

Mohamad Khalifa

a. Why didn't the original program forward packets between the hosts?  
Because the two host did not have a any gateway to link to the router

b. Is the line ' r1.cmd('sysctl -w net.ipv4.ip\_forward=1') ' required?

yes , this line is required because it allows the router to forward packets

c. 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.

This breaks the program because it cant handle 32 bits.

```
Mohamad@DESKTOP-GSCCV35 MINGW64 ~/desktop/CST311 (master)
$ git log
commit 9a6bac92ae5a054956d9ee85d8fd948a322594
Author: dopemo <mkhalifa@csumb.edu>
Date: Wed Apr 4 19:13:24 2018 -0700

    last commit

commit 55b68d6cbce6ecf8f0f2c216b75b254caf082c16
Author: dopemo <mkhalifa@csumb.edu>
Date: Sun Apr 1 14:09:59 2018 -0700

    edited version

commit f07ef376c7d349a2f135623b0d244d6c7af2a5db
Author: dopemo <mkhalifa@csumb.edu>
Date: Sun Apr 1 14:08:53 2018 -0700

    first version

commit aaec59f9bfbb434d64f1c3a0a549f76638dd30b7
Author: dopemo <mkhalifa@csumb.edu>
Date: Sun Apr 1 14:07:26 2018 -0700

    initial commit
...skipping...
commit 9a6bac92ae5a054956d9ee85d8fd948a322594
Author: dopemo <mkhalifa@csumb.edu>
Date: Wed Apr 4 19:13:24 2018 -0700

    last commit

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Date: Sun Apr 1 14:07:26 2018 -0700

    initial commit
~
~
```

```
Last login: Wed Apr  4 19:21:41 PDT 2018 on tty1
Welcome to Ubuntu 14.04.4 LTS (GNU/Linux 4.2.0-27-generic i686)
```

```
* Documentation:  https://help.ubuntu.com/
New release '16.04.4 LTS' available.
Run 'do-release-upgrade' to upgrade to it.
```

```
mininet@mininet-vm:~$ sudo python legacy_router.py
*** adding controllers\n*** add switches
*** Add hosts
*** Add links
*** Starting network
```

```
mininet> h2 ping h1
PING 10.0.1.100 (10.0.1.100) 56(84) bytes of data.
64 bytes from 10.0.1.100: icmp_seq=1 ttl=63 time=0.045 ms
64 bytes from 10.0.1.100: icmp_seq=2 ttl=63 time=0.043 ms
64 bytes from 10.0.1.100: icmp_seq=3 ttl=63 time=0.056 ms
64 bytes from 10.0.1.100: icmp_seq=4 ttl=63 time=0.037 ms
64 bytes from 10.0.1.100: icmp_seq=5 ttl=63 time=0.042 ms
64 bytes from 10.0.1.100: icmp_seq=6 ttl=63 time=0.096 ms
64 bytes from 10.0.1.100: icmp_seq=7 ttl=63 time=0.041 ms
64 bytes from 10.0.1.100: icmp_seq=8 ttl=63 time=0.042 ms
^C
--- 10.0.1.100 ping statistics ---
8 packets transmitted, 8 received, 0% packet loss, time 7001ms
rtt min/avg/max/mdev = 0.037/0.050/0.096/0.018 ms
```