**Energy Informatics**

https://proglang.informatik.uni-freiburg.de/teaching/energy-informatics/2018ws/

# Exercise Sheet 10 – Basic Networking

2019-01-07

**1. Exercise**
Consider the following network tools:

1. `ping`
2. `traceroute`
3. `ipconfig`

Solve the following tasks for each of these tools.

1. What kind of information do you get from the tools?
2. Which networking layer is addressed by the tool?
3. When does it make sense to use this tool?
4. Use it and discuss the output.

**2. Exercise**

The following two Python programs establish a primitive chat-tool between two computers:

```
import socket

IP = '192.168.2.125'
PORT = 5009
BUFFER_SIZE = 256

s = socket.socket(socket.AF_INET,
     socket.SOCK_STREAM)
s.connect((IP, PORT))
MESSAGE = b"Connection is opened!"
s.sendall(MESSAGE)

while 1:
      INPUT = input()
      if (INPUT == "quit"): break
      MESSAGE = INPUT.encode()
      s.sendall(MESSAGE)
      print("sent", MESSAGE)
      data = s.recv(BUFFER_SIZE)
      if (not data): break
      print("recvd:", data)
s.close()
```

client.py

```
import socket

IP = '192.168.2.125'
PORT = 5009
BUFFER_SIZE = 256

s = socket.socket(socket.AF_INET,
      socket.SOCK_STREAM)
s.bind((IP, PORT))
s.listen(1)

conn, addr = s.accept()
print('Connection address:', addr)

while 1:
    data = conn.recv(BUFFER_SIZE)
    if (not data): break
    print("received data:", data)
    INPUT = input()
    if (INPUT == "quit"): break
    MESSAGE = INPUT.encode()
    print("sent message:", MESSAGE)
    conn.send(MESSAGE)
conn.close()
```

server.py

1. Check out the IP4 address of the server computer and replace it for `'192.168.2.125'` in both programs. Install `server.py` on the server and `client.py` on the client computer.
2. What is the socket pair of your client computer?
3. Is the connection TCP or UDP based?
4. Modify the program such that the server adds up integers sent by the client computer and replies the sum.