Guidelines for ISPs on IPv6 Assignment to Customers

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Introduction & Background

- Summarizes Several documents from IETF & RIRs policies
- IPv6 address:
  - 64 bits of "network number" + 64 bits of "host number"
  - subnets come from the network part
- Providing a /48 to every subscriber doesn't represents a waste of address space
  - Number of /48 prefixes in the Global Unicast Address prefix (001): 2^{45} = 35.184.372.088.832 (35 trillion)
- No shortage of /48 prefixes is foreseen
  - Enterprise and individual subscribers expect to be able to connect to the network multiple always-on devices (fixed and mobile)
- The need for subneting is a required feature
  - Separate networks because different departments, SOHO where home and office network share the same access, etc.
- Subscriber requires a site prefix
- Renumbering is not a solution when networks grow

IPv6 Prefix Assignment Guidelines

- Default allocation policy is /32 (65.535 /48)
  - Bigger allocations also possible
- ISPs should keep the following allocation practices:

Prefix	General Case	Examples
/47	Very large subscribers	
/48	General case, except for very large subscribers	Home network subscribers (on-demand and always-on), SOHO, small and large enterprises
/64	When it is known that one and only one subnet is needed and for sure not required more in the future	Mobile networks (vehicles, mobile phones)
/128	When it is absolutely known that one and only one device is connecting	Single PCs (no additional need to subnet), dial-up cases

- In order to balance:
  - IPv6 address space conservation practices
  - network administration
  - deployment/growth expectations
  - avoidance of renumbering
  - scaling inefficiencies

Why Allocate Smaller Prefixes ?

- Allocation of several /32s to ISPs (or several /48s to customers) is not convenient:
  - Increase size of the routing tables
  - Other issues
- Consequently, whenever necessary or expected:
  - Smaller prefixes should be allocated with no restrictions
    - There are several already allocates, from /20 to /31

References

- The complete document available at:
  - http://www.europe.ipv6tf.org/PublicDocuments/guidelines_for_isp_on_ipv6_assignment_to_customers_v1_2.pdf

Document	URL
IAB/IESG Recommendations on IPv6 Address Allocations to Sites	ftp://ftp.rfc-editor.org/in-notes/rfc3177.txt
IPv6 Address Allocation and Assignment Policy (RIPE)	http://www.ripe.net/ripe/docs/ipv6policy.html
IPv6 Address Allocation and Assignment Policy (ARIN)	http://www.arin.net/policy/ipv6_policy.html
IPv6 Address Allocation and Assignment Policy (APNIC)	http://www.apnic.net/docs/policy/ipv6-address-policy.html
IPv6 Address Allocation and Assignment Policy (LACNIC)	http://lacnic.net/en/ipv6.html

Thanks !

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- **Madrid 2005 Global IPv6 Summit, more info soon at:**
    http://www.ipv6-es.com