The Code Time

Parallel Programming Platform

By

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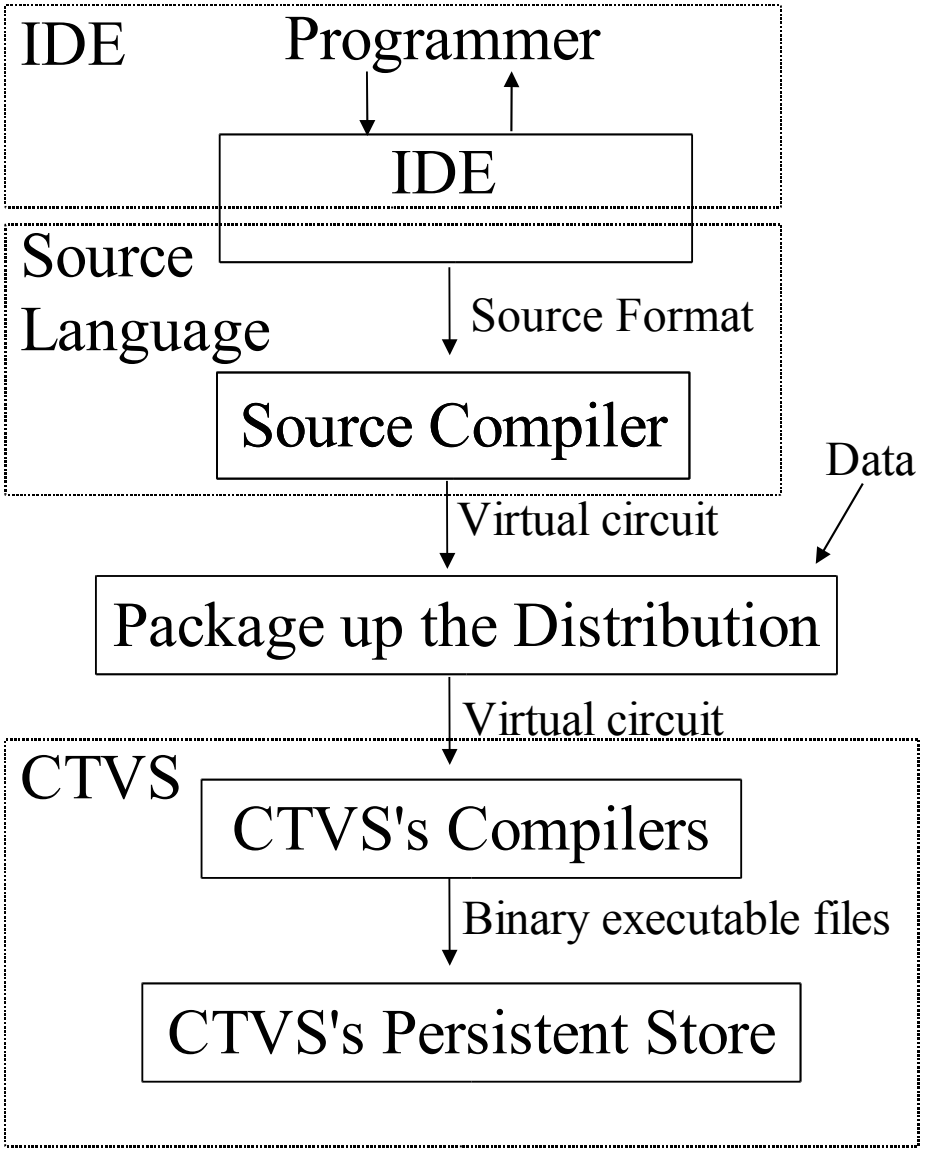
Code Time Platform Summary

- 3 elements in platform-- IDE, Lang, Virt Server
- Virt Serv ==> Write once run anywhere
- Persistent storage + cmds in VS ==> 2nd set of compilers ==> Effic. write once run anywhere
- Choice of Virt Ckt format key ==> Must enable compilers on wide array of HW + effic. on each
- One compiled image, ANY granular. of parallel
  - Ex: dual-thd Pentium, 10 workstations networked, 160,000 processor Blue Gene

