CS 183 – UNIX System Administration
Exam 1

May 7, 2019

Do not start working until you have been told to. Write down any assumptions you make.
You must show all your work in order to get credit for questions

Name: _____

Student ID: _____

1. (5 points) What are the names of the two processes which are started by the kernel as a special case and have a PID of 1?

> **Solution: Systemd and init**

2. (3 points) Which of the following are strategies stated in the for dealing with non-booting systems? (Circle all that apply)

    A. Reset network interface and re-request network credentials

    B. Restore the system to a known-good state

    C. Unmount attached media devices (NFS, tape, external hard drives, etc.)

    D. Boot the system with reduced processes and debug interactively with a shell

    E. Boot a separate system and mount the filing systems filesystem

3. (5 points) Not including special permission bits, what types of permissions can be given to allow users to work with/on a file and what letters are used to represent those permissions when viewed through `ls -l`?

> **Solution: The permissions are read (r), write (w), and execute (x)**

4. (5 points) What utility is used to modify the permissions of files?

> **Solution: chmod**

5. (5 points) What utility is used to switch from one user identity to another, what is required when attempting to do this from a typical user identity that is not required when attempting to do this from root?

> **Solution: The utility is su and the password of the user you are attempting to log into is required as a typical user but not as root**

6. (1 point) True or False, command executed by the root user are logged?

    A. True

    B. False

7. (5 points) How can you disable the root password?

> **Solution: You can add a * or ! to the password or replace the password with a ***

8. (5 points) What does the niceness of a process measure?

> **Solution: priority**

9. (5 points) What two systems can be used to schedule periodic process execution?

> **Solution: cron and systemd timers**

10. (3 points) What utility is used to send specific signals to processes?

> **Solution: kill**

11. (2 points) What command would you use to send a `SIGKILL` signal to a process named `badprocess`?

> **Solution: kill -9 badprocess**

12. (5 points) What differentiates an absolute path from a relative path?

> **Solution: Absolute paths start from the root / directory while relative paths start from the present working directory (pwd)**

13. (5 points) What two types of files are primarily used for inter process communication?

> **Solution: Local domain sockets and named pipes**

14. (5 points) What benefits do you gain by using access control lists (ACLs) over UNIX/Linux permission bits?

> **Solution: ACLs allow for more fine grained permissions by allowing you to specify permissions on additional users and groups besides the owner and owner's default group.**

15. (3 points) How many requests does a Preebot eXecution Environemnt (PXE) system need to make to the network in order to install an operating system according to the slides?
    - A. 0
    - B. 1
    - C. 2
    - **D. 3**
    - E. 4

16. (5 points) What are the two major high level package managers discussed in the slides?

> **Solution: yellowdog update manager (yum) and advanced package manager (apt)**

17. (5 points) Having a local repository mirror which contains a subset of packages available from the distributor run repositories allows for what?

> **Solution: Automatic updates for machines in the fleet**

18. (5 points) At its core a user is represented by what in a UNIX/Linux system?

> **Solution: an unsigned 32-bit integer, but I'll accept any number like answer**

19. (5 points) What is the primary benefit discussed in class for giving each user their own separate default group?

> **Solution: New files created by a user will not be accessible by other users by default**

20. (3 points) What encrption scheme is used for modern passwords?
    - **A. SHA-512**
    - B. MD5
    - C. DES
    - D. RS 232
    - E. IEEE 802.11

21. (5 points) Where (what file) are salted and hashed passwords stored in modern UNIX/Linux systems?

> **Solution: /etc/shadow**

22. (5 points) What line is required at the top of the a bash script to specify it should be executed using bash?

> **Solution: #!binbash**