Corporate VPN Using Mikrotik Cloud Feature

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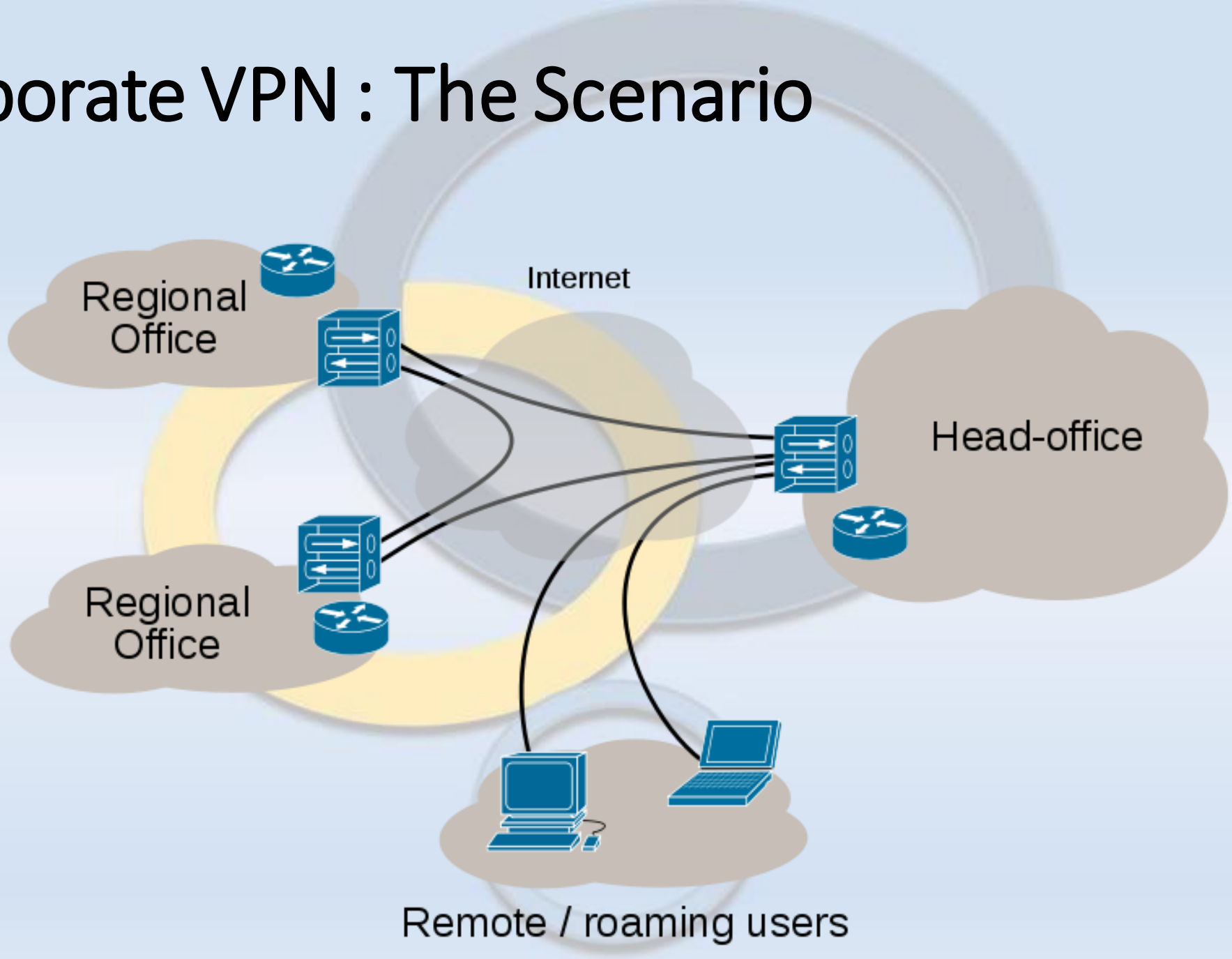
What is a VPN ?

- A virtual private network (VPN) is a method for the extension of a private network across a public network, such as the Internet.

- It enables users to send and receive data across shared or public networks as if their computing devices were directly connected to the private network.

- A VPN is created by establishing a virtual point-to-point connection through the use of dedicated connections, virtual tunneling protocols, or traffic encryption.

Corporate VPN : The Scenario



VPN Tunnels

- PPTP- Point to Point Tunneling Protocol
- L2TP- Layer 2 Tunneling Protocol
- SSTP- Secure Socket Tunneling Protocol
- OVPN- Open VPN

Common Problems

- Router does not have static IP.
- PPTP is not working, and not very secure even if it is.
- SSTP is not compatible with Mac OS, Android, Windows XP.
- IPSEC is complicated to set up.

