TASK 1
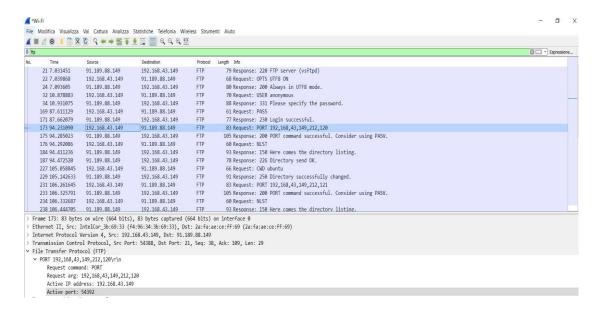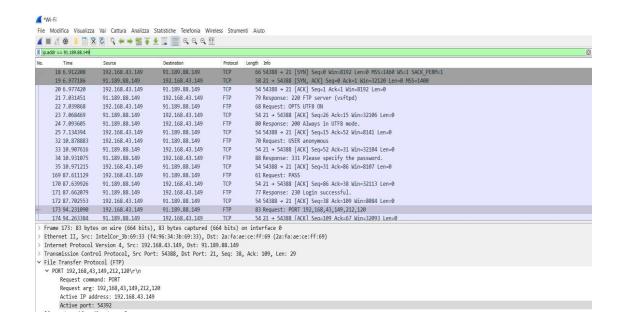

Fase 1 : usando il terminale abbiamo usato il protocollo FTP per connettersi a
ftp.ubuntu.com, inserendo nome utente e password.

Fase 2 : dopo il login e usando il comando '?' abbiamo la lista di tutti i comandi e il comando 'ls' per stampare i nomi delle cartelle presenti nella directory attuale. Con il comando 'cd ubuntu' ci spostiamo nella directory ubuntu e di nuovo il comando 'ls' per visualizzare le cartelle e i file.
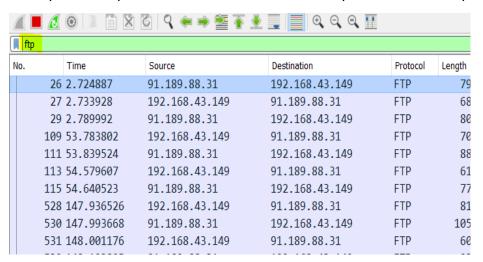
Con il comando 'get ls-lR.gz' abbiamo scaricato il file.

```
230 Login successful.
ftp> ?
I comandi possono essere abbreviati. I comandi sono:

!               delete          literal         prompt          send
?               debug           ls              put             status
append          dir             mdelete         pwd             trace
ascii           disconnect      mdir            quit            type
bell            get             mget            quote           user
binary          glob            mkdir           recv            verbose
bye             hash            mls             remotehelp
cd              help            mput            rename
close           lcd             open            rmdir
ftp> ls
200 PORT command successful. Consider using PASV.
150 Here comes the directory listing.
ubuntu
226 Directory send OK.
ftp: 11 bytes received in 0.00secondi 11.00Kbyte/sec)
ftp> cd ubuntu
250 Directory successfully changed.
ftp> ls
200 PORT command successful. Consider using PASV.
150 Here comes the directory listing.
dists
indices
ls-lR.gz
pool
project
ubuntu
226 Directory send OK.
ftp: 52 bytes received in 0.00secondi 26.00Kbyte/sec)
ftp> get ls-lR.gz
200 PORT command successful. Consider using PASV.
150 Opening BINARY mode data connection for ls-lR.gz (20263445 bytes).
226 Transfer complete.
ftp: 20263445 bytes received in 4.27secondi 4748.87Kbyte/sec)
ftp> bye
221 Goodbye.
```

TASK 2

Risposte su fase 0

1. Il filtro più adatto per monitorare la connessione del protocollo FTP è ftp

No.	Time	Source	Destination	Protocol	Length
26	2.724887	91.189.88.31	192.168.43.149	FTP	79
27	2.733928	192.168.43.149	91.189.88.31	FTP	68
29	2.789992	91.189.88.31	192.168.43.149	FTP	80
109	53.783802	192.168.43.149	91.189.88.31	FTP	70
111	53.839524	91.189.88.31	192.168.43.149	FTP	88
113	54.579607	192.168.43.149	91.189.88.31	FTP	61
115	54.640523	91.189.88.31	192.168.43.149	FTP	77
528	147.936526	192.168.43.149	91.189.88.31	FTP	81
530	147.993668	91.189.88.31	192.168.43.149	FTP	105
531	148.001176	192.168.43.149	91.189.88.31	FTP	60

Risposte su fase 1

1. L'indirizzo IP del server FTP Ubuntu è 91.189.88.174

31 8.684917	91.189.88.174	192.168.43.149	TCP	54 21 → 54247 [ACK] Seq=109 Ack=67 Win=32093 Len=0
32 8.706870	91.189.88.174	192.168.43.149	FTP	105 Response: 200 PORT command successful. Consider using PASV.

