Tools for Networkers v3.2

HyungKwang (2020.02)

Introduction

➢ Intro

While working as a Network engineer, I've experienced some common needs. It's about small programs which helpful & convenient at a practical usage perspective. This is to help others who are not good at operating Juniper router product or troubleshooting.

1) How to collect system outputs continuously without using shell script.
2) What/how to collect syslog log messages at a production, when problem occurred.
3) How to simulate packets to troubleshoot
4) ……various reasons

➢ Building Environment.

- Based on Juniper Router products.(MX/T/PTX series). Other vendor's would not work properly.
- Building environment : You have to have installed python 3.7.2, pyqt5, and scapy module
  1) Install python 3.7.2 or higher version. Then set PATH env properly.
  2) In the directory, install pyqt5 and scapy module
     Move into the directory where all files are exist.
     #cd C:\Python37\studyrootm\project\Tools for networks_V2

```
PS C:\Python37\studyrootm\project\Tools for networks_V2> pip3 install pyqt5
PS C:\Python37\studyrootm\project\Tools for networks_V2> pip3 install scapy
```

- Download : **https://github.com/HyungKwangChoi/My-programing**
- Released 4 files
  1) **"Tools for networkers_v3.2.py"**
  2) **"Window_ui.zip"** (GUI application designed with PYQT5)
  3) **"Lab Topology.zip"**
  4) **"Release_note_v3.2"**

```
 C:¥E¥ㄱㅣ술¥language¥GitHub¥My Programing¥My-programing¥Tools for networks¥version 3.2

2020-02-21  오전 10:11    <DIR>          .
2020-02-21  오전 10:11    <DIR>          ..
2020-02-21  오전 10:09            92,360 Lab Topology.zip
2020-02-21  오전 09:58           258,786 release_note_v3.2.docx
2020-02-18  오후 08:11            37,193 Tools for Networkers_v3.2.py
2020-02-21  오전 10:11             4,781 Window.zip
```

- How to Run
  To run it, you need 3 files exist in the same dir "**Tools for Networkers_v3.2 , Window.ui and Lab Topology**".

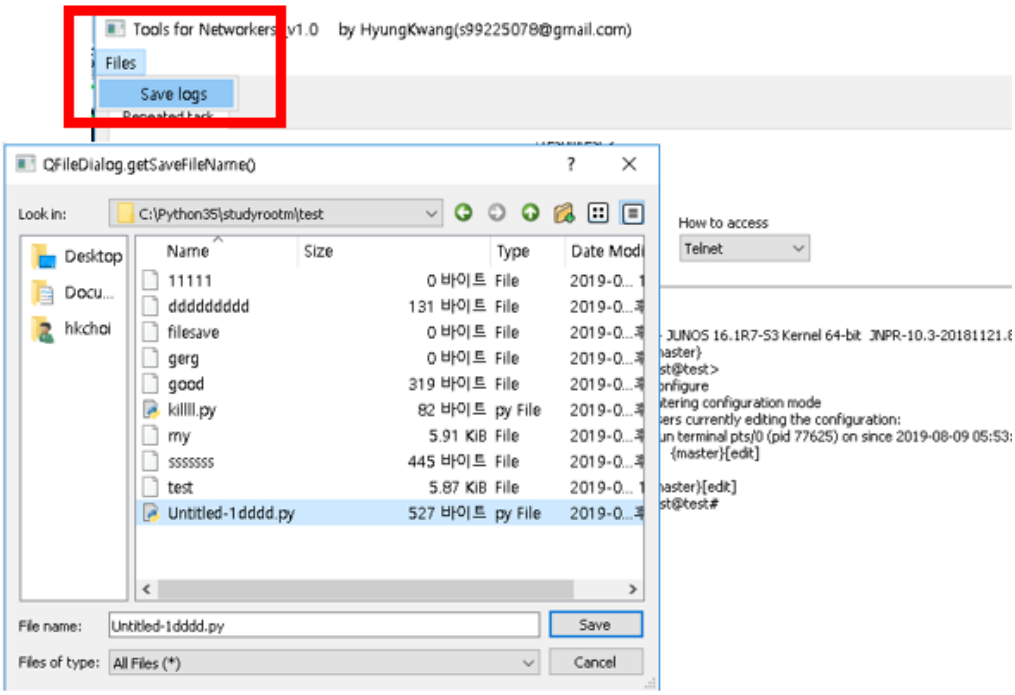
```
C:¥E¥ㄱㅣ술¥language¥GitHub¥My Programing¥My-programing¥Tools for networks¥version 3.2>python "Tools for Networkers_v3.2.py
```

