Function Reusing Based Task Distribution between Edge Cloud and Central Cloud in Hybrid CRAN

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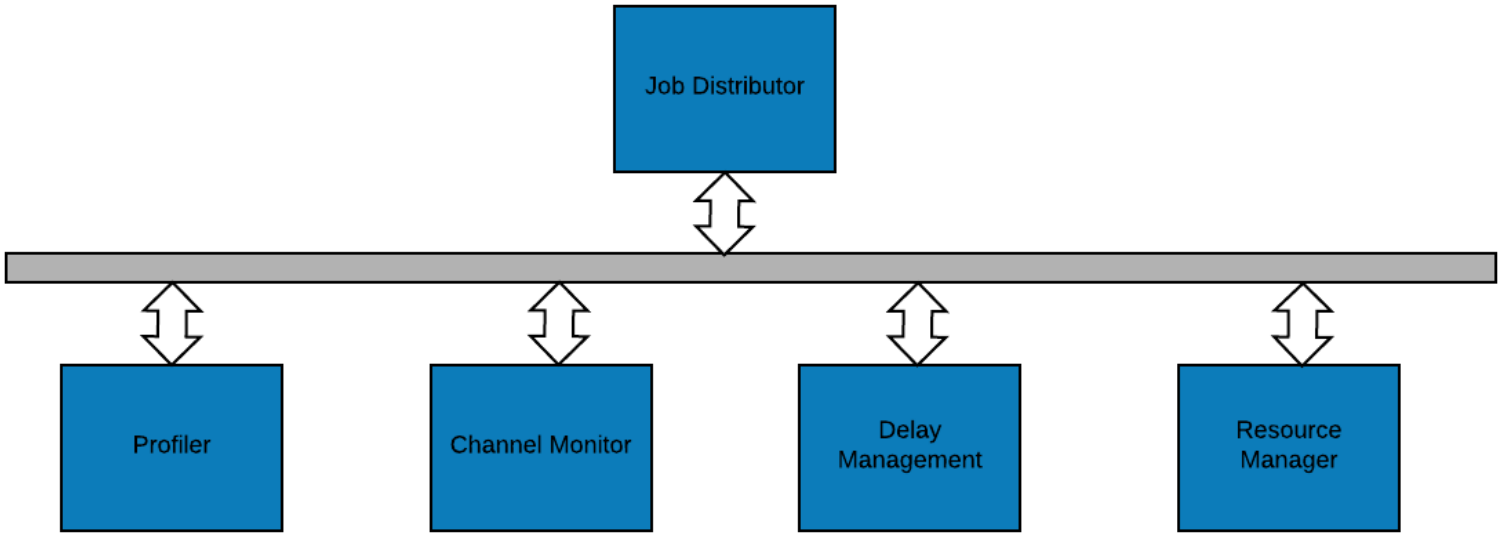
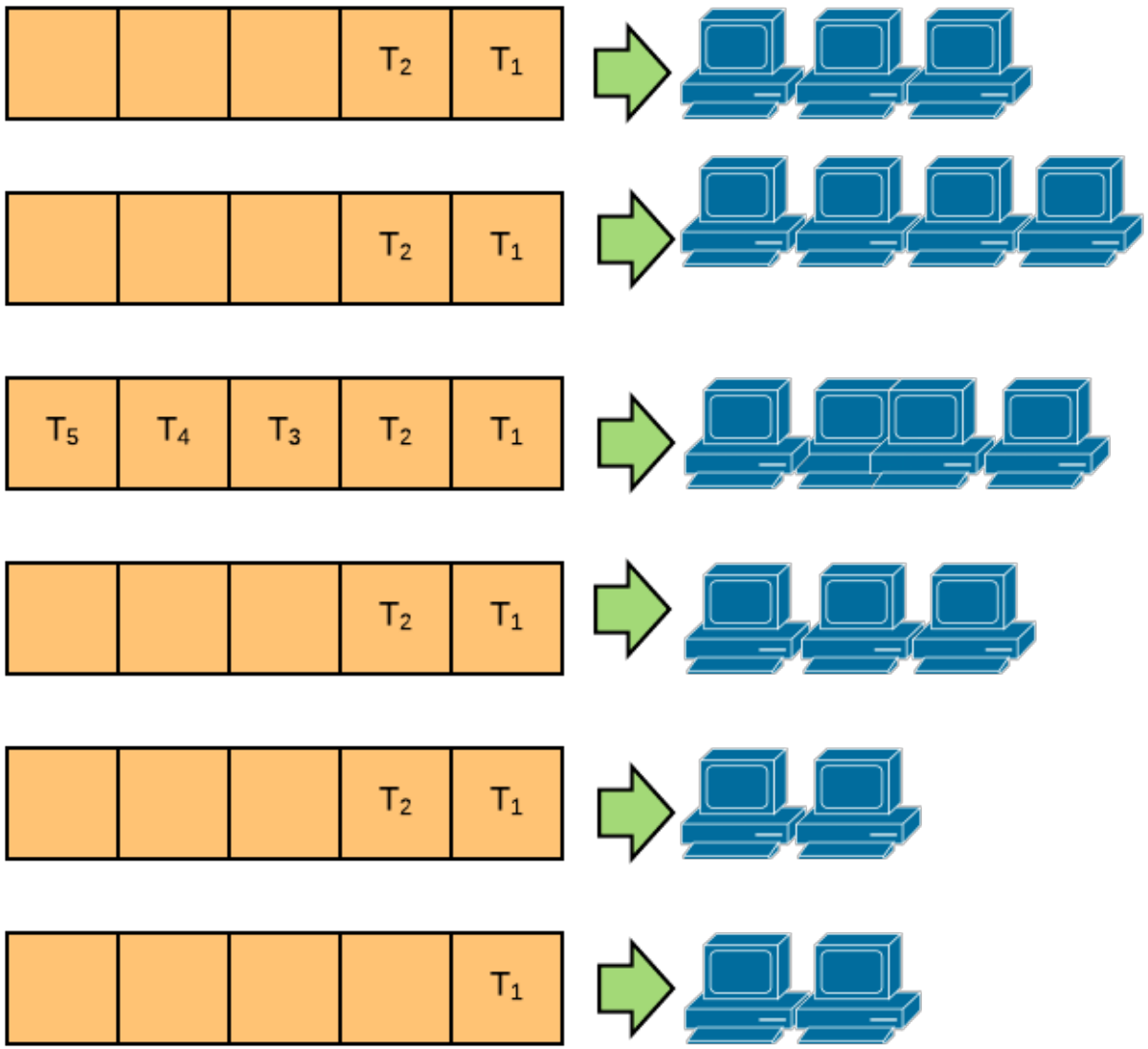
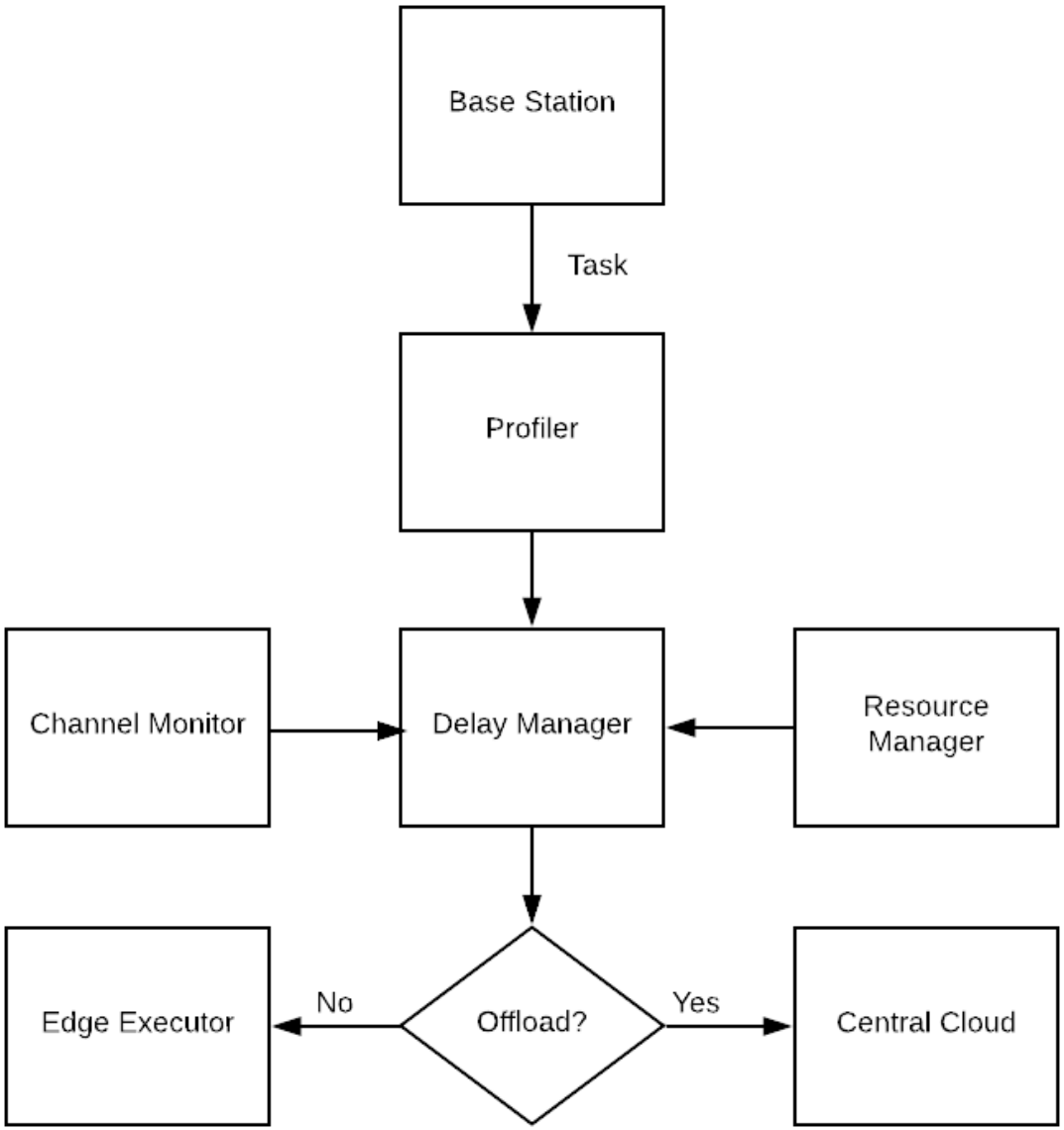
Proposed Model



