

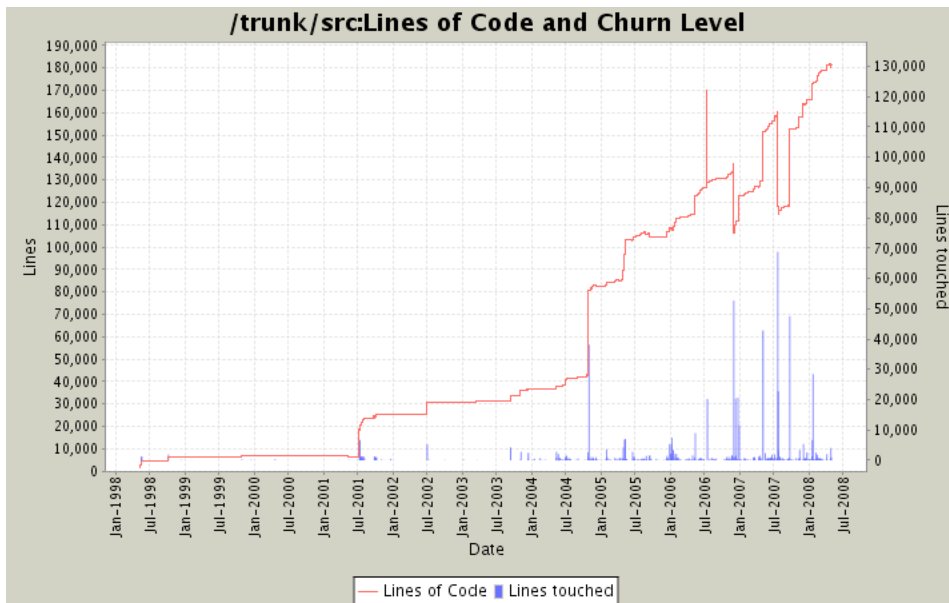
Offline Software Status

David Lawrence, JLab

May 8, 2008

Repository Activity

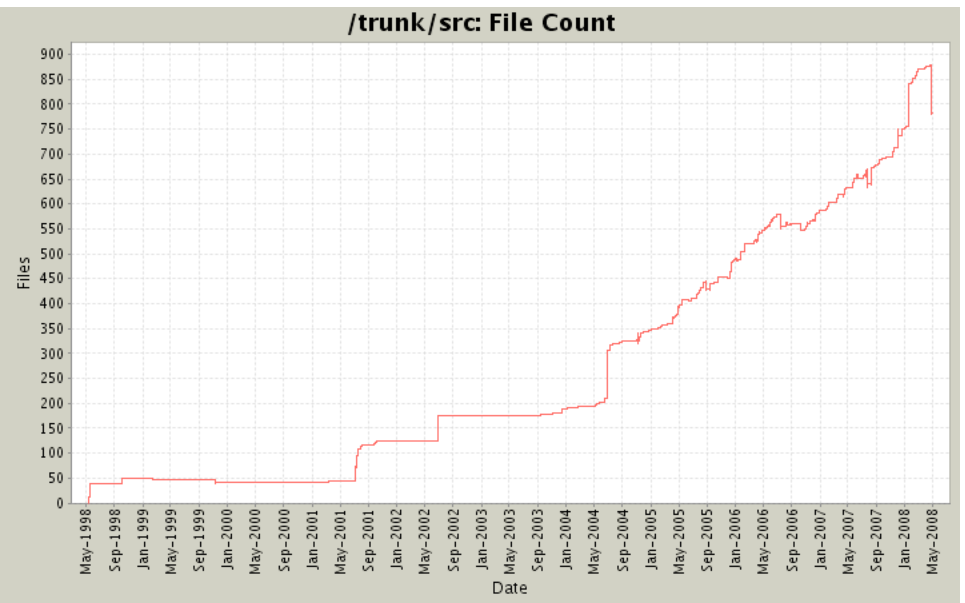
Lines of Code and “Churn”



