Software and computing environment

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Plan

- SCHNAPS
- LSD Input GUI
- LSD Output GUI
- Computing environment

SCHNAPS : a public health generic simulator

- SynCHroNous Agent and Population-based Simulator
- Coded in C++
- Command line-driven (no graphical front-end)
- Extensible and Versatile

SCHNAPS: Agent and Population-based

- System PoV:
  - Agent-based: Explicitly defined entities.
  - Population-based: Homogeneous group of agents.
- Public Health PoV:
  - Agent: virtual individuals.
  - Population: all virtual individuals in the simulator at a given time.

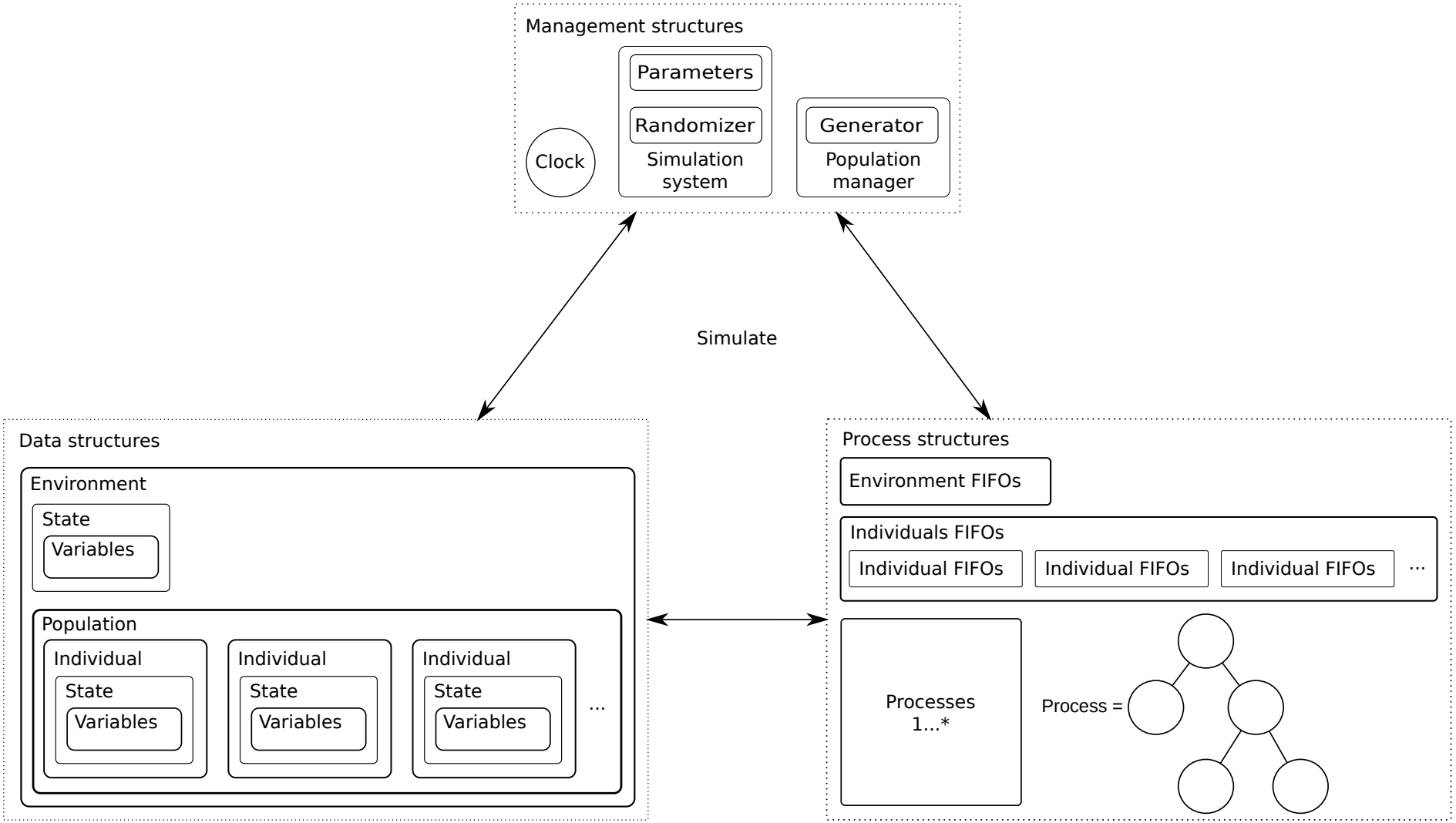
SCHNAPS: Virtual individuals

- Virtual individuals are made of variables
- Each virtual individual owns its set of variables
- The environment, a meta-individual, holds variables common to all virtual individuals

