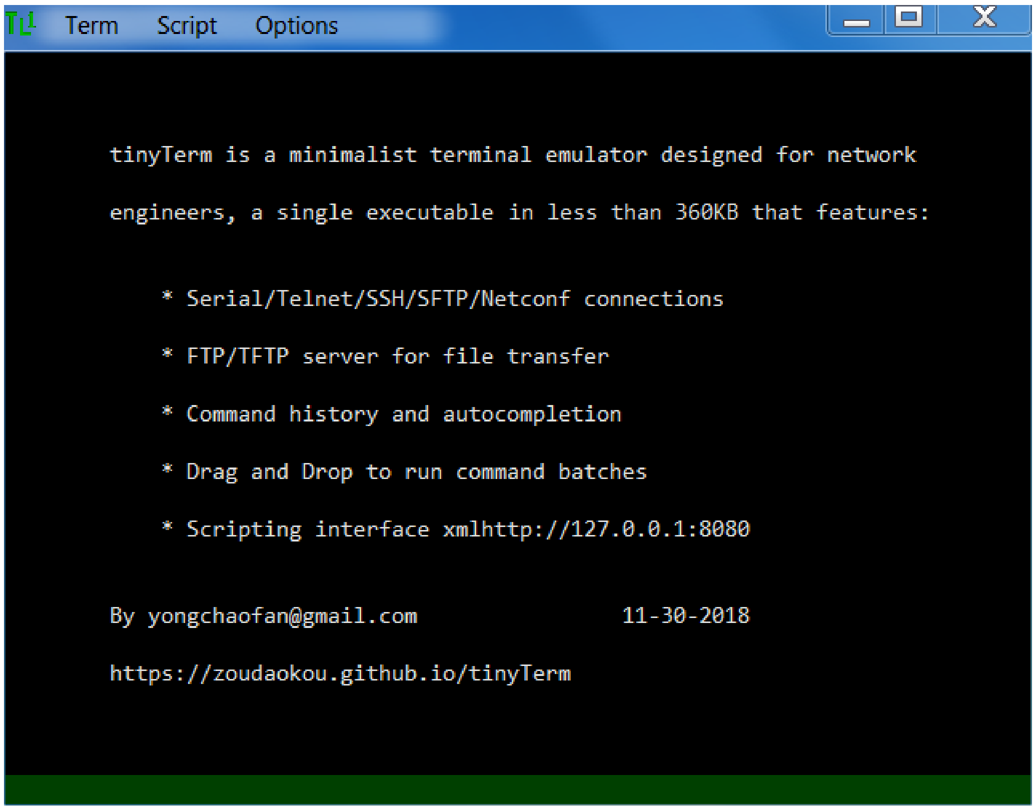
0. Introduction

tinyTerm is a terminal emulator designed to be small, simple and scriptable, and with unique additional features to improve efficiency and effectiveness of command line interface user.

It's designed with the minimalist philosophy, which resulted clean user interface, single executable file smaller than 360KB, no installation needed, and no extra DLL required



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tinyTerm is a minimalist terminal emulator designed for network
engineers, a single executable in less than 360KB that features:

    * Serial/Telnet/SSH/SFTP/Netconf connections
    * FTP/TFTP server for file transfer
    * Command history and autocompletion
    * Drag and Drop to run command batches
    * Scripting interface xmlhttp://127.0.0.1:8080

By yongchaofan@gmail.com                11-30-2018
https://zoudaokou.github.io/tinyTerm
```

tinyTerm is released under LGPL 3.0 and hosted on github.com

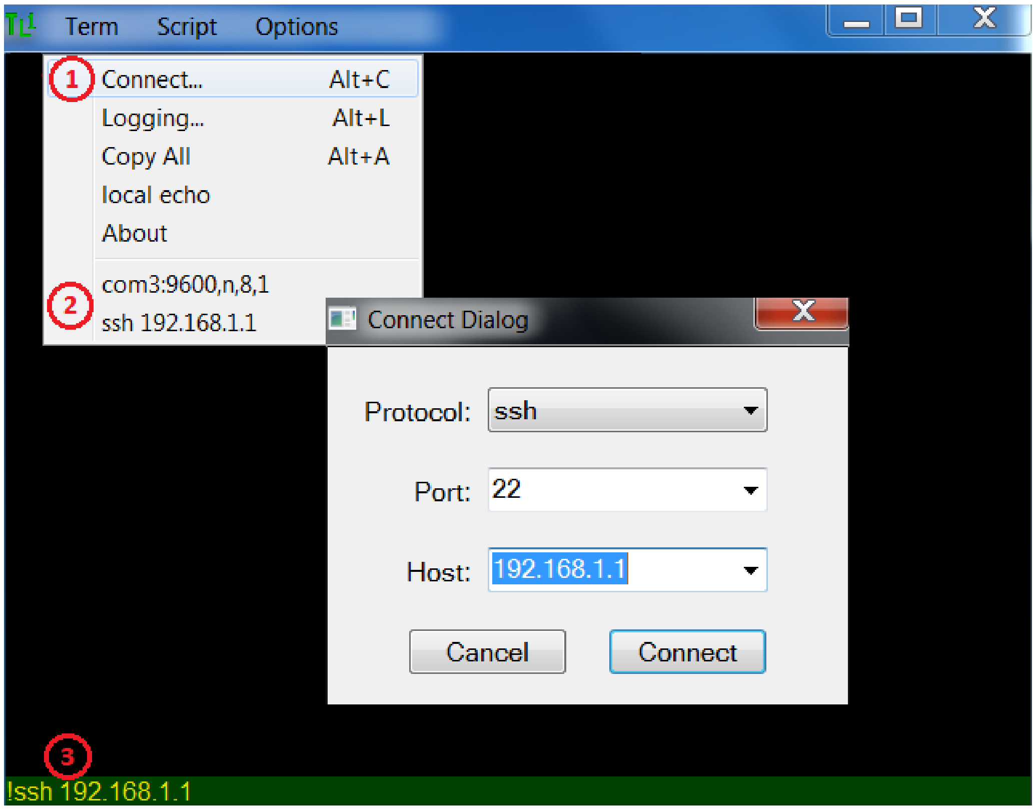
Users go to https://zoudaokou.github.io/tinyTerm for downloads and updates

Developers go to https://github.com/zoudaokou/tinyTerm for source code, license and issues

1. Making Connection

There are three ways to make a connection in tinyTerm, as shown in the screenshot below.

1. Click “Connect…” from Term menu or Alt+C, the connect dialog will popup, select protocol, select or enter port and destination host in the dialog, then click “Connect”
2. Choose one of the connections used previously from Term menu
3. Type “!” plus connection command in the editor line and press



Protocol: ssh
Port: 22
Host: 192.168.1.1

