

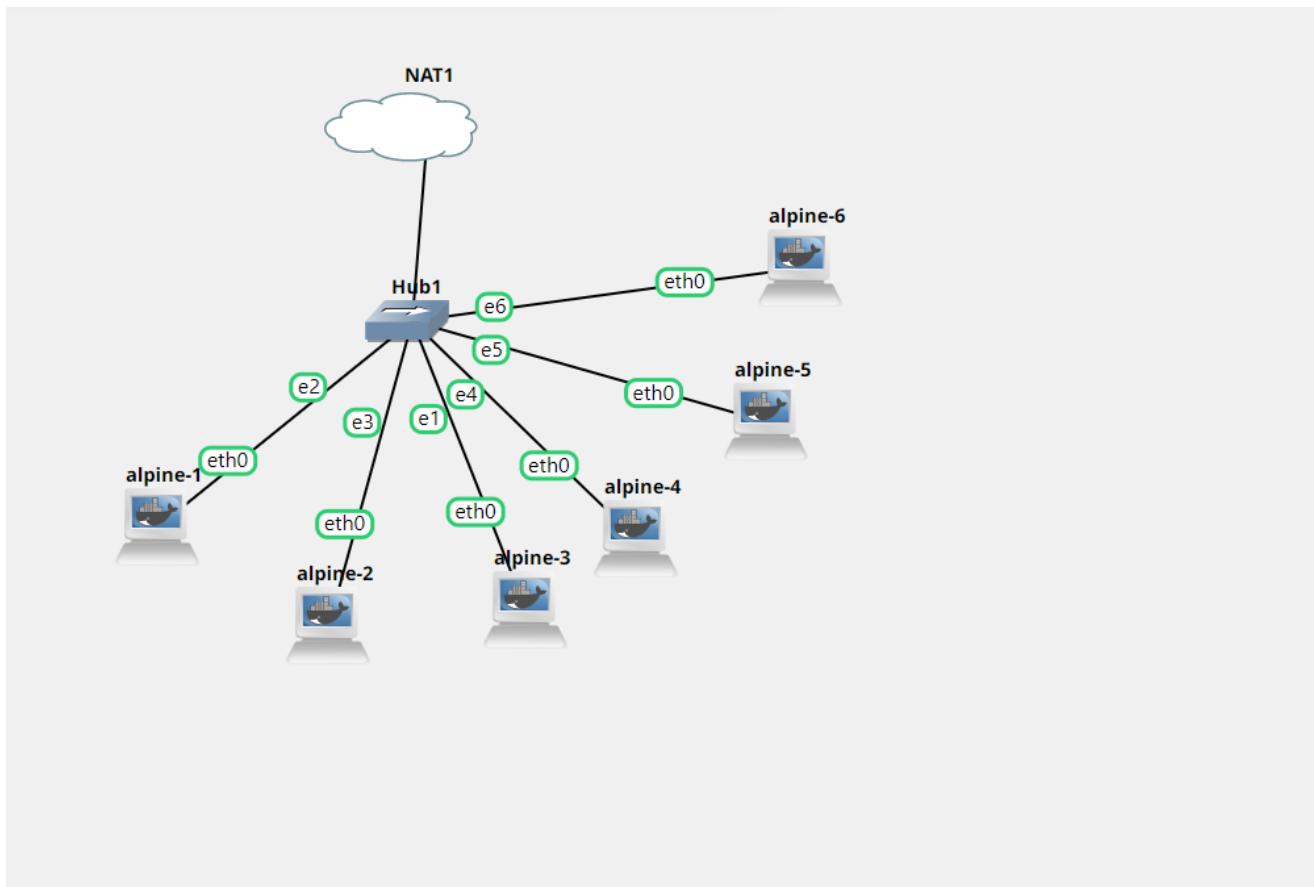
# Tugas 3 : Implementasi Concurrency

## Kasus

Server (alpine 1) ingin melakukan file streaming ke 5 file berbeda ke 5 client (alpine 2, alpine 3, alpine 4, alpine 5 dan alpine 6). Jika melakukan proses tersebut satu per satu, maka proses akan cukup lama. Jadi proses ini dapat dilakukan secara bersamaan menggunakan multi thread, multi thread async, multi process, dan multi process async. Semua pengiriman file menggunakan protokol UDP.

## Arsitektur

Pada arsitektur jaringan ini, menggunakan 6 alpine, 1 sebagai server/broadcaster dan 5 menjadi client

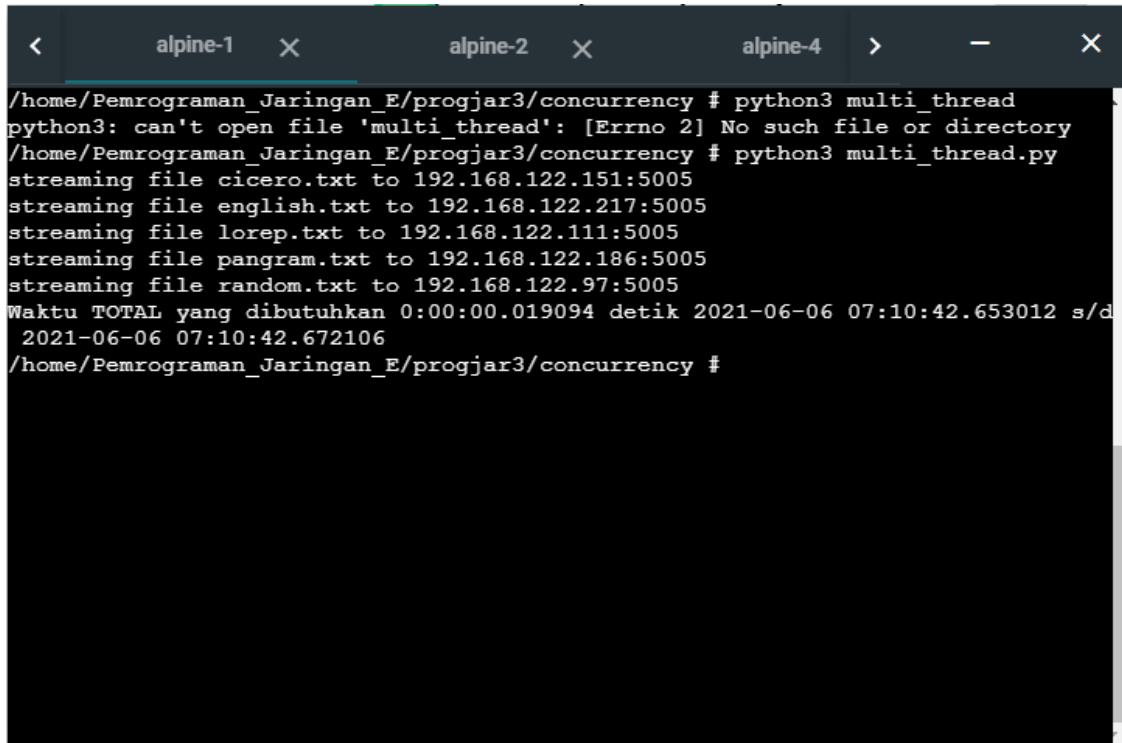


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## Menjalankan Program

### Multi Thread

#### Server



The screenshot shows a terminal window with four tabs: alpine-1, alpine-2, alpine-4, and a current tab. The current tab displays the following command-line session:

```
/home/Pemrograman_Jaringan_E/progjar3/concurrency # python3 multi_thread
python3: can't open file 'multi_thread': [Errno 2] No such file or directory
/home/Pemrograman_Jaringan_E/progjar3/concurrency # python3 multi_thread.py
streaming file cicero.txt to 192.168.122.151:5005
streaming file english.txt to 192.168.122.217:5005
streaming file lorem.txt to 192.168.122.111:5005
streaming file pangram.txt to 192.168.122.186:5005
streaming file random.txt to 192.168.122.97:5005
Waktu TOTAL yang dibutuhkan 0:00:00.019094 detik 2021-06-06 07:10:42.653012 s/d
2021-06-06 07:10:42.672106
/home/Pemrograman_Jaringan_E/progjar3/concurrency #
```

