

GMOC Updates - GEC11



GlobalNOC
Global Research Network Operations Center

Emergency Stop Drill, Monitoring Updates



Stop Drill

- **in June**
- **for Plastic Slices**
- **involved BBN, IU, I2, & NLR**
- **Tested**
 - Slice stop/restore
 - Isolation/Restoration on Openflow Backbone
- **Issues from Drill**
 - Inconsistency in slice naming
 - Authoritative backbone info
 - Cross-training at GMOC/GlobalNOC



Measurement API

- **Send & Receive Measurement data w/GMOC**
- **Files**
 - http://gmoc-db.grnoc.iu.edu/sources/measurement_api/
- **Working with Plastic Slices**
- **Front-end**
 - <http://gmoc-db.grnoc.iu.edu/snapp/>

Other Updates

- **Sanitized DB sharing**

- Sanitized version of historical data in GMOC DB
- Being shared with NetKarma & BBN

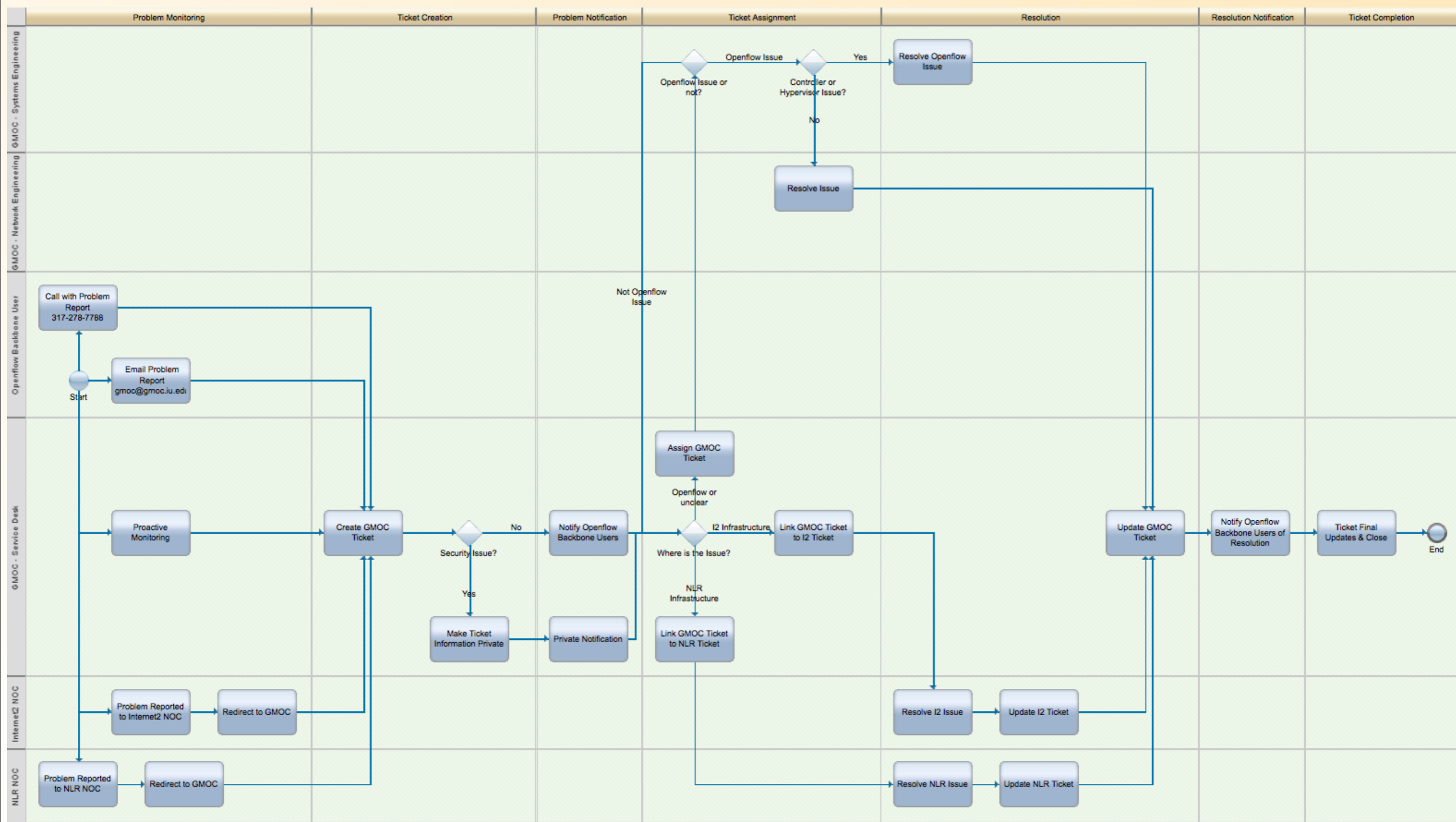
- **Protected GMOC DB Interface**

- Ability to update info on
 - Contacts (phone #s, email)
 - Nodes (location, etc)

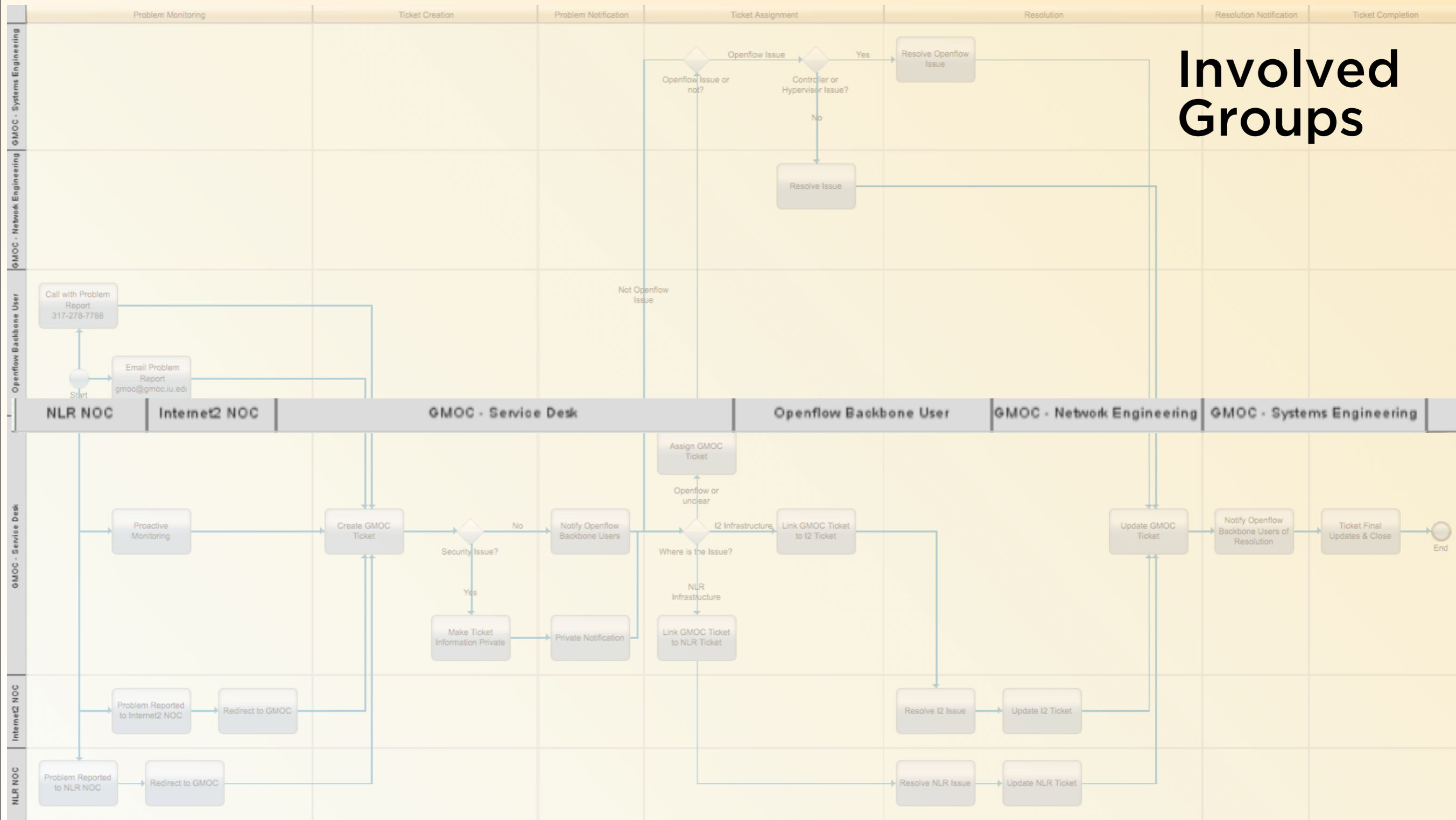


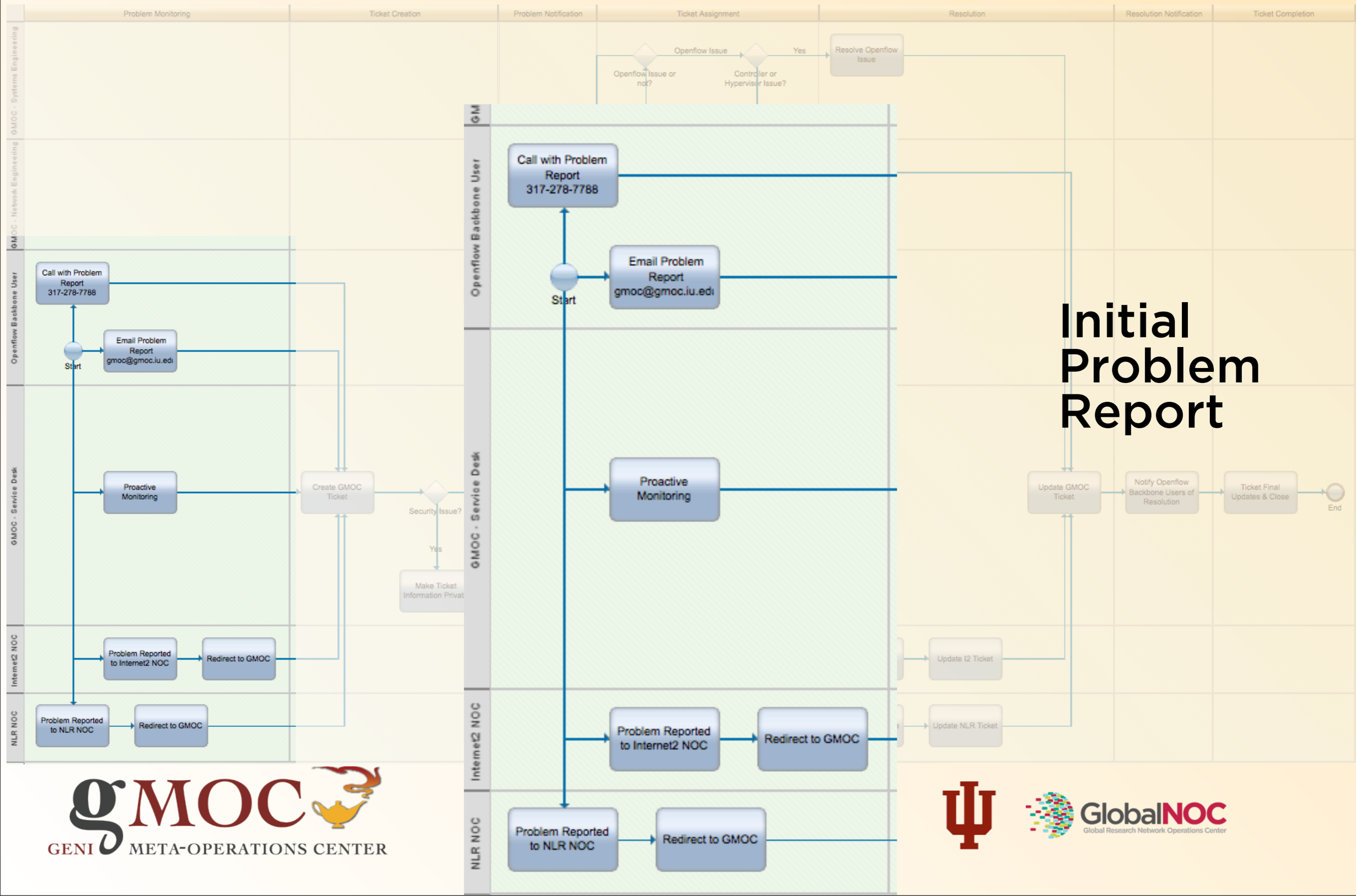
Troubleshooting Process for Openflow Backbones