Tools

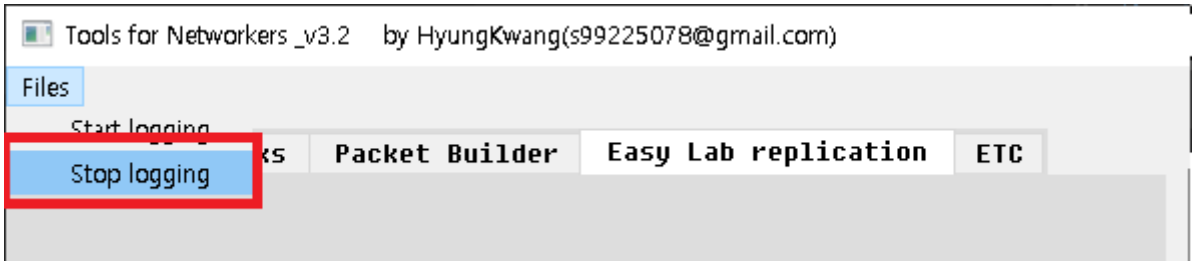
➢ How to save logs

Go to ‘Files’ -> ‘Save logs’.

- Logs are being saved on the display right screen.

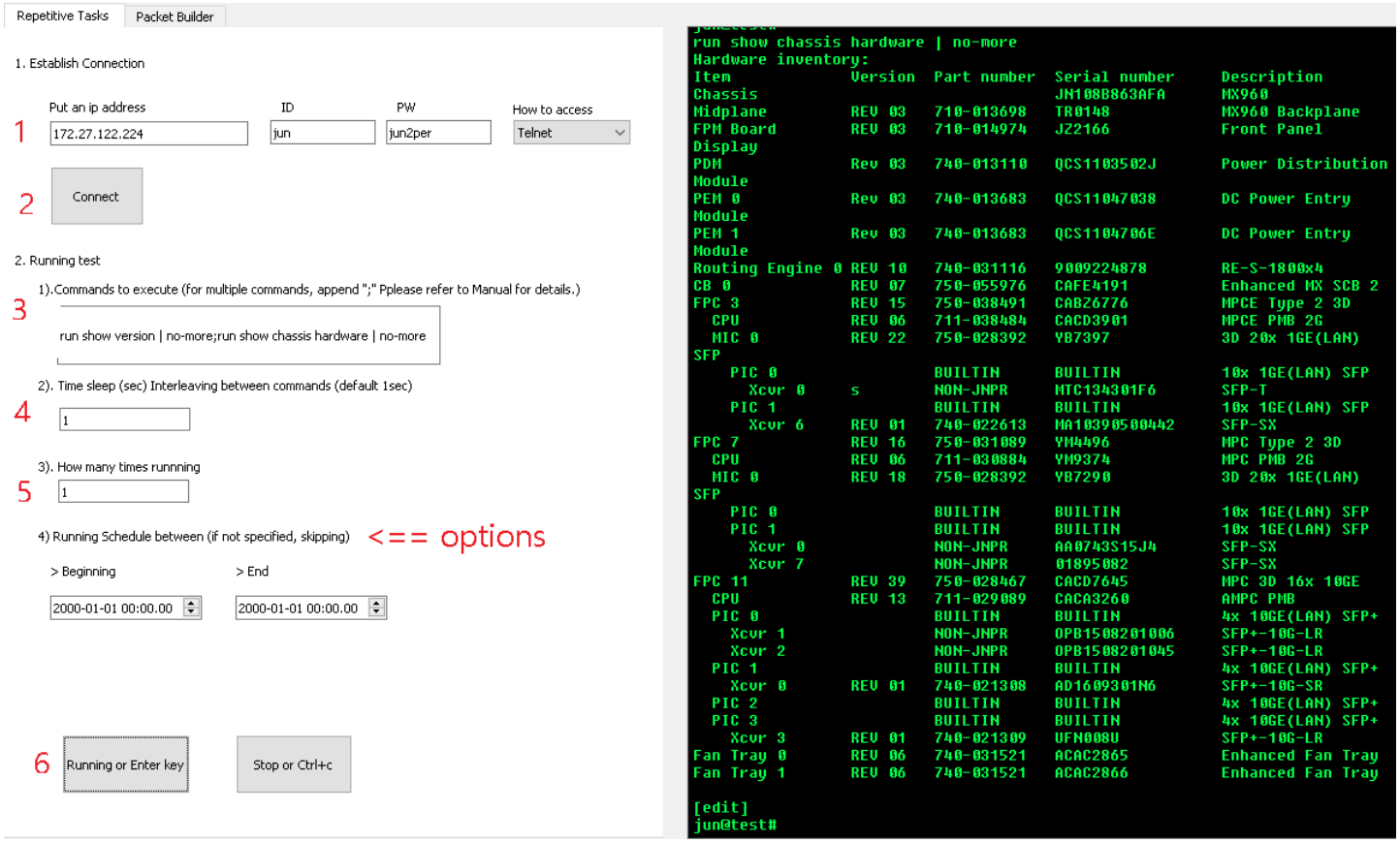


➢ How to stop logging



➢ Repetitive Tasks

- To help someone who feels hard to create a Shell script or other scripts to run commands repetitively or tasks.
- (Current Version) Task performed via Telnet access



How to run (follow the red sequence)

1. Once the Tool popped-up, Put ip & id & pw

-Telnet connection Timeout = 3
- In my source-code, login/Password prompts are “login”, “Password” coded.
So If your device doesn’t return the Char as “login”, “Password”, please modify my source-code.

2~3. If connection successful, go to ‘2. Running a test’
-Take a look at “1). commands to execute (for multiple command, append “**;**”)”
