GENI Operations: Monitoring

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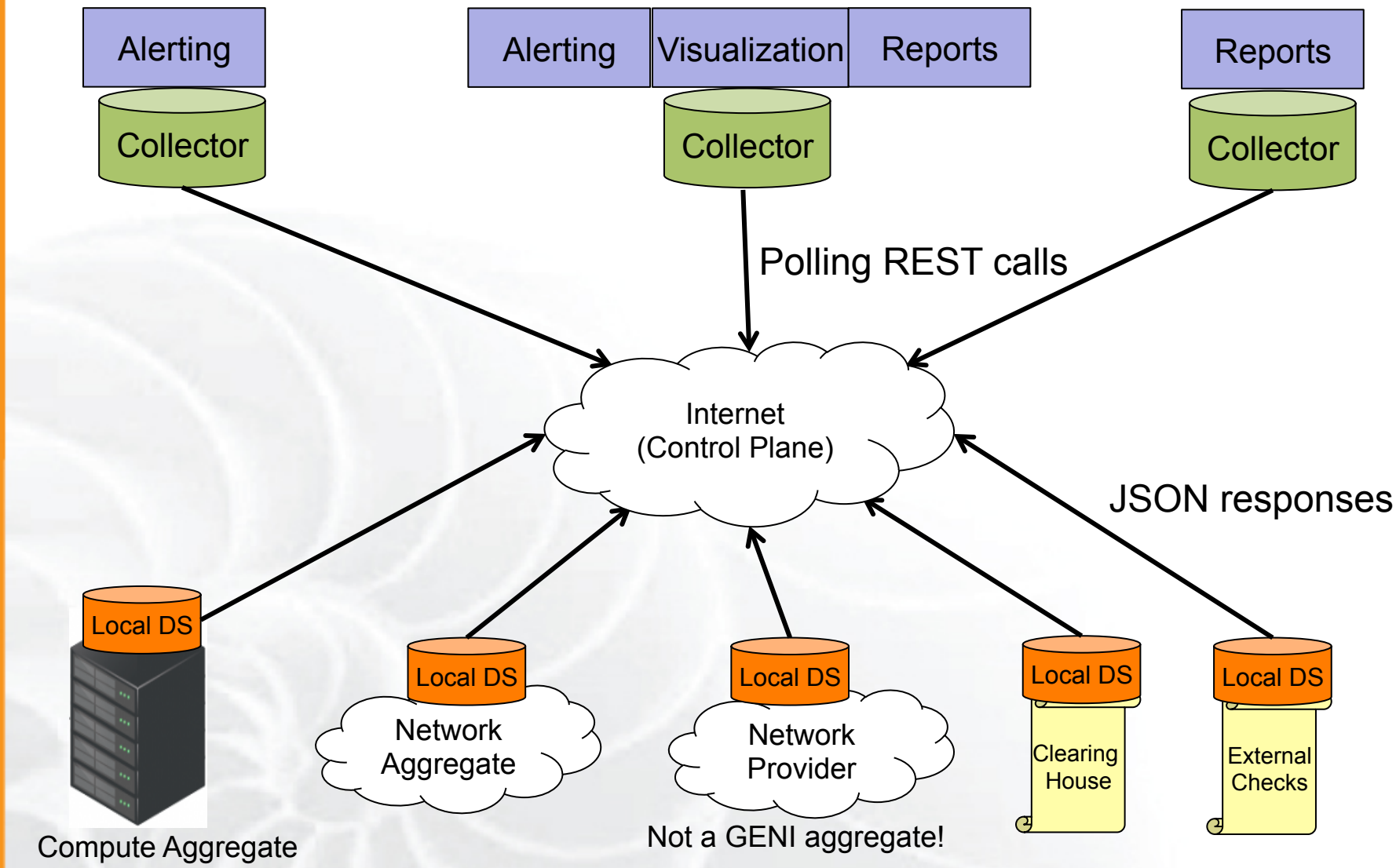
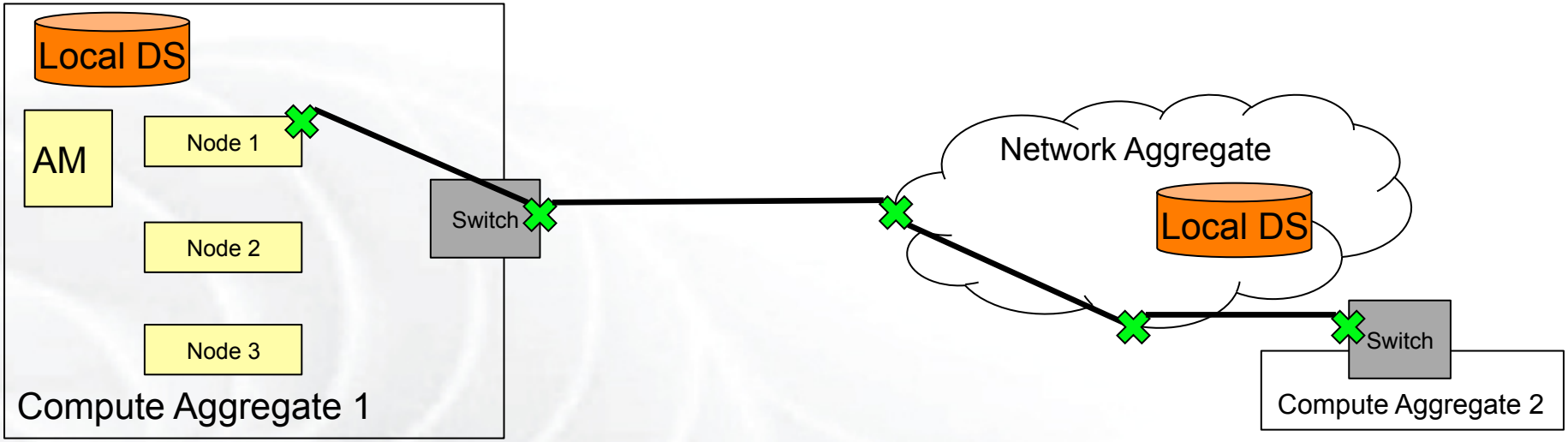
Monitoring Architecture Overview



