BaBar Computing Development

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SLAC

BaBar/Belle Workshop

16th February 2002

Overview

- **Releases**
- **Platform Updates**
- **Prompt Reconstruction System**
- **Online Computing System**
- **Other Issues**

Releases

- **Two streams of releases**
  - Development releases
    - 9.x.x 11.x.x
    - Release soon and often
  - Production releases
    - 10.x.x 12.x.x
    - Bug fixes "only"
- **Building a release takes a long time**
  - Was 30 hours on Solaris, now using multi-CPU machine to reduce it to 9½ hours

Nightly Build

- **Build software every night**
    - Keep one on disk for each night (Sat, Sun, ...)
- **Deadline of 5pm SLAC time to release new code**
- **Package Coordinators fill in web form**
    - >1200 packages and 234 PCs
- **Automatic email of error messages to Package Coordinators (for all builds)**

Development Releases

- **Freeze the nightly build on Monday**
  - Only certain people can add changes afterwards
- **Test and fix during week**
- **Use ~Friday nightly to build to next release**

Production Releases

- **Y.0.0 build on last Y-1 development release**

- **Add fixes through weekly meeting among systems and areas of computing**

- **Last offline production release is now 10.4.4**
  - Online builds on top of offline releases, 7.0.9 next
  - Use "lettered" releases to patch releases quickly
    - Not full builds, only required packages and executables rebuilt
    - Most production in 10 series done with 10.2.3 lettered releases, highest version (so far) is 10.2.3h

BaBar Platforms

- For last few years have supported three platforms (Solaris 2.6, Compaq OSF1 V4.0D, Red Hat Linux 6.2)