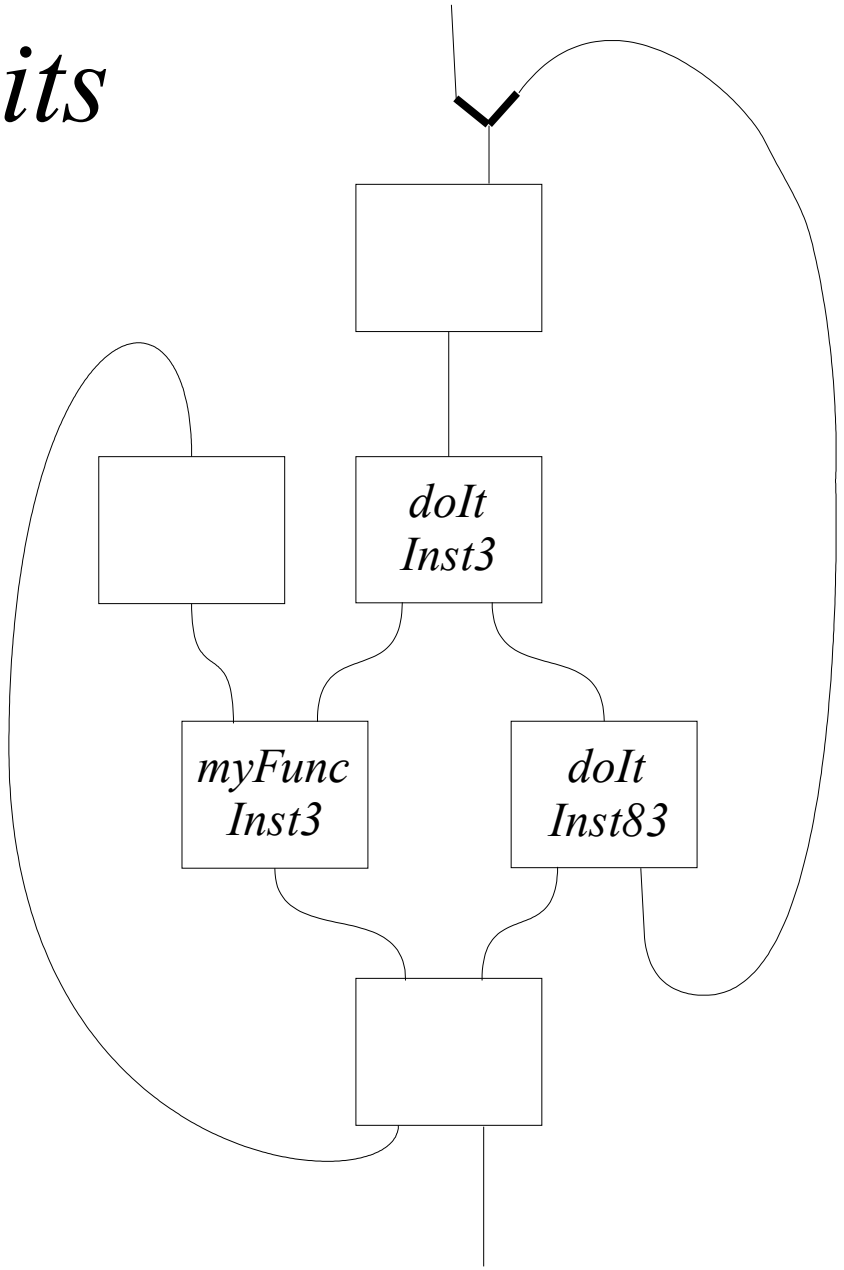


Virtual Circuit Format Is the Key

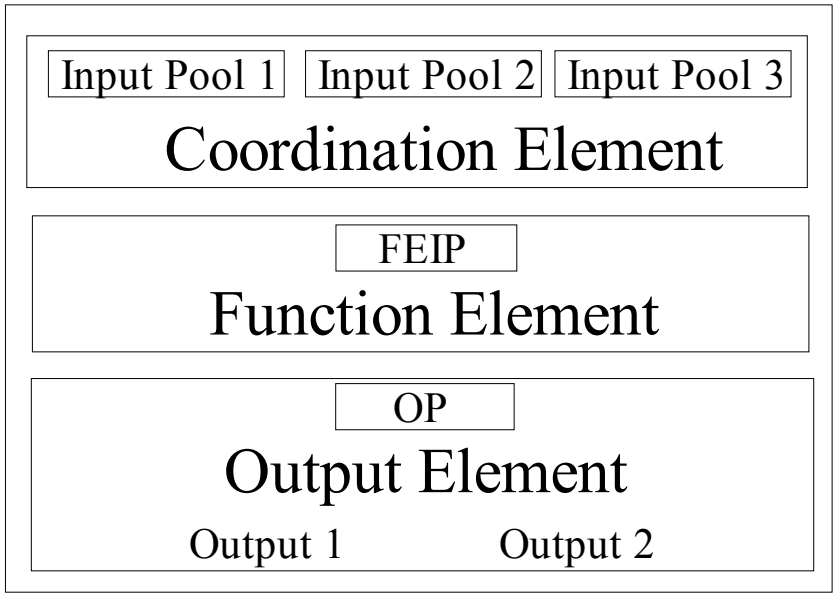
- Success rests on ease of writing a circuit-compiler for “any” HW
- Virtual-circuit format has to have these properties:
  - The code is invariant to the number of animators
  - Code can be easily split across multiple machines (task-units)
  - Data easily grouped to machines (task-units)
- The semantics must also allow a highly efficient binary
  - call-by-value rather than call-by-name
  - Memory behavior is exposed (data-structures are explicit)
    - Gives details of **how** operations spec'd in code to be done
    - Allows exposing in source language, for programmer

