How To Bridge Private Two LAN

Bridge LANs Over The Internet

Between Main Office and Branch Office

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How To Bridge Private Two LAN

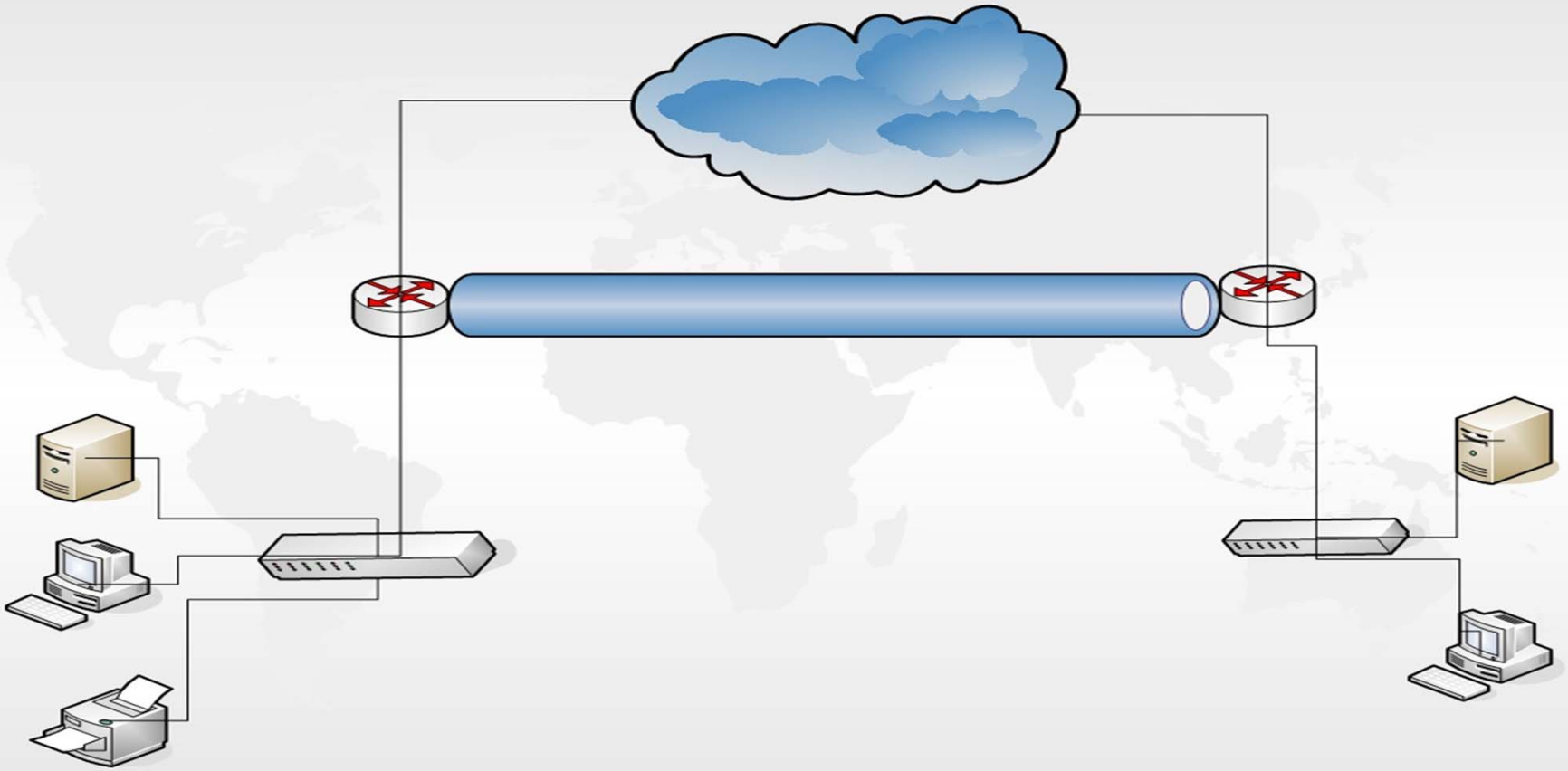
Bridge LANs Over The Internet

Between Main Office and Branch Office Can use EOIP

VPN Tunneling Protocol

- PPTP (Point-to-Point Tunneling Protocol)
- L2TP (Layer 2 Tunnel Protocol)
- SSTP (Secure Socket Tunneling Protocol)
- *Open VPN (*OpenVPN is a fairly new open source technology)
- IKEv2 (Internet Key Exchange (version 2)
- Etc……..

VPN (Virtual private network)



MikroTik Router OS support Protocol

- PPTP
- SSTP
- L2TP
- OVPN
- IPIP
- GRE
- EOIP (MikroTik Router OS Proprietary protocol)
- VPLS

EOIP (Ethernet Over IP)

- MikroTik RouterOS Proprietary protocol
- That creates an Ethernet tunnel between two routers on top of an IP connection.
- EoIP tunnel may run over IPIP tunnel, PPTP tunnel or any other connection capable of transporting IP.
- When the bridging function of the router is enabled, all Ethernet traffic (all Ethernet protocols) will be bridged just as if there where a physical Ethernet interface and cable between the two routers (with bridging enabled).
- This protocol makes multiple network schemes possible.

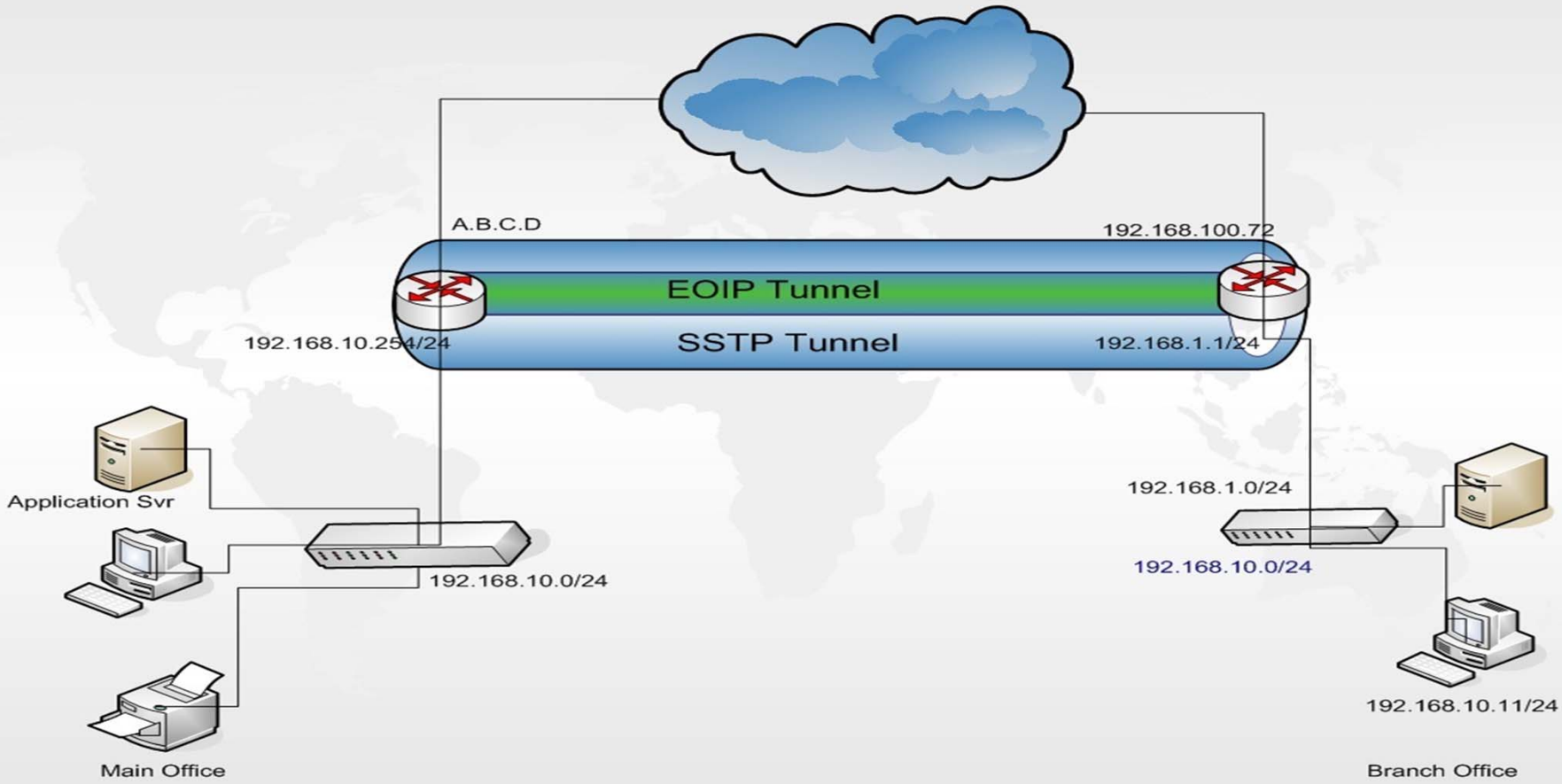
IANA has reserved

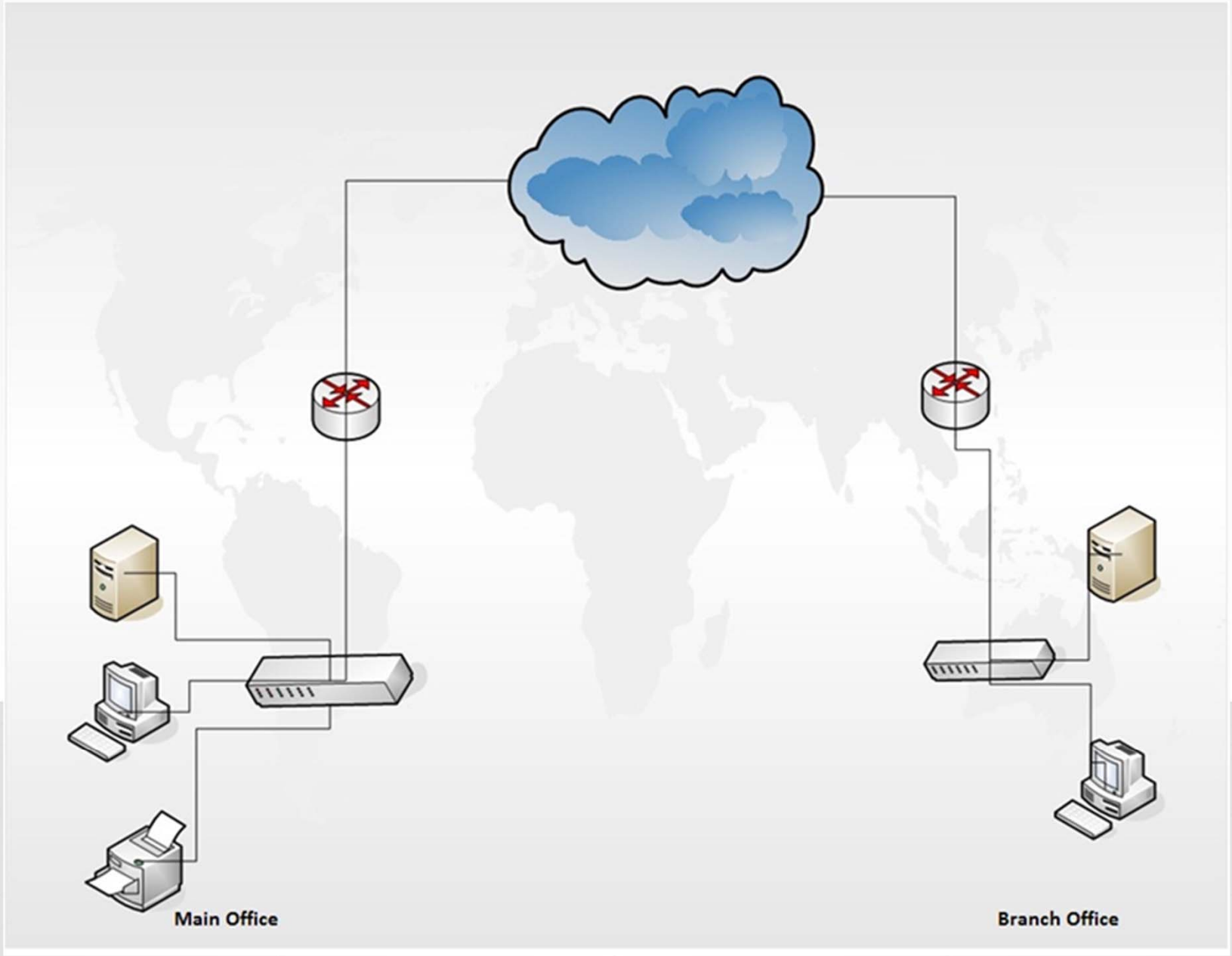
- Media Access Control number of an interface. The address numeration authority IANA allows the use of **MAC addresses** in the range from **00:00:5E:80:00:00 - 00:00:5E:FF:FF:FF** freely

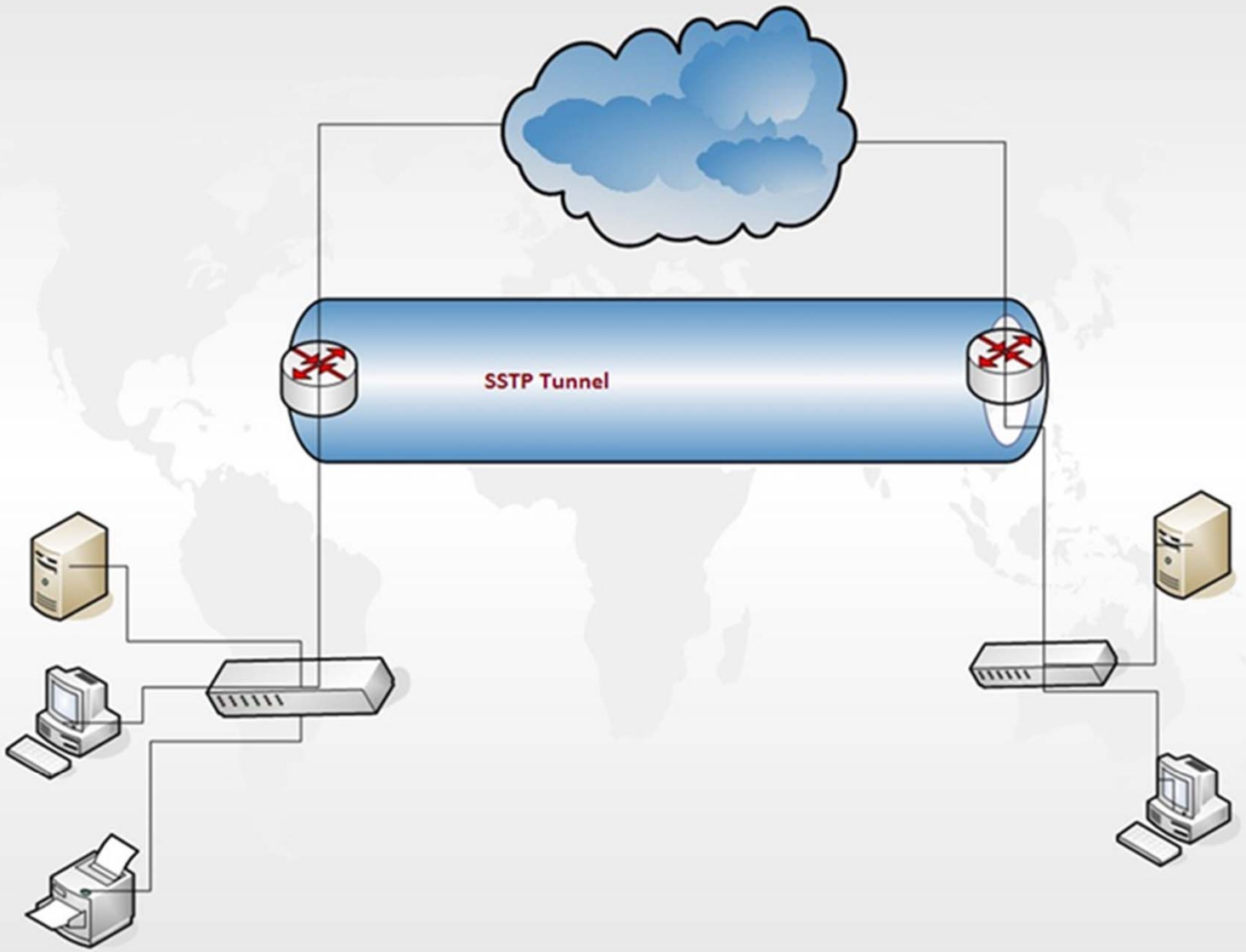
Use for those services

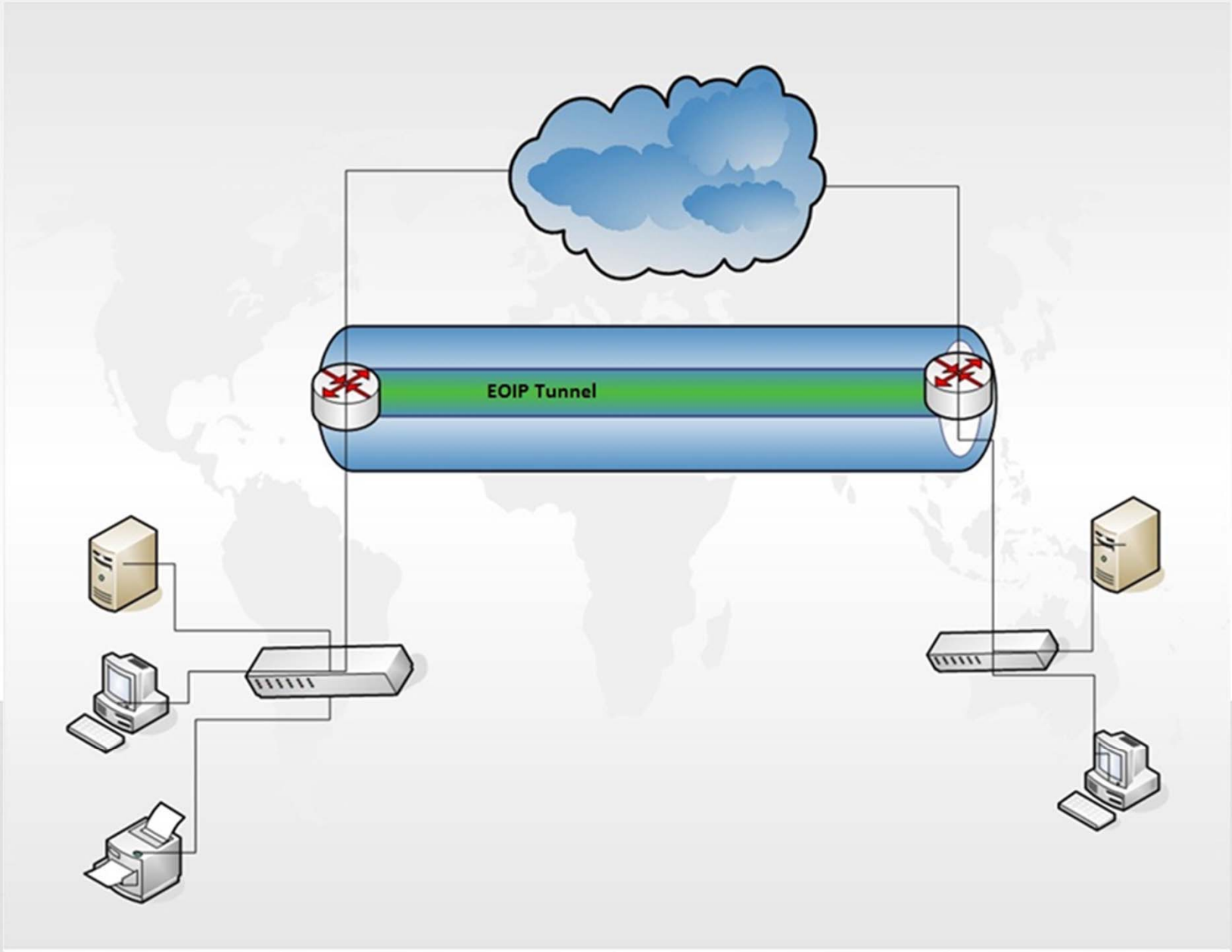
- Access Branch Office resource from Main Office
- PPPOE
- DHCP
- Application Server
- Etc..

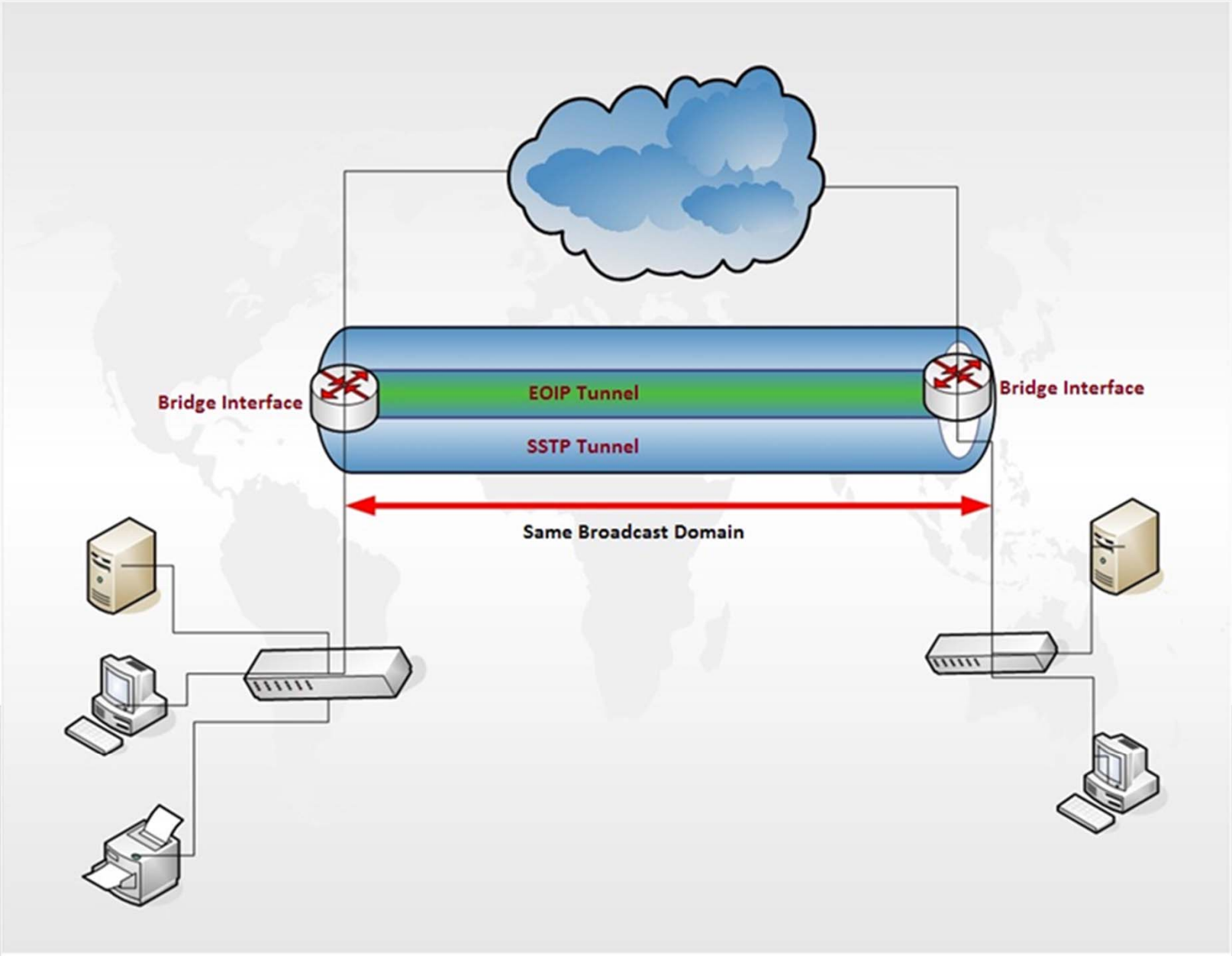
Bridge LANs Over The Internet Between Main Office and Branch Office




Main Office
Branch Office


SSTP Tunnel


EOIP Tunnel


Bridge Interface
EOIP Tunnel
SSTP Tunnel
Bridge Interface
Same Broadcast Domain

SSTP Tunnel(Secure Socket Tunneling Protocol)

- Secure Socket Tunneling Protocol (SSTP) transports a PPP tunnel over a TLS 1.0 channel. The use of TLS over TCP port 443 allows SSTP to pass through virtually all firewalls and proxy servers.

EOIP (Ethernet Over IP) Overhead

SSTP-

- **Note:** EoIP tunnel adds at least **154 byte** overhead (120 byte SSTP + 14 byte Ethernet + 20 byte IP)
- **Note:** RSA Key length must be at least 472 bits if certificate is used by **SSTP**

PPTP-

- **Note:** EoIP tunnel adds at least 42byte overhead (8byte GRE + 14 byte Ethernet + 20 byte IP)

