

台北海洋技術學院
Taipei College of Maritime Technology
103 年 HP Switch 教育訓練



時間:103 年 12 月 12 日下午 13:00~17:00
地點:台北海洋技術學院福環樓 2F D212 教室
講師:蕭玉龍 先生



台北海洋技術學院

HPN 教育訓練

簡報大綱

- ~ 章節1 : A系列產品型號
- ~ 章節2 : Switch 產品簡介
- ~ 章節2 : Switch Console操作
- ~ 章節3 : Switch WEB操作
- ~ 章節4: IRF簡介

A-Series Box Switch Naming Rule

HP **A** **5** **5** **00-24** **G**- **EI**

A **B** **C** **D** **E** **F** **G** **H**

-  (Brand)
-  (Product Series Indicate)
 -  / E / V – Product Line
 -  – Sub Series Indicate
-  (Sub Series Indicate)
 -  –DC Chassis Switch
 -  –Core Chassis Switch
 -  –Core Router
 -  –High-End Chassis Switch
 -  –High-End Router
 -  – GE Box Switch
 -  – FE Box Switch with GE uplink

- D (L2, L3 Switch Indicate)
 - >=5 – L3 Routing Switch
 - <5 – L2 Switch
- E (Switch Model)
- F (Number of Available Ports)
- G (Port Type)
 - None – 10/100
 - G – GE Port
 - P – GE SFP Uplink
 - T – GE RJ45 Uplink

- H (Service Type Indicate)
 - EI – Enhanced Software Image
 - SI – Standard Software Image
 - POE-EI – PoE Supported EI
 - POE-SI – PoE Supported SI

A -系列固定埠交換器

10GE

Large campus
distribution layer
DC access layer



A5820X-14/24 SFP+

1G plus 8
*10G

Large campus
distribution layer
DC access layer



A5800-24/48G

GE Edge
Plus 10G

SME core layer
Large campus
distribution layer



A5120SI/EI

SI : No 10G Uplink and
QoS



A5500 SI

SI : RIP Only, Lite IRF



A5500 EI

FE Edge

Access layer for
campus LAN



A3100SI/EI

SI : Lite security , ACL/AM



A3600SI

SI : RIP Only, Lite IRF



A3600EI



A3610

No Stacking Feature

Layer 2 +

Standard Layer 3

Full Layer 3

Function

BGIC Information Co., Ltd
page 4



A-系列模組交換器

數據中心，
大型企業核心
高速運算中心
(HSC)

A9500 Series
12, 8 and 5-slot 1.4 terabit switches
Up to 192 **10GB & 576 Gig ports**
Load-sharing fabrics, redundant chassis,
management, power supplies, fans
Intelligent Resilient Fabric (IRF2)

中型數據中心
學術網核心



A9500

857 Mpps



A12500

2.2 Bpps

A12500 Series
18 and 8-slot **6.6/3.3 terabit**
switches
Up to 128 (1:1)/512 (4:1) 10GB
& 864 Gig ports
Non-blocking, zero service
interruption design
Architecture supports
40/100-GbE
Wire speed
L2/IPv4/IPv6/MPLS
Intelligent Resilient Fabric
(IRF2)

企業核心
大型企業匯
集層



A7500

714 Mpps

A7500 Series
10, 6, 3 and 2-slot, **2.4 terabit** switch
Up to **84 10GB and 504 Gig ports**
Red. main control; passive backplane; Intelligent
Resilient Fabric (IRF2)

IPv4, IPv6, OSPF, BGP, IS-IS
功能與效能

HP Campus LAN Switch Comparison



Performance	A9512	A9508	A9505	A7510	A7506-V	A5820-14XG	A5800-48G-PoE
Chassis/Box Switching Capacity	1.44 Tbps	1.44 Tbps	720 Gbps	1.5 Tbps	768 Gbps	488 Gbps	284 Gbps
Throughput	857 Mpps	571 Mpps	357 Mpps	714 Mpps	488 Mpps	363Mpps	211 Mpps
10GE (1:1) Density (max per chassis/box)	48	32	20	40	24	22	8
10GE (x:1) Density (max per chassis/box)	192 (4:1)	128 (4:1)	90 (4:1)	84 (2:1)	52	22	8
1GE (1:1) Density (max per chassis/box)	576	384	240	504	312	4	80
Port to Port Latency	4-5 uSec	4-5 uSec	4-5 uSec	4-5 uSec	4-5 uSec	1.48 (sf) - 1.2 (ct) uSec	2.1 uSec
PoE(+)	No	No	No	Yes (integrated)	Yes (integrated)No		Yes

**Flexible, energy efficient architecture,
leveraging common OS, management and
network design/resiliency protocols**

Rounding out our Comprehensive Enterprise Switching Portfolio



	A3100-EI	A3600	A3610	A5120	A5500-SI	A5500-EI
Speeds	•10/100 •Gigabit	•10/100 •Gigabit	•10/100 •Gigabit •10G	•Gigabit	•10/100 •Gigabit •10GE	•10/100 •Gigabit •10GE
Expandability	Clustering	Clustering/Stackable	Clustering	IRF	Clustering/ Single IP Mgmt	IRF
Form Factor	Desk and 19" Rack Mountable	19" Rack Mountable	19" Rack Mountable	19" Rack Mountable	19" Rack Mountable	19" Rack Mountable
Management	CLI / Web / SNMP	CLI / Web / SNMP	CLI / Web / SNMP	CLI / Web / SNMP	CLI / Web / SNMP	CLI / Web / SNMP
Switching	L2	L2/3	L2/3/4	L2/3	L2/3	L2/3/4
Routing	Static Routes*	RIP/OSPF/PIM	RIP / OSPF / BGP / IS-IS / PIM	Static Routes*	RIP	RIP / OSPF / BGP / IS-IS / PIM
IPv6	Management	Management	Routing, Management, VLANs	Management	Management, VLANs	Management/Routing/VLANs
Target Markets	Medium Business / Branch / Enterprise	Enterprise	Enterprise	Medium Business / Branch / Enterprise	Medium Business / Enterprise	Enterprise

- Integrated network mgmt and Common OS reduces complexity and IT training/personnel - lowers deployment and maintenance costs

HP Data Center Switch Portfolio



	A12518	A12508	A9512	A9508	A9505	A5820-24XG	A5820-14XG
Performance							
Chassis/Box Switching Capacity	6.6 Tbps	3.3 Tbps	1.44 Tbps	1.44 Tbps	720 Gbps	488 Gbps	488 Gbps
Throughput	2.2 Bpps	950 Mpps	857 Mpps	571 Mpps	357 Mpps	363Mpps	363Mpps
10GE (1:1) Density (max per chassis/box)	128	64	48	32	20	24	22
10GE (x:1) Density (max per chassis/box)	512 (4:1)	256 (4:1)	192 (4:1)	128 (4:1)	90 (4:1)	24	22
1GE (1:1) Density (max per chassis/box)	864	384	576	384	240	4	4
1GE (x:1) Density (max per chassis/box)	864	384	576	384	240	4	4
Port to Port Latency	8.15 uSec	8.15 uSec	4-5 uSec	4-5 uSec	4-5 uSec	1.48 (sf) - 1.2 (ct) uSec	
Power consumption (fully loaded chassis)	7,400 W	2,878 W	1,370 W	990 W	640 W	160 W	178 W

New modern architecture, leveraging common OS, management and network design/resiliency protocols

HP Networking Ethernet Switching Portfolio – Competitive Cross-Ref Matrix



	HP (A-Series)	HP (E-Series)	Cisco	Juniper	Brocade
Managed Switches	A12500		Nexus 7000		Big Iron RX Net Iron MLX
	A5820		Nexus 5000 Nexus 2000	EX4500	Turbo Iron / Net Iron / Fast Iron CX
	A9500/A7500		Catalyst 6500	EX8200	Big Iron MX
	A7500	E8200	Catalyst 4500R		Big Iron RX / Fast Iron Super X
		E5400	Catalyst 4500		
	A5820	E6600	Catalyst 4900M	EX2500/EX4500	Turbo Iron 24X
	A5800/A5500EI	E4800G	Catalyst 3750X (IP Services SW)	EX4200	Fast Iron CX
	A5500SI	E5400	Catalyst 3750X (IP Base SW)	EX4200	Fast Iron CX
	A5500SI	E5400	Catalyst 3750X (LAN Base)	EX4200	
	A5500EI	E4800G	Catalyst 3560X (IP Services SW)	EX3200	
	A5500SI	E3500G/E6200	Catalyst 3560X (IP Base SW)	EX3200	Fast Iron GS
	A5500SI	E2910G	Catalyst 3560X (LAN Base SW)	EX3200	
	A5120EI	E2910G	Catalyst 2960S (LAN-Base SW)	EX2200	
	A5120SI	E25XXG	Catalyst 2960S (LAN-Lite SW)	EX2200	
Managed Switches	A3600 EI _(10/100)		Catalyst 3750v2 (IP Serv SW)		Fast Iron Edge
	A3600SI _(10/100)	E5400	Catalyst 3750v2 (IP Base SW)		
	A3600EI _(10/100)		Catalyst 3560v2 (IP Services SW)		
	A3600SI _(10/100)	E3500	Catalyst 3560v2 (IP Base SW)	EX2x00	Fast Iron WS
	A3100EI _(10/100)	E2610	Catalyst 2960 (LAN-Base SW)	EX2x00	
	A3100SI _(10/100)	E25XX	Catalyst 2960 (LAN-Lite SW)		

HP Networking Confidential

Switch Console操作

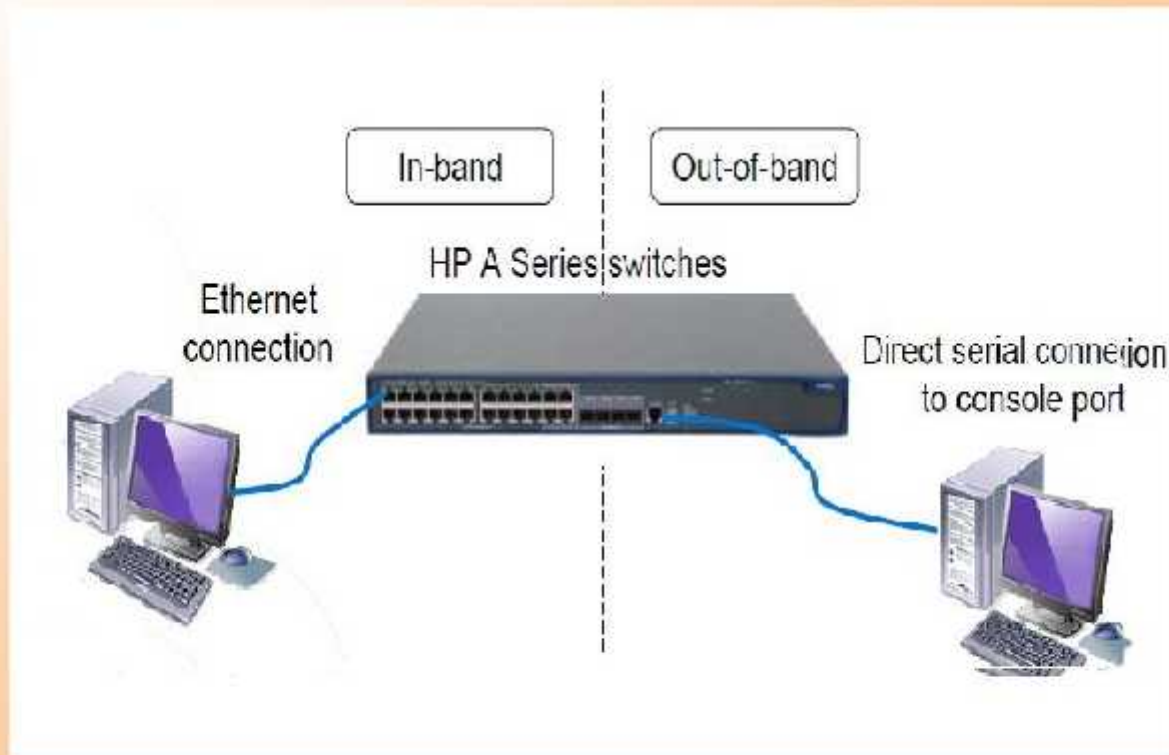
- ~ 常用指令對照
- ~ 進入CLI
- ~ 常用快速鍵
- ~ Port 名稱
- ~ 超級終端機登入方式
- ~ 進入設定模式
- ~ 顯示設定檔(display current-configuration)
- ~ 存檔(save)
- ~ 查看版本(display version)
- ~ 取消某一行設定(undo)
- ~ 在vlan 1 查看設定

Switch Console操作

- ~ 回上一層(quit)
- ~ 重開機(reboot)
- ~ 修改Console 名稱
- ~ 新增VLAN(例如: 新增VLAN 5 ,名稱叫OFFICE)
- ~ 移除VLAN 5
- ~ Add vlan by port (例如:port 1 and port 2至VLAN2)
- ~ 802.1Q(例如:把port 24 加入 VLAN 2 , 且讓每個vlan都放行)
- ~ 802.3ad link-aggregation(例如: port 47 and port 48 擲在group 1)

常用指令對照

ProVision	Comware 5	Cisco
enable	system-view	enable
show running-config	display current-config	show running-config
write memory	save	write
erase startup-config	reset saved-config	erase startup-config
no	undo	no
reload	reboot	reload
exit	quit	exit



按鍵	功能
<?>	查詢可使用指令
<Tab>	自動補齊指令
<Ctrl + E>	移動至行尾
<Ctrl + X>	刪除游標左側所有字元
<Ctrl + A>	移動至行首
<↑>	顯示上一次輸入指令

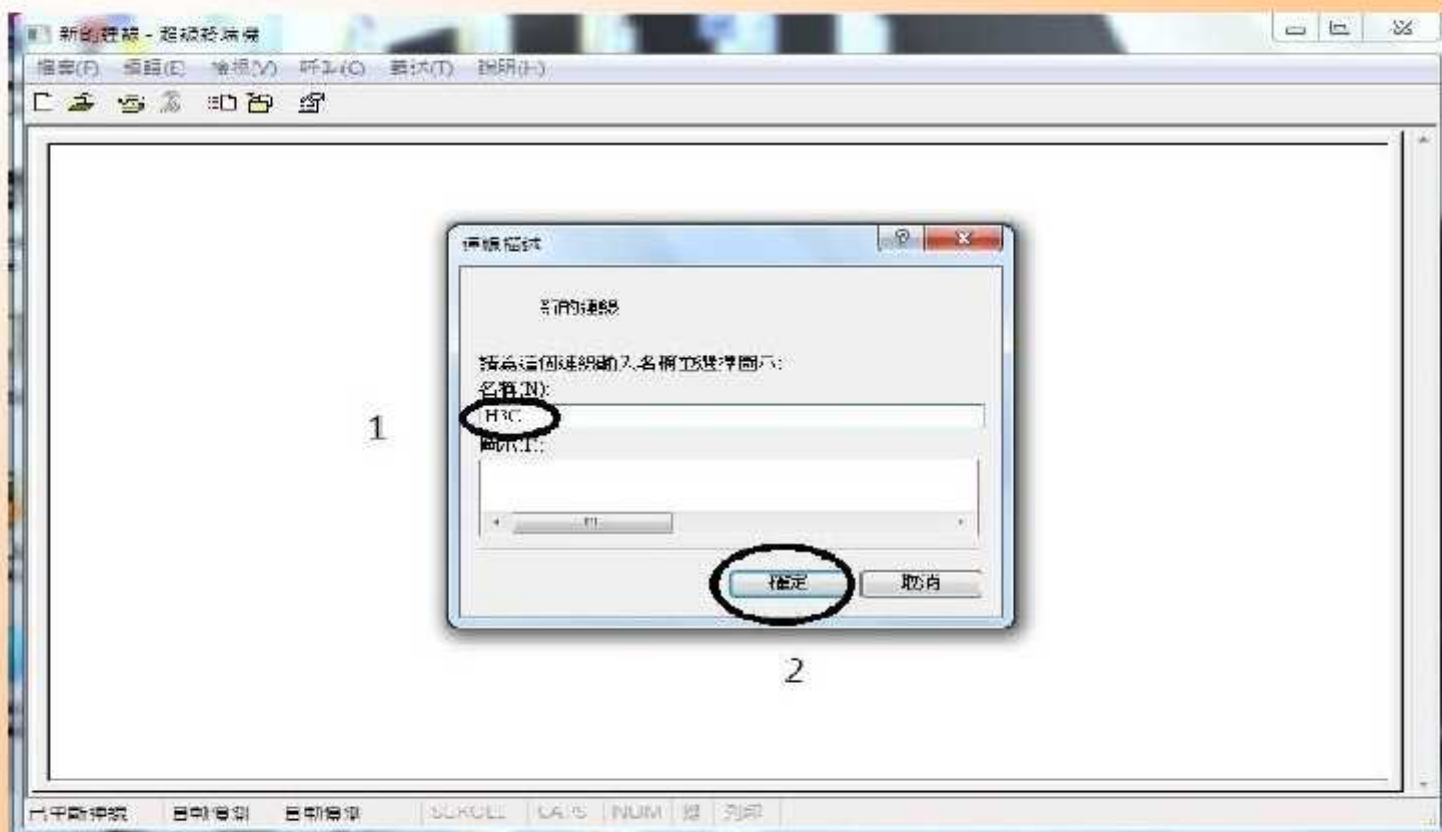
- Standalone
- slot/0/port number
- 例如
- e1/0/9
- g1/0/13



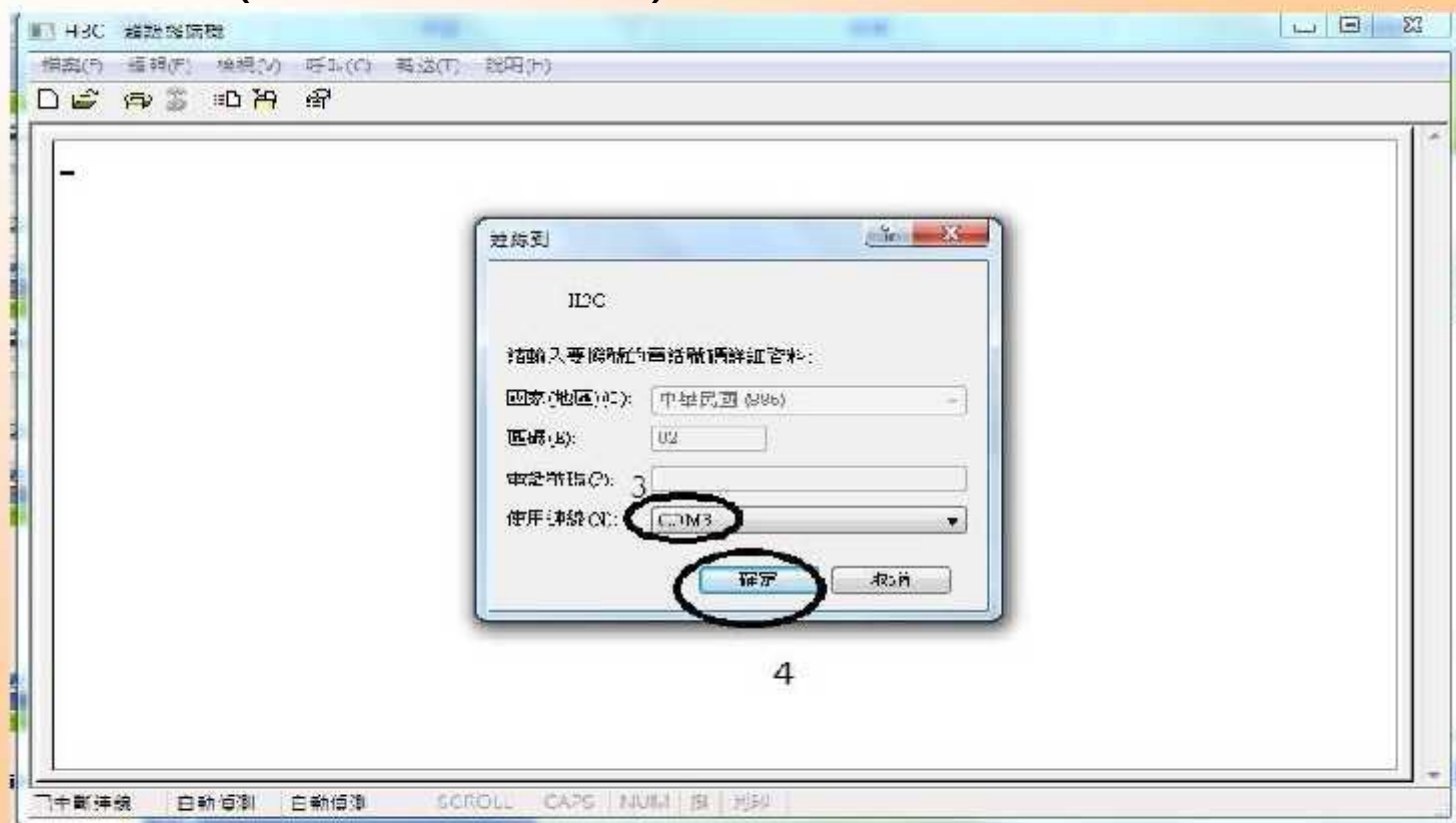
- Chassis
- Slot/module/0/port
- 例如
- g1/2/0/7
- ten2/2/0/18