Code Time Circuits

- Function-Units connected by wires
- Coord-elem, func-elem, output-elem

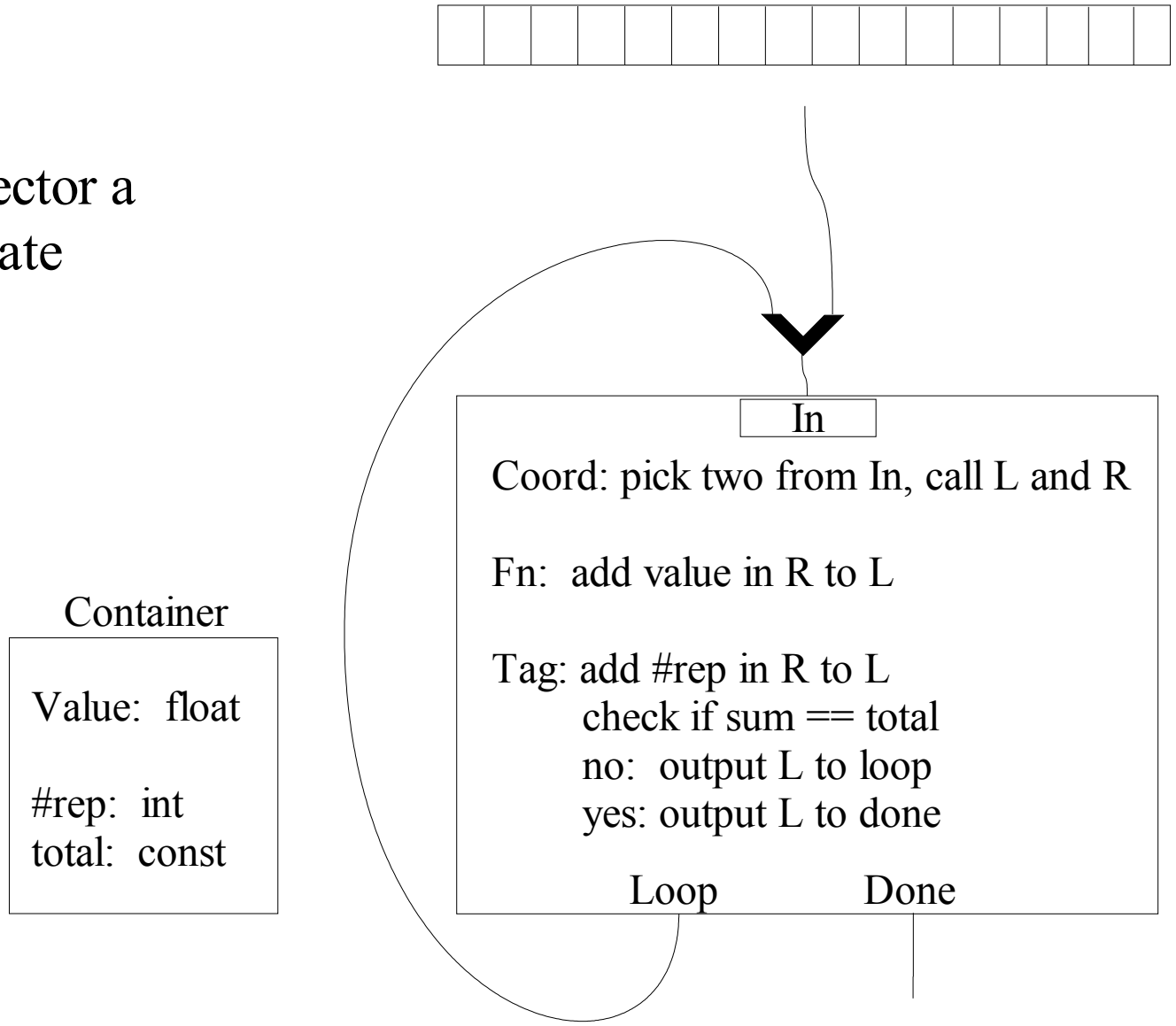


someFunc



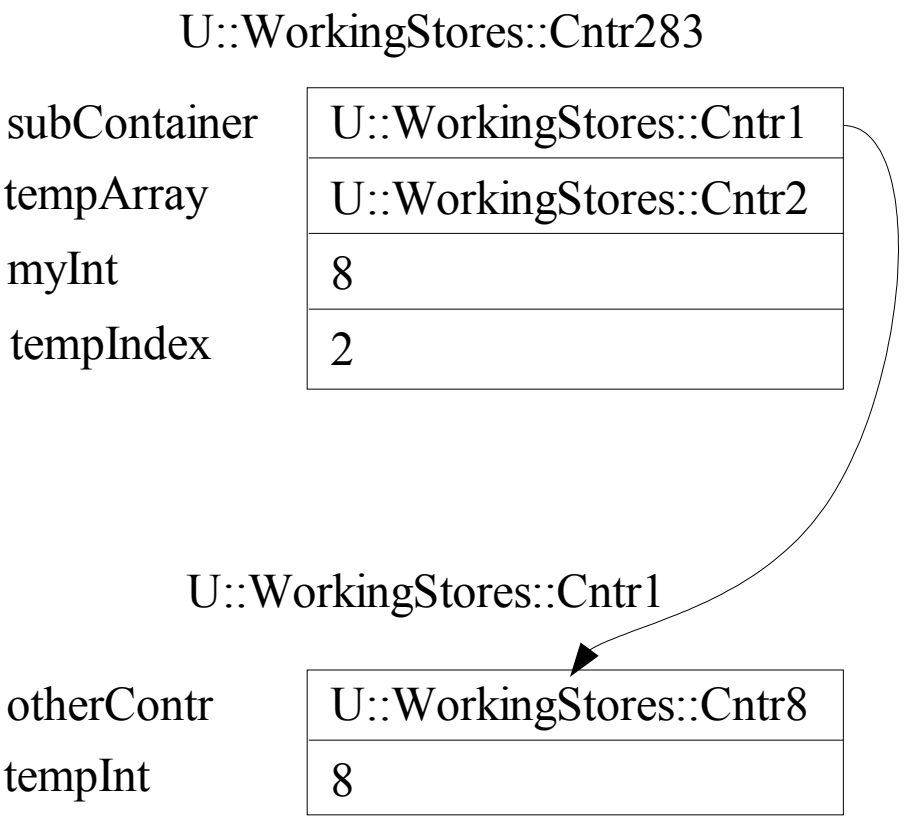
Example Program

- Vector reduction
