This tabulates CPU seconds and elapsed seconds used by various machine/models while running benchmarks provided by SASI at ANSYS Revision 4.4 or later 4.4 versions. The ANSYS benchmark input data has been modified to reflect new solution techniques available in Revision 4.4 of ANSYS. A new problem has been added, SP-5, to test the binary standard external file option in the ANSYS program. The times are the best times made available to SASI for each make/model of computer and are given without reference to machine configuration, system load, etc.

Description of Benchmark Problems

SP-1

SP-1 demonstrates a mode frequency analysis (KAN=2) using the Guyan Reduction Procedure followed by the Householder Eigenvalue Extraction Procedure. The structure is a flat plate containing 128 STIF63 four node shell elements. The maximum node number used is 177 with 288 active degrees of freedom. There are 144 Master Degrees of Freedom selected for the analysis of 1 load step with 1 iteration. The maximum wavefront is 166. The RMS wavefront is 124.

SP-2

SP-2 is a problem that is designed to demonstrate I/O. The problem is a 1/2 lb. weight dropped 40 feet using the nonlinear transient analysis type KAN=4. The data consists of 10 elements: 7 STIF1 spar elements, 1 STIF40 gap element and 2 STIF21 mass elements. The maximum node number used is 9 and the total number of active degrees of freedom is 16. There are 4 load steps in the nonlinear analysis with a total of 404 cumulative iterations. The maximum wavefront is 7. The RMS wavefront is 5.

SP-3

SP-3 is a moderate sized 3-D solid static analysis (KAN=0) of a pressure vessel containing 1020 STIF45 eight node solid elements. The maximum node number is 2381 with 4839 active degrees of freedom. The analysis consists of one load step with one iteration with the loading condition of an internal pressure. The maximum wavefront is 258. The RMS wavefront is 150.

SP-4

SP-4 is a two part (thermal then stress) analysis (including postprocessing) of an axisymmetric structure using 400 elements. The maximum node number is 459. The thermal analysis (KAN=-1) consists of STIF55 four node axisymmetric elements with a maximum wavefront of 14 and a RMS wavefront of 12. The static analysis (KAN=0) consists of STIF42 four node axisymmetric elements with a maximum wavefront of 24 and an RMS wavefront of 22. There is one load step with one iteration in both analyses.

SP-5

SP-5 is a problem to demonstrate the binary standard file option (external file option) in the ANSYS program. The data consists of the SP-3 data with the additional commands to define ANSYS File12 and ANSYS File16 as written in the external format.

