## Libpll sequential benchmarks

## January 9, 2017

• node : node index (post order traversal)

 $\bullet\,$  depth : node depth from the virtual root

• lsize : recursive number of children under the left child node

• rsize : recursive number of children under the right child node

• psize: number of unique (not repeating) sites on the current node

• lsize : number of unique (not repeating) sites on the left child node

• rsize: number of unique (not repeating) sites on the right child node

• repeats: runtime for 500 updatepartials on the node

 $\bullet$  TCLV opt : runtime for 500 update partials on the node with left and right TCLV

## 1 dataset 404

node	psrsize	lsrsize	rsrsize	repeats	bclv	bclv 2	hybrid
node0	24	5	6	14ms	$15 \mathrm{ms}$	$9 \mathrm{ms}$	9ms
node1	21	5	7	$13 \mathrm{ms}$	$14 \mathrm{ms}$	$10 \mathrm{ms}$	$9 \mathrm{ms}$
node2	28	5	21	$15 \mathrm{ms}$	$14 \mathrm{ms}$	$13 \mathrm{ms}$	14ms
node3	65	28	8	28ms	$23 \mathrm{ms}$	18ms	25ms
node4	98	65	7	$38 \mathrm{ms}$	$30 \mathrm{ms}$	28ms	$30 \mathrm{ms}$
node5	17	6	5	11ms	12ms	9ms	12ms
node6	18	5	17	12ms	$12 \mathrm{ms}$	12ms	11ms
node7	23	5	18	13ms	$12 \mathrm{ms}$	12ms	12ms
node8	13	5	5	11ms	11ms	$9 \mathrm{ms}$	11ms
node9	11	5	5	9ms	$10 \mathrm{ms}$	$9 \mathrm{ms}$	10ms
node10	20	5	11	12ms	$12 \mathrm{ms}$	$10 \mathrm{ms}$	11ms
node11	38	13	20	18ms	$20 \mathrm{ms}$	16ms	20ms
node12	51	5	38	$23 \mathrm{ms}$	$20 \mathrm{ms}$	21ms	$19 \mathrm{ms}$
node13	83	23	51	$34 \mathrm{ms}$	$32 \mathrm{ms}$	$27 \mathrm{ms}$	$31 \mathrm{ms}$
node14	194	98	83	$72 \mathrm{ms}$	$82 \mathrm{ms}$	$62 \mathrm{ms}$	$82 \mathrm{ms}$
node15	246	24	194	100ms	$69 \mathrm{ms}$	$70 \mathrm{ms}$	$70 \mathrm{ms}$
node16	267	6	246	$95 \mathrm{ms}$	$69 \mathrm{ms}$	84ms	$69 \mathrm{ms}$
node17	273	6	267	$97 \mathrm{ms}$	$70 \mathrm{ms}$	$86 \mathrm{ms}$	71ms
node18	273	5	273	$96 \mathrm{ms}$	$70 \mathrm{ms}$	$86 \mathrm{ms}$	71ms
node19	22	5	5	13ms	$15 \mathrm{ms}$	$9 \mathrm{ms}$	9ms

node	psrsize	lsrsize	rsrsize	repeats	bclv	bclv 2	hybrid
node20	23	5	5	$15 \mathrm{ms}$	$15 \mathrm{ms}$	9ms	9ms
node21	25	5	5	17ms	$15 \mathrm{ms}$	9ms	9ms
node22	120	23	25	$55 \mathrm{ms}$	$53 \mathrm{ms}$	21ms	21ms
node23	272	22	120	101ms	$76 \mathrm{ms}$	$50 \mathrm{ms}$	$76 \mathrm{ms}$
node24	341	5	272	120ms	$86 \mathrm{ms}$	$86 \mathrm{ms}$	86ms
node25	22	5	5	$13 \mathrm{ms}$	14ms	9ms	9ms
node26	63	5	22	$27 \mathrm{ms}$	21ms	$14 \mathrm{ms}$	21ms
node27	76	5	63	$32 \mathrm{ms}$	$25 \mathrm{ms}$	$25 \mathrm{ms}$	$25 \mathrm{ms}$
node28	17	6	5	11ms	12ms	9ms	12ms
node29	37	5	17	18ms	$15 \mathrm{ms}$	$12 \mathrm{ms}$	16ms
node30	24	5	6	14ms	$15 \mathrm{ms}$	$9 \mathrm{ms}$	$10 \mathrm{ms}$
node31	35	24	5	$17 \mathrm{ms}$	$15 \mathrm{ms}$	$15 \mathrm{ms}$	$15 \mathrm{ms}$
node32	131	37	35	$50 \mathrm{ms}$	$57 \mathrm{ms}$	$29 \mathrm{ms}$	28ms
node33	23	6	5	$13 \mathrm{ms}$	$14 \mathrm{ms}$	$10 \mathrm{ms}$	10ms
node34	43	6	23	$20 \mathrm{ms}$	18ms	$15 \mathrm{ms}$	19ms
node35	55	5	43	28ms	$20 \mathrm{ms}$	$21 \mathrm{ms}$	$20 \mathrm{ms}$
node36	16	5	5	11ms	$13 \mathrm{ms}$	9ms	9ms
node37	29	16	5	$15 \mathrm{ms}$	14ms	$13 \mathrm{ms}$	14ms
node38	111	55	29	44ms	$49 \mathrm{ms}$	$31 \mathrm{ms}$	51ms
node39	120	5	111	51ms	$37 \mathrm{ms}$	$40 \mathrm{ms}$	$36 \mathrm{ms}$