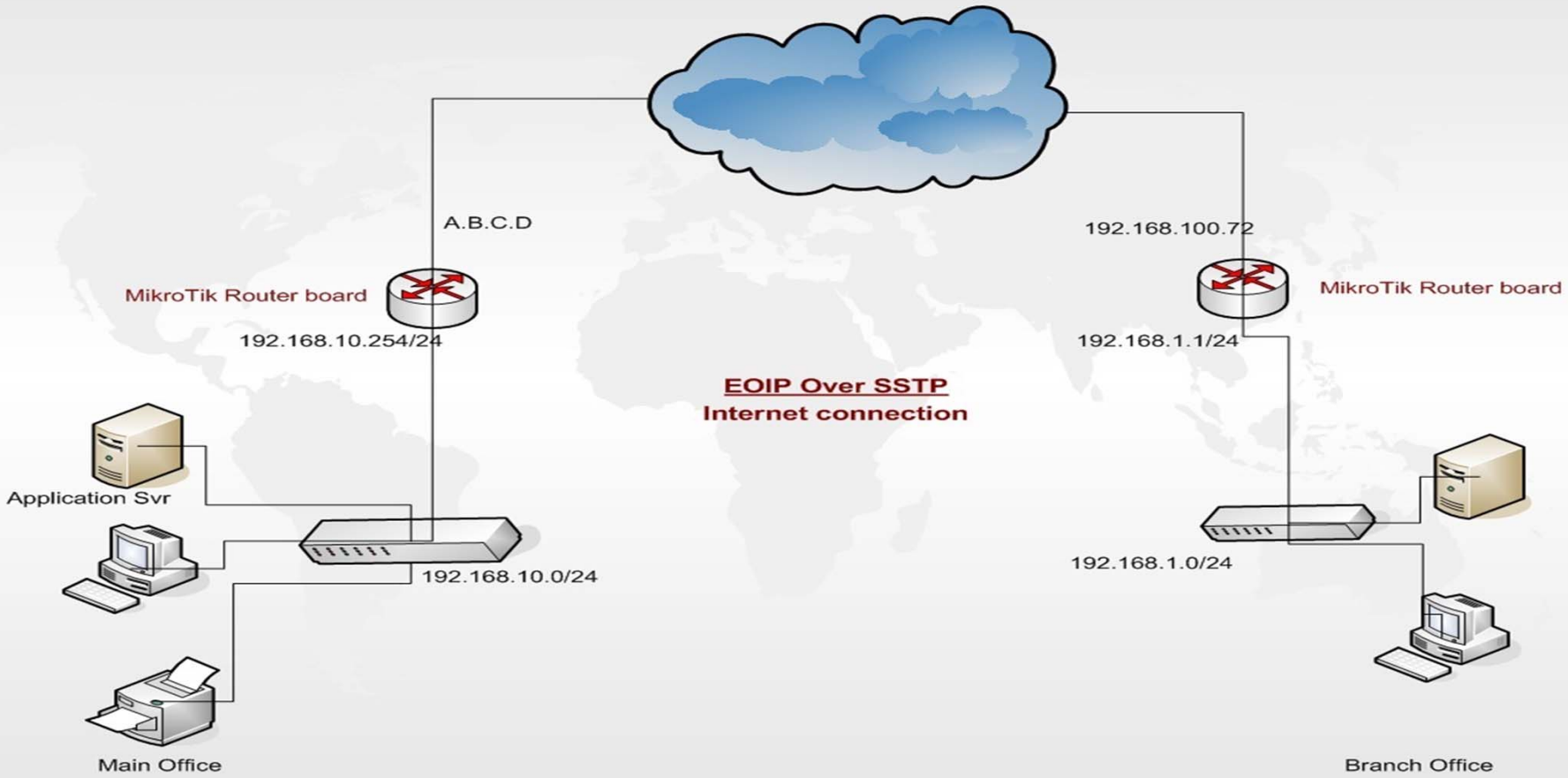
Advantages and Disadvantages

- Advantages
  - Easy to setup
  - Portability
  - Security

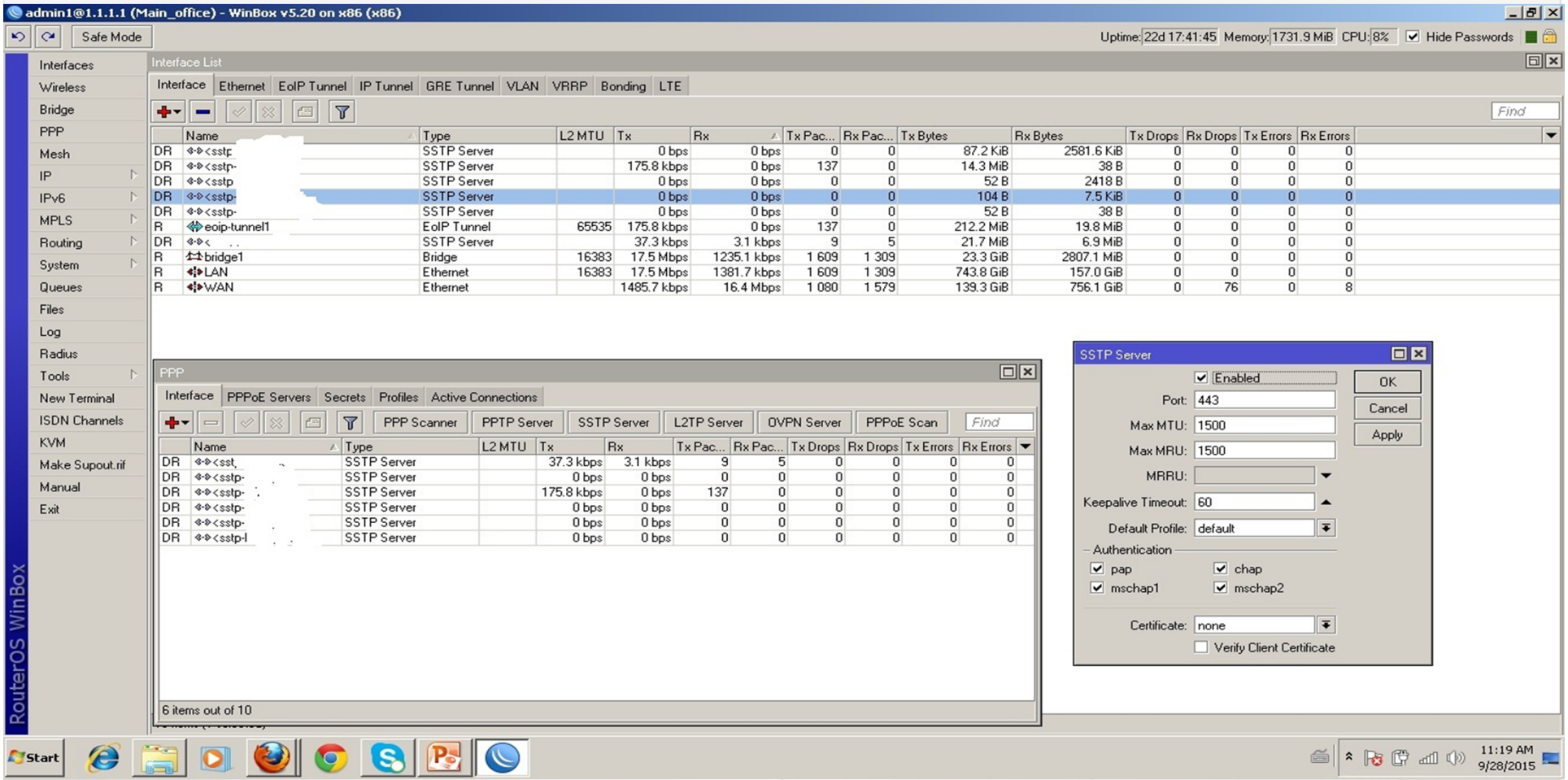
- Disadvantages
  - Only for MikroTik Router OS
  - Increase Overhead
  - More Bandwidth Requirement

EOIP (Ethernet Over IP) configuration

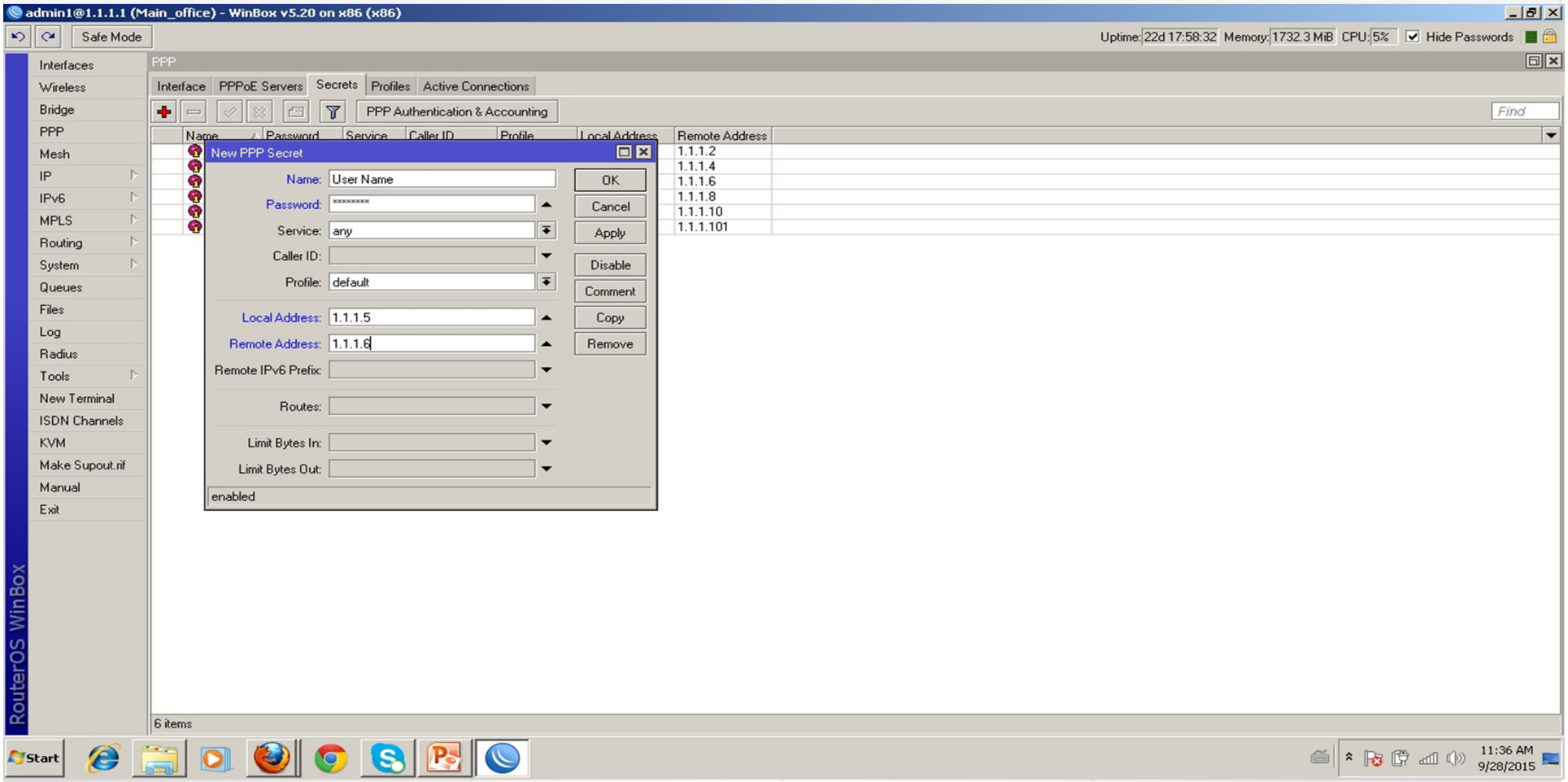
-create SSTP Tunnel



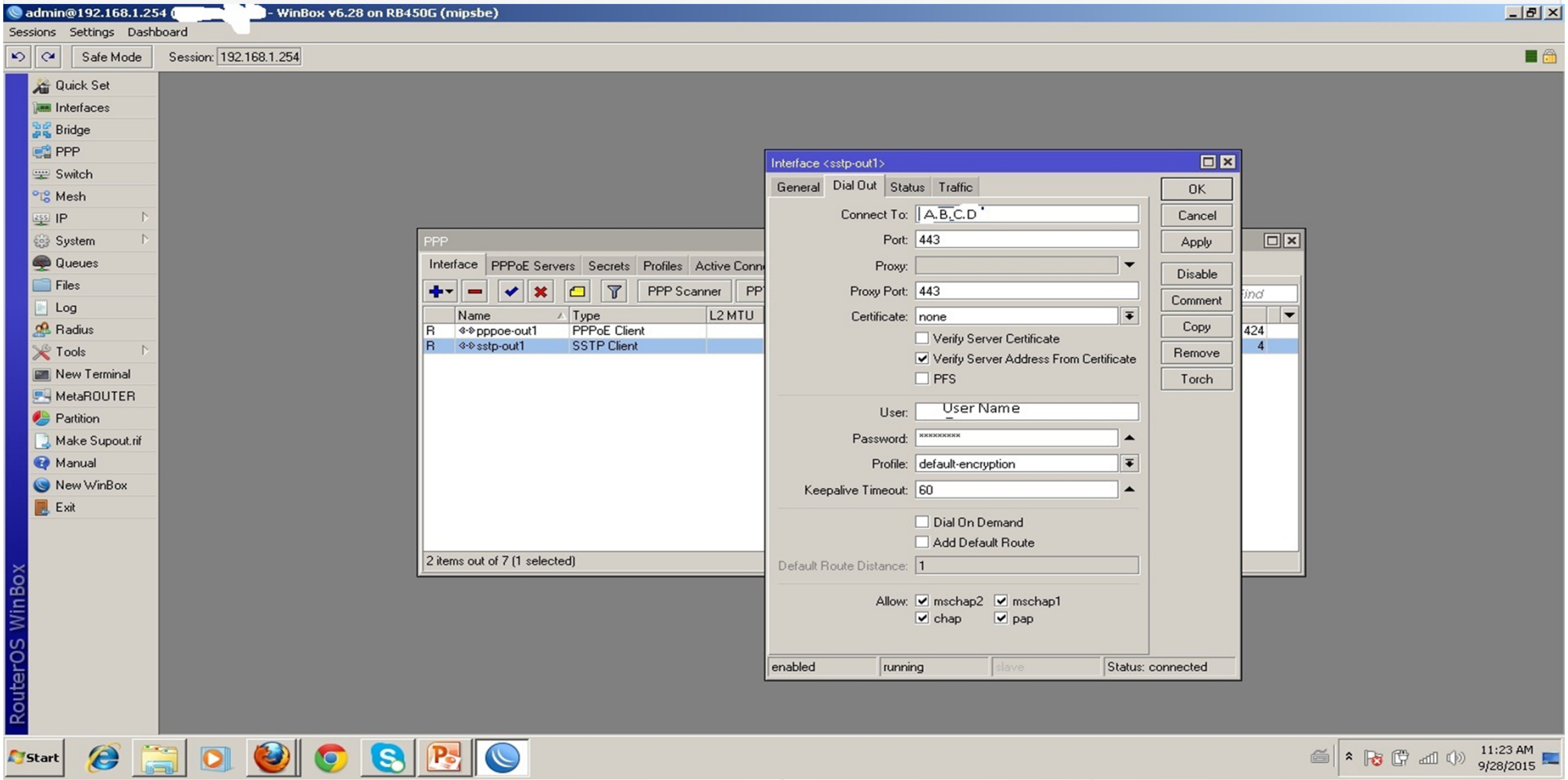
SSTP Server Enable (Main Office)



ADD SSTP User name & password

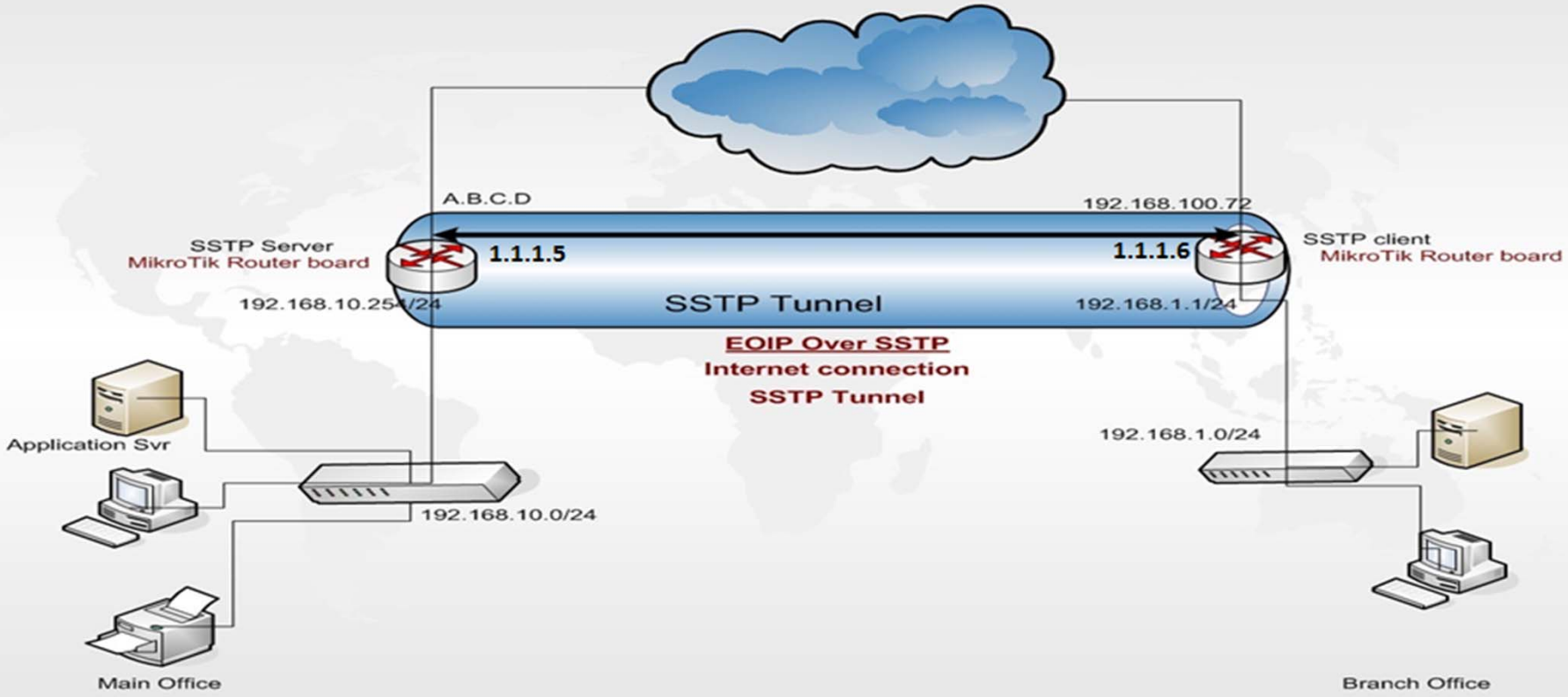


SSTP Client Configuration(Branch Office)



