

腳本建立 Mininet

```
# mkdir mininet
# gedit l.py
```

```
#!/usr/bin/python
```

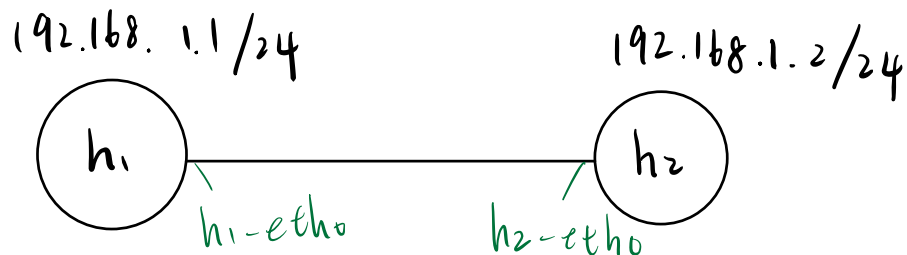
```
from mininet.cli import CLI
from mininet.net import Mininet
from mininet.link import Link, TCLink, Intf
```

```
if '__main__' == __name__:
    net = Mininet(link=TCLink)
    h1 = net.addHost('h1')
    h2 = net.addHost('h2')
    Link(h1, h2)
    net.build()
    CLI(net)
    net.stop()
```

Link \Rightarrow 電腦多快, 傳輸就多快
TCLink \Rightarrow 設定頻寬

which python
路徑

```
# chmod +x l.py
# ./l.py
> net 網路拓撲
```



```
> xterm h1 h2
```

```
h1
# ifconfig
# ping 10.0.0.2 -c 3
```

```
h2
# ifconfig
```

1. 改ip

h1 清除ip

```
# ifconfig h1-etho 0
```

設定 new ip

```
# ip addr add 192.168.1.1/24 brd + dev h1-etho
```

h2

```
# ifconfig h2-etho 0
```

```
# ip addr add 192.168.1.2/24 brd + dev h2-etho
```

```
# ping 192.168.1.1
```

2. 腳本設定ip

```
# gedit 2.py
```

```
net.build()
```

```
h1.cmd ("ifconfig h1-etho 0")
```

```
h1.cmd ("ip addr add 192.168.1.1/24 brd + dev h1-etho")
```

```
h2.cmd ("ifconfig h2-etho 0")
```

```
h2.cmd ("ip addr add 192.168.1.2/24 brd + dev h2-etho")
```

```
# ./2.py
```

```
> xterm h1 h2
```

h1

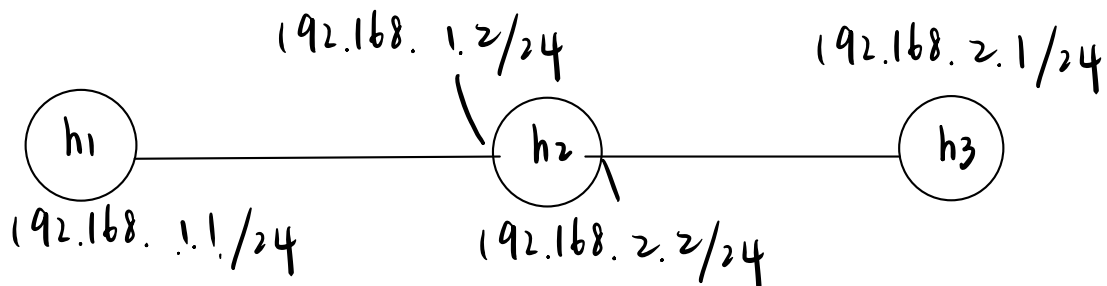
```
# ifconfig
```

```
# ping 192.168.1. -c 3
```

h2

```
# ifconfig
```

ping 192.168.2.1



```
# gedit 3.py
```

```
h3 = net.addHost('h3')
```

```
Link(h2, h3)
```

```
h2.cmd("ifconfig h2-eth1 0")  
h2.cmd("ip addr add 192.168.2.2/24 brd + dev h2-eth1")  
h3.cmd("ifconfig h3-eth1 0")  
h3.cmd("ip addr add 192.168.2.1/24 brd + dev h3-eth1")  
h1.cmd("ip route add default via 192.168.1.2 dev h1-eth0")  
h3.cmd("ip route add default via 192.168.2.2 dev h3-eth0")  
h2.cmd("echo 1 > /proc/sys/net/ipv4/ip_forward")
```

```
# ./3.py
```

```
> net
```

