

Shaping the Future with Computer Science

Penn Manor Career Day

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Everyday, Everywhere – there is Computer Science

- Check your e-mail / IM? computer science (networks/ software engineering...)
- Play video games? computer science (animation/ graphics)
- Watch “Avatar”? computer science (animation/ graphics)
- Use GPS? computer science (satellites/ networks/ software engineering)
- medical instruments monitored by computers
- stock market monitored by computers
- online universities impossible without computers
- looking at this presentation?

What other examples can you think of?

See – wherever you go, whatever you do – there is Computer Science – auto-pilot?



Some Vocational Areas in Computing

- **Artificial Intelligence**
 - Develop computers that simulate human learning and reasoning ability
- **Computer Design and Engineering**
 - Design new computer circuits, microchips, and other electronic components
- **Computer Architecture**
 - Design new computer instruction sets, and combine electronic or optical components to provide powerful but cost-effective computing
- **Information Technology**
 - Develop and manage information systems that support a business or organization
- **Software Engineering**
 - Develop methods for the production of software systems on time, within budget, and with few or no defects
- **Computer Theory**
 - Investigate the fundamental theories of how computers solve problems, and apply the results to other areas of computer science
- **Operating Systems and Networks**
 - Develop the basic software computers use to supervise themselves or to communicate with other computers
- **Software Applications**
 - Apply computing and technology to solving problems outside the computer field - in education or medicine, for example



Computer Animators



Horton Hears a Who, Happy Feet, Chicken Little, Toy Story - inanimate objects that are brought to life on film and television screens by computer animators

Multi-discipline: if you are good at art and math, confident and the able to learn quickly and apply new software programs

Deal with unexpected – because you are working within a creative industry which includes directors, CEOs, actors, animals

related Jobs: Graphics and Multimedia Designer, Webmaster

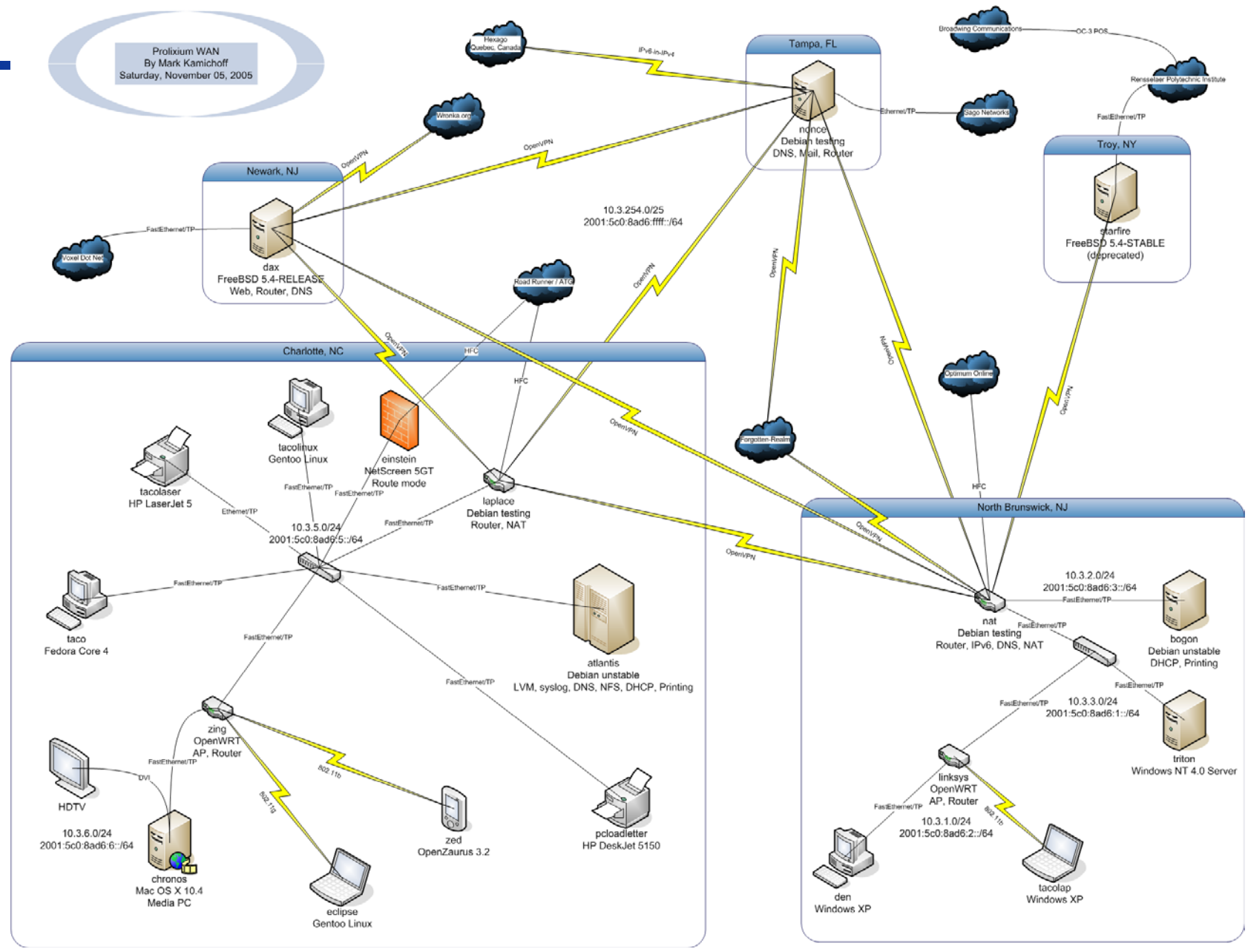
can be long hours especially during end of projects

