

# 校園Juniper EX3400 核心路由交換器 設定原理及實作 JUNOS VM

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Juniper Networks



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Cisco Certified Specialist - Enterprise SD-WAN  
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相關證照

# Juniper 課程重點

- Cisco vs Juniper
- CISCO Packet Tracert Vs Junos Vm
- Vlan概念
- interface
- Vlan
- DHCP
- JWEB

# 上課 環境需求

- CPU i3以上
- 記憶體需求 8G RAM
- 雙螢幕
- Firefox
- 預先到[pub.ntpc.edu.tw](http://pub.ntpc.edu.tw)下載課程

# VM檔案

—



junos-vsrx3-x86-64-20.1R1.11.ide

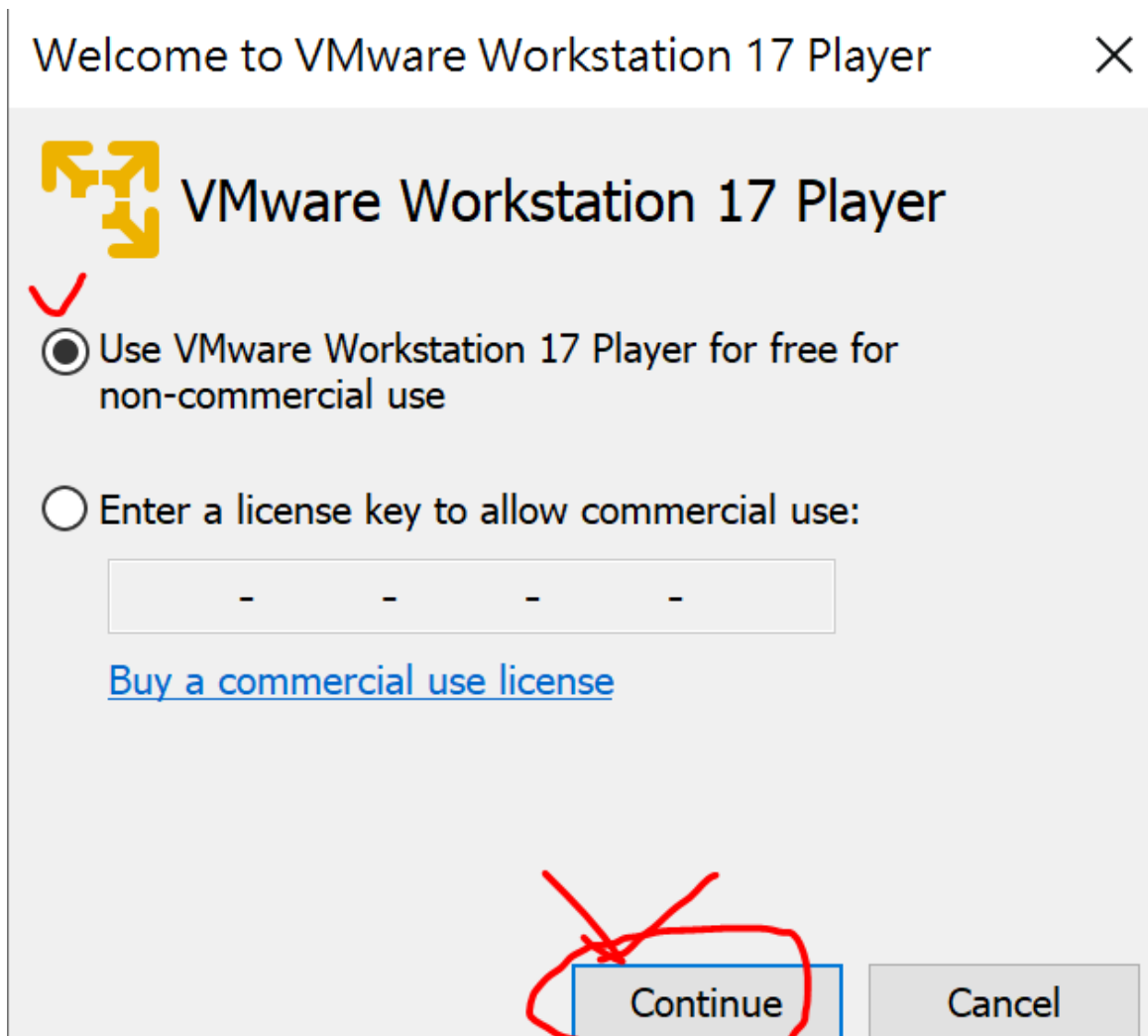
2023/4/6 下午 01:51



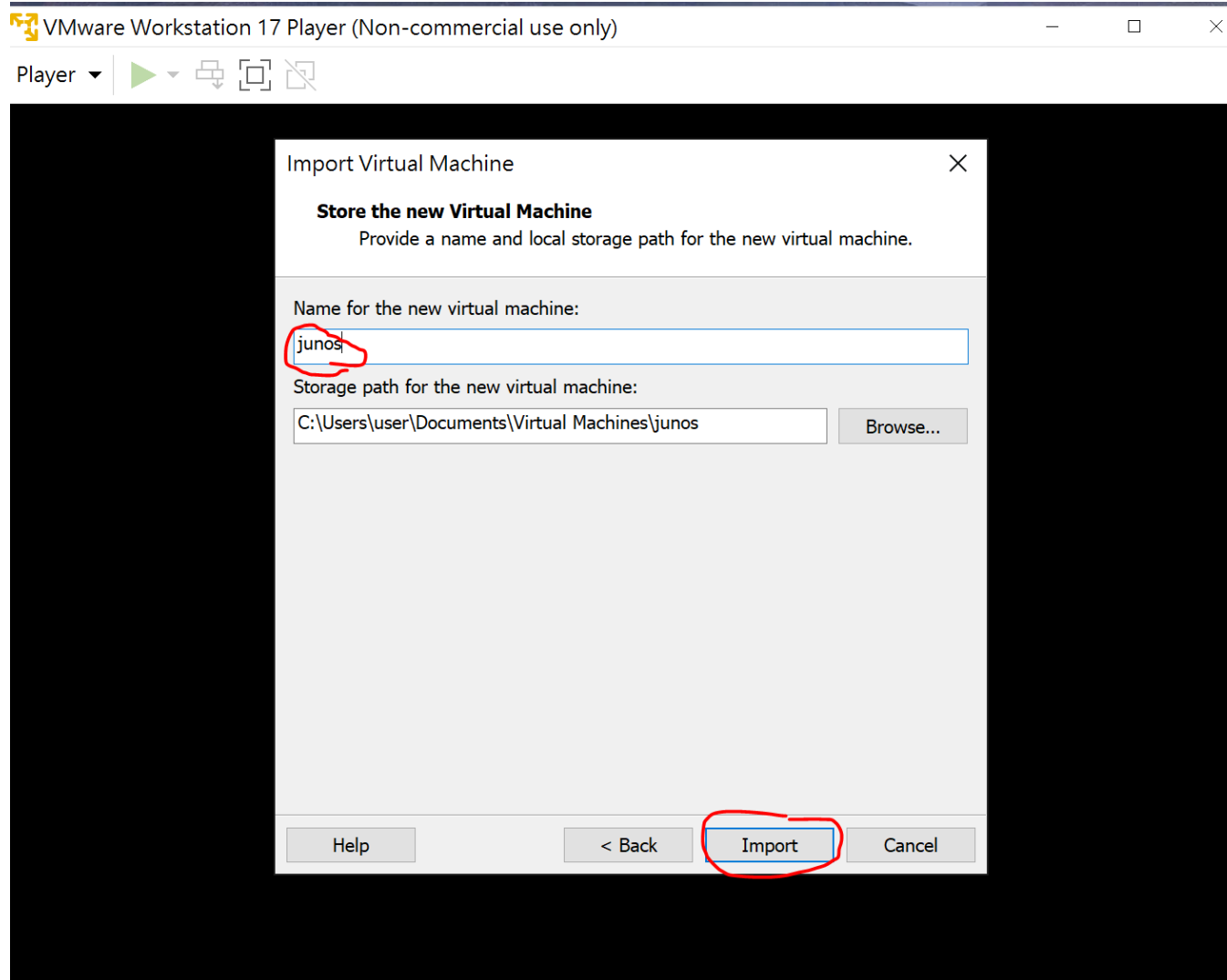
VMware-player-full-17.0.1-21139696

2023/4/6 下午 12:38

授權



vm名稱



# 帳號密碼

- Root
- No pass

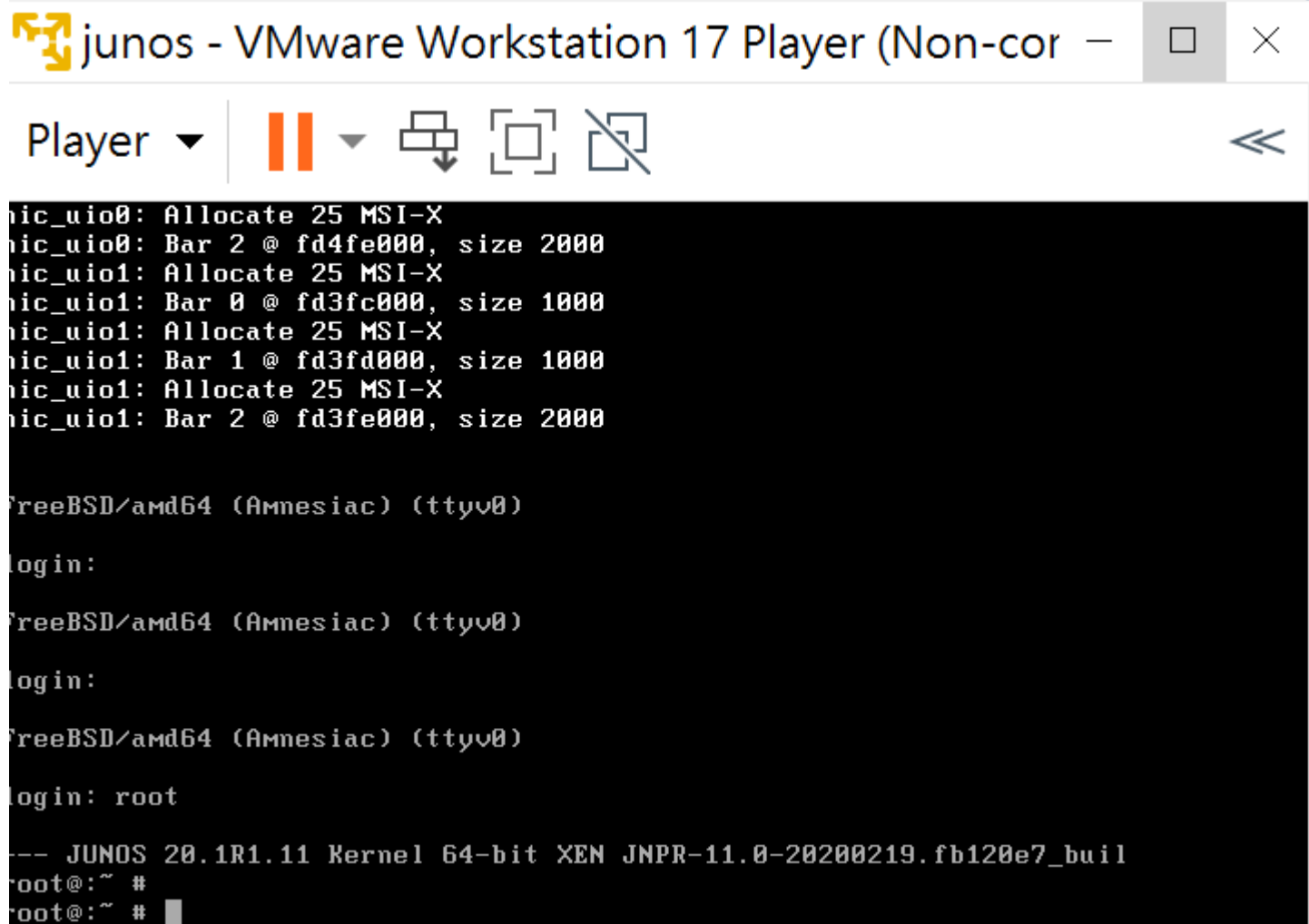
```
junos - VMware Workstation 17 Player (Non-cor - □ ×
Player ▾ | || ▾ | [ ] [ ] [ ] <<
Reconfiguring vmx0 to fxp0 ...
gpio0: <GPIO controller> at device 7.0 on pci0
device_attach: gpio0 attach returned 6
Loading JUNOS chassis module
chassis_init_hw_chassis_startup_time: chassis startup time 0.000000, shared: 0x7
ffffffff300, base: 0x7ffffffff000, offset: 0x300
IPsec: Initialized Security Association Processing.
fuse-freebsd: version 0.4.4, FUSE ABI 7.8
hwpmc: Cannot initialize hwpmc module in a virtualmachine
module_register_init: MOD_LOAD (hwpmc, 0xffffffff804417c0, 0xffffffff835fc008) e
rror 1
Loading the SLB driver
Loading the Protobuf-C module
gpio0: <GPIO controller> at device 7.0 on pci0
device_attach: gpio0 attach returned 6

pci-hgcomdev module loaded
Loading BCMSDK module....
verifexec: no fingerprint for file='/sbin/kats/cannot-exec' fsid=172 fileid=49356
gen=1 uid=0 pid=16923
lag enhanced disabled 0

FreeBSD/amd64 (Amnesiac) (ttyv0)
login: █
```