If you want to run several commands, you have to add “**;**” among commands

Ex) set interface ge-0/0/0 mtu 9000**;** commit**;** delete interface ge-0/0/0 mtu 9000**;**run show interface terse | match ge-0/0/0

-If possible, try to append ‘no-more’ after commands. To avoid logs are stuck in buffer just like the same as Telnet session.

Ex) show version **| no-more**, show log messages **| no-more**

4. please put the time-sleep which is time interval between commands executed.

5. put the number at “how many time to run”. This is a kind of loop.

6. “Running”

How to login system and execute shell or cli commands.

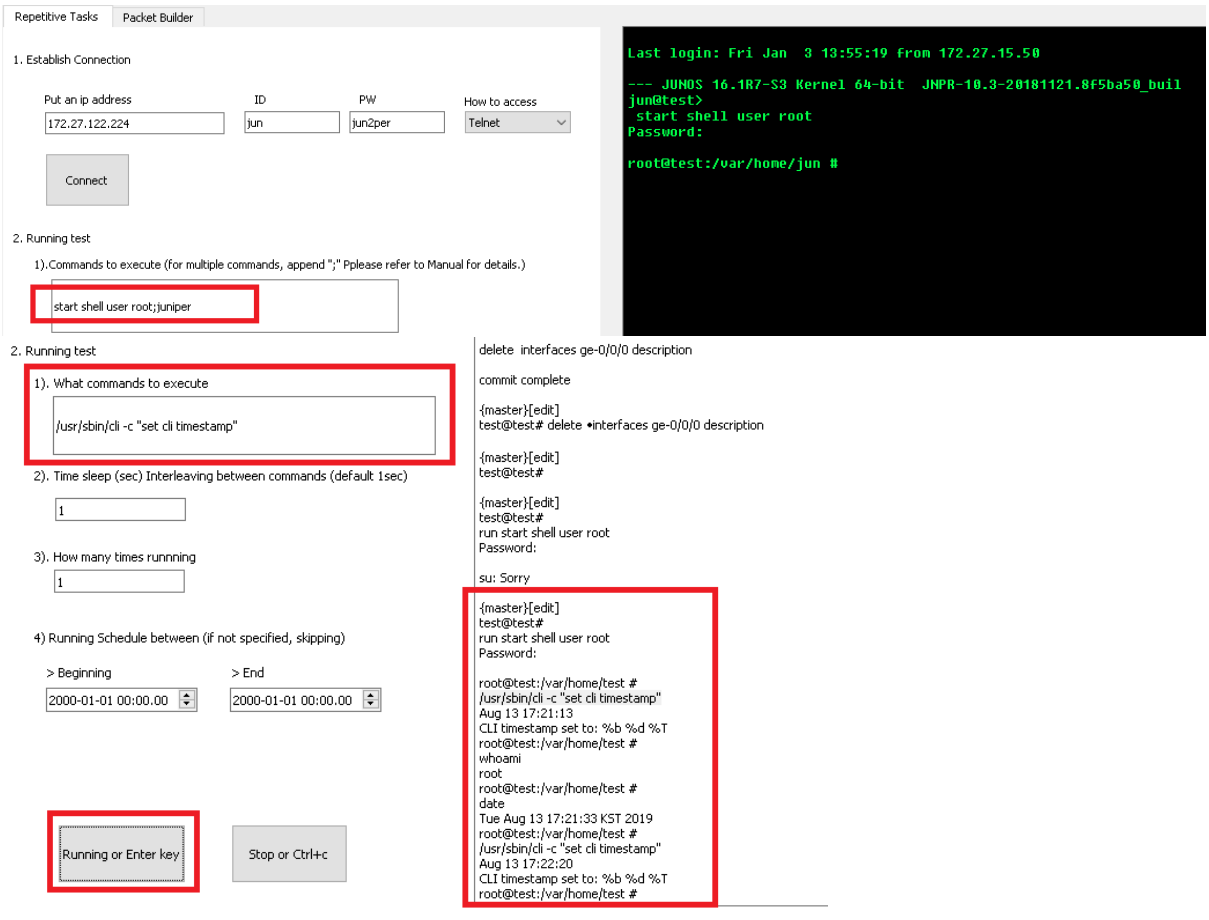
-As this ‘Repetitive Tasks’ works on Telnet session, you can do the same thing as what you do in Telnet. (Accessing to System, and executing shell command or whatever)