entry level jobs in this field: \$25,000 - \$55,000

Network Analysts: Connecting and Securing the World

- Network Analysts come in many variations
- **Network Systems and Data Communications Analysts** are needed to design, test, and evaluate systems such as local area networks (LANs), wide area networks (WANs), the Internet, intranets, and other data communications systems
- Systems can range from a connection between two offices in the same building to globally distributed networks, voice mail, and e-mail systems of a multinational organization
- Network systems and data communications analysts perform network modeling, analysis, and planning; they also may research related products and make necessary hardware and software recommendations
- **Telecommunications Specialists** focus on the interaction between computer and communications equipment. These workers design voice and data communication systems, supervise the installation of those systems, and provide maintenance and other services to clients after the system is installed.

Prolixium WAN
By Mark Kamichoff
Saturday, November 05, 2005



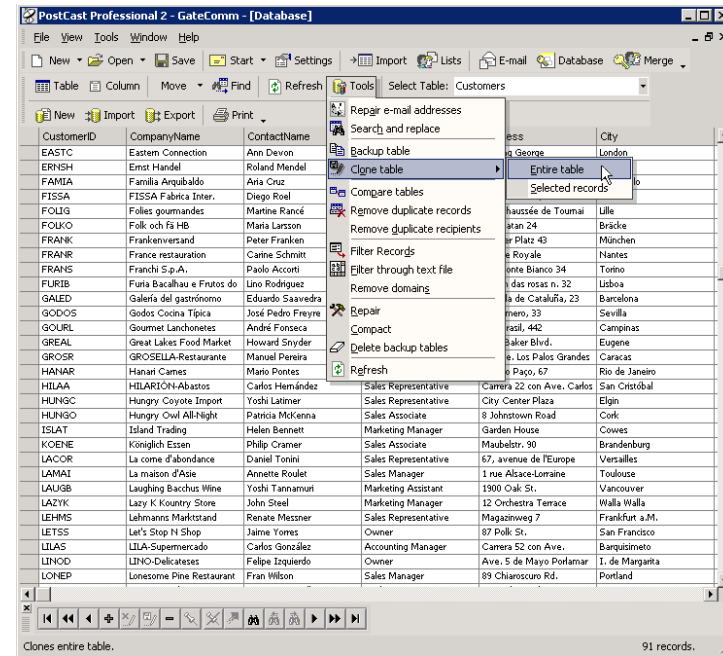
Internet Gurus: Web Development and Web 2.0

- The growth of the Internet and the expansion of the World Wide Web (the graphical portion of the Internet) have generated a variety of occupations related to the design, development, and maintenance of Web sites and their servers
- For example, **Webmasters** are responsible for all technical aspects of a Web site, including performance issues such as speed of access, and for approving the content of the site
- **Internet Developers or Web Developers**, also called **Web Designers**, are responsible for day-to-day site design and creation
- Web 2.0 technologies



E-commerce & Database Administrators: Cataloging the World

- With the Internet and electronic business generating large volumes of data, there is a growing need to be able to store, manage, and extract data effectively
- Database Administrators** work with database management systems software and determine ways to organize and store data
- They identify user requirements, set up computer databases, and test and coordinate modifications to the systems
- An organization's database administrator ensures the performance of the system, understands the platform on which the database runs, and adds new users to the system
- Because they also may design and implement system security, database administrators often plan and coordinate security measures
- With the volume of sensitive data generated every second growing rapidly, data integrity, backup systems, and database security have become increasingly important aspects of the job of database administrators.



Computer Forensics Specialists



- CSI
- CODIS
- Cyber crime
- Money Laundering

- Evidence held to very high standards in court

- The interest in computer forensics is heightened:
 - High amount of digital evidence
 - Increased scrutiny by legal profession
 - Higher level of computer skills by criminals

- Generally involves four basic steps similar to those of standard forensics:
 - Secure the crime scene
 - users should call the response unit at the first hint of security issue
 - the surroundings should be documented
 - photographs and equipment should be labeled
 - computer, peripherals, and media should be taken into custody
 - Collect the evidence
 - volatile data must be captured
 - mirror image backup must be performed
 - Establish a chain of custody
 - details of location of evidence must be documented
 - Examine and preserve the evidence

Evolution of the crime weapon:



old fashioned way



new way