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Government institute BELNET clears the way for the future

BELNET, an autonomous federal government institute and one of the largest internet players in Belgium, has begun preparations for its new research network. From the end of next year, this network will allow Belgian universities, colleges of higher education, university hospitals and research centres to exchange information at speeds of 10 gigabits per second (Gbps) or even several times that figure. The BELNET network currently has a capacity of 2.5 Gbps. The new network clears the way for an array of advanced scientific applications.

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The new network will cost €24 million spread over four years (2007-2010). BELNET will pay the sum from its own reserves generated over recent years. As a result, prices will remain the same for BELNET's 160 customers, good for around 600,000 users. BELNET customers use the network for scientific purposes. It is primarily intended to facilitate cooperation with other users of the network but is also used for browsing the internet and for e-mail. IBBT (the Interdisciplinary Institute for Broadband technology) and BELNET conducted a technical and economical feasibility study last year to test a model in which BELNET either purchased fibre optic cable or obtained an irrevocable lease for such cable. This kind of model allows BELNET to maintain control over every aspect of its network. The study showed that the model is both possible and affordable. The research demonstrated that the break-even point would be reached within five years, thus making for a feasible model from BELNET's point of view. Had that not been the case, the financial and technological uncertainty would have been too great. Certain technological functionalities can often become obsolete after five years. Five government tenders BELNET has put out five European public tenders for the new network. The requested tenders concern the provision of data centres, fibre optic cable, IP network equipment, optical equipment and an NOC (Network Operations Centre). The first public tender --for data centres-- has already been issued by BELNET. BELNET will house the network's two central nodes within an equal number of data centres in and around Brussels. Fibre optic cable will span the distance from the primary nodes, the heart of the network, and BELNET's 15 Belgian POPs (points of presence). The primary nodes are currently installed at BELNET itself and at the IT department of the VUB-ULB in Elsene. However, data centres offer better security and are permanently manned. They also offer more space and backup / hosting services. Following negotiation procedures, BELNET will decide which two data centres will host the central network nodes in November. The second tender involves the acquisition of fibre optic cable for a period of 15 years. Exclusive access to fibre optic cable is required in order to install one's own optical equipment. BELNET does not intend to lay new fibre optic cable underground but has decided, following the feasibility study, to purchase the fibre optics outright or obtain an irrevocable lease for their use. BELNET is currently engaged in negotiations with telecom operators. The final contracts are scheduled to be signed in January. A third public tender involves IP network equipment, in particular routers and switches which control data traffic in a computer network. Activation of the network equipment is planned for the summer of 2007. BELNET will also activate the optical equipment during the summer of next year. This equipment comprises 'multiplexers' and 'crossconnects' used to activate one or more wavelengths in a fibre optic cable and to extend those signals via other fibre optic cables. The fifth and final public tender is for the new NOC service (or Network Operations Centre). The NOC is essentially a support

line offering assistance 24 hours a day, seven days a week to BELNET customers' network managers. NOC will conduct interventions, make configuration changes and be on hand for general network management. Its decision to outsource the NOC service means BELNET's own employees can concentrate on generating even more added value. BELNET is dedicated to innovation and is more inclined to outsource certain activities once they have become routine. In January 2007, the contracts for the data centres and the fibre optic cable will have been concluded. By May, at the latest, agreements for the IP network and optical equipment will also be finalised. The provision of the NOC service will be assigned by September at the latest. The third trimester will see the arrival of a new, fully functional but empty network. The last three months of next year have been set aside for the migration of all BELNET customers to the new network. Once operational by the end of 2007, BELNET will have control over all aspects of the network and will no longer be dependent upon external factors.

