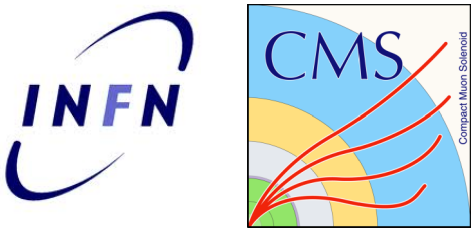


Toward universal ntuples for the L1 muon upgrade

Mario Pelliccioni
Alessandra Cappati

Basic idea

Having different inputs is inefficient

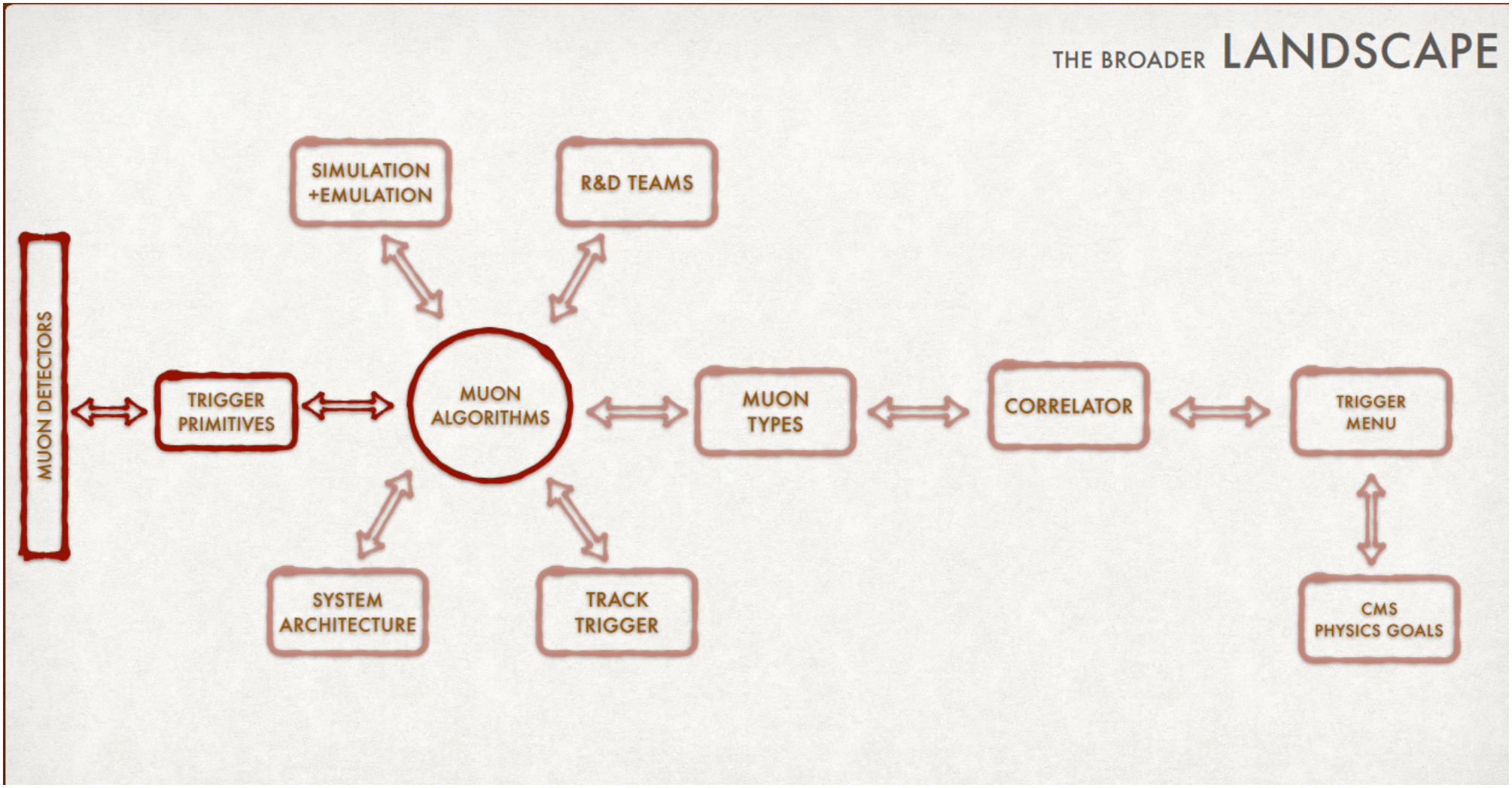
- Reinvent the wheel
- Reproducibility
- Divergence in tools, methods, etc
- Especially bad in a constrantly “fluctuating” environment

