

GEC12 - Operating GENI



The Plan for Today

- **Status of Operations today**
- **Where things are going**
- **What will be the challenges?**
- **What will Operators need?**



Agenda



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- **First Half: Updates and Level set (Mostly me talking)**
 - Review of the GENI operational model
 - Latest things available from GMOC
 - Intro to the GENI Service Desk
 - Update for Circuit mapping discussion from last time
 - Some things to think about while eating lemon bars

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 - Review of the GENI operational model
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- **Second Half: Operational Challenges to work through (Mostly you talking)**
 - Management Plane: Operations-related Access and Discovery
 - Contact Discovery
 - Notifications - What about the other parts of the slice?

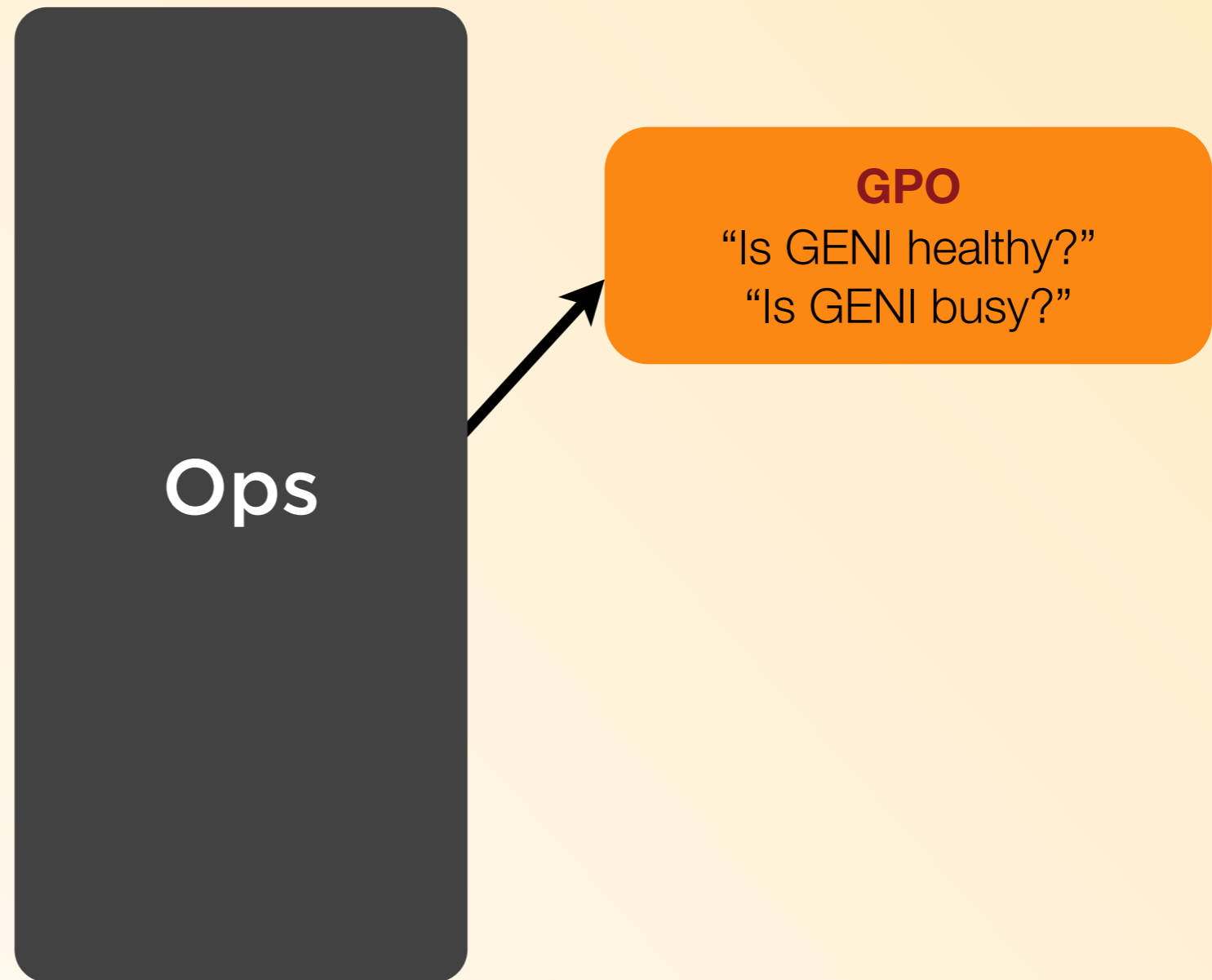
What does “MetaOps” mean, again?



