

Analog Open Constraints

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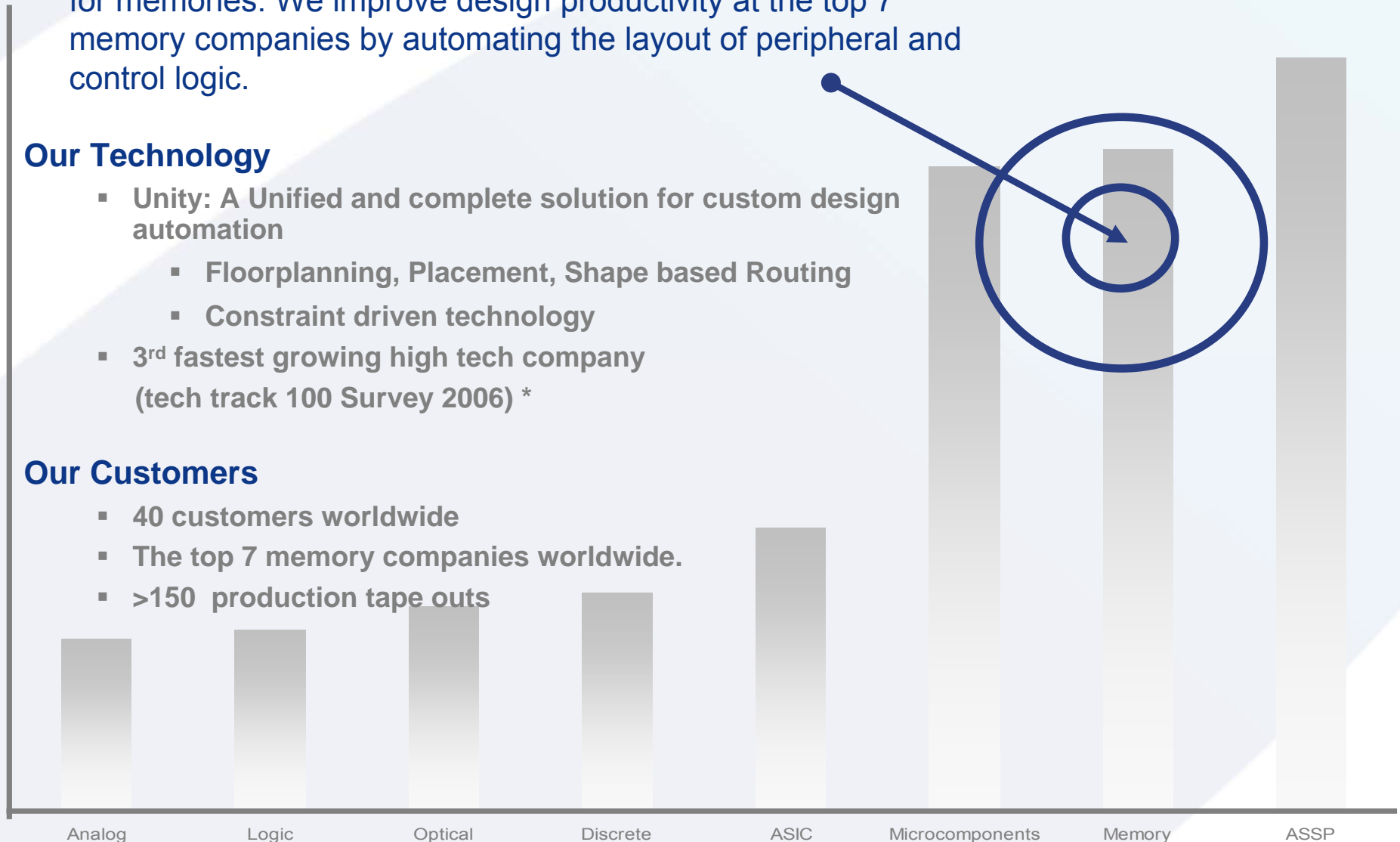
We are an EDA company focused on custom design automation for memories. We improve design productivity at the top 7 memory companies by automating the layout of peripheral and control logic.