Jan 1998

Jan 2008
Jul 2008

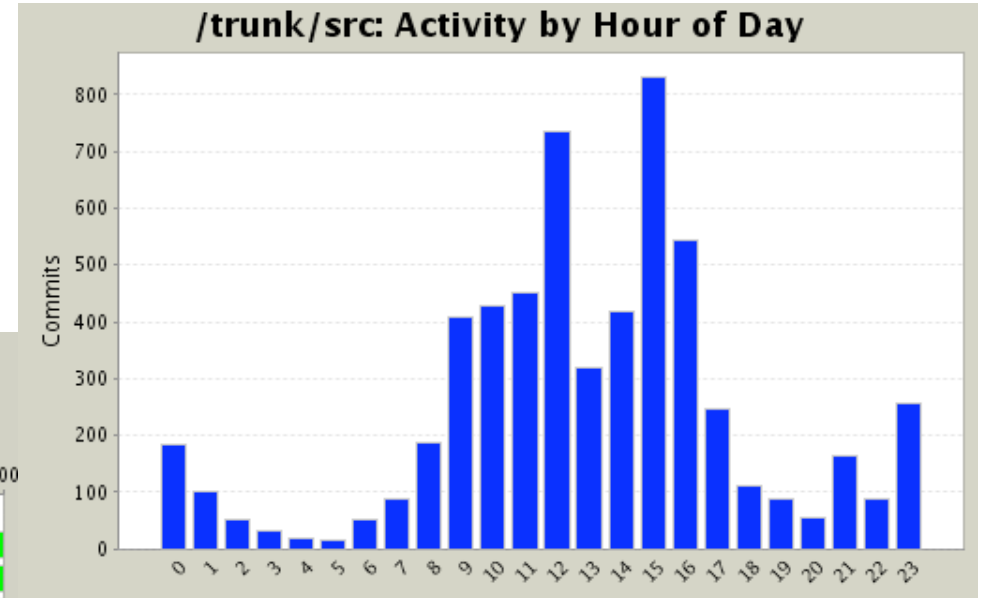
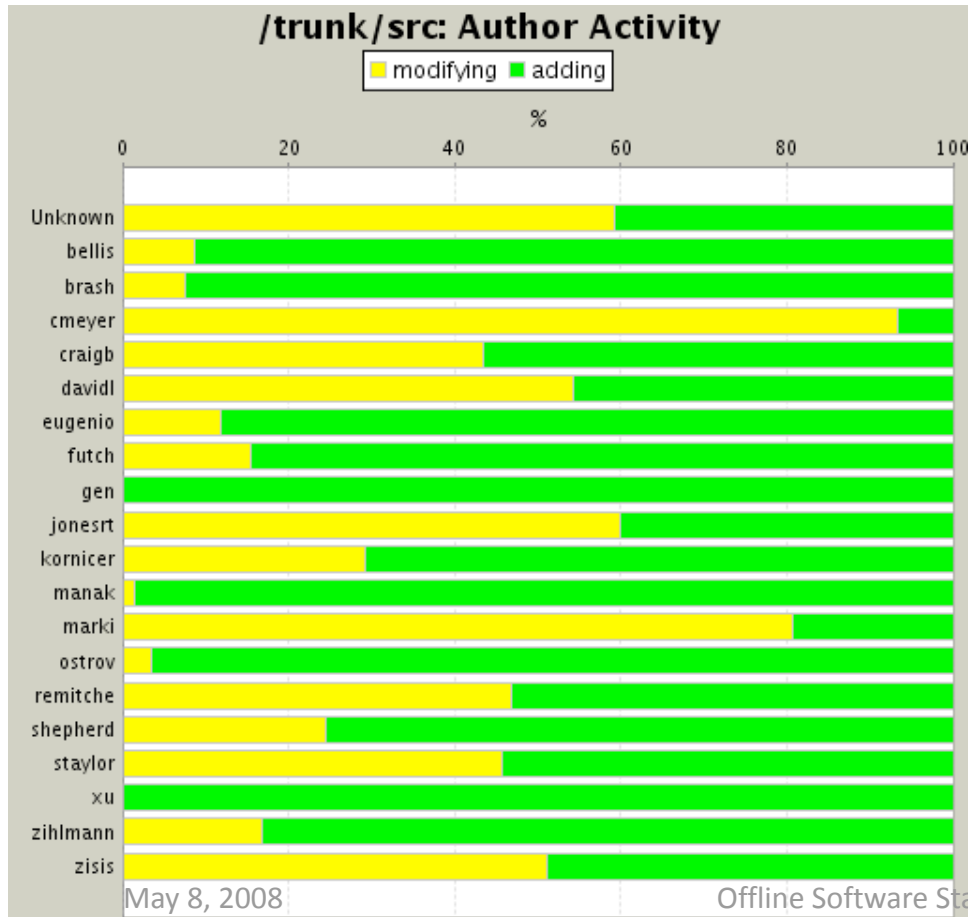
Number of Files



