

DRMSim: a Routing-Model Simulator for Large-scale Networks



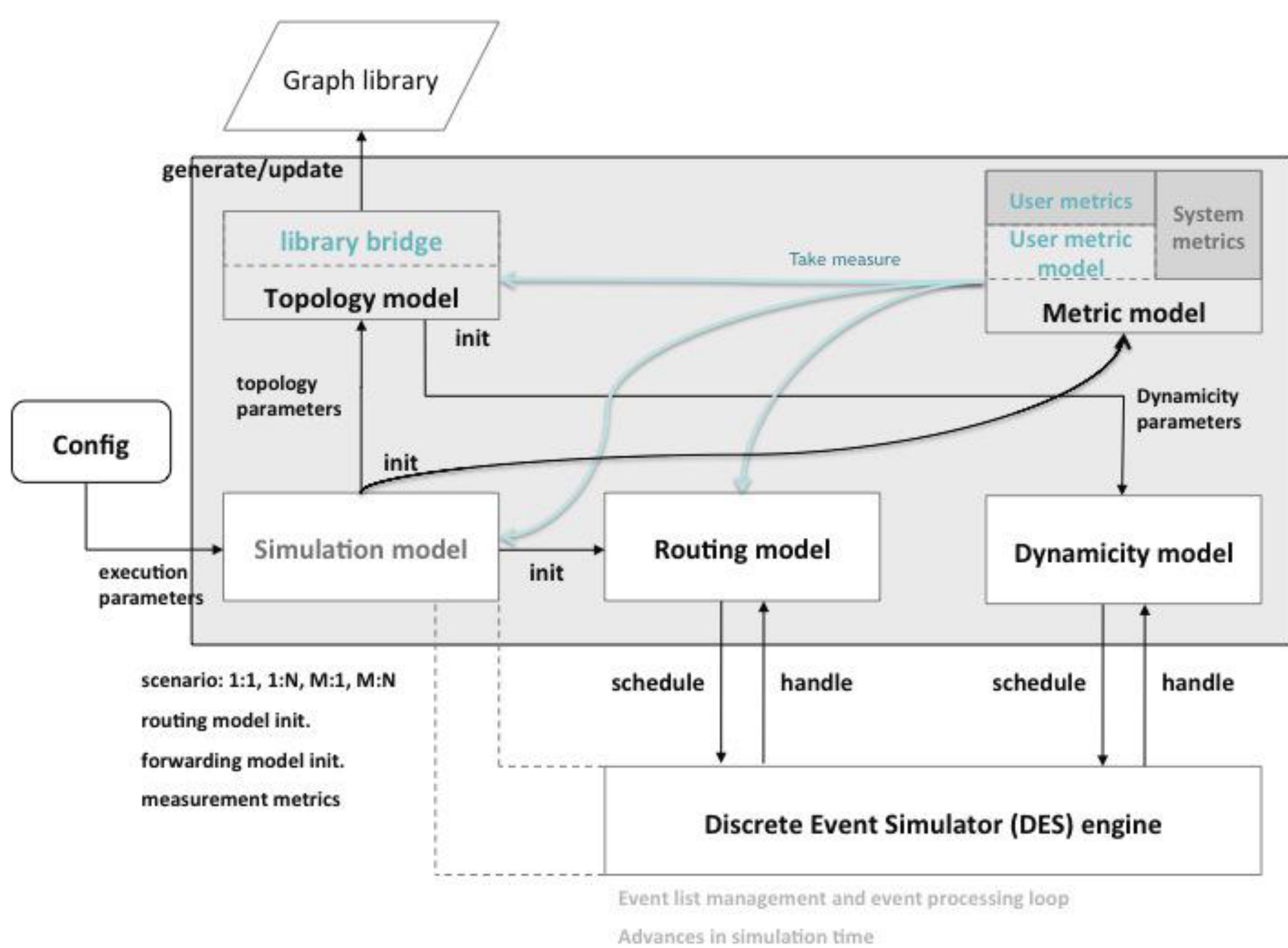
Today, inter-domain routing in the Internet is achieved by the **Border Gateway Protocol (BGP)**, a routing protocol that matches both technical and commercial aspect of Internetwork routing. Nowadays, Internet backbone consists of more than 60.000 abstract nodes called Autonomous Systems (ASes). The number of AS grows at a rate of about 10% per year.

As a consequence, **BGP shows its limits**. In practice, its data structures require too much memory that can be installed on routers and the huge size of routing tables have a negative impact on the computational time required to perform operations on those tables.

The EULER FP7 research project aims at exploring novel dynamic routing schemes adapted to the Internet environment and its evolution. The dynamic routing schemes designed to meet the fundamental trade-off between **memory space (routing table storage) vs routing path stretch vs adaptation cost (communication and computational complexity)**.

In order to achieve this goal, we are designing and developing an efficient **routing model simulator called DRMSim**.