Monitored Objects

- Aggregates
- Slices
- Slivers
- Users
- Authorities
- Nodes
- Interfaces
- Interface-VLANs
- Links

What is a link?



= endpoint of a link represented by an interfacevlan, which must then reference a valid interface. The vlan must be the same on both sides of a link.

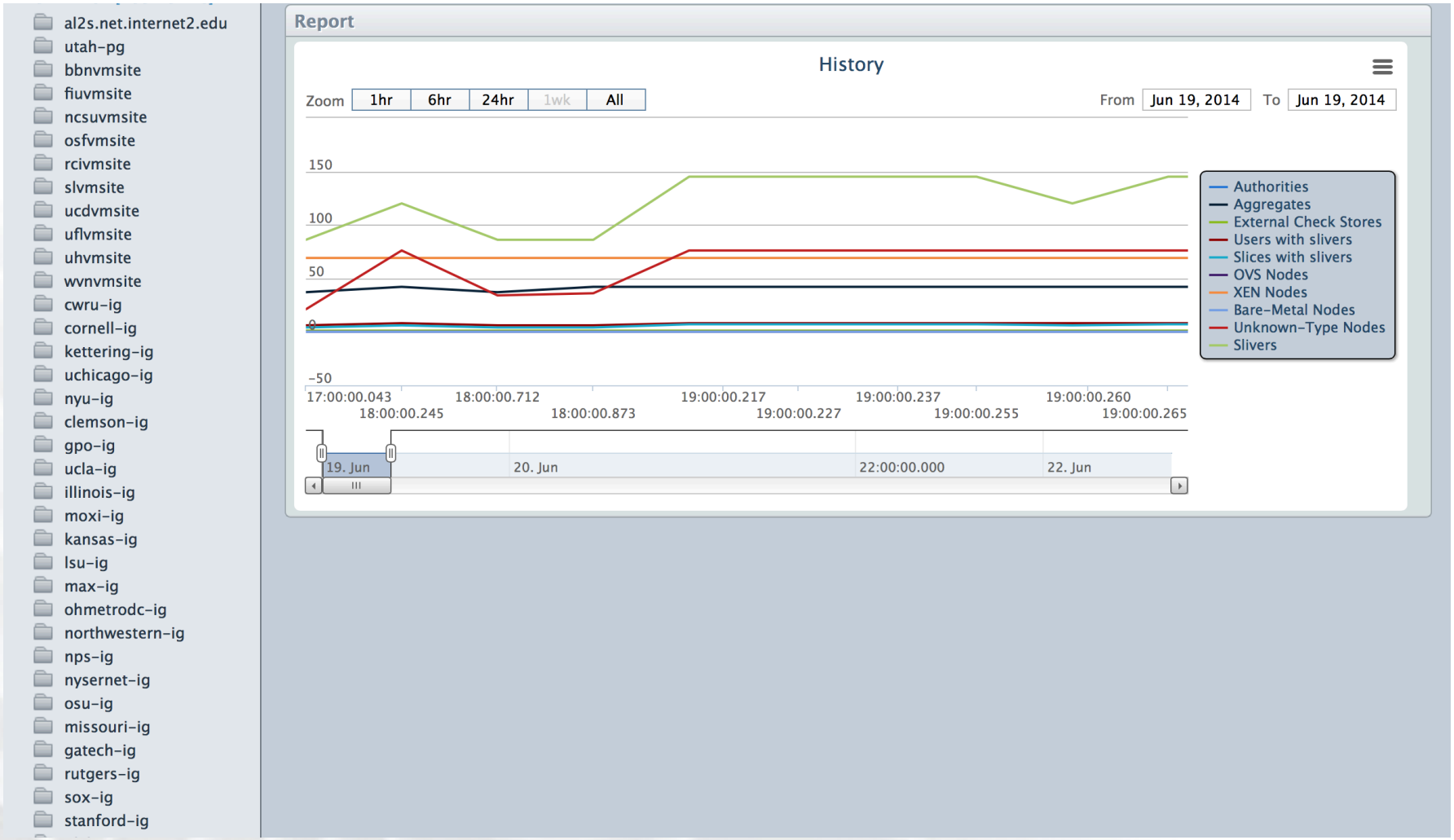
Progress

- Release 1.0 ops-monitoring software on May 1
  - Now at 1.1 patch 2
- Many datastores and collectors are coming online
- Working through issues with
  - the API
  - the implementation
  - the data coming back from the datastores

