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| --- | --- | --- | --- | --- |
| **Circuit** | **Architecture** | **Constraints** | **Results with Attraction Groups** | **Results without Attraction Groups** |
| alu4 | k4\_N8\_topology-0.85sL2-0.15gL4-on-cb-off-sb\_22nm\_22nm.xml | All blocks fixed to one spot. | VPR succeeds. | VPR has placement consistency errors. |
| alu4 | k4\_N8\_topology-0.85sL2-0.15gL4-on-cb-off-sb\_22nm\_22nm.xml | Some blocks fixed to small regions. | VPR succeeds. | VPR succeeds. |
| alu4 | k4\_N8\_topology-0.85sL2-0.15gL4-on-cb-off-sb\_22nm\_22nm.xml | Some blocks fixed to large regions. | VPR succeeds. | VPR succeeds. |
| alu4 | k4\_N8\_topology-0.85sL2-0.15gL4-on-cb-off-sb\_22nm\_22nm.xml | All blocks fixed to large regions | VPR gets stuck in initial placement.\* | VPR gets stuck in initial placement.\* |
| alu4 | k6\_frac\_N10\_40nm.xml | All blocks fixed to one spot. | VPR has placement consistency errors. | VPR has placement consistency errors. |
| spla | k4\_N8\_topology-0.85sL2-0.15gL4-on-cb-off-sb\_22nm\_22nm.xml | All blocks fixed to one spot. | VPR succeeds. | VPR has placement consistency errors. |
| spla | k4\_N8\_topology-0.85sL2-0.15gL4-on-cb-off-sb\_22nm\_22nm.xml | Some blocks fixed to small regions. | VPR succeeds. | VPR succeeds. |

\*The reason this happens is that some blocks whose PartitionRegions overlap are packed together. However, after overlapping the PartitionRegion becomes relatively small. By the time the placer gets to this block during initial placement, the few grid locations that would have been valid for it have already been used, thus putting the placer in a loop where it’s never able to place the block.

Notes

Two main issues popping up across the tests:

1. Placement consistency errors
   1. happen when blocks that are all fixed to one spot are split into two or more blocks (usually just two)
   2. attraction groups help get rid of this on the k4\_N8\_topology-0.85sL2-0.15gL4-on-cb-off-sb\_22nm\_22nm.xml arch, not the harder one k6\_frac\_N10\_40nm.xml
2. Getting stuck in initial placement
   1. happens when all valid spaces for a block have been used by the time the placer gets to that block
   2. attraction groups might help with this if the blocks from partition are packed together so there is less intersecting of different PartitionRegions (which makes them smaller, making it easier for the valid cases to be used up)
   3. might also have to change initial placement so that blocks with smaller constraints get placed first
      1. good time to switch the from the is\_pr\_size\_one approach (which just checks whether the blocks are cover one spot) to the dynamic programming approach to calculating PartitionRegion size
      2. with the actual PartitionRegion size, can make it so that blocks with smaller regions are placed first