

Profile Visualization with Cray Apprentice2

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CSC, Finland

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Pair-wise communication statistics

Text reports

Activity view

Cray Apprentice²

Call graph profile

Time-line view

I/O

Communication statistics

Communication

Source code mapping

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- Cray Apprentice²
- is target to help and correct:
 - Load imbalance
 - Excessive communication
 - Network contention
 - Excessive serialization
 - I/O Problems

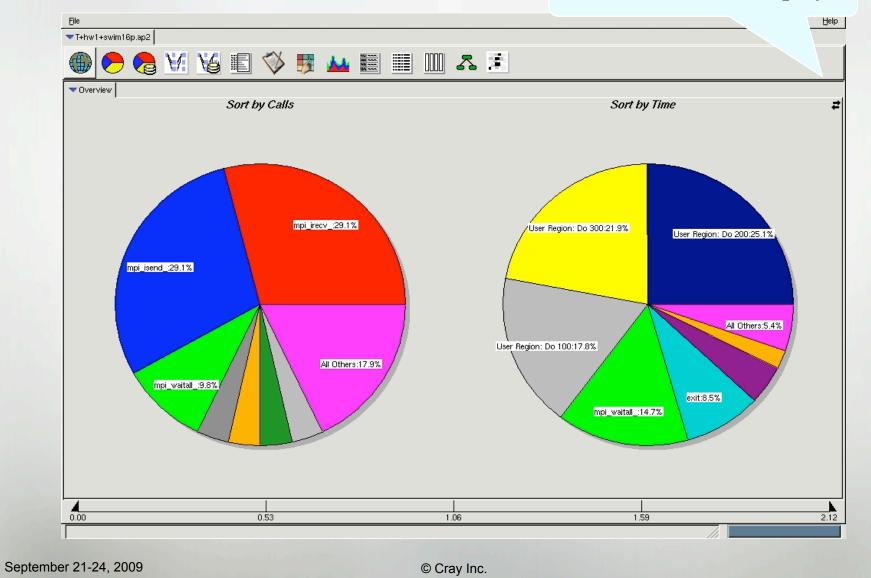




Statistics Overview



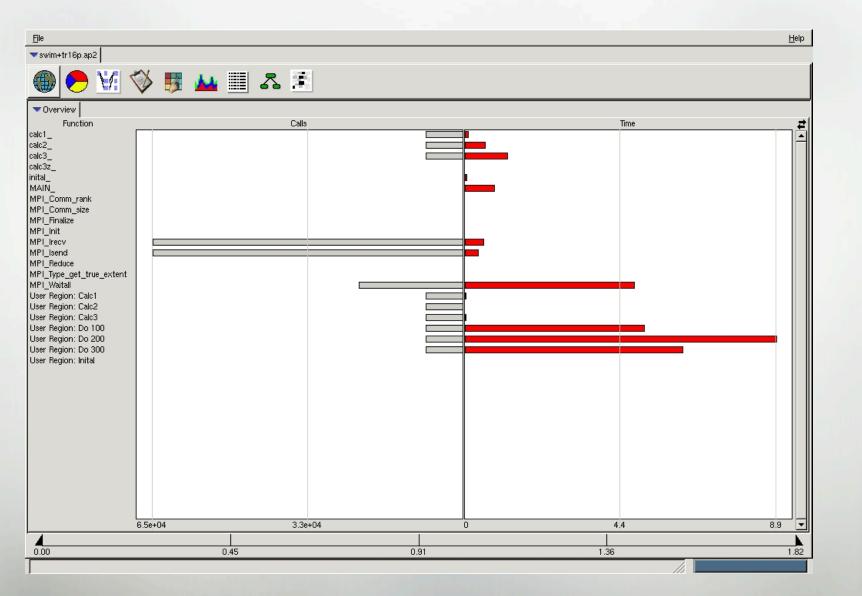
Switch Overview display



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Function Profile





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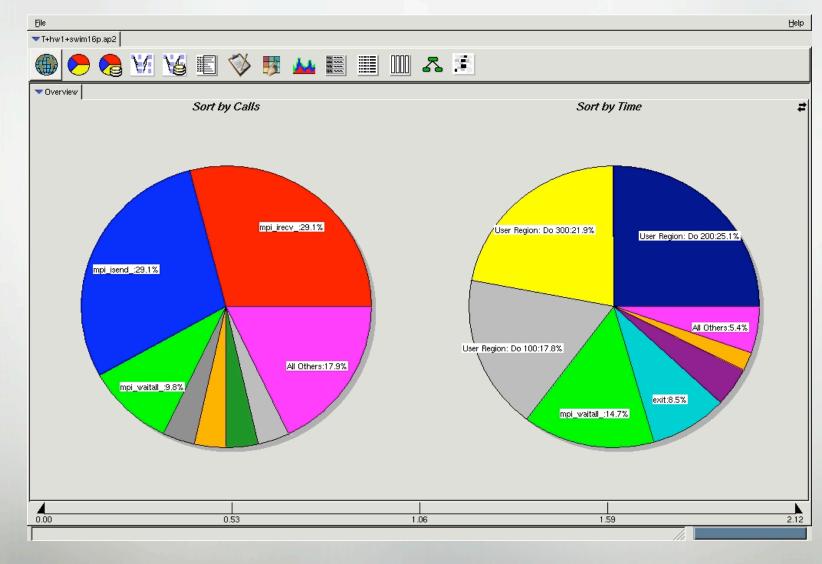
vim+iompi+15											
	8	M	16		V .	y 🚧 🎬					
Overview 🔻	Function										
Time	Percent	Hits	Callsites	imbalance %	Potential Savings	Function	1	.ine	File	A	
124.175511	63.29	576	1	5.63	0.15	sweep_	1	16	Aus/hid00036Adr/Apps/sweep3d/sweep.f		
40.211774	20.50	118080	1	23.40	0.25	mpi_recv_		0	==NA==		
16.319527	8.32	48	1	48.26	0.30	exit		35	/notbackedup/users/rsrel/rs64.REL_1_4_33.060914.Thu/pe/computelibs/glibc/stdlib/exit.c		
6.173236	3.15	1536	3	50.00	0.12	mpi_allreduce_		0	==NA==		
2.760376	1.41	118080	1	17.58	0.01	mpi_send_		0	==NA==		
2.250029	1.15	576	1	2.62	0.00	source_		18	Aus/hid00036/ldr/Apps/sweep3d/source.f		
1.984620	1.01	144	1	2.59	0.00	mpi_barrier_		0	==NA==		
0.867359	0.44	192	2	2.47	0.00	mpi_bcast_		0	==NA==		
0.416231	0.21	576	1	2.60	0.00	flux_err_		17	/lus/hid00036/ldr/Apps/sweep3d/flux_err.f		
