

DHCPv6 Server (Dibbler)

Chapter 07

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大綱

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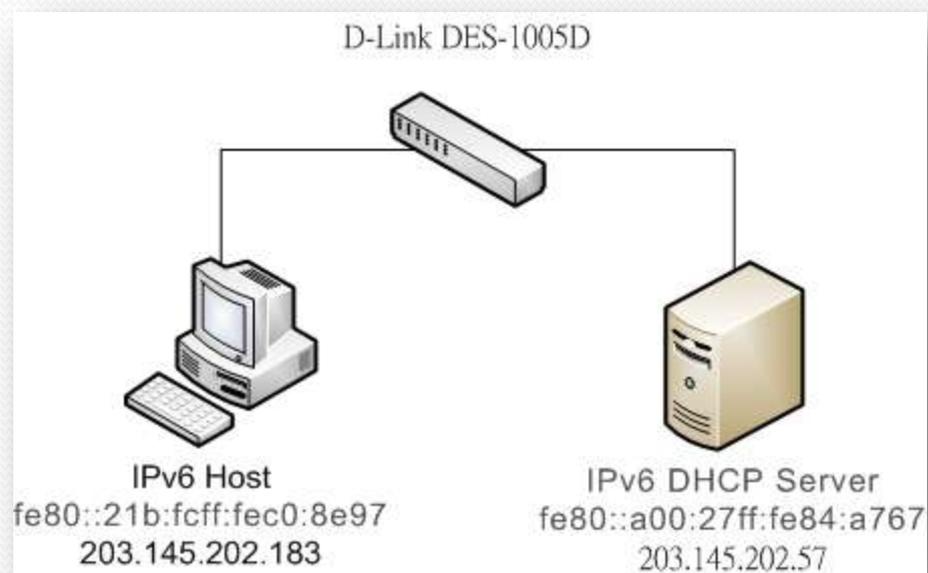
Dibbler簡介

- Dibbler 是一個跨平台的 DHCPv6 Server，在 Linux、WindowsXP、Windows2003 下都有支援，只要在 Client 端安裝 Dibbler 的 Client 程式，就可以獲取從 Dibbler – Server 配發的位址。
- 以下以 CentOS5.3 作為 Dibbler 的 Server，分別以 Windows XP、Linux 作為 Dibbler 的 Client 做 DHCPv6 分配 IP 的實做。

系統環境

- 系統環境：
 - IPv6 DHCP Server: CentOS 5.3
 - IPv6 Host: Windows XP
 - Switch : D-Link DES-1005D

- 系統架構圖：



Dibbler Server 端安裝與設定

- 由於 Dibbler 並沒有被列入 CentOS 的套件庫中，所以這邊不能用yum來安裝，先到 Dibbler 的網站下載原始檔，在命令列進行安裝
 - #wget http://klub.com.pl/dhcpv6/dibbler/dibbler-0.7.3-src.tar.gz

```
[root@localhost ~]# wget http://klub.com.pl/dhcpv6/dibbler/dibbler-0.7.3-src.tar.gz
--23:26:11-- http://klub.com.pl/dhcpv6/dibbler/dibbler-0.7.3-src.tar.gz
Resolving klub.com.pl... 88.220.59.12
Connecting to klub.com.pl|88.220.59.12|:80... connected.
HTTP request sent, awaiting response... 200 OK
Length: 3723163 (3.5M) [application/x-gzip]
Saving to: `dibbler-0.7.3-src.tar.gz'

100%[=====>] 3,723,163  2.17K/s  in 2m 22s

23:28:35 (25.5 KB/s) - `dibbler-0.7.3-src.tar.gz' saved [3723163/3723163]

[root@localhost ~]# _
```

Dibbler Server 端安裝與設定

- 下載完成後，用tar指令將其解壓縮
 - #tar zxvf dibbler-0.7.3-src.tar.gz

```
[root@localhost ~]# tar zxvf dibbler-0.7.3-src.tar.gz _
```

- 解壓縮完成畫面

```
dibbler-0.7.3/testCases/3.2-relay/  
dibbler-0.7.3/testCases/3.2-relay/relay2.conf  
dibbler-0.7.3/testCases/3.2-relay/server.conf  
dibbler-0.7.3/testCases/3.2-relay/relay1.conf  
dibbler-0.7.3/testCases/testCase01/  
dibbler-0.7.3/testCases/testCase01/server.conf  
dibbler-0.7.3/testCases/testCase01/INFO  
dibbler-0.7.3/testCases/testCase09/  
dibbler-0.7.3/testCases/testCase09/INFO  
dibbler-0.7.3/testCases/testCase07/  
dibbler-0.7.3/testCases/testCase07/server.conf  
dibbler-0.7.3/testCases/testCase07/client.conf  
dibbler-0.7.3/testCases/testCase07/INFO  
dibbler-0.7.3/testCases/testCase02/  
dibbler-0.7.3/testCases/testCase02/client.conf  
dibbler-0.7.3/testCases/testCase02/INFO  
dibbler-0.7.3/testCases/testCase08/  
dibbler-0.7.3/testCases/testCase08/server.conf  
dibbler-0.7.3/testCases/testCase08/INFO  
dibbler-0.7.3/testCases/testCase05/  
dibbler-0.7.3/testCases/testCase05/server.conf  
dibbler-0.7.3/testCases/testCase05/client.conf  
dibbler-0.7.3/testCases/testCase05/INFO  
dibbler-0.7.3/server-win32.conf  
[root@localhost ~]# _
```