Deployments

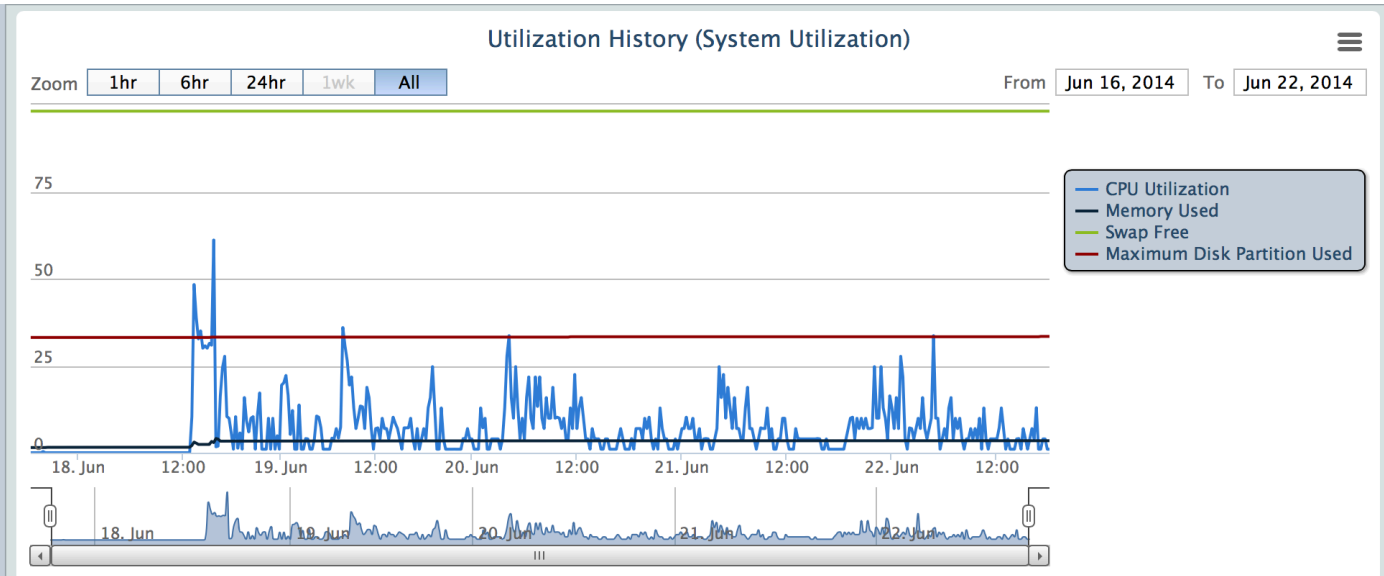
Instageni		ExoGENI	Network/Other	Collector
utah-ig utahddc-ig uky-ig princeton-ig kansas-ig nyu-ig max-ig nysernet-ig illinois-ig missouri-ig rutgers-ig stanford-ig cornell-ig lsu-ig cwru-ig moxi-ig	nps-ig idaho-ig ucla-ig osu-ig umkc-ig uchicago-ig ohmetrodc-ig northwestern-ig gpo-ig kettering-ig gatech-ig clemson-ig sox-ig wisconsin-ig utah-pg	rcivmsite bbnvmsite uva-nlvmsite osfvmsite slvmsite ucdvmsite uflvmsite wvnvmsite ncsuvmsite uhvmsite fiuvmsite nictavmsite	al2s.net.internet2.edu ion.internet2.edu of.internet.edu externalcheck/gpo ch.geni.net	GPO U Kentucky

