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Candela
TECHNOLOGIES

Network Testing and Emulation Solutions

Introduction to CLI Scripts

Goal: You will be able to execute LANforge testing scripts from the command line from Windows, Linux, remote desktop or ssh connection.

Traffic emulation may be run unattended and automated using Perl scripts provided with the LANforge Server. These scripts can be run from within the LANforge server or outside the LANforge Server (on a Windows or other desktop). The output of the scripts should be redirected into a text file for you to process the results.

```
C:\> perl
```
Desktop

LANforge

System
Under Test
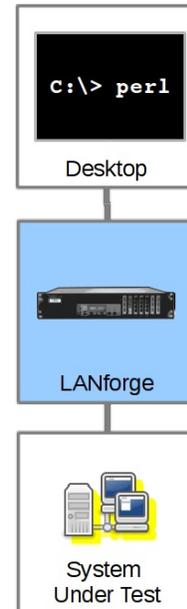
Where Do I Find Scripts?

On Windows

On most versions of windows, the LANforge Server installs scripts in

```
C:\Program Files (x86)\LANforge-Server\scripts
```

On Linux

In the home directory for user LANforge:

```
/home/lanforge/scripts
```

How to Run Scripts

Starting a script on Windows:

1. Make sure that perl is in your `PATH`. (See Inspecting DOS PATH)

2. Open a CMD window (or a PowerShell window)

3. and change directory to `C:\Program Files (x86)\LANforge-Server\scripts`

4. Type `perl .\script_name.pl` `ENTER` to run the script.

```
Command Prompt                                                                        _ □ ×
c:\>cd "c:\Program Files (x86)\LANforge-Server\scripts"

c:\Program Files (x86)\LANforge-Server\scripts>perl .\lf_firemod.pl
.\lf_firemod.pl  --action { create_endp | create_arm | show_endp | set_endp | show_port | list_ports
                          | do_cmd | start_endp | stop_endp | delete_endp
                          | create_cx | list_cx | show_cx | delete_cx } ]
    [--endp_vals {key,key,key,key}]
        # show_endp output can be narrowed with key-value arguments
        # Examples:
        #  --action show_endp --endp_vals MinTxRate,DestMAC,Avg-Jitter
        # Not available: Latency,Pkt-Gaps, or rows below steps-failed.
        # Special Keys:
        #  --endp_vals tx_bps        (Tx Bytes)
        #  --endp_vals rx_bps        (Rx Bytes)
    [--mgr       {host-name | IP}]
    [--mgr_port  {ip port}]
    [--cmd       {lf-cli-command text}]
    [--endp_name {name}]
    [--port_name {name}]
    [--resource  {number}]
    [--speed     {speed in bps}]
    [--tos       { DONT-SET | LOWDELAY | THROUGHPUT | RELIABILITY | LOWCOST },{priority}]
    [--max_speed {speed in bps}]
    [--quiet     { yes | no }]
    [--endp_type { lf_udp | lf_udp6 | lf_tcp | lf_tcp6 | mc_udp | mc_udp6 }]
    [--mcast_addr {multicast address, for example: 224.4.5.6}]
    [--mcast_port {multicast port number}]
    [--min_pkt_sz {minimum payload size in bytes}]
    [--max_pkt_sz {maximum payload size in bytes}]
    [--rcv_mcast { yes (receiver) | no (transmitter) }]
    [--use_csums { yes | no, should we checksum the payload }]
    [--ttl       {time-to-live}]
    [--report_timer {miliseconds}]
    [--cx_name   {connection name}]
    [--cx_endps  {endp1},{endp2}]
    [--test_mgr  {default_tm|all|other-tm-name}]
    [--arm_pps   {packets per second}]
  Example:
  .\lf_firemod.pl --action set_endp --endp_name udp1-A --speed 154000

  .\lf_firemod.pl --action create_endp --endp_name mcast_xmit_1 --speed 154000 \
    --endp_type mc_udp    --mcast_addr 224.9.9.8 --mcast_port 9998 \
    --rcv_mcast NO        --port_name eth1 \
    --min_pkt_sz 1072     --max_pkt_sz 1472 \
    --use_csums NO        --ttl 32 \
    --quiet no --report_timer 1000

  .\lf_firemod.pl --action create_endp --endp_name bc1 --speed 256000 \
    --endp_type lf_tcp    --tos THROUGHPUT,100 --port_name rd0#1

  .\lf_firemod.pl --action list_cx --test_mgr all --cx_name all

  .\lf_firemod.pl --action create_cx --cx_name L301 \
    --cx_endps ep_rd0a,ep_rd1a --report_timer 1000

  .\lf_firemod.pl --action create_arm --endp_name arm01-A --port_name eth1 \
    --arm_pps 80000 --min_pkt_sz 1472 --max_pkt_sz 1514 --tos LOWDELAY,100

  .\lf_firemod.pl --mgr jedtest --action create_cx --cx_name arm-01 --cx_endps arm01-A,arm01-B

c:\Program Files (x86)\LANforge-Server\scripts>
```

Generally, the script will tell you that it needs more switches.

