Slack Stealing

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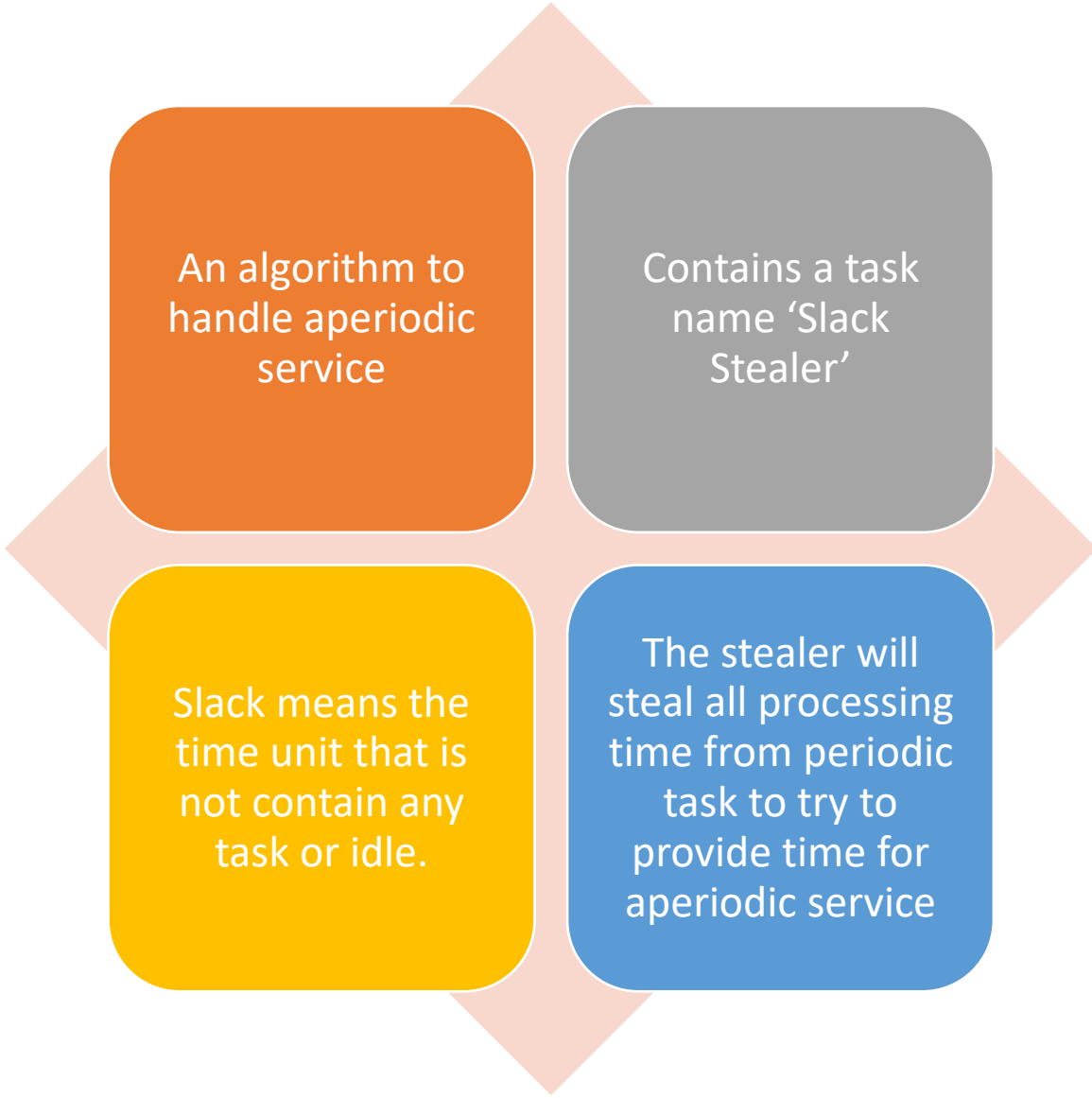
What is Slack Stealing?

