prop-047: eGLOP multicast address assignments

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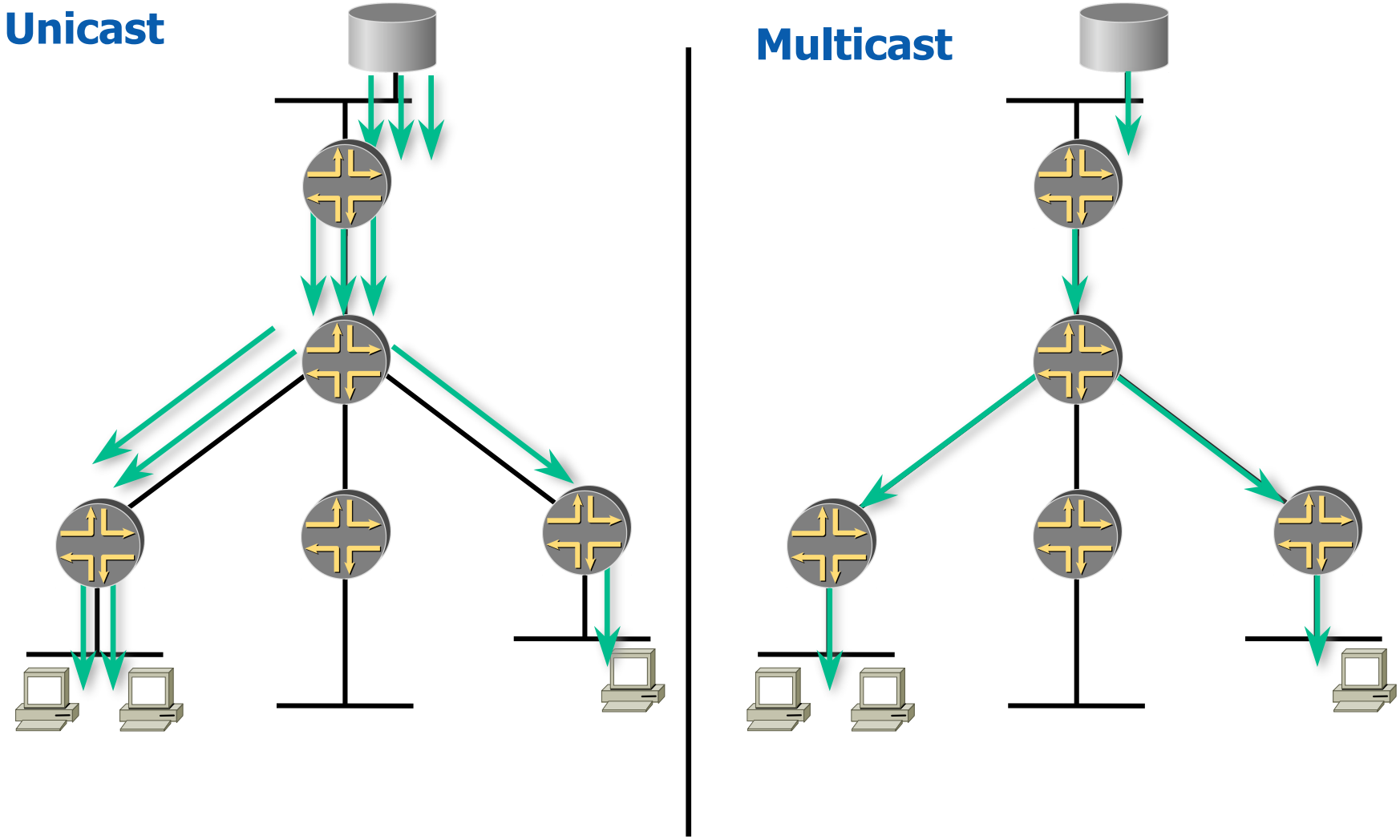
Bali
February, 2007

APNIC Meeting 2007

Multicast and Addressing

- Multicast is a means of distributing data on a one to many or many to many basis on the Internet.
- In Unicast, you send to an IP Address
- In Multicast,
  - sources send to a Multicast (“Class D”) address
  - Receivers request data from a Multicast address
  - The network takes care of the rest.
- Multicast address assignments have never been turned over to the RIRs…
  - Prop 047 would change this.

