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Major: Network Administration

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### Abstract

The major fields of study offered by the CIS department (Computer Information Systems) of San Antonio College are Database Administration, Network Administration, Network Security, and Programming. Classes in website creation and design are also offered and are a part of some degree plans. San Antonio College provides a Computer Lab for students taking Information Technology courses. In the lab students have access to computers, the internet and tutoring. The CIS department computer lab takes on projects for educational purposes as well as for the department and instructors. The Practicum course in the CIS department is meant to give students practical hands on experience in their field of study. The work-study program at San Antonio College performs a similar function. A practicum student or a work study employee who works in the CIS computer lab will be responsible for participating in lab projects, assisting students with computer problems, monitoring the lab and tutoring students. Practicum students who work in the CIS computer lab are required to keep a journal of their activities and provide it to the department.

### **CIS Practicum Journal**

Monday – August 24

- Helped install second hard drive in all 18 student machines of the computer lab.
- Second hard drive is needed to store virtual machine images.

Wednesday – August 26

- Completed the installation of second hard drives in student machines.

Friday – August 28

- Installed Visual Studio 2008 in Windows so that students can compile visual basic applications (“Visual Studio 2008 Express Editions,” n.d.).
- Installed SeaMonkey in both Windows and Fedora (“The SeaMonkey® Project,” n.d.).
- Installed OpenOffice in Windows and Fedora (“OpenOffice.org - The Free and Open Productivity Suite,” n.d.).
- Installed Adobe Reader in Windows and Fedora (“PDF open, create & edit files in pdf format,” n.d.).

- Installed PDF printer in Windows (“PDFCreator | pdfforge.org,” n.d.).
- Installed in Windows WinSCP (Windows secure copy)  
(“WinSCP :: Free SFTP and FTP client for Windows,” n.d.).

#### Monday – August 31

- Installed Oracle client in Windows machines  
(“Instant Client downloads for Windows,” n.d.).

#### Wednesday – September 2

- Installed VirtualBox in both Windows and Linux (machines dual boot WindowsXP and Linux, Fedora10)(“VirtualBox,” n.d.).
- Installing VirtualBox in Fedora required installing development packages for the kernel(“Fedora Project,” n.d.).
- Installed windows XP and Fedora10 as virtual machines (“Microsoft Windows: Windows 7, Windows Vista, Windows XP, Windows Live,” n.d.).
- Installed guest additions in both Windows XP and Fedora10.
- Installing the guest additions for the Fedora virtual machine involved installing development packages and kernel source/headers, mounting the guest additions ISO, setting the install.sh file as executable (chmod 755 install.sh) and executing it

with `./install.sh`.

- Activated USB (Universal Serial Bus) support and shared folders in both Operating Systems (“USB.org - Welcome,” n.d.).

- Activating USB support for VirtualBox in Fedora involved creating a user group named USB and adding a line to `/etc/fstab` as follows,

```
none /sys/bus/usb/drivers usbfs devgid=502,devmode=664 0 0
```

(“VirtualBox/USB - Community Ubuntu Documentation,” n.d.)

The devgid must be the groupid from the USB user group that was created the group id can be found by running,

```
cat /etc/group |grep vboxusers |awk -F : '{print $3}'
```

Friday – September 4

- Installed Debian in VirtualBox (“Debian -- The Universal Operating System,” n.d.)
- Installed Oracle Server 10g Express in Debian (“Oracle Database 10g Express Edition,” n.d.).

- Compiled apache web server from source - configure command -

```
./configure --prefix=/usr/local/apache --enable-so --enable-cgi --enable-info
```

```
--enable-rewrite --enable-spelling --enable-usertrack --enable-deflate --enable-ssl
```

```
--enable-mime-magic
```

- Set VirtualBox network adapter as bridged so that virtual machine can get an IP address on the same network instead of using a NAT(Network Address Translation). This allows Oracle and the web server to be accessed by other machines on the local network.

### Wednesday – September 9

- compiled and tested php5 with Oracle support in apache – configure command -  
`./configure' '--with-apxs2=/usr/local/apache/bin/apxs' '--with-mysql' '--  
prefix=/usr/local/apache/php' '--with-config-file-path=/usr/local/apache/php' '--  
enable-force-cgi-redirect' '--disable-cgi' '--with-zlib' '--with-gettext' '--with-gdbm  
--enable-oci8`  
(“PHP: Hypertext Preprocessor,” n.d.)
- Tested Oracle with a small script from Oracle.com  
(“Installing Oracle, PHP, and Apache on Linux,” n.d.).