Routing model simulation is not to be confused with a forwarding model simulation, which does not focus on routing internals.



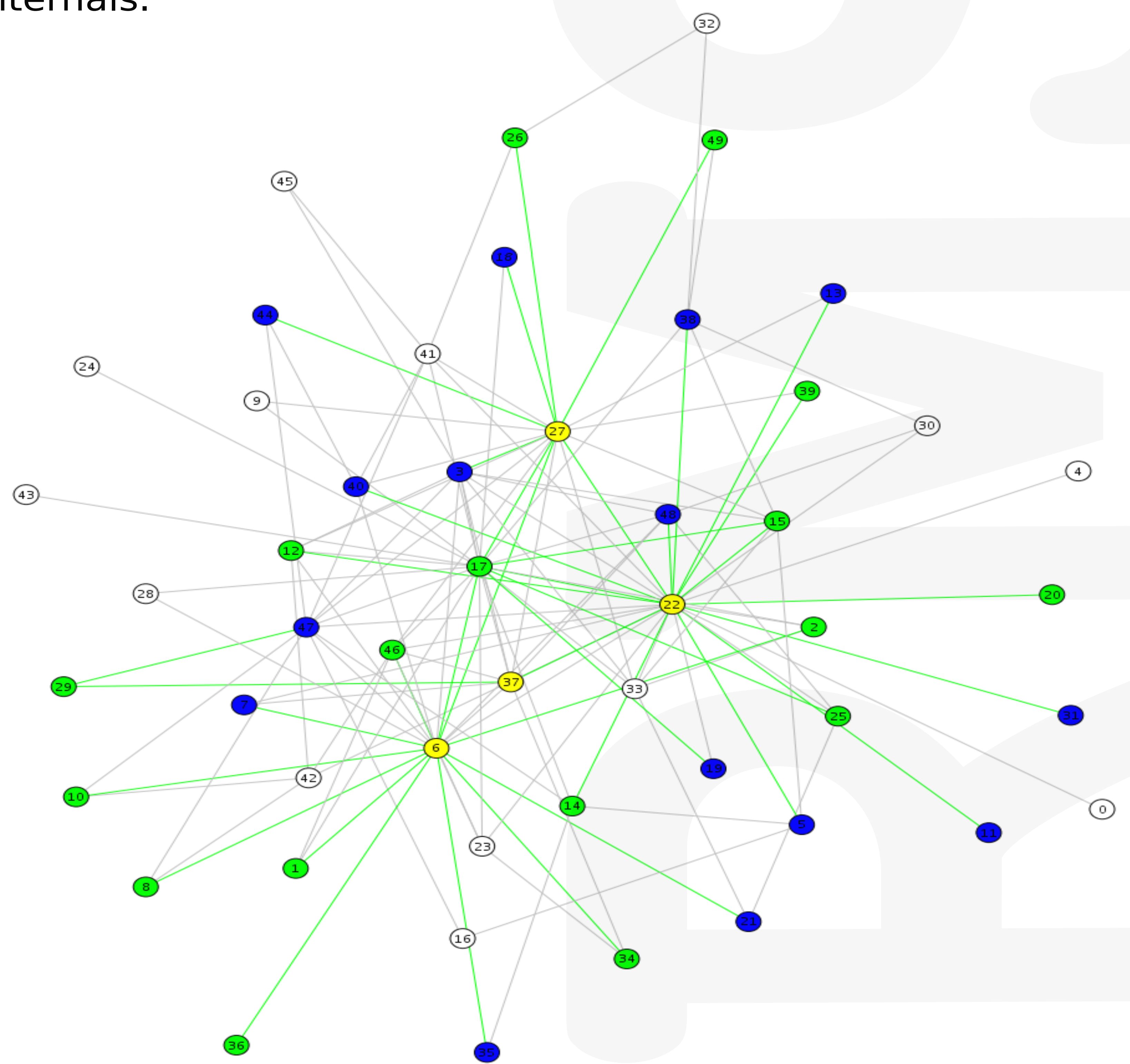
DRMSim is a **100% pure Java discrete-event** routing model simulator. Although it can run on any Java 1.5 platform, it features a number of facilities for UNIX computers.

Contrary to other network simulators, in DRMSim every node maintains a **local knowledge of the whole network**. This technical challenge is addressed by means of efficient graph-based data structures.

<http://drmsim.gforge.inria.fr/>

The first applications of DRMSim include the implementation and benchmarking of the **new NSR and AGMNT routing schemes**. DRMSim allows Researchers to compare their protocol to **BGP** (to which it provides a lightweight implementation), up to a certain number of nodes above which BGP gets harder to simulate. Then the protocol under investigation can be tested with topologies up to hundreds of thousands nodes (depending on protocol's computational requirements).

DRMSim/BGP was validated by confrontation of its output with the results provided by the SSFNet simulator.



DRMSim comes with a set of topology generators. This network was generated using the rules defined by the GLP model.

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