Visualizing Configurations

John Freeman (Fermi National Accelerator Laboratory)
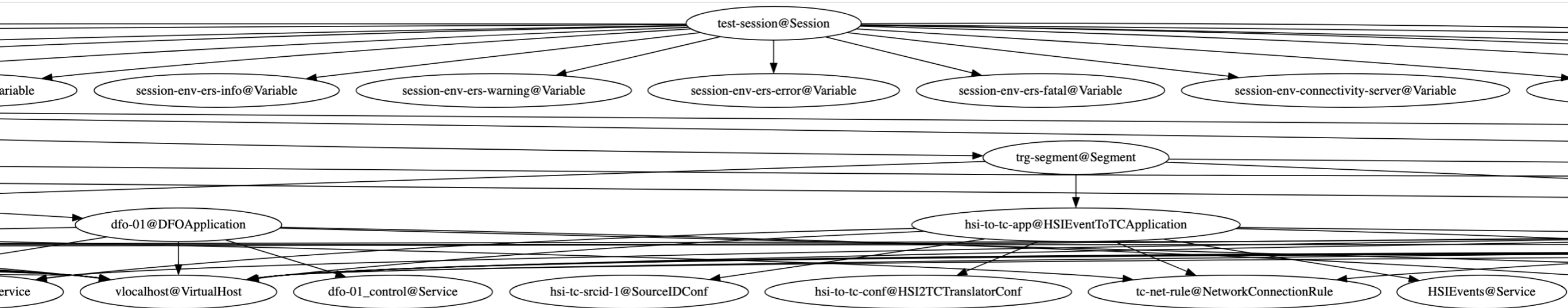OKS Meeting
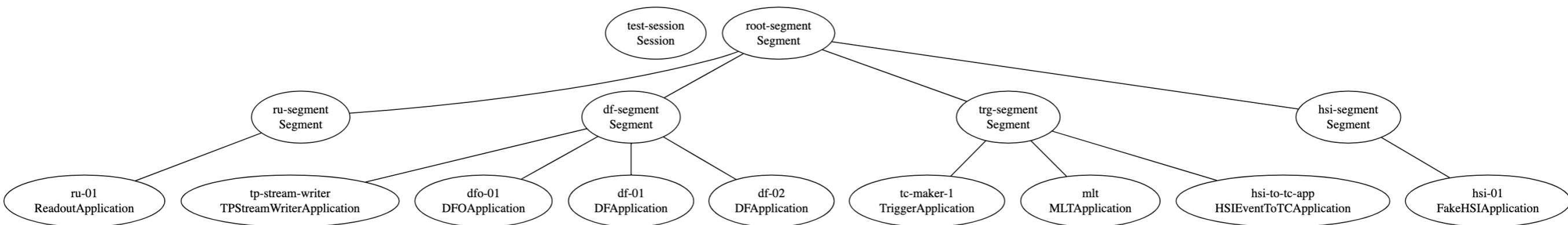Jun-06-2024

Background

- Earlier this spring Giovanna suggested I look into ways for us to visualize configurations

- Obviously, a tradeoff here is how much information a visualization contains vs. how easy it is to read

- She proposed we have differing levels of granularity

  - E.g., a session-wide view, but then also, e.g., an application-level view

- "Traditionally" have the dbe_gtool application in the dbe package

  - Originally written for ATLAS in 2016, but came as part of the port last year

  - Creates DOT files which Graphviz can display

- Displays *every object* in a configuration. Which sounds great, but…

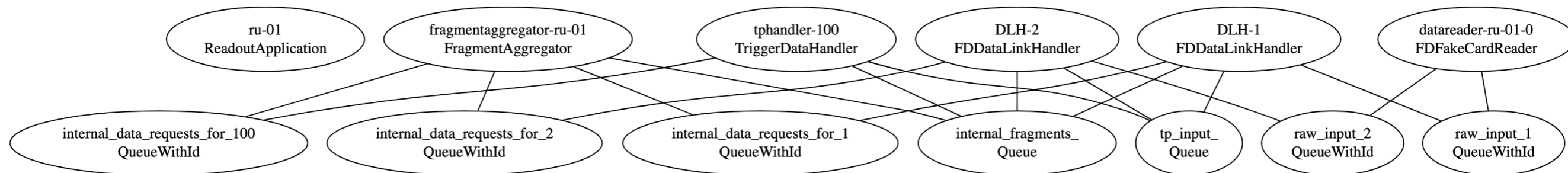Visualizing Configurations, John Freeman (FNAL)

