

Stateless Address Mapping Scenarios for the IPv4-IPv6 Coexistence

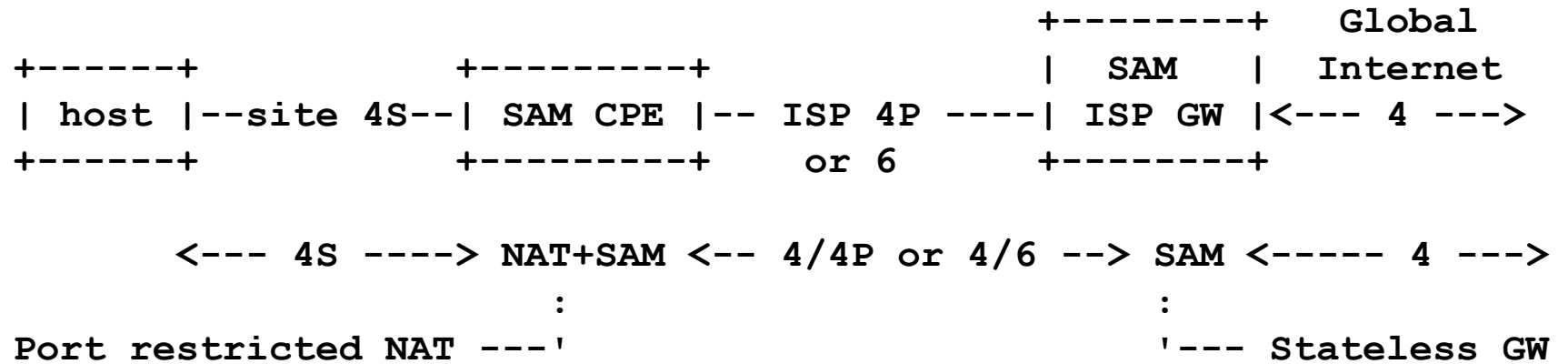
Scalability - possible IPv4 E2E transparency

draft-despres-sam-scenarios-00
draft-despres-sam-00

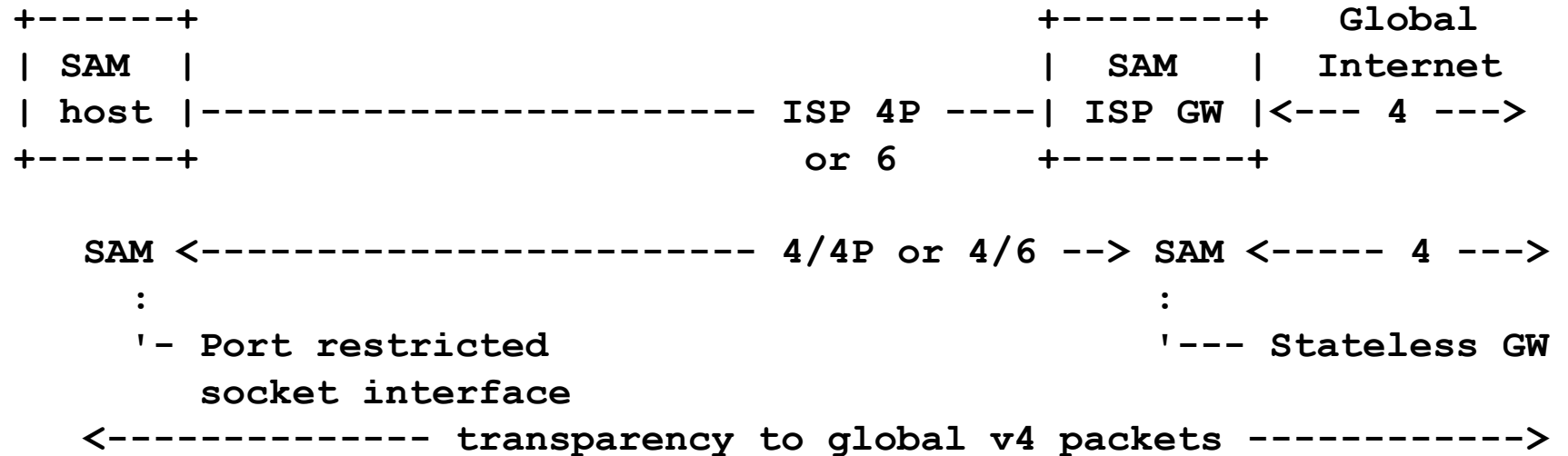
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Scenario A (SAM-IGW, SAM-CPE)