- Each element of vector a separate control-state

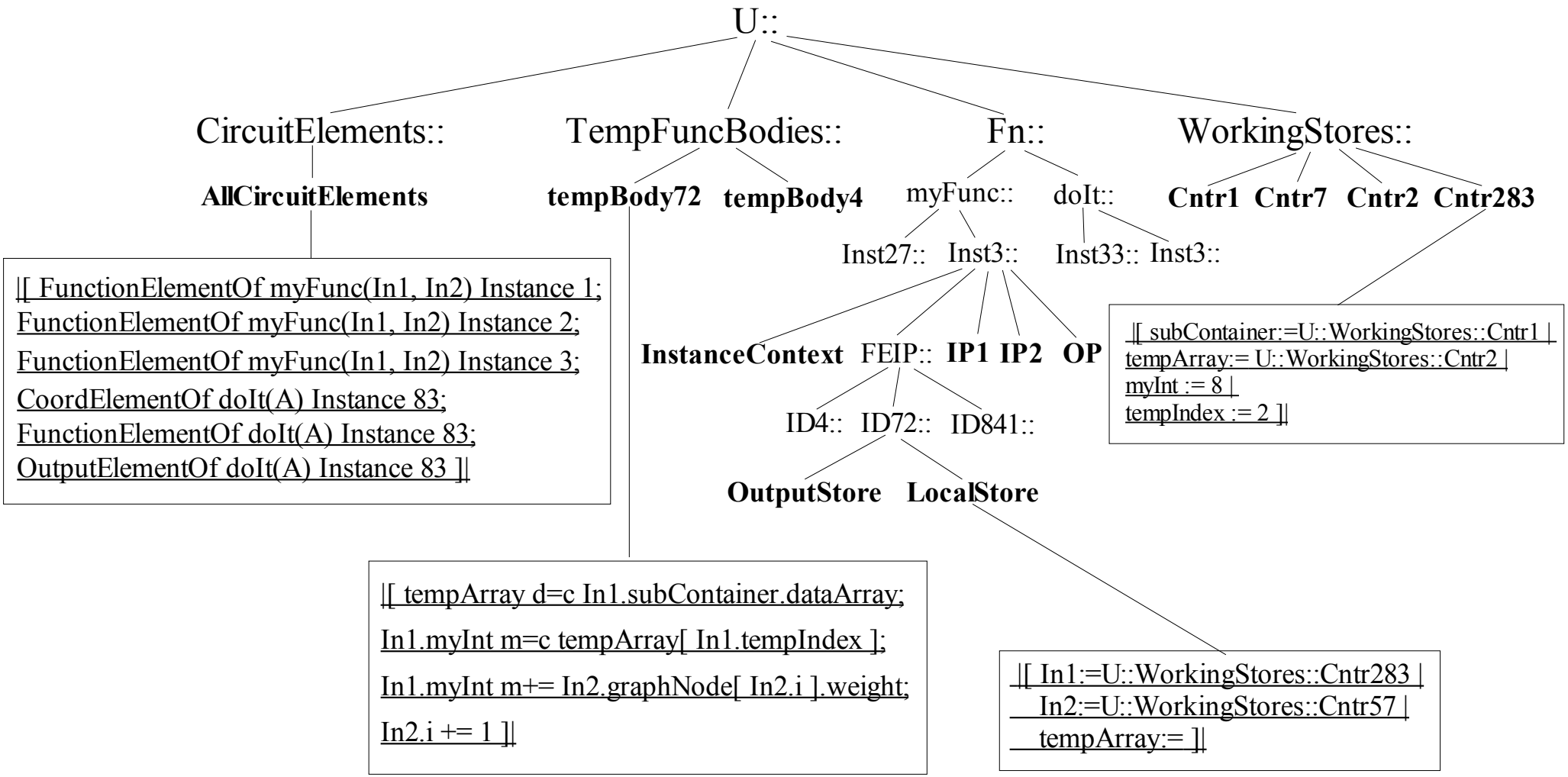


Containers

- Container = Virtual Addr Space
- Has a structure
- Addr = elemOf Struc
- Data moves inside cont
- Association to another container
- Lives in Universal Store