Every object in the session

- …is a lot to display in a single plot

- This is based on the DOT file which dbe_gtool would give us

- Imagine this extending out several slides in either direction

  - Connections in particular become un-followable
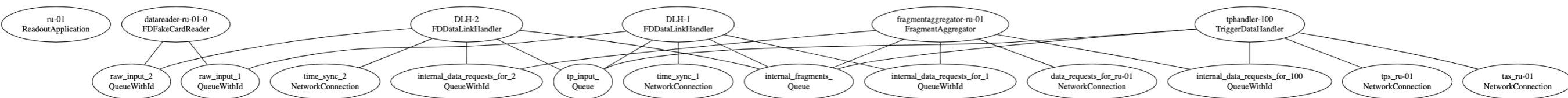
Segments and Applications

- Fairly straightforward

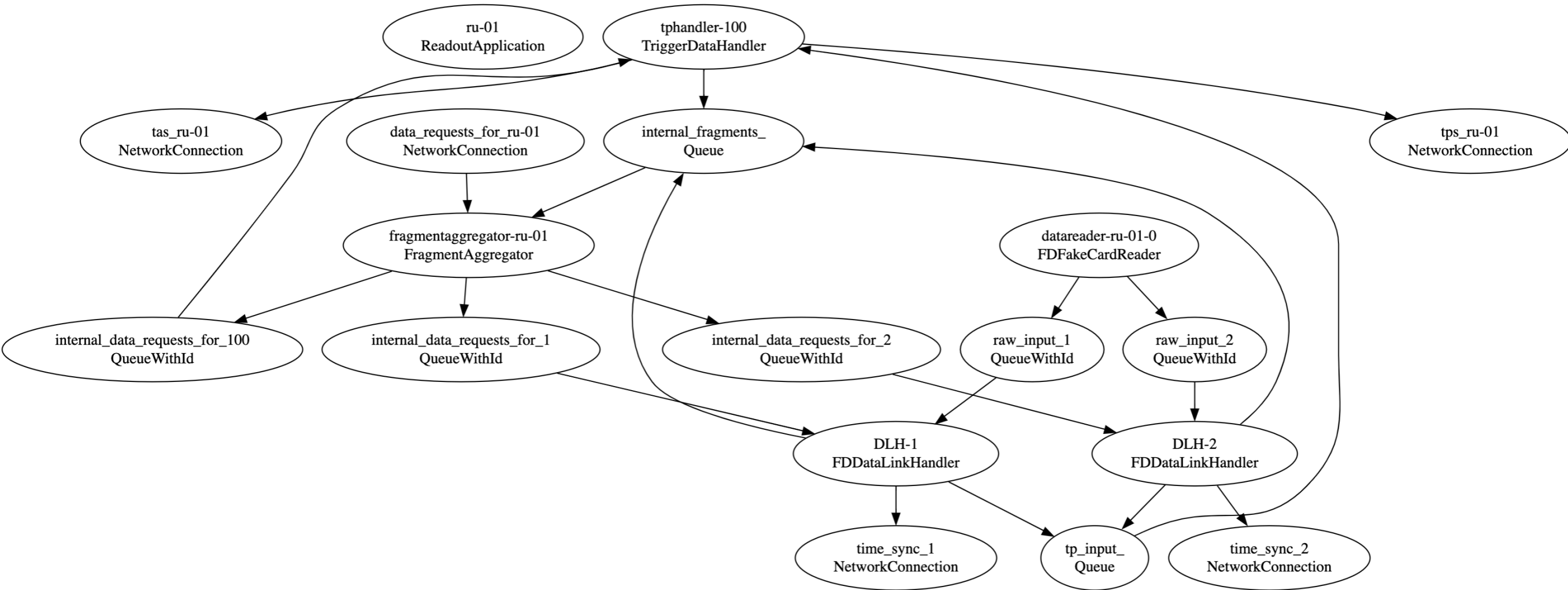- Could look into also adding network connections between the applications

ru-01 (v1)

