



High-tech Jobs Rebound

For the first time since the dot-com collapse near the turn of the millennium, California added technical workers, according to the Cyberstates report released in April by the American Electronics Association.

In 2005, the most current state data available, California added 14,400 (2%) more tech jobs than it lost, reaching a total of 919,322 jobs.



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AS Degree Application Submitted

This quarter, ICONS efforts led to the CNIT Department submitting an application to offer an Associate of Science (AS) Degree in Computer Networking and Information Technologies (CNIT). (CNIT replaced ICT, because of better name recognition in local markets.) Acceptance is expected this Fall.



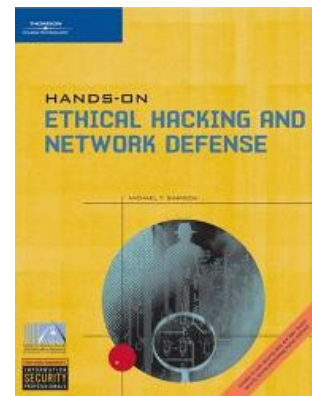
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ICONS Ethical Hacking & Network Defense

Network security has been one of the fastest growing and most important aspects of network and IT systems in the 21st century. As network and IT systems become more important to organizational operations, protecting systems and information from theft and malicious attack become more important also.

Recognizing this trend and the increasing staff and budgets dedicated to data and network security, ICONS has developed and delivered a new course in Ethical Hacking and Network Defense, strengthening its security offerings.



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ICONS Participates in High School Outreach

In June, for the second year in a row, ICONS participated in the City College of San Francisco Math, Science and CTE (Technology) Conference.

The Conference is designed to further math and science content and knowledge for K-14 teachers and future teachers with a series of relevant workshops.

Gwen Chan, the San Francisco Unified School District (SFUSD) Interim Superintendent, provided a keynote address, sharing her enthusiasm and belief in the importance of Math, Science and CTE (Technology) at the SFUSD.



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The 150-page report validates similar findings from other sources - for example, a January Joint Venture Silicon Valley study showing a 2.9 percent increase in regional tech jobs from June 2005 to June 2006.

Nationally, the Cyberstates report shows high-tech employers in all 50 states adding almost 150,000 jobs in 2006, versus 87,400 jobs added in 2005, the first year of gains after four years of national losses.

California continues to lead in almost all important high-tech job indicators, from total jobs (919,322) to an estimate of employers (41,069), far-surpassing second-place Texas, with 445,785 jobs and 22,462 employers.

The tech job increases appear across most high-tech industry sectors - manufacturing, software services, engineering and tech services are all adding to payrolls again. The telecommunications industry is the only exception. It lost 13,300 more jobs in 2006, 1 percent of the previous year's total.

The rapidly improving high-tech job market is creating a national debate about whether to meet a shortage of skilled workers by bringing in more foreign workers (via controversial H-1B visas) or whether we should develop talent domestically. H-1B visas allow U.S. employers to temporarily hire and import foreign high-tech workers.

ICONS' outspoken position in that debate is that the U.S. should be developing talented information and communications technology (ICT) professionals in the U.S., and it should be doing so aggressively. Virtually all institutions, industry and individuals now increasingly depend on ICT. It is a matter of national, state and local strategic importance to develop local talent able to implement, maintain and advance ICT technologies locally. Community colleges are the most cost-effective way to push ICT technician training into the community.

Cisco Networking Academy Changes



The first Cisco Networking Academy was established in San Francisco at Thurgood Marshall Academic High School in 1997. Since then, more than 1.6 million students have enrolled in the program in more than 10,000 Academies in high-schools, technical schools, colleges, universities and community-based organizations in more than 150 countries.

CNIT/ICONS at City College of San Francisco is a Cisco Regional Networking Academy, providing Cisco training to CCSF students and to instructors from other Cisco Academies within the region. For example, in June, ICONS PI Pierre Thiry provided training for a new Cisco Academy being formed at John O'Connell High School in San Francisco.

CNIT/ICONS and its Cisco Regional Networking Academy in turn have a relationship with The California Regional Consortium for Engineering Advances in Technological Education (CREATE - create-california.org), an NSF-funded ATE Center in Santa Clarita, CA, which is a joint effort between seven community colleges and over 50 large high tech engineering and technology employers. CREATE is a Cisco Academy Training Center (CATC), where Cisco Regional Academy instructors are trained.



The Cisco Academy program is undergoing significant review and revision, and CNIT/ICONS is very involved in those changes. For example, both Cisco Certified Networking Associate (CCNA) and Cisco Certified Networking Professional (CCNP) curriculum are undergoing significant revisions. CNIT/ICONS is hosting revised CCNP instructor training in July.

More on these developments in the next newsletter!

A **hacker** is somebody who uses computer expertise to gain unauthorized access to a computer system belonging to another, either to learn about the system or to examine its data. A **cracker** is somebody who uses computer expertise to gain unauthorized access to a computer system belonging to another to steal, destroy or manipulate data.

The Department of Justice calls both “hackers” and enforces criminal prosecution of hackers. Nevertheless, hackers and crackers are very active. In 2005, according to www.cert.org, more than 150,000 network security incidents cost organizations and individuals more than \$42 billion. According to Pennsylvania College of Technology, network security job growth is expected to increase 80% through 2010.

