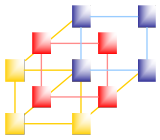
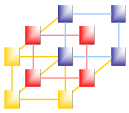


Unit 10
路由器基本設定



初始路由器設定（1/2）

1. 設定裝置名稱
```
Router(config)# hostname
```
2. 保護特權 EXEC 模式
```
Router(config)# enable secret password
```
3. 保護使用者 EXEC 模式
```
Router(config)# line console 0
Router(config-line)# password password
Router(config-line)# login
```
4. 保護遠端 Telnet/SSH 存取
```
Router(config-line)# line vty 0 4
Router(config-line)# password password
Router(config-line)# login
Router(config-line)# transport input {ssh | telnet}
```

初始路由器設定（2/2）

5. 保護設定檔中的所有密碼。

```
Router(config-line)# exit
Router(config)# service password-encryption
```

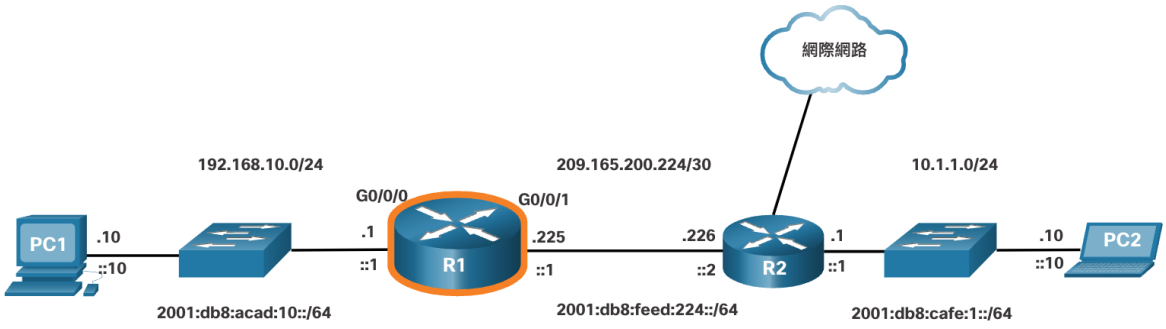
6. 提供法律通知

```
Router(config)# banner motd delimiter
message delimiter
```

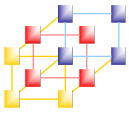
7. 儲存設定。

```
Router(config)# end
Router# copy running-config startup-config
```


路由器基本設定範例（1/3）

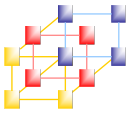



```
Router> enable
Router# configure terminal
Enter configuration commands, one per line.
End with CNTL/Z.
Router(config)# hostname R1
R1(config)#
```



路由器基本設定範例（2/3）

```
R1(config)# enable secret class
R1(config)#
R1(config)# line console 0
R1(config-line)# password cisco
R1(config-line)# login
R1(config-line)# exit
R1(config)#
R1(config)# line vty 0 4
R1(config-line)# password cisco
R1(config-line)# login
R1(config-line)# transport input ssh telnet
R1(config-line)# exit
R1(config)#
R1(config)# service password-encryption
R1(config)#
```

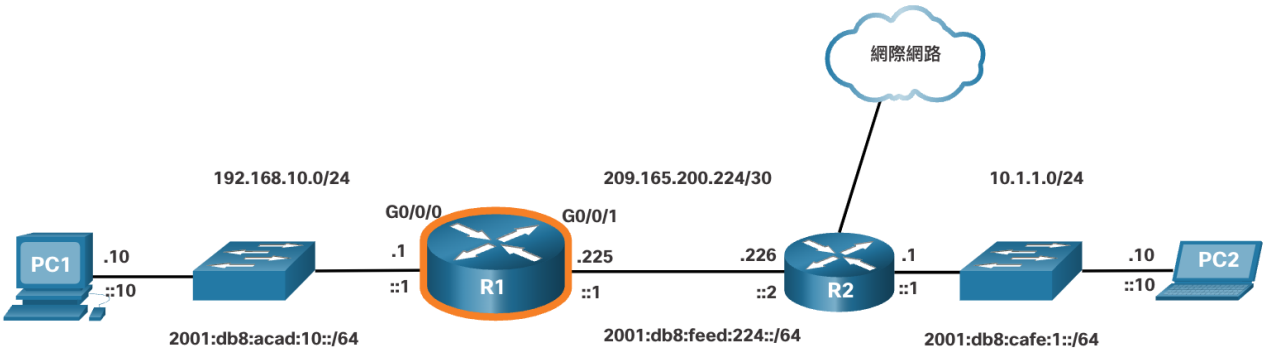
路由器基本設定範例（3/3）

```
R1(config)# banner motd #
Enter TEXT message. End with a new line and the #
**********************************************
WARNING: Unauthorized access is prohibited!
**********************************************
#
R1(config)#


R1# copy running-config startup-config
Destination filename [startup-config]?
Building configuration... [OK]
R1#
```