What Are The Solutions???

DDNS

- Dynamic Domain Name Service (DDNS) can solve the issue of absence of static ip.
- Third party DDNS services often require scripts.
- Most third party DDNS require fees.

```
:global ddnsuser "theddnsusername"
:global ddnspass "theddnspassword"
:global theinterface "interfacename"
:global ddnshost blabla.dyndns.org
:global ipddns [:resolve $ddnshost];
:global ipfresh [ /ip address get [/ip address find interface=$theinterface ] address ]
:if ([ :typeof $ipfresh ] = nil ) do={
  :log info ("DynDNS: No ip address on $theinterface .")
} else={
  :for i from=( [:len $ipfresh] - 1) to=0 do={
    :if ( [:pick $ipfresh $i] = "/") do={
   :set ipfresh [:pick $ipfresh 0 $i];
     }
}

:if ($ipddns != $ipfresh) do={
   :log info ("DynDNS: IP-DynDNS = $ipddns")
   :log info ("DynDNS: IP-Fresh = $ipfresh")
  :log info "DynDNS: Update IP needed, Sending UPDATE...!"
  :global str
"/nic/update\?hostname=$ddnshost&myip=$ipfresh&wildcard=NOCHG&mx=NOCHG&backmx
=NOCHG"
  /tool fetch address=members.dyndns.org src-path=$str mode=http user=$ddnsuser \
      password=$ddnspass dst-path=("/DynDNS.".$ddnshost)
   :delay 1
   :global str [/file find name="DynDNS.$ddnshost"];
   /file remove $str
   :global ipddns $ipfresh
 :log info "DynDNS: IP updated to $ipfresh!"
   } else={
    :log info "DynDNS: dont need changes";
   }
}

/system scheduler
add interval=1m name=DynDns on-event=DynDns
policy=ftp,reboot,read,write,policy,test,winbox,password,sniff,sensitive,api start-time=startup
```

Mikrotik Cloud

- MikroTik offers a Dynamic DNS name service for RouterBOARD devices.
- Starting with RouterOS v6.14
- Your device can automatically get a working domain name.
- Useful if your IP address changes often, and you want to always connect to your router.

