GMOC - Operational Data Sharing

Jon-Paul Herron
GEC4
Miami, FL

Topics

1. Quick Review of Spiral 1 goals
2. Operational Dataset Document
3. Findings: Discussions & Data Sharing Progress with Clusters
4. Operational Data Format & Protocol Document

Review of GMOC Spiral 1

Review of GMOC Spiral 1 Goals

1. Investigate methods and scope for GENI-wide operational data sharing
2. Begin collecting and sharing operational data
3. Develop GENI-wide operational view
4. Investigate potential mechanisms for Emergency Stop

Review of GMOC Spiral 1 Phases

1.First attempt at "what to get"

- *what types of data*
- *what scope*
- *minimal datasets to gather*

2.First attempt at "how to get it"

- *GMOC internal data format*
- *methods for gathering data in existing or new formats from clusters and projects*

3.First attempt at "what to do with it"

- *GENI maps & graphs by GEC5*
- *Access to data for research users*

4.Investigate Emergency Shutdown options

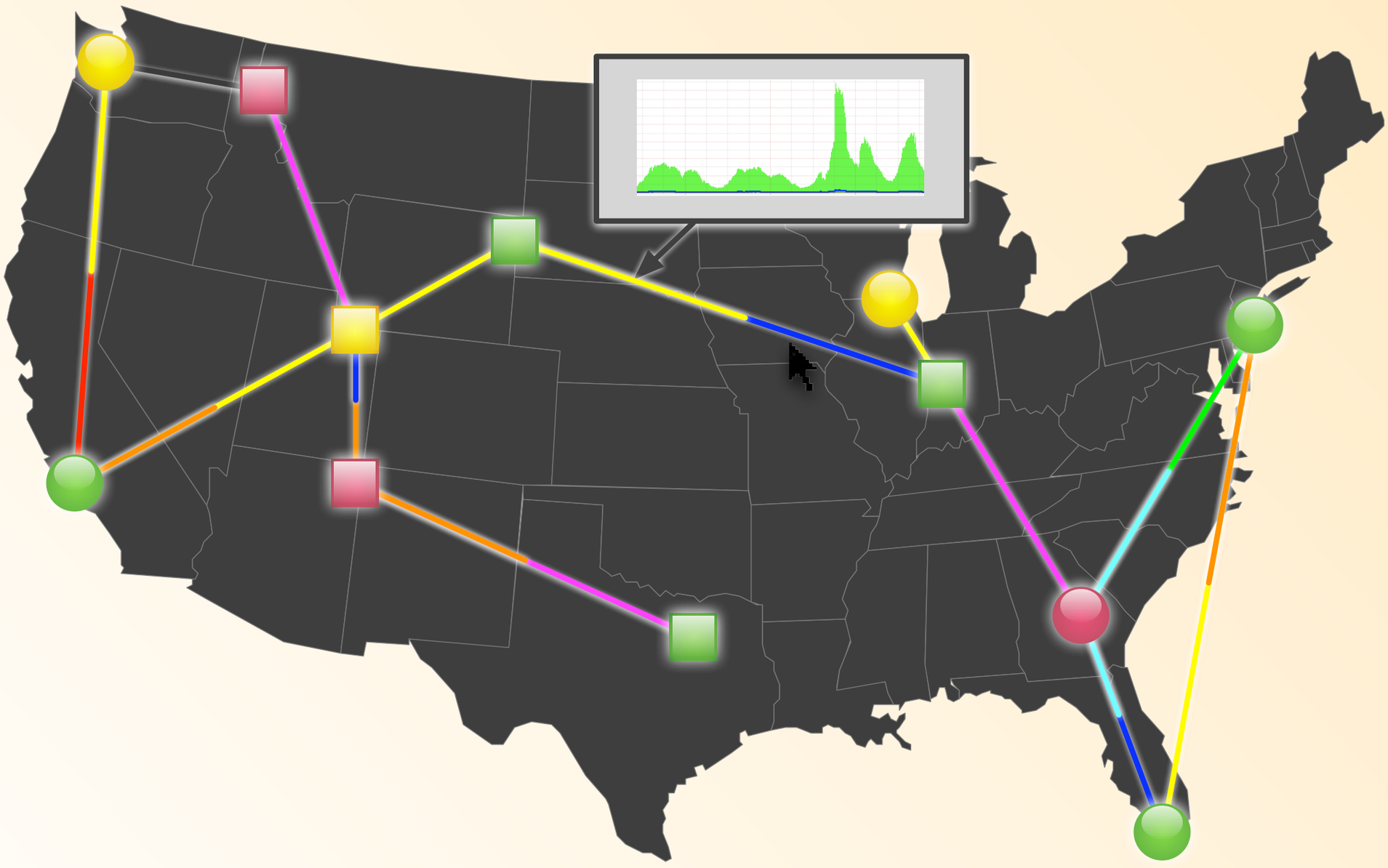
gMOC GENI META-OPERATIONS CENTER

GlobalNOC Global Research Network Operations Center

GMOC Operational Dataset Document

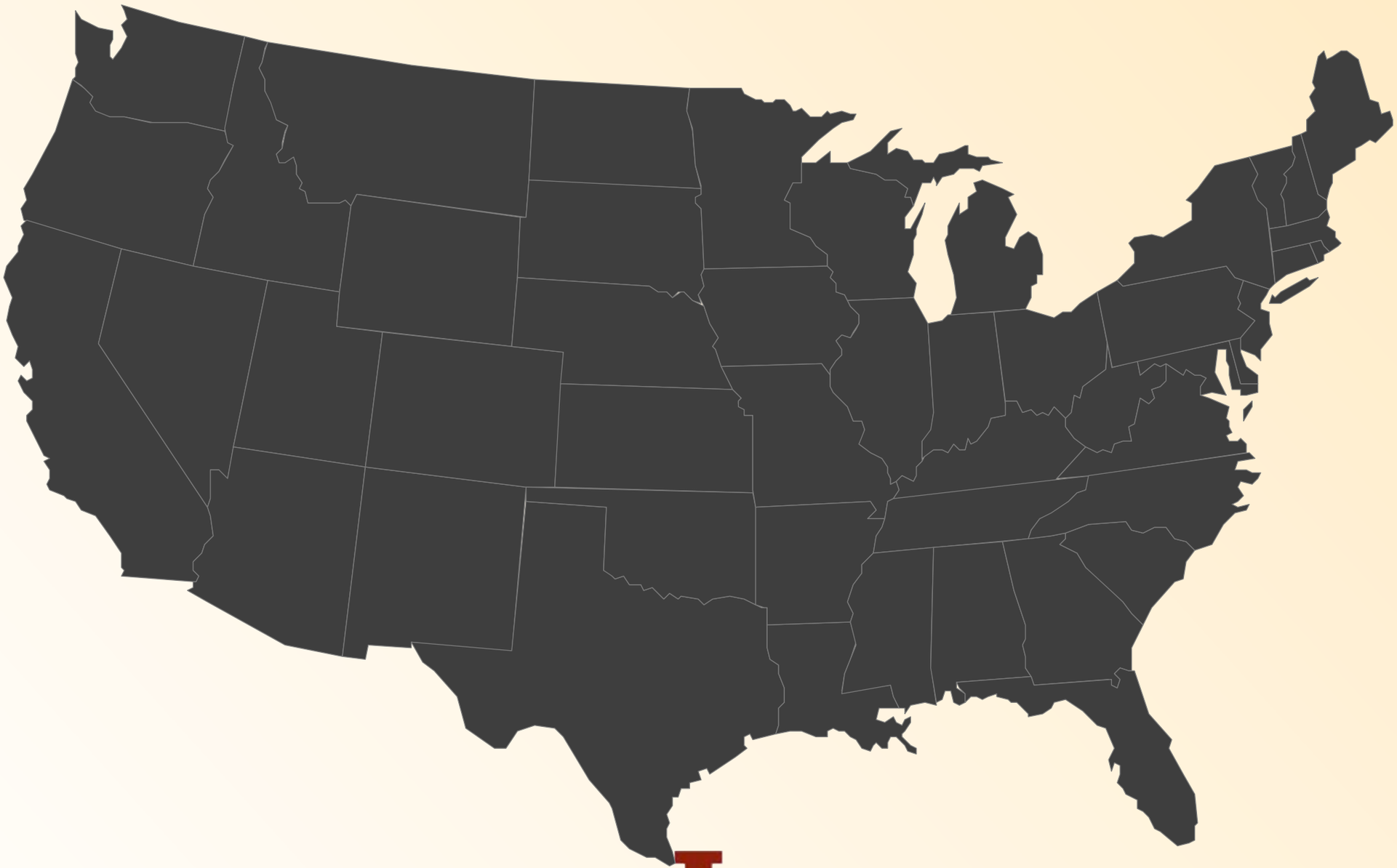
Summary

- Document to answer the “what to get” question
- Draft document distributed to all clusters for input
- Sections:
  - What we’d like to do with the data
  - Types of data
    - examples of each type
    - proposed minimum set of data we’d like to get from each project