設定路由器介面（1/2）

```
Router(config)# interface type-and-number
Router(config-if)# description description-text
Router(config-if)# ip address ipv4-address subnet-mask
Router(config-if)# ipv6 address ipv6-address/prefix-length
Router(config-if)# no shutdown
```



設定路由器介面（2/2）

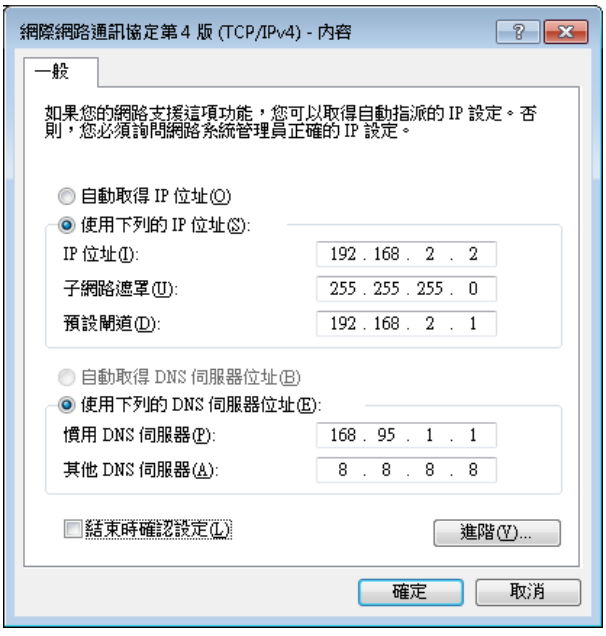
```
R1> enable
R1# configure terminal
Enter configuration commands, one per line.
End with CNTL/Z.
R1(config)# interface gigabitEthernet 0/0/0
R1(config-if)# description Link to LAN
R1(config-if)# ip address 192.168.10.1 255.255.255.0
R1(config-if)# ipv6 address 2001:db8:acad:10::1/64
R1(config-if)# no shutdown
R1(config-if)# exit
…
R1(config)#
R1(config)# interface gigabitEthernet 0/0/1
R1(config-if)# description Link to R2
R1(config-if)# ip address 209.165.200.225 255.255.255.252
R1(config-if)# ipv6 address 2001:db8:feed:224::1/64
R1(config-if)# no shutdown
R1(config-if)# exit
R1(config)#
```

