



國立中興大學

National Chung Hsing University

NCHU

兼具分流、容錯及安全防護的 分散式DNS建置

-以國立中興大學為例

國立中興大學計算機及資訊網路中心

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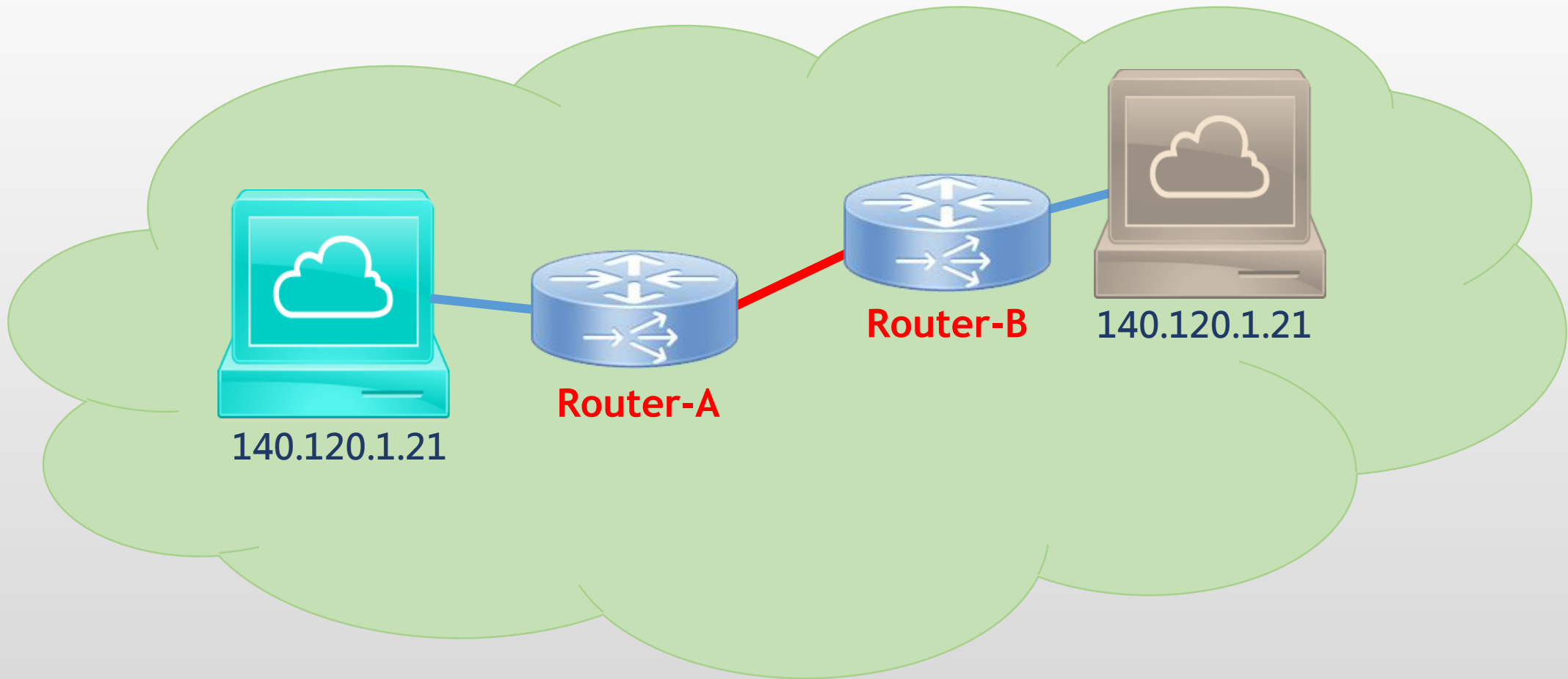
The background of the slide is a complex, abstract network diagram. It features numerous nodes of varying sizes and colors (blue, green, yellow, grey) connected by thin lines. Some nodes are highlighted with larger, semi-transparent circles. The overall pattern suggests a global or interconnected system, possibly representing data, social networks, or infrastructure. A solid magenta horizontal band is positioned across the middle of the image, serving as a backdrop for the title text.

