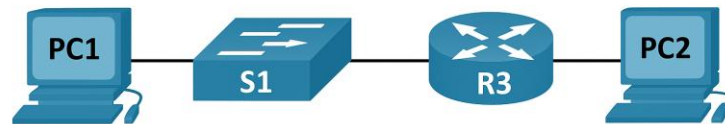


Labo 10.4.4

Travaux pratiques - Création d'un réseau avec un routeur et un commutateur



Ping PC1 -> PC2

```
root@PC-1-D:~# ping 192.168.0.3
PING 192.168.0.3 (192.168.0.3) 56(84) bytes of data:
64 bytes from 192.168.0.3: icmp_seq=1 ttl=63 time=5.54 ms
64 bytes from 192.168.0.3: icmp_seq=2 ttl=63 time=1.14 ms
64 bytes from 192.168.0.3: icmp_seq=3 ttl=63 time=1.24 ms
64 bytes from 192.168.0.3: icmp_seq=4 ttl=63 time=0.932 ms
64 bytes from 192.168.0.3: icmp_seq=5 ttl=63 time=1.20 ms
64 bytes from 192.168.0.3: icmp_seq=6 ttl=63 time=0.994 ms
64 bytes from 192.168.0.3: icmp_seq=7 ttl=63 time=1.14 ms
64 bytes from 192.168.0.3: icmp_seq=8 ttl=63 time=0.969 ms
64 bytes from 192.168.0.3: icmp_seq=9 ttl=63 time=1.07 ms
64 bytes from 192.168.0.3: icmp_seq=10 ttl=63 time=1.25 ms
64 bytes from 192.168.0.3: icmp_seq=11 ttl=63 time=1.29 ms
64 bytes from 192.168.0.3: icmp_seq=12 ttl=63 time=1.33 ms
64 bytes from 192.168.0.3: icmp_seq=13 ttl=63 time=1.18 ms
64 bytes from 192.168.0.3: icmp_seq=14 ttl=63 time=1.13 ms
64 bytes from 192.168.0.3: icmp_seq=15 ttl=63 time=1.15 ms
64 bytes from 192.168.0.3: icmp_seq=16 ttl=63 time=1.25 ms
64 bytes from 192.168.0.3: icmp_seq=17 ttl=63 time=1.30 ms
64 bytes from 192.168.0.3: icmp_seq=18 ttl=63 time=1.22 ms
64 bytes from 192.168.0.3: icmp_seq=19 ttl=63 time=1.43 ms
64 bytes from 192.168.0.3: icmp_seq=20 ttl=63 time=1.10 ms
64 bytes from 192.168.0.3: icmp_seq=21 ttl=63 time=1.30 ms
64 bytes from 192.168.0.3: icmp_seq=22 ttl=63 time=1.27 ms
64 bytes from 192.168.0.3: icmp_seq=23 ttl=63 time=1.15 ms
64 bytes from 192.168.0.3: icmp_seq=24 ttl=63 time=1.38 ms
```