驗證介面設定

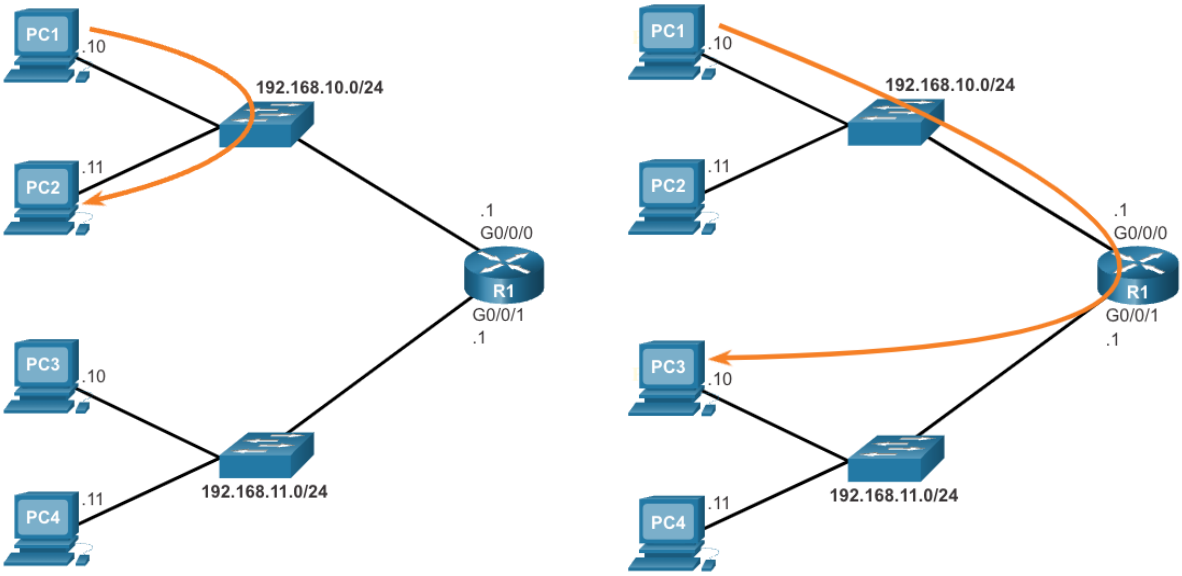
```
R1# show ip interface brief
Interface              IP-Address      OK?    Method   Status                  Protocol
GigabitEthernet0/0/0 192.168.10.1     YES    manual   up                       up
GigabitEthernet0/0/1 209.165.200.225 YES    manual   up                       up
Vlan1                unassigned       YES   unset    administratively down down
R1# show ipv6 interface brief
GigabitEthernet0/0/0 [up/up]
FE80::201:C9FF:FE89:4501
2001:DB8:ACAD:10::1
GigabitEthernet0/0/1 [up/up]
FE80::201:C9FF:FE89:4502
2001:DB8:FEED:224::1
Vlan1 [administratively down/down]
unas
R1#
```

命令	說明
show ip interface brief **show ipv6 interface brief**	輸出會顯示所有介面、其 IP 位址及其 當前狀態已設定和連接的介面應該會顯示 Status 為 "up" 和 Protocol 為 "up"。 否則則表示設定或纜線佈線 有問題。
show ip route **show ipv6 route**	顯示儲存在 RAM 中之 IP 路由表的內容。
show interfaces	顯示裝置上所有介面的統計資料。然而，本 命令只會顯示 IPv4 位址資訊。
show ip interfaces	顯示路由器上所有介面的 IPv4 統計資料。
show ipv6 interface	顯示路由器上所有介面的 IPv6 統計資料。