Dibbler Server 端安裝與設定

- 解壓縮後使用ls查詢檔案，會發現多了一個dibbler-0.7.3資料夾

- #ls

```
[root@localhost ~]# ls
anaconda-ks.cfg  dibbler-0.7.3-src.tar.gz  install.log.syslog
dibbler-0.7.3    install.log
[root@localhost ~]# _
```

- 進入資料夾內查看檔案

- #cd dibbler-0.7.3

- #ls

```
[root@localhost ~]# cd dibbler-0.7.3
[root@localhost dibbler-0.7.3]# ls
```

Dibbler Server 端安裝與設定

- dibbler-0.7.3資料夾的檔案列表，裡面有個Makefile
- 代表可以直接做 make 和 make install 安裝到系統中

```
client-win32.conf      server.conf
ClntAddrMgr           server-extraopts.conf
ClntCfgMgr            server-fqdn.conf
ClntIfaceMgr          server-guess-mode.conf
ClntMessages          server-leasequery.conf
ClntOptions           server-per-client.conf
ClntTransMgr          server-prefix-delegation.conf
doc                   server-relay.conf
experimental          server-relay-interface-id.conf
GUIDELINES            server-stateless.conf
IfaceMgr              server-ta.conf
include               server-tunnelmode.conf
LICENSE                server-win32.conf
Makefile              SrvAddrMgr
Makefile.inc          SrvCfgMgr
Messages              SrvIfaceMgr
Misc                  SrvMessages
Options               SrvOptions
oxygen.cfg            SrvTransMgr
Port-linux            test
Port-macos             testCases
Port-win32             TODO
Port-winnt2k           TransMgr
poslib                 VERSION
[root@localhost dibbler-0.7.3]# _
```

Dibbler Server 端安裝與設定

- 編譯 Dibbler
 - #make
 - 系統顯示缺少g++套件

```
[root@localhost dibbler-0.7.3]# make
[CONFIG ] /poslib/
[MAKE   ] /poslib/poslib
../libtool: line 1170: g++: command not found
make[4]: *** [dnsmessagetool] Error 1
make[3]: *** [all-recursive] Error 1
make[2]: *** [all-recursive] Error 1
make[1]: *** [all-recursive-am] Error 2
make: *** [libposlib] Error 2
[root@localhost dibbler-0.7.3]# _
```

- 利用yum將其裝上
- #yum install gcc-c++

```
[root@localhost dibbler-0.7.3]# yum install gcc-c++ _
```

Dibbler Server 端安裝與設定

- g++ 安裝完成

```
Transaction Test Succeeded
Running Transaction
  Updating      : glibc-common                [ 1/13]
  Installing    : kernel-headers              [ 2/13]
  Installing    : libstdc++-devel             [ 3/13]
  Updating      : glibc                       [ 4/13]
INIT: version 2.86 reloading
  Installing    : glibc-headers                [ 5/13]
  Installing    : libgomp                     [ 6/13]
  Updating      : nscd                        [ 7/13]
  Installing    : glibc-devel                 [ 8/13]
  Installing    : gcc                         [ 9/13]
  Installing    : gcc-c++                     [10/13]
  Cleanup       : glibc                       [11/13]
  Cleanup       : glibc-common                [12/13]
  Cleanup       : nscd                        [13/13]

Installed: gcc-c++.i386 0:4.1.2-44.el5
Dependency Installed: gcc.i386 0:4.1.2-44.el5 glibc-devel.i386 0:2.5-34.el5_3.1
glibc-headers.i386 0:2.5-34.el5_3.1 kernel-headers.i386 0:2.6.18-128.7.1.el5 lib
gomp.i386 0:4.3.2-7.el5 libstdc++-devel.i386 0:4.1.2-44.el5
Updated: glibc.i686 0:2.5-34.el5_3.1 glibc-common.i386 0:2.5-34.el5_3.1 nscd.i38
6 0:2.5-34.el5_3.1
Complete!
[root@localhost dibbler-0.7.3]# _
```

