IPv4 address sharing/4via6 mechanism comparison

Mechanism name	DS-Lite	DS-Lite?	DS-Lite?	NAT64	Lightweight 4over6	4rd	dIVI	NAT444	Public 4over6
IPv4 address sharing approach	CGN	CGN	CGN	CGN	A+P	A+P	A+P	CGN	N/A
IPv6-only access network	yes	yes	yes	yes	yes	yes	yes	no	yes
Stateful per IPv4/IPv6 prefix or address[1]	yes	yes	yes	yes	yes	no	no	no	yes
Stateful per transport connection (stateful NAPT44/NAPT64)[2]	yes	yes	yes	yes	yes	yes	yes	yes	no
IPv4 address and port (range) encoded in IPv6 addresses (less addressing flexibility)[3]	no	no	no	no	no	yes	yes	no	no
Direct CE-CE paths[4]	no	no	no	no	no	yes	yes	yes	no
Stateful NAPT44/NAPT64 placement	AFTR	AFTR	AFTR	AFTR	CPE	CPE	CPE	CPE and AFTR	N/A
IPv4 address and UDP/TCP port allocation policy[5]	dynamic	static	static	dynamic	static	static	static	dynamic	N/A
Access network transport mode[6]	stateful encapsulation	stateful encapsulation	stateful encapsulation	routing	stateful encapsulation	stateless encapsulation	double stateless NAT64/routing	routing	stateful encapsulation
Provision of additional IPv4 addresses and port ranges[7]	automatically	automatically	by request	automatically	by request	by request	by request	automatically	N/A
Requirements for provision of additional IPv4 addresses and port ranges	none	none	signaling	none	signaling	signaling, readdressing	signaling, readdressing	none	N/A
IPv4 address sharing mechanism	yes	yes	yes	yes	yes	yes	yes	yes	no
4via6 mechanism	yes	yes	yes	yes	yes	yes	yes	no	yes
Related Internet Draft/RFC	RFC 6333	RFC 6333	RFC 6333	RFC 6146	draft-cui-softwire-b4-translated-ds-lite-01	draft-murakami-softwire-4rd-00	draft-xli-behave-divi-03	draft-shirasaki-nat444-04	draft-cui-softwire-host-4over6-06

[1] The mechanism has to keep a binding table (**endpoint-table**) of mappings in order to tunnel packets to corresponding CPEs (tunnel endpoints). The size of the table is equal to the number of CPEs (or the number of port/address allocations in some mechanisms).
[2] The mechanism has to keep a binding table (**session-table**) of transport-layer session mappings for NAPT44 or NAPT64. The size of the table is equal to the number of active transport-layer sessions.
[3] Since IPv6 addressing is used for signaling, this brings less flexible addressing scheme.
[4] CEs can send traffic **directly** to other CEs without tunneling it through the BR first.
[5] **Dynamic** means that the port (range) (and IPv4 address) are allocated only for the duration of the session. After the session is complete, the port(s) (and IPv4 address) are deallocated and free to reuse (possibly by another customer). **Static** means that the port (range) and/or IPv4 address are allocated to a specific customer for a period of time or “forever”.
[6] **Stateful encapsulation** means that endpoint-table has to be looked up in order to encapsulate the packet. **Stateless encapsulation** means that the encapsulation parameters can be determined by the content of the IPv6 addresses themselves.
[7] **Automatically** means that the NAT device allocates a port (range) (and IPv4 address) on the fly, when needed (when a session-establishing packet arrives). **By request** means that the CPE has to request additional port range(s) using some kind of signaling.