在開始之前

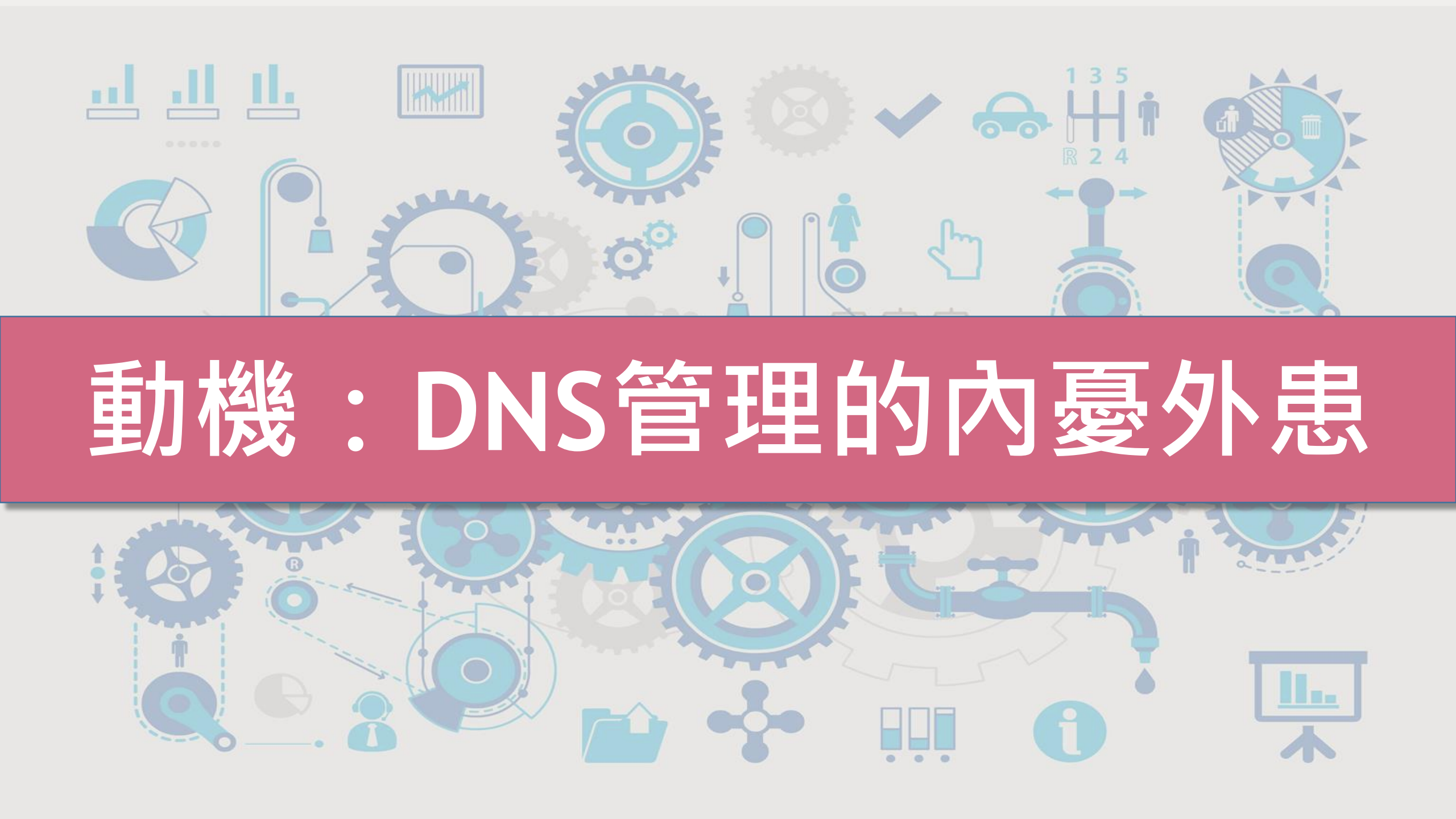


如果沒了DNS?





Public IP 能同時存在嗎？



動機：DNS管理的內憂外患

內憂

使用者要
再那什麼?
改IP?

系所

校務系統

Core

firewall

DNS
SERVER

維護

OR

故障

外患



攻撃



常見解決方式



換IP

使用者不知道要改

裝置成千上萬

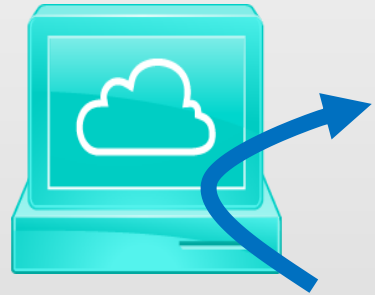


攻擊者換IP？

下一次攻擊呢？

封鎖

佈署專業防護設備



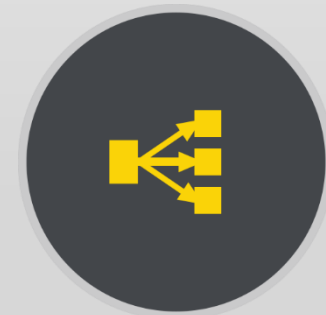
流量清洗



入侵偵測系統



防火牆



負載平衡伺服器

能不能？





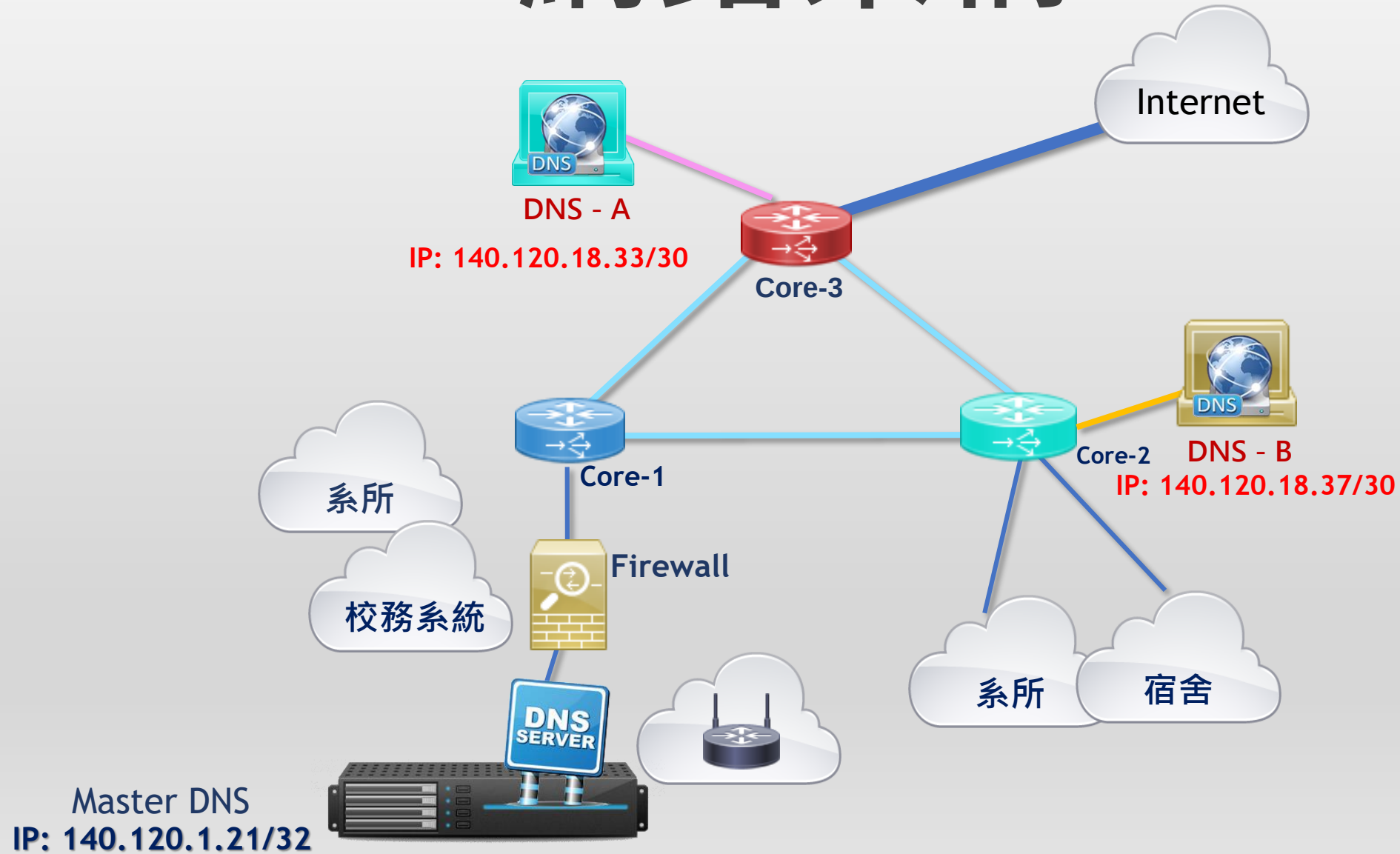
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我們的方式

