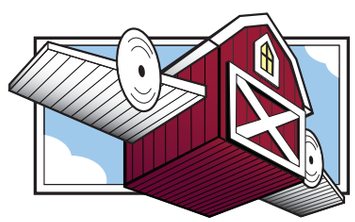
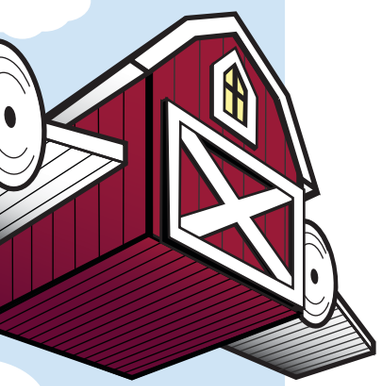
WAN Experiments Using VTS



BARNSTORMER
SOFTWORKS

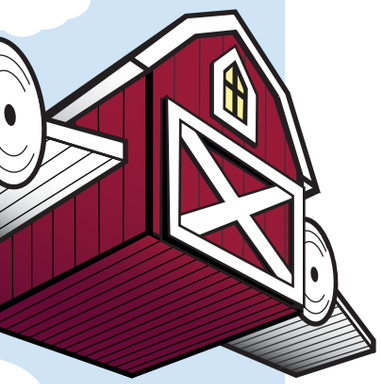
Agenda

- Update geni-lib
- VTS Overview
- Lab 1: Single Site
- WAN Overview
- Lab 2: Simple WAN



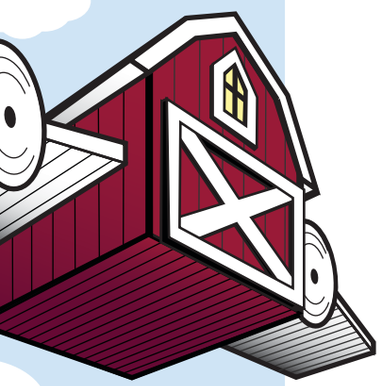
Update!

- `cd path/to/geni-lib`
- `hg pull -u`
- `hg update -C 0.9-DEV`
- `(sudo) python setup.py install`



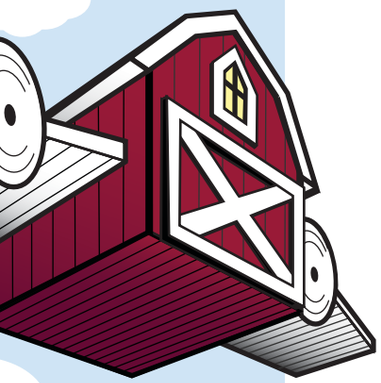
What is VTS?

- Isolated Overlay Topologies for GENI
  - Label Isolation
    - You can use the same ethertypes, MAC, IPv4, IPv6 addresses as anyone else
  - Performance Isolation
  - Exclusive Control / Management

