

Names:

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Assignment: Programming assignment 3

Date: 4/14/2019

1. Screen capture of successful ' h1 ping h2 ' and ' h2 ping h1 ' commands at the mininet> prompt.

```
*** Add Router
*** Add Switch
*** Add hosts
*** Add links
*** Starting network
*** Configuring hosts
r1 h1 h2
*** Routing Table on Router:
Kernel IP routing table
Destination      Gateway          Genmask          Flags Metric Ref    Use Iface
172.16.0.0        *                255.240.0.0      U        0      0        0 r0-eth2
192.168.1.0       *                255.255.255.0    U        0      0        0 r0-eth1
*** Starting CLI:
mininet> h1 ping h2
PING 172.16.0.100 (172.16.0.100) 56(84) bytes of data.
64 bytes from 172.16.0.100: icmp_seq=1 ttl=63 time=0.036 ms
64 bytes from 172.16.0.100: icmp_seq=2 ttl=63 time=0.029 ms
64 bytes from 172.16.0.100: icmp_seq=3 ttl=63 time=0.033 ms
64 bytes from 172.16.0.100: icmp_seq=4 ttl=63 time=0.033 ms
64 bytes from 172.16.0.100: icmp_seq=5 ttl=63 time=0.029 ms
64 bytes from 172.16.0.100: icmp_seq=6 ttl=63 time=0.017 ms
z64 bytes from 172.16.0.100: icmp_seq=7 ttl=63 time=0.027 ms
```

```
mininet> h2 ping h1
PING 192.168.1.100 (192.168.1.100) 56(84) bytes of data.
64 bytes from 192.168.1.100: icmp_seq=1 ttl=63 time=0.018 ms
64 bytes from 192.168.1.100: icmp_seq=2 ttl=63 time=0.034 ms
64 bytes from 192.168.1.100: icmp_seq=3 ttl=63 time=0.032 ms
64 bytes from 192.168.1.100: icmp_seq=4 ttl=63 time=0.036 ms
64 bytes from 192.168.1.100: icmp_seq=5 ttl=63 time=0.061 ms
64 bytes from 192.168.1.100: icmp_seq=6 ttl=63 time=0.020 ms
64 bytes from 192.168.1.100: icmp_seq=7 ttl=63 time=0.034 ms
^C
--- 192.168.1.100 ping statistics ---
7 packets transmitted, 7 received, 0% packet loss, time 6000ms
rtt min/avg/max/mdev = 0.018/0.033/0.061/0.014 ms
```

2. Your modified legacy\_router.py program as a separate test file.
3. Output of ' git log ' command, showing changes you made to the program above.

```
commit 2c820c93a7a3d70d2a6c78487eec15d237fd9ccc
```

