

# IPv6: The Next Generation

IPv6 Forum president Latif Ladid talks to InterComms about the opportunities that come with IPv6



Latif Ladid, IPv6 Forum President.

**Q: What is the problem with IP at the moment?**

**A:** IP is like the phone system. When you run out of numbers, you extend the phone numbers in order to extend the hierarchy and give each house or each person a number, later on keying in mobile phones. We are going through the same thing with IP today. IP can theoretically connect 4.3 billion numbers, although we can efficiently use only 20 percent of the address space. Currently we have 600m servers connected, but no single devices, no desktops or cell phones. They are not using real, routable IP addresses. They are using just a private IP address connected to a single global IP address. In Russia today, it could take two to three years to get a number, so they give a building a single phone number so that when you ring that number, it rings in all twenty apartments and they can all listen in. The Internet functions like this today. IPv4 has become a 'communist protocol'; it is not an individualised or self-personalised presence.

IPv4 will hit the wall in two years time. By the 1st April 2011 you won't be able to do the following: connect new routers so no new email or servers; developing countries who are now joining the Internet,

won't be able to because, no new web servers, means new websites can't exist.

Internet penetration is growing rapidly, but still we have reached only 20 percent of the world Internet penetration which means that we have used 80 percent of the current Internet address space just to connect 20 percent of the population.

**Q: What do we do for the other 80 percent?**

**A:** This is where IPv6 comes in. It takes care of the other 80 percent, plus all the things that we couldn't do with IPv4 like giving every device its own address. In the future you will be doing VoIP on your cellphone. Skype has already demonstrated that it is the cheapest way of doing voice so, these big expensive cellular machines, which cost billions of dollars will be replaced by routers and will do it for a fraction of the price. A device that costs more than \$20 will be connectable to the Internet. You then can choose to connect or not, or put them into your private network.

**Q: What sort of applications might we see for IPv6 enabled devices?**

**A:** You can use it for energy saving for example. Studies done in Japan, connecting all the heating, lighting and other power systems in one, 30 floor building found they could reduce the power bill by 35 percent. If you can reduce it by that amount, in 20 years you can build a brand new building from the savings alone. The magic is networking. If it was doable before then IPv6 would never have happened.

**Q: Are there any stop gaps to prolong IPv4's life?**

**A:** When you have a puncture on your bike, instead of changing the entire tyre you stick something on it and it keeps you going for a while. With network address translations, instead of giving everyone an IP address, we

have a global IP address among so many people. You have three types of private address space, one of which that keeps up to 16 million addresses and that is used by the 3G guys and the ISPs. One case we have is Comcast in the US. They have 20 million customers, so they are bigger than the private address space and have established two parallel net networks. That means they won't be able to manage them very well because they will have collisions between IP addresses connecting their two networks. However, to manage the homes where they have the set top boxes, they have decided to use IPv6 to get direct access to each box so that they will be able to manage them in terms of downloading new software which will make it a lot easier.

**Q: Why is IPv6 so important in terms of functionality?**

**A:** It is not only a phone number but a function too. So, for instance if we had global IP addresses you could actually build a little net between the two of us. I can call you directly, so I don't have to go through Skype. If you have an IP address to your home and you have DSL there, you will be able to ping directly. If you have a camera, you will be able to ping to it and look through the camera. If it is rotatable, you can rotate it in order to see what you want. Today that is not possible because you have to go through a third party. He can do it for you but it then becomes very expensive.

A lot of people have not yet really studied the implications. They look at IPv6 with IPv4-eyes or primarily with Net-eyes. They can't comprehend what you can do with IPv6. Microsoft recently announced Direct Access to replace VPN. The VPN of today is something which can tunnel through IP but it is complex and you have to have IPv4 address on both sides, otherwise it will not accept the connection. Now you can use IPv6 without even touching IPv4 because each

- ▶ device has its own IPv6 address. At the edge I have IPv6 but in the middle I have IPv4 but I communicate between IPv6 tunnelling through IPv4 and connect to another IPv6 as if IPv4 didn't exist.

You can be within the network at the company site, connected with IPv6 with direct access and you can connect to anything within that network. Once you take your laptop and you walk out of the office, if you have a connection, the network will always say you are within my network and the means of access is irrelevant.

**Q: Within government and industry, is there an appreciation of IPv4 gridlock and what can be done?**

**A:** Reaching the CTOs and CEOs that make the decisions is very difficult. Technical experts explain this to them but they do so on a volunteer basis. Major vendors haven't fully appreciated the problem yet.

ISPs today are the new monopoly of the Internet. We used to have telephone monopolies. Now we have Internet monopolies. ISPs have not understood that making money out of the Internet is primarily content driven. Content providers are more intelligent in doing this. By 2011 however, ISPs will not have enough addresses. That will be the end of growth and the business model which is locked around certain monopolies. This is where government can come in and say this type of non-competitive environment is not healthy for the economy. Governments, as the largest consumers, and customers could require ISPs to provide them with an IPv6 service and continue to provide the Internet and connect new customers and taxpayers. This is why the US Department of Defense has done this, which has prompted a lot of interest in the US as well as the EU with plenty of funding. Some countries like Japan are more aggressive and have been incentivising ISPs and users for some time so that they can be the first and early adopter of IPv6 products.