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COMPUTER	MODEL	SP-1		SP-2		SP-3		SP-4		SP-5		COMMENT
		CPU	ELAPSED	CPU	ELAPSED	CPU	ELAPSED	CPU	ELAPSED	CPU	ELAPSED	
ALLIANT	FX80/1	53	57	278	411	271	283	110	118	279	299	
ALLIANT	FX80/2	43	48	269	384	232	248	106	113	239	258	
ALLIANT	FX80/4	39	44	269	388	221	237	102	110	219	242	
ALLIANT	FX80/8	37	43	275	404	206	221	103	112	214	239	
ALLIANT	FX/2800 1CE	15	15	70	71	96	97	33	34	96	97	Ram Disk
Apollo	DN580T FPX	201	228	435	594	1260	1557	249	295	1265	1544	
Apollo	DN2500	298	312	308	362	1675	1872	237	242	1680	1873	
Apollo	DN3500	234	252	240	280	1347	1572	191	207	1352	1575	
Apollo	DN3500 FPA	158	159	245	287	947	1147	173	177	951	1136	
Apollo	DN4500	157	187	158	244	906	1178	120	160	918	1195	
Apollo	DN4500 FPA	117	125	175	229	667	925	118	129	673	928	
Apollo	DN5500	43	92	119	194	286	447	67	129	287	431	
Apollo	DN10000	22	35	84	90	126	132	41	49	127	131	
CONVEX	C120	43	44	161	297	172	185	68	78	180	195	
CONVEX	C210S	13	13	46	64	53	54	20	21	57	57	
CONVEX	C3210	12	14	39	58	51	53	20	22	55	56	one processor
CONVEX	C3810	6	7	24	36	24	24	10	11	25	26	
CRAY	CRAY-2	6	8	23	28	27	29	13	15	28	30	one processor
CRAY	X-MP 4/16	5	6	23	24	21	21	9	14	21	22	one processor
CRAY	Y-MP 8/128	4	4	16	16	17	17	9	9	19	19	one processor - LDCache
CRAY	XMS	41	53	303	502	196	240	100	113	213	269	
CYBER	180/830	251	277	339	390	1320	1418	247	291	1383	1503	
CYBER	960-31	24	31	56	71	151	163	32	42	156	168	
CYBER	990 Vector	11	18	37	49	67	75	23	28	69	82	
DEC	DECstation 2100	64	79	135	172	371	466	69	105	378	467	
DEC	DECstation 3100	48	61	107	144	283	371	53	73	285	372	
DEC	DECstation 5000/120	38	51	82	90	210	290	49	79	216	295	
DEC	DECstation 5000/200	28	42	56	95	145	228	28	62	149	223	
DEC	DECsystem 5100	36	46	76	123	203	296	42	59	207	287	
DEC	DECsystem 5400	44	52	100	131	245	317	48	69	248	321	
DEC	DECsystem 5500	23	25	46	51	129	207	27	38	133	214	
DEC	MicroVAX II	432	482	618	1023	3022	3337	512	579	3144	3468	
DEC	VAX 780	347	368	623	737	2415	2516	415	442	2511	2611	
DEC	VAX 3900	98	122	173	287	658	737	156	186	703	805	
DEC	VAX 4300	48	62	100	217	317	356	66	86	339	376	
DEC	VAX 4500	14	30	42	165	99	153	26	53	100	153	
DEC	VAX 4600	10	27	28	154	70	131	18	46	73	130	
DEC	VAX 4600	10	10	30	30	73	73	18	18	75	76	DECram
DEC	VAX 6410	49	74	113	240	347	457	65	98	367	478	
DEC	VAX 6510 Scalar	28	53	58	193	183	274	38	74	196	284	
DEC	VAX 6510 Vector	25	47	53	226	178	284	44	81	184	290	