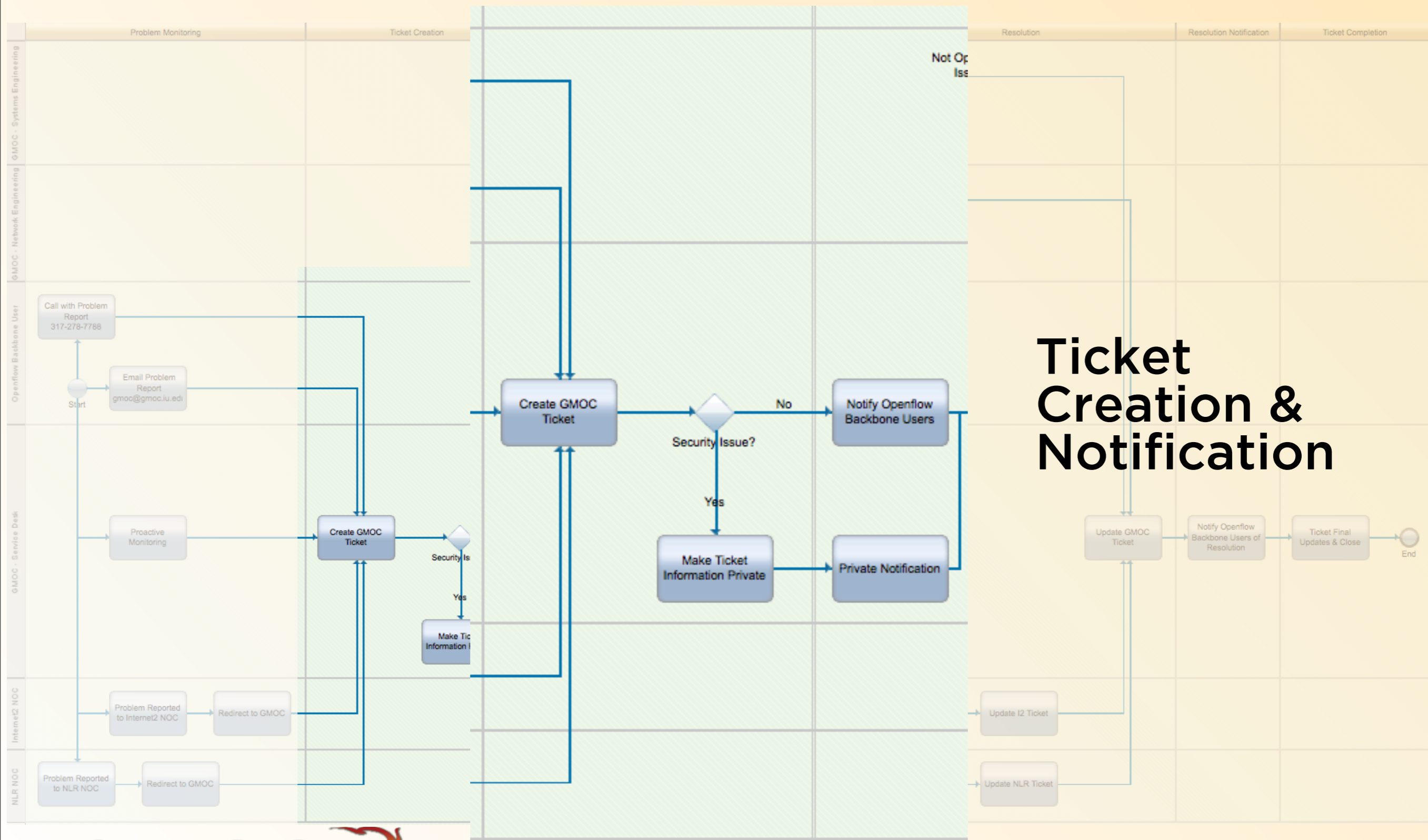




Involved Groups

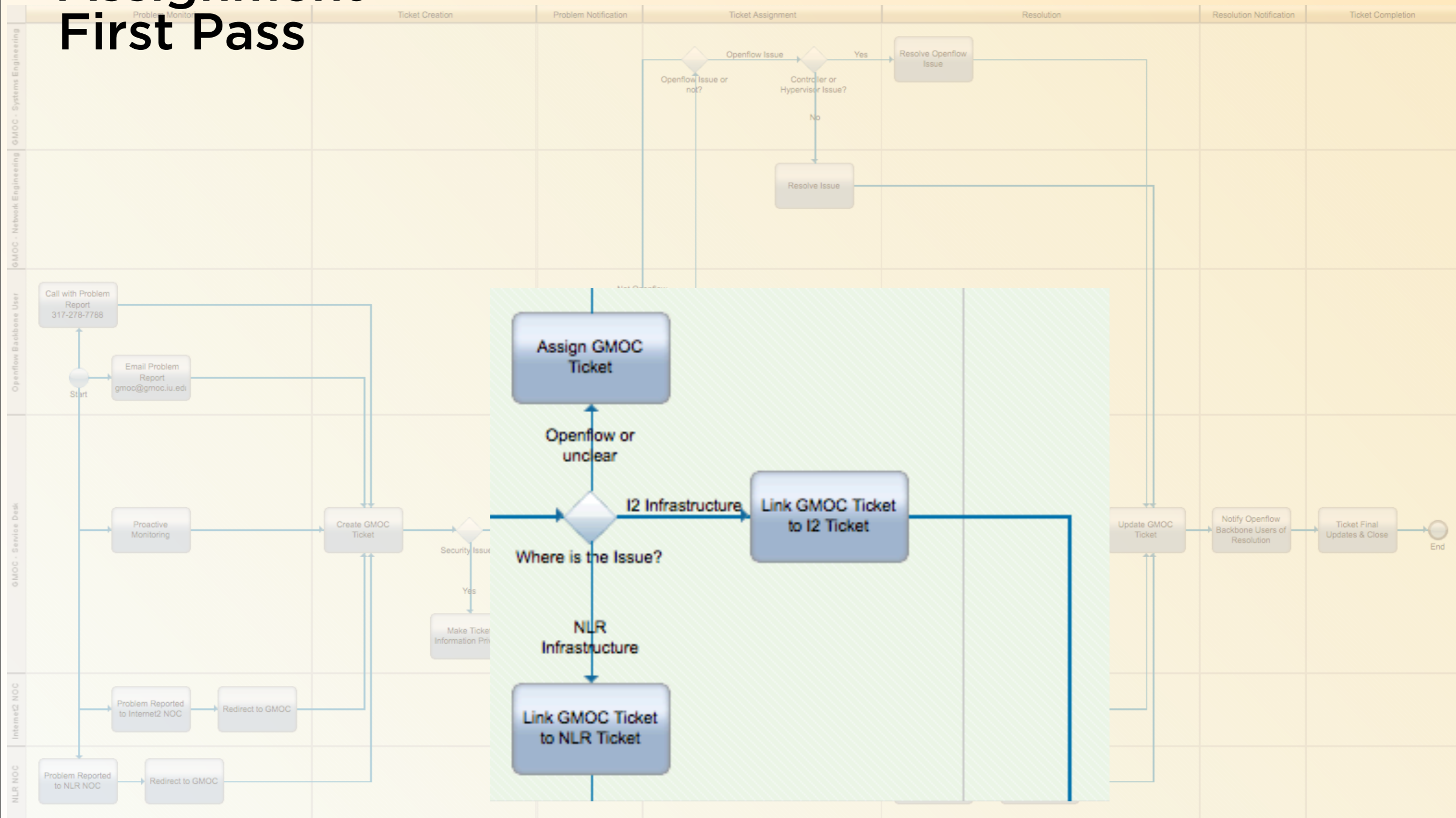




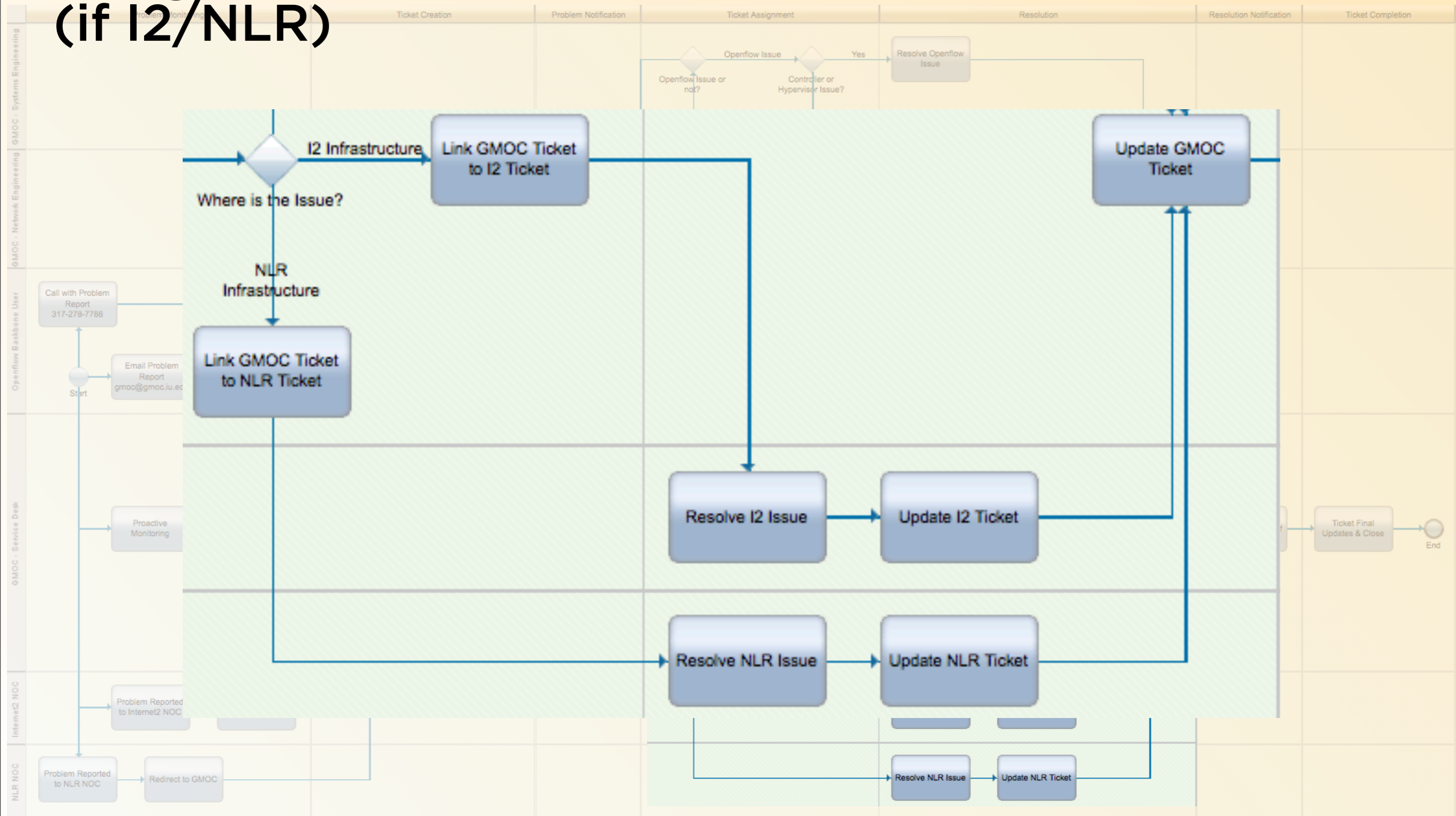


Ticket Creation & Notification

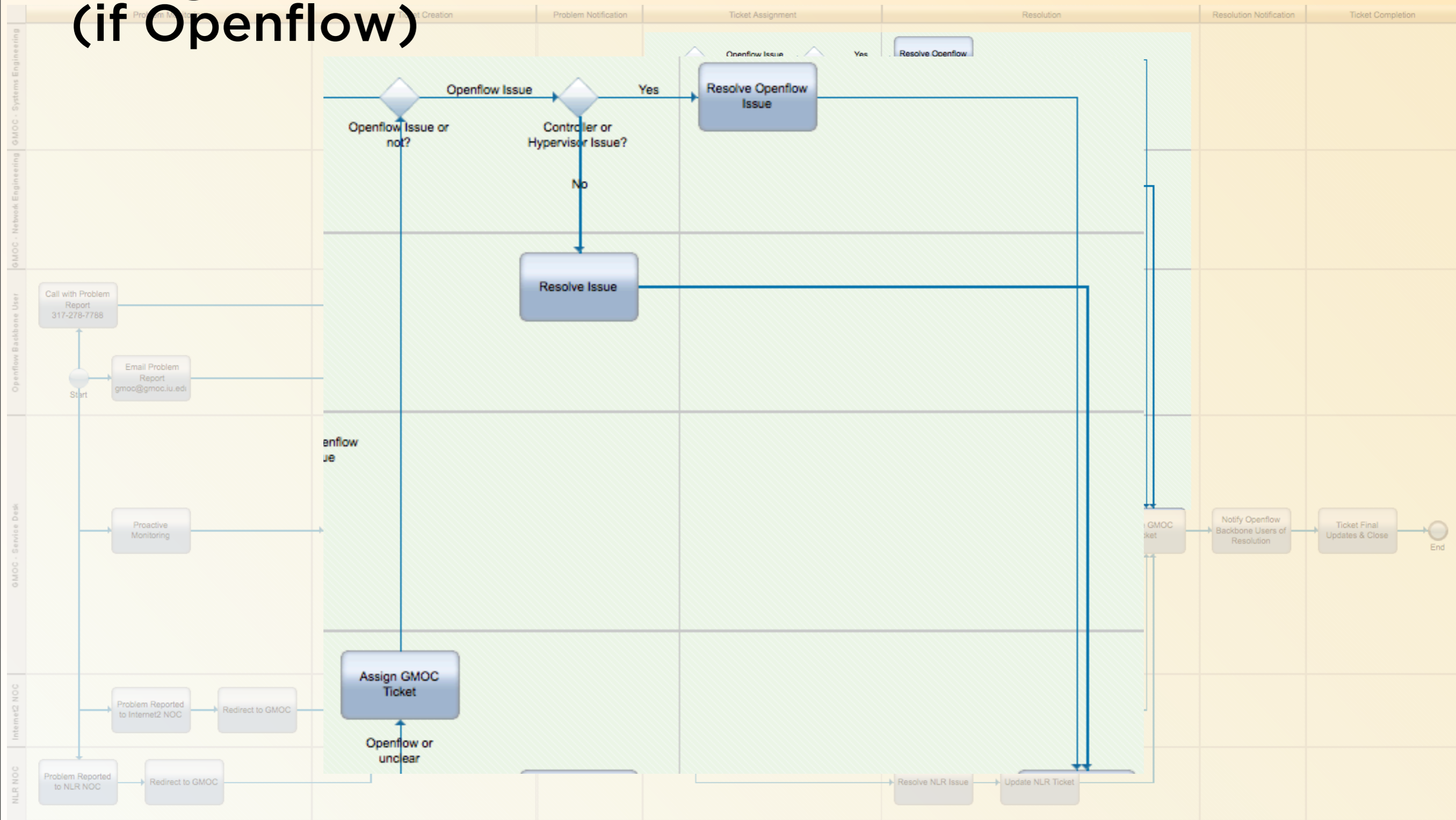
Assignment- First Pass



Assignment (if I2/NLR)