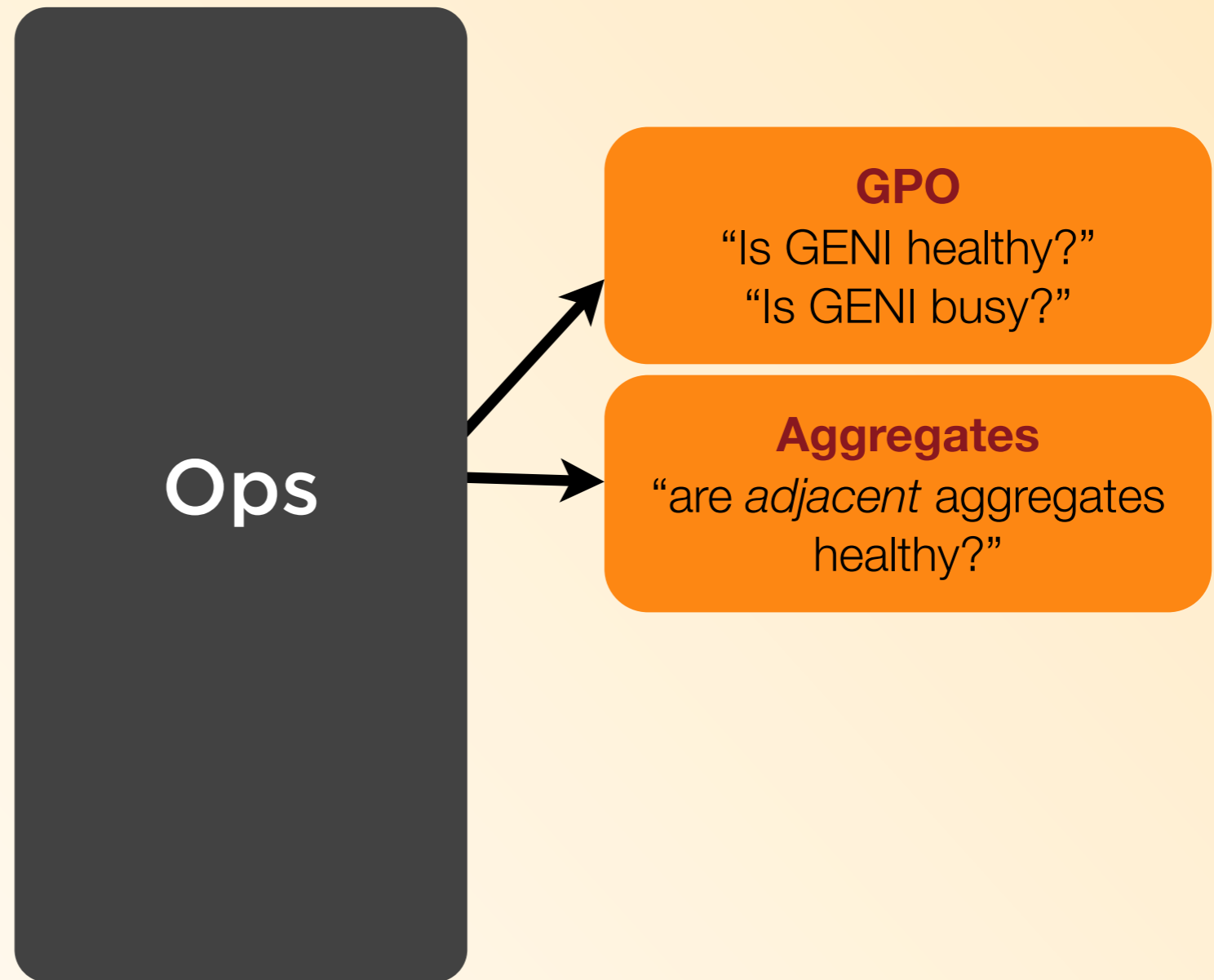
Consumers of Ops Data/Services

Ops

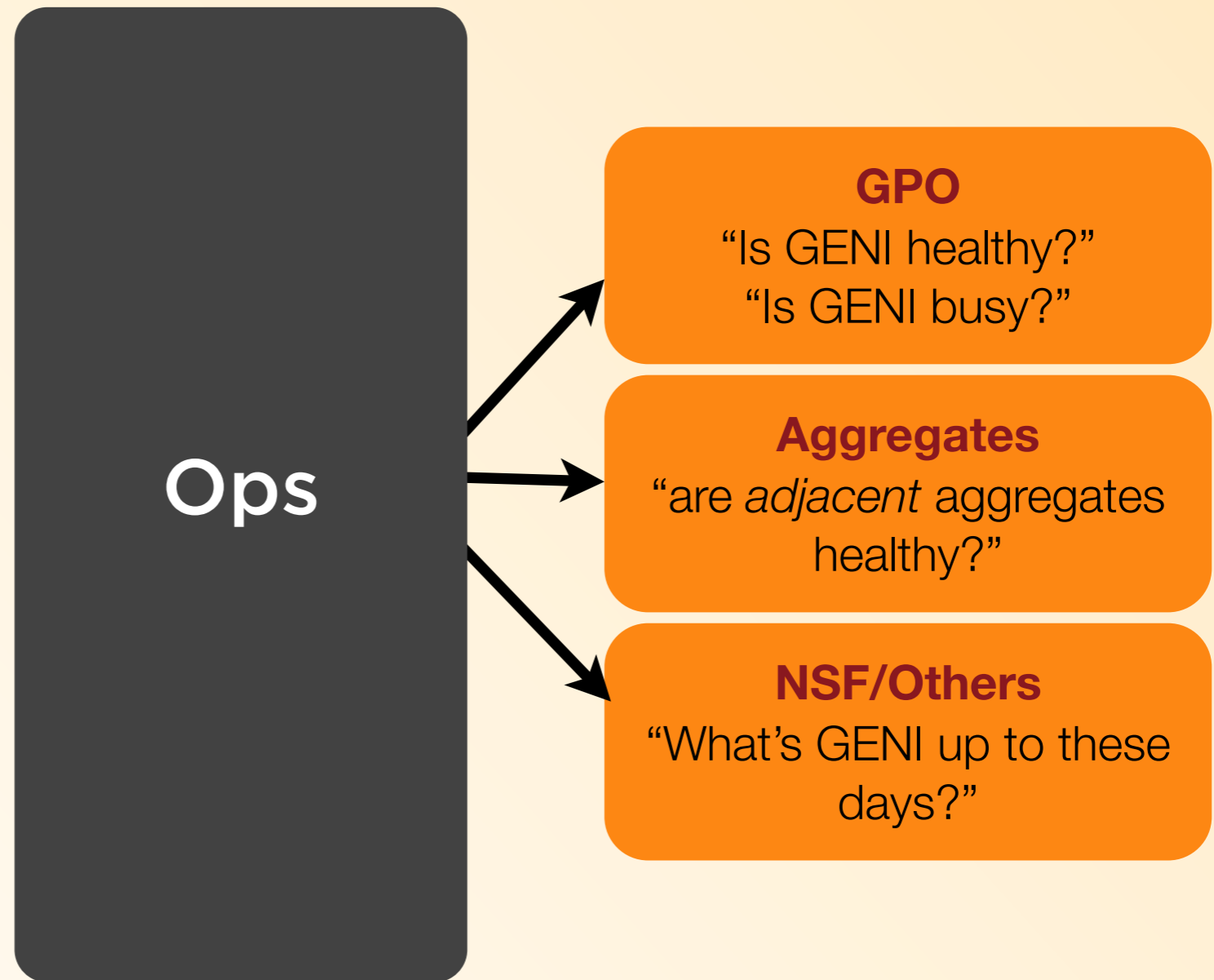
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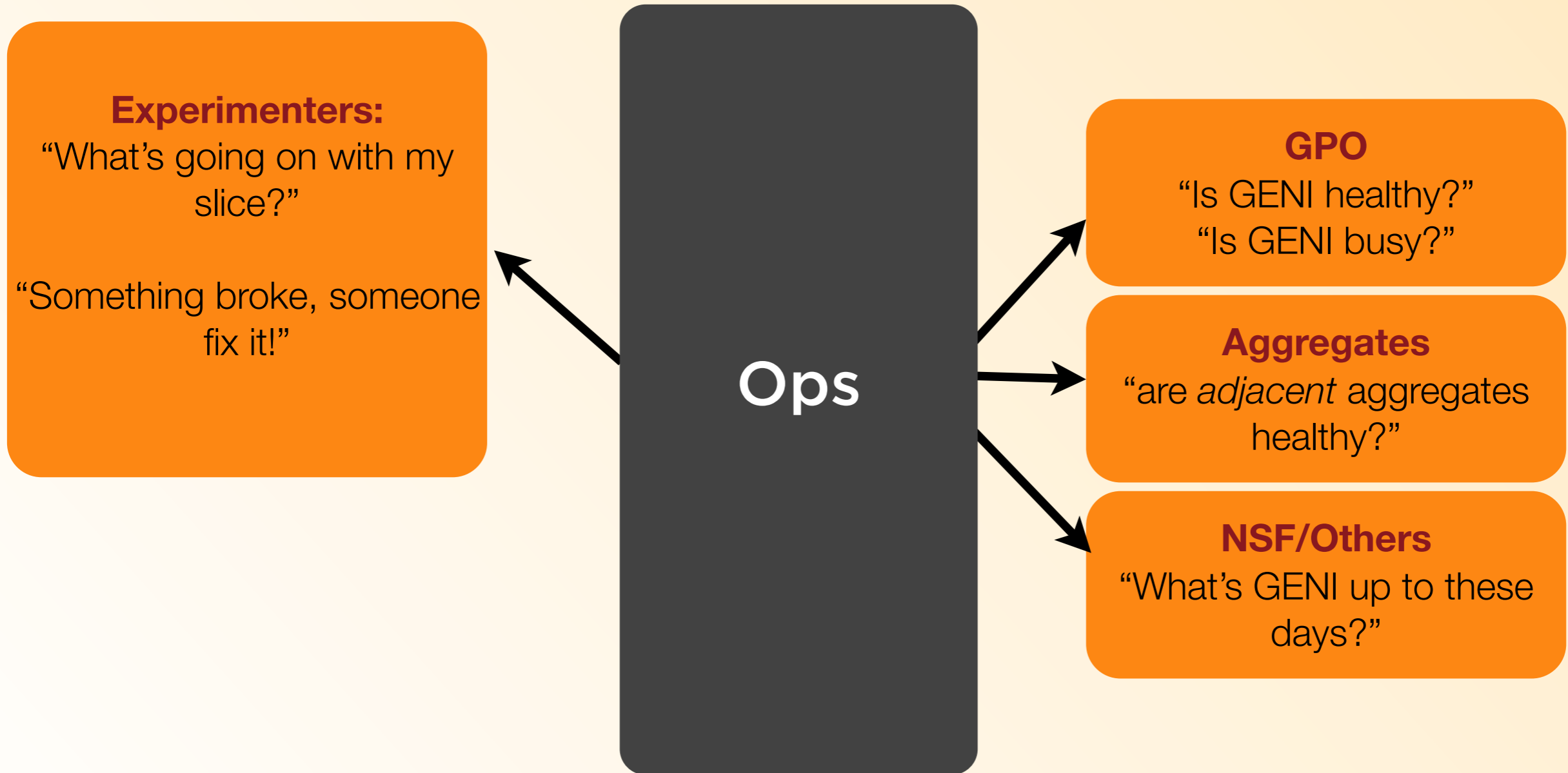
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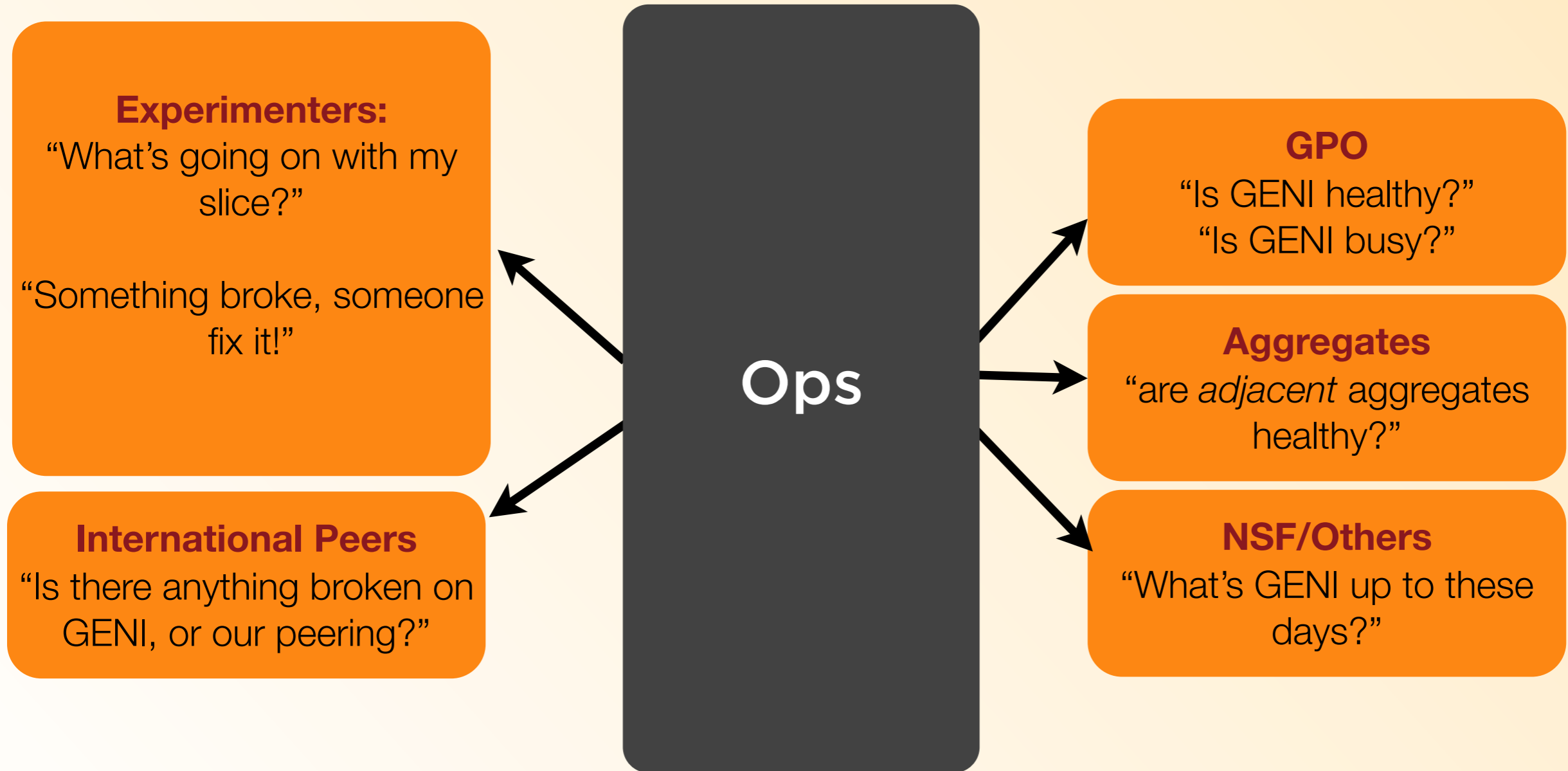
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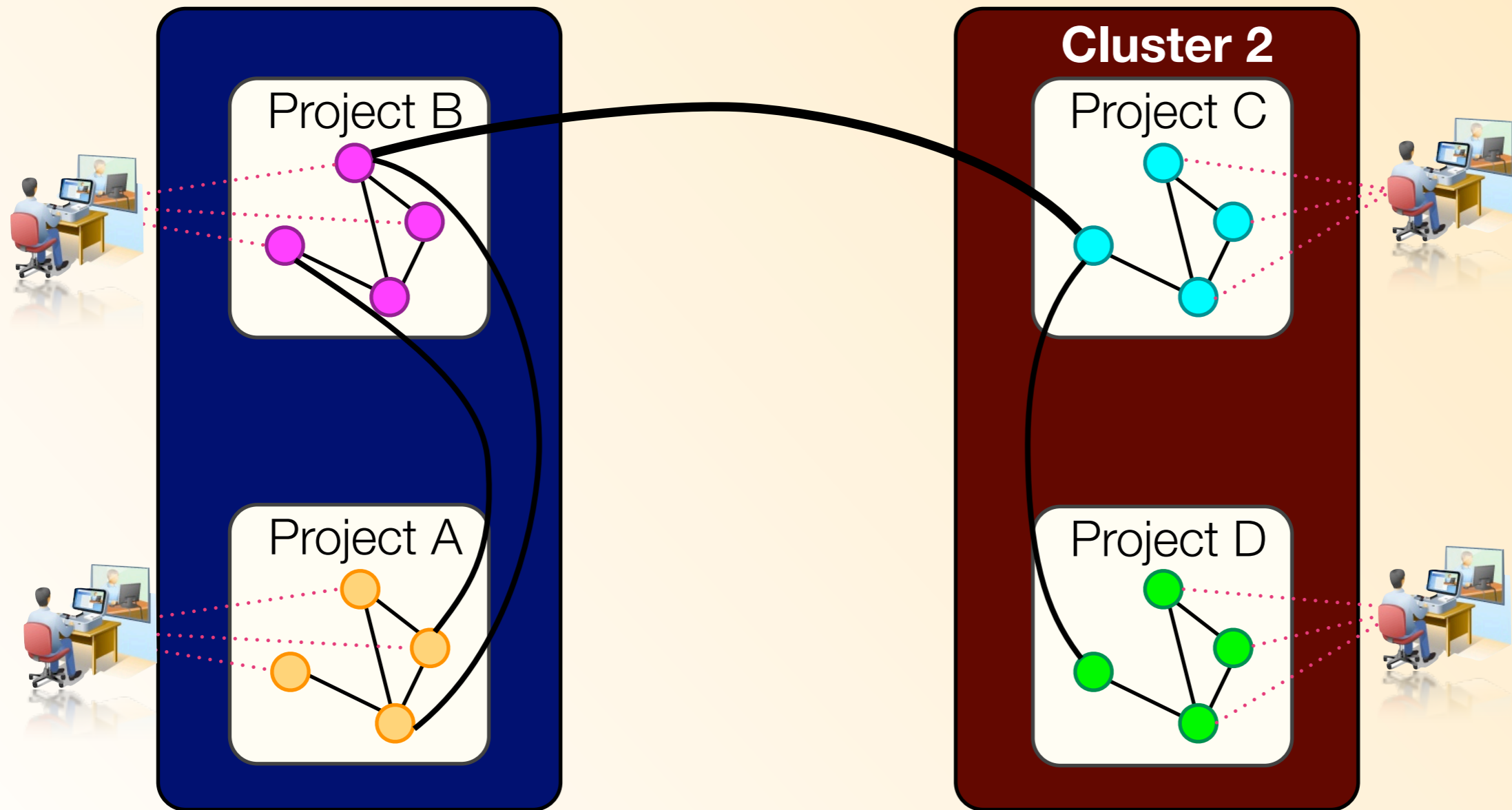
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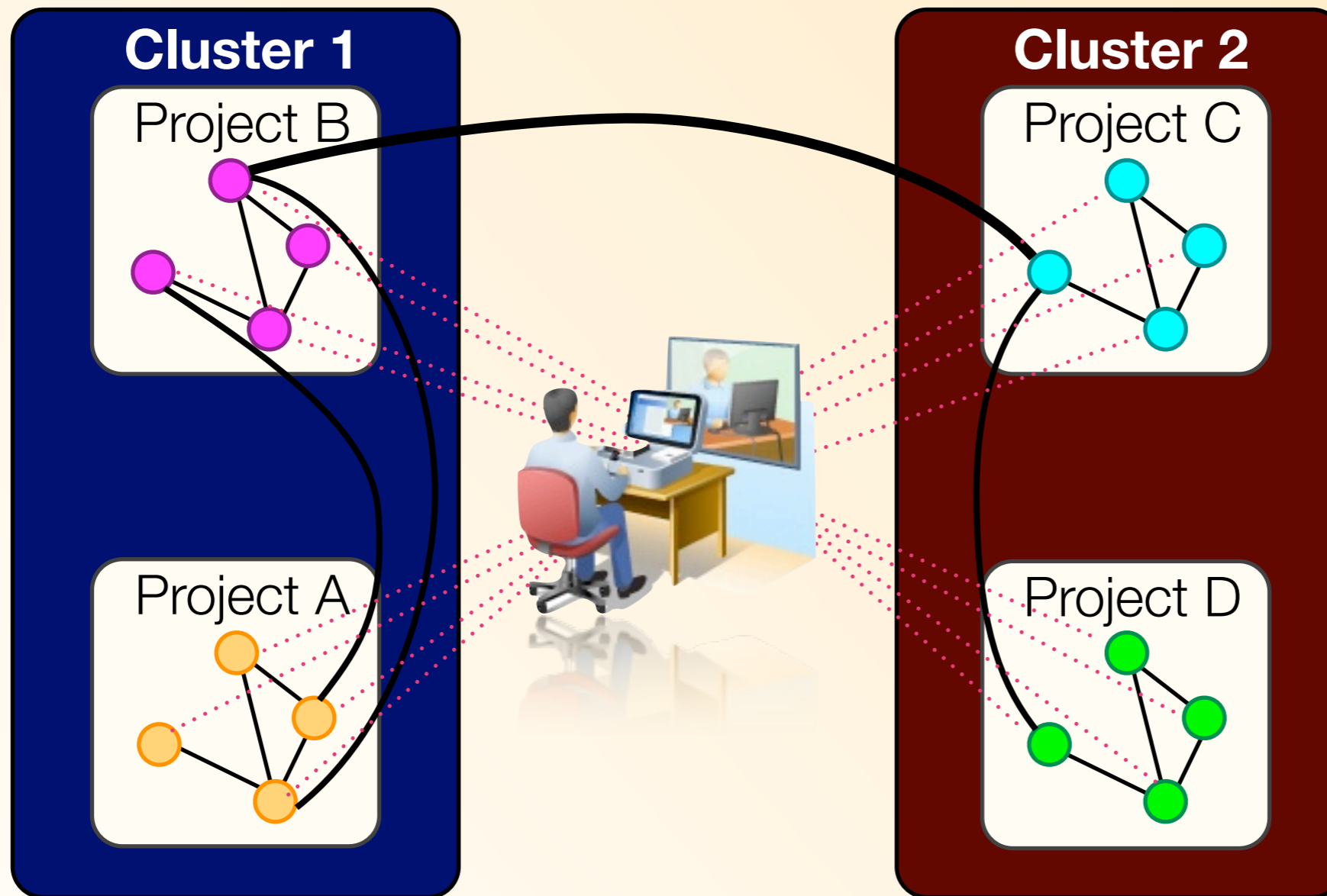
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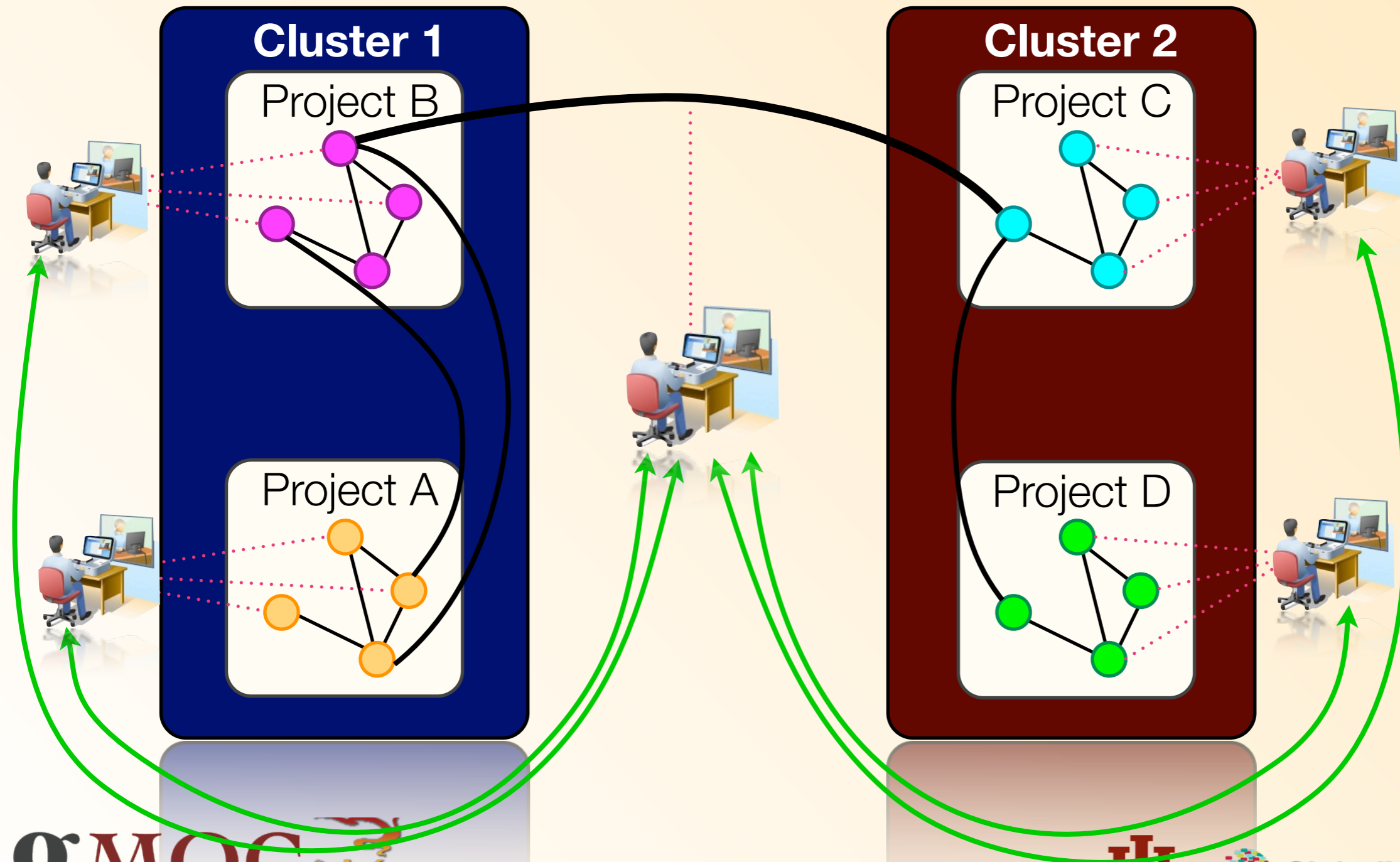
Option 1 - Completely Distributed



