

GEC 21
Experimenter Round Table

Implementing ChoiceNet
on GENI

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ChoiceNet

(NSF FIA Project)

○ Motivation

- ❑ Customers limited to a **single (local) network provider**, and providers have **access to local customers only**.
- ❑ Business transactions are for **long-term contracts**
- ❑ **Result:** Providers have **little incentive** to deploy new services (no ability to sell to all customers, no competition for customers, and no ability to set up (and be paid for) short-term contracts)

○ ChoiceNet: builds an “economy plane” for the Internet with

- ❑ **Marketplace** where
 - ◆ Customers can choose their provider
 - ◆ Providers have access to all customers
- ❑ **Fine-grained contracts** for network services
- ❑ **Competition** between providers that drives innovation

Examples of Good Things in GENI

- Can modify the kernel
 - Use Xen nodes with OVS and Click support
- Can create interesting topologies with multiple paths
 - Large topologies
 - Multiple paths between nodes
 - QoS differences (bandwidth, delay, loss rate)
- Can easily tunnel in from user Desktop - useful for testing video
- Existing support for IPv4 and IPv6
- Slices can be accessed by all members of the ChoiceNet group
- GENI Desktop is very helpful for viewing traffic and accessing nodes.

Challenges

(in no particular order)

- Setting up WAN experiments is hard, and sometimes is not possible
- Setting up XEN experiments is slow and error prone - slice creation failed frequently enough to be frustrating.
- Setting up large experiments loaded with ChoiceNet configs and software is time consuming - developed the GENI Experimenter Tool (getool).
- Community OVS experience is not there (or at least is not well documented).
- OVS does not behave like real OpenFlow routers.
- Click and OVS do not play well together.
 - Virtual Interfaces to the rescue. NOT!
- Misc Frustrations/Errors
 - IPv4 routes often incorrect
 - IPv6 routes not installed by default
 - Working with an evolving platform - Several problems with RSPECs changing (may be unique to this GEC).