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Client

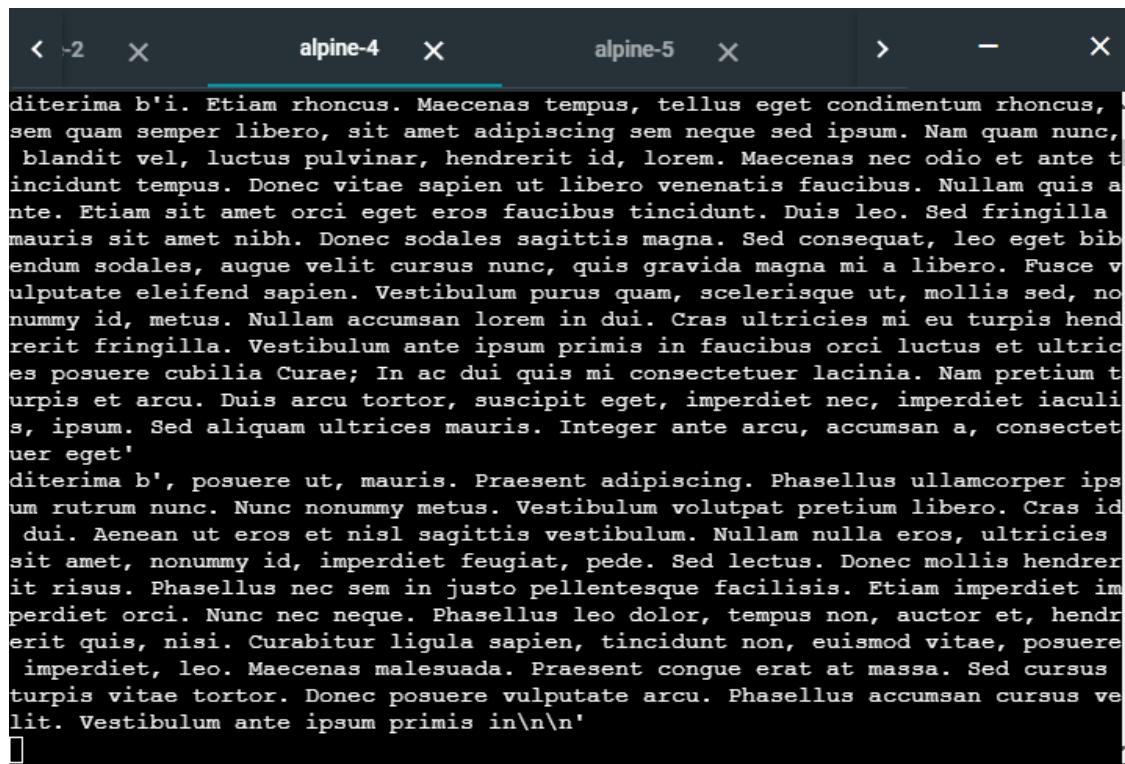
```
< alpine-1 X alpine-2 X alpine-4 > - X

These cases are perfectly simple and easy to distinguish. In a free hour, when our power of choice is untrammelled and when nothing prevents our being able to do what we like best, every pleasure is to be welcomed and every pain avoided. But in certain circumstances and owing to the claims of duty or the obligations of business it will frequently occur that pleasures have to be repudiated and annoyances accepted. The wise man therefore always holds in these matters to this principle of selection: he rejects pleasures to secure other greater pleasures, or else he endures pains to avoid worse pains. But I must explain to you how all this mistaken idea of denouncing pleasure and praising pain was born and I will give you a complete account of the system, and expound the actual teachings of' diterima b' the great explorer of the truth, the master-builder of human happiness. No one rejects, dislikes, or avoids pleasure itself, because it is pleasure, but because those who do not know how to pursue pleasure rationally encounter consequences that are extremely painful. Nor again is there anyone who loves or pursues or desires to obtain pain of itself, because it is pain, but because occasionally circumstances occur in which toil and pain can procure him some great pleasure. To take a trivial example, which of us ever undertakes laborious physical exercise, except to obtain some advantage from it? But who has any right to find fault with a man who chooses to enjoy a pleasure that has no annoying consequences, or one who avoids a pain that produces no resultant pleasure? On the other hand, we denounce with righteous indignation and dislike men who are so beguiled and demoralized by the charms of pleasure of the moment, so blinded by desire, that they cannot foresee the pain and trouble that are bound to ensue; a'
```

```
< alpine-5 X alpine-6 X alpine-3 X > - X

ambushed her, made her drunk with Longe and Parole and dragged her into their agency, where they abused her for their projects again and again. And if she hasn't been rewritten, then they are still using her. Far far away, behind the word mountains, far from the countries Vokalia and Consonantia, there live the blind texts. Separated they live in Bookmarksgrove right at the coast of the Semantics, a large language ocean. A small river named Duden flows by their place and supplies it with the necessary regelialia. It is a paradisematic country, in which roasted parts of sentences fly into your mouth. Even the all-powerful Pointing has no control about the blind texts it is an almost unorthographic life One day however' diterima b'small line of blind text by the name of Lorem Ipsum decided to leave for the far World of Grammar. The Big Oxmox advised her not to do so, because there were thousands of bad Commas, wild Question Marks and devious Semikoli, but the Little Blind Text didn't listen. She packed her seven versalia, put her initial into the belt and made herself on the way. When she reached the first hills of the Italic Mountains, she had a last view back on the skyline of her hometown Bookmarksgrove, the headline of Alphabet Village and the subline of her own road, the Line Lane. Pityful a rhetoric question ran over her cheek, then she continued her way. On her way she met a copy. The copy warned the Little Blind Text, that where it came from it would have been rewritten a thousand times and everything that was left from its origin would be the word "and" and the Little Blind Text should turn around and return to its own, safe country. But nothing the copy said could convince her and so it didn't take long until a few insidi'
```

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```
< -2 X      alpine-4 X      alpine-5 X      >      -      X
diterima b'i. Etiam rhoncus. Maecenas tempus, tellus eget condimentum rhoncus,
sem quam semper libero, sit amet adipiscing sem neque sed ipsum. Nam quam nunc,
blandit vel, luctus pulvinar, hendrerit id, lorem. Maecenas nec odio et ante t
incident tempus. Donec vitae sapien ut libero venenatis faucibus. Nullam quis a
nte. Etiam sit amet orci eget eros faucibus tincidunt. Duis leo. Sed fringilla
mauris sit amet nibh. Donec sodales sagittis magna. Sed consequat, leo eget bib
endum sodales, augue velit cursus nunc, quis gravida magna mi a libero. Fusce v
ulputate eleifend sapien. Vestibulum purus quam, scelerisque ut, mollis sed, no
nummy id, metus. Nullam accumsan lorem in dui. Cras ultricies mi eu turpis hend
rerit fringilla. Vestibulum ante ipsum primis in faucibus orci luctus et ultric
es posuere cubilia Curae; In ac dui quis mi consectetur lacinia. Nam pretium t
urpis et arcu. Duis arcu tortor, suscipit eget, imperdiet nec, imperdiet iaculi
s, ipsum. Sed aliquam ultrices mauris. Integer ante arcu, accumsan a, consecutet
uer eget'
diterima b', posuere ut, mauris. Praesent adipiscing. Phasellus ullamcorper ips
um rutrum nunc. Nunc nonummy metus. Vestibulum volutpat pretium libero. Cras id
dui. Aenean ut eros et nisl sagittis vestibulum. Nullam nulla eros, ultricies
sit amet, nonummy id, imperdiet feugiat, pede. Sed lectus. Donec mollis hendrer
it risus. Phasellus nec sem in justo pellentesque facilisis. Etiam imperdiet im
perdiet orci. Nunc nec neque. Phasellus leo dolor, tempus non, auctor et, hendr
erit quis, nisi. Curabitur ligula sapien, tincidunt non, euismod vitae, posuere
imperdiet, leo. Maecenas malesuada. Praesent congue erat at massa. Sed cursus
turpis vitae tortor. Donec posuere vulputate arcu. Phasellus accumsan cursus ve
lit. Vestibulum ante ipsum primis in\n\n'
```

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```
< -2 X alpine-4 X alpine-5 X > - X
ves quart jug of bad milk. A very bad quack might jinx zippy fowls. Few quips g
alvanized the mock jury box. Quick brown dogs jump over the lazy fox. The jay,
pig, fox, zebra, and my wolves quack! Blowzy red vixens fight for a quick jump.
Joaquin Phoenix was gazed by MTV for luck. A wizard\xe2\x80\x99s job is to vex
chumps quickly in fog. Watch "Jeopardy!", Alex Trebek's fun TV quiz game. Wov
en silk pyjamas exchanged for blue quartz. Brawny gods just flocked up to quiz
and vex him. Adjusting quiver and bow, Zompyc[1] killed the fox. My faxed joke
won a pager in the cable TV quiz show. Amazingly few discotheques provide jukeb
oxes. My girl wove six dozen plaid jackets before she quit. Six big devils from
Japan quickly for'
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Foxy parsons quiz and cajole the lovably dim wiki-girl. Have a pick: twenty si
x letters - no forcing a jumbled quiz! Crazy Fredericka bought many very exquis
ite opal jewels. Sixty zippers were quickly picked from the woven jute bag. A q
uick movement of the enemy will jeopardize six gunboats. All questions asked by
five watch experts amazed the judge. Jack quietly moved up front and seized th
e big ball of wax. The quick, brown fox jumps over a lazy dog. DJs flock by whe
n MTV ax quiz prog. Junk MTV quiz graced by fox whelps. Bawds jog, flick quartz
, vex nymphs. Waltz, bad nymph, for quick jigs vex! Fox nymphs grab quick-jived
waltz. Brick quiz whangs jumpy veldt fox. Bright vixens jump; dozy fowl quack.
Quick wafting zephyrs vex bold Jim. Quick zephyrs blow, vexing daft Jim. Sex-c
harged fop blew my junk TV quiz. How quickly daft jumping zebras vex. Two drive
n jocks help fax my big quiz. Quick, Baz, get my woven flax jodhpurs! "Now fax
quiz Jac'
```