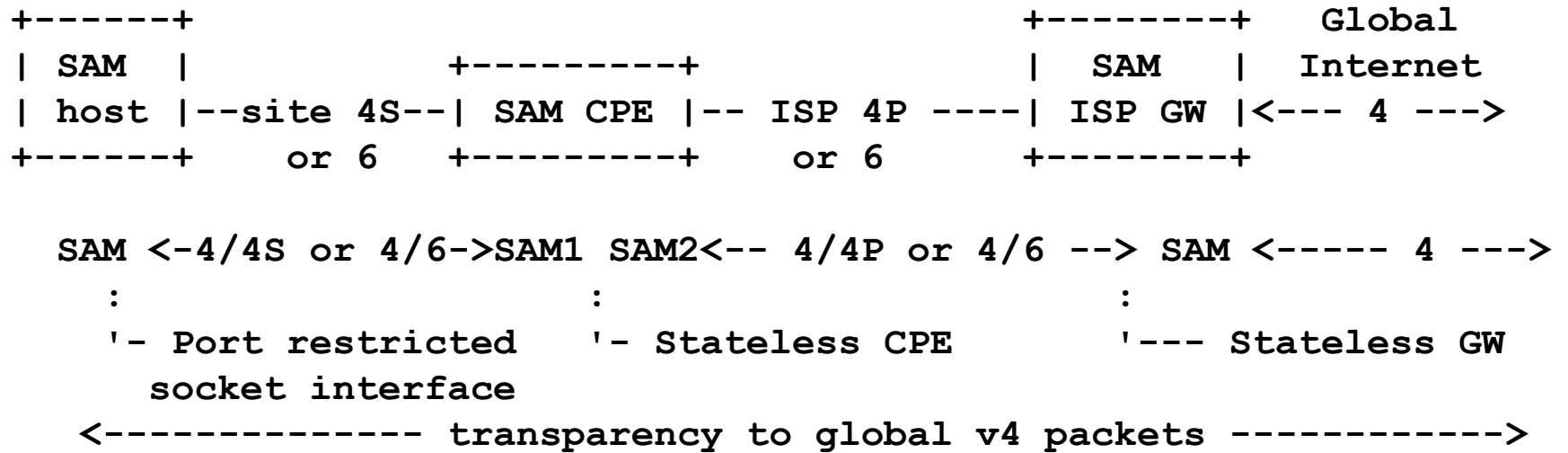


Scenario B (SAM-IGW & SAM-host)



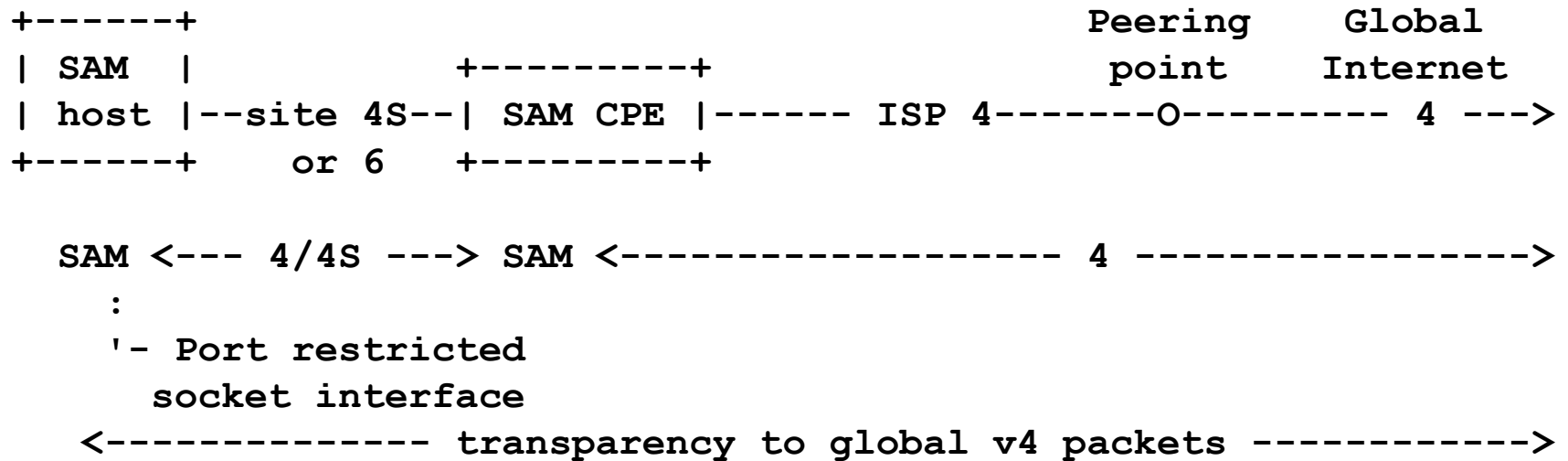
Scenario C

(SAM-IGW, SAM-CPE, SAM-host)

