

NEPI demo

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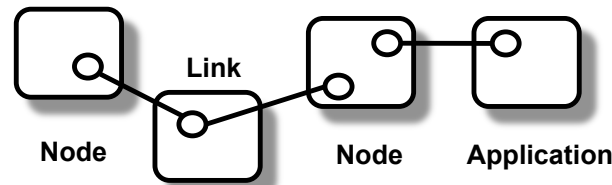
<http://nepi.inria.fr>

NEPI in a nutshell

- NEPI is a framework to manage network experiments
 - that abstracts testbed differences behind a common interface
 - to automate experimentation steps.
- NEPI runs on the user side (e.g., user desktop)
 - i.e., no need to modify the testbed.

Experiment representation

- Experiments are represented as a graph of interconnected resources.



- Each resource has 3 set of properties:
 - attributes (e.g., configuration)
 - traces (e.g., stderr, stdout)
 - states (i.e., STARTED, STOPPED, FAILED)

Demos

1. one node, one app
 - print “Hello world” remotely
2. one node, two apps (execution flow)
 - 2nd app uses results of 1st app
3. two nodes + local processing
 - deploy CCNx
 - pipe remote execution to local process

Trying out NEPI?

- NEPI is implemented in Python.
 - web <http://nepi.inria.fr>,
 - mailing list: nepi-users@inria.fr,
 - send an email to sympa@inria.fr with subject *SUBscribe nepi-users <your-username>*.

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Complementary material

Everything is a resource

- The user interacts with the **Experiment Controller** (EC), which controls the Resource Managers.
- The **Resource Managers** (RMs) control individual resources (1 RM per resource type)
- All RMs implement a same interface
 - e.g., `deploy`, `start`, `stop`.
- An experiment is a graph of interconnected resources.

A ping example

```
from nepi.execution.ec import ExperimentController
ec = ExperimentController()

node = ec.register_resource("LinuxNode")
ec.set(node, "hostname", "planetlab1.inria.fr")
ec.set(node, "username", "me")

app = ec.register_resource("LinuxApplication")
ec.set(app, "command", "ping -c3 nepi.inria.fr")
ec.register_connection(app, node)

ec.deploy()

ec.wait_finished(app)

ec.shutdown()
```

A CCNx example on PlanetLab

```
from nepi.execution.ec import ExperimentController
ec = ExperimentController()
node = ec.register_resource("LinuxNode")
ec.set(node, "hostname", "planetlab1.inria.fr")
ec.set(node, "username", "me")

ccnd = ec.register_resource("LinuxCCND")
ec.register_connection(ccnd, node)

ccnr = ec.register_resource("LinuxCCNR")
ec.register_connection(ccnr, ccnd)

entry = ec.register_resource("LinuxFIBEntry")
ec.set(entry, "host", "planetlab2.usa.org")
ec.register_connection(entry, ccnd)
```

NEPI status

- Supported testbeds:
 - (any) Linux host with SSH key authentication,
 - PlanetLab testbed,
 - OMF wireless testbeds.
- Other testbeds:
 - Amazon EC (should work. untested), Grid5000 (should work. untested), ns-3 (ongoing).
- Virtually any other testbed (= set of resources).