

prop-035:  
IPv6 portable assignment for  
multihoming

---

Sep. 7, 2006

Katsuyasu Toyama

Japanese Special Interest Group on  
IPv6 portable assignment

# Goal of our proposal

---

- To allow 'end sites' to be assigned IPv6 portable address **only if** the end sites **are multihomed**, or **plan to be multihomed**.

# Outline

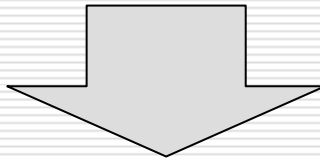
---

- 1. Current problem
  - Why portable assignment for multihoming?
  - Any other appropriate methods?
  
- 2. Draft policy on portable assignment for multihoming
  - key points for the policy
  
- 3. Comparison to other proposals

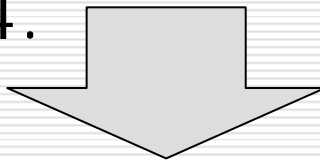
# 1. Current problem

---

- ❑ Current policy does not allow IPv6 portable assignment to ANY end sites.



- ❑ End-site organizations which need redundancy for their internet connectivity **cannot be multihomed** in IPv6 just as they do in IPv4.



- ❑ We insist that the APNIC policy should allow IPv6 portable assignment to multihomed end sites.

# No other ways for multihoming?

---

- Shim6, discussed at shim6 wg, IETF.

- But

- Shim6 is not a perfect replacement of “portable assignment” address and BGP.

- *End site administrators cannot directly control the usage of the two links.*

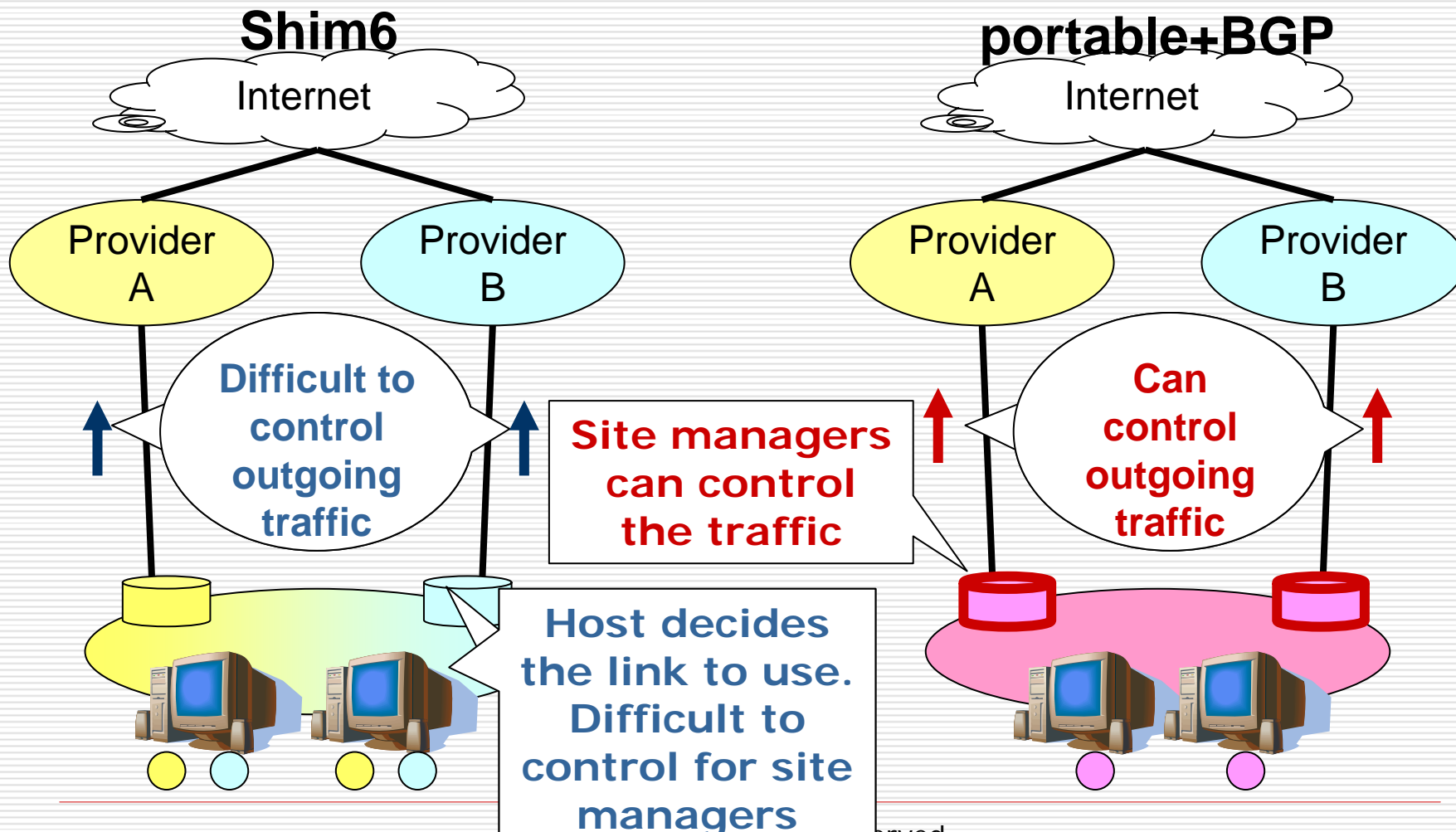
- The working group still discusses the specification and has not fixed it.