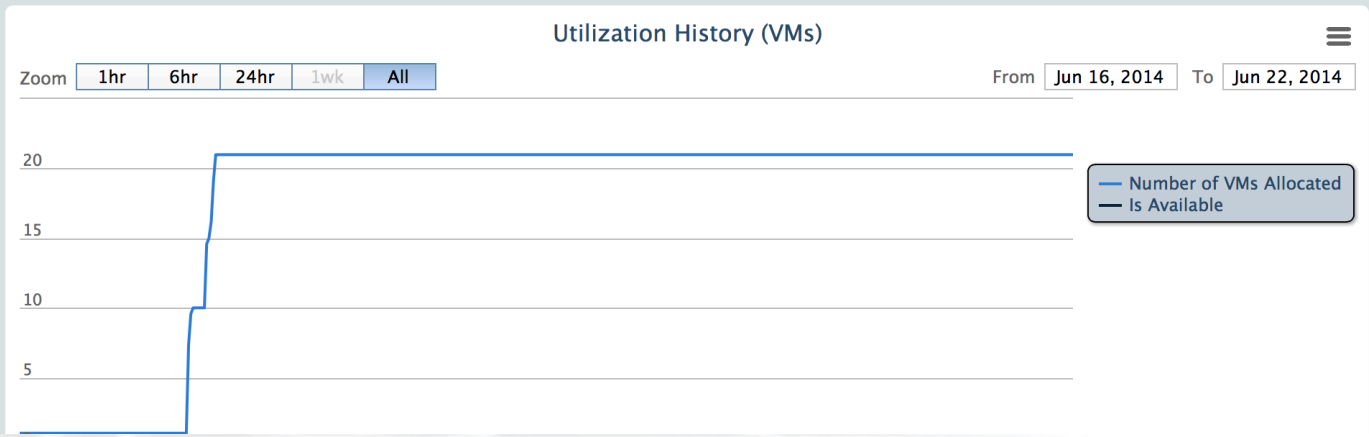
Global Report Plot



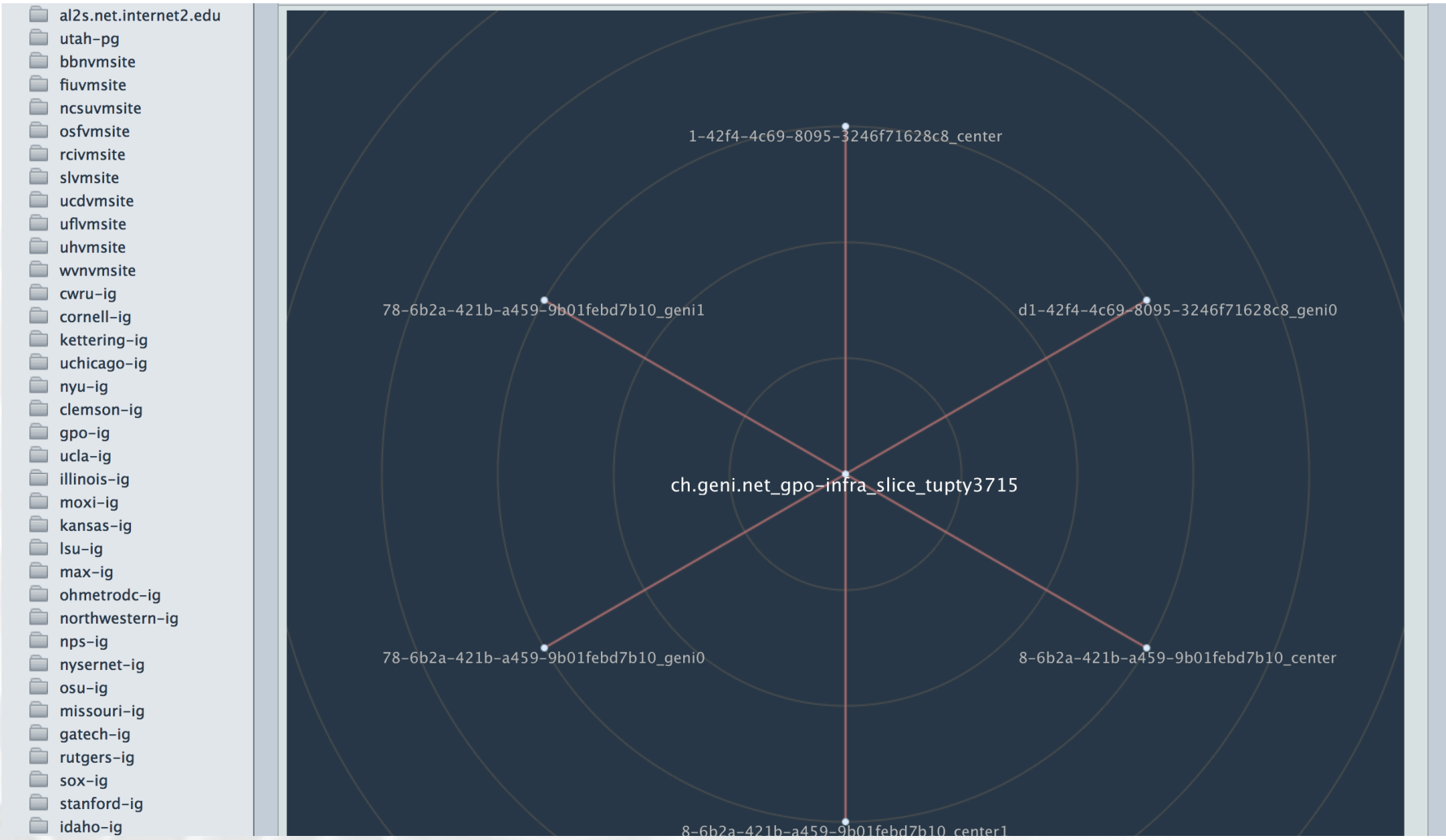
Plot of Node Stats

- al2s.net.internet2.edu
- utah-pg
- bbnvmsite
- fiuvmsite
- ncsuvmsite
- osfvmsite
- rcivmsite
- slvmsite
- ucdvmsite
- uflvmsite
- uhvmsite
- wvnvmsite
- cwru-ig
- cornell-ig
- kettering-ig
