

Computer Network Laboratory

Programming with Remote Works

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Outline

1. 33_execute_remote_telnet_cmd
2. 34_install_python_package_remotely
3. 35_create_restful_webservice
4. 36_scan_port_of_a_remote_host

**EXECUTE REMOTE TELNET
CMD**

execute remote telnet cmd

1. `sudo apt-get install telnetd`
2. `telnet localhost`

```
jwchang@ubuntu:~$ telnet localhost
Trying 127.0.0.1...
Connected to localhost.
Escape character is '^]'.
Ubuntu 18.04.2 LTS
ubuntu login: jwchang
Password:
Last login: Sun May  5 09:22:08 PDT 2019 from localhost on pts/1
Welcome to Ubuntu 18.04.2 LTS (GNU/Linux 4.18.0-17-generic x86_64)

* Documentation:  https://help.ubuntu.com
* Management:    https://landscape.canonical.com
* Support:       https://ubuntu.com/advantage

* Canonical Livepatch is available for installation.
  - Reduce system reboots and improve kernel security. Activate at:
    https://ubuntu.com/livepatch

170 packages can be updated.
0 updates are security updates.

Your Hardware Enablement Stack (HWE) is supported until April 2023.
```

execute remote telnet cmd

```
#!/usr/bin/env python
# This program is optimized for Python 3.5.2.
# It may run on any other version with/without modifications.
# To make it run on Python 2.7.x, needs some changes due to API differences.
# Follow the comments inline to make the program work with Python 2.

import getpass
import sys
import telnetlib

HOST = "localhost"

def run_telnet_session():

    user = input("Enter your remote account: ")
    # Comment out the above line and uncomment the below line for Python 2.7.
    # user = raw_input("Enter your remote account: ")

    password = getpass.getpass()

    session = telnetlib.Telnet(HOST)

    session.read_until(b"login: ")
    session.write(user.encode('ascii') + b"\n")
    if password:
        session.read_until(b"Password: ")
        session.write(password.encode('ascii') + b"\n")

    session.write(b"ls\n")
    session.write(b"exit\n")

    print (session.read_all())

if __name__ == '__main__':
    run_telnet_session()
```

execute remote telnet cmd

```
jwchang@ubuntu:~/Desktop/20190506$ python3 33_execute_remote_telnet_cmd.py
Enter your remote account: jwchang
Password:
b'\r\nLast login: Sun May  5 09:28:14 PDT 2019 from localhost on pts/2\r\nls\r\n
exit\r\nWelcome to Ubuntu 18.04.2 LTS (GNU/Linux 4.18.0-17-generic x86_64)\r\n\r
\r\n * Documentation:  https://help.ubuntu.com\r\n * Management:      https://lands
cape.canonical.com\r\n * Support:          https://ubuntu.com/advantage\r\n\r\n\r
\r\n * Canonical Livepatch is available for installation.\r\n - Reduce system reb
oots and improve kernel security. Activate at:\r\n      https://ubuntu.com/livepa
tch\r\n\r\n\r\n170 packages can be updated.\r\n0 updates are security updates.\r\n\r
\r\nYour Hardware Enablement Stack (HWE) is supported until April 2023.\r\njwchang
@ubuntu:~$ ls\r\nDesktop      examples.desktop  Public      Untitled1.ipynb\r\nDocuments  Music             readme.txt   Untitled.ipynb\r\nDownloads  Pictures
Templates   Videos\r\njwchang@ubuntu:~$ exit\r\nlogout\r\n'
```

