## Basic equations

$U(n) = \sum_{i=1}^{n} \frac{C_i}{T_i} \leq n \cdot (2^{\frac{1}{n}} - 1)$
$\prod_{i=1}^{n} (\frac{C_i}{T_i} + 1) \leq 2$
$\forall i, Rwc_i = I_i + C_i$
$I_i = \sum_{k \in hp(i)} \lceil \frac{Rwc_i}{T_k} \rceil \cdot C_k$
$U(n) = \sum_{i=1}^{n} (\frac{C_i}{T_i}) \leq 1$
$L(0) = \sum_i (C_i)$
$L(m+1) = \sum_i (\lceil \frac{L(m)}{T_i} \rceil \cdot C_i)$
$h(t) = \sum_{i=1..N} max(0, 1 + \lfloor \frac{t - D_i}{T_i} \rfloor) \cdot C_i)$
$S = \bigcup_i (S_i), S_i = \{m \cdot T_i + D_i\}, m = 0, 1, ...$

## With blocking times

$\forall_{1 \leq i \leq N} \sum_{h: P_h > P_i} (\frac{C_h}{T_h}) + \frac{C_i + B_i}{T_i} \leq i \cdot (2^{\frac{1}{i}} - 1)$
$R_i(0) = C_i + B_i$
$R_i(m) = C_i + B_i + \sum_{h: P_h > Pi} \lceil \frac{R_i(m-1)}{T_h} \rceil C_h$

## Servers

$Rwc_i^a = Ca_i + (T_s - C_s) \cdot (1 + \lceil \frac{Ca_i}{C_s} \rceil)$
$U_p + U_s \leq (n+1) \cdot (2^{\frac{1}{n+1}} - 1)$
$U_p \leq n \cdot [(\frac{2}{U_s + 1})^{\frac{1}{n}} - 1]$
$\prod_{i=1}^{n} (U_i + 1) \leq \frac{2}{U_s + 1}$
$U_{lub}^{DS} = U_s + n \cdot [(\frac{U_s + 2}{2 \cdot U_s + 1})^{\frac{1}{n}} - 1]$
$U_p^{SS} \leq n \cdot [(\frac{2}{U_s + 1})^{\frac{1}{n}} - 1]$ ; $\prod_{i=1}^{n} (U_i + 1) \leq \frac{2}{U_s + 1}$
$d_k = max(r_k, d_{k-1}) + \frac{C_k}{U_s}$
$If\ r_k + \frac{c_s}{U_s} < d_s^{actual},\ then\ d_s^{actual}\ does\ not\ change.$
$Otherwise,\ d_s = r_k + T_s\ and\ c_s = Q_s$
$If\ c_s = 0 : d_s = d_s + T_s\ and\ c_s = Q_s$

## Non-preemption

$L_i(0) = B_i + C_i$
$L_i(s) = B_i + \sum_{h: P_h \geq P_i} \left\lceil \frac{L_i(s-1)}{T_h} \right\rceil \cdot C_h$
$K_i = \left\lceil \frac{L_i}{T_i} \right\rceil$
$s_{i,k}^{(0)} = B_i + \sum_{h: P_h > P_i} C_h$
$s_{i,k}^{(l)} = B_i + (k-1) \cdot C_i + \sum_{h: P_h > P_i} \left( \left\lfloor \frac{s_{i,k}^{(l-1)}}{T_h} \right\rfloor + 1 \right) \cdot C_h$
$f_{i,k} = s_{i,k} + C_i$
$Rwc_i = \max_{k \in [1, K_i]} \{f_{i,k} - (k-1) \cdot T_i\}$

## Overheads

$\sigma = \frac{C_1^1 - C_1^0}{\left\lceil \frac{C_1^1}{T_{Tick}} \right\rceil}$ ; $\delta = \frac{C_1^1 - C_1^0}{\left\lceil \frac{C_1^1}{T_2} \right\rceil}$

## Release jitter

$\forall i, Rwc_i = I_i + C_i$, with $I_i = \sum_{k \in hp(i)} \left\lceil \frac{Rwc_i + J_k}{T_k} \right\rceil \cdot C_k$

$Rwc_i(0) = \left( \sum_{k \in hp(i)} C_k \right) + C_i$

$Rwc_i(m+1) = \left( \sum_{k \in hp(i)} \left\lceil \frac{Rwc_i(m) + J_k}{T_k} \right\rceil \cdot C_k \right) + C_i$

## Multicore

$C_i^S = \sum_{j=1}^{m_i} c_{i,j}$ ; $U_i = \frac{C_i^S}{T_i}$
$\alpha_i = \frac{T_i}{D_i}$ ; $V = \sum_i^n a_i$
$M_{lb} = \lceil \frac{V}{c} \rceil$ ; $M_{ub} = \lceil \frac{2 \cdot V}{c} \rceil$
$M_{on} \geq \frac{4}{3} M_o$

- NF/WF never use more than $2 \cdot M0$ bins
- FF/BF never use more than $(1.7 \cdot M0 + 1)$ bins
- FFD never uses more than $(\frac{4}{3} M0 + 1)$ bins
- FFD never uses more than $(\frac{11}{9} M0 + 4)$ bins
- Task sets with $U \leq \frac{m+1}{2}$ are schedulable with $m$ processors using FF + EDF scheduling.
- Task sets with $U \leq m(2^{\frac{1}{2}} - 1)$ are schedulable with $m$ processors using FF + RM scheduling.
- When each task has utilization $u_i \leq \frac{m}{3m-2}$, the task set is feasible by global RM scheduling if $U \leq \frac{m^2}{3m-2}$.