

Concurrent program metrics drawn by QUASAR numbers

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Annex: Data collected by Quasar

Program name in context5 peer to peer transaction	# task	#Places/ reduced	#transitions/ reduced	#States stored	#Arcs visited	Ratio N/N-1	Execution(s) compile/search	Space (Mb)
agoraserverada3	4	267/70	249/52	4 182	4 369	1	146/0	10.6
agoraserverada4	5	267/70	249/52	138 980	147 901	33.8	159/5	12.4
agoraserverada5	6	267/70	249/52	5 256 768	5 652 471	38.2	421/368	89.6
agoraserverjava3	4	392/93	372/73	8 292	8 633	1	253/1	10.7
agoraserverjava4	5	392/93	372/73	312 619	330 480	38.3	549/18	15.1
agoraserverjava5	6	392/93	372/73	13 140 700	14 027 263	42.4	351/1142	207
agoraserverjavastrong3	4	338/88	318/68	6 542	6 729	1	121/0	10.6
agoraserverjavastrong4	5	338/88	318/68	215 708	224 629	33.4	136/9	13.6
agoraserverjavastrong5	6	338/88	318/68	8 104 338	8 500 041	37.8	138/389	128
agoraserverjavastrongdc3	4	395/100	375/80	8 326	8 565	1	166/0	10.6
agoraserverjavastrongdc4	5	395/100	375/80	280 641	291 914	34.1	162/10	14.6
agoraserverjavastrongdc5	6	395/100	375/80	9 920 178	10 323 753	35.4	148/686	160
agoraserverposix3	4	414/89	396/69	162 912	212 221	1	97/12	12.7
agoraserverposix4	5	414/89	396/69	27 779 147	37 633 949	177	103/4 757	401
rendezvousservermonitor3	5	329/78	308/57	4 739	4 926	1	139/0	10.6
rendezvousservermonitor4	6	329/78	308/57	152 218	160 839	32.7	223/5	12.6
rendezvousservermonitor5	7	329/78	308/57	5 638 789	6 018 940	37.4	148/182	87.2
rendezvousservernested3	5	238/61	219/42	2 824	3 011	1	98 /0	10.6
rendezvousservernested4	6	238/61	219/42	99 040	107 289	35.6	232/6	11.8
rendezvousservernested5	7	238/61	219/42	3 822 728	4 169 915	38.8	262/177	60.3
cooperativeadatask3	7	550/126	519/95	23 266	24 070	1	356/1	10.9
cooperativeadatask4	9	550/126	519/95	2 277 347	2 374 070	98.5	363/177	48.5
dummy3	4	225/51	212/38	108	109	1	99/1	10.5
dummy4	5	225/51	212/38	151	153	1.4	107/1	10.5
dummy5	6	225/51	212/38	194	197	1.8	107/0	10.5
dummy6	7	225/51	212/38	237	241	2.2	97/1	10.5

