Itinerary

ITER-Grid Technology Demonstrations
NCSA ACCESS Center
Arlington, VA
December 20, 2003

Modern computer, network and grid technologies exist today which permit scientists around the globe to work together as if in a single laboratory, sharing ideas through advanced collaboration technologies, sharing data and equipment located thousands of miles away, harnessing the combined power of a global "grid" of connected computers, remotely monitoring and controlling equipment and facilities around the world.

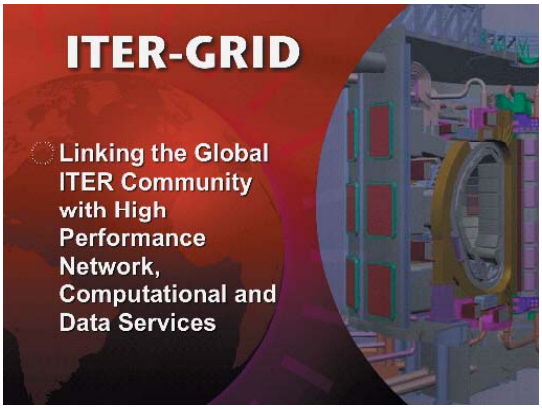
On December 20, at 3:00 pm., a demonstration of such advanced technologies is being organized by the National Center for Supercomputing Applications (NCSA) and the US-Russia-China GLORIAD team and presented at the NCSA ACCESS Center in Arlington, Virginia. The purpose is to explore how these technologies may be harnessed for a global scientific collaboratory in support of ITER.

Please join us for the two-hour series of demonstrations described on these pages, followed by 30 minutes of discussion.

Dr. Evgeny P. Velikhov, President, Russian Research Center "Kurchatov Institute"

ITER-Grid: An Overview

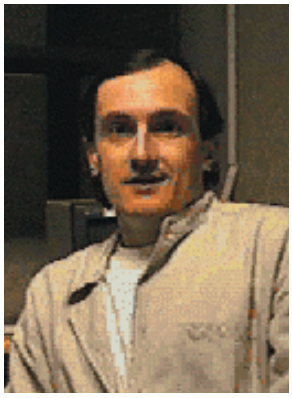
Dr. Velikhov will provide a brief introduction to the meeting and an overview of the needs motivating the ITER-Grid. He will discuss the benefits to the ITER program of a jointly developed, highly advanced infrastructure, including:



- ability to cooperatively control experiments and operations via collaborative and virtual control facilities;
- ability to share expensive and scarce resources such as computational devices, databases, data archiving centers, etc.;
- ability to monitor ITER site construction and operation;
- ability of global ITER team to more easily function as a single team and laboratory

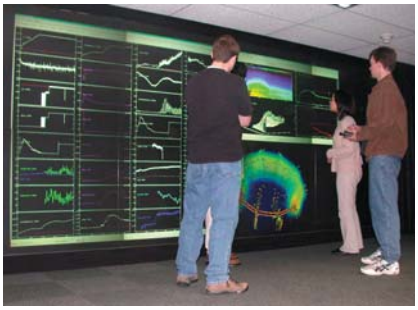
To accommodate the construction phase of the project and, later, for operational activities, the various elements – high speed networks, computational facilities, grid software tools, collaboration facilities, data archive facilities and software, collaborative control room facilities – need to be planned and provisioned today.

The demonstrations are designed to further discussion towards a shared vision and to further necessary planning.



David P. Schissel Manager, Data Analysis Applications Group DIII-D National Fusion Facility and Director, Advanced Imagery Laboratory General Atomics

Remote Collaboration Activities for Fusion experiments and application to ITER



A presentation will be given using Access Grid Technology from the control room of the DIII-D National Fusion Facility in San Diego, CA. This presentation will introduce the US National Fusion Collaboratory Project (FusionGrid) and discuss current work on remote collaboration activities, including a walk through of a recent demonstration of a "collaborative or virtual control room" given at the SuperComputing 2003 conference in Phoenix, AZ, November 2003.

