We’re sorry. The IPv4 address you are trying to reach has been disconnected.

Lori MacVittie, 2009-27-04

We know what the problem is. We know what the solution is. So why aren't we doing *something about it?*

Every year, around April Fools' day, someone pulls out the old "Internet Spring Cleaning" gag. For those of us who are not technical neophytes or have been "online" long enough, the joke is amusing but not nearly as much as when it originally appeared many, many, *many* years ago.

Is it possible, though, that one day the old "the Internet needs to be rebooted" gag might be *real?* That in order to get from here to there (IPv4 to IPv6) a complete shutdown of the infrastructure that makes "the innertubes" work might be necessary?

Roman Stanek recently discussed *yet another* problem with the depletion of IPv4 addresses; one that has the potential to very seriously negatively impact cloud computing services such as those provided by Amazon EC2.

In Can Cloud IP Address Be Damaged Goods? Roman points out, yet again,both the problem *and* the solution:

> The problem is the scarcity of IP addresses — Amazon.com doesn't have enough addresses to give every user a fresh new IP address with the new instance. And the solution to this problem is called Internet Protocol version 6/IPv6:
>
> *The very large IPv6 address space supports 2^{128} (about 3.4×10^{38}) addresses, or approximately 5×10^{28} (roughly 2^{95}) addresses for each of the roughly 6.5 billion (6.5×10^{9}) people alive today. In a different perspective, this is 2^{52} addresses for every observable star in the known universe – more than seventy nine billion billion billion times as many addresses as IPv4 (2^{32}) supports.*

We all know the depletion of IPv4 addresses is a problem. And we all know the solution is IPv6. And we've known about both for *years.* Many years, to be exact. Yet we continue to merely mention the fact that it is a problem and that there is a solution. We aren't *doing* anything about it. Not really. And given the economic conditions that exist today, it's unlikely organizations are going to be willing to invest in the kind of re-architecture necessary to support IPv6.

But even *that* isn't really a problem. There are plenty of solutions to the IPv6 –> IPv4 (and vice-versa) translation between public and private networks available. F5's BIG-IP has long offered such a gateway, and certainly routing/switching players like Cisco, Alcatel-Lucent, Nortel, Juniper, and others have similar solutions capable of supporting the transition from the old (IPv4) to the new (IPv6). Operating systems like Linux long ago implemented IPv6 support, and thus the myriad Linux-based SOHO edge solutions are also capable of handling IPv6. The technology exists – and has existed for some time - to both support IPv6 completely as well as a hybrid environment in which both IPv6 and IPv4 must communicate. But these solutions – all of them – simply support *migration efforts*. They don't really help solve the underlying problem unless we're actually moving toward IPv6.

And it certainly appears that we aren't.

WHAT'S THE HOLDUP?

So why aren't we moving to IPv6 yet?

Honestly, I'm not sure. It could be that there are so many moving parts that make up the core Internet backbone that some are *not* capable of managing IPv6. It could be that the magic of DNS that makes finding the right IP address so simple is still primarily configured to return IPv4 addresses and not IPv6. The root servers upon which every other DNS server ultimately relies are still spitting out IPv4 – not IPv6.
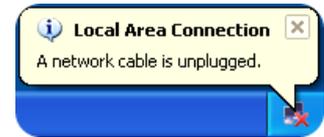
Perhaps the problem is that in order to move, en masse, to IPv6 we might actually need to "shut down the Internet" and give it a good kick in the old routing table. And not just in the US, but *globally.* The effort to coordinate such a massive, global move from one standard to another is mind-boggling, and there's no real way to know how many applications, devices, and network operations would simply cease to work if we were to attempt such a crazy thing.

I don't know why we aren't moving toward adopting IPv6. We've been harping on the problem for years and we know what we have to do, but we don't seem to be doing it. Maybe it's just a lot more complex than it appears on the surface, and I'm certainly willing to grant that. The number of moving parts that have to be reconfigured, upgraded, and tested to see if they work with other systems – outside the realm of each provider's control – is enormous. The challenge inherent in trying to get all the disparate providers and organizations that rely upon the Internet to simultaneously upgrade, update, and test interoperability seems nearly impossible to overcome.

But one day we're going to have to do it. And if that means "shutting down the Internet for a reboot" then that may well be what it requires.

Just thinking about that is amusing. An entire day, at a minimum, with no Internet. Not just the "I'm staying away from the Internet" but a technologically enforced "no Internet day".

Sounds to me like it could become the first globally recognized holiday.

- What ever happened to IPv5?
- IPv5 – What was it?
- Internet Spring Cleaning
- The Days of IP-based Management are Numbered