INSTALL PYTHON PACKAGE REMOTELY

install python package remotely

1. sudo pip3 install fabric3
2. sudo apt-get install openssh-server

```
[localhost] Login password for 'jwchang':
[localhost] out: Collecting yolk
[localhost] out: Downloading https://files.pythonhosted.org/packages/2b/c0/73510e50668b70f3fad25328c58d7a29a300a2e452058dfdc7c7538af7b/yolk-0.4.3.tar.gz (86kB)
[localhost] out:
[localhost] out: 11% |          | 10kB 1.8MB/s eta 0:00:01
[localhost] out: 23% |         | 20kB 303kB/s eta 0:00:01
[localhost] out: 35% |        | 30kB 404kB/s eta 0:00:01
[localhost] out: 47% |       | 40kB 274kB/s eta 0:00:01
[localhost] out: 59% |      | 51kB 309kB/s eta 0:00:01
[localhost] out: 71% |     | 61kB 376kB/s eta 0:00:01
[localhost] out: 83% |    | 71kB 387kB/s eta 0:00:01
[localhost] out: 95% |   | 81kB 436kB/s eta 0:00:01
[localhost] out: 100% |  | 92kB 471kB/s
[localhost] out: Collecting setuptools (from yolk)
[localhost] out: Downloading https://files.pythonhosted.org/packages/ec/51/f45cea425fd5cb0b0380f5b0f048ebc1da5b417e48d304838c02d6288a1e/setuptools-41.0.1-py2.py3-none-any.whl (575kB)
[localhost] out:
[localhost] out: 1% |          | 10kB 4.9MB/s eta 0:00:01
[localhost] out: 3% |          | 20kB 6.8MB/s eta 0:00:01
[localhost] out: 5% |          | 30kB 4.5MB/s eta 0:00:01
[localhost] out: 7% |          | 40kB 2.5MB/s eta 0:00:01
[localhost] out: 8% |          | 51kB 667kB/s eta 0:00:01
[localhost] out: 10% |         | 61kB 794kB/s eta 0:00:01
[localhost] out: 12% |         | 71kB 827kB/s eta 0:00:01
[localhost] out: 14% |         | 81kB 866kB/s eta 0:00:01
[localhost] out: 16% |         | 92kB 973kB/s eta 0:00:01
[localhost] out: 17% |         | 102kB 719kB/s eta 0:00:01
[localhost] out: 19% |         | 112kB 729kB/s eta 0:00:01
[localhost] out: 21% |         | 122kB 688kB/s eta 0:00:01
[localhost] out: 23% |         | 133kB 675kB/s eta 0:00:01
[localhost] out: 24% |         | 143kB 720kB/s eta 0:00:01
[localhost] out: 26% |         | 153kB 1.0MB/s eta 0:00:01
[localhost] out: 28% |         | 163kB 686kB/s eta 0:00:01
[localhost] out: 30% |         | 174kB 730kB/s eta 0:00:01
[localhost] out: 32% |         | 184kB 678kB/s eta 0:00:01
[localhost] out: 33% |         | 194kB 670kB/s eta 0:00:01
[localhost] out: 35% |         | 204kB 874kB/s eta 0:00:01
[localhost] out: 37% |         | 215kB 809kB/s eta 0:00:01
[localhost] out: 39% |         | 225kB 872kB/s eta 0:00:01
[localhost] out: 40% |         | 235kB 766kB/s eta 0:00:01
[localhost] out: 42% |         | 245kB 653kB/s eta 0:00:01
[localhost] out: 44% |         | 256kB 726kB/s eta 0:00:01
[localhost] out: 46% |         | 266kB 1.0MB/s eta 0:00:01
[localhost] out: 48% |         | 276kB 1.0MB/s eta 0:00:01
[localhost] out: 49% |         | 286kB 1.2MB/s eta 0:00:01
[localhost] out: 51% |         | 296kB 929kB/s eta 0:00:01
[localhost] out: 53% |         | 307kB 1.1MB/s eta 0:00:01
[localhost] out: 55% |         | 317kB 911kB/s eta 0:00:01
[localhost] out: 56% |         | 327kB 782kB/s eta 0:00:01
[localhost] out: 58% |         | 337kB 944kB/s eta 0:00:01
[localhost] out: 60% |         | 348kB 1.0MB/s eta 0:00:01
[localhost] out: 62% |         | 358kB 1.0MB/s eta 0:00:01
[localhost] out: 64% |         | 368kB 614kB/s eta 0:00:01
```


install python package remotely

```
#!/usr/bin/env python
# This program is optimized for Python 2.7.12 and Python 3.5.2.
# It may run on any other version with/without modifications.

from getpass import getpass
from fabric.api import settings, run, env, prompt

def remote_server():
    env.hosts = ['localhost']
    env.user = prompt('Enter user name: ')
    env.password = getpass('Enter password: ')
    |
def install_package():
    run("pip install yolke")

if __name__ == '__main__':
    install_package()
```