About the Presenter: *David Schissel is currently the Manager of the Data Analysis Applications Group for the DIII-D National Fusion Facility, the Director of the Advanced Imagery Laboratory at General Atomics, and is the Lead-PI for the USDOE SciDAC National Fusion Collaboratory Project. He has been actively involved in magnetic fusion research for over 20 years, been a member of the design team for the next generation fusion machine ITER, has authored over 30 scientific articles on fusion research, and is a Fellow of the American Physical Society. His current area of interest is in the computational and collaborative infrastructure that will be required to support the world wide experimental fusion research that will be conducted on ITER.*

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Ian Foster, Associate Division Director, Argonne National Laboratory Professor of Computer Science, University of Chicago

The Grid: Enabling Global Science Communities

Grid technologies and infrastructure are designed to support the integration of services and resources within and among enterprises, and thus to allow active collaborations across distributed, multi-organizational collaborations. I describe how these tools can be used to eliminate distance as a barrier to day-to-day collaboration, and to harness computational and data resources around the world to solve leading science problems.

About the Presenter: *Dr. Ian Foster is Associate Director of the Mathematics and Computer Science Division at Argonne National Laboratory and Professor of Computer Science at the University of Chicago. The Distributed Systems Lab that he heads at Argonne and Chicago is home to the Globus Toolkit, the open source software that has emerged as the de facto standard for Grid computing. He has published five books and over 200 articles and technical reports on various topics relating to programming languages, parallel computing, and distributed systems. He is a fellow of the American Association for the Advancement of Science and the British Computer Society, and has received a number of awards for his research, including the GII Next Generation Award and the British Computer Society's Lovelace Medal.*

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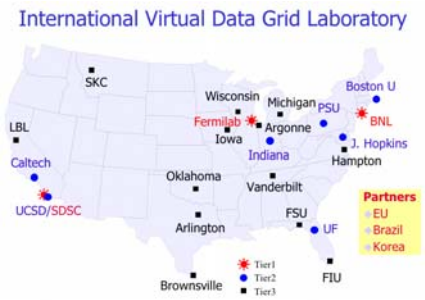
Paul Avery, Professor of Physics, University of Florida

Data Grids and Collaborative Technologies in High Energy Physics



High energy physicists have developed and deployed a variety of collaborative technologies to support their worldwide experimental collaborations. By the middle of the next decade, experiments at CERN's Large Hadron Collider will have collected and simulated approximately an exabyte (10^18 bytes) of data that must be collected, shared, processed and analyzed by global collaborations of thousands of physicists located in hundreds of institutes. Computing infrastructures based on Data Grids and optical networks offer these data intensive experiments a comprehensive, scalable framework for collaboration and resource sharing. The most exciting and far ranging of these projects are led by collaborations of high energy physicists, astronomers and computer scientists in support of experiments with massive, near-term data needs. I briefly summarize several Data Grid and networking projects that are developing comprehensive computing infrastructures managing computational, storage and optical networking resources. I describe recent experiences with Grid2003, a research and production Grid of several thousand processors (http://www.ivdgl.org/grid2003/) that has been operating for several months.

About the Presenter: *Paul Avery is Professor of Physics at the University of Florida, where he works in the area of High Energy Physics. He has authored or co-authored over 400 publications and technical reports on the properties of heavy quarks, advanced measurement algorithms, physics software methods and Grid computing. Avery is currently Director of two NSF-funded Grid projects, GriPhyN and International Virtual Data Grid Laboratory, which are researching and deploying new Data Grid tools and technologies on an international scale. He has served on a wide variety of national and international committees, most recently the UK PPARC Grid Steering Committee, the High Energy Physics Advisory Panel (HEPAP) and the HEPAP Sub-Panel on the Long-Range Future of High Energy Physics.*

