Controlling a Large-scale Experiment on GENI-FIRE Testbeds

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Abstract: This demo shows an experiment that runs on a transatlantic topology comprised of GENI and FIRE testbed resources. The goal of this experiment is to show how such large-scale slice can be reserved using FED4FIRE and GENI tools. In addition, it will be shown how the experiment can be executed using LabWiki, OMF, and OML.
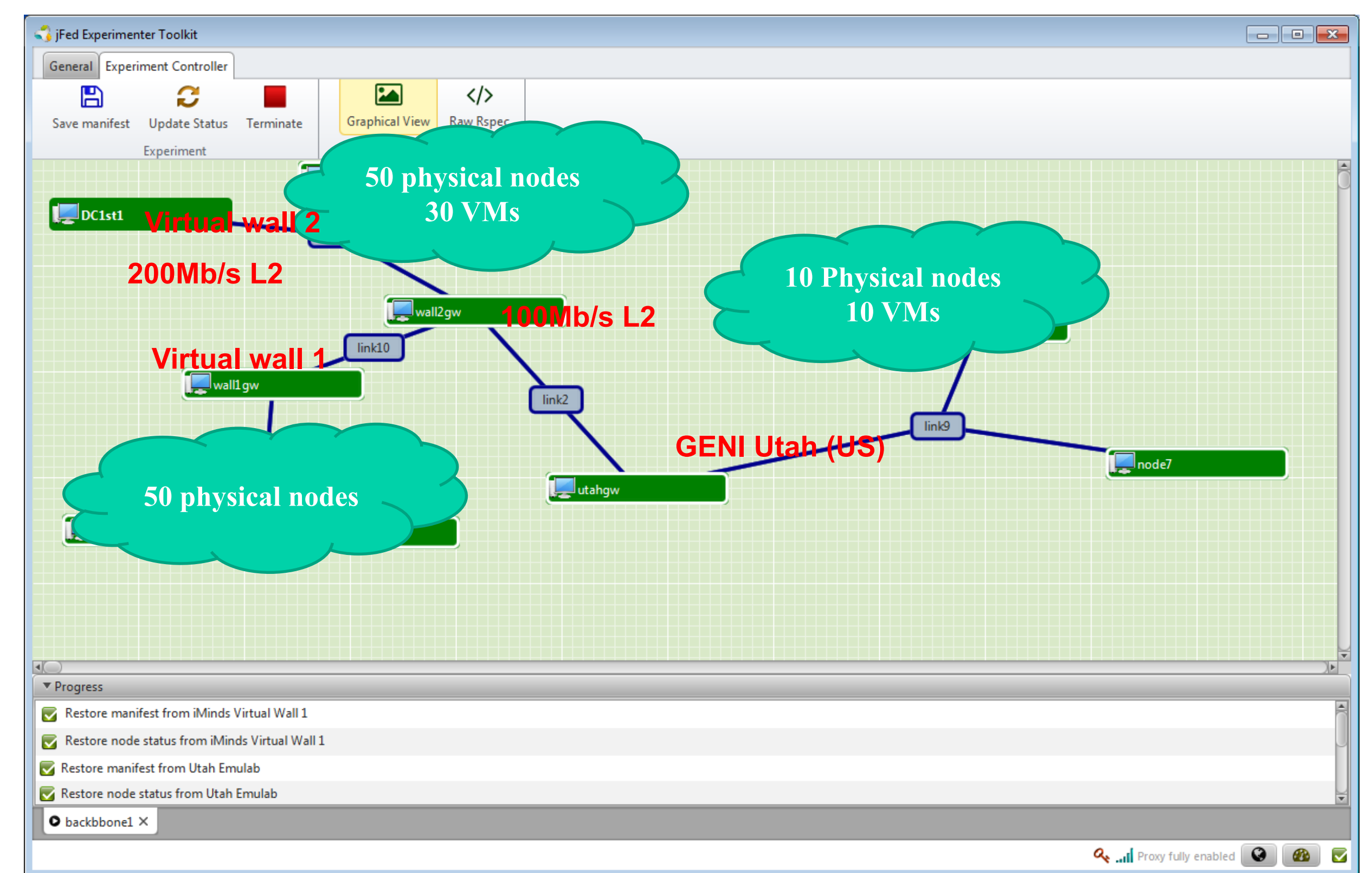
The experiment makes use of XTREEM FS for wide area data replication. In the specific case of this demo XTREEM FS is used to replicate DASH videos at different geographic locations.

