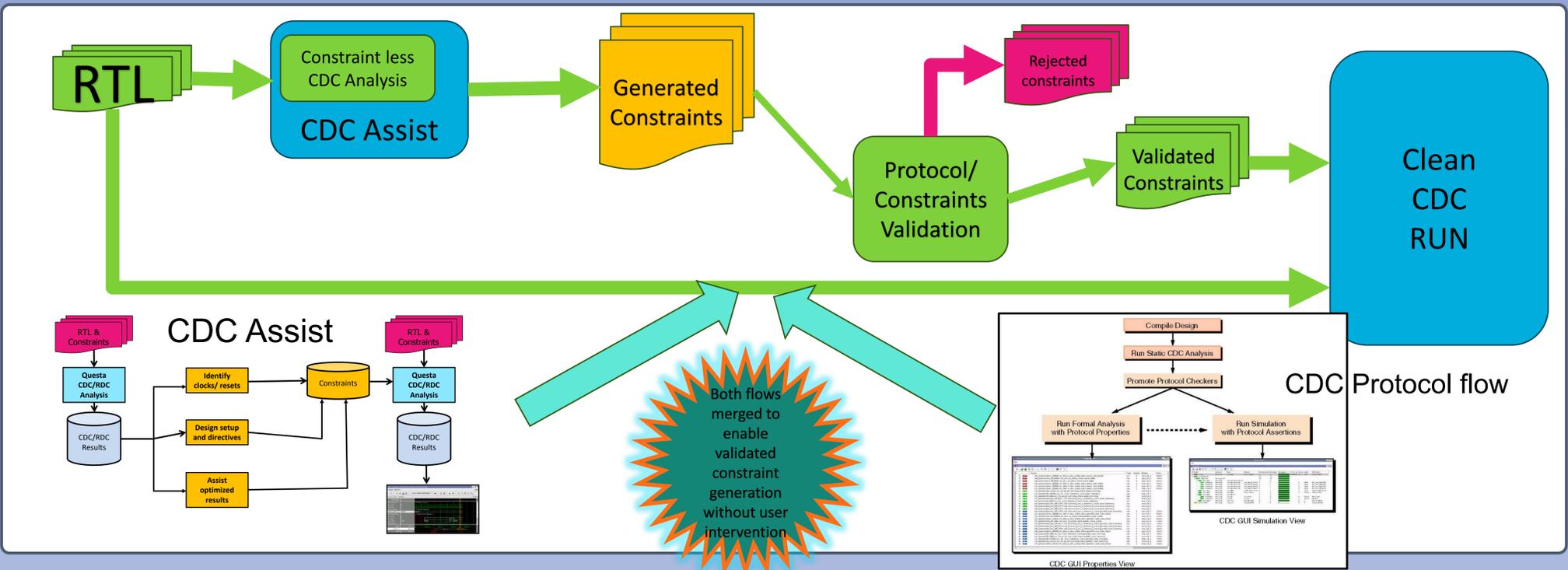
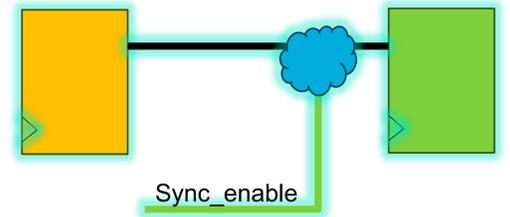


Introduction

For accurate results, CDC/RDC analysis requires a good setup. This setup provides the tool specific constraints required to achieve accurate CDC/RDC closure within a reasonable amount of time. What we want is accuracy balanced with tool performance. You cannot be too optimistic and allow CDC bugs slip by also cannot be over pessimistic and delay your project. Our proposed solution is to automatically generate the needed constraints which are proven to be correct for your design.

In this paper we present a flow where we use powerful AI/ML based utility 'CDC/RDC assist®' available with Questa CDC® to generate a set of CDC/RDC constraints and then use another existing flow called 'protocol/constraint validation' to formally and functionally validate those generated constraints. Theoretically, we suggest a proven a flow which can generate a set of validated CDC/RDC constraints without user intervention..



Results

It can be seen in the results below for some candidate designs, the raw syncenable found were formally proven to be either true or False.

Providing us :

- Quick closure of valid syncenable recognized in the design.
- Expected failing syncenable without user intervention.
 - User can now proceed to fix the design.
- Unused cases give us insight even any unknown signal is controlling the data capture.
- These are either vacuous in formal or uncovered in simulation.

Design	Number of CDC Paths	Suggested Syncenables	Proven Good Syncenables	Proven false Syncenables	Unused/Unproven Sync enables
Design1	~200k	325	250	63	12
Design2	~350k	107	70	23	14
Design3	~150k	40	25	15	0

Conclusion and Future work

- We were able to quickly achieve known validated sync-enables in the design. Every constraint is formally or functionally validated
- The same technique can be very easily applied to other supported constraints without even changing the scripts
- Manually, this task can take multiple iterations/days. As automated, this completed in two runs.
- The starting point does not require a mature CDC design, so faster CDC/RDC closure can be achieved even on a large project.
- For future work, the same flow can be explored for all available constraints in Questa CDC Assist. We can even go further and increase the scope of Questa CDC Assist and protocol flow based on this proof of concept.

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