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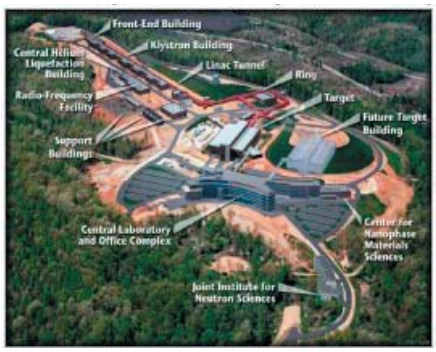
David H. Southard, Senior Vice President, IPIX Security

Remote Monitoring and Tele-presence Technologies



iPIX technology provides wide field of view surveillance; up to 360-degrees for full spherical viewing. The demonstration, organized by a partnership of IPIX, ORNL and the Spallation Neutron Source (SNS), will show the feeds from a single hemisphere camera and a full 360-degree camera, streaming live from the SNS at the ORNL. Because of iPIX's technology, the cameras never move yet provide up to 360-degree views live and recorded. Upon playback the entire spherical view can be seen and analyzed.

About the Presenter: *David H Southard is responsible for leading all product and business development for the iPIX Security Group. Over more than 3 years, he has worked in Immersive Sales and Business and Product Development, focusing on taking surveillance to the next level in Homeland Security, DoD and Law Enforcement. . Dave has worked with Immersive Still Imaging systems, conventional CCTV cameras, wide-angle 180-degree NetCams, and full 360-degree-by-360-degree capture systems for use in protecting critical infrastructure, situational awareness, and on the electronic battlefield. He is a published writer and a frequent speaker and commentator on immersive security for both local and national media including CNN's Wolf Blitzer Reports, the International Nuclear Materials Management Summit, The National Security Summit and provided testimony to the Congressional Hearing on Homeland Security. In additional he serves on the steering committee of the Tennessee Valley Technology Coalition.*

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Steve Wolff, Technical Manager for Extramural Research, Cisco Systems

Cisco and the Research Community, and IP Telephony demonstration

Dr. Wolff will present on Cisco's academic research and technology initiatives and will lead a brief demonstration of "IP Telephony" – a fast-developing technology with good potential for such international collaboratories as the ITER-Grid.

About the Presenter: *Stephen Wolff is Technical Manager for Extramural Research Programs in the Academic Research and Technology Initiatives group at Cisco Systems.*

Before joining Cisco in 1995, he was Division Director for networking at the National Science Foundation (NSF). In this position he was responsible for NSF's program of basic research in networking and communications, as well as for the development of NSFNET, the nation's first network open to the general academic community for the support of research and education. The subsequent commercialization and privatization of NSFNET formed a cornerstone of today's Internet.

Dr. Wolff is a member of AAAS and ACM, a Pioneer Member of the Internet Society (ISOC), and a Life Member of IEEE.

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Tom Coffin, National Center for Supercomputing Applications, University of Illinois at Urbana-Champaign

Virtual and 3-D Immersive Environments

Quick overview of virtual environments and concepts. Systems to be reviewed are the CAVE and Scientific Collaboration spaces. Demonstrations will include the ImmersaDesk and Geowall systems.

About the Presenter: *Tom Coffin is currently employed by the National Center for Supercomputing Applications and is the Alliance Liaison for Virtual Environments, and the Technical Coordinator for the Alliance Center for Collaboration Education Science and Software in Arlington, Virginia. The Alliance (National Computational Science Alliance) is a group of over fifty institutions funded by the National Science Foundation expanding the need for high end computation and information technologies required by the U.S. academic community. The National Center for Supercomputing Applications is the leading edge site for the Alliance and a part of the University of Illinois. Coffin is a graduate of the Pennsylvania Academy of the Fine Arts, School of the Art Institute in Chicago and the Electronic Visualization Laboratory at the University of Illinois at Chicago. Upon completion of his studies at the Electronic Visualization Laboratory, Coffin assisted in the commercialization of projection based virtual reality technologies and continues to support the users of these systems through the maintenance of web portals and the organization of community building activities such as CAVERNUS (http://cavernus.org).*