- Attempted to migrate to Solaris 7, never really completed

- Migrating towards two platforms
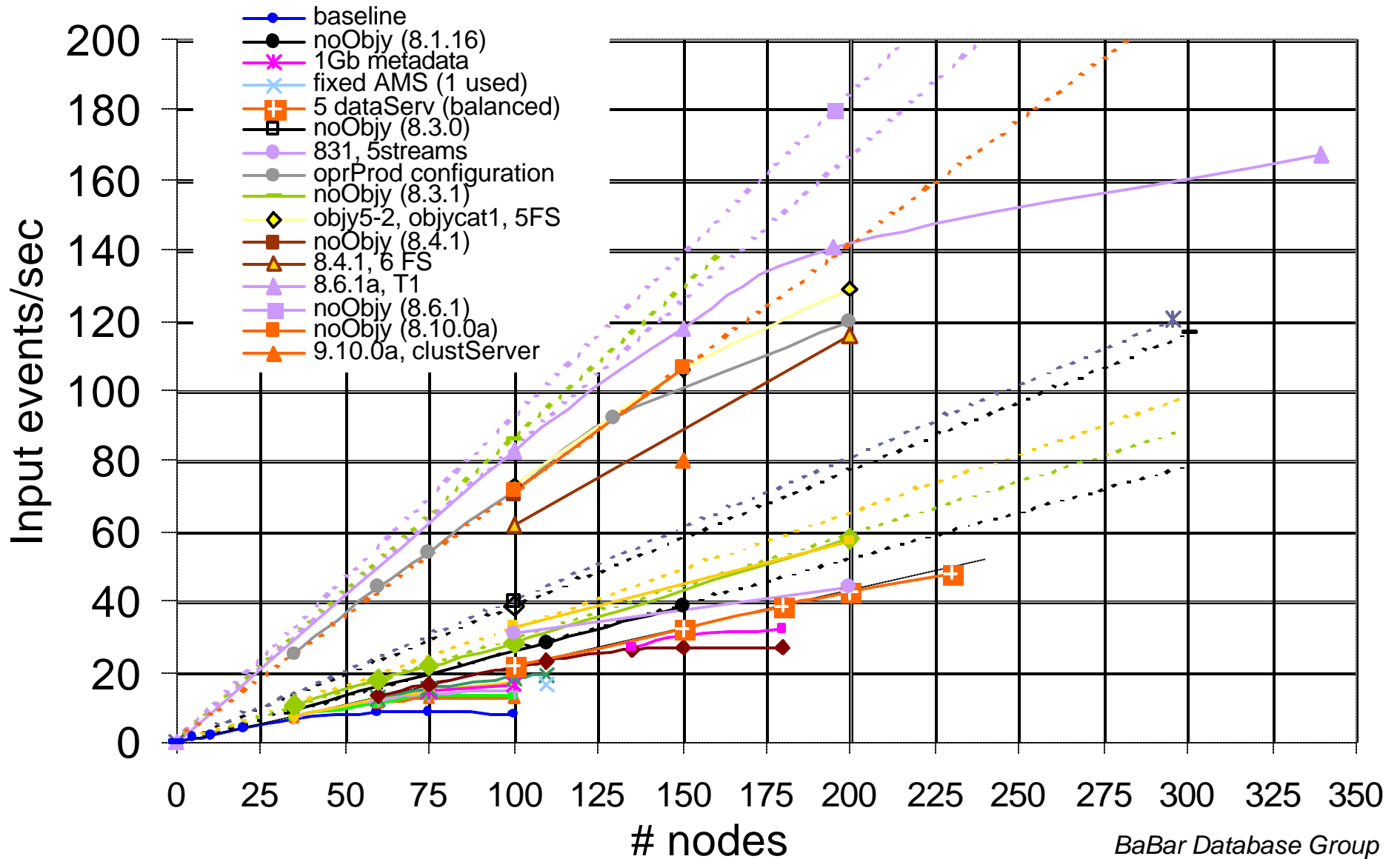 - Solaris8 Workshop 6 Update 2
  - Red Hat Linux 7.2 gcc 2.95.3
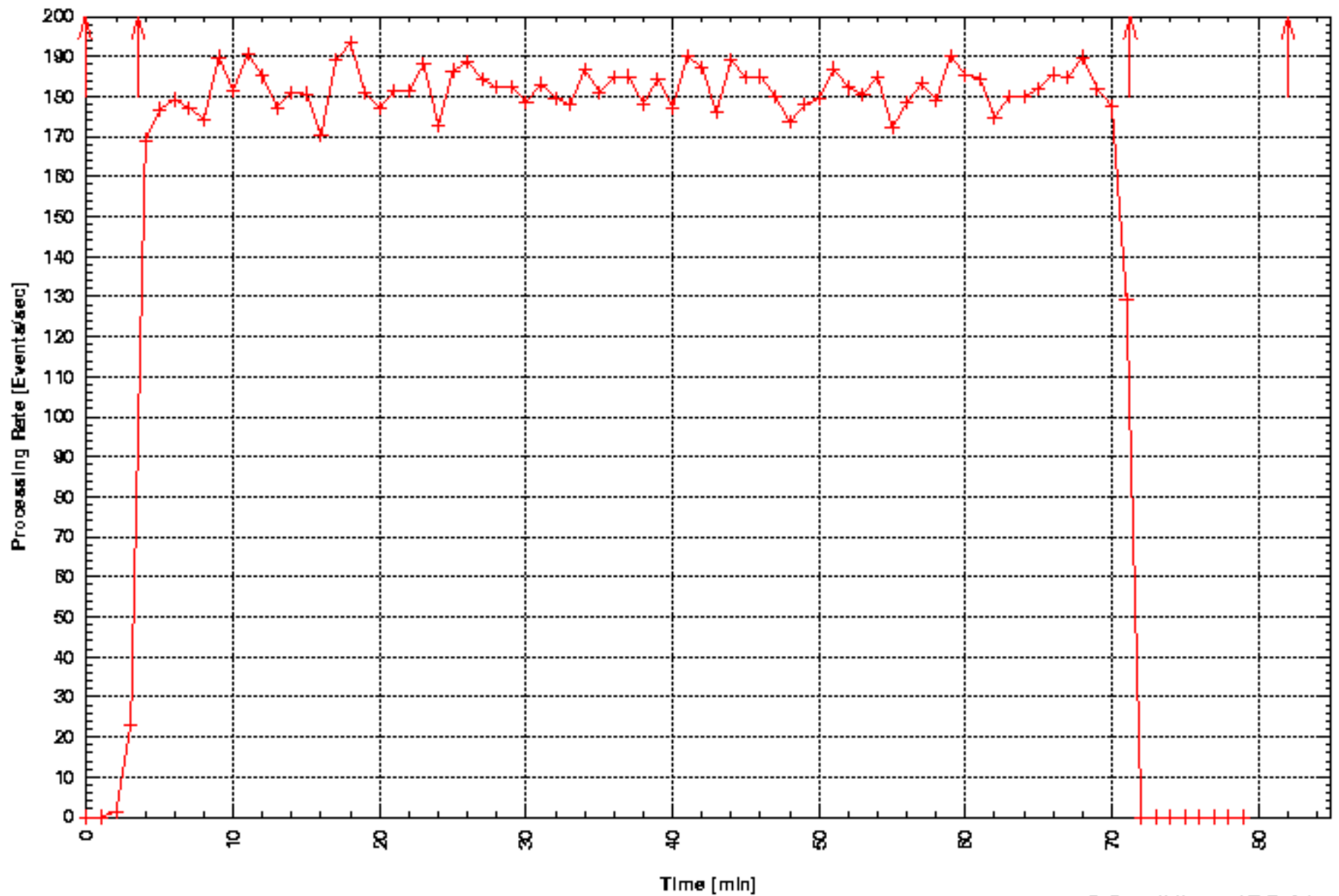
Prompt Reconstruction System