Ping PC1 -> S1

```
root@PC-1-D:~# ping 192.168.1.2
PING 192.168.1.2 (192.168.1.2) 56(84) bytes of data.
64 bytes from 192.168.1.2: icmp_seq=2 ttl=255 time=2.91 ms
64 bytes from 192.168.1.2: icmp_seq=3 ttl=255 time=2.98 ms
64 bytes from 192.168.1.2: icmp_seq=4 ttl=255 time=1.41 ms
64 bytes from 192.168.1.2: icmp_seq=5 ttl=255 time=1.11 ms
64 bytes from 192.168.1.2: icmp_seq=6 ttl=255 time=1.23 ms
64 bytes from 192.168.1.2: icmp_seq=7 ttl=255 time=1.18 ms
64 bytes from 192.168.1.2: icmp_seq=8 ttl=255 time=1.60 ms
64 bytes from 192.168.1.2: icmp_seq=9 ttl=255 time=2.86 ms
64 bytes from 192.168.1.2: icmp_seq=10 ttl=255 time=2.37 ms
64 bytes from 192.168.1.2: icmp_seq=11 ttl=255 time=4.30 ms
64 bytes from 192.168.1.2: icmp_seq=12 ttl=255 time=2.03 ms
64 bytes from 192.168.1.2: icmp_seq=13 ttl=255 time=1.25 ms
64 bytes from 192.168.1.2: icmp_seq=14 ttl=255 time=2.12 ms
64 bytes from 192.168.1.2: icmp_seq=15 ttl=255 time=2.36 ms
64 bytes from 192.168.1.2: icmp_seq=16 ttl=255 time=2.56 ms
64 bytes from 192.168.1.2: icmp_seq=17 ttl=255 time=1.16 ms
64 bytes from 192.168.1.2: icmp_seq=18 ttl=255 time=1.34 ms
64 bytes from 192.168.1.2: icmp_seq=19 ttl=255 time=1.04 ms
64 bytes from 192.168.1.2: icmp_seq=20 ttl=255 time=1.50 ms
64 bytes from 192.168.1.2: icmp_seq=21 ttl=255 time=1.90 ms
64 bytes from 192.168.1.2: icmp_seq=22 ttl=255 time=2.37 ms
64 bytes from 192.168.1.2: icmp_seq=23 ttl=255 time=4.43 ms
64 bytes from 192.168.1.2: icmp_seq=24 ttl=255 time=2.23 ms
64 bytes from 192.168.1.2: icmp_seq=25 ttl=255 time=2.02 ms
64 bytes from 192.168.1.2: icmp_seq=26 ttl=255 time=2.26 ms
64 bytes from 192.168.1.2: icmp_seq=27 ttl=255 time=2.43 ms
64 bytes from 192.168.1.2: icmp_seq=28 ttl=255 time=2.37 ms
64 bytes from 192.168.1.2: icmp_seq=29 ttl=255 time=2.72 ms
64 bytes from 192.168.1.2: icmp_seq=30 ttl=255 time=2.12 ms
64 bytes from 192.168.1.2: icmp_seq=31 ttl=255 time=5.31 ms
64 bytes from 192.168.1.2: icmp_seq=32 ttl=255 time=2.47 ms
^C
--- 192.168.1.2 ping statistics ---
32 packets transmitted, 31 received, 3% packet loss, time 31064ms
rtt min/avg/max/mdev = 1.048/2.260/5.313/0.985 ms
```

Ping PC1 -> R3

```
root@PC-1-D:~# ping 192.168.0.1
PING 192.168.0.1 (192.168.0.1) 56(84) bytes of data.
64 bytes from 192.168.0.1: icmp_seq=1 ttl=255 time=1.12 ms
64 bytes from 192.168.0.1: icmp_seq=2 ttl=255 time=1.38 ms
64 bytes from 192.168.0.1: icmp_seq=3 ttl=255 time=1.17 ms
64 bytes from 192.168.0.1: icmp_seq=4 ttl=255 time=1.58 ms
64 bytes from 192.168.0.1: icmp_seq=5 ttl=255 time=1.43 ms
64 bytes from 192.168.0.1: icmp_seq=6 ttl=255 time=1.29 ms
64 bytes from 192.168.0.1: icmp_seq=7 ttl=255 time=1.30 ms
64 bytes from 192.168.0.1: icmp_seq=8 ttl=255 time=1.21 ms
64 bytes from 192.168.0.1: icmp_seq=9 ttl=255 time=1.39 ms
64 bytes from 192.168.0.1: icmp_seq=10 ttl=255 time=1.19 ms
64 bytes from 192.168.0.1: icmp_seq=11 ttl=255 time=1.28 ms
64 bytes from 192.168.0.1: icmp_seq=12 ttl=255 time=1.22 ms
64 bytes from 192.168.0.1: icmp_seq=13 ttl=255 time=1.27 ms
64 bytes from 192.168.0.1: icmp_seq=14 ttl=255 time=1.56 ms
64 bytes from 192.168.0.1: icmp_seq=15 ttl=255 time=1.33 ms
64 bytes from 192.168.0.1: icmp_seq=16 ttl=255 time=1.32 ms
64 bytes from 192.168.0.1: icmp_seq=17 ttl=255 time=1.24 ms
64 bytes from 192.168.0.1: icmp_seq=18 ttl=255 time=1.26 ms
64 bytes from 192.168.0.1: icmp_seq=19 ttl=255 time=1.36 ms
64 bytes from 192.168.0.1: icmp_seq=20 ttl=255 time=1.45 ms
64 bytes from 192.168.0.1: icmp_seq=21 ttl=255 time=1.34 ms
64 bytes from 192.168.0.1: icmp_seq=22 ttl=255 time=1.42 ms
64 bytes from 192.168.0.1: icmp_seq=23 ttl=255 time=1.46 ms
64 bytes from 192.168.0.1: icmp_seq=24 ttl=255 time=1.47 ms
64 bytes from 192.168.0.1: icmp_seq=25 ttl=255 time=1.45 ms
64 bytes from 192.168.0.1: icmp_seq=26 ttl=255 time=1.33 ms
^C
--- 192.168.0.1 ping statistics ---
26 packets transmitted, 26 received, 0% packet loss, time 25035ms
rtt min/avg/max/mdev = 1.126/1.344/1.587/0.119 ms
root@PC-1-D:~# |
```