- uchicago-ig
- nyu-ig
- clemson-ig
- gpo-ig
- ucla-ig
- illinois-ig
- moxi-ig
- kansas-ig
- lsu-ig
- max-ig
- ohmetrodc-ig
- northwestern-ig
- nps-ig
- nysernet-ig
- osu-ig
- missouri-ig
- gatech-ig
- rutgers-ig
- sox-ig
- stanford-ig
- idaho-ig





Plot of Slice/Sliver Association



Future Work

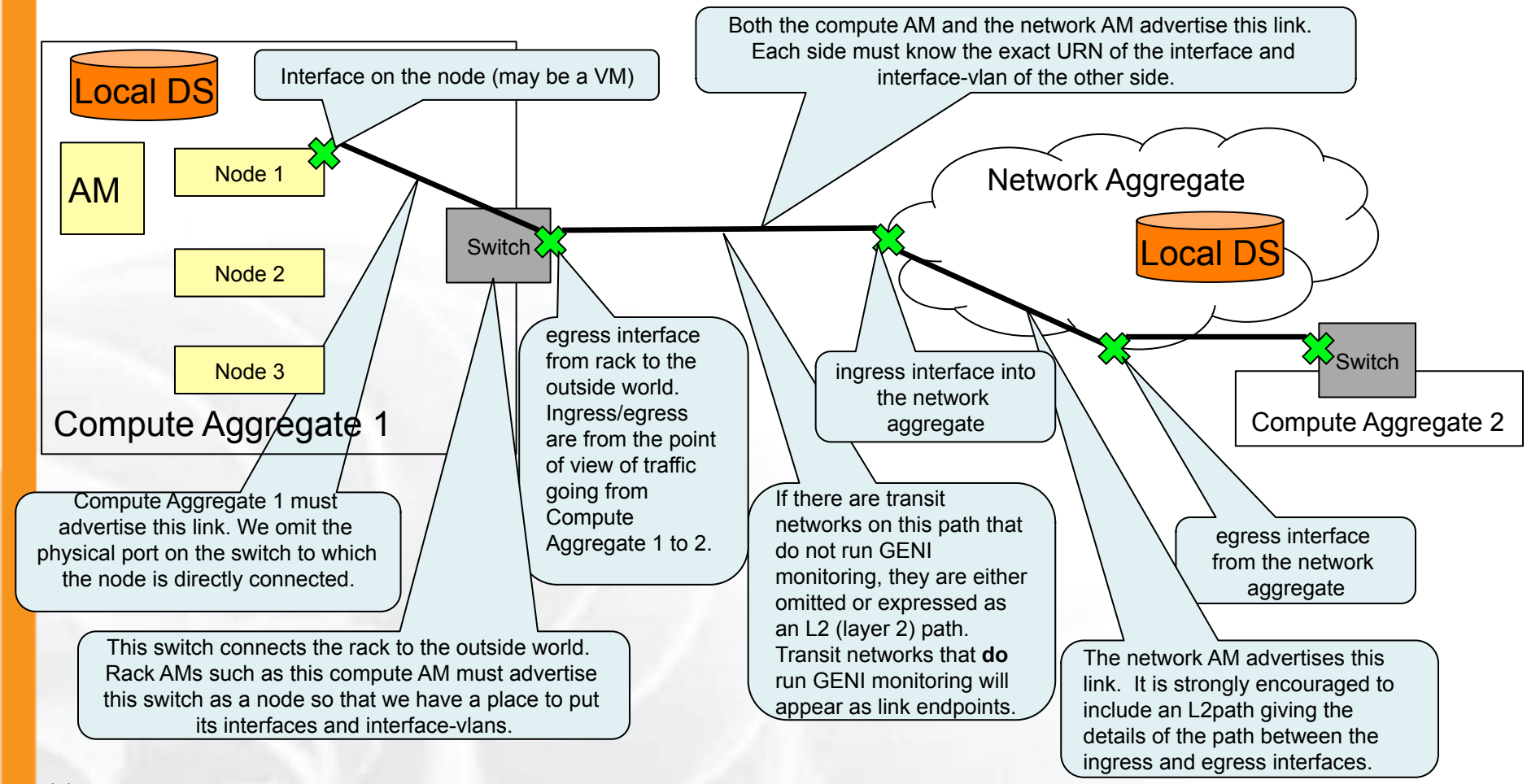
- Improve API (REST/JSON) specification
  - Scalability/performance
  - Consistency
  - Semantic clarity
- Support additional measurements
- Improve the reference implementation
  - Datastore robustness
  - Collector completeness, scalability, ease of use
- Wider production deployment

