Class Prep

The following practices are done using the Windows 11 Development Environment VMWare Virtual Machine image. You can get the image by downloading from the Microsoft developers website at https://developer.microsoft.com/en-us/windows/downloads/virtual-machines/. If you choose to just use your own windows machine, you need to make sure wsl2 is installed.

The Virtual Machine from Microsoft website requirements are 8GB of RAM and at least 70GB or storage.

After the VM (or your PC/laptop) boots up, type the following commands in sequence to get your system ready. This only needs to be done 1 time.

1. Update wsl

```
PS C:\Users\User\Desktop> wsl --update
Checking for updates.
The most recent version of Windows Subsystem for Linux is already installed.
PS C:\Users\User\Desktop>
```

2. List which linux distribution is available in wsl

```
PS C:\Users\User\Desktop> wsl -l --online
The following is a list of valid distributions that can be installed.
Install using 'wsl.exe --install <Distro>'.

NAME                                   FRIENDLY NAME
Ubuntu                                 Ubuntu
Debian                                 Debian GNU/Linux
kali-linux                             Kali Linux Rolling
Ubuntu-18.04                           Ubuntu 18.04 LTS
Ubuntu-20.04                           Ubuntu 20.04 LTS
Ubuntu-22.04                           Ubuntu 22.04 LTS
OracleLinux_7_9                        Oracle Linux 7.9
OracleLinux_8_7                        Oracle Linux 8.7
OracleLinux_9_1                        Oracle Linux 9.1
openSUSE-Leap-15.5                     openSUSE Leap 15.5
SUSE-Linux-Enterprise-Server-15-SP4    SUSE Linux Enterprise Server 15 SP4
SUSE-Linux-Enterprise-15-SP5           SUSE Linux Enterprise 15 SP5
openSUSE-Tumbleweed                    openSUSE Tumbleweed
PS C:\Users\User\Desktop>
```

3. Install OracleLinux_9_1 image. Create a user and assign a password for that Virtual Machine. Notice that after you key in the password, the prompt changes. You are now inside the linux VM.

```
PS C:\Users\User\Desktop> wsl --install OracleLinux_9_1
Installing: Oracle Linux 9.1
Oracle Linux 9.1 has been installed.
Launching Oracle Linux 9.1...
Installing, this may take a few minutes...
Please create a default UNIX user account. The username does not need to match your
Windows username.
For more information visit: https://aka.ms/wslusers
Enter new UNIX username: user
Changing password for user user.
New password: abc
BAD PASSWORD: The password is shorter than 8 characters
Retype new password: abc
passwd: all authentication tokens updated successfully.
Installation successful!
[user@WinDev2306Eval ~]$
```

4. Optionally, change the OracleLinux_9_1 virtual machine hostname by creating a */etc/wsl.conf* file.

```
[user@WinDev2306Eval ~]$ sudo vi /etc/wsl.conf

We trust you have received the usual lecture from the local System
Administrator. It usually boils down to these three things:

      #1) Respect the privacy of others.
      #2) Think before you type.
      #3) With great power comes great responsibility.

[sudo] password for user: abc
[user@WinDev2306Eval ~]$ cat /etc/wsl.conf
[boot]
systemd = true

[network]
hostname = ora
[user@WinDev2306Eval ~]$
```

5. Optionally, exit reboot the virtual machine, so that changes to the hostname are applied. Make sure to wait for a few seconds after issuing shutdown command before you boot up the VM again. Also, install the ncurses package if you wish to use the clear command to clear the screen.

```
[user@WinDev2306Eval ~]$ exit
logout
PS C:\Users\User\Desktop> wsl --shutdown
Wait for 10 seconds
PS C:\Users\User\Desktop> wsl
wsl: Nested virtualization is not supported on this machine.
[user@ora Desktop]$
[user@ora Desktop]$ systemctl status sshd
● sshd.service - OpenSSH server daemon
      Loaded: loaded (/usr/lib/systemd/system/sshd.service; enabled; vendor preset:
enabled)
      Active: active (running) since Fri 2023-07-14 04:02:26 PDT; 22s ago
      Docs: man:sshd(8)
            man:sshd_config(5)
   Main PID: 86 (sshd)
      Tasks: 1 (limit: 25030)
      Memory: 3.7M
      CGroup: /system.slice/sshd.service
            └─86 "sshd: /usr/sbin/sshd -D [listener] 0 of 10-100 startups"

Jul 14 04:02:26 ora systemd[1]: Starting OpenSSH server daemon...
Jul 14 04:02:26 ora sshd[86]: Server listening on 0.0.0.0 port 22.
Jul 14 04:02:26 ora sshd[86]: Server listening on :: port 22.
Jul 14 04:02:26 ora systemd[1]: Started OpenSSH server daemon.
[user@ora Desktop]$ sudo dnf install -y ncurses
```

