Method and System for Automatic Generation of a set of Computer System Configurations Based on Input Constraints

Disclosed is a method and system for automatically generating a set of computer system configurations based on input constraints.

The system includes an auto generation tool for automatically generating a set of computer system configuration as illustrated in figure 1.

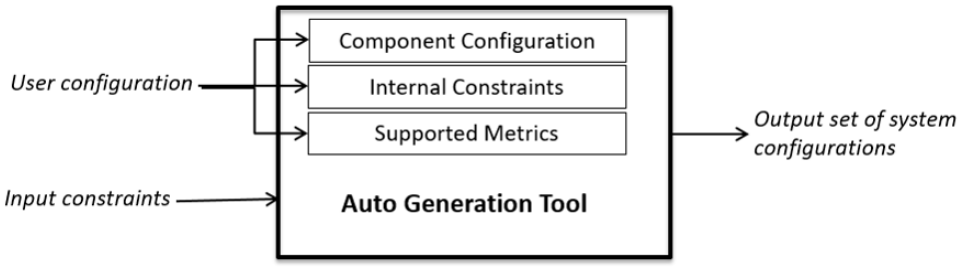

Figure 1

The auto generation tool includes a component configuration which is an extensible library of system building blocks. The building blocks include compute, memory, storage and interconnect devices. The building blocks are associated with the interface rules and metric properties. A category of the building blocks is used to group shared metrics.

The interface rules are used to govern valid and invalid connections between building blocks wherein, the rules can be defined using categories of system building blocks, types of individual system building blocks, number of system building blocks, or values of any associated metrics.

The auto generation tool takes a set of supported metrics as input such as, but not limited to, maximum price or energy consumption value for the system, a minimum bandwidth between all devices in a certain category, a minimum or maximum amount of total storage capacity. In accordance with the method and system, one of the supported metric is placed as an “bounding constraint” i.e. a constrain that places an upper bound to limit number of computing system configurations.

In accordance with the method and system, the auto generation tool is optionally provided with a set of internal constraints to limit the number of computer system configuration for the system to output. The internal constraints are defined based on cardinality, or based on experiential knowledge of the computer system design.

In order to generate a set of computer system configuration, the auto generation tool takes input constraints such as, but not limited to, cost, performance, power, resource limits and outputs a list of computer system configurations that satisfies the given input constraints.

Finally, the method and system uses known techniques from combinatorics, graph enumeration and graph isomorphism to map the above given constraints to generate the set of computer system configurations as output as shown in figure 2.

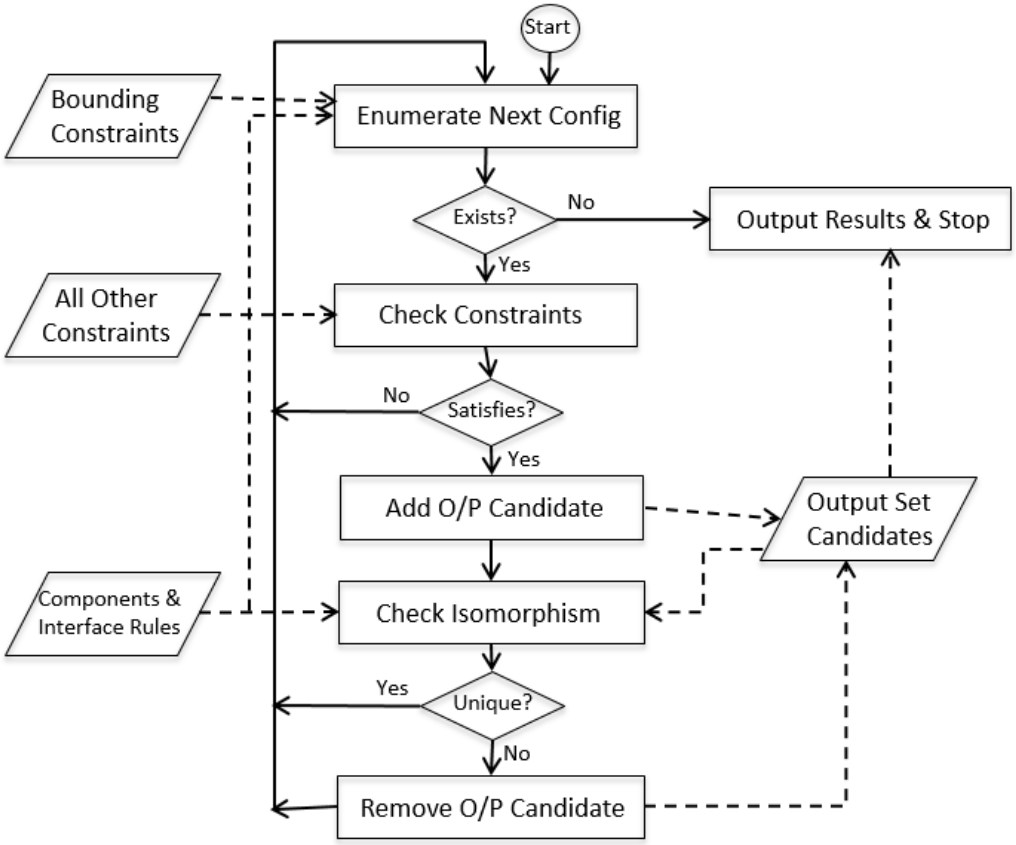

Figure 2

Thus, the method and system automatically generates a set of computer system configurations based on input constraints.