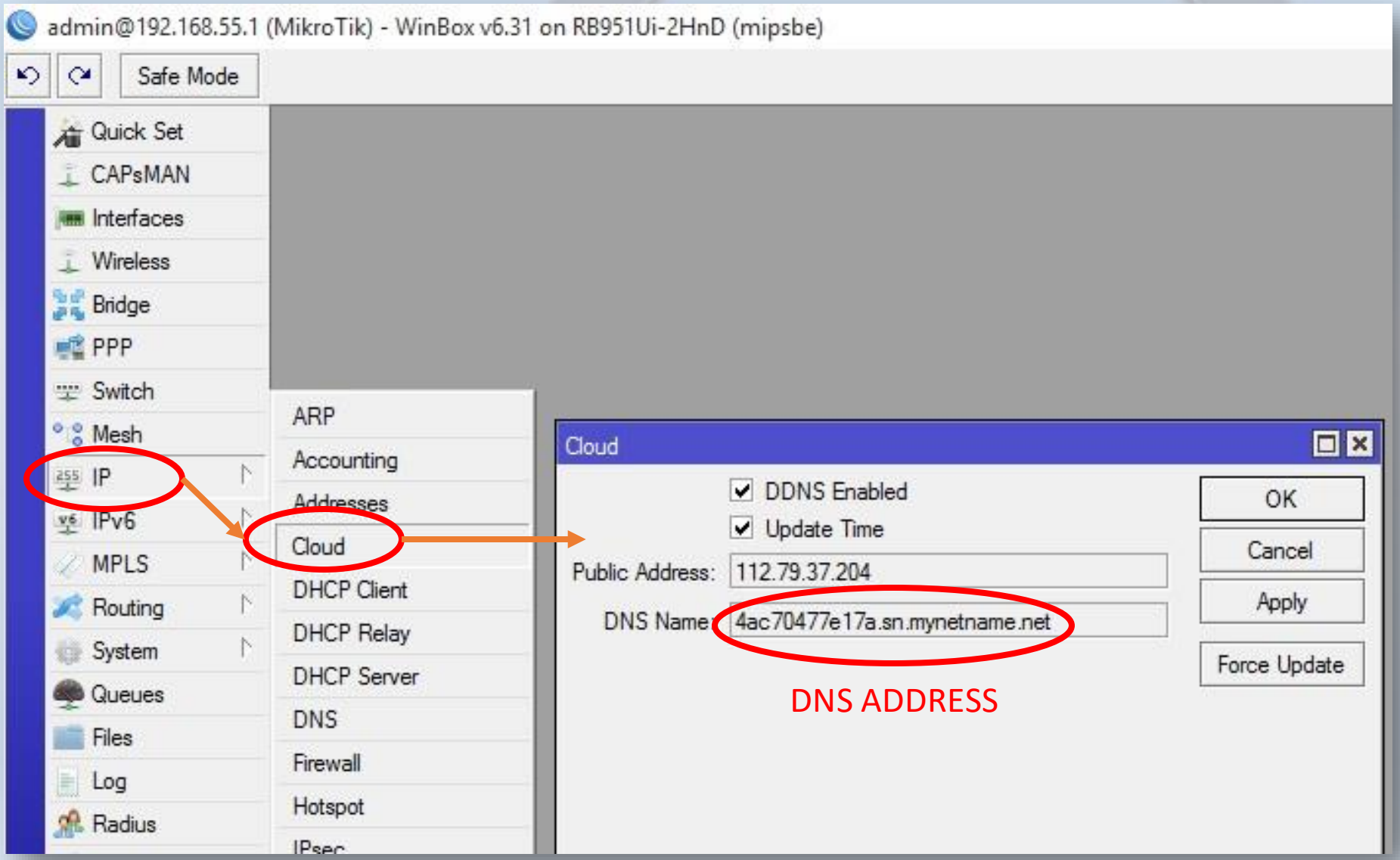
Mikrotik Cloud: Features

- **Currently the cloud feature only provides three services:**
  - Ddns (provide dns name for router's external IPv4 address. IPv6 not supported)
  - Approximate time (accuracy of several seconds, depends on UDP packet latency, useful when NTP is not available)
  - Time zone detection (if enabled, clock time zone will be updated even when DDNS and update time are disabled)

Mikrotik Cloud: Operation

- Router checks for outgoing IP address change: every 60 seconds
- Router waits for cloud server response: 15 seconds
- DDNS record TTL: 60 seconds
- Cloud time update: after router restart and during every ddns update (when router external IP address change or after force-ddns-update command)
- Time-zone-autodetect: The time zone is detected depending from router public IP address and our commercial database.

Mikrotik Cloud: Settings



PPTP With Mikrotik Cloud

- PPTP is a layer 3 tunneling protocol and uses IP routing information and addresses to bind clients to servers.
- You must permit TCP, port 1723 in the router's firewall (the PPTP server)
- Serious security vulnerabilities have been found in the protocol.
- Advantage: Compatibility with most operating systems and easy to configure.

PPTP With Mikrotik Cloud

admin@192.168.55.1 (MikroTik) - WinBox v6.31 on RB951Ui-2HnD (mipsbe)

Safe Mode

Quick Set
CAPsMAN
Interfaces
Wireless
Bridge
PPP
Switch
Mesh
IP
IPv6
MPLS
Routing
System
Queues
Files
Log
Radius
Tools
New Terminal
MetaROUTER
Partition
Make Supout.rif

PPP

Interface | PPPoE Servers | Secrets | Profiles | Active Connections

PPP Scanner | PPTP Server | SSTP Server

	Name	Type	L2 MTU	Tx	Rx
X	pptp-out1	PPTP Client		0 bps	
X	sstp-out1	SSTP Client		0 bps	

PPP Profile <server>

General | Protocols | Limits | Queue

Name: server
Local Address: 192.168.75.1
Remote Address: 192.168.75.20
Remote IPv6 Prefix Pool:
DHCPv6 PD Pool:
Bridge:
Bridge Port Priority:
Bridge Path Cost:
Incoming Filter:
Outgoing Filter:

OK | Cancel | Apply | Comment | Copy | Remove

PPTP Server

Enabled
Max MTU: 1450
Max MRU: 1450
MRRU:
Keepalive Timeout: 30
Default Profile: server
Authentication
pap
chap
mschap1
mschap2

