



Case Study

Intel® Xeon™ processor with Hyper-Threading Technology¹ and Intel® Pentium® 4 processor supporting Hyper-Threading Technology

Education

Internet connectivity and e-mail



Intel, RDG Systems & Software Pvt Ltd and Jadavpur University*

Challenge	To improve the existing Internet connectivity and e-mail infrastructure at Jadavpur University* to make it more reliable, capable of bearing higher loads and easy to manage while retaining the existing network and keeping costs manageable.
Solution	Deploying six Intel® Xeon™ processor-based servers. Four of the servers were used as proxy servers to create a scalable and easily upgradeable infrastructure for managing the load for Internet connectivity and two were deployed as e-mail servers—one each as a primary and secondary e-mail server to create a reliable, scalable e-mail solution.

One of India's most respected and oldest universities, Jadavpur University started life in pre-independence India as the National Council of Education (NCE), Bengal. Established in 1906, NCE was transformed to the state-run Jadavpur University (JU) in 1955 and is today a thriving institution with nearly 10,000 students and 800 faculty members spread over two campuses in Kolkata; the sprawling 58-acre main campus at Jadavpur and a satellite 26-acre campus at Salt Lake.

The Challenge

JU has actively embraced technology not only to improve its teaching and learning activities but also for administration and communication.

JU uses a campus WAN with a fibre optic backbone to connect over 1000 nodes across both campuses. Leased lines—512 Mbps and 2 Mbps lines at the Jadavpur campus and a 256 Kbps line at the Salt Lake campus—provide high-speed Internet connectivity.

The JU Campus Networking Project committee, which was looking into revamp of the JU network, found several issues that needed to be addressed immediately.

The Jadavpur campus, which is home to about 38 departments and 25 schools of studies, has over 500 users connecting to the Internet at peak times and this load is expected to grow significantly over the coming years. JU was using the Squid* web proxy cache running on Red Hat* Linux 7.2 hosted on an Intel® Pentium® III processor-based server to create a single proxy connection to the Internet. Coupled with the low-speed 10 Mbps internal network, the performance of the infrastructure deteriorated sharply under the load resulting in extremely poor speeds and the proxy service became highly susceptible to breakdown under heavy loads.

Samit Pahari, Information Scientist at JU and a member of the JU Campus Networking project says, "The problem worsened with many of the client PCs being virus affected. The proxy server's cache used to shutdown abruptly and could not easily recover or re-initialise. In such scenarios,

we often had to reinstall the proxy service, which meant additional forced downtime of 1–2 hours.”

JU was also running a Red Hat Linux 7.0 based e-mail service on an Intel Pentium III processor-based server. The antiquated e-mail service in use did not allow for basic features such as limiting mailbox size, web-based access of e-mail or creation of sub-domains.

While JU extended the e-mail facility only to the faculty and administrative staff and not to any of the students with the exception of some research scholars, it found that users used huge disk quotas for e-mail leading to a space crunch. Also, the use of a generic domain did not identify the department from which the e-mail originated.

Adds Samit, “We were looking for a robust e-mail service which will be accessible through the web from both on and off campus and can enforce storage quotas for individual e-mail accounts. We wanted to implement an e-mail system wherein one could tell just by looking at the e-mail address of a JU mail user, which department it originated from.”

The Proposal

The JU Campus Networking Project committee decided to:

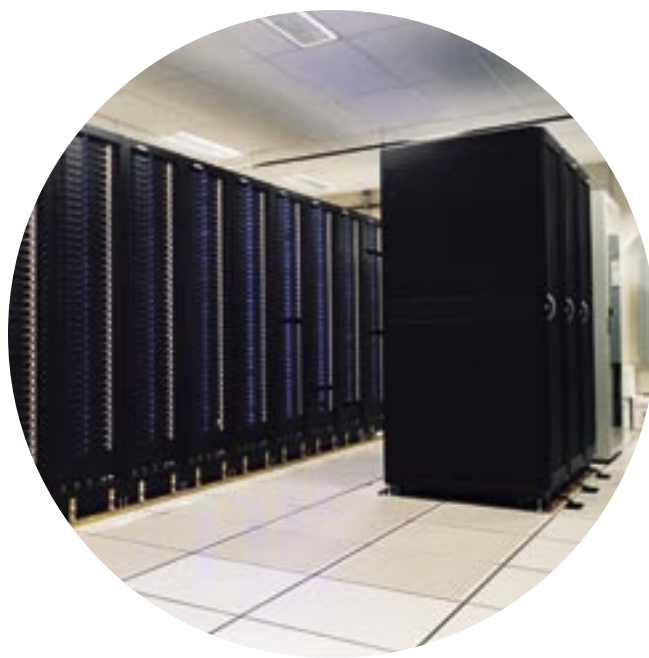
- Upgrade the Internet connectivity infrastructure so that it could manage a peak load of 700 concurrent users.
- Invest in a new e-mail setup with support for web-based access of e-mail, mailbox size limits and creation of sub-domains.

JU, however, did not want to upgrade the existing internal network systems because it would be a very expensive exercise given the vastness of the campus.

RDG Systems & Software Pvt Ltd (RDG) has been a long time vendor to JU and was well acquainted with the JU ICT infrastructure. RDG had supplied and was supporting the existing proxy and SMTP servers which gave it first hand knowledge of the problems that plagued them.

RDG, which supplies servers under the brand name Tornado* built around Intel and Intel compatible components, has also been fulfilling requirements at various departments of JU and recently supplied the JU Central Library and the Department of Civil Engineering with Tornado* servers based on the Intel® Pentium® 4 processor and Intel® Xeon™ processors respectively.

“Over the years, we have seen the infrastructure at JU evolve and are proud to have been a part of this evolution. We have



“As an Intel Premier Provider, we have seen that servers created from Intel products and Intel validated components are dependable, offer unmatched price/performance and are compatible with most popular network operating systems.”

**Suresh Gopinath
RDG**

supplied, installed and configured many servers at JU and can confidently say that we understand their requirements very well,” says Supriyo Banerjee of RDG, who was in charge of developing and implementing the solutions at JU.

The JU Campus Networking project was familiar with RDG’s association with JU and had positive feedback from the various departments which were using RDG’s systems and services.

“The Intel Pentium 4 processor-based RDG Tornado servers, which were commissioned at the JU Central Library (<http://libweb.jdvu.ac.in>), proved to be just the right solution. Even though they are entry level servers, they are being used to house the ever increasing library catalogue and publish it online, without compromising performance or reliability,” adds Samit.

The existing internal network of JU had four segments, each connected to the backbone via ATM switches. RDG suggested that instead of one proxy, JU should implement at least four proxy servers, one for each segment of its network, resulting in load sharing. The added benefit was that, in the future, by upgrading the ATM switches to Gigabit switches and the internal LAN from 10Mbps to 100 Mbps, the four proxy servers could be turned into cascading proxies which could share an individual cache amongst themselves; improving performance without a further hardware upgrade.

For the e-mail service, RDG recommended two servers—one each as a primary and secondary mail server.

RDG also proposed the use of Linux OS and open source software for the proxy and e-mail servers, thereby keeping costs low.

The Solution

RDG's solution, product offering, level and quality of support and the price advantage tilted the balance in its favour and



“With the deployment of the RDG servers and solutions, Internet and e-mail service across JU has become reliable, efficient and easy to manage.”

Samit Pahari
Information Scientist
Jadavpur University

it won an order for six servers from the JU Campus Network project committee.

Says Suresh Gopinath of RDG, “As an Intel Premier Provider, we have seen that servers created from Intel products and Intel validated components are dependable, offer unmatched price/performance and are compatible with most popular network operating systems. Also, Intel always has a long roadmap for all its products and so the future is also safeguarded against compatibility and support issues.”