Dibbler Server 端安裝與設定

- 再次進行make，就可以順利編譯了
 - #make

```
[root@localhost dibbler-0.7.3]# make
[CONFIG ] /poslib/
[MAKE   ] /poslib/poslib
[LINKS  ] /poslib
[LINKS  ] /include
[CXX    ] /IfaceMgr/SocketIPv6.o
[CXX    ] /IfaceMgr/Iface.o
[CXX    ] /IfaceMgr/IfaceMgr.o
[LIB    ] /IfaceMgr/libIfaceMgr.a
[CXX    ] /AddrMgr/AddrAddr.o
[CXX    ] /AddrMgr/AddrIA.o
[CXX    ] /AddrMgr/AddrClient.o
[CXX    ] /AddrMgr/AddrMgr.o
[CXX    ] /AddrMgr/AddrPrefix.o
[LIB    ] /AddrMgr/libAddrMgr.a
[CXX    ] /CfgMgr/CfgMgr.o
[CXX    ] /CfgMgr/TimeZone.o
[CXX    ] /CfgMgr/StationID.o
[CXX    ] /CfgMgr/StationRange.o
[LIB    ] /CfgMgr/libCfgMgr.a
[CXX    ] /Messages/Msg.o
```

Dibbler Server 端安裝與設定

- Make完成後直接進行make install將程式安裝進去
 - #make install

```
[root@localhost dibbler-0.7.3]# make install
[INSTALL] dibbler-server
[INSTALL] dibbler-client
[INSTALL] dibbler-relay
[INSTALL] client-addrparams.conf
[INSTALL] client-auth.conf
[INSTALL] client-autodetect.conf
[INSTALL] client.conf
[INSTALL] client-fqdn.conf
[INSTALL] client-prefix-delegation.conf
[INSTALL] client-stateless.conf
[INSTALL] client-ta.conf
[INSTALL] client-tunnelmode.conf
[INSTALL] client-win32.conf
[INSTALL] relay-1interface.conf
[INSTALL] relay.conf
[INSTALL] relay-echo-remoteid.conf
[INSTALL] server-3classes.conf
[INSTALL] server-addrparams.conf
[INSTALL] server-auth.conf
[INSTALL] server.conf
[INSTALL] server-extraopts.conf
```

Dibbler Server 端安裝與設定

- 安裝完成的畫面

```
[INSTALL] relay.conf
[INSTALL] relay-echo-remoteid.conf
[INSTALL] server-3classes.conf
[INSTALL] server-addrparams.conf
[INSTALL] server-auth.conf
[INSTALL] server.conf
[INSTALL] server-extraopts.conf
[INSTALL] server-fqdn.conf
[INSTALL] server-guess-mode.conf
[INSTALL] server-leasequery.conf
[INSTALL] server-per-client.conf
[INSTALL] server-prefix-delegation.conf
[INSTALL] server-relay.conf
[INSTALL] server-relay-interface-id.conf
[INSTALL] server-stateless.conf
[INSTALL] server-ta.conf
[INSTALL] server-tunnelmode.conf
[INSTALL] server-win32.conf
[INSTALL] doc/man/dibbler-client.8
[INSTALL] doc/man/dibbler-relay.8
[INSTALL] doc/man/dibbler-server.8
[INSTALL] /doc/dibbler-user.pdf
[INSTALL] /doc/dibbler-devel.pdf
[INSTALL] CHANGELOG
[root@localhost dibbler-0.7.3]# _
```

Dibbler Server 端安裝與設定

- 設定Dibbler-Server
 - 位置： /etc/dibbler/server.conf
 - #vim /etc/dibbler/server.conf

```
[root@localhost home]# vim /etc/dibbler/server.conf _
```

Dibbler Server 端安裝與設定

- 設定檔內容：
 - T1與T2 :是 Client 重新取得位址的時間
 - preferred-lifetime : 是位址的存活時間
 - valid-lifetime : 位址的有效時間
 - pool : 位址分配的範圍

```
#
# Example server configuration file
#
# This config. file is considered all-purpose as it instructs server
# to provide almost every configuratio
#
# Logging level range: 1(Emergency)-8(Debug)
log-level 8
# Don't log full date
log-mode short
# set preference of this server to 0 (higher = more preferred)
preference 0
iface "eth0" {
// also ranges can be defines, instead of exact values
t1 1800-2000
t2 2700-3000
preferred-lifetime 3600
valid-lifetime 7200

```

24,1

Top

Dibbler Server 端安裝與設定

- class { pool 2000:00/64 } : 位址的範圍

```
# assign addresses from this pool
class {
  pool 2000::/64
}

# assign temporary addresses from this pool

ta-class {
  pool 3000::/96
}

#assign /96 prefixes from this pool
pd-class {
  pd-pool 3000:458:ff01:ff03:abcd::/80
  pd-length 96
}

# provide DNS server location to the clients
option dns-server 2000::ff,2000::fe

# provide their domain name
option domain example.com

# provide vendor-specific data (vendor-id set to 5678)
```