- Repr. as syntax-string



The Universal Store (Uber Store)



...=t foo]| U::TempFuncBodies::tempBody1|[tempArray d=c ... In2.i += 1]| U::T...

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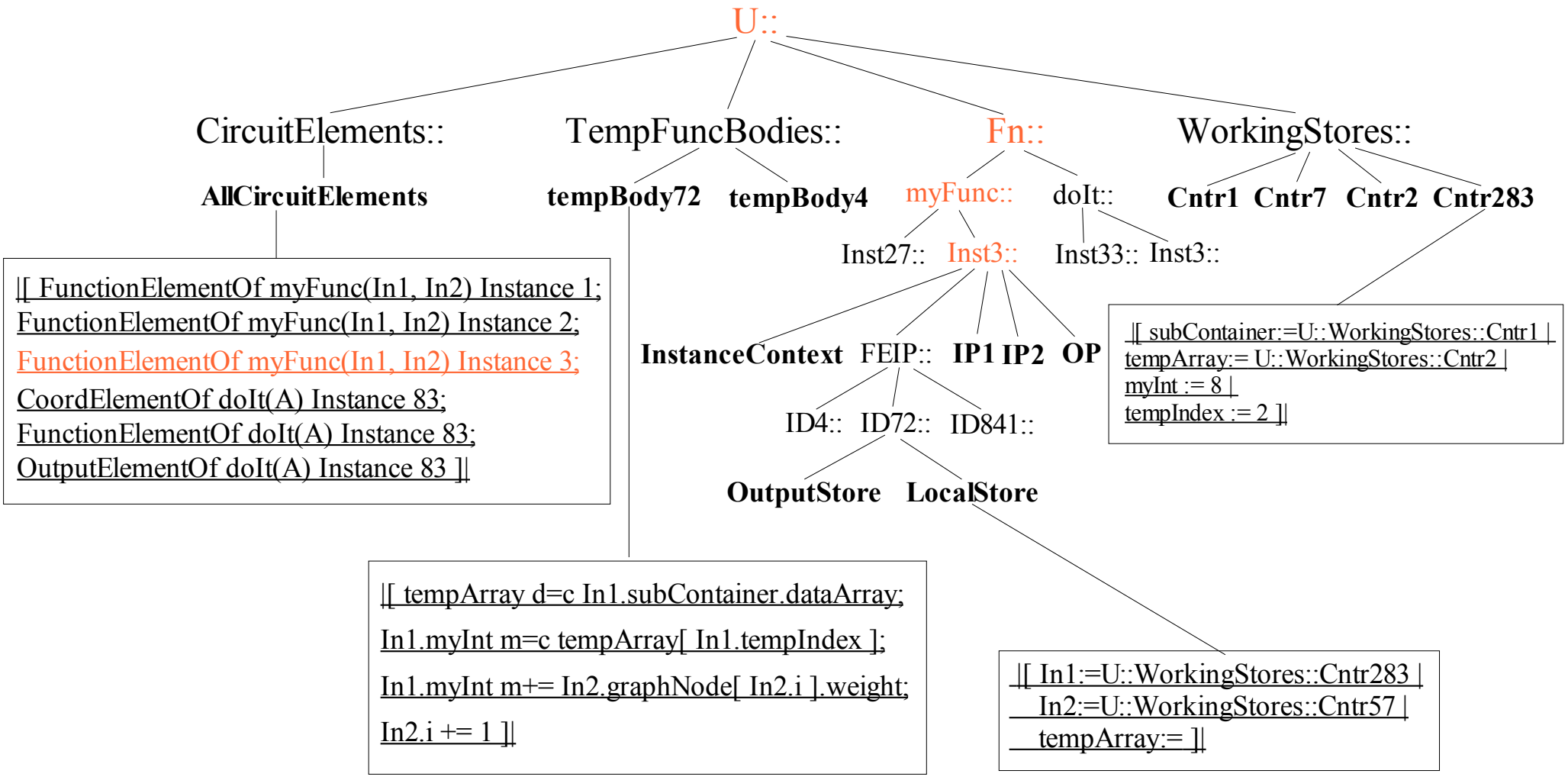

