# Resource management: IPv4 depletion and IPv6 registration

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# Overview

▸ About IANA

▸ Resource registries

  ▸ IPv4

  ▸ IPv6

▸ Resource management

▸ Education and outreach role

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# Where is IANA?

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# IANA's role

- 3 main areas of responsibility
  - Protocol registration
  - DNS management
    - root DNS
    - .arpa and .int
  - Internet number resource management
    - IPv4, IPv6 and AS Numbers

# IPv4 registries

- ‣ IPv4 address space
- ‣ Multicast address space
  - ‣ Requests received from the public
  - ‣ Reviewed by an IESG designated expert

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# IPv4 registries

**NOT TO SCALE**

# IPv4 registries

ipv4-address-space

**NOT TO SCALE**

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# IPv4 registries

ipv4-address-space

multicast-addresses

**NOT TO SCALE**

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# IPv6 registries

- IPv6 address space
- IPv6 unicast assignments
  - Where each RIR has a /12
- IPv6 special purpose address registry
  - TEREDO and ORCHID assignments
- IPv6 multicast registry

# IPv6 registries

**REALLY NOT TO SCALE**

# IPv6 registries

ipv6-address-space

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# IPv6 registries

ipv6-address-space

unicast-assignments

**REALLY NOT TO SCALE**

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# IPv6 registries

**ipv6-address-space**

unicast-
assignments

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special

**REALLY NOT TO SCALE**

# IPv6 registries

**ipv6-address-space**

unicast-
assignments

multicast-
addresses

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special

**REALLY NOT TO SCALE**

# RIR address space management

- /12 assignments to RIRs
    - /32 minimum allocations to LIRs
        - /48 assignments to end users
- Room for a million allocations to LIRs
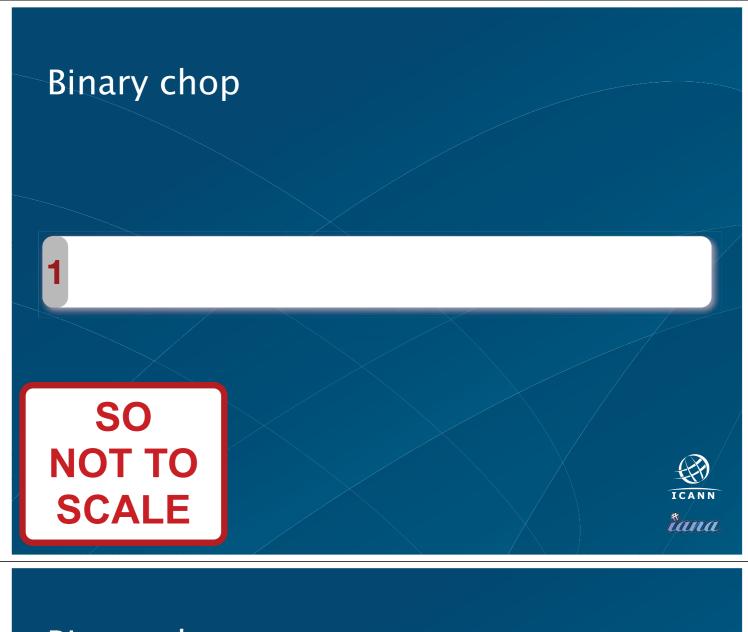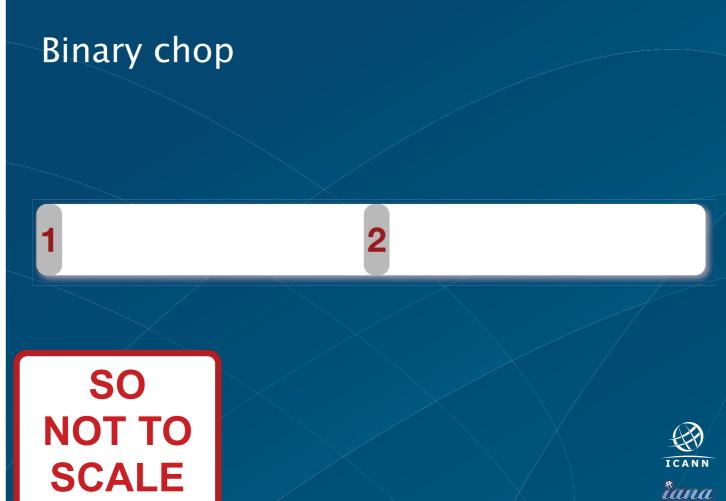- /12 chosen based on sparse allocation (binary chop) allocation method

