AGLT2 Status Update

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ATLAS Great Lakes Tier 2
University of Michigan AGLT2 Michigan State University

AGLT2 Numbers

- The ATLAS Great Lake Tier-2 (AGLT2) is a distributed LHC Tier-2 for ATLAS spanning between UM/Ann Arbor and MSU/East Lansing. Roughly 50% of storage and compute at each site
  - 10680 logical cores
    - MCORE slots 1134 (dynamic) + 10 (static)
  - **Additional** 936 Tier-3 job slots usable by Tier-2
  - Average 10.69 HS06/slot
  - **6.9 Petabytes** of storage
  - Total of **117 kHS06**
  - Tier-2 services virtualized in VMware 5.5 (upgrading to 6.5, really!!)
- 2x40 Gb inter-site connectivity, UM has 100G to WAN, MSU has 10G to WAN, lots of 10Gb internal ports and 20 x 40Gb ports, 32x100G/40G or 64x50G/25G ports
- High capacity storage systems have 2 x 50Gb or 2 x 100Gb bonded links
- 40Gb link between Tier-2 and Tier-3 physical locations

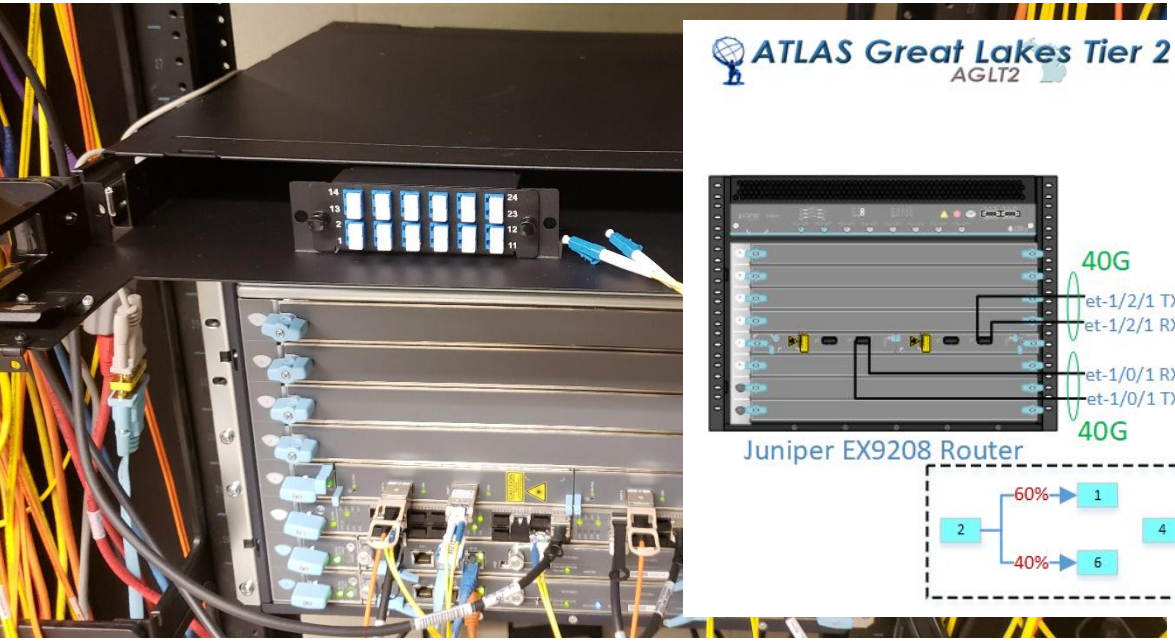
Personnel Updates

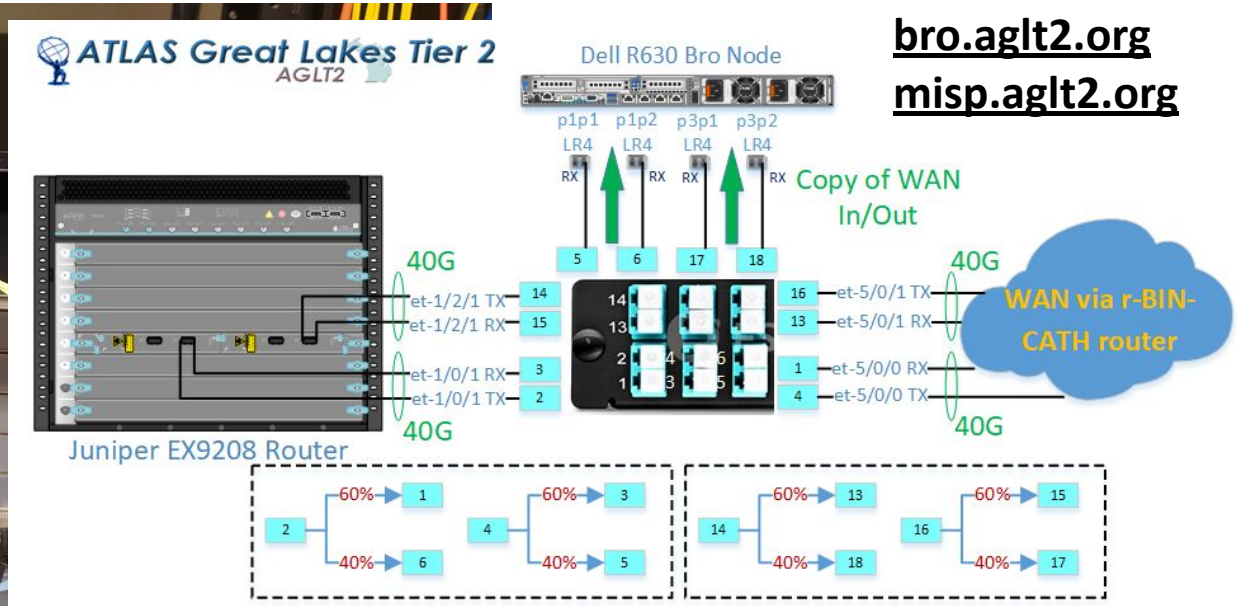
- As most of you know, **Bob Ball** our Tier-2 Manager since we started in 2006, has retired ☹
  - He will be missed!
- **Wenjing Wu** has taken over for much of Bob's work at AGLT2 at UM..
