OS Project 3

OS Team 7

COM9 - PuTTY

```
[  OK  ] Started Cynara service.
[FAILED] Failed to start nether service.
See "systemctl status nether.service" for details.
[  OK  ] Started Generate Bluetooth Address.
[  OK  ] Started sdbd.
[  OK  ] Started Permit User Sessions.
[  OK  ] Started Network Configuration service.
[  OK  ] Started Cleanup private sharing.
[  OK  ] Stopped nether service.
         Starting nether service...
[  OK  ] Started Buxton2 Configuration Service.
         Starting Buxton2 Configuration Service...
         Starting Connection service...
[  OK  ] Started D-Bus System Message Bus.
[  OK  ] Started Alarm server.
[  OK  ] Started Connection service.
         Starting D-Bus System Message Bus...
         Starting Start Application Management Daemon...
[  OK  ] Started Start the Event System Daemon.
         Starting[   24.145397] [c6] usb_mode usb0: slp_multi_usb: ena
S 'mtp'
[   24.151289] usb_mode usb0: slp_multi_usb: Cannot enable ''
 Start the Event System Daemon...
         Starting pulseaudio service...
         Starting Import APP DEKs for Preloaded Web App Decryption...
[FAILED] Failed to start nether service.
See "systemctl status nether.service" for details.
[  OK  ] Started Import APP DEKs for Preloaded Web App Decryption.
[  OK  ] Started Login Service.
[  OK  ] Started Tiny Login Manager.
         Starting Tiny Login Manager...
[  OK  ] Stopped nether service.
         Starting nether service...
         Starting Hostname Service...
         Starting User Management service...
         Starting tdm-socket setup service...
[  OK  ] Started System device daemon.
[  OK  ] Started Start Application Management Daemon.
[FAILED] Failed to start nether service.
See "systemctl status nether.service" for details.
[FAILED] Failed to start Display manager.
See "systemctl status display-manager.service" for details.
[  OK  ] Started User Management service.
[  OK  ] Started pulseaudio service.
[  OK  ] Started Hostname Service.
[  OK  ] Started Data Provider Master.
[  OK  ] Stopped nether service.
         Starting nether service...
[  OK  ] Started Start the focus profile service.
         Starting Start the focus profile service...
[  OK  ] Started Call Manager Daemon.
         Starting Call Manager Daemon...
[  OK  ] Created slice user-5001.slice.
         Starting User Manager for UID 5001...
         Starting muse server...
[FAILED] Failed to start tdm-socket setup service.
See "systemctl status tdm-socket.service" for details.
[FAILED] Failed to start nether service.
See "systemctl status nether.service" for details.
[  OK  ] Started muse server.
[  OK  ] Reached target Multi-User System.
[  OK  ] Reached target Graphical Interface.
[  OK  ] Started User Manager for UID 5001.

localhost login: root
Password:
2.4+ kernel w/o ELF notes? -- report this
Welcome to Tizen
root:~>
```

tmux /home/kajebiii/os-team7/test

```
kajebiii@ubuntu ~/o/t/shellScript> ./proc_kmsg.sh
```

동영상 캡처

저장 설정

C:₩Users₩JongBeom Kim₩Desktop

파일 이름 머릿글:

끊기 사용 | 시간 단위로 끊기 | 용량 단위로 끊기

60 분 | 500 MB

출력 설정

파일 포맷: MKV(권장) | 배속: 1

영상 코덱: MPEG-4

영상 품질: 2000 kbps | 고품질 압축 사용

영상 크기: 원본 그대로 | 가로 크기로 비율 유지(권장)

FPS: 원본 FPS 사용 | 영상 압축시 쓰레드 사용

소리 코덱: MP3 | 128 kbps

샘플 수: 원본 그대로 | 원본 그대로

정보

파일명: 스크린 캡처_20180520_184718.mkv

저장 시간: 00:00:07 | 용량: 1.88MB / 200.8GB

저장 폴더 열기 | 시작

닫기(C)