Assignment (if Openflow)

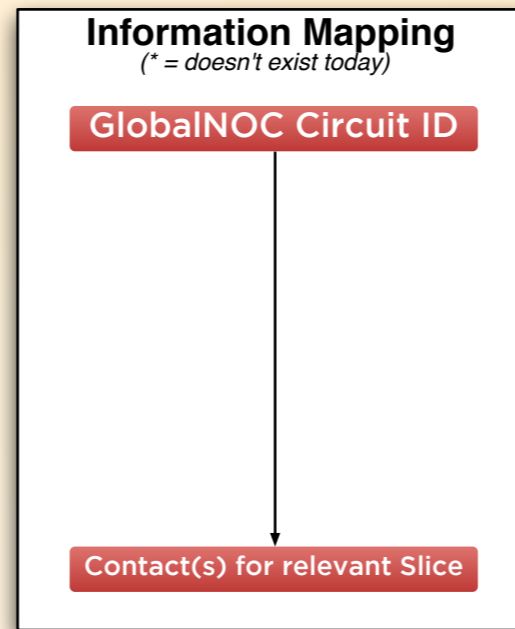


Circuit to Slice in the Plastic Slice world

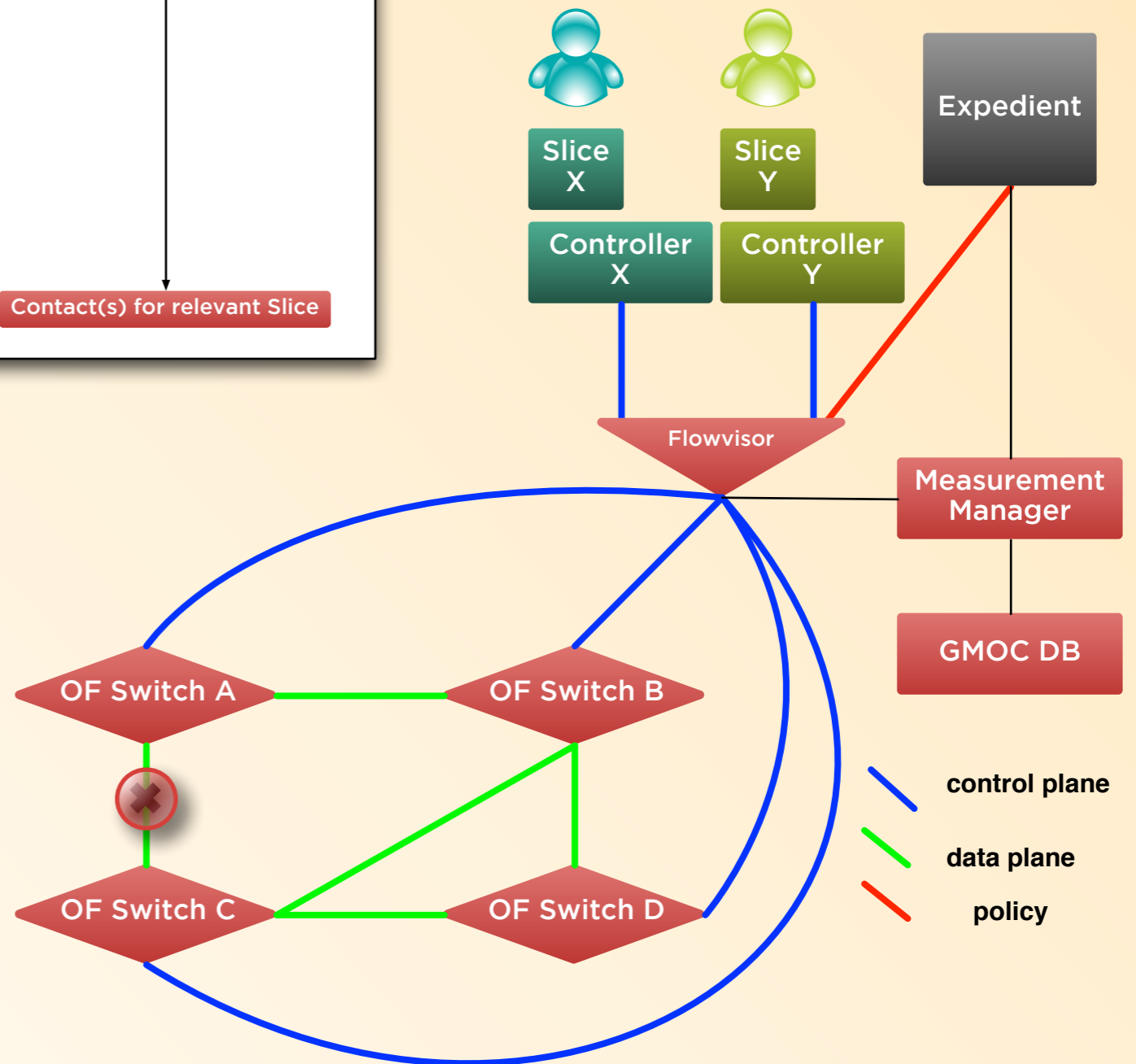


Outage Notification

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

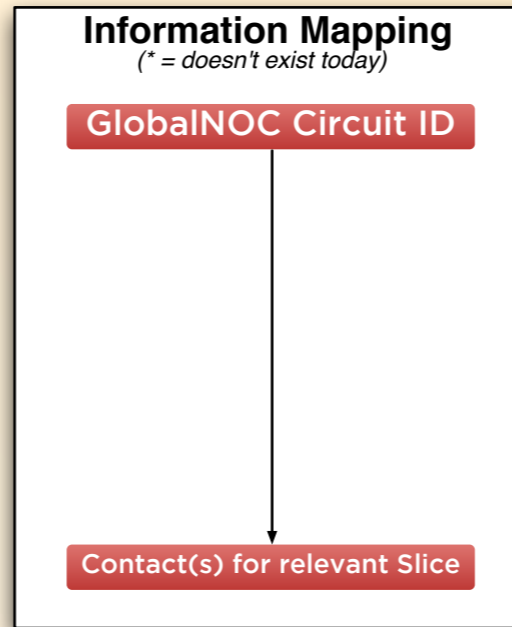


Scenario: How do you identify experimenters/slices affected by a circuit outage?

