Running Multiple PLATs in 464XLAT

draft-sun-v6ops-xlat-multi-00

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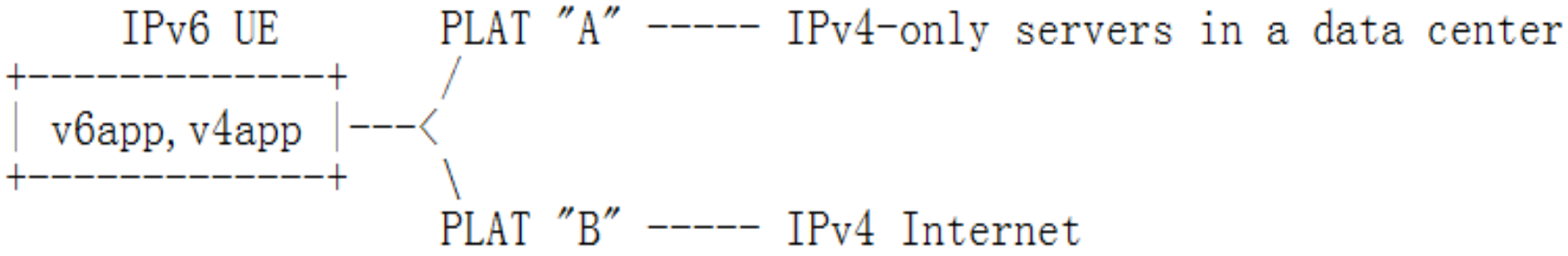
Introduction

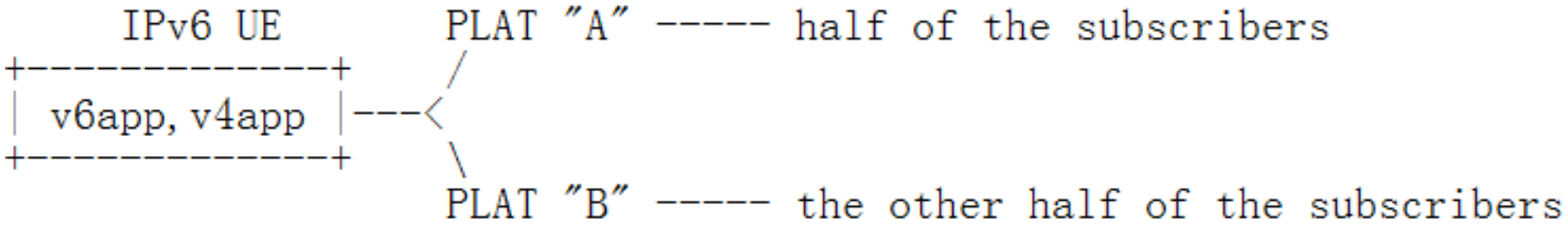
- The 464XLAT is an mechanism enabling IPv4 service reachable across IPv6-only networks. However, it can only be used for one-PLAT situation.
  - In section 6.3 [RFC6877], the CLAT will use the PLAT-side translation IPv6 prefix as the destination of all translation packets that require stateful translation to the IPv4 Internet.
  - The Prefix Discovery method [RFC7050] cannot deal with the scenario when different PLATs are using with different Pref64 prefixes.
- This draft describes the 464XLAT architecture with multiple PLATs by combining with the existing solutions.