登入方式(超級終端機第1步驟)



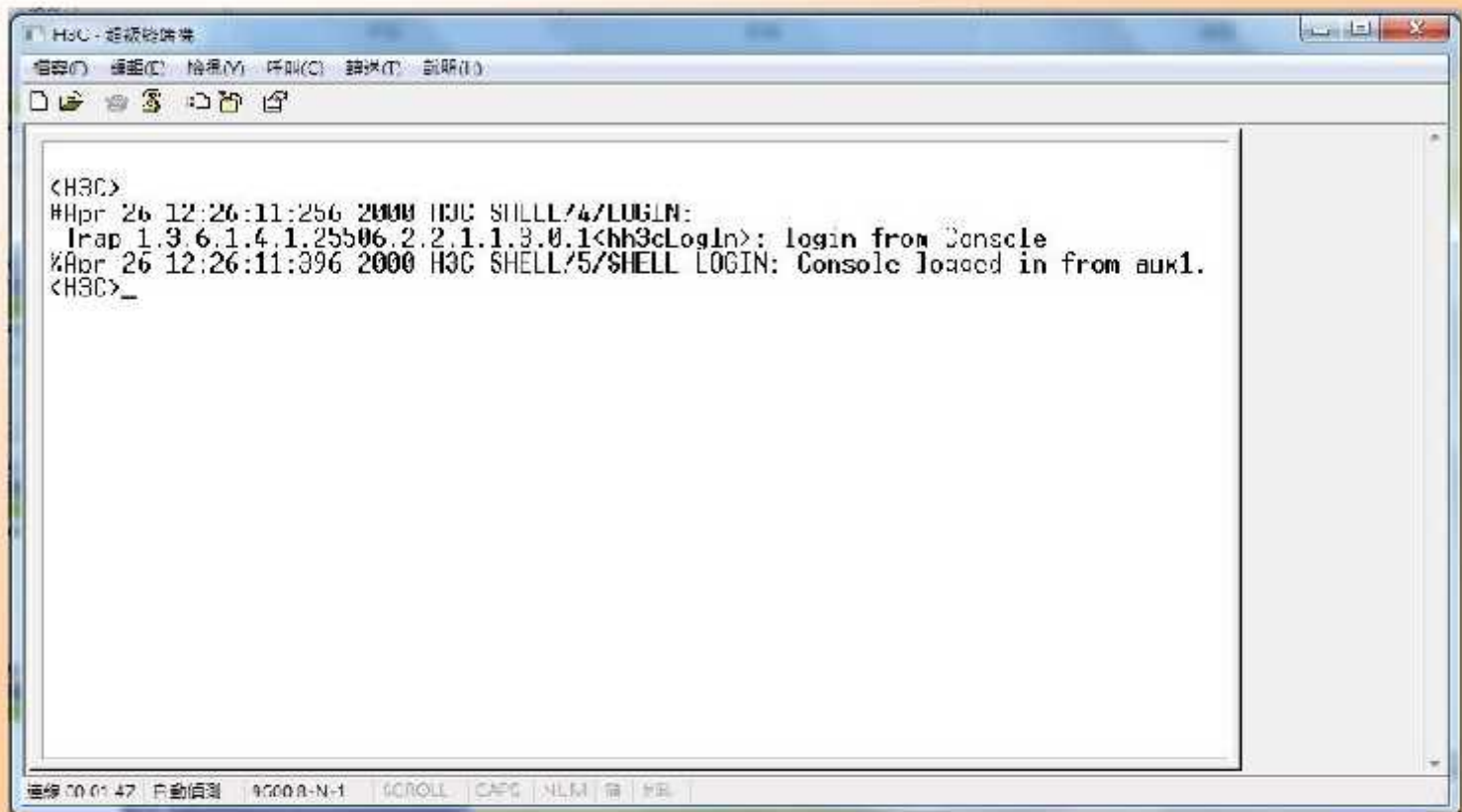
登入方式(超級終端機第2步驟)



登入方式(超級終端機第3步驟)

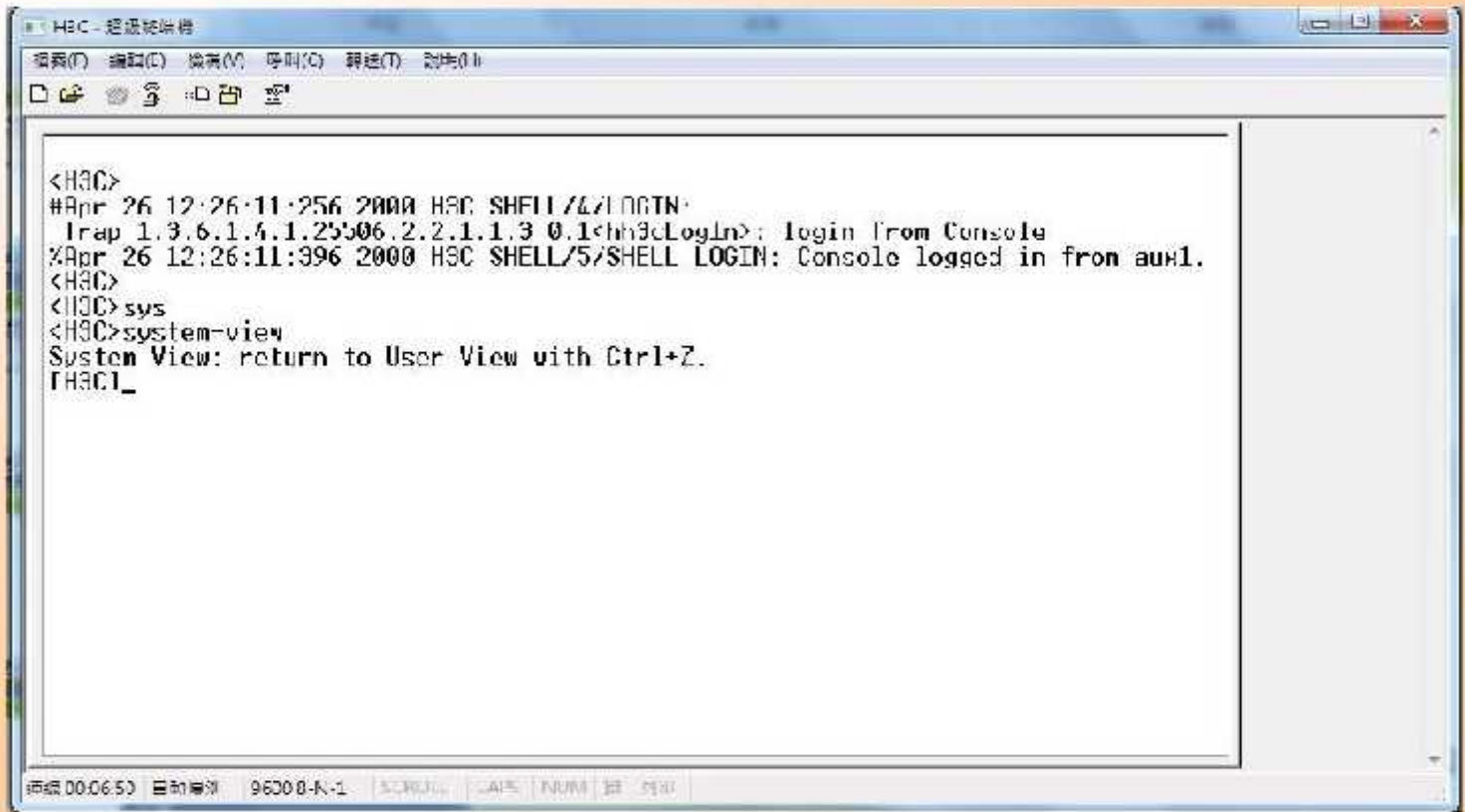


登入方式(超級終端機第4步驟)



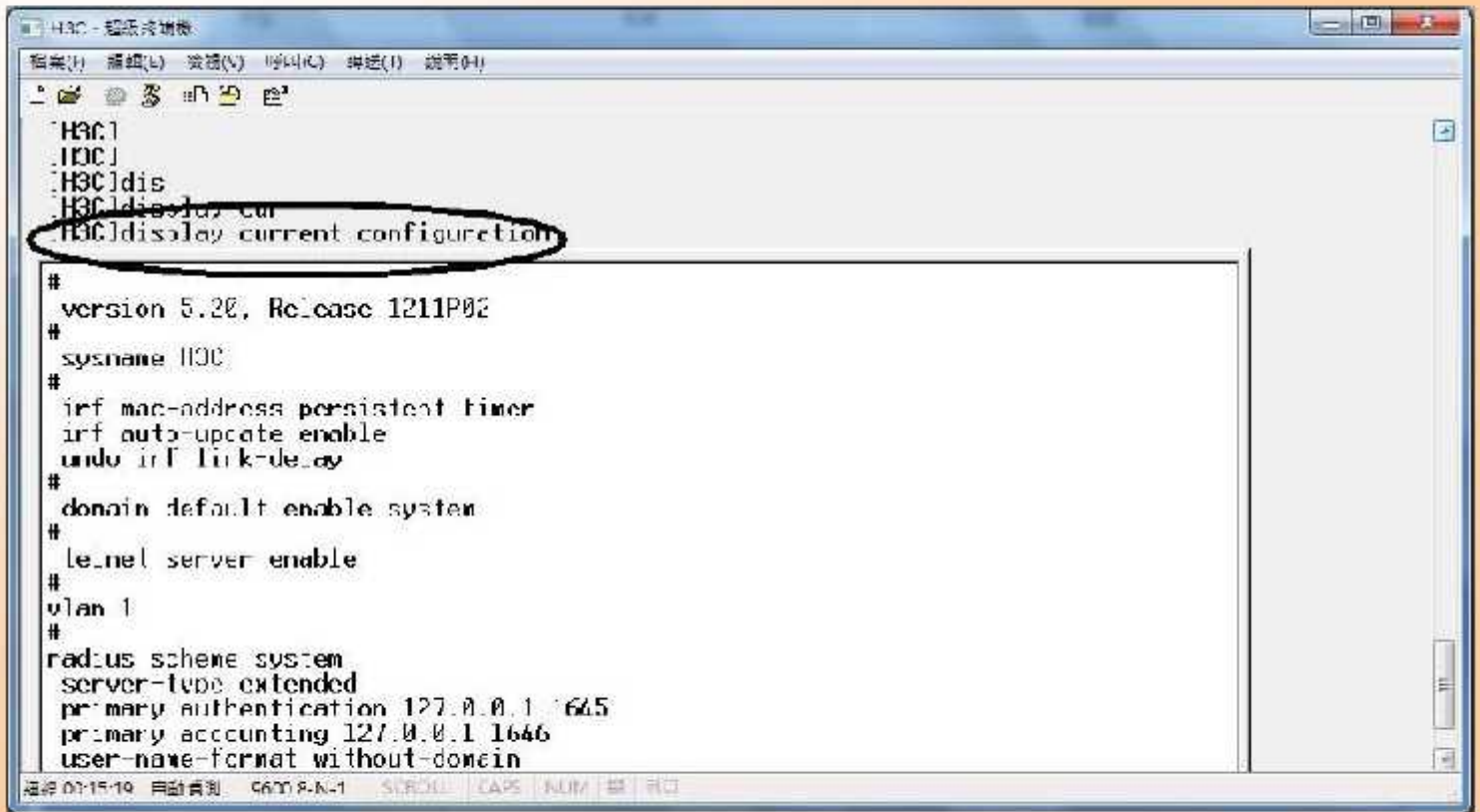
```
<H3C>
#Apr 26 12:26:11:256 2000 H3C: SHLL/4/LOGIN:
  trap 1.3.6.1.4.1.25506.2.2.1.1.3.0.1<hh3cLogin>: login from Console
%Apr 26 12:26:11:396 2000 H3C SHELL/5/SHELL LOGIN: Console loaded in from aux1.
<H3C>_
```

進入設定模式(system-view)



```
<H3C>
#Apr 26 12:26:11:256 2000 H3C SHELL/42/LOGIN:
  trap 1.3.6.1.4.1.25506.2.2.1.1.3 0.1<hh3cLogin>: login from Console
%Apr 26 12:26:11:396 2000 H3C SHELL/5/SHELL LOGIN: Console logged in from aux1.
<H3C>
<H3C>sys
<H3C>system-view
System View: return to User View with Ctrl+Z.
[H3C]
```

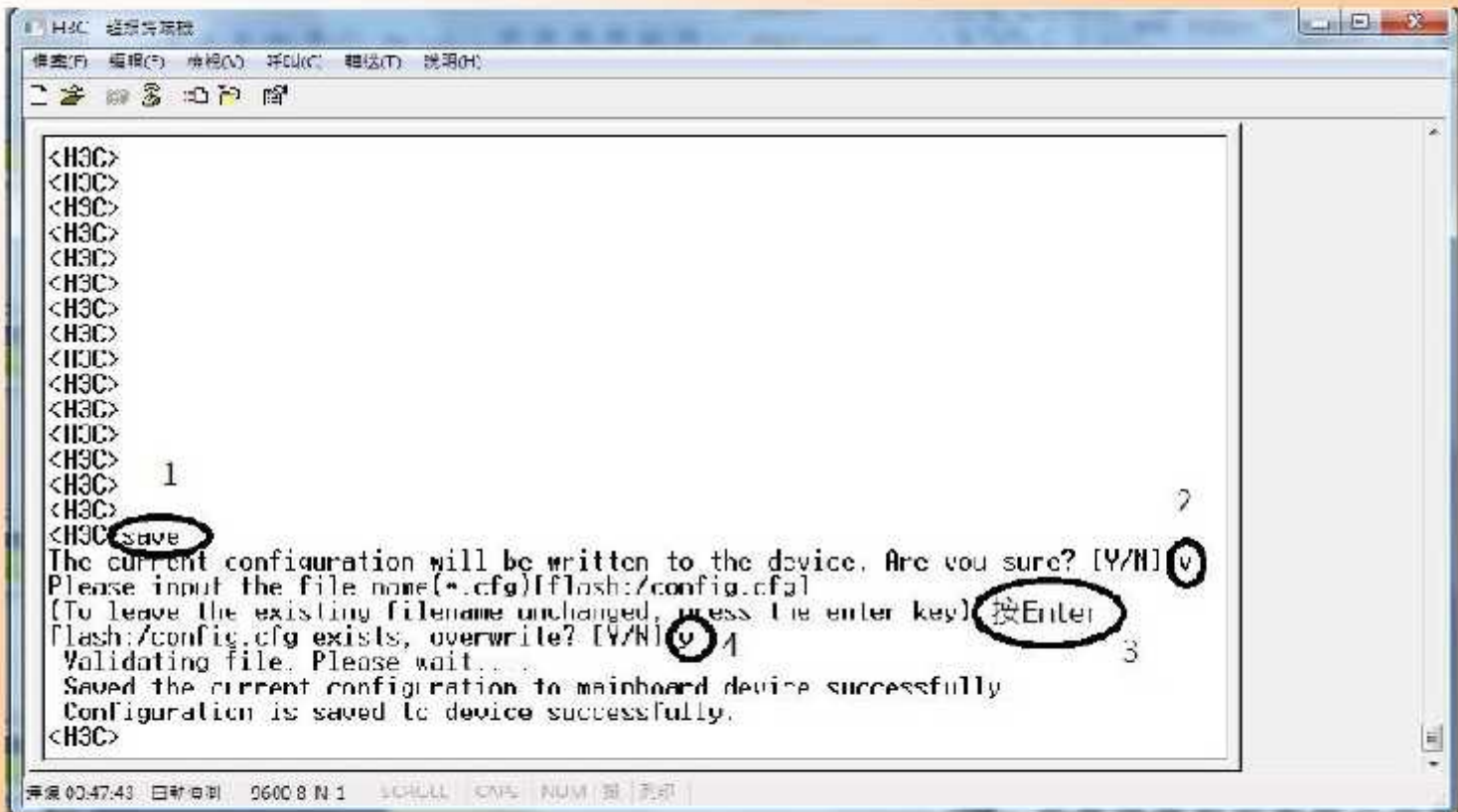
顯示設定檔(display current-configuration)



```
H3C>
H3C]
H3C]dis
H3C]display cur
H3C]display current configuration

#
version 5.20, Release 1211P02
#
sysname H3C
#
info mac-address persistent timer
info auto-update enable
undo info link-delay
#
domain default enable system
#
telnet server enable
#
vlan 1
#
radius scheme system
server-type extended
primary authentication 127.0.0.1 1645
primary accounting 127.0.0.1 1646
user-name-format without-domain
```

存檔(save)

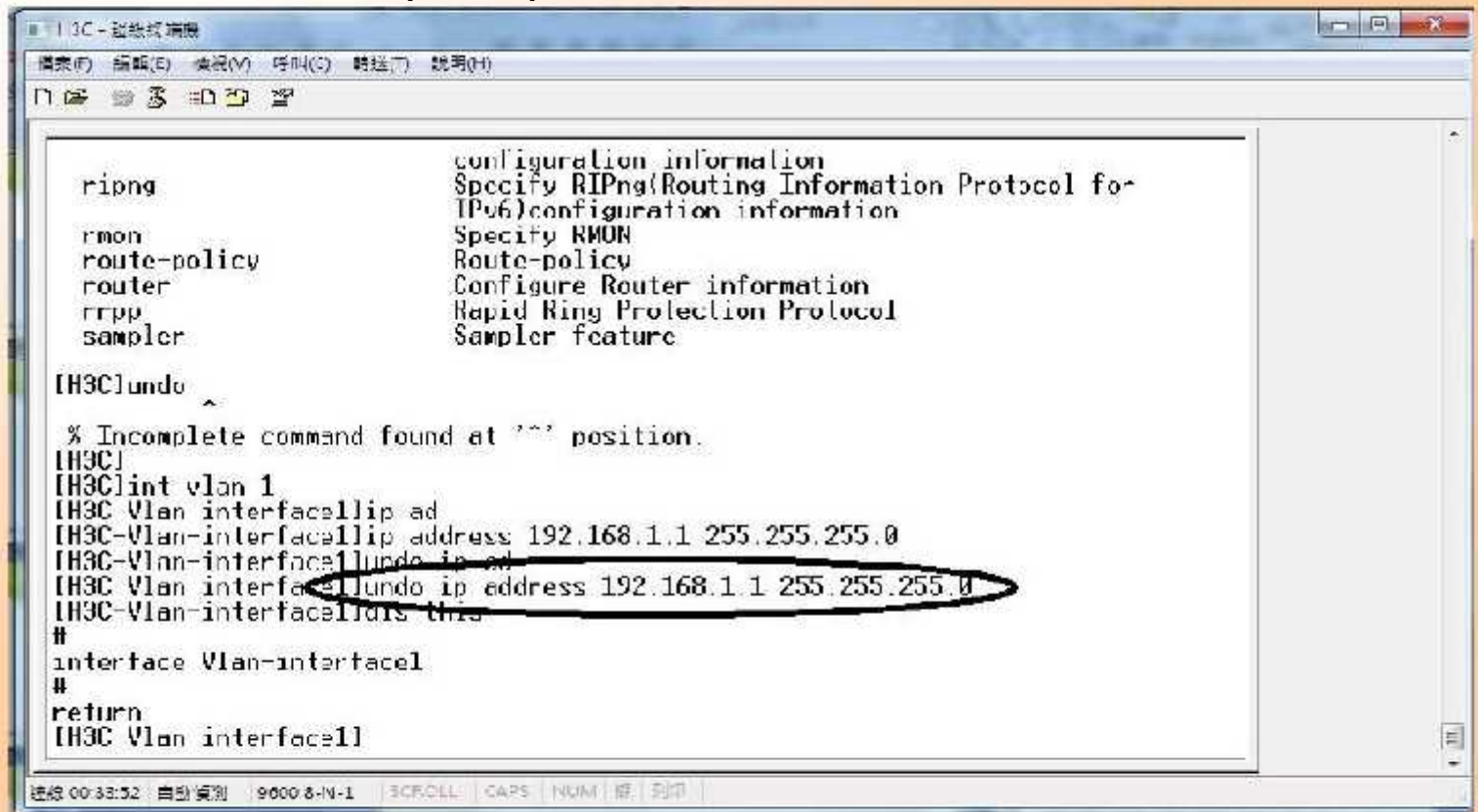


查看版本(display version)



```
H3C  
H3C  
H3C  
H3C  
H3Cdis  
H3Cdisplay ver  
H3Cdisplay version  
H3C Comware Platform Software  
Comware Software, Version 5.20, Release 1211P02  
Copyright (c) 2004-2011 Hangzhou H3C Tech. Co., Ltd. All rights reserved.  
H3C S5820X-28S uptime is 0 week, 0 day, 0 hour, 52 minutes  
  
H3C S5820X-28S with 2 Processors  
512M bytes SDRAM  
4M bytes Nor Flash Memory  
512M bytes Nand Flash Memory  
Config Register points to Nand Flash  
  
Hardware Version is Ver.B  
CPLDA Version is 002, CPLDB Version is 005  
BootRom Version is 215  
LSubSlot 01 24SFP Plus+4GL Hardware Version is Ver.B  
  
H3C1_
```