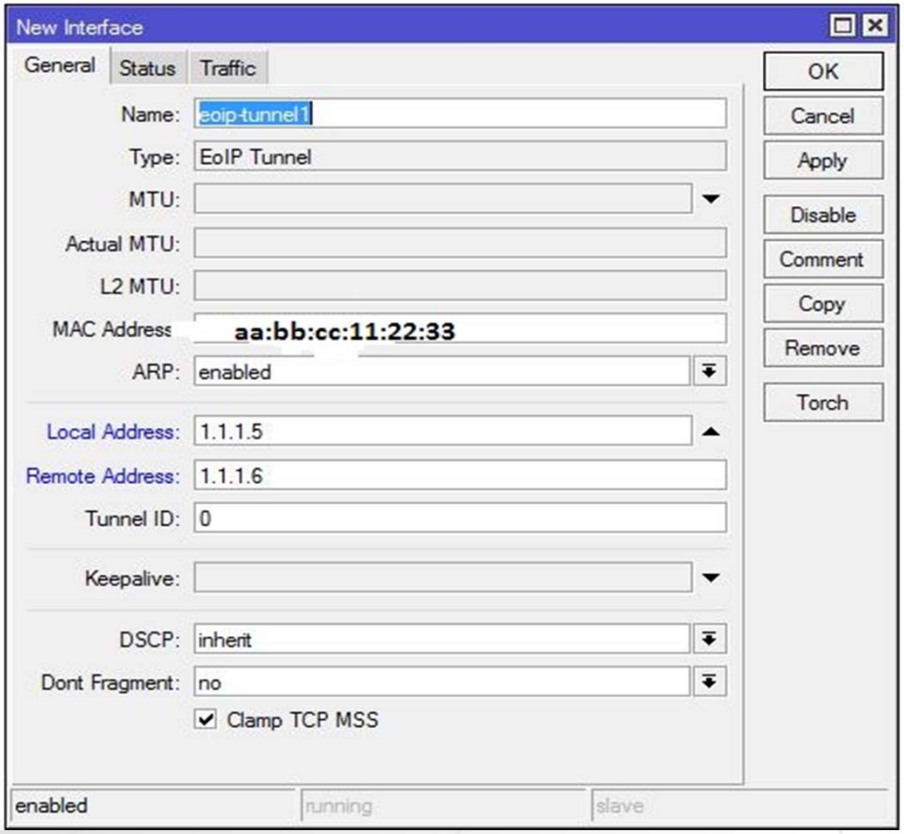
EOIP (Ethernet Over IP) configuration

-Create EOIP Tunnel



EOIP (Ethernet Over IP) configuration

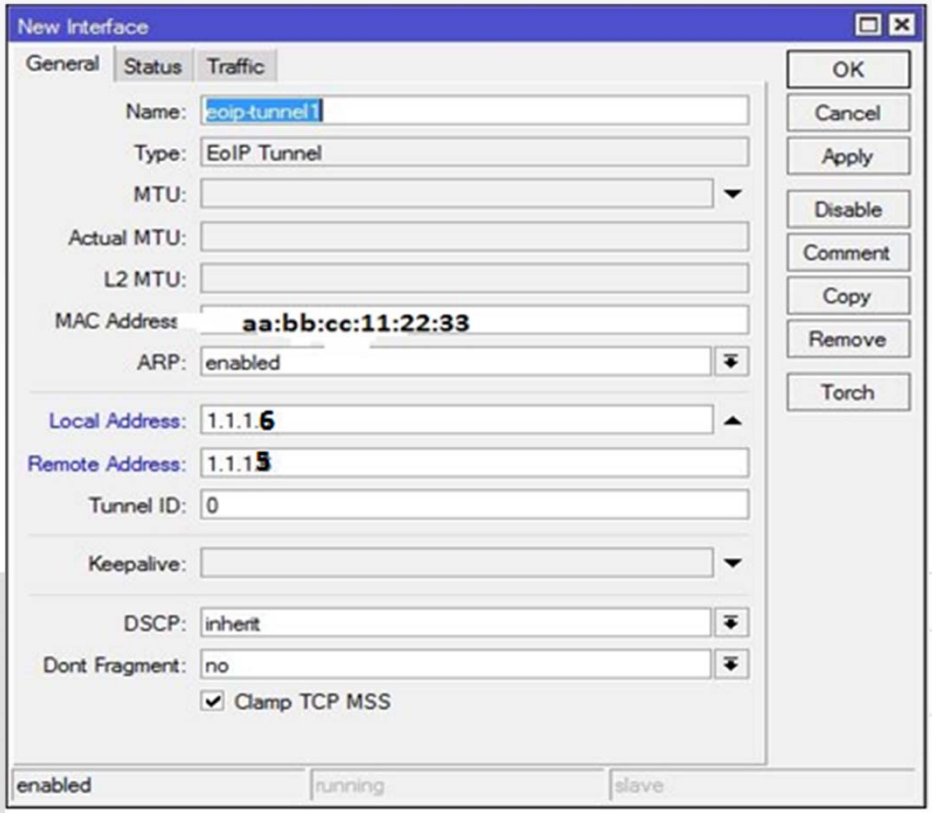
- Create EoIP tunnel On Main Office



- Enable EOIP tunnel
- Local Address and Remote Address is SSTP Tunnel Ip address

EOIP *(Ethernet Over IP) configuration*

- Create EoIP tunnel On Branch Office

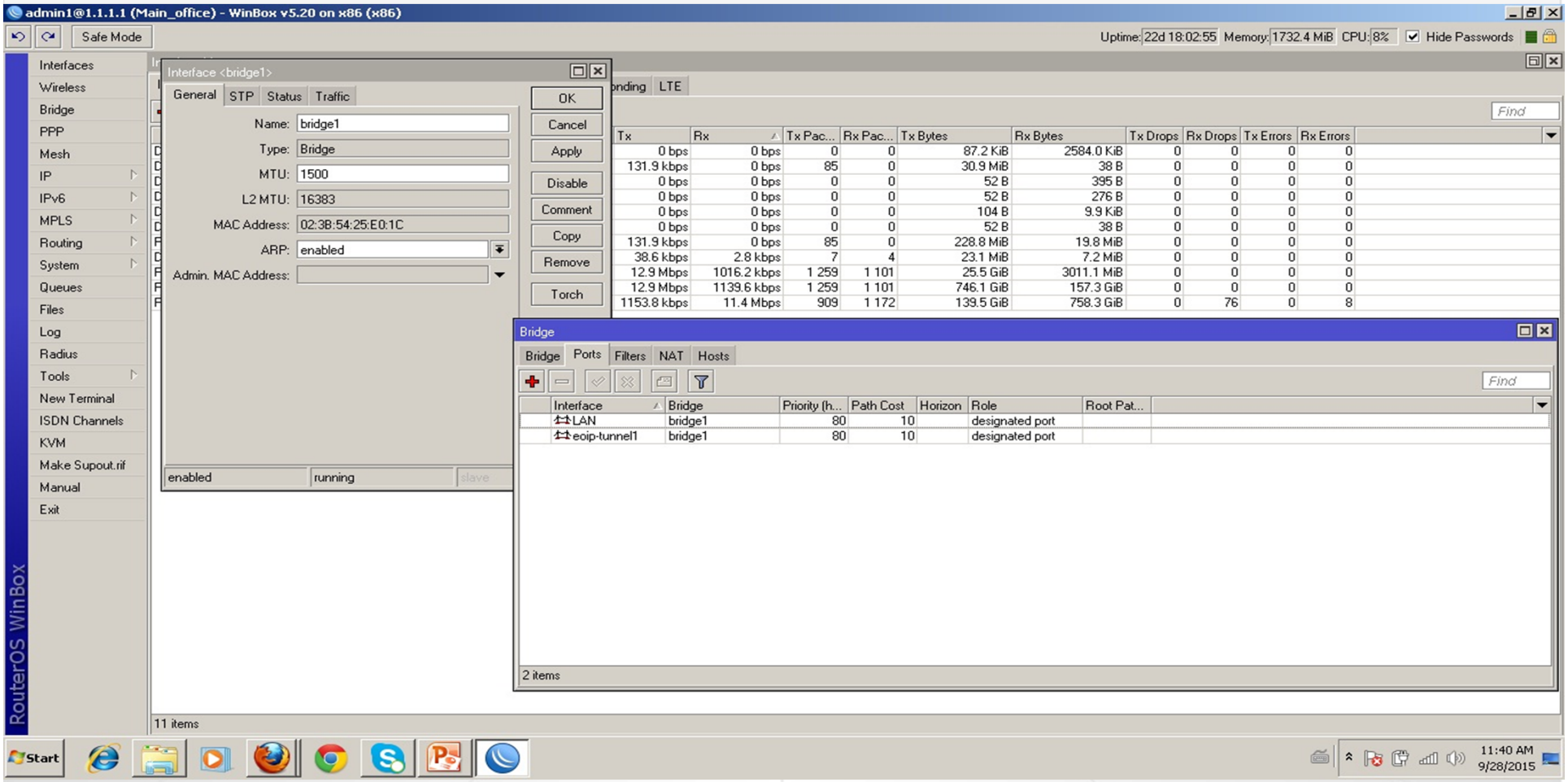


- Enable EOIP tunnel
- Local Address and Remote Address is SSTP Tunnel Ip address

EOIP (Ethernet Over IP) configuration

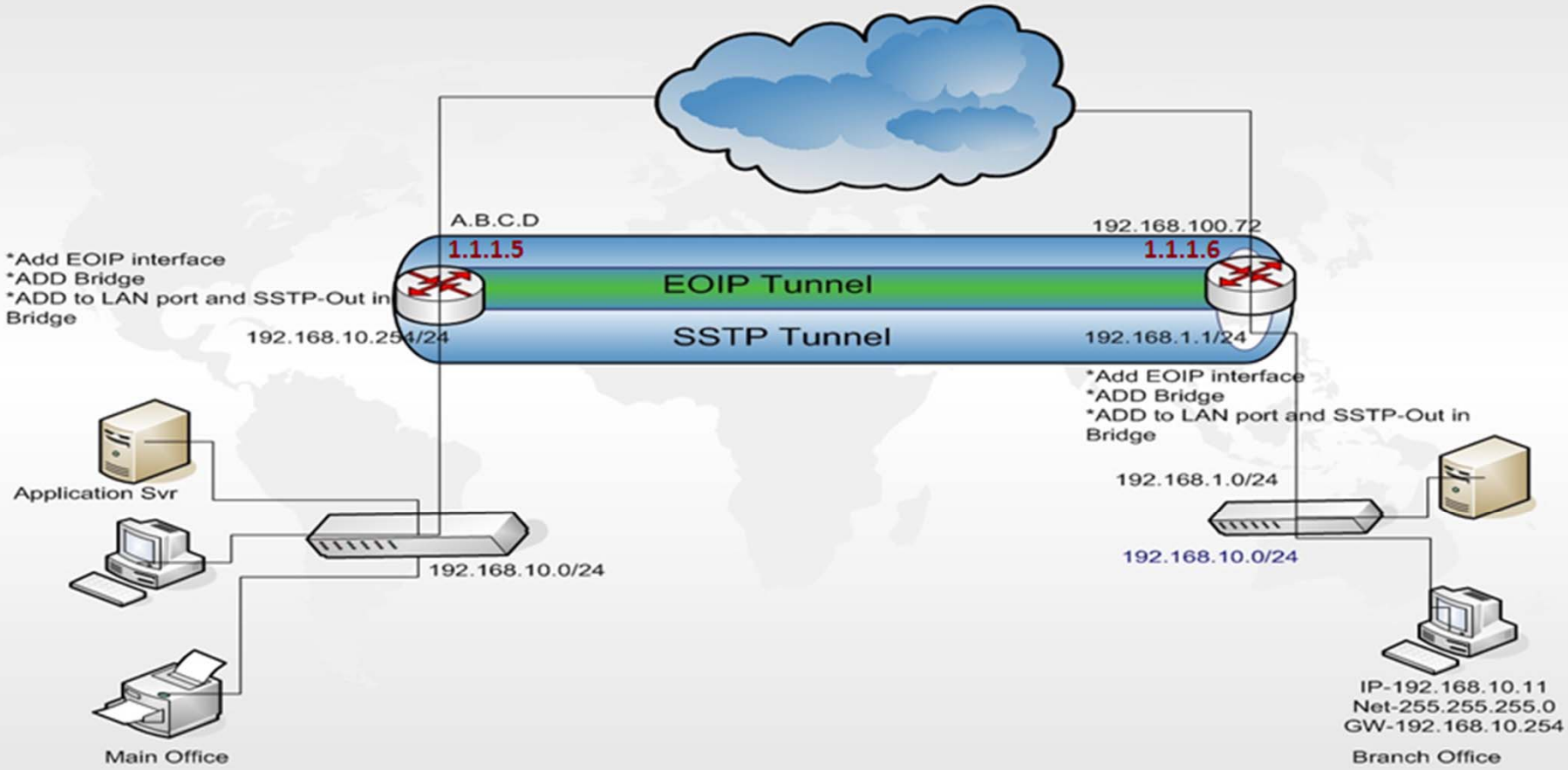
-Create Bridge interface On Both side

- Bridge local interfaces with EoIP tunnel on both side

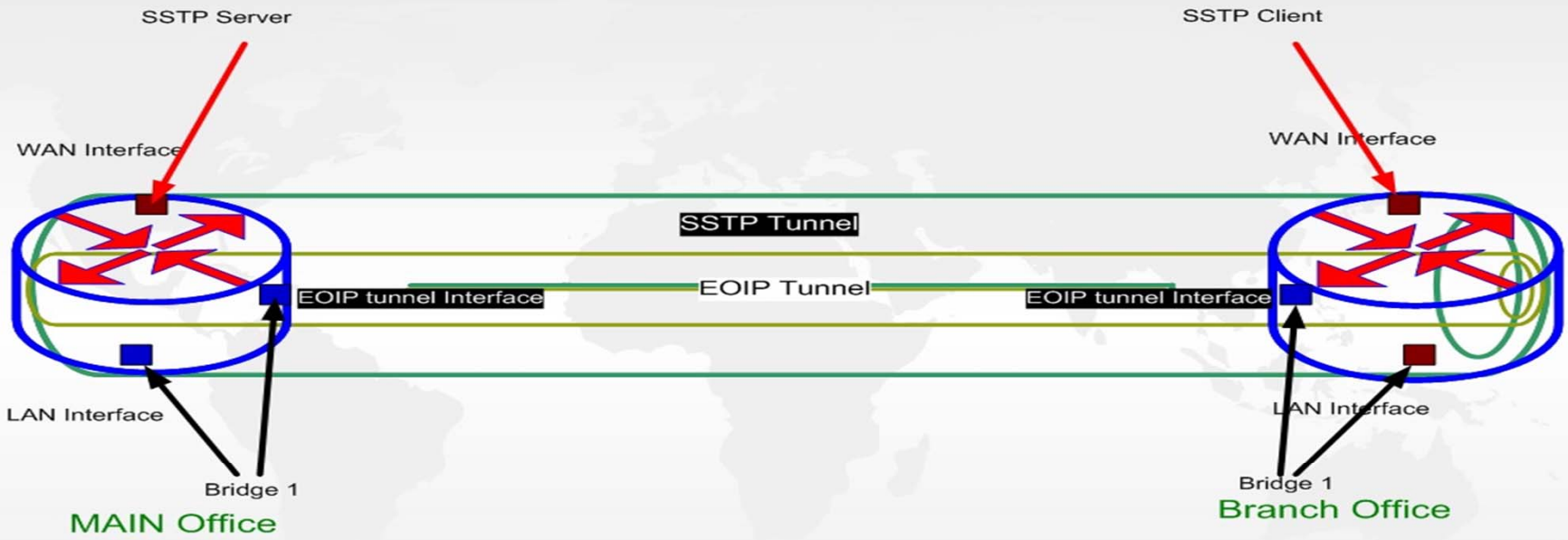


EOIP (Ethernet Over IP) configuration

-Now both sites are in the same Layer2 broadcast domain. You can set up IP addresses from the same network on both sites.



