Project - Media Delivery Network Simulator

To make Internet based media distribution better both in terms of efficient utilization of network resources as well as improving user's experience, we need to conduct experiments on different network topologies and platforms. It is difficult to generate and monitor custom loads on an existing media network. Hence it is desirable to design and build a flexible simulator which will generate and consume media traffic based on different configurations on real world network. The simulator will then collect different metrics from each node in the overlay network and reports them to a master node that manages the simulation. This kind of a simulator will help researchers to validate the design of a media delivery network based on metrics collected from a real network deployment.

The simulator is implemented as an extensible framework at application layer where we have a master node, a web client and several different type of nodes running in different node containers. The master node will be responsible for controlling entire simulation and reporting metrics to the web client. The node containers host different nodes. Node Containers can be used to simulate nodes running in different geographical regions or to simulate high/low priority demand locations.

Each node is simulating a different functionality performed in a media delivery network. Source Node is used to generate data (and meta data), Processing node is used to simulate additional processing being done (like ad-insertion) on the generated data. Relay nodes are used to simulate the proxy behavior and Sink nodes are used to simulate the clients requesting data streams.

Web Client is used to take different work configurations as input from the user and display the current status of the network along with important metrics. The work configuration specifies how many nodes are there in the simulation, how are they related, where they are hosted and what data they are sending/requesting for. The simulator also enables continuous monitoring of network and check health from a web client interface. The nodes and links periodically report metrics to the master which is then displayed in an user friendly way to the user in a web client interface.