滑鼠跳出  
CTRL+Alt



```
nic_uio0: Allocate 25 MSI-X
nic_uio0: Bar 2 @ fd4fe000, size 2000
nic_uio1: Allocate 25 MSI-X
nic_uio1: Bar 0 @ fd3fc000, size 1000
nic_uio1: Allocate 25 MSI-X
nic_uio1: Bar 1 @ fd3fd000, size 1000
nic_uio1: Allocate 25 MSI-X
nic_uio1: Bar 2 @ fd3fe000, size 2000

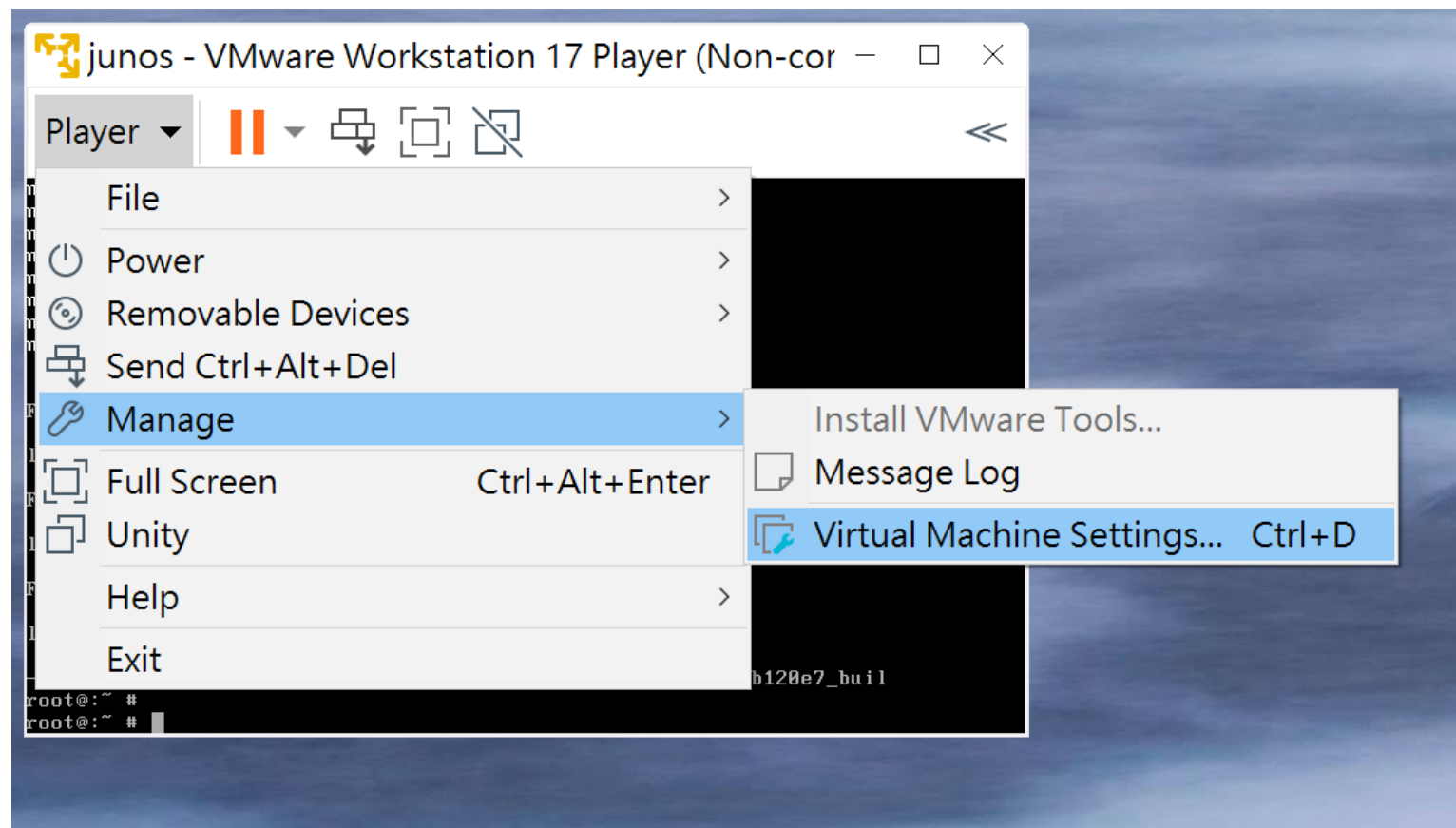
FreeBSD/amd64 (Amnesiac) (ttyv0)
login:

FreeBSD/amd64 (Amnesiac) (ttyv0)
login:

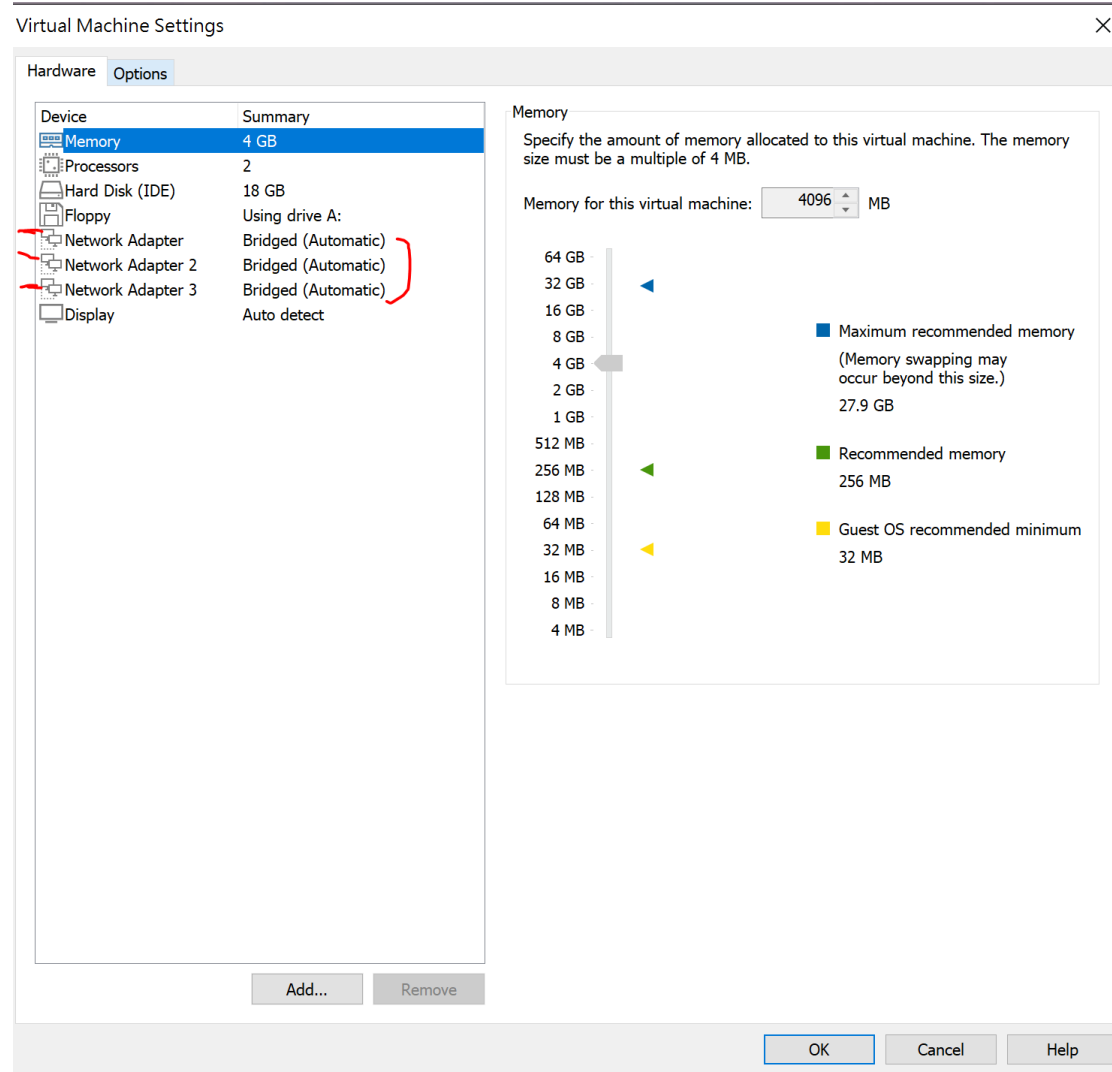
FreeBSD/amd64 (Amnesiac) (ttyv0)
login: root

-- JUNOS 20.1R1.11 Kernel 64-bit XEN JNPR-11.0-20200219.fb120e7_buil
root@:~ #
root@:~ #
```