- This is particularly a problem with an upgrade of this scope
- Provide a basic service: standard “L1 muon” ntuples for upgrade studies
  - Make “central” production for a few MC and “milestone code tags”
  - People should be able to easily rerun with their tweaks
- For this to work, it has to have a few characteristics

How this should look

- Simple ntuple structure
  - Vectorial containers
  - No CMSSW dependence for the outputs
  - No custom dataformat libraries
- Simple code
  - Everyone should be able to customize this without too much effort
- Most important: running workflow
  - Should be able to turn on/off usual parts of (re)emulation with simple bools
  - Should be able to run on RAW or RAW-RECO
  - Crab configuration simple enough for anyone to use without digging into code
- Most most important: documentation
  - This is where many of these projects die

THE BROADER LANDSCAPE



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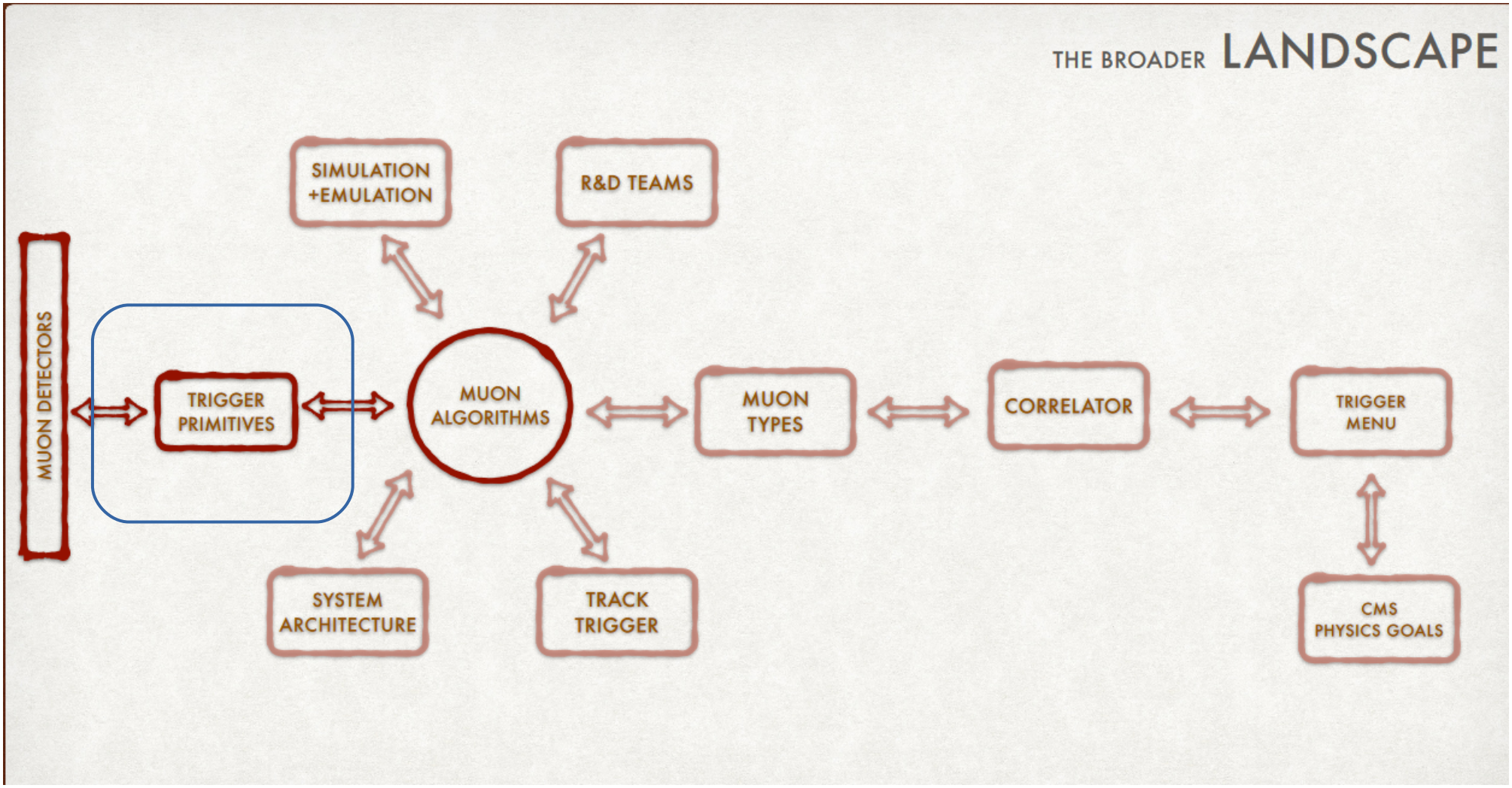