設定預設閘道

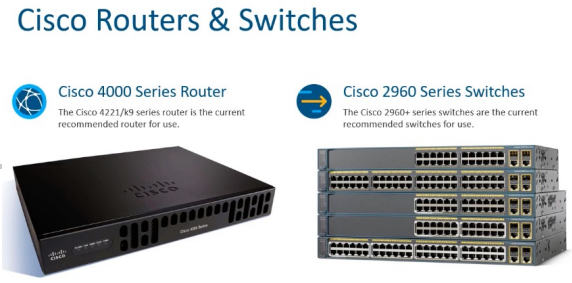


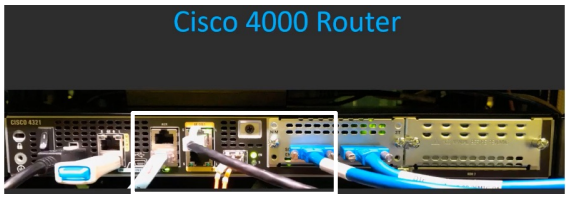
主機預設閘道

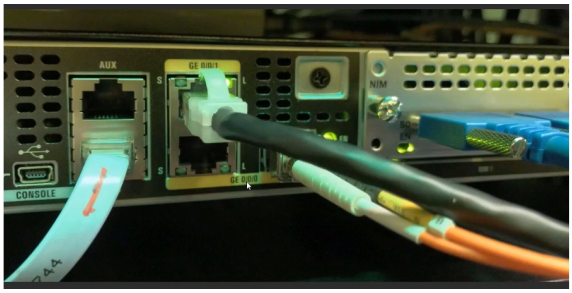


交換器預設閘道

網路裝置差異

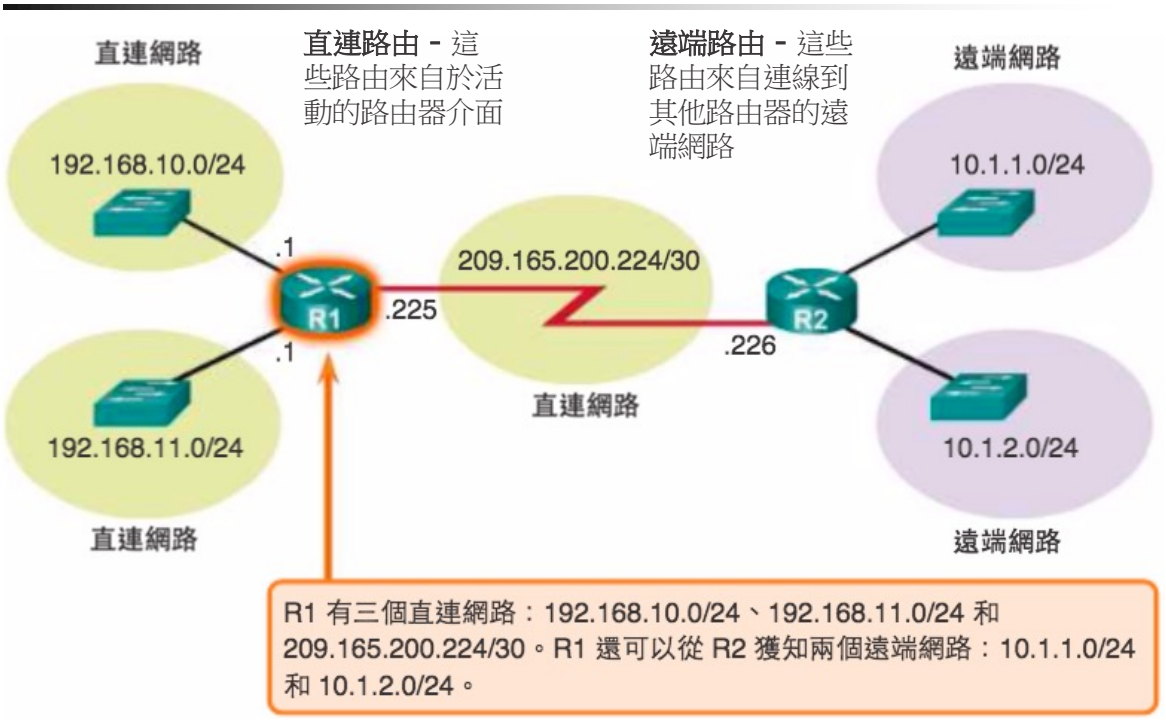




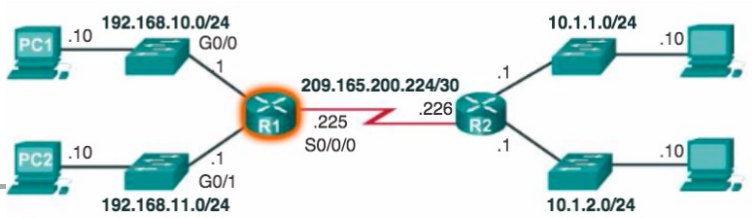


參考 10.4.1 & 10.4.2 影片

路由器封包轉送決策



IPv4 路由器路由表

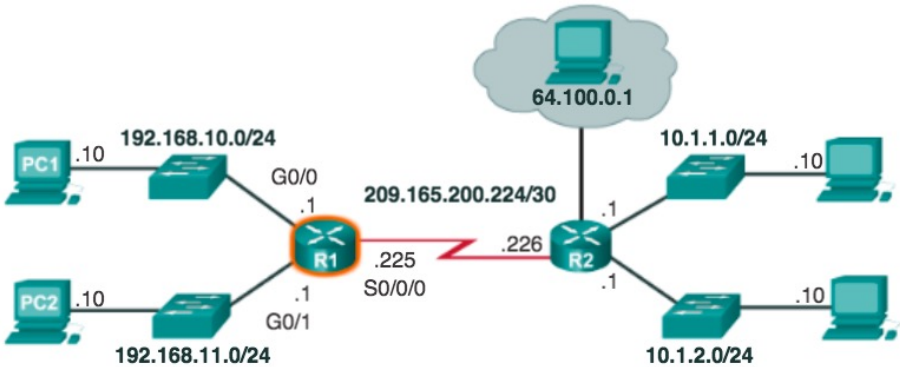



```
R1#show ip route
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, 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

     10.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
D       10.1.1.0/24 [90/2170112] via 209.165.200.226, 00:00:05, Serial0/0/0
D       10.1.2.0/24 [90/2170112] via 209.165.200.226, 00:00:05, Serial0/0/0
     192.168.10.0/24 is variably subnetted, 2 subnets, 3 masks
C       192.168.10.0/24 is directly connected, GigabitEthernet0/0
L       192.168.10.1/32 is directly connected, GigabitEthernet0/0