Jan 1998

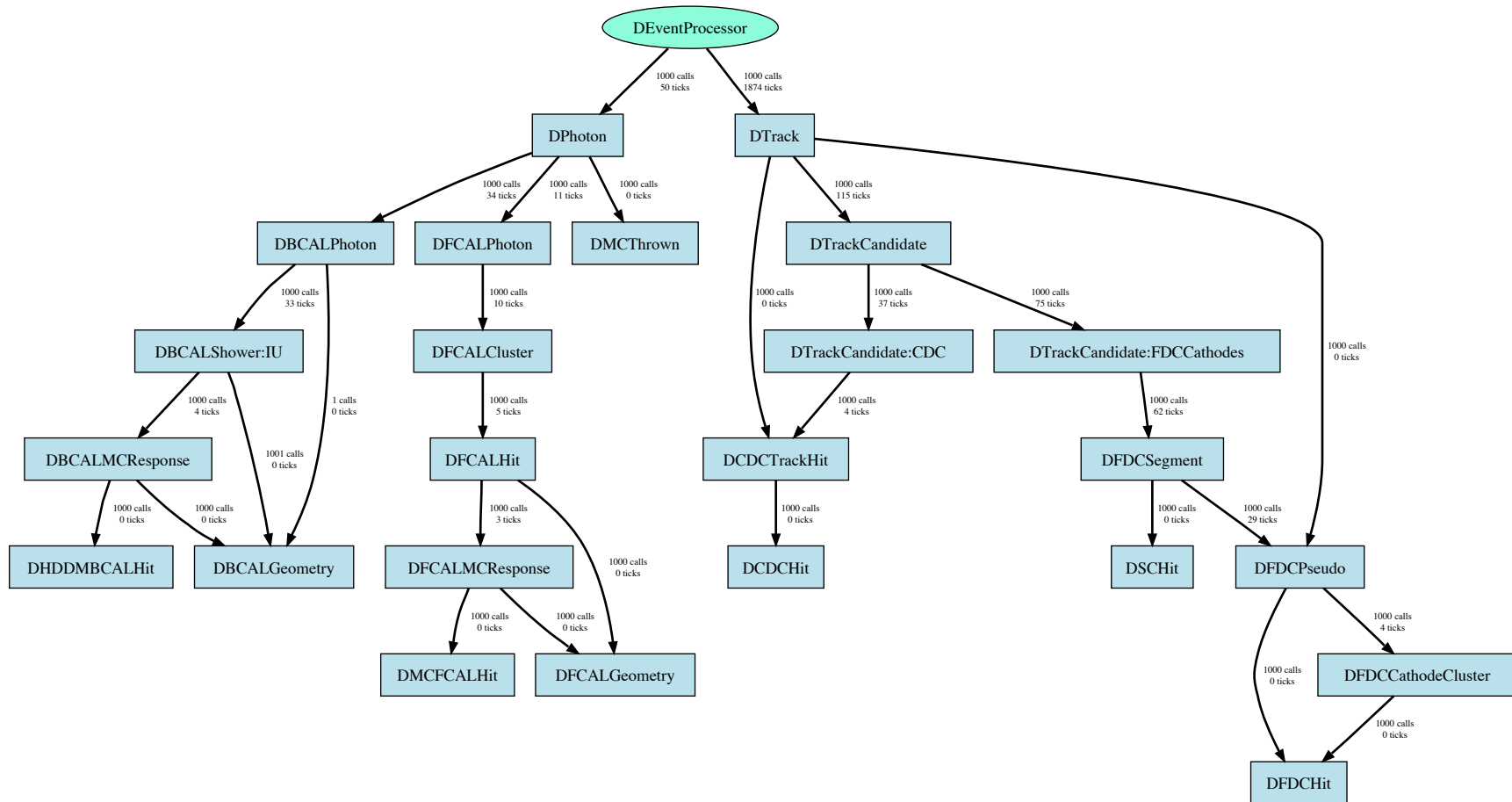
Jan 2008
Jul 2008

Repository Activity cont'