Table 1. Quasar data collected for pairing with peer to peer transaction

Program name in Context1 no pair interaction	# task	#Places/ Reduced	#Transitions/ Reduced	#States stored	#Arcs visited	Ratio N/N-1	Execution(s) Compile/Search	Space (Mb)
xs agoraserverada3	4	212/59	196/43	3 280	3 145	1	115/0	10.6
xs agoraserverada4	5	212/59	196/43	89 015	93 844	29.8	191/3	11.6
xs agoraserverada5	6	212/59	196/43	2 878 524	3 058 587	32.6	115/76	49.8
xs agoraserverjava3	4	337/83	319/65	10 836	11 206	1	223/0	10.7
xs agoraserverjava4	5	337/83	319/65	353 350	370 190	33.0	314/10	15.7
xs agoraserverjava5	6	337/83	319/65	14 215 386	15 082 942	40.7	344/1462	221.3
xs agoraserverjavastrong3	4	283/76	265/58	5 320	5 455	1	90/0	10.6
xs agoraserverjavastrong4	5	283/76	265/58	141 842	146 671	26.9	127/4	12.5
xs agoraserverjavastrong5	6	283/76	265/58	4 526 814	4 706 877	32.1	120/132	76.7
xs agoraserverposix3	4	360/78	343/59	212 632	279 715	1	85/15	13.4
xs agoraserverposix4	5	360/78	343/59	42 680 591	58 542 295	209	86/7 640	630
xs rendezvousservermonitor3	5	274/67	255/48	4 145	4 280	1	144/0	10.6
xs rendezvousservermonitor4	6	274/67	255/48	110 701	115 530	27.0	238/4	12.0
xs rendezvousservermonitor5	7	274/67	255/48	3 537 289	3 717 352	32.2	181/142	55.6
xs rendezvousservernested3	5	183/50	166/33	2 288	2 423	1	79/0	10.6
xs rendezvousservernested4	6	183/50	166/33	66 556	71 253	29.4	131/2	11.3
xs rendezvousservernested5	7	183/50	166/33	2 244 376	2 415 091	33.9	134/92	40.0
xs cooperativeadatasksb3	7	513/121	484/92	25 774	26 578	1	430/1	11.0
xs cooperativeadatasksb4	9	513/121	484/92	2 538 908	2 635 651	99.2	564/275	53.1
xx dummy3	4	168/39	157/28	31	31	1	66/1	10.5
xx dummy4	5	168/39	157/28	32	32	1	71/1	10.5
xx dummy5	6	168/39	157/28	33	33	1	98/1	10.5
xx dummy6	7	168/39	157/28	34	34	1.1	102/0	10.5

Table 2. Quasar data collected for pairing with no other interaction

Program name in different extensions with N = 3	# task	# RV	# PO	#Places/ reduced	#transitions/ reduced	#States Stored With reductions	#Arcs Visited With reductions	#States Stored without reductions	#Arcs Visited without reductions
dummy component			with	a	shared			procedure	
xx_dummy3	4	0	0	168/37	157/26	29	29	9 608 380	37 388 544
s1_dummy3	4	0	1	192/44	179/30	65	65	16 062 612	6 9421 204
adding a PO				24/7	22/4	36	36		
s2_dummy3	4	1	0	205/47	193/35	102	103	13 160 577	50 916 986
s3_dummy3	4	1	1	229/52	215/37	102	103	19 989 509	77 383 894
adding a PO				24/5	22/2	0	0		
dummy3	4	2	0	225/47	212/34	103	104	13 312 421	51 459 540
t1_dummy3	4	2	1	249/56	234/40	108	109	20 166 873	78 017 848
adding a PO				24/9	22/6	5	5		
agoraserverada			Ada	protected	object			implementation	
xs_agoraserverada3	4	0	0	212/58	196/42	3 279	3 144	17 316 336	64 230 366
s1_agoraserverada3	4	0	1	236/65	218/46	3 766	3 901	72 406 616	273 741 102
adding a PO				24/7	22/4	487	757		
s2_agoraserverada3	4	1	0	249/68	232/51	4 208	4 369	23 798 499	88 896 730
s3_agoraserverada3	4	1	1	273/73	254/53	4 416	4 577	65 691 467	247 715 698
adding a PO				24/5	22/2	208	208		
agoraserverada3	4	2	0	267/72	249/54	4 572	4 759	24 563 347	91 637 360
t1_agoraserverada3	4	2	1	293/77	273/56	4 780	4 967	66 789 871	251 631 984
adding a PO				26/5	24/2	208	208		

