Feedback From RIPE NCC Registration Services

Managing IPv4 Exhaustion

Andrea Cima | 16 May 2018 | RIPE 76

The Aim of This Update

- To report back to the RIPE community:
  - The feedback that we receive from LIRs
  - Highlighting potential problem areas

- Requesting guidance on these topics

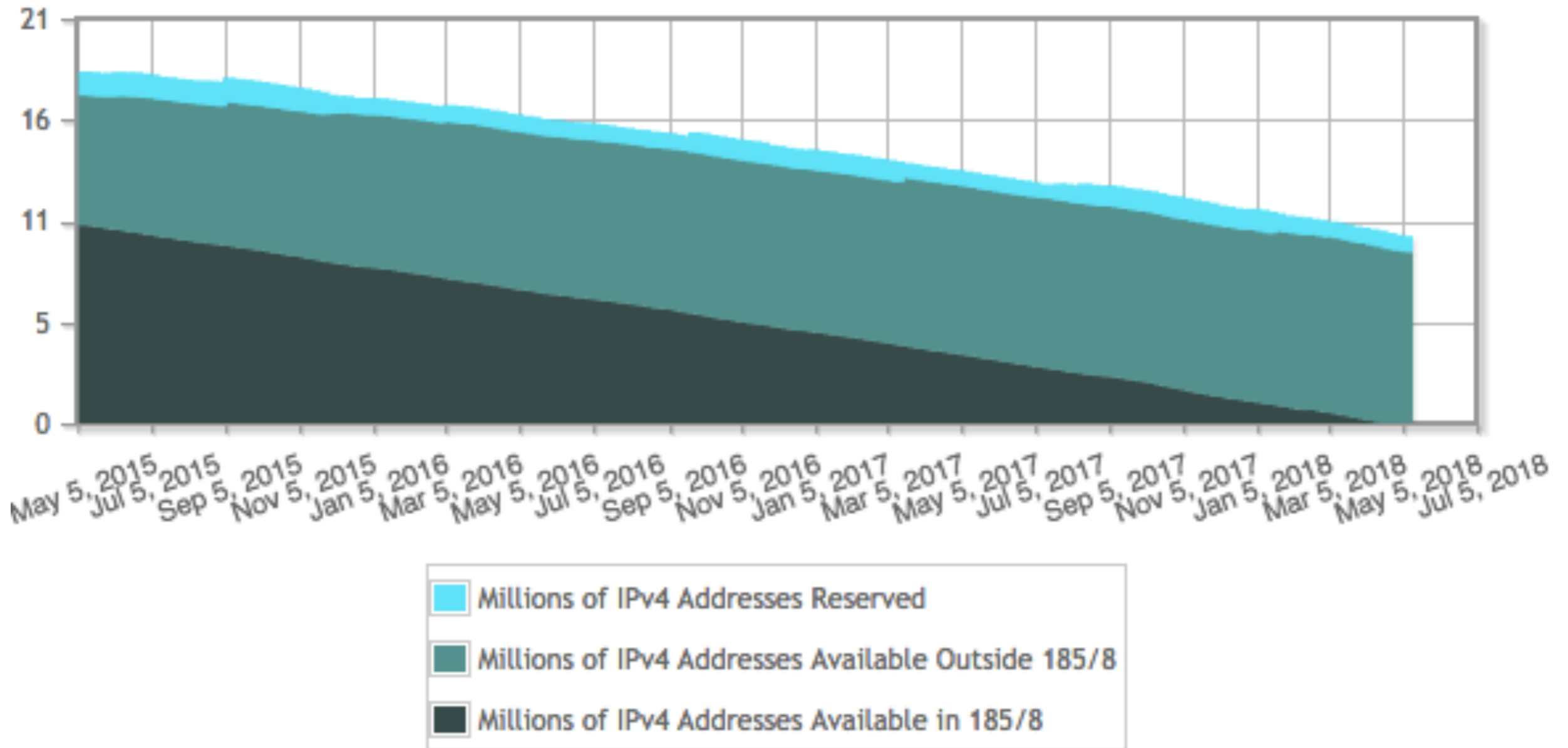- Providing input to the community for policy discussions

What I'll Cover

- Allocation practices towards IPv4 exhaustion

- After IPv4 exhaustion - what about returned addresses?

- After IPv4 exhaustion - is the IXP pool large enough?

Before IPv4 Exhaustion

IPv4 Available Pool

Legend:
- Millions of IPv4 Addresses Reserved
- Millions of IPv4 Addresses Available Outside 185/8
- Millions of IPv4 Addresses Available in 185/8

Steps Towards IPv4 Exhaustion

- Allocation practises based on prefix availability

  1. Allocate one /22 per LIR (±7700)

  2. Allocate /23s and /24s to make one /22 (±900)

  3. Allocate /25s, /26s, 27s, /28s, /29s to make one /22 (5) - ± 200 IP addresses left

  4. Allocate one /22 per LIR from the *unforeseen circumstances* pool (64) - ripe-680

  5. Exhaustion of the IPv4 address pool

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- What shall we do with IPv4 *dust*?

Temporary Assignment Pool

- *"The RIPE NCC is authorised to reserve pools of IPv4 addresses (…) for the purpose of direct assignment under this policy"* (ripe-587)

- /13 available for IPv4 temporary assignments

- Maximum contemporary usage: /15, /18

- Should the temporary assignment pool be reduced to /14, allowing 256 additional LIRs to receive a /22 allocation?

