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GENI Peering for Experiments and Services
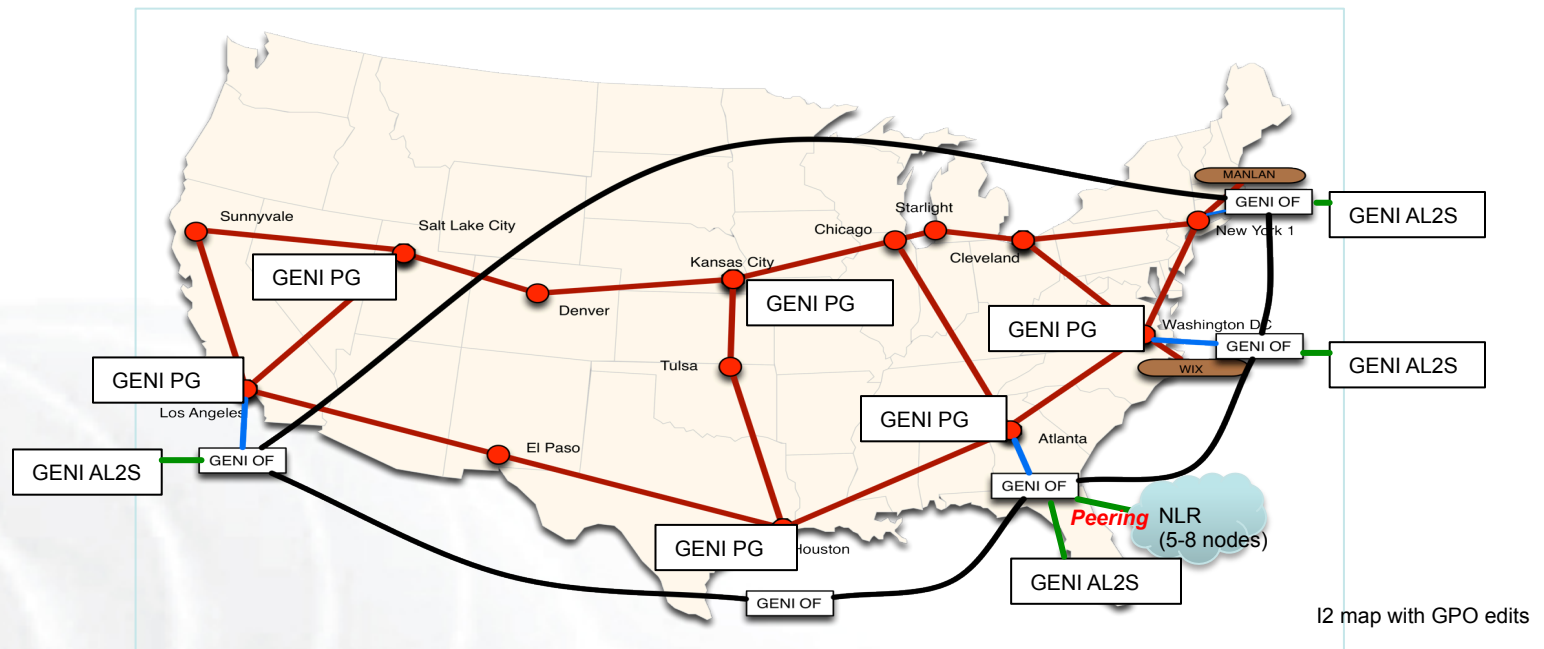
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March 20, 2013
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Q: Whose software is the "S" in SDN?