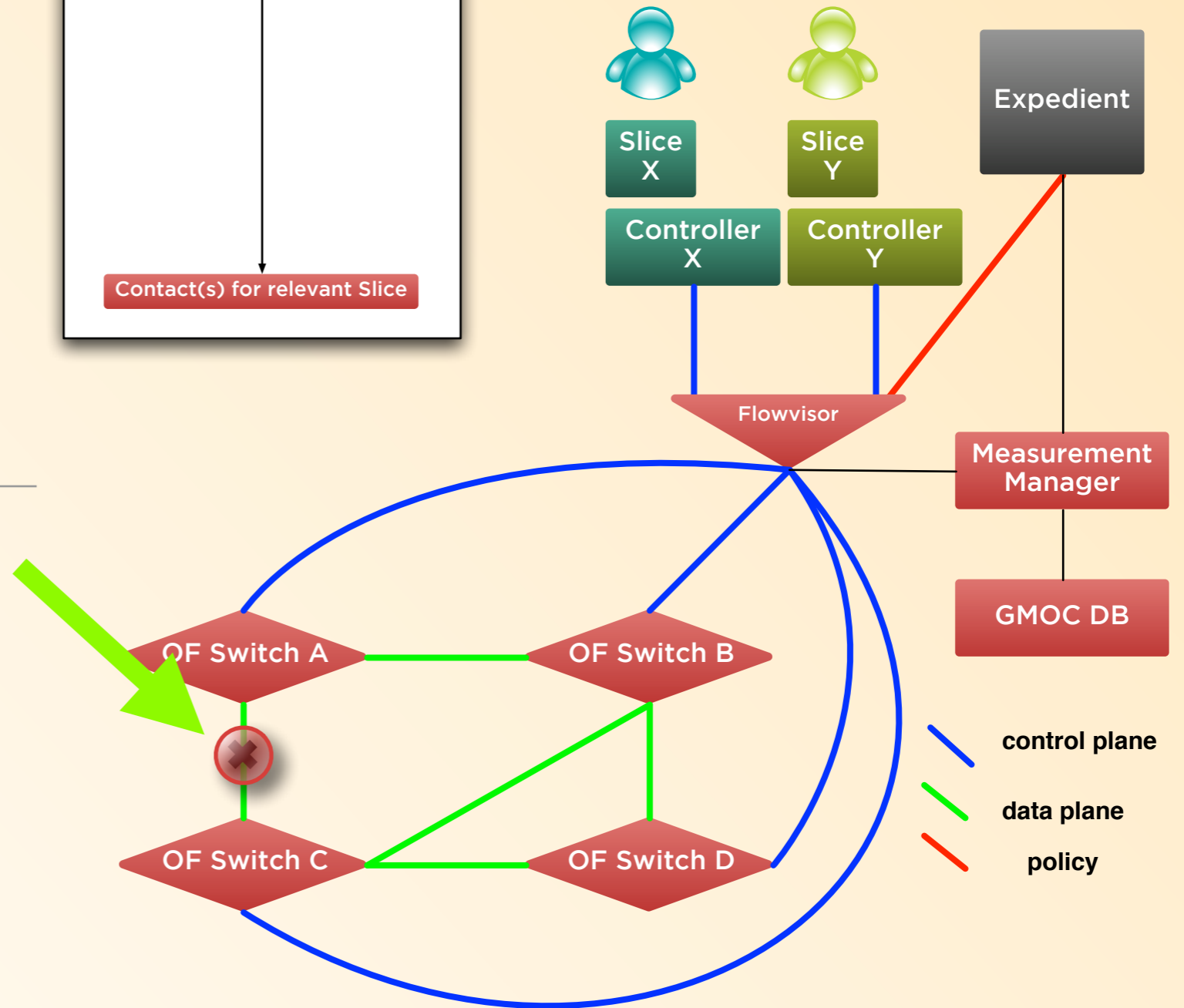


Outage Notification

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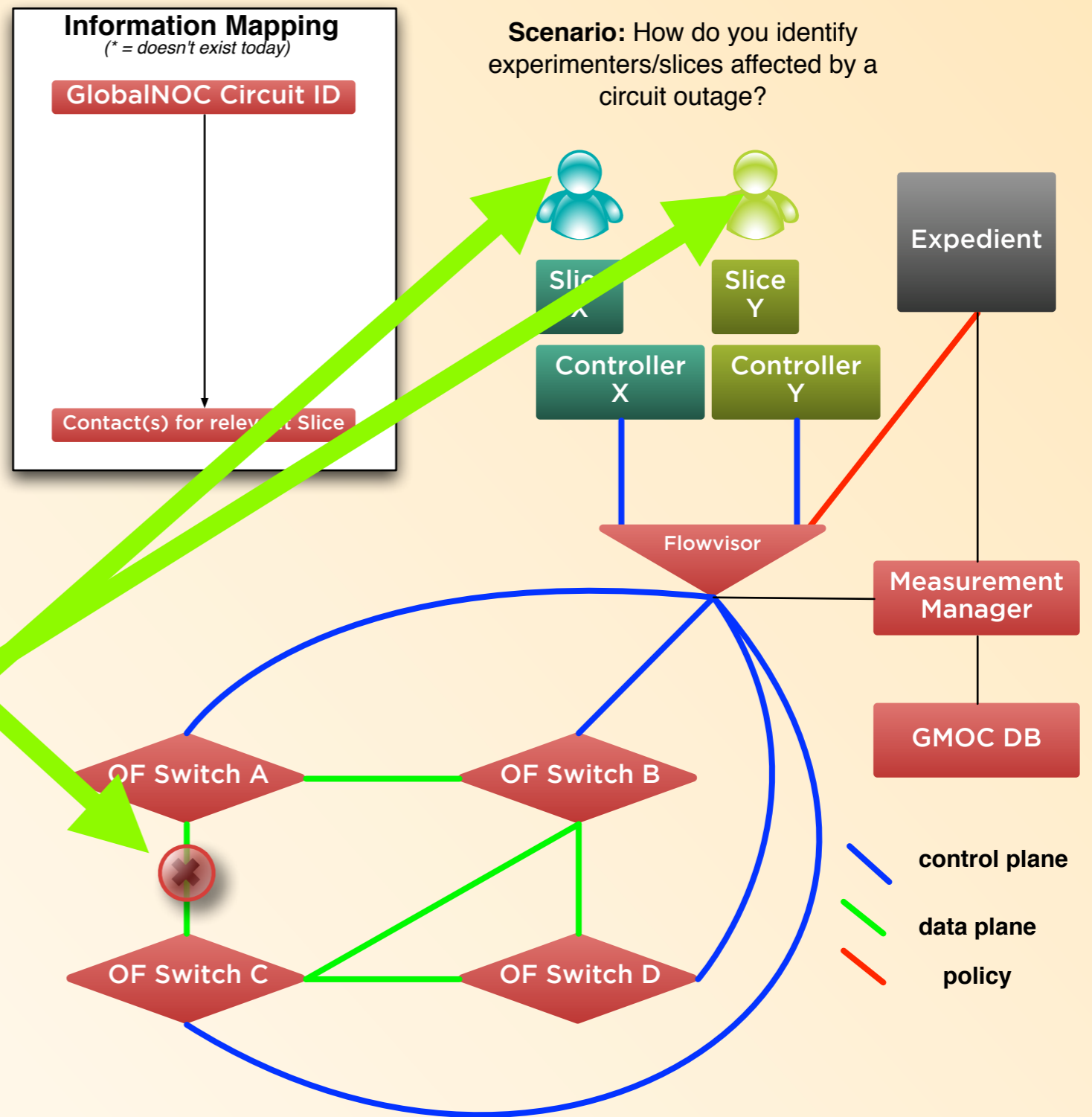


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Outage Notification

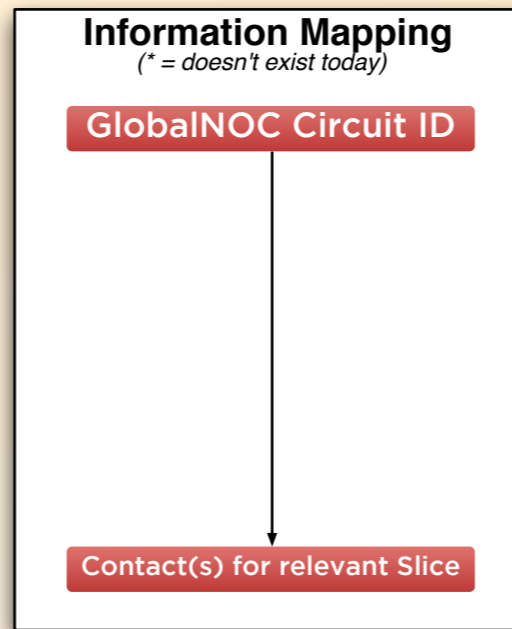
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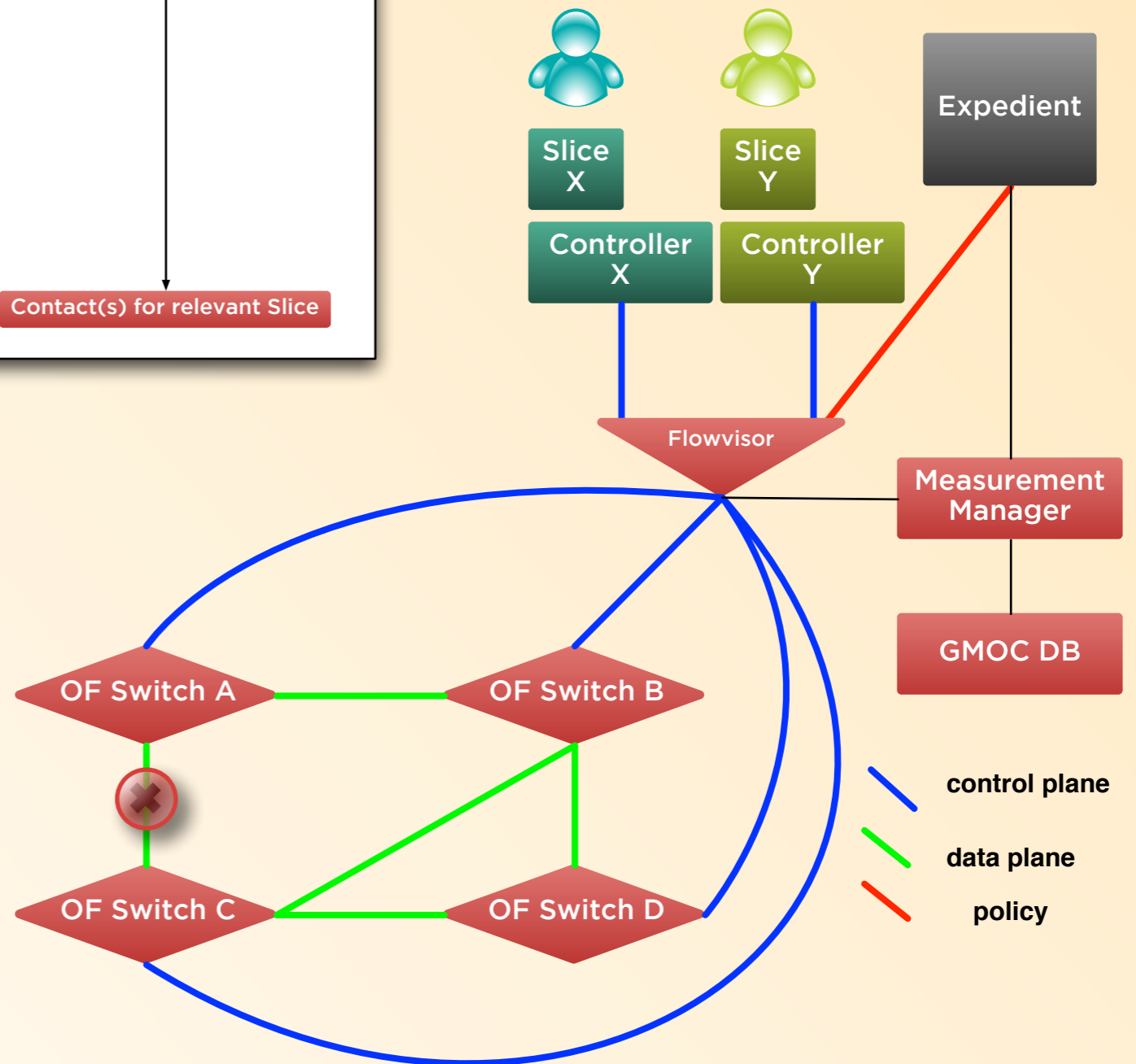
Outage Notification

Harder than it seems

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

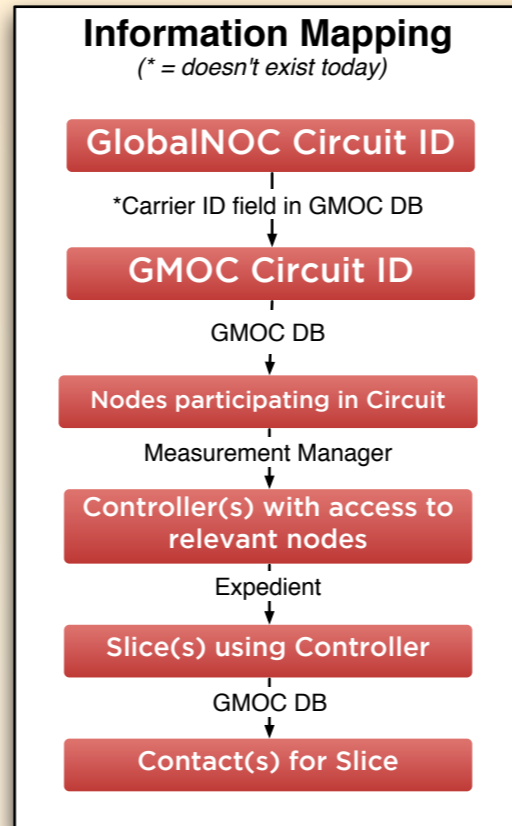


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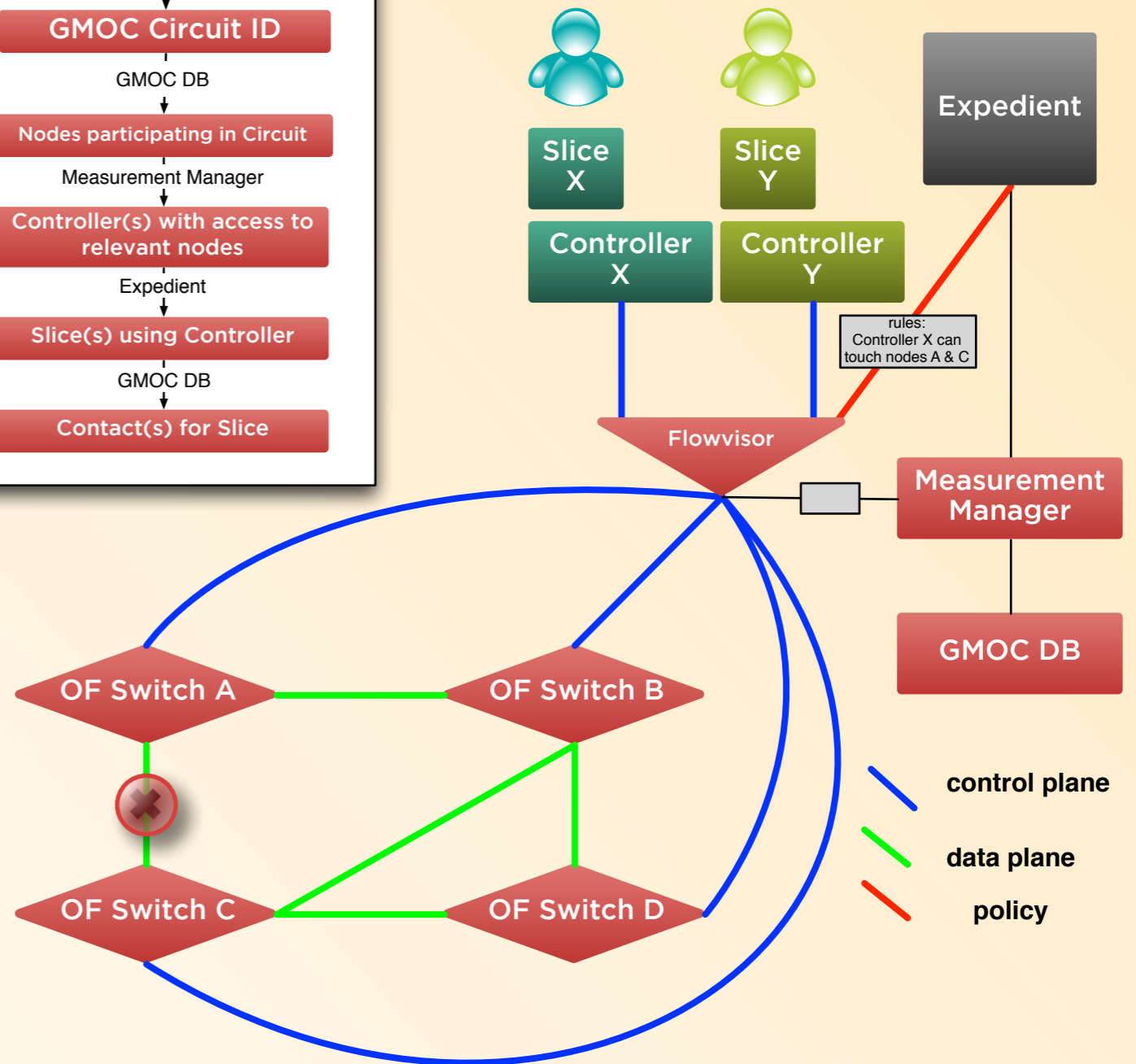
Outage Notification

The "Very Crude Option"
Map circuit endpoints to
Flowvisor access rules



Very Crude Option: notify all experiments using controllers which have access to nodes related to affected circuit

