

# Grid Computing Research—Its influence on economic and scientific progress for Pakistan

*Monday 13 February 2006 16:20 (20 minutes)*

We present a report on Grid activities in Pakistan over the last three years and conclude that there is significant technical and economic activity due to the participation in Grid research and development. We started collaboration with participation in the CMS software development group at CERN and Caltech in 2001. This has led to the current setup for CMS production and the LCG Grid deployment in Pakistan. Our research group has been participating actively in the development work of PPDG and OSG, and is now working in close collaboration with Caltech to create the next generation infrastructure for data intensive science under the Interactive Grid Enabled Environment (IGAE) project within a broader context of Ultralight collaboration. This collaboration is based on a partnership with the University of the West of England (UWE) UK under the EU funded Asia Link program and Caltech under an exchange program from the US state Department. The collaboration on Grid Monitoring and Digital divide activities with Caltech using the MonALISA monitoring framework and with SLAC on Maggie has not only helped to train our faculty and students but it has also helped to improve the infrastructure, bandwidth and computing capabilities in Pakistan. The collaboration extends to Wuhan University and BIT china, Comtec Japan and Kyong Hee University Korea on human resource and expertise development programmes in Grid and related areas.

The dedicated team of researchers (faculty and students) not only participates in international research activities but also supports industry and advising the government to address the digital divide issues, and internet information access to its population. Our initiative proved to be a catalyst for other universities in Pakistan with a growing interest in all national universities to collaborate in Grid activities. This activity strengthened the learning abilities and concepts of our students who have become the first graduate student choice by universities of international repute. Discussions have already been started about establishment of a National Grid in Pakistan and the means to mobilize resources in basic sciences, government departments and the business community.

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**Session Classification:** Grid Middleware and e-Infrastructure Operation

**Track Classification:** Grid middleware and e-Infrastructure operation