After IPv4 Exhaustion

What to Do With Returned IPv4 Addresses

Policy and Returned Addresses

- Current IPv4 allocation policy (ripe-680)

  - LIRs can receive one /22 from of the free pool

  - Returned IPv4 addresses are added to the free pool (section 5.3, ripe-680)

- What about when the IPv4 pool is exhausted?

  - Create a waiting list for returned addresses Like ARIN and APNIC?

  - Add returned addresses to the temporary assignment pool?

  - …?

Waiting List Options

- Who should be eligible?

- What should the allocation size be?

Waiting List Options

- Who should be eligible?

- What should the allocation size be?

- Is it worth it?

Simulation

Temporary Pool Option

- The RIPE NCC has a pool of IPv4 addresses for "…*events which require network connectivity for short periods of time…"* (ripe-587)

- Maximum contemporary usage so far: /15, /18

  - Usage could increase after IPv4 exhaustion

- Should we add returned IPv4 addresses to this pool?

  - How much should we let it grow?

Other Options

- Create a lottery system
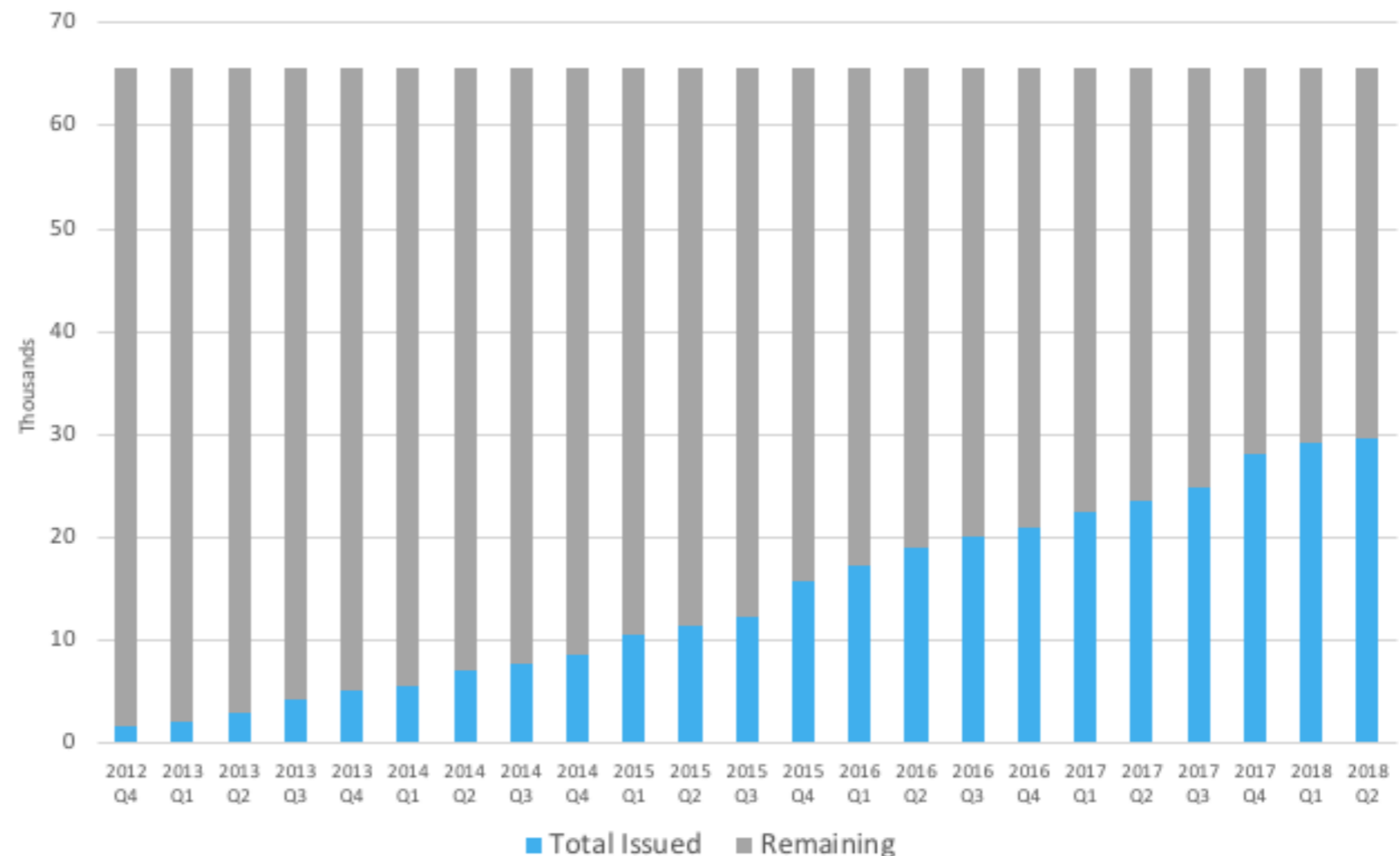
- Return IPv4 addresses to IANA

- ...?

After IPv4 Exhaustion

The IXP Pool

IXP Pool Size

- A /16 is held in reserve for IXPs (ripe-680)

- Possibly exhausted in less than four years

- Is the IXP pool large enough?

Discussion Points

- What to do with IPv4 *dust*?

- Should we reduce the temporary pool from /13 to /14 before IPv4 exhaustion?

- What should we do with returned addresses once we have reached IPv4 exhaustion?

- Should we increase the IXP pool size?

Questions

andrea@ripe.net