Our Technology

- **Unity: A Unified and complete solution for custom design automation**
 - Floorplanning, Placement, Shape based Routing
 - Constraint driven technology
- **3rd fastest growing high tech company (tech track 100 Survey 2006) ***

Our Customers

- 40 customers worldwide
- The top 7 memory companies worldwide.
- >150 production tape outs



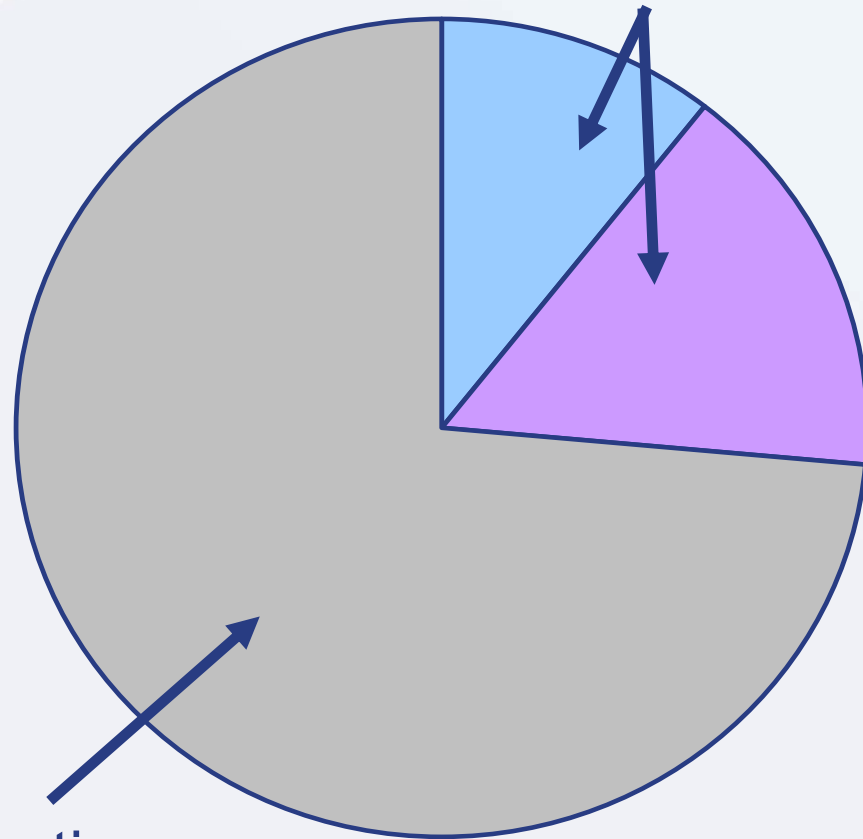
70% of time is consumed by manual interactive layout.

Rules are getting more complex

Layout requirements are more stringent and specific.

ASIC solutions for automation are inappropriate.