SCHNAPS: Time-driven

- Events are triggered at each clock step
- Time is an independant variable

SCHNAPS: Framework



Trees

- Decisions trees are built with primitives (nodes)
- Base primitives have been created at the beginning
  - Math
  - Control (Branching)
  - Data
- Specialized primitives have been added
  - Event
  - Test
  - Treatment
- Decision tree has to be separated in mutiple subtrees, called processes

Processes

- Scenario: First process to be applied
- Called: Processes can be called for immediate execution.
- Pushed: Processes can be pushed for delayed execution.
- Observers: Processes called every time the clock value changes

Learning module

- Learning module is a plugin
- It can optimize cost/effectiveness:
  - in the right combination of tests/treatments to use
  - in the right groups of the population to target

Input GUI

- Simulations are defined in configuration files
- File are written in XML(eXtensible Markup Language)
- Input GUI aims at :
  - Presenting the XML files in a user-friendly way
  - Giving tools to start new XML files
  - Giving tools to edit existing XML files

Output GUI

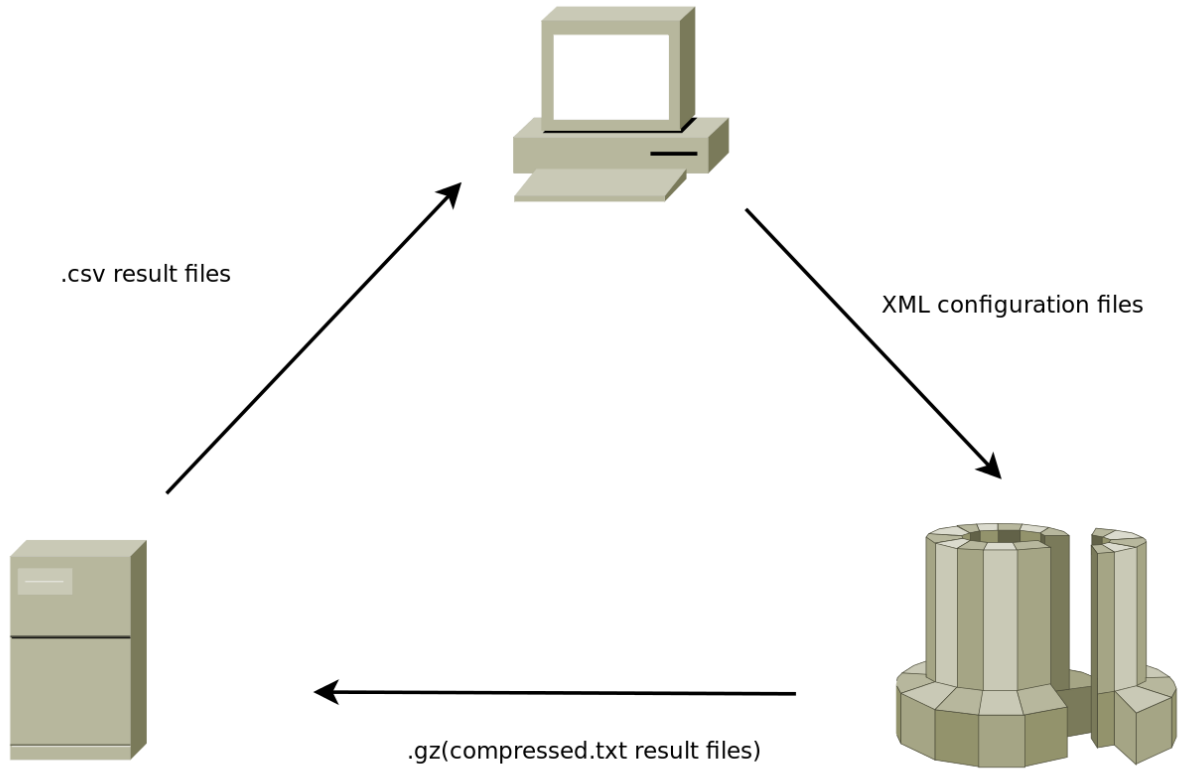
- Results outputed by SCHNAPS are hard to understand for non-programers
- They are stored on a server
- Output GUI aims at :
  - Retrieving the output files from the server
  - Presenting the output files in a user-friendly way
  - Giving tools to analyze the results

Computers, softwares and communications

- LSD Group:
  - Owns a server to store simulation results
  - Has access to CLUMEQ's supercomputer, Colosse
- Computing environment aims at:
  - Giving tools to easily create configuration files
  - Automatically sending jobs to SCHNAPS, hosted on Colosse
  - Automatically sending simulation results to the LSD server
  - Giving tools to easily retrieve and analyze the results

Computing Environment : Framework

Computer : User's Computer
Software : LSD Input GUI, LSD Output GUI
Job : Creating Configuration Files
Analyzing Results



Computer : LSD Server
Software : mySQL Database
Job : Results Storage
Simulation Benchmark

Computer : Colosse
Software : SCHNAPS
Job : Simulation