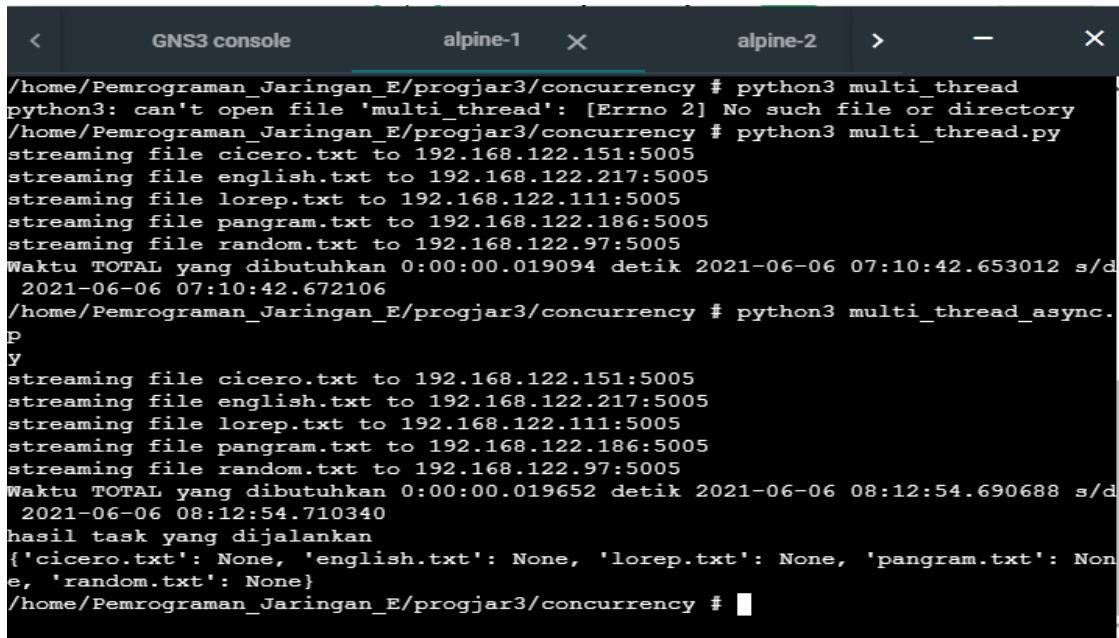
□

```
< ine-4 X alpine-5 X alpine-6 X > - X
x97 '
diterima b' #|; \xc2\xb2\xc2\xb2\xb3~ @`\xc2\xb4 \xc2\xb9\xc2\xab\xc2\xbb \xc2\xb4\
\xc2\xbc\xc3\x97 {} abc def ghi jkl mno pqrs tuv wxyz ABC DEF GHI JKL MNO PQRS T
UV WXYZ !" \xc2\xb7 $%& /() =?* '<> #|; \xc2\xb2\xc2\xb3~ @`\xc2\xb4 \xc2\xb9\x
c2\xab\xc2\xbb \xc2\xb4\xc2\xbc\xc3\x97 {} abc def ghi jkl mno pqrs tuv wxyz AB
C DEF GHI JKL MNO PQRS TUV WXYZ !" \xc2\xb7 $%& /() =?* '<> #|; \xc2\xb2\xc2\xb
3~ @`\xc2\xb4 \xc2\xb9\xc2\xab\xc2\xbb \xc2\xb4\xc2\xbc\xc3\x97 {} abc def ghi
jkl mno pqrs tuv wxyz ABC DEF GHI JKL MNO PQRS TUV WXYZ !" \xc2\xb7 $%& /() =?*
'<> #|; \xc2\xb2\xc2\xb3~ @`\xc2\xb4 \xc2\xb9\xc2\xab\xc2\xbb \xc2\xb4\xc2\xbc\xc
\xc3\x97 {} abc def ghi jkl mno pqrs tuv wxyz ABC DEF GHI JKL MNO PQRS TUV WXYZ
!" \xc2\xb7 $%& /() =?* '<> #|; \xc2\xb2\xc2\xb3~ @`\xc2\xb4 \xc2\xb9\xc2\xab\
\xc2\xbb \xc2\xb4\xc2\xbc\xc3\x97 {} abc def ghi jkl mno pqrs tuv wxyz ABC DEF G
HI JKL MNO PQRS TUV WXYZ !" \xc2\xb7 $%& /() =?* '<> #|; \xc2\xb2\xc2\xb3~ @`\x
c2\xb4 \xc2\xb9\xc2\xab\xc2\xbb \xc2\xb4\xc2\xbc\xc3\x97 {} abc def ghi jkl mno
pqrs tuv wxyz ABC DEF GHI JKL MNO PQRS TUV WXYZ !" \xc2\xb7 $%& /() =?* '<> #|
; \xc2\xb2\xc2\xb3~ @`\xc2\xb4 \xc2\xb9\xc2\xab\xc2\xbb \xc2\xb4\xc2\xbc\xc3\x9
7 {} abc def ghi jkl mno pqrs tuv wxyz ABC DEF GHI JKL MNO PQRS TUV WXYZ !" \xc2
\xb7 $%& /() =?* '<> #|; \xc2\xb2\xc2\xb3~ @`\xc2\xb4 \xc2\xb9\xc2\xab\xc2\xbb
\xc2\xb4\xc2\xbc\xc3\x97 {} abc def ghi jkl mno pqrs tuv wxyz ABC DEF GHI JKL
MNO PQRS TUV WXYZ !" \xc2\xb7 $%& /() =?* '<> #|; \xc2\xb2\xc2\xb3~ @`\xc2\xb4
\xc2\xb9\xc2\xab\xc2\xbb \xc2\xb4\xc2\xbc\xc3\x97 {} abc def ghi jkl mno pqr'
diterima b'bc def ghi jkl mno pqrs tuv wxyz ABC DEF GHI JKL MNO PQRS TUV WXYZ !
"\xc2\xb7 $%& /() =?* '<> #|; \xc2\xb2\xc2\xb3~ @`\xc2\xb4 \xc2\xb9\xc2\xab\xc
\xb2\xbb \xc2\xb4\xc2\xbc\xc3\x97 {} abc def ghi jkl mno pqrs tuv wxyz ABC\n\n'
```