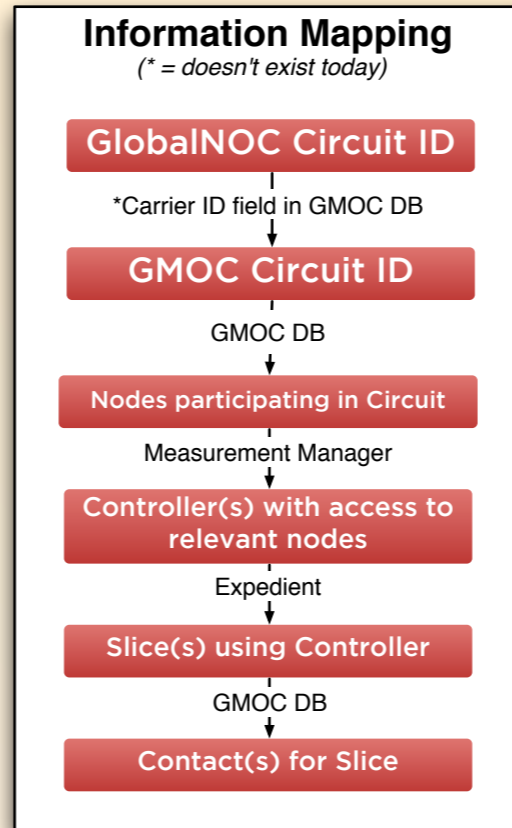
Limitations: only associates Flowvisor node access to nodes relevant to circuit. No understanding of actual topology



Outage Notification

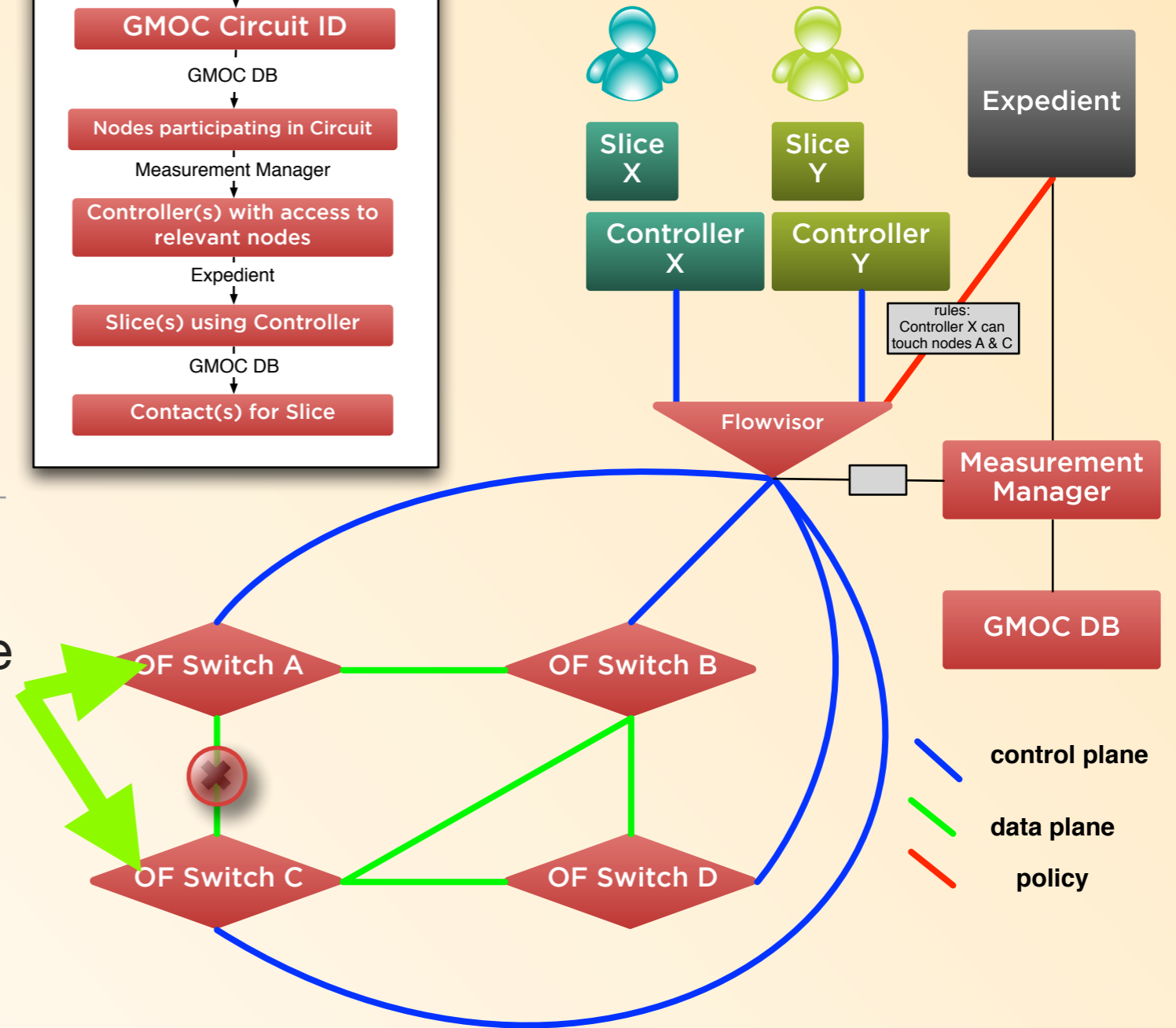
The "Very Crude Option"

1. Switches "A" and "C" terminate the affected circuit



Very Crude Option: notify all experiments using controllers which have access to nodes related to affected circuit

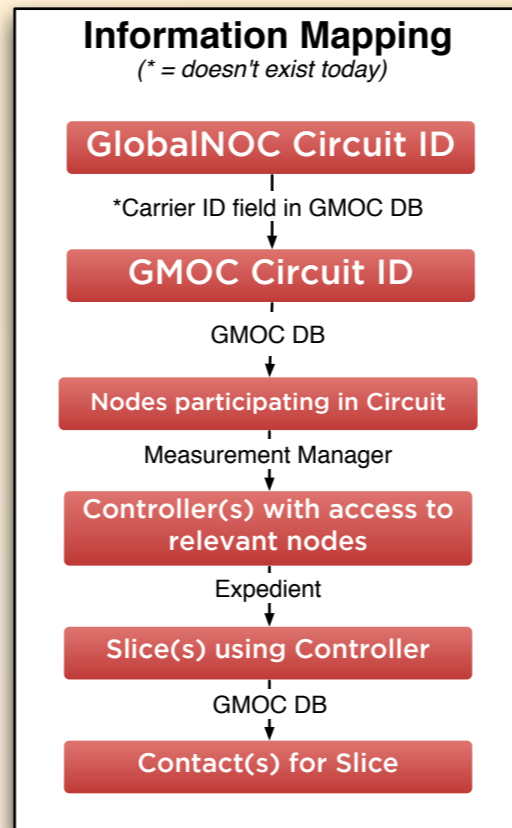
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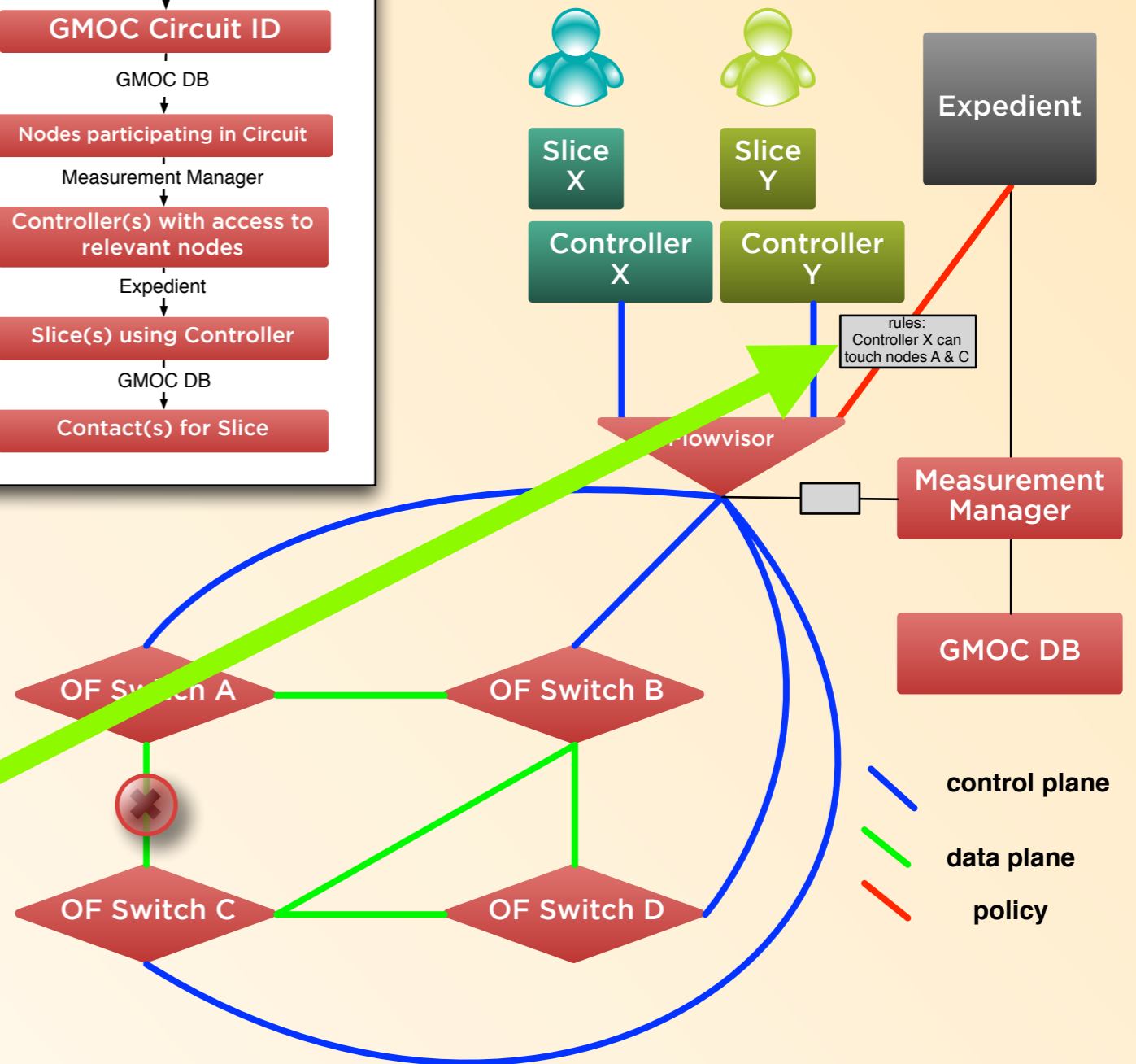
The "Very Crude Option"

1. Switches "A" and "C" terminate the affected circuit
2. Expedient has given Controller X access to both of these



Very Crude Option: notify all experiments using controllers which have access to nodes related to affected circuit

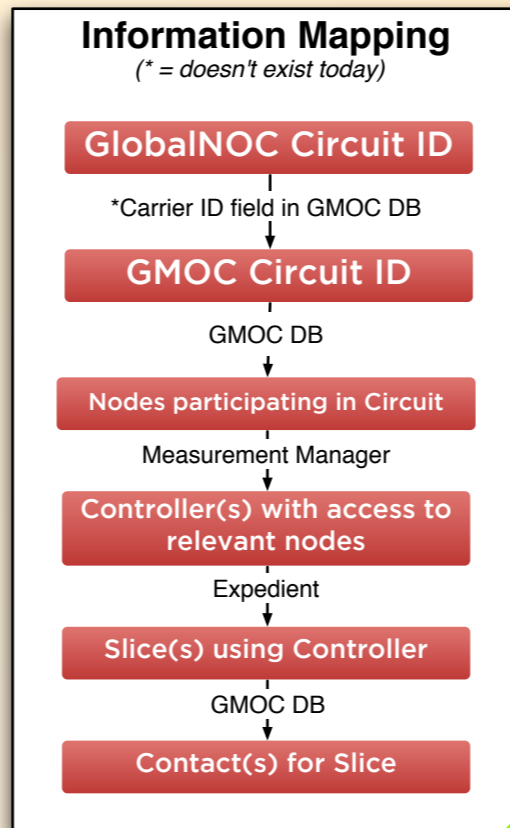
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Outage Notification