방송하기 | 모드

00:00:00 / 00:00:00

360° | 3D

```
[0] 0:fish  1:fish  2:fish  3:fish  4:fish  5:fish  6:fish  7:fish  8:vim- 9:fish*          "fish  /home/kajebiii/" 18:48 20-May-18
```

wrr_sched_entity / wrr_rq

```
struct sched_wrr_entity {
        int weight;
        struct list_head run_list;
        int time_slice;
};

struct wrr_rq {
        unsigned int wrr_weight_sum;
        struct list_head run_list;
        unsigned long next_balance;
};
```

wrr.c (Basic)

- enqueue_task_wrr: enqueue task to wrr_rq
- dequeue_task_wrr: dequeue task to wrr_rq
- yield_task_wrr: Move first task of wrr_rq to last
- pick_next_task_wrr: pick first task of wrr_rq and returns it
- task_tick_wrr:
  - decreases time slice for task.
  - If it becomes zero, (probably) rescshedule it.

wrr.c (Multicore case)

- CONFIG_SMP
  - If this flag is defined, we define more functions for multicore support
- select_task_rq_wrr
  - Pick minimum weight CPU that can handle this task.
  - Passive load balance

wrr.c (Load balance)

- SCHED_SOFTIRQ_WRR: Signal for load balancing our wrr rq
- Init_sched_wrr_class: Registers handler for SCHED_SOFTIRQ_WRR
- Run_rebalance_domains_wrr: Performs load balance
  - Find min_cpu, max_cpu
  - Find task that can be migrated
  - Migrate that task from min_cpu to max_cpu

Other Edited Files

- Include/linux/init_task.h: Initialize base policy, wrr_sched_entity
- Include/linux/interrupt.h: Added SCHED_SOFTIRQ_WRR
- Include/uapi/linux/sched.h: Added SCHED_WRR policy
- Kernel/kthread.c: Changed base policy to SCHED_WRR
- Kernel/sched/core.c: Change base policy to SCHED_WRR, trigger load balance
- Kernel/sched/debug.c: Print some informations about WRR
- Kernel/sched/rt.c: change next scheduler to WRR

