

## 網路概論 作業四

資工三乙 408262143 林采昕

資工三乙 408262416 陳嫻婷

2022/01/10

**Q1:利用R1#show version記錄所用router 之下列資料：CPU型號、memory大小、NVRAM大小、Flash memory大小、作業系統版本。**

- CPU型號: Cisco CISCO1941/K9(revision 1.0)
- memory大小: 491520K/32768K
- NVRAM大小: 255K bytes
- Flash memory大小: 249856K bytes
- 作業系統版本: Cisco IOS Software, C1900 Software (C1900-UNIVERSALK9-M), Version 15.1(4)M4, RELEASE SOFTWARE (fc2)

```
Router#show version
Cisco IOS Software, C1900 Software (C1900-UNIVERSALK9-M), Version 15.1(4)M4, RELEASE SOFTWARE (fc2)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2007 by Cisco Systems, Inc.
Compiled Wed 23-Feb-11 14:19 by pt_team

ROM: System Bootstrap, Version 15.1(4)M4, RELEASE SOFTWARE (fc1)
cisco1941 uptime is 13 minutes, 55 seconds
System returned to ROM by power-on
System image file is "flash0:c1900-universalk9-mz.SPA.151-1.M4.bin"
Last reload type: Normal Reload

This product contains cryptographic features and is subject to United
States and local country laws governing import, export, transfer and
use. Delivery of Cisco cryptographic products does not imply
third-party authority to import, export, distribute or use encryption.
Importers, exporters, distributors and users are responsible for
compliance with U.S. and local country laws. By using this product you
agree to comply with applicable laws and regulations. If you are unable
to comply with U.S. and local laws, return this product immediately.

A summary of U.S. laws governing Cisco cryptographic products may be found at:
http://www.cisco.com/wwl/export/crypto/tool/stqrg.html

If you require further assistance please contact us by sending email to
export@cisco.com.
Cisco CISCO1941/K9 (revision 1.0) with 491520K/32768K bytes of memory.
Processor board ID FTX152400KS
2 Gigabit Ethernet interfaces
2 Low-speed serial(sync/async) network interface(s)
DRAM configuration is 64 bits wide with parity disabled.
255K bytes of non-volatile configuration memory.
249856K bytes of ATA System CompactFlash 0 (Read/Write)

License Info:
License UDI:
```

OS

CPU

RAM.

NVRAM

FLASH

**Q2:利用R1#show ip interface brief記錄R1各interface 目前設定狀況。**

況。

R1:

```
Router#show ip interface brief
Interface                IP-Address      OK? Method Status        Protocol
GigabitEthernet0/0       192.168.35.17   YES manual up             up
GigabitEthernet0/1       unassigned      YES unset  administratively down down
Serial0/0/0              192.168.35.113 YES manual up             up
Serial0/0/1              192.168.35.129 YES manual up             up
Vlan1                    unassigned      YES unset  administratively down down
Router#
```

**Q3:觀看並記錄三台路由器個別的 routing table。**

R1:

```
R1#show ip route | begin Gateway
Gateway of last resort is not set

    192.168.35.0/24 is variably subnetted, 6 subnets, 2 masks
C       192.168.35.16/28 is directly connected,
GigabitEthernet0/0
L       192.168.35.17/32 is directly connected,
GigabitEthernet0/0
C       192.168.35.112/28 is directly connected, Serial0/0/0
L       192.168.35.113/32 is directly connected, Serial0/0/0
C       192.168.35.128/28 is directly connected, Serial0/0/1
L       192.168.35.129/32 is directly connected, Serial0/0/1

R1#
```

R2:

```
R2#show ip route | begin Gateway
Gateway of last resort is not set

    192.168.35.0/24 is variably subnetted, 6 subnets, 2 masks
C       192.168.35.48/28 is directly connected,
GigabitEthernet0/0
L       192.168.35.49/32 is directly connected,
GigabitEthernet0/0
C       192.168.35.112/28 is directly connected, Serial0/0/1
L       192.168.35.114/32 is directly connected, Serial0/0/1
C       192.168.35.144/28 is directly connected, Serial0/0/0
L       192.168.35.145/32 is directly connected, Serial0/0/0

R2#
```

R3:

```
R3#show ip route | begin Gateway
Gateway of last resort is not set

    192.168.35.0/24 is variably subnetted, 4 subnets, 2 masks
C       192.168.35.128/28 is directly connected, Serial0/0/0
L       192.168.35.130/32 is directly connected, Serial0/0/0
C       192.168.35.144/28 is directly connected, Serial0/0/1
L       192.168.35.146/32 is directly connected, Serial0/0/1
```