取消某一行設定(undo)



```
ripng          configuration information
                Specify RIPng(Routing Information Protocol for
                IPv6)configuration information
rmon           Specify RMON
route-policy   Route-policy
router         Configure Router information
rrpp           Rapid Ring Protection Protocol
sampler        Sampler feature

[H3C]undo
% Incomplete command found at '^' position.
[H3C]
[H3C]int vlan 1
[H3C-Vlan-interface1]ip ad
[H3C-Vlan-interface1]address 192.168.1.1 255.255.255.0
[H3C-Vlan-interface1]undo ip ad
[H3C-Vlan-interface1]undo ip address 192.168.1.1 255.255.255.0
[H3C-Vlan-interface1]dis this
#
interface Vlan-interface1
#
return
[H3C-Vlan-interface1]
```

連線 00:33:52 | 自動換列 | 9000 8-M-1 | SCROLL | CAPS | NUM | 屏 | 列印

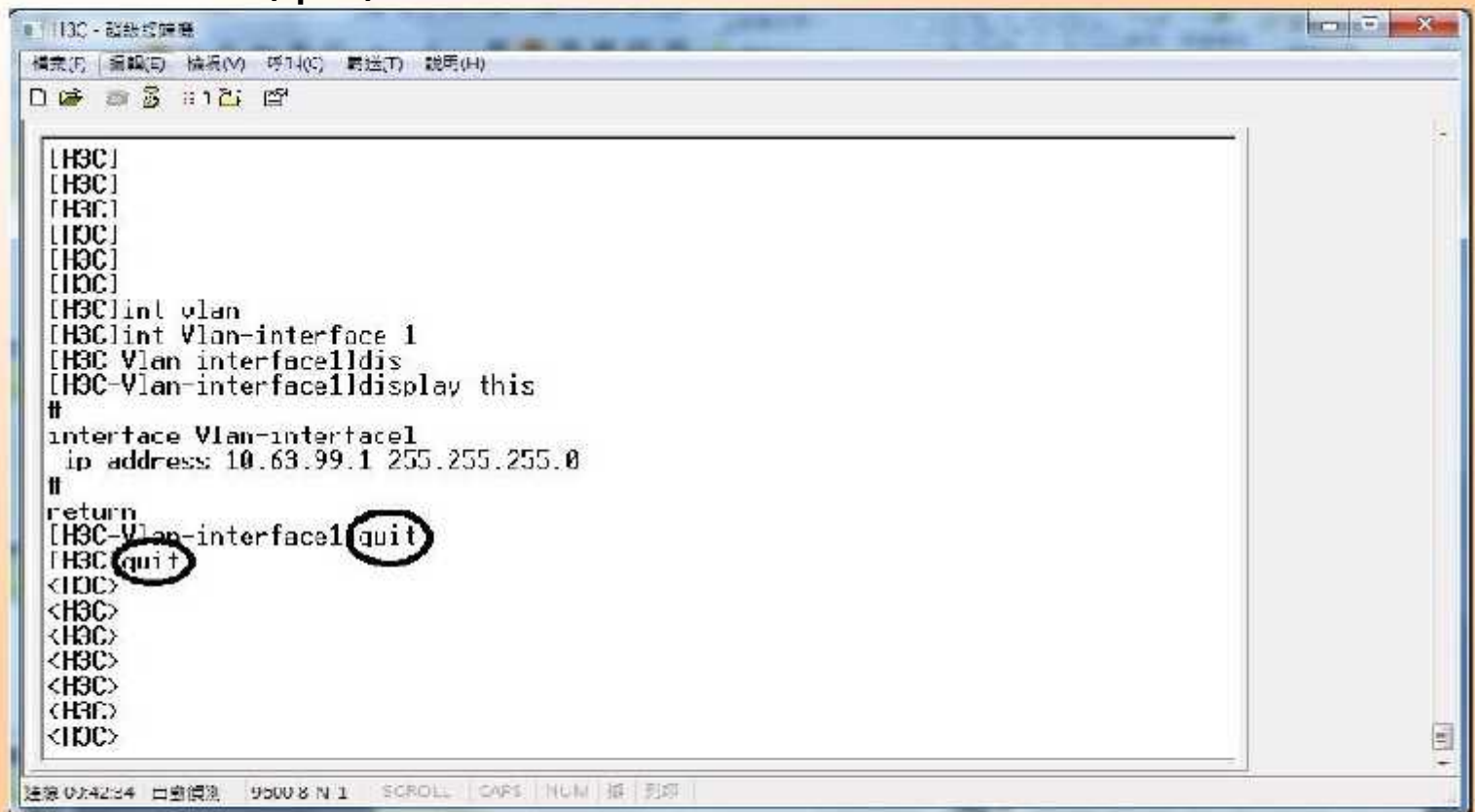
在vlan 1 查看 設定(display this)

A screenshot of a terminal window titled "H3C - 系统终端". The menu bar includes "檔案(F)", "編輯(E)", "檢視(V)", "呼叫(C)", "轉送(T)", and "說明(H)". Below the menu are icons for file operations like opening, saving, printing, and zooming. The main area contains a series of commands entered at the prompt [H3C]:
[H3C]
[H3C]
[H3C]
[H3C]
[H3C]
[H3C]
[H3C]
[H3C]
[H3C]
[H3C]
[H3C]
[H3C]
[H3C]
[H3C] int vlan
[H3C] int Vlan-interface 1
[H3C-Vlan-interface1] dis
[H3C-Vlan-interface1] display this

interface Vlan-interface1
ip address 10.60.59.1 255.255.255.0

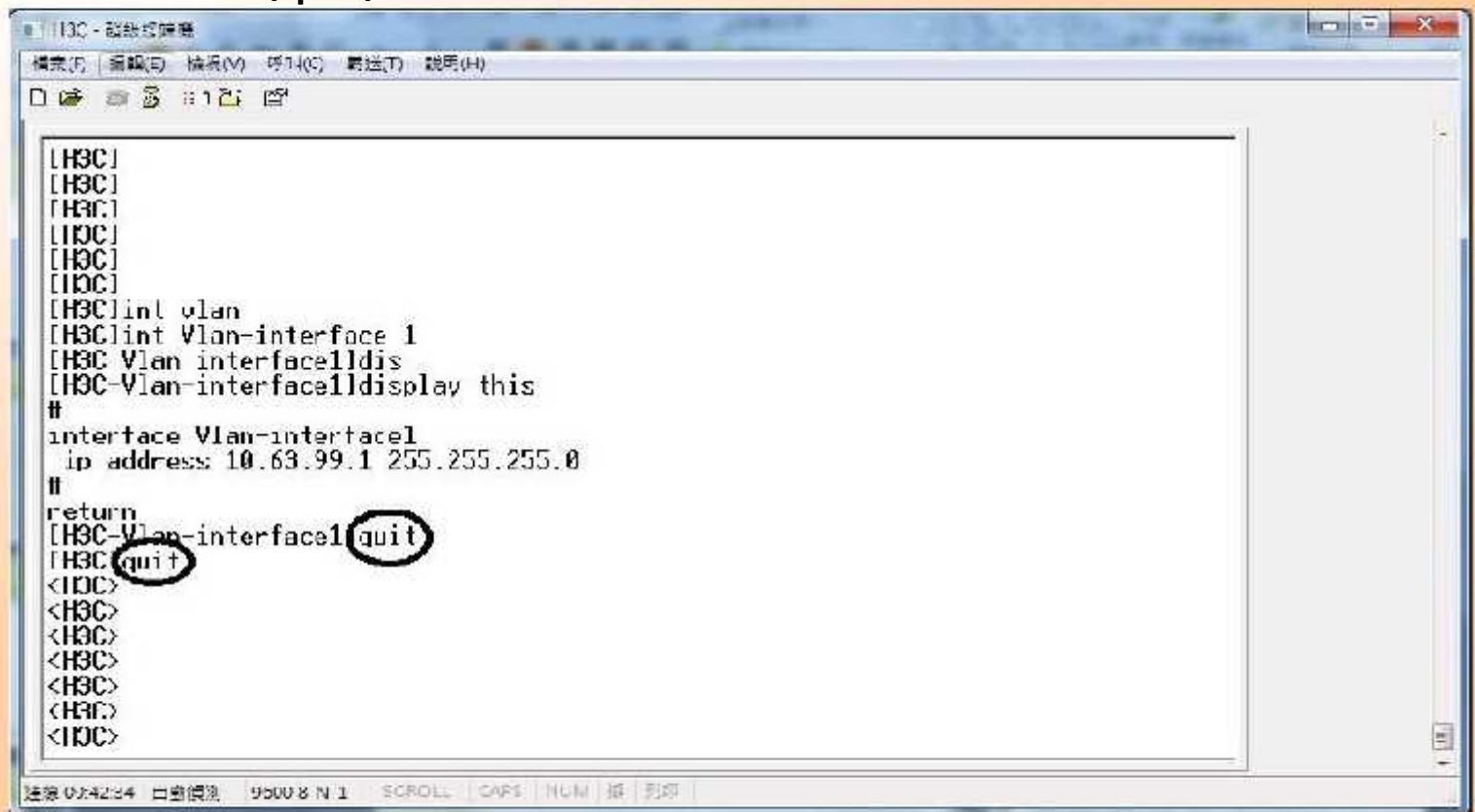
return
[H3C-Vlan-interface1_]The text "display this" in the command "[H3C-Vlan-interface1] display this" is circled in red. At the bottom status bar, it shows "連線 00:09:21", "命令模式", "9600 8-N-1", and keyboard shortcuts "SCROLL CAPS N.M.", along with scroll and enter icons.

回上一層(quit)



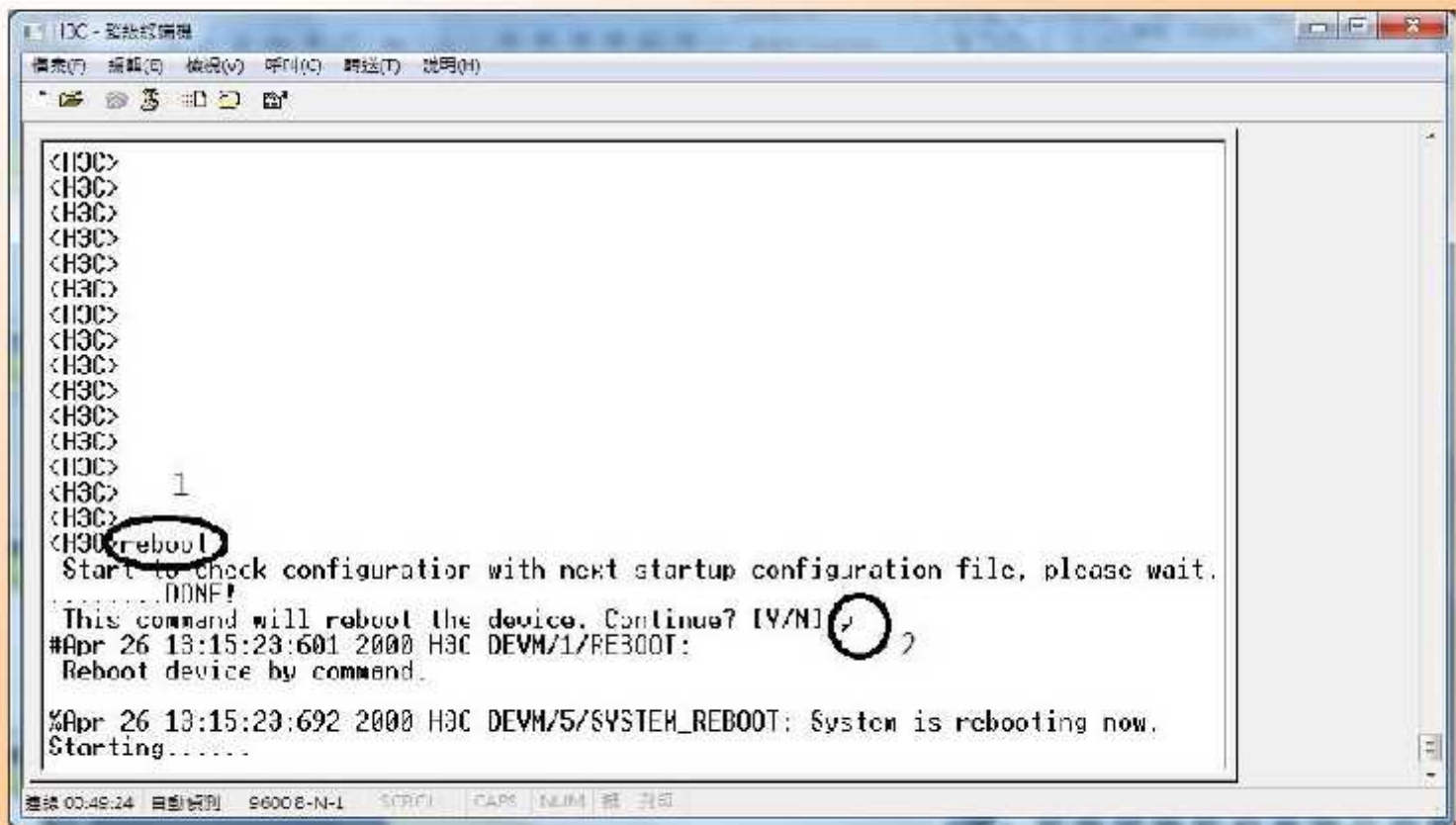
```
[H3C]
[H3C]
[H3C]
[H3C]
[H3C]
[H3C]
[H3C] int vlan
[H3C] int Vlan-interface 1
[H3C] Vlan interface1 dis
[H3C] Vlan interface1 display this
#
interface Vlan-interface1
 ip address 10.63.99.1 255.255.255.0
#
return
[H3C-Vlan-interface1] quit
[H3C] quit
<H3C>
<H3C>
<H3C>
<H3C>
<H3C>
<H3C>
<H3C>
<H3C>
```

回上一層(quit)



```
[H3C]
[H3C]
[H3C]
[H3C]
[H3C]
[H3C]
[H3C] int vlan
[H3C] int Vlan-interface 1
[H3C] Vlan interface1 dis
[H3C] Vlan-interface1 display this
#
interface Vlan-interface1
 ip address 10.63.99.1 255.255.255.0
#
return
[H3C-Vlan-interface1] quit
[H3C] quit
<H3C>
<H3C>
<H3C>
<H3C>
<H3C>
<H3C>
<H3C>
<H3C>
```

重開機(reboot)



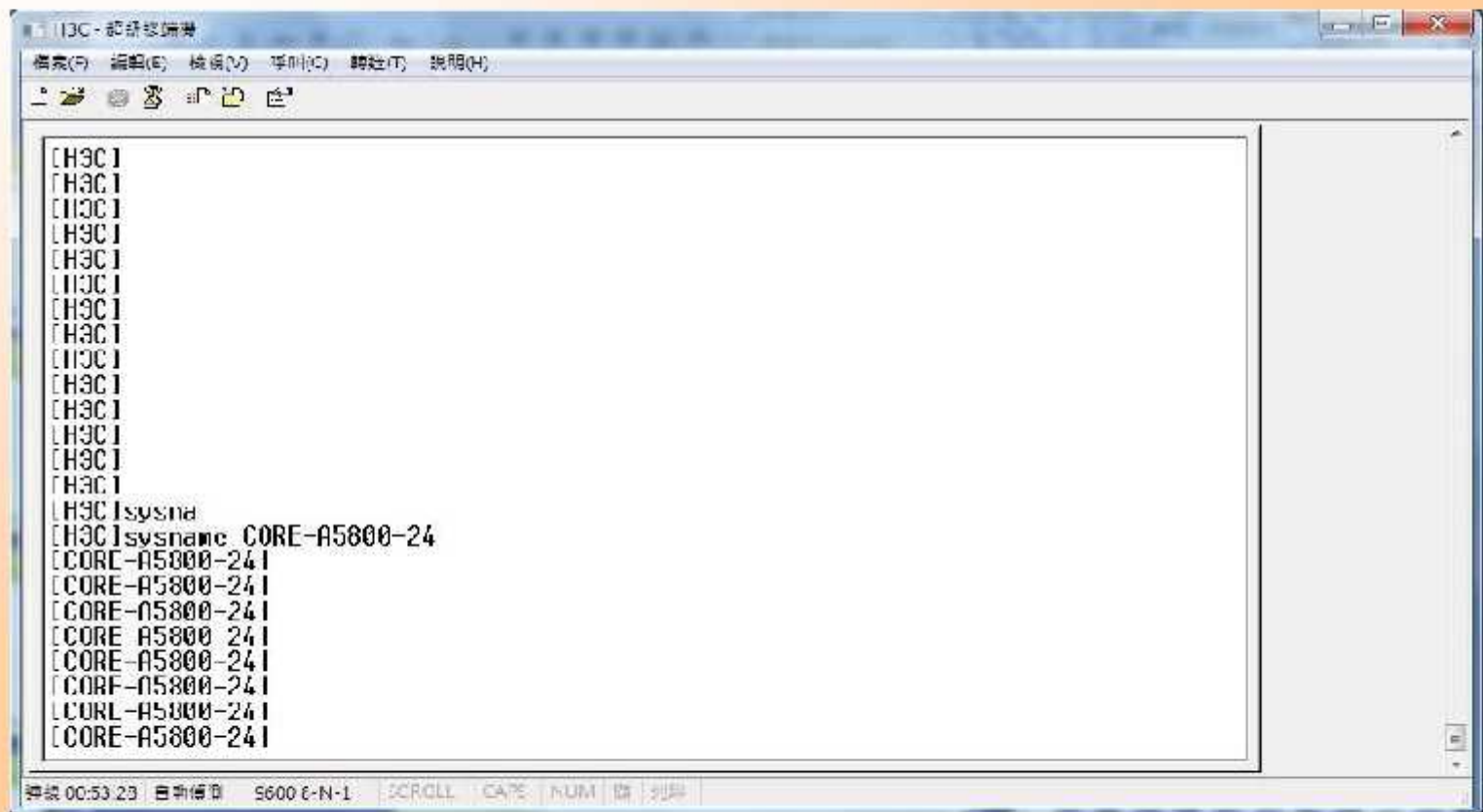
The screenshot shows a terminal window titled "H3C - 配置终端". The command history includes several "<H3C>" and "<H3C>" prompts. The user enters the command "reboot", which is circled in red. The terminal displays the following messages:

```
<H3C>
<H3C>
<H3C>
<H3C>
<H3C>
<H3C>
<H3C>
<H3C>
<H3C>
<H3C>
<H3C>
<H3C>
<H3C>
<H3C>
1
<H3C>
<H3C>
<H3C>reboot
Start to check configuration with next startup configuration file, please wait.
...DONE!
This command will reboot the device. Continue? [Y/N] Y
#Apr 26 13:15:23:601 2000 H3C DEVM/1/REBOOT:
Reboot device by command.

#Apr 26 13:15:23:692 2000 H3C DEVM/5/SYSTEM_REBOOT: System is rebooting now.
Starting.....
```

The status bar at the bottom of the terminal window shows: "连接 00:49:24 自动识别 9600 8-N-1 SCRIPT CAPS NUM 概 浏览".