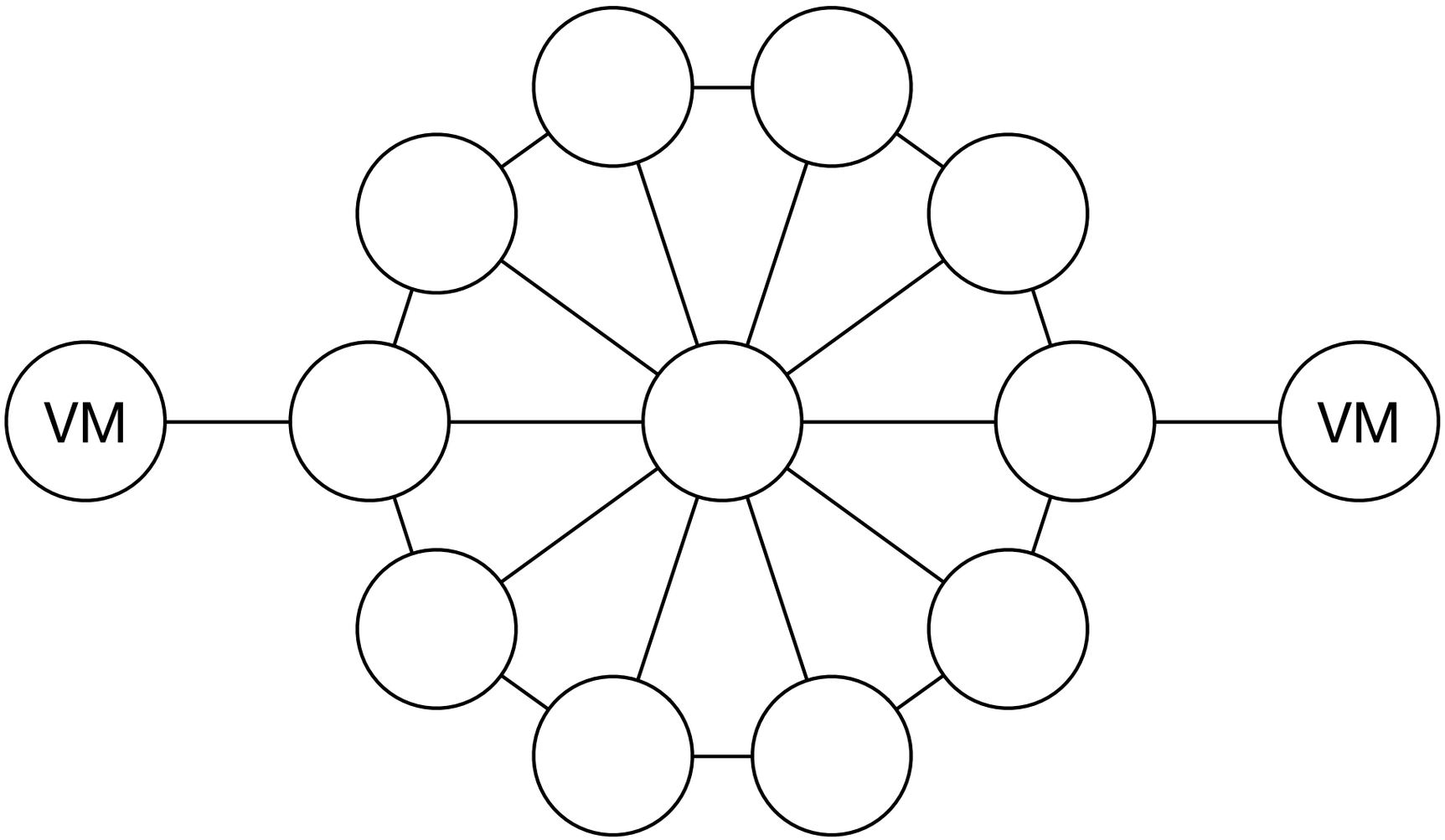


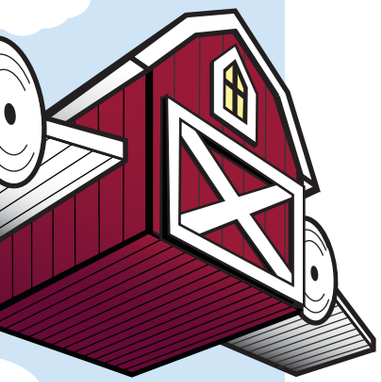
Why Use It?

- Offers features the underlying infrastructure does not
  - OpenFlow 1.3, MPLS, etc.
  - Network Device Monitoring (sflow, etc.)
  - Complex Logical Topologies
  - Dynamic Resource Operations



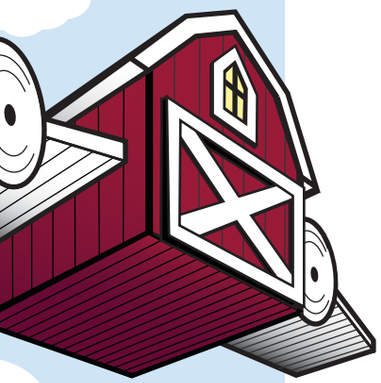
Logical Topologies





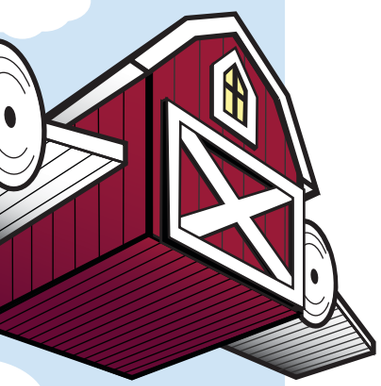
Resource Operations

- Set ports up/down
- Change controller URL and OpenFlow version on the fly
- Dump / clear flow tables
- Insert static flow rules
- Packet capture