EOIP (Ethernet Over IP) configuration

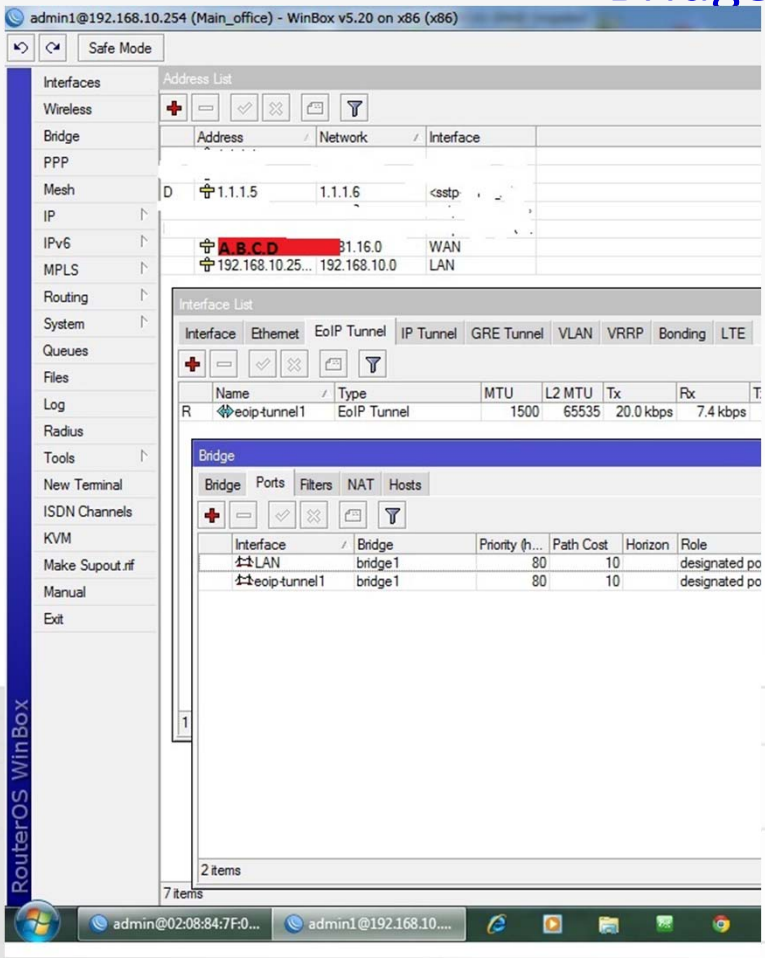


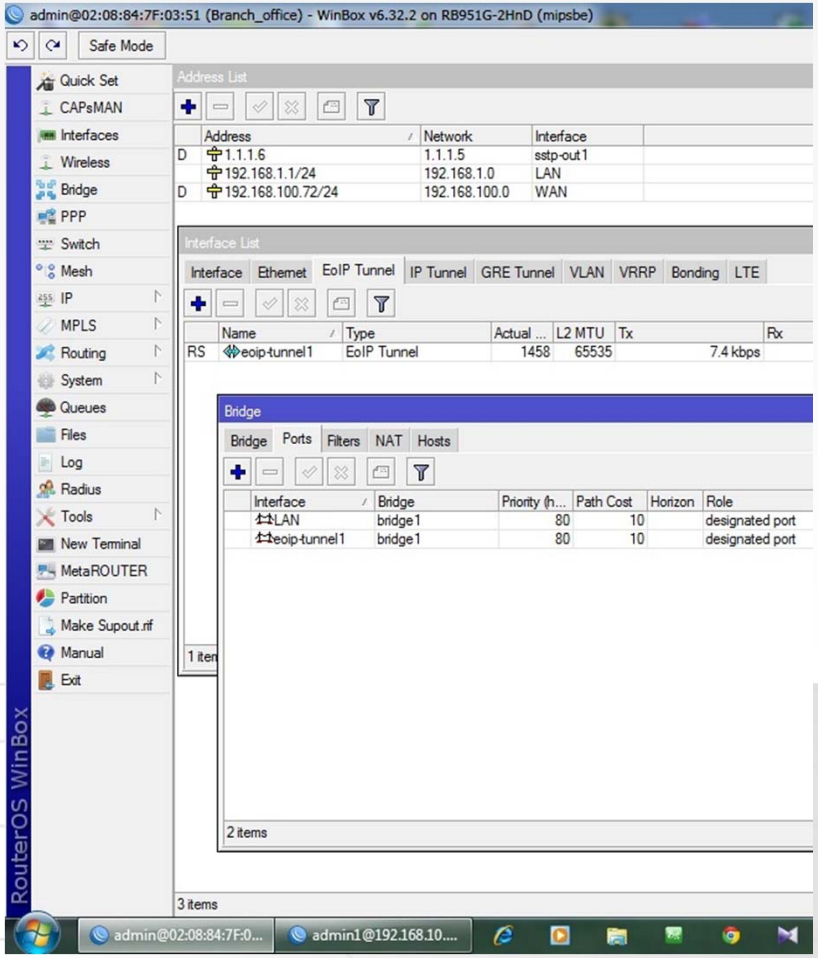
Enable SSTP Server and SSTP Client ,Create SSTP Tunnel
Add to LAN Interface and EOIP Tunnel Interface in Bridge Interface

Check & Test

EOIP (Ethernet Over IP) configuration

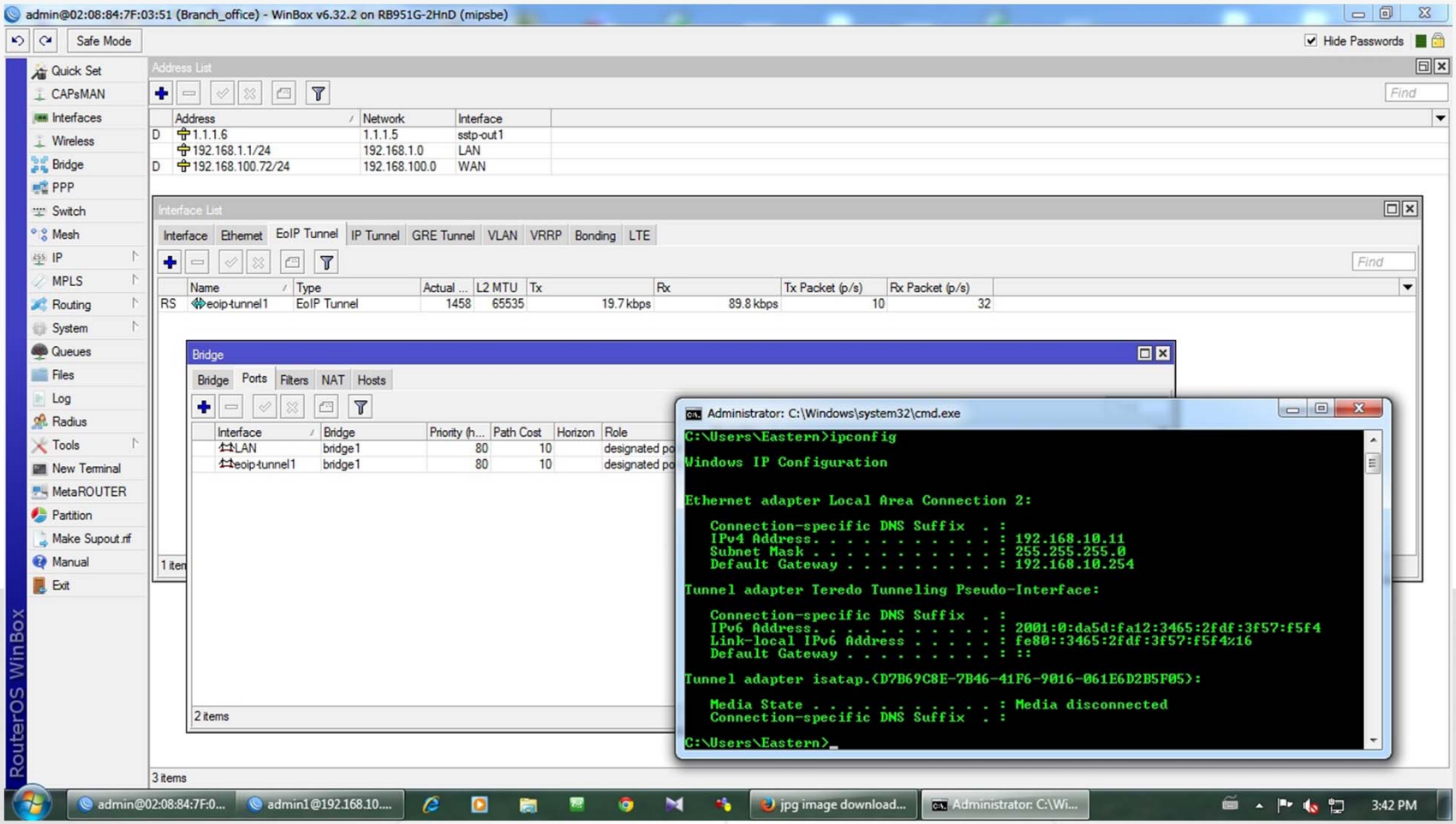
- Create SSTP tunnel
- Create EoIP tunnel
- Bridge local interfaces with EoIP tunnel