修改Console 名稱



新增VLAN(例如: 新增VLAN 5,名稱叫OFFICE)

```
[H3C]
[H3C]
[H3C]
[H3C]
[H3C]
[H3C]
[H3C]
[H3C]
[H3C]dis vlan
Total 1 VLAN exist(s).
The following VLANs exist:
1(default),
[H3C-vlan5]
[H3C-vlan5]name OFFICE
[H3C-vlan5]dis vlan 5
VLAN ID: 5
VLAN Type: static
Route Interface: not configured
Description: VLAN 0005
Name: OFFICE
Tagged Ports: none
Untagged Ports: none

[H3C-vlan5]
```

移除VLAN 5

```
[H3C-vlan5]
[H3C-vlan5]
[H3C-vlan5]QUIT
[H3C]
[H3C]
[H3C]
[H3C]
[H3C]
[H3C]
[H3C]dis vlan 5
VLAN ID: 5
VLAN Type: static
Route Interface: not configured
Description: VLAN 0005
Name: OFFICE
Tagged Ports: none
Untagged Ports: none

[H3C]undo vlan 5
[H3C]dis vlan
Total 1 VLAN exist(s).
The following VLANs exist:
1(default),
[H3C]
```

Add vlan by port (把port 1 and port 2至VLAN2)

```
[H3C]
[H3C]
[H3C]
[H3C]
[H3C]
[H3C]
[H3C]
[H3C]
[H3C]
[H3C]
[H3C]
[H3C]
[H3C]
[H3C]
[H3C-vlan2]
[H3C-vlan2]port g1/0/1 to g1/0/2
[H3C-vlan2]dis vlan 2
VLAN ID: 2
VLAN Type: static
Route Interface: not configured
Description: VLAN 0002
Name: VLAN 0002
Tagged Ports: none
Untagged Ports:
GigabitEthernet1/0/1      GigabitEthernet1/0/2
[H3C-vlan2]
```

802.1Q(例如:把port 24 加入 VLAN 2，且讓每個vlan都放行)

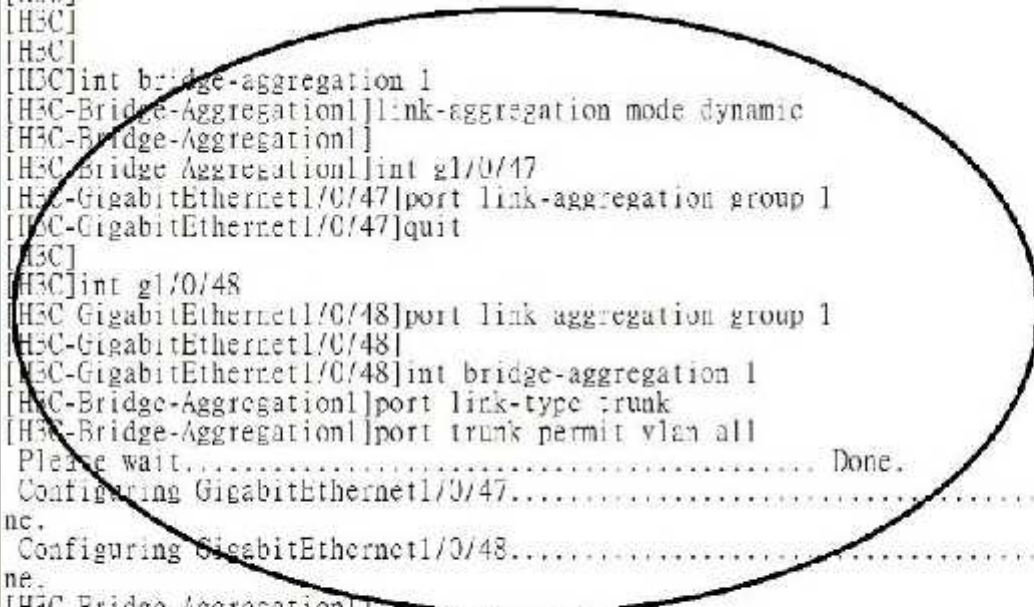
```

[H3C-GigabitEthernet1/0/24]
[H3C-GigabitEthernet1/0/24]
[H3C-GigabitEthernet1/0/24]
[H3C-GigabitEthernet1/0/24]
[H3C-GigabitEthernet1/0/24]
[H3C-GigabitEthernet1/0/24]quit
[H3C]
[H3C]
[H3C]
[H3C]
[H3C]
[H3C-GigabitEthernet1/0/24]port link-type trunk
[H3C-GigabitEthernet1/0/24]port link-type trunk
[H3C-GigabitEthernet1/0/24]port
[H3C-GigabitEthernet1/0/24]port trunk permit vlan all
Please wait... Done.
[H3C-GigabitEthernet1/0/24]dis this
#
interface GigabitEthernet1/0/24
port link-type trunk
port trunk permit vlan all
#
return
[H3C-GigabitEthernet1/0/24]_

```

802.3ad link-aggregation(例如: port 47 and port 48

擲在group 1)



```
[H3C]
[H3C]
[H3C]
[H3C]
[H3C]
[H3C]int bridge-aggregation 1
[H3C-Bridge-Aggregation1]link-aggregation mode dynamic
[H3C-Bridge-Aggregation1]
[H3C-Bridge-Aggregation1]int g1/0/47
[H3C-GigabitEthernet1/0/47]port link-aggregation group 1
[H3C-GigabitEthernet1/0/47]quit
[H3C]
[H3C]int g1/0/48
[H3C-GigabitEthernet1/0/48]port link aggregation group 1
[H3C-GigabitEthernet1/0/48]
[H3C-GigabitEthernet1/0/48]int bridge-aggregation 1
[H3C-Bridge-Aggregation1]port link-type trunk
[H3C-Bridge-Aggregation1]port trunk permit vlan all
Please wait..... Done.
Configuring GigabitEthernet1/0/47..... Do
ne.
Configuring GigabitEthernet1/0/48..... Do
ne.
[H3C-Bridge-Aggregation1]
```

连接 00:20:12 配置成功 06008-N-1 168001 [LANS] [RUN] [0] [00:12]

Switch WEB操作

- ~ 設定帳號與密碼登入WEB
- ~ CLI Command Levels
- ~ Wizard
- ~ NTP時間設定
- ~ 新增帳號
- ~ 修改admin登入密碼
- ~ 刪除nick帳號
- ~ 查看CPU、溫度、記憶體使用率
- ~ 查看Switch port up or down
- ~ 新增VLAN 2
- ~ 移除VLAN 2
- ~
- ~

Switch WEB操作

- ~ Add vlan by port (把port 1 and port 2至VLAN2)
- ~ 802.1Q(把port 24 設定成trunk port)
- ~ Detail(查看VLAN 2 的port 1、2、24)
- ~ 假設我的vlan 2是管理ip的話，如何在vlan 2新增管理ip

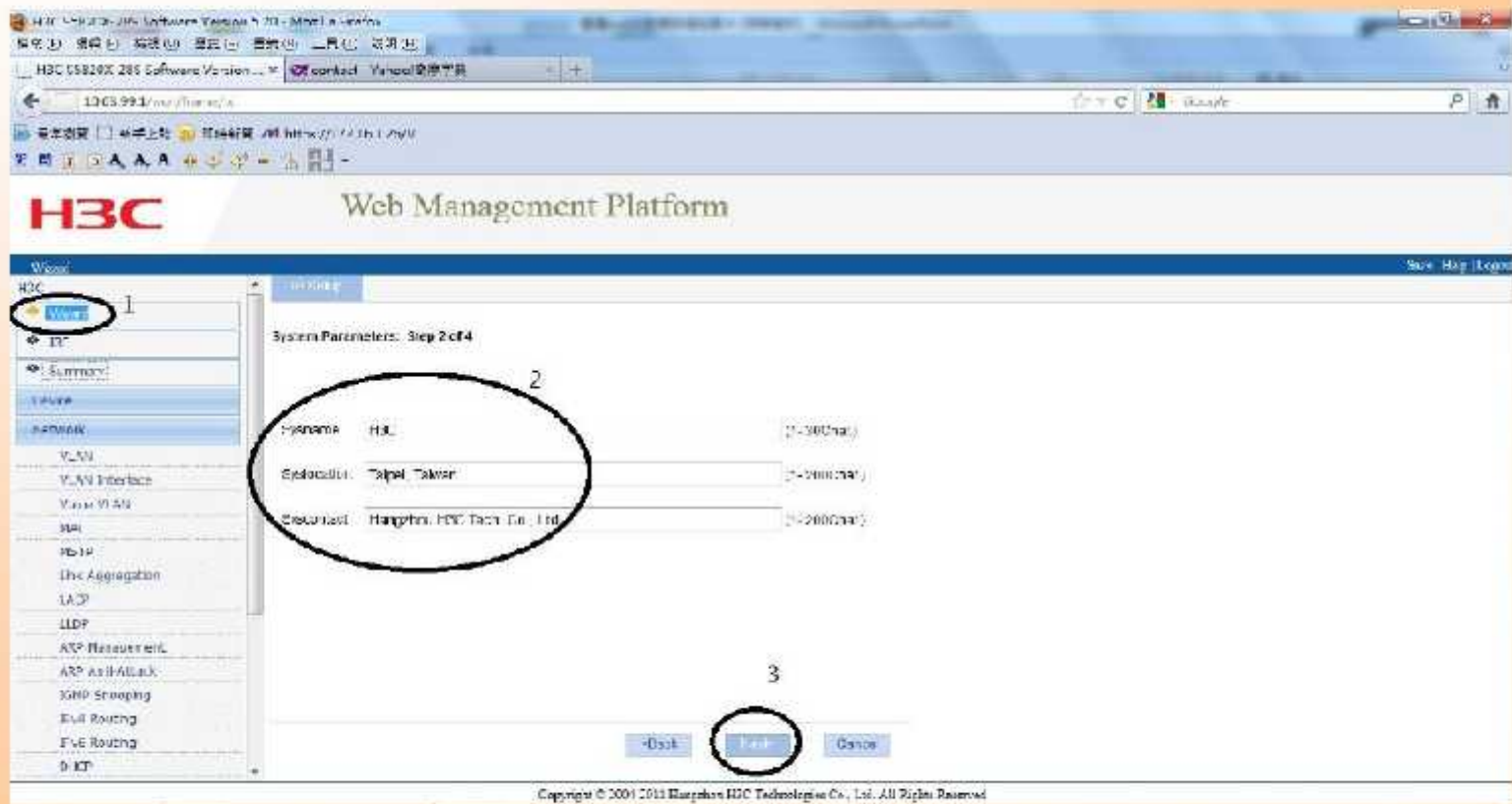
設定帳號與密碼登入WEB 與console-3



CLI Command Levels

- 0 -> Visitor
 - ping, traceroute
- 1 -> Monitor
 - Basic read-only commands
- 2 -> System
 - Services configuration commands
- 3 -> Manager
 - System(files, users) management commands

Wizard-1



Wizard-2

The screenshot shows the H3C Web Management Platform interface. The title bar indicates the browser is Firefox 5.20. The address bar shows the URL <https://172.18.1.36/V...>. The main content area is titled "Web Management Platform" and displays the "Management IP Interface configuration: Step 3 of 4".

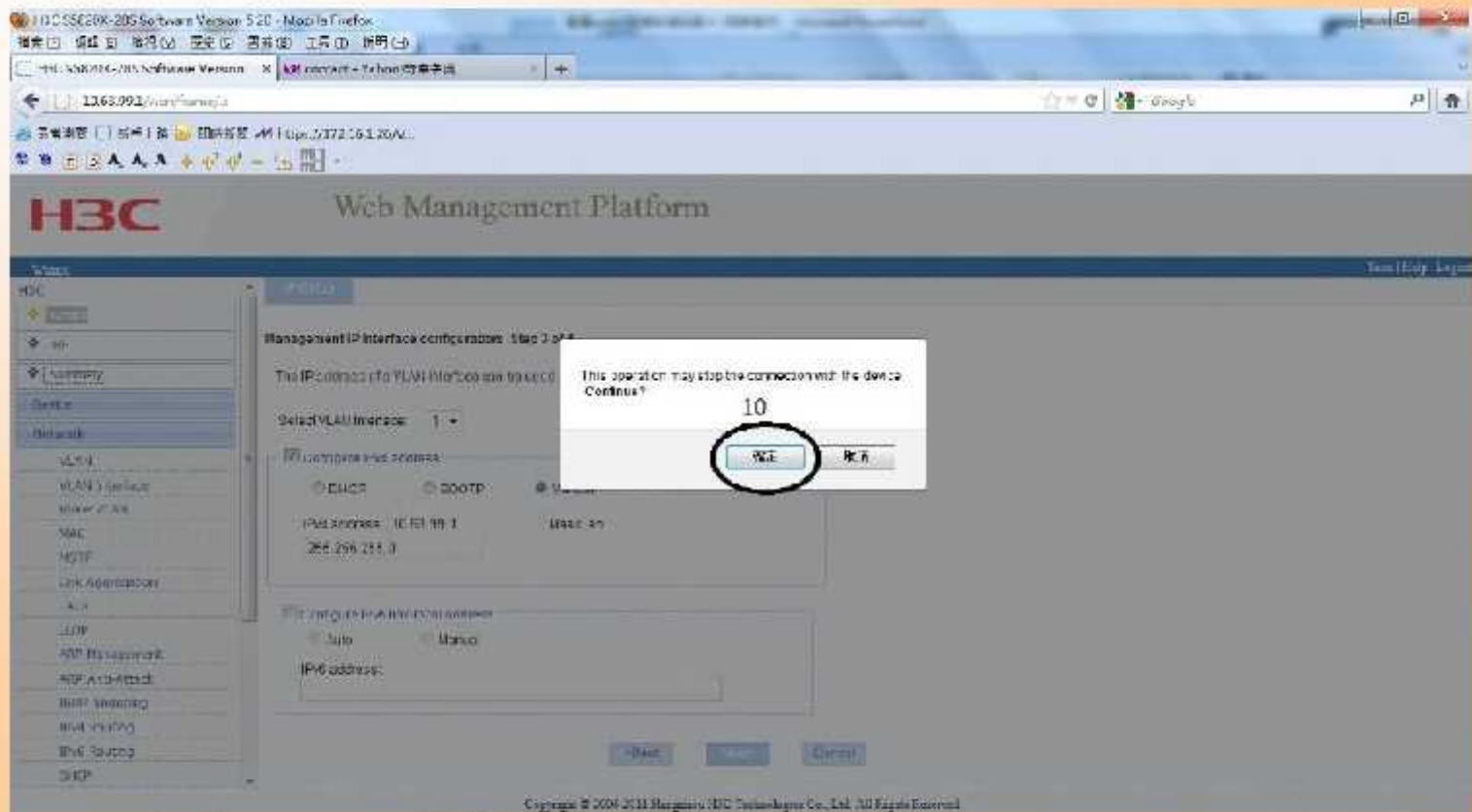
The configuration steps are as follows:

1. Select the Management IP interface (labeled 1).
2. Select the VLAN interface (labeled 2).
3. Select the Admin status (labeled 3).
4. Select the IP address (labeled 4).
5. Select the Admin status (labeled 5).
6. Select the IP address (labeled 6).
7. Select the IP address (labeled 7).
8. Select the IP address (labeled 8).

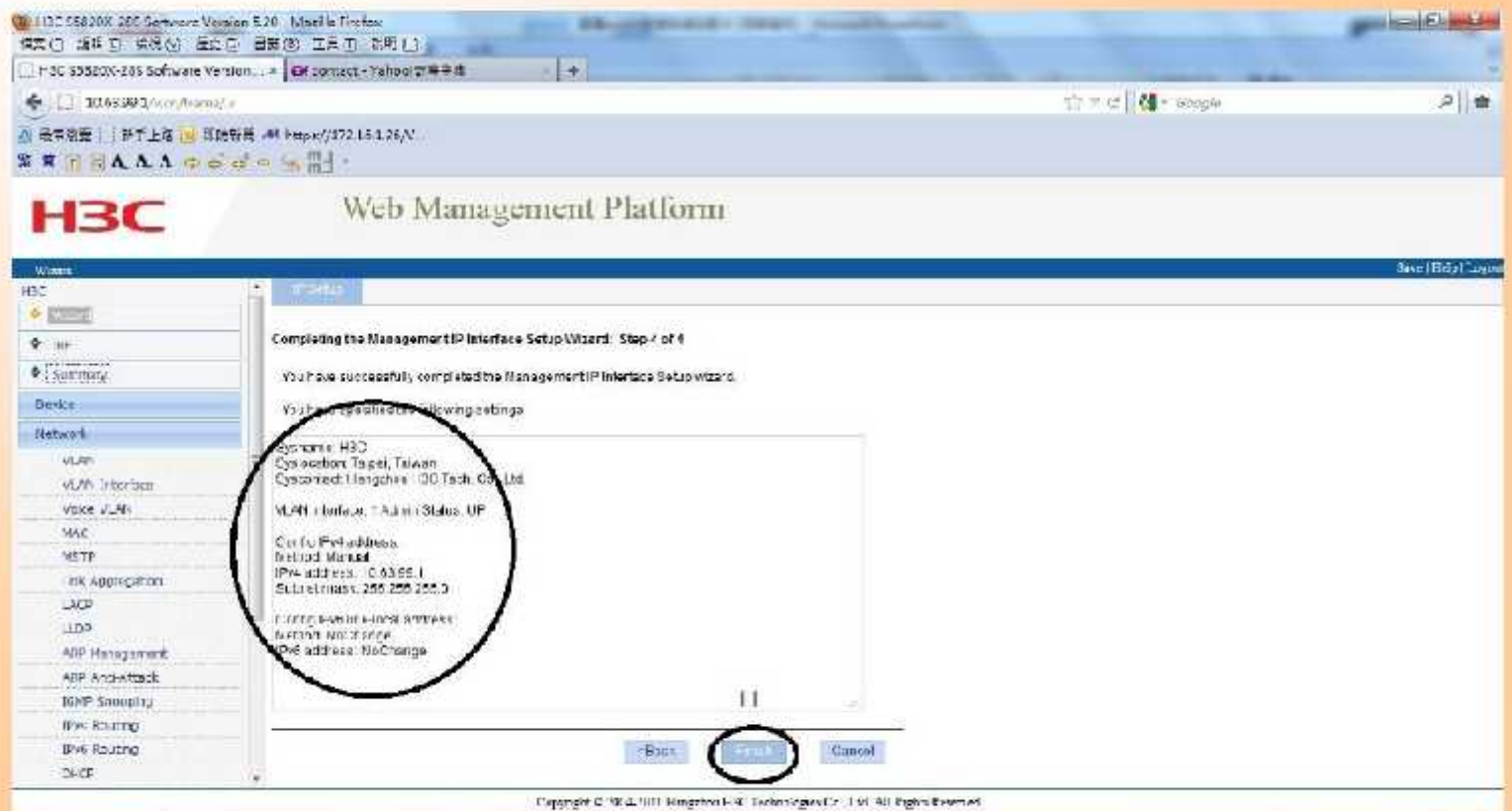
The interface also includes a sidebar with navigation options such as VLAN, VLAN Interface, and various protocols. The main area displays the configuration steps for a Management IP interface, with numbered callouts (1-8) highlighting specific fields and buttons.

Copyright © 2004-2011 H3C Technologies Co., Ltd. All Rights Reserved.