48,1

42%

Dibbler Server 端安裝與設定

- 其他設定，例如FQDN、NTP、MIS等

```
# provide their domain name
option domain example.com

# provide vendor-specific data (vendor-id set to 5678)
option vendor-spec 5678-0x0002aaaa

# provide ntp-server information
option ntp-server 2000::200,2000::201,2000::202

# provide timezone information
option time-zone CET

# provide VoIP parameter (SIP protocol servers and domain names)
option sip-server 2000::300,2000::302,2000::303,2000::304
option sip-domain sip1.example.com,sip2.example.com

# provide NIS information (server addresses and domain name)
option nis-server 2000::400,2000::401,2000::404,2000::405,2000::405
option nis-domain nis.example.com

# provide NIS+ information (server addresses and domain name)
option nis+-server 2000::501,2000::502
option nis+-domain nisplus.example.com
```

45,1 78%

Dibbler Server 端安裝與設定

- 啟動 dibbler-server
 - #dibbler-server start

```
[root@localhost home]# dibbler-server start
! Dibbler - a portable DHCPv6, version 0.4.1(SERVER, Linux port)
! Authors : Tomasz Mrugalski<thomson(at)klub.com.pl>,Marek Senderski<msend(at)o2
.pl>
! Licence : GNU GPL v2 or later. Developed at Gdansk University of Technology.
! Homepage: http://klub.com.pl/dhcpv6/
Starting daemon...
[root@localhost home]#
```

- 使用 netstat 查詢dibbler是否開始監聽
 - #netstat -antl | grep ::
 - 查詢到 port 547 已被監聽，dibbler-server 順利啟動

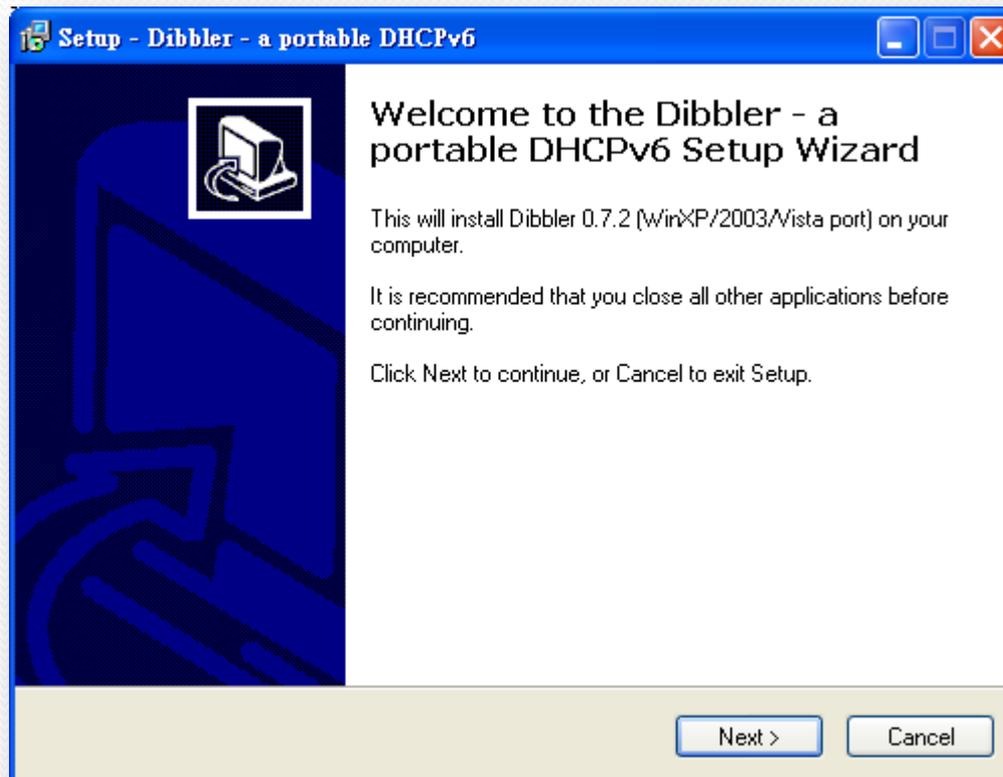
```
[root@localhost home]# netstat -anpl |grep ::
tcp        0      0  :::21                :::*                LISTEN
EN         14485/vsftpd
tcp        0      0  :::22                :::*                LISTEN
EN         2335/sshd
udp        0      0  :::39180              :::*                *
2537/avahi-daemon:
udp        0      0  ff02::1:2:547        :::*                *
5034/dibbler-server
udp        0      0  :::5353              :::*                *
2537/avahi-daemon:
[root@localhost home]# _
```

Dibbler Client 端安裝與設定(Windows)

- 在 Windows XP 下，系統必須安裝一個特定的 DHCPv6 Client 才能抓取到 DHCPv6 Server 配發的 IPv6 Address
- Windows Dibbler-Client 下載點
 - <http://klub.com.pl/dhcpv6/#DOWNLOAD>
 - 抓取目前最新的 0.72 版來安裝。