OK | Cancel | Apply

PPP Secret <ppp1>

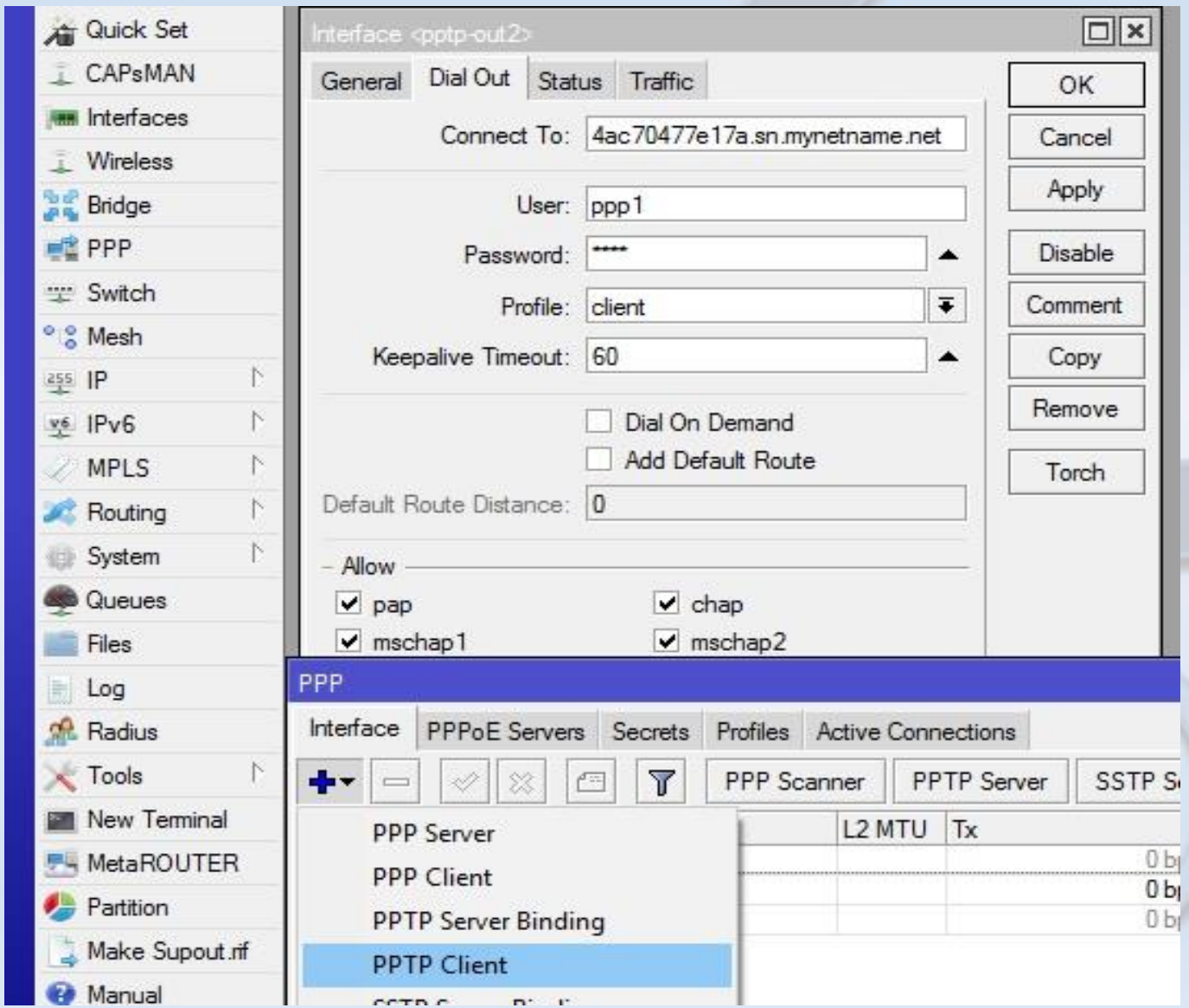
Name: ppp1
Password: ****
Service: any
Caller ID:
Profile: server
Local Address:
Remote Address:
Remote IPv6 Prefix:

OK | Cancel | Apply | Disable | Comment | Copy | Remove

- Server Settings

Make Sure Cloud is Enabled in the router

PPTP With Mikrotik Cloud



- Client Settings
  - Put Cloud DDNS address in “Connect To:” box.
  - Use the name and password configured in the “Secrets” tab of the server.

SSTP With Mikrotik Cloud

- SSTP is a tunnel that provides a mechanism to transport PPP or L2TP traffic through an SSL 3.0 channel.
- SSL provides transport-level security with key-negotiation, encryption and traffic integrity checking.
- The use of SSL over TCP port 443 allows SSTP to pass through virtually all firewalls and proxy servers except for authenticated web proxies.
- You can also specify a different TCP port to connect to.