0.382130	0.19	118080	2	10.98	0.00	snd_real_	1	35	/lus/hid00036/ldr/Apps/sweep3d/mpi_stuff.f		
0.237772	0.12	309	1	95.76	0.07	fwrite		36	/hotbackedup/users/rsrel/rs64.REL_1_4_33.060914.Thu/pe/computelibs/glibc/libio/lofwrite.c		
0.185067	0.09	118080	2	17.30	0.00	rcv_real_	1	64	/lus/hid00036/ldr/Apps/sweep3d/mpi_stuff.f		
0.067832	0.03	48	1	4.56	0.00	initialize_		42	/lus/hid00036/ldr/Apps/sweep3d/initialize.f		
0.059407	0.03	48	1	4.99	0.00	initxs_		77	/lus/hid00036/ldr/Apps/sweep3d/initialize.f		
0.041371	0.02	48	1	23.84	0.00	inner_		72	/lus/nid00036/ldr/Apps/sweep3d/inner.f		
0.023948	0.01	8	1		0.00	fputc		35	/hotbackedup/users/rsrel/rs64.REL_1_4_33.060914.Thu/pe/computelibs/glibc/libio/fputc.c		
0.016902	0.01	68	1		0.00	getc		36	/hotbackedup/users/rsrel/rs64.REL_1_4_33.060914.Thu/pe/computelibs/glibc/libio/getc.c		
0.008104	0.00	4992	2	28.14	0.00	octant_		17	/lus/hid00036/ldr/Apps/sweep3d/octant.f		
0.002457	0.00	576	1	18.79	0.00	global_real_max_	3	21	/lus/hid00036/ldr/Apps/sweep3d/mpi_stuff.f		
0.002083	0.00	48	1	69.55	0.00	MAIN_		72	/lus/hid00036/ldr/Apps/sweep3d/driver.f		
0.001588	0.00	576	1	39.10	0.00	global_int_sum_	3	73	Aus/hid00036Adr/Apps/sweep3d/mpi_stuff.f		
0.001393	0.00	48	1	10.23	0.00	inner_auto_		69	Aus/hid00036/ldr/Apps/sweep3d/inner_auto.f		
0.000982	0.00	48	1	97.74	0.00	task_init_		24	Aus/hid00036Adr/Apps/sweep3d/mpi_stuff.f		
0.000739	0.00	384	2	27.87	0.00	global_real_sum_	3	47	/lus/hid00036/ldr/Apps/sweep3d/mpi_stuff.f		
0.000662	0.00	2	1		0.00	fopen	1	06	/notbackedup/users/rsrel/rs64.REL_1_4_33.060914.Thu/pe/computelibs/glibc/libio/iofopen.c		
0.000499	0.00	48	1	7.54	0.00	initsnc_	1	75	/lus/hid00036/ldr/Apps/sweep3d/initialize.f	-	
										l	
0				1.1	5				2.30 3.45	4.61	