# 調整介面-1












# 調整介面-2



## 調整介面-3

### Virtual Machine Settings

Hardware Options

Device	Summary
 Memory	4 GB
 Processors	2
 Hard Disk (IDE)	18 GB
 Floppy	Using drive A:
 Network Adapter	Bridged (Automatic)
 Network Adapter 2	Host-only
 Network Adapter 3	Host-only
 Network Adapter 4	Custom (VMnet8)
 Display	Auto detect

# 調整介面-4

show interfaces terse

The top part of the image shows a Windows Network Connections window. The title bar reads "網路連線". The address bar shows the path: "控制台 > 網路和網際網路 > 網路連線". The window contains several network adapters:

- VMware Network Adapter VMnet1: 已啟用 (Enabled) with a red checkmark.
- VMware Network Adapter VMnet8: 已啟用 (Enabled) with a red checkmark.
- 乙太網路 2: 已拔除網路線 (No network cable plugged in).
- Intel(R) Ethernet Connection (1...): 未連線 (Not connected) with a red X.
- 藍牙網路連線: 未連線 (Not connected).
- Bluetooth Device (Personal Are...): 未連線 (Not connected) with a red X.

The bottom part of the image shows a terminal window with the output of the command "show interfaces terse". The output is as follows:

Interface	Admin	Link	Proto	Local	Remote
ge-0/0/0	up	up			
gr-0/0/0	up	up			
ip-0/0/0	up	up			
lsq-0/0/0	up	up			
lt-0/0/0	up	up			
mt-0/0/0	up	up			
sp-0/0/0	up	up			
sp-0/0/0.0	up	up	inet		
			inet6		
sp-0/0/0.16383	up	up	inet		
ge-0/0/1	up	up			
ge-0/0/1.0	up	up	inet	192.168.59.10/24	
ge-0/0/2	up	up			
ge-0/0/2.0	up	up	inet	192.168.133.254/24	
dsc	up	up			
fti0	up	up			
fxp0	up	up			
gre	up	up			
ipip	up	up			
irb	up	up			
lo0	up	up			
lo0.16384	up	up	inet	127.0.0.1	--> 0/0
lo0.16385	up	up	inet	10.0.0.1	--> 0/0

---(more)---

# VM規則

- Vlan一定要綁定激活的port上
- PC 要連VM要加PC改走的網段路由
- VM0 VM1 VM8 可以視為都接在一台HUB上
- ge-o/o/1 ge-o/o/2可以視為都接在一台HUB上
- 測試採變更port native-vlan-id來做測試

# 基本指令

- ~#Cli
- >show interfaces terse
- >configure
- #root
- #exit
- >request system reboot

# Step By Step SRX To EX

- >configure
- #delete
- #set system root-authentication plain-text-password
- #set security forwarding-options family mpls mode packet-based
- set system services web-management http
- set interfaces ge-0/0/1 unit 0 family inet address 192.168.xx.10/24
- set interfaces ge-0/0/2 unit 0 family inet address 192.168.1xx.254/24
- commit



# 設定ip，關閉 防火牆

公共場所 (例如機場或咖啡廳) 的網路，而且您的裝置在此網路上是設定為無法供探索。

## 使用中的公用網路

網路 4

## Microsoft Defender 防火牆

在您的裝置使用公用網路時協助保護您的裝置。

公用防火牆已關閉。您的裝置可能易受攻擊。

關閉

VMware Network Adapter VMnet1 狀態

網路連線詳細資料

內容	值
連線特定 DNS 尾碼	
描述	VMware Virtual Ethernet Adapter for VM
實體位址	00-50-56-C0-00-01
DHCP 已啟用	是
IPv4 位址	192.168.59.1
IPv4 子網路遮罩	255.255.255.0
已取得租約	2023年4月7日 上午 11:04:28
租約到期	2023年4月7日 下午 12:19:28
IPv4 預設閘道	
IPv4 DHCP 伺服器	192.168.59.254
IPv4 DNS 伺服器	
IPv4 WINS 伺服器	
NetBIOS over Tcpip 已啟用	是
連結-本機 IPv6 位址	fe80::190a:fa82:832f:9347%45
IPv6 預設閘道	
IPv6 DNS 伺服器	fec0:0:0:ffff::1%1 fec0:0:0:ffff::2%1 fec0:0:0:ffff::3%1

關閉(C)

## (ip) 防火牆與網路保護

決定誰和什麼裝置可以存取您的網路。

Microsoft Defender 防火牆目前使用可能會使您的裝置處於危險的設定。

還原設定

## 網域網路

防火牆已開啟。

## 私人網路

防火牆已開啟。

## 公用網路 (使用中)

防火牆已關閉。

開啟

[允許應用程式通過防火牆](#)

