



# IPv6 address assignment size for end-users

---

Tomohiro Fujisaki/Nippon Telegraph and  
Telephone Corporation

Toshiyuki Hosaka/JPNIC



# Introduction

---

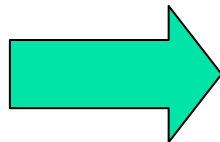
- In JP region, IPv6 service for residential users has been offered.
  - Some are commercial, the others are trial
- This presentation introduces the current practice of JP ISPs for IPv6 address assignment size for end users



# Background

---

- In RFC 3177 “IAB/IESG Recommendations on IPv6 Address Allocations to Sites”, assignment address size for end users should be:
  - /48 in the general case, except for very large subscribers.
  - /64 when it is known that one and only one subnet is needed by design.
  - /128 when it is absolutely known that one and only one device is connecting.
- There are some discussions at last APOPM about the assignment size for end-users
  - It should be dynamic or static?
  - It should be /48 or not ?



Introduce the address size assigned for IPv6 service in Japan



# IPv6 Service Trend in Japan

---

- Almost all Major ISPs offer IPv6 Service
  - Access lines: Leased line, DSL, Fiber, etc.
  - Targets: Enterprise, SOHO, residential users
  - Services: Commercial/Experimental
- A trend of assignment address size
  - /48 for enterprise service
  - /64 for residential service (e.g. DSL)

