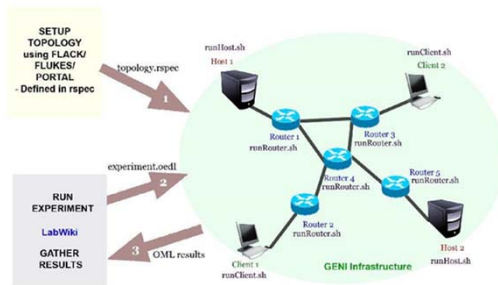


## Motivation

- The goal of this project is to implement a content centric routing scheme (also referred to as named data networking) on the GENI infrastructure instrumented by LabWiki.

### Overview



## Experiment Description

- The aim of the experiment is to evaluate the CCN scheme's inherent ability to retrieve content from the nearest node.
- When retrieving large media files over mobile networks, what is the benefit of automatically retrieving content from nearby nodes vs. distant ones as the requesting client moves further away from the content server used for the initial download?
- We compare a non-CCN scheme where the topology has a single content host with a CCN scheme with multiple content hosts providing a certain content file.

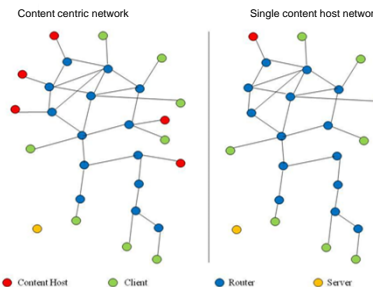
## Experimentation Tools

- GENI (Global Environment for Network Innovations) is a virtual testbed for conducting research in networking and distributed systems.
- Flack is a software to reserve resources on the GENI testbed. The topology is defined in a .rspec file.
- LabWiki is an experimentation software which helps to orchestrate applications on GENI. These experiments are written in OEDL (OMF Experiment Description Language)

## Experiment Specifications

- 29 nodes : 14 routers, 5 Hosts, 9 Clients

### Topology



## Experimental Results

- The figure draws a comparison between the round trip time in a network with a single content host and that in a content-centric network.
- The content centric network performs better than the single content host networks as the clients move further away from the single node and the topology becomes larger.

RTT comparison for single content host n/w and CCN



## Content-centric routing

- Content centric network (CCN) is a future internet architecture which aims at focusing on the data to be retrieved.
- It is designed to route packets based on content identifiers as opposed to using a scheme based on IP or MAC addresses.

## Architecture

- Clients request content and these requests are serviced by hosts nearest to them.
- In this design the minimum number of hops to the content decides the proximity.
- Each router maintains a Routing table to store information about the best path to a certain content.
- A Pending request table is maintained at the router to keep track of the requests to be serviced.

## Conclusion and Future Work

- The GENI virtual testbed provides a flexible infrastructure to deploy various future internet architectures without design constraints.
- LabWiki provides a convenient way to orchestrate large scale experiments on GENI.
- Currently LabWiki does not support interactivity once the experiment has begun which, in some cases can limit the extent to which the application design can be evaluated.
- Future work would involve integrating GENI and LabWiki.

## References

- <https://portal.geni.net>
- Link to project website: <https://db.tt/Pcg8Qiw0>