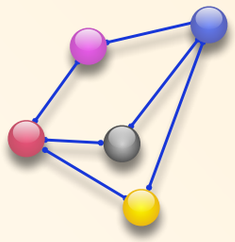
gMOC
GENI META-OPERATIONS CENTER

GlobalNOC Global Research Network Operations Center

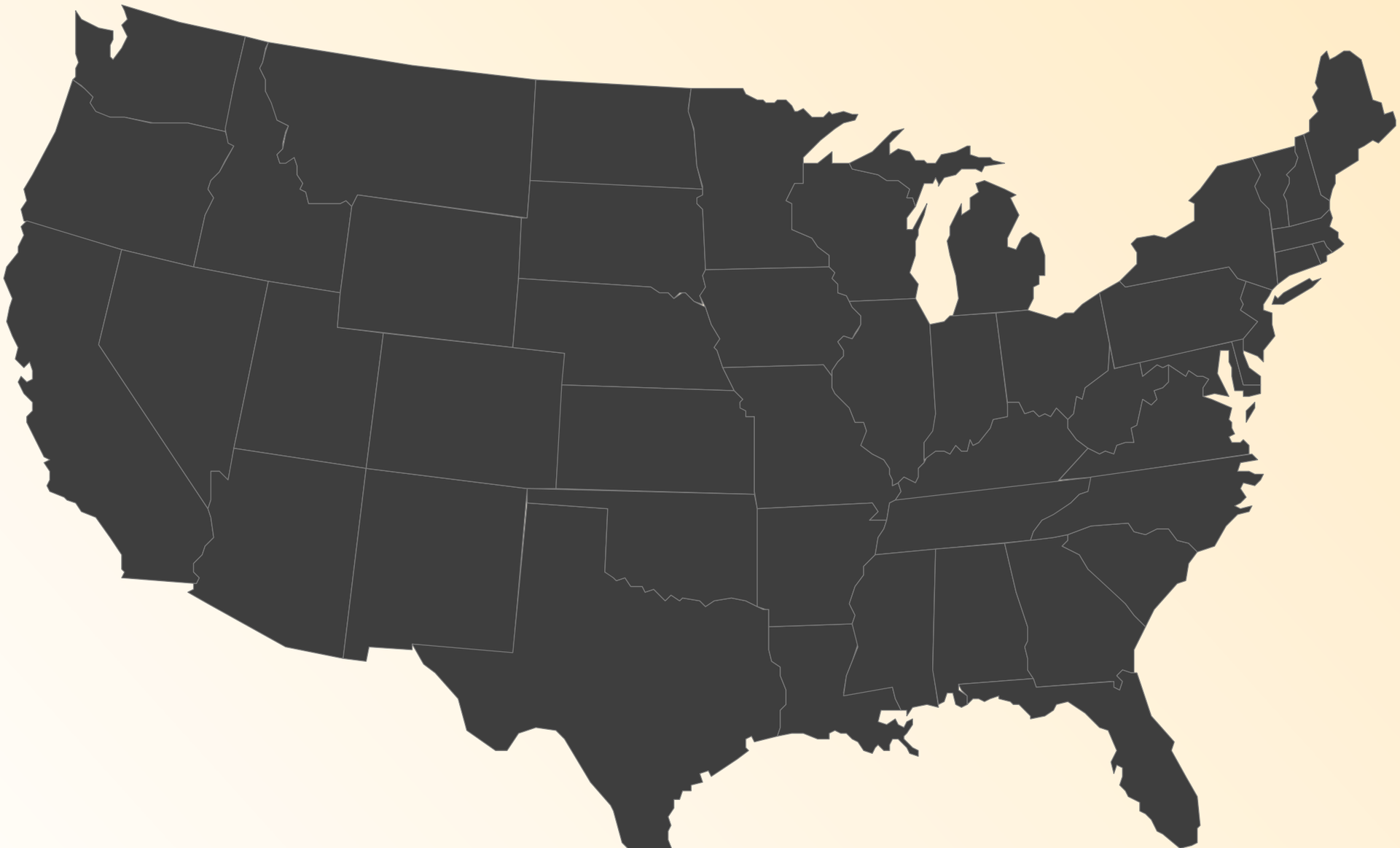


gMOC
GENI META-OPERATIONS CENTER

GlobalNOC Global Research Network Operations Center

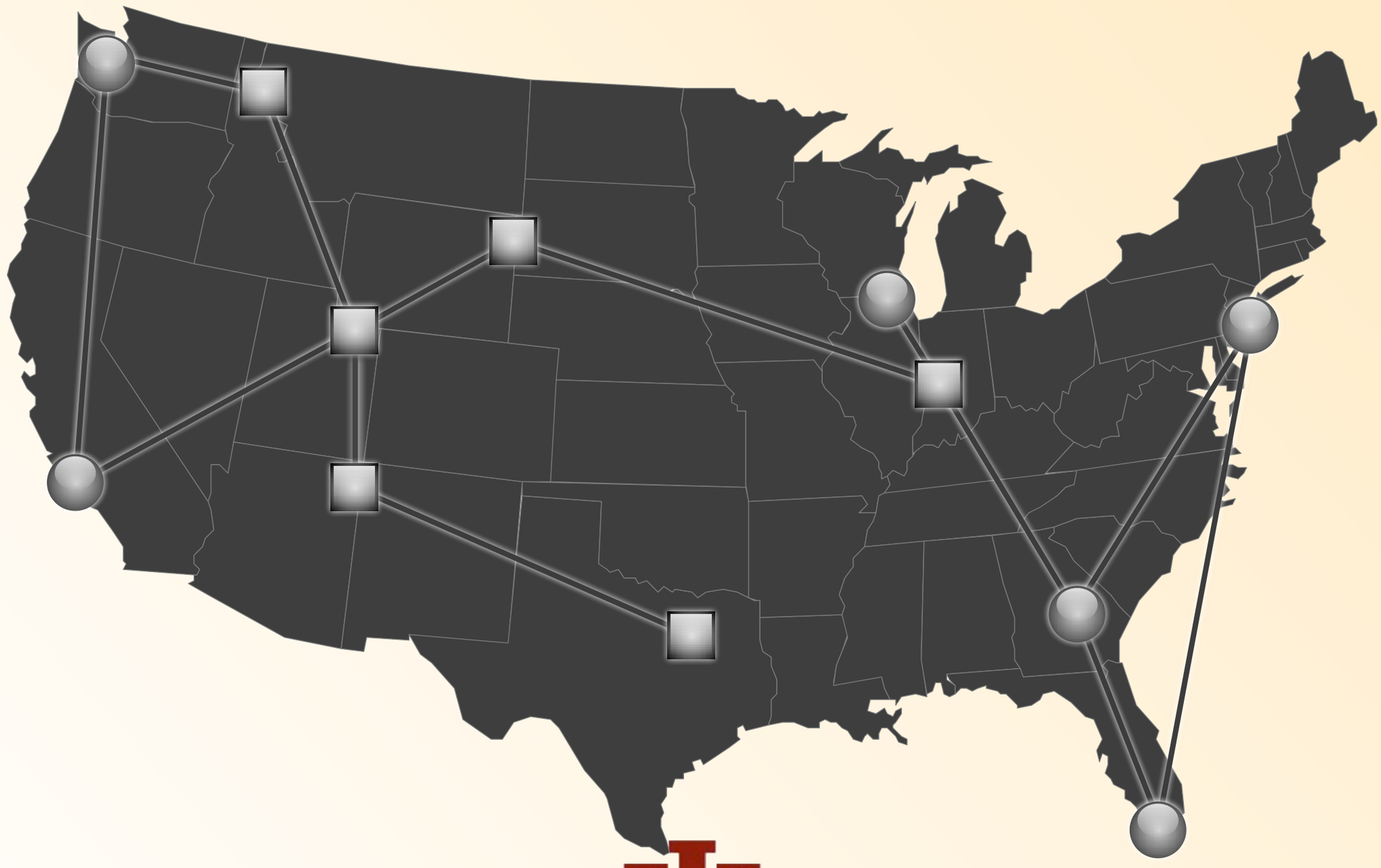