node	psrsize	lsrsize	rsrsize	repeats	bclv	bclv 2	hybrid
node40	281	131	120	100ms	117ms	91ms	115ms
node41	421	76	281	148ms	129ms	130ms	127ms
node42	927	341	421	$325 \mathrm{ms}$	372ms	239ms	372ms
node43	21	6	5	13ms	14ms	9ms	9ms
node44	46	5	21	21ms	19ms	14ms	18ms
node45	17	5	5	11ms	12ms	10ms	$10 \mathrm{ms}$
node46	10	5	5	9ms	9ms	$9 \mathrm{ms}$	$10 \mathrm{ms}$
node47	25	5	5	14ms	$15 \mathrm{ms}$	$9 \mathrm{ms}$	$9 \mathrm{ms}$
node48	69	5	25	$29 \mathrm{ms}$	$25 \mathrm{ms}$	15ms	23ms
node49	179	10	69	$66 \mathrm{ms}$	$54 \mathrm{ms}$	$33 \mathrm{ms}$	$50 \mathrm{ms}$
node50	185	5	179	$70 \mathrm{ms}$	$56 \mathrm{ms}$	58ms	$50 \mathrm{ms}$
node51	215	17	185	$80 \mathrm{ms}$	61ms	64ms	61ms
node52	25	5	5	14ms	17ms	$9 \mathrm{ms}$	$9 \mathrm{ms}$
node53	466	215	25	$165 \mathrm{ms}$	136ms	82ms	121ms
node54	704	46	466	245ms	195ms	204ms	182ms
node55	796	6	704	275ms	209ms	214ms	191ms
node56	25	5	5	14ms	16ms	9ms	9ms
node57	22	5	5	$13 \mathrm{ms}$	14ms	$9 \mathrm{ms}$	9ms
node58	57	5	22	$25 \mathrm{ms}$	21ms	14ms	$20 \mathrm{ms}$
node59	14	6	5	10ms	12ms	$9 \mathrm{ms}$	11ms

node	psrsize	lsrsize	rsrsize	repeats	bclv	bclv 2	hybrid
node60	23	5	5	$13 \mathrm{ms}$	$15 \mathrm{ms}$	$9 \mathrm{ms}$	9ms
node61	69	14	23	$29 \mathrm{ms}$	$32 \mathrm{ms}$	$17 \mathrm{ms}$	18ms
node62	9	5	5	$9 \mathrm{ms}$	9ms	8ms	9ms
node63	35	5	9	$17 \mathrm{ms}$	$19 \mathrm{ms}$	10ms	11ms
node64	87	5	35	$35 \mathrm{ms}$	$27 \mathrm{ms}$	21ms	28ms
node65	212	69	87	$78 \mathrm{ms}$	88ms	$57 \mathrm{ms}$	88ms
node66	228	5	212	84ms	$59 \mathrm{ms}$	$69 \mathrm{ms}$	$60 \mathrm{ms}$
node67	29	9	5	$16 \mathrm{ms}$	17ms	11ms	11ms
node68	19	5	5	$12 \mathrm{ms}$	$13 \mathrm{ms}$	9ms	9ms
node69	106	29	19	$42 \mathrm{ms}$	48ms	21ms	21ms
node70	15	5	5	11ms	12ms	9ms	9ms
node71	146	106	15	$56 \mathrm{ms}$	48ms	42ms	43ms
node72	434	228	146	158ms	177ms	135ms	177ms
node73	449	5	434	$167 \mathrm{ms}$	123ms	131ms	112ms
node74	522	57	449	185ms	145ms	177ms	144ms
node75	555	5	522	191ms	141ms	174ms	136ms
node76	638	5	555	224ms	$155 \mathrm{ms}$	169ms	157ms
node77	24	5	5	$14 \mathrm{ms}$	$15 \mathrm{ms}$	$9 \mathrm{ms}$	9ms
node78	23	5	5	$13 \mathrm{ms}$	14ms	$9 \mathrm{ms}$	9ms
node79	60	5	23	$28 \mathrm{ms}$	21ms	$15 \mathrm{ms}$	21ms

node	psrsize	lsrsize	rsrsize	repeats	bclv	bclv 2	hybrid
node80	212	24	60	84ms	$62 \mathrm{ms}$	$34 \mathrm{ms}$	$36 \mathrm{ms}$
node81	17	6	5	11ms	$12 \mathrm{ms}$	9ms	12ms
node82	33	5	17	$17 \mathrm{ms}$	$15 \mathrm{ms}$	$13 \mathrm{ms}$	14ms
node83	24	5	5	14ms	$15 \mathrm{ms}$	9ms	9ms
node84	17	5	5	11ms	$12 \mathrm{ms}$	9ms	9ms
node85	27	17	5	$15 \mathrm{ms}$	$14 \mathrm{ms}$	12ms	$13 \mathrm{ms}$
node86	40	5	27	$19 \mathrm{ms}$	$17 \mathrm{ms}$	$15 \mathrm{ms}$	16ms
node87	56	40	5	$25 \mathrm{ms}$	$20 \mathrm{ms}$	$19 \mathrm{ms}$	$20 \mathrm{ms}$
node88	20	5	5	12ms	$13 \mathrm{ms}$	9ms	9ms
node89	82	56	20	$33 \mathrm{ms}$	$31 \mathrm{ms}$	$29 \mathrm{ms}$	31ms
node90	8	5	5	8ms	9ms	9ms	9ms
node91	18	5	5	12ms	$13 \mathrm{ms}$	9ms	9ms
node92	37	8	18	18ms	$16 \mathrm{ms}$	13ms	16ms
node93	13	5	5	10ms	11ms	9ms	11ms
node94	16	5	5	12ms	12ms	9ms	9ms
node95	9	5	5	9ms	11ms	8ms	10ms
node96	38	16	9	$19 \mathrm{ms}$	$21 \mathrm{ms}$	$13 \mathrm{ms}$	21ms
node97	54	5	38	24ms	$19 \mathrm{ms}$	18ms	19ms
node98	73	5	54	$30 \mathrm{ms}$	$24 \mathrm{ms}$	$23 \mathrm{ms}$	24ms
node99	96	13	73	$39 \mathrm{ms}$	$31 \mathrm{ms}$	$30 \mathrm{ms}$	31ms