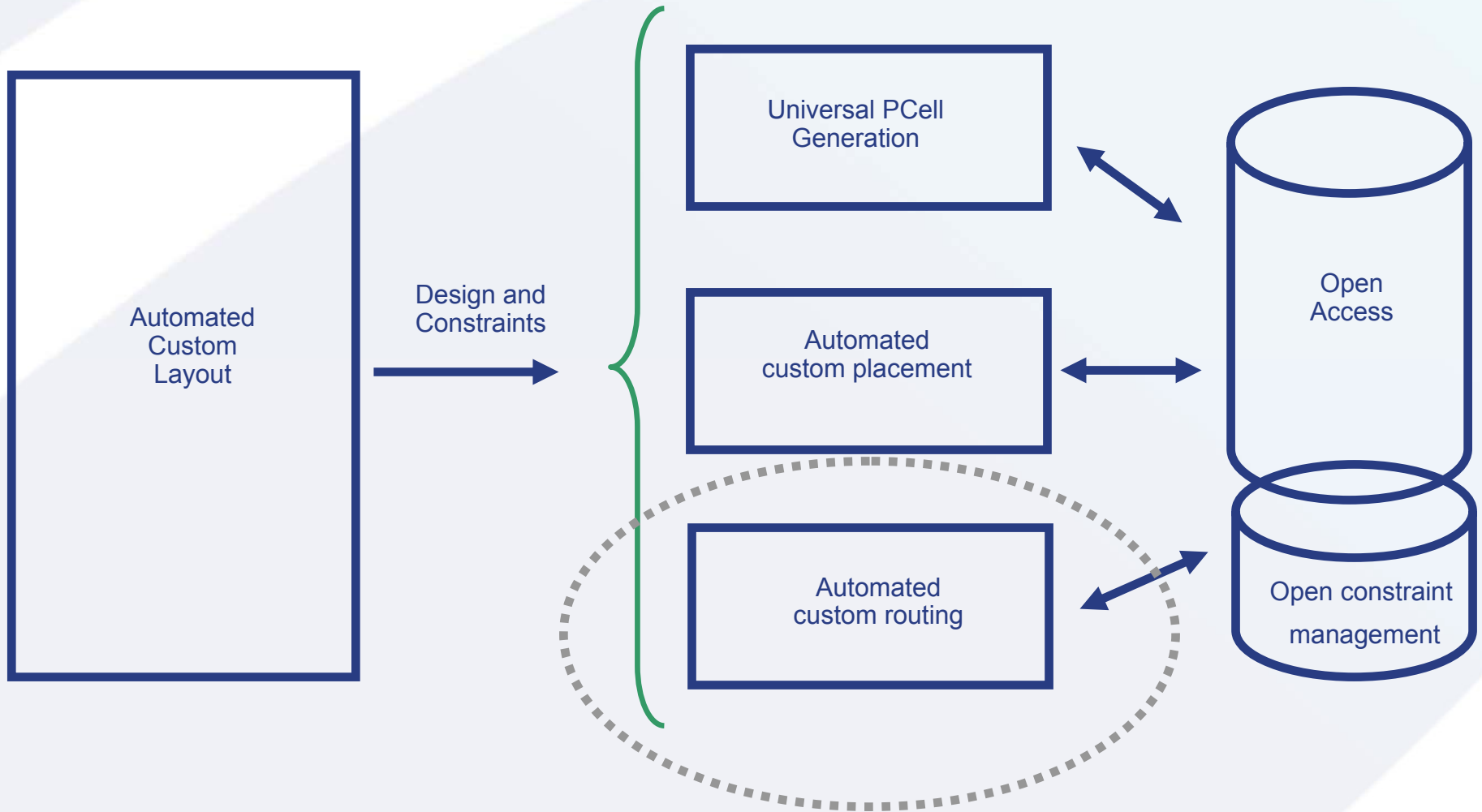
Mature Digital ASIC automation



- Timing Driven Semi Custom
- Non Timing Driven Semi Custom
- Full Custom

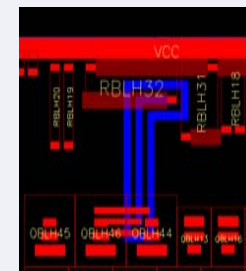
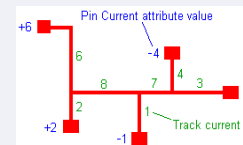
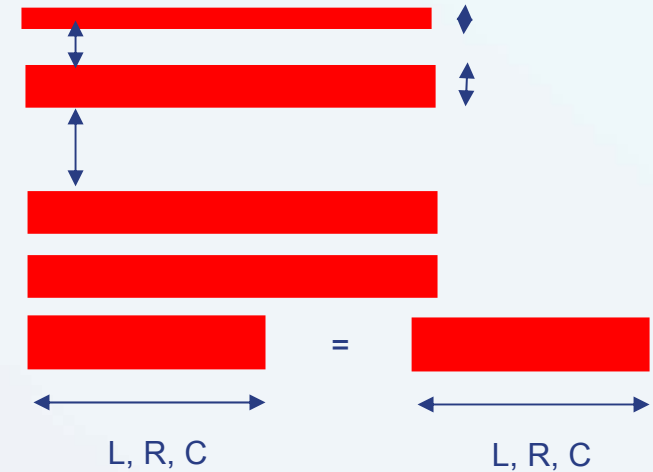
Little Automation

