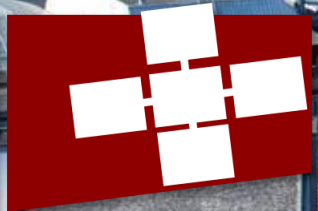
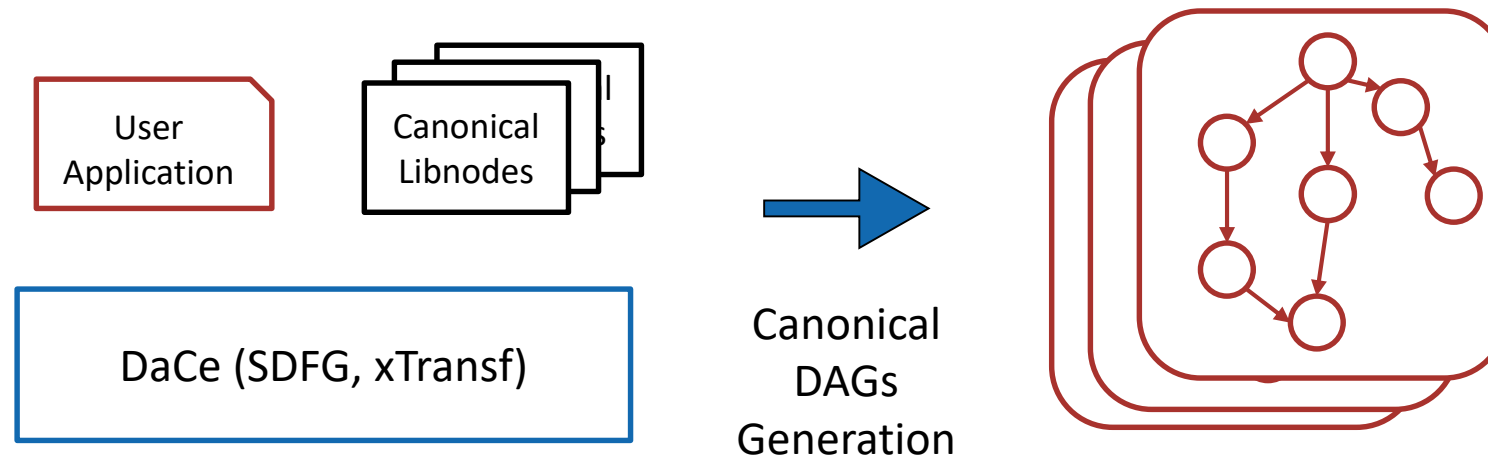