SSTP With Mikrotik Cloud

admin@192.168.55.1 (MikroTik) - WinBox v6.31 on RB951Ui-2HnD (mipsbe)

Safe Mode

Quick Set
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Switch
Mesh
IP
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Manual
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PPP

Interface | PPPoE Servers | Secrets | Profiles | Active Connections

PPP Scanner | PPTP Server | SSTP Server | L2TP Server | OVPN Server | PPPoE Scan

	Name	Type	L2 MTU	Tx	Rx	Tx Packet (p/s)	Rx Packet (p/s)
X	pptp-out1	PPTP Client		0 bps	0 bps	0	
X	sstp-out1	SSTP Client		0 bps	0 bps	0	

PPP Profile <server>

General | Protocols | Limits | Queue

Name: server
Local Address: 192.168.75.1
Remote Address: 192.168.75.20
Remote IPv6 Prefix Pool:
DHCPv6 PD Pool:

OK | Cancel | Apply | Comment | Copy | Remove

PPP Secret <ppp1>

Name: ppp1
Password: ****
Service: any
Caller ID:
Profile: server
Local Address:
Remote Address:

OK | Cancel | Apply | Disable | Comment | Copy | Remove

SSTP Server

Enabled
Port: 443
Max MTU: 1500
Max MRU: 1500
MRRU:
Keepalive Timeout: 60
Default Profile: server

Authentication
pap
chap
mschap1
mschap2

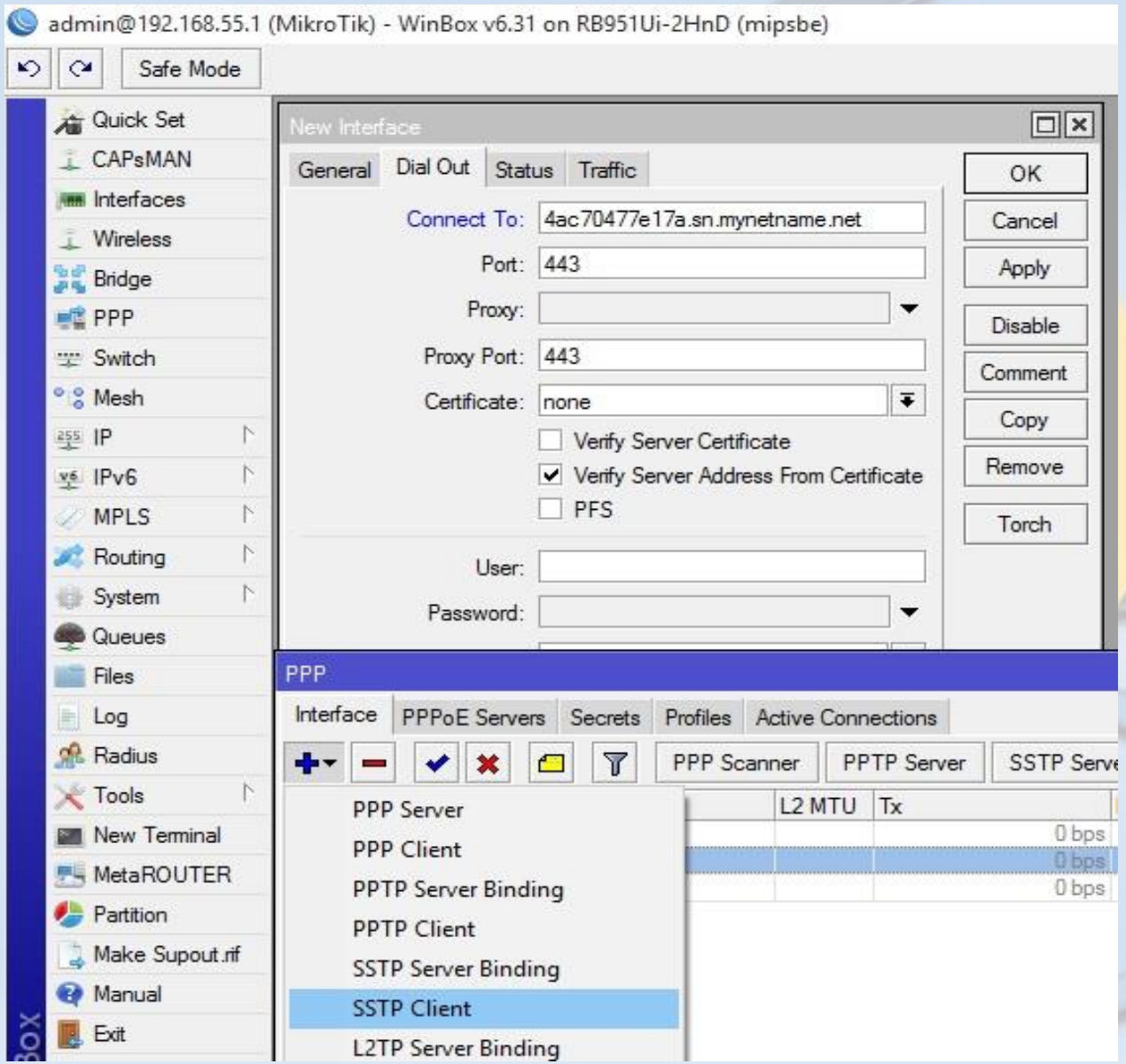
Certificate: none
Verify Client Certificate
Force AES
PFS