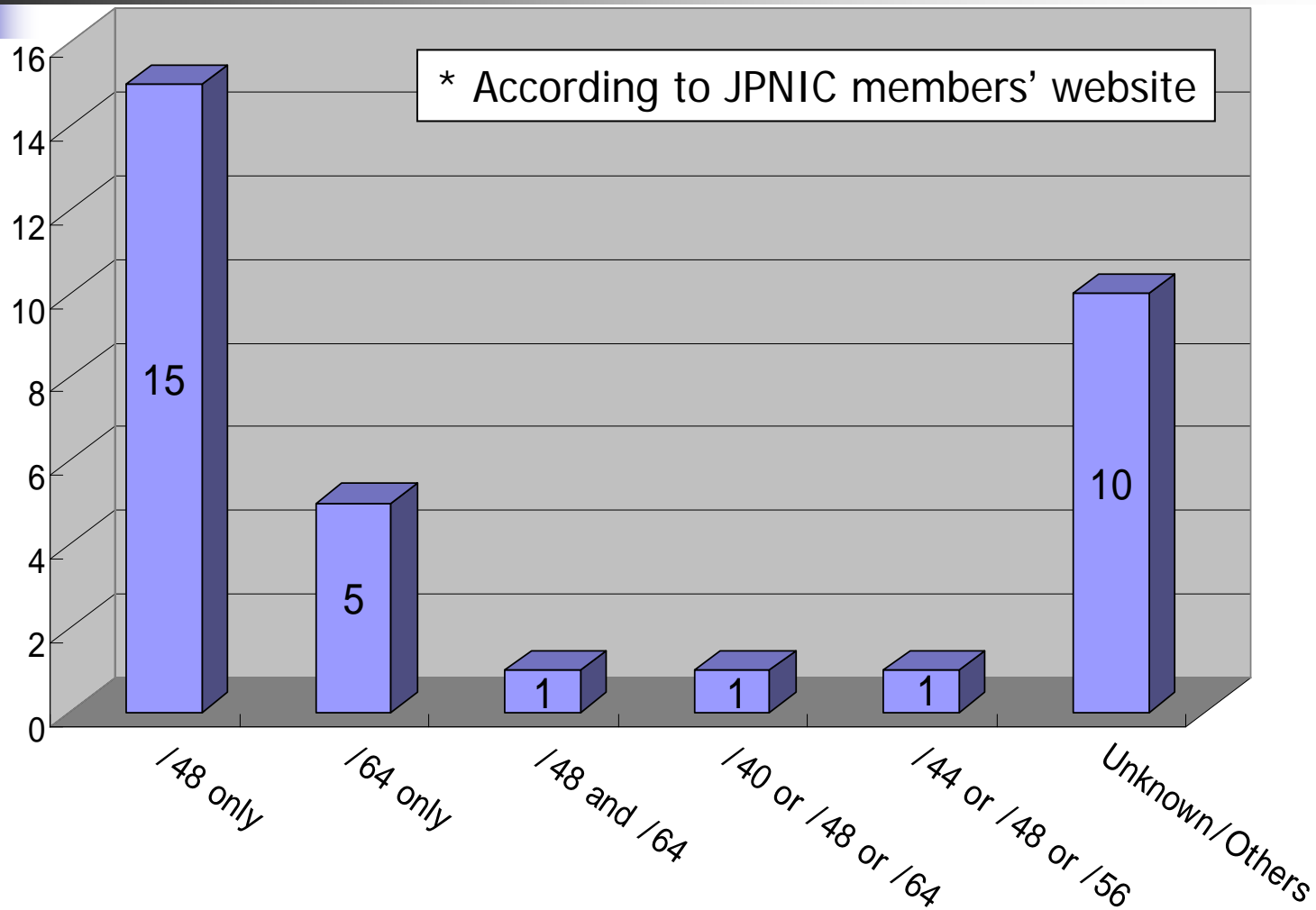


# IPv6 Service in Japan

Sampled at 20 Aug 2004

LIR	Service	Experimental/ Commercial	Access line	Target	Address assignment mechanism	Prefix size
1	IPv6/IPv4 Dual Stack Service	Commercial	leased line	Enterprise	Manual	/48
	IPv6 Native Service	Commercial	leased line	Enterprise	Manual	/48
	IPv6 Tunneling Service	Experimental	tunnel	Enterprise/SOHO/Residence	Manual	/48
2	IPv6 Tunneling Service	Commercial	tunnel	Enterprise/SOHO/Residence	Manual	/48
	ADSL Service IPv6 Dual	Commercial	ADSL	Enterprise/SOHO/Residence	DHCP-PD	/48
3	IPv6 Service	Commercial	ADSL/Fiber	Enterprise/SOHO/Residence	Router Advertisement	/64
4	IPv6 Service	Commercial	ADSL	Enterprise/SOHO/Residence	DHCP-PD	/64
5	IPv6 Monitor	Experimental	ADSL		DHCP-PD	/64
6	IPv6 Native Service	Commercial	leased line	Enterprise	Manual	/40 or /48
	IPv6 Tunnel Service	Commercial	tunnel	Enterprise/SOHO/Residence	Manual	/48
7	IPv6 ADSL Experiment	Experimental	ADSL	SOHO/Residence	DHCP-PD	/64
8	IPv6 Trial Service	Experimental	ADSL	SOHO/Residence	DHCP-PD	/48
9	IPv6 Trial	Experimental	CATV	Residence	Router Advertisement	/64
10	IPv6 Tunnel Service	Experimental	tunnel	Residence	DTCP	/48

# Service and assignment size





# ISP's voice - interview results -

- The reason offering /64 to end-users (non technical)
  - Want to differentiate enterprise service (/48) from residential service (/64) (with price)
  - /48 is too large for SOHO or residential users
    - currently no objection to the size from end-users
    - Few residential end-users have multiple segments at home
  - /32 is too small to use /48 address prefix
    - If /48 is assigned to consumer, ISPs need larger address space
  - Whois DB registration issue
    - Privacy issue(Important especially for residential users)
    - More Workload for ISPs



## ISP's voice (cont)

---

- Technical reason for /64 assignment
  - Want to specify the IPv6 prefix to provide IPv6 application service
    - To offer prefix-depend services
  - There are only a few devices which implement prefix delegation mechanism
  - Not only about assignment size, but to assign statically (permanently) or dynamically (changing over time) is important
    - Privacy issue
    - IPv4 based equipments (or network structure) assume dynamic assignment





# Japanese end-user's voice

---

- Interview results to an IPv6 user community
  - It should follow the current recommendation, RFC 3177.
  - To utilize IPv6 features, end-users should be able to use huge address space /48.
  - To promote IPv6, static address and multiple segment should be able to use without any additional fee.



# Conclusion

---

- Currently, IPv6 address assignment size for residential users (e.g. DSL users) is different from ISPs to ISPs (/64 or /48).
- If the purpose why LIRs assign /64 for end-users is enough reasonable, it may be necessary to re-consider the assignment recommendation and allocation policy.
  - RFC3177
  - Allocation Criteria (200 × /48)