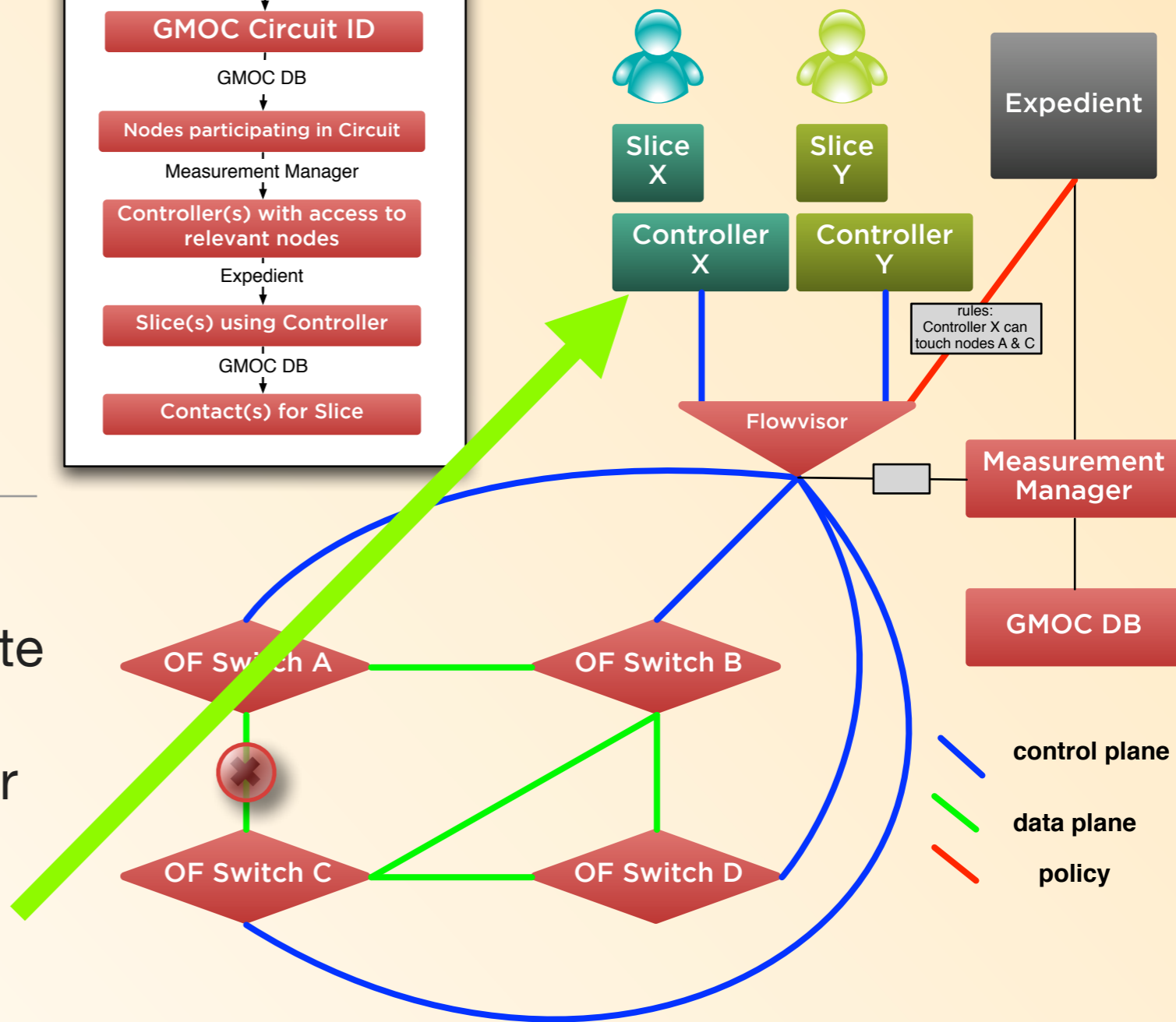
The "Very Crude Option"

1. Switches "A" and "C" terminate the affected circuit
2. Expedient has given Controller X access to both of these
3. Slice using Controller X **MAY** be affected by this outage



Very Crude Option: notify all experiments using controllers which have access to nodes related to affected circuit

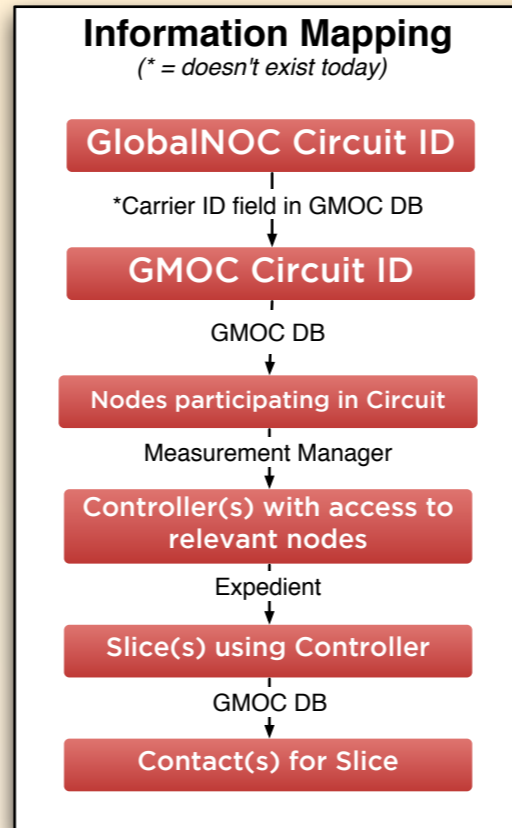
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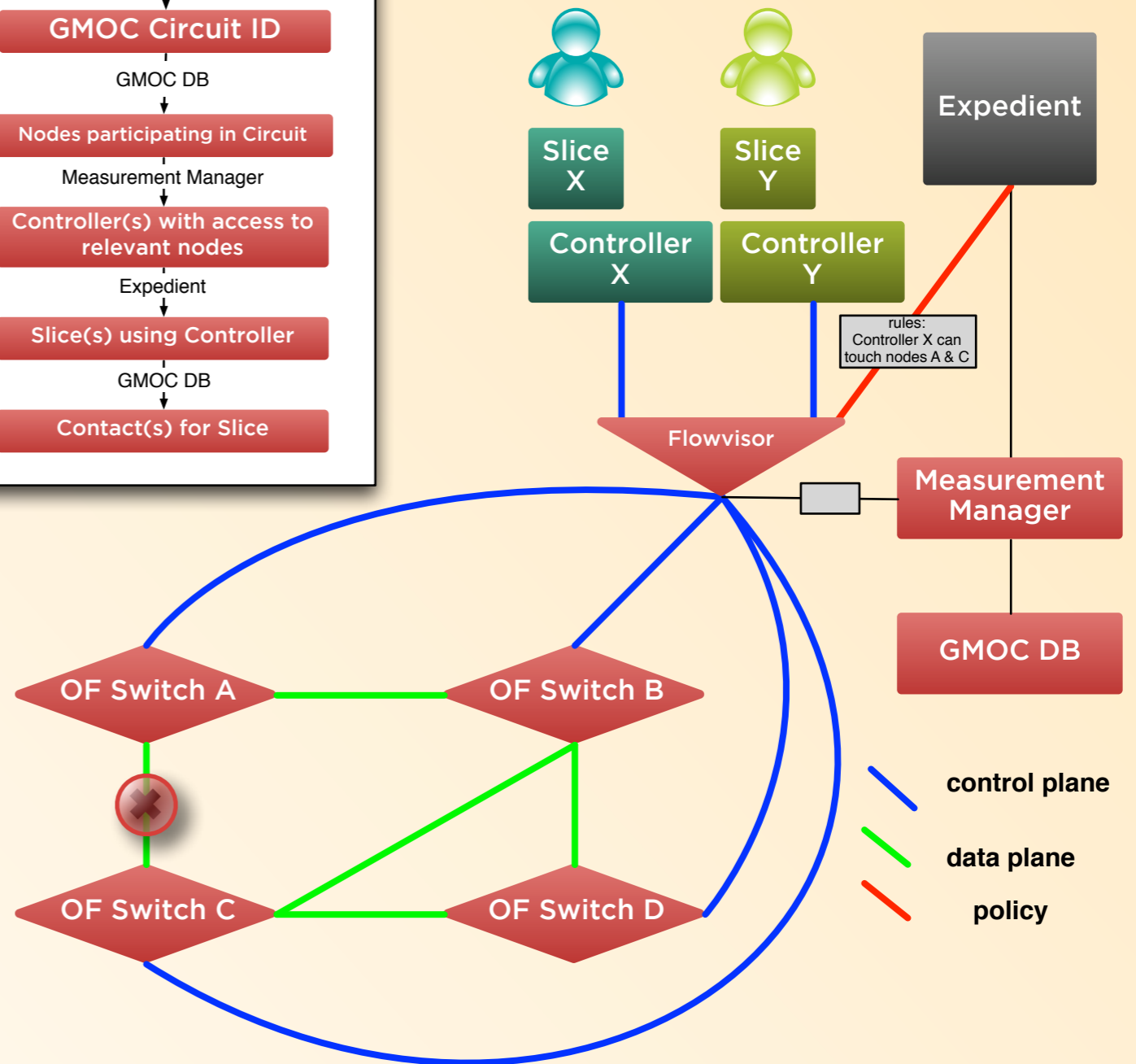
The "Very Crude Option"

- What if no flow rules currently use these nodes?



Very Crude Option: notify all experiments using controllers which have access to nodes related to affected circuit

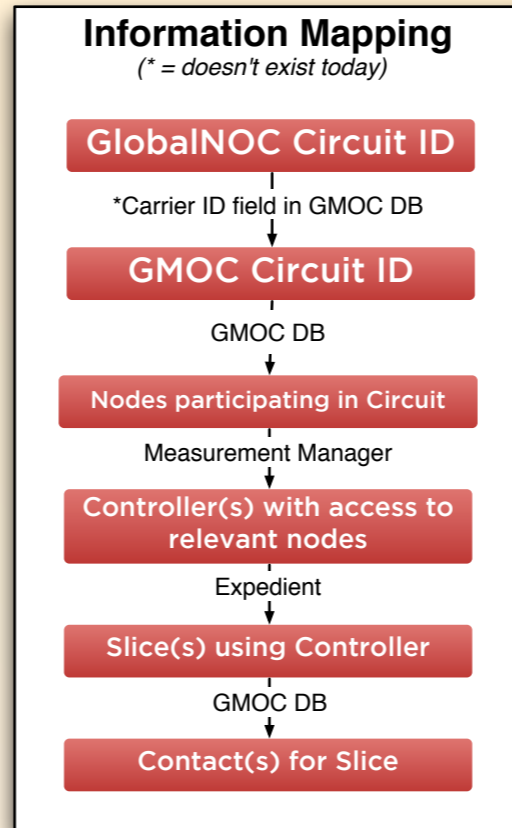
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Outage Notification

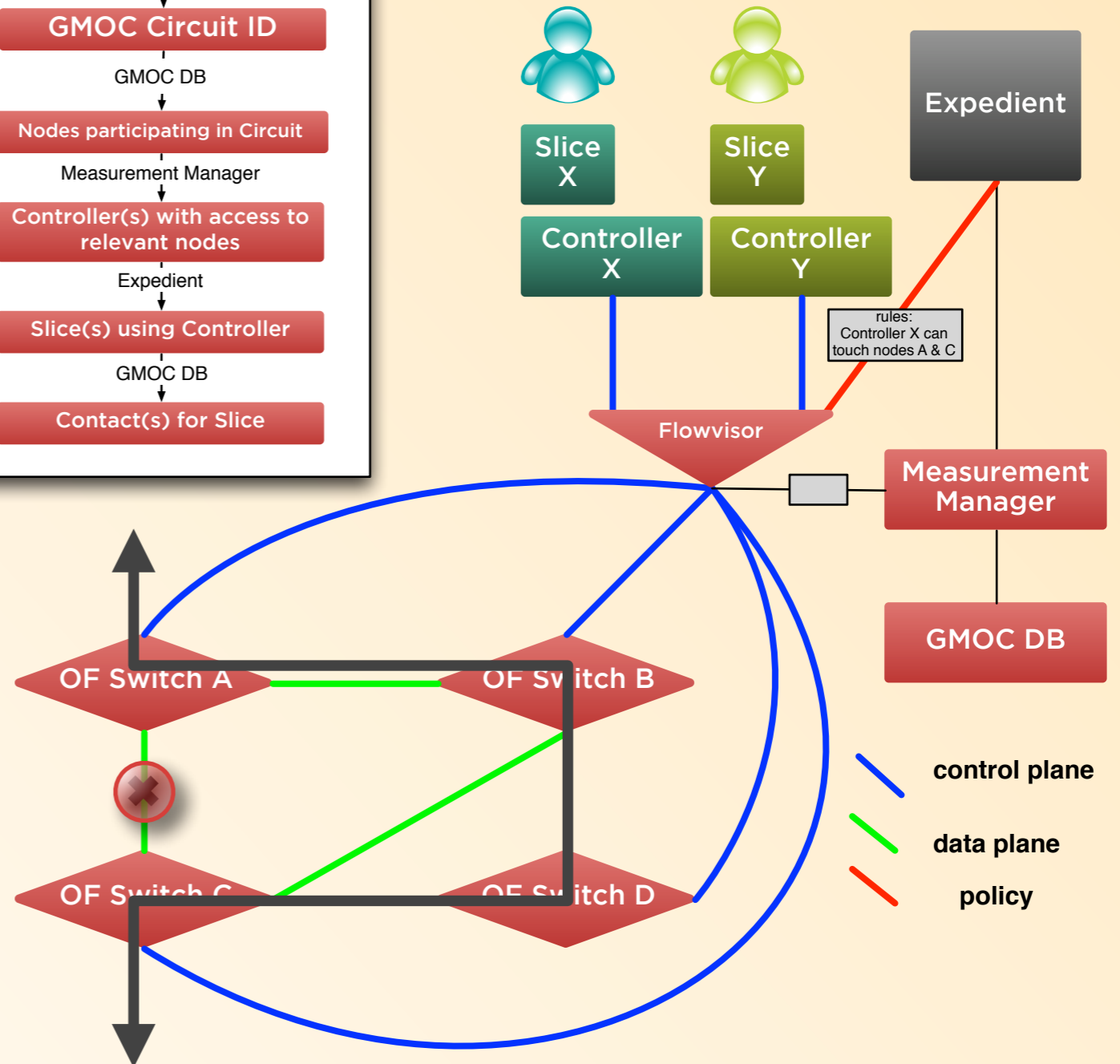
The "Very Crude Option"

- What if no flow rules currently use these nodes?
- But what if flow rules send traffic A-B-D-C?