- **Philippe Laurens** will be increasing his involvement at AGLT2 MSU and will be ramping up to 85% on AGLT2 (from 40% currently) by February 2019
- Both Wenjing and Philippe have been added as the AGLT2 collaboration board members, replacing Bob

2018 Hardware Additions

- For **AGLT2** we have gone with the *C6420* configuration from line 20 in https://docs.google.com/spreadsheets/d/1vQ8lc3dToInu--8m9HGy5tiOHr26eK-tNjOOaSV_EuQ/edit#gid=0 ($10.78/HS06)
  - **UM** getting two C6420 enclosures and 9 servers, 1 ML3 tape drive, three R740 server to replace existing ESXi hosts (+7081 HS06)
    - Old ESXi hosts (2xE5-2670) will add 1450 HS06
  - **MSU** getting one C6420 enclosure, 7 servers, 2 PDUs (+5507 HS06)
- Earlier this year we purchase a SLATE edge node and are about to put in place an S4248-ON switch to serve the SLATE and a few AGLT2 nodes
  - Switch provides 40x10G, 2x40G & 6x100G ports with deep buffers

SOC Work: Optical Splitter / Bro / MISP





bro.aglt2.org
misp.aglt2.org

Was inexpensive to enable (~$1.2K). Splitter and shelf was $300, Intel XL710-Q2 40G nics $400 x2, $100 in cables (reused worker node for server)

