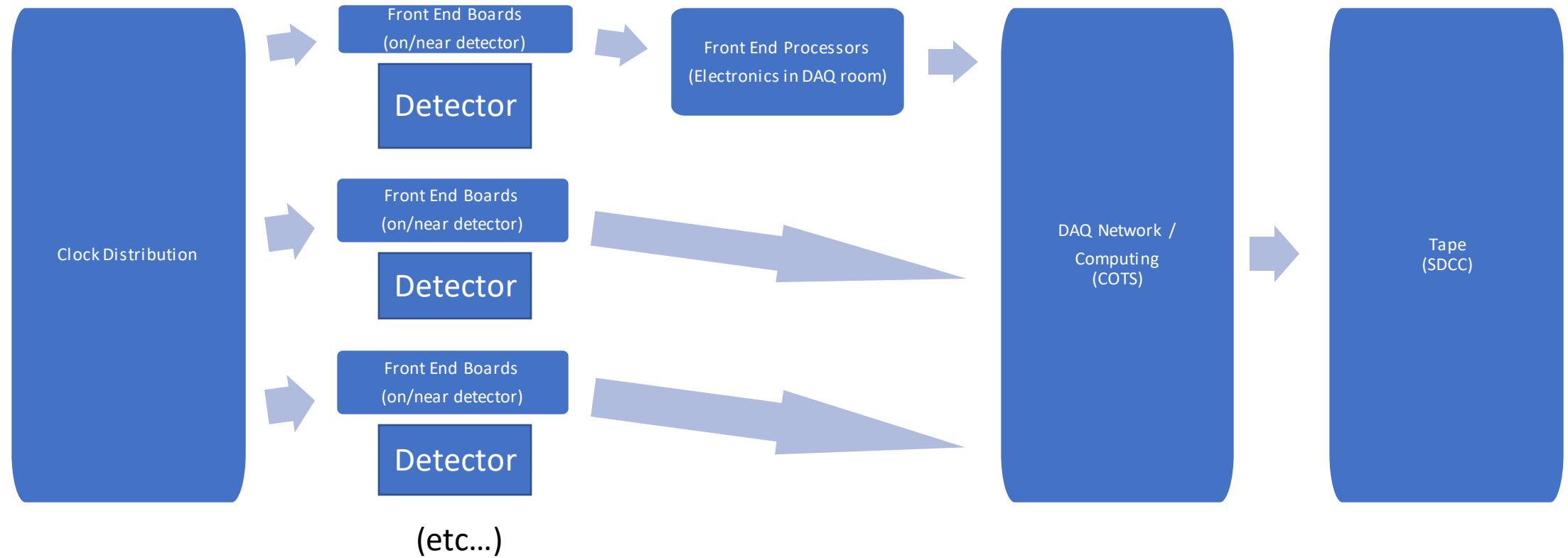# "Athena DAQ Tutorial"

1. Components:

2. Responsibilities:

DAQ WG   Detector WG   Detector / DAQ WGs   DAQ WG   SDCC / DAQ / Software WG

3. Functions
   a. Clock Distribution: distribute clock, synchronize detector timing with bunch structure, track bunch structure, share other information between detectors
   b. Front End Boards: readout digital data, zero-suppression / other data compression, multiplex channels, assemble time frames
   c. Front End Processors (if needed): more complex analysis, but continue function of Front End Boards
   d. DAQ computing / network: transport data, format data, configuration of detectors and runs, HLT, additional data compression, monitoring, logging, system control, track datafiles and configuration information
   e. Tape system: store data and make accessible for analysis

4. Interfaces
   a. CAD -> Clock Distribution: TBD
   b. Clock Distribution -> Detectors: Should define this ASAP.   How many bits? Clock, BX, programmable deadtime, start run, event handling, spin information?
   c. Clock Distribution -> DAQ Computing?
   d. FEB / FEP -> DAQ computing:
      1. Physical level: useful to specify fabric / fabrics?
      2. Logical level: do we specify details of time frames?, synchronize time frames?, do we need to specify protocols at this stage?
      3. Configuration protocols
      4. Slow controls?
   e. DAQ computing -> software
      1. Data file structure:
         • Events?
         • Combine same time regions for all detectors in specific files?
         • Time regions in multiple files split by detector?
      2. Shared Databases

f. DAQ computing -> software
   1. Data file structure:
      - Events?
      - Combine same time regions for all detectors in specific files?
      - Time regions in multiple files split by detector?
   2. Shared Databases

5. Other related components?
   a. Scalers
   b. Slow Controls
   c. Beam parameters for analysis <-> feedback to collider from detectors