6NET pushes the boundaries of IPv6 technology innovation with IPv6 Multicast

The 6NET project has deployed the world's first large-scale international native IPv6 multicast network, spanning nine countries, and based on technology proposed by members of the project consortium. The use of the technology known as 'Embedded RP' offers a number of advantages over previous IPv4-based multicasting techniques, particularly with respect to scalability across multiple domains.

Multicasting is a technique which allows a single transmission to be sent to multiple hosts anywhere on the Internet, and therefore provides efficient delivery of data for high-bandwidth applications such as videoconferencing and multimedia streaming. It has traditionally been run over the Internet as a virtual network known as the Mbone, but 6NET has now demonstrated this technology on its new-generation IPv6 network.

6NET provides the world's largest native IPv6 multicast environment and is trialling a number of new innovative mechanisms including Embedded RP. Embedded RP solves the problem of finding multicast rendezvous points (RPs), and significantly simplifies the management of the network. This is not possible with IPv4 as the 32-bit addresses that it uses are simply not large enough to incorporate the RP addresses. By comparison, IPv6 addresses are 128 bits long.

Applications which typically use a lot of bandwidth suddenly become feasible when using multicast. Imagine having video-on-demand, stock exchange updates, multi-way videoconferences and high-definition television on your computer, mobile phone or PDA, all of which now become possible on a mass scale.

Jane Butler, Chair of the 6NET Consortium, said:

The work of the 6NET Consortium in evolving the functionality of IPv6 is fundamental to the advancement of the Internet, and the introduction of multicast is a significant step in this direction. It opens the way for high-volume usage of the Internet, and will touch most of the future deployments of public and private IP networking.

Pekka Savola, one of the co-authors of Embedded RP, also said:

The 'Embedded RP' technique allows for easier and simpler deployment of IP multicast, and complements the IPv6 multicast architecture, especially when Source-Specific Multicast (SSM) is unavailable or unsuitable.

IPv6 multicast running on 6NET has already been demonstrated to great effect during technology conferences such as IST 2003, IETF 57 and the Global IPv6 Summit. 6NET is also pioneering other innovative multicast technologies that include SSM (PIM-SSM and

MLDv2), BSR global and scoped RP mapping, bi-directional PIM, and an IPv6 multicast gateway that allows communication between IPv4 and IPv6 multicast networks.

6NET is a three-year European project to build an international native IPv6 network, and to test and demonstrate new IPv6 services and applications. It also aims to help European research and industry play a leading role in defining and developing the next generation of networking technologies. Partial funding is provided by the European Commission under the IST 5th Framework Programme (Contract No. IST-2001-32603).

More information is available from the 6NET website at http://www.6net.org/

Further references:

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