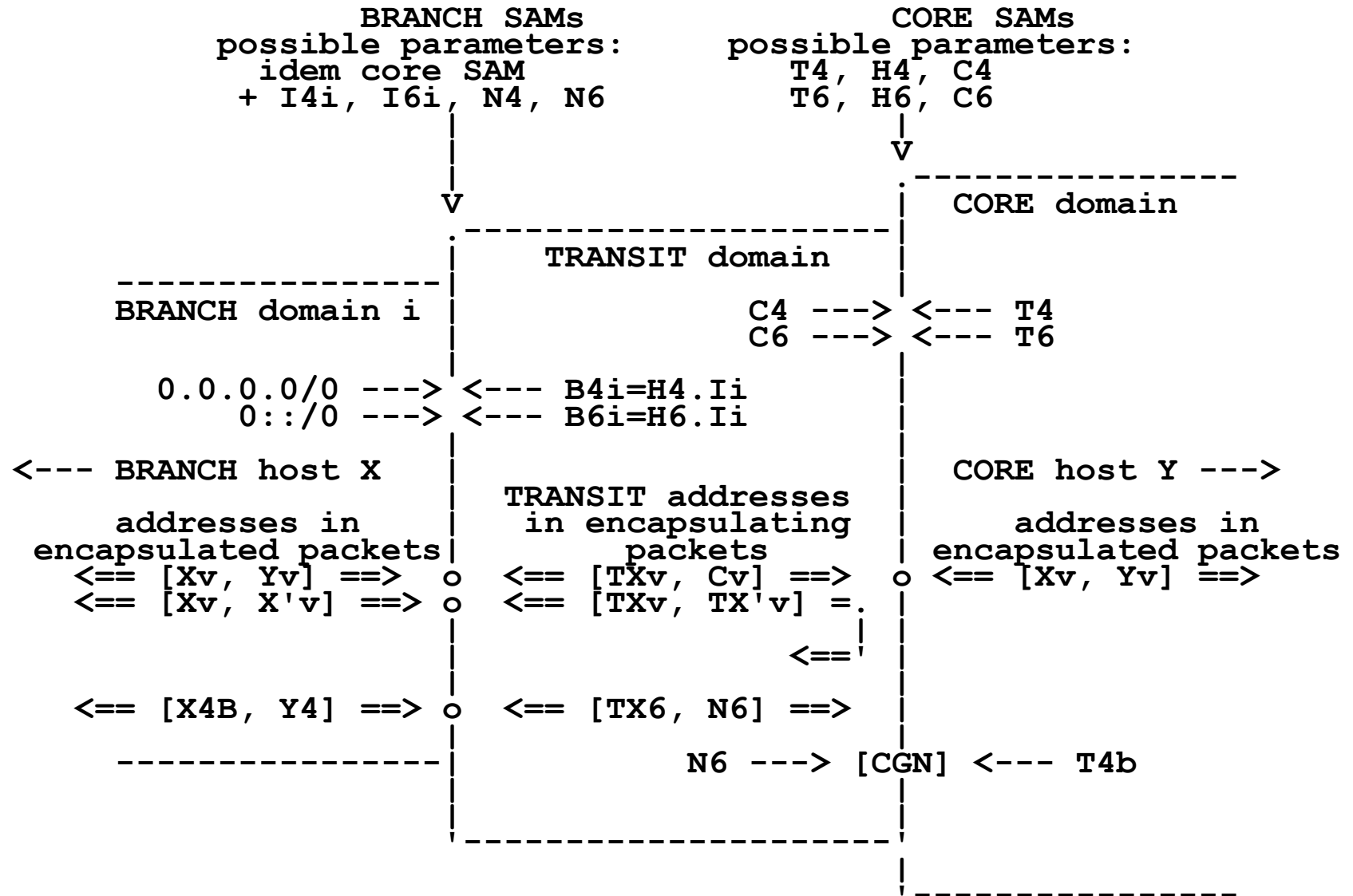


Scenario D

(SAM-CPE, SAM-host, global IPv4 site address)