Table 3. Quasar data variation when adding a protected object

Program name in different extensions with N = 3	# task	# RV	# PO	#Places/ reduced	#transitions/ reduced	#States Stored With reductions	#Arcs visited With reductions	#States Stored without reductions	#Arcs Visited without reductions
dummy component			with	a	shared			procedure	
xx_dummy3	4	0	0	168/37	157/26	29	29	9 608 380	37 388 544
s2_dummy3	4	1	0	205/47	193/35	102	103	13 160 577	50 916 986
adding a rendezvous				37/10	36/9	73	74		
s1_dummy3	4	0	1	192/44	179/30	65	65	16 062 612	69 421 204
s3_dummy3	4	1	1	229/52	215/37	102	103	19 989 509	77 383 894
adding a rendezvous				37/8	36/7	36	37		
s2_dummy3	4	1	0	205/47	193/35	102	103	13 160 577	50 916 986
dummy3	4	2	0	225/47	212/34	103	104	13 312 421	51 459 540
adding a rendezvous				20/0	19/-1	1	1		
s3_dummy3	4	1	1	229/52	215/37	102	103	19 989 509	77 383 894
t1_dummy3	4	2	1	249/56	234/40	108	109	20 166 873	78 017 848
adding a rendezvous				20/4	19/3	6	6		
dummy3	4	2	0	225/47	212/34	103	104	13 312 421	51 459 540
t2_dummy3	4	3	0	245/55	231/41	114	115	13 464 265	52 002 094
adding a rendezvous				20/8	19/7	11	11		
agoraserverada			Ada	protected	object			implementation	
xs_agoraserverada3	4	0	0	212/58	196/42	3 279	3 144	17 316 336	64 230 366
s2_agoraserverada3	4	1	0	249/68	232/51	4 208	4 369	23 798 499	88 896 730
adding a rendezvous				37/910	36/9	929	1 225		
s1_agoraserverada3	4	0	1	236/65	218/46	3 766	3 901	72 406 616	273 741 102
s3_agoraserverada3	4	1	1	273/73	254/53	4 416	4 577	65 691 467	247 715 698
adding a rendezvous				37/8	36/7	650	676		
s2_agoraserverada3	4	1	0	249/68	232/51	4 208	4 369	23 798 499	88 896 730
agoraserverada3	4	2	0	267/72	249/54	4 572	4 759	24 563 347	91 637 360
adding a rendezvous				18/4	17/3	364	390		
s3_agoraserverada3	4	1	1	273/73	254/53	4 416	4 577	65 691 467	247 715 698
t1_agoraserverada3	4	2	1	293/77	273/56	4 780	4 967	66 789 871	251 631 984
adding a rendezvous				20/4	19/3	364	390		
agoraserverada3	4	2	0	267/72	249/54	4 572	4 759	24 563 347	91 637 360
t2_agoraserverada3	4	3	0	287/76	268/57	4 936	5 149	25 355 511	94 456 846
adding a rendezvous				20/4	19/3	364	390		

