

Publishable Summary

Grant Agreement number: RI-283334

Project acronym: ORIENTPLUS

Project title: Linking European and Chinese Research Infrastructures and Communities

Funding Scheme: FP7-INFRASTRUCTURES-2011-2

Date of latest version of Annex I against which the assessment will be made:

Periodic report: 1st **X** 2nd ☐ 3rd ☐ 4th ☐

Period covered: from July 2011 to October 2012

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Between 2007 and 2010 the ORIENT project provided the first high capacity connectivity for research and education directly linking Europe and China, with FP6 funding support and successfully enabled many innovative EU-China research and application collaborations to start up. ORIENTplus is a new project running from July 2011 to Dec 2014 to continue to provide direct EU/China connectivity for researchers with the aim of increasing capacity for IP services and extending the service portfolio to also support point to point circuits. The ORIENTplus project is 50:50 funded by Europe and China, and has an overall budget for connectivity of 4M Euro, with 940K of the EU funding provided from EC FP7 funds. While the primary purpose of ORIENTplus is to provide and operate the direct Europe-China link. The project also includes support activities to optimise the performance of the link, promote the use of the link, and provide users with technical support.

During the first period a new consortium has been established: in ORIENT China was formally represented by CERNET; this time CERNET and CSTNET are equal partners, reflecting the strengthening research network relationships between the regions and offering scope for coordinated operational and user support. The number of European NREN partners has increased from 6 in ORIENT to 9 in ORIENTplus reflecting the increasing interest in relationships with China. An ORIENTplus Steering Group has met quarterly to oversee the project and has rotating EU and Chinese chairs, reflecting the 50:50 structure of the project. The project has set up an MOU with GEANT whereby the ORIENTplus link is available to all GEANT NRENs in exchange for the GEANT project collecting the EU NREN's financial contributions to ORIENTplus and a role in major policy matters from a European perspective.

During the first period the ORIENTplus project has focussed on providing and operating the direct Europe-China link. During 2011 the link continued to be provided by CERNET which had been the link owner in the final period of ORIENT connecting Beijing and Copenhagen at 2.5Gbps. CSTNET tendered for a replacement link during 2011 and the outcome was a new 2.5Gbps circuit between Beijing and London. The CSTNET circuit has been well used and has enjoyed very high quality network performance. Both the CERNET and CSTNET circuits have been managed from Beijing by the CNGI-6IX NOC, with support from the GEANT NOC.

During 2012 procurement work has been carried out for the European side of the project to source the link for 2013 and 2014. Since 2.5Gbps link has already been well used, upgrading the link was a high project priority though the challenge was if and how this could be achieved at affordable cost. Before the tender was published a Prior Information Notice was issued to test the market and give interested suppliers the opportunity to prepare in advance for the tender. Several European and Chinese providers responded to the PIN and this gave useful intelligence about market conditions. At this stage it appeared that some additional capacity could be possible but upgrading to 10 Gbps was unlikely to be afforded.

An open tender was published in July and evaluated by DANTE and 3 of the EU NREN partners: CESNET, JANET and NORDUNET. One of the bidders offered a directly routed solution at 10 Gbps capacity between London and Beijing and within the project's budgetary limits. This was fully evaluated and found to comply with technical and commercial requirements and the contract was therefore awarded to the successful provider. The contract was awarded in October 2012, and the link was contracted to enter service, after the end of the current period, in January 2013. This is very good news as it allows the project to increase capacity for IP services, to start to offer point to

point services, and allow the project to start to actively promote the use of the link. In parallel with the tendering for the link the project has undertaken network design studies for the hybrid use of the upgraded link for the IP and point to point services, and has also prepared plans for backing up the link by alternative network paths to ensure very high service availability. The decision has already been taken that the link will terminate at the London end at the new GEANT Open Exchange facility, which is initially available in trial status. The point to point service and back up plans are due to be deployed during the next reporting period.

During the period, high quality operational support has been provided for the link by the CNGI-6IX NOC in Beijing supported by the GEANT NOC. Operational procedures for fault reporting and resolution have been documented, and monthly reports are prepared to show circuit availability and traffic utilisation and flow analysis. perfSONAR equipment has been deployed at both ends of the link, supporting end to end network performance analysis across multiple network domains. This form of analysis should prove very useful for optimising performance of demanding user applications such as those collaborating between Europe and China.

Preparatory dissemination activities have taken place, though as explained above the 2.5Gbps link has been highly utilised during the period so active promotion would have been premature. During the period the external website was set up: www.orientplus.eu and initial promotional materials and logo produced. The project has been disseminated at events in Europe, China and elsewhere, and the first case study has been published. The case study illustrates the use of the ORIENTplus by the ARGO-YBJ project which is undertaking cosmic ray research. This is a collaboration between national Institute of Nuclear Physics (INFN) in Bologna, Italy and the Institute of High Energy Physics (IHEP) of the Chinese Academy of Sciences. Cosmic ray data is collected at the ARGO-BYT facility in Tibet and transmitted over the CSTNET, ORIENTplus, GEANT and GARR research and education networks for analysis at INFN.

The ORIENTplus project is already increasing collaboration between the research and education networks between China and Europe, and their user communities are now starting to benefit. With the link capacity quadrupling from January 2013 greater focus on dissemination and user support are planned to maximise the benefit of the link.

For further information about the ORIENTplus project, please contact

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