

Name: Niemo, Christian Al C.	Date Performed: Sept. 13, 2023
Course/Section: CPE232 - CPE31S6	Date Submitted: Sept. 14, 2023
Instructor: Dr. Jonathan Taylar	Semester and SY: 1st sem - 2023-2024
Activity 4: Running Elevated Ad hoc Commands	
1. Objectives: 1.1 Use commands that makes changes to remote machines 1.2 Use playbook in automating ansible commands	
2. Discussion: <i>Provide screenshots for each task.</i> Elevated Ad hoc commands So far, we have not performed ansible commands that makes changes to the remote servers. We manage to gather facts and connect to the remote machines, but we still did not make changes on those machines. In this activity, we will learn to use commands that would install, update, and upgrade packages in the remote machines. We will also create a playbook that will be used for automations. Playbooks record and execute Ansible's configuration, deployment, and orchestration functions. They can describe a policy you want your remote systems to enforce, or a set of steps in a general IT process. If Ansible modules are the tools in your workshop, playbooks are your instruction manuals, and your inventory of hosts are your raw material. At a basic level, playbooks can be used to manage configurations of and deployments to remote machines. At a more advanced level, they can sequence multi-tier rollouts involving rolling updates, and can delegate actions to other hosts, interacting with monitoring servers and load balancers along the way. You can check this documentation if you want to learn more about playbooks. Working with playbooks — Ansible Documentation	
Task 1: Run elevated ad hoc commands 1. Locally, we use the command <i>sudo apt update</i> when we want to download package information from all configured resources. The sources often defined in <i>/etc/apt/sources.list</i> file and other files located in <i>/etc/apt/sources.list.d/</i> directory. So, when you run update command, it downloads the package information from the Internet. It is useful to get info on an updated version of packages or their dependencies. We can only run	

an apt update command in a remote machine. Issue the following command:

ansible all -m apt -a update_cache=true

What is the result of the command? Is it successful?

```
workstation@workstation:~/act4$ ansible all -m apt -a update_cache=true
192.168.56.103 | FAILED! => {
  "changed": false,
  "msg": "Failed to lock apt for exclusive operation: Failed to lock directory /var/lib/apt/lists/: E:Could not open lock file /var/lib/apt/lists/lock - open (13: Permission denied)"
}
192.168.56.102 | FAILED! => {
  "changed": false,
  "msg": "Failed to lock apt for exclusive operation: Failed to lock directory /var/lib/apt/lists/: E:Could not open lock file /var/lib/apt/lists/lock - open (13: Permission denied)"
}
workstation@workstation:~/act4$
```

- No. It is because of the privilege escalation issue.

Try editing the command and add something that would elevate the privilege. Issue the command *ansible all -m apt -a update_cache=true --become --ask-become-pass*. Enter the sudo password when prompted. You will notice now that the output of this command is a success. The *update_cache=true* is the same thing as running *sudo apt update*. The *--become* command elevate the privileges and the *--ask-become-pass* asks for the password. For now, even if we only have changed the packaged index, we were able to change something on the remote server.

You may notice after the second command was executed, the status is CHANGED compared to the first command, which is FAILED.

```
workstation@workstation:~/act4$ ansible all -m apt -a update_cache=true --become --ask-become-pass
BECOME password:
192.168.56.103 | CHANGED => {
  "cache_update_time": 1694600916,
  "cache_updated": true,
  "changed": true
}
192.168.56.102 | CHANGED => {
  "cache_update_time": 1694600916,
  "cache_updated": true,
  "changed": true
}
```