Finding Help

Most scripts have a `-h` or `--help` switch that explain what switches they expect.

Script Conventions

In general, scripts will expect you to tell them a few things, regardless of the script:

- The manager IP address to connect to: `--mgr 127.0.0.1` or `--manager 192.168.100.1`. This often
  defaults to 127.0.0.1, but when connecting from outside the machine, please use the IP of the
  LANforge management port (often `eth0`).

- The manager port to connect to: `--port 4001` or `--mgr_port 4001`. This often defaults to 4001.

- Which resource to direct the command to. The manager is always resource 1. Resource 2 would be
  your second LANforge server. `--resource 2`. Some scripts use the older term **card**: `--card`

- If you need debugging output, turn off *quiet* mode: `-q no` or `--quiet no`. Some older scripts want
  you to turn quiet on explicitly: `--quiet 1`

- To capture the output, use the `>` operator to redirect the text output into a text file.

- Scripts are often executed from within a shell script (or batch file). Often the formatting of the
  commands includes '\' characters which indicate 'continue this command on the next line of input.'
  Here is an example of formatting a single script command on multipl lines:

```
$ ./lf_portmod.pl \
    --manager 192.168.100.1 \
    --card 3 \
    --show_port
```

- Comments begin with '#'. They are lines ignored by the shell, and they are also comments in perl.

Running on local LANforge manager

You can use ssh, VNC or Rdesktop to connect from your desktop to your LANforge manager server. (When
using VNC, assume display `:1`). From there, in a terminal, you will execute your script from the
`/home/lanforge/scripts` directory as shown in the example below:

```
$ cd /home/lanforge/scripts
$  ./lf_portmod.pl --help
#...help appears...
$ ./lf_portmod.pl --manager 192.168.100.1 --card 1 --show_port
# ... displays port info
```

```
                        lanforge@jedtest:~/scripts
File   Edit   View   Search   Terminal   Help

lanforge@jedtest ~/scripts
 > ./lf_portmod.pl --manager 127.0.0.1 --card 1 --quiet 1 --show_port --port_name eth1
History of all commands can be found in lf_portmod.txt
  >>> nc_show_port 1 1 eth1

 >>RSLT: 0  Cmd: 'nc_show_port' '1' '1' 'eth1'

Shelf: 1, Card: 1, Port: 1  Type: Ethernet  Alias:
  Win32-Name:   Win32-Desc:   Parent/Peer:   Rpt-Timer: 1000   CPU-Mask: 0
   Current:      UP LINK-UP 1000-FD AUTO-NEGOTIATE FLOW-CONTROL PROMISC TSO GSO GRO
   Supported:    UP 10bt-HD 10bt-FD 100bt-HD 100bt-FD 1000-FD AUTO-NEGOTIATE SEND_TO_SELF
   Partner:      UP
   Advertising: 10bt-HD 10bt-FD 100bt-HD 100bt-FD 1000-FD FLOW-CONTROL TSO-ENABLED GSO-ENABLED GRO-ENABLED
   IP: 0.0.0.0  MASK: 0.0.0.0  GW: 0.0.0.0  VID: 0  ResetState: COMPLETE
   DNS Servers:
   IPv6-Global: DELETED
   IPv6-Link: fe80::290:bff:fe29:6f9/64
   IPv6-Gateway: DELETED
   MAC: 00:90:0b:29:06:f9  DEV: eth1  MTU: 1500  TX Queue Len: 1000
   LastDHCP: 0ms  Driver: e1000e Tx-Rate: 1000000Kbps
   Bus-Speed: 25/25  Bus-Width: 1/1
   Bridge-Port-Cost: Ignore  Prio: Ignore  Aging: 0
     pps_tx: 0  pps_rx: 0  bps_tx: 0  bps_rx: 76
     Rxp: 78726  Txp: 45073  Rxb: 61059053  Txb: 23942155  RxERR: 0  TxERR: 0
     RxDrop: 0  TxDrop: 0  Multi: 24670  Coll: 0  RxLenERR: 0  RxOverFlow: 0
     RxCRC: 0  RxFrame: 0  RxFifo: 0  RxMissed: 0  TxAbort: 0  TxCarrier: 0
     TxFifo: 0  TxHeartBeat: 0  TxWindow: 0  RxBytesLL: 62948477  TxBytesLL: 25023907


default@btbits>>

lanforge@jedtest ~/scripts
 >
```

