FEDERAL STATE AUTONOMOUS EDUCATIONAL INSTITUTION
OF HIGHER EDUCATION
ITMO UNIVERSITY

Parallel algorithms for the analysis and synthesis of data on the assignments No.20, 21

Performed by
Ivan Dubinin
J4132c

St. Petersburg
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Assignment 20

Understand the new functions in Assignment20.c, complete the program according to the assignment, explain the execution of the program.

Write a function that will create a file "file.txt" with random content (or with specific text). The function must be executed before the program reads the contents of the file. Run the program on one process. Check if the contents of the file are displayed correctly. Add an option that will delete the file on close.

Listing of the program

See it in my github repo

Description

MPI library provides build-in tools to work with files.The program creates file, fill it with content, read content and deletes file using MPI functions. If option ‘-d’ is passed to our programm then the created file will be deleted in the end.

Example of launch parameters and output

Execution with and without deleting:

```
[pes@vandosik HW_MPI]$ mpic++ Assignment20.c -o task_20
[pes@vandosik HW_MPI]$
[pes@vandosik HW_MPI]$
[pes@vandosik HW_MPI]$ mpirun -n 1 --use-hwthread-cpus --mca opal_warn_on_missing_libcuda 0 task_20
Create/Open file: task_20_file.txt
Read: 'Bla Bla Bla...'
Symbols received 17
[pes@vandosik HW_MPI]$
[pes@vandosik HW_MPI]$
[pes@vandosik HW_MPI]$ mpirun -n 1 --use-hwthread-cpus --mca opal_warn_on_missing_libcuda 0 task_20 -d
Create/Open file: task_20_file.txt
Read: 'Bla Bla Bla...'
Symbols received 17
Delete file: task_20_file.txt
[pes@vandosik HW_MPI]$
```

Contetnts of file:

```
[pes@vandosik HW_MPI]$ cat task_20_file.txt
Bla Bla Bla...[pes@vandosik HW_MPI]$
```

Assignment 21

Understand the new functions in Assignment21.c, complete the program according to the assignment, explain the execution of the program. Create a file and fill it with bulky text, output the content in parallel. Change the step of reading the contents of the file and the number of characters to be output by each process.

Listing of the program

Server code file

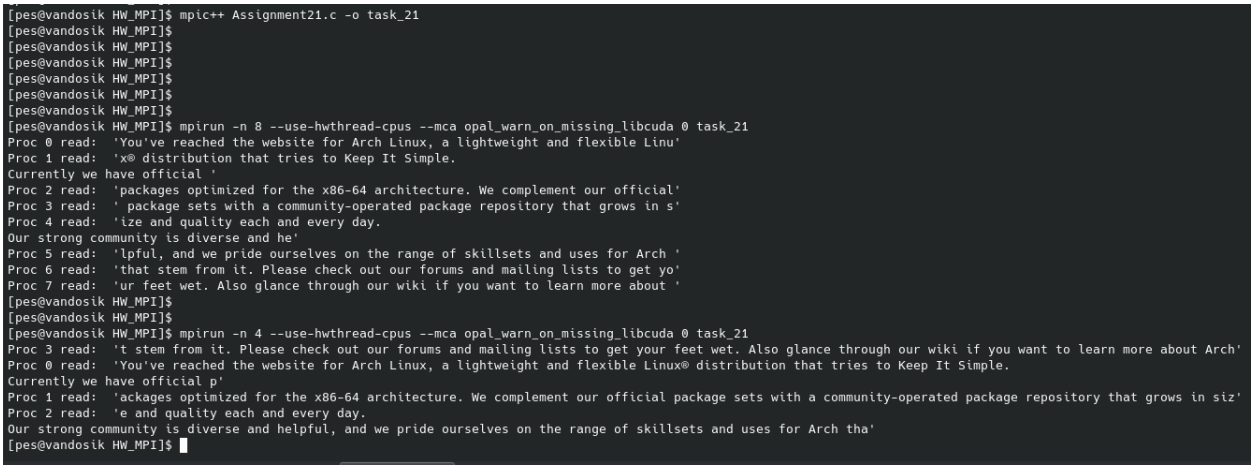
File with bulky text

Description

File task_21_file.txt with bulky content was created. Program creates n processes. Each process reads its own snippet of the file. The amount od data for each proc is counted using MPI_File_get_size and the numper of procs in comm. By using function MPI_File_set_view process putting cursor on needed position in text and by using function MPI_File_read_all process reads from cursor position needed amount of symbols. Than the symbols are displayed to console.

Example of launch parameters and output

Launch of the programm with 8 and 4 procs



Contets of the file: