RATE MONOTONIC WITH APERIODIC TASKS (POLLING SERVER) FEASIBLE

	PRIORITIES:	PERIOD:	DEADLINE:	WCET:
PING:		600	400	100
WCET:		1400	1200	300
FTP:		1200	800	400
		1800	1600	100

SERVER:

$$\text{FEASABILITY} = \left(\frac{1}{6}+1\right)\cdot\left(\frac{3}{14}+1\right)\left(\frac{1}{3}+1\right)\cdot\left(\frac{1}{18}+1\right)\le 2 \qquad \overbrace{1,98}^{\text{FEASIBLE}} > 2$$
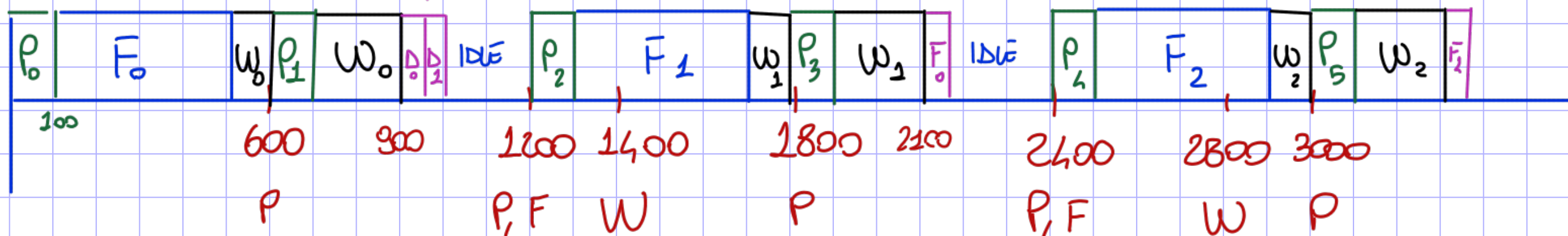
4 TASK APERIODICI:

DNS: WCET 48

FIRMWARE: WCET 60

APERIODIC TASKS

FIRMWARE ∅ (BUDGET IS 100, 60 IS THE DURATION OF F_0 + 60 DURATION OF F_1 BUT 60+60=120>100)

| P_0 | F_0 | | W_0 | P_1 | W_0 | D_0 D_1 | IDLE | P_2 | F_1 | W_1 | P_3 | W_1 | F_0 | IDLE | P_4 | F_2 | W_2 | P_5 | W_2 | F_1 |

100   600   900   1200 1400   1800 2100   2400   2800 3000

P   P,F W   P   P,F   W   P

FIRST

TWO

DNS

```
[START] Tick count 600 - Task Client1 - LastWakeTime 600 - Priority 9


[CLIENT] Client 1 pings: 64 Bytes
[END] Execution time 52 (WCET: 100) - Task Client1

[SERVER] DNS Update
[PS] Aperiodic Task Server executed - Polling Server Budget = 79


[SERVER] DNS Update
[PS] Aperiodic Task Server executed - Polling Server Budget = 61
[PS] Next Aperiodic Task Server not schedulable - Reset Polling Server Budget to 100

[END] Execution time 40 (WCET: 100) - Task PS
```

ONLY

1

FW

```
--------------------------------------------------------------------------
[START] Tick count 1850 - Task PS - LastWakeTime 1800 - Priority 6


[SERVER] Firmware Update
[PS] Aperiodic Task Server executed - Polling Server Budget = 46
[PS] Next Aperiodic Task Server not schedulable - Reset Polling Server Budget to 100


[END] Execution time 55 (WCET: 100) - Task PS


--------*[IDLE]*--------

--------------------------------------------------------------------------
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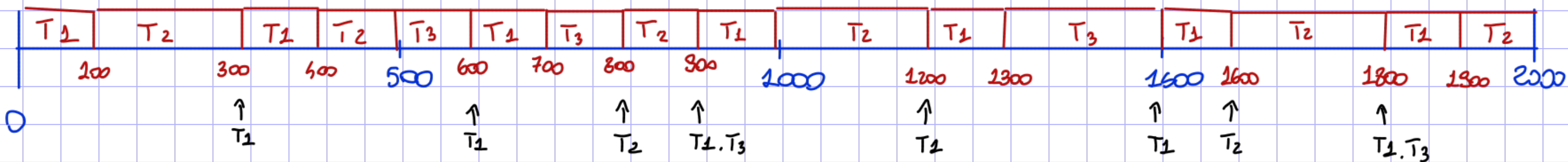
RM WCRT EXAMPLE

	PERIOD	WCET
TASK A:	300	100
TASK B:	800	300
TASK C:	800	200

FEASABILITY (RM): $\left(\frac{1}{3}+1\right)\left(\frac{3}{8}+1\right)\left(\frac{2}{9}+1\right) \leq 2$; $2,24 > 2$ NON FEASIBLE

T_1	T_2	T_1	T_2	T_3	T_1	T_3	T_2	T_1	T_2	T_1	T_3	T_1	T_2	T_1	T_2

0   200   300   400   500   600   700   800   900   1000   1200   1300   1600   1600   1800   1900   2000

↑ T_1 (at 300)
↑ T_1 (at 600)
↑ T_2 (at 800)
↑ $T_1.T_3$ (at 900)
↑ T_1 (at 1200)
↑ T_1 (at 1600)
↑ T_2 (at 1600)
↑ $T_1.T_3$ (at 1800)