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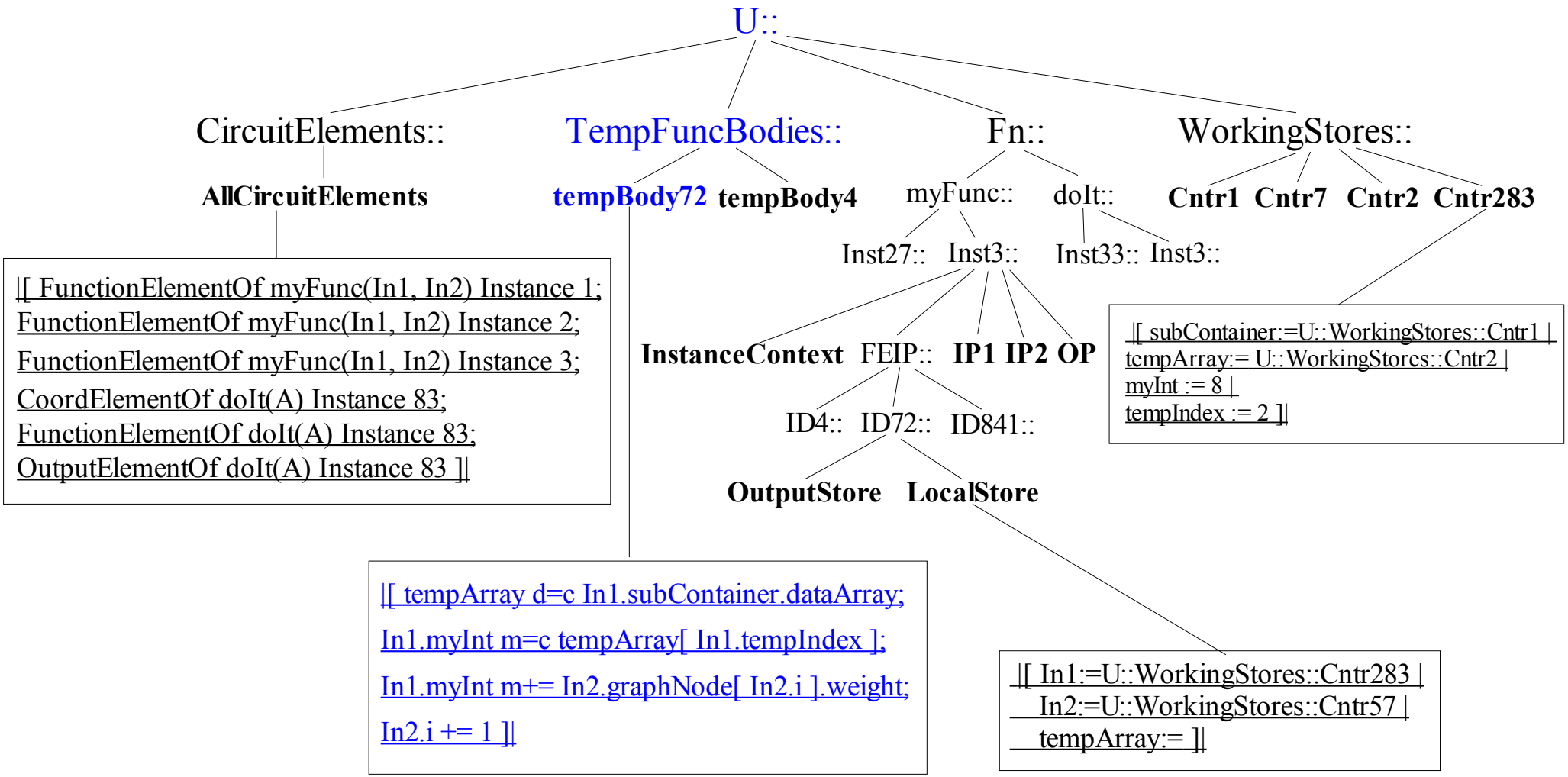

