

Trigger news and feedback

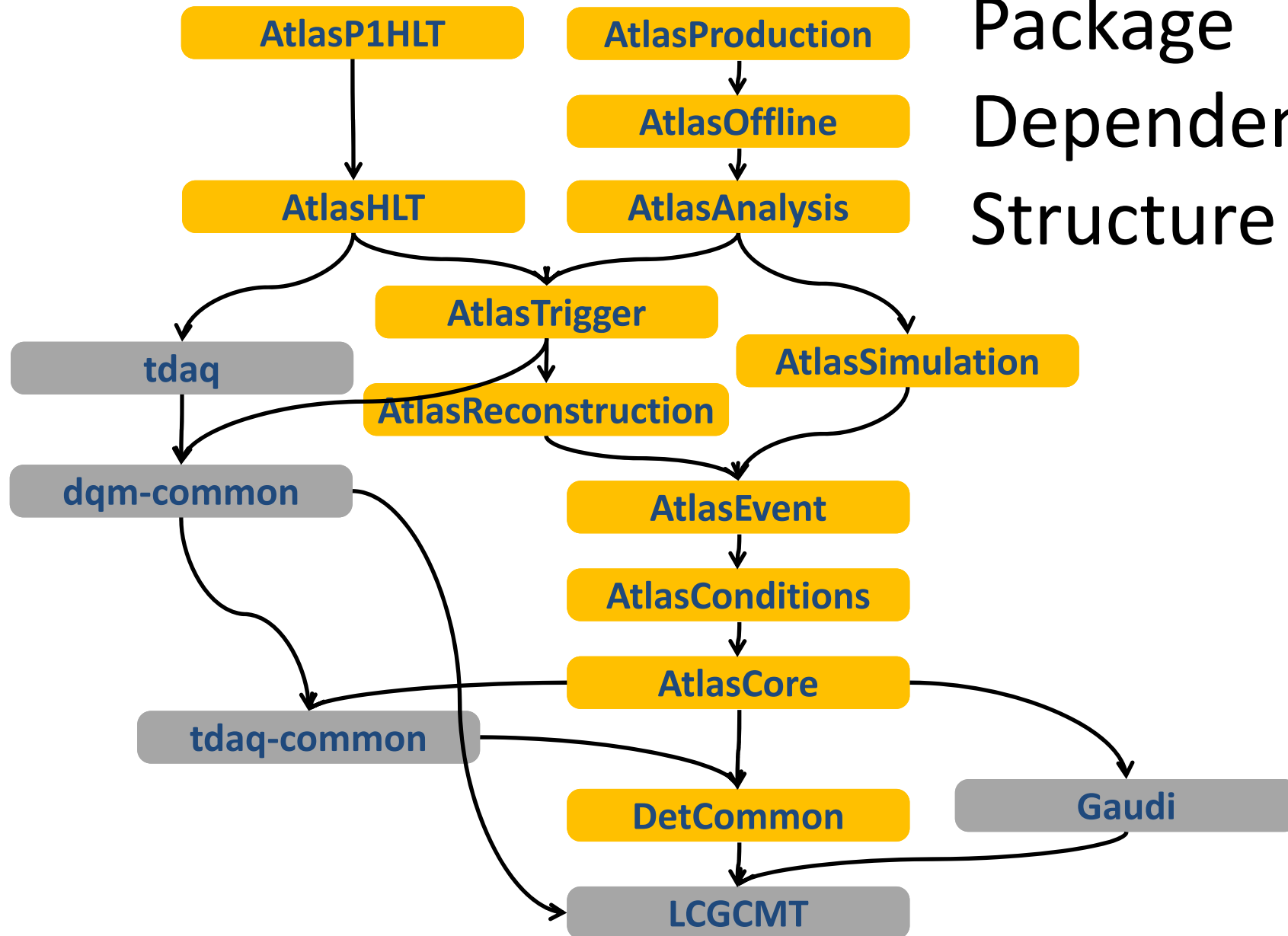
Simon George – RHUL

Reconstruction Meeting
Atlas S&C Week – 1 Dec 2010

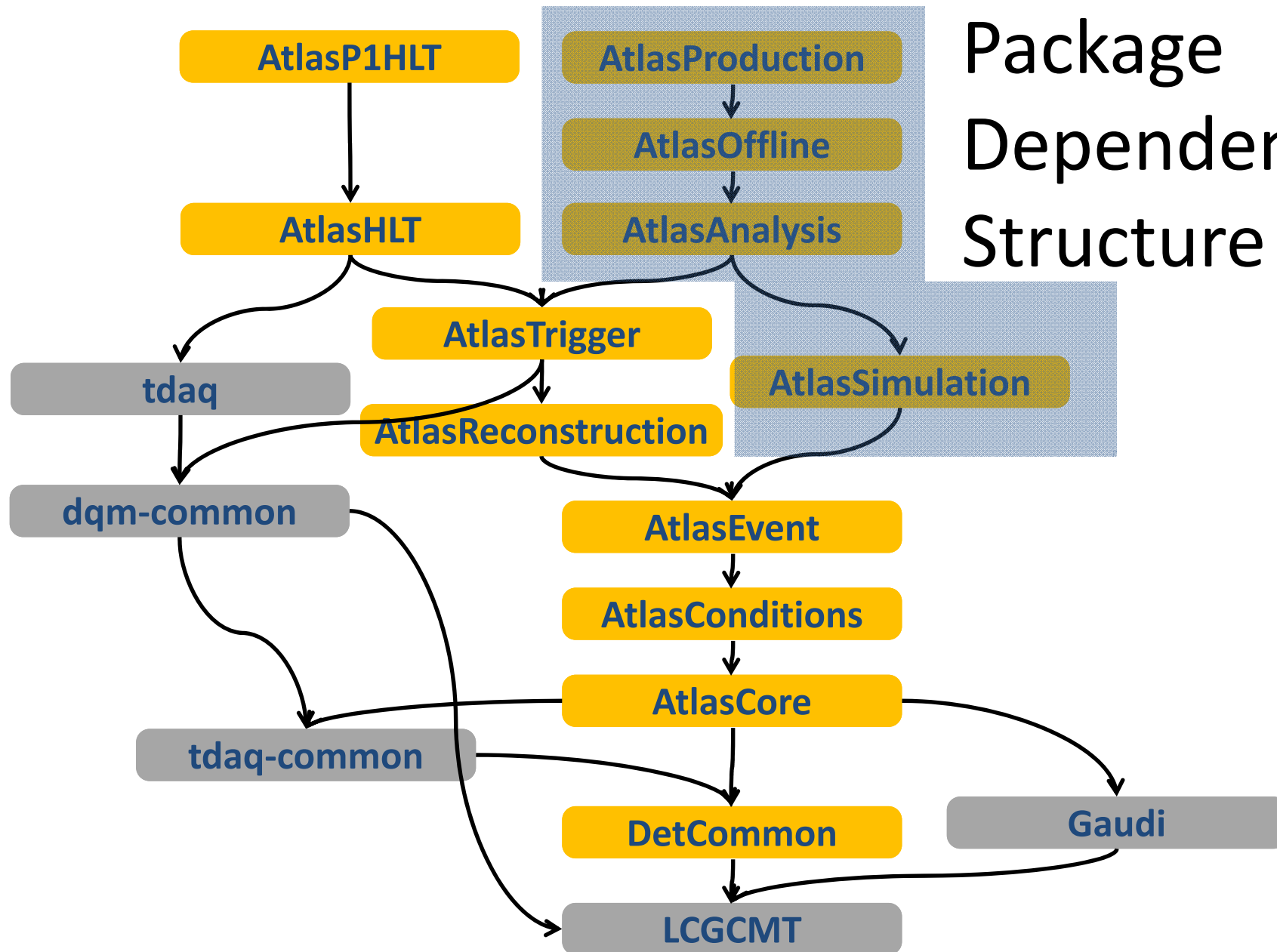
Contents

- ❑ Trigger software in context
- ❑ Feedback from 2010
- ❑ Release plans for 2011
- ❑ Trigger simulation strategy

Package Dependency Structure



Package Dependency Structure



Infrastructure feedback



Nightly builds, ATN tests and release builds are great, so we use them heavily.



Last year we were grumbling a bit about RTT, but post review it has improved a lot

- Support much more responsive
- The new results query form is really useful and we like the geek search option
- Warnings about changes and test runs with new releases really appreciated.
- We really appreciate the dedication of the RTT team to achieve this.



Tracking bugs

- Savannah not well integrated with everything else: cross references between TC, SVN, ATN, RTT and the bug report are by hand, therefore often missing.
- Consequently no accurate list of which bugs are fixed in a certain release, nor for a given bug, in which releases it exists and which it is fixed.



Solving bugs

- We need to make it easier for developers to know how to repeat problems. This usually ends up causing a delay when bugs are assigned. To us as well as the software validation team.
- It is especially hard to reproduce on Ixplus problems that first occur on the Grid.



We are working on better integration of trigger and offline shifters.

Reconstruction and other feedback



Generally good collaboration between trigger and offline

- Example: ongoing project to speed up TrigMuonEF, offline more aware of trigger needs
- Broad agreement that there is not much to complain about