Currently Bro has been running continuously since August 10th

63,115,662,766 packets captured and 266,317,103 packets lost (0.4%) in ~45 days

Netflow/Sflow Monitoring via ELK

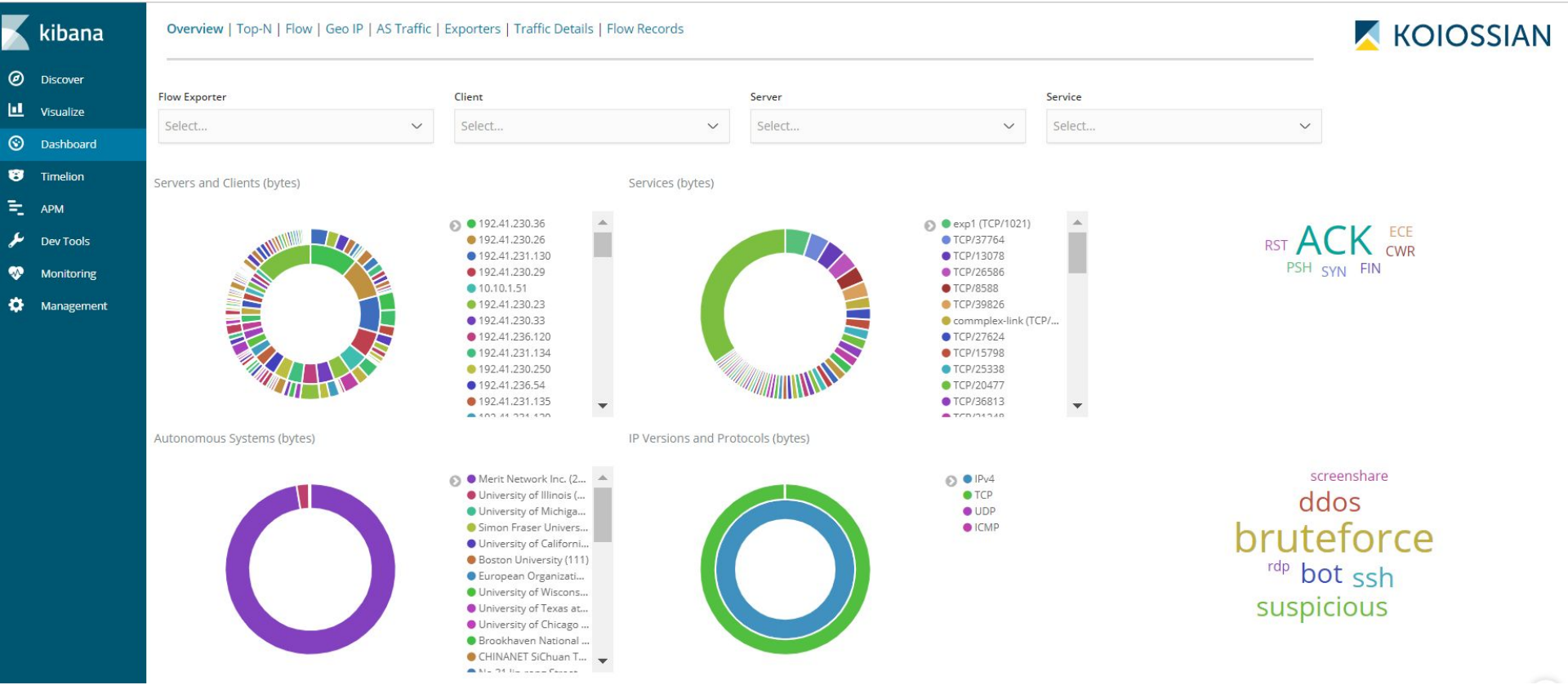
- In addition to Bro monitoring we wanted to have better visibility into our network traffic.
- Because we already had an ELK stack, when we heard about ElastiFlow we were intrigued
  - https://github.com/robcowart/elastiflow
- It was pretty easy to setup. Some challenges getting the sflow-codec and the Kibana elastiflow index imported.
  - Contact me if you want details!
- Once it was setup we just needed to point our Juniper router to it

Netflow/Sflow Monitoring via ELK (2)