topology



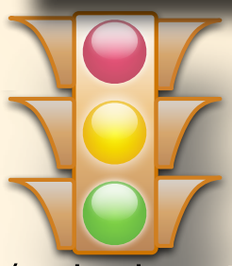
GMOC
GENI META-OPERATIONS CENTER

GlobalNOC Global Research Network Operations Center

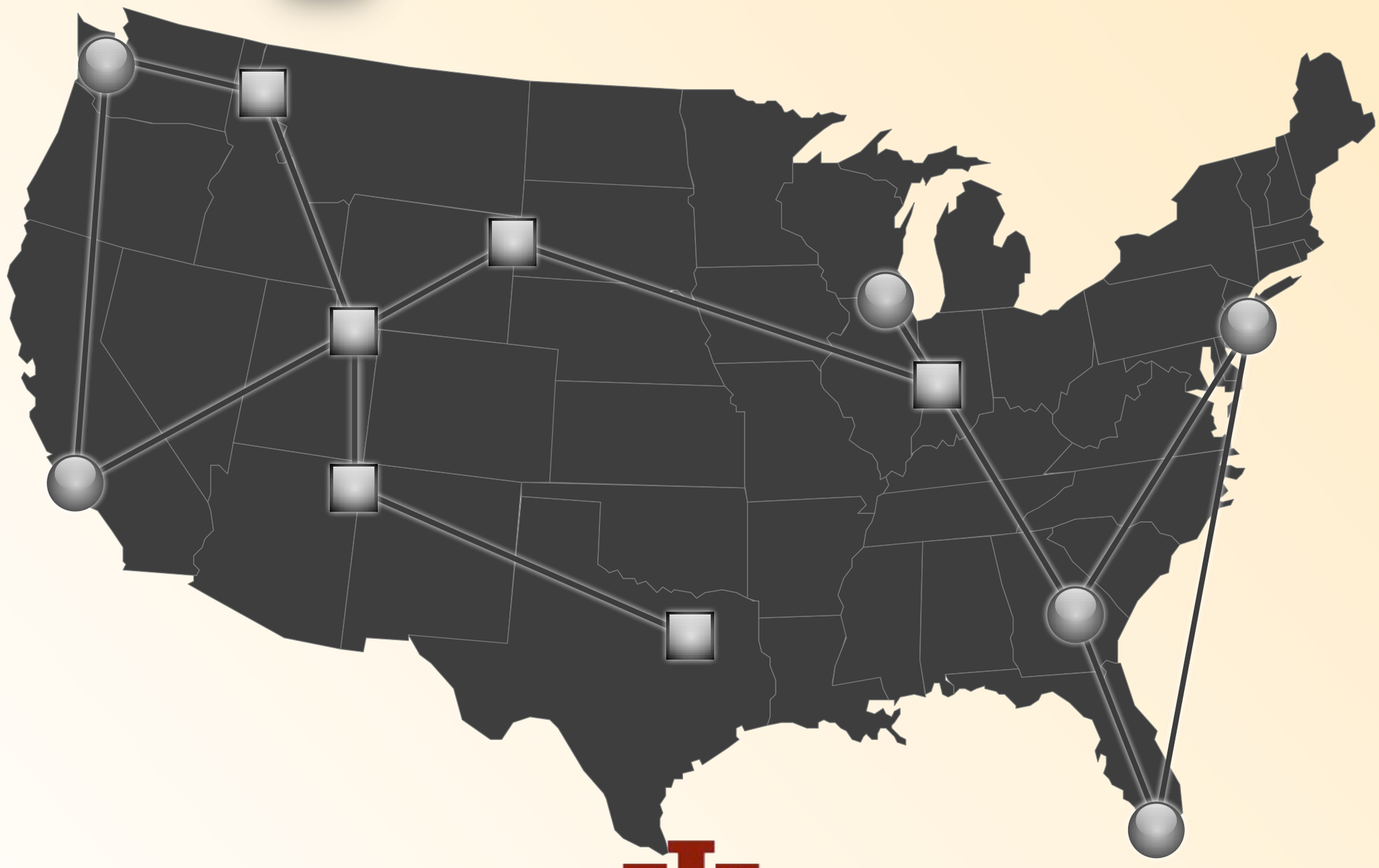


gMOC
GENI META-OPERATIONS CENTER

GlobalNOC Global Research Network Operations Center

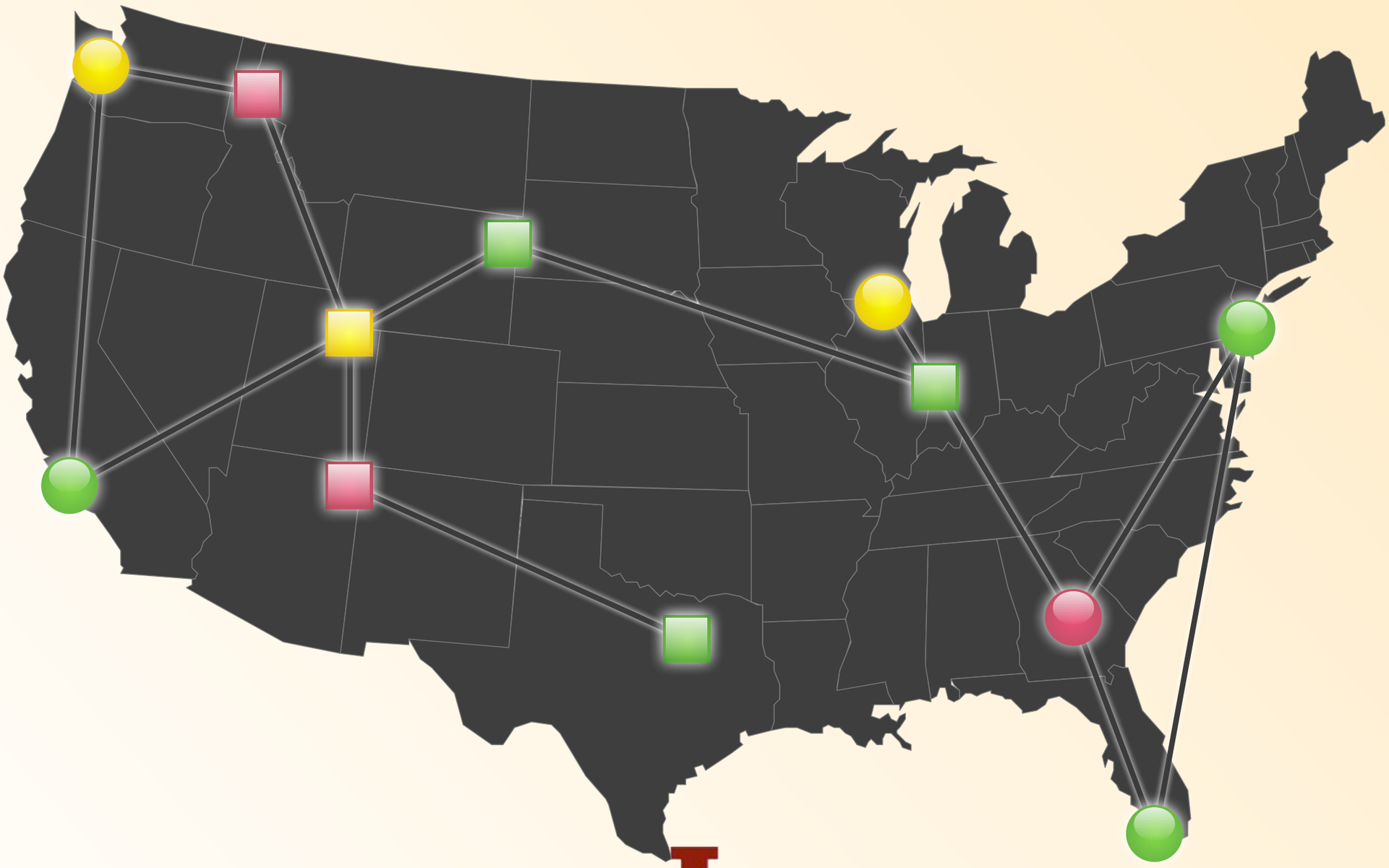


