

READY, SET, BOOST: IPv6 LAUNCHES A BIGGER INTERNET



➤ Internet Protocol version 4, or IPv4, the widely deployed addressing protocol for the Internet, is running out of space. Fortunately the next generation protocol, IPv6, is ready to go. But there hasn't been a rush to IPv6 because some enterprises have been waiting on carriers and ISPs to take the lead, which has slowed adoption. This delay has caused some concern because the world is expected to run out of IPv4 addresses by the end of 2011.

"We are seeing a resurgence of interest in IPv6 in the past few months," says Jayanth Angl, a Senior Research Analyst at Info-Tech Research Group in London, Ontario. "This has been tied to big news stories – there is definitely more interest now."

There is phenomenal growth in devices that will require IP addresses, from smartphones, to appliances and automobiles. In fact, some reports have suggested that the exhaustion of IPv4 addresses will result in a serious barrier to entry for many businesses. However, a closer look suggests that the transition to IPv6 can occur without major disruption.

"The IPv4 legacy will remain for some time," explains Warren Bridle, Senior VP, Service Delivery at Q9. "There is software that can handle both IPv4 and IPv6 by running a dual stack. Eventually IPv4 will start retiring as opportunity allows itself, but this could take a number of years. If someone has IPv4 only, then they won't be able to reach an IPv6 device. As a result, most if not all of Q9's network devices will be dual stack until we retire that last address."

Angl from Info-Tech agrees with this approach, saying that

internal networks have some breathing space, because they will not immediately require full IPv6 enablement.

"IPv4 and IPv6 will be coexisting for many years," says Angl. "Internal networks haven't seen the immediate business benefits; as a result, there will be an extended period of coexistence with dual stack configurations. We will be living with this for some time."

Part of the reason for the cautious response is that there hasn't been a strong business or technological argument for the move to IPv6, in part because there haven't yet been any issues in getting addresses for enterprise networks in North America. As well, IT departments are naturally cautious, and can be reluctant to be the first to adopt new technology.

"So far network address translation (NAT) has sufficed for internal purposes," says Angl, adding that NAT's ability to remap one IP address space into another effectively extends the capabilities of IPv4. Ultimately, however, the favoured choice will be IPv6. And a big reason for this isn't only the scarcity of IPv4 addresses; it has to do with some new capabilities that IPv6 brings to market already.

"There are clear benefits to the new standard," says Angl. "IPv6 has auto-configuration which gives it a plug-and-play feel, and security is built into the standard."

As well, alarmists who claim that the retiring of IPv4 could be the 'end of the Internet' are missing the point: IPv6 vastly extends the Internet's capabilities, and will allow it to deliver on the promise of being a truly pervasive network, with more flexibility in allocating addresses and routing traffic due to the elimination of the need for NAT.

"That's the nice thing about IPv6," says Bridle from Q9. "You

can give a public IP address to just about anything – you don't need that extra layer, which can at times add some latency and application issues."

GETTING READY

Despite the fact that the transition is expected to go smoothly, it is true that there are some challenges ahead. After all, as the four billion IPv4 addresses run out there could be a real negative effect on the number of new devices able to connect to the Web. In the United States there have been some advance reports on carrier and ISP readiness, though so far Canadian providers have kept quiet, as have many enterprises. But that doesn't mean they aren't addressing the issue behind the scenes.



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Senior VP, Service Delivery, Q9**

"We are actively working on it today," says Bridle.

Bridle says that Q9's customers can expect the company to be on the forefront of the curve during their transition to IPv6. He also feels that Q9's customers with IPv4 addresses are increasingly aware of the coming transition to IPv6.

"The American Registry for Internet Numbers (ARIN) has sent out letters to all of their customers at the CEO level," says Bridle. "ARIN suggested dates for when they will no longer be allocating IPv4 addresses, and suggested that organizations begin to

implement IPv6."

Bridle says that a lot of carriers have allocations that they haven't yet used, but it is inevitable that at some point they will have to go to ARIN, which requires that 80% of an allocation be used before a new request is made. At that point, when a carrier or enterprise is down to the last 20% of its remaining numbers, ARIN may only be able to offer IPv6.

"That could then result in a significant amount of planning and equipment upgrades," says Bridle, adding that Q9 is well on its way to prepare for IPv6, investing in new equipment and building IPv6 into its long-term vision.

"We have had an allocation for some time," he says. "We got our first IPv6 allocation from ARIN almost four years ago."

The big Internet players like Google and YouTube are IPv6 enabled, and on the carrier side in the United States, Comcast has begun IPv6 trials, with Sprint having completed the first phase of its IPv6 deployment. As well, about 20 percent of NTT America's customer ports are IPv6 enabled, and 40 percent of NTT America's peering ports are IPv6 ready.

"Comcast and Sprint have been pretty public about their IPv6 trials," says Angl. "As carriers present their strategies for moving in that direction, we will then see the enterprises follow. I think the carriers and ISPs really need to be leading with this."

Angl says there has been a 'chicken-and-egg' scenario: carriers don't see the business case unless there is a sizeable customer base, yet customers are reluctant to proceed unless they can be assured that the IPv6 applications and services are available.

"The push will come from the carriers and ISPs, and then those enterprises and organizations with a public facing presence," says Angl. "For example,

Google is pushing forward and has been a vocal proponent, because they know there are important benefits."

SOME REAL ADVANTAGES

Though many enterprise networks will be able to get by for some time by using NAT with their allotted IPv4 addresses, it is the front-line demand for IP-enabled devices that will drive adoption. This new, dynamic world of IPv6 – with access to a practically unlimited number of addresses – could then be understood as something that delivers real value to enterprises.

"Over time the problem has been building, with more resources needed to support and configure network devices, and by removing the NAT you can be a lot more liberal in your allocation," says Bridle. "IPv6 will improve address management, simplifying routing aggregation on the Internet as a whole."

This is important from Q9's perspective because one of the services the company provides is Internet bandwidth, which usually requires an allocation of IP addresses. When this occurs Q9 can discuss the advantages of IPv6 with its customer base.

"IPv6 came out of research facilities and universities, with input from the big vendors – there was a lot of thought put into IPv6 development over many years," says Bridle. "As a result, IPv6 has imbedded features such as the ability to multicast, as well as encryption within the protocol itself."

One important concern: the earlier people act, the less costly the transition to IPv6 will be, because as demand increases so might the expense in terms of resources and technology. The good news is that many of these costs can be absorbed within routine upgrades in hardware and software.