Unicast vs. Multicast



Some Uses for Multicast

- Any application with multiple receivers
  - one-to-many or many-to-many
- Periodic data delivery - "push" technology
  - stock quotes and other financial information
    - The original "killer app"
- Live video distribution
  - The new "Killer App"
  - Most new IPTV installations use IP Multicast

Two Service Models : ASM and SSM

- ASM: Any-Source Multicast. Traditional multicast – data and joins are forwarded to an RP.
  - If two services pick the same Group address, then there is a Denial of Service
  - So, there needs to be some mechanism of address assignment
    - SDR (a multicast application; now deprecated)
    - IANA
    - GLOP
    - "Make it up"
      - Actually, not uncommon and can cause bad problems
- SSM: Source-Specific Multicast. PIM-SM without RPs – instead, the source address is learned out-of-band, and the SPT is built directly to it.
  - Only the combination of the source address and group address needs to be unique
  - So, doesn't really need Address assignments
- Most new deployments are ASM, and ASM needs addresses.

Multicast Addressing

- IPv4 Multicast Group Addresses
  - 224.0.0.0–239.255.255.255 AKA 224/4
  - The “Class D” Address Space
    - High order bits of 1st Octet = “1110”
  - Source sends to group address
  - Receivers receive traffic sent to group address
- Some Multicast Address blocks :
  - 232/8 Source Specific Multicast (SSM) Block
  - 233/8 GLOP - RFC 3180 (originally 2770)
  - 239/8 Administrative Scoping - RFC2365

Multicast Addressing

- RFC 3171
- http://www.iana.org/assignments/multicast-addresses
- Examples of Reserved & Link-local Addresses
    - 224.0.0.0 - 224.0.0.255 reserved & not forwarded
    - 224.0.0.1 - All local hosts
    - 224.0.0.2 - All local routers
    - 224.0.0.4 - DVMRP
    - 224.0.0.5 - OSPF
    - 224.0.0.6 - Designated Router OSPF
    - 224.0.0.9 - RIP2
    - 224.0.0.13 - PIM
    - 224.0.0.15 - CBT
    - 224.0.0.18 – VRRP
- "Ordinary" multicasts shouldn't have to request a multicast address from IANA.
  – But, more and more do.

Multicast Address Allocation

- For a long time, this was a sore spot. There was no way to claim or register a Multicast Class D address like unicast address blocks can be registered.
  - For temporary teleconferences, this is not such a problem, but it does not fit well into a broadcast model.
- Now, there are solutions:
  - For SSM, addresses don't matter, as the broadcast address is really unique as long as the (S,G) pair is unique.
  - For ASM, there is "GLOP".
  - We are working to instantiate Extended GLOP (eGLOP) - the purpose of this talk at APNIC !

Multicast Addressing

GLOP addresses
- Provides globally available private Class D space
- 233.x.x/24 per AS number
- RFC 2770, replaced by RFC 3180

How?
- Insert the 16-bit AS number into the middle two octets of the 233/8
  - 233.x.x/24, where x.x is your ASN in binary.
- Online GLOP calculator: www.shepfarm.com/multicast/glop.html
- If you have an AS, you have multicast addresses.
  - Well, unless you got a 4 byte ASNs !
  - And, with the beginning of this year, people will have 4 byte ASNs.

Expanding Multicast Address Assignment

- GLOP based address assignment has worked well.
  - Every organization gets the same amount of space, a /24.
  - What if you need more?
  - What if you don't have a ASN ?
  - What if you have a 4 byte ASN ?
- People are going to IANA directly (not good)
  - 24 approved applications in 2006
- People are making them up (really not good!)
- There is mechanism for requesting more GLOP space: RFC 3138 extended GLOP, or eGLOP
  - It needs to be instantiated !
  - That's why we're here…

eGLOP

- The basic idea is very simple
- GLOP addresses
  - Provides globally available private Class D space
  - 233.x.x/24 per AS number, for ASN from 1-64511
- RFC 3138 eGLOP allows for assignments of Multicast addresses
  - 233.252/14 is allocated to eGLOP
  - This corresponds to the ASN 64512 - 65534 designated for private use.

eGLOP Proposal

- We propose that, from 233.252/14
  - Each RIR be allocated a /20 initially
  - They allocate a default /28, or 16 addresses
  - Multicast is not subject to CIDR, so addresses as small as a /32 could be allocated.
- An applicant MUST
  - show that the request cannot be satisfied using
    - Administratively Scoped addressing [RFC2365]
    - GLOP addressing
    - or SSM

eGLOP Proposal : Pros and Cons

- The proposed deployment will
  - facilitate multicast deployment and
  - get multicast address deployments out of IANA, which is not suited for it.
    - Also, the current situation is inequitable, as this IANA role is publicized nowhere.
  - This will also give us a means to try and stop "rogue" self-assignments.
- The only "con" we see is the effort required to set it up.

Any Questions or Comments ?