ASA: Enabling DSE

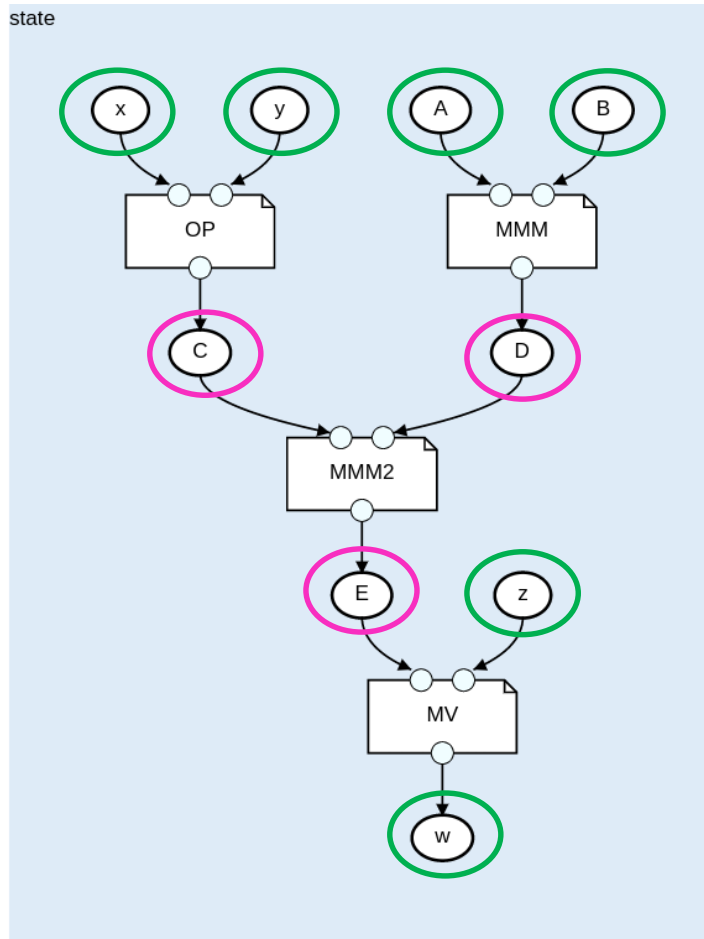


Application Space Exploration

We want to use DaCe (IR, LibNode, Transformations) to enable all of this (“data-centric and compiler approach”)



Application Space Exploration



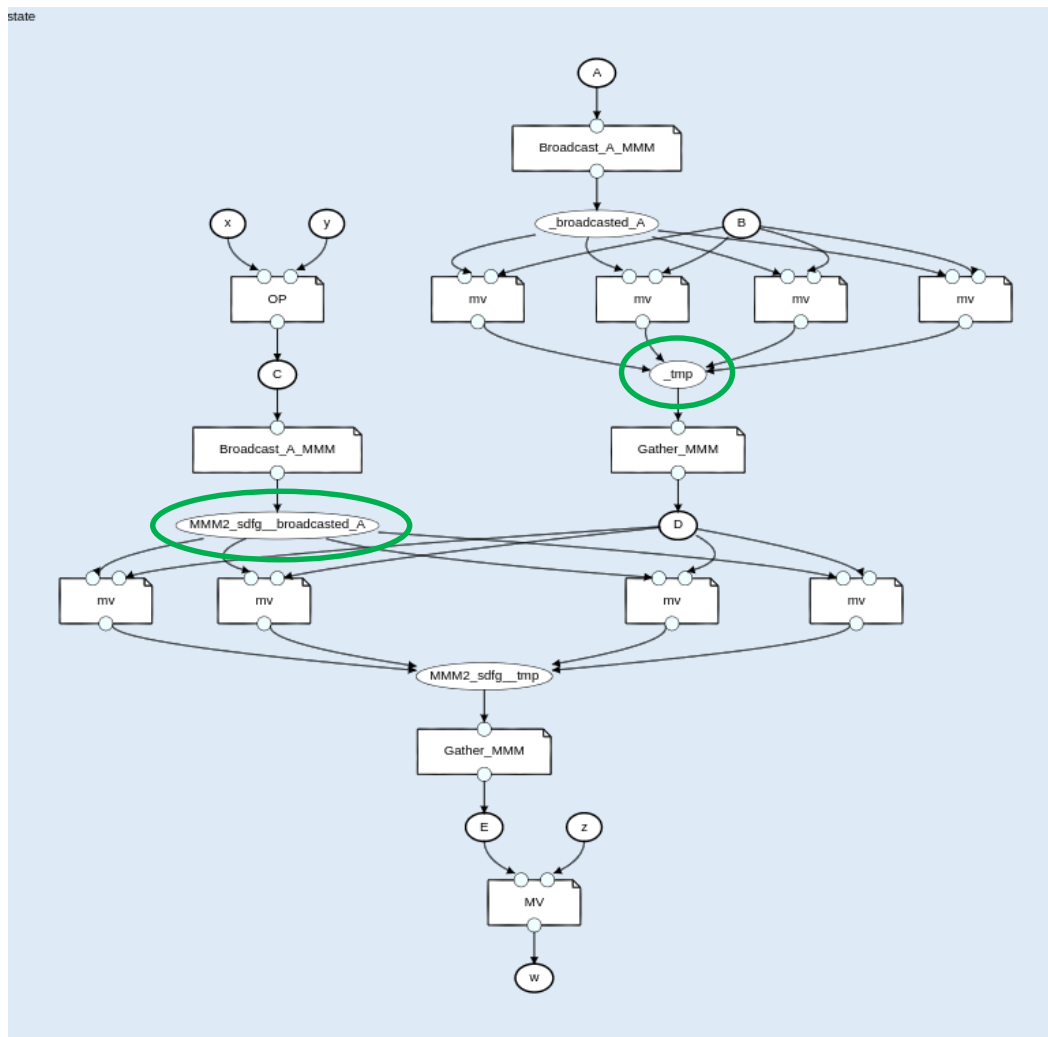
Given the application SDFG, we can enumerate all Canonical SDFG/DAGs that we can obtain using the various available expansions.