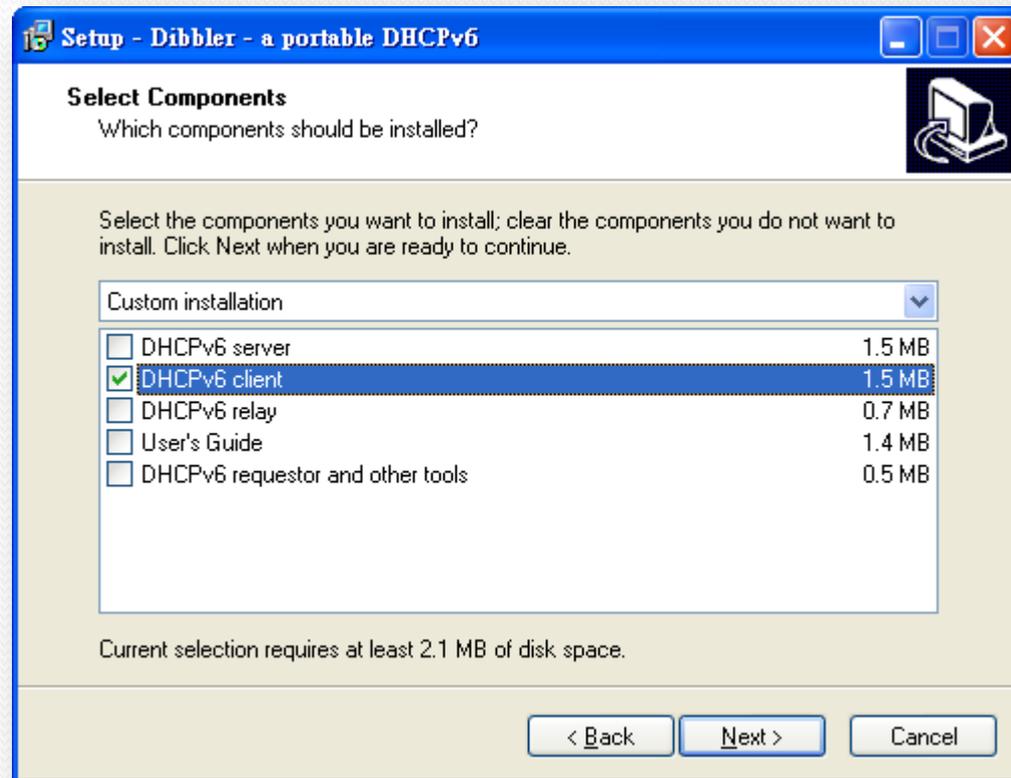
Dibbler Client 端安裝與設定(Windows)

- 安裝流程
 - 起始畫面



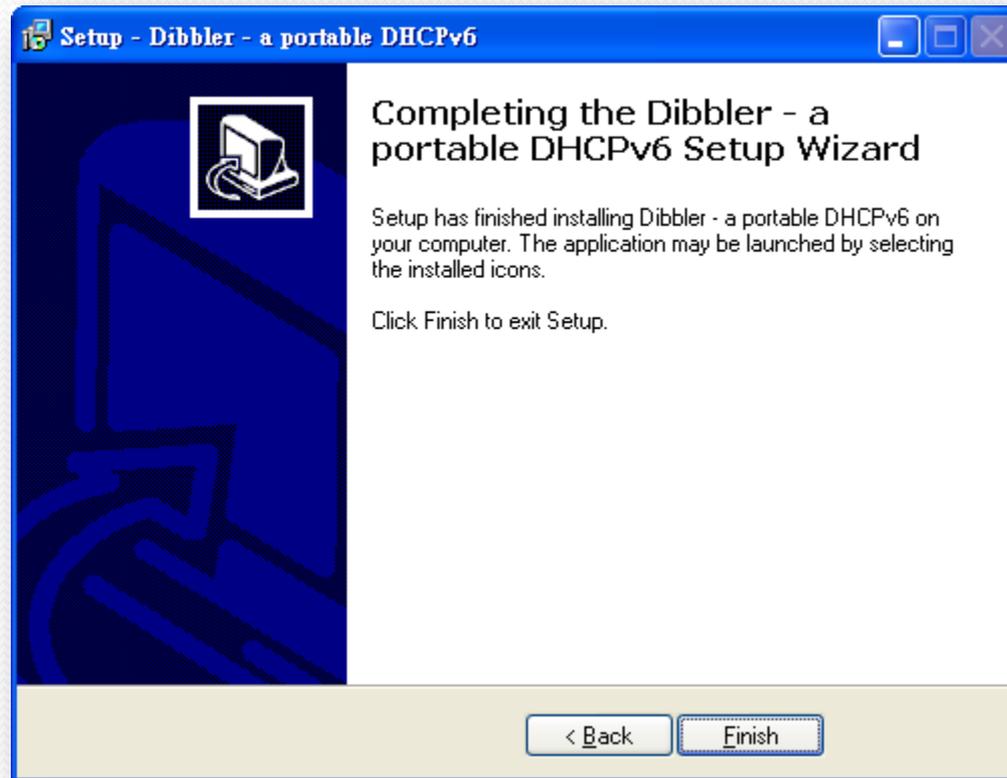
Dibbler Client 端安裝與設定(Windows)