Essential Components for Automated Custom Layout

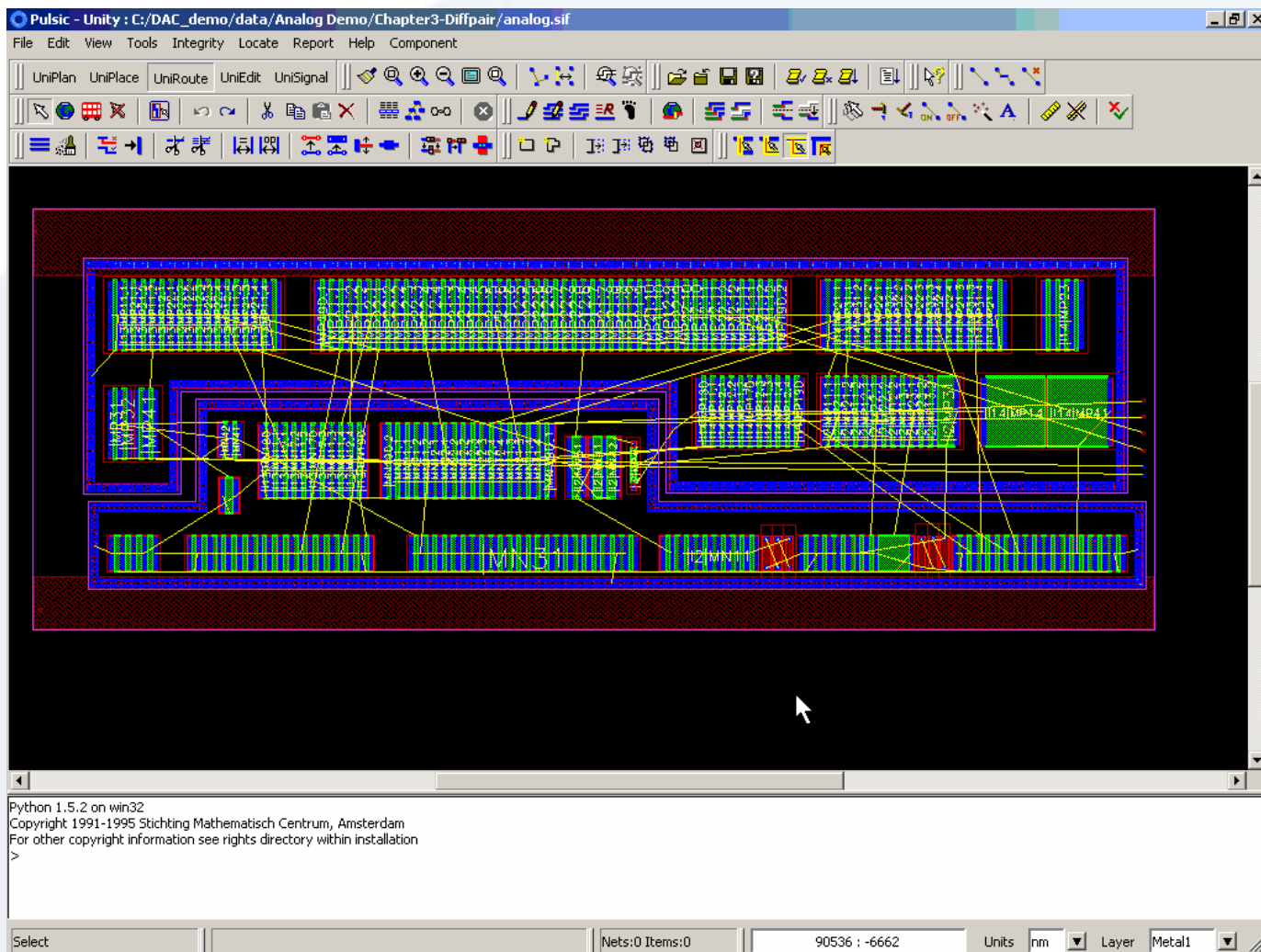


Custom Design Automation demands constraints

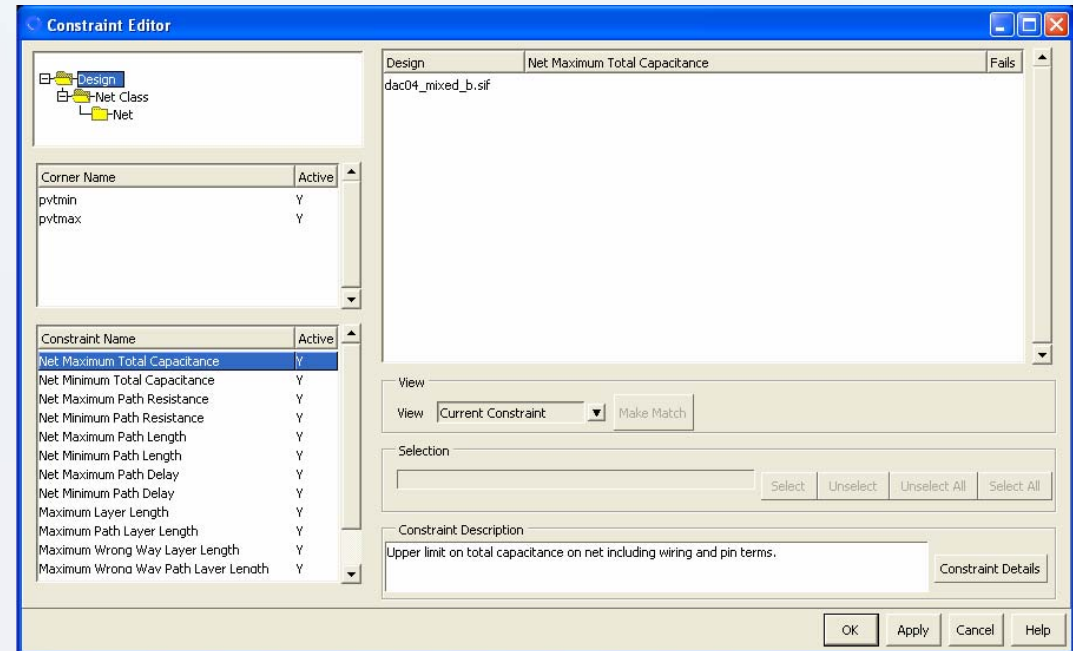
- Variable width route
- Variable spacing route
- Constrained length
- Controlled resistance/capacitance
- Matched differential pair
- Matched length R&C routing
- Current density routing e.g. Tapered Routing
- Mirror constrained routing
- Symmetry constrained routing
- Noise constrained (shielded) routing.



Differential Pair Routing -example



- Constraint management
 - Essential for accessing, specifying and editing the constraint attributes
- Ideally should be hierarchical
 - Minimum/maximum constraints for individual objects (e.g. nets)
 - at design level
 - Object (e.g. nets) class level
 - Object (e.g. net) level



- Matching group constraints —
- Maximum layer length constraints —
 - Maximum Layer Length,
 - Maximum Path Layer Length,
 - Maximum Wrong Way Layer Length and
 - Maximum Wrong Way Path Layer Length attributes.

- Interoperability of tools requires constraint communication
- Ad hoc approaches are being made to this
- Open Access offers no help here!
- Road blocks to constraints and communication are:-
 - A standard constraint format is required.
 - Currently each vendor is creating their own proprietary semantics, properties, data objects to describe these second order design rules
 - OA needs a common hierarchical set of “Constraints” to describe electrical and timing constraints

- Unity is an example of state of the art custom design automation technology.
- Constraints and constraint management form an essential part of their operation.
- Communication of constraints with other tools is essential.
- There is no standardization on this.
- Standardisation and development of a constraint format would benefit users and EDA providers.