CFS 스케줄러 파라메터

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Outline

- **CFS 스케줄러 파라메터 설명**

- **파라메터 변경 후 Trace**

Why talk about parameters?

- **CFS scheduler depends on CFS parameters.**

- **Parameters prevent context switch overhead.**

- **Tuning Value**
  - sched_nr_latency
  - sysctl_sched_latency
  - sysctl_sched_min_graularity
  - sysctl_sched_wakeup_granularity

CFS time slice

time_slice =

(sched_period * se.load.weight) / cfs_rq.load.weight;

Time slice and task load

```
time_slice =
(sched_period * se.load.weight) / cfs_rq.load.weight;
```

- nr_running : number of threads in runqueue

```
if nr_running <= nr_latency
    sched_period = sched_latency
else
        sched_period = min_granularity x nr_running
```

Parameter values

- **rq->nr_running**
- **sched_nr_latency**
  - sched_latency_ns / sched_min_granularity
- **sched_latency_ns**
  - 예 : 6000000 * factor(3) = 18000000(ns)
  - “/proc/sys/kernel/sched_latency_ns”
- **factor**
  - 스케일링 정책에 따른 비율 (예 - factor=3)
- **sched_min_granularity**
  - 최소 스케쥴 기간
  - 예) 750000 * factor(3) = 2250000(ns)
  - “/proc/sys/kernel/sched_min_granularity_ns”
- **sched_wakeup_granularity_ns**
  - 태스크의 wakeup 기간으로 디폴트 값(1000000) * factor(3) = 3000000(ns)
  - “/proc/sys/kernel/sched_wakeup_granularity_ns”

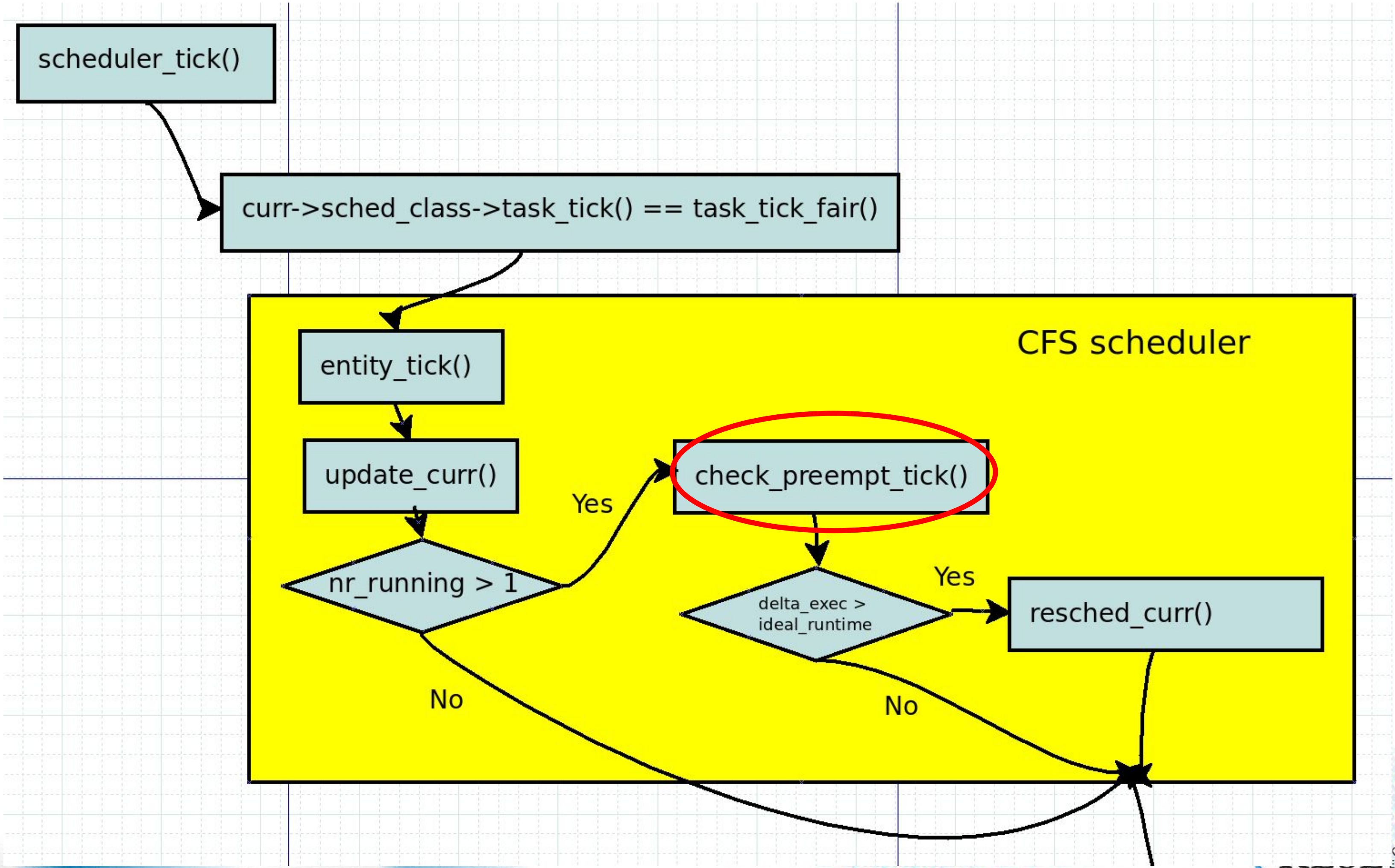
vruntime

vruntime +=
delta_exec * (NICE_0_LOAD / curr->load.weight);

- **delta_exec**
  - the time spent by the task since the last time vruntime was updated

When schedule a task

- **Scheduler Tick**



check_preempt_tick

- **delta_exec**
  - the time spent by the task since the last time vruntime was updated

```
if (delta_exec > time_slice)
    reched_task();
else if ((delta_exec < min_granularity)
    retrun; // To prevent context switch overhead
```

wakeup_preempt_entity

```
gran =
sched_wakeup_granularity * (NICE_0_LOAD / se>load.weight);
```

- **cur : wake-up task, se : running task**

```
if (cur->vruntime <= se->vruntime)
    return;
else ((cur->vruntime - se->vruntime) > gran)
    resched_task();
```

Next Step.

Energy-aware scheduling: EAS

1. **Load Balancer(Group Scheduling, Bandwidth Control, PELT)**
2. **EAS features**

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