- *The implementation will not be available in a few years.*

# Comparison: Shim6 and Portable assignment

1. Current problem

Shim6: End site administrators cannot directly control the usage of the two links.



## 2. policy on IPv6 portable assignment for multihoming

---

# Key points of this proposal

---

- Portable assignment **ONLY for multihoming** organizations
  - (A) Multihomed organization should be able to have assigned portable, regardless of the size of organizations.
  
- About global routing table
  - (B-1) mitigating the expansion of the routing table by **restricting portable assignment to the multihomed organization**, and by **paying some fee** for the assigned portables.
  
  - (B-2) operators can handle assigned portables easier than puching holes in allocated portables, by **separating the address block** of assigned portables from those of allocated portables



# Issues on the IPv6 global routing table

---

- Unavoidable that multihoming in IPv6 will increase using punching holes.
  - More constructive to allow routable assignments which is managed by the policy than to create punching holes in practice.
- 
- Future trend
    - There will always be requirements for a redundant connectivity in the future from the business perspective
    - Without portable assignment, such organization will be multihomed by making “punching holes” which is not legitimate.
    - Leaving the situation as it is would implicitly allow punching holes, just like the current IPv4 Internet, and will inevitably lead to messy situation.
  
  - Allowing portable assignments for multihomed networks from a specified address block at an early stage prevents chaos in portable allocation range, and better in terms of management
  - Routers possibly handle prefixes in the separated space for assigned portable better than “punching holes” in allocated portable
  - Punching holes are harmful: for instance, it can be used to intentionally reroute traffic to cheaper links
  - If better multihoming method comes up in the future, we can enforce them to move to the new multihoming method until a flag day.

# IPv6 portable assignment is better than punching holes

---

- From address administration, portable assignment is easier to manage than punching holes.
  - If 'assigned portable' address is separate from 'allocated portable' address space, then:
    - it becomes easier to filter 'punching holes' in Allocated portable address space.
    - it is easier to abandon the 'assigned portable' space than SWAMP in IPv4, because it is concentrated.
  - Also, sometimes punching hole is harmful to service providers because you can transit freely by using punching holes
    - Transit providers have to carry the packets but cannot get revenue.

# Proposed policy on IPv6 portable assignment

---

- Assignment target:
  - (1) End-sites which are multihomed or plan to be multihomed, regardless of their size.
  
- Assignment criteria:
  - (2-a) The end site which is assigned IPv6 portable address space must be multihomed using the assigned portable address space in three (3) months.
  - (2-b) If the portable address space is not used for multihoming after three (3) months, the address space must be reclaimed.
  - (2-c) The end site which is assigned IPv6 portable address space must pay the fee for the space.
  
- Portable address space:
  - (3-a) The portable assignment should be made from a specified block separate from address space used for portable allocations
  - (3-b) The portable assignment size to an end-site should be the same size as in non-portable assignments, currently /48, or a shorter prefix if the end-site can justify it.

## Proposed policy on IPv6 portable address space

- Assignment target:
  - (1) End-sites which are multihomed or plan to be multihomed, regardless of their size.
- Assignment criteria:
  - (2-a) The end site which is assigned IPv6 portable address space must be multihomed using the assigned portable address space in three (3) months.
  - (2-b) If the portable address space is not used for multihoming after three (3) months, the address space must be reclaimed.
  - (2-c) The end site which is assigned IPv6 portable address space must pay the fee for the space.
- Portable address space:
  - (3-a) The portable assignment should be made from a specified block separate from address space used for portable allocations
  - (3-b) The portable assignment size to an end-site should be the same size as in non-portable assignments, e.g. /48, or a shorter prefix if the end-site can justify it.

Restricting to multihome

slow growth of routing table

Manageability of prefixes

Efficient use of address space

# Comparison of other proposals

---

## Prop-034: IPv6 portable assignment for end user organisations

### ■ Target:

- for end sites to be multihomed vs  
for end sites to be independent of ISP

### ■ Assignment size:

- /48 vs /32

# Comparison of IPv6 portable assignment proposals

	Prop-035 By K. Toyama	Prop-034 By Jordi	ARIN(2005-1) By Owen and Kevin
Assigned to	<b>Only multihomed end sites</b>	End sites	End sites
Criteria	<b>To be multihomed in three months.</b>	Same criteria as ipv4 portable assignment	Same criteria as ipv4 portable assignment
Address space	Separated from allocated portable	Separated from allocated portable	Separated from allocated portable
Assignment size	Same as allocated portable (/48)	<u><a href="#">/32</a></u>	/48
Fee for portable	Yes	N/A	N/A
Routing table	To reduce the growth rate by restricting only multihoming	<u><a href="#">This policy comes with 'sunset' period (expired after specified duration?)</a></u>	Check after some duration and judge if this policy continues or not

# Summary

---

- We propose:
  - APNIC policy should be modified to allow ‘end sites’ to be assigned IPv6 portable address **only if** the end sites **are multihomed**, or **plan to be multihomed**.

---

Any questions and comments!?



# Authors of this proposal

---

- Japanese Special Interest Group on IPv6 portable assignment
  - Katsuyasu Toyama, NTT
  - Takashi Arano, Intec Netcore
  - Tomohiro Fujisaki, NTT
  - Toshinori Ishii, Internet Multifeed Co.
  - Kosuke Ito, IRI Ubiteq
  - Dai Nishino, JPIX
  - Noriaktsu Ohishi, Nextech
  - Izumi Okutani, JPNIC
  
- And special thanks to the people who discussed this policy in JPOPM!