SAM general architecture



SAM parameters for ISATAP, 6to4, 6rd

	ISATAP	6to4	6rd
Branch domains	DS hosts	customer sites	customer sites
Transit domain	customer site	global IPv4 Internet *	ISP IPv4 infrastructure
Core domain	ISP IPv6 infrastructure	global IPv6 Internet	global IPv6 Internet
T6	Site v6 prefix	2002::/16	ISP v6 prefix **
H4	0.0.0.0/0	0.0.0.0/0	0.0.0.0/0
C4	CPE local Add.	192.88.99.1	192.88.99.2 ***
Ii length	32	32	32

* For full connectivity between 6to4 sites, the 2002 prefix must be routed from the global IPv6 Internet to the global IPv4 Internet

** A /28 prefix in the Iliad-Free deployment (initially a /32)

*** Value used in the Iliad-Free deployment. Any anycast address that is local to the ISP infrastructure can do.

Address Mapping Rules

```

glob. v4 add. X4    port
<-----32-----><---16-->
+-----+-----+
| T4 |      Ii      | S4 |
+-----+-----+
<--g--><---i---><--s-->
Branch host IPv4E address (X4E)

```

```

<-----128----->
+-----+-----+-----+
|      T6      |      Ii      |      S6      |
+-----+-----+-----+
<-----g-----><---i---><-----s----->
Branch host IPv6 address (X6)