     192.168.11.0/24 is variably subnetted, 2 subnets, 3 masks
C       192.168.11.0/24 is directly connected, GigabitEthernet0/1
L       192.168.11.1/32 is directly connected, GigabitEthernet0/1
     209.165.200.0/24 is variably subnetted, 2 subnets, 3 masks
C       209.165.200.224/30 is directly connected, Serial0/0/0
L       209.165.200.225/32 is directly connected, Serial0/0/0
R1#
```


直連網路路由表條目



A	B	C
C	192.168.10.0/24 is directly connected,	GigabitEthernet0/0
L	192.168.10.1/32 is directly connected,	GigabitEthernet0/0

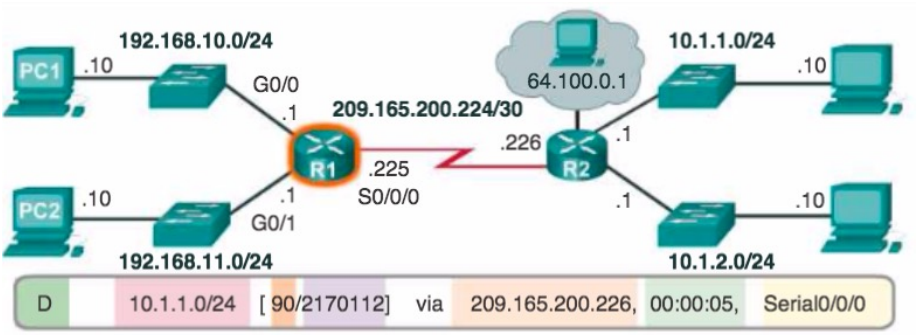
路由來源 **目的網路** **輸出介面**

圖例

- 識別路由器如何獲知網路。
- 識別目的網路及其連線。
- 識別路由器到達目的網路所使用的介面。

- **C** - 用於確定直連網路。為介面設定 IP 位址並啟用時，會自動新增直連網路。
- **L** - 表示這是鏈路本地路由。為介面設定 IP 位址並啟用時，會自動新增鏈路本地路由。

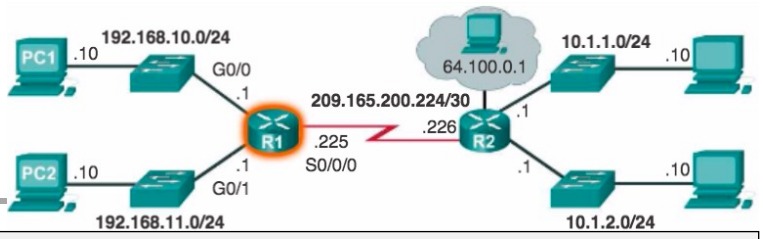
遠程網路路由表條目



圖例

- 識別路由器如何獲知網路。
- 標識目的網路。
- 標識路由來源的管理距離（可信度）。
- 識別到達遠端網路的度量。
- 識別到達遠端網路的下一跳 IP 位址。
- 識別路由最後一次偵聽之後所經過的時間。
- 標識路由器上到達目的網路的傳出介面。

