Graceful IPv4 Sunset with Traffic Migration

draft-chen-sunset4-traffic-migration-00

IETF 85- Atlanta, Nov 2012

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Motivations

- Many operators already/would likely adopt(-ed) dual-stack technologies. Steering traffic to IPv6 may be useful to advance IPv6-only deployment progress

- IPv4 and IPv6 will coexist in a very long period. Turning IPv4 off should sustain residual IPv4 services

- RFC6264 described a process of incremental IPv6 deployment. Linking it is suggested. This memo provides a DHCP configuration to enable those migrations
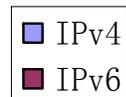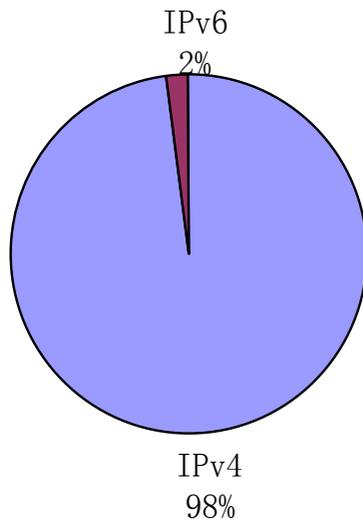
A Graceful Sunset4

- Goals
  - Deploying IPv6 single stack network and no impacts to IPv4 users/apps
  - Migrate traffic to IPv6 with transparency to user's experiences
  - The issues in IPv6-only network was documented in RFC6586. That should be well noticed and avoided during the IPv4 turning off
  - Picking a specific technology is not the goal of the document
- Traffic Migration Technologies
  - Dual-stack Lite(RFC6333)/MAP/4rd
  - 464xlat(draft-ietf-v6ops-464xlat)
  - BIH(RFC6535)
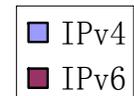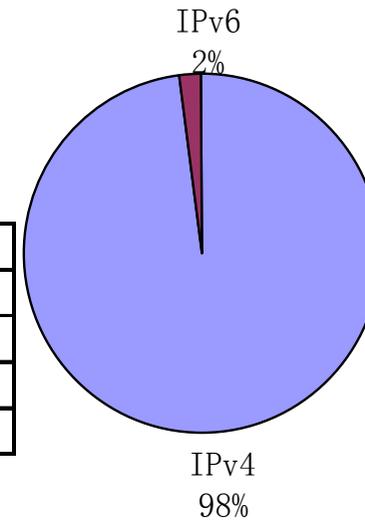
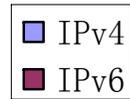# No Traffic Migration

Initial Stage

The network traffic will be increased by 50 times

Advanced Stage

IPv6
2%

IPv4
98%

☐ IPv4
☐ IPv6

The increased traffic will stay in IPv4

	IPv4	IPv6	
Initial Stage	100	2	(Units)
Proportion	98%	2%	
Advanced Stage	5000	100	(Units)
Proportion	98%	2%	

IPv6
2%

IPv4
98%

☐ IPv4
☐ IPv6

Traffic Migration

The network traffic will be increased by 50 times

Initial Stage ➡ **Advanced Stage**
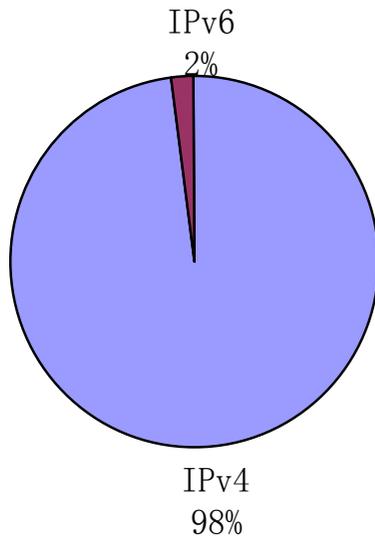
The increased traffic will be migrated to IPv6