Author: Erick Shaffer <erickshaffer@Ericks-MacBook-Pro.local>

Date: Sun Apr 14 13:24:03 2019 -0700

added comments

```
commit 94f3bcc57eaf31f6dd59d0d45873dd77a5602ccc
```

Author: Erick Shaffer <erickshaffer@Ericks-MacBook-Pro.local>

Date: Sun Apr 14 13:22:47 2019 -0700

working h1 ping h2

commit 568de68bfd3dae7c630cd6c252c8333ffd383137

Author: ankitgulekar <agulekar@csumb.edu>

Date: Thu Apr 4 13:17:48 2019 -0700

WIP

commit c878a88796f1024ea038d5891306c9829b684d09

Author: ankitgulekar <agulekar@csumb.edu>

Date: Thu Apr 4 12:16:20 2019 -0700

working w/ linuxrouter

commit ea37c40a26f8a496c9b9318d7107a155539340a9

Author: ankitgulekar <agulekar@csumb.edu>

Date: Thu Apr 4 11:59:44 2019 -0700

WIP

commit ca6d1700cc116e3fd01f0a806177b3806cedaa3d

Author: Erick Shaffer <erickshaffer@Ericks-MacBook-Pro.local>

Date: Wed Apr 3 19:51:11 2019 -0700

removed duplicate files

commit 8725c0dbc7f81eb39e34ad2c500e60361720530c

Author: None <None>

Date: Wed Apr 3 19:50:10 2019 -0700

meaningful

commit 001d5eb536df471420905bfe670e6a1a591c3a5e

Author: None <None>

Date: Wed Apr 3 19:45:51 2019 -0700

PA3

commit de4b6a7d32c7f5fccdafb8d774e58938693948e7

Author: Erick Shaffer <erickshaffer@Ericks-MacBook-Pro.local>

Date: Tue Mar 26 19:10:32 2019 -0700

final revision

commit e9fad7c7ac65363342ffc8a480bade333b08ed1b

Author: ankitgulekar <agulekar@csumb.edu>

Date: Tue Mar 26 18:30:20 2019 -0700

Final changes

commit 83c275abb8e4b7d9f3a2471f8b1a973a0859c6ee

Author: Erick Shaffer <erickshaffer@Ericks-MacBook-Pro.local>

Date: Tue Mar 26 17:59:11 2019 -0700

working version

commit 9c7d22c54cdd9ca6c337824143166530014ab394

Merge: 4f57ecf 6c50ef4

Author: Ankit Gulekar <ankitgulekar@Ankits-MacBook-Pro.local>

Date: Tue Mar 26 17:43:13 2019 -0700

changes

commit 4f57ecf4ffaef83b36a849293477a676b125be13

Author: Ankit Gulekar <ankitgulekar@Ankits-MacBook-Pro.local>

Date: Tue Mar 26 17:31:58 2019 -0700

changes

commit 6c50ef4ca30083251ef499b226571214c80b9018

Author: Erick Shaffer <erickshaffer@Ericks-MacBook-Pro.local>

Date: Sun Mar 24 22:54:58 2019 -0700

working version

commit 9ddbbe894dbe2b7e251767ade249647c84070520

Author: Erick Shaffer <erickshaffer@Ericks-MacBook-Pro.local>

Date: Sun Mar 24 20:32:12 2019 -0700

fixed error

commit 9580d421b04ab1847f857d77e7a9fc853f0ee171

Merge: ffc7ed7 22fccd8

Author: Erick Shaffer <erickshaffer@Ericks-MacBook-Pro.local>

Date: Sun Mar 24 20:31:13 2019 -0700

Merge branch 'master' of <https://github.com/ankitgulekar/CST311>

commit ffc7ed7b81ee852b3c382ce02c841620038c7ec3

Author: Erick Shaffer <erickshaffer@Ericks-MacBook-Pro.local>

Date: Sun Mar 24 20:31:04 2019 -0700

fixed error

commit 22fccd8212ee1fad6ee3a4d6454c102cc0917836

Author: Ankit Gulekar <ankitgulekar@Ankits-MacBook-Pro.local>

Date: Sun Mar 24 20:15:08 2019 -0700

fix errors

commit 62e14f21227499f590047f848ec5db0a5240f0e1

Author: Erick Shaffer <erickshaffer@Ericks-MacBook-Pro.local>

Date: Sun Mar 24 20:01:15 2019 -0700

added threading

commit c83b3d786d1b46317ef3dbae6d8a5e5e150cf316

Author: Ankit Gulekar <ankitgulekar@Ankits-MacBook-Pro.local>

Date: Sun Mar 24 19:07:31 2019 -0700

changes

commit 36eec36e19af71d7ccd0dde5cfbd1a24a34553be

Author: Ankit Gulekar <ankitgulekar@Ankits-MacBook-Pro.local>

Date: Sun Mar 24 18:47:35 2019 -0700

more changes

commit 8b22d193c8a96c2c74cbf5201c610ac5ac8905a1

Author: Ankit Gulekar <ankitgulekar@Ankits-MacBook-Pro.local>

Date: Sun Mar 24 18:43:12 2019 -0700

more changes

commit 7afbe3d25b8411a316aae4bc41ea2b4071fdb741