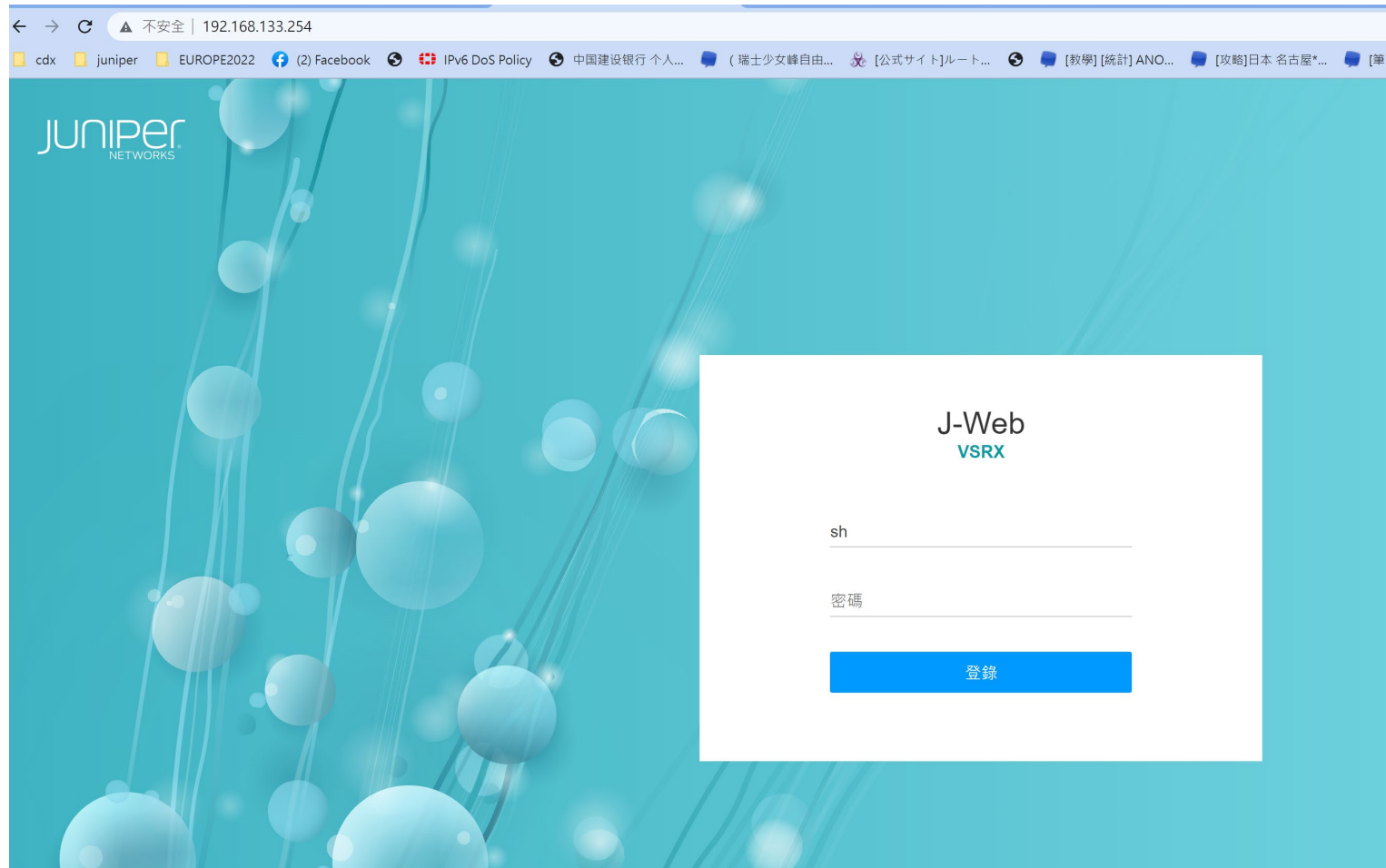
[網路和網際網路疑難排解員](#)

[防火牆通知設定](#)

[進階設定](#)

[將防火牆還原為預設設定](#)