- A: For GENI, the "S" comes from our resource providers (aggregates) and experimenters (people with GENI credentials).
- GENI community process used for agreeing on interfaces.
- End-to-end experiments often require some sort of peering between aggregates to accomplish
  - Not currently standardized
  - Not necessarily dynamic
  - Not necessarily including all peering players in GENI community process
- Building on-demand virtual research networks needs peering support with the same type granularity and dynamism
- Would like support for shared IT staff and researcher control of peering arrangements
- Must have compatible security support for peering mechanisms (e.g. GENI credentials for making changes)

GMOC

Identity Provider

GENI Clearinghouse

Experimenter Tools

Aggregates*
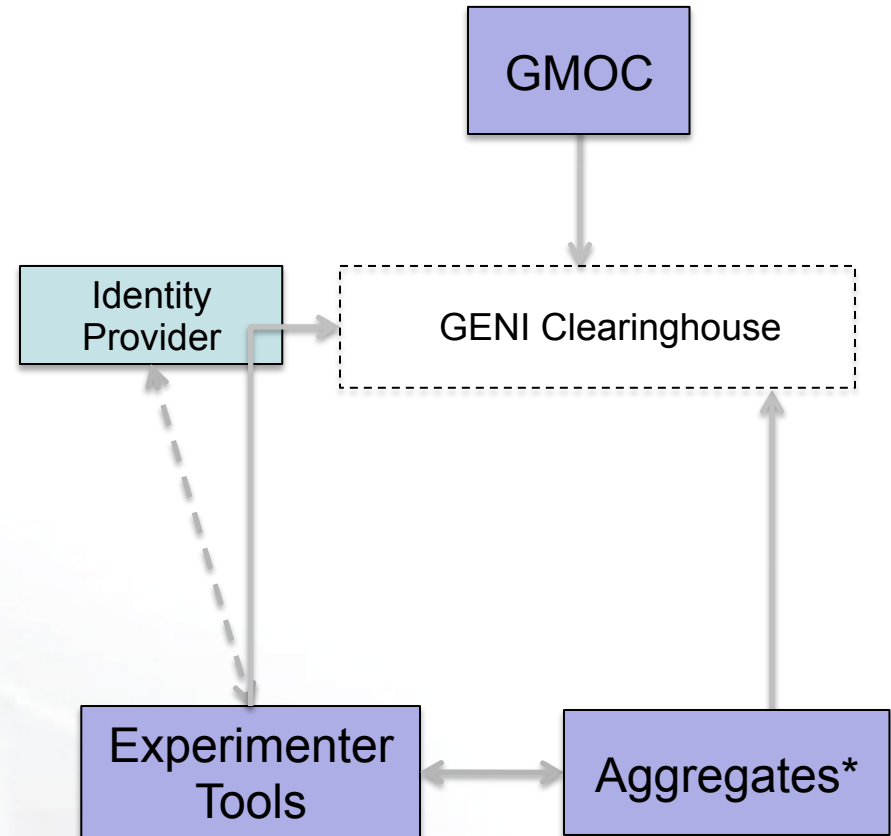
* Includes GENI racks and (if desired) designated campus resources

I2 map with GPO edits

- Multiple 1G and 10G connections with VLANs connecting experimenter nodes
- Campus access to Internet2 via ION/DYNES or direct connection (existing or AL2S)
- Campus access to NLR via FrameNet or direct connection
- Racks (not shown) and regionals (not shown) providing reservable, sliceable network resources using Aggregate Managers (AM).
- Aggregates support GENI AM API
- Aggregates, clearinghouse and tools support GENI RSpec v3
- Aggregates support federation with existing Slice Authorities (GENI Project Office (GPO), ProtoGENI (University of Utah), and PlanetLab Central (Princeton University). InCommon prototyping.
- **Campuses extending SDN from GENI rack to various campus resources**

Some Campus/network requirements (Why bother?)

- Make it easy for experimenters and IT staff to to add new applications and protocols to peering arrangements

- Support experiments that cross organizational boundaries

- Make it easy to report on and track changes in peering arrangements and who made them

- Control access to change peering based on credentials that are supported in GENI

- Make it possible to include some types of peering between R&E and commercial organizations (e.g. commercial hosting providers, cloud resource providers, commercial R&D groups)

- Make it possible to express and query policies the govern peering programmatically