Few minor issues specific to subsystems arose, for example

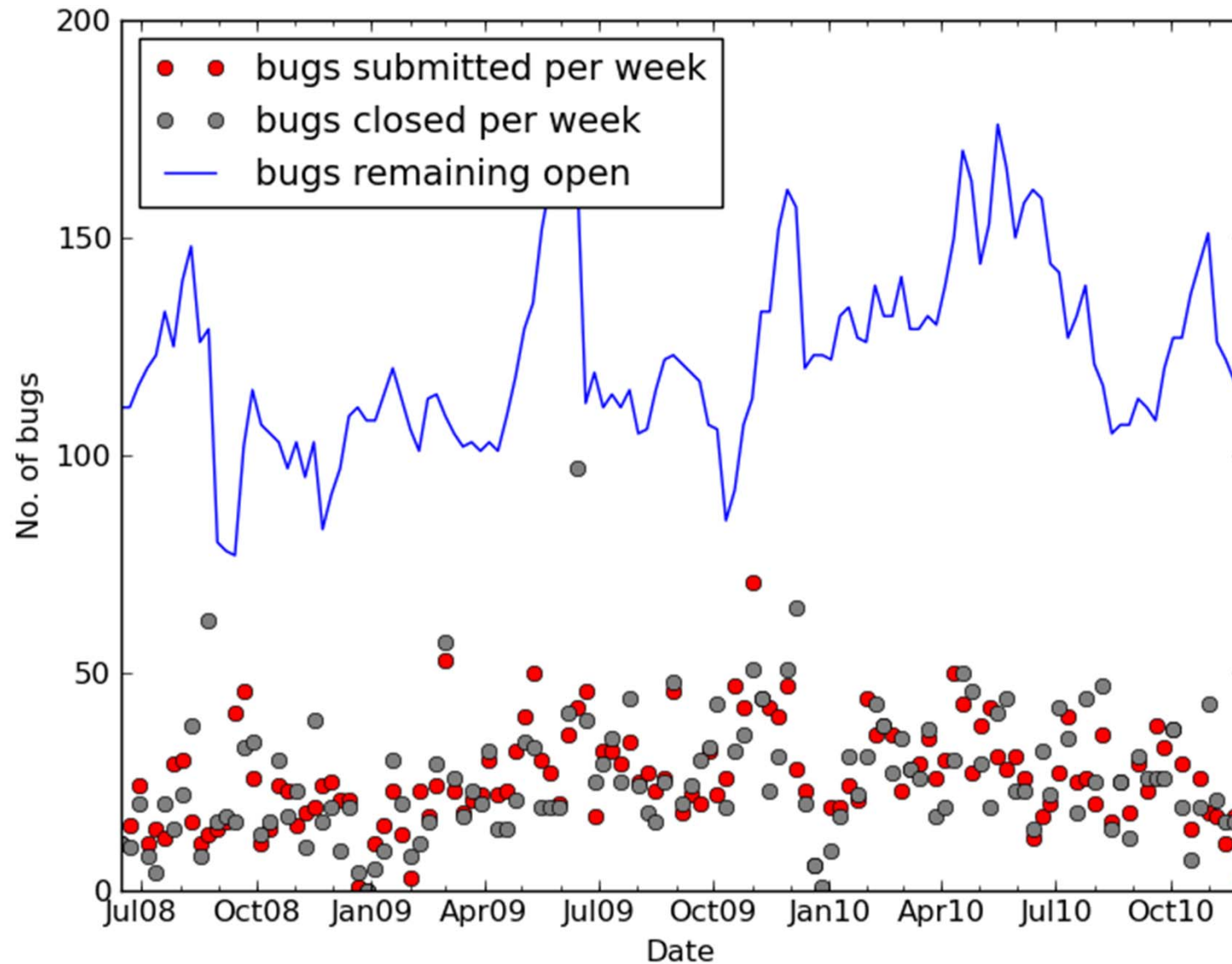
- Software changes were accidentally made without notification
- Conditions not available promptly for trigger