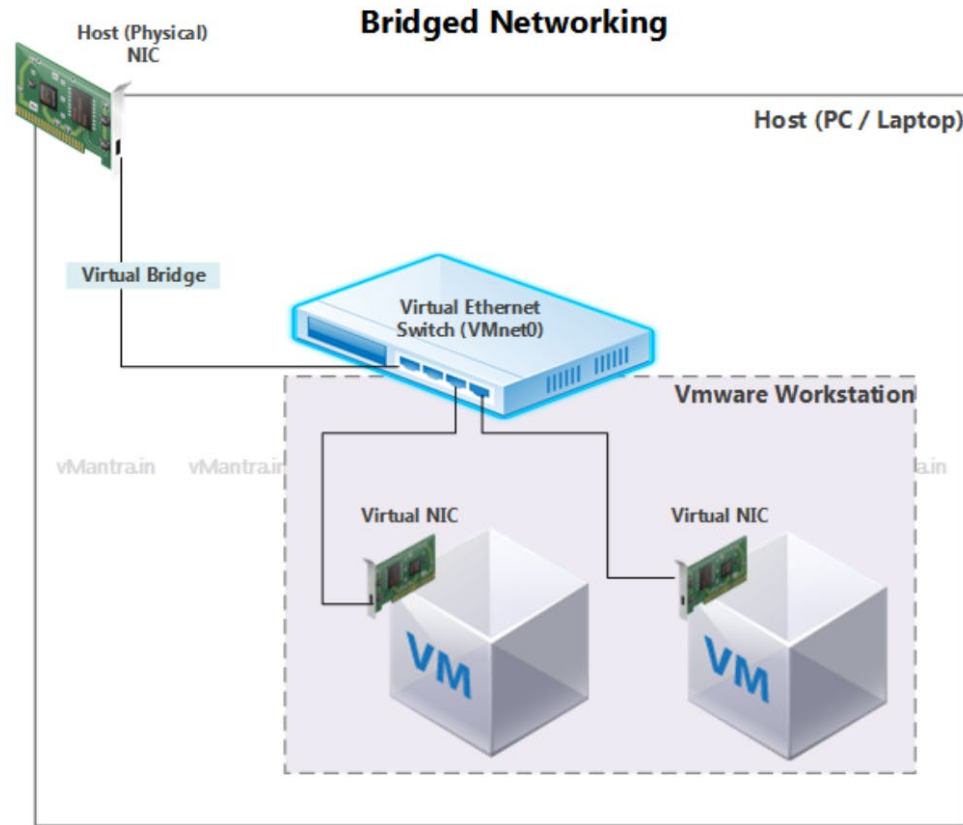
# J-web



# Vm network Bridge

## 橋接網絡：

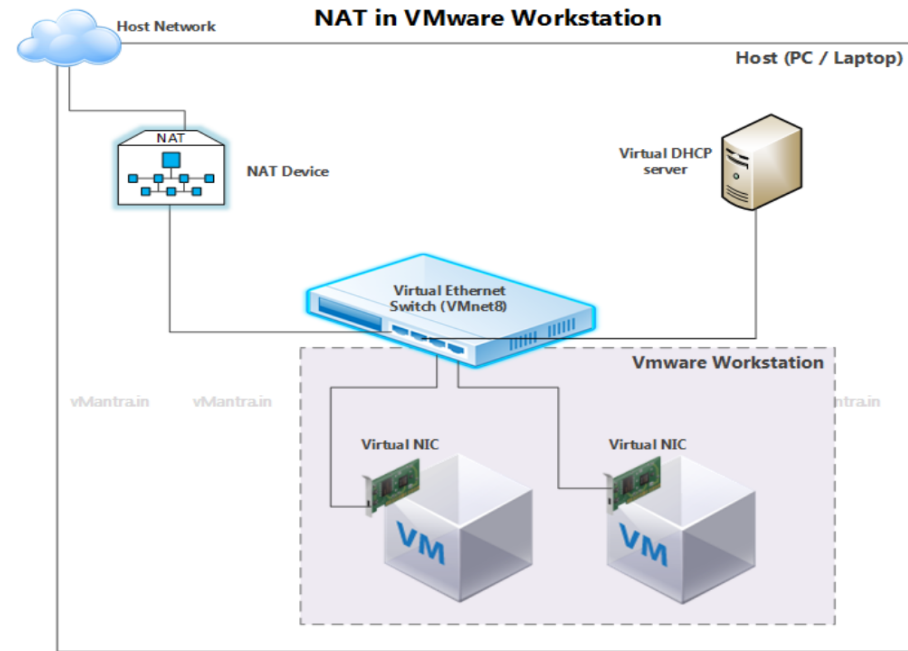
如果您選擇橋接網絡，您的 VM 將成為您的主機（安裝 VMware Workstation 的計算機）所連接的物理網絡的一部分。如果網絡中安裝了 DHCP 服務器，甚至 IP 地址也會自動配置。



# Vm network NAT Mode

## NAT ( 網絡地址轉換 ) :

如果你想為你的機器分配一個單獨的專用網絡來訪問外部網絡，NAT 是正確的選擇。默認情況下，VM 從 VMware Workstation 安裝期間自動創建的 VMware 虛擬 DHCP 服務器獲取 IP。但是，您可以根據需要禁用 DHCP 服務器。實際上有一個 NAT 設備在虛擬機和外部網絡之間傳遞網絡數據。它識別用於每個虛擬機的傳入數據包，並將它們發送到正確的目的地。

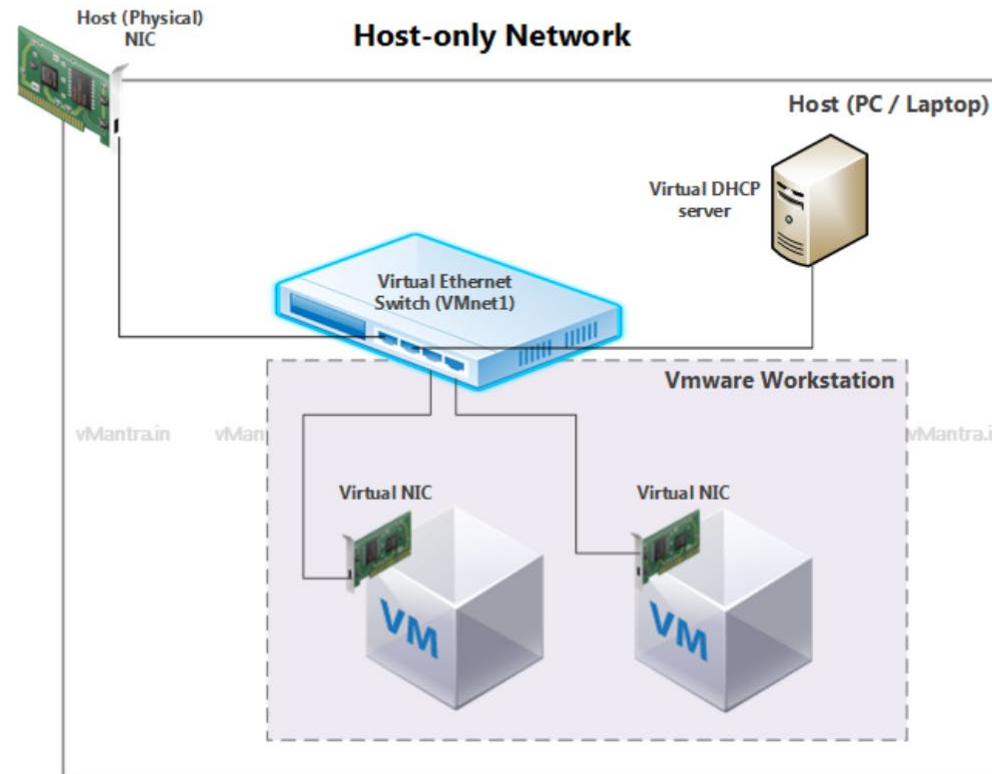


# Vm network

# Host-only Network

僅主機網絡：

如果您需要將 VM 與外部網絡隔離，請選擇 Host-only Network。在這種情況下，虛擬機只能連接到其內部網絡和運行 VMware Workstation 的主機。虛擬機將無法訪問外部網絡和互聯網。



# 100-112年重要記事

- 100年核心重建
- 102LTM轉換
- 103年中永和八校事件
- 104年 管理線路獨立
- 115年雙核心建置
- 110年3950掛點
- 112年NAT解決方案

# 知識庫

- MDM
- 九期電腦廣播
- 大屏無線建置
- 大屏Demo架構
- 生生用平板
- 話機50秒斷訊
- Multicast flooding
- IP DHCP分配
- 核心路由器技術教學
- 核心交換器技術教學
- 校園無線網路技術教學
- 防火牆透通NAT技術
- 核心VPN路由技術教學
- 無線認證教學
- 智慧網管核心技術教學
- 校園雙WAN動態路由設計
- 高可用性架構設計
- 核心備援設計
- 國際段路由 (line)
- 學術網路CDN建置

# interface

- 設備設置
  - 基本設置
  - 集群配置
  - 集群 (HA) 設置
- 安裝嚮導
- 接口
  - 端口
  - 虛擬局域網
  - 鏈路聚合
- 網絡
  - DHCP
    - 客戶端
    - DHCP服務器
  - 路由實例
  - 路由
  - ALG
  - 轉發方式
  - 政策
  - DS-精簡版
  - 服務等級
- 用戶
- 安全對象
- 安全服務