Motivation of Multi-PLATs

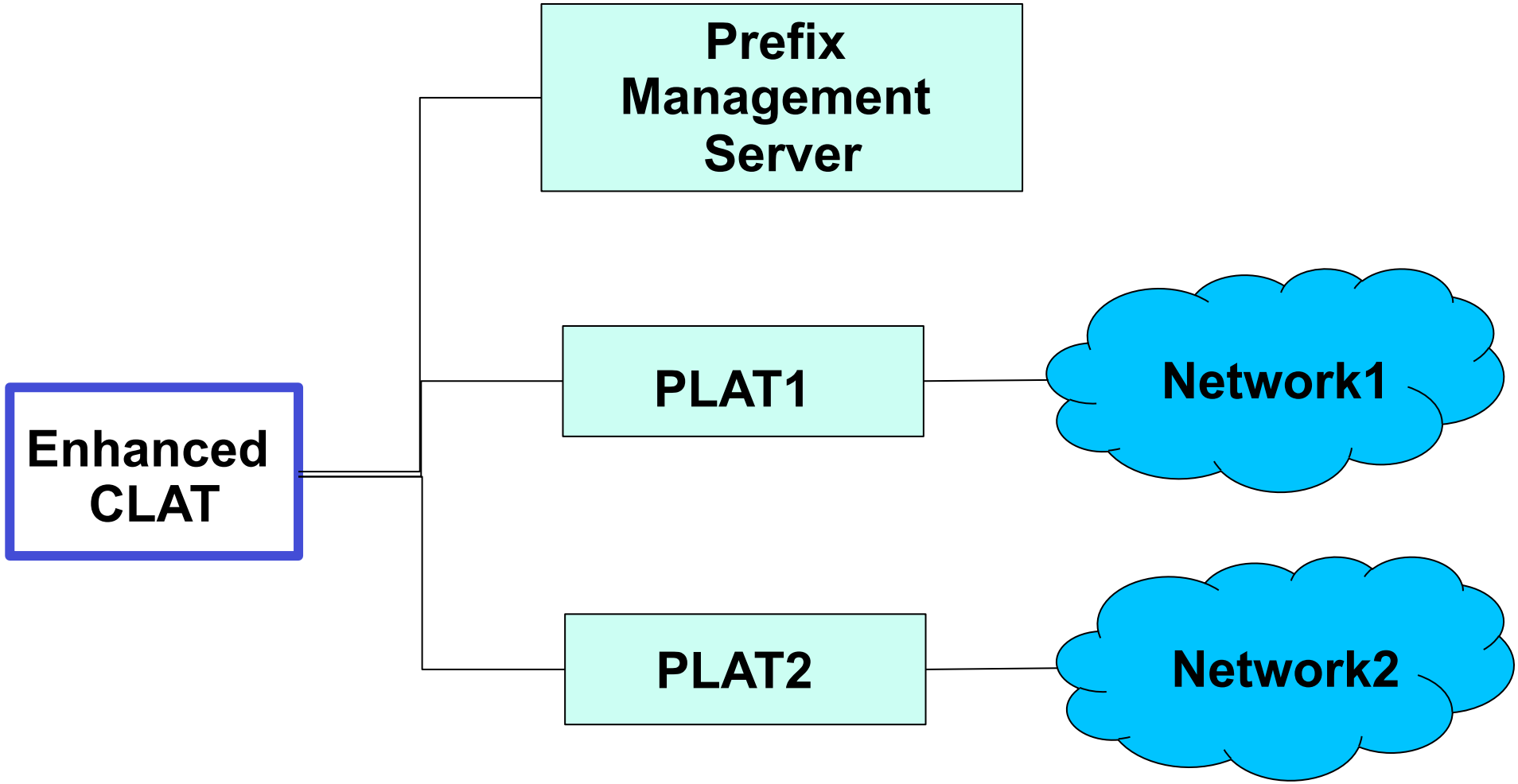
- Different PLATs may serve for different purposes, with distinguish ALG implementation, QoS treatment,etc.



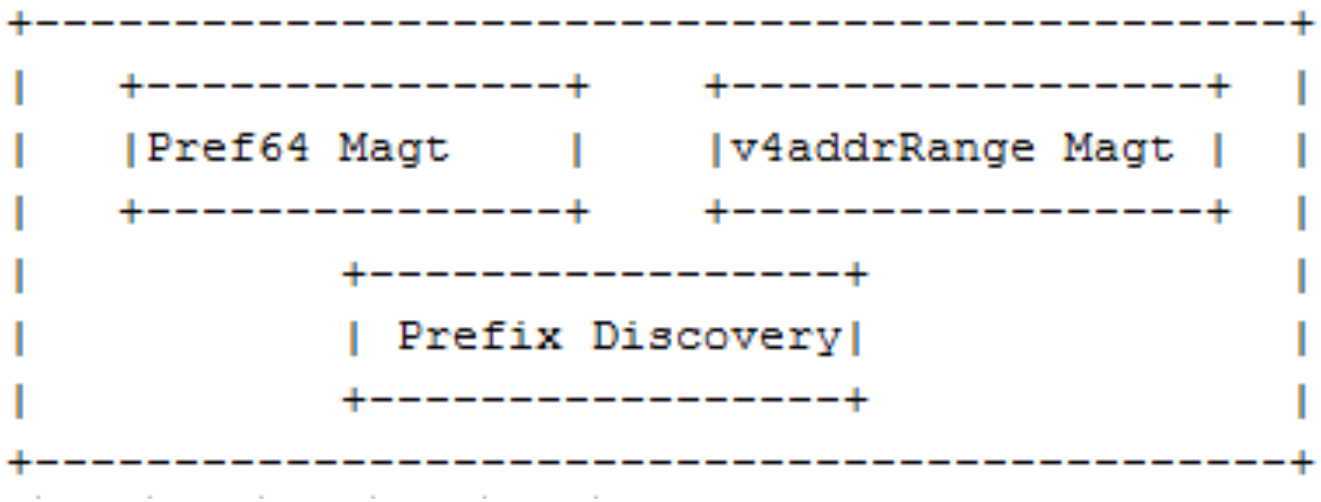
- Deploy multiple PLATs is for load balancing