Function Profile



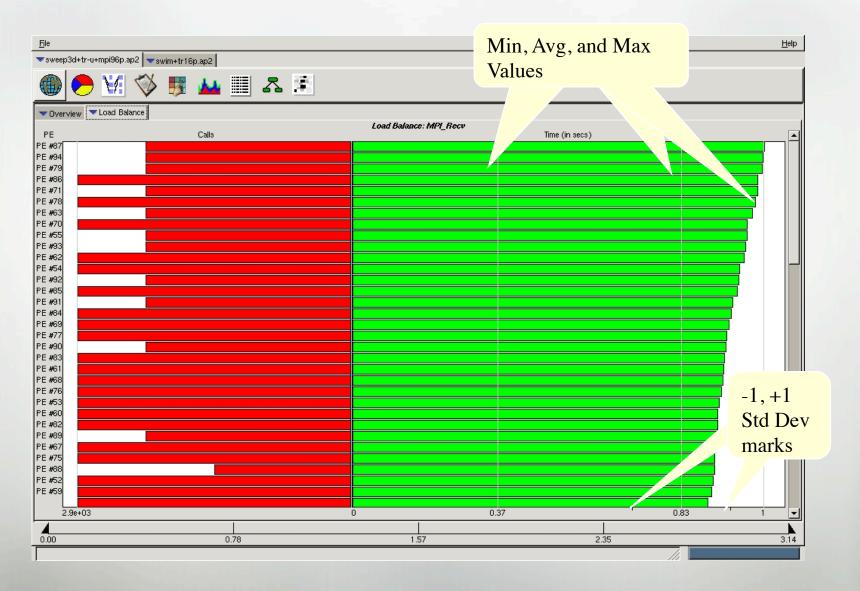
Statistics Overview





Load Balance View (Aggregated from Overview)