- A more significant change was not well planned from trigger point of view

Also:

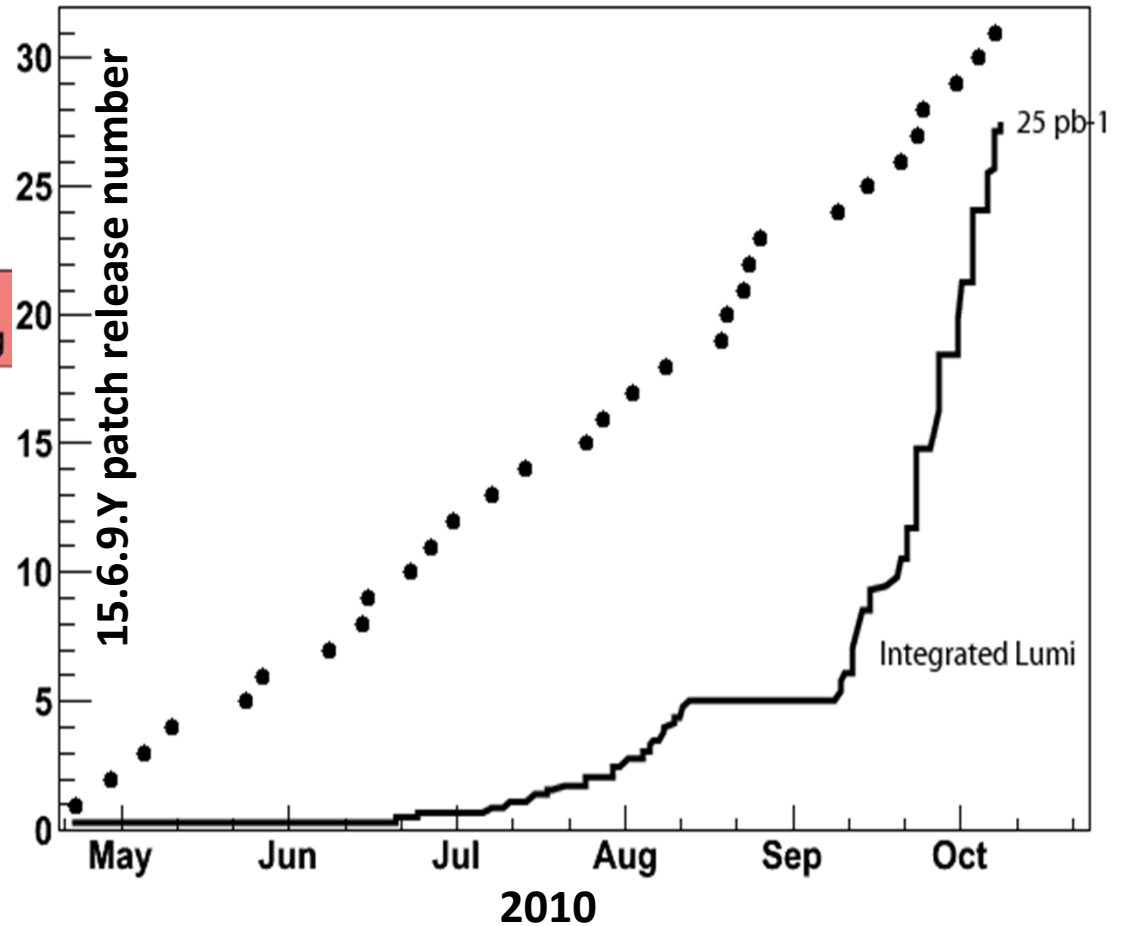
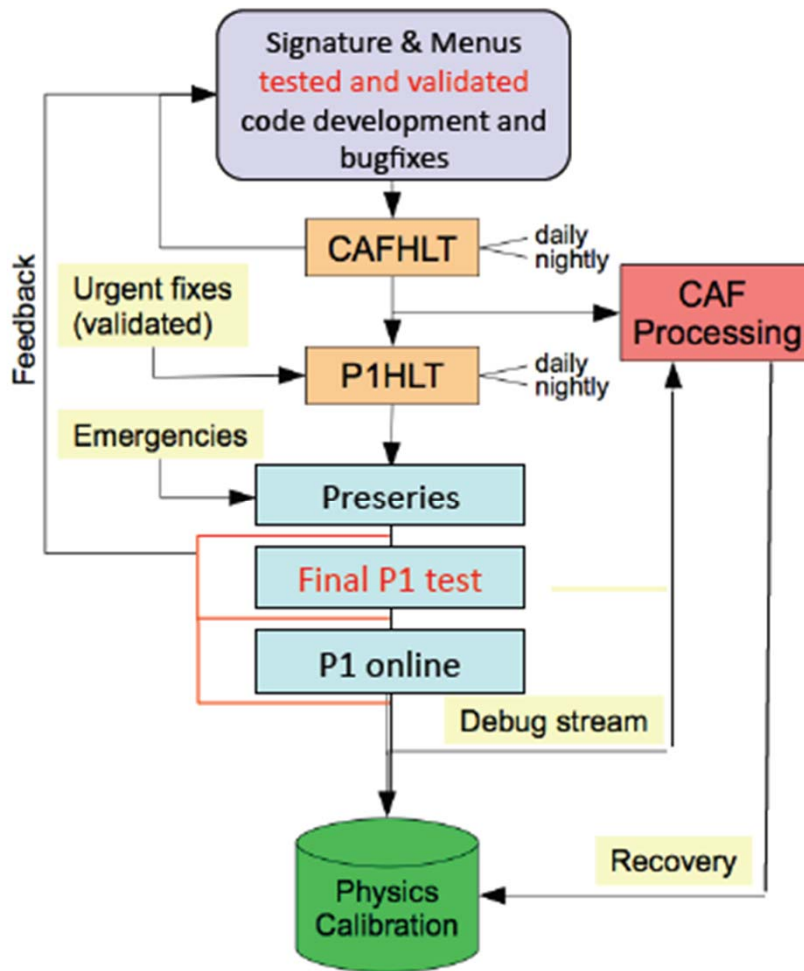