Queueing Model



Flowchart


Base Station
Task
Profiler
Channel Monitor
Delay Manager
Resource Manager
Edge Executor
No
Offload?
Yes
Central Cloud

Proposed Delay Calculation Formula

$$T_{EC} = t^{EC}_{exe} + t^{EC}_{waiting} + t^{EC}_{VM\ creation}$$
$$T_{CC} = t^{CC}_{exe} + t^{CC}_{trans}$$

We will calculate T_{exe} using the total number of required CPU cycles to complete a task. And $T_{waiting}$ using the Queueing theory.

Proposed Delay Calculation Formula

$$K^{EC} = \lambda^t t^{EC} + \lambda^e e^{EC}$$
$$K^{CC} = \lambda^t (t^{CC}_{off} + t^{CC}_{exe}) + \lambda^e e^{CC}_{off}$$

(Computation Cost [1])

Where, $\lambda^t, \lambda^e \in [0, 1]$

$$G = (1 - \alpha) \times G_1 + \alpha \times G_2$$

(Tradeoff Matric [2])

Where, G_1 and G_2 is gain/loss achieved in time and energy, respectively.
$0 \leq \alpha \leq 1$

References

[1] Macro Levorato Anna V. Gugleilmi and Leonardo Badia. "A baysean Game Theoretic Aproach to Task Offloading in Edge and Cloud Computing". In: IEEE.

[2] Mahbub E. Khoda et al. "Efficient Computation Offloading Decision in Mobile Cloud Computing over 5G Network". In: *MONET* 21.5 (2016), pp. 777–792.

Thank You