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Mitel Makes Another Acquisition

As mentioned on page 2 of InfoTelecom #12 (December 2014), Mitel is in acquisition mode. The latest is Texas startup Mavenir Wireless, for US$560 million. "This is a perfect match," declared Mitel CEO Rich McBee from this year's Mobile World Congress in Barcelona. McBee said the deal will give Mitel access to fast-growing wireless products while Mavenir will be able to tap Mitel's global sales network. "This is a growth play," said CFO Steve Spooner. "It is not a synergy play." What Mavenir offers is strong growth — revenues last year were up 28 per cent year over year and the company has a strong backlog of orders from many of the globe's largest mobile carriers, including AT&T, T-Mobile and Vodafone.

BACK TO THE FUTURE PART IPV6

DAVID CROWE

David Crowe has been involved in the telecom, IT and wireless industries since 1984, and a consultant in standards, system design and numbering systems since 1992. He runs his own consulting company, Cellular Networking Perspectives, is on the board of IFAST (ifast.org) and is chairman of TIA subcommittee TIA TR-45.8. David is a member of the Community of Telecommunications Consultants (CTC) *and can be reached at (403) 289-6609 or David.Crowe@cnp-wireless.com.*

IPv6 is designed to deliver one new capability to the Internet, a massive expansion of the available Internet addresses. There is only one problem. It won't do this. And there is a meta-problem, Netizens are in denial about problem number one.

As I write this, following on the heels of my VoLTE article (InfoTelecom #12, December 2014) in which I pointed out that VoIP over cellular systems had been promised, not since the dawn of 4G LTE, but since the dawn of 3G in 1999, I fear that I'm going to become known as the luddite of high tech, pointing out flaws that everyone knows cannot exist because big companies do not invest in flawed technologies. Well, the history of technology proves that they do. And that universal consensus is not the same as universal correctness.

With IPv6 the situation is even direr than with VoLTE, because IPv6 was defined even earlier, in 1996, and is still getting more lip service than IP service.

It seems particularly crazy for me to criticize IPv6 when it is getting installed in more and more equipment, and sometimes the IPv6 protocol stack is used instead of the IPv4 protocol stack. But this misses the point. The question to ask is 'When will IPv6 increase the address space of the Internet?' The answer is ... not until IPv4 can be turned off. And when will that be? Here are all the answers from a 2014 discussion on quora.com:

> "I think it is safe to say 'never'."
> "I'd estimate it will take on the order of hundreds of years for IPv4 to go extinct."
> "Not for a long time."
> "Never."
> "At least in America, it is hard to see the replacement."
> "NEVER EVER EVER."
> "IPv6 never ever replaces IPv4 completely."
> "Never."
> "It will take maybe 20 years yet only hybrid stacks will exist."
> "IPv6 will never replace IPv4."

By contrast, on discussion sites, such as gossamer-threads.com, populated with IPv6 credents, there is just bewilderment at the rest of the world, which is apparently populated entirely with non-believers. Bad things that happen in the world of IPv6 are simply blamed on IPv4. "Perhaps if we make our IPv6 sites difficult to access from IPv4, people will get the message?" they muse. But they know that the answer is, if they do that, their sites will simply not get accessed.

We are moving into an environment where more and more systems will be dual-protocol-stack IPv4/IPv6 while a significant portion of the Internet will remain IPv4 only. But virtually none will be IPv6 only. Even this step, which might gain us nothing, is taking longer than predicted. The editors of the Internet Protocol Journal recoiled in 2011 from an estimate that the transition could take 80 years (pointing out that the expected lifetime of IPv6 was less than that) and pessimistically predicted 5 years of dual IPv4-IPv6 protocol stacks before a full transition. Well, it is now 4 years into that period, and it is clear that we are still early in the dual-stack process, and not significantly closer to a pure IPv6 world. Perhaps the 80-year estimate is more reasonable.

The problem with dual-stack is that the one and only benefit of IPv6, relief on the IPv4 address space by providing more addresses, will not be achieved, because every stack still needs an IPv4 address. So hybrid stacks are A TOTAL WASTE OF TIME (apologies for shouting).

Looking at the problem from the other direction, many people have noted that the IPv4 address is only 32 bits, providing just over 4 billion unique addresses, clearly not enough for the future. In fact, how is it enough for today when there are more people than that on the planet? The answer, the saving grace for IPv4 has been the 16-bit port number, implemented in the same fashion in TCP, UDP and other major transport protocols, that essentially extends IPv4 addresses to 48 bits, upping the theoretical number of addresses to 281 trillion.

This theoretical maximum cannot be achieved, because Internet servers generally need a static IPv4 address, and thus block the use of about 64,000 port numbers (216 to be precise) even if they only actually use a handful of them. Furthermore, one Internet user, such as a web surfer, may consume many port numbers (500-2,000), at least for a short time, while a complex page is loading. On the other hand there are a number of newer protocols, such as HTML4, that reduce the number of simultaneous ports needed for common operations like loading a web page.

But even if only 4 trillion out of 281 trillion addresses could actually be used, we probably wouldn't have a problem with IPv4 running out of addresses even in our grandchildren's lifetimes. We have time to do it right, design IPv7 and ditch IPv6 on the scrapheap of abandoned IETF RFCs.

IPv7? Yes, we need to start over again with a total redesign.