Really appreciate help of the Tier0 support team.

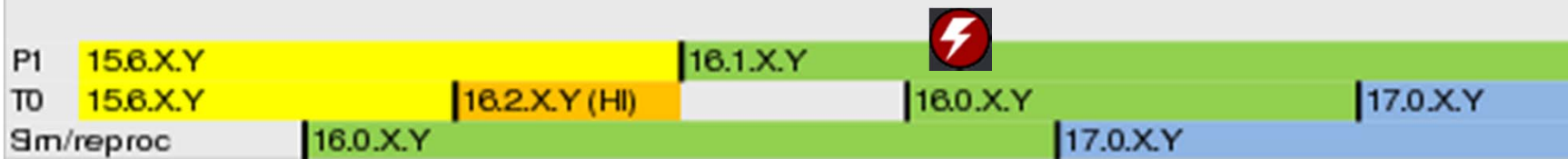
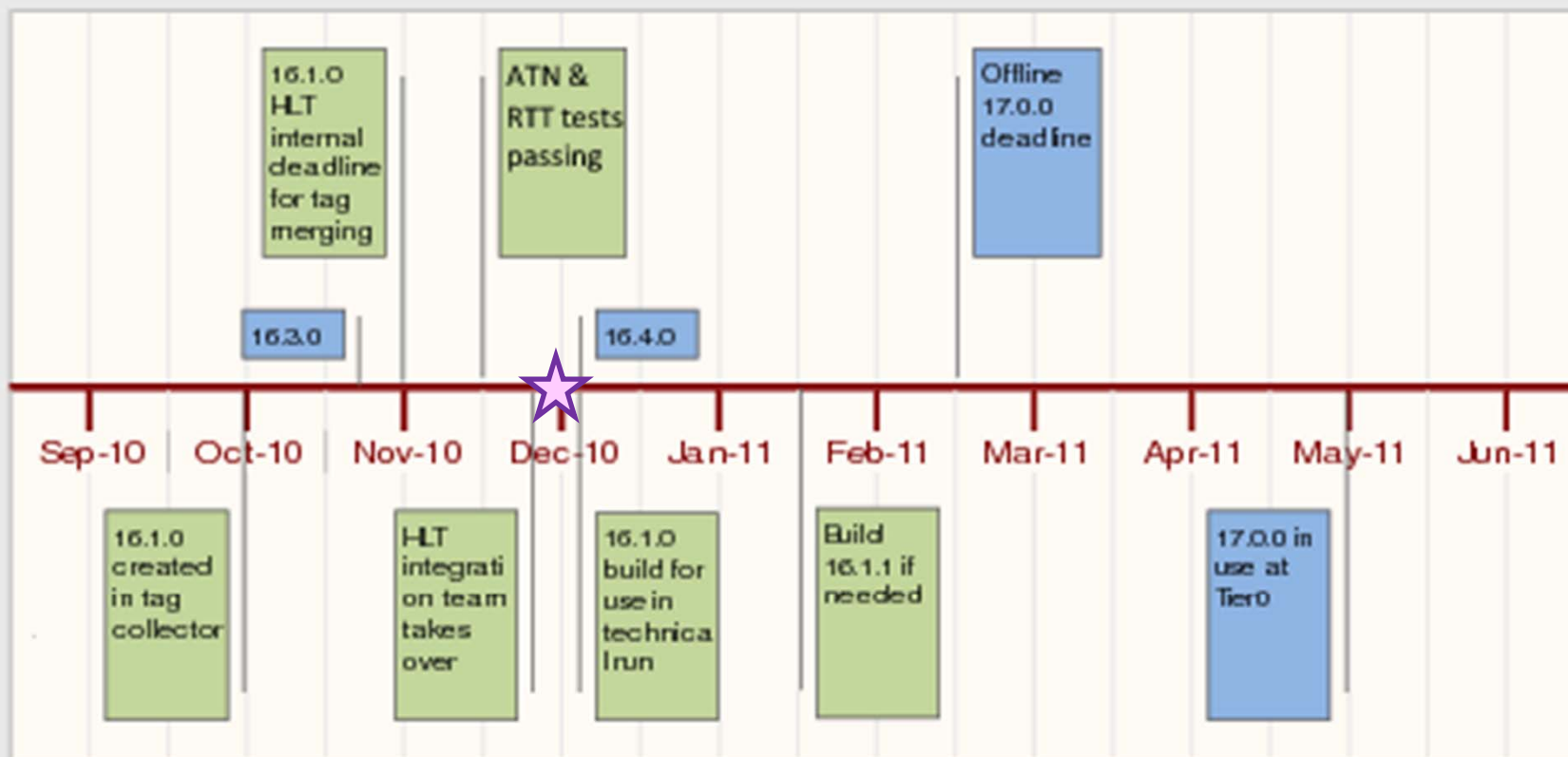
Trigger bug tracker



