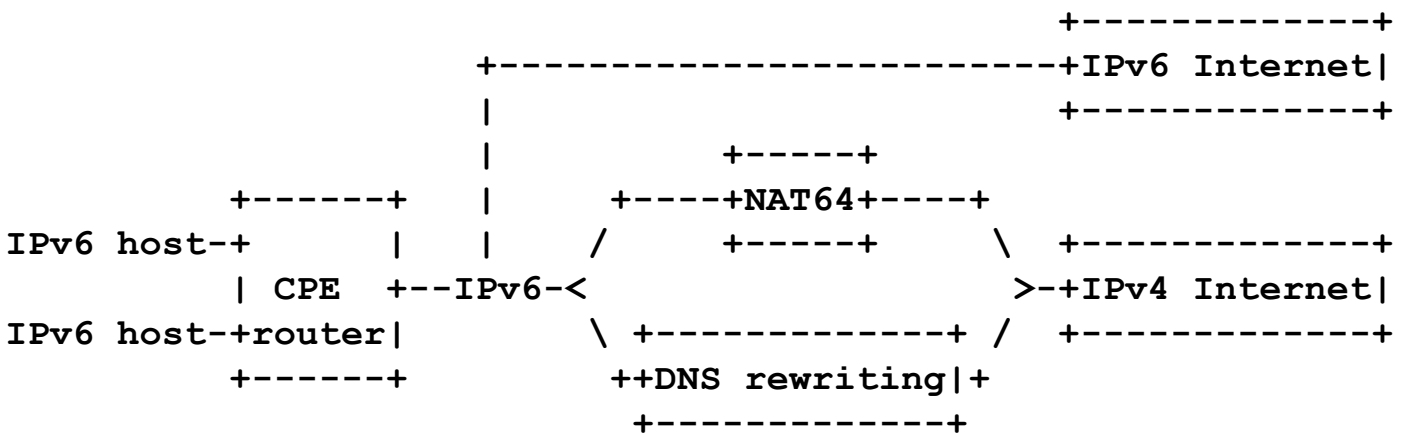
IVI


IPv6 host
IPv6 host
CPE router
IPv6
IVI
DNS-rewrite
IPv6 Internet
IPv4 Internet

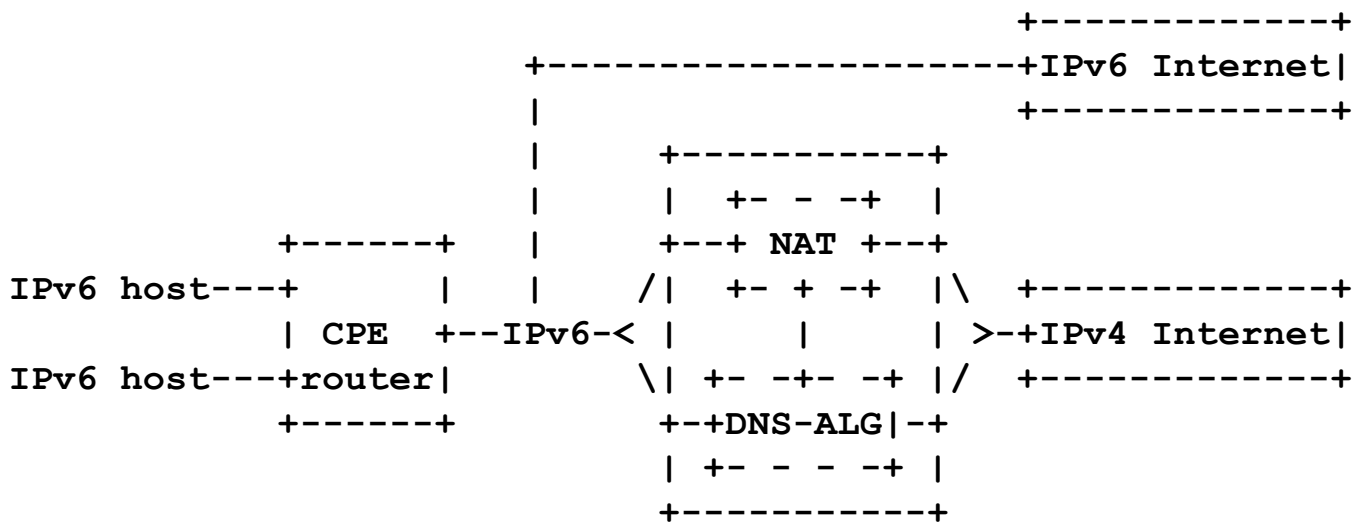
NAT6


IPv6 host
IPv6 host
CPE router
IPv6
NAT6
IPv6 Internet
IPv4 Internet

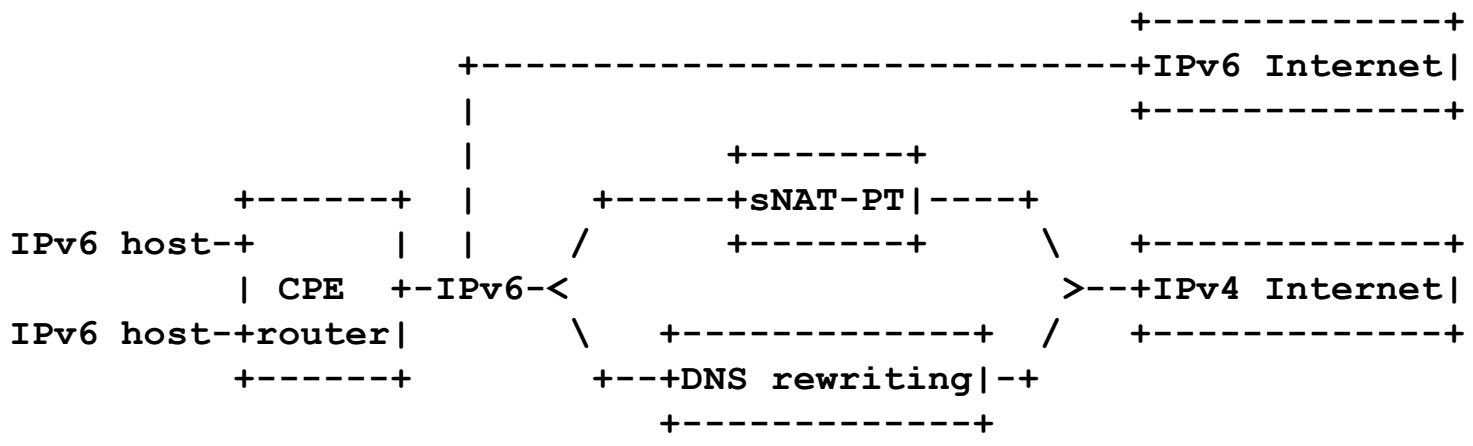
NAT64


+-------------+
+IPv6 Internet|
+-------------+
+-----+
+----+NAT64+----+
+-----+
IPv6 host-+ | CPE +--IPv6-< >-+IPv4 Internet|
IPv6 host-+router| +-------------+ +-------------+
++DNS rewriting|+
+-------------+

(NAT-PT)


IPv6 Internet
NAT
IPv6 host
CPE
IPv6
router
IPv6 host
DNS-ALG
IPv4 Internet

sNAT-PT


IPv6 host
CPE router
IPv6
sNAT-PT
DNS rewriting
IPv6 Internet
IPv4 Internet

Network Element Changes

Proposal	Subscriber hosts w/CPE	Subscriber hosts w/o CPE	CPE router	ISP Network
IVI	IPv6	IPv6	IPv6	CGN (NAT64) + DNS rewrite
NAT6	IPv6	IPv6	IPv6	NAT64
NAT64	IPv6	IPv6	IPv6	CGN (NAT64) + DNS rewrite
NAT-PT	IPv6	IPv6	IPv6	CGN (NAT64) + DNS rewrite
sNAT-PT	IPv6	IPv6	IPv6	CGN (NAT64) + DNS rewrite

v6 hosts accessing v4 Internet

Proposal	ISP's Internal Network	DNS Impact	NAT location
IVI	IPv4 AFT	DNS rewrite	CGN (NAT64)
NAT6	IPv4 AFT	DNS rewrite	CGN (NAT64)
NAT64	IPv4 AFT	DNS rewrite	CGN (NAT64)
NAT-PT	IPv4 AFT	DNS rewrite	CGN (NAT64)
sNAT-PT	IPv4 AFT	DNS rewrite	CGN (NAT64)

[1] if CPE doesn't do A+P, ISP would need CGN

v4 hosts accessing v4 Internet

Proposal	CPE router	ISP's Internal Network	Service Provider Equipment
IVI			
NAT6			
NAT64			
NAT-PT			
sNAT-PT			

Not Applicable

End