

# List-based scheduling intermediate paper

Patrick NONKI

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There is a lot of list based scheduling algorithms that have been developed by the researchers over the years. In this paper we'll have to present some of them and basically how they operate. But all these methods have a common procedure; they all use the same phases [1]:

- The prioritizing phase: where each task is assigned a priority
- The selection phase: where each task is selected regarding its priority and the ready state
- The processor selection: where a processor is selected for running the chosen task.

## 1 CPOP Algorithm

The CPOP (Critical path on processor) algorithm is based on both upward and downward ranking techniques. It has 2 steps: The task prioritization and the task allocation phases.

On the task prioritization phase, they are prioritized based on their rank values(rank upgrading way + rank downgrading way) that are calculated based on the DAG (Direct acyclic node graph where all the tasks are represented by precedence) [1], and set in a table in a decreasing order.

On the allocation phase, they are selected based on the highest rank value and then assigned to the processor having the less processor cost.

## 2 HCPT Algorithm

This algorithm is divided in three steps:

- The level sorting phase: Where the DAG is traversed from up to down to sort and group tasks on each level that are independent.
- The task prioritization phase: Where tasks are prioritized based on the ranking values as shown in the CPOP.
- The processor selection phase: Where the processor is selected based on the EFT (Earliest finish time) value of each task on a given processor [2].

### 3 HPS Algorithm

The HPS (High Performance task Scheduling) algorithm uses the same steps as the one above. As a major change, we can note that:

- In the task prioritization phase, priorities are assigned based on the Down link cost (DLC) that is the maximum communication cost from a task to his predecessors, the up link cost (ULC) that is the maximum communication cost from a task to his successors, and the link cost (LC) that is the sum of DLC and ULC. The highest priority is then given to the task with the highest LC [1].

### References

- [1] Hamid Arabnejad. List Based Task Scheduling Algorithms on Heterogeneous Systems - An overview. page 10.
- [2] C Subramanian, N Rajkumar, and S Karthikeyan. LIST BASED SCHEDULING ALGORITHM FOR HETEROGENEOUS SYSYTEM. *2015*, 10:6, 2015.