6. Finally install the container-tools package. This package contains the *podman* command which we will be using in the labs.

```
[user@ora Desktop]$ sudo dnf install -y container-tools
[sudo] password for user: abc
Last metadata expiration check: 0:02:34 ago on Fri 14 Jul 2023 04:07:23 AM PDT.
Dependencies resolved.
================================================================================
=================================
 Package                              Architecture Version
Repository                Size
================================================================================
=================================
Installing:
 container-tools                      noarch       1-12.0.1.el9
ol9_appstream             7.9 k
Installing dependencies:
 aardvark-dns                         x86_64       2:1.5.0-2.el9
ol9_appstream             1.0 M
 adobe-source-code-pro-fonts          noarch       2.030.1.050-12.el9.1
ol9_baseos_latest         849 k
…
 yajl                                 x86_64       2.1.0-21.el9_0
ol9_appstream             45 k
Installing weak dependencies:
 abattis-cantarell-fonts              noarch       0.301-4.el9
ol9_appstream             376 k
 criu-libs                            x86_64       3.17-5.el9_2
ol9_appstream             31 k
 libproxy-webkitgtk4                  x86_64       0.4.15-35.el9
ol9_appstream             21 k

Transaction Summary
================================================================================
=================================
Install  69 Packages

Total download size: 99 M
Installed size: 348 M
Downloading Packages:
(1/69): fonts-filesystem-2.0.5-7.el9.1.noarch.rpm
47 kB/s | 8.9 kB    00:00
(2/69): fuse-common-3.10.2-5.el9.x86_64.rpm
297 kB/s | 7.9 kB   00:00
…
(69/69): webkit2gtk3-jsc-2.38.5-1.el9_2.2.x86_64.rpm
4.5 MB/s | 6.5 MB   00:01
--------------------------------------------------------------------------------
---------------------------------
Total
12 MB/s |  99 MB    00:08
Running transaction check
Transaction check succeeded.
Running transaction test
```

```
Transaction test succeeded.
Running transaction
  Running scriptlet: selinux-policy-targeted-38.1.11-2.0.1.el9_2.2.noarch
       1/1
  Preparing         :
       1/1
  Installing        : selinux-policy-38.1.11-2.0.1.el9_2.2.noarch
       1/69
  Running scriptlet: selinux-policy-38.1.11-2.0.1.el9_2.2.noarch
       1/69
  Running scriptlet: selinux-policy-targeted-38.1.11-2.0.1.el9_2.2.noarch
       2/69
  Installing        : selinux-policy-targeted-38.1.11-2.0.1.el9_2.2.noarch
       2/69
…
  Installing        : rpm-plugin-selinux-4.16.1.3-19.0.1.el9_1.x86_64
       69/69
  Running scriptlet: selinux-policy-targeted-38.1.11-2.0.1.el9_2.2.noarch
       69/69
  Running scriptlet: container-selinux-3:2.205.0-1.el9_2.noarch
       69/69
  Running scriptlet: rpm-plugin-selinux-4.16.1.3-19.0.1.el9_1.x86_64
       69/69
  Verifying         : adobe-source-code-pro-fonts-2.030.1.050-12.el9.1.noarch
       1/69
  Verifying         : cockpit-bridge-276.1-1.0.1.el9.x86_64
       2/69
…
  Verifying         : yajl-2.1.0-21.el9_0.x86_64
       69/69

Installed:
  aardvark-dns-2:1.5.0-2.el9.x86_64
…
  yajl-2.1.0-21.el9_0.x86_64

Complete!
[user@ora Desktop]$
```