```
!ssh 192.168.1.1
```

Five types of connections supported: serial, telnet, ssh, sftp and netconf.

For serial connections, available serial ports are auto detected and added to the ports drop down list when protocol is changed to serial

For ssh/sftp/netconf connections, command line options are supported

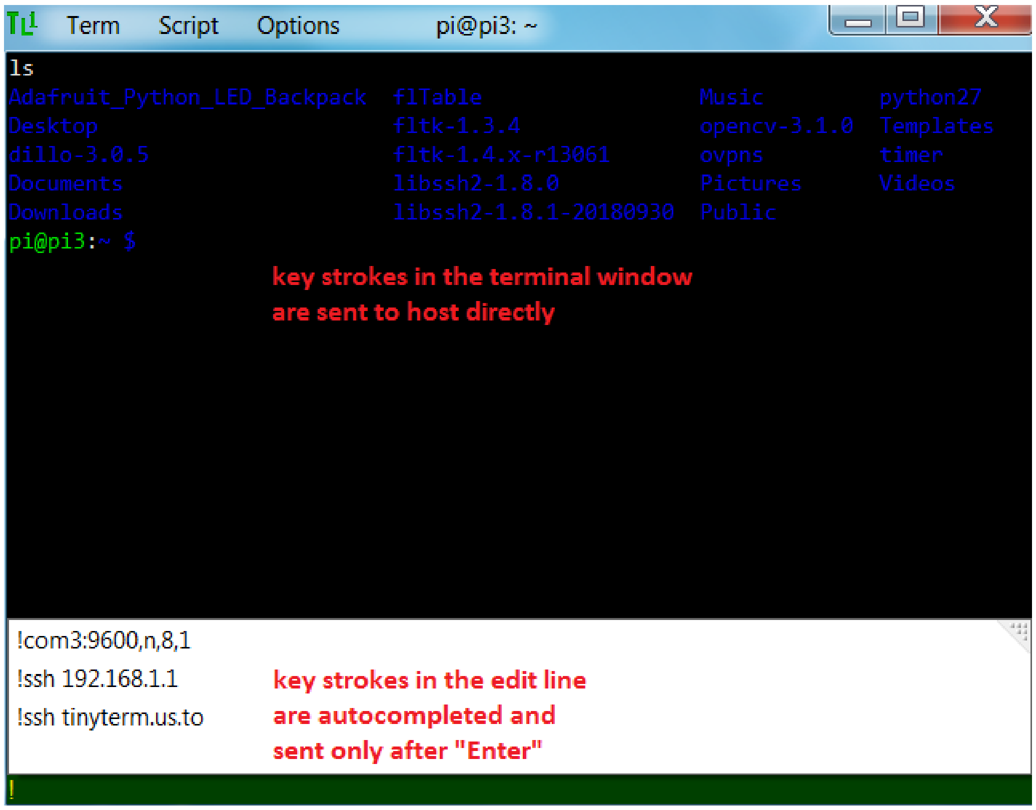
-l username, -pw password, -pp passphrase, -P destination port

Private key based authentication is supported too, key file should be stored in $USER/.ssh folder, as is the knownhost file for host verification.

2. Sending Command

Like any other terminal program, key strokes in the terminal window is sent to host directly after connection has been established.

The Editor Line at bottom of the terminal window, is a unique feature of tinyTerm. Input in the edit line is not sent until user presses "Enter" key, plus the input is auto completed using command history, every command typed in the editor line is added to command history to complete future inputs, and the command history is saved to tinyTerm.hist at exit, then loaded into memory at the next start of tinyTerm from tinyTerm.hist.



Term
Script
Options
pi@pi3: ~
key strokes in the terminal window are sent to host directly
key strokes in the edit line are autocompleted and sent only after "Enter"

```
ls
Adafruit_Python_LED_Backpack  flTable                 Music          python27
Desktop                       fltk-1.3.4              opencv-3.1.0   Templates
dillo-3.0.5                   fltk-1.4.x-r13061       ovpns          timer
Documents                     libssh2-1.8.0           Pictures       Videos
Downloads                     libssh2-1.8.1-20180930  Public
pi@pi3:~ $
```