```

```

<-----32----->
+-----+-----+
| H4 |      Ii      |
+-----+-----+
<--h--><---i--->
IPv4 TRANSIT address (TX4) for a Branch host

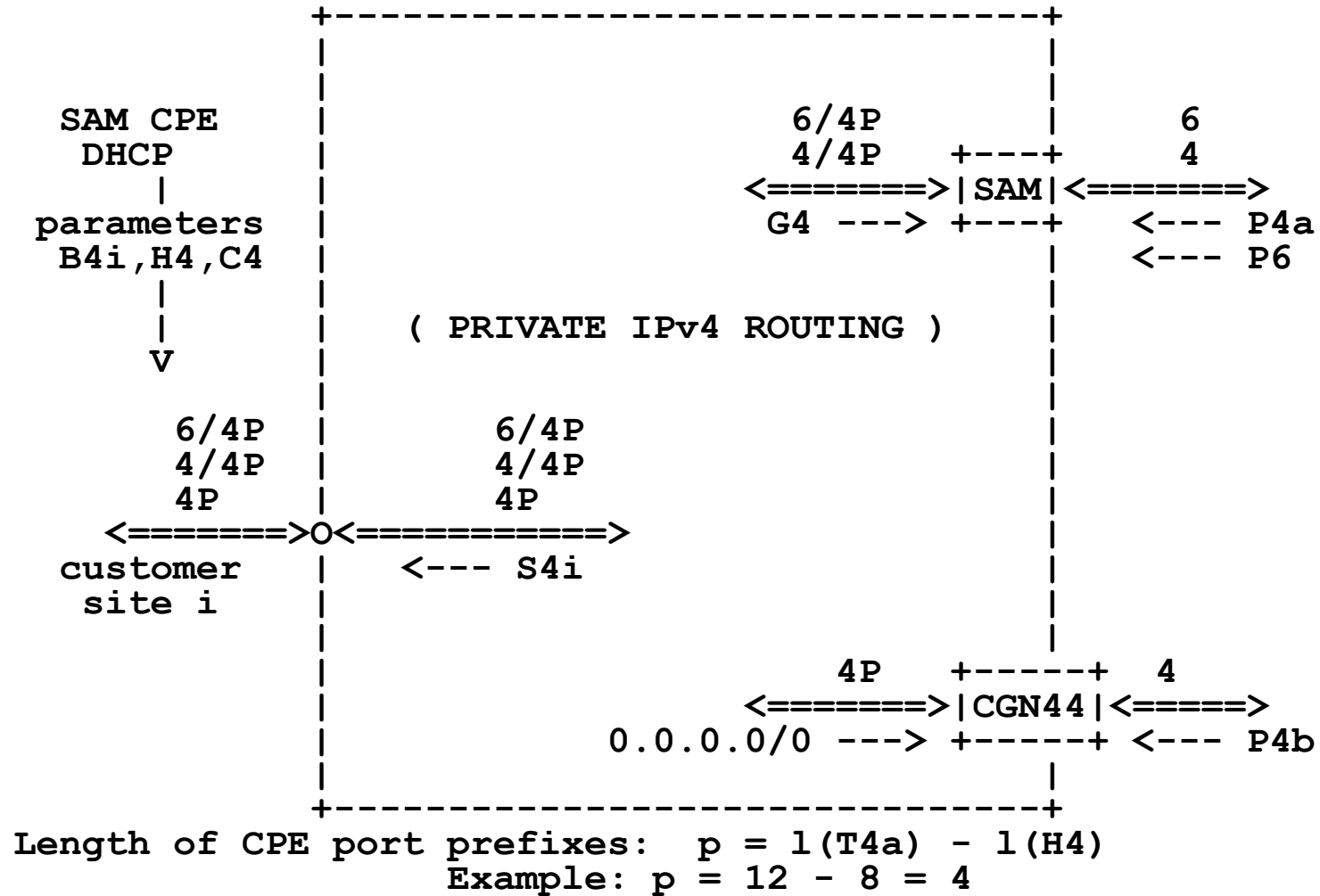
```

```

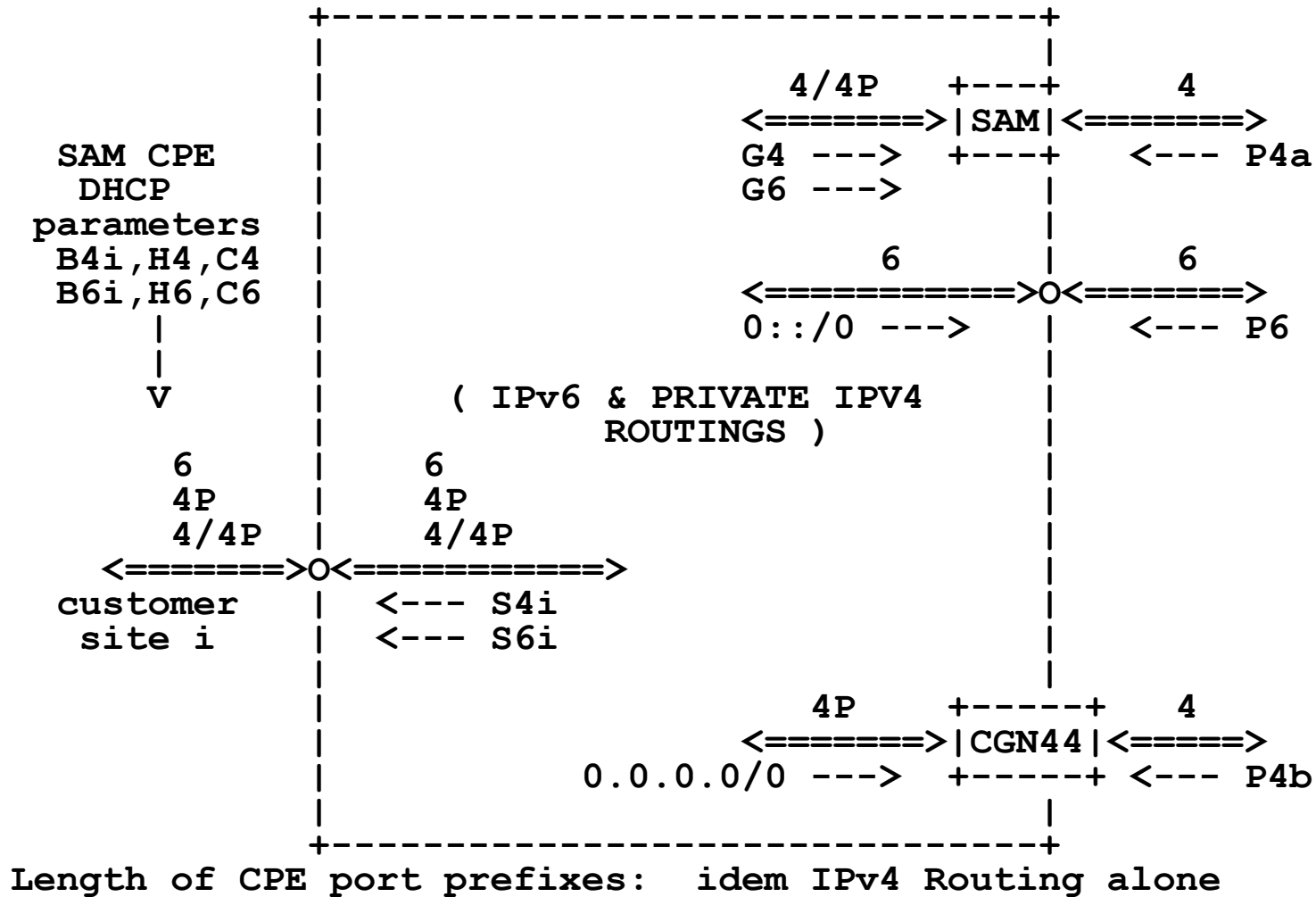
<-----128----->
+-----+-----+-----+
|      H6      |      Ii      | Sv |      0      |
+-----+-----+-----+
<-----h-----><---i---><--s-->
IPv6 TRANSIT address (TX6) for a Branch host