Light paths The new network broadens perspectives and offers BELNET customers new possibilities for research. Although the current network already has a capacity of 2.5 Gbps, a few customers are only connected to it via a 10 megabit per second (Mbps) line which they lease from a telecom operator. 10 Mbps is currently the minimum capacity required for use of the BELNET network. The universities, colleges of higher education, their associations, research institutes and university hospitals will have access to virtually limitless bandwidth via the new network. They will be able to select a connection speed from 100 Mbps, 1 Gbps, 10 Gbps or multiples and combinations thereof. By the end of 2007, the available bandwidth will be unlimited thanks to the implementation of 'light paths'. Light paths are point-to-point connections of virtual private networks between users of a fibre optic network. For every individual fibre optic cable, BELNET will be able to activate dozens of separate wavelengths each with a capacity of 10 Gbps with the use of its own optical equipment. Light paths are like private motorways in which the transmission of information is not hindered by other data traffic. A motorway from front door to front door. You know beforehand exactly when you will arrive. There are never any accidents, delays or congestion. The traffic always has the same guaranteed very high speed. Packets of information are never lost or corrupted. Light paths are indispensable for projects that cannot tolerate variable or low capacities. Applications that do not yet exist because they were unthinkable will suddenly be very possible. Think of a surgeon who operates on a patient from a distance via a robot. The reaction time of that robot has to remain constant, in real time. A top radiologist will no longer have to appear at the scene in order to examine an X-Ray. Other applications are, e.g., video conferences, remote education, grid computing, observation of the Earth or of space, meteorological simulations, weather forecasting and research into the impact of nuclear accidents. Or experiments involving the performance of a symphony orchestra, where the strings play in USA and the wind instruments in Europe... The possibilities are endless.

Belgium leading the European pack Thanks to the new network and the implementation of light paths, BELNET will take its place by the end of next year in the top 5 national research and education networks in Europe. Belgium has slowly begun to wake up. In 1992, Belgium still wallowed about at the tail of Europe. Indeed, Belgium was one of the last countries in Europe to develop its own research network. In the meantime, Belgium has more than made up the distance with BELNET providing such advanced telecom services as IPv6 and multicast. The government service will inform its customers' IT technicians and researchers about the additional possibilities of the new network. Through workshops, support channels and other campaigns, BELNET aims to be the new technological evangelist amongst the country's foremost researchers and educators. The objective is to generate a dynamic and allow scientists to discover what they can achieve with the new network so they may subsequently develop applications that were unthinkable in the past. "Science has always formed the basis for progress in information and communication technology," says Pierre Bruyère, General Manager of BELNET. "The internet was born because academics needed it. We are now anticipating the needs of the society of knowledge of the future. When the infrastructure is in place, the applications will follow. The new network is part of our overall mission to be pioneers on the front of information exchange and to promote further scientific collaboration. Until now, network managers had to take certain limitations into account and issue guidelines to manage them. They can now throw them all overboard. Now, it's a case of power to the imagination." The link between the BELNET network and Géant2, the pan European computer network for

research and education, allows users of both networks to communicate with one another at 10 Gbps. Géant2 connects 30 million users across 34 countries. About BELNET - "The network of knowledge" The government agency BELNET provides broadband Internet access to Belgian educational institutions, research centres and government departments. More than 550,000 end users have access to bandwidths of up to 2.5 gigabits per second; this is around one thousand times faster than the Internet access available to most consumers. References include all Belgian universities and most non-university higher education institutions, the computer network of the Federal Government departments (FedMAN), all federal scientific institutes, the larger public research centres and various government administrations. BELNET provides high-quality, secure Internet access via CERT (Computer Emergency Response Team) and a direct connection with worldwide research networks, including the American Internet2 and the European Géant. A pioneer on the internet, BELNET was founded in 1993 on the initiative of the Federal Research Policy. The network continues to further the cause of research, training and scientific co-operation. For more information, please go to <http://www.belnet.be> and <http://cert.belnet.be> BELNET Veerle Custers, external communications manager Wetenschapsstraat 4, B-1000 Brussels T: +32 (0)2 790 33 33 E: veerle.custers@belnet.be Media Contact: Quadrant Communications Bart Inslegers Franklin Rooseveltlaan 348, B-9000 Ghent T: +32 (0)9 265 0258 M: +32 (0)472 480 186 E: bart@quadrantcommunications.be See also <http://www.quadrantcommunications.be/downloads/belnet>