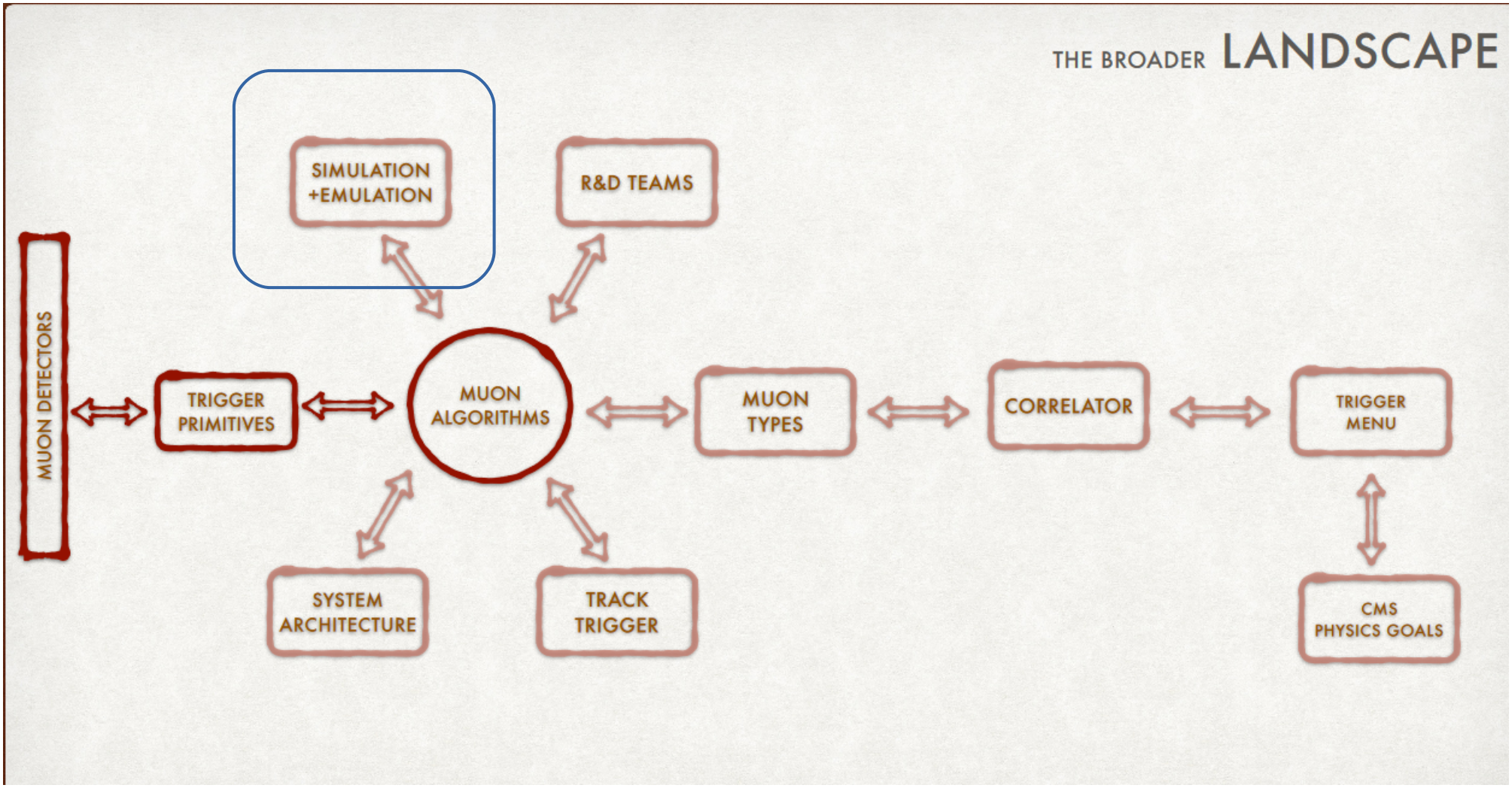
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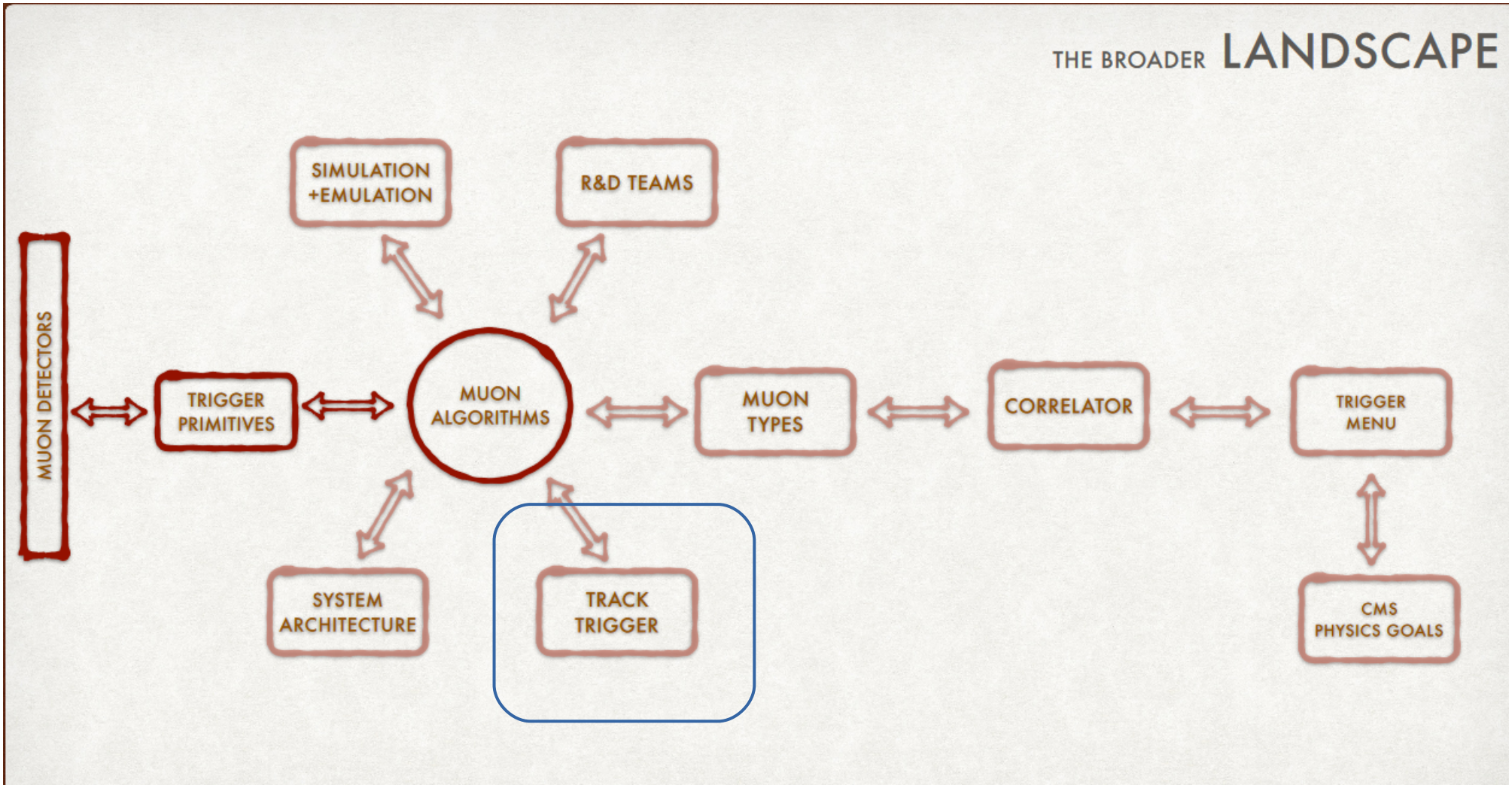
R&D TEAMS
MUON DETECTORS
TRIGGER PRIMITIVES
MUON ALGORITHMS
MUON TYPES
CORRELATOR
TRIGGER MENU
SYSTEM ARCHITECTURE
TRACK TRIGGER
CMS PHYSICS GOALS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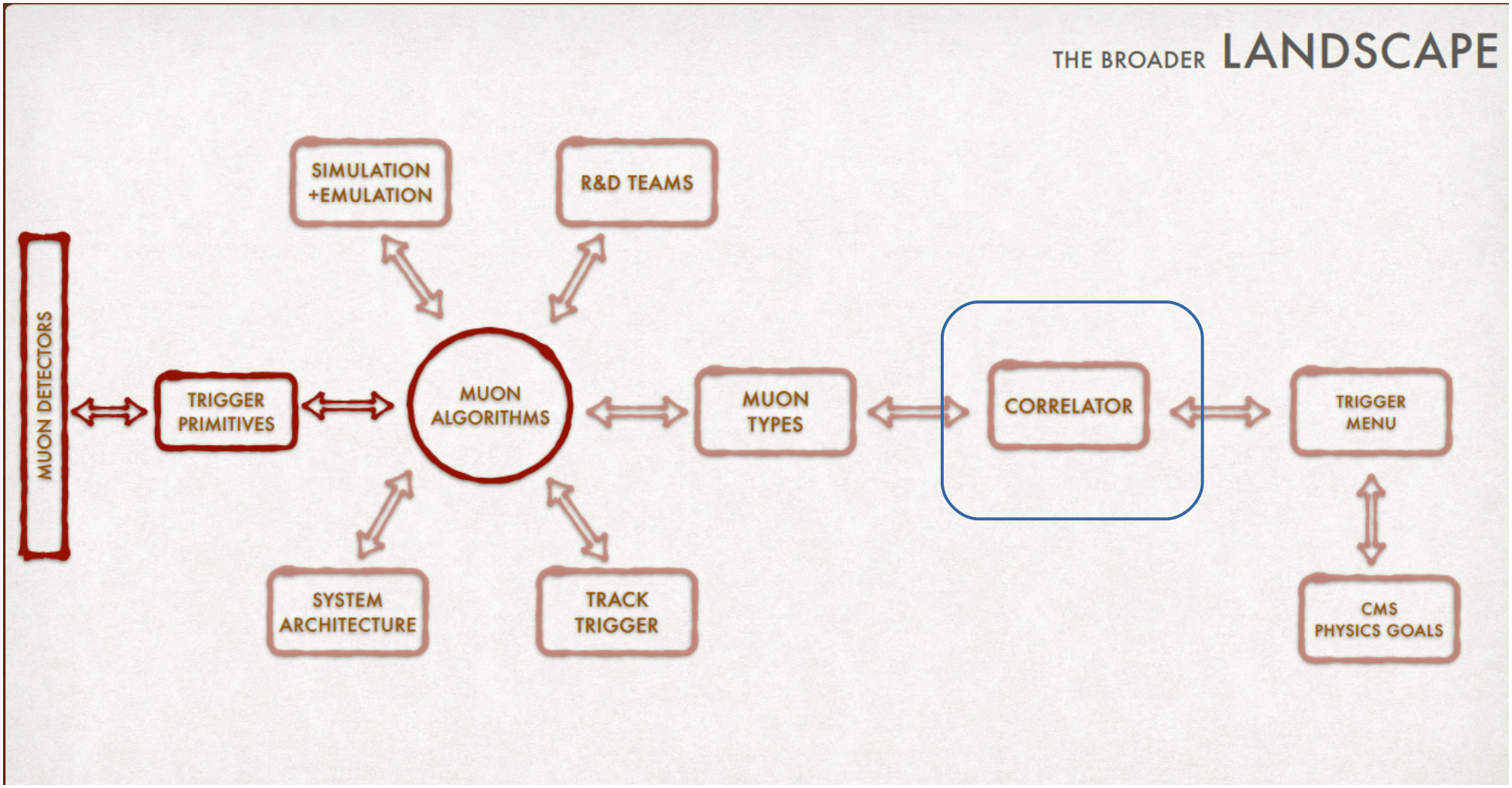

Details

- Main ntuple code is synched with cms-l1t-offline
  - The phase2-l1t-integration branch
  - This is the obvious place where mature emulation code is merged
  - Helps with integrating emulation for different systems
  - For now, this is a separate repo, but could consider merging it into cms-l1t-offline/cmssw
- Right now working in CMSSW_10_1_7

Done so far

- Basic code structure
- First ntuple iteration
  - For now, included:
    - L1 Muon
    - BMTF/OMTF/EMTF muons
    - DT primitives [L1MuDTChambPh(Th)Container]
    - Kalman filter muons
  - Disk space considerations
  - Branches ofc suppressed if products are absent
  - Adding more stuff is pretty easy
- Working on python workflow configuration right now

Next steps

- Add as much info as people request
  - Surely CSC/RPC inputs, tracker L1 objects, reco Muons
- Code cleaups
- Debug debug debug
- Write twiki with code explanation, ntuples structure, workflow to produce custom ntuples

Plan: having a first viable “full” version by end of January

P.S. For my mental sanity, please put KalmanL1Muons in the l1t namespace...