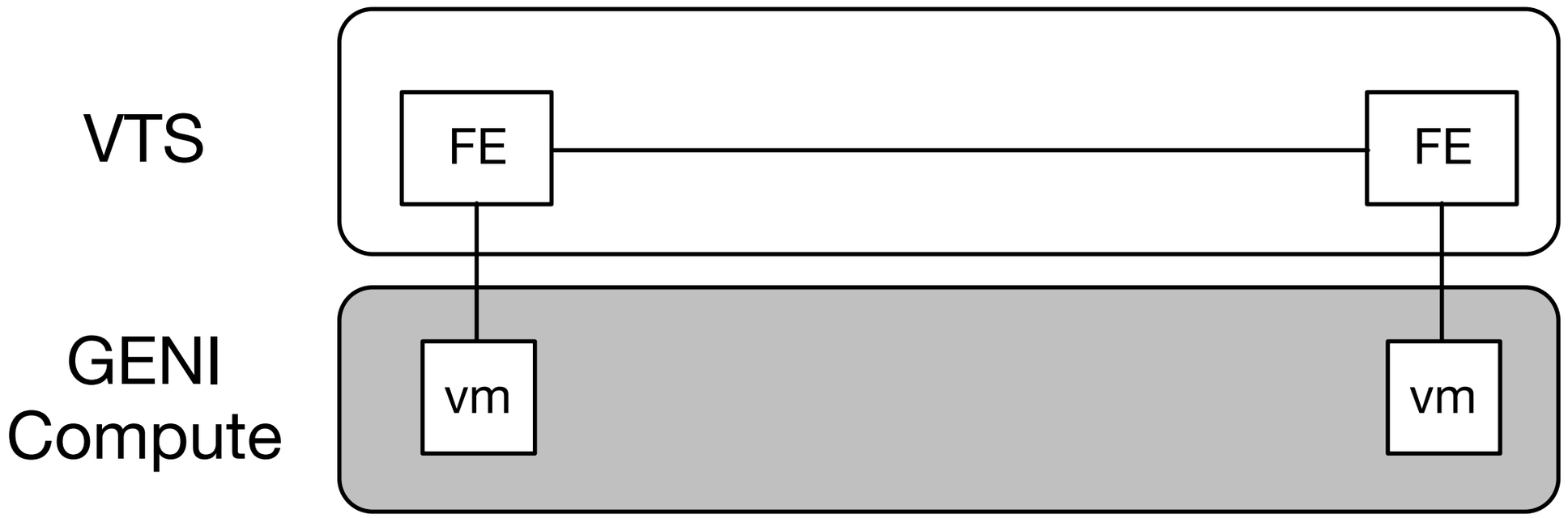
Session Take-Aways

- A working geni-lib installation
- How to build requests for GENI resources with geni-lib
- How to sequence multi-AM VTS requests at a single site
- How to sequence WAN reservations



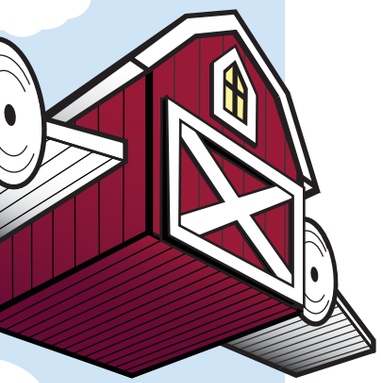
How does it work?