□

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Multi Thread Async

## Server



The screenshot shows a terminal window titled "GNS3 console" with two tabs: "alpine-1" and "alpine-2". The "alpine-1" tab is active and displays the following log output:

```
/home/Pemrograman_Jaringan_E/progjar3/concurrency # python3 multi_thread
python3: can't open file 'multi_thread': [Errno 2] No such file or directory
/home/Pemrograman_Jaringan_E/progjar3/concurrency # python3 multi_thread.py
streaming file cicero.txt to 192.168.122.151:5005
streaming file english.txt to 192.168.122.217:5005
streaming file lorem.txt to 192.168.122.111:5005
streaming file pangram.txt to 192.168.122.186:5005
streaming file random.txt to 192.168.122.97:5005
Waktu TOTAL yang dibutuhkan 0:00:00.019094 detik 2021-06-06 07:10:42.653012 s/d
2021-06-06 07:10:42.672106
/home/Pemrograman_Jaringan_E/progjar3/concurrency # python3 multi_thread_async.
py
streaming file cicero.txt to 192.168.122.151:5005
streaming file english.txt to 192.168.122.217:5005
streaming file lorem.txt to 192.168.122.111:5005
streaming file pangram.txt to 192.168.122.186:5005
streaming file random.txt to 192.168.122.97:5005
Waktu TOTAL yang dibutuhkan 0:00:00.019652 detik 2021-06-06 08:12:54.690688 s/d
2021-06-06 08:12:54.710340
hasil task yang dijalankan
{'cicero.txt': None, 'english.txt': None, 'lorem.txt': None, 'pangram.txt': Non
e, 'random.txt': None}
/home/Pemrograman_Jaringan_E/progjar3/concurrency #
```

## Client

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< nsole      alpine-1    X      alpine-2    X      >    -    X

These cases are perfectly simple and easy to distinguish. In a free hour, when our power of choice is untrammelled and when nothing prevents our being able to do what we like best, every pleasure is to be welcomed and every pain avoided. But in certain circumstances and owing to the claims of duty or the obligations of business it will frequently occur that pleasures have to be repudiated and annoyances accepted. The wise man therefore always holds in these matters to this principle of selection: he rejects pleasures to secure other greater pleasures, or else he endures pains to avoid worse pains. But I must explain to you how all this mistaken idea of denouncing pleasure and praising pain was born and I will give you a complete account of the system, and expound the actual teachings of 'diterima b' the great explorer of the truth, the master-builder of human happiness. No one rejects, dislikes, or avoids pleasure itself, because it is pleasure, but because those who do not know how to pursue pleasure rationally encounter consequences that are extremely painful. Nor again is there anyone who loves or pursues or desires to obtain pain of itself, because it is pain, but because occasionally circumstances occur in which toil and pain can procure him some great pleasure. To take a trivial example, which of us ever undertakes laborious physical exercise, except to obtain some advantage from it? But who has any right to find fault with a man who chooses to enjoy a pleasure that has no annoying consequences, or one who avoids a pain that produces no resultant pleasure? On the other hand, we denounce with righteous indignation and dislike men who are so beguiled and demoralized by the charms of pleasure of the moment, so blinded by desire, that they cannot foresee the pain and trouble that are bound to ensue; a'

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```
< alpine-5 X      alpine-6 X      alpine-3 X > - X
ambushed her, made her drunk with Longe and Parole and dragged her into their agency, where they abused her for their projects again and again. And if she hasn't been rewritten, then they are still using her. Far far away, behind the word mountains, far from the countries Vokalia and Consonantia, there live the blind texts. Separated they live in Bookmarksgrove right at the coast of the Semantics, a large language ocean. A small river named Duden flows by their place and supplies it with the necessary regelialia. It is a paradisematic country, in which roasted parts of sentences fly into your mouth. Even the all-powerful Pointing has no control about the blind texts it is an almost unorthographic life One day however' diterima b'small line of blind text by the name of Lorem Ipsum decided to leave for the far World of Grammar. The Big Oxmox advised her not to do so, because there were thousands of bad Commas, wild Question Marks and devious Semikoli, but the Little Blind Text didn't listen. She packed her seven versalia, put her initial into the belt and made herself on the way. When she reached the first hills of the Italic Mountains, she had a last view back on the skyline of her hometown Bookmarksgrove, the headline of Alphabet Village and the subline of her own road, the Line Lane. Pityful a rhetoric question ran over her cheek, then she continued her way. On her way she met a copy. The copy warned the Little Blind Text, that where it came from it would have been rewritten a thousand times and everything that was left from its origin would be the word "and" and the Little Blind Text should turn around and return to its own, safe country. But nothing the copy said could convince her and so it didn't take long until a few insidi'
```