Running on local LANforge resource

If you connect to a LANforge resource and want to run a script, you must direct the script at the LANforge manager server and specify the resource you are interested in. For example, you might be on resource 2 (192.168.100.2) and desire to run tests on resource 3 (192.168.100.3):

```
$ cd /home/lanforge/scripts
$  ./lf_portmod.pl --manager 192.168.100.1 --card 3 --show_port
# ... displays port info
```

Running on a Linux Desktop to a Remote LANforge

A more detailed set of steps follows. When running LANforge CLI scripts on a Linux desktop, you normally want to download and un-zip a copy of the LANforge-Server install file found on the Candela Technologies downloads page. Use a link similar to:
http://www.candelatech.com/private/downloads/r5.3.2/LANforgeServer-5.3.2_Linux-F21-x64.tar.gz. For best results, use the scripts packaged with the version of LANforge to which your scripts will be connecting.

1. Open a terminal on your desktop, cd to your Downloads folder

2. use `wget` or `curl` to download the tar file:

    ```
    wget "http://guest:guest@www.candelatech.com/private/downloads/r5.3.2/LANforgeServer-5.3.2_Linux-F21-x64.tar.gz"
    ```

3. Create a scripts directory in your Documents folder:

    ```
    $ cd ~/Documents/scripts
    ```

4. Expand the tar file in your Downloads directory:

    ```
    $ tar xf LANforgeServer*tar.gz
    ```

5. Copy the scripts file into your Documents folder:

    ```
    $ cp -r LANforgeServer-5.3.2/scripts/. ~/Documents/scripts/
    ```

To use your scripts, in your terminal, change directories to `~/Documents/scripts` and they will operate

similar to the above examples.

```
$ cd ~/Documents/scripts
$ ./lf_portmod.pl --manager 192.168.100.1 --card 3 --show_port
```

Running on a Windows Desktop to a Remote LANforge

The process for running CLI scripts on a Windows desktop is roughly similar, but involves running the Windows LANforge Server installer. This process does not require a Windows license as we will not be running the windows LANforge server. Perl is required to run Windows scripts. Start by installing that. You can use the perl that comes with the Cygwin project or if you just want perl, install the ActiveState ActivePerl package. ActivePerl should install update your environment `%PATH%` variable. If it does not immediately, you might need to log out and log back in.

1. Download the Windows version of the LANforge Server installer using your browser: `http://www.candelatech.com/private/downloads/r5.3.2/LANforge-Server-5.3.2-Installer.exe`. Use username *guest*, password *guest*.