2. Let's try to install VIM, which is an almost compatible version of the UNIX editor Vi. To do this, we will just changed the module part in 1.1 instruction. Here is the command: *ansible all -m apt -a name=vim-nox --become --ask-become-pass*. The command would take some time after typing the password because the local machine instructed the remote servers to actually install the package.

```
workstation@workstation:~/act4$ ansible all -m apt -a name=vim-nox --become --ask-become-pass
BECOME password:
```

```

workstation@workstation:~$ ansible all -m apt -a name=vim-nox --become --ask-become-pass
BECOME password:
192.168.56.103 | CHANGED => [
    "cache_update_time": 1694600916,
    "cache_updated": false,
    "changed": true,
    "stderr": "",
    "stderr_lines": [],
    "stdout": "Reading package lists...\nBuilding dependency tree...\nReading state information...\nThe following packages were auto
matically installed and are no longer required:\n libflashrom1 libftdi1-2 liblvm13\nUse 'sudo apt autoremove' to remove them.\nThe
following additional packages will be installed:\n fonts-lato javascript-common libjs-jquery liblua5.2-0 libruby3.0 rake ruby\n r
uby-net-telnet ruby-rubygems ruby-webrick ruby-xmllrpc ruby3.0\n rubygems-integration vim-runtime\nSuggested packages:\n apache2 |
lighttpd | httpd r1 ruby-dev bundler cscope vim-doc\nThe following NEW packages will be installed:\n fonts-lato javascript-common l
ibjs-jquery liblua5.2-0 libruby3.0 rake ruby\n ruby-net-telnet ruby-rubygems ruby-webrick ruby-xmllrpc ruby3.0\n rubygems-integrati
on vim-nox vim-runtime\n0 upgraded, 15 newly installed, 0 to remove and 5 not upgraded.\nNeed to get 17.5 MB of archives.\nAfter thi
s operation, 76.4 MB of additional disk space will be used.\nGet:1 http://ph.archive.ubuntu.com/ubuntu jammy/main amd64 fonts-lato a
ll 2.0-2.1 [2696 kB]\nGet:2 http://ph.archive.ubuntu.com/ubuntu jammy/main amd64 javascript-common all 11+nmui1 [5936 B]\nGet:3 http:
//ph.archive.ubuntu.com/ubuntu jammy/main amd64 liblua5.2-0 amd64 5.2.4-2 [125 kB]\nGet:5 http://ph.archive.ubuntu.com/ubuntu jammy/main amd64 rubygems-i
ntegration all 1.18 [5336 B]\nGet:6 http://ph.archive.ubuntu.com/ubuntu jammy-updates/main amd64 ruby3.0 amd64 3.0.2-7ubuntu2.4 [50.
1 kB]\nGet:7 http://ph.archive.ubuntu.com/ubuntu jammy/main amd64 ruby-rubygems all 3.3.5-2 [228 kB]\nGet:8 http://ph.archive.ubuntu
.com/ubuntu jammy/main amd64 ruby amd64 1:3.0-expi [5100 B]\nGet:9 http://ph.archive.ubuntu.com/ubuntu jammy/main amd64 rake all 13.
0.6-2 [61.7 kB]\nGet:10 http://ph.archive.ubuntu.com/ubuntu jammy/main amd64 ruby-net-telnet all 0.1.1-2 [12.6 kB]\nGet:11 http://ph
.archive.ubuntu.com/ubuntu jammy/universe amd64 ruby-webrick all 1.7.0-3 [51.8 kB]\nGet:12 http://ph.archive.ubuntu.com/ubuntu jammy
-updates/main amd64 ruby-xmllrpc all 0.3.2-1ubuntu0.1 [24.9 kB]\nGet:13 http://ph.archive.ubuntu.com/ubuntu jammy-updates/main amd64
libruby3.0 amd64 3.0.2-7ubuntu2.4 [5113 kB]\nGet:14 http://ph.archive.ubuntu.com/ubuntu jammy-updates/main amd64 vim-runtime all 2:8
.2.3995-1ubuntu2.11 [6828 kB]\nGet:15 http://ph.archive.ubuntu.com/ubuntu jammy-updates/universe amd64 vim-nox amd64 2:8.2.3995-1ubu
ntu2.11 [1941 kB]\nFetched 17.5 MB in 3s (6260 kB/s)\nSelecting previously unselected package fonts-lato.\n(Reading database ... \
r(Reading database ... 5%\r(Reading database ... 10%\r(Reading database ... 15%\r(Reading database ... 20%\r(Reading database ... 25
%\r(Reading database ... 30%\r(Reading database ... 35%\r(Reading database ... 40%\r(Reading database ... 45%\r(Reading database ... 50%
\r(Reading database ... 55%\r(Reading database ... 60%\r(Reading database ... 65%\r(Reading database ... 70%\r(Reading database ... 75%
\r(Reading database ... 80%\r(Reading database ... 85%\r(Reading database ... 90%\r(Reading database ... 95%\r(Reading database ... 100%
\r(Reading database ... 200433 files and directories currently installed.)\r\nPreparing to unpack .../00-fonts-lato-2.0-2
.1-all.deb .../\r\nUnpacking fonts-lato (2.0-2.1) .../\r\nSelecting previously unselected package javascript-common.\r\nPreparing to u
npack .../01-javascript-common-11+nmui1-all.deb .../\r\nUnpacking javascript-common (11+nmui1) .../\r\nSelecting previously unselected p
ackage libjs-jquery.\r\nPreparing to unpack .../02-libjs-jquery-3.6.0+dfsg+~3.5.13-1-all.deb .../\r\nUnpacking libjs-jquery (3.6.0+df
sg+~3.5.13-1) .../\r\nSelecting previously unselected package liblua5.2-0:amd64.\r\nPreparing to unpack .../03-liblua5.2-0-5.2.4-2_am
d64.deb .../\r\nUnpacking liblua5.2-0:amd64 (5.2.4-2) .../\r\nSelecting previously unselected package rubygems-integration.\r\nPrepari
ng to unpack .../04-rubygems-integration-1.18-all.deb .../\r\nUnpacking rubygems-integration (1.18) .../\r\nSelecting previously unse
lected package ruby3.0.\r\nPreparing to unpack .../05-ruby3.0-3.0.2-7ubuntu2.4-amd64.deb .../\r\nUnpacking ruby3.0 (3.0.2-7ubuntu2.4)
.../\r\nSelecting previously unselected package ruby-rubygems.\r\nPreparing to unpack .../06-ruby-rubygems-3.3.5-2-all.deb .../\r\nUnp
acking ruby-rubygems (3.3.5-2) .../\r\nSelecting previously unselected package ruby.\r\nPreparing to unpack .../07-ruby-1:3.0-expi1-
amd64.deb .../\r\nUnpacking ruby (1:3.0-expi1) .../\r\nSelecting previously unselected package rake.\r\nPreparing to unpack .../08-rake
-13.0.6-2-all.deb .../\r\nUnpacking rake (13.0.6-2) .../\r\nSelecting previously unselected package ruby-net-telnet.\r\nPreparing to u
npack .../09-ruby-net-telnet-0.1.1-2-all.deb .../\r\nUnpacking ruby-net-telnet (0.1.1-2) .../\r\nSelecting previously unselected packa
ge ruby-webrick.\r\nPreparing to unpack .../10-ruby-webrick-1.7.0-3-all.deb .../\r\nUnpacking ruby-webrick (1.7.0-3) .../\r\nSelecting
previously unselected package ruby-xmllrpc.\r\nPreparing to unpack .../11-ruby-xmllrpc-0.3.2-1ubuntu0.1-all.deb .../\r\nUnpacking ruby
-xmllrpc (0.3.2-1ubuntu0.1) .../\r\nSelecting previously unselected package libruby3.0:amd64.\r\nPreparing to unpack .../12-libruby3.0
_3.0.2-7ubuntu2.4-amd64.deb .../\r\nUnpacking libruby3.0:amd64 (3.0.2-7ubuntu2.4) .../\r\nSelecting previously unselected package vim-
runtime.\r\nPreparing to unpack .../13-vim-runtime-2:8.2.3995-1ubuntu2.11-all.deb .../\r\nAdding 'diversion of /usr/share/vim/vim82
/doc/help.txt to /usr/share/vim/vim82/doc/help.txt.vim-tiny by vim-runtime'\r\nAdding 'diversion of /usr/share/vim/vim82/doc/tags to
/usr/share/vim/vim82/doc/tags.vim-tiny by vim-runtime'\r\nUnpacking vim-runtime (2:8.2.3995-1ubuntu2.11) .../\r\nSelecting previousl
y unselected package vim-nox.\r\nPreparing to unpack .../14-vim-nox-2:8.2.3995-1ubuntu2.11-amd64.deb .../\r\nUnpacking vim-nox (2:8
.2.3995-1ubuntu2.11) .../\r\nSetting up javascript-common (11+nmui1) .../\r\nSetting up fonts-lato (2.0-2.1) .../\r\nSetting up rubygems
-integration (1.18) .../\r\nSetting up ruby-net-telnet (0.1.1-2) .../\r\nSetting up ruby-webrick (1.7.0-3) .../\r\nSetting up liblua5.2
-0:amd64 (5.2.4-2) .../\r\nSetting up libjs-jquery (3.6.0+dfsg+~3.5.13-1) .../\r\nSetting up vim-runtime (2:8.2.3995-1ubuntu2.11) .../\
r\nSetting up ruby-xmllrpc (0.3.2-1ubuntu0.1) .../\r\nSetting up rake (13.0.6-2) .../\r\nSetting up libruby3.0:amd64 (3.0.2-7ubuntu2.4)
.../\r\nSetting up ruby3.0 (3.0.2-7ubuntu2.4) .../\r\nSetting up vim-nox (2:8.2.3995-1ubuntu2.11) .../\r\nupdate-alternatives: using /
usr/bin/vim-nox to provide /usr/bin/vim (vim) in auto mode\r\nupdate-alternatives: using /usr/bin/vim-nox to provide /usr/bin/vimdiff
 (vimdiff) in auto mode\r\nupdate-alternatives: using /usr/bin/vim-nox to provide /usr/bin/rvim (rvim) in auto mode\r\nupdate-alter
natives: using /usr/bin/vim-nox to provide /usr/bin/rview (rview) in auto mode\r\nupdate-alternatives: using /usr/bin/vim-nox to pro
vide /usr/bin/vi (vi) in auto mode\r\nupdate-alternatives: using /usr/bin/vim-nox to provide /usr/bin/rvim (rvim) in auto mode\r\nupdat
e-alternatives: using /usr/bin/vim-nox to provide /usr/bin/view (view) in auto mode\r\nup
date-alternatives: using /usr/bin/vim-nox to provide /usr/bin/ex (ex) in auto mode\r\nSetting up ruby (1:3.0-expi1) .../\r\nSetting up
ruby-rubygems (3.3.5-2) .../\r\nProcessing triggers for man-db (2.10.2-1) .../\r\nProcessing triggers for fontconfig (2.13.1-4.2ubuntu
5) .../\r\nProcessing triggers for libc-bin (2.35-0ubuntu3.1) .../\r\n",
    "stdout_lines": [
        "Reading package lists...",
        "Building dependency tree...",
        "Reading state information...",
        "The following packages were automatically installed and are no longer required:",
        " libflashrom1 libftdi1-2 liblvm13",
        "Use 'sudo apt autoremove' to remove them.",
        "The following additional packages will be installed:",
        " fonts-lato javascript-common libjs-jquery liblua5.2-0 libruby3.0 rake ruby",
        " ruby-net-telnet ruby-rubygems ruby-webrick ruby-xmllrpc ruby3.0",
        " rubygems-integration vim-runtime",
    ]
  ]
]

```

```

" Suggested packages:
"  apache2 | lighttpd | httpd rl ruby-dev bundler cscope vim-doc",
"The following NEW packages will be installed:",
"  fonts-lato javascript-common libjs-jquery liblua5.2-0 libruby3.0 rake ruby",
"  ruby-net-telnet ruby-rubygems ruby-webrick ruby-xmlrpc ruby3.0",
"  rubygems-integration vim-nox vim-runtime",
"0 upgraded, 15 newly installed, 0 to remove and 5 not upgraded.",
"Need to get 17.5 MB of archives.",
" After this operation, 74.4 MB of additional disk space will be used.",
"Get:1 http://ph.archive.ubuntu.com/ubuntu jammy/main amd64 fonts-lato all 2.0-2.1 [2696 kB]",
"Get:2 http://ph.archive.ubuntu.com/ubuntu jammy/main amd64 javascript-common all 11:nnu1 [5936 B]",
"Get:3 http://ph.archive.ubuntu.com/ubuntu jammy/main amd64 libjs-jquery all 3.6.0.dfsg+3.5.13-1 [321 kB]",
"Get:4 http://ph.archive.ubuntu.com/ubuntu jammy/universe amd64 liblua5.2-0 amd64 5.2.4-2 [125 kB]",
"Get:5 http://ph.archive.ubuntu.com/ubuntu jammy/main amd64 rubygems-integration all 1.18 [5336 B]",
"Get:6 http://ph.archive.ubuntu.com/ubuntu jammy-updates/main amd64 ruby3.0 amd64 3.0.2-7ubuntu2.4 [50.1 kB]",
"Get:7 http://ph.archive.ubuntu.com/ubuntu jammy/main amd64 ruby-rubygems all 3.3.5-2 [228 kB]",
"Get:8 http://ph.archive.ubuntu.com/ubuntu jammy/main amd64 ruby amd64 1:3.0-expi [5100 B]",
"Get:9 http://ph.archive.ubuntu.com/ubuntu jammy/main amd64 rake all 13.0.6-2 [61.7 kB]",
"Get:10 http://ph.archive.ubuntu.com/ubuntu jammy/main amd64 ruby-net-telnet all 0.1.1-2 [12.6 kB]",
"Get:11 http://ph.archive.ubuntu.com/ubuntu jammy/universe amd64 ruby-webrick all 1.7.0-3 [51.8 kB]",
"Get:12 http://ph.archive.ubuntu.com/ubuntu jammy-updates/main amd64 ruby-xmlrpc all 0.3.2-1ubuntu0.1 [24.9 kB]",
"Get:13 http://ph.archive.ubuntu.com/ubuntu jammy-updates/main amd64 libruby3.0 amd64 3.0.2-7ubuntu2.4 [5113 kB]",
"Get:14 http://ph.archive.ubuntu.com/ubuntu jammy-updates/main amd64 vim-runtime all 2:8.2.3995-1ubuntu2.11 [6828 kB]",
"Get:15 http://ph.archive.ubuntu.com/ubuntu jammy-updates/universe amd64 vim-nox amd64 2:8.2.3995-1ubuntu2.11 [1941 kB]",
"Fetchd 17.5 MB in 3s (6260 kB/s)",
"Selecting previously unselected package Fonts-lato.",
"(Reading database ... ",
"(Reading database ... 5%",
"(Reading database ... 10%",
"(Reading database ... 15%",
"(Reading database ... 20%",
"(Reading database ... 25%",
"(Reading database ... 30%",
"(Reading database ... 35%",
"(Reading database ... 40%",
"(Reading database ... 45%",
"(Reading database ... 50%",
"(Reading database ... 55%",
"(Reading database ... 60%"