Ping PC2 -> PC1

```
root@PC-2-D:~# ping 192.168.1.3
PING 192.168.1.3 (192.168.1.3) 56(84) bytes of data.
64 bytes from 192.168.1.3: icmp_seq=1 ttl=63 time=1.31 ms
64 bytes from 192.168.1.3: icmp_seq=2 ttl=63 time=1.71 ms
64 bytes from 192.168.1.3: icmp_seq=3 ttl=63 time=1.53 ms
64 bytes from 192.168.1.3: icmp_seq=4 ttl=63 time=1.52 ms
64 bytes from 192.168.1.3: icmp_seq=5 ttl=63 time=1.24 ms
64 bytes from 192.168.1.3: icmp_seq=6 ttl=63 time=1.15 ms
64 bytes from 192.168.1.3: icmp_seq=7 ttl=63 time=1.36 ms
64 bytes from 192.168.1.3: icmp_seq=8 ttl=63 time=1.03 ms
64 bytes from 192.168.1.3: icmp_seq=9 ttl=63 time=1.15 ms
64 bytes from 192.168.1.3: icmp_seq=10 ttl=63 time=1.62 ms
64 bytes from 192.168.1.3: icmp_seq=11 ttl=63 time=1.42 ms
^C
--- 192.168.1.3 ping statistics ---
11 packets transmitted, 11 received, 0% packet loss, time 10015ms
rtt min/avg/max/mdev = 1.030/1.373/1.716/0.206 ms
root@PC-2-D:~# |
```

Ping PC2 -> S1

```
root@PC-2-D:~# ping 192.168.1.1
PING 192.168.1.1 (192.168.1.1) 56(84) bytes of data.
64 bytes from 192.168.1.1: icmp_seq=1 ttl=255 time=1.15 ms
64 bytes from 192.168.1.1: icmp_seq=2 ttl=255 time=1.30 ms
64 bytes from 192.168.1.1: icmp_seq=3 ttl=255 time=1.33 ms
64 bytes from 192.168.1.1: icmp_seq=4 ttl=255 time=1.34 ms
64 bytes from 192.168.1.1: icmp_seq=5 ttl=255 time=1.43 ms
64 bytes from 192.168.1.1: icmp_seq=6 ttl=255 time=1.53 ms
64 bytes from 192.168.1.1: icmp_seq=7 ttl=255 time=1.41 ms
^C
--- 192.168.1.1 ping statistics ---
7 packets transmitted, 7 received, 0% packet loss, time 6009ms
rtt min/avg/max/mdev = 1.157/1.360/1.530/0.111 ms
root@PC-2-D:~# |
```