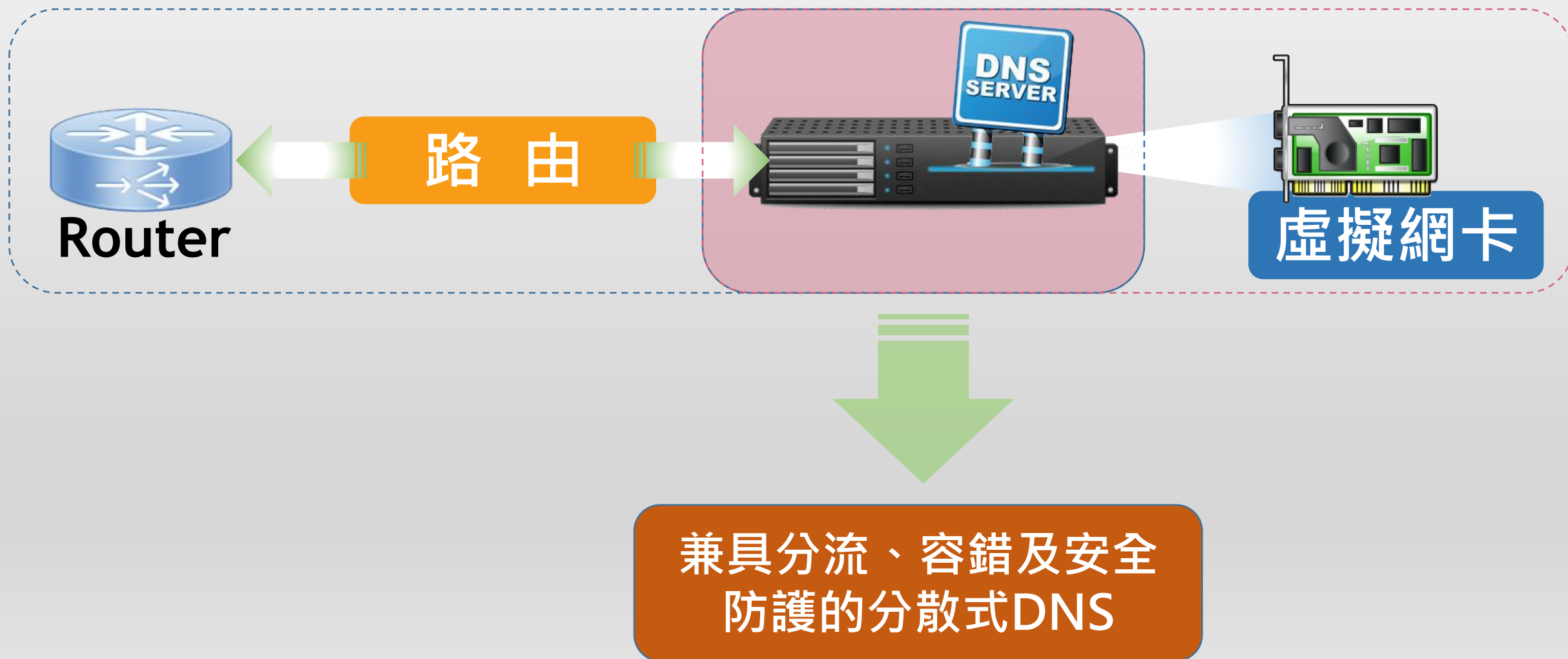
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專業知能、應用整合、審美求真、反思創新、自我表達、團隊合作、在地關懷、全球思維