配置 / 接口 / 端口

## 端口 ?

過濾 Interface Type  去 清除

界面	管理員狀態	鏈接狀態	IP地址	區	傳
ge-0/0/0	Up	Up			
lsq-0/0/0	Up	Up			
LT-0/0/0	Up	Up			
sp-0/0/0	Up	Up			
ge-0/0/1	Up	Up			
ge-0/0/2	Up	Up			
fxp0	Up	Up			
IRB	Up	Up			
低0	Up	Up			
pp0	Up	Up			
st0	Up	Up			



# 範例 interface

The screenshot displays the J-Web interface for configuring network ports. The top navigation bar includes 'Dashboard', 'Configure', 'Monitor', 'Maintain', 'Troubleshoot', and 'Commit'. The left sidebar shows a 'Configure' menu with options like 'Interfaces', 'Ports', 'Switching', 'Virtual Chassis', 'Power over Ethernet', 'Security', 'Routing', 'Class of Service', 'System Properties', 'Services', and 'CLI Tools'. The main content area is titled 'Port Configuration' and features a dropdown for 'List ports for FPC: All'. A table lists 18 ports with columns for Port, Link Status, Type, Port Role, VLAN (VLAN ID), and Description. Below the table, the 'Details of port: ge-0/0/0' are shown in a table format.

Port	Link Status	Type	Port Role	VLAN (VLAN ID)	Description
ge-0/0/0	Down	Gigabit Ethernet	None	mac_auth (36), wlan (30), wpa2 (35)	
ge-0/0/1	Up	Gigabit Ethernet	None	Intra-1 (10), Intra-2 (20), Intra-7 (70), MGMT (3), lan (...)	
ge-0/0/2	Up	Gigabit Ethernet	None	dsa_wan (8)	
ge-0/0/3	Up	Gigabit Ethernet	None	Intra-7 (70), wlan (30)	
ge-0/0/4	Down	Gigabit Ethernet	None	Intra-7 (70), voip (25), Intra-2 (20)	
ge-0/0/5	Up	Gigabit Ethernet	None	Intra-7 (70), voip (25), lan (5)	
ge-0/0/6	Down	Gigabit Ethernet	None	Intra-7 (70), voip (25), lan (5)	
ge-0/0/7	Up	Gigabit Ethernet	None	Intra-7 (70), mac_auth (36), voip (25), lan (5)	
ge-0/0/8	Up	Gigabit Ethernet	None	Intra-7 (70), mac_auth (36), lan (5)	
ge-0/0/9	Up	Gigabit Ethernet	None	Intra-7 (70), mac_auth (36), lan (5)	
ge-0/0/10	Up	Gigabit Ethernet	None	Intra-7 (70), mac_auth (36), lan (5)	
ge-0/0/11	Down	Gigabit Ethernet	None	Intra-7 (70), mac_auth (36), Intra-2 (20)	
ge-0/0/12	Down	Gigabit Ethernet	None	mac_auth (36), voip (25), Intra-2 (20)	
ge-0/0/13	Down	Gigabit Ethernet	None	Intra-7 (70), class (34), mac_auth (36), Default (1)	
ge-0/0/14	Down	Gigabit Ethernet	None	Intra-1 (10), Intra-2 (20), Intra-4 (40), Intra-5 (50), Int...	
ge-0/0/15	Down	Gigabit Ethernet	None	Intra-1 (10), Intra-2 (20), Intra-4 (40), Intra-5 (50), Int...	
ge-0/0/16	Down	Gigabit Ethernet	None	Intra-1 (10), Intra-2 (20), Intra-4 (40), Intra-5 (50), Int...	
ge-0/0/17	Down	Gigabit Ethernet	None	Intra-1 (10), Intra-2 (20), Intra-4 (40), Intra-5 (50), Int...	

Name	Value
Administrative Status	Up
Logical Interface	ge-0/0/0.0
Port Mode	trunk
Native VLAN (VLAN ID)	None
IP Address/Subnet Mask	-
IPv6 Address/Subnet Mask	-
MTU (bytes)	1514
Speed	Auto-Negotiation
Duplex	Full
Auto Negotiation	Enabled
Flow Control	Enabled

# 請大家幫忙的 工作

- 熟悉siraya操作
- 開通組長vlan調整權限
- 單純化pot vlan 設定
- 已知問題說明

# Interface

## vlan 設定

ge-0/0/9	Up	Gigabit Ethernet
ge-0/0/10	Up	Gigabit Ethernet
ge-0/0/11	Down	Gigabit Ethernet
ge-0/0/12	Down	Gigabit Ethernet
ge-0/0/13	Down	Gigabit Ethernet
ge-0/0/14	Down	Gigabit Ethernet
ge-0/0/15	Down	Gigabit Ethernet
ge-0/0/16	Down	Gigabit Ethernet
ge-0/0/17	Down	Gigabit Ethernet
ge-0/0/18	Down	Gigabit Ethernet
ge-0/0/19	Down	Gigabit Ethernet

Details of port: ge-0/0/9

Name

### Edit Vlan Options

Port Mode:

**VLAN Options**

**VLAN Members**

- Intra-7
- mac\_auth
- lan

Native VLAN:

# v lans

配置 / 接口 / 虛擬局域網

## 虛擬局域網 ②

分配

<input type="checkbox"/> ▲ VLAN名稱	VLAN ID / 列表	接口分配	說明
<input type="checkbox"/> Intra-1	10		—
<input type="checkbox"/> Intra-2	20		—
<input type="checkbox"/> 萬	5個		—

3個 項

**設備設置**

- 基本設置
- 集群配置
- 集群 (HA) 設置
- 安裝嚮導

**接口**

- 端口
- 虛擬局域網
- 鏈路聚合

**網絡**

- DHCP**
  - 客戶端
  - DHCP服務器
- 路由實例
- 路由
- ALG
- 轉發方式
- 政策
- DS-精簡版
- 服務等級

**用戶**

- 安全對象
- 安全服務

# 範例

# vlan

The screenshot displays the J-Web network management interface. The top navigation bar includes 'Dashboard', 'Configure', 'Monitor', 'Maintain', 'Troubleshoot', and 'Commit'. The left sidebar shows a tree view with 'Configure' expanded to 'Switching' and 'VLAN' selected. The main content area is titled 'VLAN Configuration' and features a table of VLANs and a details view for the 'Default' VLAN.