- Combine existing compute resources with orchestrated forwarding elements and topology



Primary Components

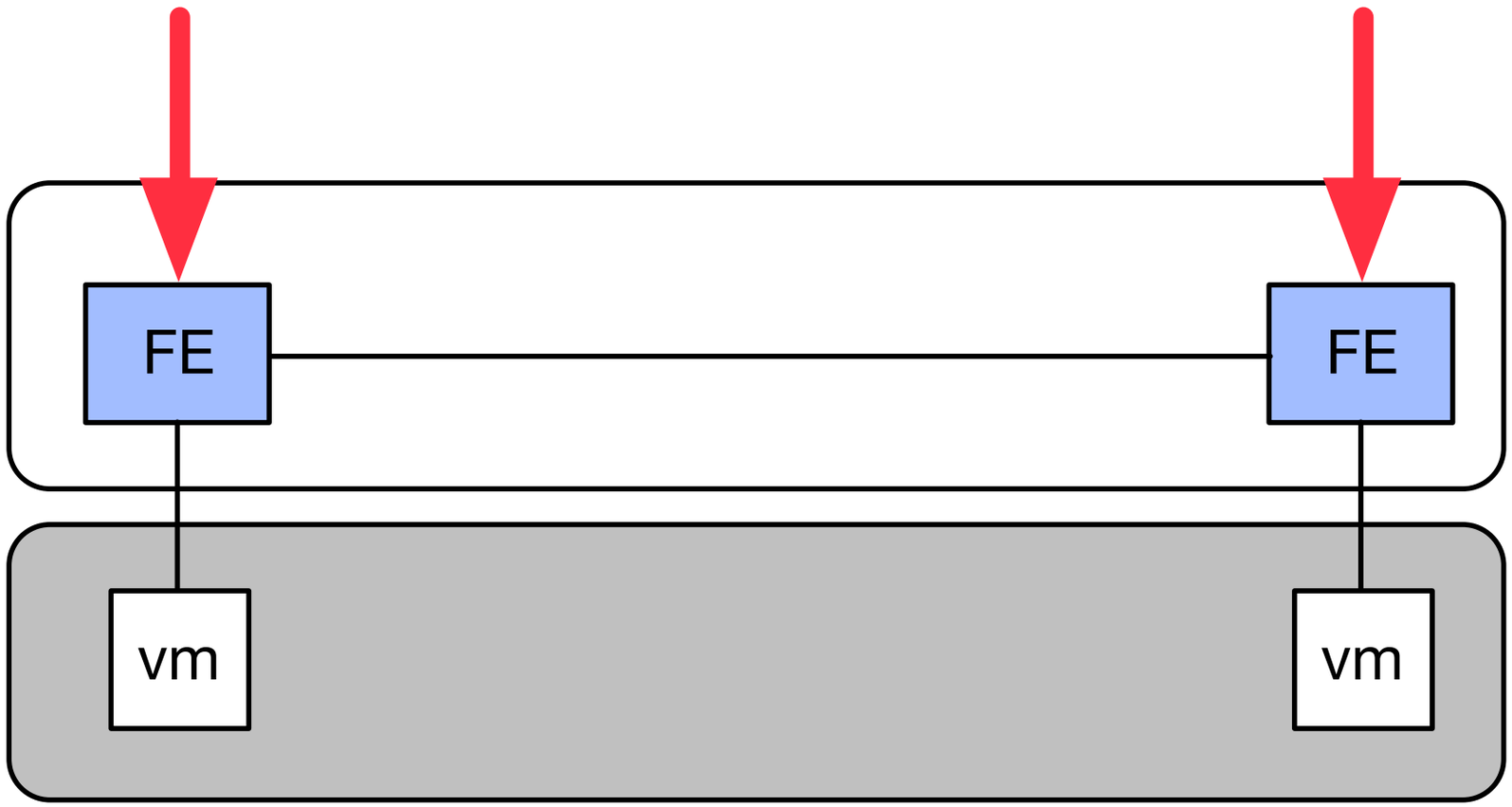
- Forwarding Elements
- Circuit Planes

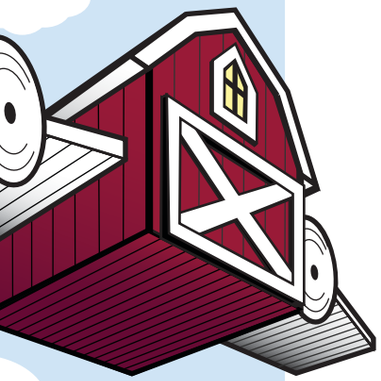


Forwarding Elements

VTS

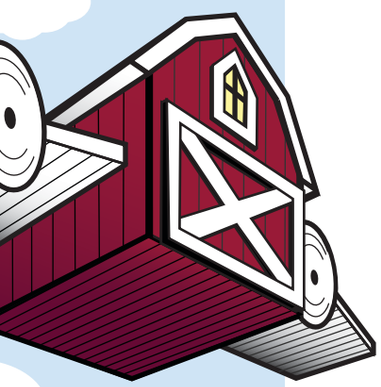
GENI
Compute





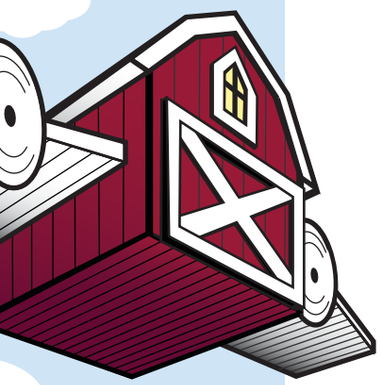
Forwarding Elements

- Anything with more than one port that forwards packets
  - Switch / Router / Firewall / etc.
- Available images will vary by site
  - Common images like OVS are available (mostly) everywhere



Where Do I Get Help?

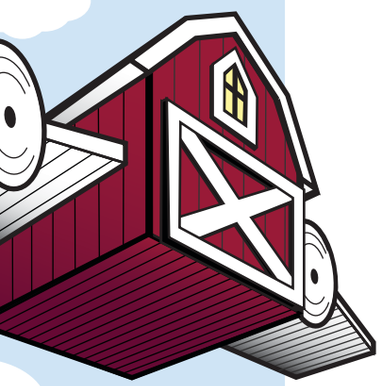
- geni-users google group!