OK | Cancel | Apply

- Server Settings
  - Specify a TCP port (default: 443)

Make Sure Cloud is Enabled in the router

SSTP With Mikrotik Cloud

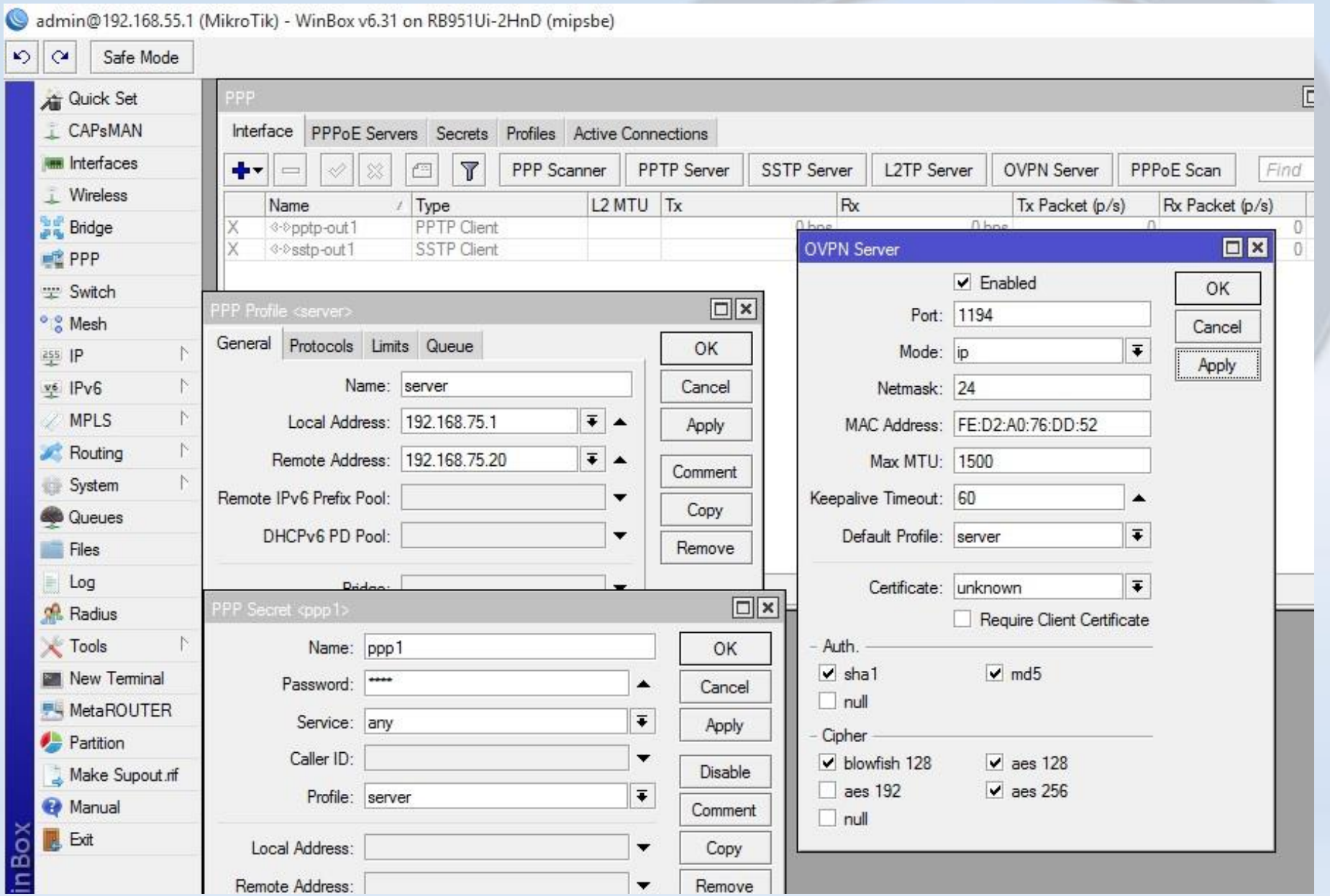


- Client Settings
  - Put Cloud DDNS address in “Connect To:” box.
  - Specify TCP port used by the server
  - Use the name and password configured in the “Secrets” tab of the server.