Ex)

0). “1).commands to execute”, in case, your system root pw is ‘juniper’

1). “**start shell user root;juniper**” , if you login to the system successfully, then put the commands/ execute again

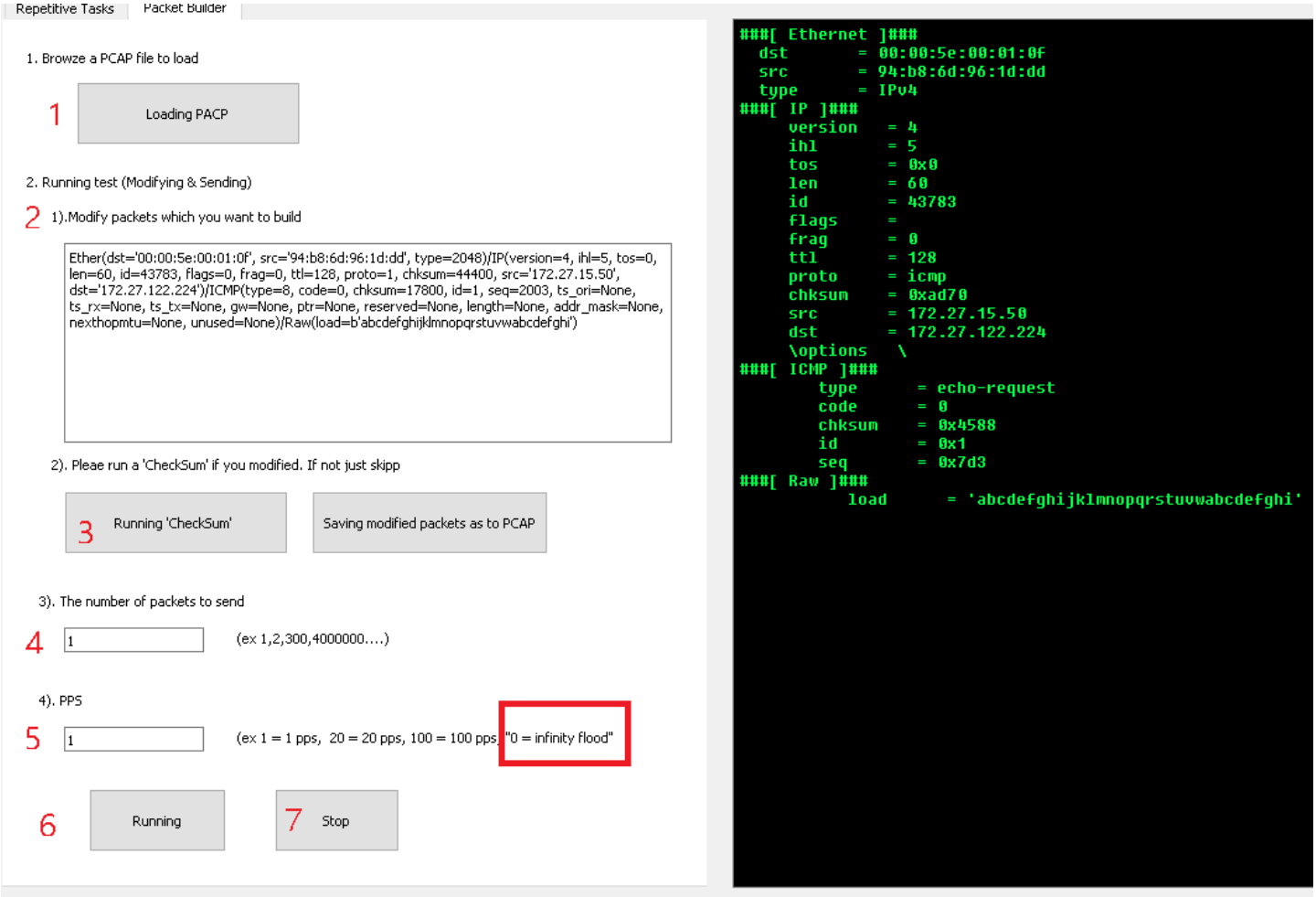
2). “**/usr/sbin/cli -c "set cli timestamp**” and so on