Ironically the header format of IPv7 could be the same as IPv6. The protocol format has never been the problem. As computer expert D.J. Bernstein wrote in 2003, "The IPv6 designers made a fundamental conceptual mistake: they designed the IPv6 address space as an alternative to the IPv4 address space, rather than an extension to the IPv4 address space." Actually, it was worse than that, they designed IPv6 as a completely separate network.

There was, for example, no defined translation to and from IPv4 headers and back again, so that a variety of *ad hoc* solutions had to be invented, all of which had a variety of problems.

DNS servers should have been designed to accept a single query, to know what the native protocol of the domain name host is and to provide the best address knowing the preferred protocol of the user. Instead of this, parallel DNS queries are used, with both DNS servers trying to provide an address, even if one of them is a fake address, requiring protocol conversion. Furthermore, if two queries are sent out, the first response will likely be used for efficiency's sake, resulting in wasted traffic.

A second supposed advantage of IPv6 that is sometimes touted, is the elimination of NAT, or Network Address Translation. This derives from the fact that NAT is the way in which a limited pool of IPv4 addresses can be expanded through the clever use of port numbers. Given the larger pool of addresses, NAT would not be required for this job. However, NAT has other uses, such as in firewalls, and mobility management, and probably would stay around even if IPv6 was fully implemented. Companies enjoy having their own IP address space internally, with total control over the connections to the outside world (even if the security-by-obscurity advantages are not as great as believed).

Although NAT is hated by Internet purists, and did break some protocols (such as Mobile IP), all new protocols have matured

Is Your Data Safe in the Cloud?

Corporate employees continue to expand their use of the cloud, an overall trend that simultaneously continues to increase risks to data security, according to a quarterly look at cloud usage published by IT security company Skyhigh Networks. In Q4 2014, the average company used an incredible 897 cloud services, a 43% increase over the same quarter a year earlier. The average employee uses 27 different cloud services. About 11% of all documents stored in the cloud were shared with people outside the company, while a fifth of those documents were shared with non-corporate email addresses. By the end of 2014, 1,459 services – only 17% of those tracked by Skyhigh – were offering multi-factor authentication, while 533 were certified using an international security standard known as ISO 27001. The growth in cloud adoption, however, is outpacing the efforts to manage and secure its use.

knowing that NAT exists, and virtually all that are widely used today have solutions.

A third supposed advantage of IPv6 that is touted is that every device could go back to having a unique IP address (if NAT is eliminated), and thus would be globally addressable. The problem with this so-called advantage is that servers already have a static, global and unique IPv4 address, and clients, particularly portable devices (laptops) and mobile devices (smartphones) don't benefit from a static address, and can't use one. If you check your laptop or smartphone today, if you have two interfaces active (say, Ethernet + Wi-Fi or Cellular Data + Wi-Fi) you will have two completely different IP addresses. And those will change if you plug into another Ethernet network, pick up a new Wi-Fi signal, or roam into another cellular carrier's network. The problem is that an IP address (v4 or v6) is not really an address for clients, it is only an interface identifier. When you activate, say, an email client on your device, your current IP address will be sent to the email server, to which the server will respond. But it will not keep your IP address because it has no way of knowing if the next time you check email, the same address will be in use.

Internet clients do have addresses, but generally they are application-specific, managed by a server-in-the-middle. IM handles, Facebook names, Skype addresses, Twitter names, and so on. The use of IP addresses is almost completely hidden from the clients. And little good it would do you if you knew the IP addresses of your friends on Flickr or Instagram, unless you want to boost your nerd credentials or install malware.

The biggest problem with IPv6 is denial. The IPv6 enthusiasts refuse to believe that the technology is dead. In fact, such an idea is impossible for them to even conceive. But this state of denial has led to nobody, except perhaps me, ever identifying the need for IPv7.

At some point in the future, some will start to experience the limitations of IPv4, quite severely, and it will be recognized that IPv6 cannot solve those problems. Until then I predict that IPv6 will mainly be the way to distinguish between high-tech/"with it" tech companies versus those who just consider themselves users of the Internet. IPv6 implementations will crawl slowly upwards, but the number of effective addresses on IPv4 will continue to dwarf those in use on IPv6 and the expansion of the address space will be virtually zero.

Where IPv6 could get some use is within single-operator networks, where it could provide a near-infinity of private addresses, that would be dynamically converted to external public IPv4 address plus port number, when user traffic enters the Internet – accomplishing the same job as IPv4 NAT networks have for years, but in a much cooler way.

IPv6 can't do what it claims to do because to change every Internet device in the world, including web servers, Internet routers, home and office gateways, computers, cellphones and more, would require a global, concerted effort, probably with massive funding for parts of the world where a complete swap-out of Internet infrastructure is economically infeasible. And there are no benefits until the transition is completed. Generally, ideas that require global governance or even global coordination do not get off the ground, particularly not with our friends to the south (remember the metric system?). And when was the last time the United Nations reached unanimous approval for anything?

On the other hand, if IPv6 was re-imagined as IPv7, with backwards and forward compatibility built in, it would be possible to have an integrated solution, whereby the number of IPv4 addresses required would slowly diminish, so that the benefits of a larger address space would accrue before total world domination of the protocol. IPv7 devices would be able to address IPv4 servers through intelligent DNS servers and simple, standardized header converters, and vice-versa, so people could buy single-stack IPv7 equipment without cutting themselves off from the rest of the world. A better protocol is possible, we just have to admit we need one.

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