### Friday – September 11

- Updated the Windows and Fedora passwords on student machines before imaging the drives.
- Since all of the software was installed and functional in one machine we used

Ghost for Linux to create images of the hard drives and store them on our FTP server. (“G4L | Get G4L at SourceForge.net,” n.d.)

Monday – September 14

- Assisted in using Ghost for Linux to restore the two drive images from our FTP server to the remaining 17 student machines.

Wednesday – September 16

- After we restored the images to the student machines and began using them we realized that many of the hard drives we used were malfunctioning and needed to be replaced.
- Began sorting out which hard drives were not fully functional.

Friday – September 18

- Continued replacing defective hard drives and re-imaging them.

Monday – September 21

- Finished replacing defective hard drives and imaging them.

Wednesday – September 23

- After all of the machines were successfully imaged, we ensured that each machine had a unique hostname in the format NTC-122-\$number ( \$number is N01-N18 )
- We documented all of the Network adapter MAC addresses so that the DHCP server could be configured to give each machine a specific IP address.

Friday – September 25

- Assisted with the configuration of an Apache Web Server to allow individual computers to get a public\_html directory and that their home directories have the right permissions to be accessed from the Internet. Achieved by adding public\_html to the /etc/skeleton file, adding a user share option to httpd.conf and running `chmod 711 /home/*`
- Troubleshoot a student's laptop. The student had a Cricket mobile Internet USB device that was not connecting (“Cricket Wireless | Broadband Wireless Internet & Service Provider,” n.d.).
- Resolved the connectivity issue and replaced the student's expired Norton 360 with Avast (“Download FREE antivirus software - avast! Home Edition,” n.d.). Helped them register and enter the license key.
- Tutored a student on TCP/IP headers for ITSY 1342, Professor Steve Kolars.



Monday – September 28

- Sick – mainly just watched lab and had it open for students while Professor Santana was teaching class.

Wednesday – September 30

- Helped student install Oracle in Windows.
- Installed Microsoft loop back adapter and enabled Internet connection sharing between the students main network connection and the loop back adapter.

Friday – October 1

- Tutored student on IPv4 network addressing.
- Went over the subnet boundary, the broadcast address and the  $2^n - 2$  formula for calculating available hosts.
- Began working on a web page tutorial for TCP/IP headers (“tcp-ip header,” n.d.).

Monday – October 5

- Continued working on web page - TCP/IP header tutorial (“Search Results: tcp header,” n.d.).
- Tutored two students on basic HTML and CSS

(“World Wide Web Consortium (W3C),” n.d.).

Wednesday – October 7

- Finished TCP/IP header tutorial – added page explaining what a hexadecimal dump of a TCP/IP header is and how one can be acquired.
- Repaired virtual machine configuration in VirtualBox for a student whose Fedora 4 virtual machine configuration had become corrupted.
- Assisted one student with homework for intro to web programming.

Friday – October 9

- Lab Supervisor assigned all work study and practicum students to write a personalized web page for the computer lab.

Monday – October 12

- Continued work on personalized web page for the computer lab.

Wednesday – October 14

- Continued work on personalized web page.

Friday – October 16

- Continued work on personalized web page.
- Added journal to personalized web page.
- Ghosted 2 machines for worker section of the lab.
- Set up network print server and printer for lab use only.

Monday – October 19

- Assisted student who was unable to log into Blackboard Vista  
(“Log in to Blackboard Learning System,” n.d.).
- After checking all security settings and observing that the browser passed the Blackboard browser check, I believe that the Internet Explorer application on her computer was either infected or corrupted.
- Installed Firefox on her machine and was able to log in to Blackboard Vista  
(“Firefox Browser | Free ways to customize your Internet,” n.d.).
- Tutored a student in intro to web programming. Assignment was to create a table showing the squares and cubes of the numbers one through ten.
- Continued working on lab page.

Wednesday – October 21

- Continued work on Lab Assistant website.
- Tutored student in Programming and Logic: IPO Worksheet and Visual Logic.
- Assisted student with virus removal.

Friday – October 23

- Continued work on Lab Assistant website.
- Assisted student with configuring a dual boot machine, Windows and Linux.
- Installed Fedora to create dual boot machine.
- Tutored student in Intro to Web Programming with Java Script.

Monday – October 26

- Began assignment of learning to use aircrack-ng to test the strength of wireless network security (“Aircrack-ng,” n.d.).
- Flashed one the Labs wireless access points with DD-WRT Linux firmware (“Router Database | [www.dd-wrt.com](http://www.dd-wrt.com),” n.d.).
- Set the administrator user name and password, ESSID and WEP encryption key.  
This was done manually with open source TFTP utility after power cycling the

access point (“TFTPD32 : a opensource TFTP server/service for windows : TFTP server,” n.d.). Access-point is WG602 v3 (“NETGEAR WG602 54 Mbps Wireless Access Point,” n.d.).