node	psrsize	lsrsize	rsrsize	repeats	bclv	bclv 2	hybrid
node100	145	37	96	$55 \mathrm{ms}$	$49 \mathrm{ms}$	$45 \mathrm{ms}$	$51 \mathrm{ms}$
node101	220	82	145	81ms	$91 \mathrm{ms}$	$70 \mathrm{ms}$	92ms
node102	331	24	220	116ms	88ms	$78 \mathrm{ms}$	88ms
node103	19	5	5	12ms	$13 \mathrm{ms}$	9ms	9ms
node104	17	5	5	11ms	$12 \mathrm{ms}$	9ms	$9 \mathrm{ms}$
node105	22	5	5	$13 \mathrm{ms}$	$14 \mathrm{ms}$	9ms	$9 \mathrm{ms}$
node106	14	5	5	$10 \mathrm{ms}$	$11 \mathrm{ms}$	9ms	11ms
node107	33	5	14	$17 \mathrm{ms}$	$14 \mathrm{ms}$	12ms	15ms
node108	46	5	33	21ms	$18 \mathrm{ms}$	18ms	18ms
node109	12	5	5	$10 \mathrm{ms}$	$11 \mathrm{ms}$	9ms	10ms
node110	15	5	5	11ms	$12 \mathrm{ms}$	9ms	$9 \mathrm{ms}$
node111	46	15	5	$23 \mathrm{ms}$	$17 \mathrm{ms}$	12ms	12ms
node112	62	12	46	$27 \mathrm{ms}$	$23 \mathrm{ms}$	22ms	23ms
node113	108	46	62	$42 \mathrm{ms}$	$49 \mathrm{ms}$	$40 \mathrm{ms}$	48ms
node114	146	5	108	$56 \mathrm{ms}$	$41 \mathrm{ms}$	$39 \mathrm{ms}$	41ms
node115	149	5	146	$63 \mathrm{ms}$	$41 \mathrm{ms}$	49ms	$42 \mathrm{ms}$
node116	189	5	149	77ms	$51 \mathrm{ms}$	51ms	66ms
node117	20	5	5	$13 \mathrm{ms}$	$13 \mathrm{ms}$	9ms	9ms
node118	256	189	20	96ms	$70 \mathrm{ms}$	71ms	77ms
node119	336	22	256	$133 \mathrm{ms}$	91ms	88ms	91ms

node	psrsize	lsrsize	rsrsize	repeats	bclv	bclv 2	hybrid
node120	344	5	336	123ms	89ms	104ms	86ms
node121	372	17	344	131ms	$99 \mathrm{ms}$	113ms	96ms
node122	15	5	5	11ms	12ms	9ms	9ms
node123	20	5	15	12ms	12ms	11ms	12ms
node124	18	5	5	12ms	$13 \mathrm{ms}$	$9 \mathrm{ms}$	$9 \mathrm{ms}$
node125	49	20	18	22ms	$25 \mathrm{ms}$	17ms	$25 \mathrm{ms}$
node126	66	5	49	28ms	22ms	$23 \mathrm{ms}$	$22 \mathrm{ms}$
node127	480	372	66	168ms	137ms	134ms	$138 \mathrm{ms}$
node128	535	19	480	187ms	134ms	151ms	$135 \mathrm{ms}$
node129	948	331	535	$326 \mathrm{ms}$	$380 \mathrm{ms}$	280ms	$380 \mathrm{ms}$
node130	1004	33	948	$346 \mathrm{ms}$	$253 \mathrm{ms}$	293ms	$247 \mathrm{ms}$
node131	1041	5	1004	$366 \mathrm{ms}$	261ms	298ms	$265 \mathrm{ms}$
node132	1379	212	1041	478ms	$405 \mathrm{ms}$	400ms	$406 \mathrm{ms}$
node133	24	5	5	14ms	15ms	9ms	$9 \mathrm{ms}$
node134	50	5	24	22ms	18ms	14ms	18ms
node135	70	5	50	29ms	24ms	$25 \mathrm{ms}$	24ms
node136	16	5	5	11ms	12ms	9ms	9ms
node137	13	5	5	$10 \mathrm{ms}$	11ms	9ms	11ms
node138	39	16	13	$19 \mathrm{ms}$	21ms	14ms	21ms
node139	56	39	5	$25 \mathrm{ms}$	20ms	22ms	$20 \mathrm{ms}$

node	psrsize	lsrsize	rsrsize	repeats	bclv	bclv 2	hybrid
node140	159	70	56	$59 \mathrm{ms}$	$68 \mathrm{ms}$	$45 \mathrm{ms}$	68ms
node141	24	5	5	14ms	18ms	9ms	9ms
node142	250	159	24	92ms	$72 \mathrm{ms}$	68ms	69ms
node143	1768	1379	250	$605 \mathrm{ms}$	490ms	493ms	489ms
node144	1774	5	1768	$603 \mathrm{ms}$	417ms	527ms	420ms
node145	1863	5	1774	634ms	444ms	529ms	443ms
node146	2448	638	1863	846ms	768ms	771ms	763ms
node147	21	8	5	$13 \mathrm{ms}$	$15 \mathrm{ms}$	$10 \mathrm{ms}$	14ms
node148	43	21	6	$20 \mathrm{ms}$	17ms	14ms	17ms
node149	82	43	5	$33 \mathrm{ms}$	26ms	23ms	26ms
node150	2574	2448	82	882ms	$635 \mathrm{ms}$	759ms	635ms
node151	21	5	5	$13 \mathrm{ms}$	14ms	9ms	$9 \mathrm{ms}$
node152	62	21	5	26ms	21ms	$16 \mathrm{ms}$	21ms
node153	125	5	62	48ms	$36 \mathrm{ms}$	31ms	$36 \mathrm{ms}$
node154	226	5	125	81ms	$59 \mathrm{ms}$	$46 \mathrm{ms}$	59ms
node155	25	5	5	14ms	17ms	9ms	$9 \mathrm{ms}$
node156	14	5	5	$10 \mathrm{ms}$	12ms	9ms	11ms
node157	58	25	14	$25 \mathrm{ms}$	28ms	18ms	28ms
node158	26	6	5	14ms	16ms	9ms	10ms
node159	25	11	5	14ms	$13 \mathrm{ms}$	$10 \mathrm{ms}$	13ms

