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And you thought a /48 was big

# Getting a /32

- Many EDUs and Gigapops/RONs are doing it.
- Most bigger EDUs can get a /32.
  - Students are “organizations” and get a /64!
  - Departments
  - Affiliates
  - Multiple campuses
- If/when you get one, the fun begins

# Managing a /32

- /32 has 16 bits of /48s and 32 bits of /64s
- Think about those numbers

# Addressing plans

- IPv4 background – 50k wired connections
  - UCB has 3 /16s
  - Some address blocks (e.g. 128.32/16) have been around for a really long time.
  - Heavily fragmented and not very aggregable
    - I'd prefer not to repeat the IPv4 situation.
  - Networks/LANs are separated *by administrative unit*.
  - Nets don't generally cross building boundaries.
  - Some depts want separate nets for workstations/servers; some don't.

# VLAN situation

- No VLANs across the backbone—totally layer 3
- VLAN numbers repeat in each router zone
- Not a real solution in and of itself

# Two options

- Router aggregation
  - Very nice technically
  - Delegate prefix to a router and create prefixes with router identifier+VLAN
    - 2607:f140:210:564::/64
    - <ucb-prefix>:<router-id>:<vlan-id>::/64
  - Aggregates very easily
  - But we have a /32 and we are considered an LIR...
    - Need to use SWIP/rWHOIS
    - Administratively, this addressing plan is difficult

# Two options

- Departmental aggregation/assignment
  - Act like an ISP and assign /48s, /56es, and /64s to departments according to policy.
    - See RFC 3177, ARIN policy
    - Need to assign so as to maximize aggregation: see RFC 3531.
  - Assign to departments, but try to maximize router aggregation.

# Misc junk

- Static addresses: did you know?
  - Cisco 6500 platform TCAM has only 128 bits for ACLs. An ACE that has an IPv6 address + port is not going to work unless the address is “compressible.”
    - EUI-64 and some other address types.
    - Static addresses that don't follow EUI-64 format may not work if you have address+port ACEs.
    - Thanks to Mike Van Norman for digging that up.
- DHCP addresses
  - 2607:f140:xxxx:xxxx:d::/96

# More misc junk

- How are folks addressing p2p links?
  - /64 is what we're *supposed* to do.
  - Randy Bush is complaining.
  - You can't pick a p2p mask that's too high.
  - /120 or maybe /124 is the longest.
  - We're mostly using /64s, but we're also testing /96es.
  - Don't need the space, but I like the hierarchy.

# The End

- *zzzz zzzz*