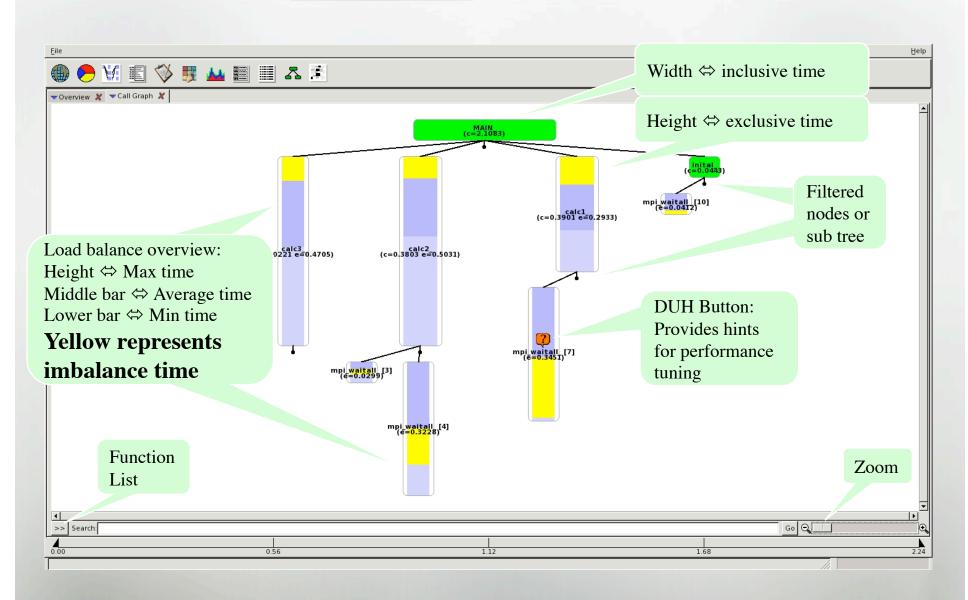




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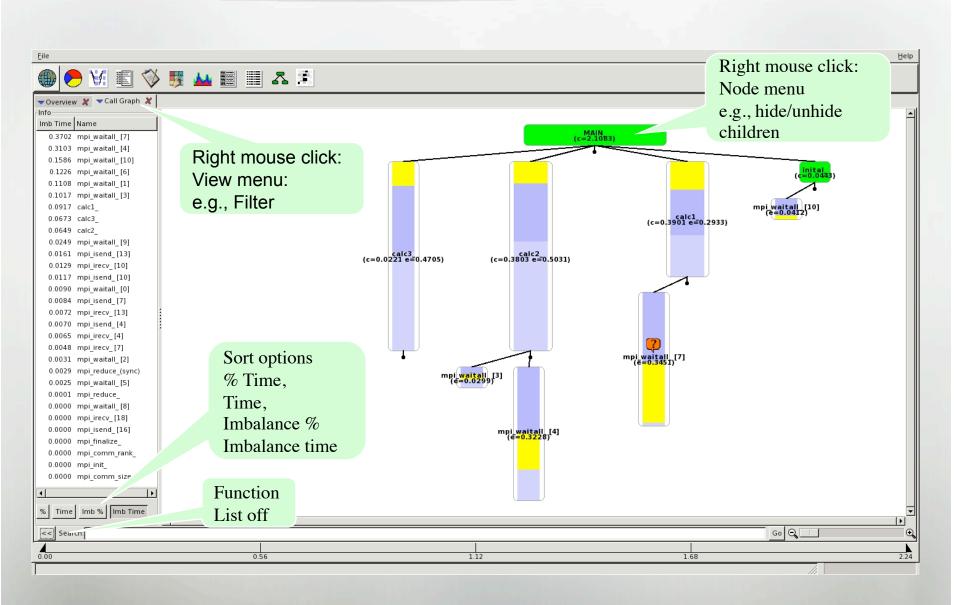
Call Tree View