Multi-PLATs Architecture

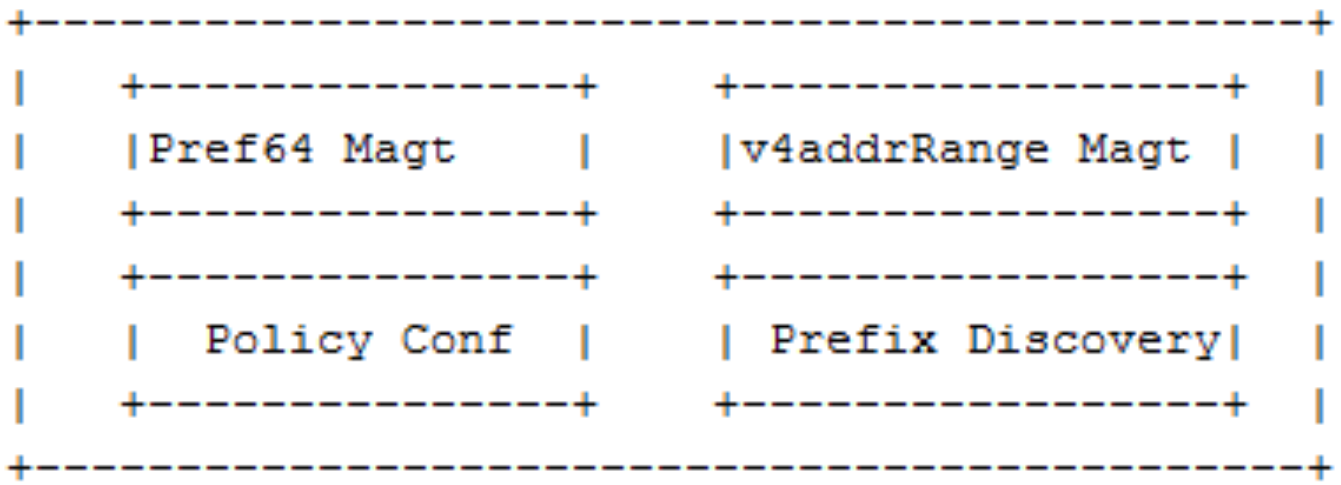


Enhanced CLAT for Multi-PLATs



- Prefix discovery agent: It may implement PCP based prefix discovery method [RFC7225] to allocate multiple Pref64 prefixes.
- Pref64 management: Extract the Pref64 from the prefix discovery procedure and manage multiple Pref64 prefixes.
- v4addrRange Management: store the corresponding IPv4 address ranges and chose the desired pref64 for each packet.

Prefix Management Server



- Policy Configuration: the policy to allocate multiple Pref64s.
- Prefix discovery agent: It may implement PCP based prefix discovery method [RFC7225] to allocate multiple Pref64 prefixes.
- Pref64/IPv4Pref management: Manage multiple Pref64 prefixes and their corresponding IPv4 prefix.

Deployment Consideration

- The CLAT need to compare the destination address range with each packet it might have effect on the performance efficiency in the client.
- Operators should limit the number of address ranges, and aggregate the addresses into a larger address range.
- There should be a maximum limit in CLAT on the number of Pref64 prefixes.
- When DNS64 is used to enable stateful translation, the multi-prefix policy should be consistent with the Prefix Management Server.