Option 2 - Centralized



Option 3 - Meta-Operations



“Interstate Commerce Clause”



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- **Intra-Aggregate Operations = not us**

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 - Emergency Stop
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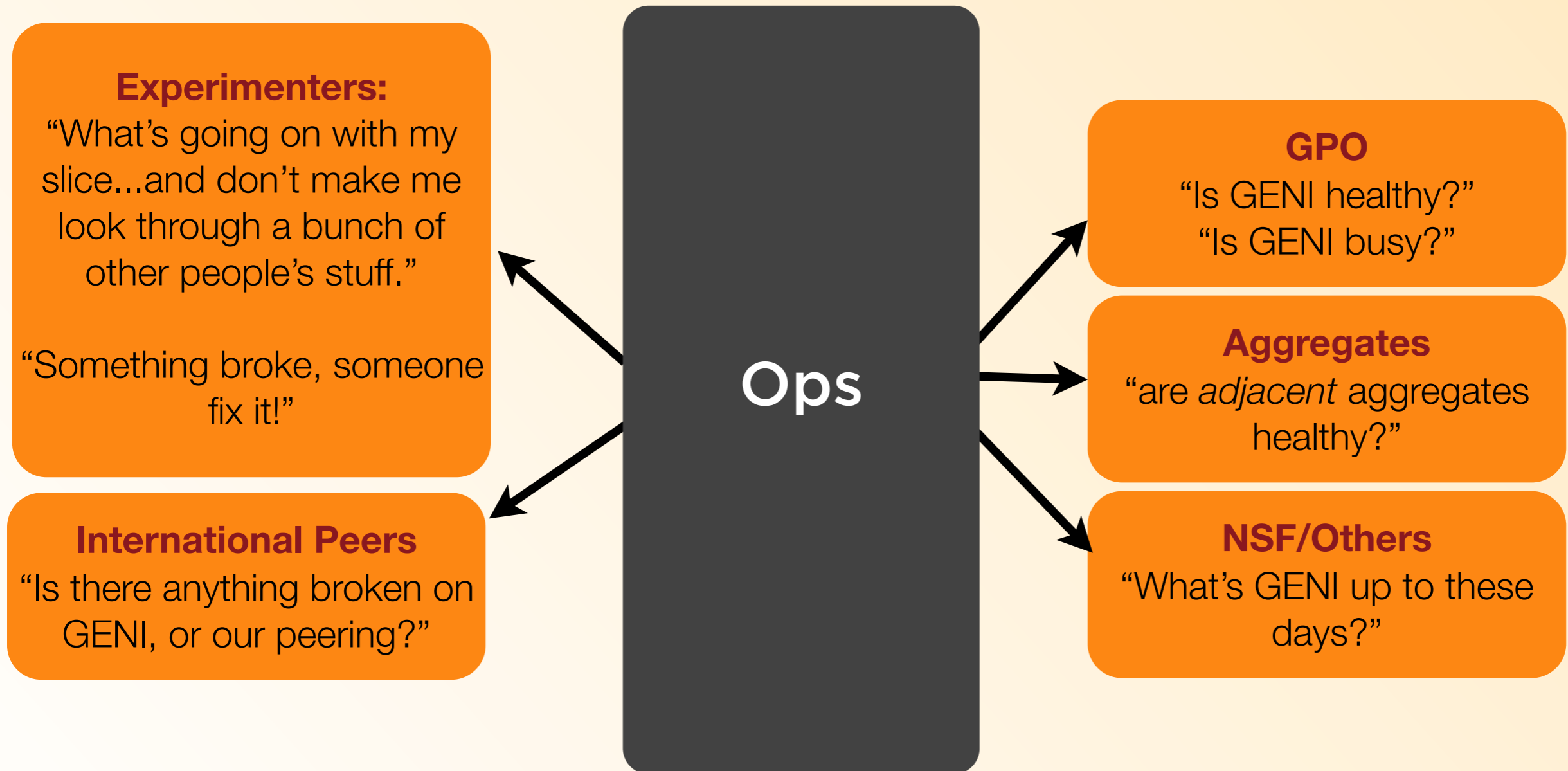
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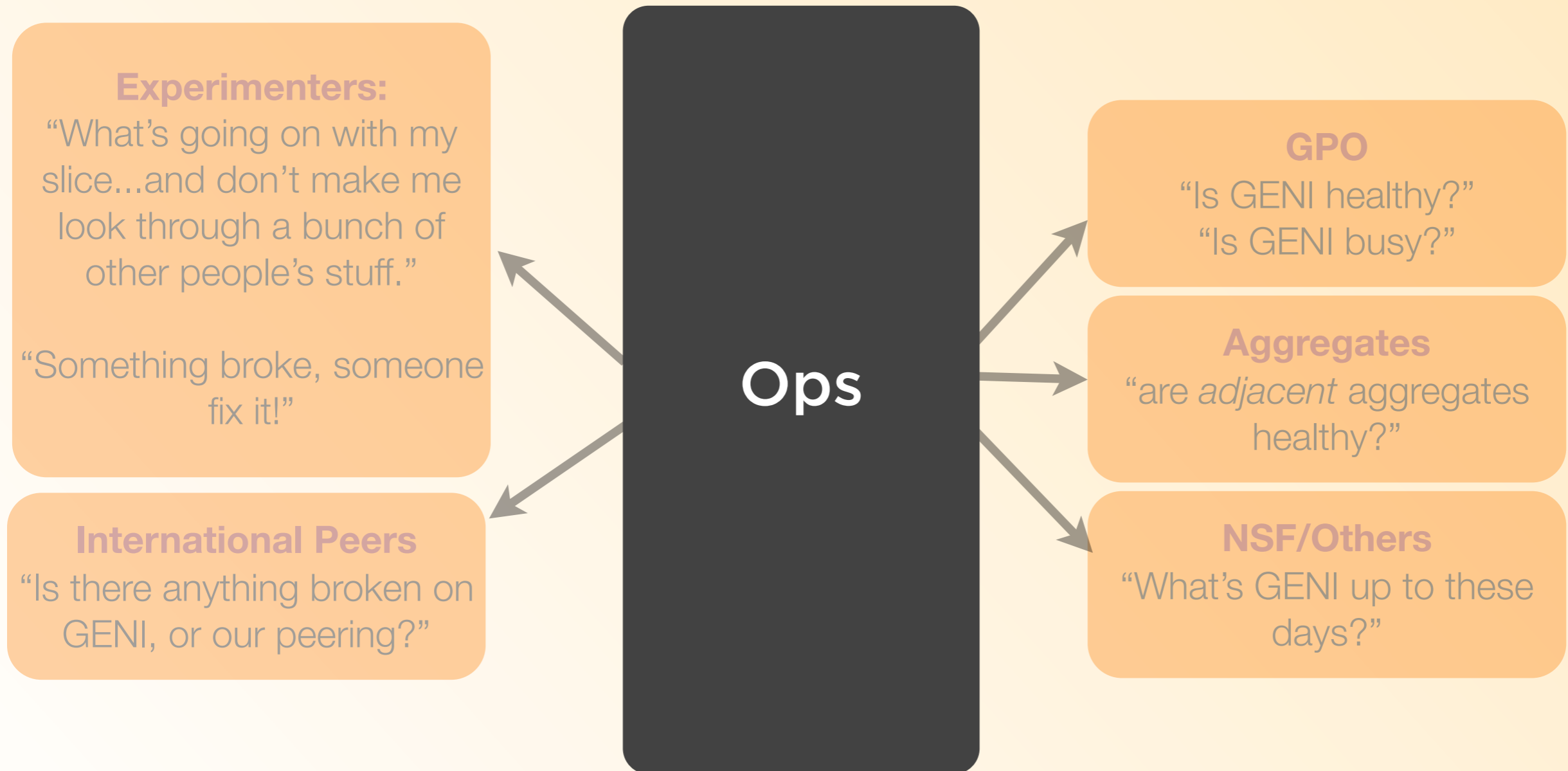
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- provide some things for slices that cross aggregate boundaries
- list is short:
 - Emergency Stop
 - GENI Support Front Door
 - Global up/down view