- 在元件選擇這邊，只把 DHCPv6 client 選項打勾即可



Dibbler Client 端安裝與設定(Windows)

- 安裝完成畫面

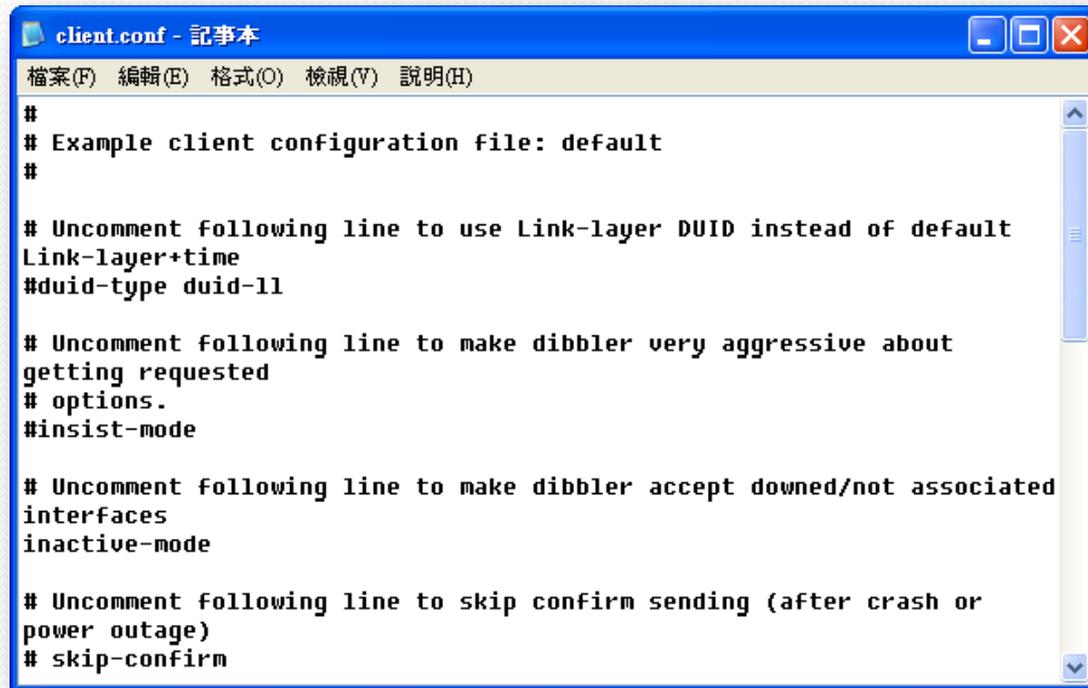


Dibbler Client 端安裝與設定(Windows)

- 修改Dibbler Client設定檔
 - 開始 -> 程式集 -> Dibbler -> Client Run in the console -> Client Edit config file
 - 將裡面的 #inactive-mode 反註解，讓Dibbler-Client 對所有的 interface 做掃描(也可以只針對單一 interface)

Dibbler Client 端安裝與設定(Windows)

- 設定畫面

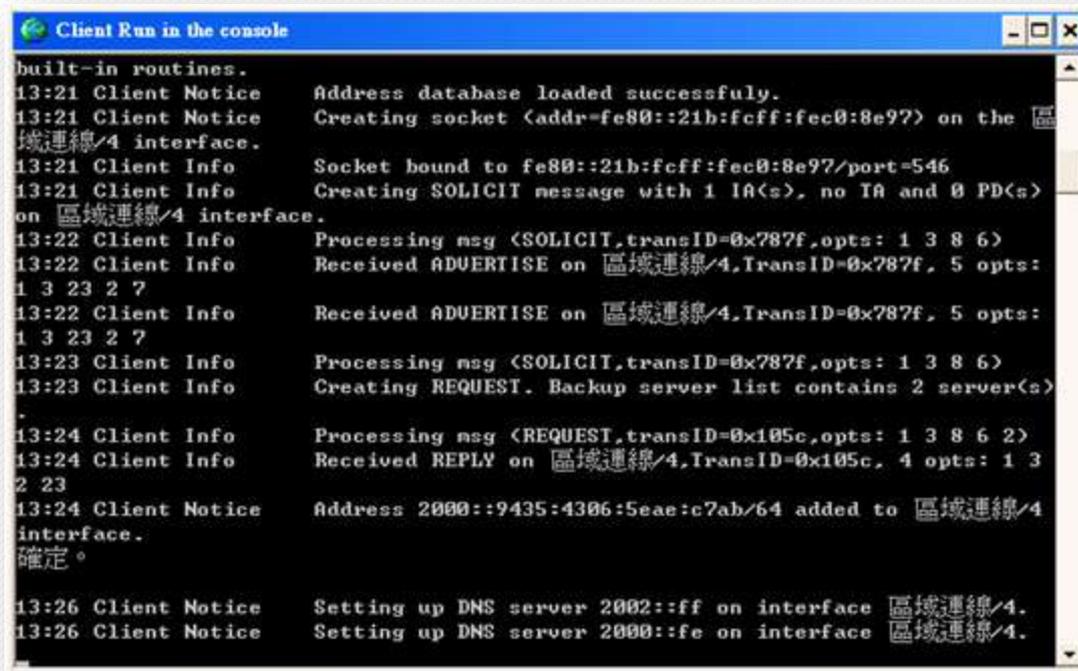


```
client.conf - 記事本
檔案(F) 編輯(E) 格式(O) 檢視(V) 說明(H)
#
# Example client configuration file: default
#
# Uncomment following line to use Link-layer DUID instead of default
Link-layer+time
#duid-type duid-ll
#
# Uncomment following line to make dibbler very aggressive about
getting requested
# options.
#insist-mode
#
# Uncomment following line to make dibbler accept downed/not associated
interfaces
inactive-mode
#
# Uncomment following line to skip confirm sending (after crash or
power outage)
# skip-confirm
```