Each of the four proxy servers is a dual Intel® Xeon™ 2.4 GHz processor-based server that used an Intel® Server Board SE7501CW2. RDG chose the dual Intel Xeon processor-based configuration because of its proven scalability and reliability. The enhanced performance brought in by the Hyper-Threading Technology¹ and Intel® NetBurst™ micro-architecture features is crucial for processor intensive operations such as content filtering.

“Using the Intel Server Board SE7501CW2 with the two integrated Intel® PRO Network Connections (one Intel Pro 100+ and one Intel Pro 1000) ensures scalable bandwidth. Whenever in the future, JU upgrades its ATM based network backbone to a Gigabit backbone, the servers will already be ‘Gigabit ready’,” adds Suresh.

The Intel Pro 100+ connection was used to connect to the 2 Mbps leased line while the Intel Pro 1000 was used to connect to the network backbone. The servers passed the Intel® Platform Confidence Test and were subsequently certified as Intel® Validated Server.

As the primary e-mail server, RDG supplied a server based on dual Intel Xeon processors 2.4 GHz. RDG used an Intel Server Board SE7501BR2, which builds on the bandwidth and performance-enhancing features of Intel NetBurst micro-architecture and Hyper-Threading Technology, and includes integrated Adaptec* Ultra320 SCSI and two integrated Intel PRO Network Connections—one Intel® Pro 100+ connected to a 512 Kbps leased line and the Intel Pro 1000 connected to the internal network backbone—to create a high-transaction e-mail server.

The server has two SCSI HDDs: a 36GB Ultra320 SCSI HDD for the operating system, mail server applications and web front-end while a 74GB Ultra320 SCSI HDD for the MySQL database for user mailboxes. A tape drive, Tandberg* SLR140, is provided for backup.

For the secondary e-mail server, RDG supplied a server based on dual Intel Xeon processors at 2.4 GHz with Intel Server Board SE7501CW2.

With Red Hat Linux 9.0 Professional as the operating system, RDG chose qmail* as the SMTP server and MySQL as the RDBMS. The qmail-MySQL combination allowed JU to implement sub-domains and user mailbox sizes with ease. To provide web-based access to e-mail, RDG chose SquirrelMail*.

The primary and secondary mail servers are configured such that in the event of the primary mail server failing, incoming or outgoing mail is stored in a catch-all account on the secondary server and relayed to the primary mail server when it is up and running.

Says Samit, "With the deployment of the RDG servers and solutions, Internet and e-mail service across JU has become reliable, efficient and easy to manage."

About RDG Systems & Software

Headquartered in Kolkata, RDG Systems & Software Private Limited was set up in 1993 to provide complete IT solutions to its clients. In the eleven years of operation, the company has built up an enviable reputation for quality in all spheres of its activity related to information technology. The company's prime focus is on providing quality and efficient products, solutions and support services to its varied clientele, through its well-trained and highly experienced team of skilled and certified engineers and technicians and has been certified ISO 9001:2000 in the year 2002.

In its quest to bring the best and the latest from the world of technology, RDG has alliances with Intel and several other technology industry leaders like Intel, Microsoft*, Samsung*, D-Link*, CISCO*, Linksys*, Tandberg Data* and many more.

For more information about RDG, visit:

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Intel® Technology

Intel® Xeon™ processor 2.4 GHz

Intel® E7501 chipset

Intel® Server Board SE7501CW2

Intel® Server Board SE7501BR2

Find out more about a business solution that is right for your company by contacting your Intel representative, or visit the Intel® Business/Enterprise Web site at intel.com/business or its industry solutions specific sites at intel.com/business/bss/industry/



*Hyper-Threading Technology requires a computer system with an Intel® Pentium® 4 processor supporting Hyper-Threading Technology and an HT Technology enabled chipset, BIOS and operating system. Performance will vary depending on the specific hardware and software you use. See <http://www.intel.com/info/hyperthreading/> for more information including details on which processors support HT Technology.

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