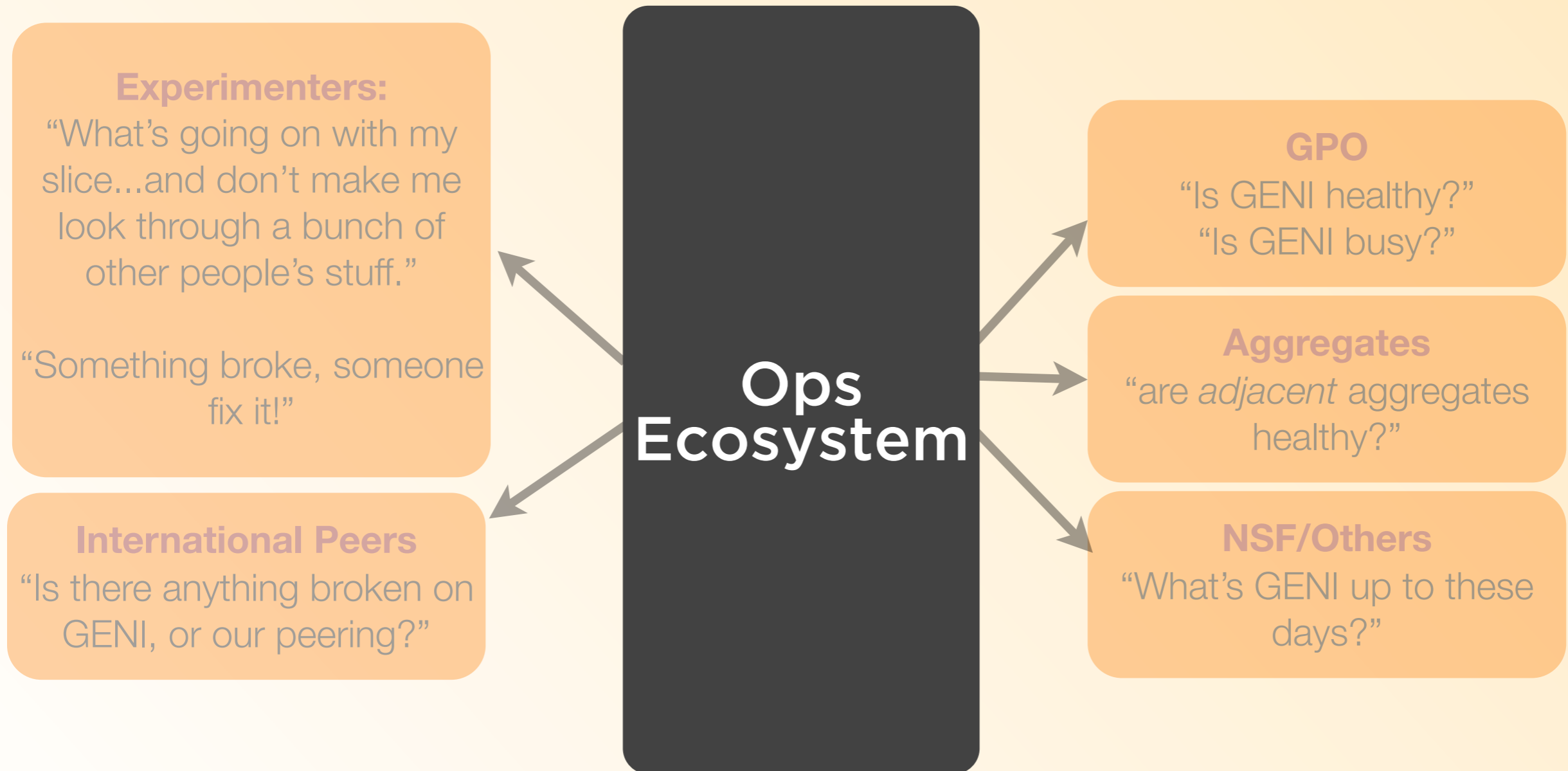
Providers of Ops Data/Services



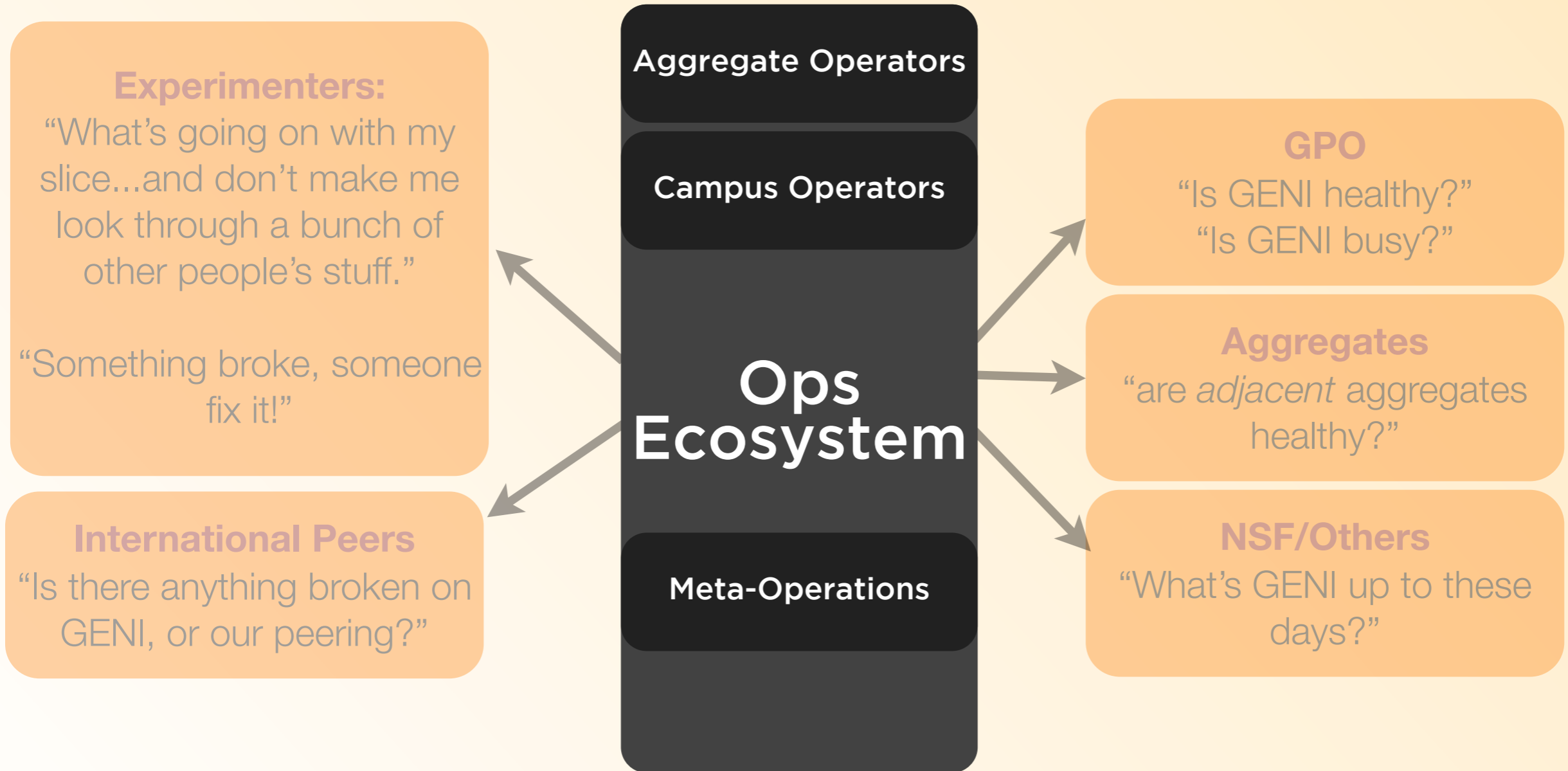
Providers of Ops Data/Services



Providers of Ops Data/Services



Providers of Ops Data/Services



New stuff!



Mesoscale Map



GMOC Web Interface

Aggregate/Cluster

All

PlanetLab

ProtoGENI

ORCA-BEN

ORBIT

OpenFlow

GMOC_KR

Mesoscale

Nodes Slices

Search:

<< first < prev 1 2 3 4 5 6 7 next > last >>

URN	Last Contacted:
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urn:publicid+IDN+cs.washington.edu+node+p	Wed Nov 2 01:46:12 2011 (UTC)
urn:publicid+IDN+cs.washington.edu+node+p	Wed Nov 2 01:46:12 2011 (UTC)
urn:publicid+IDN+gpolab.bbn.com+node+aqu	Wed Nov 2 01:46:12 2011 (UTC)
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urn:publicid+IDN+gpolab.bbn.com+node+cha	Wed Nov 2 01:46:12 2011 (UTC)

<< first < prev 1 2 3 4 5 6 7 next > last >>

Geographic Logic



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Global Research Network Operations Center

Maps...

- **Maps can also be access programmatically for embedding elsewhere**
- **What kinds of presentation would be useful? Let us know...**

Other operations stuff

- [calendar](#)
- [public ticket viewer](#)



Solicitation 3 - GENI Service Desk



GENI Service Desk Services

- **General Front Door**
- **Notifications when things in mesoscale backbone break**
- **Notifications of maintenance**
- **Maintenance of contact info**
- **Ticketing**
- **Incident Tracking & Reporting**
- **Emergency Stop Coordination**



GMOC vs GENI Service Desk

- **Original GMOC Project:**

- mainly development effort
- collect operational data from aggregates
- structure & store data
- present data
- develop operational model
- pilot tasks (emergency stop drill)
- serve as GENI “Tier2” as needed

- **GENI Service Desk**

- mainly ongoing ops
- use data from GMOC to monitor mesoscale GENI
- GENI help front-door
- execute operational model (central GENI portion)
- fully support needed tasks (emergency stop)
- reports and tracking to GPO or others



Circuit to Slice in the Plastic Slice world

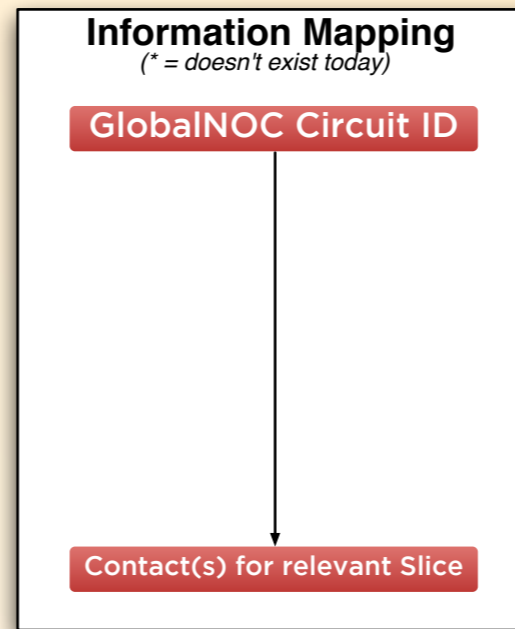


A long time ago...

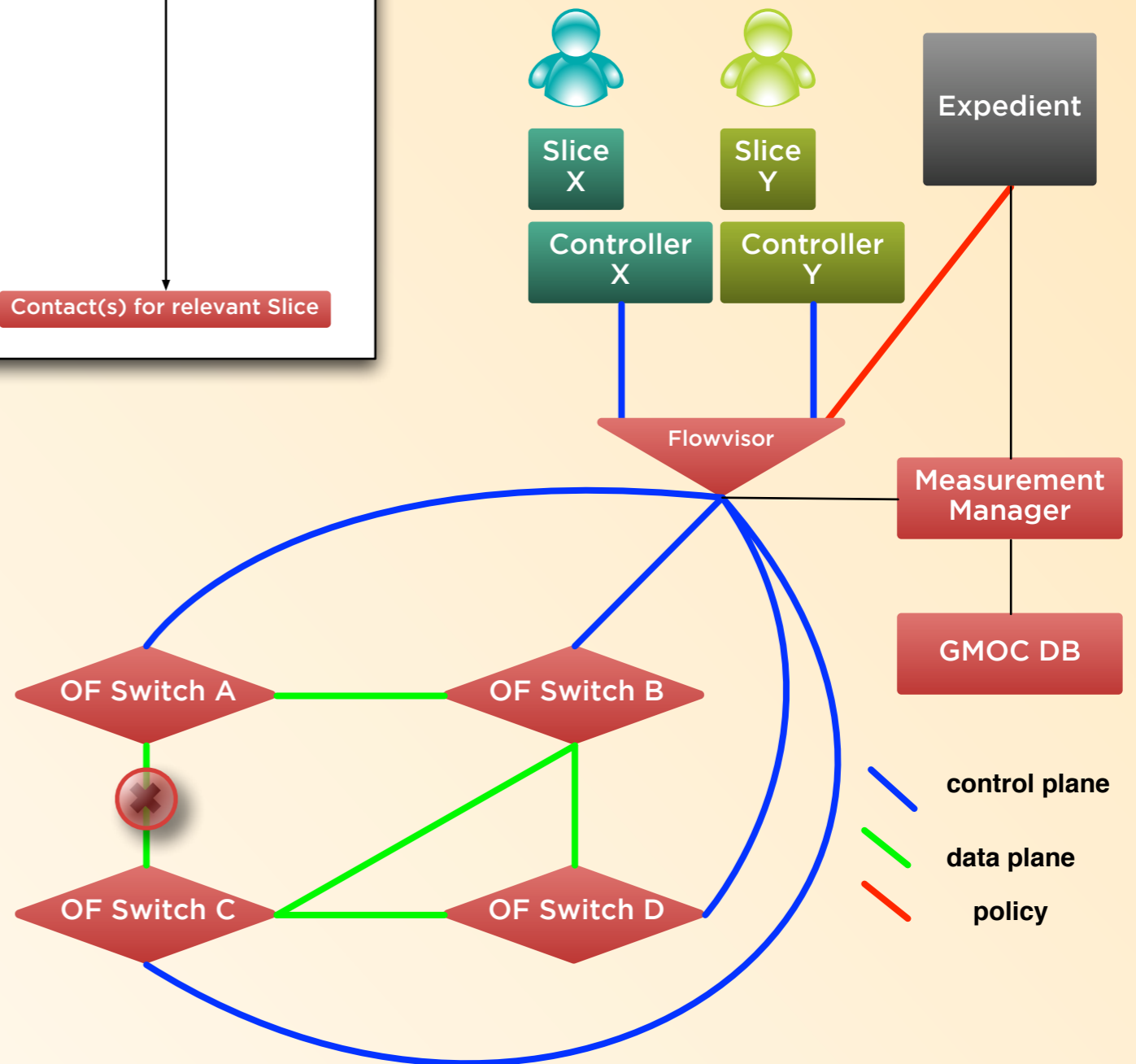


Outage Notification

How do we figure out who to notify for a circuit outage?

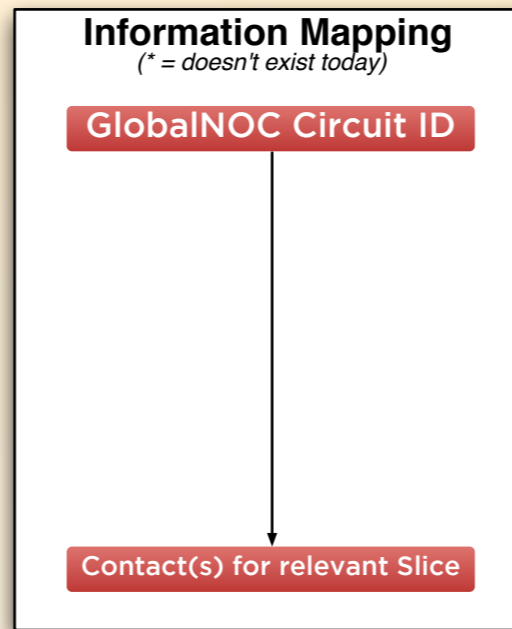


Scenario: How do you identify experimenters/slices affected by a circuit outage?