node	psrsize	lsrsize	rsrsize	repeats	bclv	bclv 2	hybrid
node160	25	5	5	$14 \mathrm{ms}$	$16 \mathrm{ms}$	9ms	9ms
node161	24	5	5	14ms	16ms	9ms	9ms
node162	24	5	5	14ms	15ms	9ms	9ms
node163	40	5	24	$19 \mathrm{ms}$	17ms	14ms	16ms
node164	101	40	5	41ms	$30 \mathrm{ms}$	$23 \mathrm{ms}$	$30 \mathrm{ms}$
node165	189	6	101	$69 \mathrm{ms}$	51ms	$38 \mathrm{ms}$	51ms
node166	23	5	5	14ms	14ms	9ms	$9 \mathrm{ms}$
node167	64	23	5	28ms	22ms	14ms	22ms
node168	364	189	64	127ms	109ms	$89 \mathrm{ms}$	110ms
node169	399	364	5	139ms	$99 \mathrm{ms}$	114ms	$99 \mathrm{ms}$
node170	431	5	399	$153 \mathrm{ms}$	108ms	$122 \mathrm{ms}$	$107 \mathrm{ms}$
node171	524	24	431	187ms	136ms	$147 \mathrm{ms}$	$135 \mathrm{ms}$
node172	560	5	524	192ms	$135 \mathrm{ms}$	$169 \mathrm{ms}$	$138 \mathrm{ms}$
node173	675	25	560	$236 \mathrm{ms}$	172ms	$183 \mathrm{ms}$	171ms
node174	729	25	675	$256 \mathrm{ms}$	184ms	$209 \mathrm{ms}$	$182 \mathrm{ms}$
node175	740	5	729	$256 \mathrm{ms}$	176ms	$218 \mathrm{ms}$	$178 \mathrm{ms}$
node176	25	5	5	14ms	$15 \mathrm{ms}$	9ms	9ms
node177	68	25	5	29ms	$23 \mathrm{ms}$	$15 \mathrm{ms}$	$23 \mathrm{ms}$
node178	24	5	5	14ms	$15 \mathrm{ms}$	9ms	9ms
node179	54	24	5	24ms	$19 \mathrm{ms}$	$15 \mathrm{ms}$	$19 \mathrm{ms}$

node	psrsize	lsrsize	rsrsize	repeats	bclv	bclv 2	hybrid
node180	236	68	54	$85 \mathrm{ms}$	$99 \mathrm{ms}$	$52 \mathrm{ms}$	$47 \mathrm{ms}$
node181	1009	740	236	$348 \mathrm{ms}$	$305 \mathrm{ms}$	292ms	$306 \mathrm{ms}$
node182	1021	1009	5	$353 \mathrm{ms}$	245ms	298ms	$245 \mathrm{ms}$
node183	25	5	5	14ms	$15 \mathrm{ms}$	9ms	$9 \mathrm{ms}$
node184	82	25	5	$34 \mathrm{ms}$	26ms	$15 \mathrm{ms}$	$15 \mathrm{ms}$
node185	1197	1021	82	414ms	$308 \mathrm{ms}$	$343 \mathrm{ms}$	$313 \mathrm{ms}$
node186	1240	26	1197	426ms	304ms	$367 \mathrm{ms}$	$304 \mathrm{ms}$
node187	1279	5	1240	436ms	$303 \mathrm{ms}$	$373 \mathrm{ms}$	$305 \mathrm{ms}$
node188	1295	1279	5	$439 \mathrm{ms}$	306ms	$376 \mathrm{ms}$	$305 \mathrm{ms}$
node189	1334	8	1295	456ms	347ms	392ms	$317 \mathrm{ms}$
node190	1389	5	1334	475ms	368ms	$403 \mathrm{ms}$	$334 \mathrm{ms}$
node191	27	5	8	$15 \mathrm{ms}$	$17 \mathrm{ms}$	10ms	$10 \mathrm{ms}$
node192	22	5	5	13ms	15ms	9ms	9ms
node193	27	5	9	15ms	16ms	10ms	$10 \mathrm{ms}$
node194	58	6	27	$25 \mathrm{ms}$	21ms	16ms	21ms
node195	104	6	58	41ms	31ms	$25 \mathrm{ms}$	31ms
node196	23	5	6	13ms	14ms	$10 \mathrm{ms}$	$10 \mathrm{ms}$
node197	39	5	23	19ms	$16 \mathrm{ms}$	14ms	16ms
node198	59	7	39	26ms	21ms	$19 \mathrm{ms}$	21ms
node199	88	59	5	$36 \mathrm{ms}$	28ms	$29 \mathrm{ms}$	$27 \mathrm{ms}$