```

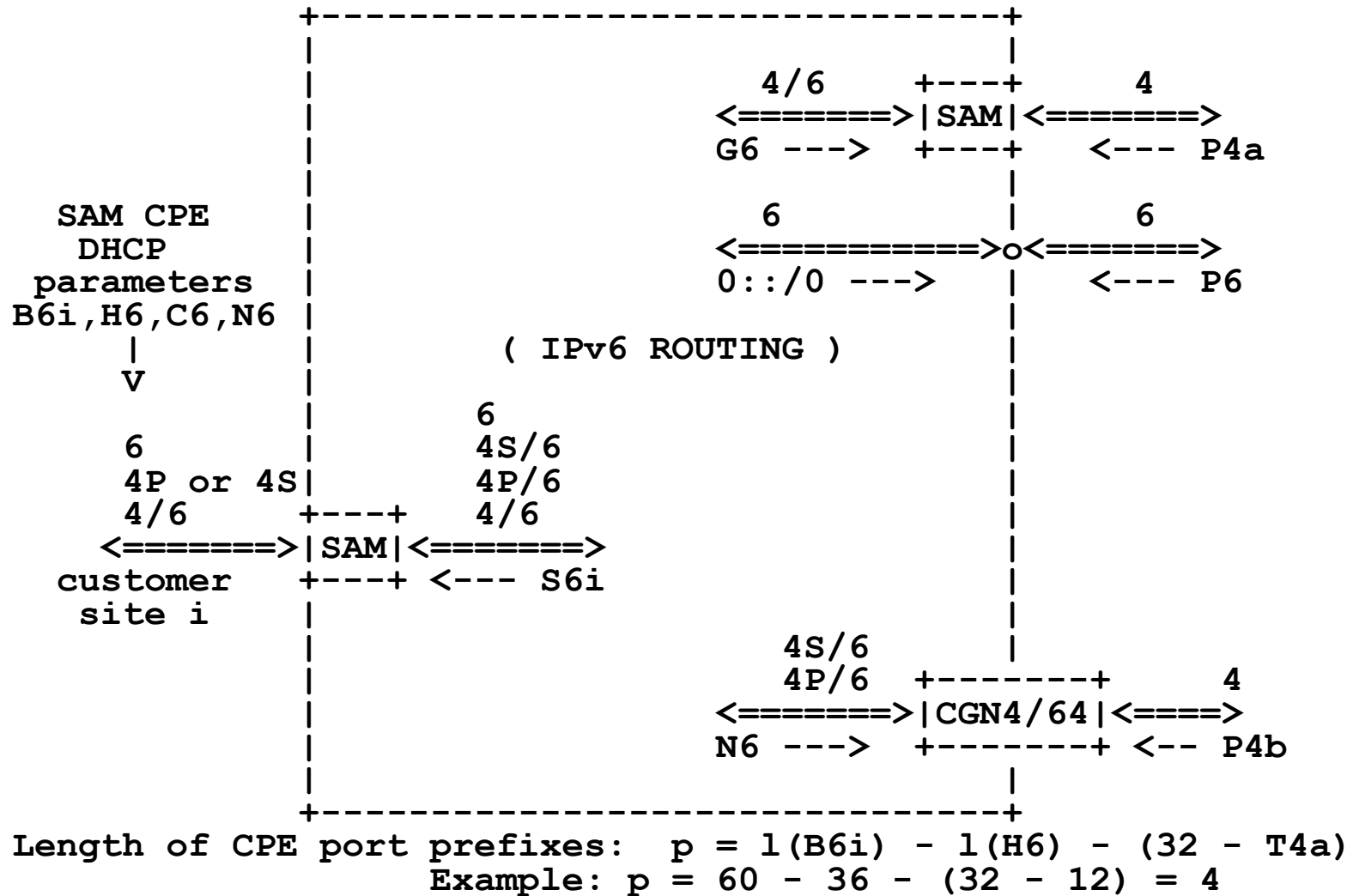

ISP configuration 1 (Private IPv4 routing)