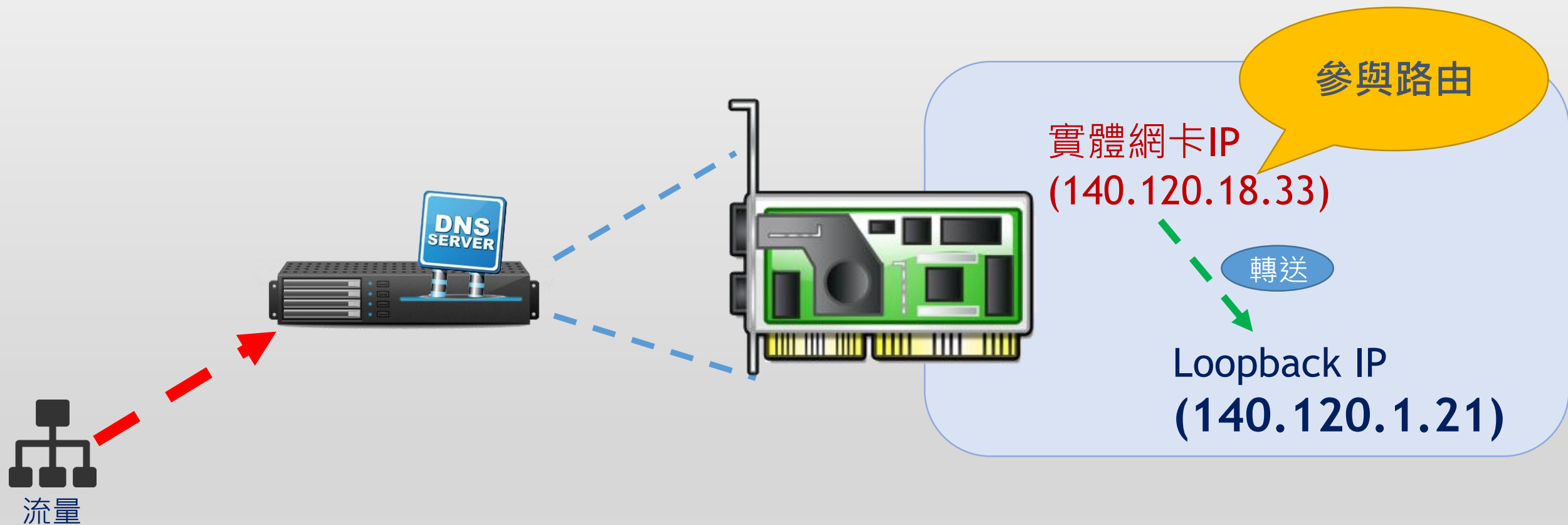
網路架構



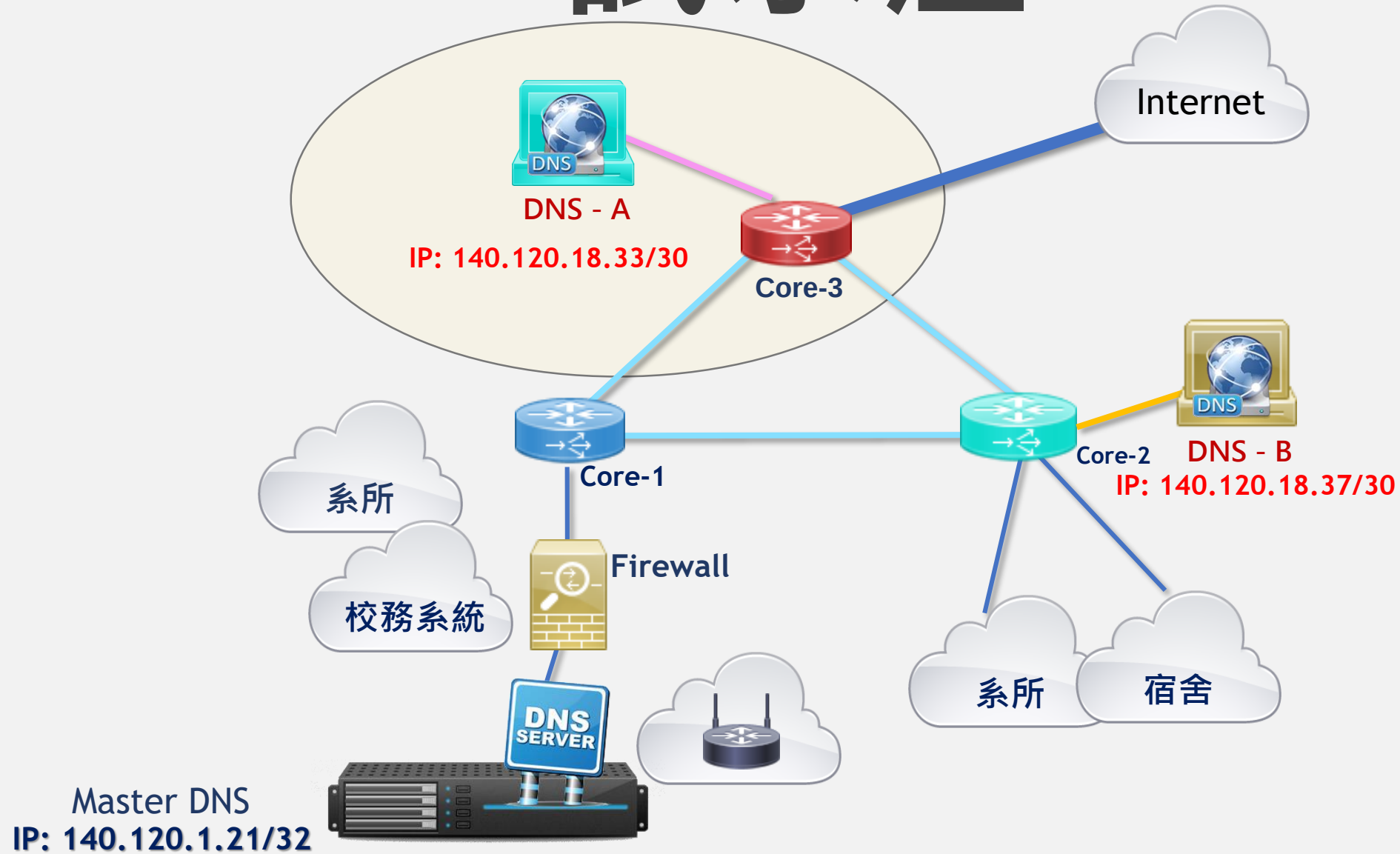
原理及機制



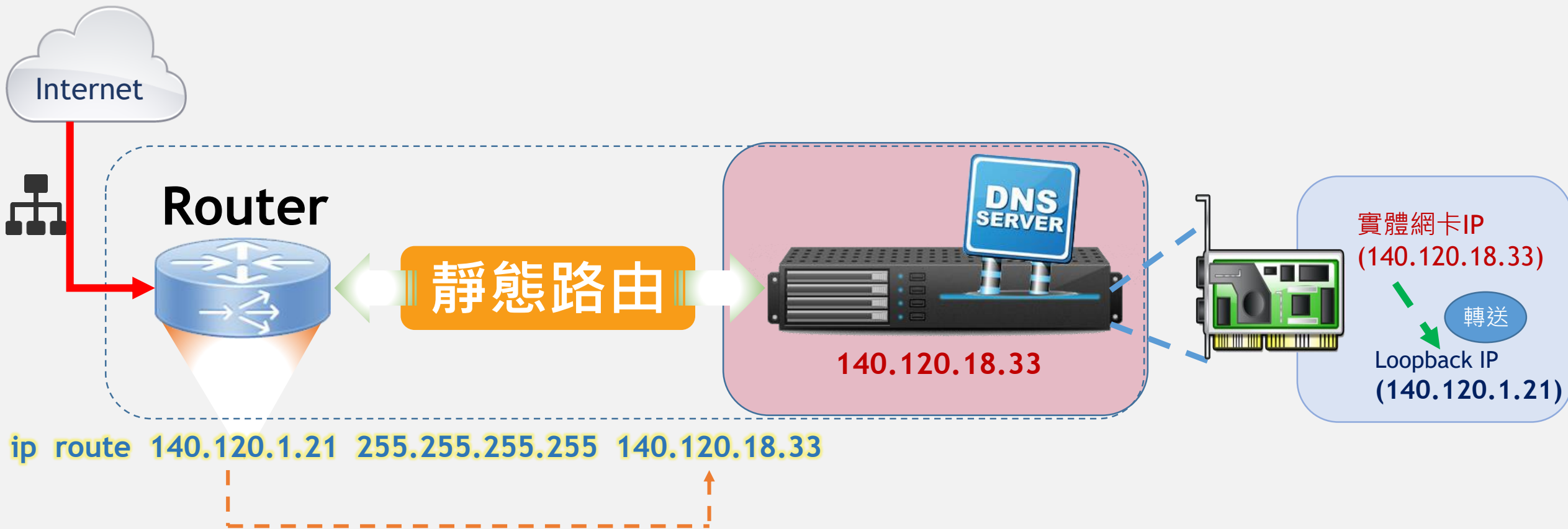
虛擬網卡