```
!com3:9600,n,8,1
!ssh 192.168.1.1
!ssh tinyterm.us.to
!
```

When special characters “!,#,^,/” is typed at the beginning of the editor line, the command will be executed by tinyTerm instead of sending to remote host, for functions like making connection, search scroll buffer, set terminal options, scp file transfer or ssh tunnel setup etc. See Appendix A for list of supported special commands.

Note1: since the command history file tinyTerm.hist is just a plain text file, user can edit the file outside of tinyTerm to put additional commands in the list for command auto-completion. For example put all the TL1 commands that are used often in the history list to use as a dictionary.

Note 2: connection command started with “!” in the history file will be added to “Term” menu at the start of tinyTerm, so that connections can be made easily through menu clicks

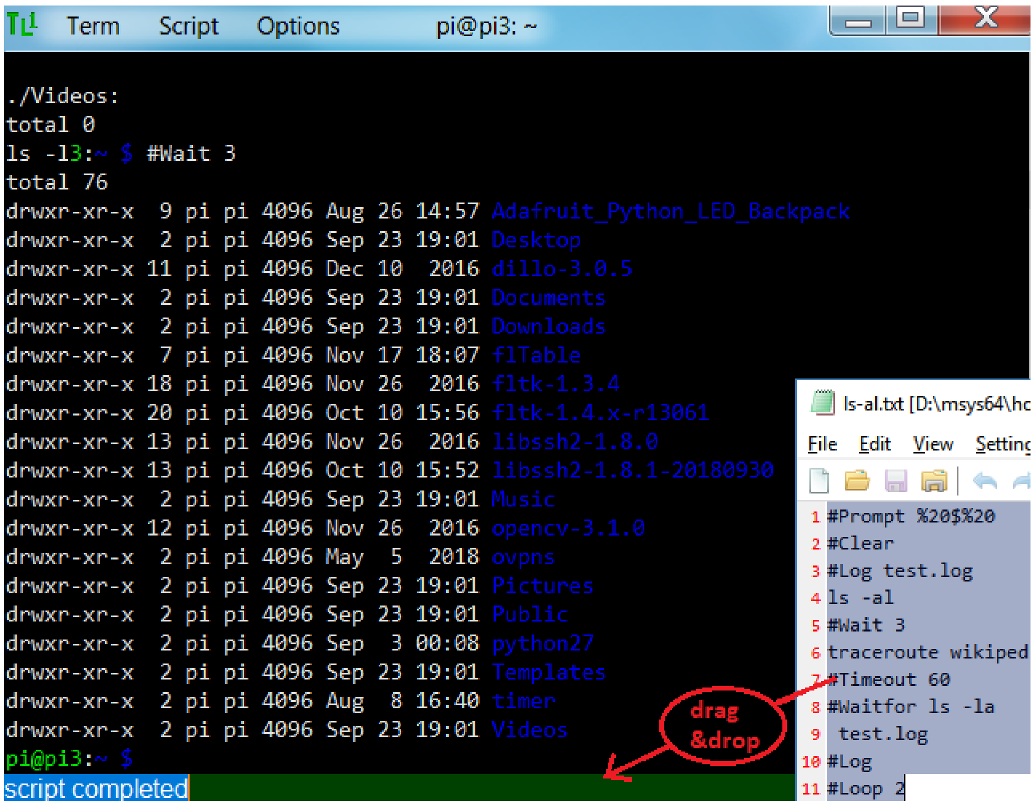
3. Running Script

Scripting is the way of choice to automate repetitive tasks, tinyTerm is designed to make scripting as easy as possible.

The simplest type of script is just a list of commands in plain text format, either drag&drop a block of text to the editor line, or drag&drop a text file to the terminal window, or “Run…” a text files from the “Script” menu, tinyTerm will send commands in the list one by one.

Note that contrary to popular terminal programs, tinyTerm will not send all commands at once, risking overflow of the input buffer at remote host or network device, instead tinyTerm will wait for the prompt string from remote host before sending each command. Most command line interface system uses a prompt string to tell user it’s ready for the next command, for example “> “or “$ “used by Cisco routers.

tinyTerm will auto detect the prompt string used by remote host when user is typing commands interactively, and use the detected prompt string during scripting. Additionally, prompt string can be set in the script using special command “#Prompt {str}”, refer to appendix A for details and other special commands supported for scripting.



