

Interface Compatibility

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Revision of compatibility of 4 APIs (1)

- No base -> many incompatibilities for C3
- HQ_is_disjoint_from_HQ: only in PPL
- HQSet includes HQSysGen: PPL, Polka
- HQ_is_OK, debugging purpose: PPL, C3 (*)
- HQSet->getHQSysCon, getHQSysGen: PPL and Polka have 2 versions (minimized/lazy), C3 not minimized
- add_new_dimension (project and embed): C3 has only one version (project)

Revision of compatibility of 4 APIs (2)

- `remove_dimension`: Polka has 2 versions (at the end and anywhere)
- `map dimension`: C3, PPL, Polka (permutation)
- `HQ_intersect_with_HQ`: only Polka has array versions; only PPL has 2 versions (minimized)
- `HQ_intersect_HQSysCon`: only PPL has 2 versions (minimized)
- `union` : only Polka has array versions
- `HQ_difference_with_HQ`: PPL, C3 (Oct and Polka not available)

Revision of compatibility of 4 APIs (3)

- `affine_image` and `affine_preimage`: C3 not available
- `widening`: C3 not available, Oct and Polka have 2 versions, PPL has more than 2 versions
- `narrowing`: C3, Polka not available
- `getNbConstraints` vs `getNbInequalities` and `getNbEqualities`
- `getBox` (intervals): C3, Polka not available
- Full support for access to constraints in C3 and PPL, while Oct low level function, Polka matrix
- PPL's `expand_dimension`, `fold_dimensions` not available in Oct, C3, Polka

Other operators

- `getAbstractSize` or `getAbstractWeight`
- widenings, generalized image, preimage in PPL
- format conversion inter domains, same domain
- `weak_update`
- `elapsed_time` operator (Oct, PPL)
- Implementation partial and fully supported common operators

- NNC of PPL: other domain
- exception handler in 4 libraries (manager)
- number of constraints (Polka,Oct) vs number of inequalities, equations vs abstract size
- `HQSet->HQConSys->nbineq` vs `HQSet.getNbIneq` (minimized, exact, calculated)
- same for map in HQBase: affect HQSet associated or not?
- versus notation in Polka: test relation between 2 objects

Debugging purposes

- fix index/dimension ($0 \rightarrow (n - 1)$ or $1 \rightarrow n$) -> need a wrapping with name
- backup versions for debugging (memory space or overflow -> free memory -> lost current object)
- trace difficult at level 0: no variable name
- one parameter for time out, a fields of heuristic coefficients (e.g. feasible 2p, union 5p, projection 3p)

Unchecked points

- Sub-libraries used (linking problem)
- Control of memory use (maxObjectSize)
- under-approximation: BC's example (over-appro read region \ominus over-appro write region) not make sens

Decisions/Discussions (1)

- transfert functions (permutation)
- Accessibility of objects (vectors, constraints, sc, sg, matrices)
- undefined objects
- several args (union; projection)
- Object vs list of objects (constraint, generator, set and expression)
- mode imperative with several effect: return what (PPL int)
- type, abstract value, 32-bit, 64-bit, gmp, etc.

Decisions/Discussions (2)

- optimisation (Selection of algorithmes, parameter for heuristics)
- choice of algorithm by user
- integer/rational
- memory management (version recycle, ref counter, memory used, minimized/lazy version)
- Product of domains
- Factorisation?