node	psrsize	lsrsize	rsrsize	repeats	bclv	bclv 2	hybrid
node200	25	5	6	14ms	$15 \mathrm{ms}$	$10 \mathrm{ms}$	10ms
node201	65	25	5	28ms	22ms	$15 \mathrm{ms}$	22ms
node202	250	88	65	98ms	$103 \mathrm{ms}$	$60 \mathrm{ms}$	$105 \mathrm{ms}$
node203	29	11	6	$16 \mathrm{ms}$	$17 \mathrm{ms}$	11ms	$17 \mathrm{ms}$
node204	65	6	29	28ms	22ms	$17 \mathrm{ms}$	23ms
node205	386	250	65	$135 \mathrm{ms}$	113ms	98ms	117ms
node206	417	5	386	145ms	105ms	122ms	$103 \mathrm{ms}$
node207	538	104	417	192ms	161ms	171ms	$166 \mathrm{ms}$
node208	584	22	538	202ms	147ms	182ms	148ms
node209	645	27	584	$225 \mathrm{ms}$	181ms	186ms	$167 \mathrm{ms}$
node210	28	5	9	$15 \mathrm{ms}$	17ms	$10 \mathrm{ms}$	$10 \mathrm{ms}$
node211	34	12	6	$17 \mathrm{ms}$	16ms	11ms	$15 \mathrm{ms}$
node212	182	28	34	$72 \mathrm{ms}$	77ms	31ms	$31 \mathrm{ms}$
node213	29	10	5	$15 \mathrm{ms}$	14ms	12ms	$14 \mathrm{ms}$
node214	59	6	29	$26 \mathrm{ms}$	21ms	$19 \mathrm{ms}$	21ms
node215	93	59	6	$37 \mathrm{ms}$	29ms	$25 \mathrm{ms}$	$29 \mathrm{ms}$
node216	151	7	93	$56 \mathrm{ms}$	42ms	$35 \mathrm{ms}$	42ms
node217	169	5	151	$62 \mathrm{ms}$	46ms	51ms	$46 \mathrm{ms}$
node218	23	5	5	14ms	$15 \mathrm{ms}$	9ms	9ms
node219	46	6	23	21ms	18ms	$16 \mathrm{ms}$	18ms

node	psrsize	lsrsize	rsrsize	repeats	bclv	bclv 2	hybrid
node220	29	8	6	$15 \mathrm{ms}$	$17 \mathrm{ms}$	$10 \mathrm{ms}$	$10 \mathrm{ms}$
node221	90	5	29	$36 \mathrm{ms}$	28ms	$17 \mathrm{ms}$	$17 \mathrm{ms}$
node222	245	46	90	$90 \mathrm{ms}$	$103 \mathrm{ms}$	$52 \mathrm{ms}$	$102 \mathrm{ms}$
node223	17	5	5	11ms	12ms	$9 \mathrm{ms}$	9ms
node224	56	5	17	$25 \mathrm{ms}$	$25 \mathrm{ms}$	$13 \mathrm{ms}$	14ms
node225	28	5	8	$15 \mathrm{ms}$	16ms	$10 \mathrm{ms}$	11ms
node226	97	28	12	$40 \mathrm{ms}$	$33 \mathrm{ms}$	$19 \mathrm{ms}$	$20 \mathrm{ms}$
node227	297	56	97	$107 \mathrm{ms}$	121ms	$58 \mathrm{ms}$	68ms
node228	328	5	297	116ms	83ms	$95 \mathrm{ms}$	$83 \mathrm{ms}$
node229	663	245	328	234ms	270ms	184ms	$267 \mathrm{ms}$
node230	686	5	663	236ms	$165 \mathrm{ms}$	$212 \mathrm{ms}$	170ms
node231	877	169	686	$307 \mathrm{ms}$	$257 \mathrm{ms}$	$261 \mathrm{ms}$	$256 \mathrm{ms}$
node232	882	5	877	$300 \mathrm{ms}$	209ms	$260 \mathrm{ms}$	211ms
node233	1258	182	882	434ms	$356 \mathrm{ms}$	$389 \mathrm{ms}$	$350 \mathrm{ms}$
node234	1267	5	1258	433ms	298ms	$377 \mathrm{ms}$	$304 \mathrm{ms}$
node235	1744	645	1267	620ms	703ms	$617 \mathrm{ms}$	$803 \mathrm{ms}$
node236	7429	1389	1744	2514ms	2916ms	1141ms	1130ms
node237	7429	5	7429	2492ms	1714ms	2244ms	1691ms
node238	7429	58	7429	2494ms	1730ms	2254ms	1722ms
node239	7429	226	7429	2499ms	1808ms	2303ms	1772ms

node	psrsize	lsrsize	rsrsize	repeats	bclv	bclv 2	hybrid
node240	7429	5	7429	2490ms	1751ms	$2252 \mathrm{ms}$	1704ms
node241	25	5	5	$15 \mathrm{ms}$	$15 \mathrm{ms}$	9ms	9ms
node242	37	5	25	20ms	16ms	14ms	$15 \mathrm{ms}$
node243	17	5	5	$13 \mathrm{ms}$	$13 \mathrm{ms}$	$9 \mathrm{ms}$	$9 \mathrm{ms}$
node244	71	37	17	$36 \mathrm{ms}$	$27 \mathrm{ms}$	$21 \mathrm{ms}$	$30 \mathrm{ms}$
node245	139	5	71	$53 \mathrm{ms}$	$39 \mathrm{ms}$	$32 \mathrm{ms}$	$39 \mathrm{ms}$
node246	7429	7429	139	2513ms	1910ms	$2284 \mathrm{ms}$	$1729 \mathrm{ms}$
node247	7429	2574	7429	$2525 \mathrm{ms}$	2507ms	2972ms	2392ms
node248	25	5	5	14ms	16ms	$9 \mathrm{ms}$	9ms
node249	83	25	5	34ms	$27 \mathrm{ms}$	$15 \mathrm{ms}$	16ms
node250	25	5	5	$15 \mathrm{ms}$	$15 \mathrm{ms}$	$10 \mathrm{ms}$	9ms
node251	264	83	25	$96 \mathrm{ms}$	$75 \mathrm{ms}$	$47 \mathrm{ms}$	$42 \mathrm{ms}$
node252	7429	7429	264	2497ms	1938ms	$2323 \mathrm{ms}$	1770ms
node253	7429	25	7429	2497ms	1742ms	$2263 \mathrm{ms}$	1707ms
node254	24	5	5	14ms	$15 \mathrm{ms}$	$9 \mathrm{ms}$	$9 \mathrm{ms}$
node255	41	8	12	$19 \mathrm{ms}$	22ms	$12 \mathrm{ms}$	12ms
node256	25	5	5	14ms	$15 \mathrm{ms}$	$9 \mathrm{ms}$	$9 \mathrm{ms}$
node257	26	9	5	$15 \mathrm{ms}$	$16 \mathrm{ms}$	$10 \mathrm{ms}$	$16 \mathrm{ms}$
node258	45	26	6	22ms	18ms	$15 \mathrm{ms}$	18ms
node259	75	45	5	$31 \mathrm{ms}$	24ms	21ms	$25 \mathrm{ms}$