```

```
"(Reading database ... 66%",
"(Reading database ... 65%",
"(Reading database ... 70%",
"(Reading database ... 75%",
"(Reading database ... 80%",
"(Reading database ... 85%",
"(Reading database ... 90%",
"(Reading database ... 95%",
"(Reading database ... 100%",
"(Reading database ... 200433 files and directories currently installed.)",
"Preparing to unpack .../00-fonts-lato-2.0-2.1_all.deb ...",
"Unpacking fonts-lato (2.0-2.1) ...",
"Selecting previously unselected package javascript-common.",
"Preparing to unpack .../01-javascript-common_11+nnu1_all.deb ...",
"Unpacking javascript-common (11+nnu1) ...",
"Selecting previously unselected package libjs-jquery.",
"Preparing to unpack .../02-libjs-jquery_3.6.0+dfsg+3.5.13-1_all.deb ...",
"Unpacking libjs-jquery (3.6.0+dfsg+3.5.13-1) ...",
"Selecting previously unselected package liblua5.2-0:amd64.",
"Preparing to unpack .../03-liblua5.2-0_5.2.4-2_amd64.deb ...",
"Unpacking liblua5.2-0:amd64 (5.2.4-2) ...",
"Selecting previously unselected package rubygems-integration.",
"Preparing to unpack .../04-rubygems-integration_1.18_all.deb ...",
"Unpacking rubygems-integration (1.18) ...",
"Selecting previously unselected package ruby3.0.",
"Preparing to unpack .../05-ruby3.0_3.0.2-7ubuntu2.4_amd64.deb ...",
"Unpacking ruby3.0 (3.0.2-7ubuntu2.4) ...",
"Selecting previously unselected package ruby-rubygems.",
"Preparing to unpack .../06-ruby-rubygems_3.3.5-2_all.deb ...",
"Unpacking ruby-rubygems (3.3.5-2) ...",
"Selecting previously unselected package ruby.",
"Preparing to unpack .../07-ruby_1%3a3.0-exp1_amd64.deb ...",
"Unpacking ruby (1:3.0-exp1) ...",
"Selecting previously unselected package rake.",
"Preparing to unpack .../08-rake_13.0.6-2_all.deb ...",
"Unpacking rake (13.0.6-2) ...",
"Selecting previously unselected package ruby-net-telnet.",
"Preparing to unpack .../09-ruby-net-telnet_0.1.1-2_all.deb ...",
```

```
"Preparing to unpack .../10-ruby-webrick_1.7.0-3_all.deb ...",
"Unpacking ruby-webrick (1.7.0-3) ...",
"Selecting previously unselected package ruby-xmllrpc.",
"Preparing to unpack .../11-ruby-xmllrpc_0.3.2-1ubuntu0.1_all.deb ...",
"Unpacking ruby-xmllrpc (0.3.2-1ubuntu0.1) ...",
"Selecting previously unselected package libruby3.0:amd64.",
"Preparing to unpack .../12-libruby3.0_3.0.2-7ubuntu2.4_amd64.deb ...",
"Unpacking libruby3.0:amd64 (3.0.2-7ubuntu2.4) ...",
"Selecting previously unselected package vim-runtime.",
"Preparing to unpack .../13-vim-runtime_2%3a8.2.3995-1ubuntu2.11_all.deb ...",
"Adding 'diversion of /usr/share/vim/vim82/doc/help.txt to /usr/share/vim/vim82/doc/help.txt.vim-tiny by vim-runtime'",
"Adding 'diversion of /usr/share/vim/vim82/doc/tags to /usr/share/vim/vim82/doc/tags.vim-tiny by vim-runtime'",
"Unpacking vim-runtime (2:8.2.3995-1ubuntu2.11) ...",
"Selecting previously unselected package vim-nox.",
"Preparing to unpack .../14-vim-nox_2%3a8.2.3995-1ubuntu2.11_amd64.deb ...",
"Unpacking vim-nox (2:8.2.3995-1ubuntu2.11) ...",
"Setting up javascript-common (11+nmui) ...",
"Setting up fonts-lato (2.0-2.1) ...",
"Setting up rubygems-integration (1.18) ...",
"Setting up ruby-net-telnet (0.1.1-2) ...",
"Setting up ruby-webrick (1.7.0-3) ...",
"Setting up liblua5.2-0:amd64 (5.2.4-2) ...",
"Setting up libjs-jquery (3.6.0+dfsg+~3.5.13-1) ...",
"Setting up vim-runtime (2:8.2.3995-1ubuntu2.11) ...",
"Setting up ruby-xmllrpc (0.3.2-1ubuntu0.1) ...",
"Setting up rake (13.0.6-2) ...",
"Setting up libruby3.0:amd64 (3.0.2-7ubuntu2.4) ...",
"Setting up ruby3.0 (3.0.2-7ubuntu2.4) ...",
"Setting up vim-nox (2:8.2.3995-1ubuntu2.11) ...",
"update-alternatives: using /usr/bin/vim.nox to provide /usr/bin/vim (vim) in auto mode",
"update-alternatives: using /usr/bin/vim.nox to provide /usr/bin/vimdiff (vimdiff) in auto mode",
"update-alternatives: using /usr/bin/vim.nox to provide /usr/bin/rvim (rvim) in auto mode",
"update-alternatives: using /usr/bin/vim.nox to provide /usr/bin/rview (rview) in auto mode",
"update-alternatives: using /usr/bin/vim.nox to provide /usr/bin/vi (vi) in auto mode",
"update-alternatives: using /usr/bin/vim.nox to provide /usr/bin/view (view) in auto mode",
"update-alternatives: using /usr/bin/vim.nox to provide /usr/bin/ex (ex) in auto mode",
"Setting up ruby (1:3.0-exp1) ...",
"Setting up ruby-rubygems (3.3.5-2) ...",
```

```
"Processing triggers for man-db (2.10.2-1) ...",
"Processing triggers for fontconfig (2.13.1-4.2ubuntu5) ...",
"Processing triggers for libc-bin (2.35-0ubuntu3.1) ..."
```

```
}
]
192.168.56.102 | CHANGED => {
  "cache_update_time": 1694600916,
  "cache_updated": false,
  "changed": true,
  "stderr": "",
  "stderr_lines": [],
  "stdout": "Reading package lists...\nBuilding dependency tree...\nReading state information...\nThe following packages were auto\natically installed and are no longer required:\n libflashrom1 libftdi1-2 liblvm13\nUse 'sudo apt autoremove' to remove them.\nThe\nfollowing additional packages will be installed:\n fonts-lato javascript-common libjs-jquery liblua5.2-0 libruby3.0 rake ruby\n r\nuby-net-telnet ruby-rubygems ruby-webrick ruby-xmllrpc ruby3.0\n rubygems-integration vim-runtime\nSuggested packages:\n apache2 | \nlighttpd | httpd ri ruby-dev bundler cscope vim-doc\nThe following NEW packages will be installed:\n fonts-lato javascript-common l\nibjs-jquery liblua5.2-0 libruby3.0 rake ruby\n ruby-net-telnet ruby-rubygems ruby-webrick ruby-xmllrpc ruby3.0\n rubygems-integrati\non vim-nox vim-runtime\n0 upgraded, 15 newly installed, 0 to remove and 5 not upgraded.\nNeed to get 17.5 MB of archives.\nAfter thi\ns operation, 76.4 MB of additional disk space will be used.\nGet:1 http://ph.archive.ubuntu.com/ubuntu jammy/main amd64 fonts-lato a\nll 2.0-2.1 [2696 kB]\nGet:2 http://ph.archive.ubuntu.com/ubuntu jammy/main amd64 javascript-common all 11+nmui [5936 B]\nGet:3 http://ph.archive.ubuntu.com/ubuntu jammy/main amd64 libjs-jquery all 3.6.0+dfsg+~3.5.13-1 [321 kB]\nGet:4 http://ph.archive.ubuntu.com/u\nbuntu jammy/universe amd64 liblua5.2-0 amd64 5.2.4-2 [125 kB]\nGet:5 http://ph.archive.ubuntu.com/ubuntu jammy/main amd64 rubygems-i\nntegration all 1.18 [5336 B]\nGet:6 http://ph.archive.ubuntu.com/ubuntu jammy-updates/main amd64 ruby3.0 amd64 3.0.2-7ubuntu2.4 [50\n.1 kB]\nGet:7 http://ph.archive.ubuntu.com/ubuntu jammy/main amd64 ruby-rubygems all 3.3.5-2 [228 kB]\nGet:8 http://ph.archive.ubuntu\n.com/ubuntu jammy/main amd64 ruby amd64 1:3.0-exp1 [5100 B]\nGet:9 http://ph.archive.ubuntu.com/ubuntu jammy/main amd64 rake all 13\n.0.6-2 [61.7 kB]\nGet:10 http://ph.archive.ubuntu.com/ubuntu jammy/main amd64 ruby-net-telnet all 0.1.1-2 [12.6 kB]\nGet:11 http://ph\n.archive.ubuntu.com/ubuntu jammy/universe amd64 ruby-webrick all 1.7.0-3 [51.8 kB]\nGet:12 http://ph.archive.ubuntu.com/ubuntu jammy\n-updates/main amd64 ruby-xmllrpc all 0.3.2-1ubuntu0.1 [24.9 kB]\nGet:13 http://ph.archive.ubuntu.com/ubuntu jammy-updates/main amd64\nlibruby3.0 amd64 3.0.2-7ubuntu2.4 [5113 kB]\nGet:14 http://ph.archive.ubuntu.com/ubuntu jammy-updates/main amd64 vim-runtime all 2:8\n.2.3995-1ubuntu2.11 [6828 kB]\nGet:15 http://ph.archive.ubuntu.com/ubuntu jammy-updates/universe amd64 vim-nox amd64 2:8.2.3995-1ubu\nntu2.11 [1941 kB]\nFetched 17.5 MB in 6s (2784 kB/s)\nSelecting previously unselected package fonts-lato.\n\n(Reading database ... 5%\r(Reading database ... 10%\r(Reading database ... 15%\r(Reading database ... 20%\r(Reading database ... 25\n%\r(Reading database ... 30%\r(Reading database ... 35%\r(Reading database ... 40%\r(Reading database ... 45%\r(Reading database ... 50%\r(Reading database ... 55%\r(Reading database ... 60%\r(Reading database ... 65%\r(Reading database ... 70%\r(Reading database ... 75%\r(Reading database ... 80%\r(Reading database ... 85%\r(Reading database ... 90%\r(Reading database ... 95%\r(Reading database ... 100%\r(Reading database ... 200433 files and directories currently installed.)\n\nPreparing to unpack .../00-fonts-lato_2.0-2.1_all.deb ...\nUnpacking fonts-lato (2.0-2.1) ...\n\nSelecting previously unselected package javascript-common.\n\nPreparing to u\nnpack .../01-javascript-common_11+nmui_all.deb ...\n\nUnpacking javascript-common (11+nmui) ...\n\nSelecting previously unselected p
```

```

ackage libjs-jquery.\r\nPreparing to unpack .../02-libjs-jquery_3.6.0+dfsg+~3.5.13-1_all.deb ... \r\nunpacking libjs-jquery (3.6.0+df
sg+~3.5.13-1) ... \r\nSelecting previously unselected package liblua5.2-0:amd64.\r\nPreparing to unpack .../03-liblua5.2-0_5.2.4-2.am
d64.deb ... \r\nunpacking liblua5.2-0:amd64 (5.2.4-2) ... \r\nSelecting previously unselected package rubygems-integration.\r\nPrepari
ng to unpack .../04-rubygems-integration_1.18_all.deb ... \r\nunpacking rubygems-integration (1.18) ... \r\nSelecting previously unsele
cted package ruby3.0.\r\nPreparing to unpack .../05-ruby3.0_3.0.2-7ubuntu2.4_amd64.deb ... \r\nunpacking ruby3.0 (3.0.2-7ubuntu2.4)
... \r\nSelecting previously unselected package ruby-rubygems.\r\nPreparing to unpack .../06-ruby-rubygems_3.3.5-2_all.deb ... \r\nUnp
acking ruby-rubygems (3.3.5-2) ... \r\nSelecting previously unselected package rake.\r\nPreparing to unpack .../07-ruby_1%3a3.0-exp1
_amd64.deb ... \r\nunpacking rake (1:3.0-exp1) ... \r\nSelecting previously unselected package rake.\r\nPreparing to unpack .../08-rake
_13.0.6-2_all.deb ... \r\nunpacking rake (13.0.6-2) ... \r\nSelecting previously unselected package ruby-net-telnet.\r\nPreparing to u
npack .../09-ruby-net-telnet_0.1.1-2_all.deb ... \r\nunpacking ruby-net-telnet (0.1.1-2) ... \r\nSelecting previously unselected packa
ge ruby-webrick.\r\nPreparing to unpack .../10-ruby-webrick_1.7.0-3_all.deb ... \r\nunpacking ruby-webrick (1.7.0-3) ... \r\nSelecting
previously unselected package ruby-xmlrpc.\r\nPreparing to unpack .../11-ruby-xmlrpc_0.3.2-1ubuntu0.1_all.deb ... \r\nunpacking ruby
-xmlrpc (0.3.2-1ubuntu0.1) ... \r\nSelecting previously unselected package libruby3.0:amd64.\r\nPreparing to unpack .../12-libruby3.0
_3.0.2-7ubuntu2.4_amd64.deb ... \r\nunpacking libruby3.0:amd64 (3.0.2-7ubuntu2.4) ... \r\nSelecting previously unselected package vim-
runtime.\r\nPreparing to unpack .../13-vim-runtime_2%3a8.2.3995-1ubuntu2.11_all.deb ... \r\nAdding 'diversion of /usr/share/vim/vim82
/doc/help.txt to /usr/share/vim/vim82/doc/help.txt.vim-tiny by vim-runtime'\r\nAdding 'diversion of /usr/share/vim/vim82/doc/tags to
/usr/share/vim/vim82/doc/tags.vim-tiny by vim-runtime'\r\nUnpacking vim-runtime (2:8.2.3995-1ubuntu2.11) ... \r\nSelecting previousl
y unselected package vim-nox.\r\nPreparing to unpack .../14-vim-nox_2%3a8.2.3995-1ubuntu2.11_amd64.deb ... \r\nunpacking vim-nox (2:8
.2.3995-1ubuntu2.11) ... \r\nSetting up javascript-common (11+nmui) ... \r\nSetting up fonts-lato (2.0-2.1) ... \r\nSetting up rubygems
-integration (1.18) ... \r\nSetting up ruby-net-telnet (0.1.1-2) ... \r\nSetting up ruby-webrick (1.7.0-3) ... \r\nSetting up liblua5.2
-0:amd64 (5.2.4-2) ... \r\nSetting up libjs-jquery (3.6.0+dfsg+~3.5.13-1) ... \r\nSetting up vim-runtime (2:8.2.3995-1ubuntu2.11) ... \r
\nSetting up ruby-xmlrpc (0.3.2-1ubuntu0.1) ... \r\nSetting up rake (13.0.6-2) ... \r\nSetting up libruby3.0:amd64 (3.0.2-7ubuntu2.4)
... \r\nSetting up ruby3.0 (3.0.2-7ubuntu2.4) ... \r\nSetting up vim-nox (2:8.2.3995-1ubuntu2.11) ... \r\nupdate-alternatives: using /
usr/bin/vim.nox to provide /usr/bin/vim (vim) in auto mode\r\nupdate-alternatives: using /usr/bin/vim.nox to provide /usr/bin/vimdiff
f (vimdiff) in auto mode\r\nupdate-alternatives: using /usr/bin/vim.nox to provide /usr/bin/vim (vim) in auto mode\r\nupdate-alter
natives: using /usr/bin/vim.nox to provide /usr/bin/rview (rview) in auto mode\r\nupdate-alternatives: using /usr/bin/vim.nox to pro
vide /usr/bin/vi (vi) in auto mode\r\nupdate-alternatives: using /usr/bin/vim.nox to provide /usr/bin/viex (viex) in auto mode\r\nup
date-alternatives: using /usr/bin/vim.nox to provide /usr/bin/ex (ex) in auto mode\r\nSetting up ruby (1:3.0-exp1) ... \r\nSetting up
ruby-rubygems (3.3.5-2) ... \r\nProcessing triggers for man-db (2.10.2-1) ... \r\n\r\nProcessing triggers for fontconfig (2.13.1-4.2ubunt
u5) ... \r\n\r\nProcessing triggers for libc-bin (2.35-0ubuntu3.1) ... \r\n",
"stdout_lines": [
  "Reading package lists...",
  "Building dependency tree...",
  "Reading state information...",
  "The following packages were automatically installed and are no longer required:",
  "  libflashrom1 libftdi1-2 liblvm13",
  "Use 'sudo apt autoremove' to remove them.",
  "The following additional packages will be installed:",