In order to effectively defend and secure networks against hacking, it is necessary to understand how hackers think and work and to understand techniques they use to access and compromise networks and computer systems. That is the purpose of CNIT/ICONS *Ethical Hacking and Network Defense* course, which is taught by CNIT instructor Sam Bowne.

Further, organizations now frequently employ or contract with “ethical hackers” to attack their systems and network defenses in order to assess vulnerabilities and enhance defenses. These demands have led to relevant industry certifications:



CompTIA offers a Security+ certification on basic familiarity with security concepts and terminology. CNIT courses prepare students for this certification.



The Institute for Security and Open Methodologies (ISECOM) offers certification as an OSSTMM Professional Security Tester (OPST), based on the Open Source Security Testing Methodology Manual (OSSTMM).

In Ethical Hacking and Network Defense, students learn how hackers attack computers and networks, and how to protect systems from such attacks, using both Windows and Linux systems. They learn legal restrictions and ethical guidelines and are required to obey them. Students perform many hands-on labs, both attacking and defending: performing and analyzing port scans; footprinting; exploiting Windows and Linux vulnerabilities; testing firewalls; sniffing, cracking and stealing passwords; exploiting buffer overflows; SQL injection; privilege escalation; Trojans; and backdoors.

This course has been offered during regular semesters and has been fully enrolled twice. An introductory version was taught at the NCTT Winter 2007 Conference in January, and it is being taught at the CCSF Summer Convergence Workshops and at the Convergence Technology Center (CTC) in Frisco, TX this summer. Sam Bowne will present experiences with the course at this year's Defcon Conference in Las Vegas in August (<http://www.defcon.org/>). There have been no security incidents with students, who are often working network professionals and have enthusiastically praised the course and expressed interest in other similar courses.

According to a study of companies by Mazu Networks:

- Almost half had worms
- 23% had internal breaches
- 27% lack tools to know if they've had an internal breach
- 40% had critical services disrupted
- 40% loss or corruption of data
- 17% had intellectual property stolen

These skills are in great demand, and this course strengthens CNIT's security offerings. CNIT's Security Academic Certificate currently consists of a core of Introduction to Networks, Network Security and Firewalls, plus either Wireless Security, Security for Windows Networks, Advanced Security for Network System Administrators or Cisco PIX Firewall & Router Security.



Following Superintendent Chan in the Diego Rivera Theatre at City College of San Francisco, KCBS Technology Analyst, Larry Magid, provided a "Glimpse Into the Future," updating the audience on cutting edge technology jobs of the future and trends in business with an emphasis on math, science and CTE (technology) content.

At this year's event, Pierre Thiry, ICONS' PI, presented workshops on "Hands-on Wi-Fi Networking." Last year, ICONS presented workshops on "Fiber Optics" and "Networking Basics."

Other workshops included: a hands-on exploration of the earth and how to do podcasting in the classroom by the Exploratorium's Teacher Institute; an interactive game on reptile and amphibian diversity and lessons on evolution and on organic and locally grown produce from the California Academy of Sciences; groups of four activities designed by the Lawrence Hall of Science; and methods to integrate literacy skills into science classes by the SFUSD.

Other CCSF workshops included: Calibrated Peer Review, Applied Mathematics in Engineering, Web 2.0, Let's Get Mathematical, Pollination Syndrome and Algebra Reform. A member of Al Gore's Global Warming Taskforce closed the conference with a presentation on Climate Change – By the Numbers.

ICONS is pleased to participate in San Francisco high school outreach and development. SFUSD teachers were able to receive college credit for the event.

Student Certifications Awarded

This spring semester, the CNIT department awarded students 18 academic certificates, including: Network Security, Computer Technician, Fundamentals of Networking, Website Development Techniques, and Routing and Switching. Students receiving certificates included: Gerald Oborn, Angela Bradley, Hai Nguyen, Thanach Phatchaivuttiknl, Eugene Kaneshima, Kirk Yang, Ye Sint, Gurkan Ozmert, Joseph Catera, Kelvin Domensen, Maria Cisneros and Hong Bo Liu.



IEEE Student Chapter Tours 200 Paul Data Center

In May, members of the ICONS' developed IEEE Student Chapter at City College of San Francisco toured the Digital Realty Trust carrier hotel/data center at 200 Paul in San Francisco.



With more than 400,000 square feet of space, 200 Paul is one of the premier telecom carrier facilities in the United States, serving as a major nexus of metro-area, national and international communications networks in the Bay Area.

Students viewed City College of San Francisco's leased equipment rack at 200 Paul and how the college cross-connects in that facility to networks operated by ICONS' advisory panel member the Corporation for Educational Networking Initiatives in California (CENIC) for gigabit access to the public Internet and Internet2 and to ICONS advisory panel member Telekenex for advanced VoIP interconnections with the Public Switched Telephone Network (PSTN).



San Francisco IEEE Communications Society Chairman Michael Butler, ICONS PI Pierre Thiry, United Layer's Tim Pozar and IEEE Student Chapter Members at United Layer's Operations in 200 Paul

ICONS advisory panel member Tim Pozar arranged and led the tour, which included insight and understanding of the operations and services of UnitedLayer, a new class of managed colocation company. UnitedLayer's brings networking, datacenter management and systems administration expertise to client partners to architect, deploy, monitor and fully manage client backend platforms, allowing clients to focus on building applications.