Wednesday – October 28

- Made a bootable USB with Backtrack3 for one of the other lab assistants to assist them with the wireless security assignment (“Remote-Exploit.org - Supplying offensive security products to the world,” n.d.).
- Continued learning the aircrack-ng utility.

Friday – October 30

- Successfully retrieved lab access-point WEP key with the aircrack-ng utility.

Monday – November 2

- Tutored student in Intro to Web Programming with Java Script.
- Added some videos to lab assistant web page (“YouTube - Broadcast Yourself,” n.d.).
- Added some linked program images to lab assistant website.

Wednesday – November 4

- Began installing Oracle in Centos

(“www.centos.org - The Community ENTERprise Operating System,” n.d.).

Friday – November 6

- Finished installing Oracle in Centos

(“Installing Oracle Database 11g Release 1 on Oracle Enterprise Linux 5,” n.d.).

- Transferred lab assistant website files to lab server(“CIS Lab Assistant,” n.d.).
- Updated lab assistant journal on lab assistant web page.
- Tutored student on compiling programs in the Java programming language  
(Java, not Java script).

Monday – November 9

- Fixed students Internet connection. Was not working because the wrong connection was set as the default Internet connection.
- Continued working on lab assistant website.

Wednesday – November 11

- Configured dual boot machine, Windows 7 and Fedora 11

- Removed Oracle from students machine. Student had attempted to install Oracle but was unsuccessful.
- Installed Microsoft loopback on students machine for future Oracle installation.

Friday – November 13

- Updated Journal on lab assistant website.
- Assisted student with checking their personal hard drives and reinstalled Windows XP Home on the their personal desktop.
- Inspected students old desktop that was not functional. Determined that the motherboard had failed due to a blown capacitor.

Monday – November 16

- Tutored student for Programming and Logic, Visual Logic(“Visual Logic,” n.d.).
- Work on making Linux Oracle server auto start after reboot.

Wednesday – November 18

- Installed new Dell 5330n network printers in CIS computer lab(“CIS LAB,” n.d.).  
Obtained IP from Dell Printer digital display menu.  
Obtained MAC address through arp command and through nmap utility.

Downloaded drivers from the Dell website (“Drivers & Downloads,” n.d.).

- Tutored student in Program Logic and Design with Visual Logic.

Friday – November 20

- Assisted other lab assistants with the testing of a students computer.

We concluded that the power supply and the front panel (power connectors) were bad. The motherboard, CPU, RAM, Video card and modem were all good.

- Tutored student in Intro to Web Programming with Javascript.

Monday – November 23

- Tutored student in PHP and MYSQL

(“MySQL :: The world's most popular open source database,” n.d.).

- Tutored student in Program Logic and Design.
- Installed Virtual PC with Fedora\_4 and Windows\_XP in student machine for Intro to PC Operating Systems (“Windows Virtual PC: Home Page,” n.d.).

Monday – November 30

- Assisted student who could access their Oracle database.

After inspection I noticed the student's loopback adapter had been disabled.



Re-enabled student's Microsoft loopback adapter.

- Updated lab assistant website, added pictures and updated my practicum journal.
- Tutored student in Program Logic and Design, Visual Logic.

Wednesday – December 2

- Assistants Pancho Martinez (lab assistant) with student machine. Student's machine has an excessive amount of dust which was preventing the computers cooling system from functioning properly. We cleaned the dust from the system and it returned to normal functionality.
- Tutored student in Javascript.
- Tutored student in Visual Logic.

Friday – December 4

- Evaluated new group of laptops that were brought down to the computer lab. 6 were functional, I repaired 2 and 1 was missing memory, a hard drive and a wireless adapter. In all 8 are functional and 1 is not.

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Table 1

#### Practicum and Work Study Schedule

| Day       | In       | Out      | In      | Out     | Total Hrs |
|-----------|----------|----------|---------|---------|-----------|
| Monday    | 8:00 AM  | 12:00 PM | 1:00 PM | 4:00 PM | 7         |
| Tuesday   |          |          |         |         |           |
| Wednesday | 8:00 AM  | 12:00 PM | 1:00 PM | 4:00 PM | 7         |
| Thursday  |          |          |         |         |           |
| Friday    | 10:00 AM | 3:00 PM  |         |         | 5         |
| Saturday  |          |          |         |         |           |