



Internet2, GÉANT2, and ESnet Demonstrate Phoebus at SC07 to Showcase Seamless Set up of Dynamic Circuits

Performance Protocol Provides Transparent Access to Dynamic Lightpaths to Facilitate Broader Use and Adoption of New Network Services

RENO, Nevada. – November 12, 2007 – Internet2, ESnet, and GÉANT2 today announced at SC07, the annual international conference on high performance computing, networking, storage, and analysis, the major demonstration of the Phoebus performance framework which allows applications to seamlessly set up dynamic lightpaths regardless of the user's edge network access method. In doing so, Phoebus provides a bridge to enable a broader segment of users to take advantage of the performance and reliability of optical circuit networks such as the Internet2 Dynamic Circuit (DC) Network, ESnet Science Data Network (SDN) and the GÉANT2 pan-European research network.

"TCP is currently the standard protocol for applications to access national backbone networks. Because of this, new disruptive network technologies like dynamic circuit networks need a simple method for users to implement at the edge of the network to enable their broad use. By leveraging standard Internet technologies at the edge of the network, Phoebus provides an on-ramp for any type of application to access these revolutionary new types of networks enabling more users to benefit immediately," explained Martin Swamy, assistant professor, Department of Computer and Information Sciences, University of Delaware and Internet2 faculty fellow. "In the longer term, Phoebus will enable network providers to offer a richer set of services to their users because they will no longer be constrained by the performance limitations of TCP in high-bandwidth networks."

At SC07, Internet2, ESNet and GÉANT2 together with co-collaborators from GRNET, the national research and education network for Greece; HEAnet, the national research and education network for Ireland, and PIONIER, the national research and education network for Poland, will showcase the set up of a one Gigabit per second (Gbps) dynamic circuit using standard video transfer and file transfer applications. The applications will be initiated from the Internet2 SC booth and will leverage the Phoebus framework to access, and then dynamically set up, a separate point-to-point circuit between Reno, Nevada across the Internet2 DC network and the ESnet network, to the GÉANT2 network in Europe and then to the GRNET, HEAnet and PIONIER networks respectively. The applications are anticipated to transfer approximately seven gigabytes of data, the amount of data stored on a standard movie DVD, in one minute.

"As a result of our work on dynamic provisioning of user-requested network circuits within GÉANT2, our AutoBAHN (Automated Bandwidth Allocation across Heterogeneous Networks) architecture is capable of setting up on-demand dedicated circuits, spanning multiple countries and multiple networks" said Afrodite Sevasti, Activity Leader for GÉANT2 AutoBAHN and GRNET Network Services Development Manager. "AutoBAHN has enabled the first Trans-Atlantic demonstration of the Phoebus performance framework, by allowing the provisioning of up to 10Gbps circuits from Internet2 and/or ESnet to GÉANT2 and the European NRENs, within a few minutes."

As a framework and protocol for high-performance optical networks, Phoebus works to transparently split the end-to-end network path into distinct segments at specific adaptation points, typically located at backbone ingress and egress points. Phoebus then works to minimize the impact of packet loss and latency by finding and creating the best network path for the specific application from each adaptation point. Because of its architecture, many applications can begin to utilize Phoebus and the DC Network with no modification because of its ability to transparently authenticate and redirect the application to the circuit network via a Phoebus Gateway.

Because of its inherent ability to find and enable the best possible end to end network path, Phoebus will be used in a SC07 Bandwidth Challenge submission to showcase its ability to maximize the performance of a 10 Gbps connection between Reno and CERN in Geneva, Switzerland. The challenge submission will use data related to the Large Hadron Collider (LHC) experimentation to showcase how Phoebus can support researchers utilizing high speed networks to participate in this bandwidth-intensive worldwide project. Phoebus will work to split the network path into distinct segments at specific adaptation points to optimize the performance of each segment thereby maximizing performance on the entire end to end path. Results of the Bandwidth Challenge will be announced on Thursday, November 15, 2007.

About Internet2(R)

Internet2 is the foremost U.S. advanced networking consortium. Led by the research and education community since 1996, Internet2 promotes the missions of its members by providing both leading-edge network capabilities and unique partnership opportunities that together facilitate the development, deployment and use of revolutionary Internet technologies. Internet2 brings the U.S. research and academic community together with technology leaders from industry, government and the international community to undertake collaborative efforts that have a fundamental impact on tomorrow's Internet. For more information: <http://www.internet2.edu>

About GÉANT2 and AutoBAHN:

GÉANT2 delivers the next generation research and education network for Europe. With over 30 million research and education users in 34 countries across the continent, GÉANT2 offers unrivalled geographical coverage, high bandwidth, innovative hybrid networking technology and a range of user-focused services. GÉANT2 has links totaling more than 50,000km in length and its extensive geographical reach interconnects with other world regions to enable global research collaboration. Europe's academics and researchers can now exploit the power of dedicated GÉANT2 "point-to-point" links, creating optical private networks solely for their use, that connect specific research centres.

GÉANT2 is co-funded by the European Commission under the Sixth Research and Development Framework Programme. The project partners are 30 European National Research and Education Networks (NRENs), TERENA and DANTE. It is co-ordinated by DANTE, the research networking organisation that plans, manages and builds research networks all over the world.

AutoBAHN (Automated Bandwidth Allocation across Heterogeneous Networks) is a service architecture that allows authorised end-users to directly access network resources from their workstation, wherever it is located in Europe. This is achieved by setting up on-demand dedicated circuits spanning multiple countries, and multiple networks, administered

by different entities and using different technologies. For more information visit www.geant2.net

About ESnet

ESnet is a high-speed network serving thousands of Department of Energy scientists and collaborators worldwide. A 20-year pioneer in providing high-bandwidth, reliable connections, ESnet enables researchers at national laboratories, universities and other institutions to communicate with each other using the collaborative capabilities needed to address some of the world's most important scientific challenges. Funded principally by DOE's Office of Science, ESnet services allow scientists to make effective use of unique DOE research facilities and computing resources, independent of time and geographic location. ESnet is managed by Lawrence Berkeley National Laboratory. For more information: <http://www.es.net/>

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