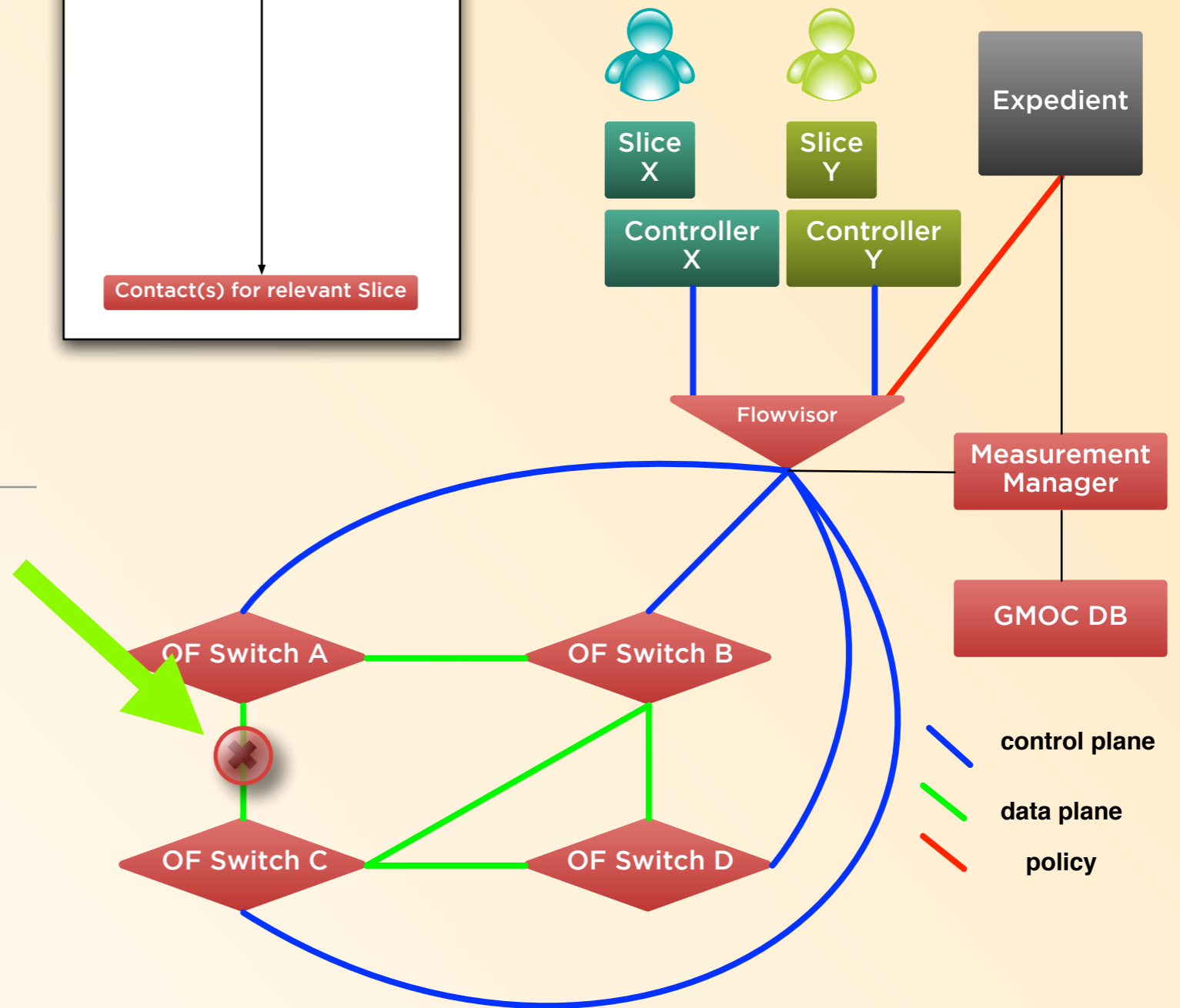


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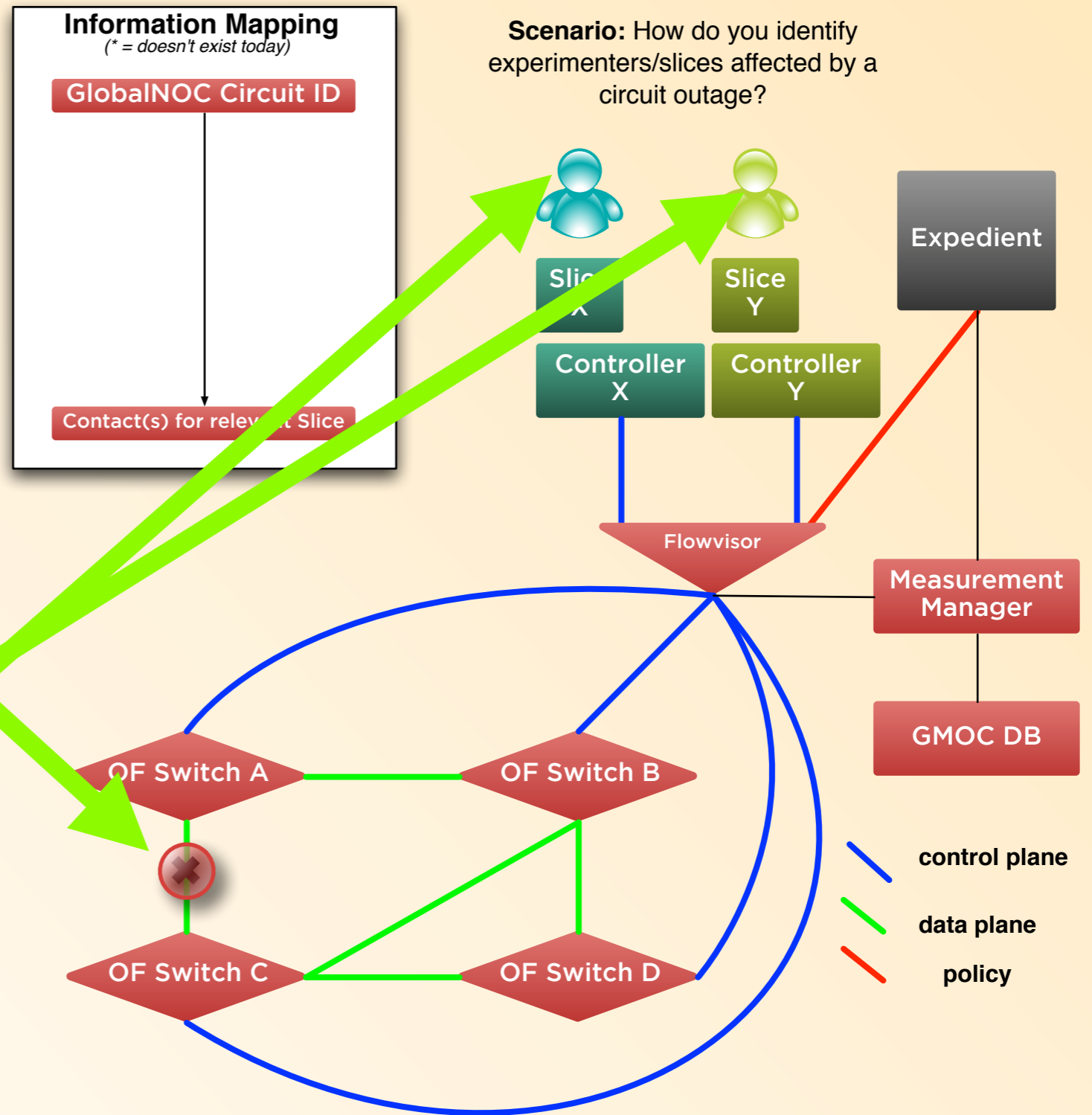


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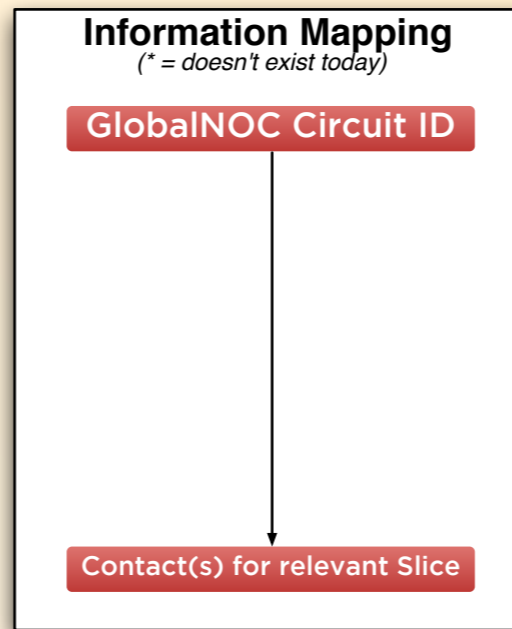
How do we figure out who to notify for a circuit outage?



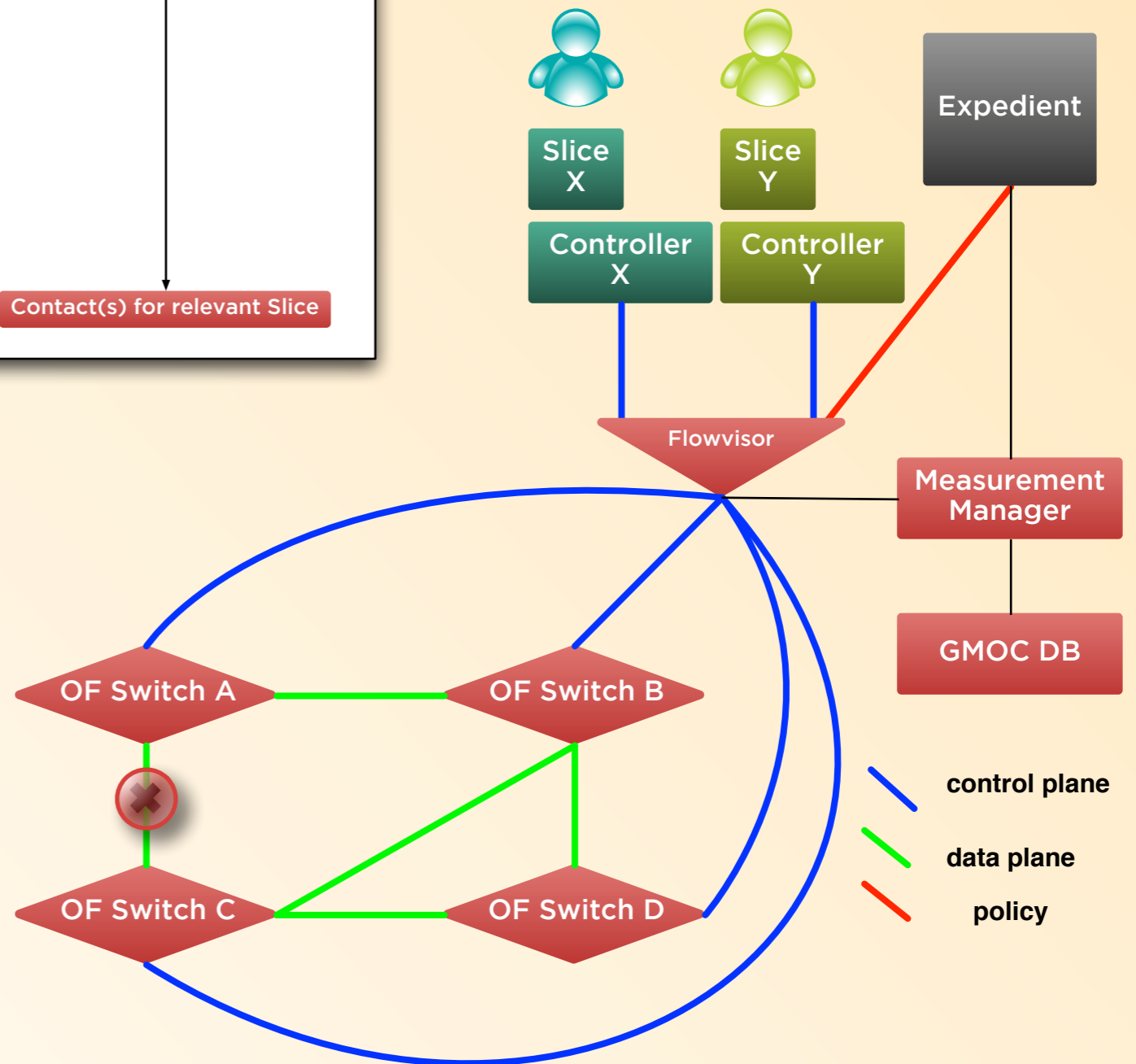
Outage Notification

Harder than it seems

Flowvisor & Expedient don't track topology, or current usage

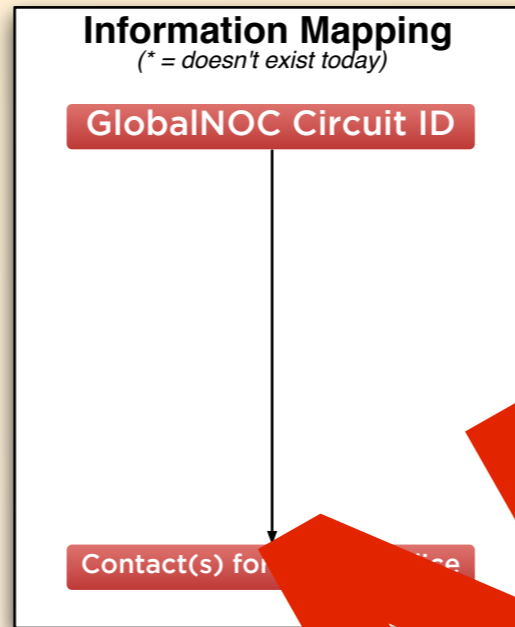


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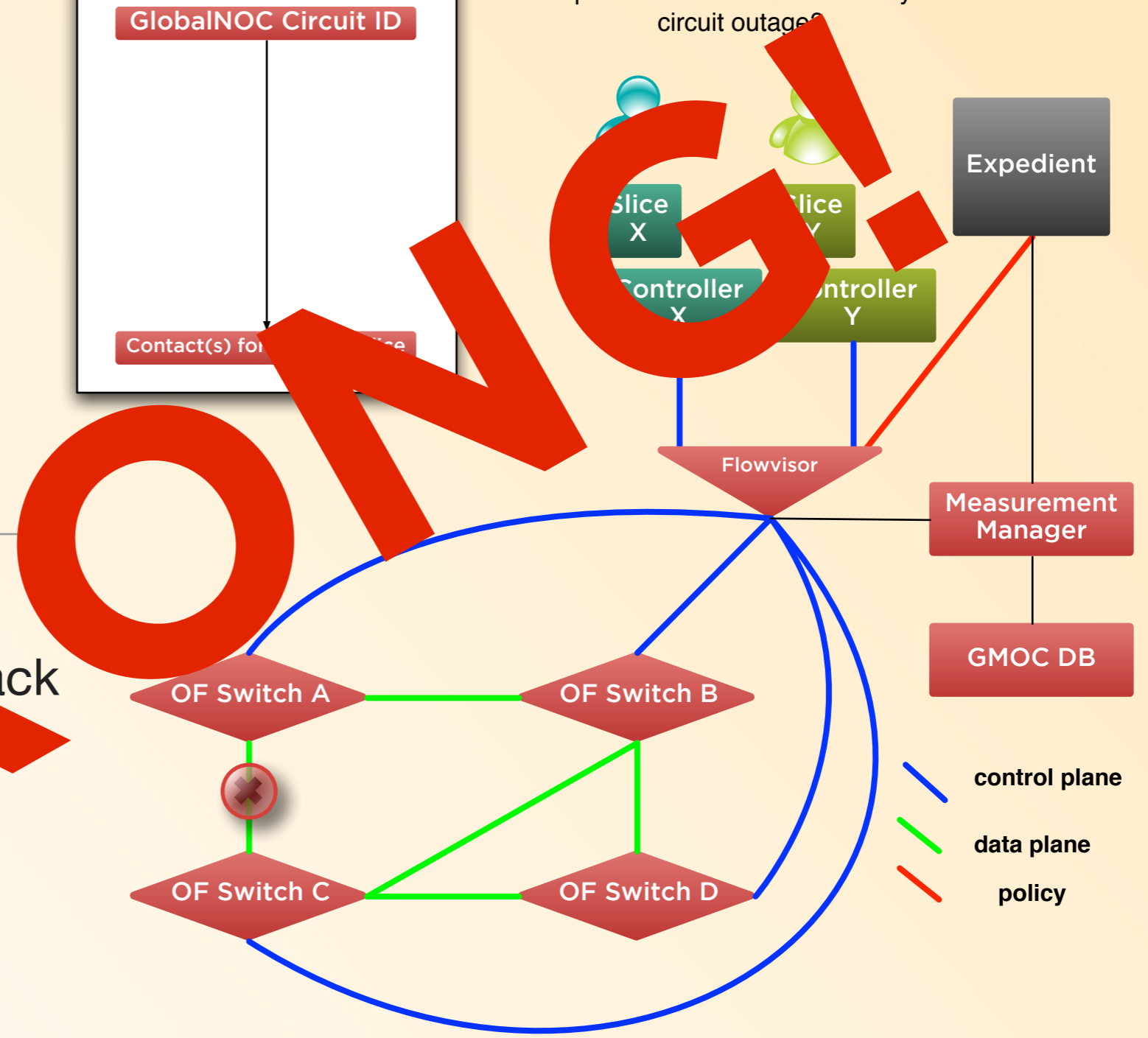