```
< X      alpine-4 X      alpine-5 X      alpine-6 X > - X
diterima b'i. Etiam rhoncus. Maecenas tempus, tellus eget condimentum rhoncus, sem quam semper libero, sit amet adipiscing sem neque sed ipsum. Nam quam nunc, blandit vel, luctus pulvinar, hendrerit id, lorem. Maecenas nec odio et ante tincidunt tempus. Donec vitae sapien ut libero venenatis faucibus. Nullam quis ante. Etiam sit amet orci eget eros faucibus tincidunt. Duis leo. Sed fringilla mauris sit amet nibh. Donec sodales sagittis magna. Sed consequat, leo eget bibendum sodales, augue velit cursus nunc, quis gravida magna mi a libero. Fusce vulputate eleifend sapien. Vestibulum purus quam, scelerisque ut, mollis sed, nonummy id, metus. Nullam accumsan lorem in dui. Cras ultricies mi eu turpis hendrerit fringilla. Vestibulum ante ipsum primis in faucibus orci luctus et ultrices posuere cubilia Curae; In ac dui quis mi consectetur lacinia. Nam pretium turpis et arcu. Duis arcu tortor, suscipit eget, imperdiet nec, imperdiet iaculis, ipsum. Sed aliquam ultrices mauris. Integer ante arcu, accumsan a, consectetur eget' diterima b', posuere ut, mauris. Praesent adipiscing. Phasellus ullamcorper ipsum rutrum nunc. Nunc nonummy metus. Vestibulum volutpat pretium libero. Cras id dui. Aenean ut eros et nisl sagittis vestibulum. Nullam nulla eros, ultricies sit amet, nonummy id, imperdiet feugiat, pede. Sed lectus. Donec mollis hendrerit risus. Phasellus nec sem in justo pellentesque facilisis. Etiam imperdiet imperdiet orci. Nunc nec neque. Phasellus leo dolor, tempus non, auctor et, hendrerit quis, nisi. Curabitur ligula sapien, tincidunt non, euismod vitae, posuere imperdiet, leo. Maecenas malesuada. Praesent congue erat at massa. Sed cursus turpis vitae tortor. Donec posuere vulputate arcu. Phasellus accumsan cursus velit. Vestibulum ante ipsum primis in\n\n'
```

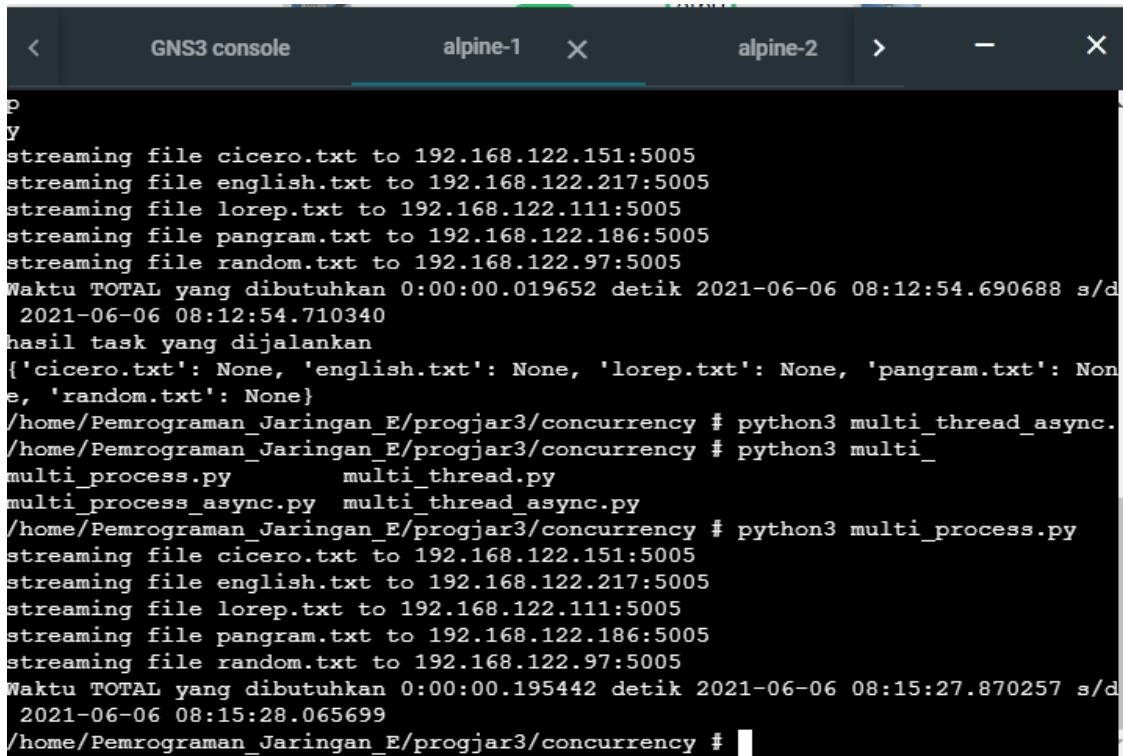
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ves quart jug of bad milk. A very bad quack might jinx zippy fowls. Few quips g  
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pig, fox, zebra, and my wolves quack! Blowzy red vixens fight for a quick jump.  
Joaquin Phoenix was gazed by MTV for luck. A wizard\xe2\x80\x99s job is to vex  
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Japan quickly for'  
diterima b't how to waltz. Big July earthquakes confound zany experimental vow.  
Foxy parsons quiz and cajole the lovably dim wiki-girl. Have a pick: twenty si  
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, vex nymphs. Waltz, bad nymph, for quick jigs vex! Fox nymphs grab quick-jived  
waltz. Brick quiz whangs jumpy veldt fox. Bright vixens jump; dozy fowl quack.  
Quick wafting zephyrs vex bold Jim. Quick zephyrs blow, vexing daft Jim. Sex-c  
harged fop blew my junk TV quiz. How quickly daft jumping zebras vex. Two drive  
n jocks help fax my big quiz. Quick, Baz, get my woven flax jodhpurs! "Now fax  
quiz Jac"

# Multi Process

## Server

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[Link Github](#)



The screenshot shows a terminal window titled "GNS3 console" with two tabs: "alpine-1" and "alpine-2". The "alpine-1" tab is active and displays the following terminal output:

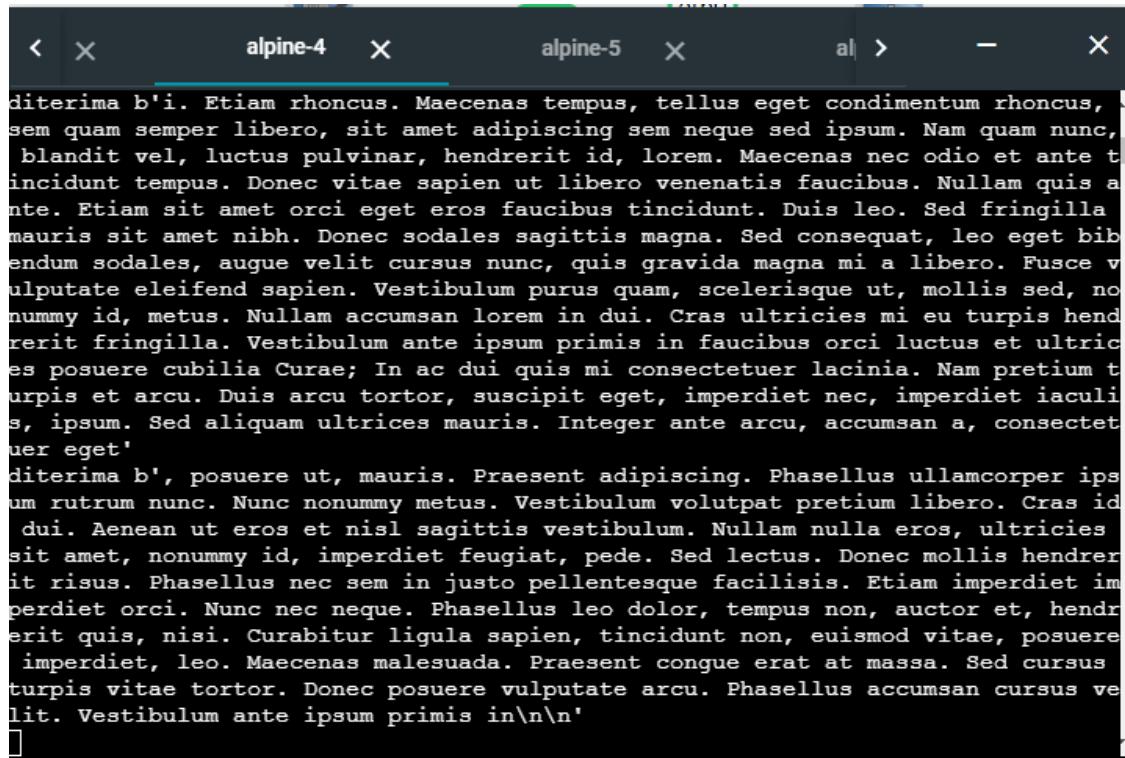
```
p
y
streaming file cicero.txt to 192.168.122.151:5005
streaming file english.txt to 192.168.122.217:5005
streaming file lorem.txt to 192.168.122.111:5005
streaming file pangram.txt to 192.168.122.186:5005
streaming file random.txt to 192.168.122.97:5005
Waktu TOTAL yang dibutuhkan 0:00:00.019652 detik 2021-06-06 08:12:54.690688 s/d
2021-06-06 08:12:54.710340
hasil task yang dijalankan
{'cicero.txt': None, 'english.txt': None, 'lorem.txt': None, 'pangram.txt': Non
e, 'random.txt': None}
/home/Pemrograman_Jaringan_E/progjar3/concurrency # python3 multi_thread_async.
/home/Pemrograman_Jaringan_E/progjar3/concurrency # python3 multi_
multi_process.py      multi_thread.py
multi_process_async.py  multi_thread_async.py
/home/Pemrograman_Jaringan_E/progjar3/concurrency # python3 multi_process.py
streaming file cicero.txt to 192.168.122.151:5005
streaming file english.txt to 192.168.122.217:5005
streaming file lorem.txt to 192.168.122.111:5005
streaming file pangram.txt to 192.168.122.186:5005
streaming file random.txt to 192.168.122.97:5005
Waktu TOTAL yang dibutuhkan 0:00:00.195442 detik 2021-06-06 08:15:27.870257 s/d
2021-06-06 08:15:28.065699
/home/Pemrograman_Jaringan_E/progjar3/concurrency #
```

Geizka Wahyu Fahriza  
05111840000062  
Pemrograman Jaringan E  
[Link Github](#)  
Client

```
< nsole      alpine-1  X      alpine-2  X      >      -      X
ater pleasures, or else he endures pains to avoid worse pains. But I must expla-
in to you how all this mistaken idea of denouncing pleasure and praising pain w-
as born and I will give you a complete account of the system, and expound the a-
ctual teachings of the great explorer of the truth, the master-builder of human
happiness. No one rejects, dislikes, or avoids pleasure itself, because it is
pleasure, but because those who do not know how to pursue pleasure rationally e-
ncounter consequences that are extremely painful. Nor again is there anyone who
loves or pursues or desires to obtain pain of itself, because it is pain, but
because occasionally circumstances occur in which toil and pain can procure him
some gr'
diterima b'eat pleasure. To take a trivial example, which of us ever undertakes
laborious physical exercise, except to obtain some advantage from it? But who
has any right to find fault with a man who chooses to enjoy a pleasure that has
no annoying consequences, or one who avoids a pain that produces no resultant
pleasure? On the other hand, we denounce with righteous indignation and dislike
men who are so beguiled and demoralized by the charms of pleasure of the momen-
t, so blinded by desire, that they cannot foresee the pain and trouble that are
bound to ensue; and equal blame belongs to those who fail in their duty throug-
h weakness of will, which is the same as saying through shrinking from toil and
pain. These cases are perfectly simple and easy to distinguish. In a free hour
, when our power of choice is untrammelled and when nothing prevents our being
able to do what we like best, every pleasure is to be welcomed and every pain a-
voided. But in certain circumstances and owing to the claims of duty or the obli-
gations'
diterima b' of business it will frequently occur that pleasures have to be repu-
```

