CS312 Homework Solutions #2

February 13, 2015

Answers

1. `lvcreate -L 100G -n data -i 2 vg_cs312`

2. `lvextend -L +200G /dev/vg_cs312/data`
   or
   `lvextend -L 300G /dev/vg_cs312/data`

3. `ks.cfg`

```
install
cdrom
lang en_US.UTF-8
keyboard us
network --bootproto=dhcp
rootpw cs312
firewall --disabled
selinux --permissive
unsupported_hardware
bootloader --location=mbr
text
skipx
zerombr
clearpart --all --initlabel
part /boot --fstype=ext4 --size=512
part pv.01 --grow --size=100
volgroup vg_cs312 pv.01
logvol swap --vgname=vg_cs312 --name=swap --fstype=swap --
    ↪ size=1024
logvol / --vgname=vg_cs312 --name=root --fstype=ext4 --grow
    ↪ --size=100
```

```
repo --name=epel --baseurl=http://epel.osuosl.org/6/x86_64/
repo --name=base --baseurl=http://centos.osuosl.org/6/os/
    ↪ x86_64/
timezone US/Pacific
# OR
# timezone America/Los_Angeles
services --enabled=httpd
auth --enableshadow --passalgo=sha512 --kickstart
firstboot --disabled
poweroff
user --name=cs312 --plaintext --password cs312

%packages --nobase
sudo
bash-completion
httpd
%end
```

4. authpriv

5. TCP and SSL/TLS

6. `12 */6 * * 0,3,6 /bin/date`
   or
   `12 */6 * * sun,wed,sat /bin/date`

7. 4

8. Create a RAID6:

```
$ mdadm -C /dev/md0 --level=6 --raid-devices=4 /dev/loop1 /
    ↪ dev/loop2 /dev/loop3 /dev/loop4
mdadm: Defaulting to version 1.2 metadata
mdadm: array /dev/md0 started.
$ cat /proc/mdstat
Personalities : [raid6] [raid5] [raid4]
md0 : active raid6 loop4[3] loop3[2] loop2[1] loop1[0]
      202752 blocks super 1.2 level 6, 512k chunk, algorithm
          ↪ 2 [4/4] [UUUU]

unused devices: <none>
$ mdadm -D /dev/md0
/dev/md0:
        Version : 1.2
  Creation Time : Thu Feb 12 06:22:39 2015
     Raid Level : raid6
     Array Size : 202752 (198.03 MiB 207.62 MB)
```

```
   Used Dev Size : 101376 (99.02 MiB 103.81 MB)
    Raid Devices : 4
  Total Devices : 4
     Persistence : Superblock is persistent

     Update Time : Thu Feb 12 06:22:40 2015
           State : clean
  Active Devices : 4
 Working Devices : 4
  Failed Devices : 0
   Spare Devices : 0

          Layout : left-symmetric
      Chunk Size : 512K

            Name : mdadm:0   (local to host mdadm)
            UUID : e5869c61:75a969cd:6d55f15c:fe1f91c7
          Events : 17

    Number   Major   Minor   RaidDevice State
       0        7       1        0       active sync   /dev/
         ↪ loop1
       1        7       2        1       active sync   /dev/
         ↪ loop2
       2        7       3        2       active sync   /dev/
         ↪ loop3
       3        7       4        3       active sync   /dev/
         ↪ loop4
```

9. Fail and remove a drive:

```
$ mdadm /dev/md0 -f /dev/loop1
mdadm: set /dev/loop1 faulty in /dev/md0
$ mdadm /dev/md0 -r /dev/loop1
mdadm: hot removed /dev/loop1 from /dev/md0
$ cat /proc/mdstat
Personalities : [raid6] [raid5] [raid4]
md0 : active raid6 loop4[3] loop3[2] loop2[1]
      202752 blocks super 1.2 level 6, 512k chunk, algorithm
          ↪  2 [4/3] [_UUU]

unused devices: <none>
$ mdadm -D /dev/md0
/dev/md0:
        Version : 1.2
  Creation Time : Thu Feb 12 06:22:39 2015
```

```
        Raid Level : raid6
        Array Size : 202752 (198.03 MiB 207.62 MB)
     Used Dev Size : 101376 (99.02 MiB 103.81 MB)
      Raid Devices : 4
     Total Devices : 3
       Persistence : Superblock is persistent

       Update Time : Thu Feb 12 06:26:57 2015
             State : clean, degraded
    Active Devices : 3
   Working Devices : 3
    Failed Devices : 0
     Spare Devices : 0

            Layout : left-symmetric
        Chunk Size : 512K

              Name : mdadm:0  (local to host mdadm)
              UUID : e5869c61:75a969cd:6d55f15c:fe1f91c7
            Events : 20

    Number   Major   Minor   RaidDevice State
       0        0       0        0       removed
       1        7       2        1       active sync   /dev/
         ↪ loop2
       2        7       3        2       active sync   /dev/
         ↪ loop3
       3        7       4        3       active sync   /dev/
         ↪ loop4
```

