

APNIC **33** CONFERENCE
27 February - 2 March 2012
NEW DELHI,
INDIA



APNIC IPv6 Pool Management

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Overview

- Background
- Current practice
- Issues discovered
- Solution
- Policy considerations



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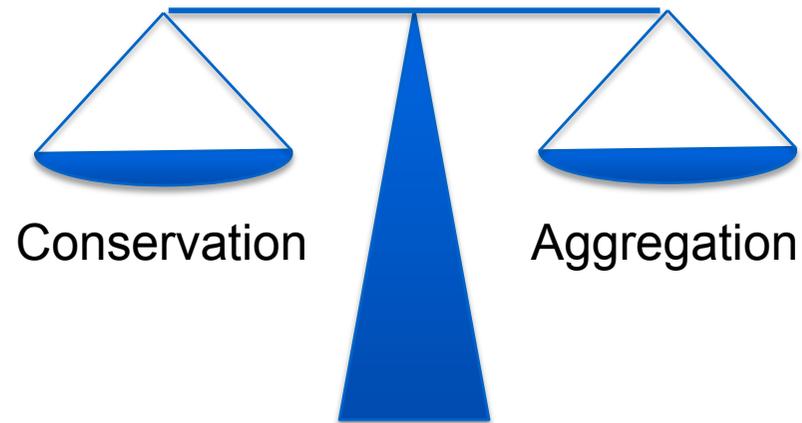
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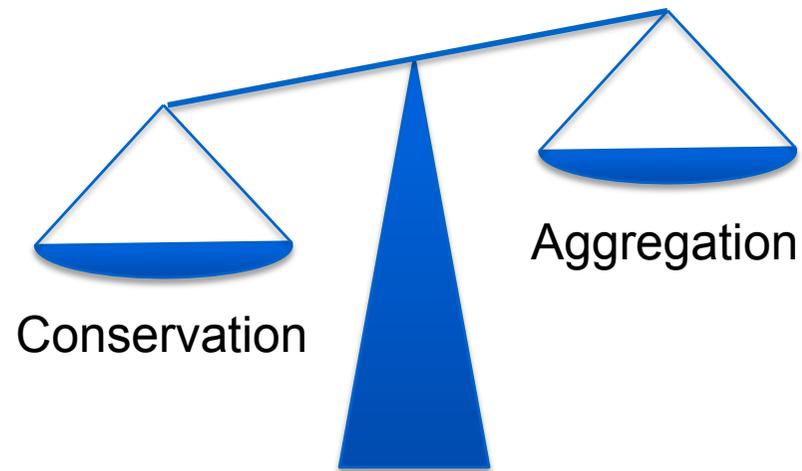
Background

- There are two IP address management principles which need to be balanced



Background

- IPv4's limited space put emphasis on conservation over aggregation
 - Results in heavily fragmented space and complex/large global routing table



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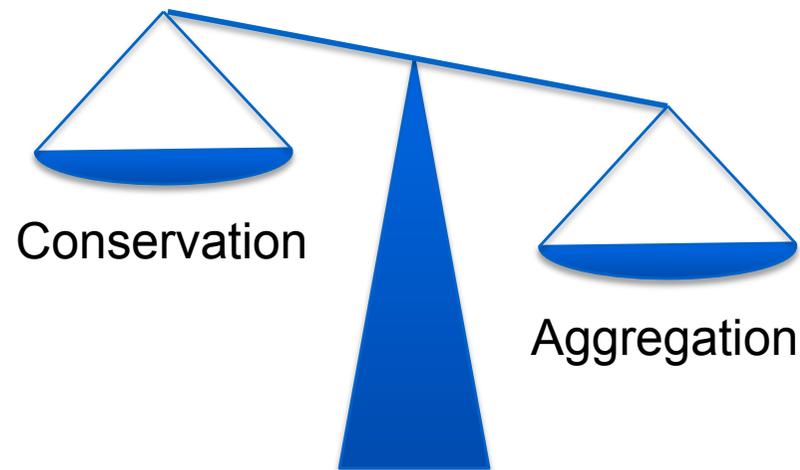
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Background

- IPv6's huge space puts emphasis on aggregation over conservation
 - Policies and practices should maximize long-term aggregation potential