**Q4:**等待約一分鐘後，觀看並記錄三台路由器個別的routing table，  
和Q3中所記錄的有無不同？

R1:

```
Router#show ip route | begin Gateway
Gateway of last resort is not set

    192.168.35.0/24 is variably subnetted, 8 subnets, 2 masks
C       192.168.35.16/28 is directly connected, GigabitEthernet0/0
L       192.168.35.17/32 is directly connected, GigabitEthernet0/0
R       192.168.35.48/28 [120/1] via 192.168.35.114, 00:00:15, Serial0/0/0
C       192.168.35.112/28 is directly connected, Serial0/0/0
L       192.168.35.113/32 is directly connected, Serial0/0/0
C       192.168.35.128/28 is directly connected, Serial0/0/1
L       192.168.35.129/32 is directly connected, Serial0/0/1
R       192.168.35.144/28 [120/1] via 192.168.35.130, 00:00:04, Serial0/0/1
        [120/1] via 192.168.35.114, 00:00:15, Serial0/0/0
```

R2:

```
Router#show ip route | begin Gateway
Gateway of last resort is not set

    192.168.35.0/24 is variably subnetted, 8 subnets, 2 masks
R       192.168.35.16/28 [120/1] via 192.168.35.113, 00:00:14,
Serial0/0/1
C       192.168.35.48/28 is directly connected,
GigabitEthernet0/0
L       192.168.35.49/32 is directly connected,
GigabitEthernet0/0
C       192.168.35.112/28 is directly connected, Serial0/0/1
L       192.168.35.114/32 is directly connected, Serial0/0/1
R       192.168.35.128/28 [120/1] via 192.168.35.146, 00:00:19,
Serial0/0/0
        [120/1] via 192.168.35.113, 00:00:14,
Serial0/0/1
C       192.168.35.144/28 is directly connected, Serial0/0/0
L       192.168.35.145/32 is directly connected, Serial0/0/0
```

R3:

```
Router#show ip route | begin Gateway
Gateway of last resort is not set

    192.168.35.0/24 is variably subnetted, 7 subnets, 2 masks
R       192.168.35.16/28 [120/1] via 192.168.35.129, 00:00:01,
Serial0/0/0
R       192.168.35.48/28 [120/1] via 192.168.35.145, 00:00:15,
Serial0/0/1
R       192.168.35.112/28 [120/1] via 192.168.35.145, 00:00:15,
Serial0/0/1
                               [120/1] via 192.168.35.129, 00:00:01,
Serial0/0/0
C       192.168.35.128/28 is directly connected, Serial0/0/0
L       192.168.35.130/32 is directly connected, Serial0/0/0
C       192.168.35.144/28 is directly connected, Serial0/0/1
L       192.168.35.146/32 is directly connected, Serial0/0/1
```

Q5:點選 PC1，在 Desktop 分頁中，點選 Command Prompt，鍵入  
tracert<PC2' s IP>，記錄目前 PC1 到 PC2 之路徑所經過之 IP  
address，該路徑共經過幾個 hop。

```
Packet Tracer PC Command Line 1.0
C:\>tracert 192.168.35.50

Tracing route to 192.168.35.50 over a maximum of 30 hops:

  1  1 ms    0 ms    0 ms    192.168.35.17
  2  0 ms    1 ms    0 ms    192.168.35.114
  3  *        10 ms   13 ms   192.168.35.50

Trace complete.
```

PC1 -> R1 -> R2 -> PC2

Q6:到R1的s0/0/0 port，輸入shutdown指令來模擬R1與R2間link斷  
線的狀況，等待約一分鐘，觀看並記錄三台router上個別的routing  
table，是否有任何改變。從PC1再次tracert<PC2's IP>，記錄目前  
PC1到PC2之路徑，和先前有無不同。



```
C:\>tracert 192.168.35.50

Tracing route to 192.168.35.50 over a maximum of 30 hops:

  1  0 ms    0 ms    0 ms    192.168.35.17
  2  1 ms    1 ms    1 ms    192.168.35.130
  3  1 ms    5 ms    0 ms    192.168.35.145
  4  3 ms    0 ms    1 ms    192.168.35.50

Trace complete.
```

PC1 -> R1 -> R3 -> R2 -> PC2

R1:

```
Gateway of last resort is not set

192.168.35.0/24 is variably subnetted, 6 subnets, 2 masks
C    192.168.35.16/28 is directly connected, GigabitEthernet0/0
L    192.168.35.17/32 is directly connected, GigabitEthernet0/0
R    192.168.35.48/28 [120/2] via 192.168.35.130, 00:00:25, Serial0/0/1
C    192.168.35.128/28 is directly connected, Serial0/0/1
L    192.168.35.129/32 is directly connected, Serial0/0/1
R    192.168.35.144/28 [120/1] via 192.168.35.130, 00:00:25, Serial0/0/1
```

R2:

```
Router#show ip route | begin Gateway
Gateway of last resort is not set

192.168.35.0/24 is variably subnetted, 8 subnets, 2 masks
R    192.168.35.16/28 [120/1] via 192.168.35.113, 00:00:14,
Serial0/0/1
C    192.168.35.48/28 is directly connected,
GigabitEthernet0/0
L    192.168.35.49/32 is directly connected,
GigabitEthernet0/0
C    192.168.35.112/28 is directly connected, Serial0/0/1
L    192.168.35.114/32 is directly connected, Serial0/0/1
R    192.168.35.128/28 [120/1] via 192.168.35.146, 00:00:19,
Serial0/0/0
[120/1] via 192.168.35.113, 00:00:14,
Serial0/0/1
C    192.168.35.144/28 is directly connected, Serial0/0/0
L    192.168.35.145/32 is directly connected, Serial0/0/0
```