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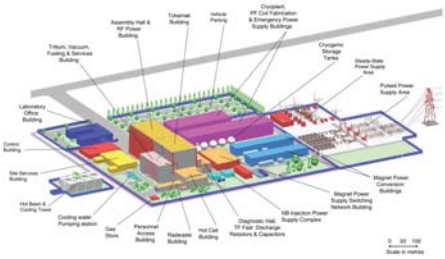
Frederico Casci, European Fusion Development Agreement (EFDA); Pietro Barabaschi, Deputy Leader of the ITER International Team

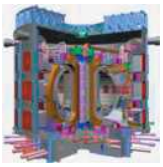
ITER Network Needs During the Construction Phase

The presentation will focus primarily on the needs for Concurrent Engineering during the construction phase. Presentation will be given from ITER offices in Garching, Germany.



ITER Viewed From North East

About the Presenter: *Frederico Casci joined the ITER project early in 1993 in the Design Integration and computing infrastructure. He currently is responsible for computing in the EFDA agreement and also in charge of public information. As Deputy Director of the ITER International team, Pietro Barabaschi is responsible for Design Integration. He has worked in the ITER project from its onset in 1992 and was previously at the JET-Joint European Torus.*



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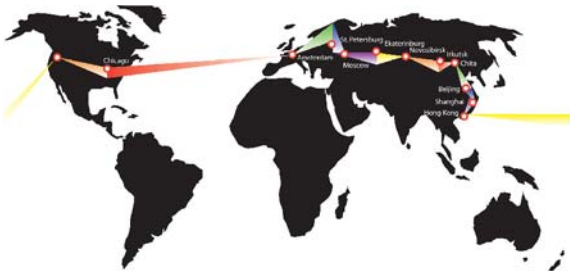
The US-Russia-China GLORIAD team, meeting in Beijing, December 2002, after signing MoU agreeing to develop the international GLORIAD network. Pictured include Evgeny Velikhov (RF), Yan Baoping (PRC), Greg Cole and Natasha Bulashova (US) and senior members of the Chinese Academy of Sciences Computer Networking Information Center

Global Ring Network for Advanced Applications Development (GLORIAD): Proposed Network Infrastructure for the ITER Community



The presentation will introduce the Global Ring Network for Advanced Application Development (GLORIAD) – which the US, Russia and China are formally launching in Beijing January 12, 2004. Starting at speeds of 155 Mbps, the joint team is building a 10 Gbps "wavelength" network, based on a hybrid circuit-switched and routed architecture, around the entire northern hemisphere to support S&E cooperation. ITER is one of the primary science communities for which the GLORIAD backbone network is being developed; it will provide, minimally, dedicated 1 Gbps ethernet service to the ITER program and additional capacity and dedicated circuits as required. While built as a global backbone network by the US, Russia and China, the network will provide for general routed and circuit-switched exchange with European and Asian high performance S&E networks.

The GLORIAD program supports a strong alliance between S&E institutions in the US – led by the National Center for Supercomputing Applications (NCSA) at the University of Illinois, the Chinese Academy of Sciences,the Russian Research Center "Kurchatov Institute", the Russian Ministry of Industry, Science and Technology, the Russian Academy of Sciences, the Russian Ministry of Communications, the Russian Ministry of Atomic Energy, the Russian Ministry of Education, the Moscow-based Joint Supercomputer Center of the Russian Academy of Sciences, Moscow State University. The program features a strong R&D partnership with Tyco Global Networks which is building the GLORIAD network on its undersea cable system. The program also works with telecomm providers in Russia and China and with the Netherlight network and facility in Amsterdam.

About the Presenters: *Evgeny Velikhov, President of the Russian Research Center "Kurchatov Institute"; Yan Baoping, Director of the Computer Network Information Center of the Chinese Academy of Sciences directs the effort in China; Greg Cole and Natasha Bulashova, with the NCSA, lead the effort in the U.S.; Thomas Champ is with Tyco Global Networks in Falls Church, Virginia.*

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