
What Would Jon Do [about running out of IPv4 Addresses]?

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What Would Jon Do (Now)?

- I haven't the foggiest idea.
- Could ask: what DID Jon do?
 - *Ask Danny Cohen*
- Which Jon? Probably different answers ...
 - The Internet guru (“Protocol Czar”)
 - The network researcher

Early History of TCP/IP

- Running out of address space was not high on TCP/IP research agenda. More urgent issues:
 - Making TCP work
 - Making routers and routing work
 - Interfacing LANs to WANs
 - Interworking with X.25 and OSI
 - Making congestion control work
 - ...

What does the record show?

- Cerf/Kahn paper: *IEEE TOC*, May 74: **8 bit network numbers**
- TCP v1: INWG Note 72, Dec 74: ??
- TCP v2: Cerf, IEN 5, Mar 77: **8 bits**
- Comment on v2: Postel, IEN 2, Aug 77:
 - **Variable length in 4bit chunks**
 - Hop-by-hop (src routed) forwarding

What does the record show?

- TCP v3: Cerf & Postel, IEN 21, Jan 78:
 - **Variable Length Net/Host addresses** in octet chunks.
 - **But:** network numbers assumed to be **8 bits**
 - TCP/IP split formalized in v3.
- TCP v4: Postel, IEN 41, June 78:
 - **Variable Length Net/Host addresses** in octet chunks.

Converging...

- *Latest Header Formats*, Postel, IEN 44, Jun 78.
 - **Fixed length 32-bit addresses.**
 - BUT: First byte assumed to be network number
- *Internet Protocol*, Postel, IEN 111, Aug 79
 - **Ditto**

The great divide!

- *Assigned Numbers*, Postel, RFC 776, Jan 81
 - Network numbers are still 8 bits
- *Assigned Numbers*, Postel, RFC 790, Sep 81
 - **32 bit addresses, classes A, B, C.**
- Did not invent CIDR
 - (Probably would have, if concerned about exhausting address space)

I remember...

- At one meeting, Jon and Danny pushed for variable-length IP addresses.
- Vint said “**NO. Too hard to implement!**”
 - Vint was ARPA PM, that closed the argument.
 - Jon grumbled from the back of the room.
 - Danny fumed.

So, what would Jon do?

1. Expand the address space to be so big that we will not run out in near future.
 - => PUSH FOR UBIQUITY OF IPv6
 - Or else find another line of work.
2. Re-introduce variable length addresses?
(probably not)