DO Event Selector

Plans For a Generic Event Selector

For MC

Dave Evans

DO Event Selector

Currently, doing event selection requires:

- C++
- mcpp manual
- PDG Data Book
- Knowledge of DZero Framework
- Huge Pile of Events
- Patience

Result: Most Selection done with hacked packages like MC_analyze, Analyze etc to produce a custom executable

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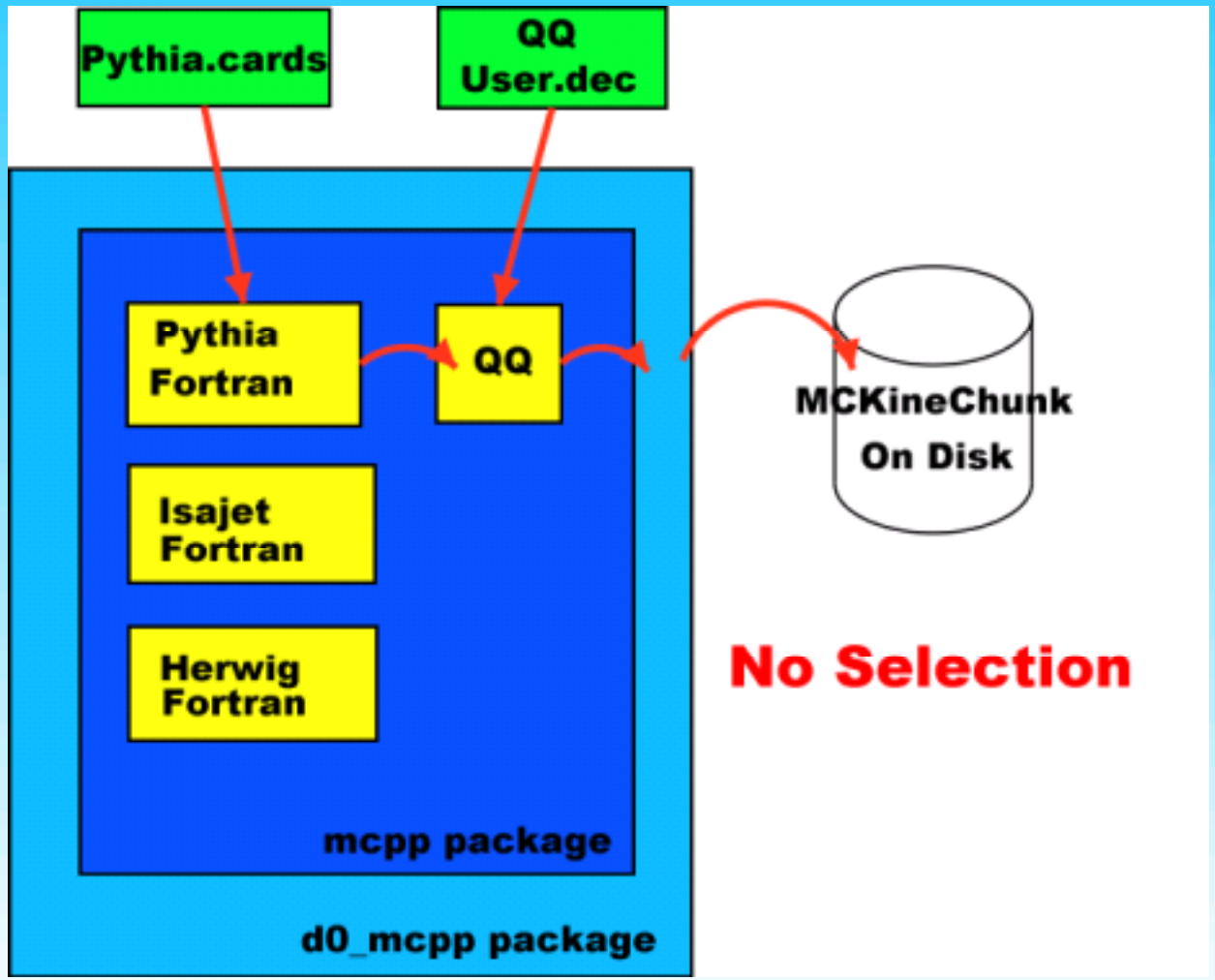
D0 Event Selector



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Disadvantages of Current system:

- Non-intuitive
- No Official Selection Code/Exe
- No way to log selected events in SAM
- No mc_runjob support (implying...)
- No Farm production
- New Users havent got a hope
- It isnt even a system...
- Waste of time/space:
- eg: 100,000 bbbar-incl events yield ~100 triggerable dimuon events

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Solution:

Intuitive, Simple to use selection routine to provide selection to most features of MC, that doesnt waste time or disk space.

(And doesnt start with "Hey Dave, I need...")

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The Plan:

C++ Framework Package Called from Generator framework rcp and selects events as they are generated.

A set of modular classes/functions that can be easily expanded and run within d0_mcpp.

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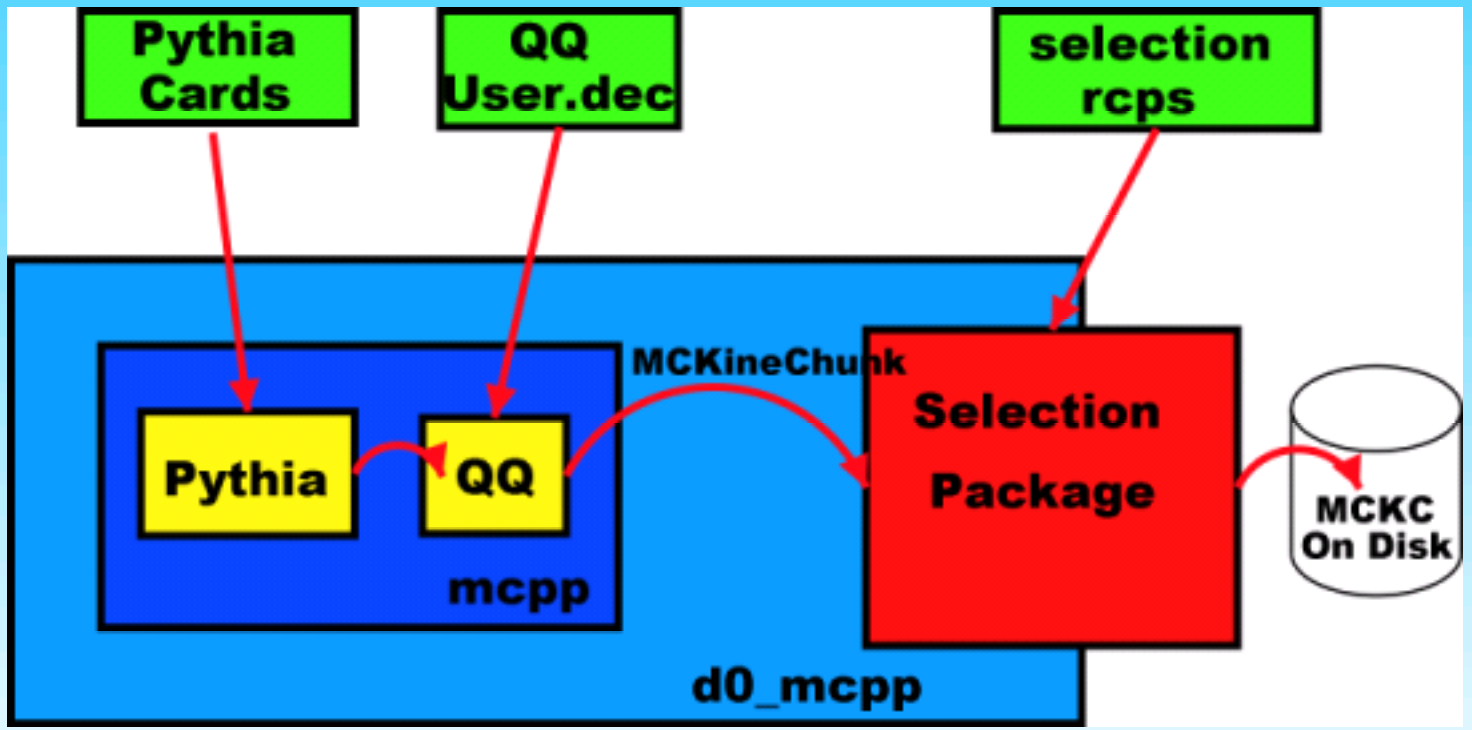
Schematic of where it will run:



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Input:

Pythia Cards: Generate 10 Billion bbbar incl events with particle X stable.

QQ User.dec:

If X in event, decay it to A+B+C

Selection RCPs:

When 1500 events are written, stop Pythia

Only write events with particle X, particle A and pT(X)>3, eta(X)in(-1,+1), parent(X)=b

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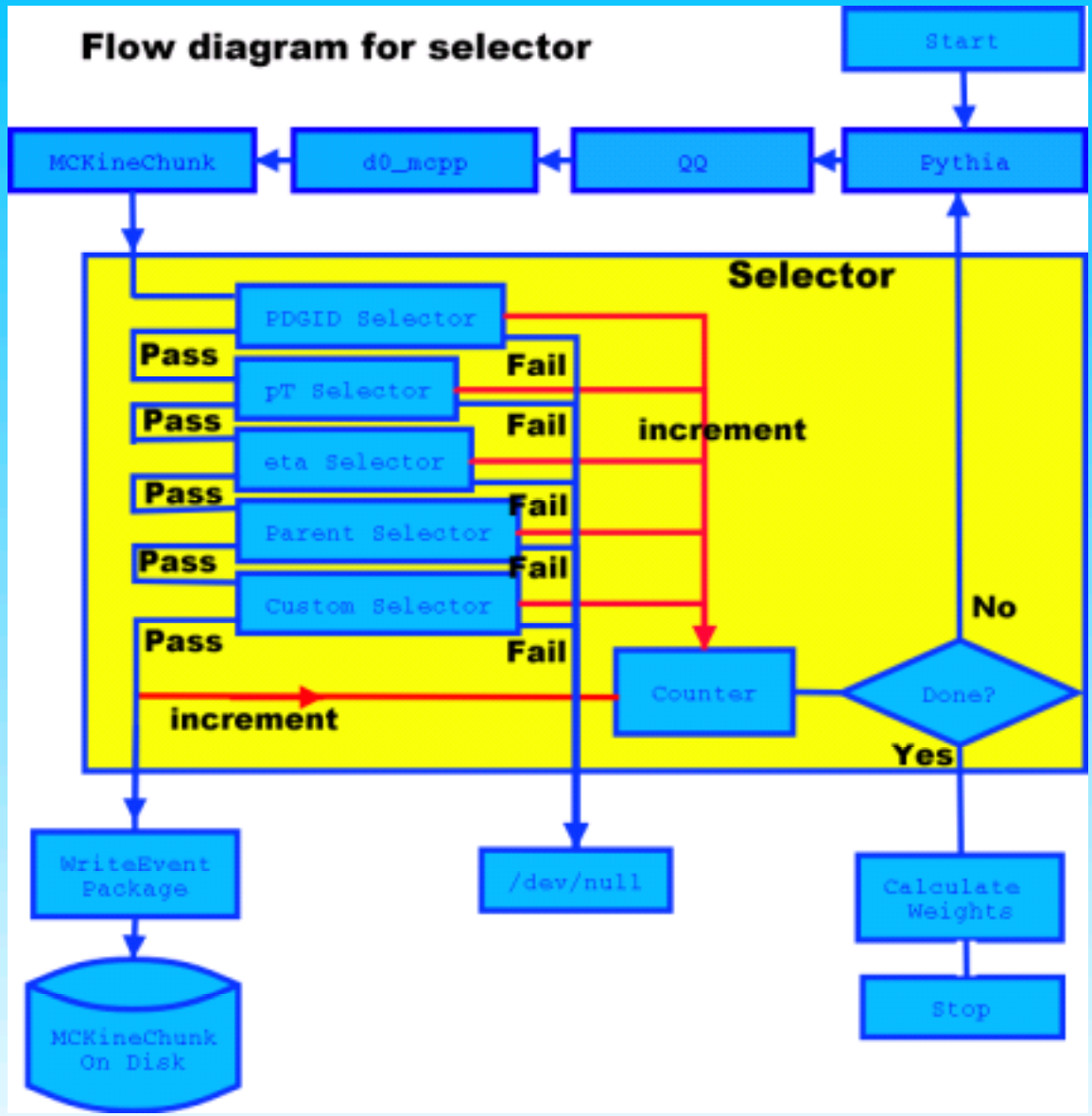

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The package (shown in yellow) acts as a container for several objects:

1. Counter
2. Generic Selector class (not shown)
3. PDGID selector
4. pT selector
5. eta selector
6. Parent selector
7. Custom Selectors

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1. Counter Object.

Tracks: # events written

events generated

Controls # events written and kills pythia

when done

Calculates weights for events

(could be complicated...)

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2. Generic Selection Class

Generic object that gets inherited by individual selectors to allow them to run in the selection package.

Contains methods that all selectors should have, for instance wether or not a selector is active and should be used.

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3,4,5,6 Individual selectors that inherit from the generic selector and provide simple selection functions such as checking pT range, or eta range.

Each would have its own parameter sets

eg for pT, user would provide a pdgID and a pT range for those particles

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7. Custom Selectors

   If it doesnt do what you want, write a customised selector class, that inherits the generic selector and put it into CVS, then the next release will contain that selector.

   It will be switched off as a default, but you can turn it on in the main selection rcp

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Issues:

1. It doesnt do everything.
   (But hey! It does more than what we have...)

2. I am not sure how to do the weight stuff, that
   needs input from others

3.It uses RCPs and as such is hard to track.
   (Set of approved selection rcps in CVS???)

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What Will I do:

1. The framework package
2. The generic selector
3. The Counter (with help ...)
4. A few of the basic selectors

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Need:

- List of useful selectors (& people to code them)
- Experienced people's advice
- Help in General
  - If you know python, or have a spare student just lying around, let me know...

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