



uhexp: A Framework for Automating the Execution of Repeatable & Portable Network Experiments

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uhexp Abstractions for Automation of Experiments on Available Infrastructures:

infrastructure-specific access mechanisms
OS-specific installation and configuration requirements

process handling on experiment vertices
experiment data retrieval from vertices

} common API
wrappers for custom applications/tools

Experiment Controller

Install Applications

Start Measurements

Conditional Events:
start/run apps

Collect Experiment Data

OS-specific application
configuration

Start/Run Applications

Start/Run Applications

Stop Measurements

uhexp
ABSTRACTIONS

**Per node remote access
permissions and methods:**

Remote access mechanisms
Infrastructure-specific access API

**Per node application
installation:**

OS-specific application
setup and configuration

Measurements:

Packet capture
Timestamps
Logging of events

Applications and protocols:

Start, run, and stop per experiment
design and per triggering events
Remote process control per node

Experiment data:

Retrieve data from network nodes
Experiment-sourced metadata for
results

Example Infrastructures and Associated Framework Support

VTS

ssh, GENI project/slice ownership/membership, alpine, ubuntu, debian, centos OS requirements, tcpdump, logging, etc

CloudLab

ssh, CL/GENI project/slice ownership/membership, ubuntu, debian, centos OS requirements, tcpdump, logging, etc

RPi Network

ssh, local network, raspbian OS requirements, tcpdump, logging, etc