Press Release

IPv6 research networks pioneer global provision of next generation data networks

Cambridge, January 2004 – GÉANT, the multi-gigabit pan-European research network that connects over 3,500 research and education institutions in more than 30 countries, is taking the lead in implementing the IPv6 protocol. Together with its counterparts across the world, GÉANT now offers the world's first next generation IPv6 Internet network with global reach.

Thanks to GÉANT and its counterparts, IPv6 research networking services are now available across Europe, North America, Asian countries including China, Japan, South Korea, Taiwan and Thailand, and Latin American countries including Argentina, Brazil, Chile and Mexico.

The implementation of IPv6 on GÉANT was achieved in an ambitious timescale in recognition of the importance of adopting the new network protocol. Pilot IPv6 services were begun on GÉANT in April 2003, and a full production service was launched in November 2003. The experience gained from testing and implementing IPv6 on GÉANT has also been valuable to several other research projects dedicated to developing IPv6.

GÉANT continues to accomplish its mission of adopting and proving new technologies ahead of the marketplace. Together with most of Europe's National Research and Education Networks, which also now operate IPv6, GÉANT continues to offer Europe's research community the most advanced research networking services in the world. This European IPv6 "network of networks" is the product of successful co-operation within Europe's research networking community.

By offering IPv6 on GÉANT, DANTE, the company that operates GÉANT on behalf of Europe's National Research and Education Networks (NRENs), has reinforced its leading role as the provider of the world's most advanced research networking infrastructure.

"GÉANT must remain at the forefront of network technology developments to provide the world's best network to Europe's researchers. That's why early implementation of IPv6 services on the GÉANT network was so important," explains Dai Davies, General Manager of DANTE.

Native IPv6 is operated in dual-stack mode across the GÉANT network using Juniper Networks routing platforms. *"We are very satisfied with the performance the Juniper Networks routing platforms have provided. Juniper Networks ASIC-based forwarding and JUNOS software have*

consistently provided great performance while supporting stable dual-stack operation on GÉANT," Mr Davies added.

IPv6 offers extraordinary new opportunities over IPv4, the current standard (see "About Ipv6", below). However, deployment of IPv6 suffers from a classic chicken-and-egg problem. Commercial ISPs are reluctant to invest until the demand is there - and developers won't offer new applications until the network is IPv6-enabled. The tough economic climate of the past few years didn't help.

Hence the importance of introducing IPv6 in GÉANT.

Tim Chown, Professor at the University of Southampton, said: "*GÉANT reaches over 3,000 universities in Europe, and tens of millions of students. By making it IPv6-enabled, GÉANT encouraged the National Research and Education Networks to follow suit and deploy IPv6 – which, in turn, is convincing the universities to take the same step. And what better place than a university to generate innovation in new applications and services? By working with vendors, the research networks are validating high performance IPv6 equipment that can be deployed with more confidence by commercial ISPs."*

The fact that the first global IPv6 transit service is now available thanks to GÉANT and other research networks around the world is of great commercial importance. *"The development of new markets based on applications that rely on IPv6 will be accelerated by the widespread deployment of IPv6-capable networks,"* said Mr Davies. *"The challenge IPv6 still faces is to achieve a globally accepted protocol and its uniform interpretation, so as to avoid market fragmentation due to technical incompatibilities. The fact that research networks around the world are leading the way with early adoption of IPv6 is an important step towards overcoming this challenge."*

What is IPv6?

IPv6, a new version of the Internet Protocol, offers three key benefits.

First, it enormously expands the number of addresses available (from 32bit addresses to 128bit addresses). This means that a huge number of devices can become linked to the Internet (such as every package carried by the post office, or every electrical appliance in every home in the world).

Second, it can offer built-in Plug and Play: the computer is automatically configured and made internet-ready whenever and wherever it is plugged in.

Thirdly, security is vastly enhanced by sender authentication and data encryption, which is built-in to IPv6.

IPv6 will help to ensure a more open and competitive arena, revolutionising the provision of new networked services which favour direct communications. "*All manner of consumer digital devices will benefit from being able to communicate directly between homes, opening new worlds of convenience and entertainment"* explains Tim Chown, Professor, University of Southampton.

Beyond the home, IPv6 will enable direct communication with very large networks of sensor devices. This is extraordinarily useful for all manner of applications.

For example, IPv6 will enable accurate monitoring of water levels or local meteorological conditions, making the forecasting of floods or local weather events much more accurate and timely. Companies will be able to easily monitor their entire supply chain. Automobile self-diagnosis can be communicated into the full maintenance supply chain before the driver even knows there's a problem – and the key parts wait for her by the time she gets to the garage. Large factories will have exact, timely readings of energy and input consumption at every step of the manufacturing process. The possibilities are almost literally endless, and in practice limited only by the imagination of users.

Such networks have already been introduced, for example, in the automobile industry: "*A famous demonstrator in Japan showed how 2,000 IPv6-enabled taxis were used to give a city-wide overview of congestion and weather conditions thanks to sensor information from their speed and their windscreen wipers",* explains Chown.

About GÉANT

Reaching over 3,500 research and education institutions in 32 countries through its direct connection to 28 National and Regional Research and Education Networks, GÉANT provides the highest capacity and offers the greatest geographic coverage of any network of its kind in the world. Enabling scientists to compete on an international stage by providing them with a world-class backbone that offers the bandwidth and the Quality of Service required for research and development activities at this level, GÉANT has dual roles of providing an infrastructure to support researchers, as well as providing an infrastructure for research itself. GÉANT is co-funded by the European Commission as part of its Fifth R&D Framework Programme. GÉANT is delivered by DANTE for Europe's research and education networks.

About DANTE

DANTE's name derives from the acronym 'Delivery of Advanced Network Technology to Europe'. Owned by European NRENs (National Research and Education Networks), it is an organisation whose purpose is to plan, build and operate pan-European networks for research and education. Working in partnership with Europe's NRENs and in cooperation with the European Commission, DANTE has been fundamental to the success of European research networking over the last decade, delivering the data communications infrastructure essential to the success of many research projects in Europe today.

For further information, please contact:
DANTE
Dale Robertson
Tel : +44 1223 302 992
Fax : +44 1223 303 005
E-mail: Dale.robertson@dante.org.uk