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CSD – Entering An Era Of Collaborative Research

From Grid Computing to collaboration with MIT, some of the CSD's recent initiatives have the potential to position BITS Pilani as the largest provider of science and technology-based education in India.

Among the prominent initiatives is The Grid Computing initiative, in the area of next generation networking (IPv6 included). The aim is to build an architecture that would allow the grid computing application sitting in the application layer to be able to transparently utilize the quality of service, enhancements as defined by the recent flow level specification for the IPv6.

GRID COMPUTING

An umbrella project known as "Project Grid One" was launched by BITS last year. In

its first phase, partly funded by Microsoft Research, the group aims to build a heterogeneous, IPv6-QoS aware campus wide grid comprising of 1000 subscribed nodes (out of an estimated capacity of 5000 nodes on campus). This is using a heterogeneous combination of hardware and software platforms atop an IPv4/IPv6 dual stack enabled Giga bit backbone. It involves building a medium-sized campus-wide grid involving several Server-class systems, about 3000 PCs class systems, used inside the institute's laboratories and

faculty chambers, large number of student-owned PCs in their hostel rooms and many of the staff-owned PCs / Laptops etc.

As part of the work planned in the second phase, mobile access components will be able to selectively use the grid apart from forming an ad hoc (intermittent connectivity

based) micro grid amongst themselves. As part of the work planned in this phase, various devices like pocket PC's, pocket PC phones and other PDS running on variants of Intel-X-Scale processors and select processors from Texas Instruments would be used. Next, the plan is to develop identical campus-wide grid islands in the other campuses of BITS Pilani and interconnect these grid islands to form a larger multi-campus grid environment with built in capability of IPv6-QoS awareness.

This would be hooked into other research grids in different parts of the world; those who volunteer to either adopt the Grid One architecture or allow a translation facility based mechanism for hooking to their existing infrastructure. Since grid computing is an umbrella research project like the "Project IPv6@BITS" (<http://ipv6@bits-pilani.ac.in>), it has several sub projects separately planned as its other components. Most prominent of this is the telemedicine project meant for rural and semi urban health support system assistance. This project has been named "i-charak".



The image shows the MIT iCampus logo on the left, which consists of a stylized 'i' made of three overlapping squares and the text 'mit iCampus'. To the right is a blue navigation menu with white text: 'iCampus', 'projects', 'themes', 'news', and 'gallery'. Below the logo is a dark blue box with white text: 'MIT iCampus, sponsored by Microsoft Research, is aimed at achieving broad, substantial, and sustainable impact on higher education through information technology. iCampus incubates innovations for labs, classrooms, and campus communities at MIT and promotes their dissemination around the world.' To the right of this text are three small, light blue images: a person working at a computer, a group of people in a meeting, and a person at a desk.

Website
discovery.bits-pilani.ac.in/gridone/index.htm

MIT BITS PILANI iCAMPUS

The MIT iCampus is aimed at achieving broad, substantial, and sustainable on higher education through information technology. iCampus incubates innovations for labs, classrooms, and campus communities at MIT and promotes their dissemination around the world. BITS Pilani has been identified as an **iCampus Hub Institution** in India under the Memorandum of Understanding between the two institutions taking effect the 1st of October, headed by **Dr. Philip Long** from MIT and **Dr. Rahul Banerjee** from BITS Pilani. The BITS-MIT collaborated iCampus originated as a research and development project when MIT (with funding from Microsoft Research) started developing collaborative technology, under their iCampus initiative, allowing over the network learning facilities to be made available both on campus and off campus. It also permits those that do not have adequate infrastructural facilities, expensive lab equipment, or domain expertise in select areas etc to be able to connect to iCampus project sites and utilize these recourses even remotely. In addition to adaptation, co-development and deployment of iLabs, iMOAT and xTutor for its own students as well as helping several other interested institutions of higher learning in the country to use these resources, BITS Pilani shall carry out joint collaborative research with researchers at MIT under the broad agreement between the two institutions.

Website

discovery.bits-pilani.ac.in/icampus/index.htm

BITS VIRTUAL UNIVERSITY

BITS Pilani is heralded as the pioneer of Science and Technology based education through its off-campus collaborative and distance learning programs. Currently distance learning caters to more than 10,000 students all over the country; all of who are employed and sponsored professionals in industries, research laboratories and select educational institutions. Quite a large number of these students derive colossal benefits from the services provided by BITS virtual university

[\(<http://vu.bits-pilani.ac.in>\)](http://vu.bits-pilani.ac.in) which provides the following:

- Asynchronous interactive as well as non-interactive learning environment using web based lessons, soft tutors and animation tools.
- Desktop (internet based - 64 kbps and above at the individual user's end) live interactive lecture sessions for 300 students for every single course offered through the distance learning mode
[\(<http://202.54.26.115/bits/portal/dlpd>\)](http://202.54.26.115/bits/portal/dlpd)
- Live interactive (internet based) group discussion facility
- Live interactive (internet based) tutorial facility.
- Web based seminar facility for up to 1500 students at a time
- Live interactive project meeting over the internet

with a participation capacity of 100 students.

- Students who miss these sessions can use the on-demand capability of the system to see the recorded events.

The facility also allows in addition to the above, the following:

- Asking on-line questions of objective type, descriptive type
- Taking on-line polls
- Web-casting of an event
- Use of internal expressway services that allows automatic server selection, spread over different continents around the world, based on some pre-determined parameter values in a dynamic way.

The **Live Interactive Sessions** are a vital part of this endeavor and this constituent portal is an easy-to-use interface, which allows application-sharing facilities while in the LIVE mode. It also allows the user to ask questions using voice or text, participate in group discussions, attend seminars, meetings, tutorials – all through the web-browser and an Internet connection. If any first-time user has trouble during sessions, she can click the 'Help' tab to learn using the facility. In addition, there is a pre-recorded on-demand tutorial on using the facility accessible from the 'On-Demand' tab.

WEBSITE

<http://202.54.26.115/bits/portal/dlpd/default.asp>

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