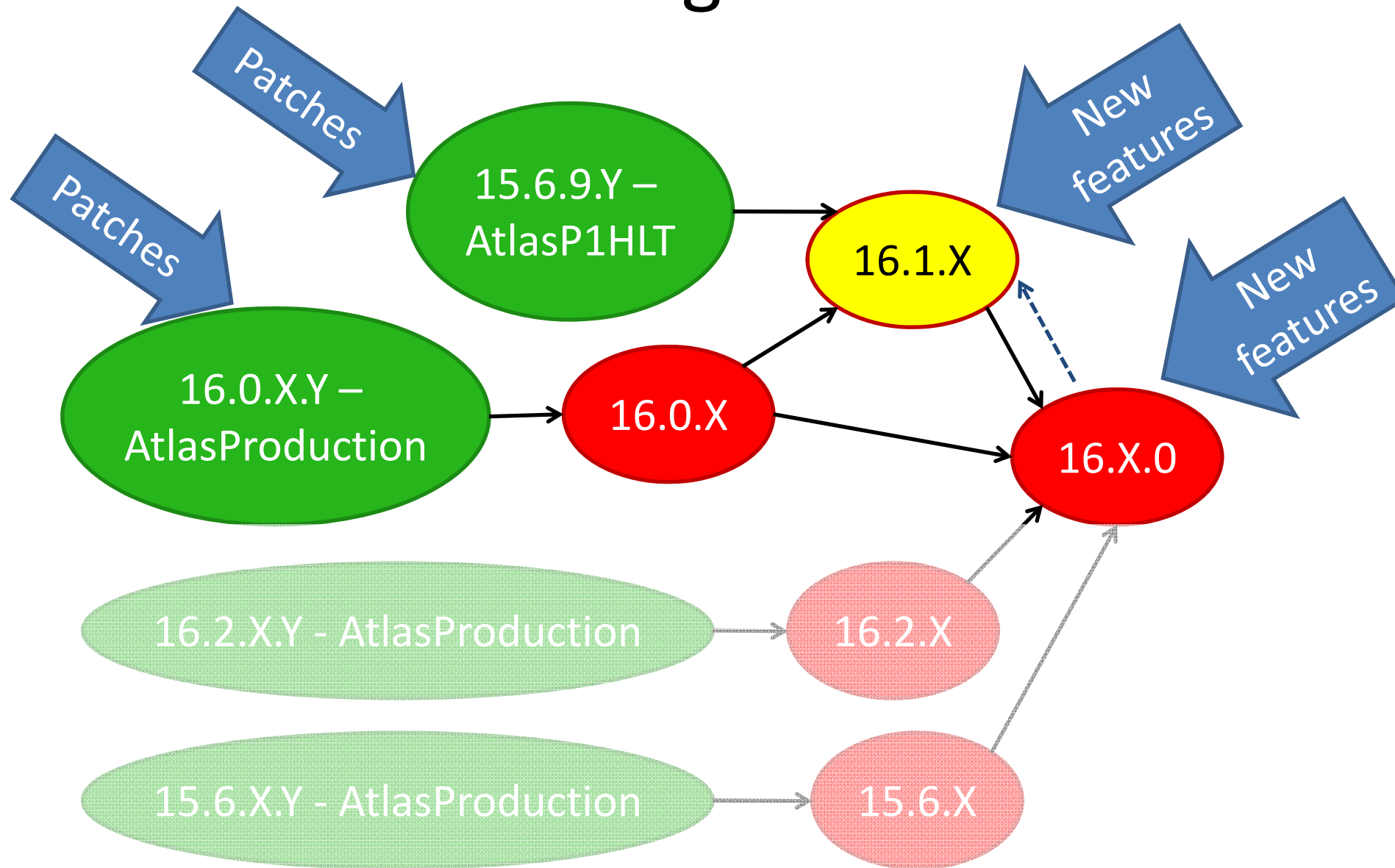
HLT online change procedure



Release plans autumn 2010 - spring 2011



Source of tags for 16.1.X



Trigger Simulation



□ What we do now

- Part of MC reconstruction trf (RDO to ESD)
- LVL1 electronics simulation + HLT actual software
- Fully configurable: joboptions, menu
- Prod cache which we try to sync with current trigger, but reco changes prevent exact sync.