oper/admin status



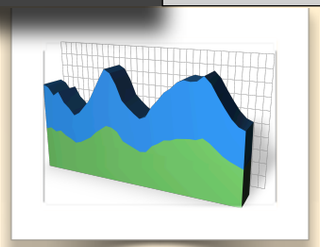
gMOC
GENI META-OPERATIONS CENTER

GlobalNOC Global Research Network Operations Center

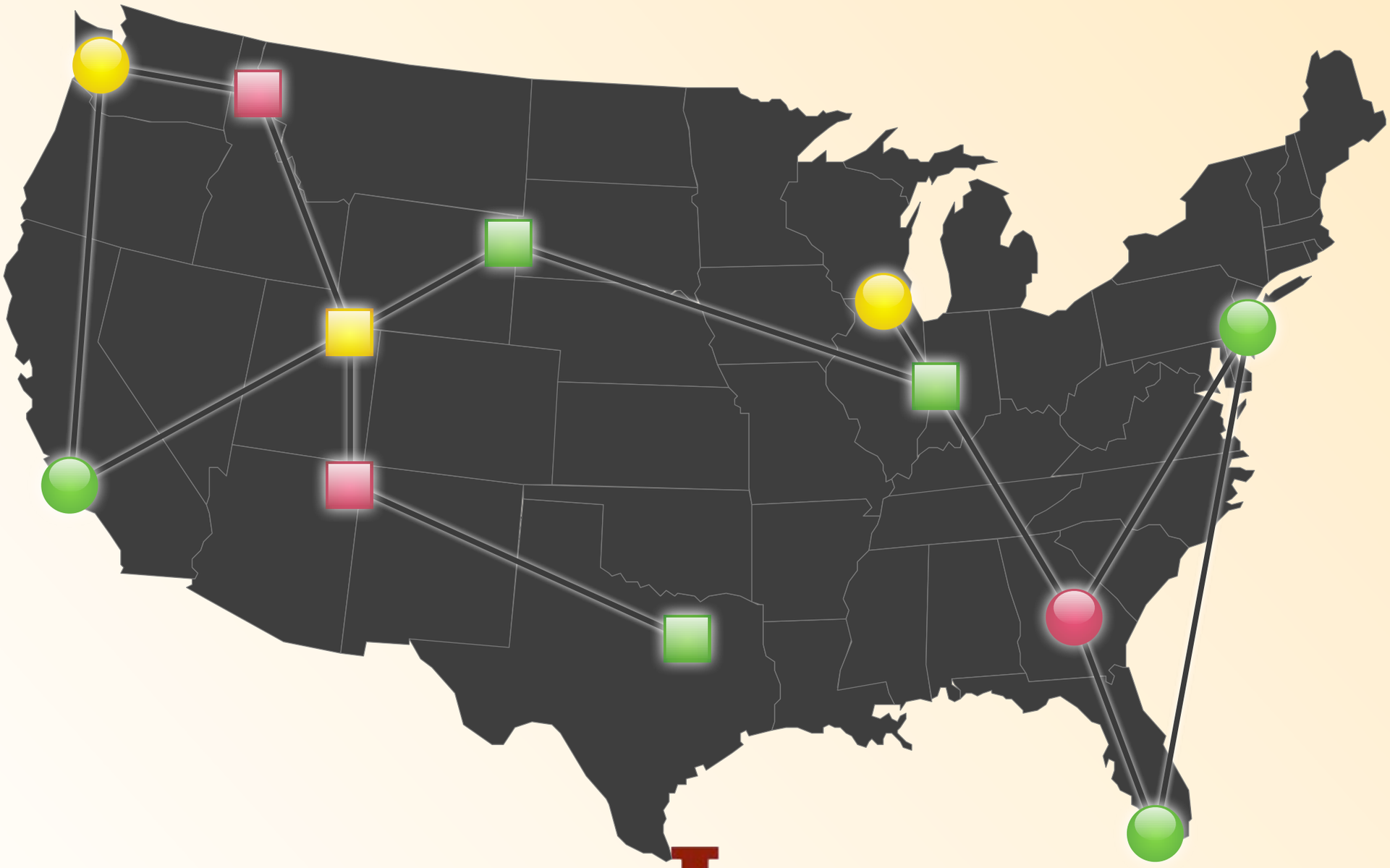


gMOC
GENI META-OPERATIONS CENTER

GlobalNOC Global Research Network Operations Center