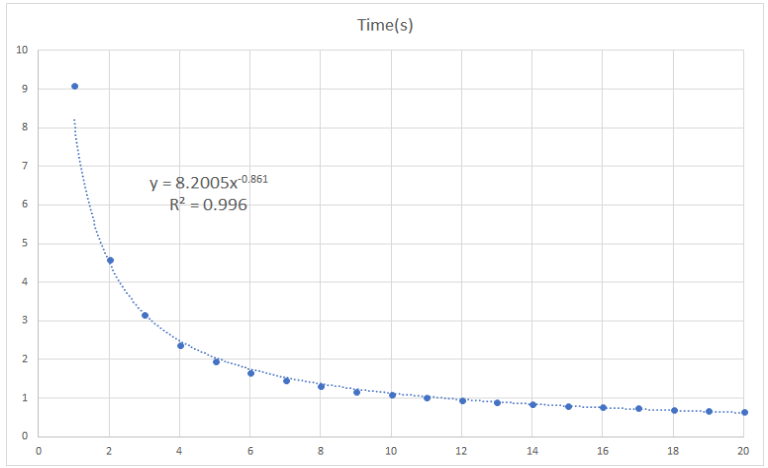
Concurrency control

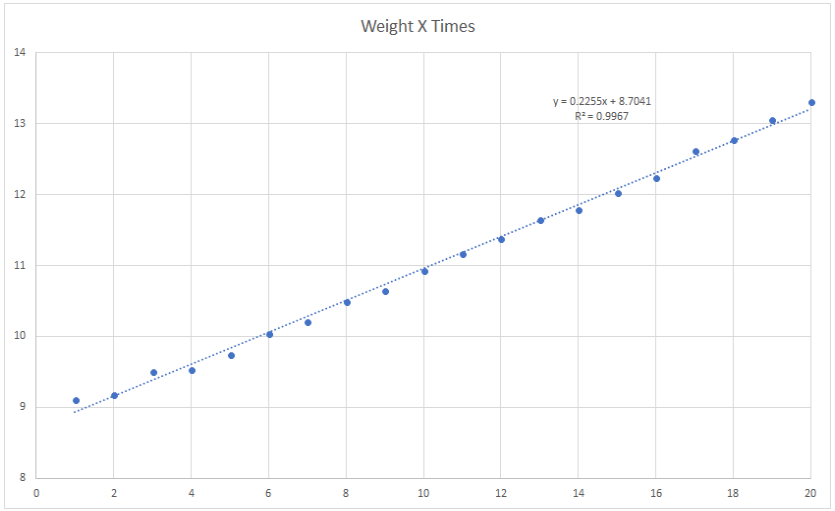
- Lock related with scheduler
  - task_struct.pi_lock : Lock of task_struct
  - rq.lock : Lock of runqueue
  - rcu_read_lock : Accquire when access cpu-related information. Almost every where.
- Assume that every callback in sched_class will call with accquired rq's lock and rcu_read_lock
- In setweight system call, we should get rq lock of given task
  - core.c's task_rq_lock : acquire given task_struct's pi_lock and correspond runqueue's lock and return runqueue
- In load_balance, when move task, we should get source and destination run queue's lock.
  - Use core.c's double_rq_lock to get both lock for preventing deadlock

Test code

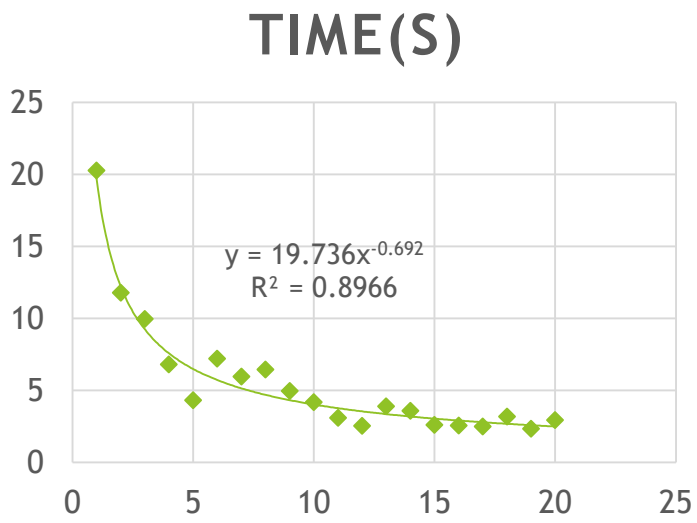
- Calls lots of spinning process
  - Set process weight to random value between 1~20
  - While(1);
- Call factorization code
  - For each weight, calculate factorization result ITER(=100) times
  - Get average for each weight

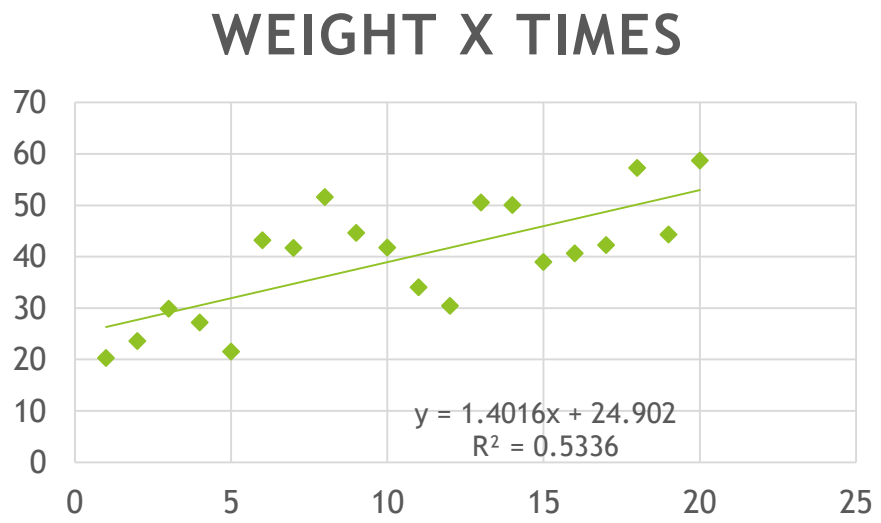
Average Wall-clock time by Weight





Without Active Load balancing





With Load balancing