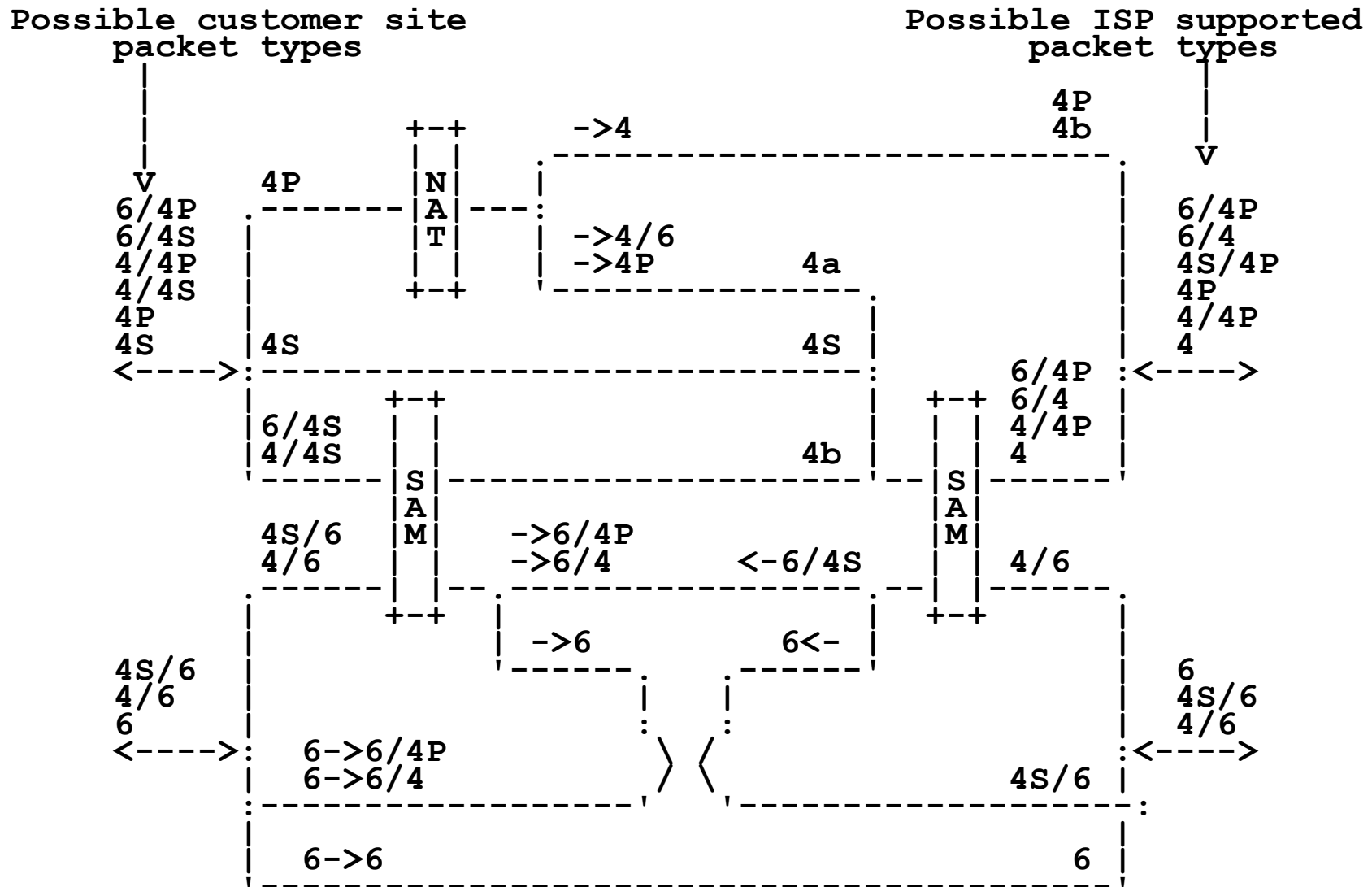
ISP configuration 2 (IPv4-P & IPv6 routings)