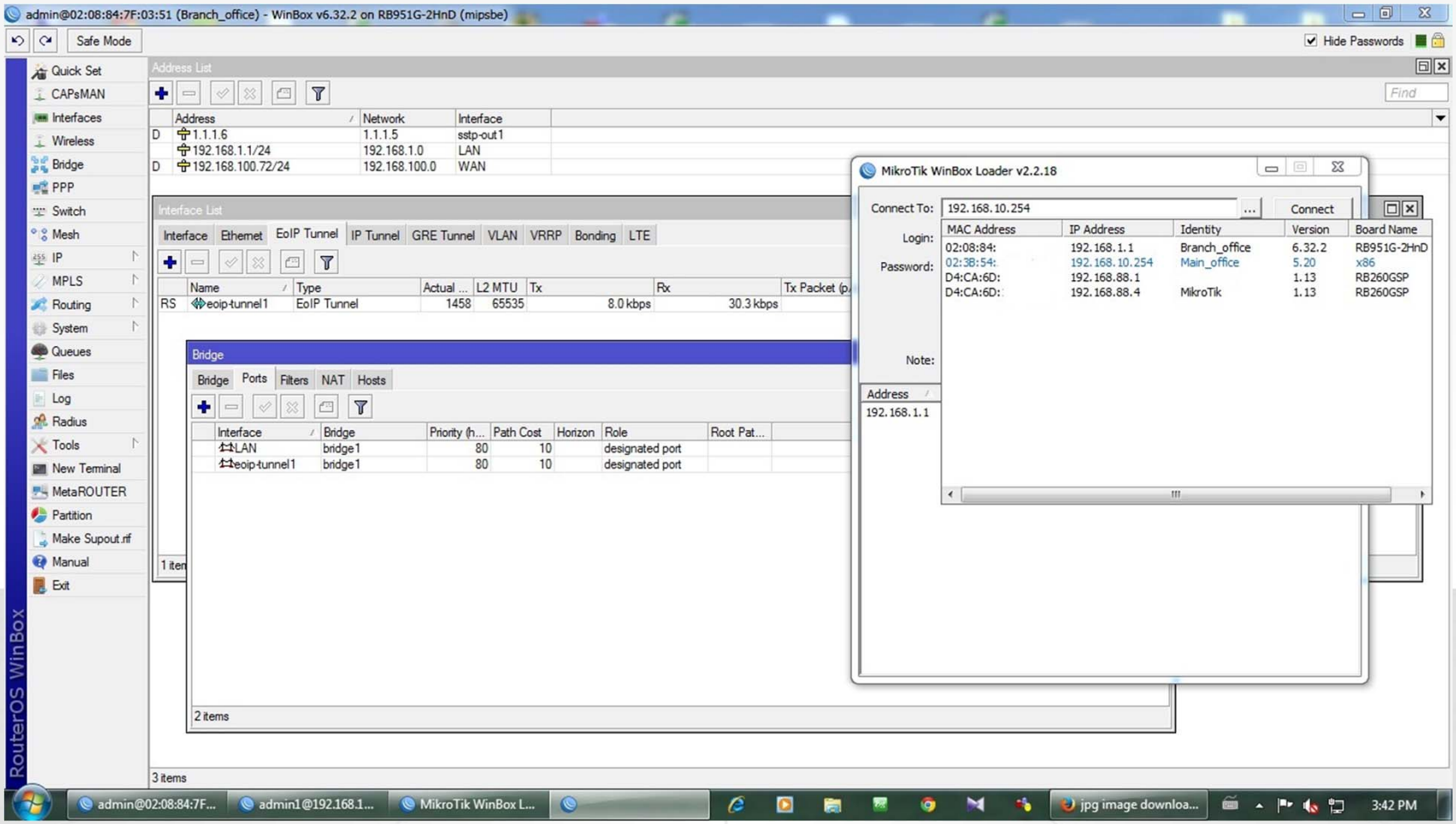
EOIP (Ethernet Over IP) configuration

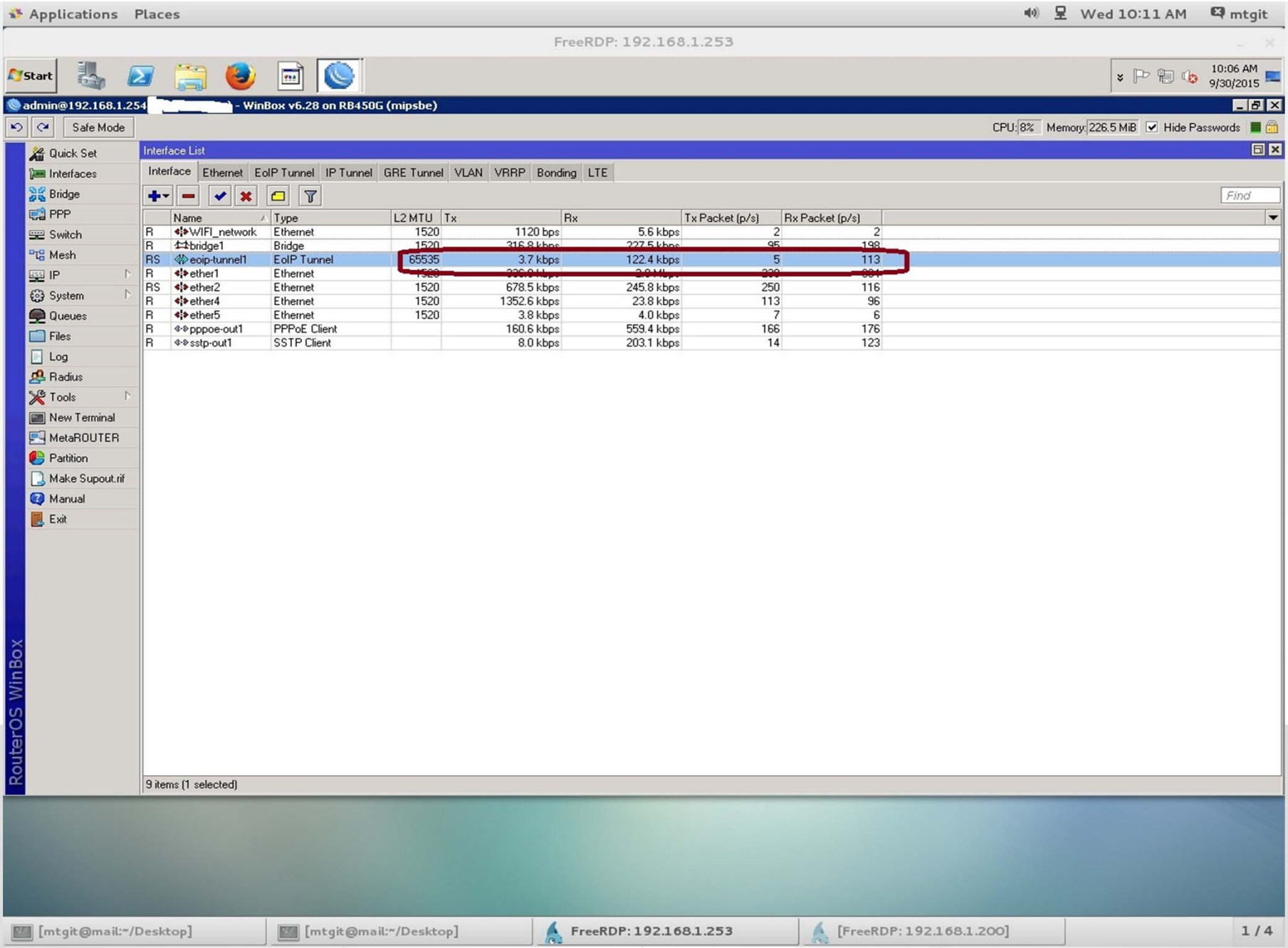
-Test DHCP requests over EoIP

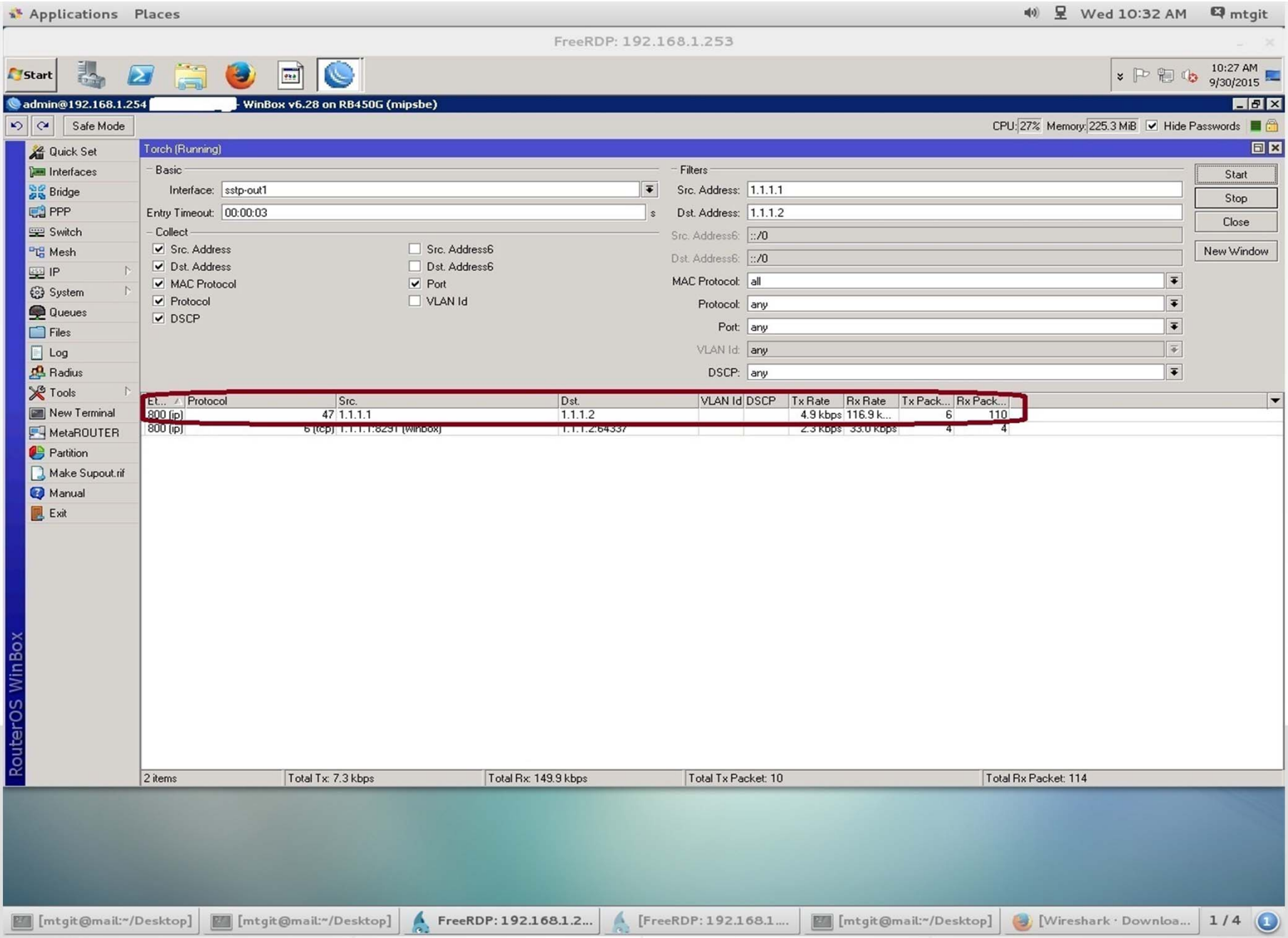


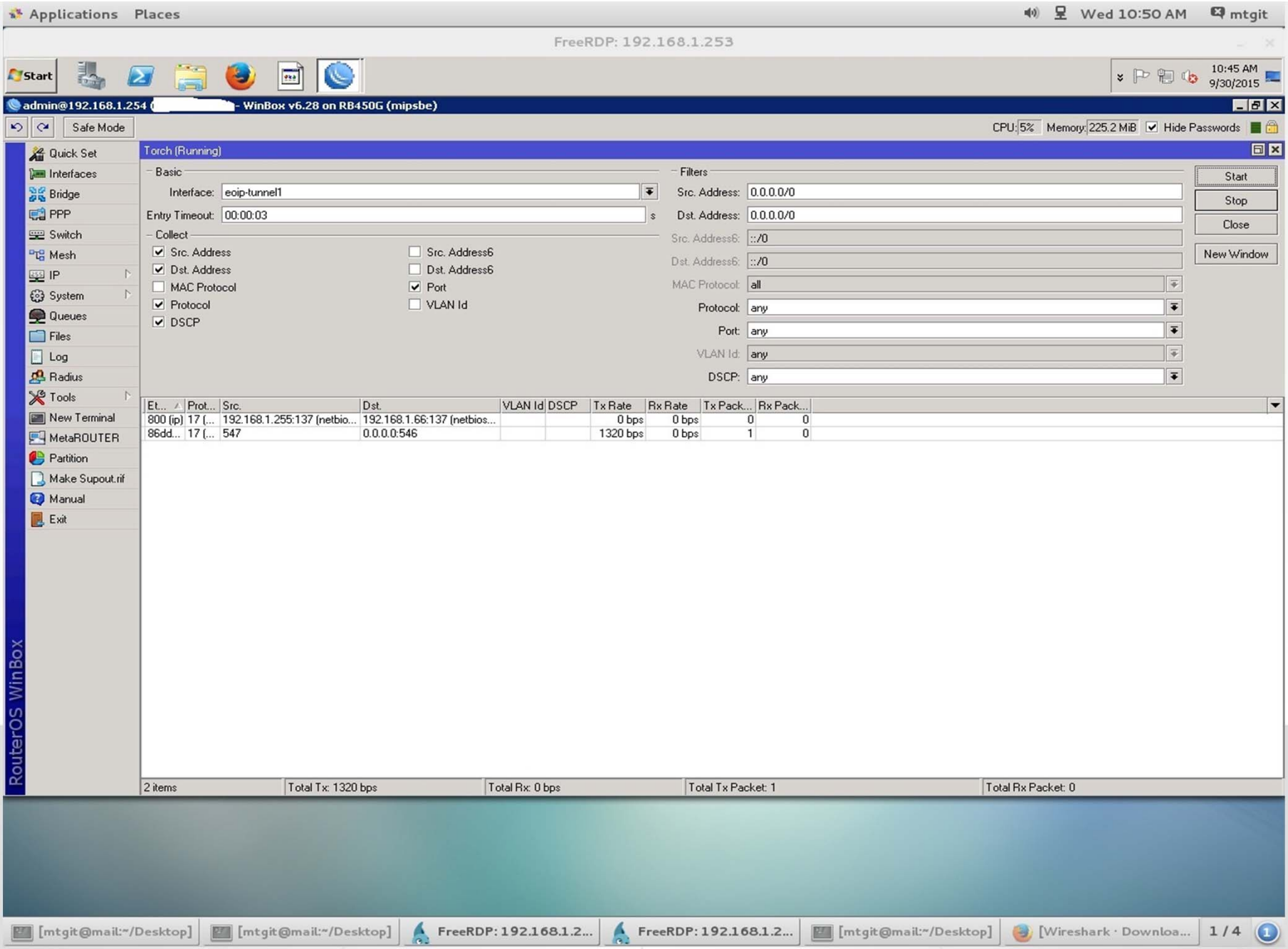
EOIP (Ethernet Over IP) configuration

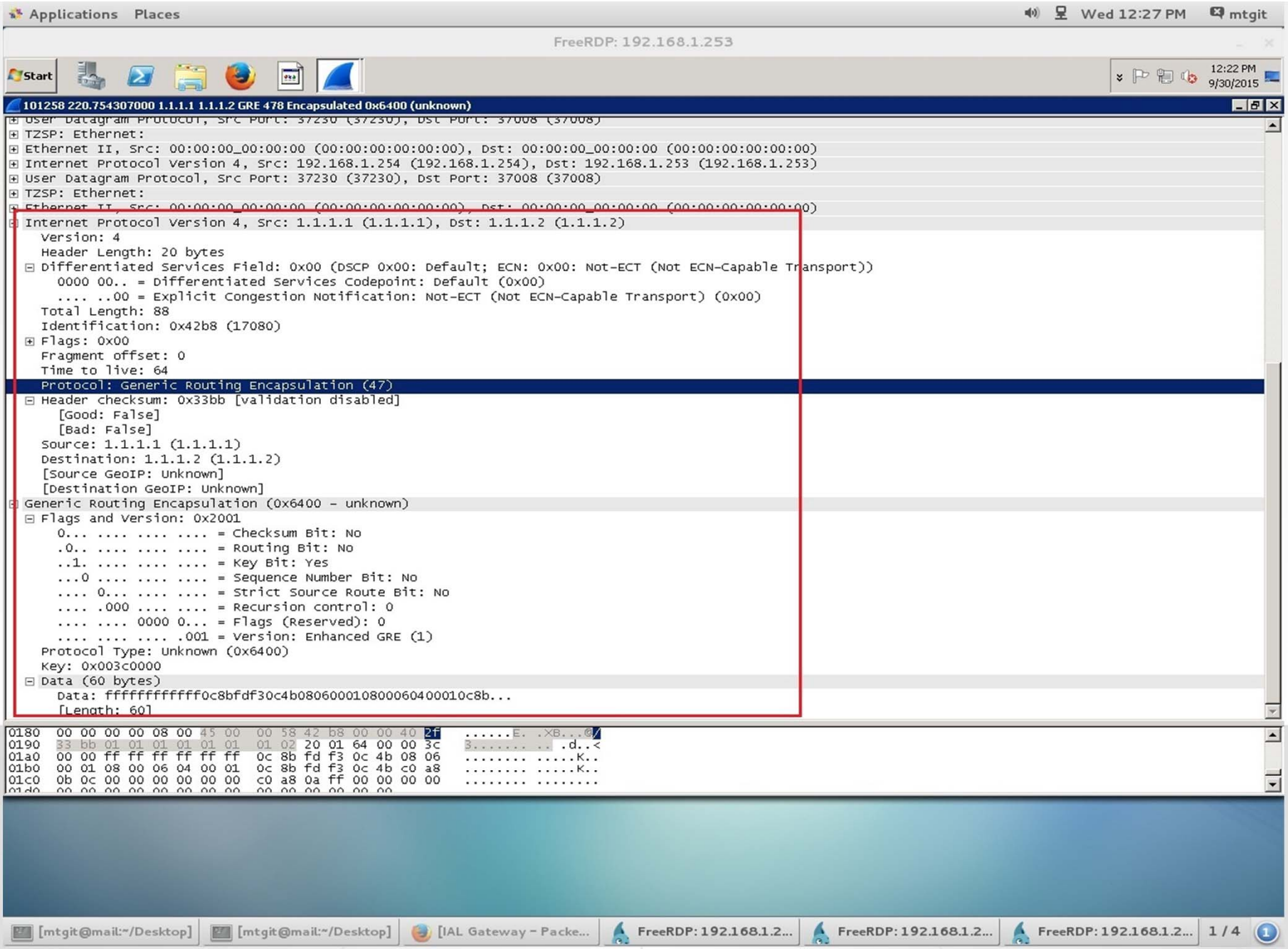
-Test Mikrotik Neighbor discovery software (Winbox)

