The CMS Level-1 Calorimeter Trigger for the HL-LHC

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The main calorimeter trigger objects are: electrons, photons, jets, hadronically decaying taus, as well as various energy

**HIGH LUMINOSITY LHC 💥☄**

**LEVEL-1 TRIGGER**
- Processed in following steps:
  - Barrel:
    - Regional calorimeter trigger (RCT)
    - Global calorimeter trigger (GCT)
  - HF and HCAL: GCT
  - Input: detector backend electronics
  - Output to: Correlator
  - Global trigger (GT)

**CALO TRIGGER ARCHITECTURE**
- Hardware Device: Xilinx XCVU9P FPGA
- Support 3 SLRs (super logic region)
- RCT geometry for FPGA:
  - 17 x 4 of barrel (for 36 FPGAs)
  - 17 x 6 of barrel (for 24 FPGAs)
- GCT geometry:
  - 12 unique RCT (17 x 4 x 4 neighbours)
  - 8 unique RCT (17 x 6 x 4 neighbours)

**RCT ALGORITHM**
- 2 SLR implementation
- Full RCT coverage
- Implemented in Vivado-HLS (2019)
- Clock: 240 MHz
- Link bandwidth: 16 gbps

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**REFERENCE**