- Current system (as you've probably heard) doesn't scale very well
  - Nonlinear in startup and shutdown
  - Can add more independent farms for reprocessing

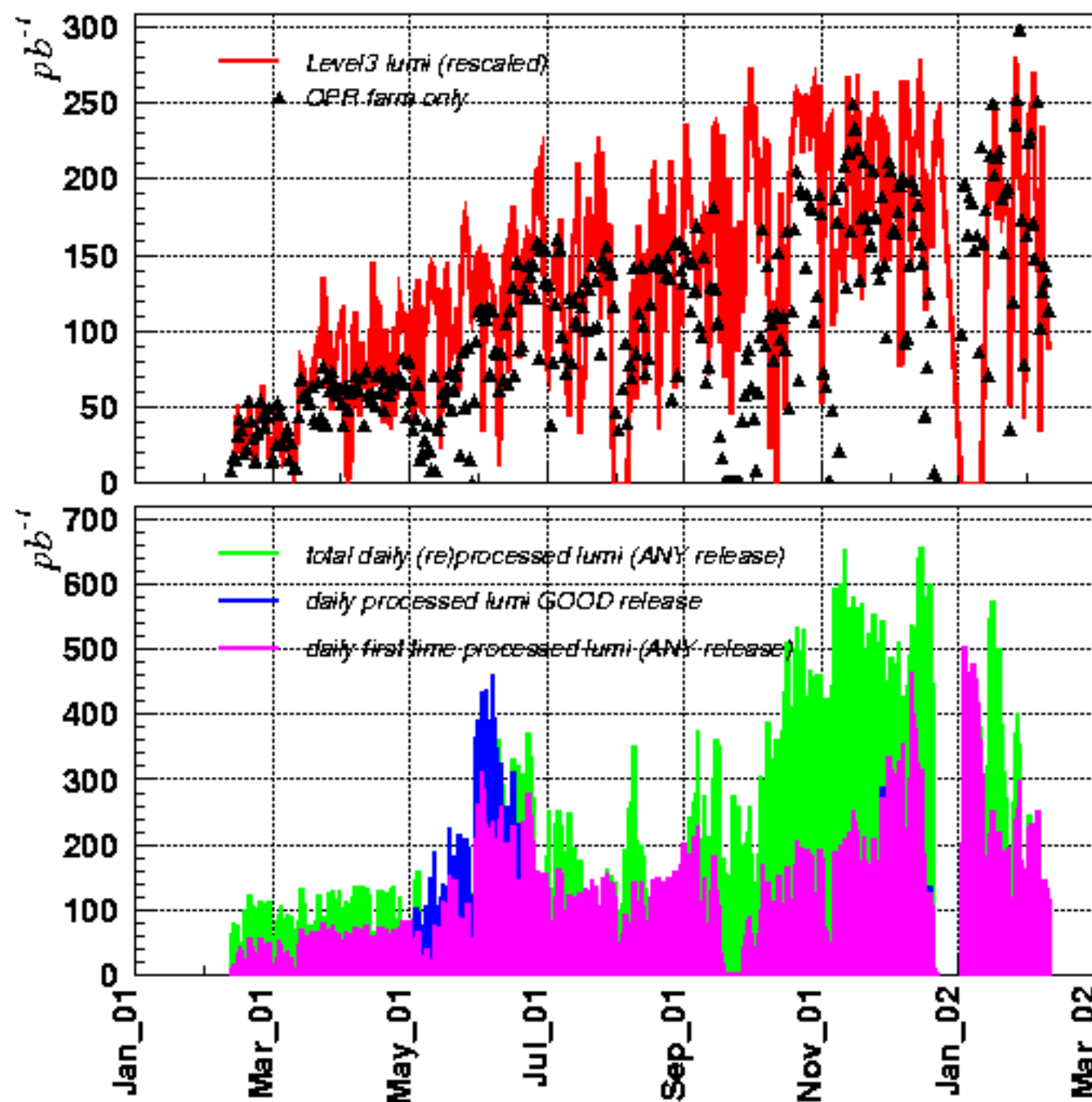- Redesign has been done, and now implementing

1999/2000 Peak Processing Rates

Legend:
- baseline
- noObjy (8.1.16)
- 1Gb metadata
- fixed AMS (1 used)
- 5 dataServ (balanced)
- noObjy (8.3.0)
- 831, 5streams
- oprProd configuration
- noObjy (8.3.1)
- objy5-2, objycat1, 5FS
- noObjy (8.4.1)
- 8.4.1, 6 FS
- 8.6.1a, T1
- noObjy (8.6.1)
- noObjy (8.10.0a)
- 9.10.0a, clustServer

Y-axis: Input events/sec (0 to 200)

X-axis: # nodes (0 to 350)

BaBar Database Group

Proc: 2002-02-01 17:40:36 - 160 Nodes, 740286 Events, 0 IsPhysics   B: -0.12; U: 3.50; D: 71.25; E: 92.02 min

Run-25777-1-02-02-01.17:38:55 - P10.2.3hV00fb (Avg Speed 150.21, 192.11 evts/sec)

Processing Rate [Events/sec]

Time [min]

Fri Feb 01 19:06:17 2002

G.Grosdidier and F.Safai

Daily recorded and processed luminosity as of 20020213

New PR System

- Basic principle is to remove main bottleneck of Rolling Calibrations
  - Each run defines the constants for the next
- First pass done to do required calibrations
  - Means a run will be reconstructed with constants derived from that run
- Works for the future as the luminosity goes up the calibration requirements remain ~constant
- Add more reconstruction farms in second pass as needed to do runs in parallel