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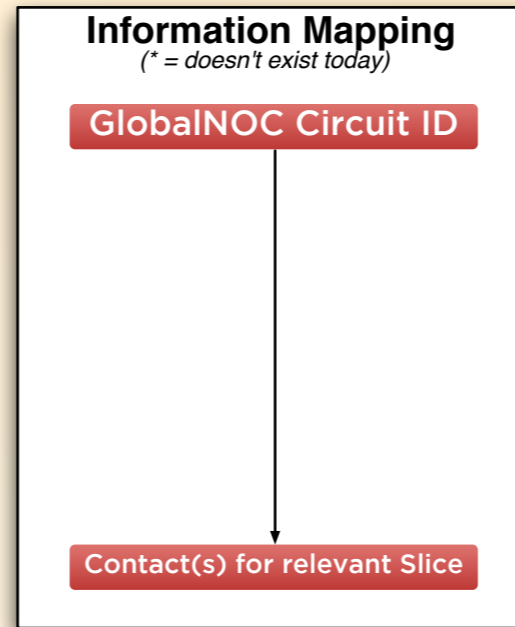


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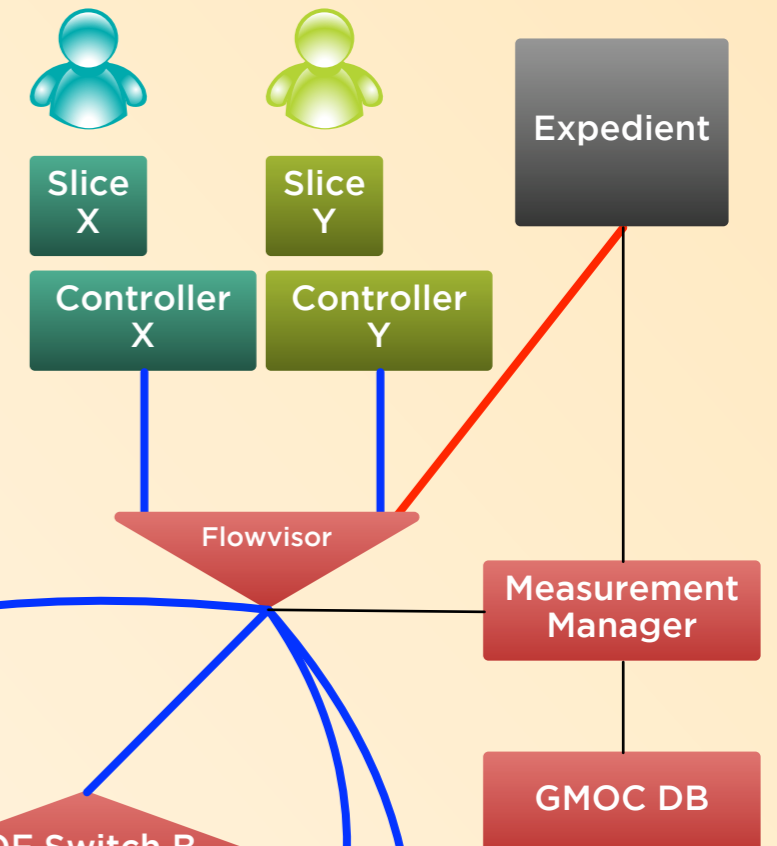


- **Flowvisor DOES provide current topology...pretty much**
 - Can tell what switch ports are related to a slice
 - port naming doesn't necessarily match device's port naming
 - (can be deduced, usually)
 - Polling-based
 - might lose fast-changing topology
 - depends on how fast you can poll, without killing it!

Outage Notification

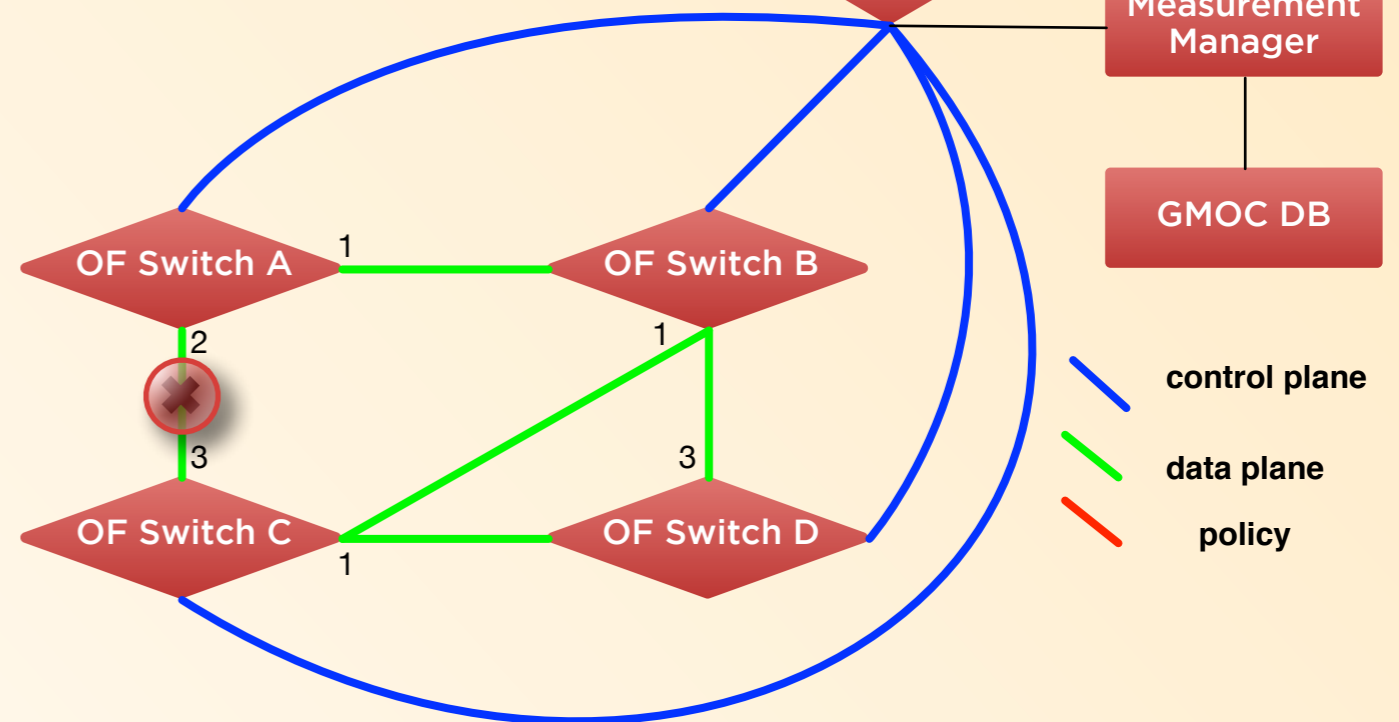


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Flowvisor will tell us:

- slice X, has a rule for Switch A, port 1
- slice X, has a rule for Switch C, port 3
- so, with some more info, we can infer the topology of X...



During break, think about...

- How should we setup access controls so GMOC can see slice info?
- What happens when maintenance isn't in the backbone?

BREAKTIME!!!



Discussion - Operational Issues & Model



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Access



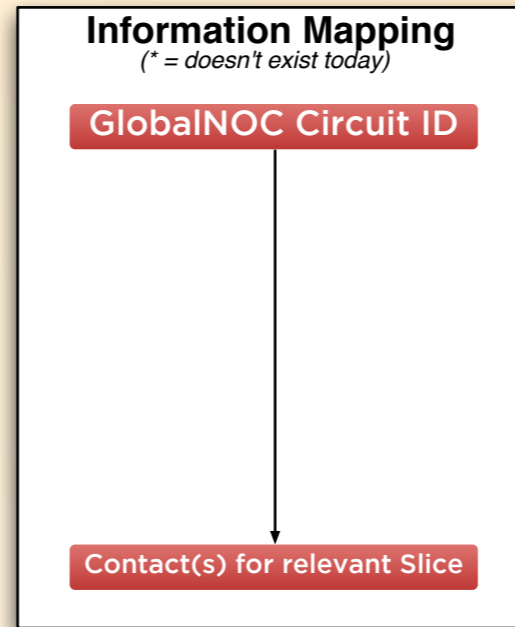
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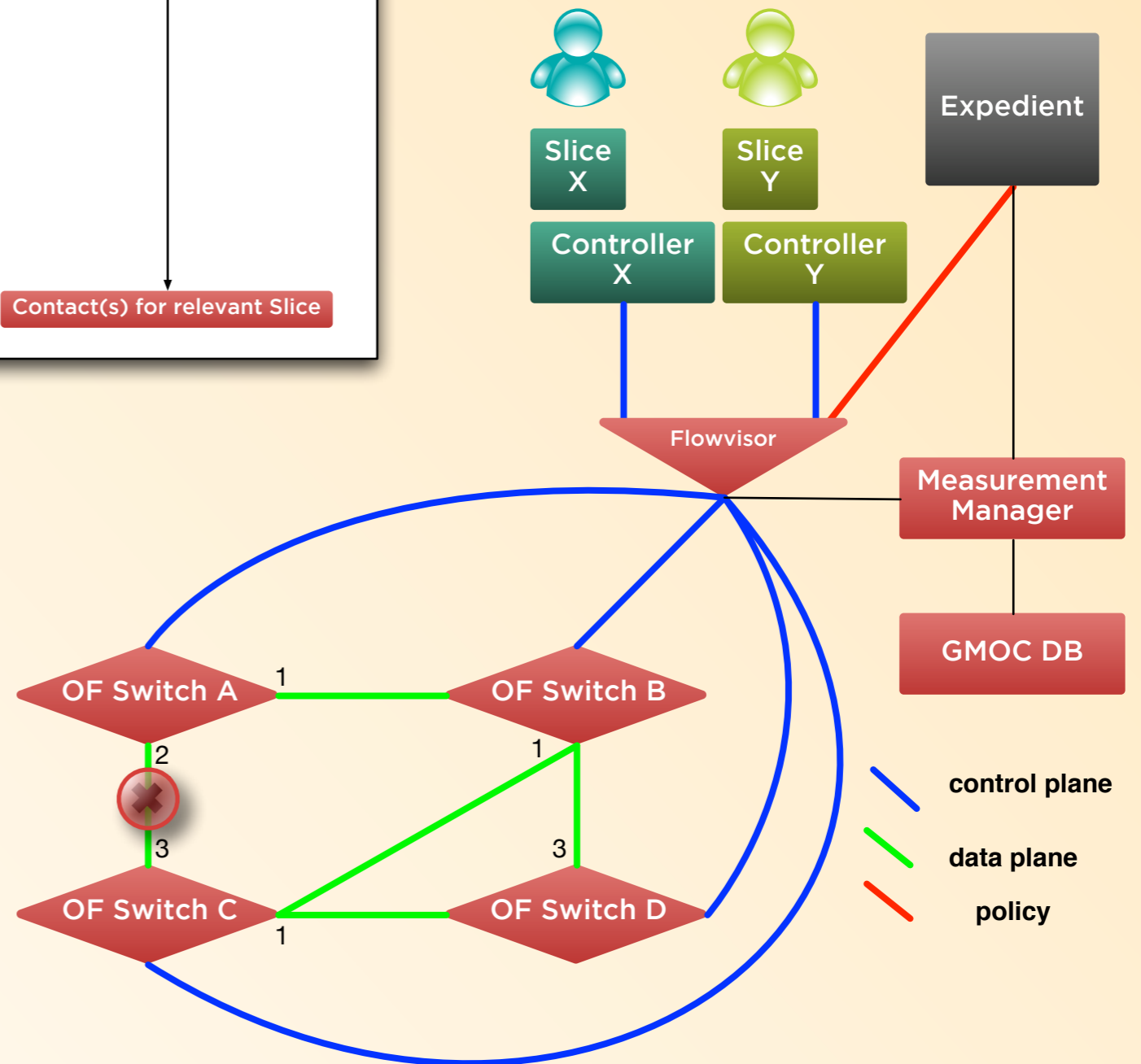
Access

- For notifications, we can get topology from flowvisors...
- ...but we also need slice contacts