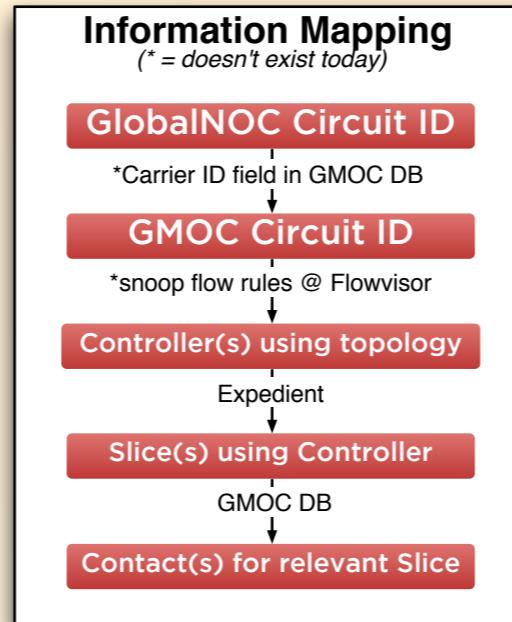
Very Crude Option: notify all experiments using controllers which have access to nodes related to affected circuit

Limitations: only associates Flowvisor node access to nodes relevant to circuit. No understanding of actual topology



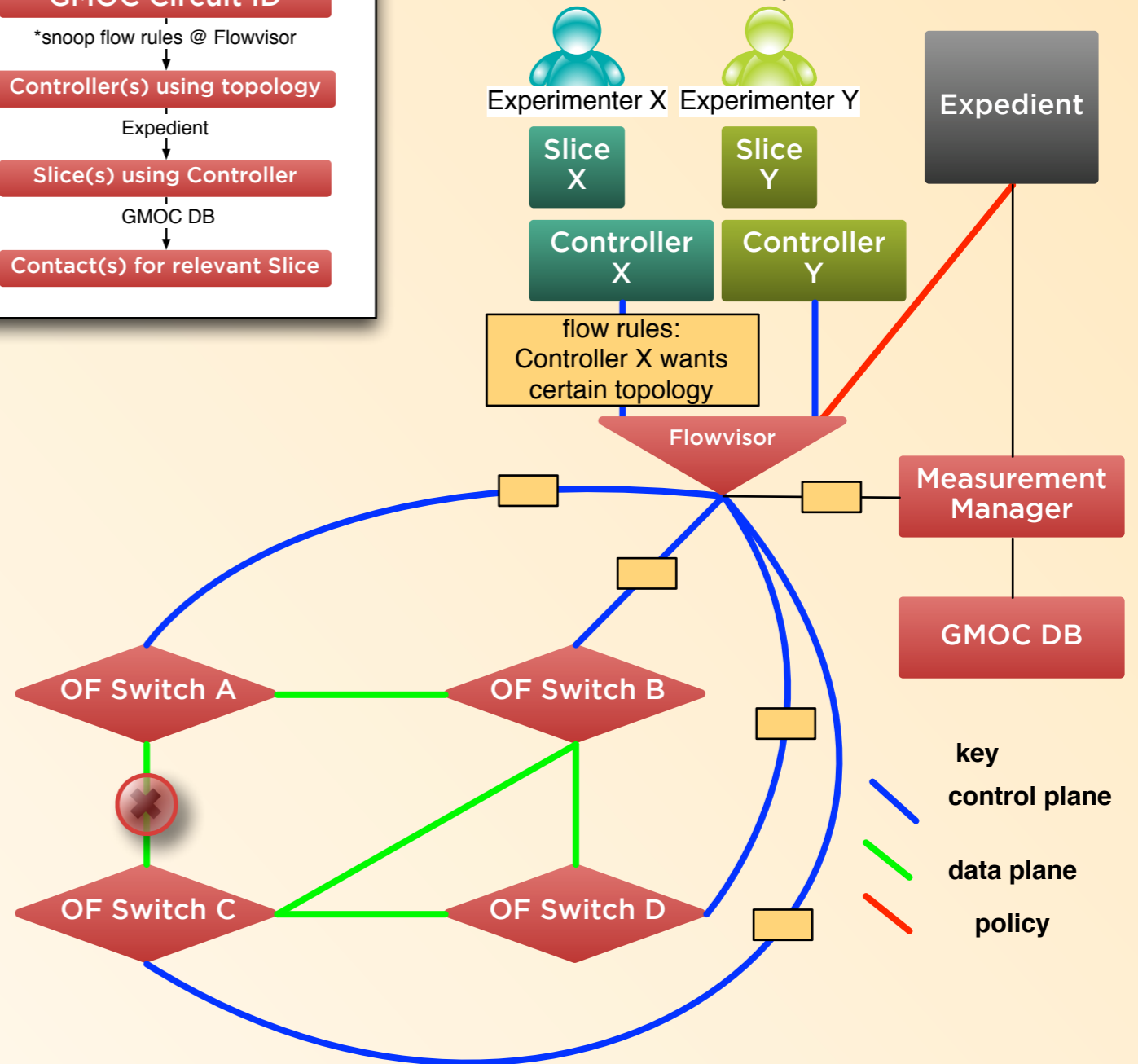
Outage Notification

The “Less Crude Option”
 Map Flow Rules to Circuits that may carry traffic as a result



Less Crude Option: notify all experiments using controllers which have created flow rules to use affected circuit

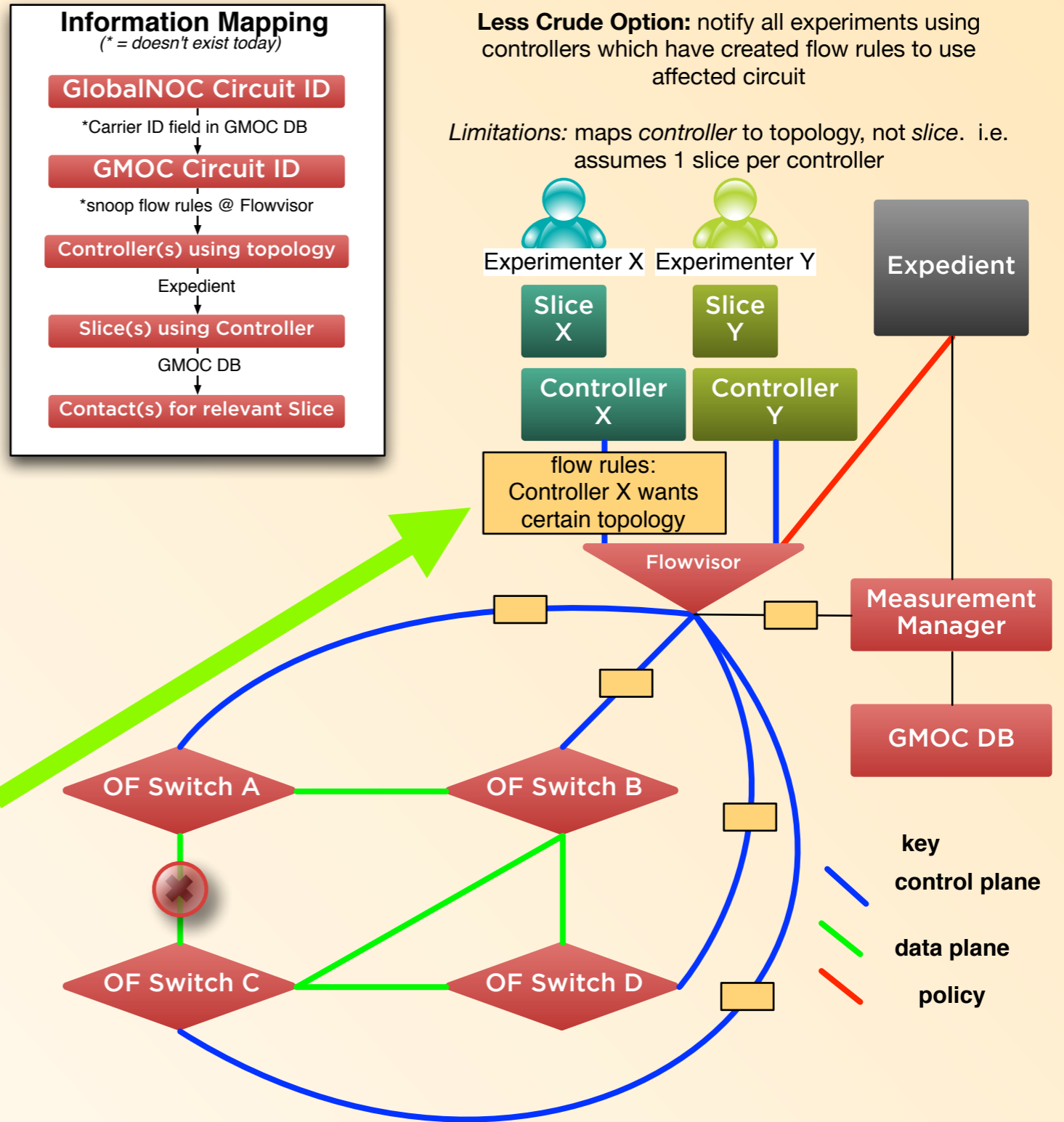
Limitations: maps controller to topology, not slice. i.e. assumes 1 slice per controller



Outage Notification

The "Less Crude Option"

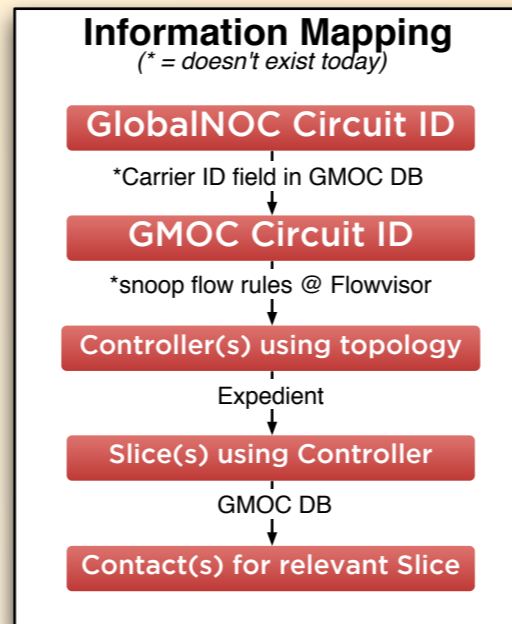
1. Controller X sends Flow rules to switch via Flowvisor



