The Broadband Forum is Making Progress on IPv6 Global Initiatives

By Robin Mersh, CEO of the Broadband Forum

Robin Mersh is the Chief Executive Officer of the Broadband Forum and has been with the organisation since July 2006 as its senior full time executive. He has worked in the telecommunications industry for over 17 years and he now leads the operations, strategic development and liaison efforts of the Broadband Forum.

Architecting the connected lifestyle, the Broadband Forum is now the central body for end-to-end multi-service architecture development and network specifications. This organization, comprising around 200 members of the world's leading service providers, equipment manufacturers, chipset vendors and other key organizations, defines best practices for global networks, enables service and content delivery, establishes technology migration strategies, engineers critical device & service management tools, and continues to redefine the meaning and reach of broadband. The Broadband Forum's formal Technical Reports and white papers are publicly available at www.broadband-forum.org.

There is no doubt that the Internet has changed the world in which we live and communicate. In fact a world without the Internet now seems an impossible thought. The insatiable demand for access to the world wide web is today presenting a challenge to the industry because the number of unique IP addresses critical to identifying individual devices and applications are running out more quickly than originally anticipated.

We continue to connect more and more devices over time thanks to a combination of NAPT (Network address Port Translation) and a big pot of 4 billion unique IP addresses that we have been steadily pulling from. Sometime in the next year or so, the ability to get more IPv4 addresses will end, leaving us only NAPT. Even as markets emerge for trading of IPv4 addresses, the overall number available remains fixed, limiting the growth of the Internet as we have come to expect.

The Broadband Forum, which comprises some 200 of the industry's leading service providers, equipment and chipset manufacturers, and research establishments, has already been addressing this key issue and earlier this year it published Technical Report (TR) 187 "IPv6 for PPP Broadband Access"– the first in a series of reports designed to help operators move their networks smoothly from the current generation of addresses – known as IPv4 (internet protocol version 4) to IPv6.

TR-187 updates Point-to-Point (PPP)-Based Broadband Forum architectures with all the details necessary for the deployment of IPv6 Internet Access alongside IPv4, known

▶ as "dual-stack" IP access. This augments and updates previous Broadband Forum TRs TR-59, TR-101, and other documents that describe PPP-Based IPv4 access. Using the IPv6 connectivity highlighted in TR-187, service providers will be able to provide basic IPv6 services like tiered internet access, although there still needs to be work done on more advanced IPv6 based services like IPTV.

It has been known since the 1990s that IPv4 addresses would run out and initiatives such as Classless Interdomain Routing (CIDR) and Network Address Translation (NAT) were started to prolong IPv4 until the next-generation IP protocol (IPv6) could be completed. The IPv6 specification is now complete and projections by scientists in the Internet community indicate that the free pool of global IPv4 addresses is likely to be exhausted very soon (2011-2012).

While IPv6 was created to meet the requirements of the ever-growing demand for public IP addresses, during its development a number of changes were made, incorporating many lessons from IPv4 deployment. The end result is that IPv6 is not backwards compatible with IPv4. The protocols are instead intended to be operated alongside one another, until the time IPv4 access can begin to be phased out altogether.

The Broadband Forum TR-187 report is intended for service providers who wish to adopt IPv6 by building on the capabilities of Point-to-Point Protocol (PPP) to support both IPv4 and IPv6 in order to provide basic IPv6 services like internet access. It also outlines how basic PPP based IPv6 access can be added to the existing Broadband Forum Architectures.

Further Technical Reports can be expected from the Forum before the end of 2010 covering these industry critical areas:
• IP Sessions
• IPv6 for TR-101 IP Access Aggregated

• Best Practices Document- Migration Strategies to IPv4/IPv6 Dual Stack and Sunsetting Strategies for IPv4
• IPv6 in Residential Gateway Requirements
• IPv6 updates to TR-069 Customer WAN Management Protocol

For industry educational purposes, a new tutorial and white paper are also in development and will be issued shortly.

These developments by the Broadband Forum's working groups will bring multiple benefits to service providers, the primary one being the promise of continuity of service in the face of a key industry challenge. This is not just the transition from IPv4 to IPv6, but transition to a world where the service provider no longer has access to more global IPv4 addresses. This will have implications on SLAs, operations, services, architecture, security and in fact just about everything a service provider does. Deploying IPv6 while still supporting existing IPv4 is a critical integration aspect of what a service provider needs to address to ensure its business future.

As the IPv6 numbering scheme takes root, there will be companies, service providers, and areas of the world where it will be more cost-effective, or mandated by policy, to operate with IPv6 rather than IPv4. The business opportunity for connecting these devices and networks that require IPv6 is proportional to the speed in which this unfolds.

Emerging technologies available on SmartGrids, Sensor networks, and services that reach into the home and enterprise are moving rapidly towards requiring IPv6. New wireless infrastructures such as LTE and DOCSIS 3.0 mandate IPv6. Apple's iOS 4.0, Google's Android, and Windows 7 all come with IPv6 enabled by default, often with no

simple way for IPv6 to be disabled. At the very least, these are all very good ingredients for a business opportunity.

So for service providers the opportunities are enormous and originally it had been anticipated that IPv6 would indeed be backwards compatible. Back in the 90s it was common for networks to run more than one type or version of a network protocol side by side on the same network. IPv6 was designed to do the same; to operate alongside IPv4, coexist for some time, and then, once fully deployed, IPv4 could fade away. However, in the past decade, the wild success of IPv4 has led to technologies, products, operations and applications that are no longer equipped to deal with more than one network protocol at a time. As such, the industry has had to go back and "relearn" some of the things it knew a decade ago, which can be very challenging.

Certainly service operators have a number of migration options, although all of them revolve around where to introduce IPv6 first, how to bridge existing gaps, and when to start moving IPv4 out of the network. Dual-stack remains a core component, whether it means IPv6 next to IPv4 in the classic sense, IPv6 on top of IPv4, or IPv4 on top of IPv6.

In this regard, the Broadband Forum specifications are tools for providers and manufactures to address this opportunity in a unified and effective transition. It is giving high priority to this work and to assisting the industry in taking a biggest step forward, ensuring exponential growth can continue without delay.

We welcome you to learn more about the Broadband Forum and the IPv6 work in process.

For more information visit:
www.broadband-forum.org