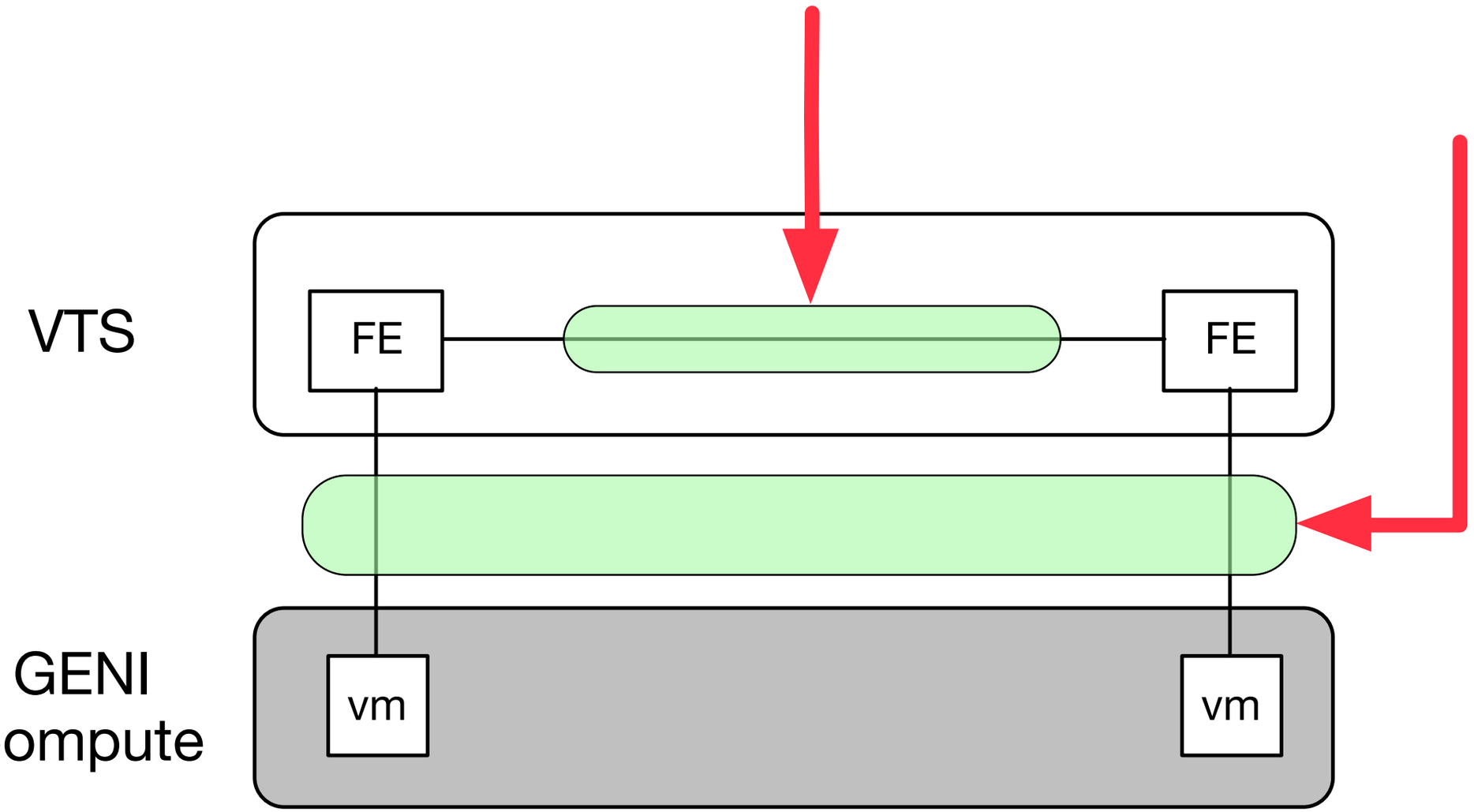
Lab 1: Single Site

Online instructions at:
http://geni-lib.readthedocs.org/en/latest/tutorials/simplevts.html

- Illinois
- UKYPKS2
- UtahDDC
- NPS

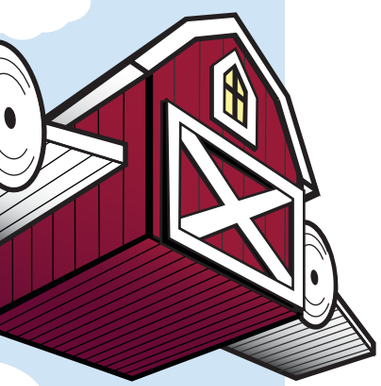


Circuit Planes



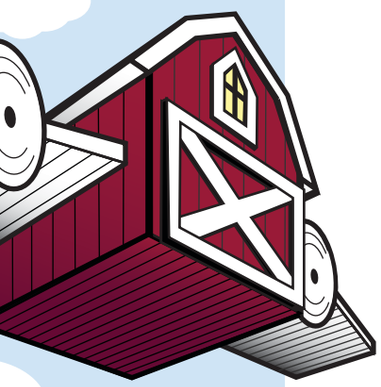
Circuit Planes

- A named substrate over which you can create circuits
- Circuits can be constructed between any two resources that share a connection to the same circuit plane
- Most forwarding elements support almost all circuit planes



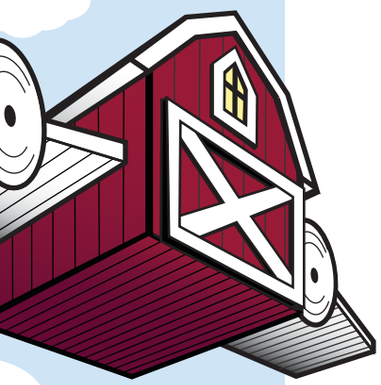
Circuit Planes

- "Local" circuit plane shared with site-local compute aggregate
- "Internal" circuit plane for creating circuits between forwarding elements within the same site