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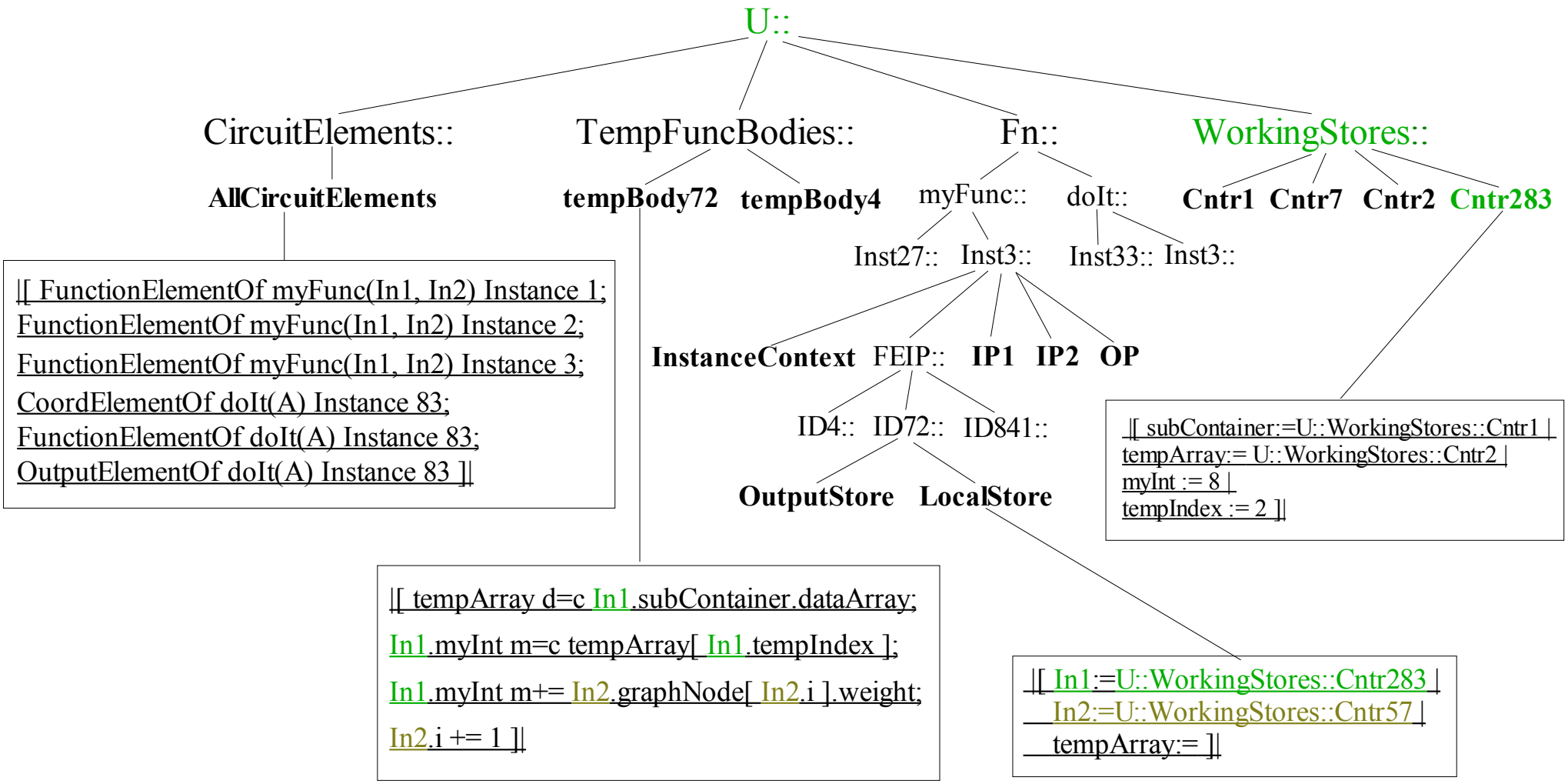