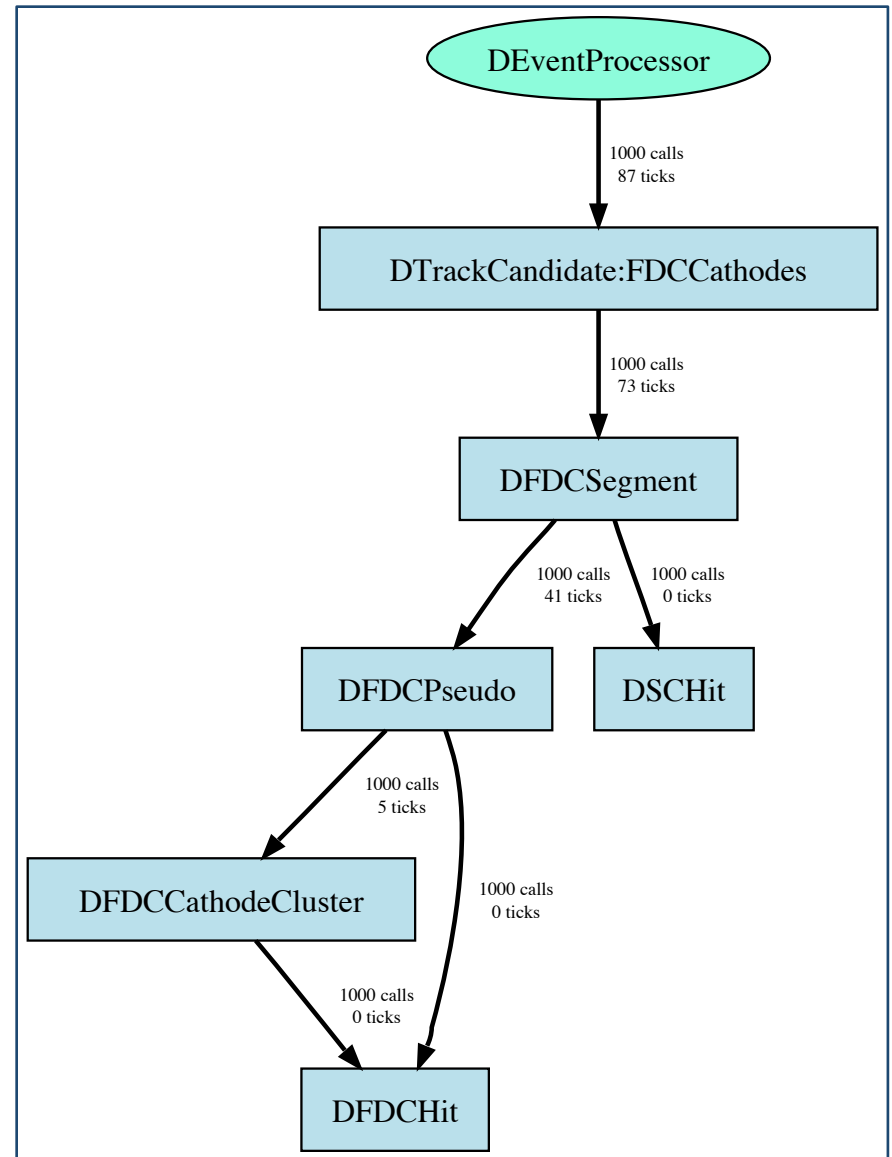
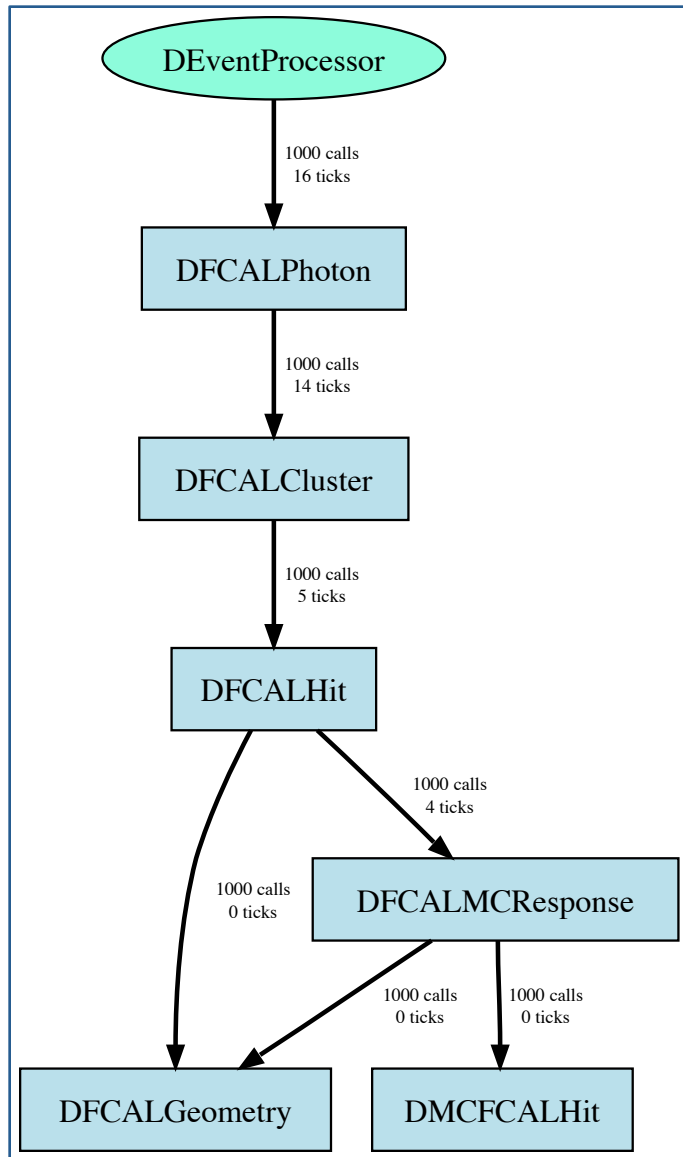
Reconstruction Tree