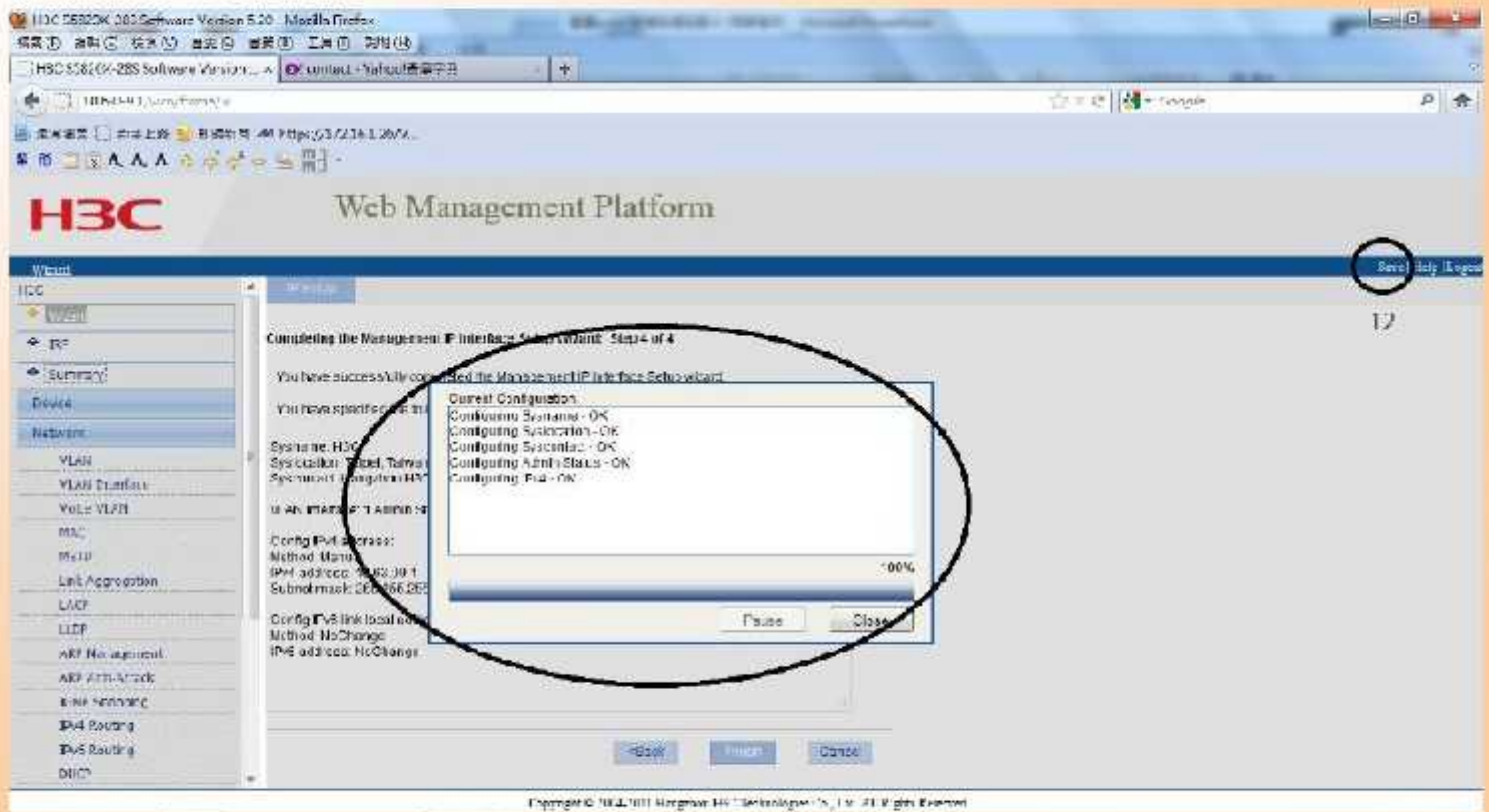
Wizard-3



Wizard-4



Wizard-5



NTP時間設定

H3C Web Management Platform

System Time

Clock status: unsynchronized

Source Interface

Key	ID	Key String	Reference Key ID
Key 1	1234567890	1234567890	1234567890
Key 2	1234567890	1234567890	1234567890

External Reference Source

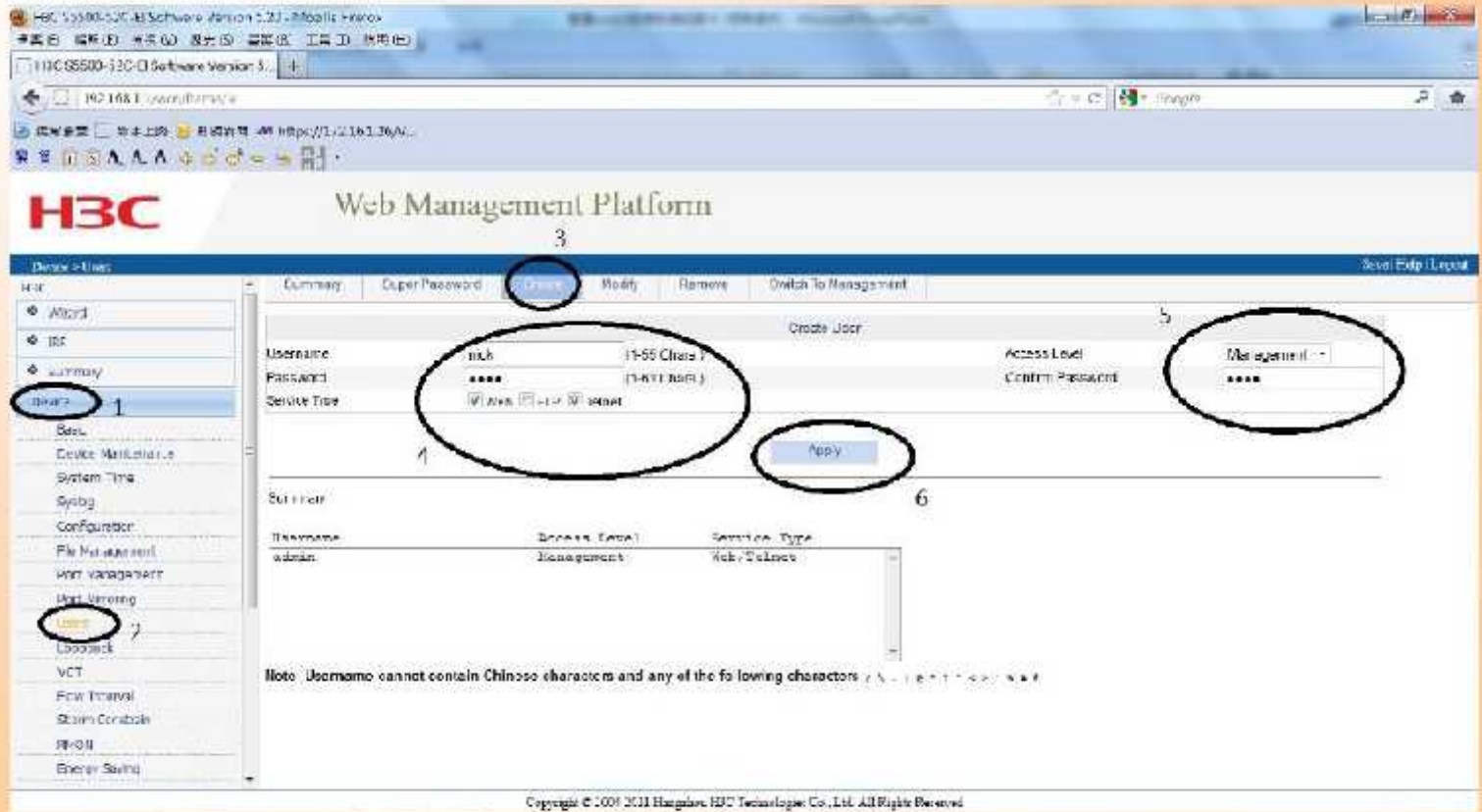
NTP Server	Reference Key ID
NTP Server 1	1234567890
NTP Server 2	1234567890

Set System Time Zone

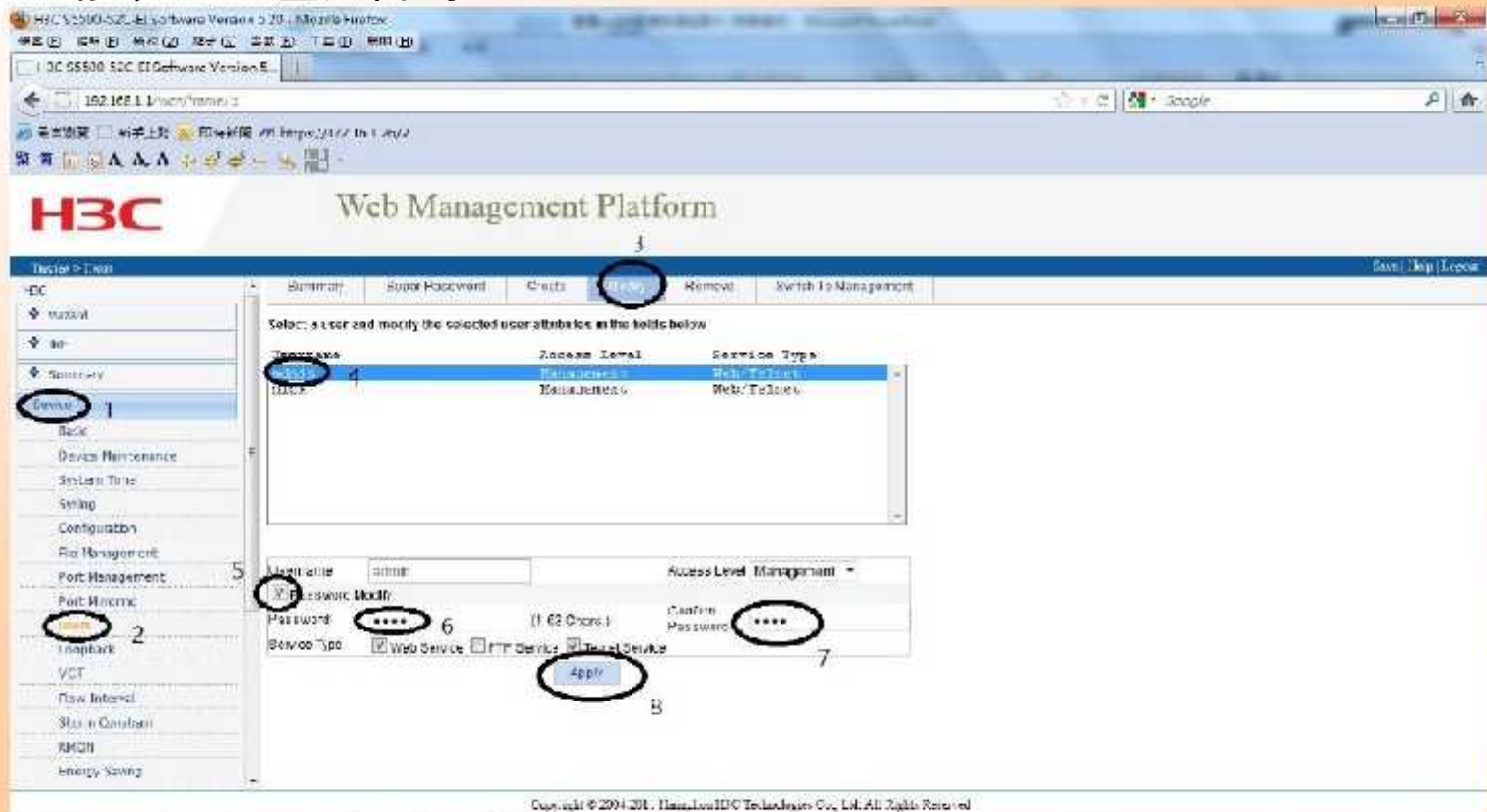
Time Zone: (GMT+08:00) Taipei

Apply

Copyright © 2004-2011 H3C Technologies Co., Ltd. All Rights Reserved

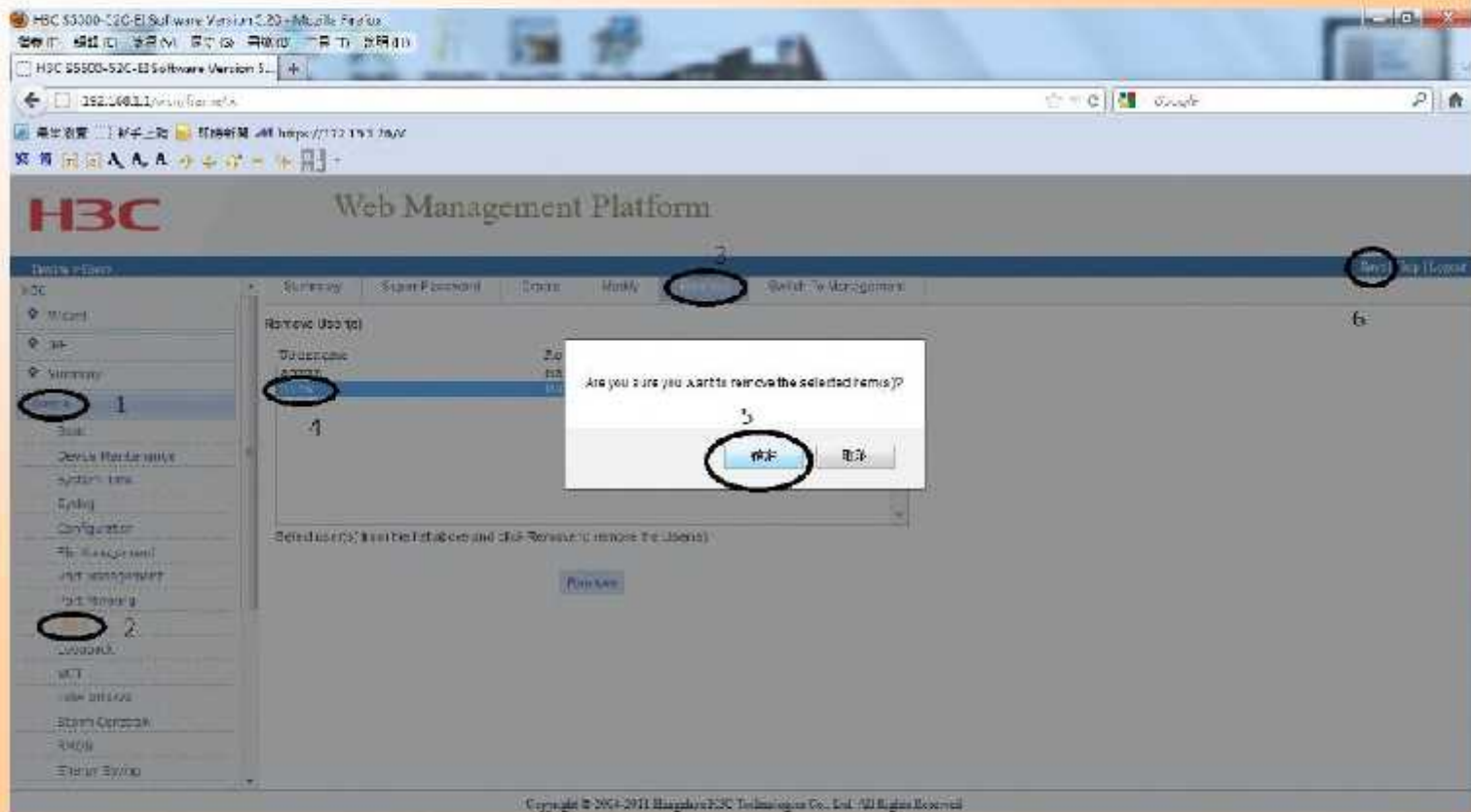


修改admin登入密碼



The screenshot shows the H3C Web Management Platform interface. The left sidebar contains a menu with 'admin' selected (1). The 'Password Modify' option is highlighted in the sidebar (2). The top navigation bar has the 'Modify' tab selected (3). The main content area shows a table of users with 'admin' selected (4). Below the table, the 'Password Modify' form is visible, showing the 'Password' field (5), 'Confirm Password' field (6), and 'Web Service' checkbox (7). The 'Apply' button is highlighted (8).

刪除nick帳號





查看Switch port up or down

The screenshot displays the H3C Web Management Platform interface. On the left sidebar, the 'System' menu is expanded, and 'Switch' is selected. The main content area shows the 'System information' tab for a specific switch. The port configuration for 'GigabitEthernet2/0/26' is visible, showing it is 'Up'. A tooltip provides additional details: 'Port: GigabitEthernet2/0/26', 'Type: 1000BASE-T', 'Speed: 1000M Full Duplex', 'Utilization: <1%', and 'Status: Enabled'. A legend at the bottom explains the color coding for port status: Green for 'Connected port', Red for 'Port that has been set to inactive by user or protected', and Blue for 'Port that has been set to inactive by user'.

新增VLAN 2(步驟 1)

The screenshot displays the H3C Web Management Platform interface. The left sidebar contains a navigation tree with the following items: VLAN, VLAN Interface, Voice VLAN, MAC, MSTP, Link Aggregation, LACP, LLDP, ARP, ARP-Monitor, ARP-Attack, DHCP Snooping, IPv6 Routing, IPv6 Multicast, and DHCP. The main content area is titled 'Web Management Platform' and shows the 'Create' button in the top menu. The 'VLAN ID' field is set to '2', and the 'Create' button is highlighted. The 'Description' field is empty. The 'Apply' button is at the bottom right.

Copyright © 2004-2011 Hangzhou H3C Technologies Co., Ltd. All Rights Reserved

新增VLAN 2(步驟2)

The screenshot shows the H3C Web Management Platform interface. The left sidebar contains a navigation menu with options like 'VLAN', 'VLAN Interface', 'VLAN Mapping', etc. The main content area is titled 'Web Management Platform' and shows the 'Create' tab for VLANs. A table lists existing VLANs:

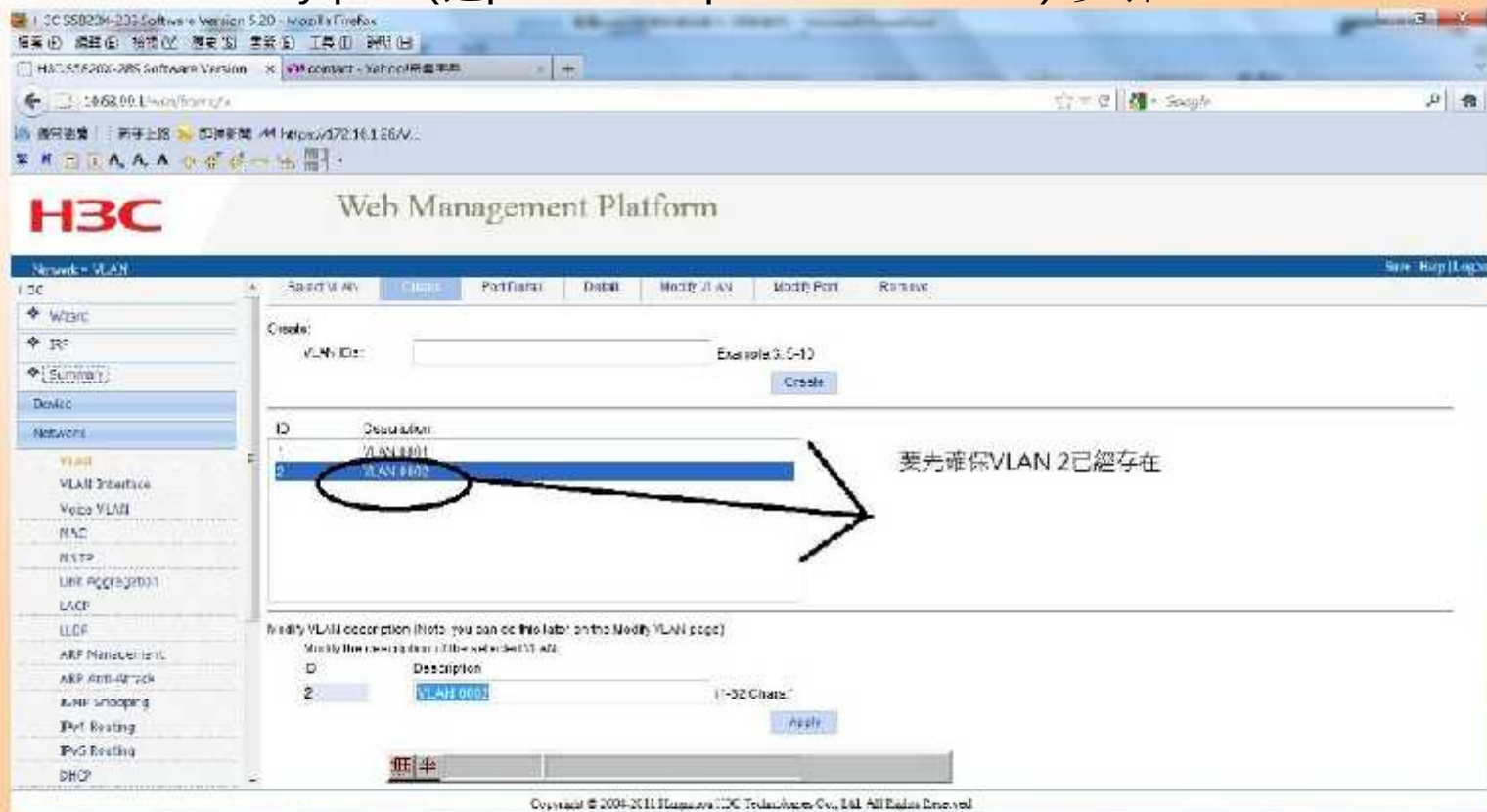
ID	Description
1	VLAN 100
2	VLAN 200

The 'VLAN 2' row is highlighted. Below the table, the 'Modify' tab is selected, showing the 'Modify the description of the selected VLAN' form. The form includes fields for 'ID' (set to 2) and 'Description' (set to VLAN 200). The 'Apply' button is visible at the bottom right of the form.

移除VLAN 2 (步驟 1)

The screenshot displays the H3C Web Management Platform interface. The left sidebar shows a tree view with 'VLAN' selected under the 'Network' category. The top navigation bar includes tabs for 'Select VLAN', 'Create', 'For Detail', 'Detail', 'Modify VLAN', 'Modify Port', and 'Remove'. The main content area has a 'Enter VLAN ID to remove' section with a text input field containing '2' and a 'Remove' button. Below this is a table titled 'Selected VLANs to remove' with two rows: '1' and '2', both labeled 'VLAN 2000'. At the bottom of the main content area, there are buttons for 'Select All', 'Select None', 'Remove', and 'Cancel'. The top right corner of the interface shows a 'Save' button and a 'Help' link. Numbered callouts 1 through 5 indicate the sequence of steps to remove VLAN 2.