10. Install Jenkins:

```
$ wget -O /etc/yum.repos.d/jenkins.repo \
  http://pkg.jenkins-ci.org/redhat/jenkins.repo
$ rpm --import http://pkg.jenkins-ci.org/redhat/jenkins-ci.
    ↪ org.key
$ yum install jenkins java-1.6.0-openjdk
$ service jenkins start
```

After that, login to the site at http://140.211.168.xxx:8080. Next Setup security and enable the security. Go to Access Control and set Jenkins to use its own user database, and uncheck signup. Then set logged-in users can do anything. Setup your own account and relogin.

11. Show output of jenkins job:

```
Started by GitHub push by ramereth
Building in workspace /var/lib/jenkins/jobs/cs312/workspace
Cloning the remote Git repository
Cloning repository https://github.com/ramereth/cs312.git
 > git init /var/lib/jenkins/jobs/cs312/workspace # timeout
    ↪ =10
Fetching upstream changes from https://github.com/ramereth/
    ↪ cs312.git
 > git --version # timeout=10
 > git fetch --tags --progress https://github.com/ramereth/
    ↪ cs312.git +refs/heads/*:refs/remotes/origin/*
 > git config remote.origin.url https://github.com/ramereth/
    ↪ cs312.git # timeout=10
 > git config --add remote.origin.fetch +refs/heads/*:refs/
    ↪ remotes/origin/* # timeout=10
 > git config remote.origin.url https://github.com/ramereth/
    ↪ cs312.git # timeout=10
Fetching upstream changes from https://github.com/ramereth/
    ↪ cs312.git
 > git fetch --tags --progress https://github.com/ramereth/
    ↪ cs312.git +refs/heads/*:refs/remotes/origin/*
 > git rev-parse refs/remotes/origin/master^{commit} #
    ↪ timeout=10
 > git rev-parse refs/remotes/origin/origin/master^{commit}
    ↪ # timeout=10
Checking out Revision 585732
    ↪ d6db53784c74bef543b722105cf743b841 (refs/remotes/
    ↪ origin/master)
 > git config core.sparsecheckout # timeout=10
 > git checkout -f 585732d6db53784c74bef543b722105cf743b841
First time build. Skipping changelog.
[workspace] $ /bin/sh -xe /tmp/hudson8876005717684907772.sh
+ bash -ex scripts/build.sh
+ git checkout master
Switched to a new branch 'master'
Branch master set up to track remote branch master from
    ↪ origin.
+ git pull -q
+ '[' '!' -d venv ']'
+ virtualenv venv
New python executable in venv/bin/python
Installing Setuptools
    ↪ ..................................................................................................
    ↪ done.
Installing Pip
```