Dibbler Client 端安裝與設定(Windows)

- 啟動Dibbler-Client

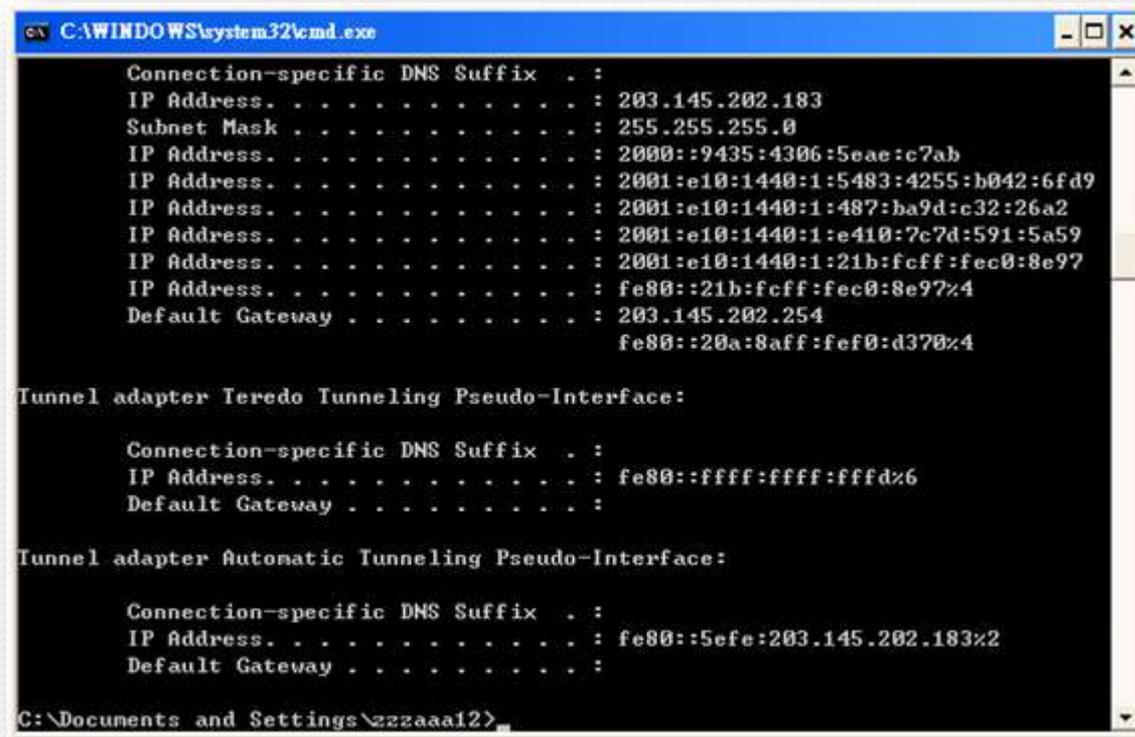
- 開始 -> 所有程式 -> Dibbler -> Client Run in the console
- 區域連線是已取得2000::9435:4306:5eae:c7ab 這個位址了



```
Client Run in the console
built-in routines.
13:21 Client Notice   Address database loaded successfully.
13:21 Client Notice   Creating socket (addr=fe80::21b:fcff:fec0:8e97) on the 區域連線/4 interface.
13:21 Client Info     Socket bound to fe80::21b:fcff:fec0:8e97/port=546
13:21 Client Info     Creating SOLICIT message with 1 IA(s), no IA and 0 PD(s) on 區域連線/4 interface.
13:22 Client Info     Processing msg (SOLICIT,transID=0x787f,opts: 1 3 8 6)
13:22 Client Info     Received ADVERTISE on 區域連線/4,TransID=0x787f, 5 opts: 1 3 23 2 7
13:22 Client Info     Received ADVERTISE on 區域連線/4,TransID=0x787f, 5 opts: 1 3 23 2 7
13:23 Client Info     Processing msg (SOLICIT,transID=0x787f,opts: 1 3 8 6)
13:23 Client Info     Creating REQUEST. Backup server list contains 2 server(s)
13:24 Client Info     Processing msg (REQUEST,transID=0x105c,opts: 1 3 8 6 2)
13:24 Client Info     Received REPLY on 區域連線/4,TransID=0x105c, 4 opts: 1 3 2 23
13:24 Client Notice   Address 2000::9435:4306:5eae:c7ab/64 added to 區域連線/4 interface.
確定。
13:26 Client Notice   Setting up DNS server 2002::ff on interface 區域連線/4.
13:26 Client Notice   Setting up DNS server 2000::fe on interface 區域連線/4.
```

