

# TCP File Transfer – Practical Work 1

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## 1 Introduction

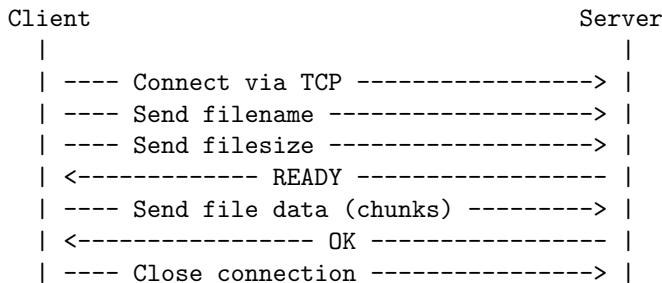
This practical work aims to develop a simple file transfer system using TCP/IP in a command-line interface. The system includes one server and one client using sockets.

## 2 Protocol Design

Our protocol is based on a simple request–response model:

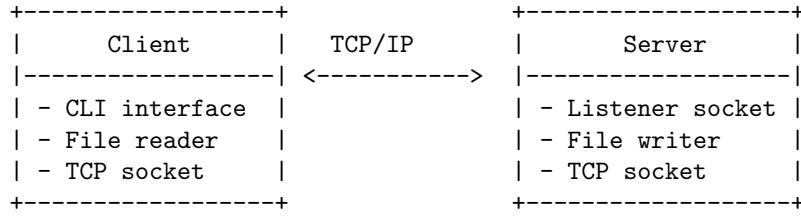
1. Client connects to server.
2. Client sends filename.
3. Client sends filesize.
4. Server replies READY.
5. Client sends file data in binary chunks.
6. Server stores the file and responds OK.

Figure ?? illustrates the protocol flow.



### 3 System Organization

Figure ?? shows the architecture.



### 4 Implementation

#### 4.1 Server Code

```
import socket

HOST = "0.0.0.0"
PORT = 5001

server = socket.socket(socket.AF_INET, socket.SOCK_STREAM)
server.bind((HOST, PORT))
server.listen(1)

conn, addr = server.accept()

filename = conn.recv(1024).decode().strip()
filesize = int(conn.recv(1024).decode().strip())

conn.send(b"READY")

with open(filename, "wb") as f:
    received = 0
    while received < filesize:
        data = conn.recv(4096)
        if not data:
            break
        f.write(data)
        received += len(data)

conn.send(b"OK")
conn.close()
```

## 4.2 Client Code

```
import socket
import os

HOST = "127.0.0.1"
PORT = 5001

filename = "test.txt"
filesize = os.path.getsize(filename)

client = socket.socket(socket.AF_INET, socket.SOCK_STREAM)
client.connect((HOST, PORT))

client.send((filename + "\n").encode())
client.send(str(filesize) + "\n".encode())

if client.recv(1024).decode() != "READY":
    client.close()

with open(filename, "rb") as f:
    data = f.read(4096)
    while data:
        client.send(data)
        data = f.read(4096)

print(client.recv(1024).decode())
client.close()
```

## 5 Conclusion

We successfully implemented a TCP file transfer system using one client and one server. The protocol works reliably for text and binary files. The system demonstrates basic distributed communication using sockets.