node	psrsize	lsrsize	rsrsize	repeats	bclv	bclv 2	hybrid
node260	14	7	6	$10 \mathrm{ms}$	$12 \mathrm{ms}$	9ms	11ms
node261	23	5	14	14ms	$13 \mathrm{ms}$	11ms	12ms
node262	14	5	5	$10 \mathrm{ms}$	$11 \mathrm{ms}$	9ms	11ms
node263	18	5	5	12ms	$13 \mathrm{ms}$	9ms	9ms
node264	36	14	18	18ms	$20 \mathrm{ms}$	15ms	$19 \mathrm{ms}$
node265	47	36	5	21ms	$19 \mathrm{ms}$	20ms	$19 \mathrm{ms}$
node266	66	23	47	$27 \mathrm{ms}$	$28 \mathrm{ms}$	26ms	28ms
node267	25	5	8	$15 \mathrm{ms}$	$15 \mathrm{ms}$	10ms	$10 \mathrm{ms}$
node268	92	66	25	$37 \mathrm{ms}$	$33 \mathrm{ms}$	32ms	$33 \mathrm{ms}$
node269	12	5	5	$10 \mathrm{ms}$	$10 \mathrm{ms}$	9ms	$10 \mathrm{ms}$
node270	20	5	12	12ms	$12 \mathrm{ms}$	11ms	12ms
node271	29	20	5	$15 \mathrm{ms}$	$14 \mathrm{ms}$	13ms	14ms
node272	32	5	29	$17 \mathrm{ms}$	14ms	15ms	$15 \mathrm{ms}$
node273	15	5	5	11ms	11ms	9ms	10ms
node274	50	32	15	23ms	21ms	19ms	21ms
node275	20	6	8	12ms	$13 \mathrm{ms}$	10ms	13ms
node276	14	6	5	$10 \mathrm{ms}$	$12 \mathrm{ms}$	9ms	11ms
node277	19	6	14	12ms	$12 \mathrm{ms}$	$13 \mathrm{ms}$	14ms
node278	33	19	9	18ms	$16 \mathrm{ms}$	14ms	$16 \mathrm{ms}$
node279	57	20	33	26ms	$28 \mathrm{ms}$	23ms	28ms

node	psrsize	lsrsize	rsrsize	repeats	bclv	bclv 2	hybrid
node280	98	50	57	$38 \mathrm{ms}$	44ms	$37 \mathrm{ms}$	44ms
node281	107	6	98	41ms	$32 \mathrm{ms}$	$35 \mathrm{ms}$	$32 \mathrm{ms}$
node282	178	92	107	$66 \mathrm{ms}$	$75 \mathrm{ms}$	$76 \mathrm{ms}$	$75 \mathrm{ms}$
node283	190	178	6	$72 \mathrm{ms}$	$51 \mathrm{ms}$	$58 \mathrm{ms}$	51ms
node284	196	5	190	$83 \mathrm{ms}$	$52 \mathrm{ms}$	$61 \mathrm{ms}$	$53 \mathrm{ms}$
node285	200	5	196	87ms	$54 \mathrm{ms}$	$62 \mathrm{ms}$	$55 \mathrm{ms}$
node286	293	75	200	119ms	$97 \mathrm{ms}$	$97 \mathrm{ms}$	$96 \mathrm{ms}$
node287	436	5	293	$152 \mathrm{ms}$	$107 \mathrm{ms}$	$103 \mathrm{ms}$	$107 \mathrm{ms}$
node288	559	5	436	192ms	$136 \mathrm{ms}$	$139 \mathrm{ms}$	$136 \mathrm{ms}$
node289	666	25	559	231ms	$169 \mathrm{ms}$	$176 \mathrm{ms}$	172ms
node290	1098	41	666	377ms	271ms	223ms	274ms
node291	1383	8	1098	475ms	$330 \mathrm{ms}$	$353 \mathrm{ms}$	$329 \mathrm{ms}$
node292	1565	24	1383	541ms	$385 \mathrm{ms}$	428ms	381ms
node293	7429	7429	1565	2493ms	2280ms	2813ms	2114ms
node294	7429	796	7429	2492ms	1918ms	2480ms	1924ms
node295	37	8	10	$19 \mathrm{ms}$	$20 \mathrm{ms}$	11ms	11ms
node296	26	5	7	$15 \mathrm{ms}$	$16 \mathrm{ms}$	$9 \mathrm{ms}$	$9 \mathrm{ms}$
node297	24	5	5	$14 \mathrm{ms}$	$15 \mathrm{ms}$	$9 \mathrm{ms}$	9ms
node298	41	5	24	$20 \mathrm{ms}$	$16 \mathrm{ms}$	$14 \mathrm{ms}$	$17 \mathrm{ms}$
node299	24	5	5	14ms	$15 \mathrm{ms}$	9ms	9ms