(Automatically generated using *janadot* plugin)



`hd_root --plugin=janadot -DDTrack -DDPhoton hdgeant.hddm`

Reconstruction Branches



12 GeV Computing Plan

- Jlab IT division (Chip Watson and Sandy Philpott) are trying to get estimates of resources that the physics division will need in the 12GeV era
- No money in 12 GeV budget for additional resources. It is all expected to come from “Operations”.
- This is an opportunity for us to think some more about our computing model and to influence the normal upgrade plans of the IT division.

Hall-D 12GeV Computing Numbers

(part 1)

◇	A	B	C	D	E	F	G
1							
2	Event Simulation	2012	2013	2014	2015	2016	2017
3	SPECint_rate2006 sec/event	6.2	6.2	6.2	6.2	6.2	6.2
4	Number of events	1.0E+09	1.0E+09	2.0E+10	9.0E+10	9.0E+10	9.0E+10
5	Event size (KB)	15	15	15	15	15	15
6	% Stored Long Term	10%	10%	10%	10%	10%	10%
7	Total CPU (SPECint_rate2006)	2.0E+02	2.0E+02	4.0E+03	1.8E+04	1.8E+04	1.8E+04
8	Petabytes / year (PB)	0.0	0.0	0.0	0.1	0.1	0.1
9							
10							
11	Data Acquisition	2012	2013	2014	2015	2016	2017
12	Average event size (KB)	10	10	10	10	10	10
13	Max sustained event rate (kHz)	0	0	2	20	20	20
14	Average event rate (kHz)	0	0	2	20	20	20
15	Average 24-hour duty factor (%)	0%	0%	30%	45%	60%	60%
16	Weeks of operation / year	0	0	13	26	26	26
17	Network (n*10gigE)	1	1	1	1	1	1
18	Silo Bandwidth (MB/s)	0	0	20	200	200	200
19	Petabytes / year	0.0	0.0	0.0	1.4	1.9	1.9

