CS312 Homework #3 Answer Key

February 16, 2016

Questions

1. Give the command(s) to manually bring up the IP address `10.1.1.100`, netmask of `255.255.254.0`, and a default gateway to `10.1.1.1` on an interface named `em0`.

   `ip addr add 10.1.1.100/255.255.254.0 dev em0`
   `ip route add default via 10.1.1.1 dev em0`

2. Give the command(s) to manually turn off multicast on an interface named `eth0`.

   `ip link set eth0 multicast off`

3. Give the command(s) to show all Unix domain sockets.

   `ss -x`

4. What file (including the full path) would you need to create if you wanted to configure network settings for an interface named `enP1p1s0f3`?

   `/etc/sysconfig/network-scripts/ifcfg-enP1p1s0f3`

5. The predictable naming scheme for ethernet interfaces usually starts using the prefix `eth` and then falls back to using `em`.

   - True
   - **False**

6. Provide the command(s) that will notify `NetworkManager` of a configuration change.

`nmcli connection reload`

7. Which version of NFS is considered stateful?

   (a) 2
   (b) 3
   (c) 3 and 4
   (d) **4**

8. Provide the configuration for `/etc/exports` that would provide the following:

   - Export `/data/www`
   - Allow read-write access to hosts `foo.example.org`, `bar.example.org` and any subdomain under `baz.example.org`
   - Disable root squashing for `bar.example.org`
   - Allow read-only access to any other host

   `/data/www foo.example.org(rw) bar.example.org(rw,`
   `↪ no_root_squash) *.baz.example.org(rw) (ro)`

9. Which file on a Linux system would you modify to enable LDAP support for name-service information such as users and groups?

`/etc/nsswitch.conf`

10. What is the name of the LDAP server daemon service for OpenLDAP?

   (a) **`slapd`**
   (b) `ldapdd`
   (c) `ldap-server`
   (d) `openldap-server`

11. Name the e-mail system components and their primary functions.

- **Mail User Agent (MUA): Allows users to read and compose email. (i.e. Thunderbird, Outlook, etc)**
- **Mail Submission Agent (MSA): Accepts outgoing mail from a MUA and submits it to the transport system.**
- **Mail Transport Agent (MTA): Routes messages among machines. (i.e. postfix, sendmail)**
- **Local Delivery Agent (LDA): Places the messages in a local store (i.e. procmail)**
- **Access Agent (AA): Connect the user agent to the message store (i.e. IMAP or POP)**

12. Given the following e-mail header:

```
Received: from whitealder.osuosl.org (smtp1.osuosl.org. [140.211.166.138])
  by mx.google.com with ESMTP id rl9si26152457pab.109.2016.02.01.12.16.38
  for <ramereth@gapps.osuosl.org>;
  Mon, 01 Feb 2016 12:16:39 -0800 (PST)
```

(a) Which server received the email?
mx.google.com

(b) What is the queue ID for the e-mail?
rl9si26152457pab.109.2016.02.01.12.16.38

(c) Which server sent the email?
whitealder.osuosl.org

13. Most Linux kernel modules allow parameters to be updated without unloading the module

(a) True

(b) **False**

14. Name the virtual file system that exports information about various kernel subsystems, hardware devices, and device drivers.

sysfs

15. Which virtual file system allows you to modify runtime kernel tunable parameters?

    sysctl

16. Explain what Control Groups are and why they are important in modern Linux system administration.

    Controls Groups allows you to allocate fine-grained control on system resources include CPU Time, system memory, network bandwidth, or combinations of these resources. Control Groups are important because they are the basis for applications such as systemd and container technology such as Docker.

17. In which systemd cgroup slice would containers typically reside?

    (a) `-.slice`

    (b) **`machine.slice`**

    (c) `user.slice`

    (d) `system.slice`

18. Name four cgroup resource controllers

    blkio, cpu, cpuacct, cpuset, memory and others which might be enabled in `/proc/cgroups`.

19. Which Linux performance tool provides information about processes, memory, paging and other various metrics in real-time?

    `vmstat`

20. Which Linux I/O scheduler would be ideal for database servers?

    Deadline