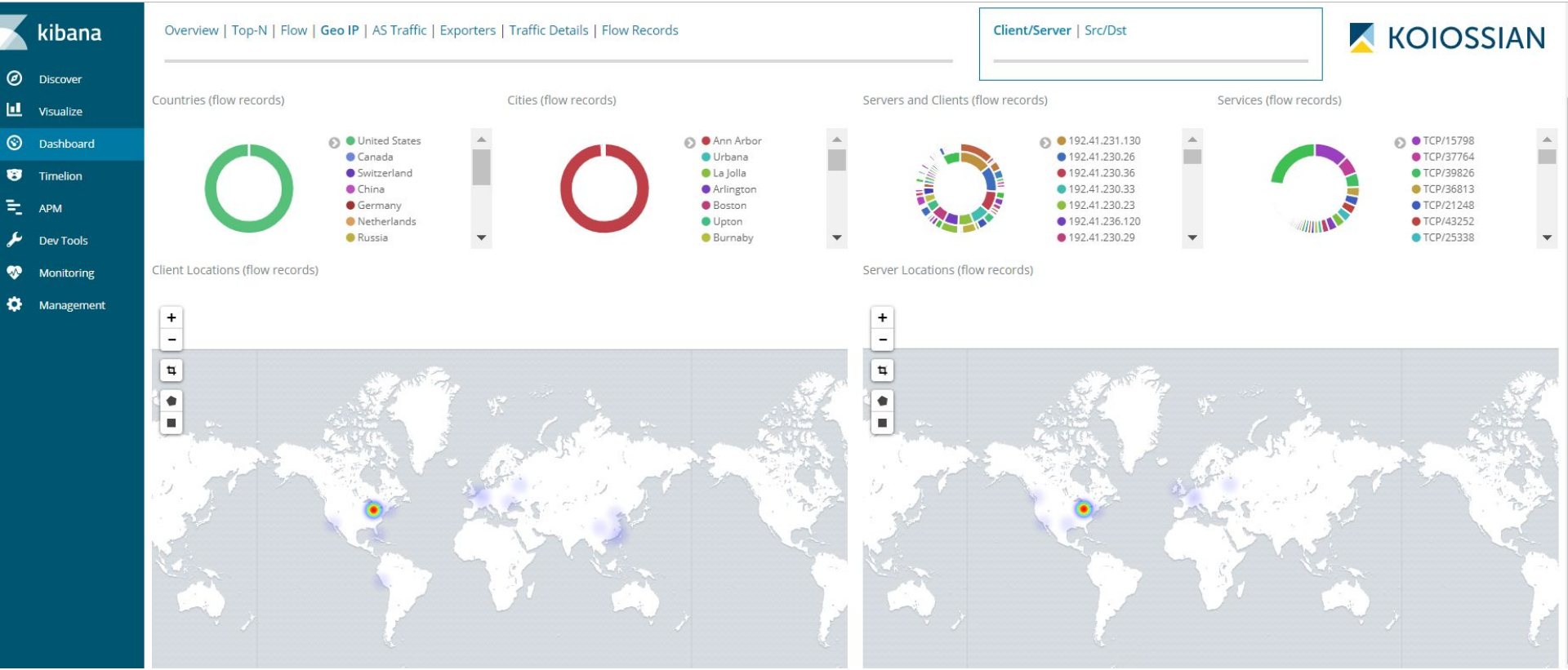
- Setting up our Juniper EX9208 was pretty simple
- The configuration on the right is the bulk of what is needed
- Add additional interfaces as need (those interfaces that connect to the WAN)

```
sflow {
    agent-id 10.10.1.2;
    polling-interval 1;
    sample-rate {
        ingress 100;
        egress 100;
    }
    source-ip 10.10.1.2;
    collector 10.10.1.9 {
        udp-port 6343;
    }
    interfaces xe-0/0/3.0 {
        polling-interval 1;
        sample-rate {
            ingress 100;
            egress 100;
        }
    }
```

