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CENTER FOR SOFTWARE DEVELOPMENT

New initiatives and strategic direction of the CSD @ BITS, Pilani.

The Center for Software Development (CSD) CSD was set up by Dr. KRV Subramanian with the vision that it would "provide a forum where the IT development activity at BITS would find a wider utility and the intellectual capital available at BITS would be tapped towards development of quality software". This is the objective that has driven Team CSD. After Dr. KRV Subramanian, CSD has been led by his wife Mrs. Usha Subramanian and is now currently under the stewardship of Dr. Rahul Banerjee, CSD coordinator.

Over the years the CSD has grown into a facility for cutting edge tech research and development in addition to its original objective of software development. Dr Banerjee believes that there is no dearth of talented young minds at BITS who are enthusiastic about software development initiatives and software research. In fact this is how members are inducted into the team. The criterion of your CGPA plays no role in the selection process. What the team demands can be summarized in just two words: sincerity and aptitude. The sincerity to work with dedication on tasks assigned. And the aptitude to learn and grasp facts and methods easily and quickly. CSD today includes 75% first degree students, 10% Masters and the remaining 15% PhD students.

The CSD makes use of hardware platforms already available at the institute and has also added hardware systems like the IBM Netvista™ / Netfinity™ / xSeries 235 / 255 eServer™ servers, IBM Netvista Workstations, HP Scanners, Logitech QuickCam™ Pro Web Cameras, iPen™ Graphics Tablets. In addition to these the CSD also uses developmental software tools such as Visual Studio, Visual Studio .Net, Eclipse and WSAD for Java related development, Macromedia Studio Mx for multimedia related development and the Lotus Domino Server for E-learning related services. The CSD has identified the areas of internetworking, grid computing, wearable computing and technology transfer as its primary areas of emphasis.

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CSD's

BLUECHIP INITIATIVES

Project BITS Linux commenced in 2001 and now has a focus on developing and distributing its own version of the Linux Operating System which has several new and innovative features. It will have CMFS Architecture, default support for IPv6 and Bluetooth, a new graphical web browser with IPv6 support, a Video-on-Demand (VoD) base system with native IPv6 capability and related enhancements.

The **BITS Multimedia Operating System (BITS MOS)** project, initiated in 1999 aims to develop an operating system which caters to soft real time restrictions of multimedia applications. With the knowledge acquired since the project's inception, Team CSD now believes that it can after all develop such a system that can provide inherent support for the soft real-time restrictions imposed by multimedia applications.

Another initiative is the **Virtual University** (VU) project. The VU is a supplementary facility for the students pursuing a degree through the Distance Learning Programmes Division of BITS, Pilani. Using this facility, off-campus students can make use of facilities normally only available to someone who is on-campus. Project VU is

Cutting edge
Software
Solutions...

Centre for Software Development   about CSD : projects : courses : team : hall of fame : contact

extremely beneficial as a student can work at his/her own pace without being the limitations of time and space! Efforts are being made to simulate classroom teaching which would make it easier for the student to understand the course. CSD plays a major role in providing technical support to distance learning operators of BITS, wherein it enables professors on campus to deliver live interactive lectures with full video and audio apart from slides and other documents. All that a student (sitting in any part of the world!) needs is a multimedia PC or a laptop with headphones, a microphone and a good internet connection to participate in this virtual classroom. A student can ask questions and also participate in online quizzes.

consists of researchers from various disciplines such as Computer Science, Physics, Chemistry, Instrumentation and Mathematics working quantum algorithms, cryptography and circuits.

CampusBuzz is an initiative managed wholly by students in the CSD team. It was started in 2001 to bridge any gap arising from the absence of any online resource about the campus and its activities. In the near future the CBuzz Team @ CSD hopes that this intranet portal would be capable of managing all the needs of a BITSian.

Perhaps the most important achievement of the CSD has been relating to the Internet Protocol version 6 (Ipv6), **Project – IPv6@BITS**, one of the earliest structured international projects in this field, started in 1998. Dr. Rahul Banerjee believes that Ipv6 will be the cornerstone of Next Generation Networks.

CSD Team @ BITS Pilani

CSD Bluechips
Linux
BITS MOS
Virtual University
Quantum
CampusBuzz
IPv6@BITS
Grid-One Computing

Some of the highlights of the IPv6 specific work at BITS are as follows:

- BITS, Pilani was the first from India to be on the International IPv6 Backbone known as the 6-Bone.

- BITS, is the first university in the world and the only Indian University that holds the status of a pTLA (pseudo top-level

aggregator for 6-bone addresses) for IPv6.