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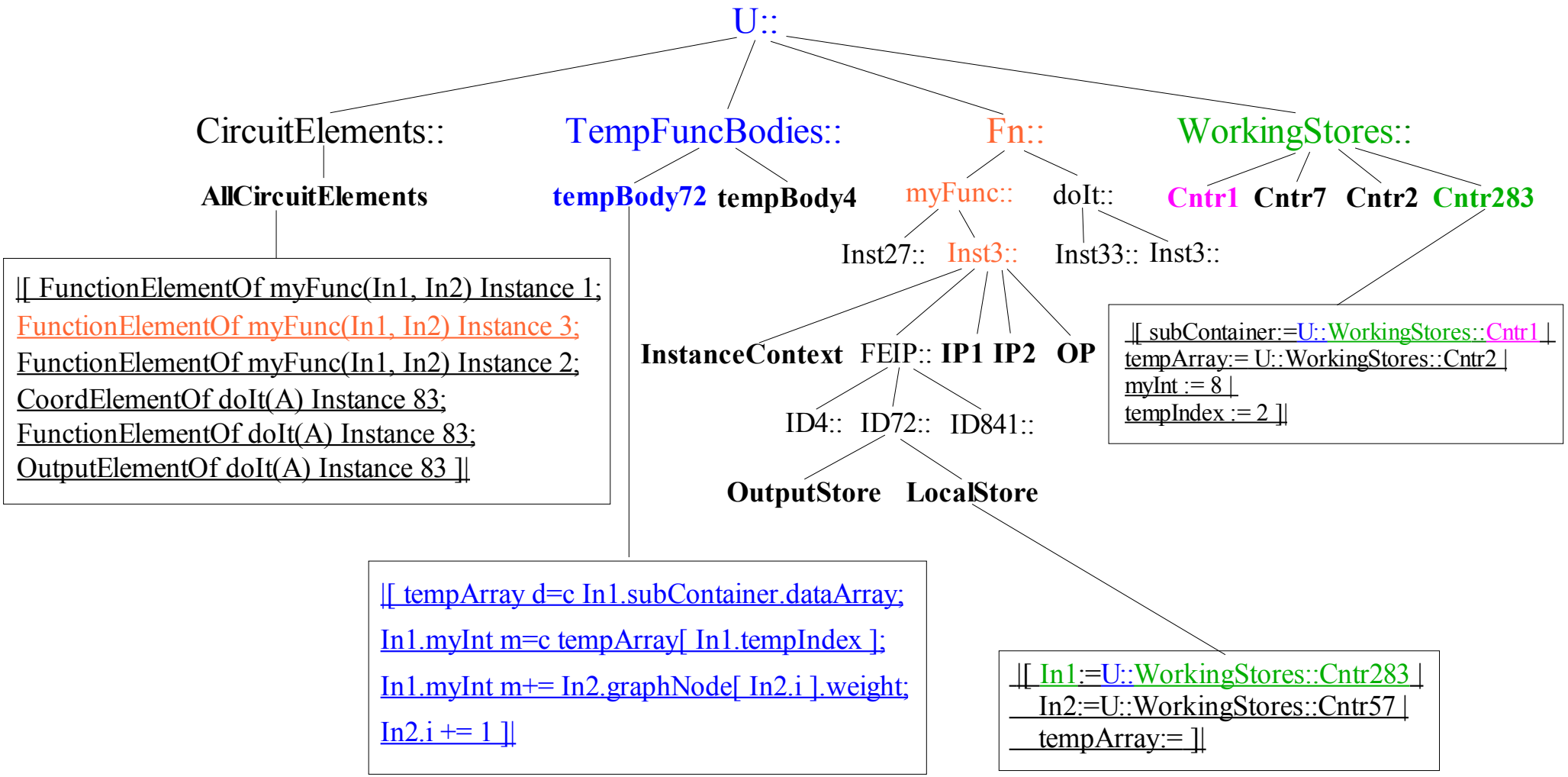

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