node	psrsize	lsrsize	rsrsize	repeats	bclv	bclv 2	hybrid
node300	58	24	5	$25 \mathrm{ms}$	$20 \mathrm{ms}$	$15 \mathrm{ms}$	$20 \mathrm{ms}$
node301	174	41	58	$65 \mathrm{ms}$	$74 \mathrm{ms}$	$36 \mathrm{ms}$	$36 \mathrm{ms}$
node302	305	26	174	109ms	$84 \mathrm{ms}$	$66 \mathrm{ms}$	$85 \mathrm{ms}$
node303	21	5	6	$13 \mathrm{ms}$	$16 \mathrm{ms}$	9ms	$9 \mathrm{ms}$
node304	38	5	21	18ms	$16 \mathrm{ms}$	13ms	16ms
node305	16	6	5	11ms	$14 \mathrm{ms}$	9ms	12ms
node306	24	5	16	14ms	$13 \mathrm{ms}$	12ms	12ms
node307	34	5	24	$17 \mathrm{ms}$	$15 \mathrm{ms}$	14ms	15ms
node308	47	5	34	21ms	$18 \mathrm{ms}$	17ms	18ms
node309	13	5	5	$10 \mathrm{ms}$	$11 \mathrm{ms}$	9ms	11ms
node310	19	5	13	12ms	$12 \mathrm{ms}$	11ms	12ms
node311	27	7	7	14ms	$16 \mathrm{ms}$	10ms	10ms
node312	31	5	27	$17 \mathrm{ms}$	14ms	15ms	15ms
node313	73	5	31	$30 \mathrm{ms}$	$25 \mathrm{ms}$	17ms	25ms
node314	97	73	5	$38 \mathrm{ms}$	$30 \mathrm{ms}$	28ms	$30 \mathrm{ms}$
node315	151	6	97	$58 \mathrm{ms}$	42ms	$38 \mathrm{ms}$	44ms
node316	171	7	151	$63 \mathrm{ms}$	$47 \mathrm{ms}$	$53 \mathrm{ms}$	$47 \mathrm{ms}$
node317	236	19	171	84ms	$66 \mathrm{ms}$	64ms	$65 \mathrm{ms}$
node318	309	47	236	110ms	$92 \mathrm{ms}$	$97 \mathrm{ms}$	90ms
node319	18	5	5	12ms	$13 \mathrm{ms}$	$9 \mathrm{ms}$	$9 \mathrm{ms}$

node	psrsize	lsrsize	rsrsize	repeats	bclv	bclv 2	hybrid
node320	30	5	18	16ms	14ms	12ms	14ms
node321	51	6	30	$23 \mathrm{ms}$	$20 \mathrm{ms}$	$16 \mathrm{ms}$	19ms
node322	65	51	5	$27 \mathrm{ms}$	$23 \mathrm{ms}$	$22 \mathrm{ms}$	22ms
node323	424	309	65	151ms	$125 \mathrm{ms}$	$135 \mathrm{ms}$	124ms
node324	464	5	424	162ms	$113 \mathrm{ms}$	$133 \mathrm{ms}$	119ms
node325	14	5	6	$10 \mathrm{ms}$	11ms	$9 \mathrm{ms}$	12ms
node326	25	5	14	14ms	$13 \mathrm{ms}$	$12 \mathrm{ms}$	$13 \mathrm{ms}$
node327	536	464	25	185ms	$140 \mathrm{ms}$	$164 \mathrm{ms}$	$137 \mathrm{ms}$
node328	569	6	536	199ms	$140 \mathrm{ms}$	$161 \mathrm{ms}$	141ms
node329	739	38	569	254ms	188ms	189ms	189ms
node330	23	5	5	13ms	$15 \mathrm{ms}$	10ms	9ms
node331	25	5	5	14ms	$15 \mathrm{ms}$	9ms	9ms
node332	24	5	6	14ms	$15 \mathrm{ms}$	9ms	9ms
node333	46	24	5	22ms	18ms	14ms	18ms
node334	72	5	46	$30 \mathrm{ms}$	24ms	21ms	24ms
node335	98	72	6	40ms	31ms	28ms	$30 \mathrm{ms}$
node336	212	25	98	$78 \mathrm{ms}$	$63 \mathrm{ms}$	$43 \mathrm{ms}$	62ms
node337	30	5	9	$16 \mathrm{ms}$	18ms	$10 \mathrm{ms}$	$10 \mathrm{ms}$
node338	76	30	5	$31 \mathrm{ms}$	$25 \mathrm{ms}$	$17 \mathrm{ms}$	$25 \mathrm{ms}$
node339	25	5	5	14ms	16ms	9ms	9ms

node	psrsize	lsrsize	rsrsize	repeats	bclv	bclv 2	hybrid
node340	68	6	25	1	24ms		$\frac{11y \text{ brid}}{23 \text{ms}}$
			_	$29 \mathrm{ms}$		15ms	
node341	26	6	5	$15 \mathrm{ms}$	$16 \mathrm{ms}$	$9 \mathrm{ms}$	9ms
node342	140	68	26	$53 \mathrm{ms}$	45ms	$34 \mathrm{ms}$	$46 \mathrm{ms}$
node343	244	76	140	88ms	101ms	$69 \mathrm{ms}$	102ms
node344	267	5	244	$95 \mathrm{ms}$	68ms	82ms	$68 \mathrm{ms}$
node345	22	5	6	13ms	14ms	$9 \mathrm{ms}$	9ms
node346	48	22	5	22ms	18ms	15ms	19ms
node347	65	48	6	$27 \mathrm{ms}$	22ms	21ms	23ms
node348	101	65	7	41ms	$31 \mathrm{ms}$	$30 \mathrm{ms}$	31ms
node349	416	267	101	$145 \mathrm{ms}$	130ms	115ms	197ms
node350	455	5	416	$157 \mathrm{ms}$	113ms	126ms	119ms
node351	701	212	455	248ms	229ms	205ms	235ms
node352	19	7	5	12ms	13ms	9ms	13ms
node353	35	5	19	18ms	17ms	13ms	15ms
node354	7	5	5	8ms	8ms	8ms	8ms
node355	25	6	7	14ms	16ms	$10 \mathrm{ms}$	10ms
node356	42	5	25	$20 \mathrm{ms}$	17ms	$17 \mathrm{ms}$	17ms
node357	47	5	42	21ms	18ms	$20 \mathrm{ms}$	18ms
node358	83	47	5	$34 \mathrm{ms}$	28ms	$22 \mathrm{ms}$	27ms
node359	15	6	5	11ms	12ms	$10 \mathrm{ms}$	11ms