The streaming of the videos from web servers to the clients is controlled by OMF and LabWiki is used to visualize measurement results.
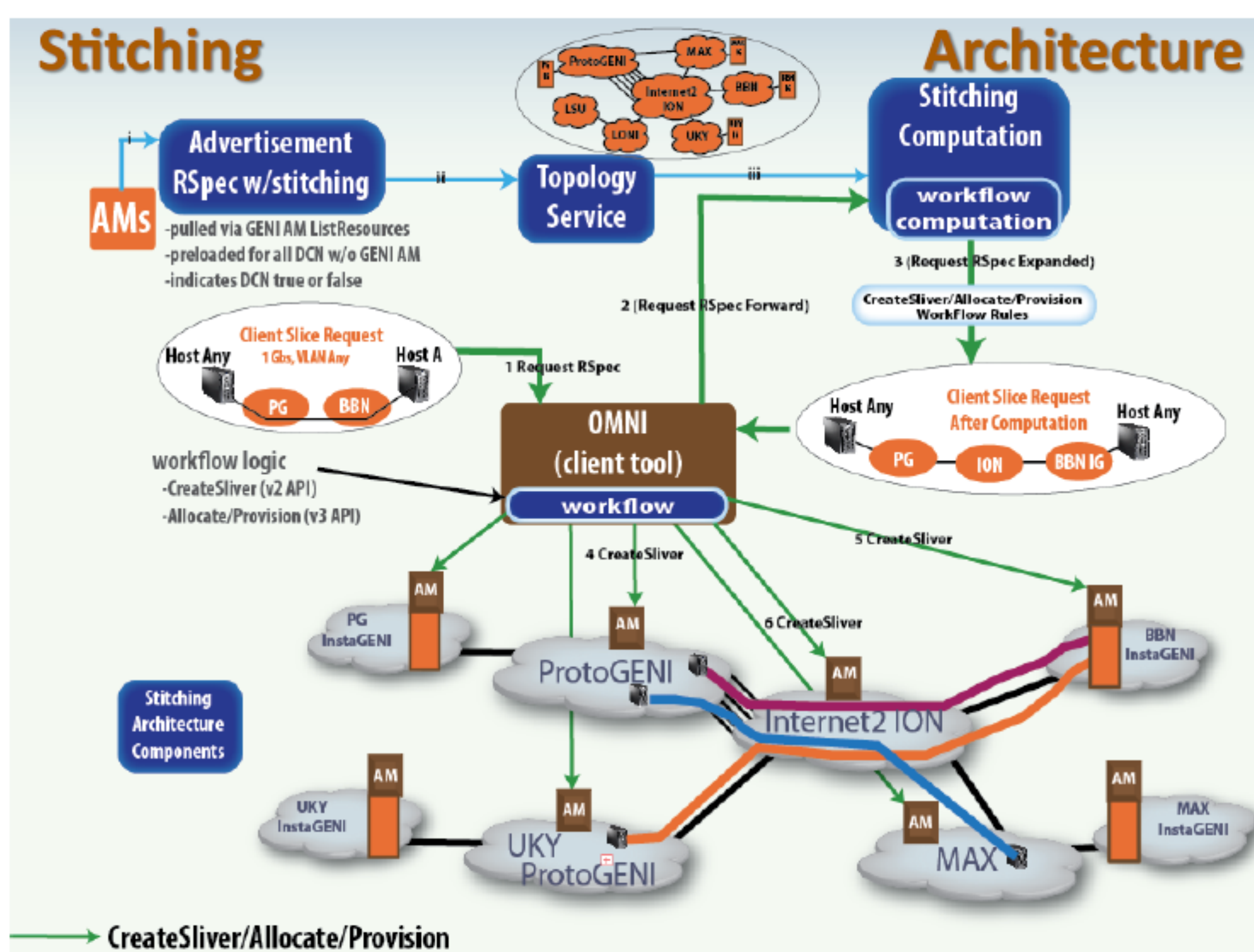
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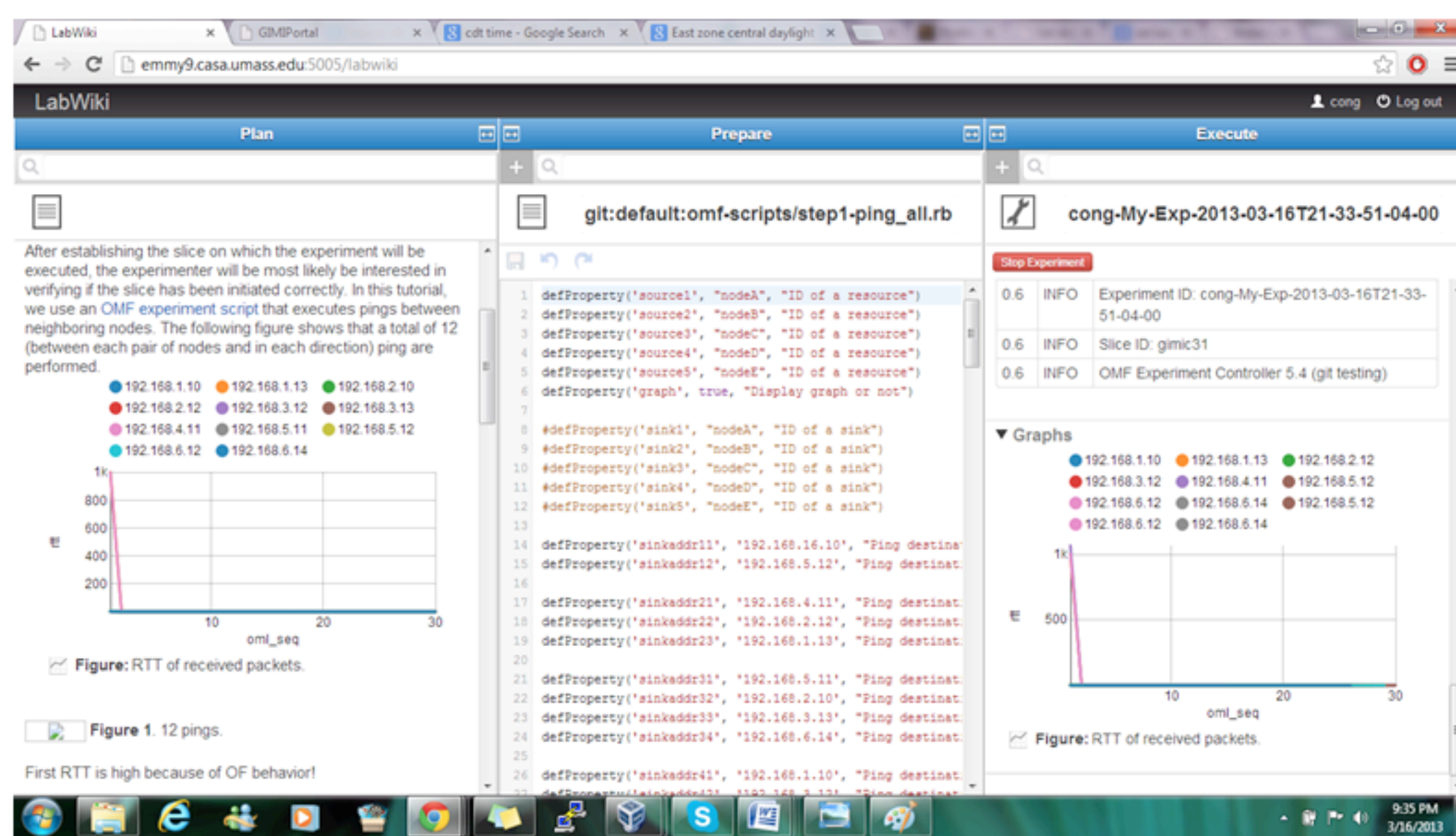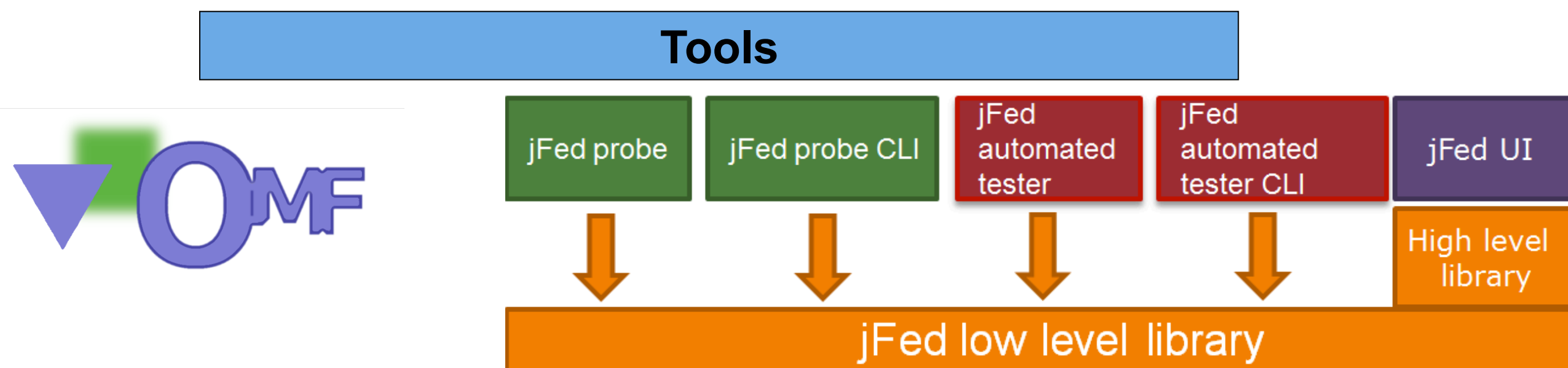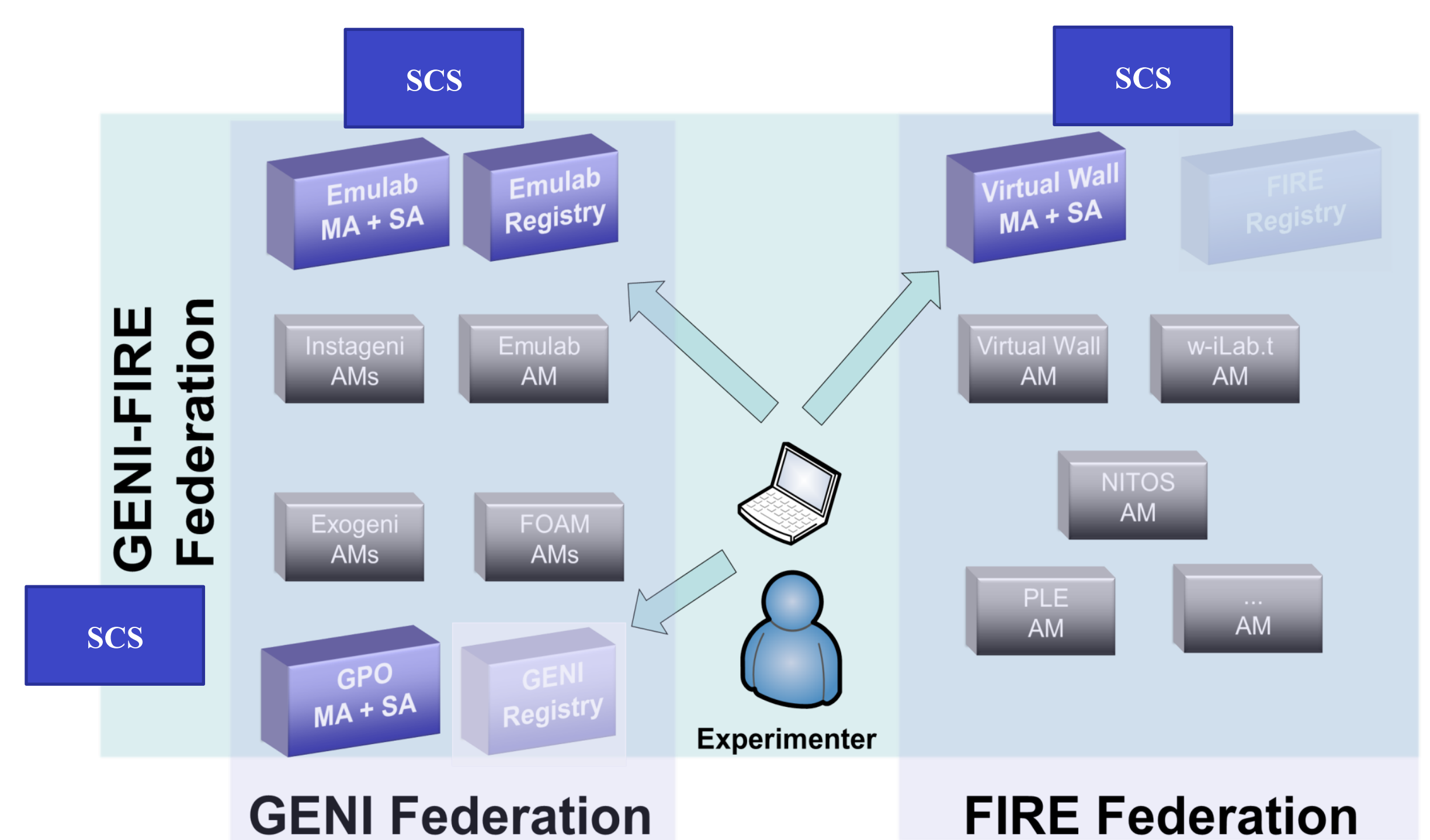
Stitched Large-Scale Architecture

Control Architectures

SCS per Federation

Experiment

- Compute resources at Virtual Wall 1 & 2 in Belgium and InstaGENI in Utah. A total of 3 web servers and 110 clients.
- Testbed are stitched together via layer 2 links (I2 ION)
- XTREEM FS runs on top of this large-scale topology and replicates videos between the three locations.
- Videos are requested from web servers that are instantiated at different locations in topology.
- Video requests are controlled by OMF.
- OML-ified VLC is used to measure quality of streamed videos.
- LabWiki is used for experiment execution and live visualization of measurement results.

XTREEM FS on Large-Scale

XTREEMFS

XtreemFS is a fault-tolerant distributed file system for all storage needs.

Versatile

XtreemFS is a general purpose storage system and covers most storage needs in a single deployment. It is open-source, requires no special hardware or kernel modules, and can be mounted on Linux, Windows and OS X.

XtreemFS is easy to setup and

Reliable

XtreemFS is the only **fault-tolerant file system** that automatically handles all failure modes — including network splits.

Fault-tolerant replication keeps your data safe and gives you peace of mind.

Scalable

XtreemFS scales according to your needs **within minutes**, simply by adding new standard hardware. Starting with a single server, growing to a cluster and across datacenters.

Be more flexible and protect your investments.