2. Il client usa la porta 54289

28 4.095691	192.168.43.149	91.189.88.24	TCP	54 54289 → 21 [ACK] Seq=1 Ack=1 Win=8192 Len=0
29 4.158158	91.189.88.24	192.168.43.149	FTP	79 Response: 220 FTP server (vsftpd)
30 4.166348	192.168.43.149	91.189.88.24	FTP	68 Request: OPTS UTF8 ON

```
C:\Users\zheliang>ftp ftp.ubuntu.com
Connesso a ftp.ubuntu.com.
220 FTP server (vsftpd)
200 Always in UTF8 mode.
Utente (ftp.ubuntu.com:(none)): anonymous
331 Please specify the password.
Password:
230 Login successful.
```

3.

   a. Risposta del server FTP al client

16 2.167901	192.168.43.149	91.189.88.174	TCP	54 54504 → 21 [ACK] Seq=1 Ack=1 Win=8192 Len=0
17 2.168709	91.189.88.174	192.168.43.149	FTP	79 Response: 220 FTP server (vsftpd)
18 2.173245	192.168.43.149	91.189.88.174	FTP	68 Request: OPTS UTF8 ON

```
220 FTP server (vsftpd)
200 Always in UTF8 mode.
```

b. Domanda mandata dal server al client per username

| 26 5.527230 | 192.168.43.149 | 91.189.88.174 | FTP | 70 Request: USER anonymous |

```
Utente (ftp.ubuntu.com:(none)): anonymous
```

c. Risposta del server al client per avvisarlo di specificare la password

| 28 5.584702 | 91.189.88.174 | 192.168.43.149 | FTP | 88 Response: 331 Please specify the password. |

```
331 Please specify the password.
```

d. Richiesta di inserimento della password al client

| 32 7.195451 | 192.168.43.149 | 91.189.88.174 | FTP | 61 Request: PASS |

e. Risposta del server per il login

| 34 7.246004 | 91.189.88.174 | 192.168.43.149 | FTP | 77 Response: 230 Login successful. |

```
230 Login successful.
```

Per il client è stata usata la porta TCP 54388 e per il server la porta 21.

22 7.039908	192.168.43.149	91.189.88.149	FTP	68 Request: OPTS UTF8 ON
23 7.068469	91.189.88.149	192.168.43.149	TCP	54 21 → 54388 [ACK] Seq=26 Ack=15 Win=32106 Len=0
24 7.093605	91.189.88.149	192.168.43.149	FTP	80 Response: 200 Always in UTF8 mode.
25 7.134394	192.168.43.149	91.189.88.149	TCP	54 54388 → 21 [ACK] Seq=15 Ack=52 Win=8141 Len=0

4. Non ci sono messaggi scambiati durante la connessione dei dati perché i messaggi scambiati fanno parte della connessione dei comandi.