➢ Packet Builder

How to run (follow the red sequence)

1. Once the Tool popped-up, “Loading PCAP” file
   - It must load only PCAP file, which you want to simulate.
   - PCAP files will be displayed on the screen right.
2. Modify packets items.
3. You must run ‘CheckSum’. After checksum done, new modify packet would be refreshed on the right screen.
4. put how many packets you want to send
5. put ‘PPS’
   - if you put ‘0’, it means infinity flood
6. Running
7. Stopping.



➢ Easy Lab Replication

- Aims :

1) To help easy lab replication with only one Router Box, in case with juniper router.
2) With 30 x lab scenario, you can study various routing protocols & features.

- Total 30 Lab scenario.

MPLS L3VPN : 14
MPLS L2VPN : 2
MPLS VPLS : 2
Multicast : 5
6PE : 1
6VPE : 1
INTRA-AS VPN : 3
Various scenario: 2

- In details

Main Feature	Subset
MPLS L3VPN	IGP-OSPF # MPLS RSVP LSP # NO PE-CE Protocol
	IGP-OSPF # MPLS RSVP LSP # PE-CE Protocol OSPF # NO RR
	IGP-OSPF # MPLS RSVP LSP # PE-CE Protocol BGP # NO RR
	IGP-OSPF # MPLS RSVP LSP # PE-CE Protocol OSPF # SINGLE RR
	IGP-OSPF # MPLS RSVP LSP # PE-CE Protocol BGP # SINGLE RR
	IGP-OSPF # MPLS RSVP LSP # PE-CE Protocol OSPF # DUAL RR
	IGP-OSPF # MPLS RSVP LSP # PE-CE Protocol BGP # DUAL RR
	IGP-OSPF # MPLS LDP # NO PE-CE Protocol
	IGP-OSPF # MPLS LDP # PE-CE Protocol OSPF # NO RR
	IGP-OSPF # MPLS LDP # PE-CE Protocol BGP # NO RR
	IGP-OSPF # MPLS LDP # PE-CE Protocol OSPF # SINGLE RR
	IGP-OSPF # MPLS LDP # PE-CE Protocol BGP # SINGLE RR
	IGP-OSPF # MPLS LDP # PE-CE Protocol OSPF # DUAL RR
	IGP-OSPF # MPLS LDP # PE-CE Protocol BGP # DUAL RR
MPLS L2VPN	MPLS L2VPN - IGP-OSPF # MPLS RSVP LSP # SINGLE RR [3 loops Required]
	MPLS L2VPN - IGP-OSPF # MPLS LDP # SINGLE RR [3 loops Required]
MPLS VPLS	VPLS [3 CE] - IGP OSPF # MPLS RSVP LSP # SINGLE RR [4 loops Required]
	VPLS [3 CE] - IGP OSPF # MPLS LDP # SINGLE RR [4 loops Required]
Multicast	PLAIN MULTICAST # PIM - SPARSE MODE # STATIC RP CONFIGURED # ASM
	PLAIN MULTICAST # PIM - DENCE MODE
	PLAIN MULTICAST # PIM - SPARSE MODE # NO RP CONFIGURED # SSM
	NG-MVPN # MBGP Multicast VPN with PIM SSM as PE-CE Protocol
	NG-MVPN # MBGP Multicast VPN with PIM ASM as PE-CE Protocol # RPT-SPT