DAG #	Makespan	I/Os	Buffer Space
1	36	212	14
2	163	324	17
3	67	276	18
4	99	270	28
5	210	372	20
6	110	292	18
7	36	212	14
8	163	324	17
9	52	244	18

Scheduled with 8 PEs, 4x4 matrices

Other info

We may think of extracting other info

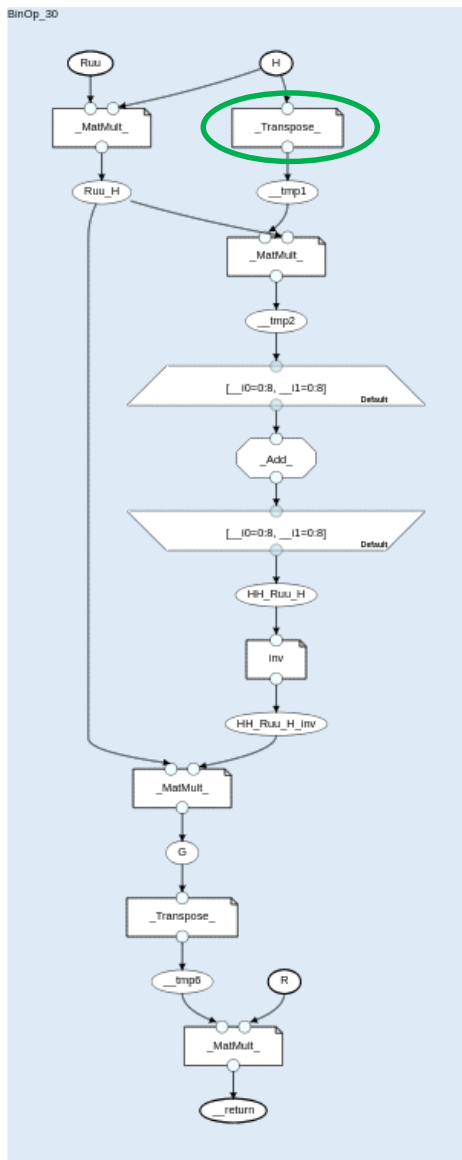


- Max Fan-in/Fan-out: certain expansions may be invalid because do not meet certain constraints
- FLOPs
- More accurate I/O models (possible but will be not be done here)
- ...

All this info can be used for **Application Space Exploration** (quick evaluation of solutions)

Some of them are more related to the **Architecture Space Exploration**, but it may have sense to “anticipate” to the application level

PUSCH-MIMO



Started implementing MIMO as a DaCe SDFG to apply the same Application Space Exploration idea (WIP)

Transposition (ConjugateT), represented explicitly:

- Can be then interpreted as off-chip accesses
- We can represent tasks that do transposition on the fly

Inv, needs to be implemented.

- Cholesky decomposition
- Triangular inversion?

Next steps

- Finalize MIMO example
- (ML workload)
- Start adding “intelligence” to Application Space Exploration
- Define