- A representation of the DAQ modules and queues in ru-01

- Top row DAQ modules, bottom row queues

- Lines just mean "this DAQ module uses this queue"
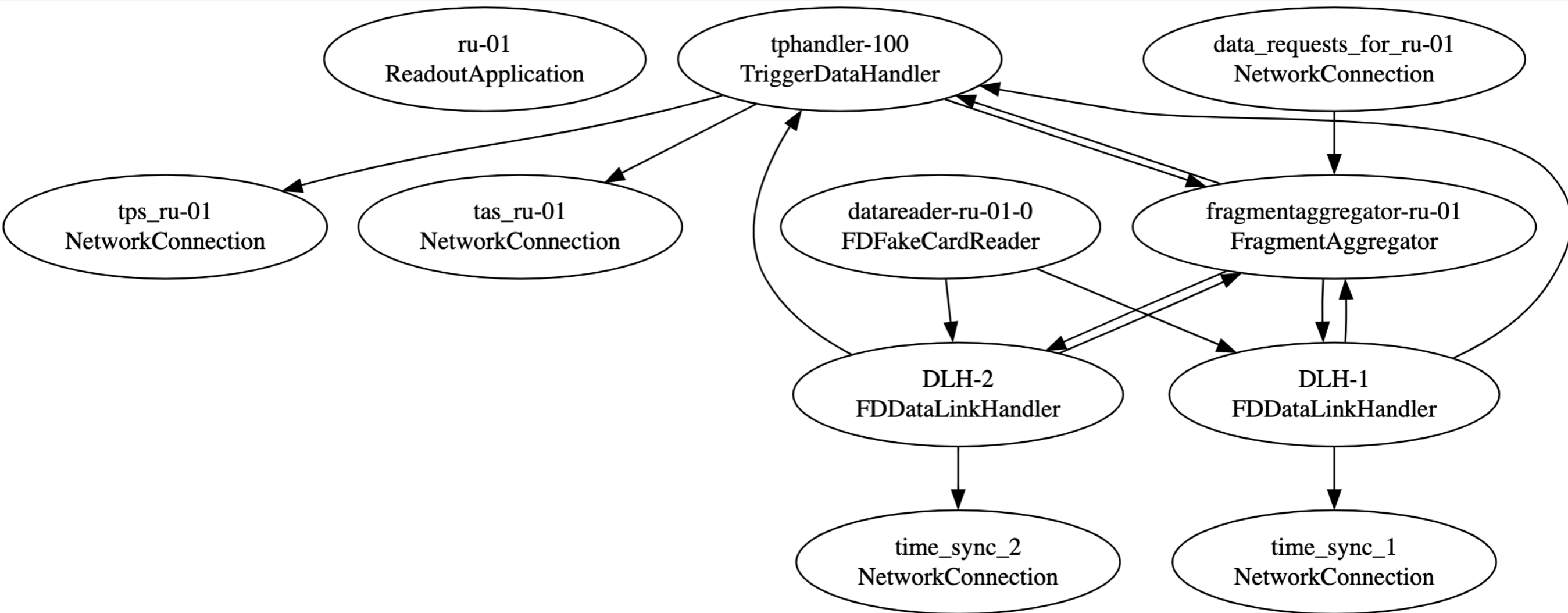
ru-01 (v2)

- Now with the network connection added

- More information than the previous…but also busier

- (Still) no information about directional dataflow

ru-01 (v3)

- Have now added arrows

- Arrows are an obvious pro, but the decreased "horizontality" has both pros and cons

ru-01 (v4)

- Removing queues as distinct vertices: less information, easier to read

- Preference between v3 and v4?

Moving forward

- This is still on a feature branch in dbe (johnfreeman/issue20_visualize_config)

- Various ideas could improve this

  - E.g., maybe we care about the ID of DAQ module objects, but not queues

  - Different colors for different types of objects?

- Right now this is a command line tool

- Could auto-generate this (*.png, etc) for every configuration, to be viewed when desired

  - In this case, each application could get its own plot

  - Along with a session-wide plot

- Thoughts? Questions?