```
U_max > 2

STANDARD FEASIBILITY TEST NOT PASSED

Task Client1 - WCET 100 - WCRT 100
Task Client2 - WCET 300 - WCRT 500
Task Client3 - WCET 200 - WCRT 800

FEASIBILITY WCRT TEST PASSED
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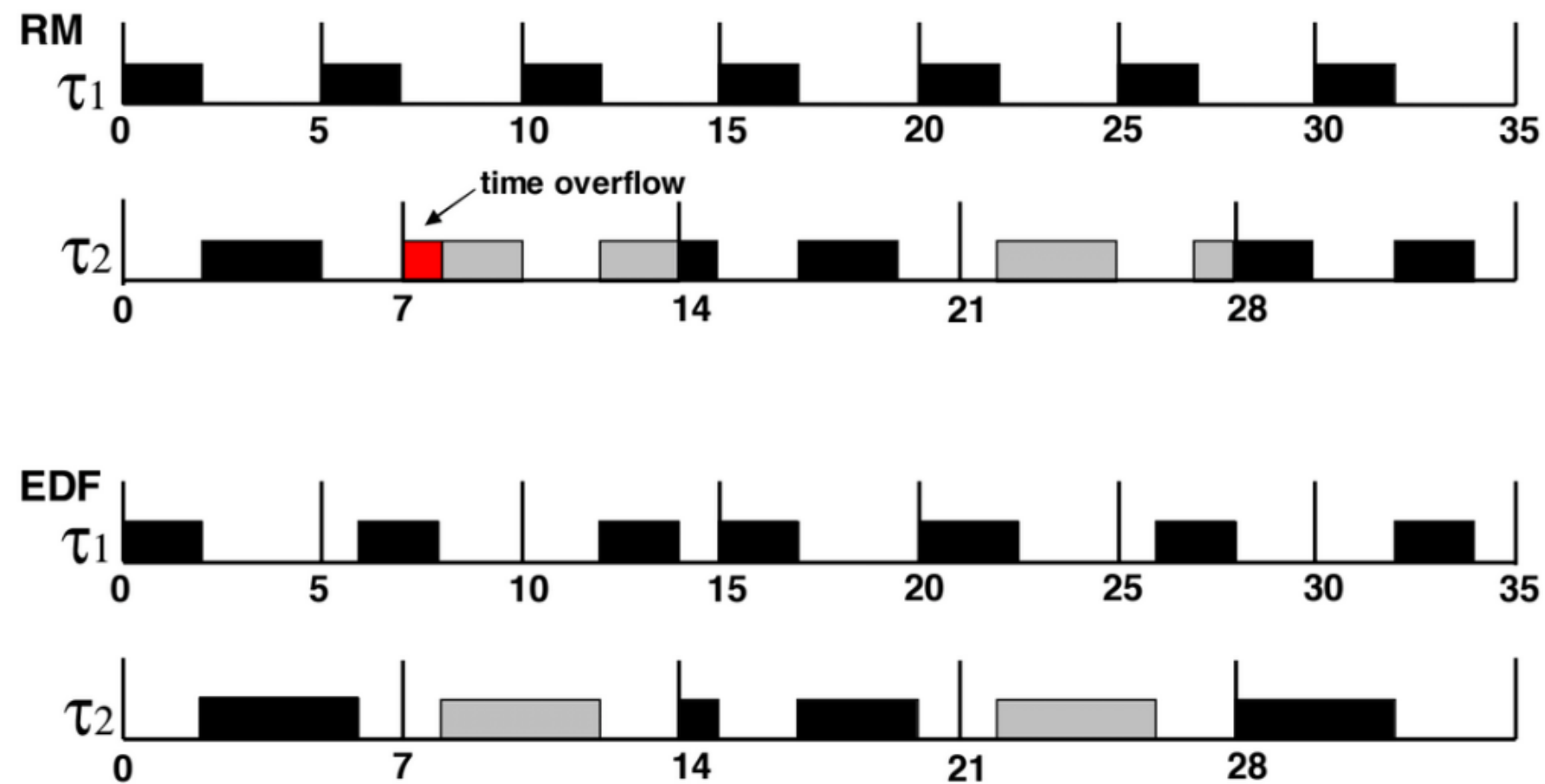
RM vs EDF

- $C_1=2, T_1=5, C_2=4, T_2=7$

RM — τ1, τ2 (time overflow marked in red) — **NOT FEASIBLE**

EDF — τ1, τ2

$$RM: \left(\frac{2}{5}+1\right)\left(\frac{4}{7}+1\right) \leq 2 \;\rightarrow\; 2,2 > 2 \;\; \text{NOT FEASIBLE}$$

```
U_max > 2

STANDARD FEASIBILITY TEST NOT PASSED

Task Client1 - WCET 200 - WCRT 200

FEASIBILITY WCRT TEST FAILED - The Task Set is not schedulable - EXITING PROGRAM
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EDF: $\frac{2}{5} + \frac{4}{7} = 0,97 < 1$ FEASIBLE

MA NON CON WCRT

SPUNTO PER DISCUSSIONE