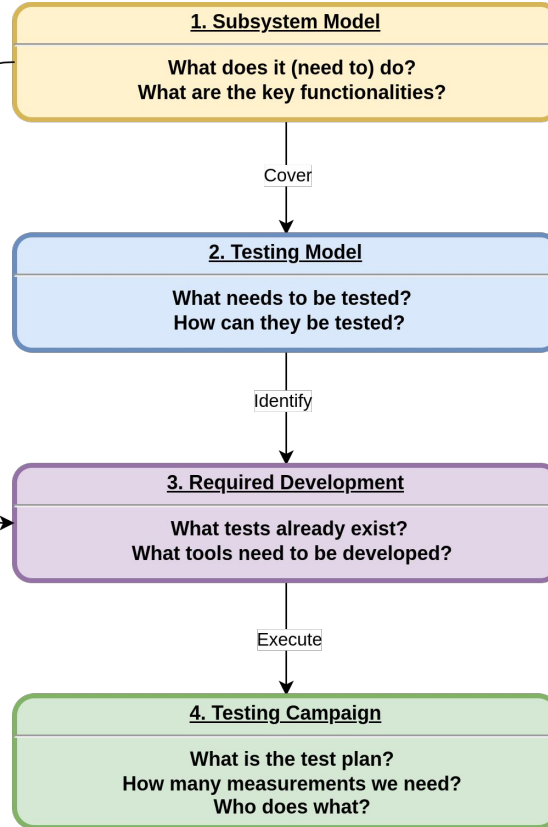


# Approach diagram

## Assessment stages

1. Model of subsystems
2. Model for testing
3. Developments required for testing
4. Testing campaign

Mockups



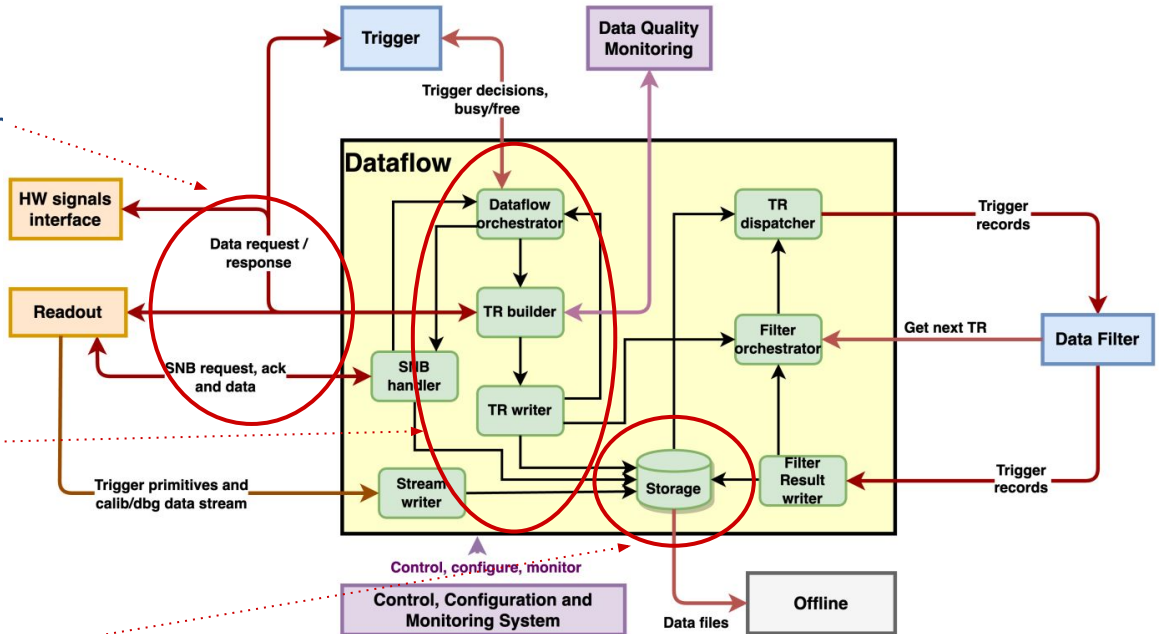
## Expected outcome

1. List of components and functionalities mapped to server spec. needs
2. Methods for quantifying the resources needs
3. Tools to be developed tied to a list of tests
4. Test plan for measurements we need for assessment

# Dataflow subsystem

- List of components mapped to server spec. needs

- Network: I/O interfaces over multiple high-speed aggregated links (100Gb)
- CPU/Memory sensitive
  - TR Builder, Writer
  - Stream writer
  - Other processes?
- Storage capacity/bandwidth
  - Mixed high-speed I/O



FDR Page 105: [https://edms.cern.ch/ui/file/2812882/2/DUNE\\_DAQ\\_System\\_Design\\_v1.2.pdf](https://edms.cern.ch/ui/file/2812882/2/DUNE_DAQ_System_Design_v1.2.pdf)

# Dataflow subsystem

- Methods for quantifying the resources needs

Components/ what needs to be tested	Device features and interconnects	CPU utilization	Memory utilization	Storage device utilization
<b>Request / Response SNB Transfer</b>	<u>Network</u> Avg. throughput is 10 Gb/s SNB peak: 100 Gb/s  QoS requirements? (Heavily mixed workload)	Component perf tests? System saturation tests? Measurement of 10Gb peak input Measurement of 100Gb peak input	Component perf tests? System saturation tests? Measurement of 10Gb peak input Measurement of 100Gb peak input	SNB transfer file writer tests? Needed for refining mixed workload and requirements. (E.g.: transfer speed limiter, etc.)
<b>TR builder / writer Stream writer</b>	?	Component perf tests? Saturation tests? Measurement of 10Gb peak input Measurement of 100Gb peak input	Component perf tests? Saturation tests? Measurement of 10Gb peak input Measurement of 100Gb peak input	Define mixed-workload requirement? Measurement of 10Gb peak input Measurement of 100Gb peak input
<b>DFO</b>	?			
<b>“Storage” (as component)</b>	<u>JBOD/RAID</u> Hybrid store between 10Gb and 100Gb (SNB) inputs? Calculable? Testable?	Measurements during saturation tests?	Measurements during saturation tests?	Can be calculated, cross-checked with standalone benchmarks if mixed workload is well defined



# Dataflow subsystem

- **Tools/mockups available or to be developed**

- Are the subcomponent tests available to assess the resource footprint?
  - We need a shopping list.
- If available, are they sufficient to assess the resource footprint?
  - Tests are scalable and parameterized: “File writer test: number of files, rate of Write ops.”
- Saturation tests to reach requirements (10Gb with 100Gb peak)
  - I think our emulator chain is sufficient
  - It is configurable to target the desired rates (high rate, many sources)
  - Programmatically scannable? (With the help of the Perf. testing team, I think yes.)
  - Hardware apparatus available? (Yes, at EHN1)
- Mixed workload tests:
  - Define representative workload, test, and configuration
  - Mockup SNB test? (At multi Gb test, transfer files from readout nodes to storage node)
  - Shopping list for metrics and measurements needed

# Dataflow subsystem

- **Test plan for measurements we need for assessment (What / Who / When to test)**
  - What
    - I think the Dataflow can follow very similar principles of the Readout testing, due to the fact the both servers are highly-specialized with high-performance needs
  - Who
    - I think the Perf. testing activity group gained substantial expertise and built a sufficient toolkit to export resource utilization metrics of servers and applications
    - They can help for sure, if it's clear and well defined what they need to test
  - When
    - I refuse to show wishful Gantts based on the previous 2 days of the workshop