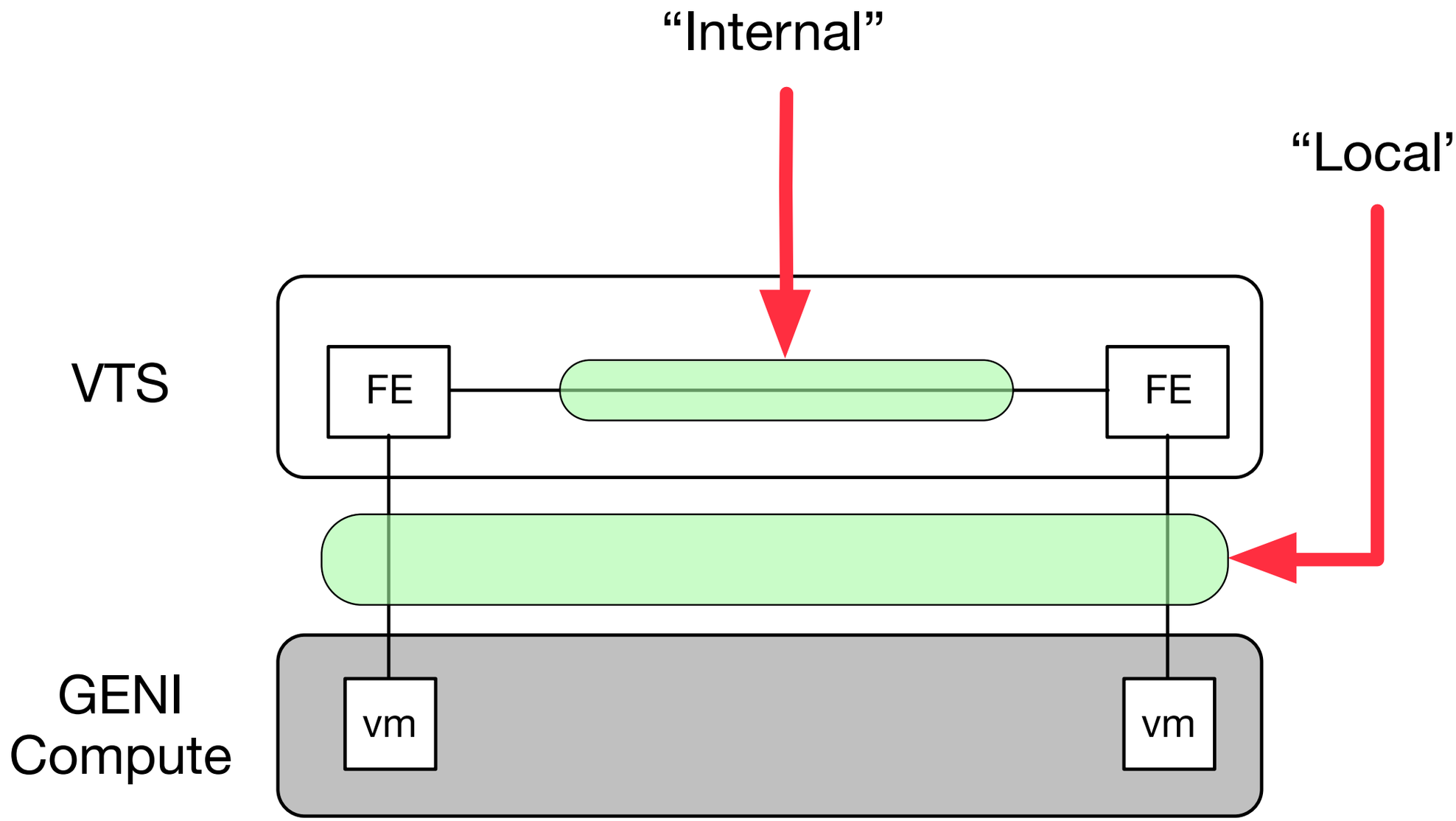


Circuit Planes

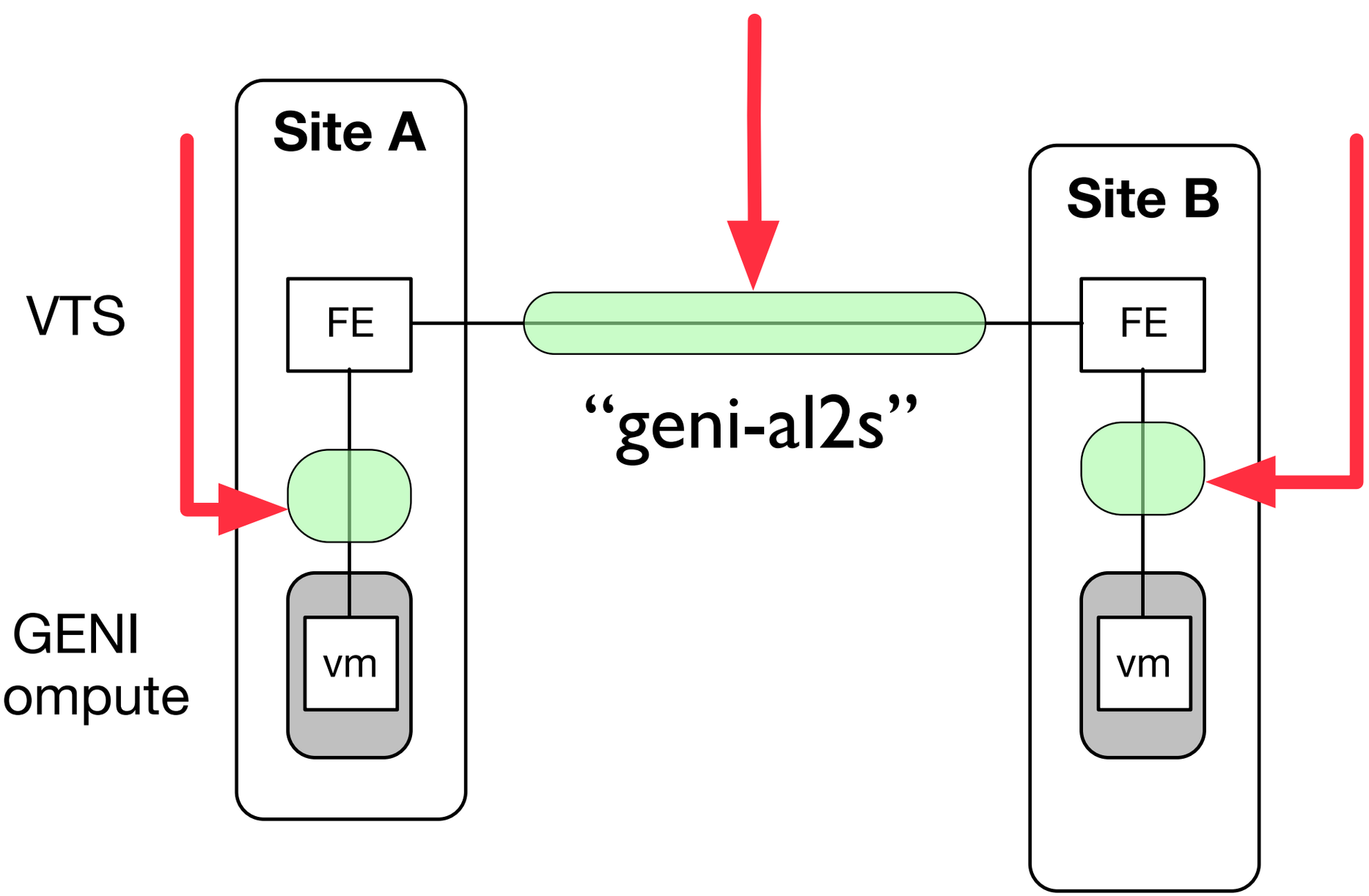
- Properties
  - Name / ID
  - MAC Learning in the path
  - MTU
  - Encapsulation Types
    - Transparency
    - Multipoint



Circuit Planes



Circuit Planes



GENI
Compute

Lab 2: Simple WAN

Online instructions at:
http://geni-lib.readthedocs.org/en/latest/tutorials/wanvts.html