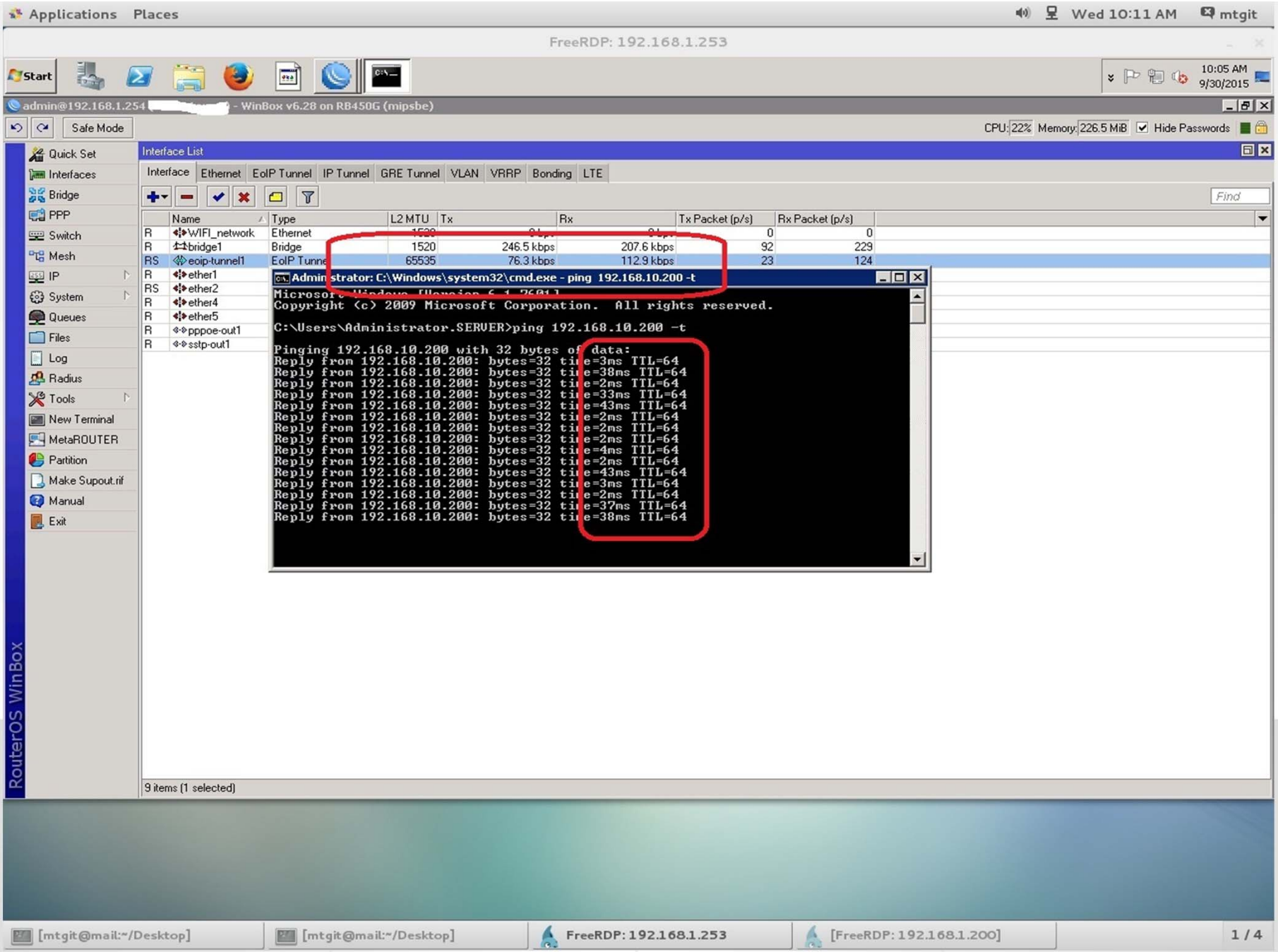


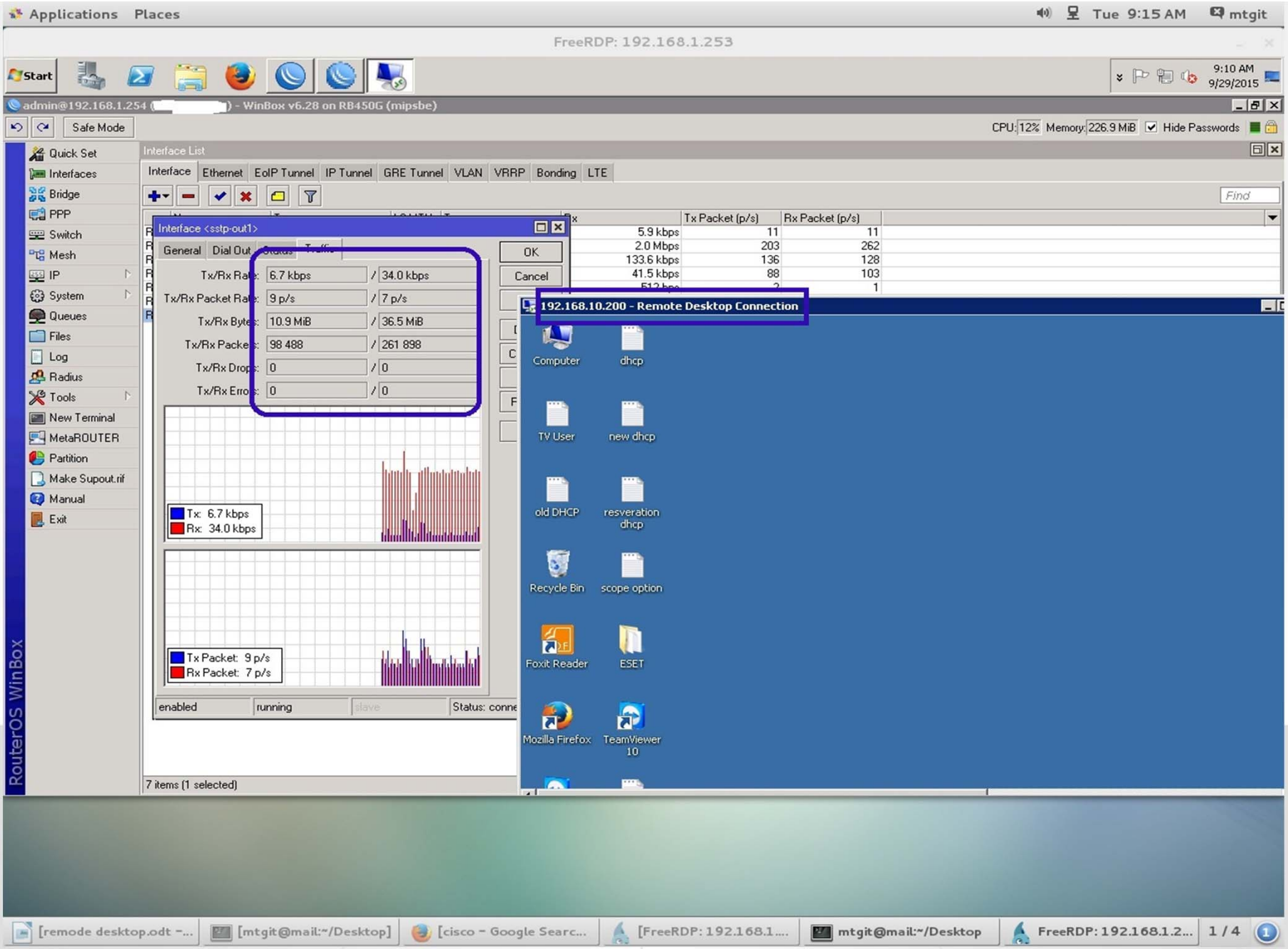

Applications Places
Wed 10:11 AM mtgit
FreeRDP: 192.168.1.253
Start
10:06 AM
9/30/2015
admin@192.168.1.254 - WinBox v6.28 on RB450G (mipsbe)
Safe Mode
CPU: 8% Memory: 226.5 MiB Hide Passwords
Quick Set
Interfaces
Bridge
PPP
Switch
Mesh
IP
System
Queues
Files
Log
Radius
Tools
New Terminal
MetaROUTER
Partition
Make Supout.rif
Manual
Exit
RouterOS WinBox
Interface List
Interface Ethernet EoIP Tunnel IP Tunnel GRE Tunnel VLAN VRRP Bonding LTE
Find
Name Type L2 MTU Tx Rx Tx Packet (p/s) Rx Packet (p/s)
R WIFI_network Ethernet 1520 1120 bps 5.6 kbps 2 2
R bridge1 Bridge 1520 316.8 kbps 227.5 kbps 95 198
RS eoip-tunnel1 EoIP Tunnel 65535 3.7 kbps 122.4 kbps 5 113
R ether1 Ethernet 1520 336.8 kbps 2.0 Mbps 330 884
RS ether2 Ethernet 1520 678.5 kbps 245.8 kbps 250 116
R ether4 Ethernet 1520 1352.6 kbps 23.8 kbps 113 96
R ether5 Ethernet 1520 3.8 kbps 4.0 kbps 7 6
R pppoe-out1 PPPoE Client 160.6 kbps 559.4 kbps 166 176
R sstp-out1 SSTP Client 8.0 kbps 203.1 kbps 14 123
9 items (1 selected)
[mtgit@mail:~/Desktop]
[mtgit@mail:~/Desktop]
FreeRDP: 192.168.1.253
[FreeRDP: 192.168.1.200]
1 / 4

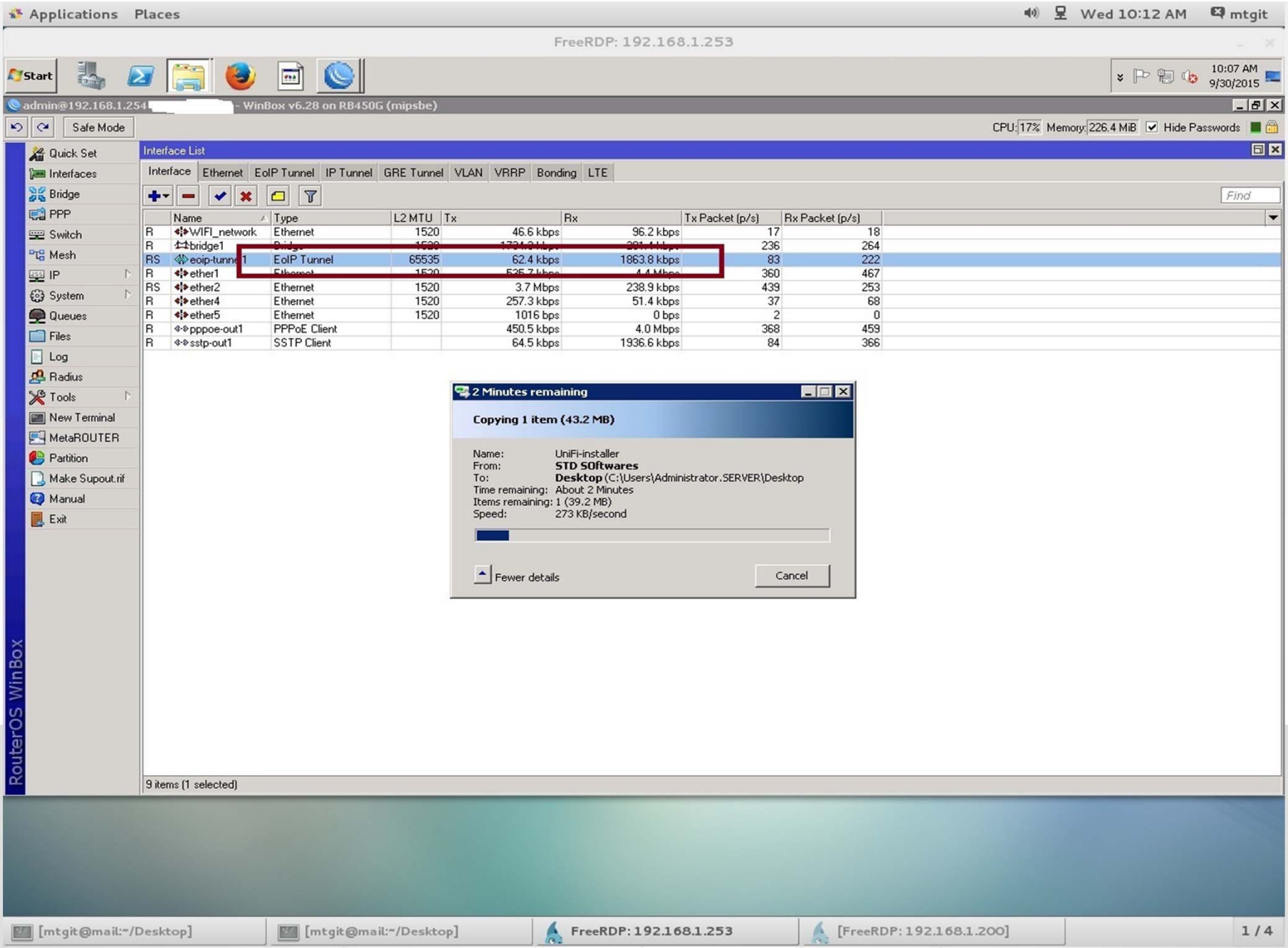

Applications Places
Wed 10:32 AM mtgit
FreeRDP: 192.168.1.253
10:27 AM 9/30/2015
admin@192.168.1.254 - WinBox v6.28 on RB450G (mipsbe)
Safe Mode
CPU: 27% Memory: 225.3 MiB Hide Passwords
Quick Set
Interfaces
Bridge
PPP
Switch
Mesh
IP
System
Queues
Files
Log
Radius
Tools
New Terminal
MetaROUTER
Partition
Make Supout.rif
Manual
Exit
RouterOS WinBox
Torch (Running)
Basic
Interface: sstp-out1
Entry Timeout: 00:00:03 s
Collect
Src. Address
Dst. Address
MAC Protocol
Protocol
DSCP
Src. Address6
Dst. Address6
Port
VLAN Id
Filters
Src. Address: 1.1.1.1
Dst. Address: 1.1.1.2
Src. Address6: ::/0
Dst. Address6: ::/0
MAC Protocol: all
Protocol: any
Port: any
VLAN Id: any
DSCP: any
Start
Stop
Close
New Window
Et... Protocol Src. Dst. VLAN Id DSCP Tx Rate Rx Rate Tx Pack... Rx Pack...
800 (ip) 47 1.1.1.1 1.1.1.2 4.9 kbps 116.9 k... 6 110
800 (ip) 6 (tcp) 1.1.1.1:8291 (winbox) 1.1.1.2:64337 2.3 kbps 33.0 kbps 4 4
2 items
Total Tx: 7.3 kbps
Total Rx: 149.9 kbps
Total Tx Packet: 10
Total Rx Packet: 114
[mtgit@mail:~/Desktop]
[mtgit@mail:~/Desktop]
FreeRDP: 192.168.1.2...
[FreeRDP: 192.168.1....
[mtgit@mail:~/Desktop]
[Wireshark · Downloa...
1 / 4