OVPN With Mikrotik Cloud

- OpenVPN is an open-source software application that uses a custom security protocol that utilizes SSL/TLS for key exchange.
- It uses the OpenSSL encryption library extensively, as well as the SSLv3/TLSv1 protocol, and contains many security and control features.
- OpenVPN has been ported and embedded to several systems.
- It is compatible with Solaris, Linux, OpenBSD, FreeBSD, NetBSD, QNX, Mac OS X, and Windows 2000/XP/Vista/7/8, Windows Mobile 6.5, iOS 3GS+, Android 4.0+.

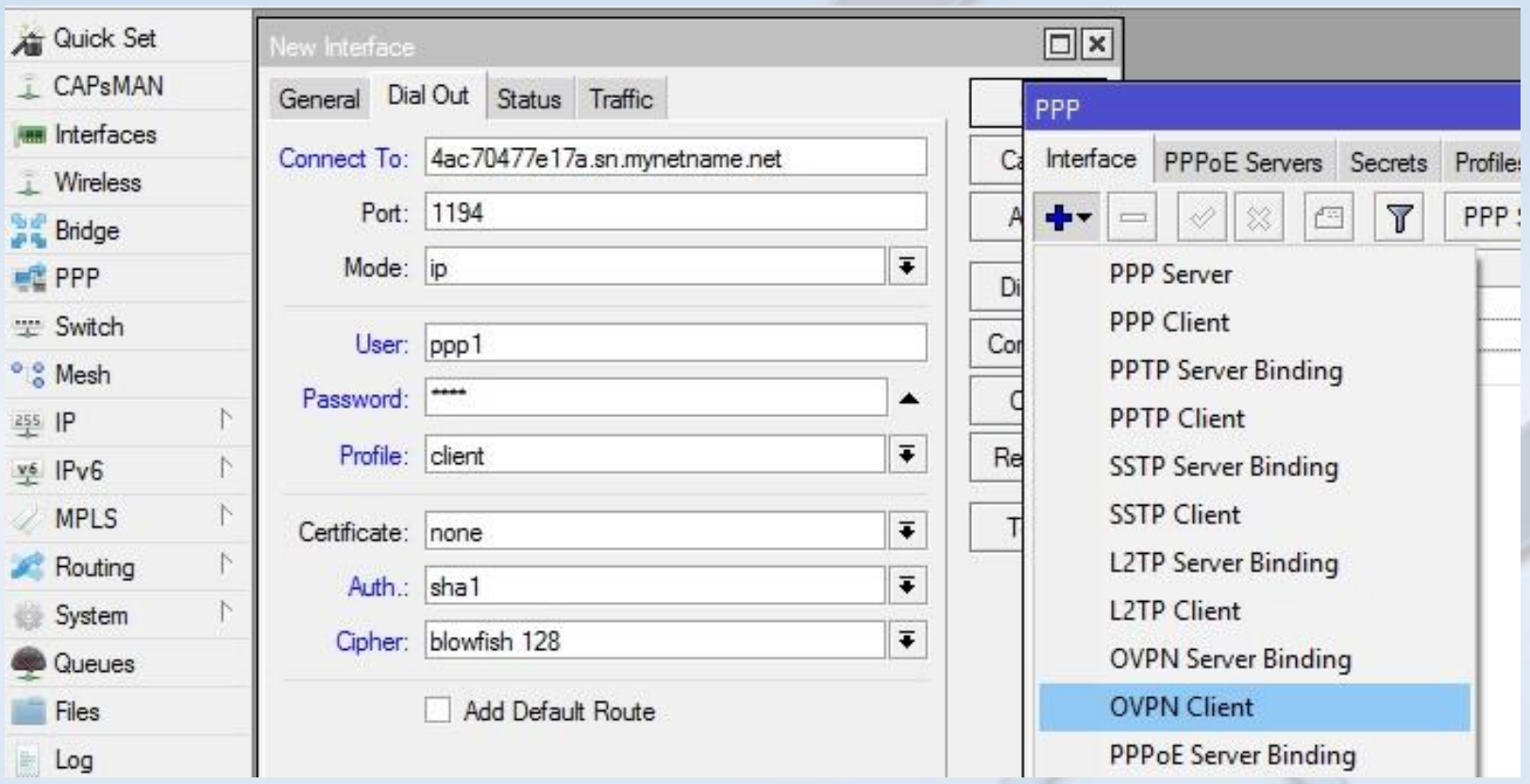
OVPN With Mikrotik Cloud



- Server Settings
  - Specify a port (default: 1194)
  - Specify authentication methods and ciphers