Risposte sulla fase 2

1. Messaggi scambiati sono:

21 7.031451	91.189.88.149	192.168.43.149	FTP	79 Response: 220 FTP server (vsftpd)
22 7.039868	192.168.43.149	91.189.88.149	FTP	68 Request: OPTS UTF8 ON
24 7.093605	91.189.88.149	192.168.43.149	FTP	80 Response: 200 Always in UTF8 mode.
32 10.878883	192.168.43.149	91.189.88.149	FTP	70 Request: USER anonymous
34 10.931075	91.189.88.149	192.168.43.149	FTP	88 Response: 331 Please specify the password.
169 87.611129	192.168.43.149	91.189.88.149	FTP	61 Request: PASS
171 87.662079	91.189.88.149	192.168.43.149	FTP	77 Response: 230 Login successful.
173 94.231090	192.168.43.149	91.189.88.149	FTP	83 Request: PORT 192,168,43,149,212,120
175 94.285023	91.189.88.149	192.168.43.149	FTP	105 Response: 200 PORT command successful. Consider using PASV.
176 94.292086	192.168.43.149	91.189.88.149	FTP	60 Request: NLST
184 94.411236	91.189.88.149	192.168.43.149	FTP	93 Response: 150 Here comes the directory listing.
187 94.472520	91.189.88.149	192.168.43.149	FTP	78 Response: 226 Directory send OK.
227 105.058845	192.168.43.149	91.189.88.149	FTP	66 Request: CWD ubuntu
229 105.142633	91.189.88.149	192.168.43.149	FTP	91 Response: 250 Directory successfully changed.
231 106.261645	192.168.43.149	91.189.88.149	FTP	83 Request: PORT 192,168,43,149,212,121
233 106.325791	91.189.88.149	192.168.43.149	FTP	105 Response: 200 PORT command successful. Consider using PASV.
234 106.332687	192.168.43.149	91.189.88.149	FTP	60 Request: NLST
238 106.444705	91.189.88.149	192.168.43.149	FTP	93 Response: 150 Here comes the directory listing.
246 106.511593	91.189.88.149	192.168.43.149	FTP	78 Response: 226 Directory send OK.
275 117.211874	192.168.43.149	91.189.88.149	FTP	83 Request: PORT 192,168,43,149,212,124
283 117.264306	91.189.88.149	192.168.43.149	FTP	105 Response: 200 PORT command successful. Consider using PASV.
284 117.272931	192.168.43.149	91.189.88.149	FTP	69 Request: RETR ls-lR.gz
289 117.398071	91.189.88.149	192.168.43.149	FTP	126 Response: 150 Opening BINARY mode data connection for ls-lR.gz (20263445 bytes).
29024 121.724105	91.189.88.149	192.168.43.149	FTP	78 Response: 226 Transfer complete.
29027 124.249935	192.168.43.149	91.189.88.149	FTP	60 Request: QUIT
29029 124.307836	91.189.88.149	192.168.43.149	FTP	68 Response: 221 Goodbye.

2. I messaggi scambiati durante la connessione dei dati:

```
ftp> ls
200 PORT command successful. Consider using PASV.
150 Here comes the directory listing.
ubuntu
```

173 94.231090	192.168.43.149	91.189.88.149	FTP	83 Request: PORT 192,168,43,149,212,120
174 94.263384	91.189.88.149	192.168.43.149	TCP	54 21 → 54388 [ACK] Seq=109 Ack=67 Win=32093 Len=0
175 94.285023	91.189.88.149	192.168.43.149	FTP	105 Response: 200 PORT command successful. Consider using PASV.
176 94.292086	192.168.43.149	91.189.88.149	FTP	60 Request: NLST
177 94.319315	91.189.88.149	192.168.43.149	TCP	54 21 → 54388 [ACK] Seq=160 Ack=73 Win=32114 Len=0
178 94.346262	91.189.88.149	192.168.43.149	TCP	74 35525 → 54392 [SYN] Seq=0 Win=29200 Len=0 MSS=1400 SACK_PERM=1 TSval=3351149815 TSecr=0 WS=128
179 94.346325	192.168.43.149	91.189.88.149	TCP	66 54392 → 35525 [SYN, ACK] Seq=0 Ack=1 Win=65535 Len=0 MSS=1460 WS=256 SACK_PERM=1
180 94.410795	91.189.88.149	192.168.43.149	TCP	54 35525 → 54392 [ACK] Seq=1 Ack=1 Win=29312 Len=0
181 94.410795	91.189.88.149	192.168.43.149	TCP	62 35525 → 54392 [PSH, ACK] Seq=1 Ack=1 Win=29312 Len=8
182 94.410994	91.189.88.149	192.168.43.149	TCP	54 35525 → 54392 [FIN, ACK] Seq=9 Ack=1 Win=29312 Len=0
183 94.411040	192.168.43.149	91.189.88.149	TCP	54 54392 → 35525 [ACK] Seq=1 Ack=10 Win=131584 Len=0
184 94.411236	91.189.88.149	192.168.43.149	FTP	93 Response: 150 Here comes the directory listing.

```
200 PORT command successful. Consider using PASV.
150 Opening BINARY mode data connection for ls-lR.gz (20263445 bytes).
226 Transfer complete.
ftp: 20263445 bytes received in 4.27secondi 4748.87Kbyte/sec)
```

283 117.264306	91.189.88.149	192.168.43.149	FTP	105 Response: 200 PORT command successful. Consider using PASV.
284 117.272931	192.168.43.149	91.189.88.149	FTP	69 Request: RETR ls-lR.gz
285 117.302561	91.189.88.149	192.168.43.149	TCP	54 21 → 54388 [ACK] Seq=425 Ack=164 Win=32105 Len=0
286 117.329488	91.189.88.149	192.168.43.149	TCP	74 37981 → 54396 [SYN] Seq=0 Win=29200 Len=0 MSS=1400 SACK_PERM=1 TSval=3351172793 TSecr=0 WS=128
287 117.329549	192.168.43.149	91.189.88.149	TCP	66 54396 → 37981 [SYN, ACK] Seq=0 Ack=1 Win=65535 Len=0 MSS=1460 WS=256 SACK_PERM=1
288 117.389544	91.189.88.149	192.168.43.149	TCP	54 37981 → 54396 [ACK] Seq=1 Ack=1 Win=29312 Len=0
289 117.398071	91.189.88.149	192.168.43.149	FTP	126 Response: 150 Opening BINARY mode data connection for ls-lR.gz (20263445 bytes).

I messaggi scambiati durante la connessione dei comandi:

```
ftp> cd ubuntu
250 Directory successfully changed.
ftp> ls
200 PORT command successful. Consider using PASV.
150 Here comes the directory listing.
dists
indices
ls-lR.gz
pool
project
ubuntu
226 Directory send OK.
ftp: 52 bytes received in 0.00secondi 26.00Kbyte/sec)
ftp> get ls-lR.gz
```

227 105.058845	192.168.43.149	91.189.88.149	FTP	66 Request: CWD ubuntu
228 105.120949	91.189.88.149	192.168.43.149	TCP	54 21 → 54388 [ACK] Seq=223 Ack=85 Win=32108 Len=0
229 105.142633	91.189.88.149	192.168.43.149	FTP	91 Response: 250 Directory successfully changed.
230 105.182797	192.168.43.149	91.189.88.149	TCP	54 54388 → 21 [ACK] Seq=85 Ack=260 Win=7933 Len=0
231 106.261645	192.168.43.149	91.189.88.149	FTP	83 Request: PORT 192,168,43,149,212,121
232 106.304239	91.189.88.149	192.168.43.149	TCP	54 21 → 54388 [ACK] Seq=260 Ack=114 Win=32093 Len=0
233 106.325791	91.189.88.149	192.168.43.149	FTP	105 Response: 200 PORT command successful. Consider using PASV.
234 106.332687	192.168.43.149	91.189.88.149	FTP	60 Request: NLST
235 106.357900	91.189.88.149	192.168.43.149	TCP	54 21 → 54388 [ACK] Seq=311 Ack=120 Win=32114 Len=0
236 106.392322	91.189.88.149	192.168.43.149	TCP	74 37971 → 54393 [SYN] Seq=0 Win=29200 Len=0 MSS=1400 SACK_PERM=1 TSval=3351161855 TSecr=0 WS=128
237 106.392384	192.168.43.149	91.189.88.149	TCP	66 54393 → 37971 [SYN, ACK] Seq=0 Ack=1 Win=65535 Len=0 MSS=1460 WS=256 SACK_PERM=1
238 106.444705	91.189.88.149	192.168.43.149	FTP	93 Response: 150 Here comes the directory listing.
239 106.444705	91.189.88.149	192.168.43.149	TCP	54 37971 → 54393 [ACK] Seq=1 Ack=1 Win=29312 Len=0
240 106.444705	91.189.88.149	192.168.43.149	TCP	103 37971 → 54393 [PSH, ACK] Seq=1 Ack=1 Win=29312 Len=49
241 106.444705	91.189.88.149	192.168.43.149	TCP	54 37971 → 54393 [FIN, ACK] Seq=50 Ack=1 Win=29312 Len=0
242 106.444902	192.168.43.149	91.189.88.149	TCP	54 54393 → 37971 [ACK] Seq=1 Ack=51 Win=131328 Len=0
243 106.452716	192.168.43.149	91.189.88.149	TCP	54 54393 → 37971 [FIN, ACK] Seq=1 Ack=51 Win=131328 Len=0
244 106.484530	192.168.43.149	91.189.88.149	TCP	54 54388 → 21 [ACK] Seq=120 Ack=350 Win=7843 Len=0
245 106.505887	91.189.88.149	192.168.43.149	TCP	54 37971 → 54393 [ACK] Seq=51 Ack=2 Win=29312 Len=0
246 106.511593	91.189.88.149	192.168.43.149	FTP	78 Response: 226 Directory send OK.

```
ftp> bye
221 Goodbye.
```
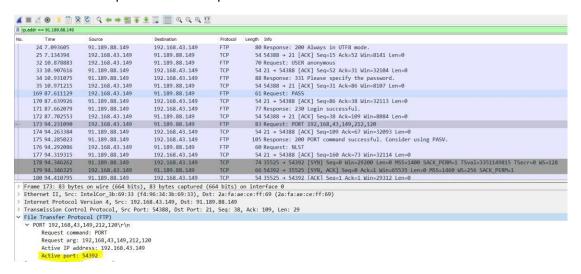
29027 124.249935	192.168.43.149	91.189.88.149	FTP	60 Request: QUIT
29028 124.283945	91.189.88.149	192.168.43.149	TCP	54 21 → 54388 [ACK] Seq=521 Ack=170 Win=32114 Len=0
29029 124.307836	91.189.88.149	192.168.43.149	FTP	68 Response: 221 Goodbye.