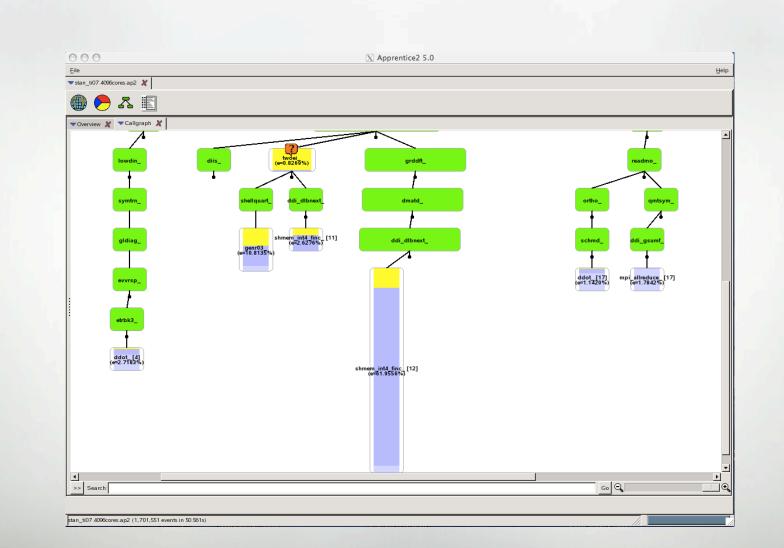
Call Tree View – Function List





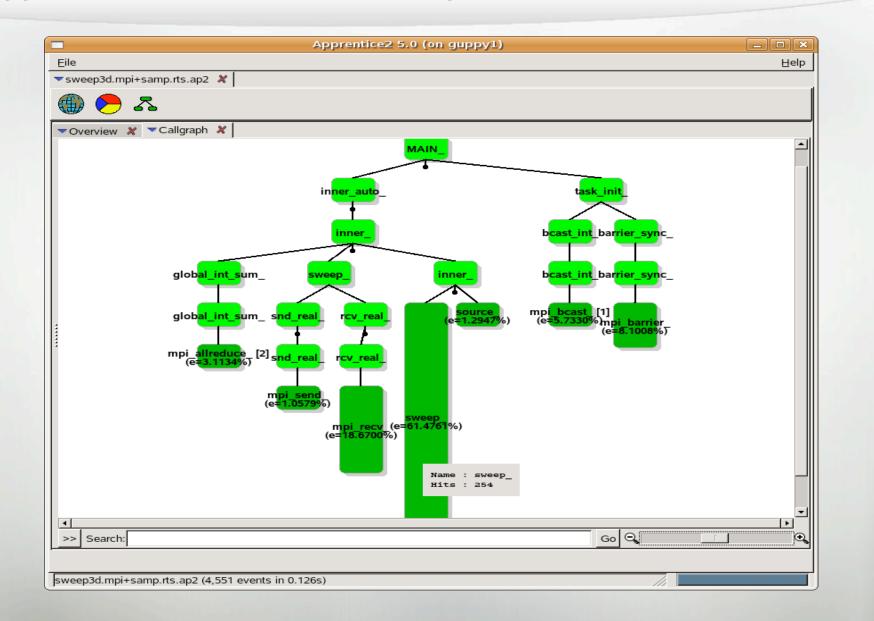
Call Tree Load Imbalance





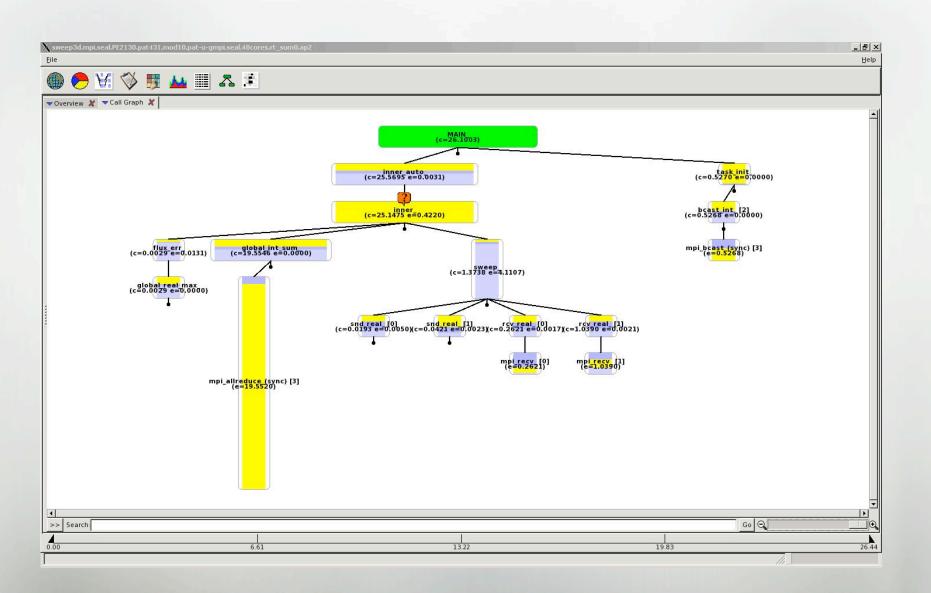
Apprentice² Call Tree View of Sampled Data