5

```
    ↪ .............................................................................
    ↪ done.
+ source venv/bin/activate
++ deactivate nondestructive
++ unset pydoc
++ '[' -n '' ']'
++ '[' -n '' ']'
++ '[' -n /bin/bash -o -n '' ']'
++ hash -r
++ '[' -n '' ']'
++ unset VIRTUAL_ENV
++ '[' '!' nondestructive = nondestructive ']'
++ VIRTUAL_ENV=/var/lib/jenkins/jobs/cs312/workspace/venv
++ export VIRTUAL_ENV
++ _OLD_VIRTUAL_PATH=/sbin:/usr/sbin:/bin:/usr/bin
++ PATH=/var/lib/jenkins/jobs/cs312/workspace/venv/bin:/sbin
    ↪ :/usr/sbin:/bin:/usr/bin
++ export PATH
++ '[' -n '' ']'
++ '[' -z '' ']'
++ _OLD_VIRTUAL_PS1=
++ '[' x '!=' x ']'
+++ basename /var/lib/jenkins/jobs/cs312/workspace/venv
++ '[' venv = __ ']'
+++ basename /var/lib/jenkins/jobs/cs312/workspace/venv
++ PS1='(venv)'
++ export PS1
++ alias 'pydoc=python -m pydoc'
++ '[' -n /bin/bash -o -n '' ']'
++ hash -r
+ pip install -r requirements.txt

<snip build output>

Successfully installed Jinja2 MarkupSafe Pillow Pygments
    ↪ Sphinx argparse docutils hieroglyph pyparsing six
    ↪ sphinx-rtd-theme wsgiref
Cleaning up...
+ '[' -e build/html/objects.inv -a -e build/html/slides/
    ↪ objects.inv ']'
+ make slides
sphinx-build -b slides -d build/slide-doctrees   -c source
    ↪ source/slides build/html/slides
Making output directory...
Running Sphinx v1.2.3
```

```
loading pickled environment... not yet created
loading intersphinx inventory from http://cs312.osuosl.org/
    ↪ slides/objects.inv...
loading intersphinx inventory from http://cs312.osuosl.org/
    ↪ objects.inv...
building [slides]: targets for 16 source files that are out
    ↪ of date
updating environment: 16 added, 0 changed, 0 removed
reading sources... [  6%] 00_introduction
reading sources... [ 12%] 01_linux_basics
reading sources... [ 18%] 02_linux_basics
reading sources... [ 25%] 03_linux_basics
reading sources... [ 31%] 04_linux_basics
reading sources... [ 37%] 05_linux_basics
reading sources... [ 43%] 06_linux_basics
reading sources... [ 50%] 07_agile_methods
reading sources... [ 56%] 08_continuous_integration
reading sources... [ 62%] 09_jenkins
reading sources... [ 68%] 10_cfg_mgt
reading sources... [ 75%] 11_chef
reading sources... [ 81%] 12_chef_midterm_notes
reading sources... [ 87%] 13_chefdk_tk
reading sources... [ 93%] 14_chefdk_tk
reading sources... [100%] index

looking for now-outdated files... none found
pickling environment... done
checking consistency... done
preparing documents... done
writing output... [  6%] 00_introduction
writing output... [ 12%] 01_linux_basics
writing output... [ 18%] 02_linux_basics
writing output... [ 25%] 03_linux_basics
writing output... [ 31%] 04_linux_basics
writing output... [ 37%] 05_linux_basics
writing output... [ 43%] 06_linux_basics
writing output... [ 50%] 07_agile_methods
writing output... [ 56%] 08_continuous_integration
writing output... [ 62%] 09_jenkins
writing output... [ 68%] 10_cfg_mgt
writing output... [ 75%] 11_chef
writing output... [ 81%] 12_chef_midterm_notes
writing output... [ 87%] 13_chefdk_tk
writing output... [ 93%] 14_chefdk_tk
writing output... [100%] index
```

```
writing additional files... genindex search
copying images... [  1%] ../_static/booting.png
copying images... [  3%] ../_static/pxelinux-boot.png
copying images... [  5%] ../_static/openstack_security.png
copying images... [  7%] ../_static/vim_logo.jpeg
copying images... [  9%] ../_static/debian-logo.png
copying images... [ 10%] ../_static/rpm.png
copying images... [ 12%] ../_static/lvm.svg
copying images... [ 14%] ../_static/vim_cheatsheet.gif
copying images... [ 16%] ../_static/xkcd149.png
copying images... [ 18%] ../_static/mcilroy.jpg
copying images... [ 20%] ../_static/buildbot.png
copying images... [ 21%] ../_static/xkcd-fight.png
copying images... [ 23%] ../_static/
    ↪ openstack_key_pairs_import.png
copying images... [ 25%] ../_static/
    ↪ openstack_key_pairs_first_key_pair_added.png
copying images... [ 27%] ../_static/vim_modes.png
copying images... [ 29%] ../_static/docker.jpg
copying images... [ 30%] ../_static/scrum.svg
copying images... [ 32%] ../_static/openstack_add_instance.
    ↪ png
copying images... [ 34%] ../_static/torvalds.jpg
copying images... [ 36%] ../_static/learning_curves.jpg
copying images... [ 38%] ../_static/you_are_here.jpg
copying images... [ 40%] ../_static/opensuse-logo.png
copying images... [ 41%] ../_static/
    ↪ openstack_change_password.png
copying images... [ 43%] ../_static/Devops.svg