3. a. La connessione dei dati è in modalità attiva, perché il server apre una connessione verso il client sulla porta comunicata.

b. Viene usata la porta TCP 54392 per stabilire la connessione.

4. a. Connessione dei comandi:

No.	Time	Source	Destination	Protocol	Length	Info
21	7.031451	91.189.88.149	192.168.43.149	FTP	79	Response: 220 FTP server (vsftpd)
22	7.039868	192.168.43.149	91.189.88.149	FTP	68	Request: OPTS UTF8 ON
24	7.093605	91.189.88.149	192.168.43.149	FTP	80	Response: 200 Always in UTF8 mode.
32	10.878883	192.168.43.149	91.189.88.149	FTP	70	Request: USER anonymous
34	10.931075	91.189.88.149	192.168.43.149	FTP	88	Response: 331 Please specify the password.
169	87.611129	192.168.43.149	91.189.88.149	FTP	61	Request: PASS
171	87.662079	91.189.88.149	192.168.43.149	FTP	77	Response: 230 Login successful.

No.	Time	Source	Destination	Protocol	Length	Info
227	105.058845	192.168.43.149	91.189.88.149	FTP	66	Request: CWD ubuntu
229	105.142633	91.189.88.149	192.168.43.149	FTP	91	Response: 250 Directory successfully changed.
231	106.261645	192.168.43.149	91.189.88.149	FTP	83	Request: PORT 192,168,43,149,212,121
233	106.325791	91.189.88.149	192.168.43.149	FTP	105	Response: 200 PORT command successful. Consider using PASV.
234	106.332687	192.168.43.149	91.189.88.149	FTP	60	Request: NLST
238	106.444705	91.189.88.149	192.168.43.149	FTP	93	Response: 150 Here comes the directory listing.
246	106.511593	91.189.88.149	192.168.43.149	FTP	78	Response: 226 Directory send OK.
275	117.211874	192.168.43.149	91.189.88.149	FTP	83	Request: PORT 192,168,43,149,212,124
283	117.264306	91.189.88.149	192.168.43.149	FTP	105	Response: 200 PORT command successful. Consider using PASV.
284	117.272931	192.168.43.149	91.189.88.149	FTP	69	Request: RETR ls-lR.gz

```
ftp> cd ubuntu
250 Directory successfully changed.
ftp> ls
200 PORT command successful. Consider using PASV.
150 Here comes the directory listing.
dists
indices
ls-lR.gz
pool
project
ubuntu
226 Directory send OK.
ftp: 52 bytes received in 0.00secondi 26.00Kbyte/sec)
ftp> get ls-lR.gz
```

```
ftp> bye
221 Goodbye.
```

- il server risponde e opzione per UTF8

| 21 7.031451 | 91.189.88.149 | 192.168.43.149 | FTP | 79 Response: 220 FTP server (vsftpd) |
| 22 7.039868 | 192.168.43.149 | 91.189.88.149 | FTP | 68 Request: OPTS UTF8 ON |

- connessione di richiesta per utente 'anonymous'

23 7.154994	192.168.43.149	91.189.88.149	TCP	54 54388 → 21 [ACK] Seq=19 Ack=32 Win=8141 Len=0
32 10.878883	192.168.43.149	91.189.88.149	FTP	70 Request: USER anonymous
33 10.907616	91.189.88.149	192.168.43.149	TCP	54 21 → 54388 [ACK] Seq=52 Ack=31 Win=32104 Len=0

- risposta mandata dal server per richiedere la password e trasmissione della password