7. Test podman command. If it fails, OracleLinux 9.1 has a bug where newuidmap command doesn't have the correct capabilities set. Just restore the shadow-utils package and it should work.

```
[user@ora Desktop]$ podman info
WARN[0000] "/" is not a shared mount, this could cause issues or missing mounts with
rootless containers
ERRO[0000] running `/usr/bin/newuidmap 17619 0 1000 1 1 100000 65536`: newuidmap:
write to uid_map failed: Operation not permitted
Error: cannot set up namespace using "/usr/bin/newuidmap": should have setuid or have
filecaps setuid: exit status 1
[user@ora Desktop]$ sudo rpm --restore shadow-utils
chown: cannot access '/usr/share/locale/bs/LC_MESSAGES/shadow.mo': No such file or
directory
…
chmod: cannot access '/usr/share/man/zh_TW/man8/usermod.8.gz': No such file or
directory
[user@ora Desktop]$ podman info
WARN[0000] "/" is not a shared mount, this could cause issues or missing mounts with
rootless containers
host:
  arch: amd64
  buildahVersion: 1.29.0
  cgroupControllers: []
  cgroupManager: cgroupfs
  cgroupVersion: v1
  conmon:
       package: conmon-2.1.7-1.el9_2.x86_64
       path: /usr/bin/conmon
       version: 'conmon version 2.1.7, commit:
ee2f8dd0a09933610c92940874094961cd55a4bf'
  cpuUtilization:
       idlePercent: 82.92
       systemPercent: 4.48
       userPercent: 12.6
  cpus: 1
  distribution:
       distribution: '"ol"'
       variant: server
       version: "9.1"
  eventLogger: journald
  hostname: ora
  idMappings:
       gidmap:
       - container_id: 0
       host_id: 1000
       size: 1
       - container_id: 1
       host_id: 100000
       size: 65536
       uidmap:
       - container_id: 0
       host_id: 1000
       size: 1
       - container_id: 1
```

```
      host_id: 100000
      size: 65536
  kernel: 5.15.90.1-microsoft-standard-WSL2
  linkmode: dynamic
  logDriver: journald
  memFree: 2939940864
  memTotal: 4107681792
  networkBackend: netavark
  ociRuntime:
      name: crun
      package: crun-1.8.4-1.el9_2.x86_64
      path: /usr/bin/crun
      version: |-
      crun version 1.8.4
      commit: 5a8fa99a5e41facba2eda4af12fa26313918805b
      rundir: /run/user/1000/crun
      spec: 1.0.0
      +SYSTEMD +SELINUX +APPARMOR +CAP +SECCOMP +EBPF +CRIU +YAJL
  os: linux
  remoteSocket:
      path: /run/user/1000/podman/podman.sock
  security:
      apparmorEnabled: false
      capabilities:
CAP_CHOWN,CAP_DAC_OVERRIDE,CAP_FOWNER,CAP_FSETID,CAP_KILL,CAP_NET_BIND_SERVICE,CAP_SE
TFCAP,CAP_SETGID,CAP_SETPCAP,CAP_SETUID,CAP_SYS_CHROOT
      rootless: true
      seccompEnabled: true
      seccompProfilePath: /usr/share/containers/seccomp.json
      selinuxEnabled: false
  serviceIsRemote: false
  slirp4netns:
      executable: /usr/bin/slirp4netns
      package: slirp4netns-1.2.0-3.el9.x86_64
      version: |-
      slirp4netns version 1.2.0
      commit: 656041d45cfca7a4176f6b7eed9e4fe6c11e8383
      libslirp: 4.4.0
      SLIRP_CONFIG_VERSION_MAX: 3
      libseccomp: 2.5.2
  swapFree: 1073741824
  swapTotal: 1073741824
  uptime: 0h 6m 49.00s
plugins:
  authorization: null
  log:
  - k8s-file
  - none
  - passthrough
  - journald
  network:
```

```
  - bridge
  - macvlan
  volume:
  - local
registries:
  search:
  - container-registry.oracle.com
  - docker.io
store:
  configFile: /home/user/.config/containers/storage.conf
  containerStore:
       number: 0
       paused: 0
       running: 0
       stopped: 0
  graphDriverName: overlay
  graphOptions: {}
  graphRoot: /home/user/.local/share/containers/storage
  graphRootAllocated: 1081101176832
  graphRootUsed: 862482432
  graphStatus:
       Backing Filesystem: extfs
       Native Overlay Diff: "true"
       Supports d_type: "true"
       Using metacopy: "false"
  imageCopyTmpDir: /var/tmp
  imageStore:
       number: 0
  runRoot: /run/user/1000/containers
  transientStore: false
  volumePath: /home/user/.local/share/containers/storage/volumes
version:
  APIVersion: 4.4.1
  Built: 1683878118
  BuiltTime: Fri May 12 00:55:18 2023
  GitCommit: ""
  GoVersion: go1.19.6
  Os: linux
  OsArch: linux/amd64
  Version: 4.4.1

[user@ora Desktop]$
```

8. You are ready for the class.