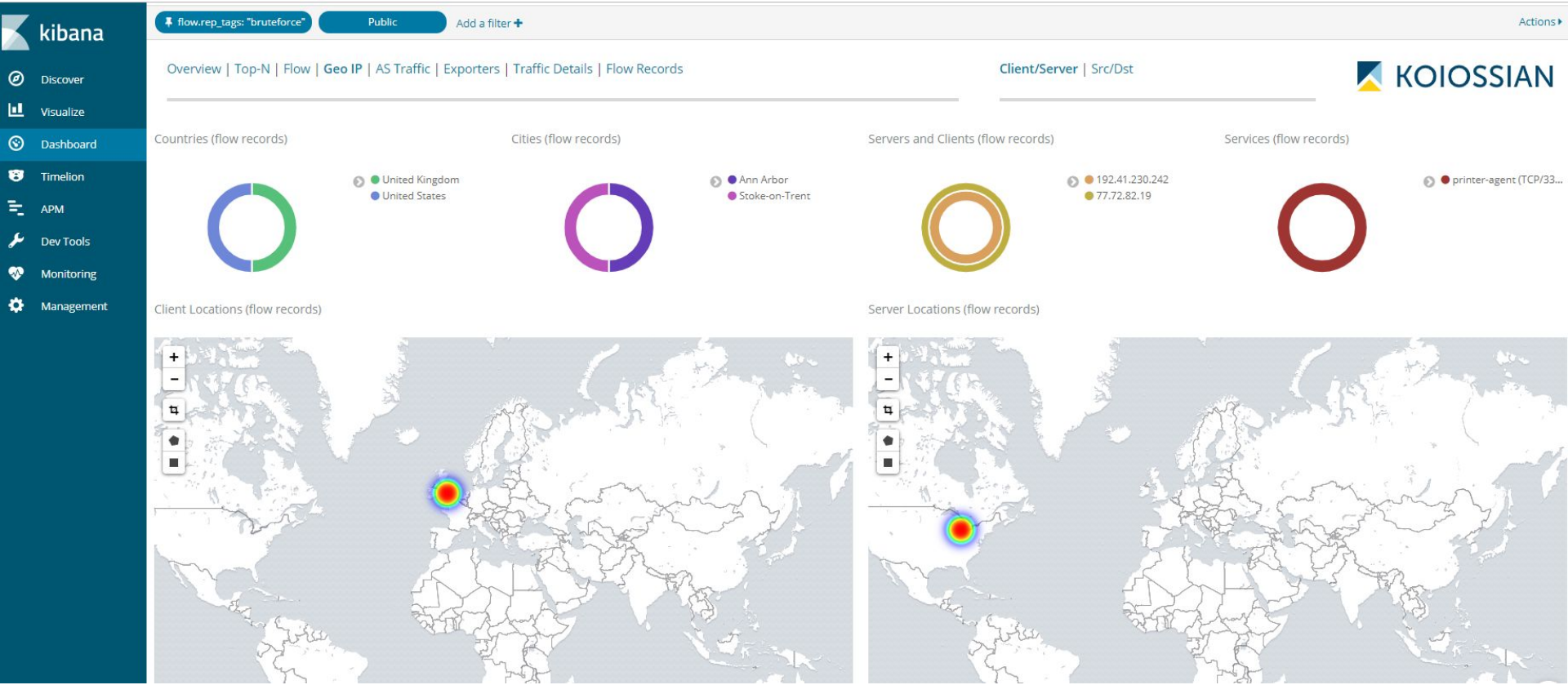
ElastiFlow @ AGLT2 Examples



ElastiFlow @ AGLT2 Examples



ElastiFlow @ AGLT2 Examples



Near Term Plans

- SLATE containerization deployments
- Experimenting with SDN/NFV/OVS in our Tier-2 and as part of LHCONE point-to-point testbed.
  - This has been delayed but still planning to work with KIT and MWT2 once they have OVS on their production storage
- Update to VMware soon: new version (5.5->6.5, then to 6.7), new configuration for HA, new ESXi host at UM deployed
- Will begin testing dCache on Ceph using AGLT2 and OSiRIS
- Participating in the WLCG SOC (Security Operations Center) work
- Have students engaged in creating new dashboards for AGLT2 that leverage ELK for syslogs and dCache