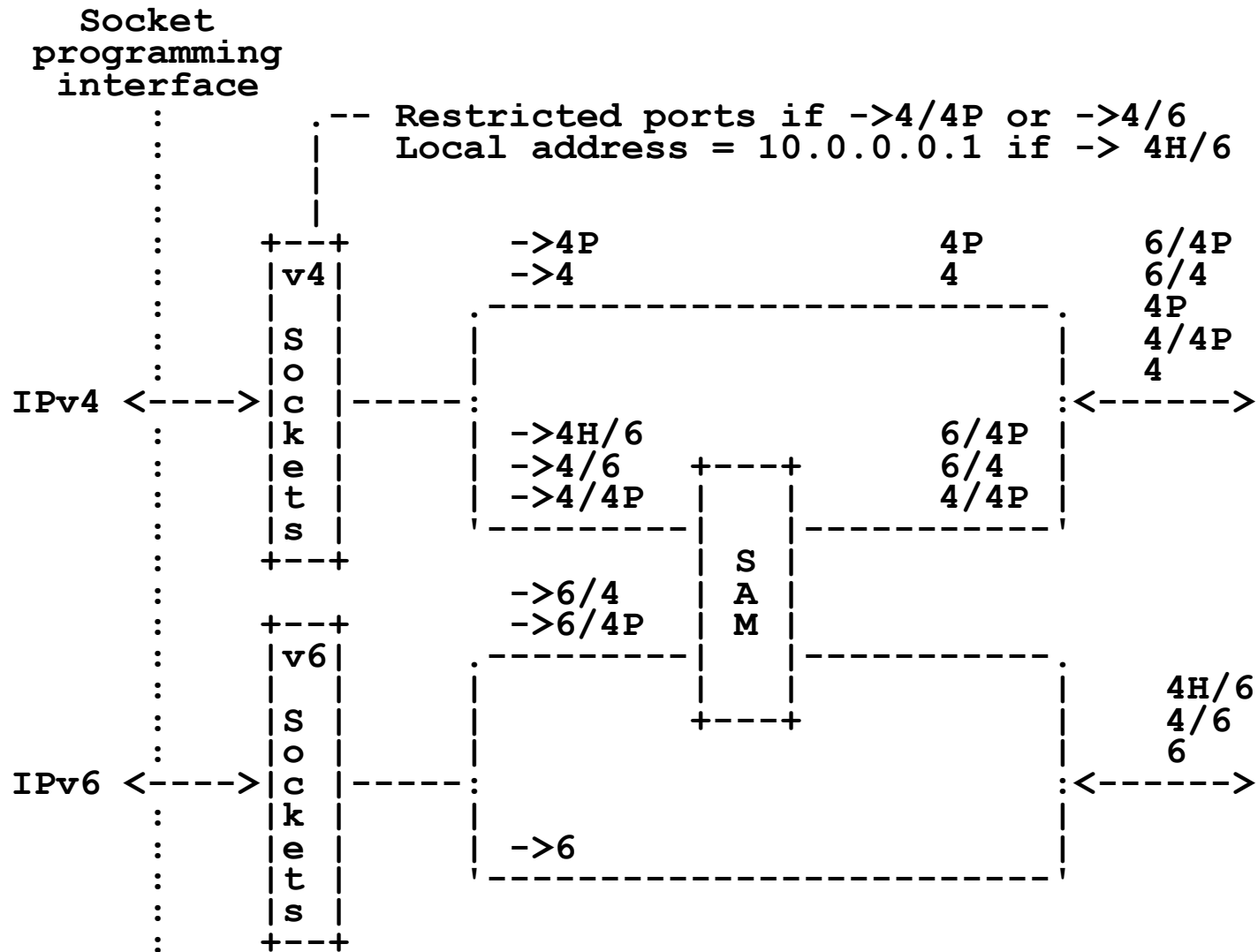
ISP configuration 3 (IPv6-only routing)



CPE internal architecture (backward compatible)



Host internal architecture (backward compatible)



Mitigating port restriction consequences

(in draft-despres-sam-scenarios-00 sec.6)

a local socket used for a given connection identified by its 5-tuple [source and destination addresses & ports and protocol], may be reused for different 5-tuples.

Thus, the number of ports needed by each host can be drastically reduced.

Whether this optimization has no risk to interfere with existing NAT traversal techniques like ICE has however to be checked.

Conclusion

- SAM is still new
- ...But it provides much
 - Simple design
 - Backward compatibility (incremental deployment)
 - Scalability and global IPv4 transparency
- What next?
 - SAM architecture – new work item ?
 - Port use optimization - in Behave ?
 - Implement and test ?
- Change name ?
 - Scalable Adaptive Multicast in IRTF-WG

Thank you