

Notes in ECEN 5623

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Quiz today, half lecture

The test will be on 3/8 or 3/10 possibly split over both.
Exercise isn't due until Saturday after next.
quiz done

Lecture

deadline monotonic sufficient feasibility:
for all tasks i :

$$\frac{C_i + I_i}{D_i} \leq 1.0$$
$$I_i = \sum_{j=1}^{i-1} \lceil \frac{D_i}{T_j} \rceil C_j$$

improved interference estimation, still not N&S though:
in the notes
N&S feasibility tests are $O(N^3)$. proven with some calculus.

look up optimization algorithms for real-time applications.

dynamic allocation of new services in fixed priority systems.
requires calculation of new priorities.

feasibility test is created as a service in the system.

Pathfinder mission is an example of this.

EDF sufficient test based on hyper period is:

$$\sum_{i=1}^m \left(\frac{C_i}{T_i} \right) \leq 1$$

blocking is possible any time you have shared memory. Often designing better hardware helps with this.
interrupts and dmas help with many of these problems.

sometimes you might have priority inversion and it might be okay because you know how long it lasts.

most of the time the first person to get called when something breaks is the real time person.

spin-locks are apparently used by linux. limits the amount of time after a blocking situation occurs.

priority ceiling protocol. Safe from unbounded inversion because the low priority service inherits the higher priority service priority.

priority inversion wasn't really known about until the 80s.

RM vs EDF: paper judgement day vs Giorgio Buttazzo.
pretty complete discussion of the issue.
relative vs absolute time.

next timing services