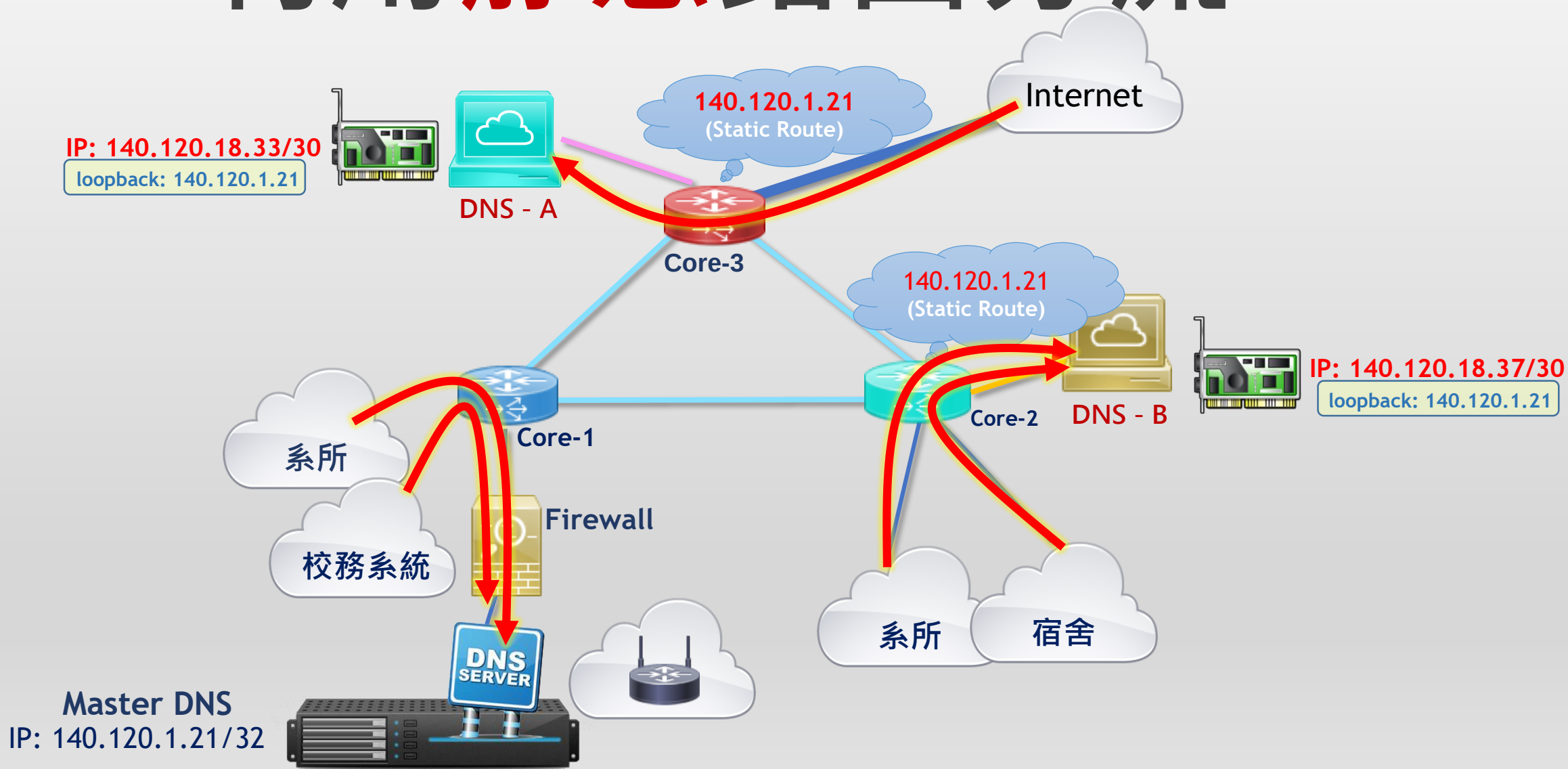
試水溫



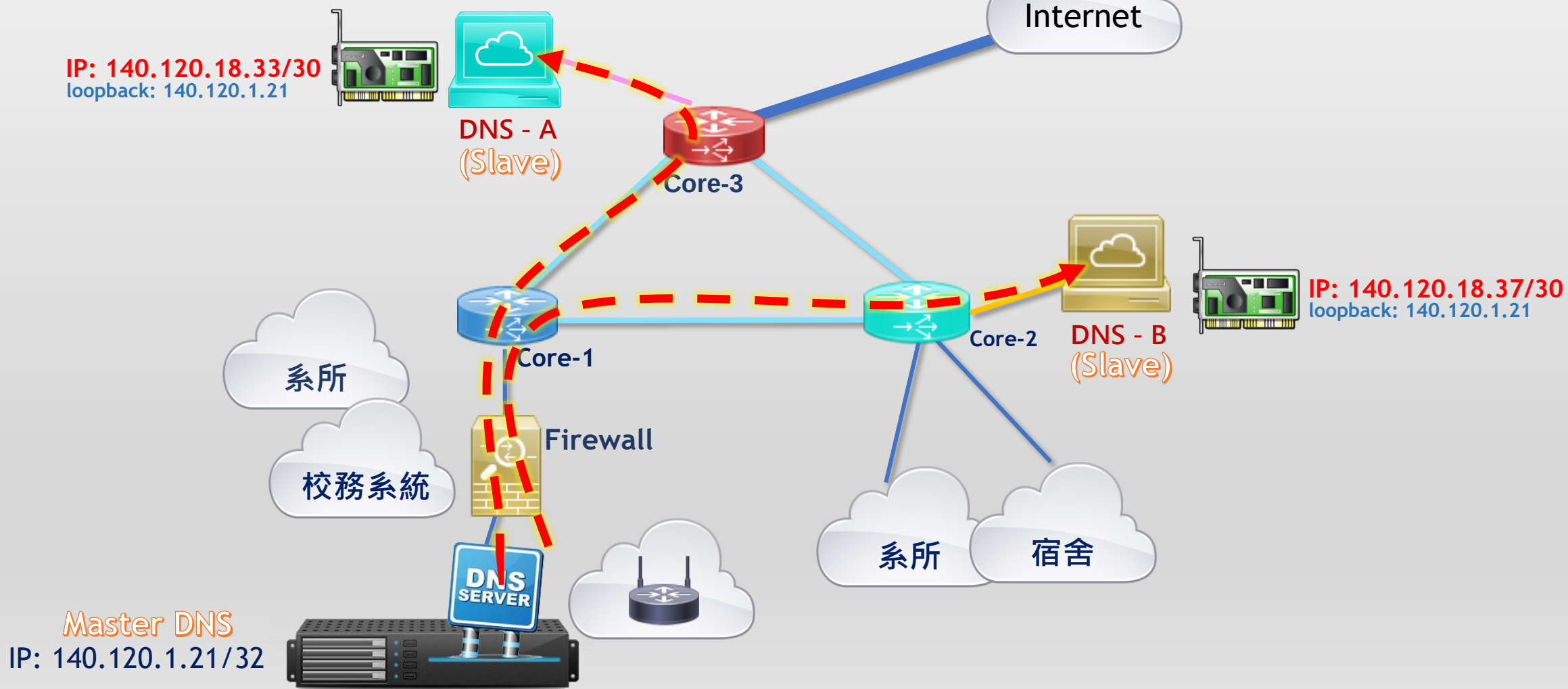
以靜態路由(Static Routes)建置分散式DNS 架構



利用靜態路由分流



Zone File Update



不夠彈性

BUT !!
靜態路由.....