copying images... [ 45%] ../_static/silo-fire.jpg
copying images... [ 47%] ../_static/hierarchy.jpg
copying images... [ 49%] ../_static/single-user-mode.png
copying images... [ 50%] ../_static/sls-screenshot.png
copying images... [ 52%] ../_static/lvm-visual.png
copying images... [ 54%] ../_static/kernighan.jpg
copying images... [ 56%] ../_static/stallman.jpg
copying images... [ 58%] ../_static/xkcd838.png
copying images... [ 60%] ../_static/slackware-logo.jpg
copying images... [ 61%] ../_static/Linus_Torvalds.jpeg
copying images... [ 63%] ../_static/openstack_login.png
copying images... [ 65%] ../_static/openstack_instances.png
copying images... [ 67%] ../_static/yum.png
copying images... [ 69%] ../_static/redhat-logo.png
copying images... [ 70%] ../_static/openstack_instance_added
```

```
      ↪ .png
copying images... [ 72%] ../_static/
      ↪ openstack_key_pairs_first.png
copying images... [ 74%] ../_static/emacs.png
copying images... [ 76%] ../_static/squishy.png
copying images... [ 78%] ../_static/centos-install.png
copying images... [ 80%] ../_static/KanbanBoard01.png
copying images... [ 81%] ../_static/openstack_overview.png
copying images... [ 83%] ../_static/waterfall.png
copying images... [ 85%] ../_static/FC025.png
copying images... [ 87%] ../_static/ritchie.jpg
copying images... [ 89%] ../_static/fsck.jpg
copying images... [ 90%] ../_static/thompson.jpg
copying images... [ 92%] ../_static/gitflow.png
copying images... [ 94%] ../_static/xkcd_378.png
copying images... [ 96%] ../_static/emacs_logo.jpeg
copying images... [ 98%] ../_static/xkcd215.png
copying images... [100%] ../_static/
      ↪ openstack_key_pairs_import_filled_out_form.png

copying static files... done
copying extra files... done
dumping search index... done
dumping object inventory... done
build succeeded.
Build finished. The HTML slides are in build/html/slides.
+ make html
sphinx-build -b html -d build/doctrees   source build/html
Running Sphinx v1.2.3
loading pickled environment... not yet created
loading intersphinx inventory from http://cs312.osuosl.org/
      ↪ slides/objects.inv...
loading intersphinx inventory from http://cs312.osuosl.org/
      ↪ objects.inv...
building [html]: targets for 8 source files that are out of
      ↪ date
updating environment: 8 added, 0 changed, 0 removed
reading sources... [ 12%] assignments
reading sources... [ 25%] calendar
reading sources... [ 37%] index
reading sources... [ 50%] openstack
reading sources... [ 62%] readings
reading sources... [ 75%] resources
reading sources... [ 87%] ssh_keys
reading sources... [100%] syllabus
```

```
looking for now-outdated files... none found
pickling environment... done
checking consistency... done
preparing documents... done
writing output... [ 12%] assignments
writing output... [ 25%] calendar
writing output... [ 37%] index
writing output... [ 50%] openstack
writing output... [ 62%] readings
writing output... [ 75%] resources
writing output... [ 87%] ssh_keys
writing output... [100%] syllabus

writing additional files... genindex search
copying images... [ 14%] _static/openstack_instance_added.
    ↪ png
copying images... [ 28%] _static/openstack_add_instance.png
copying images... [ 42%] _static/
    ↪ openstack_key_pairs_import_filled_out_form.png
copying images... [ 57%] _static/openstack_change_password.
    ↪ png
copying images... [ 71%] _static/
    ↪ openstack_key_pairs_first_key_pair_added.png
copying images... [ 85%] _static/openstack_instances.png
copying images... [100%] _static/openstack_key_pairs_first.
    ↪ png

copying downloadable files... [ 25%] /var/lib/jenkins/jobs/
    ↪ cs312/workspace/source/_static/hw/solutions1.pdf
copying downloadable files... [ 50%] /var/lib/jenkins/jobs/
    ↪ cs312/workspace/source/_static/hw/homework2.pdf
copying downloadable files... [ 75%] /var/lib/jenkins/jobs/
    ↪ cs312/workspace/source/_static/hw/homework1.pdf
copying downloadable files... [100%] /var/lib/jenkins/jobs/
    ↪ cs312/workspace/source/_static/hw/homework3.pdf

copying static files... done
copying extra files... done
dumping search index... done
dumping object inventory... done
build succeeded.

Build finished. The HTML pages are in build/html.
+ deactivate
```

```
+ unset pydoc
+ '[' -n /sbin:/usr/sbin:/bin:/usr/bin ']'
+ PATH=/sbin:/usr/sbin:/bin:/usr/bin
+ export PATH
+ unset _OLD_VIRTUAL_PATH
+ '[' -n '' ']'
+ '[' -n /bin/bash -o -n '' ']'
+ hash -r
+ '[' -n '' ']'
+ unset VIRTUAL_ENV
+ '[' '!' '' = nondestructive ']'
+ unset -f deactivate
Finished: SUCCESS
```