	IPv4	IPv6	
Initial Stage	100	2	(Units)
Proportion	98%	2%	
Advanced Stage	100	4902	(Units)
Proportion	2%	98%	
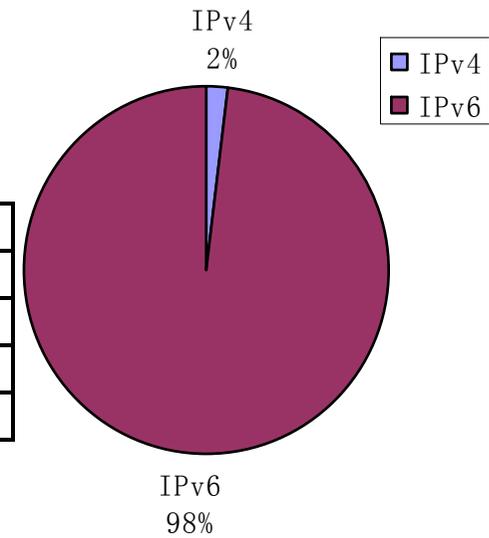
A Graceful Sunset4 Path
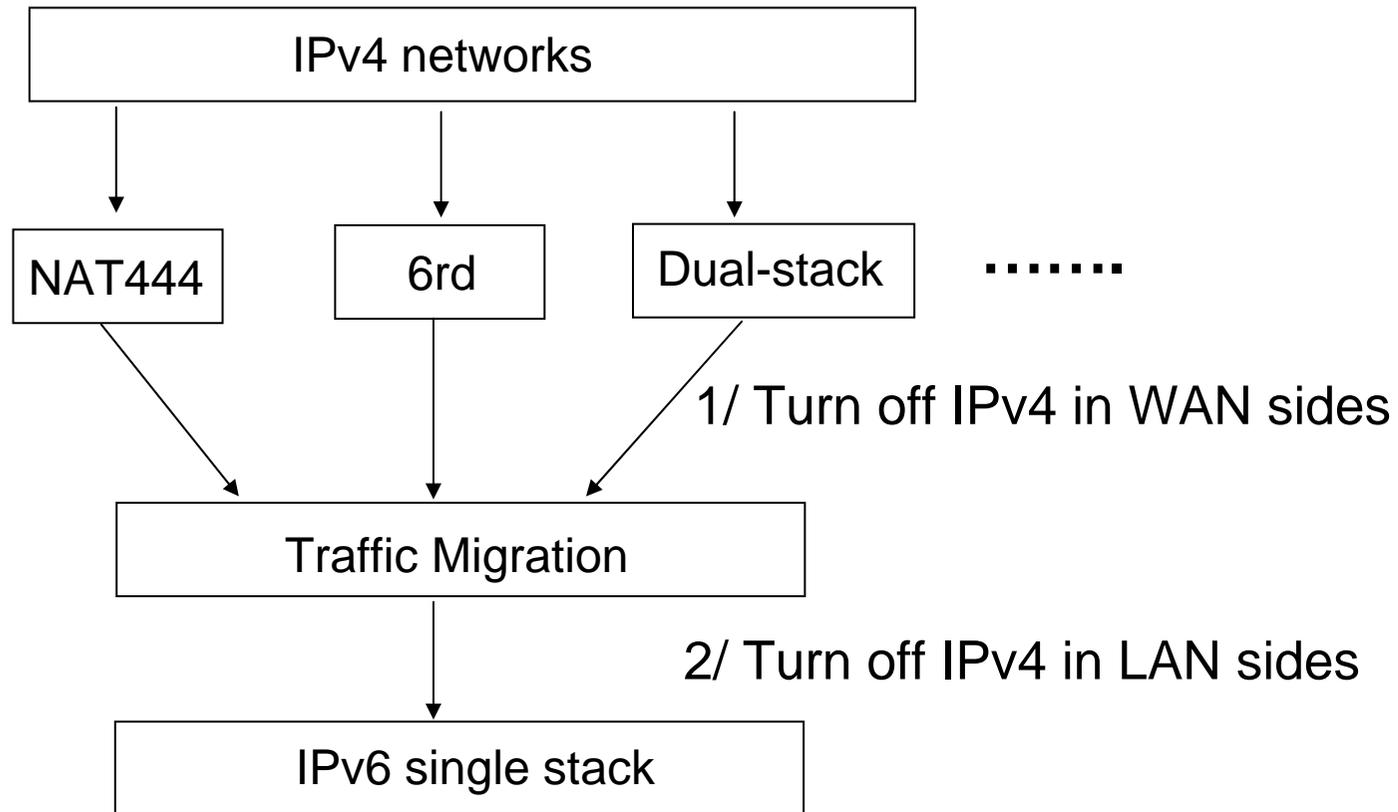
Proposal and Discussions

- **DHCPv6 options**
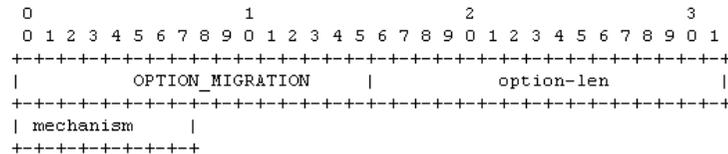
```
 0                   1                   2                   3
 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|          OPTION_MIGRATION        |           option-len        |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
| mechanism     |
+-+-+-+-+-+-+-+-+

option-code     OPTION_MIGRATION(TBD)

option-len      1

mechanism       This data is to indicate the particular
                mechanism to be performed
```

- **PCP options**
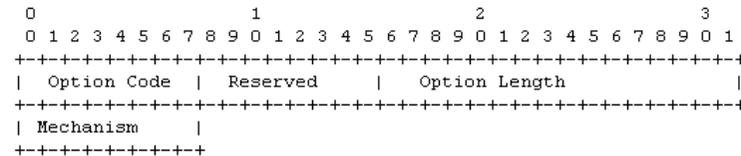
```
 0                   1                   2                   3
 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
| Option Code  |  Reserved     |   Option Length               |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
| Mechanism     |
+-+-+-+-+-+-+-+-+

option-code     To be assigned by IANA

option-len      1

mechanism       This data is to indicate the particular mechanism to be performed
```

- **Discussions**
  - Is it of value to define different approaches to enable traffic migration?
  - How granular does the signaling need to be?

Next Step

- Is it a valid input to WG?
- Should we continue the work?