CREATE RESTFUL WEBSERVICE

create restful webservice

- pip3 install flask

```
jwachang@ubuntu:~$ pip3 install flask
Collecting flask
  Using cached https://files.pythonhosted.org/packages/7f/e7/08578774ed4536d3242b14dacb4696386634607af824ea997202cd0edb4b/Flask-1.0.2-py2.py3-none-any.whl
Collecting Werkzeug>=0.14 (from flask)
  Downloading https://files.pythonhosted.org/packages/18/79/84f02539cc181cdbf5ff5a41b9f52cae870b6f632767e43ba6ac70132e92/Werkzeug-0.15.2-py2.py3-none-any.whl (328kB)
    100% |████████████████████████████████████████| 337kB 928kB/s
Collecting Jinja2>=2.10 (from flask)
  Downloading https://files.pythonhosted.org/packages/1d/e7/fd8b501e7a6dfe492a433deb7b9d833d39ca74916fa8bc63dd1a4947a671/Jinja2-2.10.1-py2.py3-none-any.whl (124kB)
    100% |████████████████████████████████████████| 133kB 1.2MB/s
Collecting itsdangerous>=0.24 (from flask)
  Using cached https://files.pythonhosted.org/packages/76/ae/44b03b253d6fade317f32c24d100b3b35c2239807046a4c953c7b89fa49e/itsdangerous-1.1.0-py2.py3-none-any.whl
Collecting click>=5.1 (from flask)
  Using cached https://files.pythonhosted.org/packages/fa/37/45185cb5abbc30d7257104c434fe0b07e5a195a6847506c074527aa599ec/Click-7.0-py2.py3-none-any.whl
Collecting MarkupSafe>=0.23 (from Jinja2>=2.10->flask)
  Using cached https://files.pythonhosted.org/packages/b2/5f/23e0023be6bb885d00ffbefad2942bc51a620328ee910f64abe5a8d18dd1/MarkupSafe-1.1.1-cp36-cp36m-manylinux1_x86_64.whl
Installing collected packages: Werkzeug, MarkupSafe, Jinja2, itsdangerous, click, flask
Successfully installed Jinja2-2.10.1 MarkupSafe-1.1.1 Werkzeug-0.15.2 click-7.0 flask-1.0.2 itsdangerous-1.1.0
```