- The IPv6@BITS website was the first Indian website to be 100% IPv6 capable – IPv6 or IPv4 enabled.

- BITS led the IPv6-QoS Group at the European Commission's Next Generation Networks Initiative.

- BITS has bought out the world's first three native IPv6 based applications employing Video-over-IPv6 technology and allowing Dual-Stack Compatibility.

- BITS Pilani is the first university outside Europe to be granted the NGN-I (Next Generation Networks Initiative) Membership by the European Union (EU). A variety of projects undertaken by the CSD have also been sponsored by the EU.

- BITS is also helping several Indian companies such as Wipro, Novell, Samsung Research, FutureSoft other universities and engineering colleges to build small experimental IPv6 setups.

Also underway is the **BITS Digital Library Project** to design a digital library system that can inter-operate with other digital library systems. The idea is to provide a smooth user interface with high-quality, efficient search and service engines so that anyone accessing this feature would be comfortable getting the feel of using this as a single knowledge base. CSD also participates in the Oxford based JournalServer Digital Library Project.

The first phase of the **Grid-One Computing** initiative involves building a medium-sized grid spanning the campus and involves many server-class systems, as many as a thousand PCs for the institute laboratories and in faculty chambers, and PCs in hostel rooms and staff quarters. This could use operating systems like Linux, FreeBSD, SCO Unix, HP-UX, Sun Solaris, Windows 2003 Server, Windows 2000/Me/XP, Novell Netware, Win CE, Palm OS, et cetera. In the second phase, the initiative will connect the resultant grid to span the BITS campuses of Goa and Dubai. This would be amazing when one looks at it from the point of campus connectivity. This'll be built as an IPv6 native support based grid.

A research facility of mobile and wearable computer research is also in the pipeline replete with wireless access including IEEE 802.11b, Bluetooth, and IRDA apart from the regular connectivity of the Ethernet genre. The setup involves Pocket PCs, SmartFones, Tablet PCs and a host of software to support R&D. Part of this funding has come from Microsoft Research, Redmond and will be used for providing
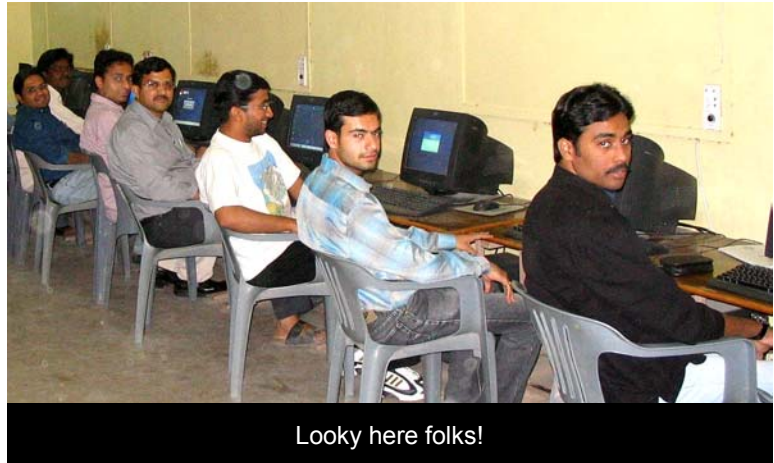
Looky here folks!

on-campus students and faculty facilities for performing experiments related to software development and deployment for mobile services.

CSD COURSES

CSD also offers a set of skill-oriented courses each semester which can be undertaken by any student in addition to a regular academic course load. These courses include ASP.NET, Java, Linux Programming, OOP with C++, basic C Programming, Oracle, VB.net, C# & .NET, and XML. Students can register in these courses by paying a prescribed semester fee. The students are also provided certificates on completion of the course. Further, assistance is provided to students appearing in campus interviews on basic programming concepts which are required for job interviews.

ACHIEVEMENTS

Dr. Rahul Banerjee believes that the work that CSD has been doing over the years is slowly but surely getting noticed also gaining critical acclaim. The amount of external funding that BITS, Pilani has received for its R & D projects has crossed Rs. 95 lakhs excluding the grant

provided by Cisco for the BITSConnect project. A team of five students won the IBM Great Minds Challenge, an all-India competition in 2003, where they presented a prototype of the Panchayati Raj System – their in-house evolved system of e-Governance. Three students were chosen for Microsoft Research Internship at Redmond, USA. A two member team of BITS students reached the finals of the Intel Student Research Contest.

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Or Visit
http://www.bits-pilani.ac.in/csd/Home/

All these are clear indicators that Team CSD's efforts are coming to fruition and creating reason for some serious BITS, Pilani pride.

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