**Programming Test2**

**Administration and Programming Test (use any reference please challenge yourself)**

**Choose 1 question**

1. a) Write a shell script to display system information and save it to a file.

**#!/bin/sh**

**# check that parameter #1 exists, give message if it doesn’t**

**if [ “$#” –lt “1” ]; then**

**echo “Usage: $0 savefile”**

**exit 1**

**fi**

**# display information and save to file too**

**echo $(hostname) | tee “$1”**

**echo $(uname –a) | tee –a “$1”**

**echo $(df –k) | tee -a “$1”**

**# End Script**

b) How can you make this script executable?

**chmod 7xx myscript or chmod u+x myscript**

1. a) Write a short ‘C/C++’ program that will display the status of a system.

**/\*myprog.c provides system status \*/**

**#include <stdio.h>**

**#include <stdlib.h>**

**int main(int argc, char \*argv[]) {**

**/\* check for parameter 1, give message \*/**

**while (argc<2) {**

**printf("Usage: %s %s\n", argv[0],"save\_file");**

**exit(1);**

**}**

**/\* Print System Information to screen and save to file \*/**

**printf("File: %s\n",argv[1]);**

**FILE \*file = fopen(argv[1],"w");**

**system("hostname | tee \*file");**

**system("uname -a | tee -a \*file");**

**system("df -k | tee -a \*file");**

**fclose(file);**

**return(0);**

**}**

b) How could you compile this source code to make it executable using gcc?

**gcc –o myprog myprog.c**

**Choose 3 questions**

1. List the basic steps to be taken by a Linux Administrator to install an xxxx.tar.gz application file – be specific as possible.

**1) tar –zxvf xxxx.tar.gz**

**2) cd xxxx**

**3) ./configure**

**4) make**

**5) make install**

1. a) Briefly discus how you would set up a PERL script as an executable (use examples if needed).

* **Put the perl interpreter #!/bin/perl , #!/usr/local/bin/perl at the top of the script**
* **chmod 7XX myscript.pl to make it executable**
* **use pp compiler to compile perl program into an executable**

1. What problems could be encountered while setting this PERL script up?

* **There could be multiple instances of perl with different versions installed on the system, so choosing the correct version would be necessary**

1. Explain the differences between the ifconfig command and the ipconfig command.

* **The Linux ifconfig command can list and modify network interface parameters.**
* **The Windows ipconfig command can list and modify network parameters.**

1. Write a short vbscript program to determine a user logged into a Windows Machine.

**‘Vbscript to determine and display logged in user including date and time**

**dtToday = Date()**

**dtTime = Time()**

**set objNetwork = createobject("wscript.network")**

**wscript.echo objNetwork.Username,dtToday, dtTime**

**Choose 3 questions**

1. Explain a process you’re familiar with to remotely access a Linux machine – be specific.

**From local Linux or MAC terminal use ‘ssh remote\_linux’ command to access remote Linux box.**

**From local Windows machine use putty or another ssh client to access remote Linux host.**

1. Using a language you’re familiar with write a short program that has some utility, include comments to explain its usage and purpose. Make your program executable.

**Awk oneliner to print the total number of K-Bytes in a Linux directory**

**ls -l files | awk '{ x += $5 } END { print "total K-bytes: " (x + 1023)/1024 }'**

**Perl oneliner to change every instance of a word in a file named somefile**

**perl -i.bak -pe 's/oldword/NEWWORD/g' /home/usr/somefile**

**Any** **Java, Python, Ruby, Powershell program, MatLab m-file that works will do**

1. Briefly explain how you would debug a shell script (use examples).

**A shell script can be run directly using the interpreter with debug flags –x or –v to observe the lines executed by script: /bin/sh –x myscript or /bin/bash –v myscript.**

**Enter set –x or set –v directly into the script after the interpreter to view script execution.**

**Enter set –n directly into the script to observe what the script is expected to do without actually executing the script.**

1. Briefly discuss general troubleshooting of a Linux system that won’t boot into normal operation.

**For a system that won’t boot, in the grub or lilo boot loader splash screen modify the boot parameters to allow verbose display to observe and boot errors. Modify the boot loader to allow the system to boot into single user mode, then login to observe logs, system error messages to fix the problem.**

**Answer all of these**

1. Explain the concepts and operation of Network Address Translation (NAT) – give example.

**Answer:**

**NAT maps IP addresses from one range into another range of IP addresses using a routing device to perform the mapping. The routing device needs to have 2 or more physical or virtual Network Interface Cards with different IP addresses to transit the IP packets between the different IP ranges. IP private addresses are usually NAT’d to public IP addresses using this method with a netfiltering application performing the translation.**

1. Using network tools, determine whether a network host is available on the network or LAN – give examples, list steps.

**Answer:**

* **ping hostname send echo request wait for echo replies.**
* **traceroute or tracert house examine the hops listing.**
* **telnet hostname:port 🡨 telnet to a host at some port# e.g. 25 look for a reponse.**
* **From the same subnet ‘arping hostname’, look for replies.**

1. a) A Windows Server isn’t booting how would you determine why it’s not booting (give an example and list steps)?

**Answer:**

1. **Boot the system into safe mode – press F8 key**
2. **Choose safe mode selection**

**Or**

1. **Insert Windows install disk and boot it**
2. **Click ‘repair your computer’**

b) How would you restore it to correct operation (give examples and list steps)?

**Answer:**

* **Restore system to earlier point in time when system was error free.**

**Or**

* **Use Startup Repair option to fix a suspected boot problem.**

**Answer all of these**

1. List the 3-Private IP address ranges, list their netmasks and class types.

**Answer:**

**10.0.0.0 – 10.255.255.255 255.0.0.0 A**

**172.16.0.0 – 172.31.255.255 255.240.0.0 B**

**192.168.0.0 – 192.168.255.255 255.255.0.0 C**

1. List the steps to NFS mount a directory from a Linux/UNIX Server machine to a Linux Client machine (be specific).

**Answer:**

1. **Share the directory from the server:**

* **Enter the directory in the /etc/exports file**

**e.g ‘/work 192.168.10.0/24(rw,async,no\_root\_squash)’**

**2) Mount the shared directory on the client:**

**- manually: mount server:/work /client\_dir**

**- automatically: add ‘server:/work /client\_dir ext2 rw 0 0’ to /etc/fstab file.**