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COMPUTER	MODEL	SP-1		SP-2		SP-3		SP-4		SP-5		COMMENT
		CPU	ELAPSED	CPU	ELAPSED	CPU	ELAPSED	CPU	ELAPSED	CPU	ELAPSED	
DEC	VAX 6610	11	33	29	150	73	161	18	55	77	163	
DEC	VAX 6610	11	11	30	30	75	75	19	19	79	79	DECram
DEC	VAX 8550	63	103	101	444	389	660	70	138	406	677	
DEC	VAX 9210 Vector	9	41	21	192	70	201	18	65	75	203	
DEC	VAX 9210 Vector	9	9	23	23	71	71	18	18	76	76	Turbo Cache/Turbo Disk
DEC	VAXstation 3100	160	209	264	427	1037	1407	185	258	1074	1449	
FPS	M64/35	57	95	114	1728	244	395	80	206	N/A	N/A	
FPS	M64/40	54	99	143	2132	278	338	100	168	N/A	N/A	
FPS Scalar	510	32	40	79	83	192	200	39	47	194	199	
[illegible] Vector	511	17	20	56	58	92	95	33	39	94	96	
FUJITSU	VP100E Vector	9	38	81	944	45	130	20	73	49	134	
HP9000	320	774	825	957	1392	4282	4459	492	700	N/A	N/A	
HP9000	340	368	397	357	655	2006	2075	260	308	2011	2073	
HP9000	350	402	423	329	657	2174	2259	240	282	2178	2251	
HP9000	350 FPA	206	231	330	704	1081	1155	208	254	1088	1159	
HP9000	360	250	271	268	579	1380	1450	186	226	1383	1452	
HP9000	360 FPA	177	208	265	604	982	1055	175	220	987	1053	
HP9000	370	192	227	206	638	1044	1158	138	195	1043	1150	
HP9000	370 FPA	120	144	209	568	641	722	125	180	644	749	
HP9000	375	126	157	131	426	694	939	94	174	696	942	
HP9000	400s (DOMAIN/OS)	108	110	102	106	650	699	94	95	649	698	
HP9000	400s (HP-UX/OS)	126	157	131	426	694	939	94	174	696	942	
HP9000	425s (DOMAIN/OS)	38	39	79	110	256	310	50	61	258	302	
HP9000	425s (HP-UX/OS)	54	64	90	207	340	382	69	93	342	382	
HP9000	710	13	15	40	41	72	101	23	24	72	102	8K blk/1K frag file sys
HP9000	710	13	14	40	41	69	77	22	24	69	77	32K blk/1K frag file sys
HP9000	720	10	12	29	30	57	90	17	19	58	88	8K blk/1K frag file sys
HP9000	720	10	12	29	30	56	66	17	19	56	65	32K blk/4K frag file sys
HP9000	730	8	10	23	23	45	61	13	14	45	62	8K blk/1K frag file sys
HP9000	730	8	9	22	23	43	48	13	17	44	49	32K blk/4K frag file sys
HP9000	750	8	10	22	23	43	52	13	14	44	50	8K blk/1K frag file sys
HP9000	750	8	9	22	23	42	43	12	14	42	43	32K blk/4K frag file sys
HP9000	835	54	65	117	139	319	428	62	88	319	360	
HP9000	855	37	42	58	80	210	241	35	40	212	243	
IBM	3090 (MVS/XA)	12	79	79	870	61	201	18	103	64	200	
IBM	4361-5	201	274	330	1061	1089	1568	160	299	1054	1439	
IBM	RISC System/6000 320H	19	22	49	49	84	85	30	31	85	86	
IBM	RISC System/6000 530	17	18	47	48	82	85	29	32	84	85	
IBM	RISC System/6000 540	14	14	39	39	68	70	24	25	70	70	
IBM	RISC System/6000 550	11	14	29	29	49	50	18	20	50	51	
IBM	RSIC System/6000 560	9	9	24	24	41	41	15	15	42	42	