Add vlan by port (把port 1 and port 2 至VLAN 2)-步驟1



The screenshot shows the H3C Web Management Platform interface. The left sidebar contains a navigation menu with options like 'Device', 'Network', 'VLAN', 'VLAN Interface', 'Voice VLAN', 'MAC', 'RSTP', 'Link Aggregation', 'LACP', 'LLDP', 'ARP Monitor', 'ARP Anti-Attack', 'Storm Control', 'IPsec', 'IPv6', and 'DHCP'. The main content area is titled 'Web Management Platform' and shows the 'VLAN' configuration page. The 'Create' tab is selected, and the 'VLAN ID' field is set to '2'. The 'Description' field is set to 'VLAN 0002'. A table below shows the existing VLANs: ID 1 (VLAN 0001) and ID 2 (VLAN 0002). A red circle highlights the 'VLAN 0002' entry in the table, and a red arrow points from it to the text '要先確保VLAN 2已經存在' (Make sure VLAN 2 already exists). Below the table, there is a 'Verify VLAN description' section with a table showing ID 2 and Description 'VLAN 0002'. The 'Apply' button is visible at the bottom right of the configuration area.

Network: VLAN

Create: VLAN ID: Example: 2, 100 Description: Create

ID	Description
1	VLAN 0001
2	VLAN 0002

要先確保VLAN 2已經存在

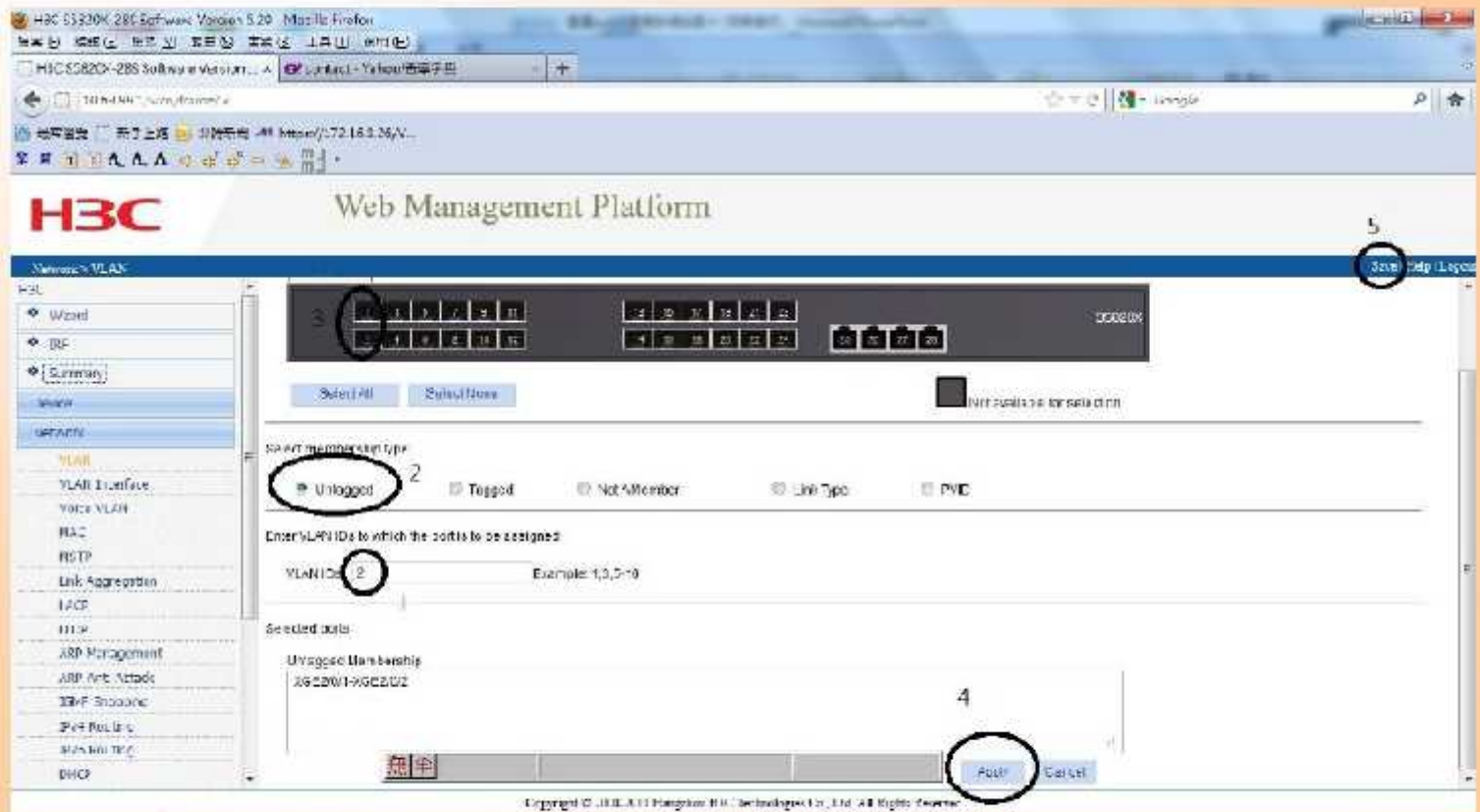
Verify VLAN description (Note: you can do this later on the Modify VLAN page)
Modify the description of the selected VLAN:

ID	Description
2	VLAN 0002

Apply

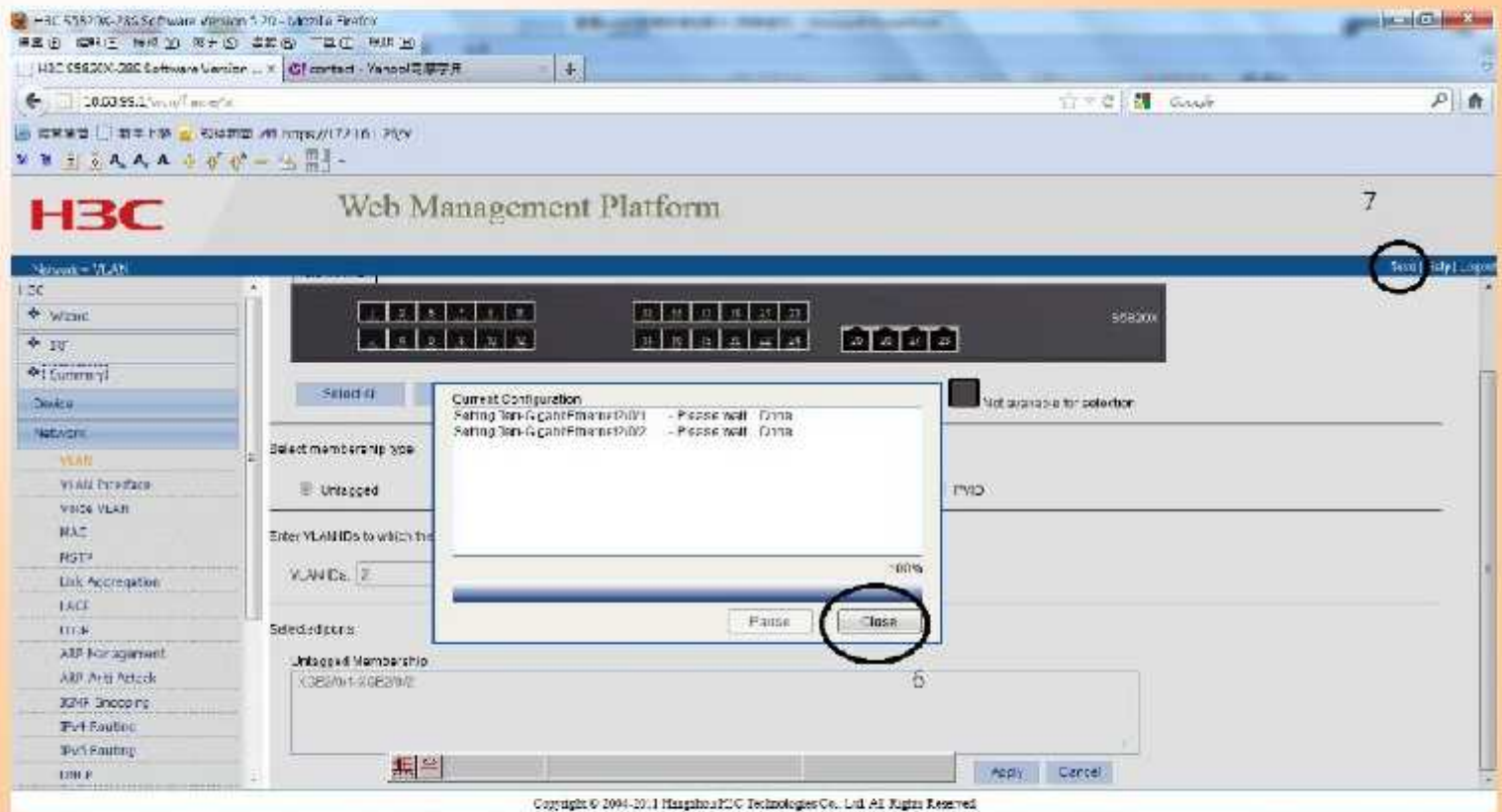
Copyright © 2004-2011 H3C Technologies Co., Ltd. All Rights Reserved.

Add vlan by port (把port 1 and port 2 至VLAN 2)-步驟2

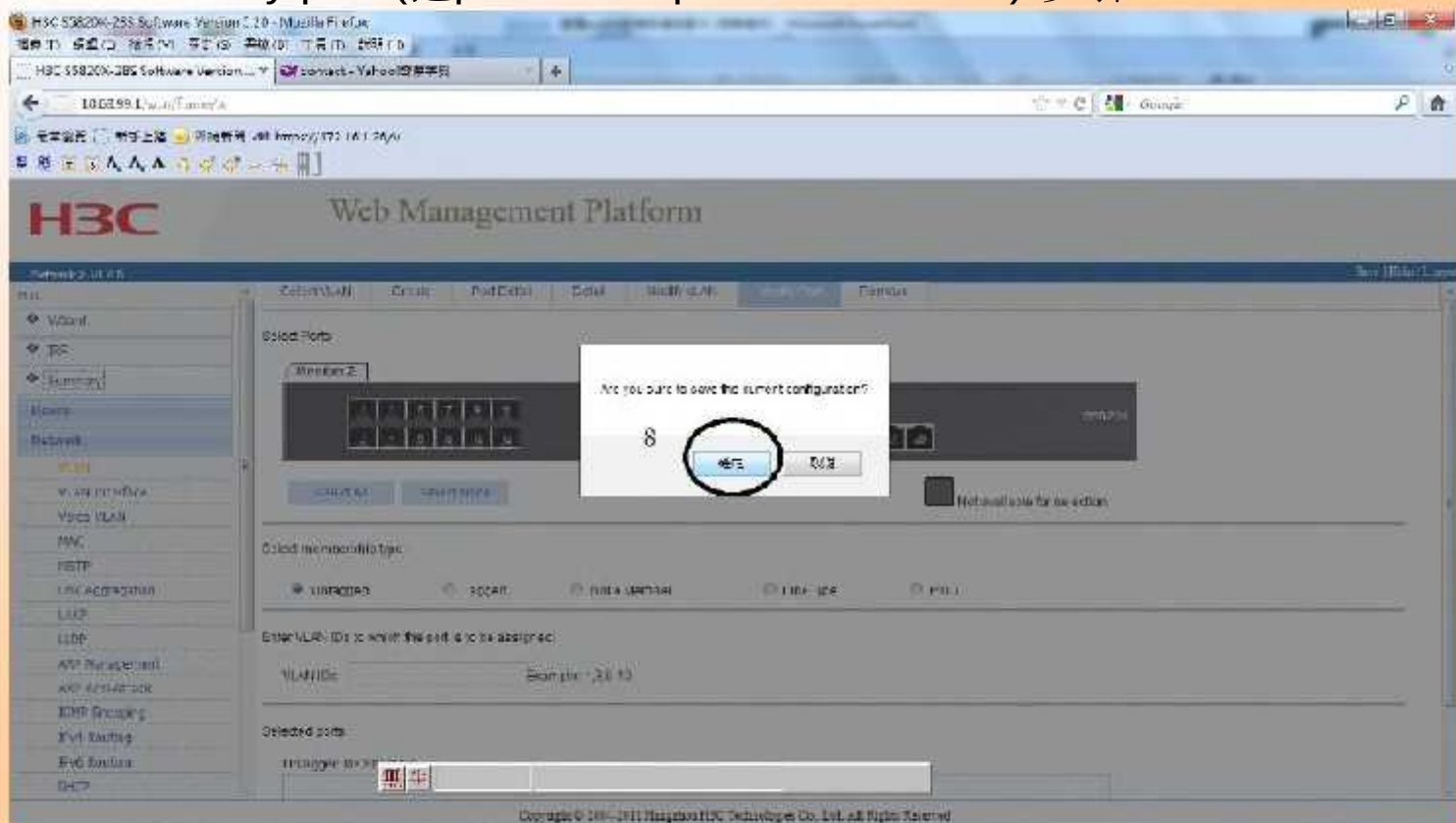


The screenshot shows the H3C Web Management Platform interface. The left sidebar contains a navigation menu with options like Wizard, VRF, Summary, Switch, and various protocols. The main area displays the 'Network VLAN' configuration page. At the top, there are three tables for selecting ports: 'Select All', 'Select None', and a table with port numbers 1-24. A 'Port number for selection' field is also present. Below this, the 'VLAN membership type' section has radio buttons for 'Unlogged' (selected), 'Tagged', 'Not a Member', 'Line Type', and 'PVID'. The 'Enter VLAN IDs to which the ports to be assigned:' section has a text input field with '2' entered, and an example 'Example: 1,3,5-10'. The 'Selected ports' section shows 'Unlogged Membership' and 'Access VLAN ID: 2'. At the bottom right, there are 'Apply' and 'Cancel' buttons. The page is numbered 2 in the top right corner and 4 in the bottom right corner.

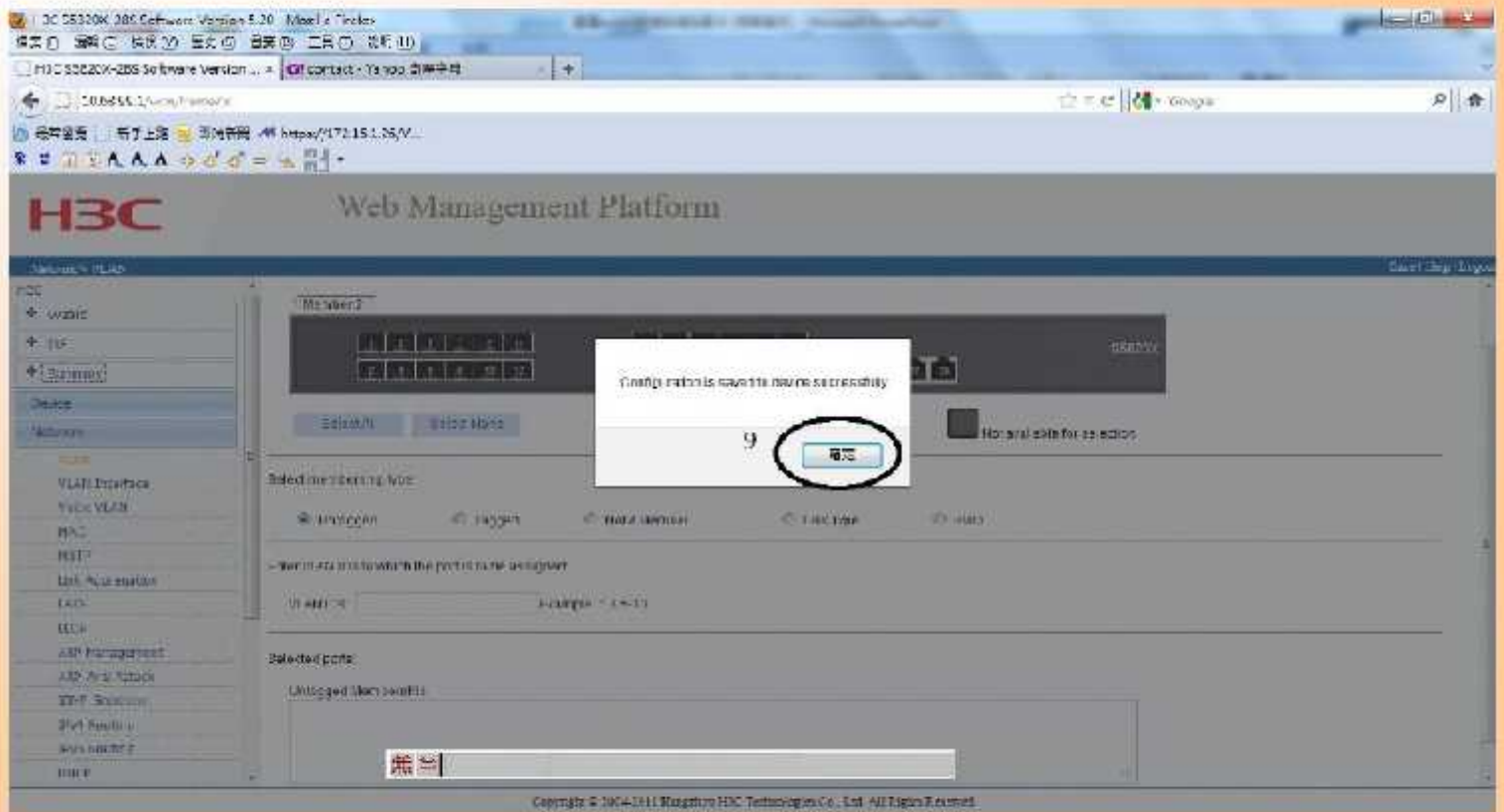
Add vlan by port (把port 1 and port 2 至VLAN 2)-步驟3



Add vlan by port (把port 1 and port 2 至VLAN 2)-步驟4



Add vlan by port (把port 1 and port 2 至VLAN 2)-步驟5



802.1Q(把port 24 設定成trunk port)-步驟1



Web Management Platform

Network > VLAN

Save | Help | Log Out

Wizard | Stack | TRF | Summary | **Service** | **Network**

VLAN 1

VLAN Interface | Voice VLAN | MAC | MSTP | Link Aggregation | LACP | LLDP | ARP Management | ARP Anti-Attack | STP

Select Ports

Member 1

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48

HP A6120-212 SL

Select All | Select None

Select membership type:

☐ Unaggregated ☐ Tagged ☐ Not A Member ☒ **Link Type** ☐ PVID

Link Type: **Trunk**

Selected ports:

Link Type: 802.1Q

Not available for selection

802.1Q(把port 24設定成trunk port)步驟2



Web Management Platform

Network > VLAN

Save Help Log

HP

Wizard
Stack
IRF
Summary
Device
Network
VLAN
VLAN Interface
Voice VLAN
MAC
MSTP
Link Aggregation
LACP
LLDP
ARP Management
ARP Anti-Attack

Member 1

HP A5120-24G-S1

Selected All Selected None

NO: 3/31/2010 10:18:00 AM

Select membership type

☐ Unlabeled ☐ Tagged ☐ Not a Member ☒ Link Type ☐ FMD

Link type: Trunk

Selected ports:

Link type: GE1/0/24

6

Apply Cancel

Copyright © 2010-2011 Hewlett-Packard Development Company, L.P.