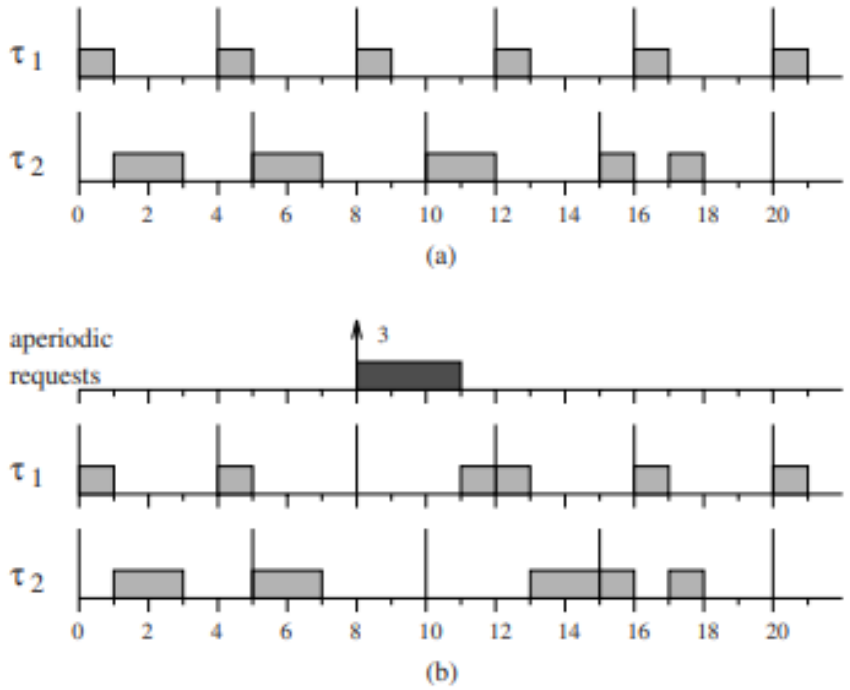


Why use Slack Stealing?

It schedule and handle aperiodic task as soon as possible.

To guarantee the schedulability of all critical tasks in worst-case conditions

To maintain long term reliability of the desired program.

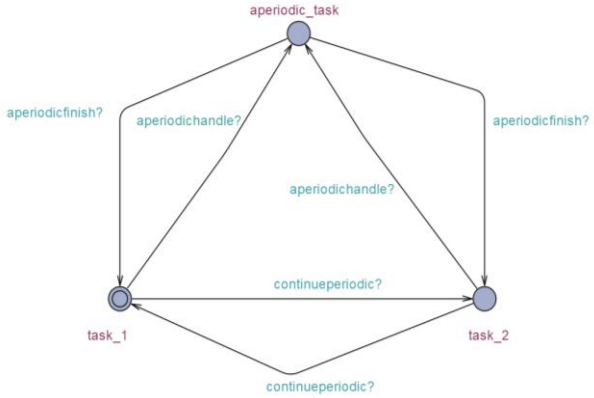


Periodic task	Periods / T	Execution Time/ C
τ1	4	1
τ2	5	2

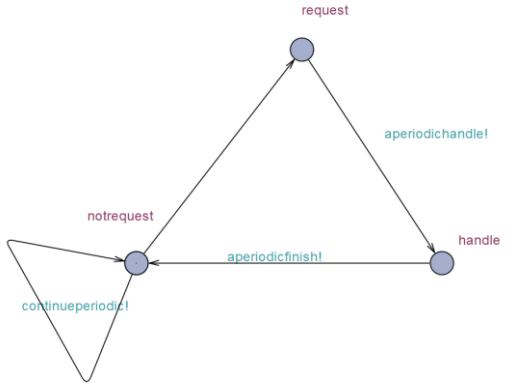
Model of Slack Stealing

- Figure (a) shows how periodic scheduling schedule when there is no aperiodic request.
- Figure (b) shows an aperiodic request of three units arrives at time t = 8

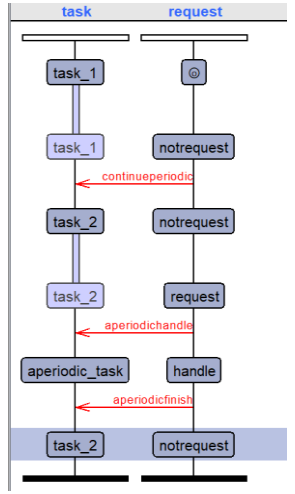
Simulation in UPPAAL



Scheduling Task



Request Task



Simulation

Performance

	Performance	Computational complexity	Memory requirement	Implementation complexity
Background Service	Poor	Excellent	Excellent	Excellent
Polling Server	Poor	Excellent	Excellent	Excellent
Deferrable Server	Good	Excellent	Excellent	Excellent
Priority Exchange	Good	Good	Good	Good
Sporadic Server	Good	Good	Good	Good
Slack Stealing	Excellent	Poor	Poor	Poor

Reference

- Thuel and Lehoczky, ”Algorithms for scheduling hard aperiodic tasks in fixed-priority systems using slack stealing,” 1994 Proceedings Real-Time Systems Symposium, 1994, pp. 22-33, doi: 10.1109/REAL.1994.342733.

- Real-Time-Systems/Slack Stealing Uppaal.xml at main · VillaKimi/Real-Time-Systems (github.com)

- Real-Time-Systems/Slack Stealing Documentation.pdf at main · VillaKimi/Real-Time-Systems (github.com)

Thank You