```

```

"  fonts-lato javascript-common libjs-jquery liblua5.2-0 libruby3.0 rake ruby",
"  ruby-net-telnet ruby-rubygems ruby-webrick ruby-xmlrpc ruby3.0",
"  rubygems-integration vim-runtime",
"Suggested packages:",
"  apache2 | lighttpd | httpd ri ruby-dev bundler cscope vim-doc",
"The following NEW packages will be installed:",
"  fonts-lato javascript-common libjs-jquery liblua5.2-0 libruby3.0 rake ruby",
"  ruby-net-telnet ruby-rubygems ruby-webrick ruby-xmlrpc ruby3.0",
"  rubygems-integration vim-nox vim-runtime",
"0 upgraded, 15 newly installed, 0 to remove and 5 not upgraded.",
"Need to get 17.5 MB of archives.",
"After this operation, 76.4 MB of additional disk space will be used.",
"Get:1 http://ph.archive.ubuntu.com/ubuntu jammy/main amd64 fonts-lato all 2.0-2.1 [2696 kB]",
"Get:2 http://ph.archive.ubuntu.com/ubuntu jammy/main amd64 javascript-common all 11+nmui [5936 B]",
"Get:3 http://ph.archive.ubuntu.com/ubuntu jammy/main amd64 libjs-jquery all 3.6.0+dfsg+~3.5.13-1 [321 kB]",
"Get:4 http://ph.archive.ubuntu.com/ubuntu jammy/universe amd64 liblua5.2-0 amd64 5.2.4-2 [125 kB]",
"Get:5 http://ph.archive.ubuntu.com/ubuntu jammy/main amd64 rubygems-integration all 1.18 [5336 B]",
"Get:6 http://ph.archive.ubuntu.com/ubuntu jammy-updates/main amd64 ruby3.0 amd64 3.0.2-7ubuntu2.4 [50.1 kB]",
"Get:7 http://ph.archive.ubuntu.com/ubuntu jammy/main amd64 ruby-rubygems all 3.3.5-2 [228 kB]",
"Get:8 http://ph.archive.ubuntu.com/ubuntu jammy/main amd64 ruby amd64 1:3.0-exp1 [5100 B]",
"Get:9 http://ph.archive.ubuntu.com/ubuntu jammy/main amd64 rake all 13.0.6-2 [61.7 kB]",
"Get:10 http://ph.archive.ubuntu.com/ubuntu jammy/main amd64 ruby-net-telnet all 0.1.1-2 [12.6 kB]",
"Get:11 http://ph.archive.ubuntu.com/ubuntu jammy/universe amd64 ruby-webrick all 1.7.0-3 [51.8 kB]",
"Get:12 http://ph.archive.ubuntu.com/ubuntu jammy-updates/main amd64 ruby-xmlrpc all 0.3.2-1ubuntu0.1 [24.9 kB]",
"Get:13 http://ph.archive.ubuntu.com/ubuntu jammy-updates/main amd64 libruby3.0 amd64 3.0.2-7ubuntu2.4 [5113 kB]",
"Get:14 http://ph.archive.ubuntu.com/ubuntu jammy-updates/main amd64 vim-runtime all 2:8.2.3995-1ubuntu2.11 [6828 kB]",
"Get:15 http://ph.archive.ubuntu.com/ubuntu jammy-updates/universe amd64 vim-nox amd64 2:8.2.3995-1ubuntu2.11 [1941 kB]",
"Fetched 17.5 MB in 6s (2784 kB/s)",
"Selecting previously unselected package fonts-lato.",
"(Reading database ... ",
"(Reading database ... 5%",
"(Reading database ... 10%",
"(Reading database ... 15%",
"(Reading database ... 20%",
"(Reading database ... 25%",
"(Reading database ... 30%",
"(Reading database ... 35%",
"(Reading database ... 40%",

```



```
"(Reading database ... 45%",
"(Reading database ... 50%",
"(Reading database ... 55%",
"(Reading database ... 60%",
"(Reading database ... 65%",
"(Reading database ... 70%",
"(Reading database ... 75%",
"(Reading database ... 80%",
"(Reading database ... 85%",
"(Reading database ... 90%",
"(Reading database ... 95%",
"(Reading database ... 100%",
"(Reading database ... 200433 files and directories currently installed.)",
"Preparing to unpack .../00-fonts-lato_2.0-2.1_all.deb ...",
"Unpacking fonts-lato (2.0-2.1) ...",
"Selecting previously unselected package javascript-common.",
"Preparing to unpack .../01-javascript-common_11+nmui_all.deb ...",
"Unpacking javascript-common (11+nmui) ...",
"Selecting previously unselected package libjs-jquery.",
"Preparing to unpack .../02-libjs-jquery_3.6.0+dfsg+~3.5.13-1_all.deb ...",
"Unpacking libjs-jquery (3.6.0+dfsg+~3.5.13-1) ...",
"Selecting previously unselected package liblua5.2-0:amd64.",
"Preparing to unpack .../03-liblua5.2-0_5.2.4-2_amd64.deb ...",
"Unpacking liblua5.2-0:amd64 (5.2.4-2) ...",
"Selecting previously unselected package rubygems-integration.",
"Preparing to unpack .../04-rubygems-integration_1.18_all.deb ...",
"Unpacking rubygems-integration (1.18) ...",
"Selecting previously unselected package ruby3.0.",
"Preparing to unpack .../05-ruby3.0_3.0.2-7ubuntu2.4_amd64.deb ...",
"Unpacking ruby3.0 (3.0.2-7ubuntu2.4) ...",
"Selecting previously unselected package ruby-rubygems.",
"Preparing to unpack .../06-ruby-rubygems_3.3.5-2_all.deb ...",
"Unpacking ruby-rubygems (3.3.5-2) ...",
"Selecting previously unselected package ruby.",
"Preparing to unpack .../07-ruby_1%3a3.0-exp1_amd64.deb ...",
"Unpacking ruby (1:3.0-exp1) ...",
"Selecting previously unselected package rake.",
"Preparing to unpack .../08-rake_13.0.6-2_all.deb ...",
```

```
"Unpacking rake (13.0.6-2) ...",
"Selecting previously unselected package ruby-net-telnet.",
"Preparing to unpack .../09-ruby-net-telnet_0.1.1-2_all.deb ...",
"Unpacking ruby-net-telnet (0.1.1-2) ...",
"Selecting previously unselected package ruby-webrick.",
"Preparing to unpack .../10-ruby-webrick_1.7.0-3_all.deb ...",
"Unpacking ruby-webrick (1.7.0-3) ...",
"Selecting previously unselected package ruby-xmllrpc.",
"Preparing to unpack .../11-ruby-xmllrpc_0.3.2-1ubuntu0.1_all.deb ...",
"Unpacking ruby-xmllrpc (0.3.2-1ubuntu0.1) ...",
"Selecting previously unselected package libruby3.0:amd64.",
"Preparing to unpack .../12-libruby3.0_3.0.2-7ubuntu2.4_amd64.deb ...",
"Unpacking libruby3.0:amd64 (3.0.2-7ubuntu2.4) ...",
"Selecting previously unselected package vim-runtime.",
"Preparing to unpack .../13-vim-runtime_2%3a8.2.3995-1ubuntu2.11_all.deb ...",
"Adding 'diversion of /usr/share/vim/vim82/doc/help.txt to /usr/share/vim/vim82/doc/help.txt.vim-tiny by vim-runtime'",
"Adding 'diversion of /usr/share/vim/vim82/doc/tags to /usr/share/vim/vim82/doc/tags.vim-tiny by vim-runtime'",
"Unpacking vim-runtime (2:8.2.3995-1ubuntu2.11) ...",
"Selecting previously unselected package vim-nox.",
"Preparing to unpack .../14-vim-nox_2%3a8.2.3995-1ubuntu2.11_amd64.deb ...",
"Unpacking vim-nox (2:8.2.3995-1ubuntu2.11) ...",
"Setting up javascript-common (11+nmui) ...",
"Setting up fonts-lato (2.0-2.1) ...",
"Setting up rubygems-integration (1.18) ...",
"Setting up ruby-net-telnet (0.1.1-2) ...",
"Setting up ruby-webrick (1.7.0-3) ...",
"Setting up liblua5.2-0:amd64 (5.2.4-2) ...",
"Setting up libjs-jquery (3.6.0+dfsg+~3.5.13-1) ...",
"Setting up vim-runtime (2:8.2.3995-1ubuntu2.11) ...",
"Setting up ruby-xmllrpc (0.3.2-1ubuntu0.1) ...",
"Setting up rake (13.0.6-2) ...",
"Setting up libruby3.0:amd64 (3.0.2-7ubuntu2.4) ...",
"Setting up ruby3.0 (3.0.2-7ubuntu2.4) ...",
"Setting up vim-nox (2:8.2.3995-1ubuntu2.11) ...",
"update-alternatives: using /usr/bin/vim.nox to provide /usr/bin/vim (vim) in auto mode",
"update-alternatives: using /usr/bin/vim.nox to provide /usr/bin/vimdiff (vimdiff) in auto mode",
"update-alternatives: using /usr/bin/vim.nox to provide /usr/bin/rvim (rvim) in auto mode",
"update-alternatives: using /usr/bin/vim.nox to provide /usr/bin/rview (rview) in auto mode",
```

```
"update-alternatives: using /usr/bin/vim.nox to provide /usr/bin/vi (vi) in auto mode",
"update-alternatives: using /usr/bin/vim.nox to provide /usr/bin/view (view) in auto mode",
"update-alternatives: using /usr/bin/vim.nox to provide /usr/bin/ex (ex) in auto mode",
"Setting up ruby (1:3.0-exp1) ...",
"Setting up ruby-rubygems (3.3.5-2) ...",
"Processing triggers for man-db (2.10.2-1) ...",
"Processing triggers for fontconfig (2.13.1-4.2ubuntu5) ...",
"Processing triggers for libc-bin (2.35-0ubuntu3.1) ..."
}
```

2.1 Verify that you have installed the package in the remote servers. Issue the command *which vim* and the command *apt search vim-nox* respectively. Was the command successful?

```
workstation@workstation:~/CPE232_Niemo$ which vi
/usr/bin/vi
workstation@workstation:~/CPE232_Niemo$ apt search vim-nox
Sorting... Done
Full Text Search... Done
vim-nox/jammy-updates,jammy-security 2:8.2.3995-1ubuntu2.11 amd64
Vi IMproved - enhanced vi editor - with scripting languages support

vim-tiny/jammy-updates,jammy-security,now 2:8.2.3995-1ubuntu2.11 amd64 [installable,automatic]
Vi IMproved - enhanced vi editor - compact version
```

- Yes. In my case, I used a different name when running the command because the vim command doesn't have an output.

2.2 Check the logs in the servers using the following commands: *cd /var/log*. After this, issue the command *ls*, go to the folder *apt* and open *history.log*. Describe what you see in the *history.log*.

```
GNU nano 6.2 history.log
Start-Date: 2022-08-09 11:48:47
Commandline: apt-get --yes -oDebug::pkgDepCache::AutoInstall=yes --force=yes upgrade
Upgrade: dpkg:amd64 (1.21.1ubuntu2, 1.21.1ubuntu2.1), networkd-dispatcher:amd64 (2.1-2, 2.1-2ubuntu0.22.04.2), udev:amd64 (249.11-0ubuntu0.22.04.1, 249.11-0ubuntu0.22.04.2)
End-Date: 2022-08-09 11:48:58

Start-Date: 2022-08-09 11:49:08
Commandline: apt-get --yes -oDebug::pkgDepCache::AutoInstall=yes install linux-generic-hwe-22.04 adduser base-passwd bash bsdutils
Install: kerneloops:amd64 (0.12+git20140509-6ubuntu5), openvpn:amd64 (2.5.5-1ubuntu3), fontconfig:amd64 (2.13.1-4.2ubuntu5), libvul
End-Date: 2022-08-09 11:51:53

Start-Date: 2022-08-09 11:51:58
Commandline: apt-get --yes -oDebug::pkgDepCache::AutoInstall=yes install casper fonts-arphic-ukai fonts-arphic-uming gnome-user-docs
Install: libreoffice-l10n-en-gb:amd64 (1:7.3.5-0ubuntu0.22.04.1), libn17n-0:amd64 (1.8.0-4), libreoffice-l10n-en-za:amd64 (1:7.3.5-0ubuntu0.22.04.1)
End-Date: 2022-08-09 11:54:02

Start-Date: 2023-09-13 15:47:54
Requested-By: ubuntu (999)
Upgrade: language-pack-en-base:amd64 (1:22.04+20220721, 1:22.04+20230801), libreoffice-common:amd64 (1:7.3.5-0ubuntu0.22.04.1, 1:7.3.5-0ubuntu0.22.04.1)
End-Date: 2023-09-13 15:48:22

Start-Date: 2023-09-13 15:49:14
Requested-By: ubuntu (999)
End-Date: 2023-09-13 15:49:15

Start-Date: 2023-09-13 15:49:36
Requested-By: ubuntu (999)
Purge: libreoffice-l10n-en-gb:amd64 (1:7.3.5-0ubuntu0.22.04.1), libn17n-0:amd64 (1.8.0-4), libreoffice-l10n-en-za:amd64 (1:7.3.5-0ubuntu0.22.04.1)
End-Date: 2023-09-13 15:51:30

Start-Date: 2023-09-13 15:51:33
Requested-By: ubuntu (999)
Purge: libdhash1:amd64 (0.6.2-1), libini-config5:amd64 (0.6.2-1), libcollection4:amd64 (0.6.2-1), libc-ares2:amd64 (1.18.1-1build1)
End-Date: 2023-09-13 15:51:39
```

- History logs records a history of events or actions

3. This time, we will install a package called snapd. Snap is pre-installed in Ubuntu system. However, our goal is to create a command that checks for the latest installation package.

3.1 Issue the command: *ansible all -m apt -a name=snapd --become --ask-become-pass*

Can you describe the result of this command? Is it a success? Did it change anything in the remote servers?


```
workstation@workstation:~/act4$ ansible all -m apt -a name=snapd --become --ask-become-pass
BECOME password:
192.168.56.102 | SUCCESS => {
  "cache_update_time": 1694600916,
  "cache_updated": false,
  "changed": false
}
192.168.56.103 | SUCCESS => {
  "cache_update_time": 1694600916,
  "cache_updated": false,
  "changed": false
}
workstation@workstation:~/act4$
```

- No. Because my snapd is already updated so it didn't change a thing.

3.2 Now, try to issue this command: *ansible all -m apt -a "name=snapd state=latest" --become --ask-become-pass*

Describe the output of this command. Notice how we added the command *state=latest* and placed them in double quotations.

```
workstation@workstation:~/act4$ ansible all -m apt -a "name=snapd state=latest" --become --ask-become-pass
BECOME password:
192.168.56.102 | SUCCESS => {
  "cache_update_time": 1694600916,
  "cache_updated": false,
  "changed": false
}
192.168.56.103 | SUCCESS => {
  "cache_update_time": 1694600916,
  "cache_updated": false,
  "changed": false
}
workstation@workstation:~/act4$
```

4. At this point, make sure to commit all changes to GitHub.

```
workstation@workstation:~/act4$ git status
On branch main
Your branch is up to date with 'origin/main'.

nothing to commit, working tree clean
workstation@workstation:~/act4$ git push origin main
Everything up-to-date
```

Task 2: Writing our First Playbook

1. With ad hoc commands, we can simplify the administration of remote servers. For example, we can install updates, packages, and applications, etc. However, the real strength of ansible comes from its playbooks. When we write a playbook, we can define the state that we want our servers to be in and the place or commands that ansible will carry out to bring to that state. You can use an editor to create a playbook. Before we proceed, make sure that you are in the directory of the repository that we use in the previous activities (*CPE232_yourname*). Issue the command *nano install_apache.yml*. This will create a playbook file called *install_apache.yml*. The .yml is the basic standard extension for playbook files.

```
workstation@workstation:~/CPE232-Niemo$ sudo nano install_apache.yml
```

When the editor appears, type the following:

```
GNU nano 4.8                                install_apache.yml
--
- hosts: all
  become: true
  tasks:

    - name: install apache2 package
      apt:
        name: apache2
```

Make sure to save the file. Take note also of the alignments of the texts.

```
workstation@workstation: ~/CPE232-Niemo
GNU nano 6.2                                install_apache.yml
--
- hosts: all
  become: true
  tasks:

    - name: install apache2 package
      apt:
        name: apache2
```

2. Run the yml file using the command: *ansible-playbook --ask-become-pass install_apache.yml*. Describe the result of this command.

```
workstation@workstation:~/CPE232_Niemo$ ansible-playbook --ask-become-pass install_apache.yml
BECOME password:

PLAY [all] *********************************************************************

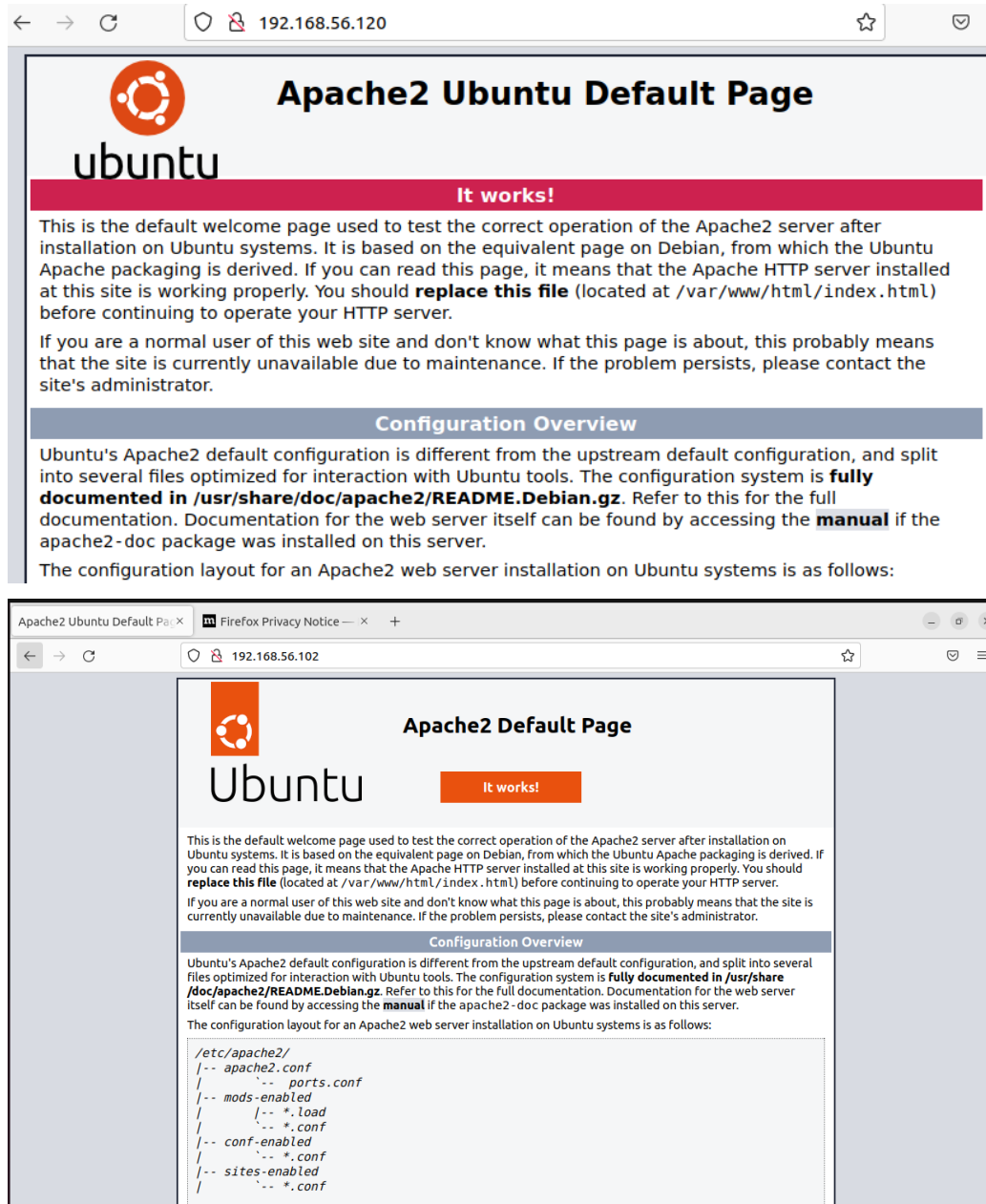
TASK [Gathering Facts] *********************************************************
ok: [192.168.56.102]
ok: [192.168.56.103]

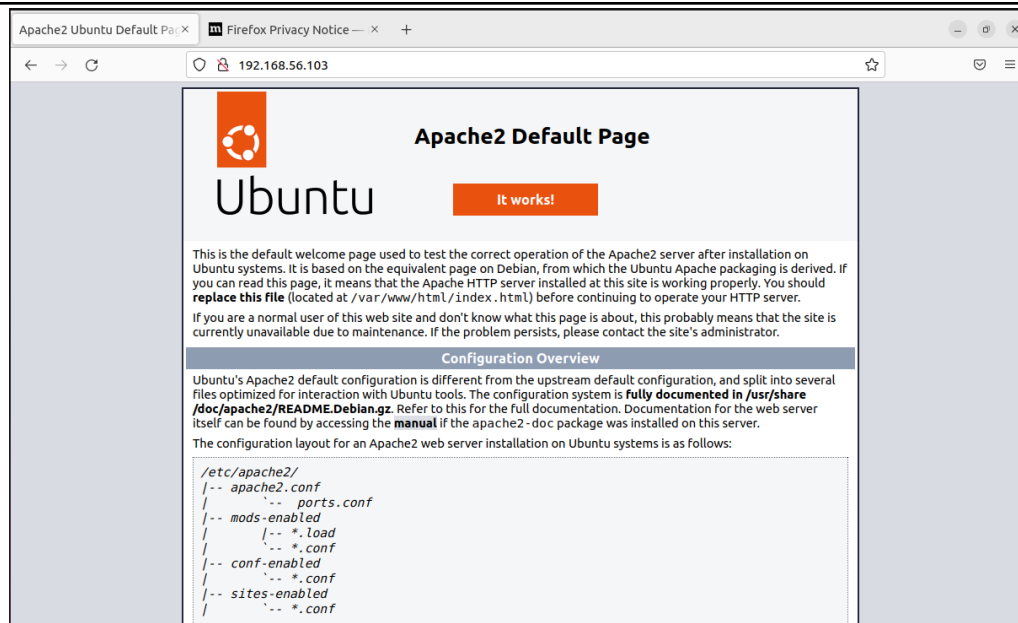
TASK [install apache2 package] ************************************************
changed: [192.168.56.102]
changed: [192.168.56.103]

PLAY RECAP *********************************************************************
192.168.56.102      : ok=2    changed=1    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0
192.168.56.103      : ok=2    changed=1    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0
```

- It provides real-time feedback on the terminal, indicating whether each task succeeded or failed. It also displays any output generated by the tasks, such as installation progress or configuration changes.

3. To verify that apache2 was installed automatically in the remote servers, go to the web browsers on each server and type its IP address. You should see something like this.





