REAL-TIME EMBEDDED SYSTEMS (EE_255_001_24W, CS_251_001_24W)

HW2 - TEAM 06

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Question 1:

Task parameters:

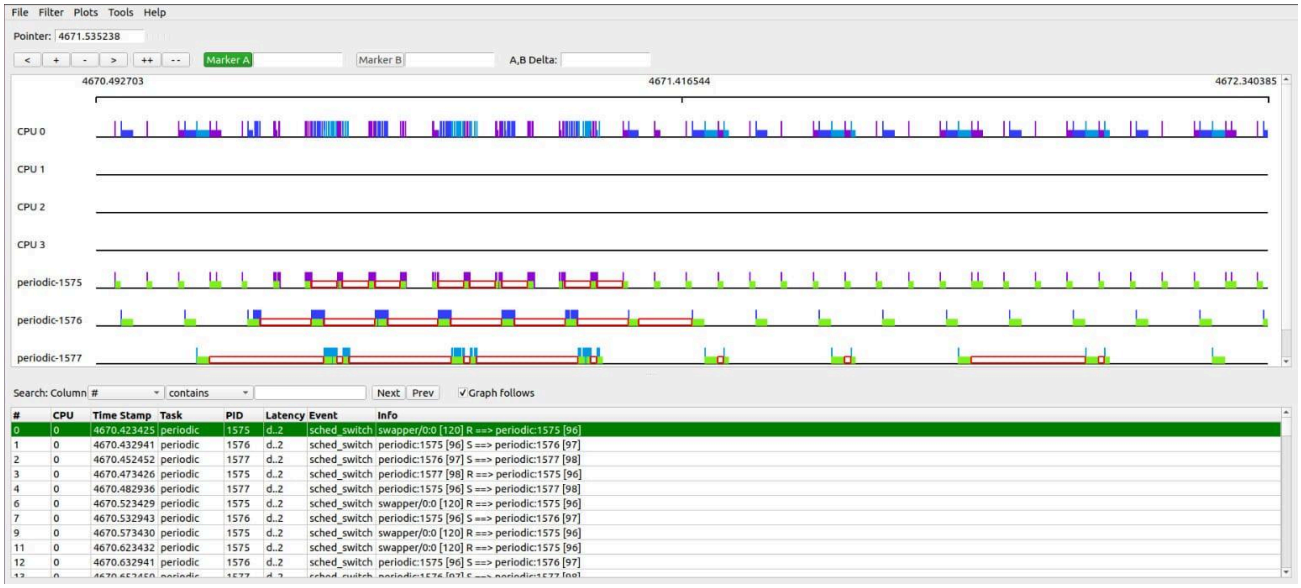
- Task 1: C = 10 ms, T = 50 ms, CPUID = 1
- Task 2: C = 20 ms, T = 100 ms, CPUID = 1
- Task 3: C = 30 ms, T = 200 ms, CPUID = 1

#	CPU	Time Stamp	Task	PID	Latency	Event	Info
0	1	195.244162	periodic	1138	d..2.	sched/sched_switch	periodic:1138 [120] S ==> periodic:1140 [120]
2	1	195.267570	periodic	1139	d..2.	sched/sched_switch	periodic:1139 [120] S ==> periodic:1140 [120]
4	1	195.402995	ktimers/1	27	d..2.	sched/sched_switch	ktimers/1:27 [98] S ==> periodic:1140 [120]
6	1	195.403201	ksoftirqd/1	28	d..2.	sched/sched_switch	ksoftirqd/1:28 [120] S ==> periodic:1140 [120]
7	1	195.415188	periodic	1140	d..2.	sched/sched_switch	periodic:1140 [120] R ==> periodic:1139 [120]
8	1	195.431189	periodic	1138	d..2.	sched/sched_switch	periodic:1138 [120] R ==> periodic:1140 [120]
9	1	195.439191	periodic	1140	d..2.	sched/sched_switch	periodic:1140 [120] R ==> periodic:1139 [120]
10	1	195.448146	periodic	1138	d..2.	sched/sched_switch	periodic:1138 [120] S ==> periodic:1140 [120]
12	1	195.459190	periodic	1138	d..2.	sched/sched_switch	periodic:1138 [120] R ==> periodic:1140 [120]
13	1	195.464235	periodic	1140	d..2.	sched/sched_switch	periodic:1140 [120] S ==> periodic:1138 [120]
14	1	195.603002	ktimers/1	27	d..2.	sched/sched_switch	ktimers/1:27 [98] S ==> periodic:1140 [120]
16	1	195.603227	ksoftirqd/1	28	d..2.	sched/sched_switch	ksoftirqd/1:28 [120] S ==> periodic:1140 [120]
17	1	195.615195	periodic	1140	d..2.	sched/sched_switch	periodic:1140 [120] R ==> periodic:1139 [120]

Question 2:

Task parameters:

- Task 1: real-time priority = 3 (high)
- Task 2: real-time priority = 2
- Task 3: real-time priority = 1 (low)



Question 3:

In question 2, with real-time priorities assigned, the task exhibits more predictable and deterministic behavior compared to question 1. Real-time priorities ensure that tasks have deterministic scheduling behavior, meaning they have higher priority compared to non-real-time tasks and are scheduled ahead of them.

Question 4:

Contributions

Keerthana Bidare (kbida003)

1. Created the miscellaneous device,Implemented set_rtmon and cancel_rtmon.
2. Helped in implementation and debugging of WAIT_FOR_NEXTPERIOD along with the logic for the hrtimer.

Dhanush Radhakrishna (dradh003)

1. Implemented read handler for the misc driver.
2. Implemented the WAIT_FOR_NEXTPERIOD along with all the research and logic for the hrtimer.

Akshay Jayaram (ajaya026)

1. Setup of KernelShark and executing the trace-cmd files.
2. Report.