Partial restart of a distributed data acquisition system

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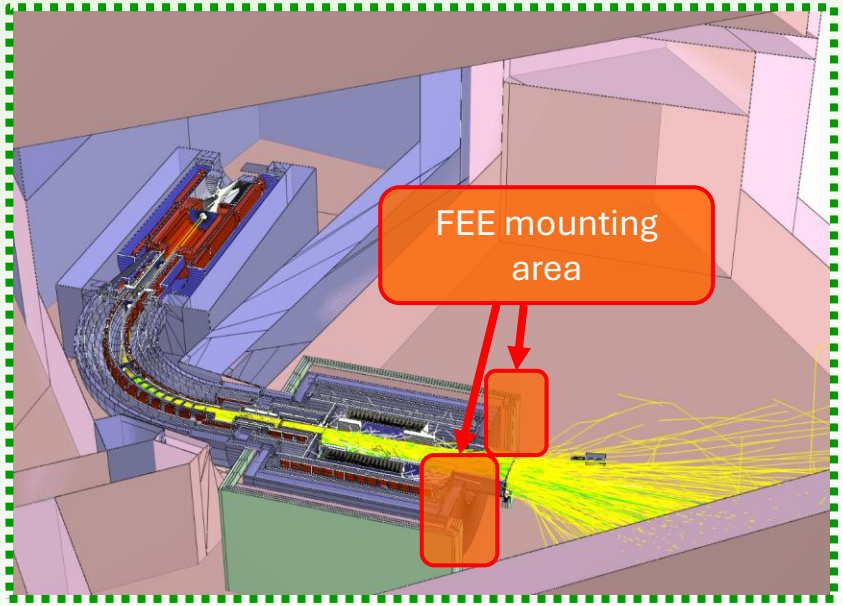
Motivation

- **Modern detector systems employ a vast number of Front-End Electronics (FEEs).**
  - These FEEs can occasionally exhibit instability, necessitating a system restart.
  - FEEs mounted close to detectors are exposed to radiation-induced SEUs, which can cause failures during data taking.
- **In the COMET Phase-I experiment at J-PARC, SEU-induced FEE failures are expected every 7.2 minutes.**
  - Restarting the entire DAQ system for every failure would introduce significant dead time.
- **On the other hands,**
  - Temporary loss of a small number of FEEs has little impact on detector acceptance.
  - The loss of a small number of FEEs does not significantly affect the physics analysis.



COMET detector (CyDet)

Partial restart of FEEs during data taking can improve the DAQ live time.

Automatic partial restart of FEEs enables continuous DAQ operation during SEU-induced failures.

The recovery procedure is automatically triggered by the watchdog process.