(R1到R2斷連)

```
Gateway of last resort is not set

192.168.35.0/24 is variably subnetted, 6 subnets, 2 masks
R    192.168.35.16/28 [120/2] via 192.168.35.146, 00:00:01, Serial0/0/0
C    192.168.35.48/28 is directly connected, GigabitEthernet0/0
L    192.168.35.49/32 is directly connected, GigabitEthernet0/0
R    192.168.35.128/28 [120/1] via 192.168.35.146, 00:00:01, Serial0/0/0
C    192.168.35.144/28 is directly connected, Serial0/0/0
L    192.168.35.145/32 is directly connected, Serial0/0/0

R2#
```

R3

```

Gateway of last resort is not set

    192.168.35.0/24 is variably subnetted, 7 subnets, 2 masks
R   192.168.35.16/28 [120/1] via 192.168.35.129, 00:00:04, Serial0/0/0
R   192.168.35.48/28 [120/1] via 192.168.35.145, 00:00:12, Serial0/0/1
R   192.168.35.112/28 is possibly down, routing via 192.168.35.145, Serial0/0/1
C   192.168.35.128/28 is directly connected, Serial0/0/0
L   192.168.35.130/32 is directly connected, Serial0/0/0
C   192.168.35.144/28 is directly connected, Serial0/0/1
L   192.168.35.146/32 is directly connected, Serial0/0/1
R3#

```

**Q7:**到 R1 的 s0/0/0 port，輸入 no shutdown 指令將 R1 與 R2 間 link 恢復連線，等待約一分鐘，觀看並記錄三台 router 上個別的 routing table，是否又有任何改變。從 PC1 再次 tracert<PC2's IP>，記錄目前 PC1 到 PC2 之路徑又為何，有無更改。

PC1 -> R1 -> R2 -> PC2

```

Tracing route to 192.168.35.50 over a maximum of 30 hops:

  1  0 ms      2 ms      0 ms      192.168.35.17
  2  1 ms      3 ms      0 ms      192.168.35.114
  3  11 ms     3 ms      0 ms      192.168.35.50

Trace complete.

```

R1

```

Gateway of last resort is not set

    192.168.35.0/24 is variably subnetted, 8 subnets, 2 masks
C   192.168.35.16/28 is directly connected, GigabitEthernet0/0
L   192.168.35.17/32 is directly connected, GigabitEthernet0/0
R   192.168.35.48/28 [120/1] via 192.168.35.114, 00:00:16, Serial0/0/0
C   192.168.35.112/28 is directly connected, Serial0/0/0
L   192.168.35.113/32 is directly connected, Serial0/0/0
C   192.168.35.128/28 is directly connected, Serial0/0/1
L   192.168.35.129/32 is directly connected, Serial0/0/1
R   192.168.35.144/28 [120/1] via 192.168.35.130, 00:00:19, Serial0/0/1
    [120/1] via 192.168.35.114, 00:00:16, Serial0/0/0
R1#

```

R2

```

Gateway of last resort is not set

    192.168.35.0/24 is variably subnetted, 8 subnets, 2 masks
R   192.168.35.16/28 [120/1] via 192.168.35.113, 00:00:24, Serial0/0/1
C   192.168.35.48/28 is directly connected, GigabitEthernet0/0
L   192.168.35.49/32 is directly connected, GigabitEthernet0/0
C   192.168.35.112/28 is directly connected, Serial0/0/1
L   192.168.35.114/32 is directly connected, Serial0/0/1
R   192.168.35.128/28 [120/1] via 192.168.35.146, 00:00:09, Serial0/0/0
    [120/1] via 192.168.35.113, 00:00:24, Serial0/0/1
C   192.168.35.144/28 is directly connected, Serial0/0/0
L   192.168.35.145/32 is directly connected, Serial0/0/0
R2#

```

R3

Gateway of last resort is not set

```
    192.168.35.0/24 is variably subnetted, 7 subnets, 2 masks
R      192.168.35.16/28 [120/1] via 192.168.35.129, 00:00:14, Serial0/0/0
R      192.168.35.48/28 [120/1] via 192.168.35.145, 00:00:21, Serial0/0/1
R      192.168.35.112/28 [120/1] via 192.168.35.145, 00:00:21, Serial0/0/1
      [120/1] via 192.168.35.129, 00:00:14, Serial0/0/0
C      192.168.35.128/28 is directly connected, Serial0/0/0
L      192.168.35.130/32 is directly connected, Serial0/0/0
C      192.168.35.144/28 is directly connected, Serial0/0/1
L      192.168.35.146/32 is directly connected, Serial0/0/1
```

R3#

---