$$R_{\text{hadronic}} * f_{\text{x-sec}} * D * T * 3 * N_{\text{chan}} = 4.2 * 10^9 \text{ events}$$

$R_{\text{hadronic}} = 365\text{kHz}$ Total hadronic rate for 9GeV photons on protons

$f_{\text{x-sec}} = 1\text{nb}/124\mu\text{b}$ Ratio of single physics channel cross-section to total hadronic

$D = 60\%$ 24 hour duty factor

$T = \pi * 10^7 / 2 \text{ sec} = 26 \text{ weeks}$ of Hall-D operation in a year

$3 =$ Ratio of simulate to real events needed for a single channel

$N_{\text{chan}} = 50$ Number of physics channels that need simulating

Hall-D 12GeV Computing Numbers

(part 2)

22	Calibration	2012	2013	2014	2015	2016	2017
23	SPECint_rate2006 sec/event	20	20	20	20	20	20
24	Number of calibration passes	0	0	5	4	3	3
25	Data used in calibration (%)	0%	0%	100%	10%	10%	10%
26	Set size for calibration (GB)	0	0	72	720	720	720
27	Desired set processing time (min)	1	1	60	120	120	120
28	Total CPU (SPECint_rate2006)	0.0E+00	0.0E+00	1.5E-02	3.6E-02	3.6E-02	3.6E-02
29	Priority CPU (SPECint_rate2006)	0.0E+00	0.0E+00	4.0E+01	2.0E+02	2.0E+02	2.0E+02
30							
31							
32	1st Pass Analysis	2012	2013	2014	2015	2016	2017
33	SPECint_rate2006 sec/event	20	20	20	20	20	20
34	Number of analysis passes	0	0	3	2	1.5	1.5
35	Event size out / event size in	0	0	1	0.5	0.5	0.5
36	Total CPU (SPECint_rate2006)	0.0E+00	0.0E+00	9.0E-03	1.8E-01	1.8E-01	1.8E-01
37	Silo Bandwidth (MB/s)	0	0	120	600	450	450
38	Petabytes / year	0.0	0.0	0.0	0.7	0.9	0.9
39							
40							
41	Total SPECint_rate2006	2.0E+02	2.0E+02	4.0E+03	1.8E+04	1.8E+04	1.8E+04
42	SPECint_rate2006 / node	600	900	1350	2025	3038	4556
43	# nodes needed (current year)	0	0	3	9	6	4
44	Petabytes / year	0	0	0	2	3	3
45							
46	Cost of disk \$/TB	\$198	\$132	\$88	\$59	\$39	\$26
47	Cost of tape \$/TB	\$68	\$56	\$47	\$39	\$33	\$27
48	Annual cost of tape (\$K)	\$0	\$0	\$6	\$88	\$97	\$80
49	Number of new nodes	0	0	3	7	1	0
50	Cost of compute nodes (\$K)	\$0	\$0	\$0	\$14	\$1	\$0
51	Budget (\$K) (IT Division)	\$0	\$0	\$6	\$102	\$98	\$80

Work to focus on this Summer

- Considerable work is still needed on the tracking reconstruction package
 - Work has started on Kalman filter (see Simon's talk)
 - List of issues/studies made at April 4, 2008 Tracking meeting on wiki
- Implement calibration database for schedule line 1.2.3.3.3-015 by Jan 2009
- *HDParseSim* development and **use** (see Mark's talk)