Dibbler Client 端安裝與設定(Windows)

- 利用ipconfig再查詢一下
- 也有顯示取得 2000::9435:4306:5eae:c7ab 位址了



```
C:\WINDOWS\system32\cmd.exe

Connection-specific DNS Suffix . : 
IP Address. . . . . : 203.145.202.183
Subnet Mask . . . . . : 255.255.255.0
IP Address. . . . . : 2000::9435:4306:5eae:c7ab
IP Address. . . . . : 2001:e10:1440:1:5483:4255:b042:6fd9
IP Address. . . . . : 2001:e10:1440:1:487:ba9d:c32:26a2
IP Address. . . . . : 2001:e10:1440:1:e410:7c7d:591:5a59
IP Address. . . . . : 2001:e10:1440:1:21b:fcff:fec0:8e97
IP Address. . . . . : fe80::21b:fcff:fec0:8e97%4
Default Gateway . . . . . : 203.145.202.254
                             fe80::20a:8aff:fef0:d370%4

Tunnel adapter Teredo Tunneling Pseudo-Interface:

    Connection-specific DNS Suffix . : 
    IP Address. . . . . : fe80::ffff:ffff:fffd%6
    Default Gateway . . . . . : 

Tunnel adapter Automatic Tunneling Pseudo-Interface:

    Connection-specific DNS Suffix . : 
    IP Address. . . . . : fe80::5efe:203.145.202.183%2
    Default Gateway . . . . . : 

C:\Documents and Settings\zzzaa12>
```

Dibbler Client端安裝與設定(Windows)

- 將Dibbler-Client設為系統服務
 - 開始 -> 所有程式 -> Dibbler -> Client Install as service
 - 開機就會自動執行取得位址

Dibbler Client 端安裝與設定(Linux)

- Linux 的 Dibbler-Client 在我們安裝 Dibbler 原始檔時，就已經被安裝進來了
- 設定Client設定檔
 - 位置：/etc/dibbler/client.conf
 - 直接用預設值即可使用
- 啟動Dibbler-Client
 - 先用 ifconfig 查詢網卡eth0位址
 - ifconfig eth0

```
[root@localhost ~]# ifconfig eth0
eth0      Link encap:Ethernet  HWaddr 08:00:27:84:A7:AA
          inet addr:192.168.105.147  Bcast:192.168.105.255  Mask:255.255.255.0
          inet6 addr: 2001:c10:1440:1:a00:27ff:fe84:a7aa/64  Scope:Global
          inet6 addr: fe80::a00:27ff:fe84:a7aa/64  Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:65032 errors:4 dropped:0 overruns:0 frame:0
          TX packets:5482 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:8625683 (8.2 MiB)  TX bytes:763512 (745.6 KiB)
          Interrupt:11 Base address:0xd020

[root@localhost ~]#
```

Dibbler Client 端安裝與設定(Linux)

- 執行dibbler-client
- #dibbler-client start

```
[root@localhost ~]# dibbler-client start
! Dibbler - a portable DHCPv6, version 0.4.1(CLIENT, Linux port)
! Authors : Tomasz Mrugalski<thomson(at)klub.com.pl>,Marek Senderski<msend(at)o2
.pl>
! Licence : GNU GPL v2 or later. Developed at Gdansk University of Technology.
! Homepage: http://klub.com.pl/dhcpv6/
Starting daemon...
[root@localhost ~]# _
```

- 再查詢一下eth0位址，已取得Server所配發的位址
- #ifconfig eth0

```
[root@localhost ~]# ifconfig eth0
eth0      Link encap:Ethernet  HWaddr 08:00:27:84:A7:AA
          inet addr:192.168.105.147  Bcast:192.168.105.255  Mask:255.255.255.0
          inet6 addr: 2000::f91d:980d:e998:d142/128 Scope:Global
          inet6 addr: 2001:e10:1440:1:a00:27ff:fe84:a7aa/64 Scope:Global
          inet6 addr: fe80::a00:27ff:fe84:a7aa/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:67504 errors:4 dropped:0 overruns:0 frame:0
          TX packets:5497 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:8817320 (8.4 MiB)  TX bytes:765914 (747.9 KiB)
          Interrupt:11 Base address:0xd020
[root@localhost ~]# _
```

參考資料

- <http://library.pantek.com/Miscellaneous/The%20Linux%20Documentation%20Project/HOWTO/Linux+IPv6-HOWTO/hints-daemons-dibbler.html>



END