□ What is missing for exact simulation of trigger?

- No DAQ simulation, so no MC debug stream
- Use actual online releases (P1HLT cache) and configurations (menu + properties from TriggerDB)
- Use same conditions (calib, alignment, noise, dead channels, ...) as we had online at the time the data was taken, not the improved ones to match data reproc.

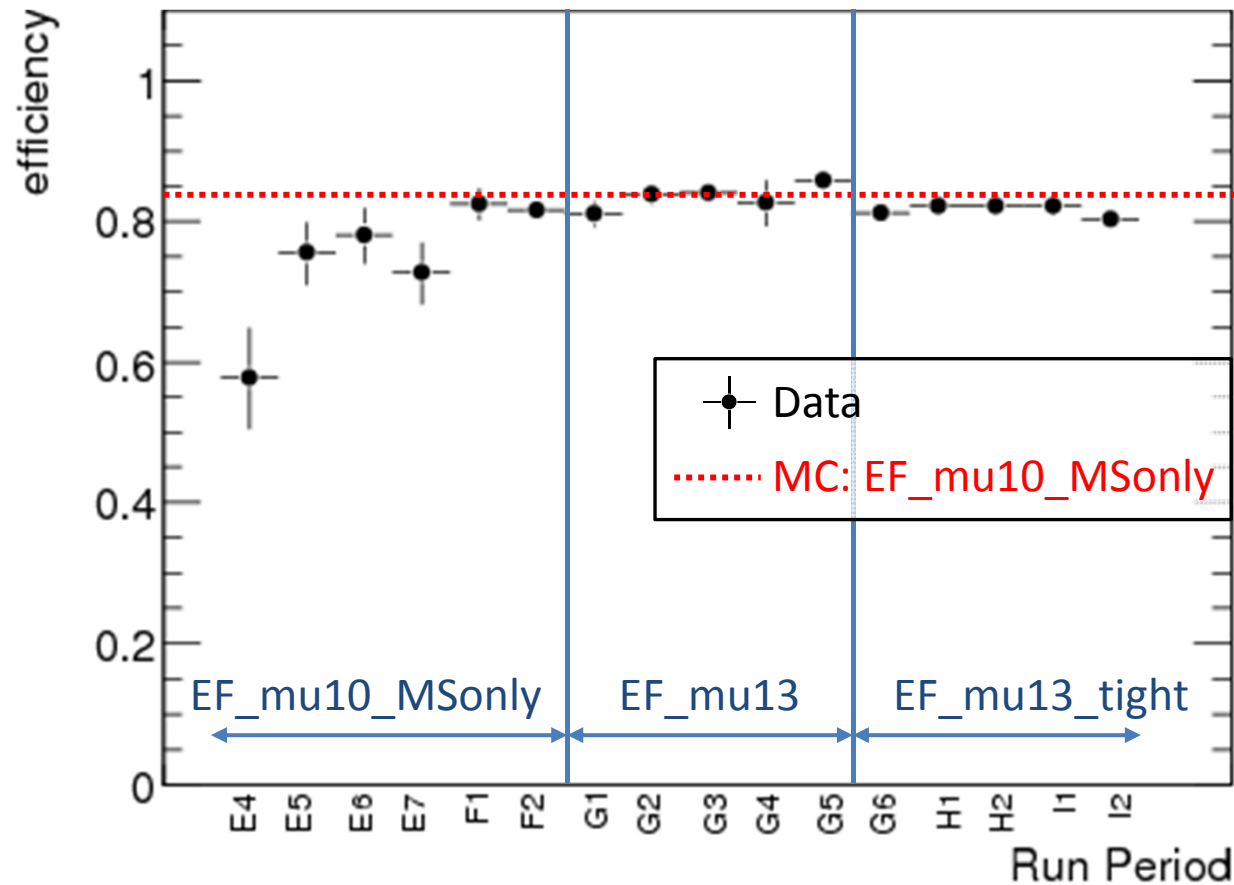
Simulation options

1. Use actual online setup
 - Deluxe option, but requires major changes to transforms & production system, plus additional validation and possible update of HLT online releases
2. Make offline simulation release *fairly representative* of recent trigger setups
 - Pretty much the status quo, need quantitative feedback
3. User parameterised trigger response
 - Project would need to be revived

Trigger efficiency vs data period cf MC

Anna Henrichs, ATL-COM-PHYS-2010-826

Lepton Trigger and Identification for the first *Top quark* observation



- May 2010 r1302 r1306
- Tag & probe efficiency from data
- Compared to Simulation
- Detailed evolution of trigger understood
- Correction factors applied

Recommendations

- ❑ **Adopt option 2 (make sim fairly representative) as the baseline proposal**, while following the points below to identify whether it is sufficient.
- ❑ Establish the level of accuracy required for physics analysis – get input from physics analysis groups, especially quantitative input from individuals.
- ❑ **Quantify the accuracy** of option 2: define metrics with input from trigger signature groups, develop tools and calculate these routinely on releases and if practical even nightly builds. Try to answer the question: which range of online data is reproduced sufficiently well with a given simulation release.
- ❑ If it is established that option 1 (actual online setup) accuracy is required in some cases, need to work on changes to the transform and production procedures with software & computing experts. This needs full commitment from all involved parts of Atlas.
- ❑ Option 3 needs renewed impetus.
- ❑ Engage with the work on time-dependent MC production, especially regarding conditions
- ❑ Identify new effort to work on trigger simulation.

ATL-COM-DAQ-2010-082

Summary

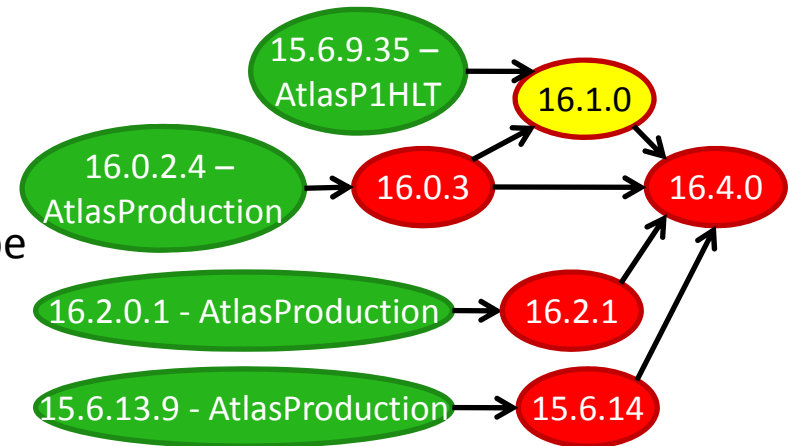
- ❑ Reflecting on 2010: generally very good collaboration between trigger and offline with few counter-examples.
- ❑ 2011 running : trigger should be more stable
- ❑ Need to cope with forward compatibility
16.1.X.Y-P1HLT → 16.0.X.Y-Prod (Tier0)
until ~May 2011
- ❑ Trigger simulation: focus on quantitative validation of strategy

Backup slides

Preparation of 2011 HLT online release

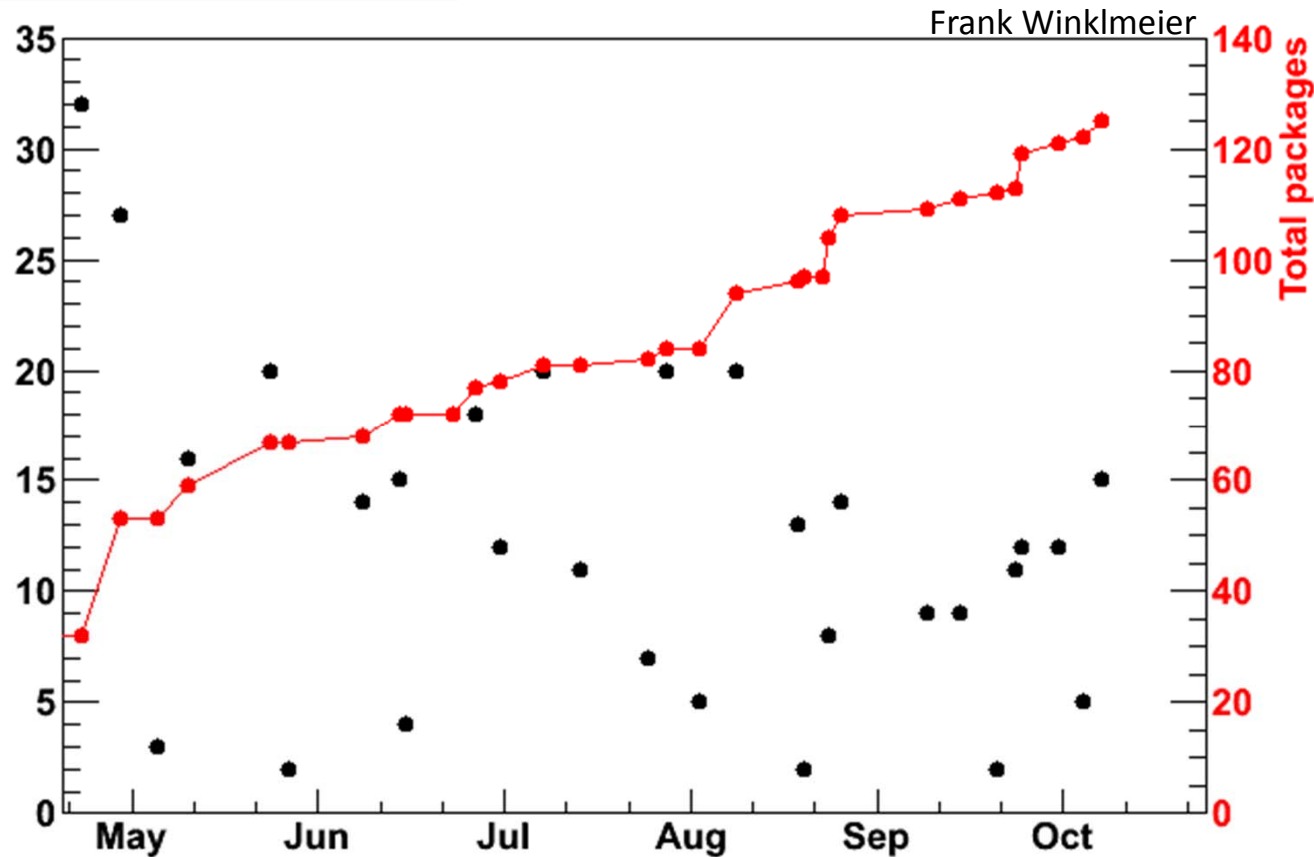
- Release 16.1.0 – copy of 16.0.X.Y
- Tags swept in from AtlasP1HLT 15.6.X.Y, 16.0.X.
- Tags swept out to 16.X.0.
- Tags in 16.X.0 needed for online next year will be manually copied back.
 - Process to be managed by Simon.
- Internal deadline for significant trigger code changes for next year: 1 Nov.
 - Using list of 'left over' deliverables from 16.0.0
 - Let me know anything you're struggling to finish before the deadline.
- 1 month for technical integration (compatible tags, ATN/RTT tests working, etc.)
- HLT Integration take over coordination and ramp up testing around end Nov.
- Build 16.1.0 latest early December to be used for the technical run in mid-December.
- This release can then be used by detectors with DetCommon dependencies (CTP, L1Calo) to compile their software.
- If needed we might build another 16.1.1 closer to start up next year.