Applications Places
Wed 10:50 AM mtgit
FreeRDP: 192.168.1.253
Start
10:45 AM
9/30/2015
admin@192.168.1.254 - WinBox v6.28 on RB450G (mipsbe)
Safe Mode
CPU: 5% Memory: 225.2 MiB Hide Passwords
Quick Set
Interfaces
Bridge
PPP
Switch
Mesh
IP
System
Queues
Files
Log
Radius
Tools
New Terminal
MetaROUTER
Partition
Make Supout.rif
Manual
Exit
RouterOS WinBox
Torch (Running)
Basic
Interface: eoip-tunnel1
Entry Timeout: 00:00:03 s
Collect
Src. Address
Dst. Address
MAC Protocol
Protocol
DSCP
Src. Address6
Dst. Address6
Port
VLAN Id
Filters
Src. Address: 0.0.0.0/0
Dst. Address: 0.0.0.0/0
Src. Address6: ::/0
Dst. Address6: ::/0
MAC Protocol: all
Protocol: any
Port: any
VLAN Id: any
DSCP: any
Start
Stop
Close
New Window
Et... Prot... Src. Dst. VLAN Id DSCP Tx Rate Rx Rate Tx Pack... Rx Pack...
800 (ip) 17 (... 192.168.1.255:137 (netbio... 192.168.1.66:137 (netbios... 0 bps 0 bps 0 0
86dd... 17 (... 547 0.0.0.0:546 1320 bps 0 bps 1 0
2 items
Total Tx: 1320 bps
Total Rx: 0 bps
Total Tx Packet: 1
Total Rx Packet: 0
[mtgit@mail:~/Desktop]
[mtgit@mail:~/Desktop]
FreeRDP: 192.168.1.2...
FreeRDP: 192.168.1.2...
[mtgit@mail:~/Desktop]
[Wireshark · Downloa...
1 / 4


Applications Places
Wed 12:27 PM
mtgit
FreeRDP: 192.168.1.253
Start
12:22 PM
9/30/2015
101258 220.754307000 1.1.1.1 1.1.1.2 GRE 478 Encapsulated 0x6400 (unknown)
User Datagram Protocol, Src Port: 37230 (37230), Dst Port: 37008 (37008)
TZSP: Ethernet:
Ethernet II, Src: 00:00:00_00:00:00 (00:00:00:00:00:00), Dst: 00:00:00_00:00:00 (00:00:00:00:00:00)
Internet Protocol Version 4, Src: 192.168.1.254 (192.168.1.254), Dst: 192.168.1.253 (192.168.1.253)
User Datagram Protocol, Src Port: 37230 (37230), Dst Port: 37008 (37008)
TZSP: Ethernet:
Ethernet II, Src: 00:00:00_00:00:00 (00:00:00:00:00:00), Dst: 00:00:00_00:00:00 (00:00:00:00:00:00)
Internet Protocol Version 4, Src: 1.1.1.1 (1.1.1.1), Dst: 1.1.1.2 (1.1.1.2)
Version: 4
Header Length: 20 bytes
Differentiated Services Field: 0x00 (DSCP 0x00: Default; ECN: 0x00: Not-ECT (Not ECN-Capable Transport))
0000 00.. = Differentiated Services Codepoint: Default (0x00)
.... ..00 = Explicit Congestion Notification: Not-ECT (Not ECN-Capable Transport) (0x00)
Total Length: 88
Identification: 0x42b8 (17080)
Flags: 0x00
Fragment offset: 0
Time to live: 64
Protocol: Generic Routing Encapsulation (47)
Header checksum: 0x33bb [validation disabled]
[Good: False]
[Bad: False]
Source: 1.1.1.1 (1.1.1.1)
Destination: 1.1.1.2 (1.1.1.2)
[Source GeoIP: Unknown]
[Destination GeoIP: Unknown]
Generic Routing Encapsulation (0x6400 - unknown)
Flags and Version: 0x2001
0... .... = Checksum Bit: No
.0.. .... = Routing Bit: No
..1. .... = Key Bit: Yes
...0 .... = Sequence Number Bit: No
.... 0... .... = Strict Source Route Bit: No
.... .000 .... = Recursion control: 0
.... 0000 0... = Flags (Reserved): 0
.... .001 = Version: Enhanced GRE (1)
Protocol Type: Unknown (0x6400)
Key: 0x003c0000
Data (60 bytes)
Data: ffffffffffff0c8bfdf30c4b08060001080006040001 0c8b...
[Length: 60]
0180 00 00 00 00 08 00 45 00 00 58 42 b8 00 00 40 2f ......E. .XB...@/
0190 33 bb 01 01 01 01 01 01 01 02 20 01 64 00 00 3c 3..... .. .d..<
01a0 00 00 ff ff ff ff ff ff 0c 8b fd f3 0c 4b 08 06 ....K..
01b0 00 01 08 00 06 04 00 01 0c 8b fd f3 0c 4b c0 a8 ....K..
01c0 0b 0c 00 00 00 00 00 00 c0 a8 0a ff 00 00 00 00 ....
[mtgit@mail:~/Desktop]
[mtgit@mail:~/Desktop]
[IAL Gateway - Packe...
FreeRDP: 192.168.1.2...
FreeRDP: 192.168.1.2...
FreeRDP: 192.168.1.2...
1 / 4


Applications Places
Wed 10:11 AM
mtgit
FreeRDP: 192.168.1.253
Start
10:05 AM
9/30/2015
admin@192.168.1.254 - WinBox v6.28 on RB450G (mipsbe)
Safe Mode
CPU: 22% Memory: 226.5 MiB Hide Passwords
Quick Set
Interfaces
Bridge
PPP
Switch
Mesh
IP
System
Queues
Files
Log
Radius
Tools
New Terminal
MetaROUTER
Partition
Make Supout.rif
Manual
Exit
RouterOS WinBox
Interface List
Interface Ethernet EoIP Tunnel IP Tunnel GRE Tunnel VLAN VRRP Bonding LTE
Find
Name Type L2 MTU Tx Rx Tx Packet (p/s) Rx Packet (p/s)
R WIFI_network Ethernet 0 0
R bridge1 Bridge 1520 246.5 kbps 207.6 kbps 92 229
RS eoip-tunnel1 EoIP Tunne 65535 76.3 kbps 112.9 kbps 23 124
R ether1
RS ether2
R ether4
R ether5
R pppoe-out1
R sstp-out1
9 items (1 selected)
Administrator: C:\Windows\system32\cmd.exe - ping 192.168.10.200 -t
Copyright (c) 2009 Microsoft Corporation. All rights reserved.
C:\Users\Administrator.SERVER>ping 192.168.10.200 -t
Pinging 192.168.10.200 with 32 bytes of data:
Reply from 192.168.10.200: bytes=32 time=3ms TTL=64
Reply from 192.168.10.200: bytes=32 time=38ms TTL=64
Reply from 192.168.10.200: bytes=32 time=2ms TTL=64
Reply from 192.168.10.200: bytes=32 time=33ms TTL=64
Reply from 192.168.10.200: bytes=32 time=43ms TTL=64
Reply from 192.168.10.200: bytes=32 time=2ms TTL=64
Reply from 192.168.10.200: bytes=32 time=2ms TTL=64
Reply from 192.168.10.200: bytes=32 time=2ms TTL=64
Reply from 192.168.10.200: bytes=32 time=4ms TTL=64
Reply from 192.168.10.200: bytes=32 time=2ms TTL=64
Reply from 192.168.10.200: bytes=32 time=43ms TTL=64
Reply from 192.168.10.200: bytes=32 time=3ms TTL=64
Reply from 192.168.10.200: bytes=32 time=2ms TTL=64
Reply from 192.168.10.200: bytes=32 time=37ms TTL=64
Reply from 192.168.10.200: bytes=32 time=38ms TTL=64
[mtgit@mail:~/Desktop]
[mtgit@mail:~/Desktop]
FreeRDP: 192.168.1.253
[FreeRDP: 192.168.1.200]
1 / 4


Applications Places
Tue 9:15 AM mtgit
FreeRDP: 192.168.1.253
Start
9:10 AM
9/29/2015
admin@192.168.1.254 ( ) - WinBox v6.28 on RB450G (mipsbe)
Safe Mode
CPU: 12% Memory: 226.9 MiB Hide Passwords
Quick Set
Interfaces
Bridge
PPP
Switch
Mesh
IP
System
Queues
Files
Log
Radius
Tools
New Terminal
MetaROUTER
Partition
Make Supout.rif
Manual
Exit
RouterOS WinBox
Interface List
Interface Ethernet EoIP Tunnel IP Tunnel GRE Tunnel VLAN VRRP Bonding LTE
Find
Tx Packet (p/s) Rx Packet (p/s)
5.9 kbps 11 11
2.0 Mbps 203 262
133.6 kbps 136 128
41.5 kbps 88 103
Interface <sstp-out1>
General Dial Out Status Traffic
OK
Cancel
Tx/Rx Rate: 6.7 kbps / 34.0 kbps
Tx/Rx Packet Rate: 9 p/s / 7 p/s
Tx/Rx Bytes: 10.9 MiB / 36.5 MiB
Tx/Rx Packets: 98 488 / 261 898
Tx/Rx Drops: 0 / 0
Tx/Rx Errors: 0 / 0
Tx: 6.7 kbps
Rx: 34.0 kbps
Tx Packet: 9 p/s
Rx Packet: 7 p/s
enabled running slave Status: conne
7 items (1 selected)
192.168.10.200 - Remote Desktop Connection
Computer
dhcp
TV User
new dhcp
old DHCP
resveration dhcp
Recycle Bin
scope option
Foxit Reader
ESET
Mozilla Firefox
TeamViewer 10
[remode desktop.odt -...
[mtgit@mail:~/Desktop]
[cisco - Google Searc...
[FreeRDP: 192.168.1....
mtgit@mail:~/Desktop
FreeRDP: 192.168.1.2...
1 / 4


Applications Places
Wed 10:12 AM mtgit
FreeRDP: 192.168.1.253
Start
10:07 AM
9/30/2015
admin@192.168.1.254 - WinBox v6.28 on RB450G (mipsbe)
Safe Mode
CPU: 17% Memory: 226.4 MiB Hide Passwords
Quick Set
Interfaces
Bridge
PPP
Switch
Mesh
IP
System
Queues
Files
Log
Radius
Tools
New Terminal
MetaROUTER
Partition
Make Supout.rif
Manual
Exit
RouterOS WinBox
Interface List
Interface Ethernet EoIP Tunnel IP Tunnel GRE Tunnel VLAN VRRP Bonding LTE
Find
Name Type L2 MTU Tx Rx Tx Packet (p/s) Rx Packet (p/s)
R WIFI_network Ethernet 1520 46.6 kbps 96.2 kbps 17 18
R bridge1 Bridge 1520 1734.3 kbps 391.4 kbps 236 264
RS eoip-tunnel1 EoIP Tunnel 65535 62.4 kbps 1863.8 kbps 83 222
R ether1 Ethernet 1520 535.7 kbps 4.4 Mbps 360 467
RS ether2 Ethernet 1520 3.7 Mbps 238.9 kbps 439 253
R ether4 Ethernet 1520 257.3 kbps 51.4 kbps 37 68
R ether5 Ethernet 1520 1016 bps 0 bps 2 0
R pppoe-out1 PPPoE Client 450.5 kbps 4.0 Mbps 368 459
R sstp-out1 SSTP Client 64.5 kbps 1936.6 kbps 84 366
9 items (1 selected)
2 Minutes remaining
Copying 1 item (43.2 MB)
Name: UniFi-installer
From: STD SOftwares
To: Desktop (C:\Users\Administrator.SERVER\Desktop
Time remaining: About 2 Minutes
Items remaining: 1 (39.2 MB)
Speed: 273 KB/second
Fewer details
Cancel
[mtgit@mail:~/Desktop]
[mtgit@mail:~/Desktop]
FreeRDP: 192.168.1.253
[FreeRDP: 192.168.1.200]
1 / 4


Applications Places
Wed 10:15 AM
mtgit
FreeRDP: 192.168.1.253
Start
10:10 AM
9/30/2015
Speedtest.net by Ookla - The...
www.speedtest.net
Search
OOKLA SPEEDTEST PINGTEST AWARDS
The Global Standard in Internet Metrics
SPEEDTEST
ADVERTISE
BECOME A HOST
MY RESULTS
SUPPORT
SETTINGS
LOGIN
CREATE ACCOUNT
SatSite 2.5G macro BTS
Lightweight, low power base station Software upgrade to 4G LTE
Slow speeds?
Make your PC faster by fixing system issues
PING
5 ms
DOWNLOAD SPEED
1.16 Mbps
UPLOAD SPEED
1.33 Mbps
SHARE THIS RESULT
SLOW PC PERFORMANCE?
Run a test to identify issues and speed up your PC
START NOW
Are you on
Yatanarpon Teleport, Internet Service?
Take our Broadband Internet Survey!
Measure the quality of your connection.
BEGIN TEST
START SCAN
122.248.100.20
Yatanarpon Teleport, Internet Service
Rate Your ISP
TEST AGAIN
NEW SERVER
Hosted by
Myanma Posts and
Advertise on Speedtest.net
2 Minutes remaining
Copying 1 item (43.2 MB)
Name: UniFi-installer
From: STD SOftwares
To: Desktop (C:\Users\Administrator.SERVER\Desktop
Time remaining: About 2 Minutes
Items remaining: 1 (17.2 MB)
Speed: 140 KB/second
Fewer details
Cancel
Satellite Internet
Global Satellite Services - Satellite Internet
[mtgit@mail:~/Desktop]
[mtgit@mail:~/Desktop]
FreeRDP: 192.168.1.253
[FreeRDP: 192.168.1.200]
[mtgit@mail:~/Desktop]
1 / 4

Thank You

Good Bye

Myanmar MikroTik User Meeting
Welcome To Next Years