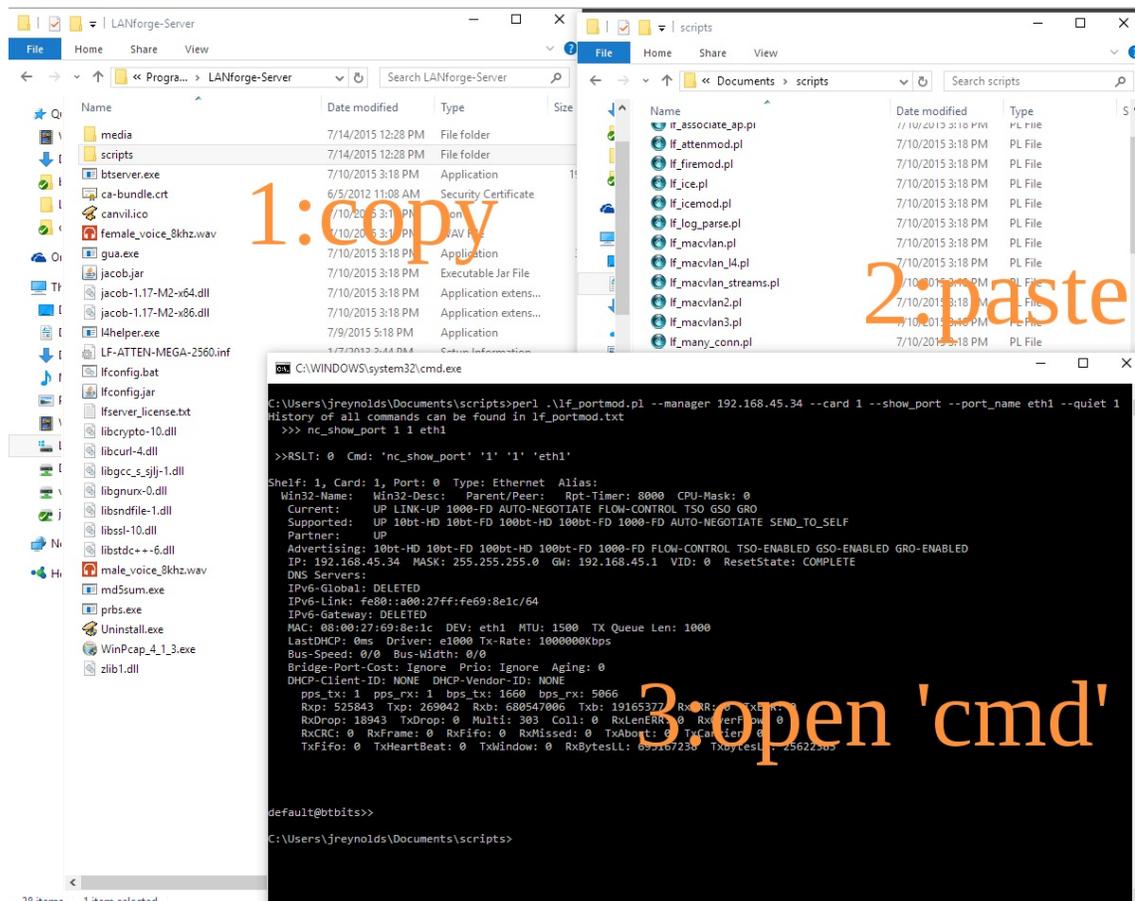2. In your Downloads folder, double click and install the `LANforge-Server-Installer.exe`.
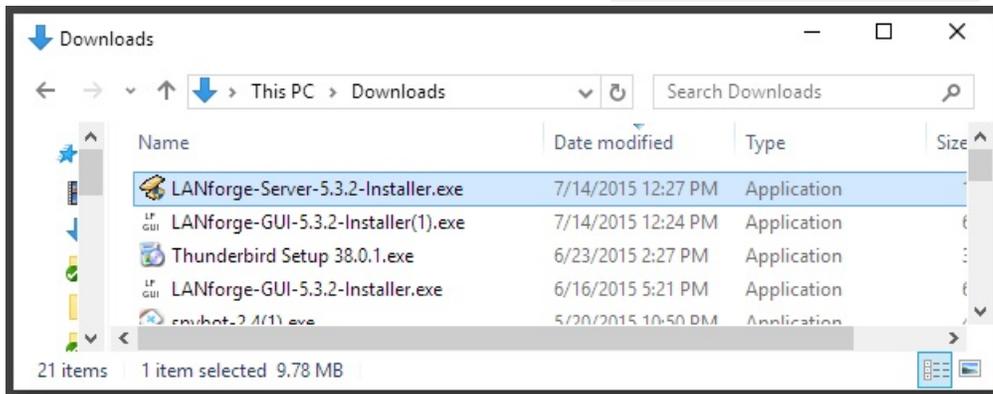
Do not configure it, do not run LANforgeServer.
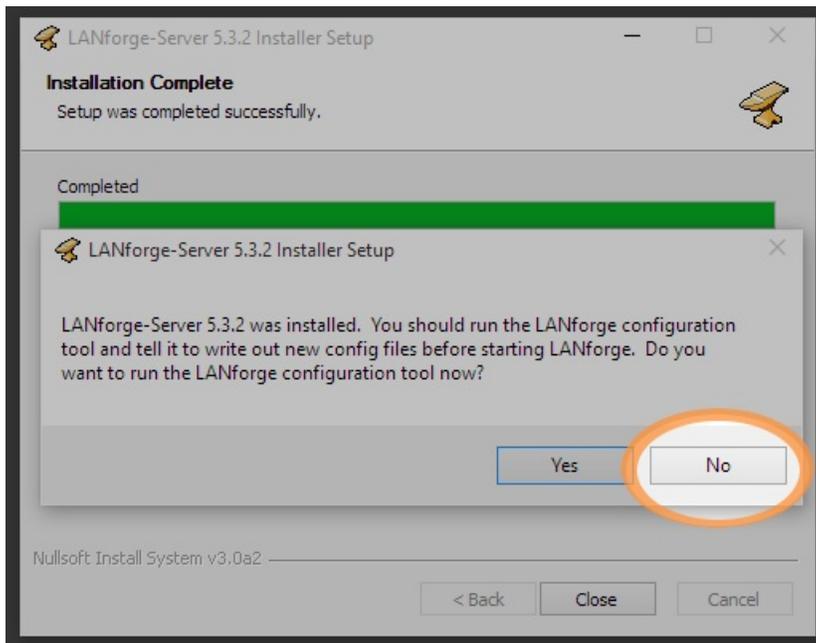
You will not need to be running the LANforge GUI to do this install.