無法具備自動容錯能力

動態路由

- **Administrative Distance**
 - RIPv2 : 120
 - EIGRP: 90
- **Longest Prefix Match 特性**
 - /32(140.120.1.21)優先



Core-3

```
router rip
version 2
network 140.120.0.0
```

RIPv2

動態路由

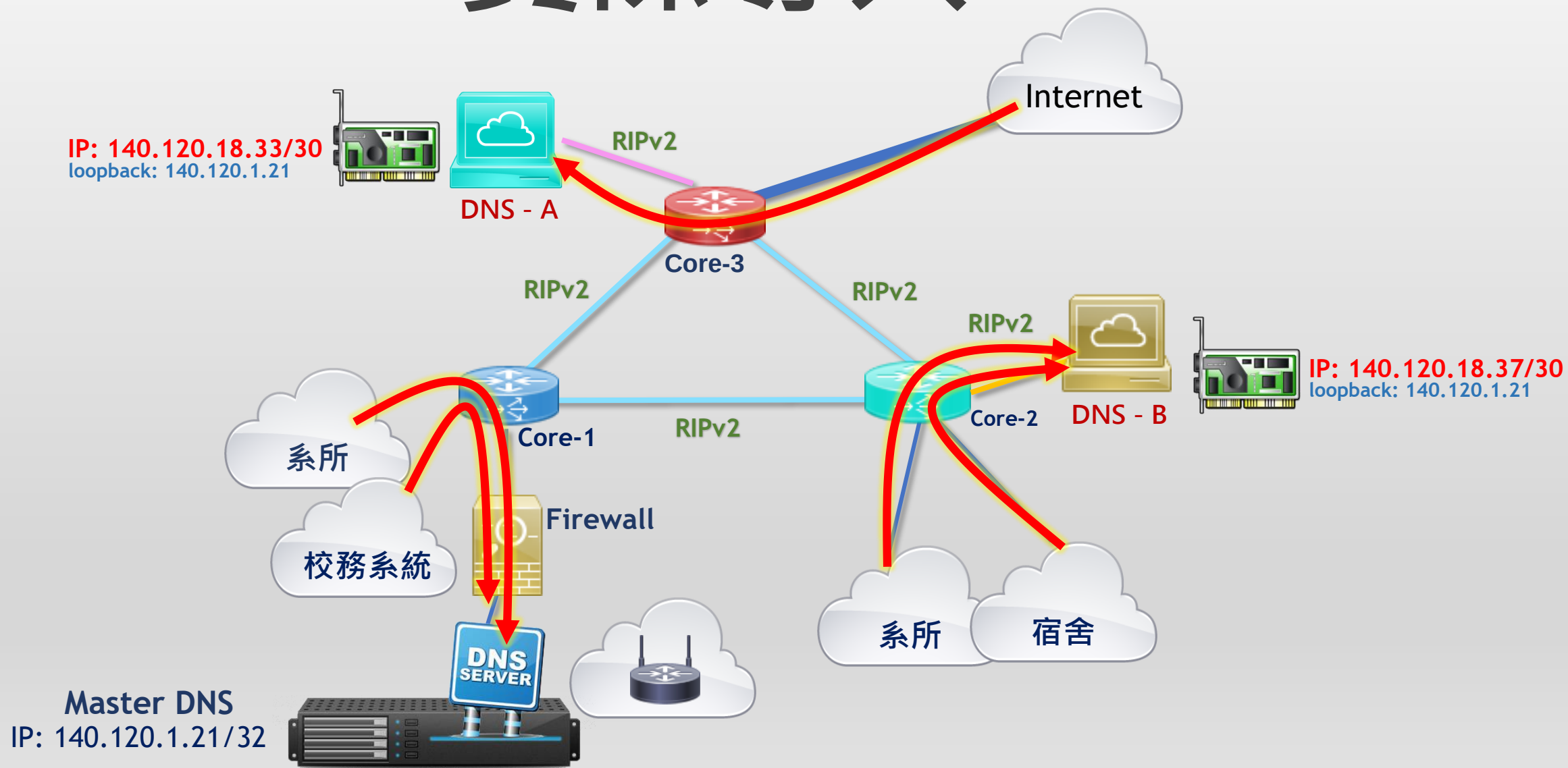
安裝動態路由軟體

Quagga



```
router rip
version 2
network 140.120.1.21/32
network 140.120.18.33/30
```