Ping PC2 -> S1

```
root@PC-2-D:~# ping 192.168.1.2
PING 192.168.1.2 (192.168.1.2) 56(84) bytes of data.
64 bytes from 192.168.1.2: icmp_seq=2 ttl=254 time=1.85 ms
64 bytes from 192.168.1.2: icmp_seq=3 ttl=254 time=1.40 ms
64 bytes from 192.168.1.2: icmp_seq=4 ttl=254 time=3.18 ms
64 bytes from 192.168.1.2: icmp_seq=5 ttl=254 time=6.33 ms
64 bytes from 192.168.1.2: icmp_seq=6 ttl=254 time=2.81 ms
64 bytes from 192.168.1.2: icmp_seq=7 ttl=254 time=2.61 ms
64 bytes from 192.168.1.2: icmp_seq=8 ttl=254 time=1.95 ms
64 bytes from 192.168.1.2: icmp_seq=9 ttl=254 time=2.16 ms
64 bytes from 192.168.1.2: icmp_seq=10 ttl=254 time=2.05 ms
64 bytes from 192.168.1.2: icmp_seq=11 ttl=254 time=2.20 ms
^C
--- 192.168.1.2 ping statistics ---
11 packets transmitted, 10 received, 9% packet loss, time 10039ms
rtt min/avg/max/mdev = 1.407/2.659/6.330/1.316 ms
root@PC-2-D:~# |
```

Ping PC2 -> R3

```
root@PC-2-D:~# ping 192.168.0.1
PING 192.168.0.1 (192.168.0.1) 56(84) bytes of data.
64 bytes from 192.168.0.1: icmp_seq=1 ttl=255 time=1.65 ms
64 bytes from 192.168.0.1: icmp_seq=2 ttl=255 time=1.24 ms
64 bytes from 192.168.0.1: icmp_seq=3 ttl=255 time=1.26 ms
64 bytes from 192.168.0.1: icmp_seq=4 ttl=255 time=1.36 ms
64 bytes from 192.168.0.1: icmp_seq=5 ttl=255 time=0.997 ms
64 bytes from 192.168.0.1: icmp_seq=6 ttl=255 time=1.16 ms
64 bytes from 192.168.0.1: icmp_seq=7 ttl=255 time=1.23 ms
64 bytes from 192.168.0.1: icmp_seq=8 ttl=255 time=1.06 ms
64 bytes from 192.168.0.1: icmp_seq=9 ttl=255 time=1.28 ms
64 bytes from 192.168.0.1: icmp_seq=10 ttl=255 time=1.24 ms
64 bytes from 192.168.0.1: icmp_seq=11 ttl=255 time=1.42 ms
64 bytes from 192.168.0.1: icmp_seq=12 ttl=255 time=1.32 ms
64 bytes from 192.168.0.1: icmp_seq=13 ttl=255 time=1.09 ms
^C
--- 192.168.0.1 ping statistics ---
13 packets transmitted, 13 received, 0% packet loss, time 12016ms
rtt min/avg/max/mdev = 0.997/1.258/1.657/0.164 ms
root@PC-2-D:~#
```

Ping R3 -> S1

Ping R3 -> PC1

Ping R3 -> PC2

```

R3#ping 192.168.1.2

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.1.2, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/2/4 ms
R3#ping 192.168.1.3

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.1.3, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/4 ms
R3#ping 192.168.0.3

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.0.3, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/4 ms
R3#
```

Ping S1 -> PC1

Ping S1 -> PC2

```
S1#ping 192.168.1.3

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.1.3, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/9/34 ms
S1#ping 192.168.0.3

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.0.3, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/4/9 ms
S1#
```

Pour R3 : show ip interface brief

Pour R3 : show ipv6 interface brief

```
R3#show ip interface brief
Interface                IP-Address      OK? Method Status      Protocol
FastEthernet0/0          192.168.0.1     YES manual up           up
FastEthernet0/1          192.168.1.1     YES manual up           up
Serial0/0/0              unassigned      YES unset   administratively down down
Serial0/0/1              unassigned      YES unset   administratively down down
R3#show ipv6 interface brief
FastEthernet0/0          [up/up]
FE80::1
2001:DB8:ACAD::1
FastEthernet0/1          [up/up]
FE80::1
2001:DB8:ACAD:1::1
Serial0/0/0              [administratively down/down]
unassigned
Serial0/0/1              [administratively down/down]
unassigned
R3#
```