```
< alpine-5  X      alpine-6  X      alpine-3  X      >      -      X
copy warned the Little Blind Text, that where it came from it would have been r-
ewritten a thousa'
diterima b' times and everything that was left from its origin would be the wor-
d "and" and the Little Blind Text should turn around and return to its own, saf-
e country. But nothing the copy said could convince her and so it didn\xe2\x80\x99t take long until a few insidious Copy Writers ambushed her, made her drunk
with Longe and Parole and dragged her into their agency, where they abused her
for their projects again and again. And if she hasn\xe2\x80\x99t been rewritten
, then they are still using her.Far far away, behind the word mountains, far fr-
om the countries Vokalia and Consonantia, there live the blind texts. Separated
they live in Bookmarksgrove right at the coast of the Semantics, a large langu-
age ocean. A small river named Duden flows by their place and supplies it with
the necessary regelialia. It is a paradisematic country, in which roasted parts
of sentences fly into your mouth. Even the all-powerful Pointing has no contro-
l about the blind texts it is an almost unorthographic life One day however a s-
mall line of blind text by'
diterima b' name of Lorem Ipsum decided to leave for the far World of Grammar.
The Big Oxmox advised her not to do so, because there were thousands of bad Com-
mas, wild Question Marks and devious Semikoli, but the Little Blind Text didn\xe2\x80\x99t listen. She packed her seven versalia, put her initial into the bel-
t and made herself on the way. When she reached the first hills of the Italic M-
ountains, she had a last view back on the skyline of her hometown Bookmarksgro-
ve, the headline of Alphabet Village and the subline of her own road, the Line L-
ane. Pityful a rhetoric question ran over her cheek, then she continued her'
```

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```
< X alpine-4 X alpine-5 X al > - X
diterima b'i. Etiam rhoncus. Maecenas tempus, tellus eget condimentum rhoncus,
sem quam semper libero, sit amet adipiscing sem neque sed ipsum. Nam quam nunc,
blandit vel, luctus pulvinar, hendrerit id, lorem. Maecenas nec odio et ante t
incident tempus. Donec vitae sapien ut libero venenatis faucibus. Nullam quis a
nte. Etiam sit amet orci eget eros faucibus tincidunt. Duis leo. Sed fringilla
mauris sit amet nibh. Donec sodales sagittis magna. Sed consequat, leo eget bib
endum sodales, augue velit cursus nunc, quis gravida magna mi a libero. Fusce v
ulputate eleifend sapien. Vestibulum purus quam, scelerisque ut, mollis sed, no
nummy id, metus. Nullam accumsan lorem in dui. Cras ultricies mi eu turpis hend
rerit fringilla. Vestibulum ante ipsum primis in faucibus orci luctus et ultric
es posuere cubilia Curae; In ac dui quis mi consectetur lacinia. Nam pretium t
urpis et arcu. Duis arcu tortor, suscipit eget, imperdiet nec, imperdiet iaculi
s, ipsum. Sed aliquam ultrices mauris. Integer ante arcu, accumsan a, consecutet
uer eget'
diterima b', posuere ut, mauris. Praesent adipiscing. Phasellus ullamcorper ips
um rutrum nunc. Nunc nonummy metus. Vestibulum volutpat pretium libero. Cras id
dui. Aenean ut eros et nisl sagittis vestibulum. Nullam nulla eros, ultricies
sit amet, nonummy id, imperdiet feugiat, pede. Sed lectus. Donec mollis hendrer
it risus. Phasellus nec sem in justo pellentesque facilisis. Etiam imperdiet im
perdiet orci. Nunc nec neque. Phasellus leo dolor, tempus non, auctor et, hendr
erit quis, nisi. Curabitur ligula sapien, tincidunt non, euismod vitae, posuere
imperdiet, leo. Maecenas malesuada. Praesent congue erat at massa. Sed cursus
turpis vitae tortor. Donec posuere vulputate arcu. Phasellus accumsan cursus ve
lit. Vestibulum ante ipsum primis in\n\n'
```

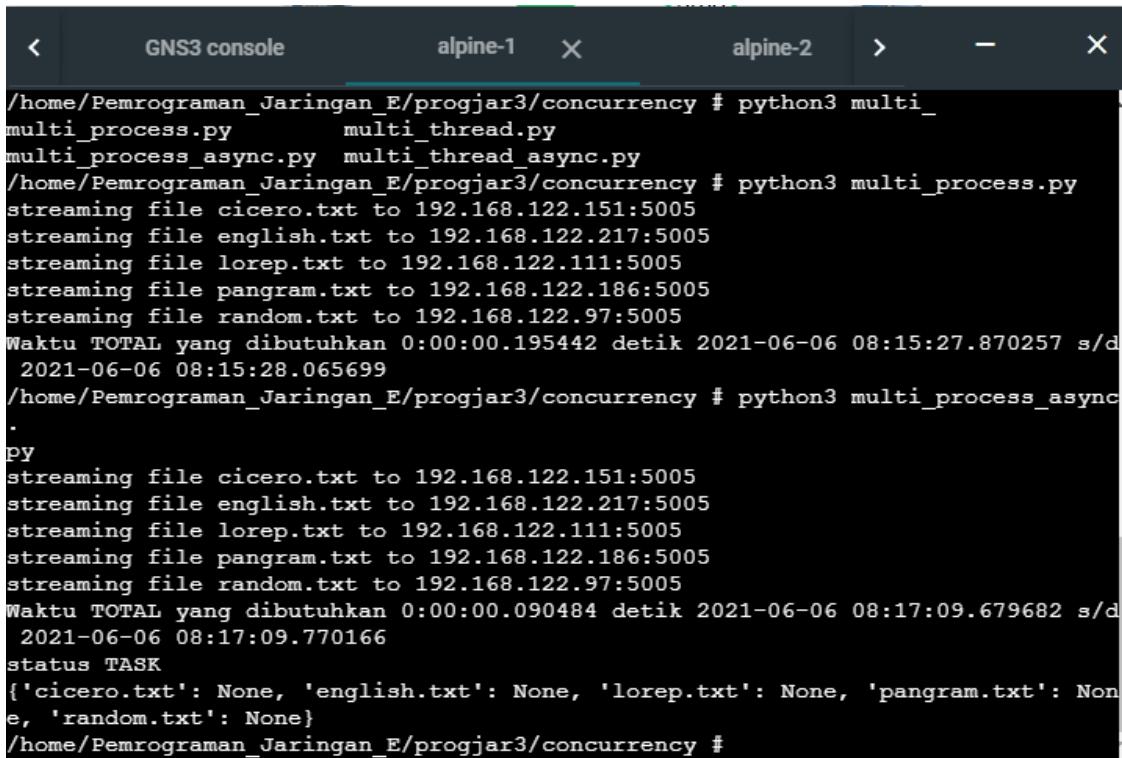
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```
alpine-4 X alpine-5 X al| > - X
ght jinx zippy fowls. Few quips galvanized the mock jury box. Quick brown dogs
jump over the lazy fox. The jay, pig, fox, zebra, and my wolves quack! Blowzy r
ed vixens fight for a quick jump. Joaquin Phoenix was gazed by MTV for luck. A
wizard\xe2\x80\x99s job is to vex chumps quickly in fog. Watch "Jeopardy!", Ale
x Trebek\'s fun TV quiz game. Woven silk pyjamas exchanged for blue quartz. Bra
wny gods just flocked up to quiz and vex him. Adjusting quiver and bow, Zompyc[1]
killed the fox. My faxed joke won a pager in the cable TV quiz show. Amazing
ly few discotheque'
diterima b'provide jukeboxes. My girl wove six dozen plaid jackets before she q
uit. Six big devils from Japan quickly forgot how to waltz. Big July earthquake
s confound zany experimental vow. Foxy parsons quiz and cajole the lovably dim
wiki-girl. Have a pick: twenty six letters - no forcing a jumbled quiz! Crazy F
redericka bought many very exquisite opal jewels. Sixty zippers were quickly pi
cked from the woven jute bag. A quick movement of the enemy will jeopardize six
gunboats. All questions asked by five watch experts amazed the judge. Jack qui
etly moved up front and seized the big ball of wax. The quick, brown fox jumps o
ver a lazy dog. DJs flock by when MTV ax quiz prog. Junk MTV quiz graced by fox
whelps. Bawds jog, flick quartz, vex nymphs. Waltz, bad nymph, for quick jigs
vex! Fox nymphs grab quick-jived waltz. Brick quiz whangs jumpy veldt fox. Brig
ht vixens jump; dozy fowl quack. Quick wafting zephyrs vex bold Jim. Quick zeph
yrs blow, vexing daft Jim. Sex-charged fop blew my junk TV quiz. How quickly da
ft jumpi'
diterima b'ng zebras vex. Two driven jocks help fax my big quiz. Quick, Baz, ge
t my woven flax jodhpurs! "Now fax quiz Jack!" my\n\n'
```