**VLAN Configuration**

VLAN Name	VLAN ID/List	Description
Default	1	None
Intra-1	10	None
Intra-2	20	None
Intra-4	40	None
Intra-5	50	None
Intra-7	70	None
MGMT	3	None
NTPC-Mobile	32	None
TANetRoaming	31	None
class	34	None
dsa_wan	8	None
eduroam	33	None
lan	5	None
mac_auth	36	None

Details of VLAN: Default

Name	Value
Multilayer switching(RV1)	irb.1
IP address	10.226.120.254/24
IPv6 address	None
Layer3-interface-input filter	None
Layer3-interface-output filter	None
Input filter	None
Output filter	None

# Static route

The screenshot displays a network configuration interface for a device named '無名 VSRX'. The breadcrumb path is '配置 / 網絡 / 路由 / 靜態路由'. The main title is '靜態路由'. The interface includes a left-hand navigation menu with categories like '設備設置', '接口', '網絡', 'DHCP', '路由', 'ALG', '政策', 'DS-精簡版', '用戶', '安全對象', and '安全服務'. The '靜態路由' option is selected and highlighted in blue. The main content area shows a table with columns '路線' and '下一跳'. A single entry is visible: '0.0.0.0/0' with '163.20.66.142' as the next hop. There are also icons for adding (+), editing (pencil), and deleting (X) routes.

路線	下一跳	路由實例
0.0.0.0/0	163.20.66.142	

# DHCP

配置 / 網絡 / DHCP / 客戶端

## 客戶端 <sup>?</sup>

### DHCP Client Information

\* Interface  <sup>?</sup>

Client Identifier   <sup>?</sup>

Lease Time  <sup>?</sup>

Retransmission Attempt  <sup>?</sup>

Retransmission Interval  <sup>?</sup>

DHCP Server Address  <sup>?</sup>

Vendor Class ID  <sup>?</sup>

Update Server  <sup>?</sup>

The screenshot shows a web-based configuration interface for DHCP Client Information. On the left is a teal sidebar with a navigation menu. The main content area is light gray and contains the configuration form. The breadcrumb path is '配置 / 網絡 / DHCP / 客戶端'. The title is '客戶端' with a help icon. The form has several fields: 'Interface' (text input), 'Client Identifier' (two text inputs), 'Lease Time' (text input), 'Retransmission Attempt' (text input), 'Retransmission Interval' (text input), 'DHCP Server Address' (text input), 'Vendor Class ID' (text input), and 'Update Server' (checkbox). All text inputs have a help icon. At the bottom are 'OK' and 'Cancel' buttons.

# DHCP

The screenshot shows a web-based configuration interface for a DHCP server. On the left is a vertical navigation menu with icons and labels for various settings: 設備設置 (Device Settings), 基本設置 (Basic Settings), 集群配置 (Cluster Configuration), 集群 (HA) 設置 (Cluster (HA) Settings), 安裝嚮導 (Installation Wizard), 接口 (Interfaces), 網絡 (Network), DHCP (DHCP), 客戶端 (Clients), DHCP 服務器 (DHCP Servers), 路由實例 (Routing Instances), 路由 (Routes), ALG, 轉發方式 (Forwarding Mode), 政策 (Policies), DS-精簡版 (DS-Lite), 服務等級 (Service Level), 用戶 (Users), 安全對象 (Security Objects), and 安全服務 (Security Services). The main content area is titled "DHCP 服務器" (DHCP Servers) and includes a breadcrumb "配置 / 網絡 / DHCP / DHCP 服務器". It features a "路由實例" (Routing Instance) dropdown set to "master (default)". Below this are two main sections: "DHCP 池" (DHCP Pools) and "DHCP 組" (DHCP Groups). Each section contains a table with columns for name, network address, and routing instance, both currently showing "沒有數據顯示" (No data displayed). At the bottom, there are two more sections: "池的 DHCP 地址範圍" (DHCP Address Ranges for Pools) and "池的 DHCP 靜態綁定" (DHCP Static Bindings for Pools), each with a table for name, address range, and MAC/IP address, also showing "沒有數據顯示".

配置 / 網絡 / DHCP / DHCP 服務器

## DHCP 服務器

路由實例: master (default)

DHCP 池:

池名稱	網絡地址	路由實例
沒有數據顯示		

DHCP 組:

團隊名字	接口	路由實例
沒有數據顯示		

池的 DHCP 地址範圍:

地址範圍名稱	地址範圍 (低)	地址範圍 (高)
沒有數據顯示		

池的 DHCP 靜態綁定:

主機名	MAC地址	固定IP地址
沒有數據顯示		



# DHCP 範例

**Configure**

- Interfaces
- Switching
- Virtual Chassis
- Power over Ethernet
- Security
- Routing
- Class of Service
- System Properties
- Services
  - DHCP
  - SNMP
- CLI Tools

### DHCP Service Configuration

[Add](#) [Edit](#) [Delete](#)

DHCP Pools:

Pool Name	Network Address
v3	10.228.120.0/24
v31	10.211.120.0/24
v33	10.215.120.0/24
v34	10.217.102.0/24
v32	10.202.324.0/22
v5	163.20.73.0/24

DHCP Address range for pool: v3

Address Range Name	Address Range(Low)	Address Range(High)
v3	10.228.120.2	10.228.120.10

DHCP Groups:

[Global Settings](#) [Add](#) [Edit](#) [Delete](#)

Group Name	Interfaces
DHCP_group	irb.5,irb.31,irb.32,irb.33,irb.34

DHCP Static Bindings for pool: v3

Host Name	MAC Address	Fixed IP Address
No Data to display		

### Edit DHCP Pool

General | **Address Range** | Static Bindings

Pool Name:

Link Pool:

**Network Address**

IP Address:  .  .  .

Subnet mask:  .  .  .

**DHCP Attributes**

OK Cancel

### Edit DHCP Pool

General | **Address Range** | Static Bindings

Name	Low	High
v31	10.211.120.1	10.211.120...

Add Edit Remove

OK Cancel

### Edit DHCP Group

Groups | **Authentication**

Group Name:

**Interfaces**

Available	Selected
irb.1	irb.5
irb.10	irb.31
irb.100	irb.32
irb.2	irb.33

OK Cancel

# DHCP pool attributes

### DHCP Pool Attributes

Pool Name:  Domain Name:

Server Identifier:

TFTP Server:

Maximum Lease Time (Secs):

Boot File:

Boot Server:

Grace Period (Secs):

Netbios Node Type:

#### DNS Name Servers

Address	
203.72.153.153	<input type="button" value="Add"/>
203.72.153.154	<input type="button" value="Edit"/>
	<input type="button" value="Remove"/>

#### WINS Servers

Address	
	<input type="button" value="Add"/>
	<input type="button" value="Edit"/>
	<input type="button" value="Remove"/>

#### Gateway Routers

Name	
10.211.120.254	<input type="button" value="Add"/>
	<input type="button" value="Edit"/>
	<input type="button" value="Remove"/>

#### Option

Code	
	<input type="button" value="Add"/>
	<input type="button" value="Edit"/>
	<input type="button" value="Remove"/>

#### Option-82

Circuit Identifier:

Ranges:

Remote Identifier:

Ranges: