

EE-255 Real-Time Embedded Systems Project 2

Writeup (Group No- 17)

TEAM MEMBERS:

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1. Screenshots captured for the execution traces for 3 seconds using trace-cmd for the three instances of the periodic program (periodic.c) ran.

Used the following task parameters as mentioned in the handout: -

Task 1: C = 40 ms, T = 250 ms, CPUID = 1

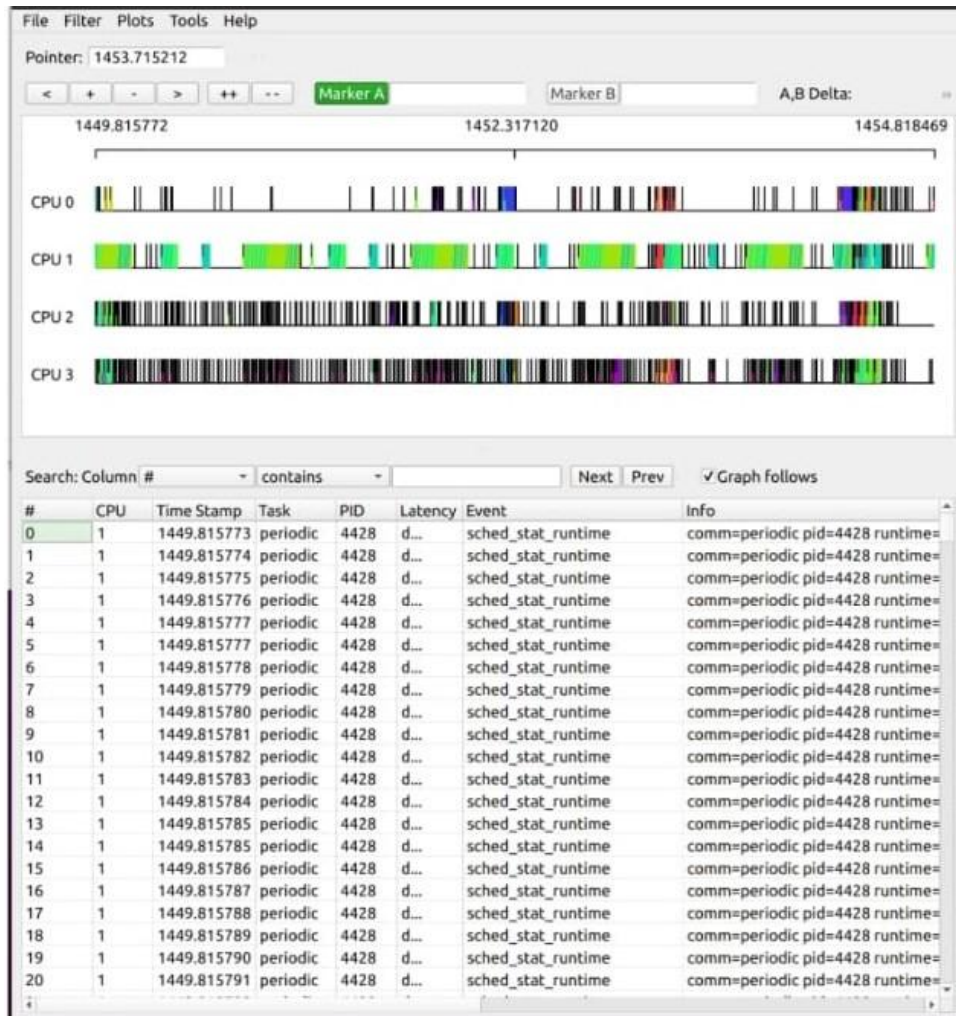
Task 2: C = 60 ms, T = 500 ms, CPUID = 1

Task 3: C = 200 ms, T = 1000 ms, CPUID = 1

Screenshot of kernel-shark captured:

Launched the tasks at the same time:

```
$ ./periodic 40 250 1 & ./periodic 60 500 1 & ./periodic 200 1000 1 &
```



2. Captured the screenshot of the kernel-shark:

We ran the same taskset, but after launching them, **assigned real-time priorities to each task** by using **chrt** on the command line.

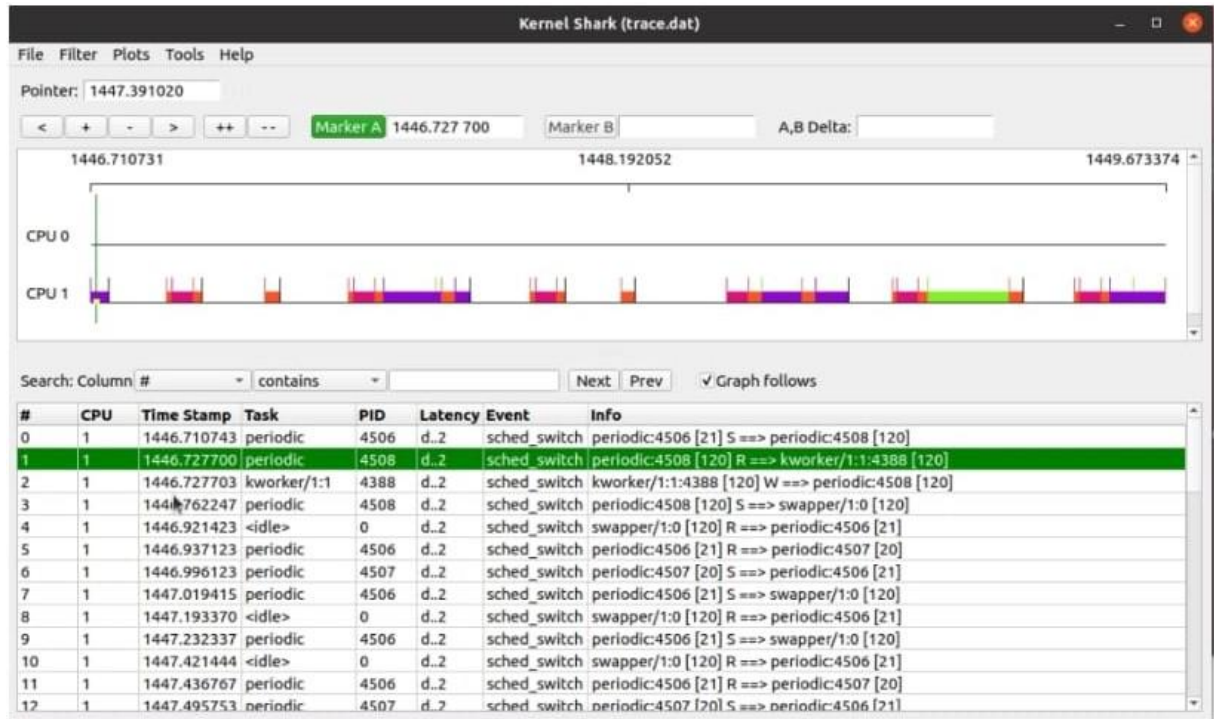
(e.g., `$ sudo chrt -f -p 80`)

Used **SCHED_FIFO**.

Task 1: C = 40 ms, T = 250 ms, CPUID = 1 -- real-time priority: 80

Task 2: C = 60 ms, T = 500 ms, CPUID = 1 -- real-time priority: 79

Task 3: C = 200 ms, T = 1000 ms, CPUID = 1 -- real-time priority: 78



3. Compare the two results and give an explanation of task behavior.

- ➔ For task 2, they can finish more quickly and adhere to their deadlines. Contrarily, in Task Set 1, where real-time priorities are not assigned, task completion durations are longer and some jobs may even be late.
- ➔ Also, we can see that in Task Set 2, the tasks with higher priorities come first which helps in utilizing the CPU more effectively than Task 1. This is demonstrated by the trace-cmd output, which shows that some wake-up events are produced by higher priority activities, which preempts lower priority jobs.
- ➔ Thus, it is crucial to give tasks in real-time systems real-time priorities in order to ensure their correct operation.

4. Give a brief summary of the contributions of each member.

WORK	PIYUSH	SRUSHTI	SAMEEHA
4.1	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
4.2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
4.3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

4.4	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.5	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4.6	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
WRITEUP	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>