4. Try to edit the *install_apache.yml* and change the name of the package to any name that will not be recognized. What is the output?

```
workstation@workstation: ~/CPE232_Niemo
GNU nano 6.2                                install_apache.yml
---
- hosts: all
  become: true
  tasks:

  - name: install apache2 package
    apt:
      name: testing123

workstation@workstation: ~/CPE232_Niemo$ ansible-playbook --ask-become-pass install_apache.yml
BECOME password:

PLAY [all] **********************************************************************************

TASK [Gathering Facts] **********************************************************************************
ok: [192.168.56.103]
ok: [192.168.56.102]

TASK [install apache2 package] **********************************************************************************
fatal: [192.168.56.102]: FAILED! => ["changed": false, "msg": "No package matching 'testing123' is available"]
fatal: [192.168.56.103]: FAILED! => ["changed": false, "msg": "No package matching 'testing123' is available"]

PLAY RECAP **********************************************************************************
192.168.56.102      : ok=1    changed=0    unreachable=0    failed=1    skipped=0    rescued=0    ignored=0
192.168.56.103      : ok=1    changed=0    unreachable=0    failed=1    skipped=0    rescued=0    ignored=0
```

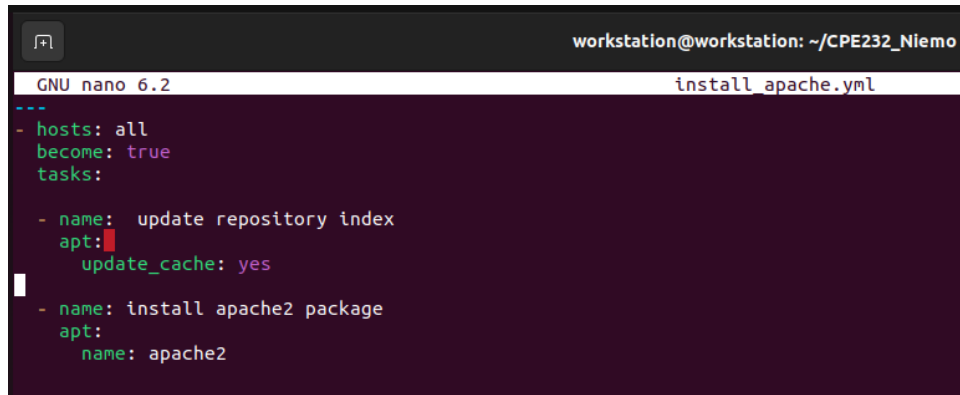
5. This time, we are going to put additional task to our playbook. Edit the *install_apache.yml*. As you can see, we are now adding an additional command, which is the *update_cache*. This command updates existing package-indexes on a supporting distro but not upgrading installed-packages (utilities) that were being installed.

```
---
- hosts: all
  become: true
  tasks:

    - name: update repository index
      apt:
        update_cache: yes

    - name: install apache2 package
      apt:
        name: apache2
```

Save the changes to this file and exit.

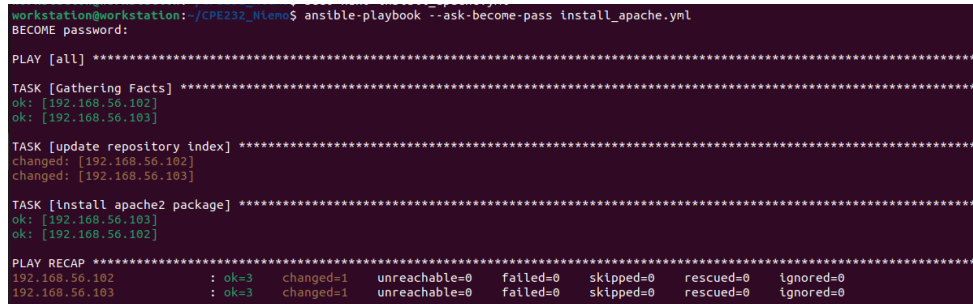


```
workstation@workstation: ~/CPE232_Niemo
GNU nano 6.2 install_apache.yml
---
- hosts: all
  become: true
  tasks:

    - name: update repository index
      apt:
        update_cache: yes

    - name: install apache2 package
      apt:
        name: apache2
```

6. Run the playbook and describe the output. Did the new command change anything on the remote servers?



```
workstation@workstation: ~/CPE232_Niemo$ ansible-playbook --ask-become-pass install_apache.yml
BECOME password:

PLAY [all] *****

TASK [Gathering Facts] *****
ok: [192.168.56.102]
ok: [192.168.56.103]

TASK [update repository index] *****
changed: [192.168.56.102]
changed: [192.168.56.103]

TASK [install apache2 package] *****
ok: [192.168.56.103]
ok: [192.168.56.102]

PLAY RECAP *****
192.168.56.102      : ok=3    changed=1    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0
192.168.56.103      : ok=3    changed=1    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0
```

- Yes. It updated the repository index of remote servers.

7. Edit again the *install_apache.yml*. This time, we are going to add a PHP support for the apache package we installed earlier.

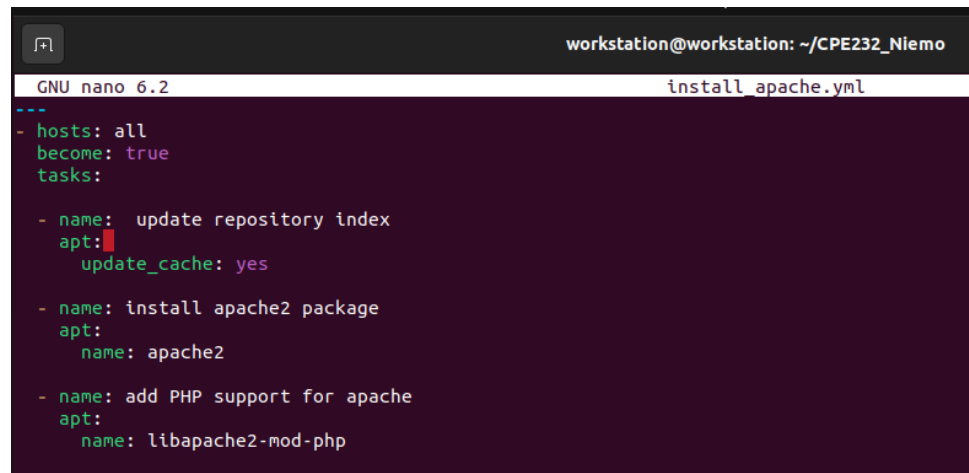
```
---
- hosts: all
  become: true
  tasks:

    - name: update repository index
      apt:
        update_cache: yes

    - name: install apache2 package
      apt:
        name: apache2

    - name: add PHP support for apache
      apt:
        name: libapache2-mod-php
```

Save the changes to this file and exit.



```
workstation@workstation: ~/CPE232_Niemo
GNU nano 6.2 install_apache.yml
---
- hosts: all
  become: true
  tasks:

    - name: update repository index
      apt:
        update_cache: yes

    - name: install apache2 package
      apt:
        name: apache2

    - name: add PHP support for apache
      apt:
        name: libapache2-mod-php
```


8. Run the playbook and describe the output. Did the new command change anything on the remote servers?

```
workstation@workstation:~/CPE232_Niemo$ ansible-playbook --ask-become-pass install_apache.yml
BECOME password:

PLAY [all] *********************************************************************

TASK [Gathering Facts] *********************************************************
ok: [192.168.56.103]
ok: [192.168.56.102]

TASK [update repository index] ************************************************
changed: [192.168.56.103]
changed: [192.168.56.102]

TASK [install apache2 package] ************************************************
ok: [192.168.56.102]
ok: [192.168.56.103]

TASK [add PHP support for apache] *********************************************
changed: [192.168.56.103]
changed: [192.168.56.102]

PLAY RECAP *********************************************************************
192.168.56.102      : ok=4    changed=2    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0
192.168.56.103      : ok=4    changed=2    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0
```

- Yes. It successfully installed the PHP support for both remote servers.
9. Finally, make sure that we are in sync with GitHub. Provide the link of your GitHub repository.

https://github.com/siiieyy/CPE232_Niemo

Reflections:

Answer the following:

1. What is the importance of using a playbook?
 - Ansible playbooks play a crucial role in IT automation, offering efficiency by automating repetitive tasks, ensuring consistency across systems, providing idempotency for safe automation, enabling reusability and modularity, allowing for version control and collaboration, serving as documentation for knowledge sharing, offering scalability, providing reporting and monitoring capabilities, supporting role-based access control (RBAC), accommodating multi-platform environments, and allowing customization, making them indispensable tools for modern IT operations and valuable skills for IT students and professionals
2. Summarize what we have done on this activity.
 - In this activity, we installed vim-nox and snapd using ansible inside the CPE232_lastname directory. We also created a playbook that installs php support for apache, apache2 and updates of repository index for remote servers.

Conclusion:

In conclusion, the objectives of using commands that make changes to remote machines and leveraging playbooks for automation in Ansible are integral components of effective IT management and automation practices. By utilizing commands to remotely execute tasks on target machines, administrators can efficiently implement changes and configurations across their infrastructure. Furthermore, the adoption of playbooks enhances this process by allowing for structured, repeatable, and scalable automation, ultimately streamlining operations, improving consistency, and enabling more efficient management of IT resources. Together, these objectives empower IT professionals to achieve greater control and effectiveness in managing complex environments and contribute to the success of modern IT operations.