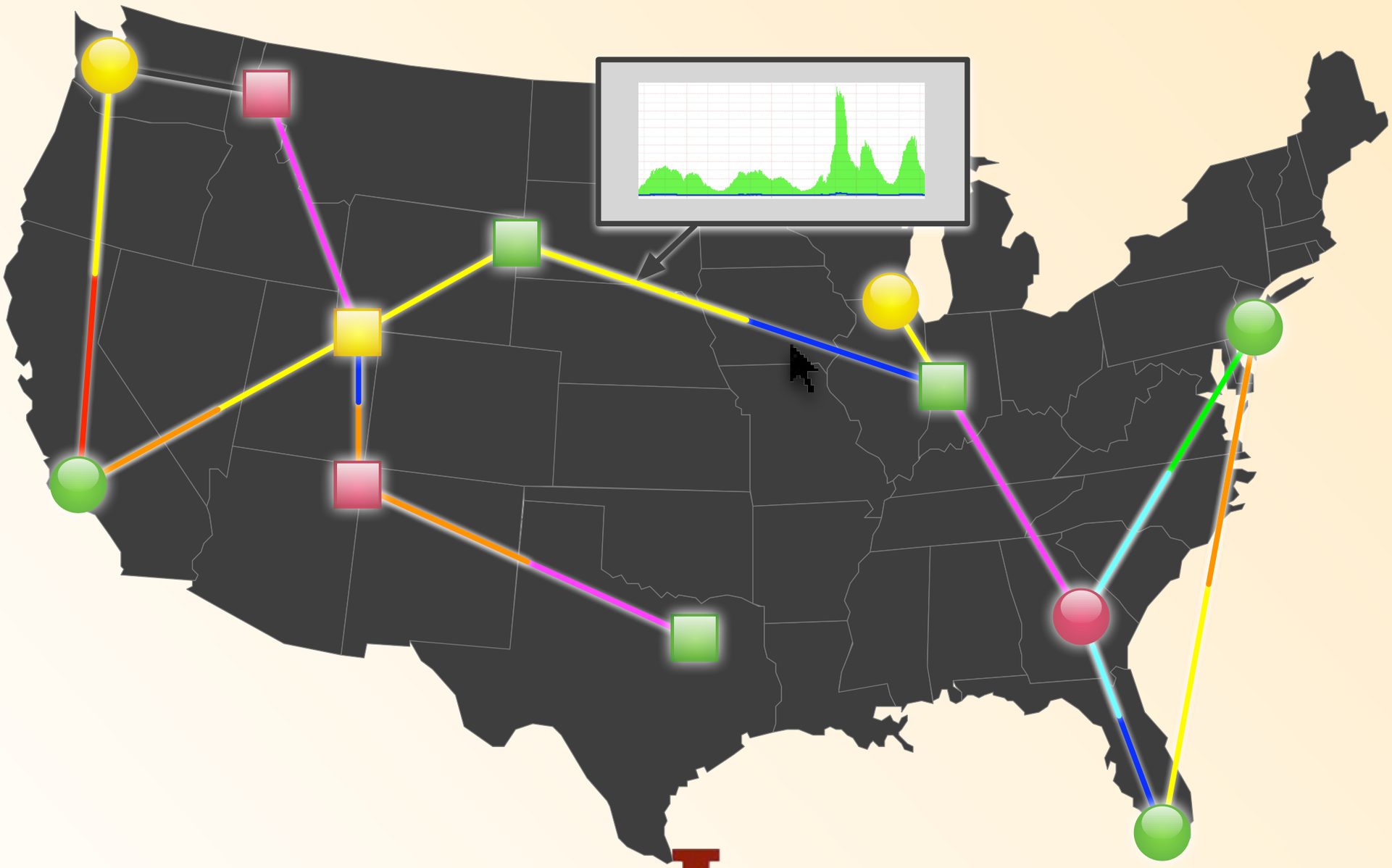


utilization



GMOC
GENI META-OPERATIONS CENTER

GlobalNOC Global Research Network Operations Center

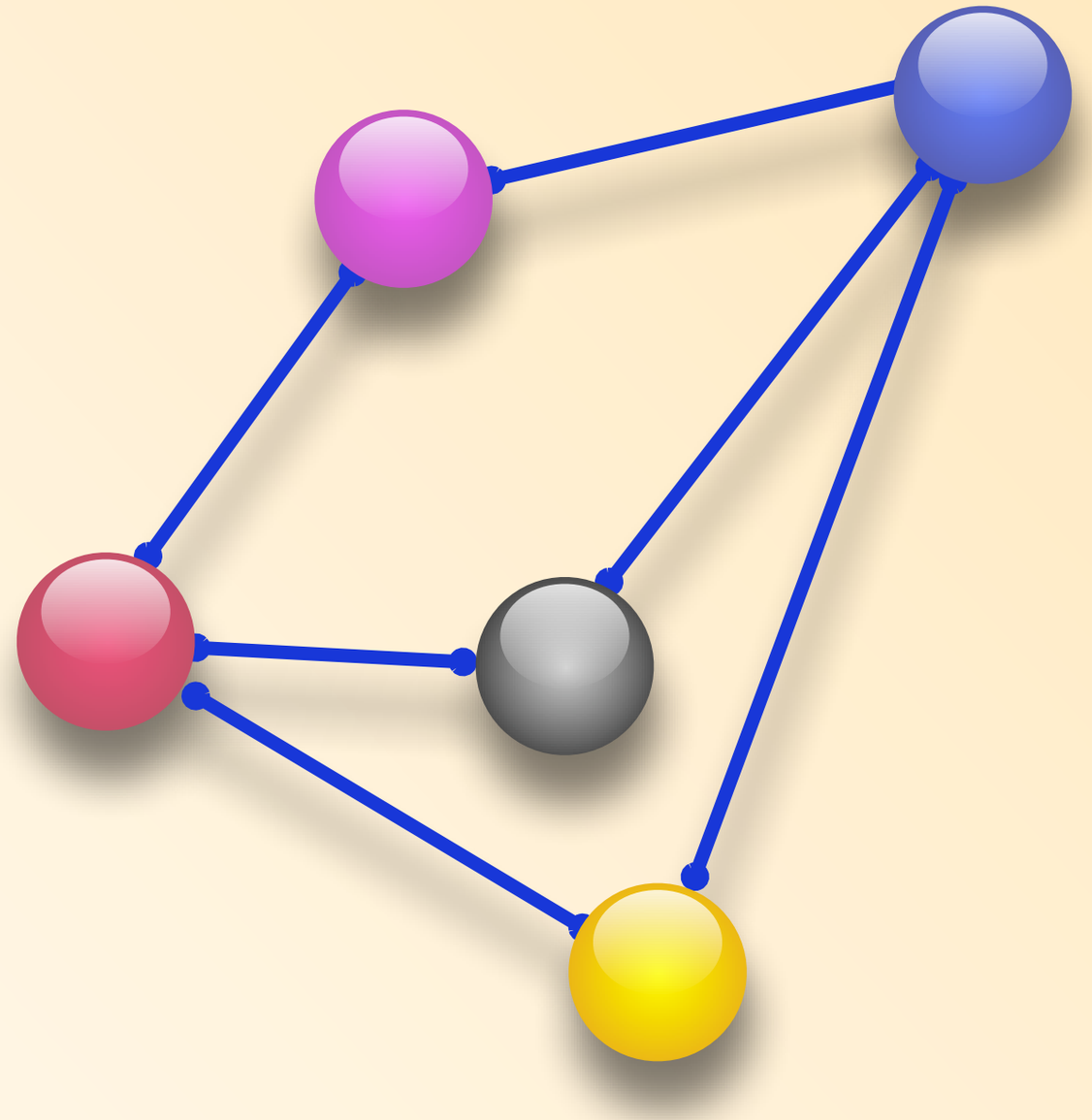


GENI META-OPERATIONS CENTER

GlobalNOC Global Research Network Operations Center

Types of Data: Topology

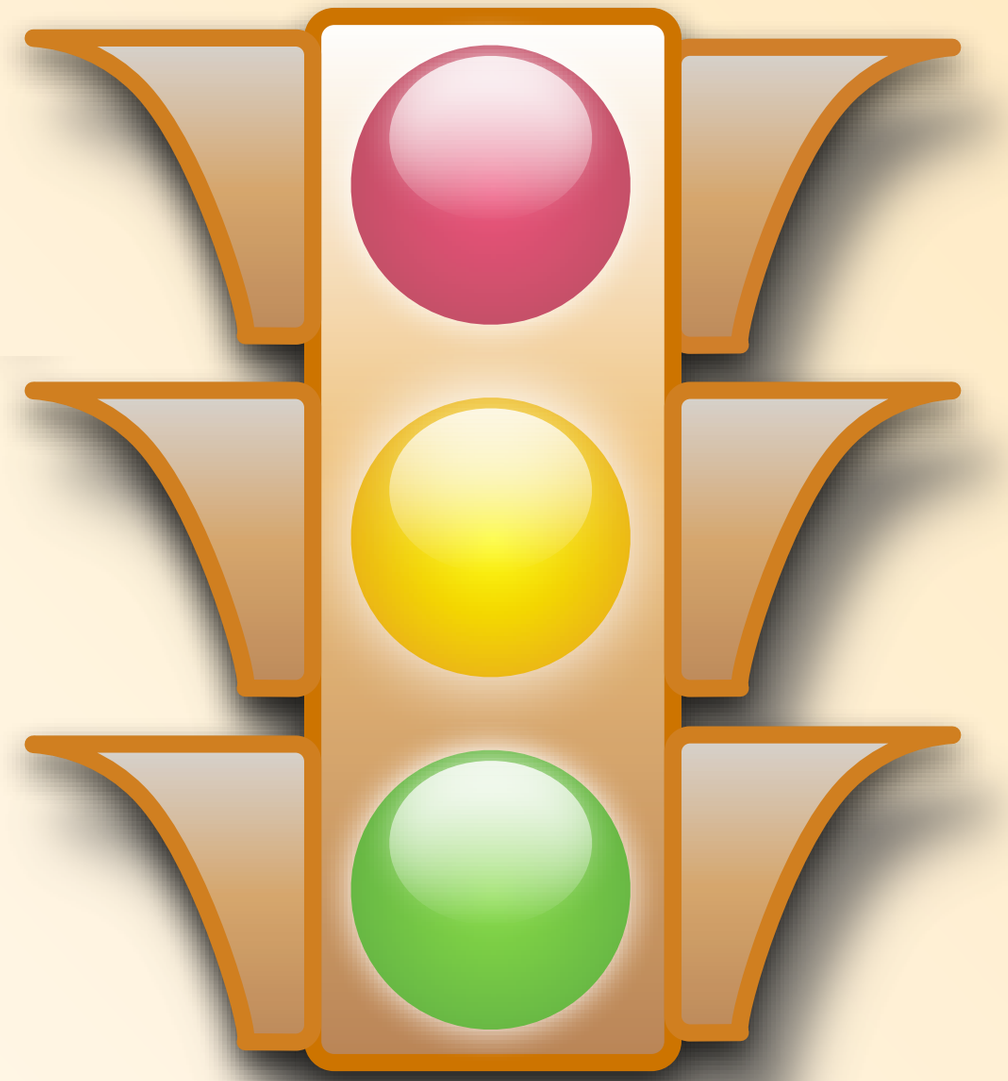
- **Proposed Minimum:**
  - *substrate information:*
    - component to operator
    - component to aggregate
    - component location
    - interface to component
    - link to interface
    - link max bandwidth
  - *slice information:*
    - sliver to component
    - sliver to principals