Pour R3 : show ip route

Pour R3 : show ipv6 route

```
R3#show ip route
Codes: C - connected, S - static, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2
       i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2
       ia - IS-IS inter area, * - candidate default, U - per-user static route
       o - ODR, P - periodic downloaded static route

Gateway of last resort is not set

C 192.168.0.0/24 is directly connected, FastEthernet0/0
C 192.168.1.0/24 is directly connected, FastEthernet0/1
R3#show ipv6 route
IPv6 Routing Table - Default - 5 entries
Codes: C - Connected, L - Local, S - Static, U - Per-user Static route
       B - BGP, HA - Home Agent, MR - Mobile Router, R - RIP
       I1 - ISIS L1, I2 - ISIS L2, IA - ISIS interarea, IS - ISIS summary
       D - EIGRP, EX - EIGRP external
       O - OSPF Intra, OI - OSPF Inter, OE1 - OSPF ext 1, OE2 - OSPF ext 2
       ON1 - OSPF NSSA ext 1, ON2 - OSPF NSSA ext 2
C 2001:DB8:ACAD::/64 [0/0]
   via FastEthernet0/0, directly connected
L 2001:DB8:ACAD::1/128 [0/0]
   via FastEthernet0/0, receive
C 2001:DB8:ACAD:1::/64 [0/0]
   via FastEthernet0/1, directly connected
L 2001:DB8:ACAD:1::1/128 [0/0]
   via FastEthernet0/1, receive
L FF00::/8 [0/0]
   via Null0, receive
R3#
```

Pour R3 : show ip interface f0/1

```
R3#show ip interface f0/1
FastEthernet0/1 is up, line protocol is up
  Internet address is 192.168.1.1/24
  Broadcast address is 255.255.255.255
  Address determined by setup command
  MTU is 1500 bytes
  Helper address is not set
  Directed broadcast forwarding is disabled
  Outgoing access list is not set
  Inbound access list is not set
  Proxy ARP is enabled
  Local Proxy ARP is disabled
  Security level is default
  Split horizon is enabled
  ICMP redirects are always sent
  ICMP unreachable are always sent
  ICMP mask replies are never sent
  IP fast switching is enabled
  IP fast switching on the same interface is disabled
  IP Flow switching is disabled
  IP CEF switching is enabled
  IP CEF switching turbo vector
  IP multicast fast switching is enabled
  IP multicast distributed fast switching is disabled
```

Pour R3 : show ipv6 interface f0/1

```
R3#show ipv6 interface f0/1
FastEthernet0/1 is up, line protocol is up
IPv6 is enabled, link-local address is FE80::1
No Virtual link-local address(es):
Global unicast address(es):
  2001:DB8:ACAD:1::1, subnet is 2001:DB8:ACAD:1::/64
Joined group address(es):
  FF02::1
  FF02::2
  FF02::1:FF00:1
MTU is 1500 bytes
ICMP error messages limited to one every 100 milliseconds
ICMP redirects are enabled
ICMP unreachable are sent
ND DAD is enabled, number of DAD attempts: 1
ND reachable time is 30000 milliseconds (using 40537)
ND advertised reachable time is 0 (unspecified)
ND advertised retransmit interval is 0 (unspecified)
ND router advertisements are sent every 200 seconds
ND router advertisements live for 1800 seconds
ND advertised default router preference is Medium
Hosts use stateless autoconfig for addresses.
```