實際導入





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導入成效及效益

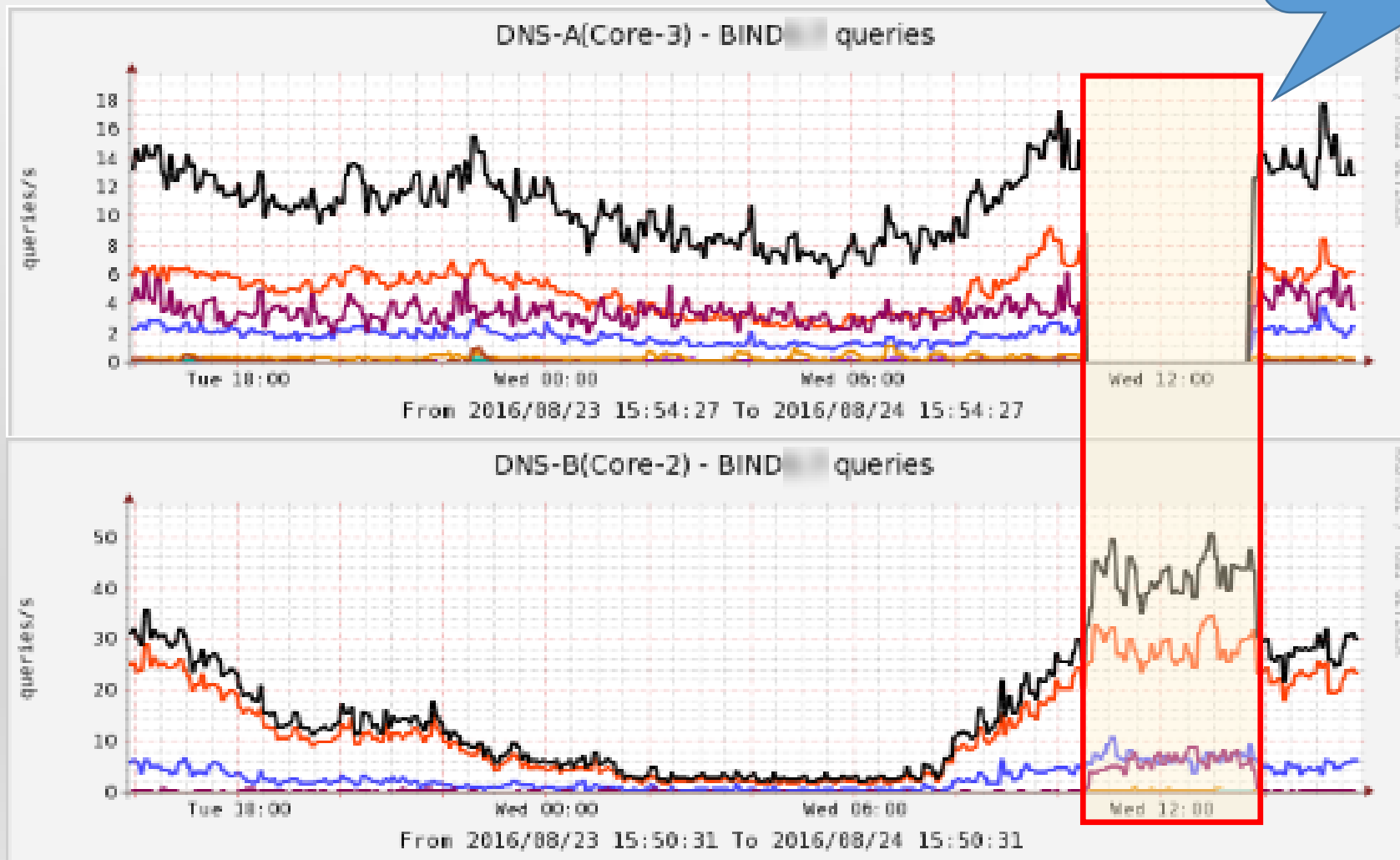


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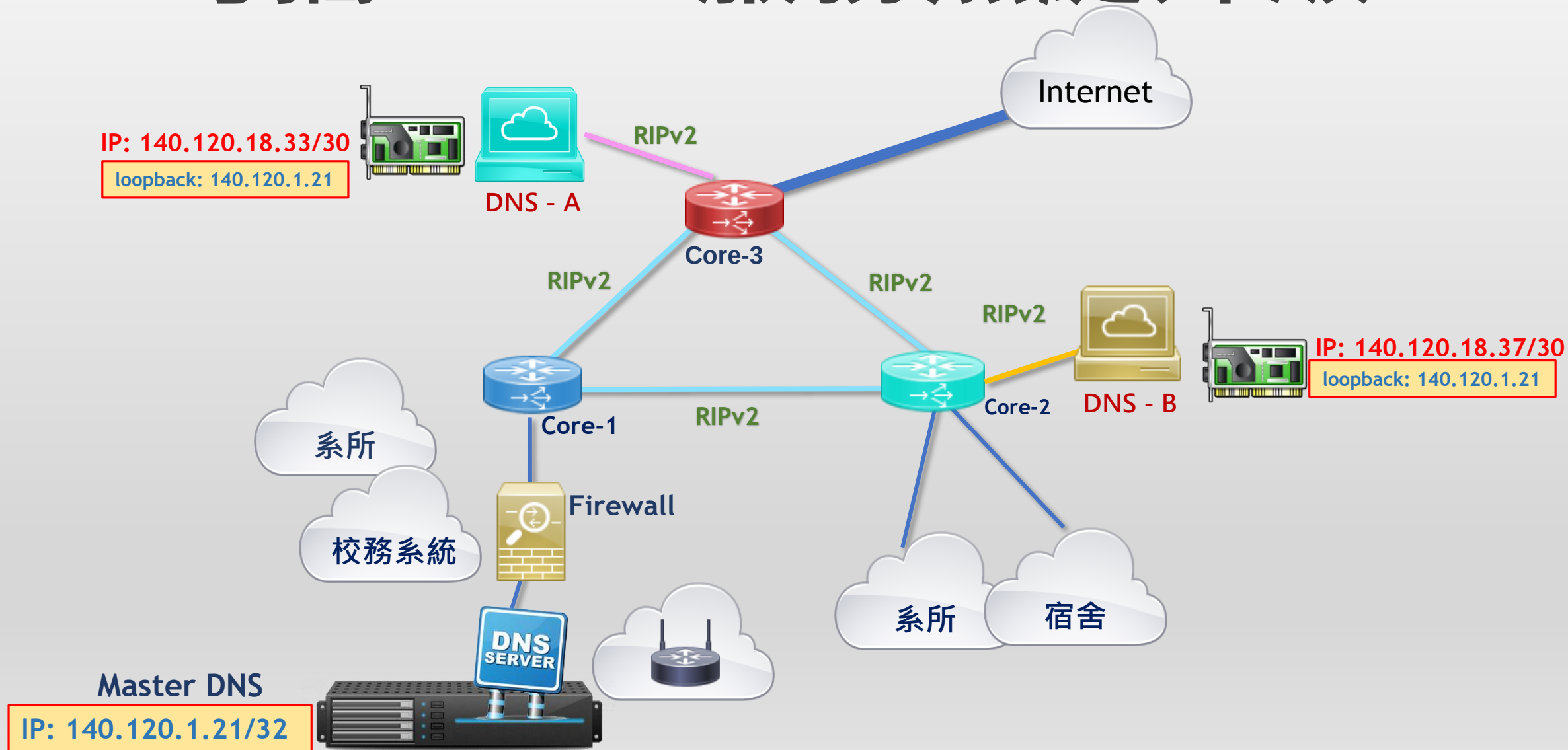
專業知能、應用整合、審美求真、反思創新、自我表達、團隊合作、在地關懷、全球思維