GENI META-OPERATIONS CENTER

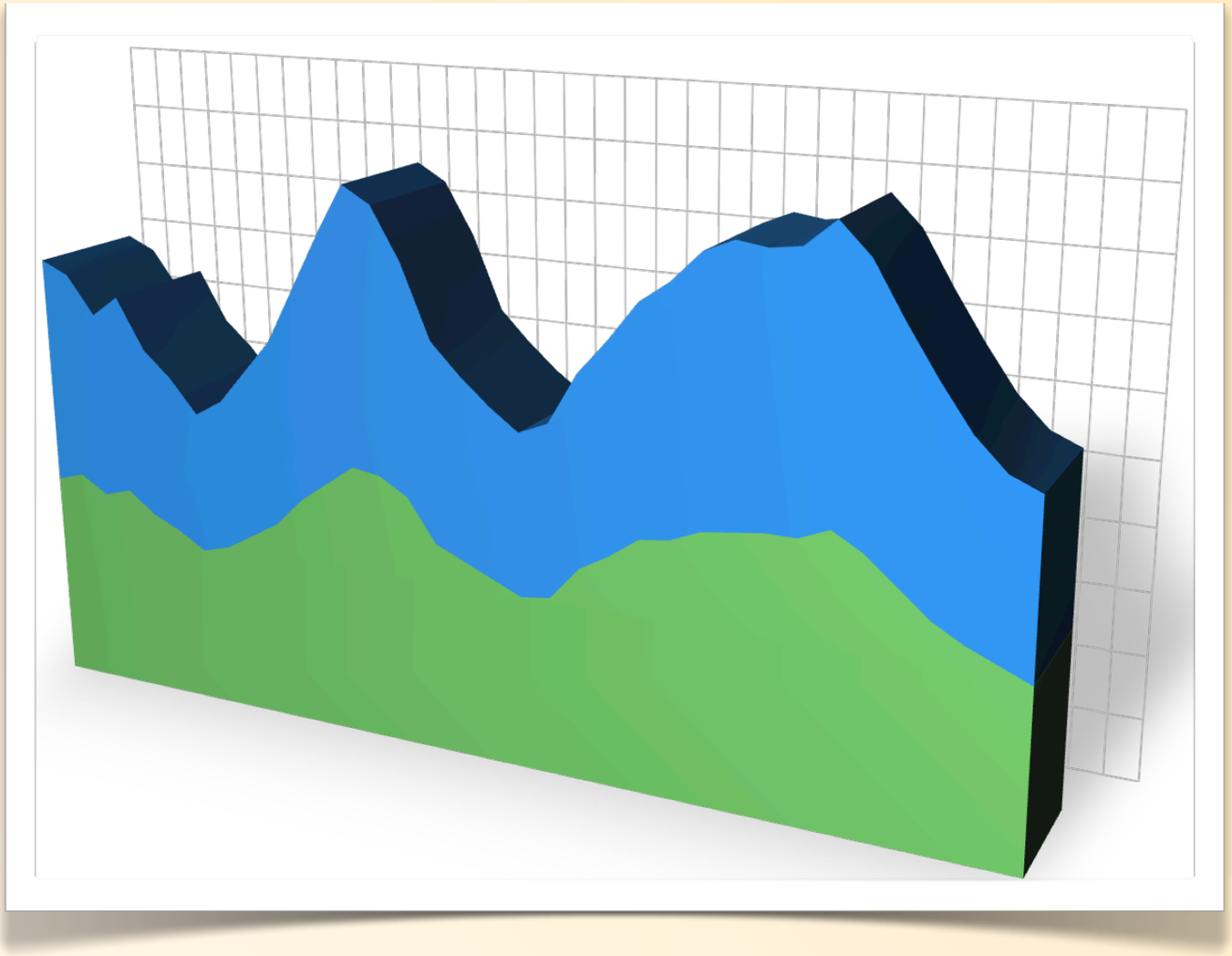
Types of Data: Oper/Admin Status

- Health Status, in terms of **up**/**down**/**impaired**, optionally with more detail
- Oper Status: actual status at a given time
- Admin Status: intended status at a given time
- **Proposed Minimum (both Oper & Admin):**
  - Component or Aggregate status
  - Link status



Types of Data: Utilization & Condition Measures

- **Proposed Minimum:**
  - *Utilization*
    - Link counters (packets, bits)
    - Component CPU usage
  - *Condition*
    - Link errors
    - Link packet drops



Datasharing Discussions and Progress with Clusters

Our Approach

- Working with:
  - clusters
  - projects with existing relationships to us
  - other related stakeholders (Security, PerfSONAR)
- Expect high degree of variability in capabilities and methods for sharing
- We try to use what's already there, not make projects add more

NLR & Internet2

- Access already in place for operational data (no surprise)
- We have agreement from both to share the data about their GENI pieces between the Global NOC container and the GMOC container
- As soon as these resources are in use, we can track them.

Cluster B: PlanetLab

- There was rough consensus among PlanetLab cluster projects to try to use PlanetLab Central as the source for much of the operational data
- GMOC visited Princeton to discuss capabilities with PlanetLab
- We are now actively gathering most of the minimal data described in Operational Dataset document
  - No mapping of slices to principals yet
  - Little network topology information (not applicable to PL-proper)

MAX

- MAX has well-developed capabilities for operational data
- Working with MAX to begin gathering data directly
- Can compare data gathered via PlanetLab to data gathered directly

Other Clusters

- Good Discussions with all Clusters
  - Plans in place for all clusters to begin gathering some data
  - Already have some data exports from most
  - More detailed understanding of each individually is required
- Some interest in helping clusters evaluate what monitoring tools & data formats to use, in the medium and long-term

Some Findings

Some Findings

- What are we getting data from?

Some Findings

- What are we getting data from?
  - Varies: control framework/clearinghouses in some cases, AMs in some cases, CMs in others

Some Findings

- What are we getting data from?
  - Varies: control framework/clearinghouses in some cases, AMs in some cases, CMs in others
- What level of information will be provided?

Some Findings

- What are we getting data from?
  - Varies: control framework/clearinghouses in some cases, AMs in some cases, CMs in others
- What level of information will be provided?
  - Varies: Some projects will quickly provide rich dataset, others will only be providing more general data

Some Findings

- What are we getting data from?
  - Varies: control framework/clearinghouses in some cases, AMs in some cases, CMs in others
- What level of information will be provided?
  - Varies: Some projects will quickly provide rich dataset, others will only be providing more general data
- Will we get data on an aggregate, component, or slice level?

Some Findings

- What are we getting data from?
  - Varies: control framework/clearinghouses in some cases, AMs in some cases, CMs in others
- What level of information will be provided?
  - Varies: Some projects will quickly provide rich dataset, others will only be providing more general data
- Will we get data on an aggregate, component, or slice level?
  - Varies (noticing a pattern here?): different projects have different capabilities and scope, which affects what data they have

GMOC Internal Data Format and GMOC Data Exchange Documents

Data Format Summary

- The “how to get it” piece
- **2 documents**
  - *Internal Data Format Document:* describes the unified format to store operational data in internally.
  - *Data Exchange Document:* describes the methods for formatting and protocols for exchanging operational data to/from GENI projects and between GENI and other networks
- kept separate to allow one to change without impacting the other.

PerfSONAR

- An existing, developed framework
- Meant for sharing network data among networks
- Allows for sharing without loss of sovereignty
- Might be a useful basis for operational data sharing development
- Discussions & Investigations underway

fin


gMOC
GENI META-OPERATIONS CENTER


GlobalNOC
Global Research
Network Operations Center