create restful webservice

```
#!/usr/bin/env python
# This program is optimized for Python 2.7.12 and Python 3.5.2.
# It may run on any other version with/without modifications.

from flask import Flask
app = Flask(__name__)

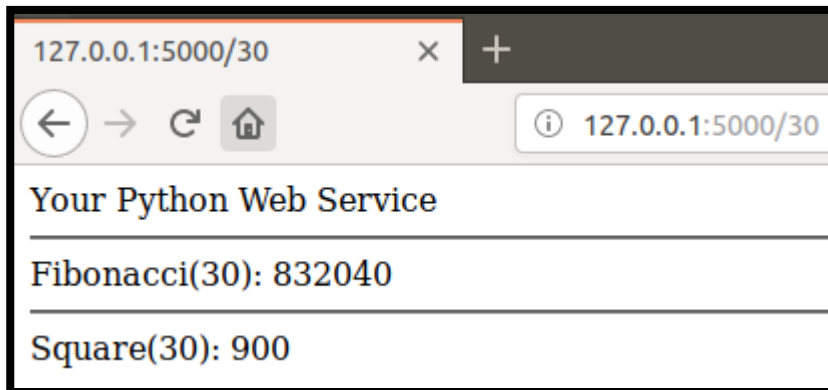
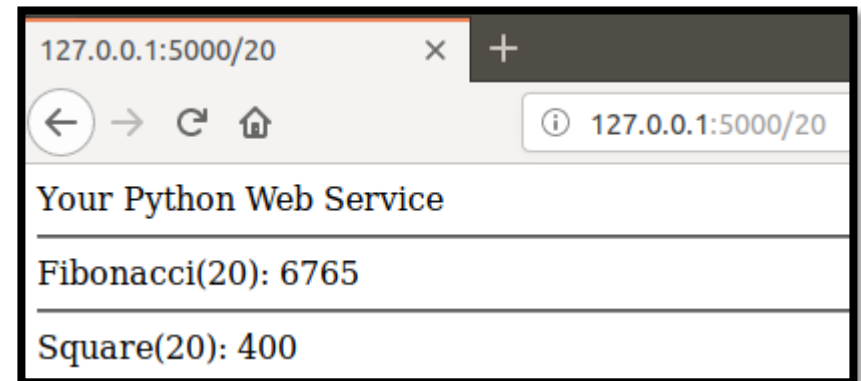
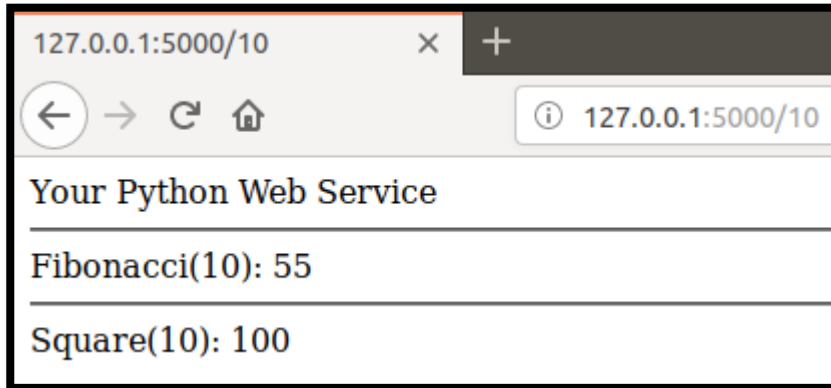
@app.route('/<int:num>')
def index(num=1):
    return "Your Python Web Service <hr>Fibonacci("+ str(num) + "): " + str(fibonacci(num))+ "<hr>Square("+ str(num) + "): " + str(square(num))

def fibonacci(n):
    if n == 0:
        return 0
    elif n == 1:
        return 1
    else:
        return fibonacci(n-1) + fibonacci(n-2)

def square(n):
    print ("Calculating for the number %s" %n)
    return n*n

if __name__ == '__main__':
    app.run(debug=True)
```

create restful webservice



SCAN PORT OF A REMOTE HOST

scan port of a remote host

```
#!/usr/bin/env python
# This program is optimized for Python 2.7.12 and Python 3.5.2.
# It may run on any other version with/without modifications.

import argparse
import socket
import sys

def scan_ports(host, start_port, end_port):
    """ Scan remote hosts """
    #Create socket
    try:
        sock = socket.socket(socket.AF_INET, socket.SOCK_STREAM)
    except socket.error as err_msg:
        print ('Socket creation failed. Error code: ' + str(err_msg[0]) + ' Error message: ' + err_msg[1])
        sys.exit()

    #Get IP of remote host
    try:
        remote_ip = socket.gethostbyname(host)
    except socket.error as error_msg:
        print (error_msg)
        sys.exit()

    #Scan ports
    end_port += 1
    for port in range(start_port, end_port):
        try:
            sock.connect((remote_ip, port))
            print ('Port ' + str(port) + ' is open')
            sock.close()
            sock = socket.socket(socket.AF_INET, socket.SOCK_STREAM)
        except socket.error:
            pass # skip various socket errors
```

scan port of a remote host

```
if __name__ == '__main__':  
    # setup commandline arguments  
    parser = argparse.ArgumentParser(description='Remote Port Scanner')  
    parser.add_argument('--host', action="store", dest="host", default='localhost')  
    parser.add_argument('--start-port', action="store", dest="start_port", default=1, type=int)  
    parser.add_argument('--end-port', action="store", dest="end_port", default=100, type=int)  
    # parse arguments  
    given_args = parser.parse_args()  
    host, start_port, end_port = given_args.host, given_args.start_port, given_args.end_port  
    scan_ports(host, start_port, end_port)
```

```
jwchang@ubuntu:~/Desktop/20190513$ python3 36_scan_port_of_a_remote_host.py  
Port 21 is open  
Port 22 is open  
Port 23 is open  
Port 25 is open  
Port 80 is open
```


延伸閱讀

- Socket Programming in Python (Guide)
 - <https://realpython.com/python-sockets/#socket-api-overview>
- Python 网络编程
 - <http://www.runoob.com/python/python-socket.html>

Resource is available by
<https://jiaweichang.github.io/biography/>

THANKS