Outage Notification

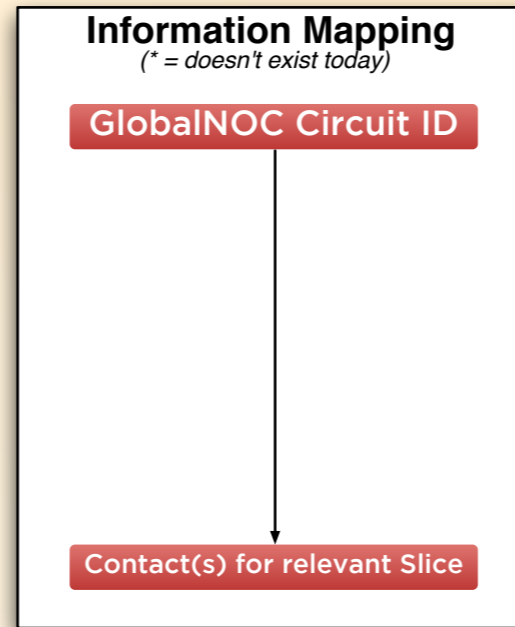


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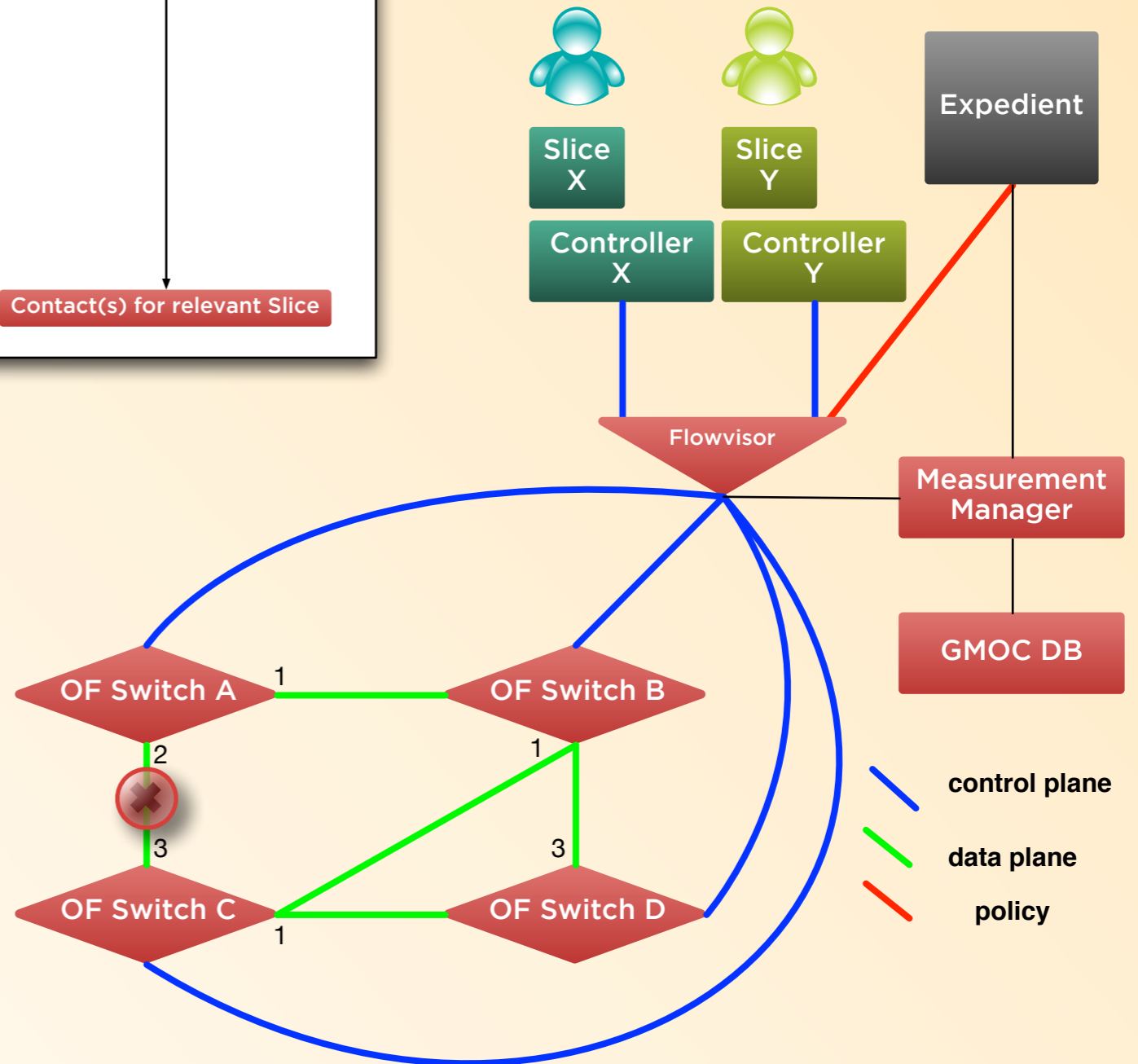


Outage Notification

- We know Slice X is affected, but WHO should we contact?
- HOW do we gather that info?



Scenario: How do you identify experimenters/slices affected by a circuit outage?



Access - what you need for slice maps

- maps require topology of other aggregates too

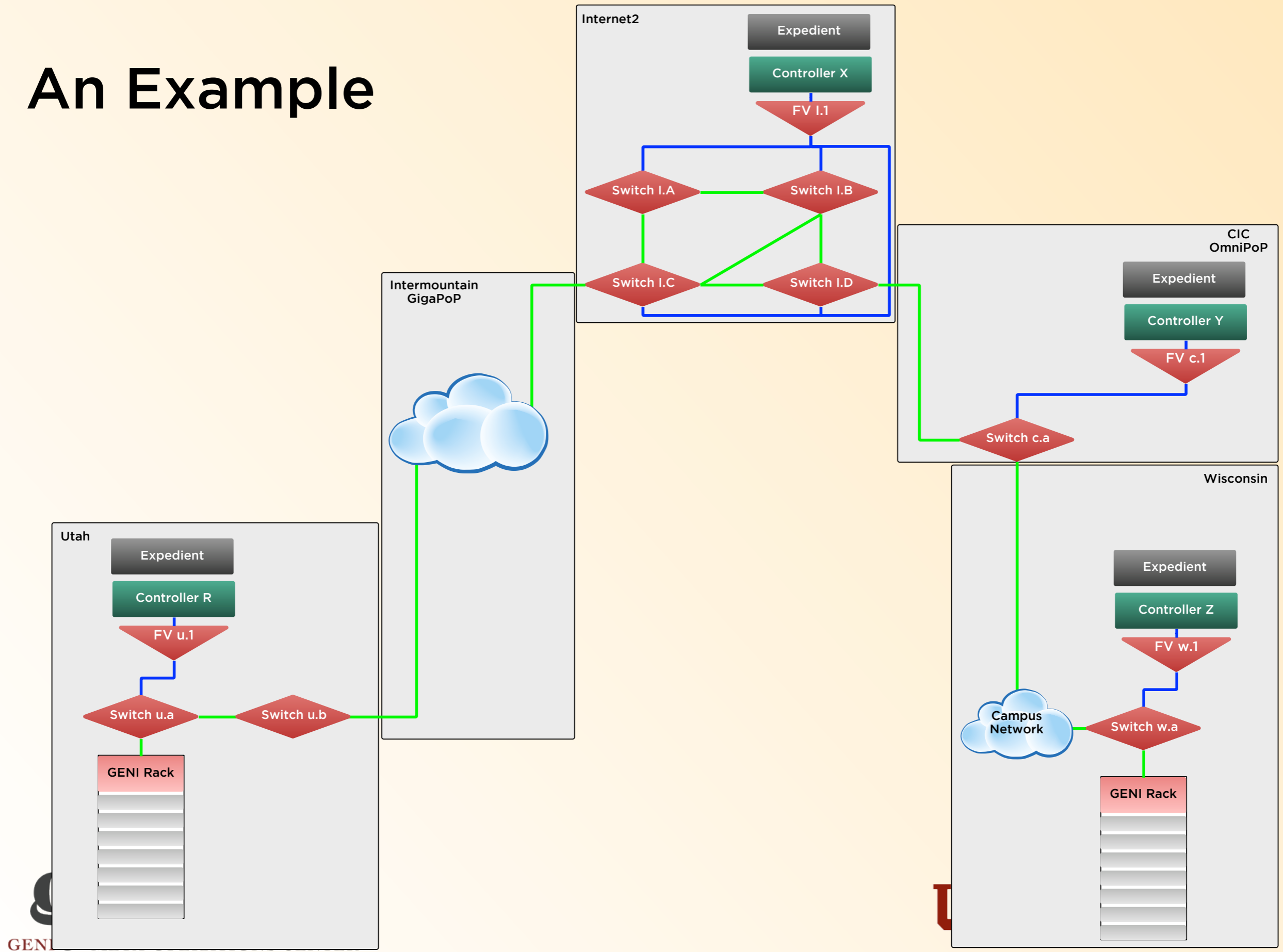
Global Read-only access?