Author: Ankit Gulekar <ankitgulekar@Ankits-MacBook-Pro.local>

Date: Sun Mar 24 18:33:30 2019 -0700

fixed the errors

commit 6c8c3870ef5c8546f23292bb3e1189db8225b7b9

Author: Erick Shaffer <erickshaffer@Ericks-MacBook-Pro.local>

Date: Sun Mar 24 18:07:17 2019 -0700

readded files

commit ba9d211da74bbe6b5c610715c221482eded68ad9

Author: Erick Shaffer <erickshaffer@Ericks-MacBook-Pro.local>

Date: Sun Mar 24 17:51:35 2019 -0700

switched to tcp

commit af215cb30a23a1af4d641ee9aafdde3841bb6565



Author: ankitgulekar <42821708+ankitgulekar@users.noreply.github.com>

Date: Sun Mar 24 17:37:00 2019 -0700

Update server.py

commit 11355b41eab67597606fe0f55f4eff30d36eecd5

Author: ankitgulekar <42821708+ankitgulekar@users.noreply.github.com>

Date: Sun Mar 24 17:34:52 2019 -0700

Update ClientY.py

commit 7286fc9117be170713cfa6ab20c8b4d59eeb6436

Author: ankitgulekar <42821708+ankitgulekar@users.noreply.github.com>

Date: Sun Mar 24 17:32:57 2019 -0700

Update ClientX.py

commit cb0d84e3477cd21087b4427881d66a732156d088

Author: ankitgulekar <42821708+ankitgulekar@users.noreply.github.com>

Date: Sun Mar 24 17:24:06 2019 -0700

Update and rename c.py to server.py

commit b723bfdcfe9f9b09bd603941d502beb5493c9d

Author: ankitgulekar <42821708+ankitgulekar@users.noreply.github.com>

Date: Sun Mar 24 17:17:05 2019 -0700

Update and rename serverY.py to ClientY.py

commit 6b38b365d44b95dbcf29c35f29b2d1b6191a8a08

Author: ankitgulekar <42821708+ankitgulekar@users.noreply.github.com>

Date: Sun Mar 24 17:16:24 2019 -0700

Rename serverX.py to ClientX.py

commit 2bda03eaad34bf28db4bf0f4f69b0e067d0093e7

Author: ankitgulekar <42821708+ankitgulekar@users.noreply.github.com>

Date: Sun Mar 24 17:15:59 2019 -0700

Update serverX.py

commit cadf6330f042e55ec4870797cb978c1db0c21d53

Author: ankitgulekar <42821708+ankitgulekar@users.noreply.github.com>

Date: Sun Mar 24 17:12:29 2019 -0700

Update serverY.py

commit a36ea8a7c3d013b473cead69cb4c0e13b5c16427

Author: ankitgulekar <42821708+ankitgulekar@users.noreply.github.com>

Date: Sun Mar 24 17:11:58 2019 -0700

Update serverX.py

commit a84ee2a65f67076217acf8dc18469187f12f51a6

Author: ankitgulekar <42821708+ankitgulekar@users.noreply.github.com>

Date: Sun Mar 24 17:05:17 2019 -0700

Add files via upload

commit a6877ba1671e3bf5b5f61e254697ac3b66f71ae4

Author: ankitgulekar <42821708+ankitgulekar@users.noreply.github.com>

Date: Sun Mar 24 16:00:35 2019 -0700

Add files via upload

4. Why didn't the original program forward packets between the hosts?
  - a. First problem was the router did not have a valid ip address. The second problem was h2 and h1 had the same subnet. The third problem was that the default route wasn't set. The final problem was the interface names were not set.
5. Is the line ' r1.cmd('sysctl -w net.ipv4.ip\_forward=1') ' required?

- a. Yes, this is how we enable the packet to be forwarded via IPv4.
6. Intentionally break your working program, e.g.: change a subnet length, IP address, or default route for a host. Explain why your change caused the network to break.
- a. Here, we changed both the hosts to have the same default route. The default route should be dependent on the ip address of the host. This is because they have to be in the same network.

```
info('*** Add hosts\n')
# The default route is the route that will connect the host to the route
h1 = net.addHost('h1', cls=Host, ip='192.168.1.100/24', defaultRoute='via 192.168.1.1')
h2 = net.addHost('h2', cls=Host, ip='172.16.0.100/12', defaultRoute='via 192.168.1.1')
```