Pour R3 : show ipv6 interface f0/0

```
R3#show ipv6 interface f0/0
FastEthernet0/0 is up, line protocol is up
IPv6 is enabled, link-local address is FE80::1
No Virtual link-local address(es):
Global unicast address(es):
  2001:DB8:ACAD::1, subnet is 2001:DB8:ACAD::/64
Joined group address(es):
  FF02::1
  FF02::2
  FF02::1:FF00:1
MTU is 1500 bytes
ICMP error messages limited to one every 100 milliseconds
ICMP redirects are enabled
ICMP unreachable are sent
ND DAD is enabled, number of DAD attempts: 1
ND reachable time is 30000 milliseconds (using 32229)
ND advertised reachable time is 0 (unspecified)
ND advertised retransmit interval is 0 (unspecified)
ND router advertisements are sent every 200 seconds
ND router advertisements live for 1800 seconds
ND advertised default router preference is Medium
Hosts use stateless autoconfig for addresses.
```

Pour R3 : show ip interface br

```
R3#show ip interface br
Interface      IP-Address      OK? Method Status        Protocol
FastEthernet0/0 192.168.0.1     YES manual up            up
FastEthernet0/1 192.168.1.1     YES manual up            up
Serial0/0/0     unassigned      YES unset administratively down down
Serial0/0/1     unassigned      YES unset administratively down down
R3#
```

Pour S1 : show ip interface brief

```
S1#show ip interface brief
Interface                IP-Address      OK? Method Status  Protocol
Vlan1                    192.168.1.2     YES manual  up      up
FastEthernet0/1          unassigned      YES unset  down    down
FastEthernet0/2          unassigned      YES unset  down    down
FastEthernet0/3          unassigned      YES unset  down    down
FastEthernet0/4          unassigned      YES unset  down    down
FastEthernet0/5          unassigned      YES unset  up       up
FastEthernet0/6          unassigned      YES unset  up       up
FastEthernet0/7          unassigned      YES unset  down    down
FastEthernet0/8          unassigned      YES unset  down    down
FastEthernet0/9          unassigned      YES unset  down    down
FastEthernet0/10         unassigned      YES unset  down    down
FastEthernet0/11         unassigned      YES unset  down    down
FastEthernet0/12         unassigned      YES unset  down    down
FastEthernet0/13         unassigned      YES unset  down    down
FastEthernet0/14         unassigned      YES unset  down    down
FastEthernet0/15         unassigned      YES unset  down    down
FastEthernet0/16         unassigned      YES unset  down    down
FastEthernet0/17         unassigned      YES unset  down    down
FastEthernet0/18         unassigned      YES unset  down    down
FastEthernet0/19         unassigned      YES unset  down    down
FastEthernet0/20         unassigned      YES unset  down    down
FastEthernet0/21         unassigned      YES unset  down    down
--More-- |
```

Telnet PC1 -> S1

```
root@PC-1-D:~# telnet 192.168.1.2
Trying 192.168.1.2...
Connected to 192.168.1.2.
Escape character is '^]'.

Bonjour

User Access Verification

Password:
S1>|
```

Telnet PC2 -> R3

```
root@PC-2-D:~# telnet 192.168.0.1
Trying 192.168.0.1...
Connected to 192.168.0.1.
Escape character is '^]'.
Authorized Users Only!

User Access Verification

Password:
R3>|
```


Pour R3 : show interfaces

```
R3#show interfaces
FastEthernet0/0 is up, line protocol is up
  Hardware is Gt96k FE, address is 2893.fe0e.9922 (bia 2893.fe0e.9922)
  Internet address is 192.168.0.1/24
  MTU 1500 bytes, BW 100000 Kbit/sec, DLY 100 usec,
    reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation ARPA, loopback not set
  Keepalive set (10 sec)
  Full-duplex, 100Mb/s, 100BaseTX/FX
  ARP type: ARPA, ARP Timeout 04:00:00
  Last input 00:00:01, output 00:00:01, output hang never
  Last clearing of "show interface" counters never
  Input queue: 0/75/0/0 (size/max/drops/flushes); Total output drops: 0
  Queueing strategy: fifo
  Output queue: 0/40 (size/max)
  5 minute input rate 2000 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
    4752 packets input, 1538363 bytes
      Received 4400 broadcasts, 0 runts, 0 giants, 0 throttles
    0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored
    0 watchdog
    0 input packets with dribble condition detected
  75861 packets output, 4611417 bytes, 0 underruns
    0 output errors, 0 collisions, 3 interface resets
```