34 10.931075	91.189.88.149	192.168.43.149	FTP	88 Response: 331 Please specify the password.
35 10.971215	192.168.43.149	91.189.88.149	TCP	54 54388 → 21 [ACK] Seq=31 Ack=86 Win=8107 Len=0
169 87.611129	192.168.43.149	91.189.88.149	FTP	61 Request: PASS
170 87.630086	91.189.88.149	192.168.43.149	TCP	54 21 → 54388 [ACK] Seq=86 Ack=38 Win=32112 Len=0

- risposta del server per il login avvenuto con successo

| 171 87.662079 | 91.189.88.149 | 192.168.43.149 | FTP | 77 Response: 230 Login successful. |

- richiesta del cliente per cambiare la directory e la risposta del server per il risultato con successo.

| 227 105.058845 | 192.168.43.149 | 91.189.88.149 | FTP | 66 Request: CWD ubuntu |
| 229 105.142633 | 91.189.88.149 | 192.168.43.149 | FTP | 91 Response: 250 Directory successfully changed. |

- richiesta del cliente per stabilire la porta TCP per lo scambio di dati

| 231 106.261645 | 192.168.43.149 | 91.189.88.149 | FTP | 83 Request: PORT 192,168,43,149,212,121 |
| 232 106.325791 | 91.189.88.149 | 192.168.43.149 | FTP | 105 Response: 200 PORT command successful. Consider using PASV |

- è stata utilizzata la modalità attiva

- la richiesta della lista per il comando 'ls'

- risposta del server per la stampa della lista

233 106.325791	91.189.88.149	192.168.43.149	FTP	105 Response: 200 PORT command successful. Consider using PASV.
234 106.332687	192.168.43.149	91.189.88.149	FTP	60 Request: NLST
238 106.444705	91.189.88.149	192.168.43.149	FTP	93 Response: 150 Here comes the directory listing.
246 106.511593	91.189.88.149	192.168.43.149	FTP	78 Response: 226 Directory send OK.

- richiesta del client per il download del file

| 283 117.204968 | 91.189.88.149 | 192.168.43.149 | FTP | 105 Response: 200 PORT command successful. Consider using PASV. |
| 284 117.272931 | 192.168.43.149 | 91.189.88.149 | FTP | 69 Request: RETR ls-lR.gz |

b. connessione dei dati :

```
173 94.231090     192.168.43.149     91.189.88.149      FTP      83 Request: PORT 192,168,43,149,212,120
175 94.285023     91.189.88.149      192.168.43.149     FTP     105 Response: 200 PORT command successful. Consider using PASV.
176 94.292086     192.168.43.149     91.189.88.149      FTP      60 Request: NLST
184 94.411236     91.189.88.149      192.168.43.149     FTP      93 Response: 150 Here comes the directory listing.

289 117.398071    91.189.88.149      192.168.43.149     FTP     126 Response: 150 Opening BINARY mode data connection for ls-lR.gz (20263445 bytes).
29024 121.724105  91.189.88.149      192.168.43.149     FTP      78 Response: 226 Transfer complete.
```

```
200 PORT command successful. Consider using PASV.
150 Here comes the directory listing.
ubuntu
```

```
200 PORT command successful. Consider using PASV.
150 Opening BINARY mode data connection for ls-lR.gz (20263445 bytes).
226 Transfer complete.
ftp: 20263445 bytes received in 4.27secondi 4748.87Kbyte/sec)
```

- richiesta da parte del client per stabilire la porta TCP per lo scambio dati e risposta del server.

```
173 94.231090     192.168.43.149     91.189.88.149      FTP      83 Request: PORT 192,168,43,149,212,120
175 94.285023     91.189.88.149      192.168.43.149     FTP     105 Response: 200 PORT command successful. Consider using PASV.
```

- richiesta del client per la lista con il comando 'ls' e la stampa della lista

```
176 94.292086     192.168.43.149     91.189.88.149      FTP      60 Request: NLST
184 94.411236     91.189.88.149      192.168.43.149     FTP      93 Response: 150 Here comes the directory listing.
```

- risposta del server per la trasmissione dei dati per il file e completamento del download

```
289 117.398071    91.189.88.149      192.168.43.149     FTP     126 Response: 150 Opening BINARY mode data connection for ls-lR.gz (20263445 bytes).
29024 121.724105  91.189.88.149      192.168.43.149     FTP      78 Response: 226 Transfer complete.
```

GRUPPO : Zheliang Zhu
          Marco Hu
          Ismam Abu