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ACTUAL SIZE
MAY VARY
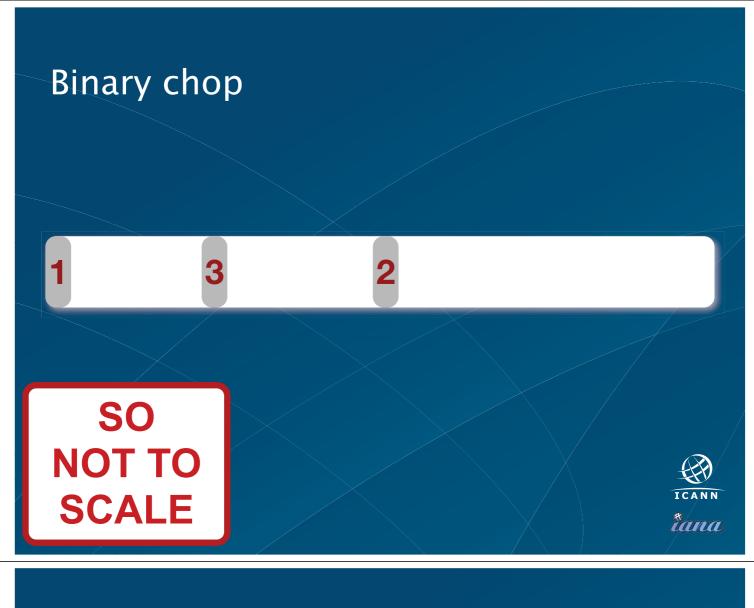
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# Binary chop

**SO NOT TO SCALE**

# Binary chop

**SO NOT TO SCALE**

# Binary chop

**1**

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# Binary chop

**1**  **2**

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# Binary chop



**SO NOT TO SCALE**

# Binary chop



**SO NOT TO SCALE**

# Binary chop

| 1 | 5 | 3 | | 2 | | 4 |

**SO NOT TO SCALE**

# Binary chop

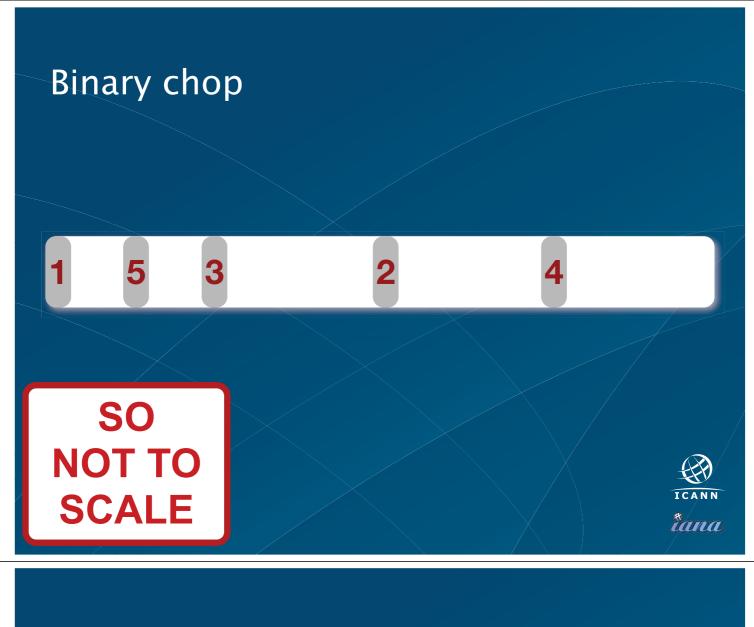| 1 | 5 | 3 | 6 | 2 | | 4 |

**SO NOT TO SCALE**

# Binary chop

| 1 | 5 | 3 | 6 | 2 | 4 |

**SO NOT TO SCALE**

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# Binary chop

- Sparse allocation maximises potential aggregation
- APNIC uses this mechanism
- The other RIRs don't

# Registry management

- XMLification
  - XML backend
  - Multiple publication formats
  - Support for non-Latin character sets
- XML directorate have been asked to review the registry schemas

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# Resource management

- IPv4 address space reclamation
  - 14.0.0.0/8 recovery
- 46.0.0.0/8 returned by BBN
- 49 and 50.0.0.0/8 status updated to reserved

# Discussion areas

- Potential for IPv4 market: formal or informal
  - Ongoing discussion in all 5 RIR communities

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‣ Encouraging IPv4 reclamation

   ‣ Working with RIRs to reclaim unused address space

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    - Working with RIRs to reclaim unused address space
- Used but unallocated address space
    - Article in IPJ
    - Talks at operators meetings

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    - Working with RIRs to reclaim unused address space

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# Thank you

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