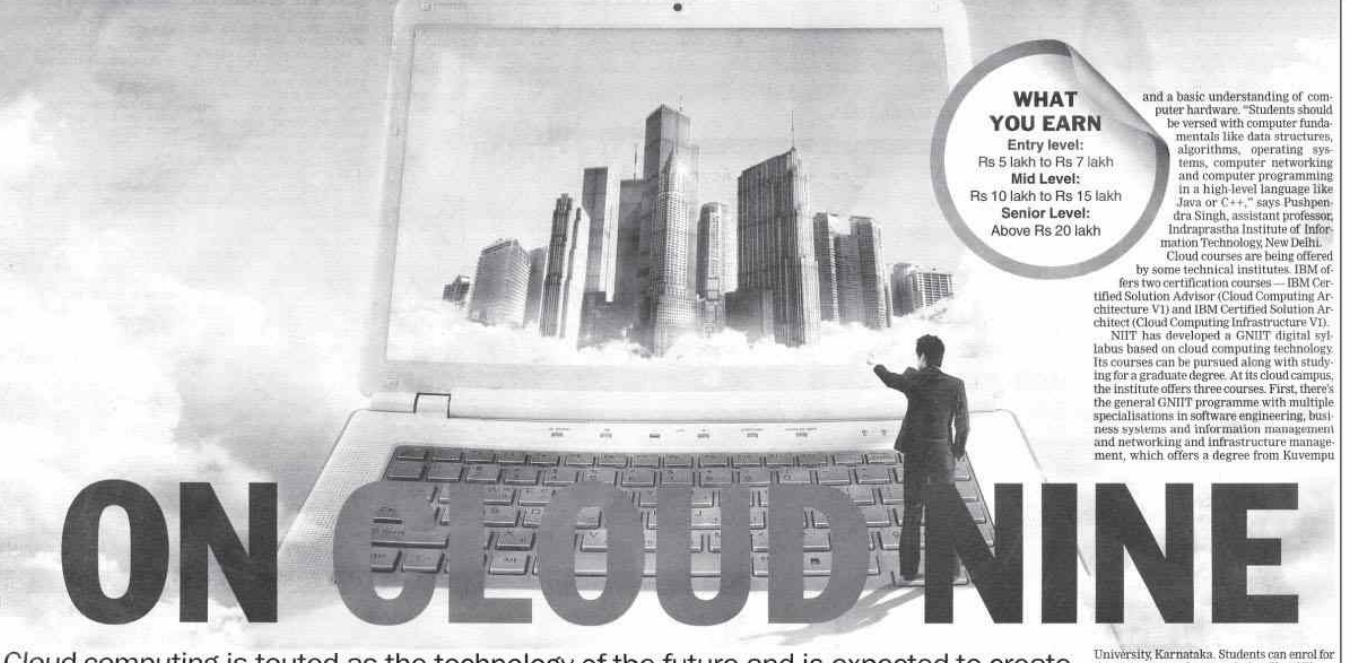

ON CLOUD NINE

Cloud computing is touted as the technology of the future and is expected to create 14 million jobs by 2015. **Avijit Chatterjee** and **Varuna Verma** give you the lowdown

Cloud computing technology works like an electric bulb. The bulb is the only point of contact between the ultimate user and the entire power supply system — you don't need to bother about transformers and power grids. Similarly, in cloud computing, the computer is reduced to a simple screen that connects to the Internet – all the computing power, storage and software reside in the network, without the user knowing where they are and who owns them. In other words, cloud computing is a technology that uses remote servers or a "cloud" to store and maintain data.

The number of people who are unaware of cloud computing is shrinking fast, as it's being touted as the technology of the future. "Cloud computing is the next phase of the Internet expansion," says Sudhir Dixit, director, HP Labs India, a research lab for Hewlett-Packard, the information technology (IT) conglomerate. "All computational resources – be it hardware, software, applications or stored data – will be delivered to the end user via a network instead of a local computer," he explains.

With new technology comes new job opportunities. Dixit finds there is a growing interest in this field among students. "People with skills in operations engineering, management information systems, business development, accounting and finance have new work opportunities waiting for them," he says.

S. Sadagopan, director, Indian Institute of Information Technology, Bangalore, explains what cloud computing is, devoid of the jargon. "It is a way of distributing computing resources — like processors, memory, storage and software — in a managed environment which is away from the user."

For the ultimate user of the computer, cloud computing will translate into saving time and money, says the professor, adding that this is the main reason organisations are increasingly opting for this technology. "As organisations opt for the cloud, naturally, many software assignments and jobs will move to cloud computing — in the same way as technologies like the personal computer, local area network (LAN) and web programming evolved in the last decades," explains Sadagopan.