Prompt Reco Schematic

HPSS

PromptCalib

RecoFarm1

RecoFarm2

RecoFarm3

RecoFarmN
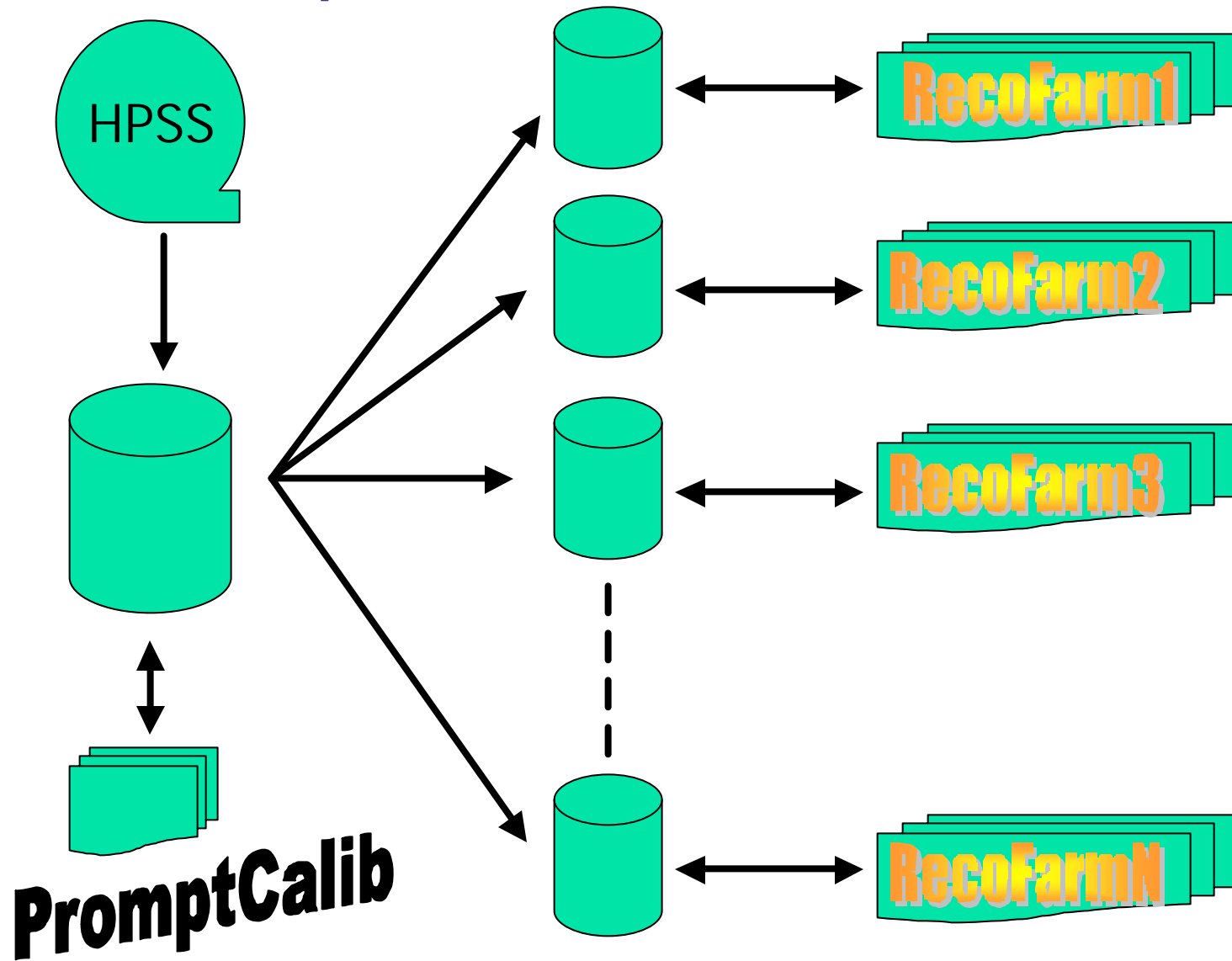
Online

- **System redesigned due to luminosity upgrades**
- **Commissioning cross platform farm**
  - Linux clients, Solaris servers
- **Now testing with small number of test machines**
- **Final system to be installed before shutdown for testing**
- **Will provide factor 5 in scaling**
  - Needed to do more filtering in Level 3 Trigger

Other Issues

- ## Undergoing removal of RogueWave Tools.h++

  - Replacing with C++ Standard Library now that it is "mature"

- ## Working on Objectivity Contingency Plan

  - Want to leverage LHC effort

- ## Project started recently on Site Independent Batch

  - Will be required as we move towards 4 analysis sites, which each may only have a subset of the data
  - Will build on GRID tools as they become available/usable

Summary

- **Taking data for almost 3 years**
- **Reasonably successful in meeting needs**
- **Increasing luminosity required redesign in many areas**