Table 4. Quasar data variation when adding a rendezvous

Different context names	#Places/	ratio	#transitions/	ratio	#States stored	ratio	#Arcs visited	ratio
dummy component			with	a	shared		procedure	
xx dummy3 (0 RV, 0 PO)								
no reduction	168	1	157	1	9 608 380	1	37 388 544	1
static reduction only	37	4.5	26	6.0	8 548	1124	28 758	1 300
dynamic reduction only	168	1	157	1	303	31 711	303	123 395
static + dynamic reduction	37	4.5	26	6.0	29	331 323	29	1 289 260
s1 dummy3 (0 RV, 1 PO)								
no reduction	192	1	179	1	16 062 612	1	62 491 204	1
static reduction only	44	4.4	30	6	14 185	1 132	48 147	1 298
dynamic reduction only	192	1	179	1	526	30 537	528	118 355
static + dynamic reduction	44	4.4	30	6	65	247 117	65	961 403
s2 dummy3 (1 RV, 0 PO)								
no reduction	205	1	193	1	13 160 577	1	50 916 986	1
static reduction only	47	4.3	35	5.5	19 081	690	63 071	807
dynamic reduction only	205	1	193	1	632	20 824	633	80 437
static + dynamic reduction	47	4.3	35	5.5	102	129 025	103	494 340
s3 dummy3 (1 RV, 1 PO)								
no reduction	229	1	215	1	19 989 509	1	77 383 894	1
static reduction only	52	4.4	37	5.8	21 861	914	72 483	1 067
dynamic reduction only	229	1	215	1	1 422	14 057	1 430	54 115
static + dynamic reduction	52	4.4	37	5.8	102	195 976	103	751 300
dummy3 (2 RV, 0 PO)								
no reduction	225	1	212	1	13 312 421	1	51 459 540	1
static reduction only	47	4.8	34	6.2	13 053	1 020	42 511	1 210
dynamic reduction only	225	1	212	1	670	19 869	671	76 690
static + dynamic reduction	47	4.8	34	6.2	103	129 247	104	494 803
t1 dummy3 (2 RV, 1 PO)								
no reduction	249	1	234	1	20 166 873	1	78 017 848	1
static reduction only	56	4.4	40	5.8	22 185	909	72 281	1 079
dynamic reduction only	249	1	234	1	1 662	12 134	1 672	46 661
static + dynamic reduction	56	4.4	40	5.8	108	186 730	109	715 760
t2 dummy3 (3 RV,0 PO)								
no reduction	245	1	231	1	13 464 265	1	52 002 094	1
static reduction only	55	4.5	41	5.6	19 705	683	64 607	805
dynamic reduction only	245	1	231	1	708	19 017	709	73 346
static + dynamic reduction	55	4.5	41	5.6	114	118 108	115	452 192
agoraserverada		Ada	protected		object		implementation	
xs agoraserverada3 (0 RV, 0 PO)								
no reduction	212	1	196	1	17 316 336	1	64 230 366	1
static reduction only	58	3.7	42	4.7	91 878	188	268 874	239
dynamic reduction only	212	1	196	1	13 534	1 279	13 669	4 699
static + dynamic reduction	58	3.7	42	4.7	3 279	5 281	3 414	18 814
s1 agoraserverada3 (0 RV, 1 PO)								
no reduction	236	1	218	1	72 406 616	1	273 741 102	1
static reduction only	65	3.6	46	4.7	182 484	397	561 181	488
dynamic reduction only	236	1	218	1	57 282	1 264	58 351	4 691
static + dynamic reduction	65	3.6	46	4.7	3 766	19 226	3 901	70 172
s2 agoraserverada3 (1 RV, 0 PO)								
no reduction	249	1	232	1	23 798 499	1	88 896 730	1
static reduction only	68	3.7	51	4.5	75 223	316	218 483	407
dynamic reduction only	249	1	232	1	16 342	1 456	16 503	5 387
static + dynamic reduction	68	3.7	51	4.5	4 208	5 656	4 369	20 347
s3 agoraserverada3 (1 RV, 1 PO)								
no reduction	273	1	254	1	65 691 467	1	247 715 698	1
static reduction only	73	3.7	53	4.8	123 451	532	369 703	670
dynamic reduction only	273	1	254	1	53 720	1 223	54 567	4 540
static + dynamic reduction	73	3.7	53	4.8	4 416	14 876	4 577	54 122
agoraserverada3 (2 RV, 0 PO)								
no reduction	267	1	249	1	24 563 347	1	91 637 360	1
static reduction only	72	3.7	54	4.6	77 077	319	222 947	411
dynamic reduction only	267	1	249	1	17 980	1 366	18 167	5 044
static + dynamic reduction	72	3.7	54	4.6	4 572	5 373	4 759	19 256
t1 agoraserverada3 (2 RV, 1 PO)								
no reduction	293	1	273	1	66 789 871	1	251 631 984	1
static reduction only	77	3.8	56	4.9	125 593	532	374 887	671
dynamic reduction only	293	1	273	1	56 494	1 182	57 391	4 385
static + dynamic reduction	77	3.8	56	4.9	4 780	13 973	4 967	50 661
t2 agoraserverada3 (3 RV,0 PO)								
no reduction	287	1	268	1	25 355 511	1	94 456 846	1
static reduction only	76	3.8	57	4.7	78 931	321	227 411	415
dynamic reduction only	287	1	268	1	19 722	1 286	19 935	4 738
static + dynamic reduction	76	3.8	57	4.7	4 936	5 137	5 149	18 345

Table 5. Quasar data with different kind of reductions