Cloud computing will also help create leaner organisations, believes Vivek Menon, assistant professor (information systems), Amrita University, Kerala. "With the cloud, companies don't need to buy or maintain IT equipment or software licences. This way, they save on the cost of hiring personnel and infrastructure," adds Menon. Also, since cloud computing works on a pay-as-you-use basis, it reduces costs and increases adaptability. "Cloud allows companies to scale up or down the quantum of services, depending on demand," he explains.

That is probably why the technology world is so upbeat about the future of cloud computing. A recent survey commissioned by Microsoft and conducted by the International Data Corporation forecasts that some 14 million new cloud jobs will be created across the world by 2015. Half of these will be based in India and China, adds the study.

Prateek Chatterjee, associate vice president, NIIT Limited, the computer education company, believes a majority of cloud-related jobs will be generated in three industries — communications and media, banking and discrete manufacturing. "Cloud computing will drive the growth of the education sector by empowering students to learn on their own terms, at their own pace, wherever and whenever they want," he says. Explaining the cloud-education link, Chatterjee says cloud computing will make it possible to take high quality education to every corner of the country. Students will enjoy higher mobility as they can easily access educational services using a netbook or a mobile device that connects them to its cloud campus network. Further, interactive features like 24x7 lab and e-library access, instant tech updates, interaction with faculty and peers and access to online video streams will help in delivering educational content to students at their doorsteps. Thus the learning process will not be limited to textbooks but enhanced through interactive learning. As such, students across the country will able to follow the same curriculum, he adds.

More and more companies are climbing the cloud bandwagon. Globally, Amazon, Google, Microsoft, IBM, Yahoo, SalesForce and Verizon are cloud leaders. In India, top IT companies companies like Infosys, TCS and Wipro and smaller outfits like Makemytrip.com have invested in this technology. The new technology is bringing new career opportunities in the IT sector. "As an increasing number of services shift to cloud, job opportunities are being created for fresh recruits as well as experts. Besides developers, cloud computing is generating jobs for test engineers as well," says Hemant Kumar Rath, IT manager, Tata Consultancy Services, Bangalore.

Shrutidhar Paliwal, vice-president and head, corporate communication, Aptech, says cloud jobs can be categorised into three — cloud development, implementation and service providers. "Developers will be required to create cloud-based applications. In the implementation segment, jobs are available in the areas of security, data centers and infrastructure implementers. Cloud service providers will hire personnel to manage data storage, security and provide services," elaborates Paliwal.

Besides technology, cloud computing will also generate jobs for law graduates, believes RK Shyamasundar, professor, Tata Institute of Fundamental Research, Mumbai. "As cloud computing gains momentum, it will throw up issues of cyber laws about data storage. This will bring law specialists into the picture," he explains.

Though an engineering background is not mandatory to study cloud computing, students should have a knowledge of computer programming and a basic understanding of computer hardware. "Students should be versed with computer fundamentals like data structures, algorithms, operating systems, computer networking and computer programming in a high-level language like Java or C++," says Pushpendra Singh, assistant professor, Indraprastha Institute of Information Technology, New Delhi.

Cloud courses are being offered by some technical institutes. IBM offers two certification courses — IBM Certified Solution Advisor (Cloud Computing Architecture V1) and IBM Certified Solution Architect (Cloud Computing Infrastructure V1).

NIIT has developed a GNIIT digital syllabus based on cloud computing technology. Its courses can be pursued along with studying for a graduate degree. At its cloud campus, the institute offers three courses. First, there's the general GNIIT programme with multiple specialisations in software engineering, business systems and information management and networking and infrastructure management, which offers a degree from Kuvempu University, Karnataka. Students can enrol for the programme after completing Class XII.

The USP of the NIIT cloud programmes, according to Chatterjee, is that they are completely digitalised. "Students will be provided with fully-loaded netbooks and a data card. This will enable them to carry the curriculum anywhere and not be physically present at a study centre," he explains.

Aptech, the computer education company, offers two modules on cloud computing. The first — introduction to cloud computing — teaches them to access cloud services and develop applications. The second module — application development and deployment with cloud computing — teaches students to develop applications, deploy them in cloud and access them. "Anyone with a basic knowledge of computers and the Internet can enrol for the first module. Students with programming skills in NET or J2EE are eligible for the second module," says Aptech's Paliwal.

With the demand for cloud computing professionals predicted to rise, this new technology could be the silver lining in the global, recession-hit technology job market.

WHAT YOU EARN

Entry level:
Rs 5 lakh to Rs 7 lakh

Mid Level:
Rs 10 lakh to Rs 15 lakh

Senior Level:
Above Rs 20 lakh

WHAT YOU BECOME

Cloud architect
Cloud business applications engineer
Cloud computing analyst
Storage engineer
Cloud computing consultant

The Telegraph, Kolkata, *April 5, 2012*