Make Sure Cloud is Enabled in the router

OVPN With Mikrotik Cloud



- Client Settings
  - Put Cloud DDNS address in “Connect To:” box.
  - Specify port used by the server
  - Specify authentication methods and ciphers used by the server

Which VPN should we use?

SSTP

- Advantages:
  - SSTP VPN makes use of TCP port 443 meaning that it can help you bypass most DNS restriction filters and firewalls on the web.
  - SSTP is largely compatible with Windows Vista, Windows 7 and above.
  - SSTP VPN has seamless security. Since SSTP uses SSL, its PPP and L2TP traffic passes over a secure https session.

- Disadvantages:
  - It is a disappointment if you've got an iPhone, an Xbox, an Android or any other non-Windows gadget.
  - Since SSTP VPN is not open source, it can be easily invaded by spying agencies that need to exert little effort to inject backdoors in security software
  - Typical setting for data encryption on SSTP is 256bit.

Which VPN should we use?

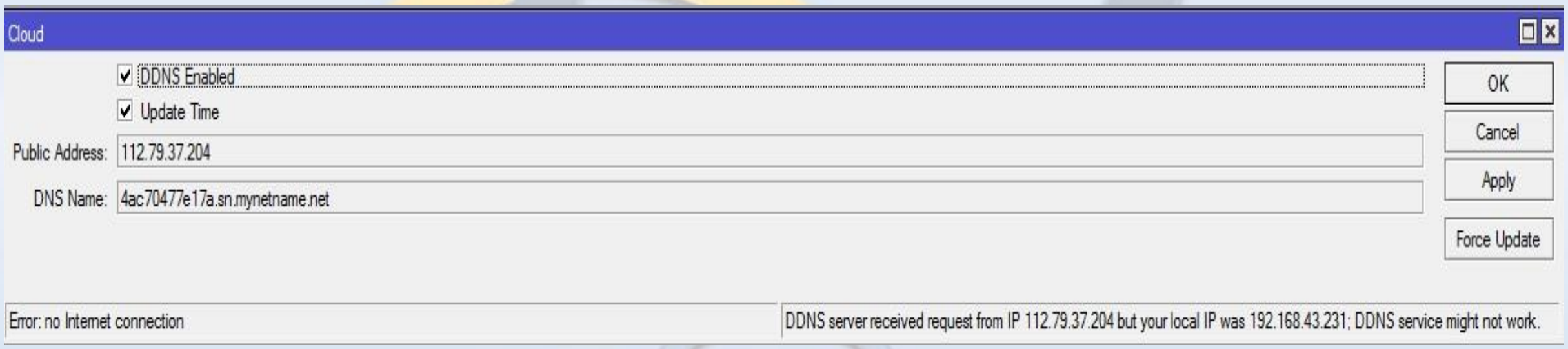
OVPN

- Advantages:
  - OpenVPN is compatible with almost any device, including Windows, Mac, PC, Android, iPhone and Linux systems.
  - OpenVPN is also relatively a new encryption technology. It employs an OpenSSL library and SSLv3/TLSv1 protocols.
  - Its cryptographic algorithms take a variety of forms like 3DES, AES, RC5 and Blowfish.
  - If the ease of functional configuration is a thing to matter, then OpenVPN is definitely the right choice.

- Disadvantages:
  - No real disadvantages are known in OpenVPN. There is, however, one:
  - Unlike the Windows based SSTP, manual configuration of OpenVPN can be burdensome.

Drawbacks of Mikrotik Cloud

- Does not work if router is behind NAT.



- If router has multiple public IP addresses and/or multiple internet gateways, the exact IP used for the update may not be as expected

To Conclude

- Mikrotik Cloud is mainly provided for ease of access if there is no static ip on the router.
- Easy to configure.
- Free of charge.
- Good feature to be used along with VPNs.

Thank You for Your Attention

Questions???