node	psrsize	lsrsize	rsrsize	repeats	bclv	bclv 2	hybrid
node360	122	83	15	48ms	$38 \mathrm{ms}$	$34 \mathrm{ms}$	38ms
node361	21	5	5	$13 \mathrm{ms}$	$16 \mathrm{ms}$	9ms	9ms
node362	51	21	6	$23 \mathrm{ms}$	$20 \mathrm{ms}$	14ms	19ms
node363	75	6	51	$30 \mathrm{ms}$	24ms	23ms	24ms
node364	101	75	5	$39 \mathrm{ms}$	$30 \mathrm{ms}$	32ms	$30 \mathrm{ms}$
node365	283	122	101	102ms	119ms	$73 \mathrm{ms}$	117ms
node366	373	35	283	$133 \mathrm{ms}$	102ms	98ms	$103 \mathrm{ms}$
node367	420	373	5	147ms	105ms	116ms	$103 \mathrm{ms}$
node368	473	5	420	$163 \mathrm{ms}$	118ms	130ms	118ms
node369	1117	701	473	$387 \mathrm{ms}$	493ms	$347 \mathrm{ms}$	$445 \mathrm{ms}$
node370	1195	23	1117	410ms	288ms	344ms	291ms
node371	9	5	5	9ms	9ms	8ms	$9 \mathrm{ms}$
node372	23	9	5	$13 \mathrm{ms}$	$15 \mathrm{ms}$	$10 \mathrm{ms}$	$15 \mathrm{ms}$
node373	17	5	5	11ms	12ms	9ms	$9 \mathrm{ms}$
node374	41	5	17	$19 \mathrm{ms}$	16ms	14ms	$16 \mathrm{ms}$
node375	81	41	5	$34 \mathrm{ms}$	26ms	$23 \mathrm{ms}$	$33 \mathrm{ms}$
node376	25	5	5	14ms	$15 \mathrm{ms}$	$10 \mathrm{ms}$	14ms
node377	182	81	25	67ms	61ms	$45 \mathrm{ms}$	$95 \mathrm{ms}$
node378	271	23	182	98ms	79ms	86ms	84ms
node379	25	5	5	$15 \mathrm{ms}$	$15 \mathrm{ms}$	9ms	9ms

node	psrsize	lsrsize	rsrsize	repeats	bclv	bclv 2	hybrid
node380	69	6	25	$30 \mathrm{ms}$	$23 \mathrm{ms}$	18ms	24ms
node381	91	5	69	$36 \mathrm{ms}$	29ms	29ms	29ms
node382	466	271	91	$164 \mathrm{ms}$	$139 \mathrm{ms}$	$122 \mathrm{ms}$	143ms
node383	1553	1195	466	$532 \mathrm{ms}$	$538 \mathrm{ms}$	540ms	$536 \mathrm{ms}$
node384	1556	1553	6	$530 \mathrm{ms}$	$366 \mathrm{ms}$	$457 \mathrm{ms}$	$368 \mathrm{ms}$
node385	2211	739	1556	772ms	$737 \mathrm{ms}$	704ms	733ms
node386	2336	5	2211	793ms	$558 \mathrm{ms}$	$672 \mathrm{ms}$	$554 \mathrm{ms}$
node387	2372	5	2336	810ms	620ms	706ms	$557 \mathrm{ms}$
node388	2639	305	2372	919ms	791ms	897ms	719ms
node389	25	5	5	14ms	$15 \mathrm{ms}$	$9 \mathrm{ms}$	$10 \mathrm{ms}$
node390	2764	2639	25	956ms	749ms	801ms	$687 \mathrm{ms}$
node391	2963	37	2764	1030ms	795ms	$879 \mathrm{ms}$	721ms
node392	3006	5	2963	1033ms	774ms	$1130 \mathrm{ms}$	726ms
node393	7429	7429	3006	2510ms	2591ms	$3095 \mathrm{ms}$	$2523 \mathrm{ms}$
node394	7429	927	7429	2491ms	2069ms	$2523 \mathrm{ms}$	$1956 \mathrm{ms}$
node395	7429	7429	6	2492ms	1901ms	$2236 \mathrm{ms}$	1710ms
node396	17	5	5	11ms	$13 \mathrm{ms}$	$9 \mathrm{ms}$	$9 \mathrm{ms}$
node397	25	5	17	14ms	14ms	$12 \mathrm{ms}$	$13 \mathrm{ms}$
node398	7429	7429	25	$2535 \mathrm{ms}$	1736ms	$2235 \mathrm{ms}$	1712ms
node399	7429	7429	5	2483ms	1757ms	$2235 \mathrm{ms}$	1704ms

hybrid bclv 2 2242ms psrsize 7429 repeats node bclv lsrsize rsrsize 1702ms node400 6 7429 2485ms 1710ms node401 7429 7429 2490ms 1702ms 5  $1747 \mathrm{ms}$ 2234ms