Demo System of Multi-PLATs

```
+-----------------------------+----------------+
| ipv6fix                     | ipv4addr       |
+-----------------------------+----------------+
| 2001:778:0:ffff:64::/96     | 180.76.0.0/16  |
| 2001:67c:2b0:db32:0:1::/96  | 111.13.0.0/16  |
| 2001:67c:27e4:641::/64      | 123.58.0.0/16  |
| 2001:67c:27e4:64::/64       | 220.181.0.0/16 |
| 2001:67c:27e4:11::/64       | 125.39.0.0/16  |
+-----------------------------+----------------+
5 rows in set (0.00 sec)
```

```
ipv4_dst_to_ipv6_dst
ipv4 destination:   7d27f02f
mysql plat_subnet:  2001:067c:27e4:0011:0000:0000:0000:0000
ipv6 destination:   2001:67c:27e4:11:0:0:7d27:f02f
```

1403 14.314260	2001:778:0:ffff:64:0:cb82:3d11	2001:da8:215:819:fc4d:d46d:d48b:464	TCP
1404 14.314639	2001:da8:215:819:fc4d:d46d:d48b:464	2001:778:0:ffff:64:0:cb82:3d11	TCP
1407 14.382632	2001:da8:215:819:fc4d:d46d:d48b:464	2001:67c:27e4:11::7d27:f02f	TCP
1852 15.682789	2001:da8:215:819:fc4d:d46d:d48b:464	2001:67c:27e4:641::7b3a:b0e0	TCP
1956 16.712323	2001:67c:27e4:641::7b3a:b0e0	2001:da8:215:819:fc4d:d46d:d48b:464	TCP
1957 16.713011	2001:da8:215:819:fc4d:d46d:d48b:464	2001:67c:27e4:641::7b3a:b0e0	TCP
1963 16.910135	2001:67c:27e4:641::7b3a:b0e0	2001:da8:215:819:fc4d:d46d:d48b:464	TCP
1964 16.910563	2001:da8:215:819:fc4d:d46d:d48b:464	2001:67c:27e4:641::7b3a:b0e0	TCP
1965 16.912456	2001:67c:27e4:641::7b3a:b0e0	2001:da8:215:819:fc4d:d46d:d48b:464	TCP
1966 16.912791	2001:67c:27e4:641::7b3a:b0e0	2001:da8:215:819:fc4d:d46d:d48b:464	TCP
1967 16.913042	2001:da8:215:819:fc4d:d46d:d48b:464	2001:67c:27e4:641::7b3a:b0e0	TCP
1968 16.913783	2001:da8:215:819:fc4d:d46d:d48b:464	2001:67c:27e4:641::7b3a:b0e0	TCP
1973 17.188605	2001:67c:27e4:641::7b3a:b0e0	2001:da8:215:819:fc4d:d46d:d48b:464	TCP
1974 17.189318	2001:da8:215:819:fc4d:d46d:d48b:464	2001:67c:27e4:641::7b3a:b0e0	TCP
1975 17.198525	2001:da8:215:819:fc4d:d46d:d48b:464	2001:778:0:ffff:64:0:e11:1f2c	TCP
1977 17.262961	2001:67c:27e4:641::7b3a:b0e0	2001:da8:215:819:fc4d:d46d:d48b:464	TCP

```
ipv4_dst_to_ipv6_dst
ipv4 destination:   e111f2c
moren plat_subnet:  2001:778:0:ffff:64::
ipv6 destination:   2001:778:0:ffff:64:0:e11:1f2c
```

2023 18.824210	2001:778:0:ffff:64:0:71cf:149c	2001:da8:215:819:fc4d:d46d:d48b:464	TCP
2024 18.811213	2001:778:0:ffff:64:0:e11:1f2c	2001:da8:215:819:fc4d:d46d:d48b:464	TCP
2025 18.811739	2001:da8:215:819:fc4d:d46d:d48b:464	2001:778:0:ffff:64:0:e11:1f2c	TCP
2026 18.813424	2001:da8:215:819:fc4d:d46d:d48b:464	2001:778:0:ffff:64:0:e11:1f2c	HTTP
2027 18.863177	2001:67c:27e4:11::7d27:f02f	2001:da8:215:819:fc4d:d46d:d48b:464	TCP
2028 18.867288	2001:67c:27e4:11::7d27:f02f	2001:da8:215:819:fc4d:d46d:d48b:464	HTTP
2029 18.868026	2001:67c:27e4:11::7d27:f02f	2001:da8:215:819:fc4d:d46d:d48b:464	TCP
2030 18.868316	2001:778:0:ffff:64:0:71cf:149c	2001:da8:215:819:fc4d:d46d:d48b:464	TCP

Questions? Discussion?

Next Step ?

Thanks!