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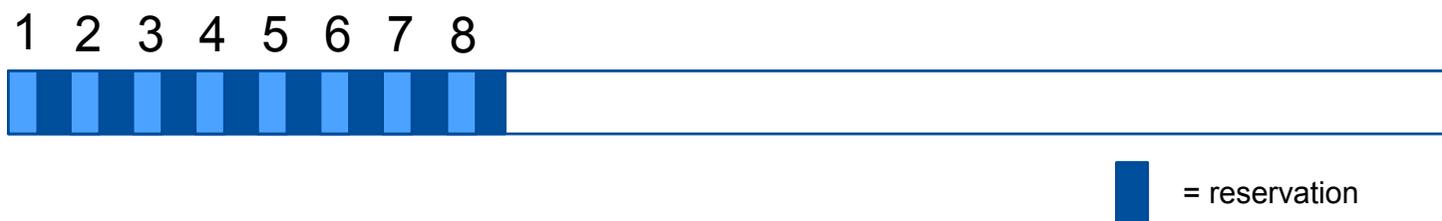
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What is Sparse Allocation?

Sequential Allocation:



Sparse Allocation:



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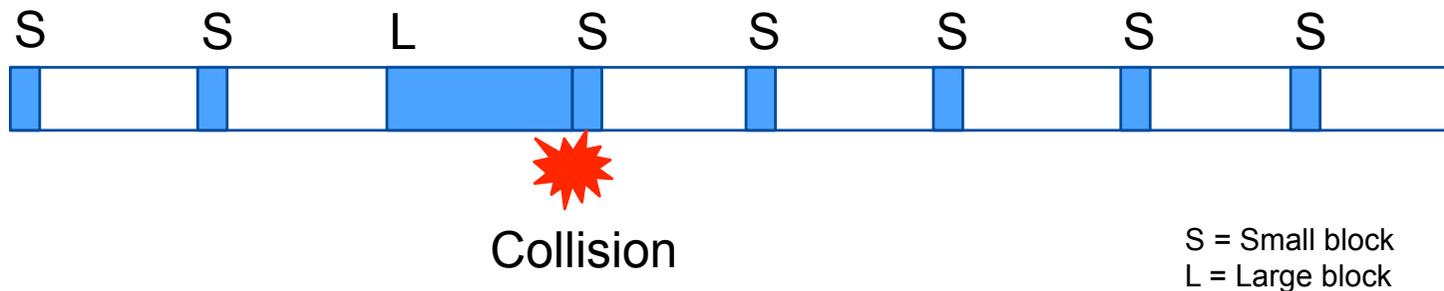
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Collisions

- Mixing large (fast-growing) and small (slow-growing) blocks in the same sparse allocation pool is problematic
 - Early collisions result in disaggregation
 - “Same size fits all” creates fragmentation



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Multiple Pools

- Use multiple large allocation pools
 - For example, one pool for very large/fast-growing blocks, the other for “normal”
- Reduced fragmentation as the larger blocks have more room to grow
- Still an informal “best effort” strategy
 - We cannot predict the future!

Current Practice

- APNIC currently has a single /12 IPv6 block (delegated 3 October 2006)
- Two sparse allocation pools
 - /13 pool for large (fragmented to /17)
 - /13 pool for small/medium (fragmented to /24)
 - No reservations
- So far, so good
 - But, collision is coming
 - Need additional pools for better management

Future Practice

- Designate additional separate IPv6 pools
- Introduce internal, administrative “reservations”
- Requires additional /12 from IANA
 - APNIC will qualify under global policy
 - Can submit IANA request shortly

IPv6 Address Pool Map

Example

Pool ID	Pool size	Maximum Reservation *	Maximum blocks
A	/13	/28	32,768
B	/13	/24	2,048
C	/13	/20	128
D	/13	/16	8

*) Reservations can expire and the space will be optimally used



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Selection Process

- APNIC/NIR hostmasters select pool on:
 - Economy size, population etc
 - ISP market share, customer base, plans, etc
- Note: still a best-effort process
 - Aim is to be “good” not “perfect”

Reservation Conditions

- Currently considered as an internal/administrative practice
- Reservations are not registered or certified
 - i.e. no authority to advertise or route
- Never guaranteed
 - May be advised to holder
 - Will be reallocated if/when necessary

Policy Considerations

- Address pool management (including sparse allocation and reservation) is currently considered as administrative practice
 - Chosen by APNIC staff/Secretariat
 - Must be consistent with all address policies
- Should any part of it be formalised in Policy?
 - Community decision
 - Proposals welcome as always

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Questions?