```
alpine-5 X alpine-6 X al| > - X
x97 '
diterima b' #|; \xc2\xb2\xc2\xb3~ @`\xc2\xb4 \xc2\xab\ xc2\xb2\xbb \xc2\xab\ 
\xc2\xbc\xc3\x97 {} abc def ghi jkl mno pqrs tuv wxyz ABC DEF GHI JKL MNO PQRS T
UV WXYZ !" \xc2\xab\ $%& /() =?* `<> #|; \xc2\xb2\xc2\xb3~ @`\xc2\xb4 \xc2\xab\ 
\xc2\xab\ \xc2\xb4\xc2\xbc\xc3\x97 {} abc def ghi jkl mno pqrs tuv wxyz AB
C DEF GHI JKL MNO PQRS TUV WXYZ !" \xc2\xab\ $%& /() =?* `<> #|; \xc2\xb2\xc2\xb
3~ @`\xc2\xb4 \xc2\xab\ \xc2\xb2\xc2\xbb \xc2\xab\ \xc2\xb4\xc2\xbc\xc3\x97 {} abc def ghi
jkl mno pqrs tuv wxyz ABC DEF GHI JKL MNO PQRS TUV WXYZ !" \xc2\xab\ $%& /() =?*
`<> #|; \xc2\xb2\xc2\xb3~ @`\xc2\xb4 \xc2\xab\ \xc2\xb2\xc2\xbb \xc2\xab\ \xc2\xb4\xc2\xbc
\xc3\x97 {} abc def ghi jkl mno pqrs tuv wxyz ABC DEF GHI JKL MNO PQRS TUV WXYZ
!" \xc2\xab\ $%& /() =?* `<> #|; \xc2\xb2\xc2\xb3~ @`\xc2\xb4 \xc2\xab\ \xc2\xb2\xc2\xab\
\xc2\xbb \xc2\xab\ \xc2\xb4\xc2\xbc\xc3\x97 {} abc def ghi jkl mno pqrs tuv wxyz ABC DEF G
HI JKL MNO PQRS TUV WXYZ !" \xc2\xab\ $%& /() =?* `<> #|; \xc2\xb2\xc2\xb3~ @`\xc
2\xb4 \xc2\xab\ \xc2\xb2\xc2\xab \xc2\xb4\xc2\xbc\xc3\x97 {} abc def ghi jkl mno
pqrs tuv wxyz ABC DEF GHI JKL MNO PQRS TUV WXYZ !" \xc2\xab\ $%& /() =?* `<> #|
; \xc2\xb2\xc2\xb3~ @`\xc2\xb4 \xc2\xab\ \xc2\xb2\xc2\xbb \xc2\xab\ \xc2\xb4\xc2\xbc\xc3\x9
7 {} abc def ghi jkl mno pqrs tuv wxyz ABC DEF GHI JKL MNO PQRS TUV WXYZ !" \xc2
\xab\ $%& /() =?* `<> #|; \xc2\xb2\xc2\xb3~ @`\xc2\xb4 \xc2\xab\ \xc2\xb2\xc2\xbb
\xc2\xab\ \xc2\xb4\xc2\xbc\xc3\x97 {} abc def ghi jkl mno pqrs tuv wxyz ABC DEF GHI JKL
MNO PQRS TUV WXYZ !" \xc2\xab\ $%& /() =?* `<> #|; \xc2\xb2\xc2\xb3~ @`\xc2\xb4
\xc2\xab\ \xc2\xb2\xc2\xab \xc2\xb4\xc2\xbc\xc3\x97 {} abc def ghi jkl mno pqr'
diterima b'bc def ghi jkl mno pqrs tuv wxyz ABC DEF GHI JKL MNO PQRS TUV WXYZ !
"\xc2\xab\ $%& /() =?* `<> #|; \xc2\xb2\xc2\xb3~ @`\xc2\xb4 \xc2\xab\ \xc2\xb2\xc2\x
\xb4\xc2\xbc\xc3\x97 {} abc def ghi jkl mno pqrs tuv wxyz ABC\n\n'
```

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Multi Process Async

Server



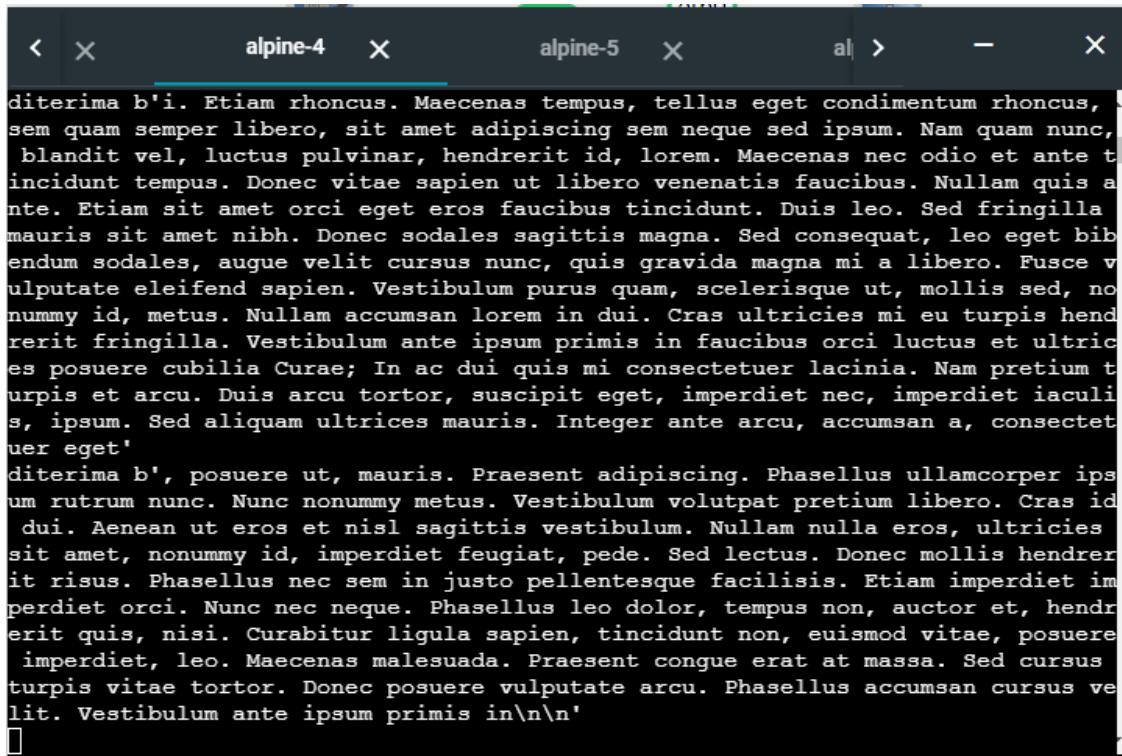
```
/home/Pemrograman_Jaringan_E/progjar3/concurrency # python3 multi_
multi_process.py      multi_thread.py
multi_process_async.py multi_thread_async.py
/home/Pemrograman_Jaringan_E/progjar3/concurrency # python3 multi_process.py
streaming file cicero.txt to 192.168.122.151:5005
streaming file english.txt to 192.168.122.217:5005
streaming file lorem.txt to 192.168.122.111:5005
streaming file pangram.txt to 192.168.122.186:5005
streaming file random.txt to 192.168.122.97:5005
Waktu TOTAL yang dibutuhkan 0:00:00.195442 detik 2021-06-06 08:15:27.870257 s/d
2021-06-06 08:15:28.065699
/home/Pemrograman_Jaringan_E/progjar3/concurrency # python3 multi_process_async
.
py
streaming file cicero.txt to 192.168.122.151:5005
streaming file english.txt to 192.168.122.217:5005
streaming file lorem.txt to 192.168.122.111:5005
streaming file pangram.txt to 192.168.122.186:5005
streaming file random.txt to 192.168.122.97:5005
Waktu TOTAL yang dibutuhkan 0:00:00.090484 detik 2021-06-06 08:17:09.679682 s/d
2021-06-06 08:17:09.770166
status TASK
{'cicero.txt': None, 'english.txt': None, 'lorem.txt': None, 'pangram.txt': Non
e, 'random.txt': None}
/home/Pemrograman_Jaringan_E/progjar3/concurrency #
```

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Client