3. The installation *scripts* folder will be system-protected, so you want to copy the folder over to your desktop *Documents* directory.

4. Open a DOS terminal, either using *Run→cmd* Enter or *Run→powershell* Enter

5. Change to the new copy of the scripts directory, and then you can run scripts by giving them to perl:

```
C:> cd C:\Users\bob\Documents\scripts
C:> perl .\lf_portmod.pl --manager 192.168.100.1 --card 3 --show_port --port_name eth1 --quiet 1
```

6. To capture output from a script, use the shell redirect operator: >. This example shows redirecting and browsing the results with *Notepad*:

```
C:> perl .\lf_portmod.pl --manager 192.168.100.1 --card 3 --show_port --port_name eth1 --quiet 1 > results.txt
C:> notepad.exe results.txt
```

results.txt - Notepad

File   Edit   Format   View   Help

```
History of all commands can be found in lf_portmod.txt
  >>> nc_show_port 1 1 eth1

 >>RSLT: 0  Cmd: 'nc_show_port' '1' '1' 'eth1'

Shelf: 1, Card: 1, Port: 0  Type: Ethernet  Alias:
  Win32-Name:   Win32-Desc:   Parent/Peer:   Rpt-Timer: 8000 CPU-Mask: 0
  Current:     UP LINK-UP 1000-FD AUTO-NEGOTIATE FLOW-CONTROL TSO GSO GRO
  Supported:   UP 10bt-HD 10bt-FD 100bt-HD 100bt-FD 1000-FD AUTO-NEGOTIATE SEND_TO_SELF
  Partner:     UP
  Advertising: 10bt-HD 10bt-FD 100bt-HD 100bt-FD 1000-FD FLOW-CONTROL TSO-ENABLED GSO-ENABLED GRO-ENABLED
  IP: 192.168.45.34  MASK: 255.255.255.0  GW: 192.168.45.1  VID: 0  ResetState: COMPLETE
  DNS Servers:
  IPv6-Global: DELETED
  IPv6-Link: fe80::a00:27ff:fe69:8e1c/64
  IPv6-Gateway: DELETED
  MAC: 08:00:27:69:8e:1c  DEV: eth1  MTU: 1500  TX Queue Len: 1000
  LastDHCP: 0ms  Driver: e1000 Tx-Rate: 1000000Kbps
  Bus-Speed: 0/0  Bus-Width: 0/0
  Bridge-Port-Cost: Ignore  Prio: Ignore  Aging: 0
  DHCP-Client-ID: NONE  DHCP-Vendor-ID: NONE
    pps_tx: 0  pps_rx: 2  bps_tx: 360  bps_rx: 4234
    Rxp: 527714  Txp: 269630  Rxb: 681181720  Txb: 19212680  RxERR: 0  TxERR: 0
    RxDrop: 19528  TxDrop: 0  Multi: 313  Coll: 0  RxLenERR: 0  RxOverFlow: 0
    RxCRC: 0  RxFrame: 0  RxFifo: 0  RxMissed: 0  TxAbort: 0  TxCarrier: 0
    TxFifo: 0  TxHeartBeat: 0  TxWindow: 0  RxBytesLL: 693846856  TxBytesLL: 25683800



default@btbits>>
```

```
C:\Users\jreynolds\Documents\scripts>perl .\lf_portmod.pl --manager 192.168.45.34 --card 1 --show_port --port_name eth1 --quiet 1
>results.txt

C:\Users\jreynolds\Documents\scripts>notepad.exe results.txt

C:\Users\jreynolds\Documents\scripts>
```