802.1Q(把port 24設定成trunk port)-步驟3

HP Web Management Platform

Network > VLAN

HP

Wizard
Stack
LIF
Summary
Device
Network

VLAN
VLAN Interface
Voice VLAN
MAC
MSTP
Link Aggregation
LACP
LLDP
ARP Management
Anti Anti-Attack

Selected All Select None

Not available for selection

Select membership type:

Untagged **Trunk** Not A Member Link type AND

Enter VLAN ID to which the port is to be assigned:

VLAN ID **1,2** Example: 1,3,6-10

Selected ports: **8**

Trapped Member ship

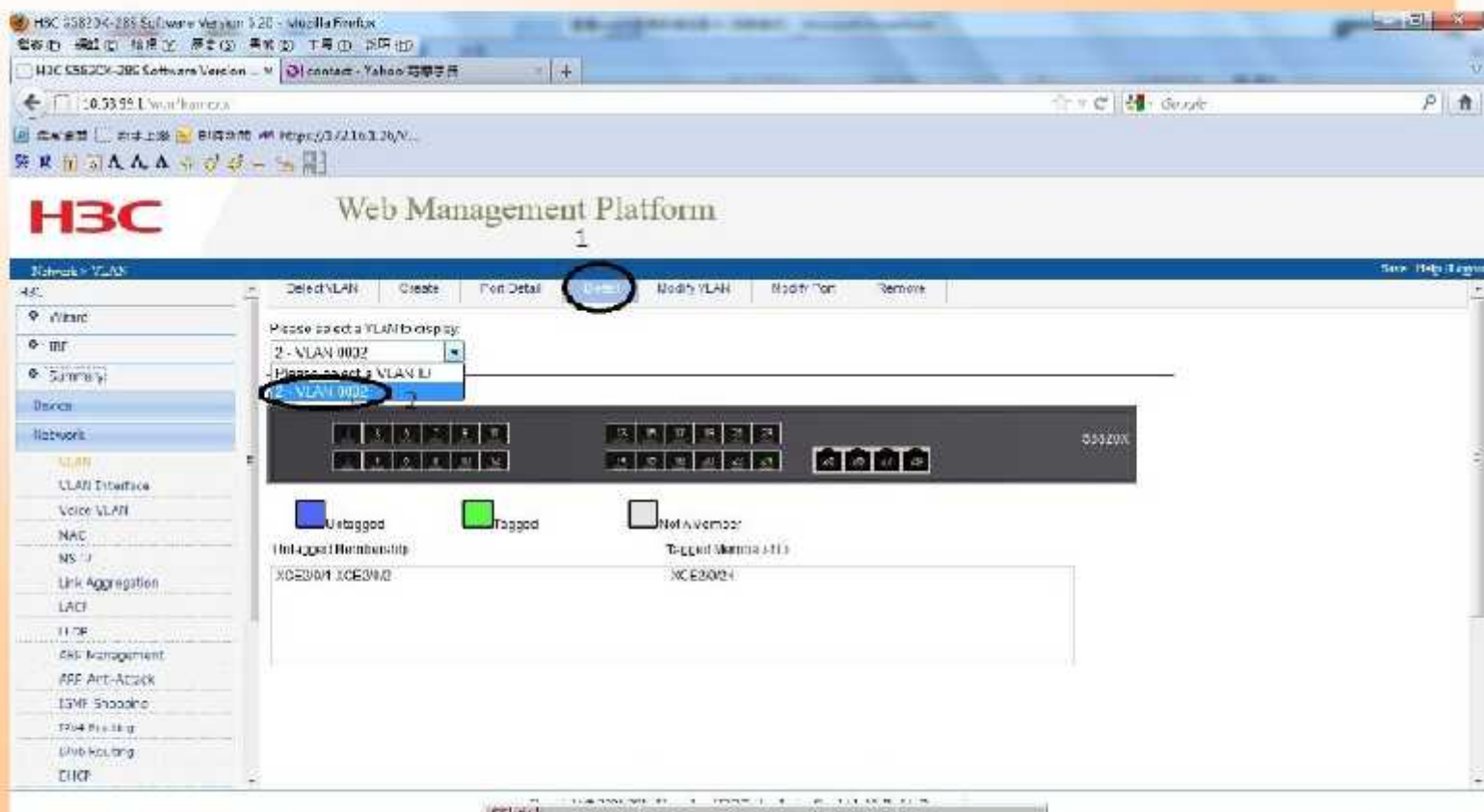
GE10/24

9 Apply Cancel

802.1Q(把port 24設定成trunk port)-步驟4

```
interface GigabitEthernet1/0/24
#
return
[HP-GigabitEthernet1/0/24]dis this
#
interface GigabitEthernet1/0/24
port link-type trunk
port trunk permit vlan 1 to 2
#
return
[HP-GigabitEthernet1/0/24]
```

Detail(查看VLAN 2 的port 1、2、24)



假設我的vlan 2是管理ip的話，如何在vlan 2新增管理ip-1

The screenshot shows the H3C Web Management Platform interface. The left sidebar contains a navigation menu with options like 'VLAN', 'VLAN Interface', 'Voice VLAN', 'MAC', 'MSTP', 'Link Aggregation', 'LACP', 'LLDP', 'ARP Neighbour', 'ARP Anycast', 'IGMP Snooping', 'Port Forwarding', and 'Port Forwarding'. The main content area is titled 'VLAN' and has tabs for 'Create', 'Modify', 'Delete', 'View', 'Export', and 'Import'. The 'Create' tab is active, showing a form to create a new VLAN. The 'VLAN ID' field is set to 2, and the 'Create' button is circled in red. Below the form, there is a table with the following data:

ID	Description
1	VLAN 0001

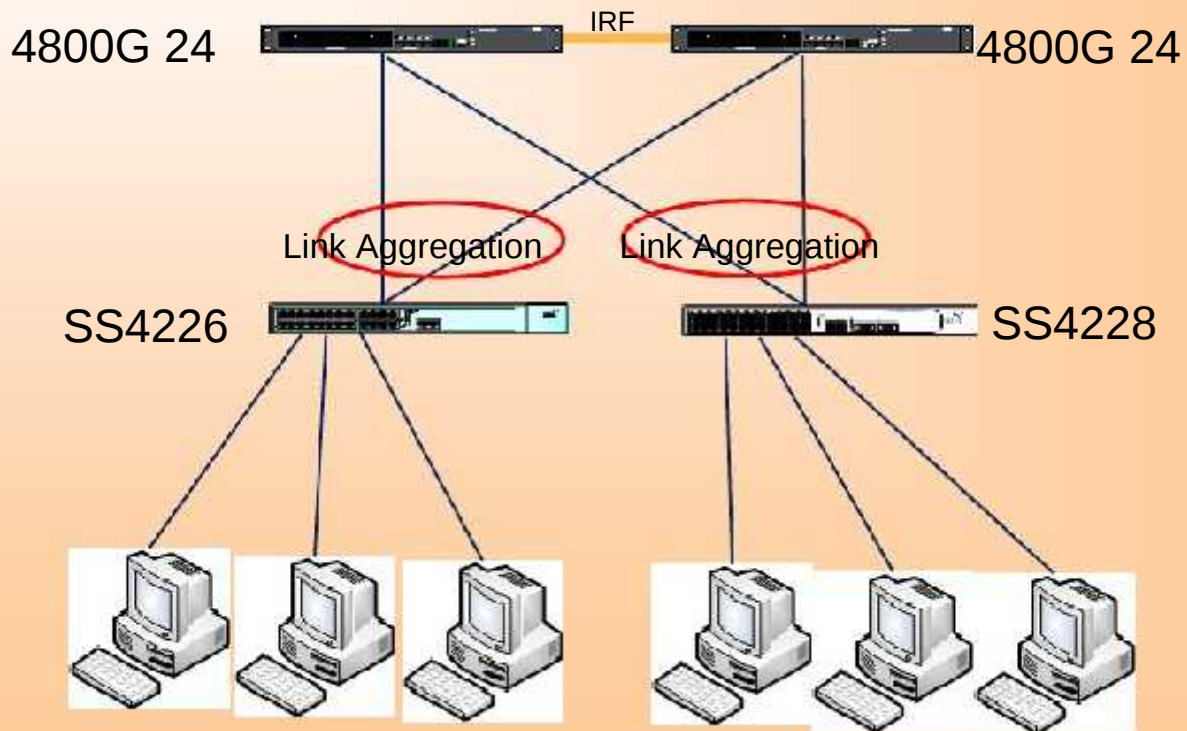
At the bottom of the page, there is a copyright notice: 'Copyright © 2004-2010 H3C Technologies Co., Ltd. All Rights Reserved. (Version 1.0)'.

假設我的vlan 2是管理ip的話，如何在vlan 2新增管理ip-2

The screenshot shows the H3C Web Management Platform interface. The left sidebar contains a navigation menu with options like 'VLAN', 'Device', 'Network', 'VLAN Interface', 'VLAN2', 'VLAN3', 'VLAN4', 'VLAN5', 'VLAN6', 'VLAN7', 'VLAN8', 'VLAN9', 'VLAN10', 'VLAN11', 'VLAN12', 'VLAN13', 'VLAN14', 'VLAN15', 'VLAN16', 'VLAN17', 'VLAN18', 'VLAN19', 'VLAN20', 'VLAN21', 'VLAN22', 'VLAN23', 'VLAN24', 'VLAN25', 'VLAN26', 'VLAN27', 'VLAN28', 'VLAN29', 'VLAN30', 'VLAN31', 'VLAN32', 'VLAN33', 'VLAN34', 'VLAN35', 'VLAN36', 'VLAN37', 'VLAN38', 'VLAN39', 'VLAN40', 'VLAN41', 'VLAN42', 'VLAN43', 'VLAN44', 'VLAN45', 'VLAN46', 'VLAN47', 'VLAN48', 'VLAN49', 'VLAN50', 'VLAN51', 'VLAN52', 'VLAN53', 'VLAN54', 'VLAN55', 'VLAN56', 'VLAN57', 'VLAN58', 'VLAN59', 'VLAN60', 'VLAN61', 'VLAN62', 'VLAN63', 'VLAN64', 'VLAN65', 'VLAN66', 'VLAN67', 'VLAN68', 'VLAN69', 'VLAN70', 'VLAN71', 'VLAN72', 'VLAN73', 'VLAN74', 'VLAN75', 'VLAN76', 'VLAN77', 'VLAN78', 'VLAN79', 'VLAN80', 'VLAN81', 'VLAN82', 'VLAN83', 'VLAN84', 'VLAN85', 'VLAN86', 'VLAN87', 'VLAN88', 'VLAN89', 'VLAN90', 'VLAN91', 'VLAN92', 'VLAN93', 'VLAN94', 'VLAN95', 'VLAN96', 'VLAN97', 'VLAN98', 'VLAN99', 'VLAN100'. The 'VLAN2' interface is selected. The main area shows the configuration for 'VLAN2'. The 'Summary' tab is active. The 'Input a VLAN ID' field is set to '2'. The 'Configure Primary IP Address' section is expanded. The 'IP Address' field is set to '192.168.1.1'. The 'Mask Length' field is set to '24'. The 'Apply' button is highlighted with a red circle.

IRF簡介

IRF(Intelligent Resilient Framework)架構

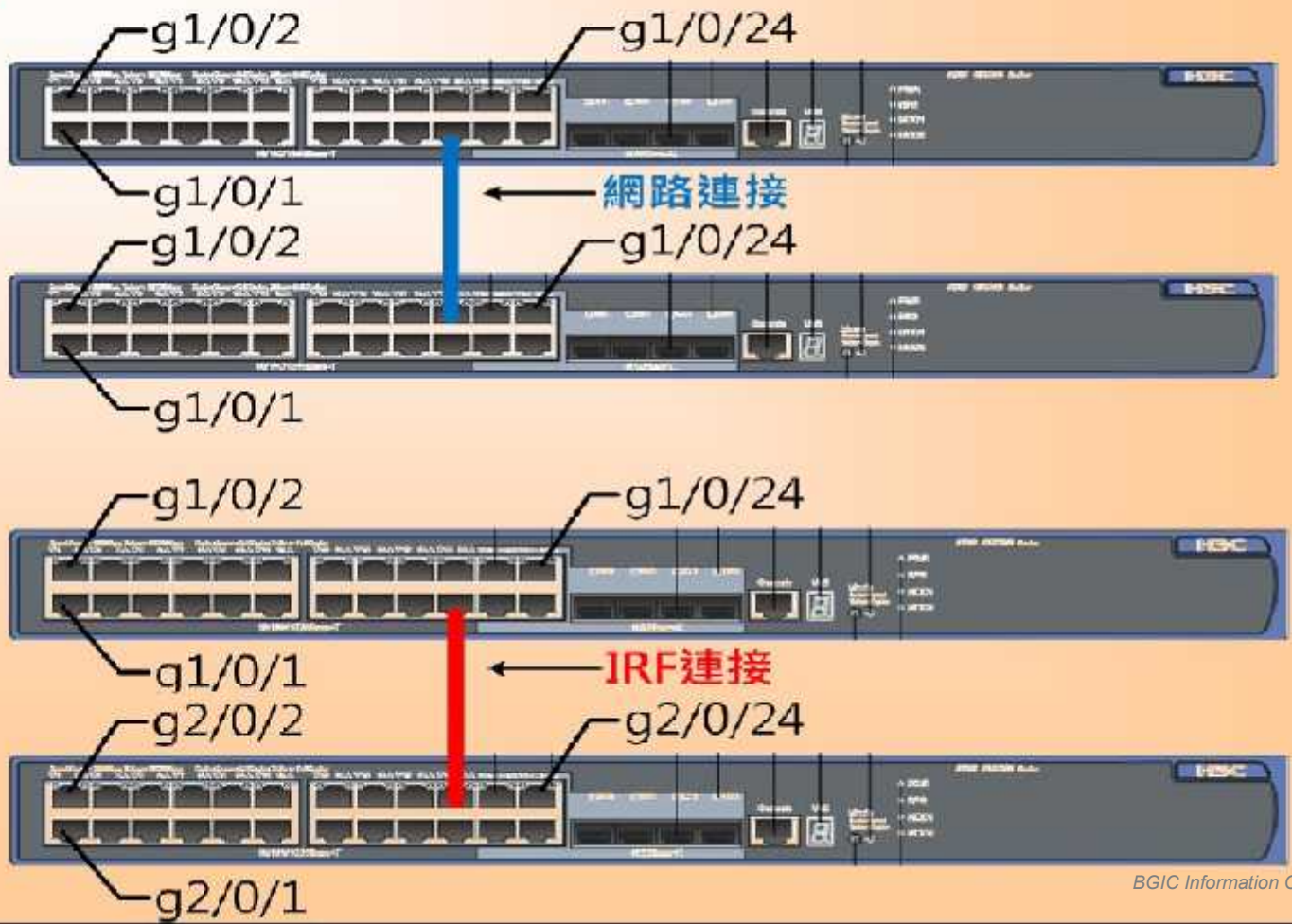


2台實體的24port的Switch



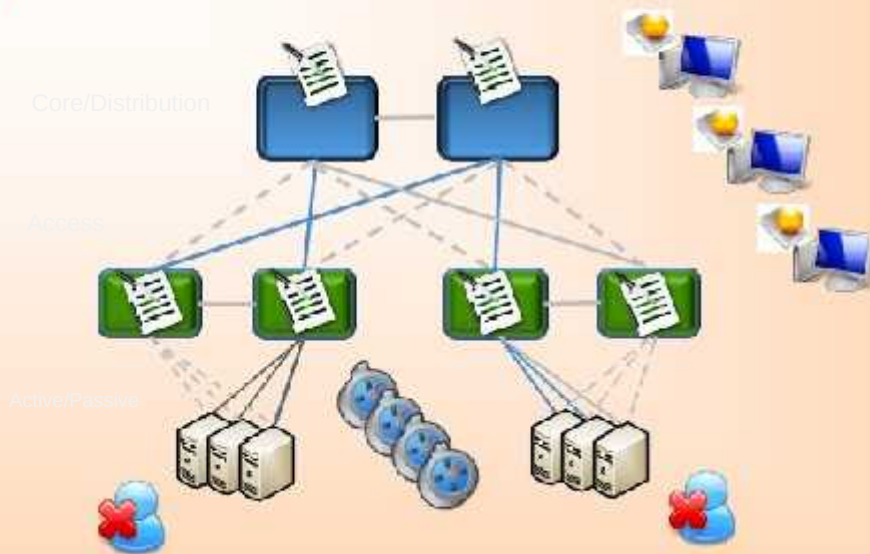
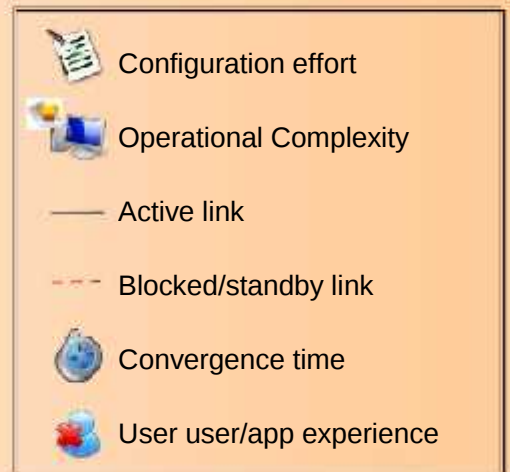
1台邏輯的48port的Switch



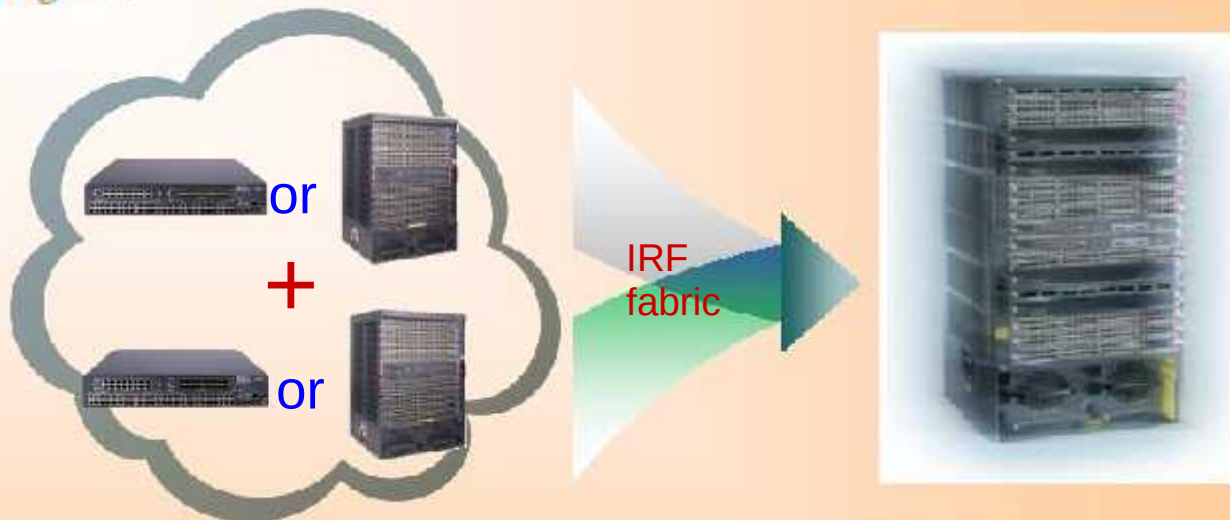


今日網路設計面臨的挑戰

Legend



- × STP stops loops, but blocks paths - reducing effective bandwidth
- × Configuration Intensive (switch by switch)
- × Operational complexity for configuration change and support
- × Slow convergence during failure can often impact business applications and users



多台實體交換器

個別設定與管理

只負責本身封包轉發

只能點對點匯集鏈路

IRF 虛擬交換器

單一介面設定與管理(DDM)

路由同步再各自轉發(DRR)

跨交換機做匯集鏈路(DLA)

IRF與堆疊？

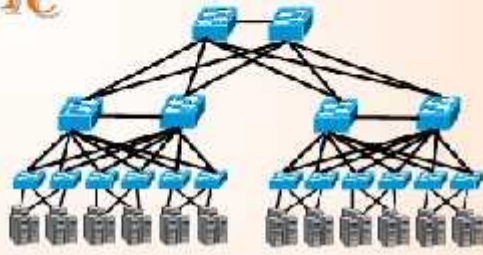
IRF2不就是堆疊麼？

IRF2比堆疊強多了。堆疊只是將設備連在一起，設備之間還是各跑各的，而IRF是真正讓多台設備虛擬化成一台統一的設備，所有的控制，路由轉發都統一進行， **Active-Active**模式，真正當作一台設備來運行。

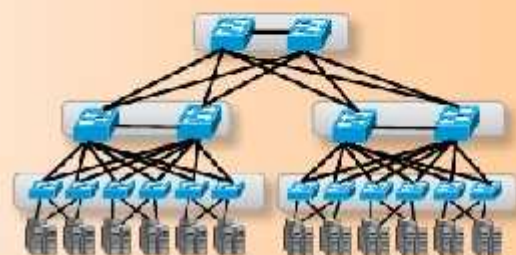
Why HP IRF?