```
< nsole      alpine-1  X      alpine-2  X      >      -      X
ater pleasures, or else he endures pains to avoid worse pains. But I must expla-
in to you how all this mistaken idea of denouncing pleasure and praising pain w-
as born and I will give you a complete account of the system, and expound the a-
ctual teachings of the great explorer of the truth, the master-builder of human
happiness. No one rejects, dislikes, or avoids pleasure itself, because it is
pleasure, but because those who do not know how to pursue pleasure rationally e-
ncounter consequences that are extremely painful. Nor again is there anyone who
loves or pursues or desires to obtain pain of itself, because it is pain, but
because occasionally circumstances occur in which toil and pain can procure him
some gr'
diterima b'eat pleasure. To take a trivial example, which of us ever undertakes
laborious physical exercise, except to obtain some advantage from it? But who
has any right to find fault with a man who chooses to enjoy a pleasure that has
no annoying consequences, or one who avoids a pain that produces no resultant
pleasure? On the other hand, we denounce with righteous indignation and dislike
men who are so beguiled and demoralized by the charms of pleasure of the momen-
t, so blinded by desire, that they cannot foresee the pain and trouble that are
bound to ensue; and equal blame belongs to those who fail in their duty throug-
h weakness of will, which is the same as saying through shrinking from toil and
pain. These cases are perfectly simple and easy to distinguish. In a free hour
, when our power of choice is untrammelled and when nothing prevents our being
able to do what we like best, every pleasure is to be welcomed and every pain a-
voided. But in certain circumstances and owing to the claims of duty or the obli-
gations'
diterima b' of business it will frequently occur that pleasures have to be repu-
```

```
< alpine-5  X      alpine-6  X      alpine-3  X      >      -      X
a copy. The copy warned the Little Blind Text, that where it came from it woul-
d have been rewritten a thousand times and everything that was left from its or-
igin would be the word "and" and the Little Blind Text should turn around and r-
eturn to its own, safe country. But nothing the copy said could convince her an-
d so it didn\xe2\x80\x99t take long until a few insidious Copy Writers ambushed
her, made her drunk with Longe and Parole and dragged her into their agency, w-
here they abused her for their projects again and again. And if she hasn\xe2\x80\x99t
been rewritten, then they are still using her. Far far away, behind the
word mountains, far from the countries Vokalia and Consonantia, there live the
blind texts. Separated the'
diterima b've in Bookmarksgrove right at the coast of the Semantics, a large la-
nguage ocean. A small river named Duden flows by their place and supplies it wi-
th the necessary regelialia. It is a paradisematic country, in which roasted pa-
rts of sentences fly into your mouth. Even the all-powerful Pointing has no con-
trol about the blind texts it is an almost unorthographic life One day however
a small line of blind text by the name of Lorem Ipsum decided to leave for the
far World of Grammar. The Big Oxmox advised her not to do so, because there wer-
e thousands of bad Commas, wild Question Marks and devious Semikoli, but the Li-
ttle Blind Text didn\xe2\x80\x99t listen. She packed her seven versalia, put he-
r initial into the belt and made herself on the way. When she reached the first
hills of the Italic Mountains, she had a last view back on the skyline of her
hometown Bookmarksgrove, the headline of Alphabet Village and the subline of he-
r own road, the Line Lane. Pityful a rhetoric question ran over her cheek, then
she continued he'
```

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```
diterima b'i. Etiam rhoncus. Maecenas tempus, tellus eget condimentum rhoncus,  
sem quam semper libero, sit amet adipiscing sem neque sed ipsum. Nam quam nunc,  
blandit vel, luctus pulvinar, hendrerit id, lorem. Maecenas nec odio et ante t  
incident tempus. Donec vitae sapien ut libero venenatis faucibus. Nullam quis a  
nte. Etiam sit amet orci eget eros faucibus tincidunt. Duis leo. Sed fringilla  
mauris sit amet nibh. Donec sodales sagittis magna. Sed consequat, leo eget bib  
endum sodales, augue velit cursus nunc, quis gravida magna mi a libero. Fusce v  
ulputate eleifend sapien. Vestibulum purus quam, scelerisque ut, mollis sed, no  
nummy id, metus. Nullam accumsan lorem in dui. Cras ultricies mi eu turpis hend  
rerit fringilla. Vestibulum ante ipsum primis in faucibus orci luctus et ultric  
es posuere cubilia Curae; In ac dui quis mi consectetur lacinia. Nam pretium t  
urpis et arcu. Duis arcu tortor, suscipit eget, imperdiet nec, imperdiet iaculi  
s, ipsum. Sed aliquam ultrices mauris. Integer ante arcu, accumsan a, consecut  
uer eget'  
diterima b', posuere ut, mauris. Praesent adipiscing. Phasellus ullamcorper ips  
um rutrum nunc. Nunc nonummy metus. Vestibulum volutpat pretium libero. Cras id  
dui. Aenean ut eros et nisl sagittis vestibulum. Nullam nulla eros, ultricies  
sit amet, nonummy id, imperdiet feugiat, pede. Sed lectus. Donec mollis hendrer  
it risus. Phasellus nec sem in justo pellentesque facilisis. Etiam imperdiet im  
perdiet orci. Nunc nec neque. Phasellus leo dolor, tempus non, auctor et, hendr  
erit quis, nisi. Curabitur ligula sapien, tincidunt non, euismod vitae, posuere  
imperdiet, leo. Maecenas malesuada. Praesent congue erat at massa. Sed cursus  
turpis vitae tortor. Donec posuere vulputate arcu. Phasellus accumsan cursus ve  
lit. Vestibulum ante ipsum primis in\n\n'
```

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Pemrograman Jaringan E  
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ght jinx zippy fowls. Few quips galvanized the mock jury box. Quick brown dogs jump over the lazy fox. The jay, pig, fox, zebra, and my wolves quack! Blowzy red vixens fight for a quick jump. Joaquin Phoenix was gazed by MTV for luck. A wizard\xe2\x80\x99s job is to vex chumps quickly in fog. Watch "Jeopardy!", Alex Trebek's fun TV quiz game. Woven silk pyjamas exchanged for blue quartz. Bra wny gods just flocked up to quiz and vex him. Adjusting quiver and bow, Zompyc[1] killed the fox. My faxed joke won a pager in the cable TV quiz show. Amazingly few discotheque'

diterima b'provide jukeboxes. My girl wove six dozen plaid jackets before she quit. Six big devils from Japan quickly forgot how to waltz. Big July earthquake confound zany experimental vow. Foxy parsons quiz and cajole the lovably dim wiki-girl. Have a pick: twenty six letters - no forcing a jumbled quiz! Crazy F redericka bought many very exquisite opal jewels. Sixty zippers were quickly picked from the woven jute bag. A quick movement of the enemy will jeopardize six gunboats. All questions asked by five watch experts amazed the judge. Jack quietly moved up front and seized the big ball of wax. The quick, brown fox jumps over a lazy dog. DJs flock by when MTV ax quiz prog. Junk MTV quiz graced by fox whelps. Bawds jog, flick quartz, vex nymphs. Waltz, bad nymph, for quick jigs vex! Fox nymphs grab quick-jived waltz. Brick quiz whangs jumpy veldt fox. Bright vixens jump; dozy fowl quack. Quick wafting zephyrs vex bold Jim. Quick zephyrs blow, vexing daft Jim. Sex-charged fop blew my junk TV quiz. How quickly daft jumpi'

diterima b'ng zebras vex. Two driven jocks help fax my big quiz. Quick, Baz, get my woven flax jodhpurs! "Now fax quiz Jack!" my\n\n'

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## Perbandingan waktu

Implementasi Concurrency	Waktu Run Time (Seconds)
Multi Thread	0.019094
Multi Thread Async	0.019652
Multi Process	0.195442
Multi Process Async	0.090484

## Kesimpulan

Menjalankan broadcast UDP secara konkuren paling cepat menggunakan multi thread