6PE	6PE - IGP-OSPF # MPLS RSVP LSP # PE-CE Protocol BGP # SINGLE RR
6VPE	6VPE - IGP-OSPF # MPLS RSVP LSP # PE-CE Protocol BGP # SINGLE RR
INTER-AS VPN	INTER-AS L3VPN OPTION-A IGP-OSPF # MPLS LDP # PE-CE Protocol EBGP
	INTER-AS L3VPN OPTION-B IGP-OSPF # MPLS LDP # PE-CE Protocol EBGP
	INTER-AS L3VPN OPTION-C IGP-OSPF # MPLS LDP # PE-CE Protocol EBGP
Various scenario	IGP-OSPF -- MULTI-AREA - STUB - NSSA -TSA -ALL P2MP LINKS [1 loop]
	IGP-OSPF -- MULTI-AREA - STUB - NSSA -TSA -ALL P2P LINKS [1 loop]

- How to run

1) Just follow the sequential number
2) First select lab topo and template.
3) When you selected done, simple lab template will pop-up.
4) If you think that's the lab you are using, then put the interface number correctly.
   It's implemented only in Router Box, so in according to your interface number put, you have to do physical cable connection as a loop direct connection

5) After you put the interface name correctly, window pop-up will be refreshed displaying it's interface name on the template.
   Then it will give you configurations on the right display box.
6) (OPTIONS) it's all done.
   But if you want to upload the configurations to your Router, if you add IP,ID, Password, it will try to upload it to your Router via Telnet.
   So to use it, you have to make sure that enabling 'telnet' service at your Router before that.

- ETC :

This feature works only in Juniper Router product, which supports 'Logical Router' feature.