Customer requirement: 1000 servers, GbE, 10 GbE
Core, dist and access layer, network resiliency,
Internet/extranet WAN connectivity

Other
Vendor



STP, RSTP, Rapid-PVST, VSS, vPC, RPR, Stackwise



IRF

	Other	Configuration	HP	
	136	VLANS	50	✓ 8 7 6 5 4 3 2 1 / Active
×Active / Stand-by	136	IP Subnets	50	
×Various protocols	2	OSPF Area	2	✓ 8 7 6 5 4 3 2 1 consistency
×Failover often	42	VRRP Groups	0	✓ 8 7 6 5 4 3 2 1 measured
measured in seconds 88		Access switch configs	in	5 milliseconds seconds
or minutes	4	Agg switch configs	2	✓ 8 7 6 5 4 3 2 1 design
	2	Core switch Configs	and	1
×Highly complex		STP Instances	1	configuration
configuration intensive 42	196	OSPF adjacencies	0	
	250	Interfaces	50	
	94	Device configs	5	

IRF 提供什麼優勢？

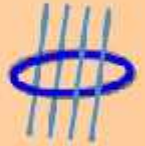
1 - 極簡化了網絡營運

通過整合多個獨立交換器到單一的管控，每一階層的網絡達到易於管理，與虛擬交換器，真正達到扁平化架構



2 - 提供超高效能

充分利用所有交換機和伺服器/匯聚層交換器之間的鏈路，可“依據需求”擴展 性能和能力，以支持關鍵業務應用



3 - 確保網路與業務的高取用性

不管是鏈路或設備故障，皆能確保快速的網絡回復（以毫秒為單位），以確保應用程序和服務不間斷



Core to Edge都支援IRF

- HP Campus LAN Switch Portfolio

Data Center /Campus Core			
A12500	A9500	A7500	A5820
			
• Up to 512 10GE/864 GE • Application Modules (inc. multi-core) • IRF, IPv6			
Edge/Aggregation / Core			
A7500	A5800/A5820	A5500	
			
• Chassis or Flex chassis + stackable • IRF PoE(+), 10GE, App modules, IPv6			
Edge/Access			
A5120	A3600-EI		
			
• Flexible • Stackable stackable PoE(+), 10GE– IRF, • OSN, PoE, Auto-voice VLAN - uplinks, Ethernet, Gig, w/10G uplinksIPv6 • Fast			

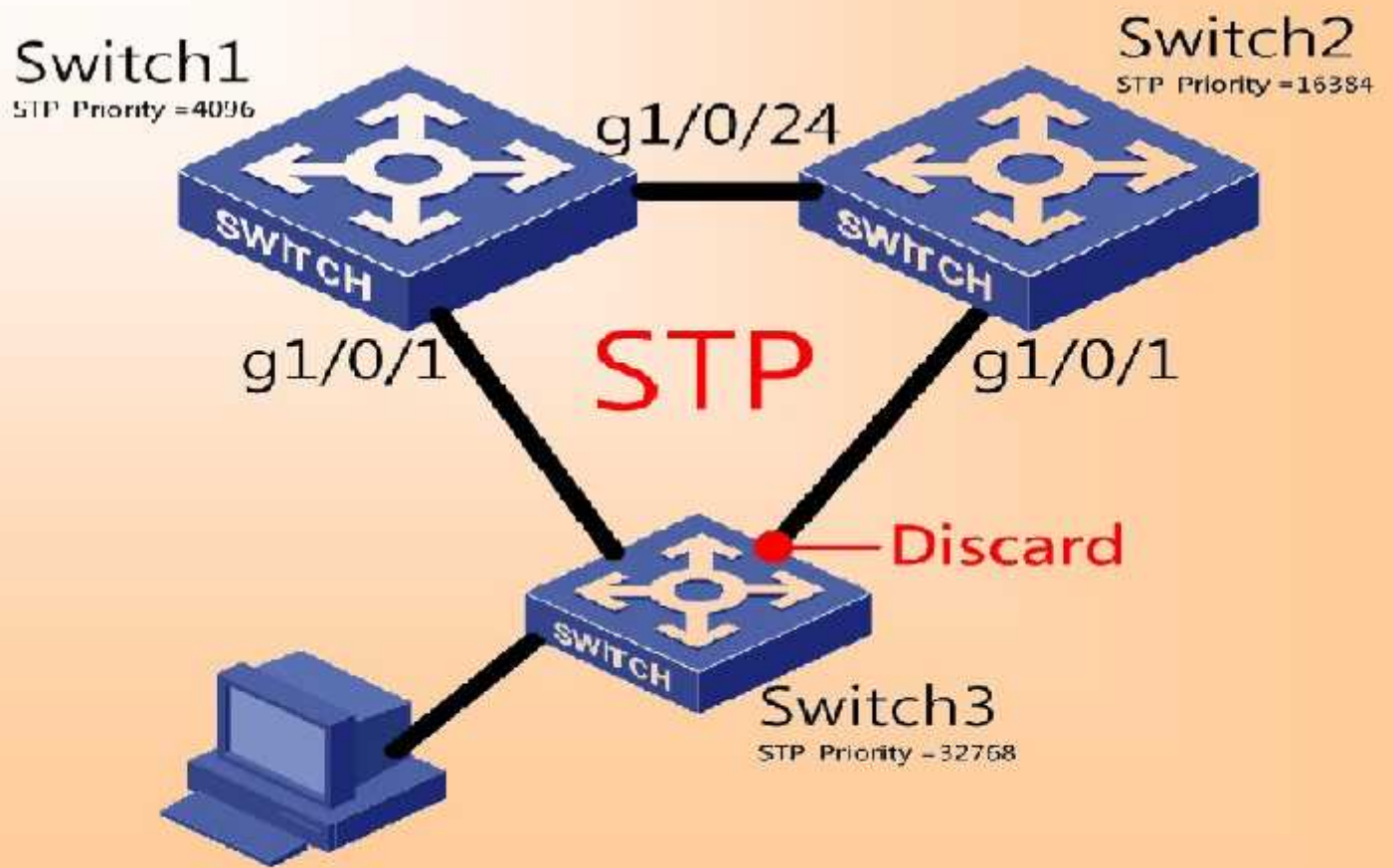
IRF 2.0 規格

功能	A3600-EI IRF 1.0 only (Comware 3)	A5120-SI	A5120-EI	A5500-SI	A5500-EI	A5800	A5820X	A7500	A9500	A12500
堆疊介面	GE	GE	GE or 10GE	10GE	10GE	10GE	10GE	10GE	10GE	10GE
Stack Bandwidth		2*GE	4*10GE	4*10GE	4*10GE	8*10GE	8*10GE	8*10GE	12*10G	12*10G
Stack Number	8	4	4	4	9	9	9	2	2	2
Stack with different model	No	No	No	No	No	Yes	Yes	No	No	No
Geographic Connection	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
IRF Split Detection (MAD)	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes

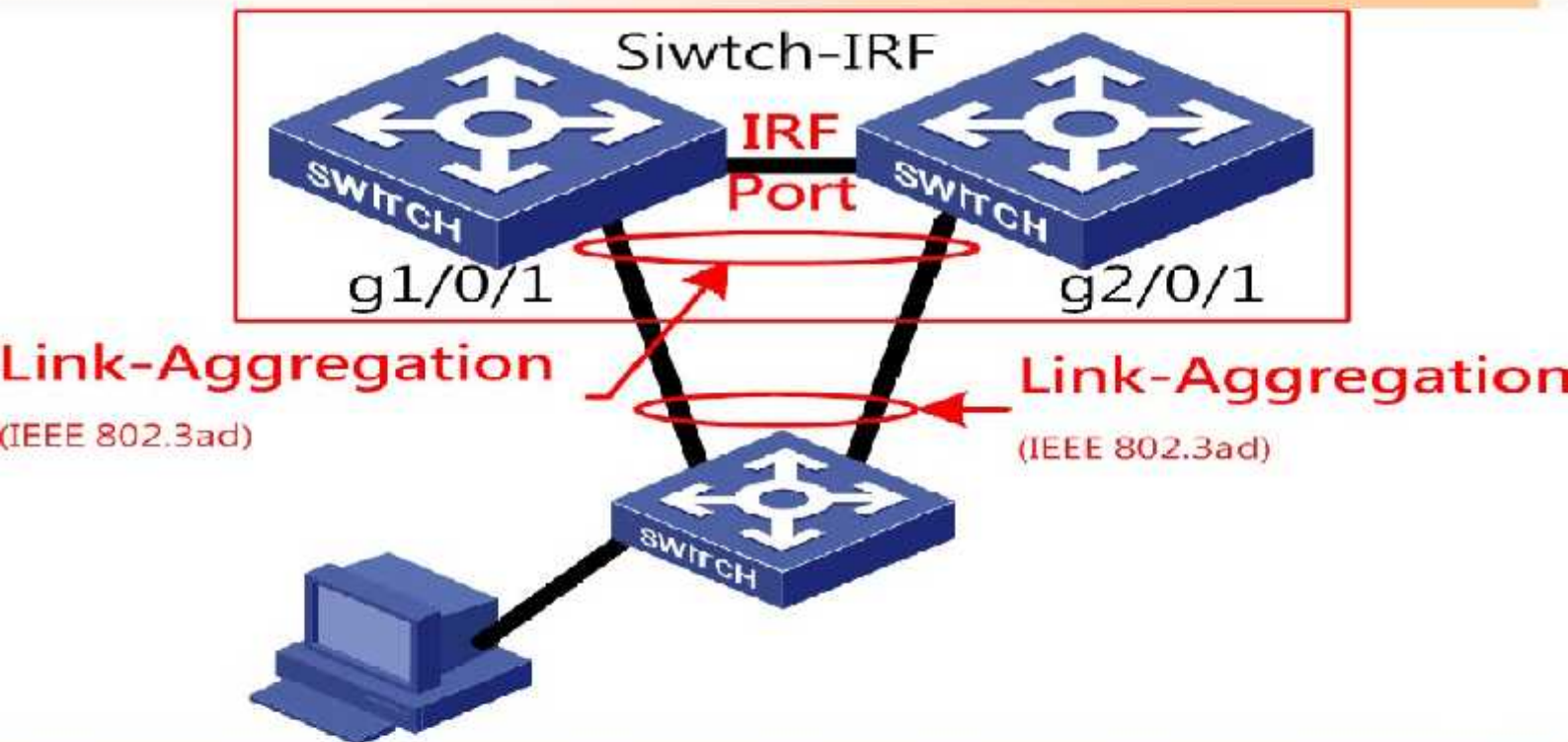
HPN IRF 與友商有何不同？

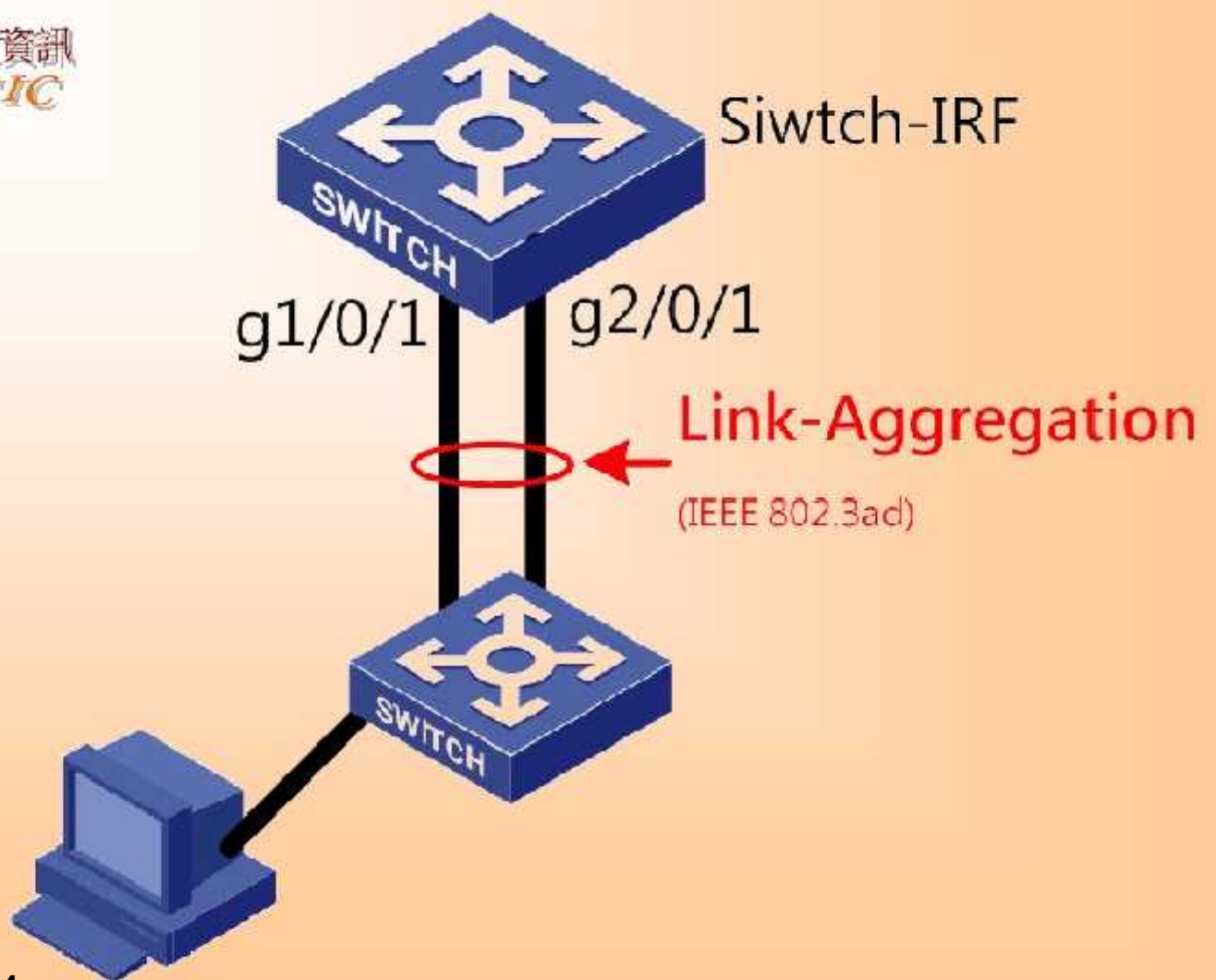
- 2003即研發出 XRN，一直到現在的IRF 2，技術成熟穩定，眾多成功案例
- 沒特殊限制，只要10G介面連接即可，無模組種類、韌體版本…等限制
- Core到Edge都有支援 IRF，完全扁平化網路架構
- IRF連線可以用光纖與銅線(CX4)，光纖可以跨機櫃，建築
- Failover切換速度較快
- 單機功能不會因為做IRF後，損失一些功能

非IRF的備援架構！



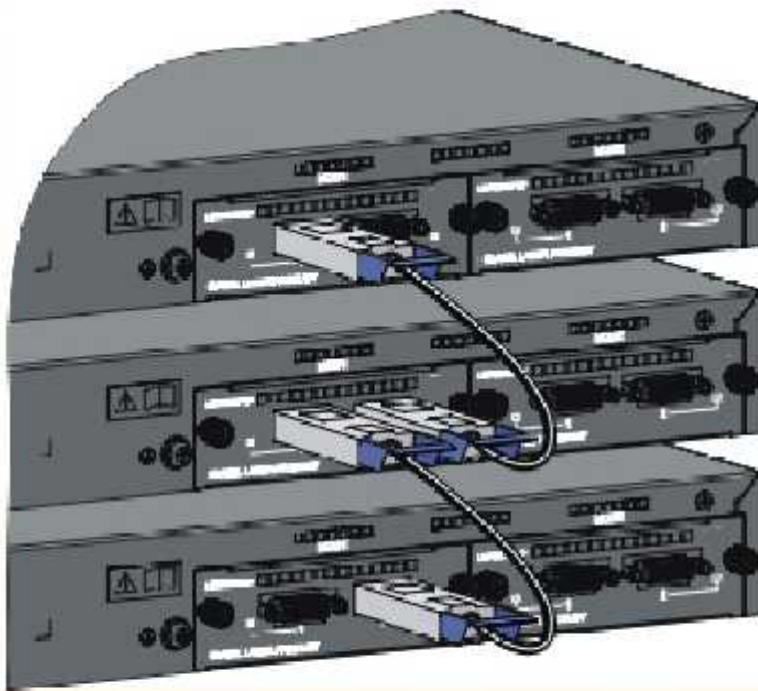
使用IRF的備援架構！



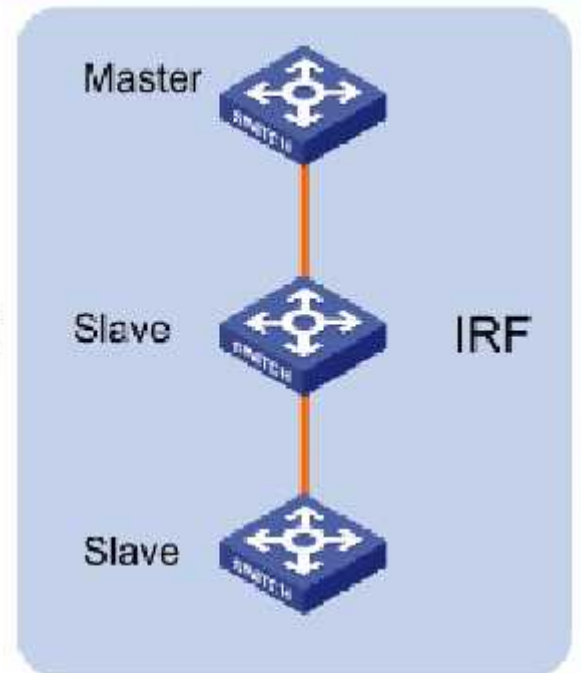


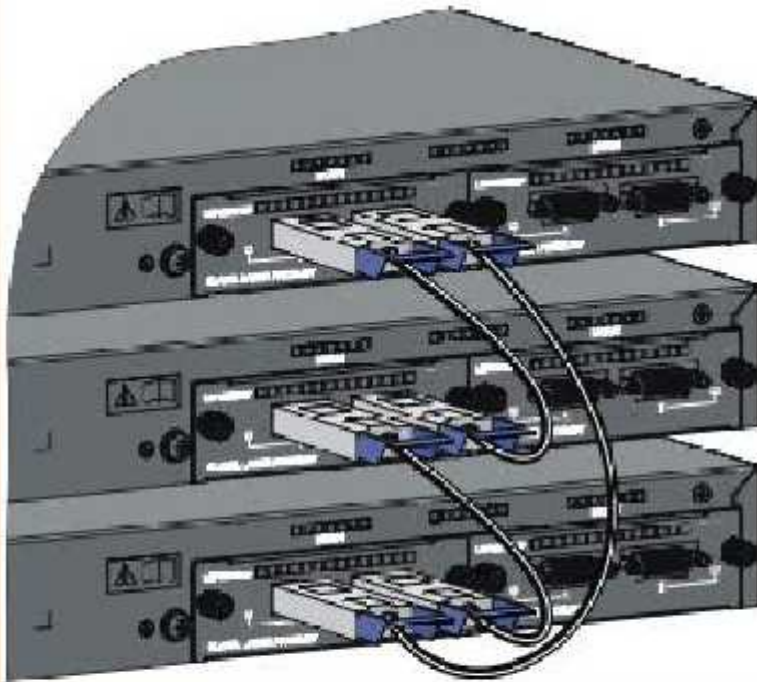
IRF-Port1接IRF-Port2



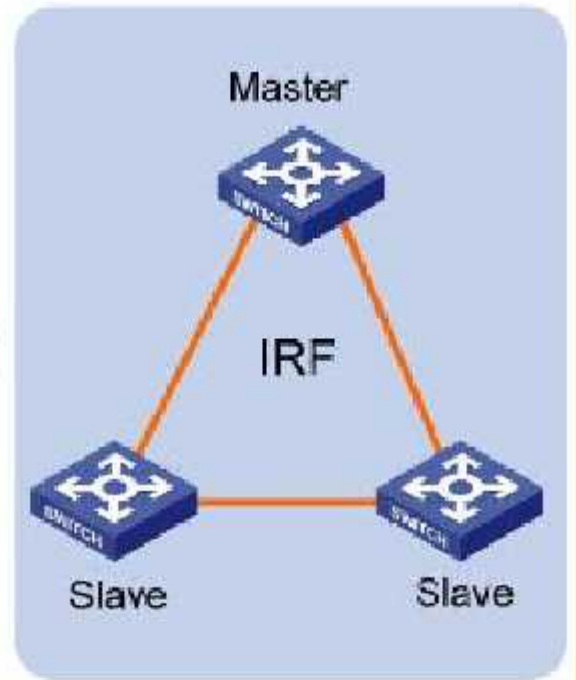


=





=



IRF Config(第1台)

- irf member 1 priority 32
- int Ten-GigabitEthernet1/0/25
- sh
- int Ten-GigabitEthernet1/0/26
- sh
- quit
- irf-port 1/1
- port group int Ten-GigabitEthernet 1/0/25
- irf-port 1/2
- port group int Ten-GigabitEthernet 1/0/26
- int Ten-GigabitEthernet1/0/25
- undo sh
- int Ten-GigabitEthernet1/0/26
- undo sh
- quit
- save
- y

IRF Config(第2台)

- irf member 1 renumber 2
- y
- quit
- Reboot
- Y
- int Ten-GigabitEthernet2/0/25
- sh
- int Ten-GigabitEthernet2/0/26
- sh
- quit
- irf-port 2/1
- port group int Ten-GigabitEthernet 2/0/25
- irf-port 2/2
- port group int Ten-GigabitEthernet 2/0/26

IRF Config (第2台)

```
int Ten-GigabitEthernet2/0/25  
undo sh  
int Ten-GigabitEthernet2/0/26  
undo sh  
quit  
quit  
save  
y
```

- Display irf

```
<CORE-A5800-1>display irf
Switch  Role    Priority  CPU-Mac      Description
*+1     Master    1        3822-d631-b22c  -----

* indicates the device is the master.
+ indicates the device through which the user logs in.

The Bridge MAC of the IRF is: 3822-d631-b228
Auto upgrade           : yes
Mac persistent         : 6 min
Domain ID              : 0
```

Thanks