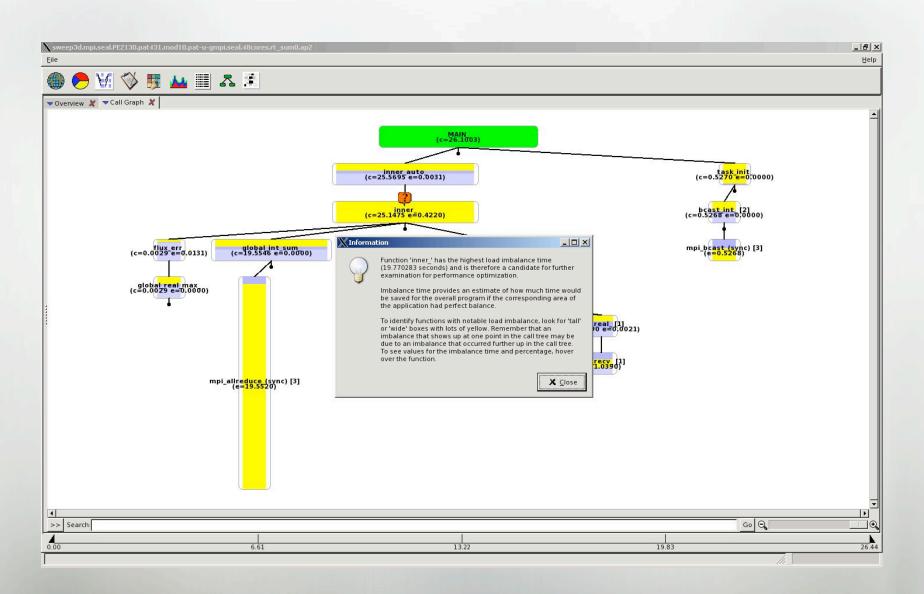
Call Tree Visualization (Sweep3d)





Discrete Unit of Help (DUH Button)





Load Balance View (from Call Tree)



			Min, Avg, and Max	<u>H</u> elp
weep3d+tr-u+mpi96p.ap2	▼swim+tr16p.ap2			
🔊 🛃 🦰	🖗 🐺 🏊 🧾 🏞 🗄		Values	
Overview 🔽 Call Graph	▼Load Balance			
E	Calls	Load Balance: MPI_Bcast	Time (in secs)	
#33	Cais		nine (in secs)	
#37				
#43				
#41				
#61				
#57				
#39 #63				
#51				
#45				
# 67				
#91				
#47				
#59 #35				
#81				
#34				
#85				
#93				
#89				
#83				
#42				
#49 #87				-1,+1
#69				
#38				Std Dev
#7 3				
#75				marks
#53				
#77				
#71 #62				
#02				
1		0	1.2e-05 1.2.2e-05	5 2.6e-05 V
0	0.78	1.57	2.35	3.14

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Source Mapping from Call Tree



<u>Fi</u> le		<u>H</u> el
▼sweep3o	+mpi96p+tr.×ml.gz	
	ــــــــــــــــــــــــــــــــــــــ	
🔻 Overvie	v 🔽 Traffic Report 🔍 Activity 🔍 Call Graph 🔍 Sweep.f	
165 166 167 168	c angle pipelining loop (batches of mmi angles) c DO mo = 1, mmo	
169	mio = (mo−1)*mmi	
170 171	c K-inflows (k=k0 boundary)	
172 173 174 175 176 177 178	c do mi = 1, mmi do j = 1, jt do i = 1, it phikb(i,j,mi) = 0.0d+0 end do	
179	end do	
180 181	end do else	
182 183	if (do_dsa) then leak = 0.0	
184	k = k0 - k2	
185 186	do mi = 1, mmi m = mi + mio	
187	do j = 1, jt	
188 189	do i = 1, it phikb(i,j,mi) = phikbc(i,j,m)	
190 191	leak = leak & + wtsi(m)*phikb(i,j,mi)*di(i)*dj(j)	
192	face(i,j,k+k3,3) = face(i,j,k+k3,3) & + wtsi(m)*phikb(i,j,mi)	
193 194	end do	
195 196	end do end do	
197	leakage(5) = leakage(5) + leak	
▲		Ŀ

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Profile Visualization with Cray Apprentice2 Questions / Comments Thank You!

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