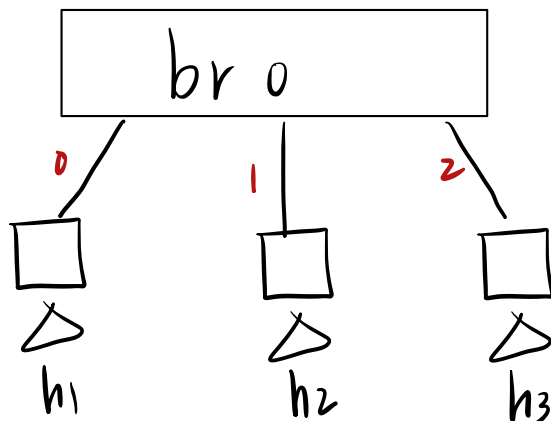
```
> xterm h1 h2 h3
```

```
h1
```

```
# ifconfig
```

```
# ping 192.168.1.2 -c 3  
192.168.2.1  
192.168.2.2
```

✓



gedit 4.py :

```
bro = net.addHost('bro')
Link(h1, bro)
Link(h2, bro)
Link(h3, bro)
:
```

. /4.py

> xterm bro h1 h2 h3

```
bro
# brctl addbr mybr
# brctl addif mybr bro-eth0
# brctl addif mybr bro-eth1
# brctl addif mybr bro-eth2
# brctl show
# ifconfig
10.0.0.4
```

```
h1
# ifconfig
10.0.0.1
# ping 10.0.0.2
10.0.0.3
X
```

```
h2
# ifconfig
10.0.0.2
```

```
bro
# ifconfig -a
ping 不到因為 mybr down
# ifconfig mybr up
```

```
host h1
# ping 10.0.0.2
10.0.0.3
✓
```

寫入腳本

gedit 4.py

```
bro.cmd("brctl addbr mybr")
bro.cmd("brctl addif mybr bro-eth0")
bro.cmd("brctl addif mybr bro-eth1")
bro.cmd("brctl addif mybr bro-eth2")
bro.cmd("ifconfig mybr up")
:
```

./4.py

> h1 ping h2

> h1 ping h3

"brctl setageing mybr 0" 模擬 Hub

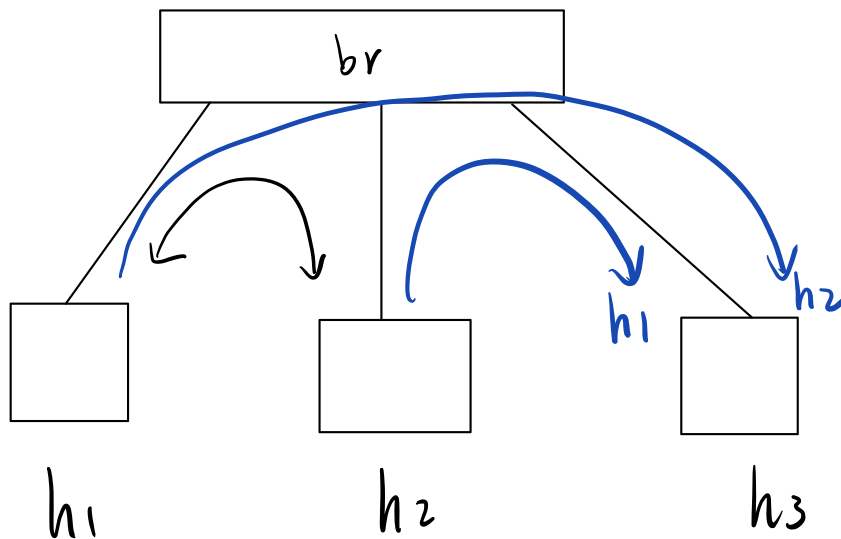
靜態 arp

欺騙 br

h3 ⇒ hacker

h1, h2 通訊, h3 聽不到, h3 欺騙 h1 自己是 h2

欺騙 h2 自己是 h1



./4.py

> xterm h1 h1 h3 h3

h1
ping 10.0.0.2

```
h3  
# ifconfig  
# wireshark &  
# tcpdump -i h3-eth0 -nn
```

```
h1  
# arp -n
```

```
h3  
# arpspoof -i h3-eth0 -t 10.0.0.1 10.0.0.2
```

```
h2  
# arp -n xn
```

```
h3  
# arpspoof -i h3-eth0 -t 10.0.0.2 10.0.0.1
```