Outage Notification

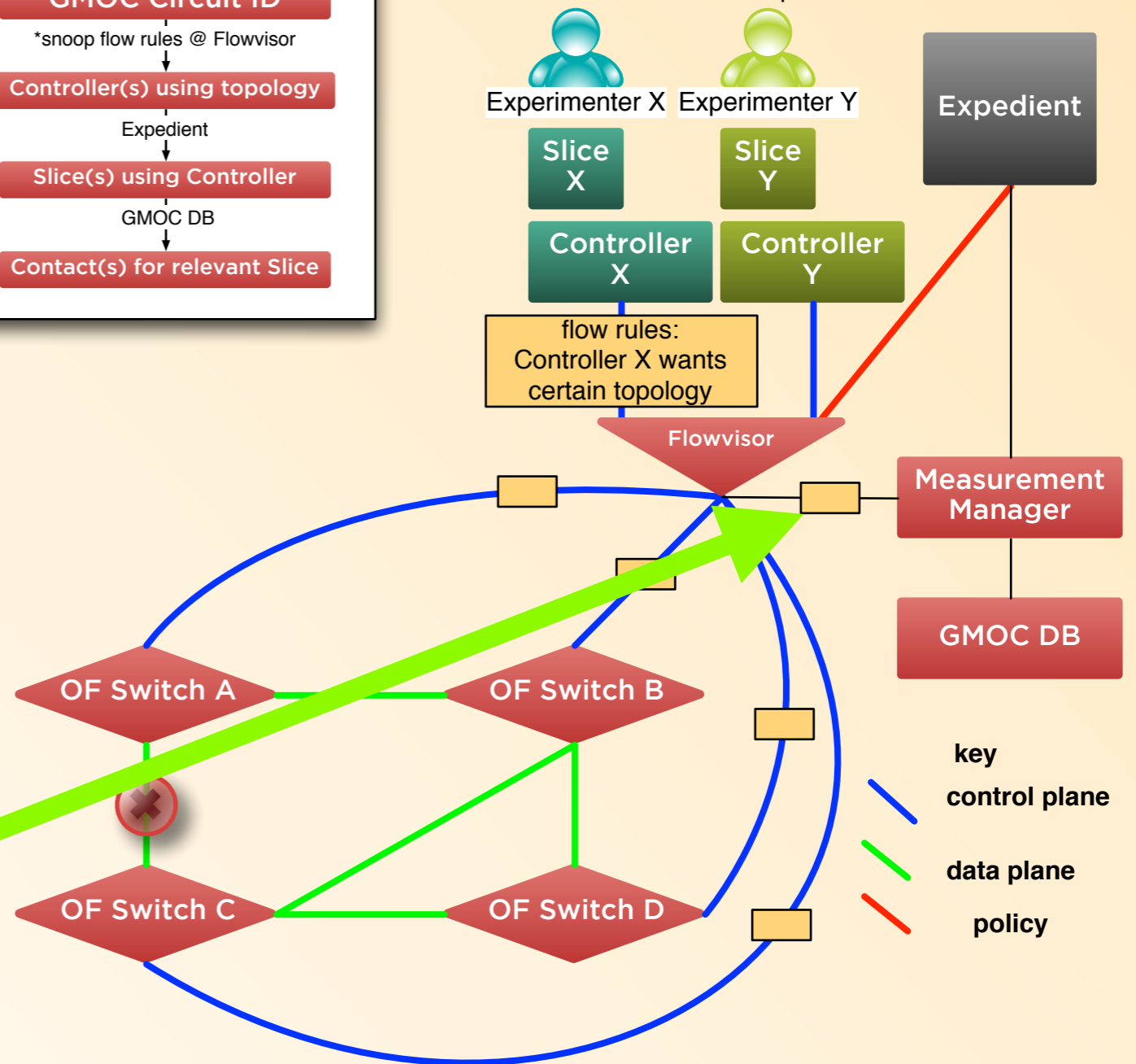
The "Less Crude Option"

1. Controller X sends Flow rules to switch via Flowvisor
2. Measurement Manager "snoops" flow rules & GMOC builds topology



Less Crude Option: notify all experiments using controllers which have created flow rules to use affected circuit

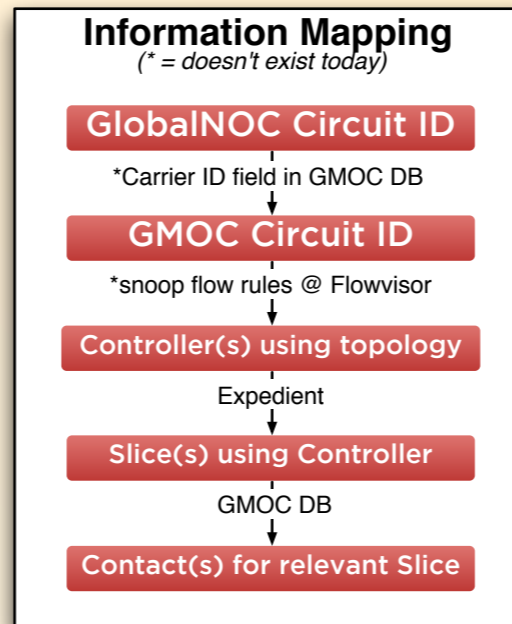
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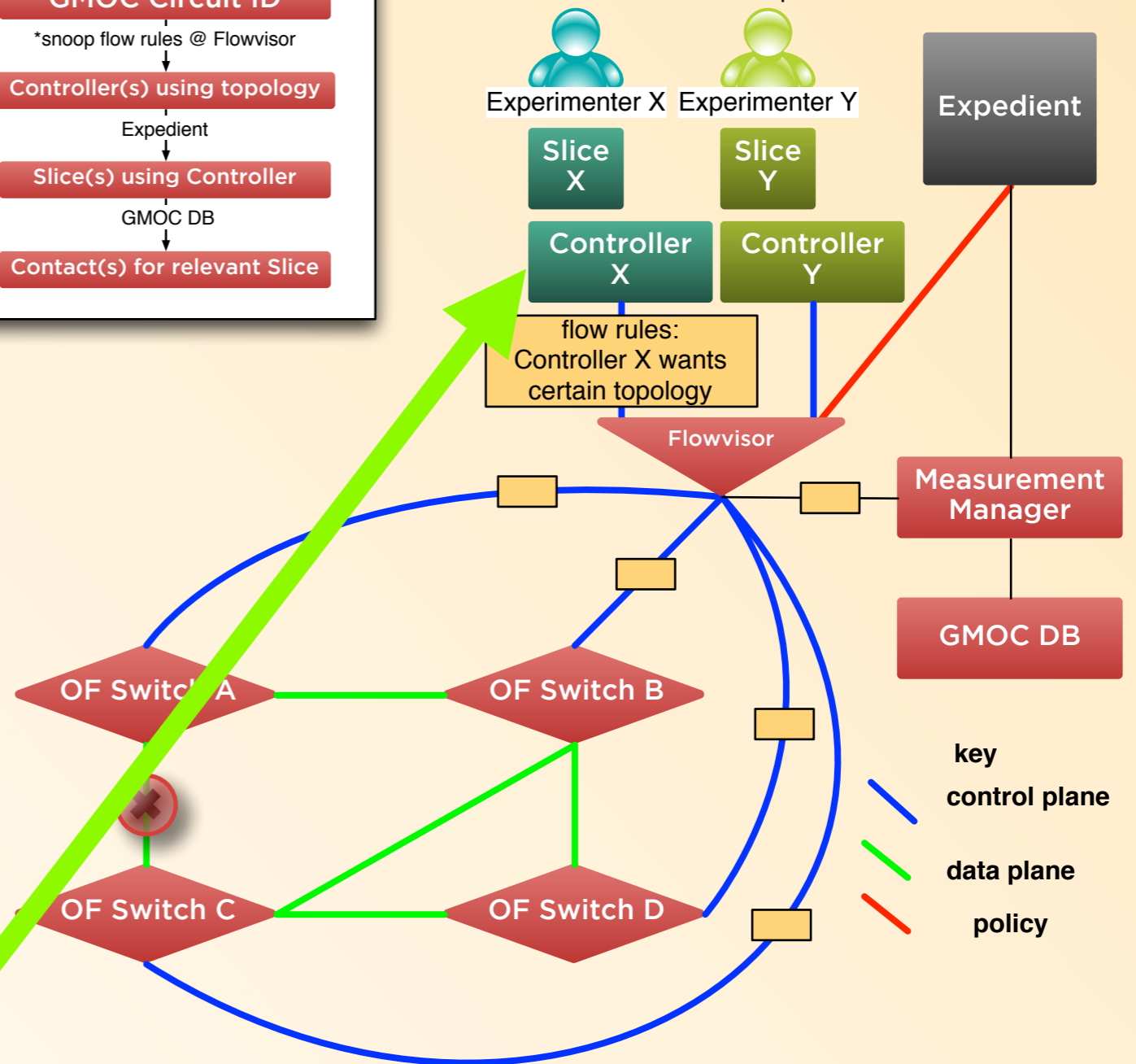
The “Less Crude Option”

1. Controller X sends Flow rules to switch via Flowvisor
2. Measurement Manager “snoops” flow rules & GMOC builds topology
3. Controller X’s flow rules include affected circuit



Less Crude Option: notify all experiments using controllers which have created flow rules to use affected circuit

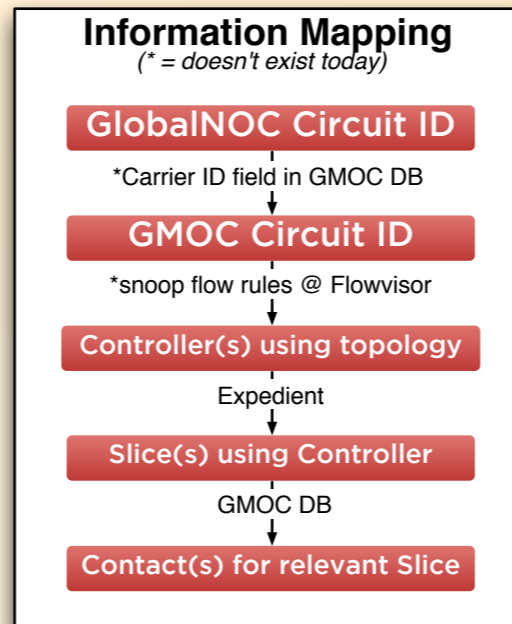
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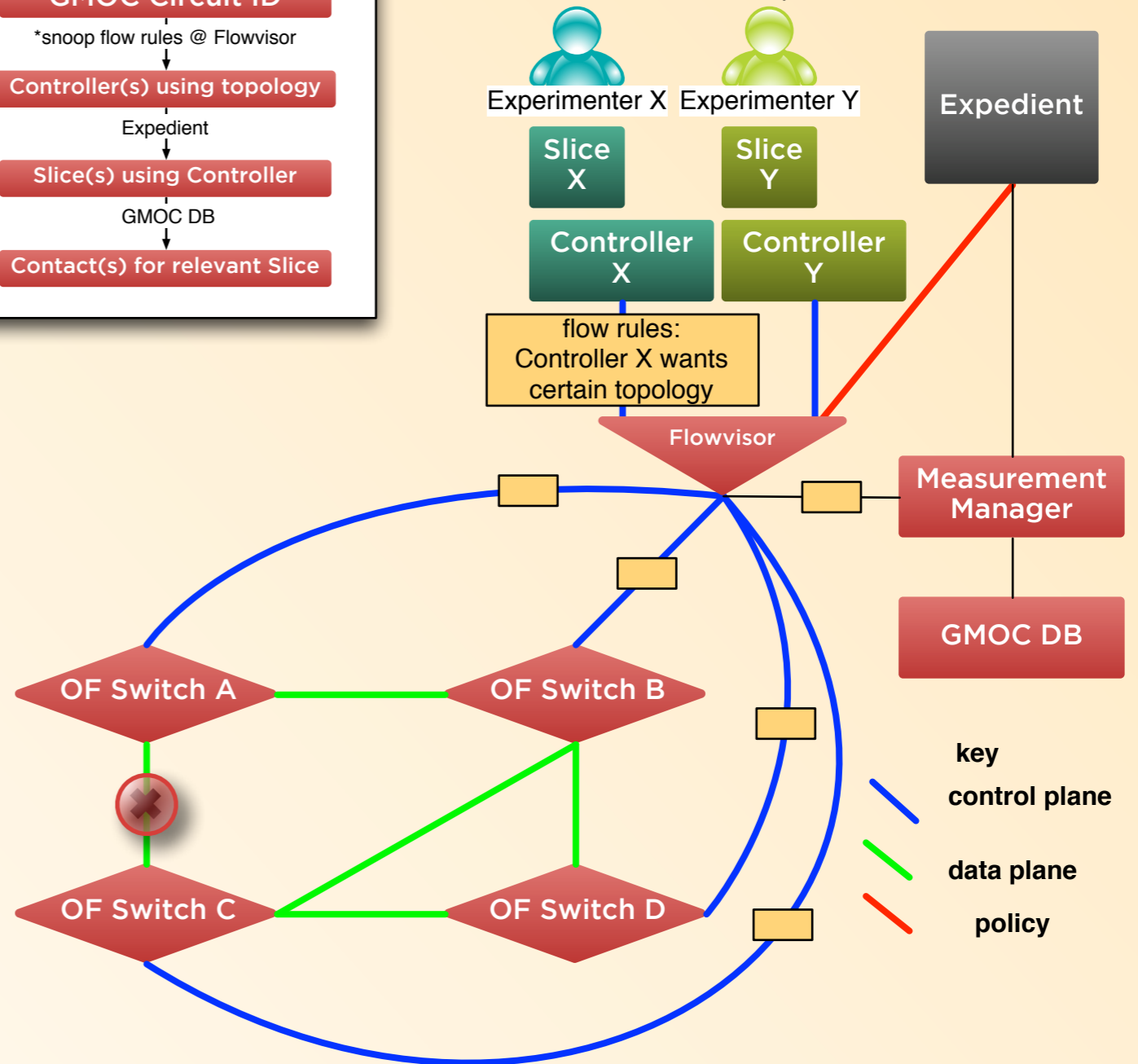
The "Less Crude Option"

- What about multiple aggregates/flowvisors?
- Requires things that don't exist:
 - Flow Rule Snooping
 - Flow Rule -> Topology



Less Crude Option: notify all experiments using controllers which have created flow rules to use affected circuit

Limitations: maps controller to topology, not slice. i.e. assumes 1 slice per controller



the Better(?) option

- ***Something* knows topology already: controller software or apps**
- **These could be augmented to share the data directly**
- **discover controllers with Measurement Manager, then poll them for topology info**

So, what's the plan?

- Start with “Very Crude”
- Explore “Less Crude” vs “Better?” to see which is more practical