下一跳位址




```
R1# show ip route
Codes: L - local, 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, E - EGP
       i - IS-IS, 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

     10.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
D       10.1.1.0/24 [90/2170112] via 209.165.200.226, 00:00:05, Serial0/0/0
D       10.1.2.0/24 [90/2170112] via 209.165.200.226, 00:00:05, Serial0/0/0
     192.168.10.0/24 is variably subnetted, 2 subnets, 3 masks
C       192.168.10.0/24 is directly connected, GigabitEthernet0/0
L       192.168.10.1/32 is directly connected, GigabitEthernet0/0
     192.168.11.0/24 is variably subnetted, 2 subnets, 3 masks
C       192.168.11.0/24 is directly connected, GigabitEthernet0/1
L       192.168.11.1/32 is directly connected, GigabitEthernet0/1
     209.165.200.0/24 is variably subnetted, 2 subnets, 3 masks
C       209.165.200.224/30 is directly connected, Serial0/0/0
L       209.165.200.225/32 is directly connected, Serial0/0/0
R1#
```

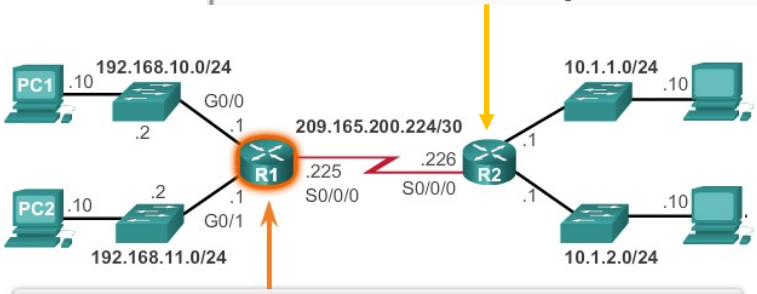
靜態路由(1/2)

- 手動配置
  - 定義兩個網路裝置之間的明確路徑
  - 優點包括提高了安全性和資源利用率
- 路由表中有兩種常見的靜態路由類型
  - 指向特定網路的靜態路由
  - 預設靜態路由

靜態路由(2/2)

```
R2(config)# ip route 192.168.10.0 255.255.255.0 s0/0/0
R2(config)# ip route 192.168.11.0 255.255.255.0 209.165.200.225
R2(config)# exit
R2#
R2# show ip route | begin Gateway
Gateway of last resort is not set

     10.0.0.0/8 is variably subnetted, 4 subnets, 2 masks
C       10.1.1.0/24 is directly connected, GigabitEthernet0/0
L       10.1.1.1/32 is directly connected, GigabitEthernet0/0
C       10.1.2.0/24 is directly connected, GigabitEthernet0/1
L       10.1.2.1/32 is directly connected, GigabitEthernet0/1
S    192.168.10.0/24 is directly connected, Serial0/0/0
S    192.168.11.0/24 [1/0] via 209.165.200.225
     209.165.200.0/24 is variably subnetted, 2 subnets, 2 masks
```




```
R1(config)# ip route 0.0.0.0 0.0.0.0 Serial0/0/0
R1(config)# exit
R1#
*Feb  1 10:19:34.483: %SYS-5-CONFIG_I: Configured from console
by console

R1# show ip route | begin Gateway
Gateway of last resort is 0.0.0.0 to network 0.0.0.0

S* 0.0.0.0/0 is directly connected, Serial0/0/0
     192.168.10.0/24 is variably subnetted, 2 subnets, 2 masks
C       192.168.10.0/24 is directly connected, GigabitEthernet0/0
```