- Maybe Ops should be able to get slice info globally via GENI API
- But not SET

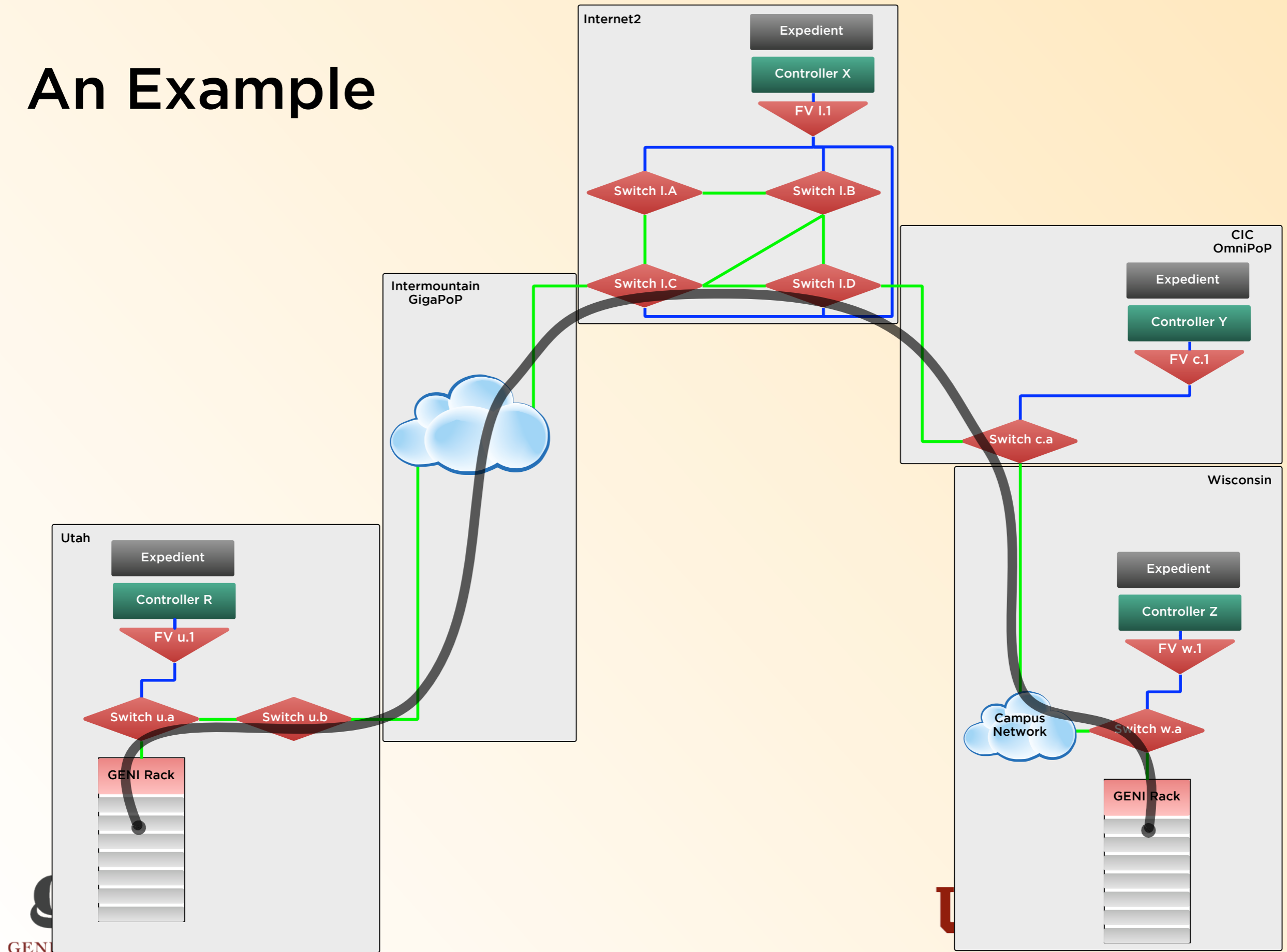
Notifications - Expanded



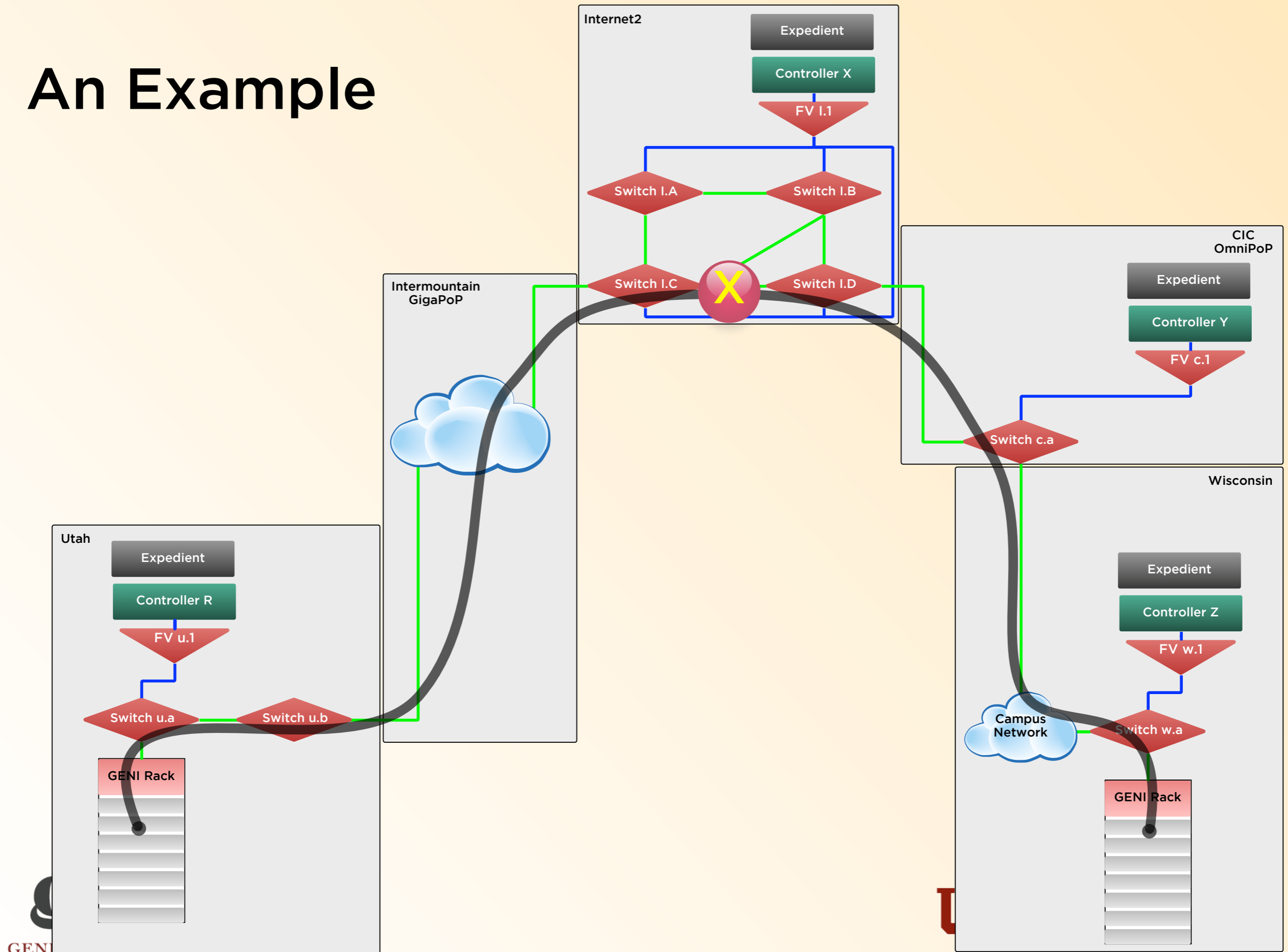
An Example



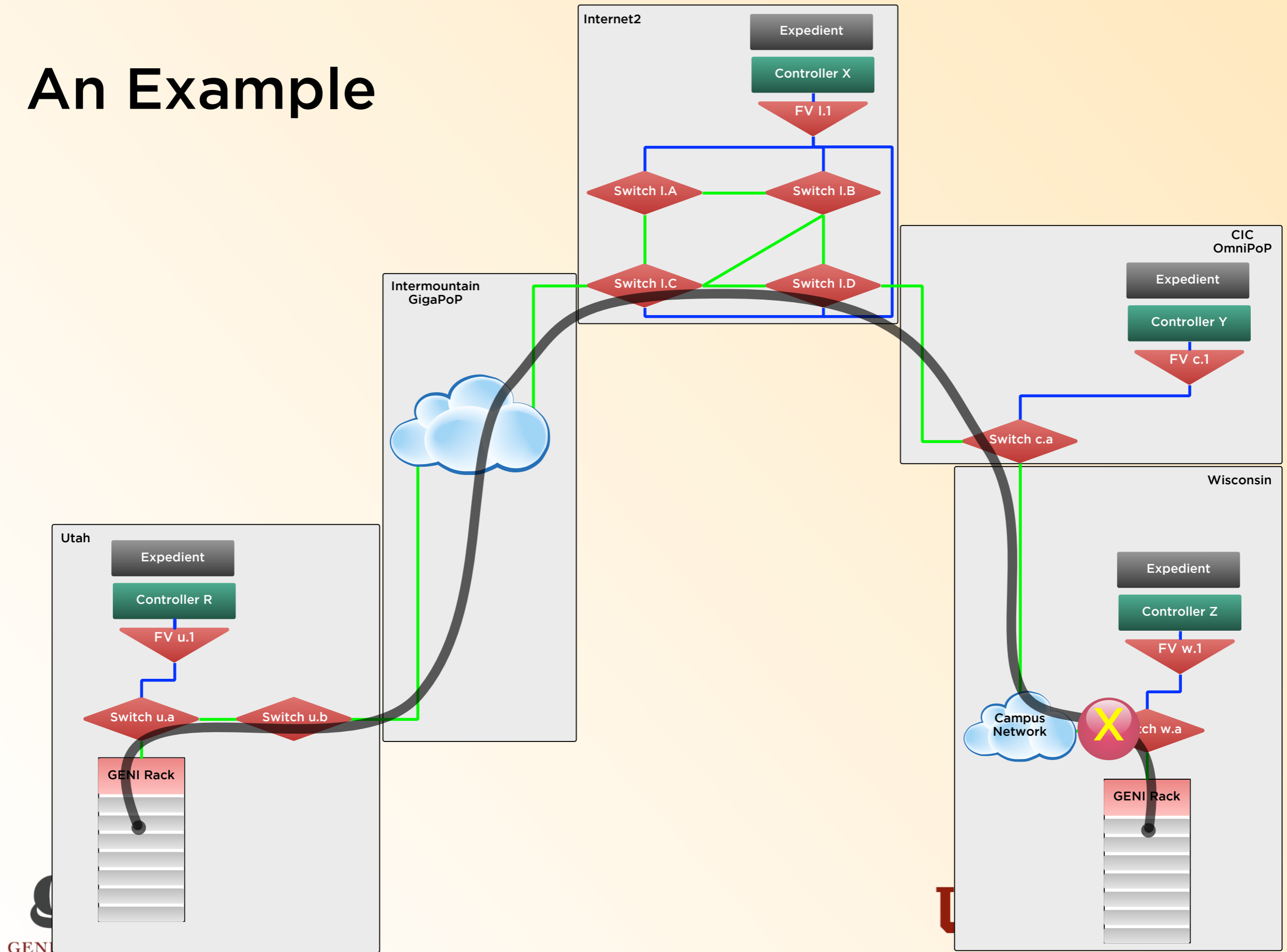
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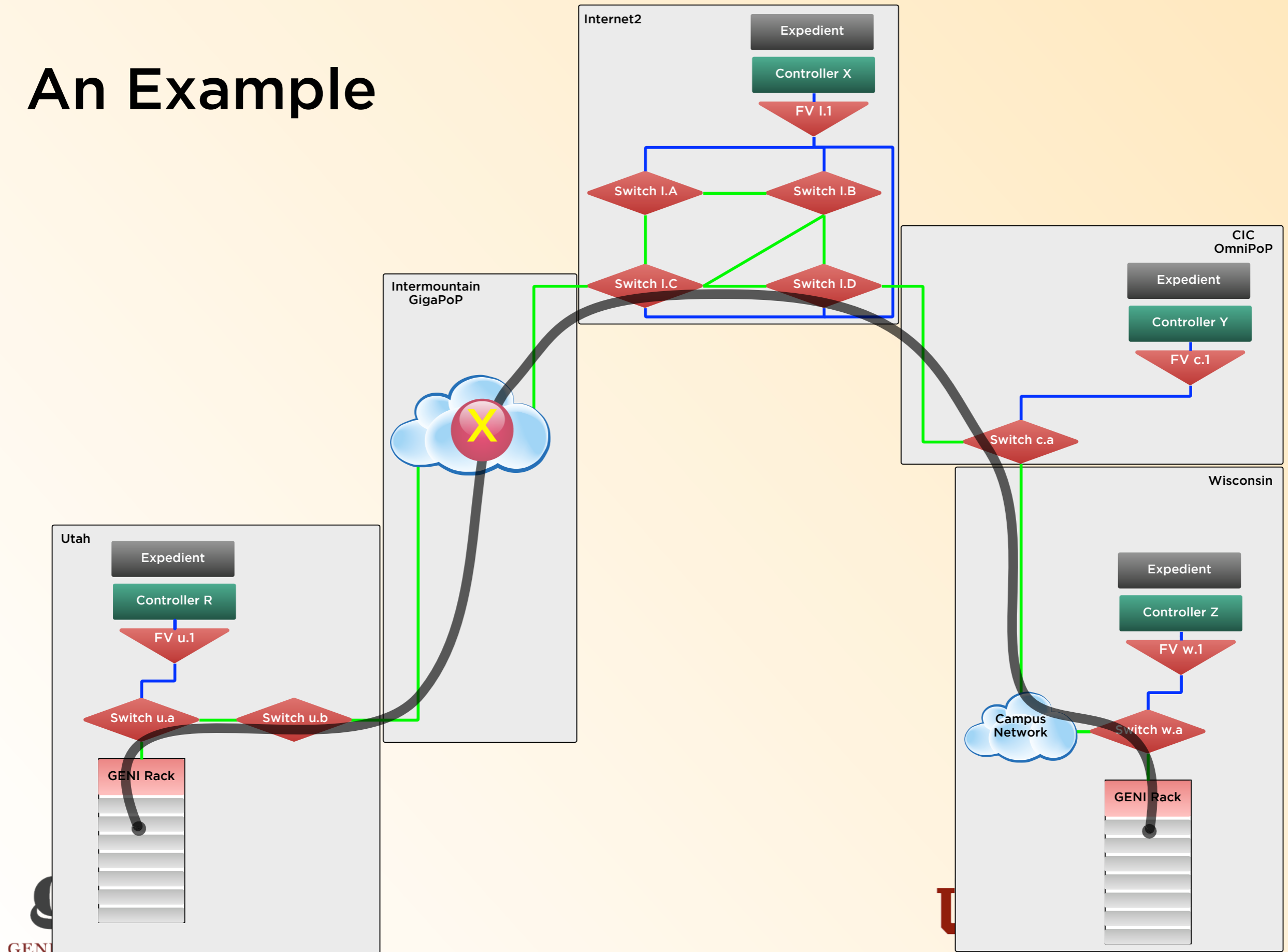
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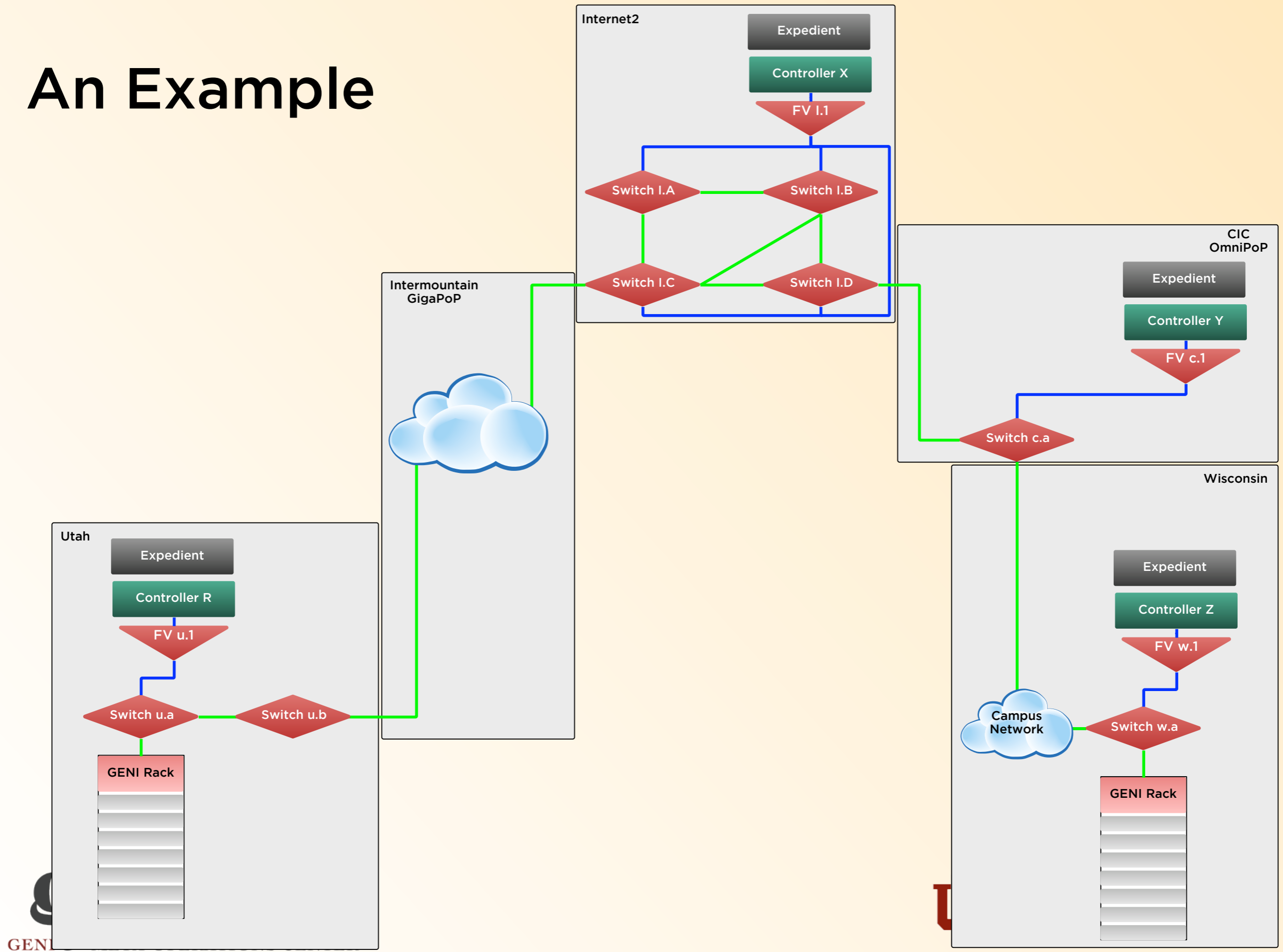
An Example



An Example



An Example



GENI

What should the responsibilities of the aggregate be for notifications?

- 1.Nothing.** It's not a good idea for operators to be doing this kind of thing
- 2.Optional.** Operators can notify if they want to.
- 3.Expected, when reasonable.** If we can make it easy, operators should try to notify.
- 4.Required.** Slices can't produce good experiments if they don't know what's going on underneath their slice.

What model?

1. Aggregate Operators can access slice contact info and figure out topology

2. GMOC can do it

- expand scope of things we track topology on to include other aggregates

3. GMOC can help

- GMOC “Find affected slices” code can be run by aggregate or GMOC
- GMOC “Notify slice” service can be used to proxy communications to slice owners

4. Mix?