```
./Videos:
total 0
ls -l3:~ $ #Wait 3
total 76
drwxr-xr-x  9 pi pi 4096 Aug 26 14:57 Adafruit_Python_LED_Backpack
drwxr-xr-x  2 pi pi 4096 Sep 23 19:01 Desktop
drwxr-xr-x 11 pi pi 4096 Dec 10  2016 dillo-3.0.5
drwxr-xr-x  2 pi pi 4096 Sep 23 19:01 Documents
drwxr-xr-x  2 pi pi 4096 Sep 23 19:01 Downloads
drwxr-xr-x  7 pi pi 4096 Nov 17 18:07 flTable
drwxr-xr-x 18 pi pi 4096 Nov 26  2016 fltk-1.3.4
drwxr-xr-x 20 pi pi 4096 Oct 10 15:56 fltk-1.4.x-r13061
drwxr-xr-x 13 pi pi 4096 Nov 26  2016 libssh2-1.8.0
drwxr-xr-x 13 pi pi 4096 Oct 10 15:52 libssh2-1.8.1-20180930
drwxr-xr-x  2 pi pi 4096 Sep 23 19:01 Music
drwxr-xr-x 12 pi pi 4096 Nov 26  2016 opencv-3.1.0
drwxr-xr-x  2 pi pi 4096 May  5  2018 ovpns
drwxr-xr-x  2 pi pi 4096 Sep 23 19:01 Pictures
drwxr-xr-x  2 pi pi 4096 Sep 23 19:01 Public
drwxr-xr-x  2 pi pi 4096 Sep  3 00:08 python27
drwxr-xr-x  2 pi pi 4096 Sep 23 19:01 Templates
drwxr-xr-x  2 pi pi 4096 Aug  8 16:40 timer
drwxr-xr-x  2 pi pi 4096 Sep 23 19:01 Videos
pi@pi3:~ $
script completed
```

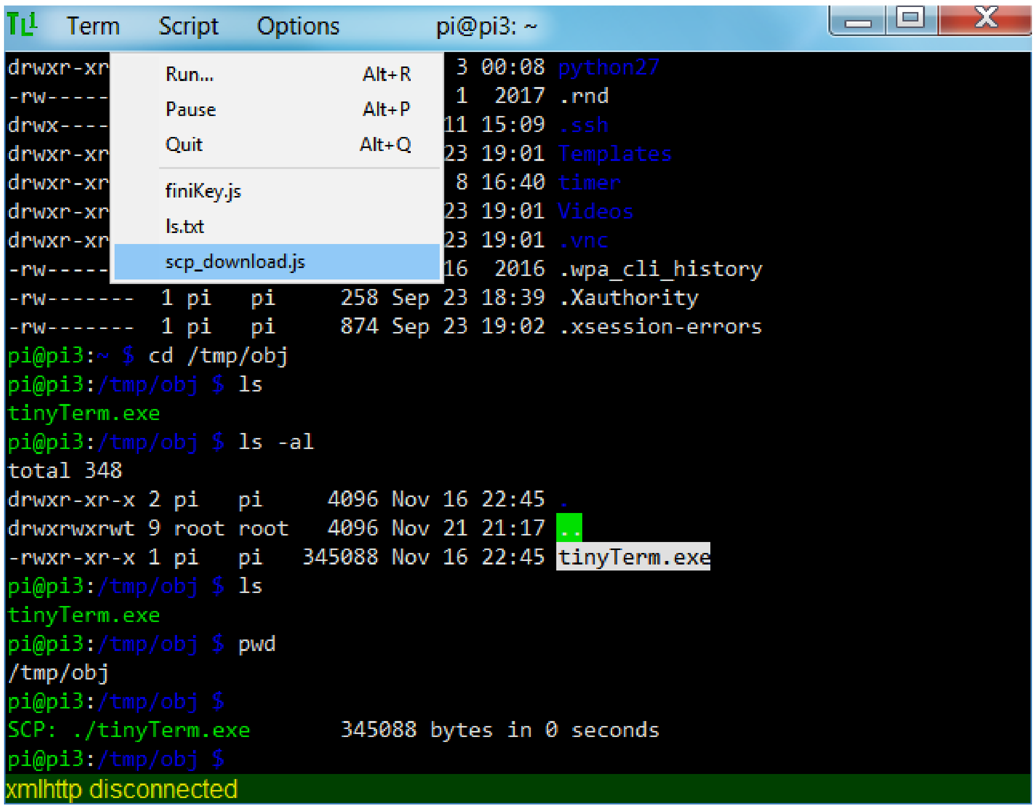
```
#Prompt %20$%20
#Clear
#Log test.log
ls -al
#Wait 3
traceroute wikiped
#Timeout 60
#Waitfor ls -la
 test.log
#Log
#Loop 2
```

4. Advanced Scripting

tinyTerm has a xmlhttp interface built in at 127.0.0.1:8080 for advanced scripting. VBScript and JavaScript are two of the scripting languages that can take advantage of the xmlhttp interface. Files in the script folder will be listed in the script menu, select one to execute, or use "Run..." to choose a script file from the file system.

The screen capture below shows the execution of scp_download.js from script menu, which retrieves the selected filename "tinyTerm.exe" and uses "#scp" command to download from remote host, all operation are performed using xmlhttp://127.0.0.1:8080 to send command through tinyTerm. When multiple instance of tinyTerm are started, each instance will use a unique port number starting from 8080 and counting up, 8081, 8082...etc. Special commands supported on the xmlhttp interface:

#Disp {str}	Display {str} in terminal window
#Recv	Return scroll buffer content since last Disp/Recv/Send command
#Send {cmd}	Send command and return immediately
#Selection	Get current text selection



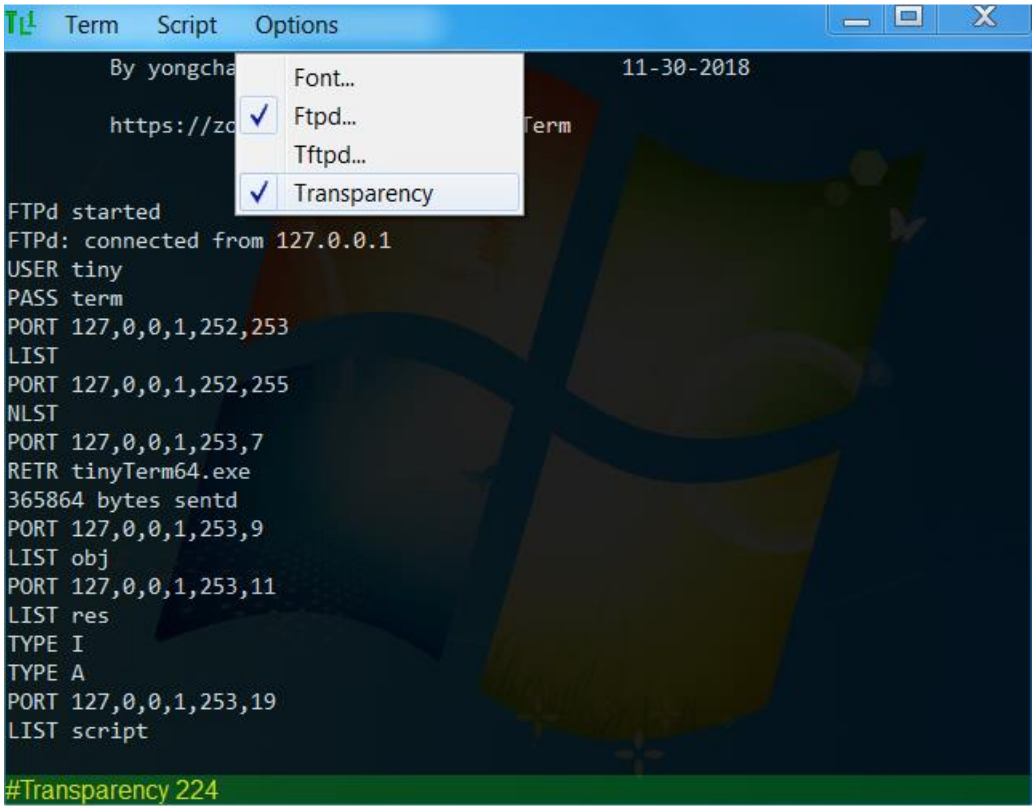
```
drwxr-xr                                3 00:08 python27
-rw-----                                1  2017 .rnd
drwx----                               11 15:09 .ssh
drwxr-xr                               23 19:01 Templates
drwxr-xr                                8 16:40 timer
drwxr-xr                               23 19:01 Videos
drwxr-xr                               23 19:01 .vnc
-rw-----                               16  2016 .wpa_cli_history
-rw-------  1 pi   pi      258 Sep 23 18:39 .Xauthority
-rw-------  1 pi   pi      874 Sep 23 19:02 .xsession-errors
pi@pi3:~ $ cd /tmp/obj
pi@pi3:/tmp/obj $ ls
tinyTerm.exe
pi@pi3:/tmp/obj $ ls -al
total 348
drwxr-xr-x 2 pi   pi     4096 Nov 16 22:45 .
drwxrwxrwt 9 root root   4096 Nov 21 21:17 ..
-rwxr-xr-x 1 pi   pi   345088 Nov 16 22:45 tinyTerm.exe
pi@pi3:/tmp/obj $ ls
tinyTerm.exe
pi@pi3:/tmp/obj $ pwd
/tmp/obj
pi@pi3:/tmp/obj $
SCP: ./tinyTerm.exe       345088 bytes in 0 seconds
pi@pi3:/tmp/obj $
xmlhttp disconnected
```

5. Options

While the user interface is minimal, there are a few options to customize through Options menu, like font face and font size, window transparency for example. All of the options can be set with command through the editor line or scripts. See appendix A for list of all supported commands.

A built in FTP server can be used for simple file transfer tasks, like software download to network devices. Only one user name "tiny" is allowed to login, with password "term". For security, user session to the FTP server is timed out in 1 minute without action, and FTP server will time out in 15 minutes without active connection.

Similarly a built in TFTP server can be used for file transfer with simpler devices like cable modems. TFTP server times out after 5 minutes.