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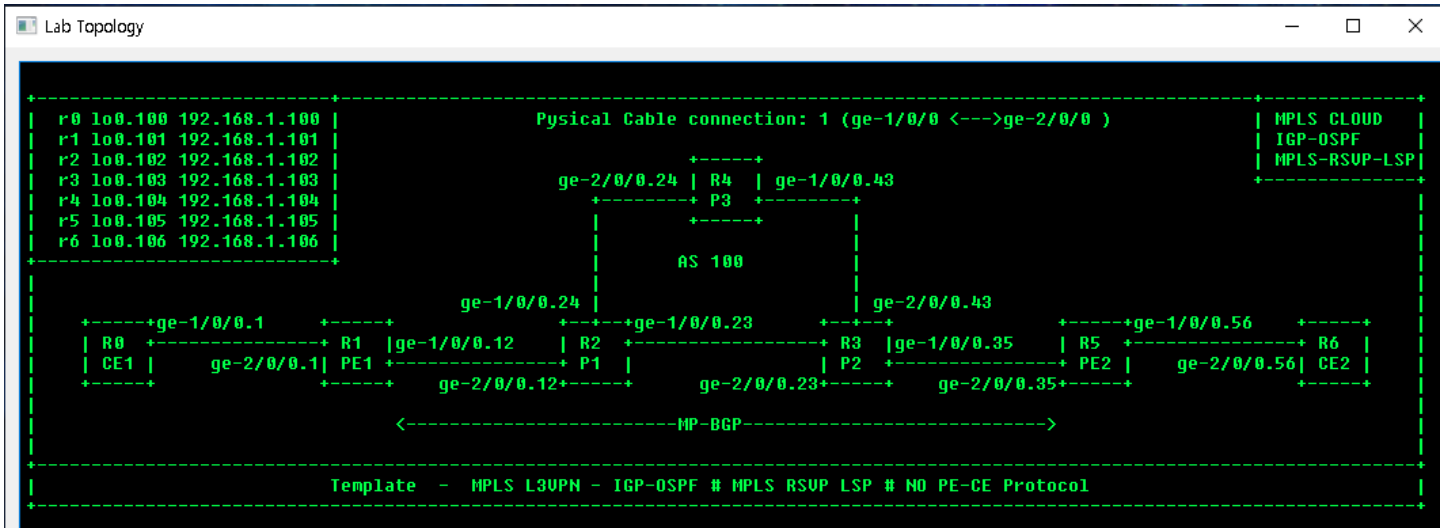
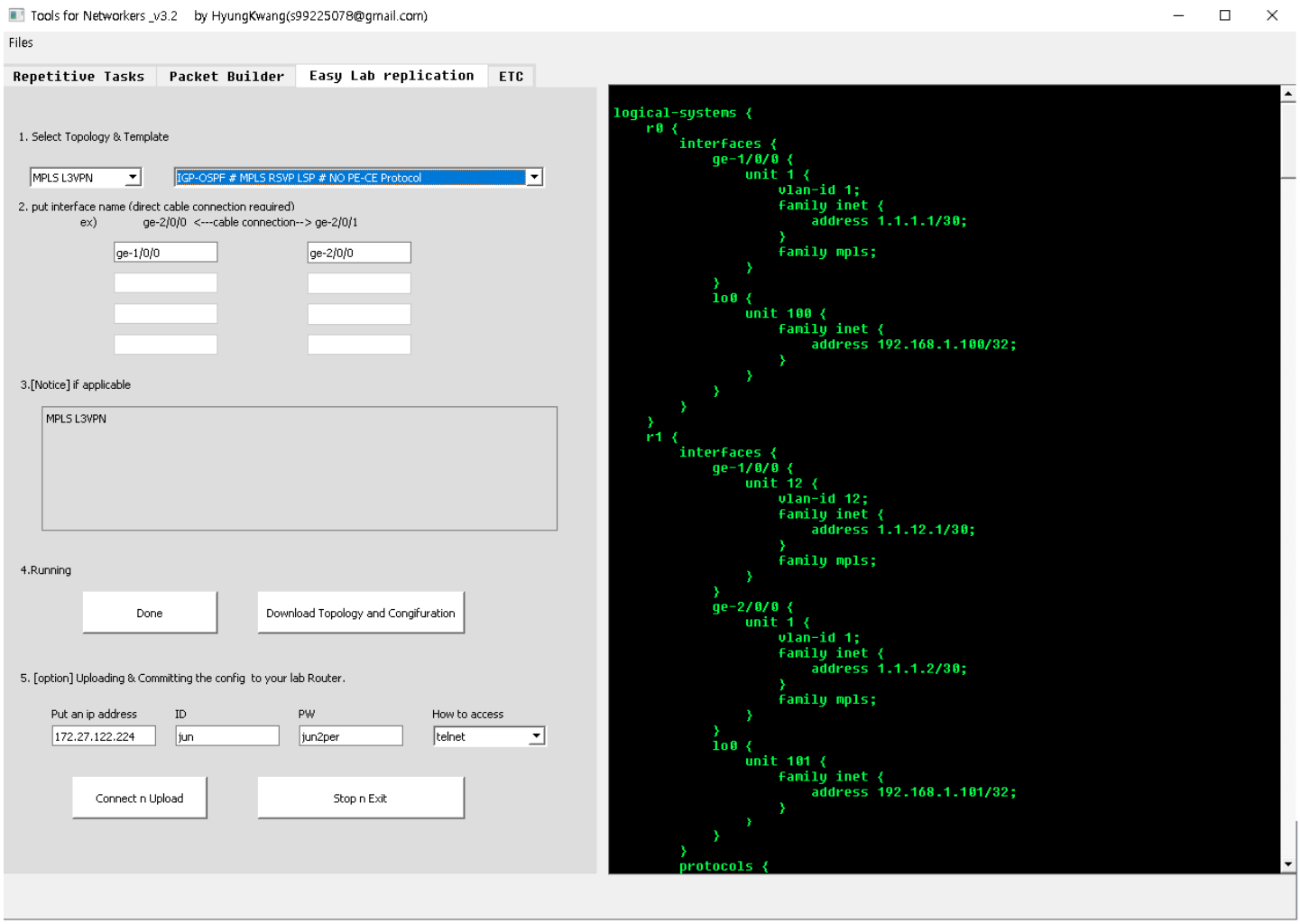
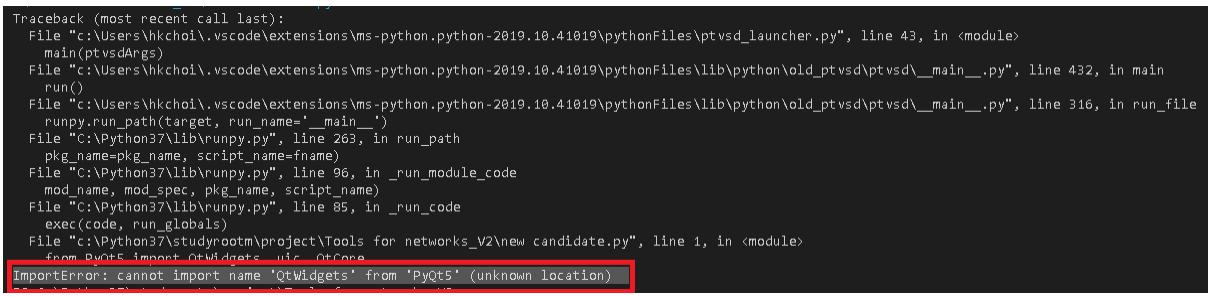
- Display