- Changes arising from the Amsterdam Trigger Workshop are expected to be mainly strategic, menu changes so can be accommodated through the cache in the normal way. Minor software changes can also be included in this way once agreed and prioritised between trigger operations and the trigger management.



P1HLT cache during 2010 - tags

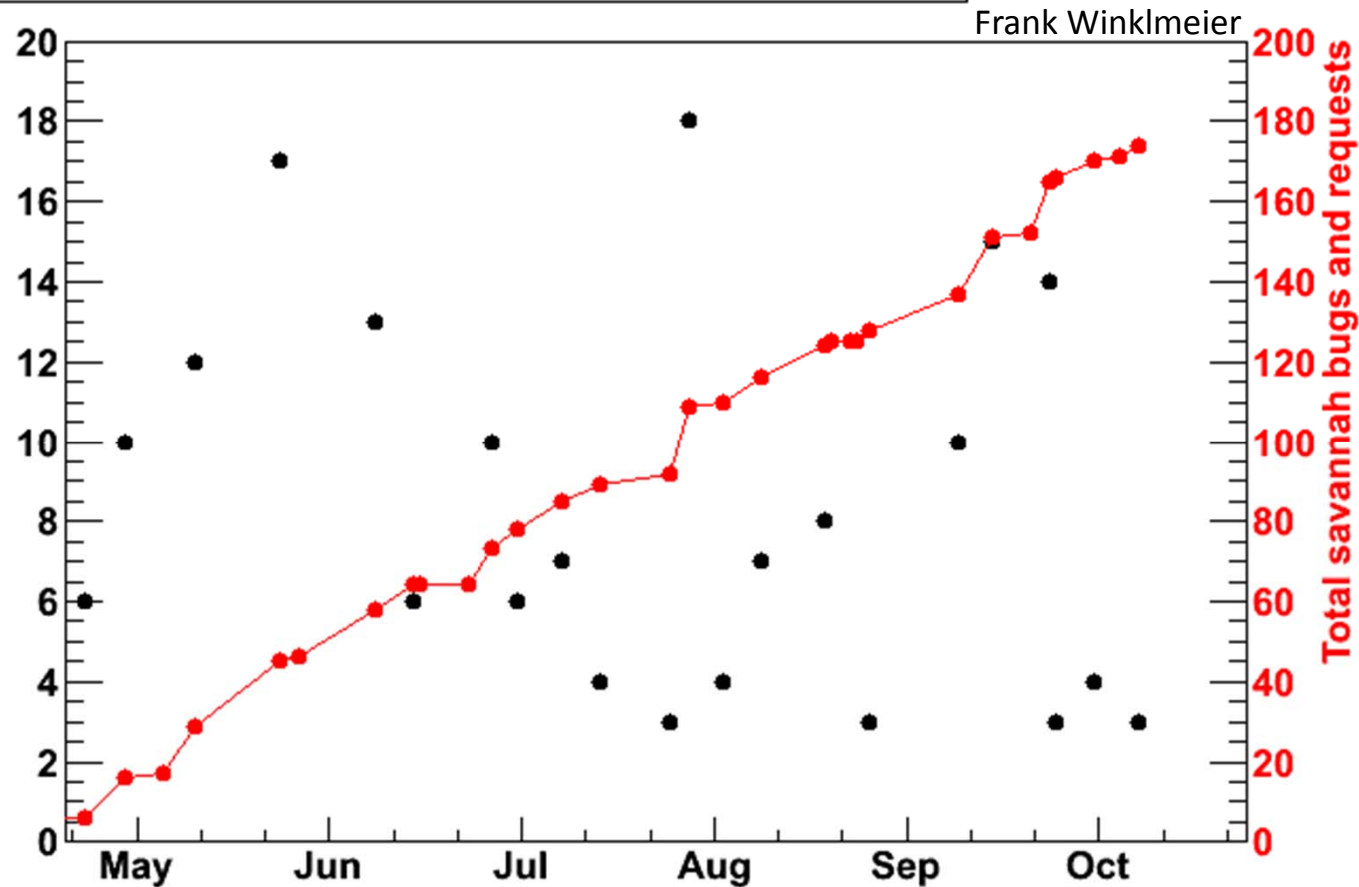
15.6.9.Y tags per cache



- Average ~12 updated packages per cache release
- Note: 3 test-only packages are frequently updated
- Note: 7 packages are recompiled due to interface changes

P1HLT cache during 2010 - bugs

15.6.9.Y Savannah bugs and requests per cache



- For each release assign fixed Savannah reports
- Incomplete list (done by hand and not all bugs in savannah)
- About 50% are feature requests – menu changes

Simulation: Conclusions from Amsterdam trigger workshop

- Not a lot of input from analysis groups
- Trigger efficiency is not yet a critical item in many analyses (loose cuts, early days)
- Sometimes background efficiency is important (SUSY)
- Few per cent accuracy for efficiency reproduction is normally sufficient
- Trigger should be more stable in the future than it was in 2010, but there will always be changes to cope with
- Efficiency needs to be measured with data for each analysis