Dual Vth Algorithm
Group 24
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The LVT Design and the required Savings are received as input

If the required Savings is not valid (smaller than zero or greater than one) exit

Save the Design leakage power (LVT-Power) : the power of the design
with only LVT cells (LVT-Design);
Compute the minimum possible leakage power (HVT-Power): the power
of the design with only HVT cells (HVT-Design);
Define and set new attributes for each cells: LVT-Power, HVT-Power.

If the required Savings exceed the maximum Savings achievable
swap all the cells from LVT to HVT and return the new Design,
otherwise continue.

If the required power is closer to LVT-Power insert HVT-cells into LVT-Design
otherwise insert LVT-cells into HVT-Design

In the HVT-Design the best choice is to swap the cells from critical
and quasi-critical paths into LVT.

In the LVT-Design the best choice is to swap into HVT the cells from the paths
with the greater slack but removing from this subset the cells also inside
critical paths.

With the selected subset of cells is it possible to meet the constraints?
If not change get_timing_paths command options (slack_greater/lesser_than,
nworst) to include more cells, otherwise continue.

For each and every cell of the subset compute:
dP as the difference between the LVT and HVT power of the cell;
N as the number of paths in the subset in which the cell is included.
Maximum N among the cells is saved for HVT-Heuristics

For each and every path of the subset compute the ratio between:
- The maximum arrival time and arrival time of the path for LVT-Design;
- The arrival time of the path and the minum arrival time for HVT-Design.
To set the maximum number of cells to swap per iteration of the Heuristics.

HVT Heuristics

The subset is scrolled down starting from the path with greater slack
to the path with smaller (or negative if needed) slack.
Two parameters are taken into account:
Only cells with N equal to one are considered at the first iteration.
If the number of cells exceed the maximum number of cells swappable per iteration
for the path, the best are selected by dP (maximum available).
If the heuristics didn't meet the constraints, it increments N and repeat.

LVT Heuristics

The subset is scrolled down starting from the path with smaller slack
to the path with greater slack.
Two parameters are taken into account:
Only cells with N equal to Nmax are considered at the first iteration.
If the number of cells exceed the maximum number of cells swappable per iteration
for the path, the best are selected by dP (minimum available).
If the heuristics didn't meet the constraints, it decrement N and repeat.