Thanks!

- ExoGENI: Jonathan Mills, Victor Orlikowski, Ilya Baldin
- Internet2: A.J. Ragusa
- GMOC: Chad Kotil
- InstaGENI: Gary Wong, Leigh Stoller
- MAX: Tom Lehman, Xi Yang
- UKY: Cody Bumgardner, Caylin Hickey
- GPO: Ryan Irwin, Stéphane Blais, Ali Sydney, Heidi Picher Dempsey

Backup slides

What is a link?



= endpoint of a link represented by an interfacevlan, which must then reference a valid interface. The vlan must be the same on both sides of a link.

Only dataplane links are reported, i.e., links that are part of an experiment and thus can carry experiment traffic. Endpoints of such links are not usually reachable from the arbitrary places on the Internet, in contrast to the control plane.

Sample Collected Data

```
collector=> select id, urn from ops_link_interfacevlan where link_id = 'ion.internet2.edu-100021' ;
                              id                              |                                        urn
-------------------------------------------------------------+-----------------------------------------------------------------------------
 ion.internet2.edu/rtr.salt.ion.internet2.edu/ge-10/2/7/885 | urn:publicid:IDN+ion.internet2.edu+interface+rtr.salt:ge-10/2/7:protogeni:885
 ion.internet2.edu/rtr.newy.ion.internet2.edu/xe-0/2/2/305  | urn:publicid:IDN+ion.internet2.edu+interface+rtr.newy:xe-0_2_2:*:305
(2 rows)


collector=> select tag, interface_urn from ops_interfacevlan where id = 'ion.internet2.edu/rtr.salt.ion.internet2.edu/ge-10/2/7/885' ;
 tag |                                 interface_urn
-----+-------------------------------------------------------------------------------
 885 | urn:publicid:IDN+ion.internet2.edu+interface+rtr.salt:ge-10/2/7:protogeni
(1 row)


collector=> select id, properties$role, properties$max_bps  from ops_interface
where urn = 'urn:publicid:IDN+ion.internet2.edu+interface+rtr.salt:ge-10/2/7' ;

                              id                            | properties$role | properties$max_bps
-------------------------------------------------------------+-----------------+--------------------
 ion.internet2.edu/rtr.salt.ion.internet2.edu/ge-10/2/7 | transport       |            1000000
(1 row)
```

This demonstrates tracing from a link to its interfacevlans to its interfaces.