流量平衡負載

自動備援



IP 可攜:DNS 服務無縫升級



自動緊急備援

IP: 140.120.18.33/30
loopback: 140.120.1.21



DNS - A

RIPv2

Core-3

Internet

- 自動導向可用伺服器
- 選擇路徑成本(Hop count)較低的

RIPv2

RIPv2

RIPv2



DNS - B

RIPv2

Core-1

Core-2

系所

校務系統

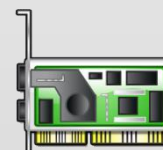
Firewall

DNS
SERVER

系所

宿舍

IP: 140.120.18.37/30
loopback: 140.120.1.21

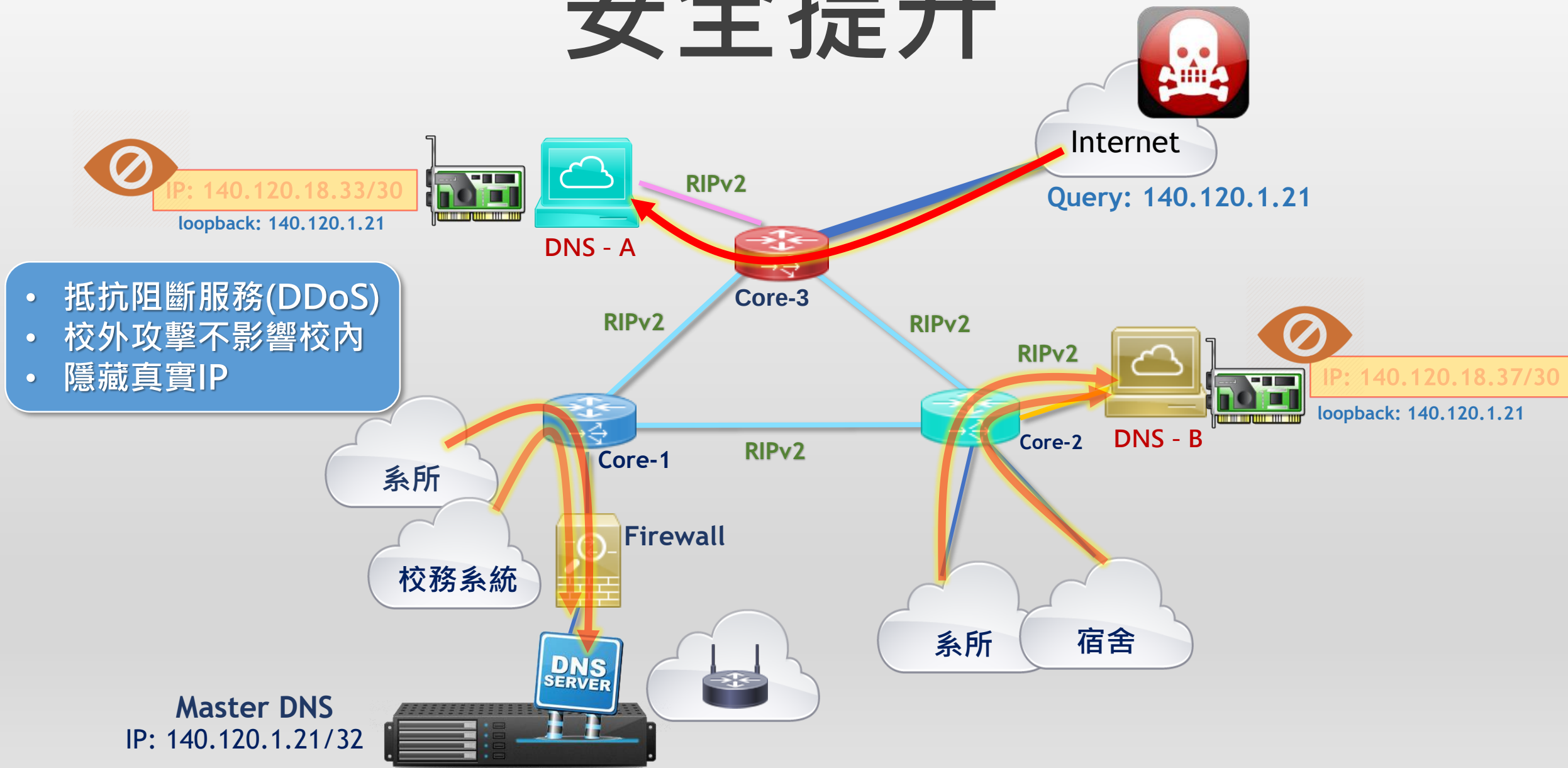


Master DNS

IP: 140.120.1.21/32



安全提升



低成本

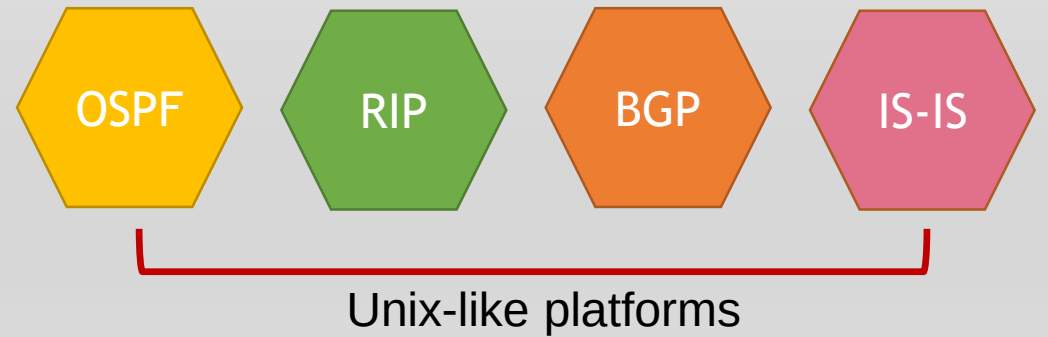


+



+

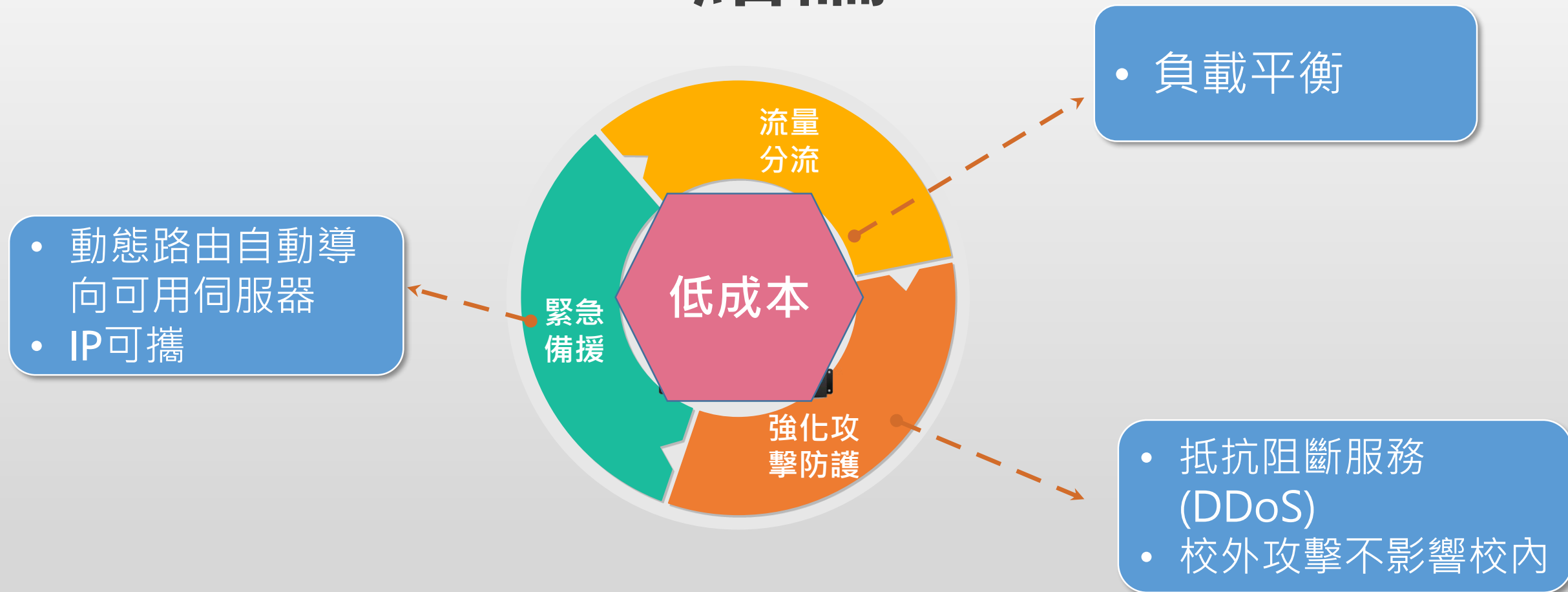
Quagga
(GNU General Public License)





結論與未來工作

結論



謝謝各位