```
        By yongcha                          11-30-2018

        https://zo                      Term


FTPd started
FTPd: connected from 127.0.0.1
USER tiny
PASS term
PORT 127,0,0,1,252,253
LIST
PORT 127,0,0,1,252,255
NLST
PORT 127,0,0,1,253,7
RETR tinyTerm64.exe
365864 bytes sentd
PORT 127,0,0,1,253,9
LIST obj
PORT 127,0,0,1,253,11
LIST res
TYPE I
TYPE A
PORT 127,0,0,1,253,19
LIST script

#Transparency 224
```

Appendix A. List of special command for editor line and scripting

Connection

!com3:9600,n,8,1	serial connection to port com3 using settings 9600,n,8,1
!telnet 192.168.1.1	telnet to 192.168.1.1
!ssh 192.168.1.1	ssh to host 192.168.1.1
!sftp -l admin 192.168.1.1	sftp to host 192.168.1.1 with user admin
!netconf -P 830 192.168.1.1	netconf to port 830 of host 192.168.1.1
!disconn	disconnect from current connection
!{DOS command}	execute command and display result, e.g. ping 192.168.1.1

Options

#TermSize 100x40	set terminal window size to 100 columns x 40 rows
#Transparency 192	set window transparency level to 192/255
#FontFace Consolas	set font face to “Consolas”
#FontSize 18	set font size to 18

Scripting

#Clear	set clear scroll back buffer
#Prompt $%20	set command prompt to “$ “, for batch command execution
#Timeout 30	set time out to 30 seconds for batch command execution
#Wait 10	wait 10 seconds during batch command execution
#Waitfor 100%	wait for “100%” from during batch command execution
#Loop 2	repeat two times from start of script
#Log test.log	start/stop logging with log file test.log

Advanced Scripting

#Disp test case #1	display “test case #1” in terminal window
#Send ping 192.168.1.1	send “ping 192.168.1.1” to host
#Recv	get all text received since last Disp/Send/Recv command
#Echo	toggle local ech on/off
#Selection	get current selected text
#Ftpd c:/tmp	start/stop ftp server using c:/tmp as root directory
#Tftpd c:/tmp	start/stop tftp server using c:/tmp as root directory
#scp test.txt :test1.txt	secure copy local file test.txt to remote host as test1.txt
#scp :test1.txt d:/	secure copy remote file test1.txt to local d:/test1.txt
#tun	list all ssh2 tunnels
#tun 3256	terminal ssh2 tunnel number 3256
#tun 127.0.0.1:2222 127.0.0.1:22	start ssh2 tunnel from localhost port 2222 to remote host port 22