Lab Topology
r0 lo0.100 192.168.1.100
r1 lo0.101 192.168.1.101
r2 lo0.102 192.168.1.102
r3 lo0.103 192.168.1.103
r4 lo0.104 192.168.1.104
r5 lo0.105 192.168.1.105
r6 lo0.106 192.168.1.106
Pysical Cable connection: 1 (ge-1/0/0 <--->ge-2/0/0)
MPLS CLOUD
IGP-OSPF
MPLS-RSVP-LSP
ge-2/0/0.24
R4
ge-1/0/0.43
P3
AS 100
ge-1/0/0.24
ge-2/0/0.43
ge-1/0/0.1
R1
CE1
ge-2/0/0.1
PE1
ge-1/0/0.12
ge-2/0/0.12
P1
R2
ge-1/0/0.23
ge-2/0/0.23
P2
R3
ge-1/0/0.35
ge-2/0/0.35
PE2
R5
ge-1/0/0.56
ge-2/0/0.56
R6
CE2
<----------MP-BGP----------
Template - MPLS L3VPN - IGP-OSPF # MPLS RSVP LSP # NO PE-CE Protocol

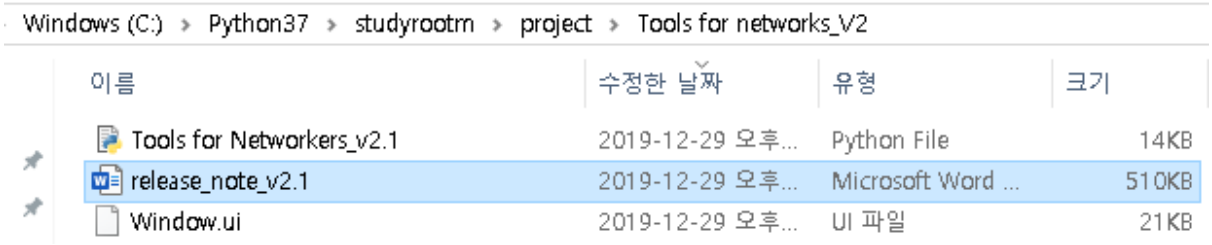

Tools for Networkers _v3.2 by HyungKwang(s99225078@gmail.com)
Files
Repetitive Tasks
Packet Builder
Easy Lab replication
ETC
1. Select Topology & Template
MPLS L3VPN
IGP-OSPF # MPLS RSVP LSP # NO PE-CE Protocol
2. put interface name (direct cable connection required)
ex) ge-2/0/0 <---cable connection--> ge-2/0/1
ge-1/0/0
ge-2/0/0
3.[Notice] if applicable
MPLS L3VPN
4.Running
Done
Download Topology and Congifuration
5. [option] Uploading & Committing the config to your lab Router.
Put an ip address
ID
PW
How to access
172.27.122.224
jun
jun2per
telnet
Connect n Upload
Stop n Exit
logical-systems {
r0 {
interfaces {
ge-1/0/0 {
unit 1 {
vlan-id 1;
family inet {
address 1.1.1.1/30;
}
family mpls;
}
}
lo0 {
unit 100 {
family inet {
address 192.168.1.100/32;
}
}
}
}
}
r1 {
interfaces {
ge-1/0/0 {
unit 12 {
vlan-id 12;
family inet {
address 1.1.12.1/30;
}
family mpls;
}
}
ge-2/0/0 {
unit 1 {
vlan-id 1;
family inet {
address 1.1.1.2/30;
}
family mpls;
}
}
lo0 {
unit 101 {
family inet {
address 192.168.1.101/32;
}
}
}
}
protocols {

Error

- "ImportError : cannot import name 'qtwidgets' from 'PyQt5' (unknown location)"
  - While you are running the script, if you meet the error like that, PYQT5 is not installed properly with a right PATH. So please check path environment set properly.



- How to resolve
  - Move to the directory which "Window.ui" and the script located.
  - And install pyqt5 under the directory.



Future Release

1. 'Mib Browzer' expected on Q2 2020
2. 'DHCP Shooter_v1' expected on Q2 2020
3. 'Collecting system outputs' expected on Q3 2020

Revision History

v1.1 : Modified some Telnet bug at 'Repetitive Tasks' (12.2019)
v2.1 : New feature added naming 'Packet Builder' (01.2020)
v2.2 : Auto scroll down feature added on the right display screen of the Tool. (02.2020)
v3.2 : New feature added naming 'Easy Lab Replication' (02.2020)

Contributor

> Rengaramalingam A (rengahcl@gmail.com)

Contributed to the feature of "Easy Lab Replication", which originated from his shell script "scriptit.sh"