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COMPUTER	MODEL	SP-1		SP-2		SP-3		SP-4		SP-5		COMMENT
		CPU	ELAPSED	CPU	ELAPSED	CPU	ELAPSED	CPU	ELAPSED	CPU	ELAPSED	
INTERGRAPH	IP 126	292	412	836	1923	1546	2218	320	588	1533	2097	
INTERGRAPH	IA 340	243	327	703	1762	1296	1780	266	468	1274	1712	
INTERGRAPH	IP 2020	98	113	268	452	519	588	125	159	525	593	
INTERGRAPH	IP 3050	121	140	329	452	648	702	150	179	652	704	
INTERGRAPH	IP 6040	112	122	284	290	600	640	138	164	607	643	
INTERGRAPH	IP 6240	90	109	249	360	478	522	116	148	487	533	
INTERGRAPH	IS 6585	63	78	162	266	339	389	76	110	340	390	
PC386	AMI 25MHZ	136	136	515	515	653	653	171	171	652	652	Intel RapidCAD chip
PC386	EVEREX 25MHZ	247	247	524	524	1115	1115	197	197	1163	1163	
PC386	GATEWAY 33MHZ	170	170	617	617	804	804	162	162	810	810	
PC386	NEC 98RL(JAPAN)20MHZ	402	402	953	953	1710	1710	383	383	1731	1731	
PC386	NEC H98(JAPAN)33MHZ	202	202	624	624	895	895	223	223	N/A	N/A	
PC386	IBM PS/2 25MHZ	341	341	939	939	1387	1387	322	322	1378	1378	
PC386 SX	AMI 20MHZ	405	405	962	962	1628	1628	493	493	1628	1628	
PC486	ALR 33MHZ	60	60	125	125	360	360	57	57	361	361	
PC486	COMPAQ 33MHZ	83	83	170	170	389	389	103	103	393	393	
PC486	DECstation 425c 25MHZ	115	115	462	462	555	555	152	152	549	549	
PC486	HP VECTRA 25MHZ	139	139	570	570	550	550	185	185	546	546	
PC486	IBM PS/2 25MHZ	134	134	424	424	677	677	185	185	674	674	
PRIME	2655	542	719	624	1350	2720	3730	457	748	2953	4034	
PRIME	4150	218	270	277	327	1063	1527	216	347	1128	1586	
SGI	CRIMSON	13	14	27	30	59	64	18	25	60	72	
SGI	IRIS 4D/20	94	98	186	188	455	472	112	121	458	475	
SGI	IRIS 4D/25	55	57	99	101	256	279	61	69	257	281	
SGI	IRIS 4D/35	22	24	37	39	105	110	26	31	105	110	
SGI	IRIS 4D/85	64	66	111	113	301	306	72	75	299	305	
SGI	IRIS 4D/2xx	26	28	56	59	140	149	32	39	141	152	one processor
SGI	IRIS 4D/3xx	21	21	49	50	113	114	28	28	114	115	one processor
SGI	IRIS INDIGO 4D/RPC	30	30	50	51	128	130	35	38	129	131	
Stardent	3020	20	34	93	175	108	160	43	60	109	177	
Sun SPARC	490 Server	34	40	58	805	186	187	35	41	187	188	
Sun SPARC	SPARCStation 1	71	101	133	201	377	508	75	118	377	478	
Sun SPARC	SPARCStation 1+	57	68	106	159	311	444	62	95	312	433	
Sun SPARC	SPARCStation 2	40	57	76	118	225	306	48	67	225	281	
Sun SPARC	SPARCStation 330	53	58	114	806	303	441	58	62	307	426	
Sun-3	80	337	365	319	381	1807	1901	245	308	1807	1892	
Sun-3	160	485	499	375	455	2588	2703	303	335	2597	2701	
Sun-3	160 FPA	242	258	362	445	1331	1467	247	291	1375	1498	
Sun-3	470	172	181	164	810	926	958	118	131	930	957	
Sun-3	470 FPA	117	124	167	810	655	679	106	122	662	691	
Sun-4	260	85	92	139	808	439	455	81	91	441	463	

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MODAL ANALYSIS TIMING RESULTS (SECONDS)			LM1		LM2		LM3		LM4		
COMPUTER	MODEL	OS	CPU	ELAPSED	CPU	ELAPSED	CPU	ELAPSED	CPU	ELAPSED	COMMENT
HP9000	730	HP-UX	257	300	1722	1884	5770	6125	N/A	N/A	8K blk/1K frag file sys
HP9000	730	HP-UX	254	283	1712	1810	5745	5960	N/A	N/A	32K blk/4K frag file sys
HP9000	750	HP-UX	257	295	1744	1902	5901	6254	15377	16005	8K blk/1K frag file sys
HP9000	750	HP-UX	254	274	1733	1833	5875	6094	15331	15712	32K blk/4K frag file sys
IBM	3090-180J	MVS/ESA	759	776	5615	5697	18424	18678	43172	44307	one processor
IBM	3090-180J Vector	MVS/ESA	201	215	1280	1319	3916	4020	8969	9248	one processor
IBM RISC	System/6000 320H	AIX	432	433	2796	2935	8647	9182	19402	20767	
IBM RISC	System/6000 530	AIX	408	411	2626	2836	8059	8836	18176	20722	
IBM RISC	System/6000 540	AIX	341	341	2132	2156	6632	6965	15997	16804	
IBM RISC	System/6000 550	AIX	246	246	1570	1573	4880	5209	10874	11634	
IBM RISC	System/6000 560	AIX 3.2	206	206	1332	1335	4112	4446	9180	10111	

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DESCRIPTION OF THE MODAL ANALYSIS LARGE SCALE BENCHMARK PROBLEMS

THESE EXAMPLES WERE DELIBERATELY SET WITH A POOR WAVEFRONT AND A LARGE NUMBER OF NODES TO STRESS THE COMPUTER SYSTEMS.

The mode frequency examples represent a cantilevered plate using the ANSYS 3-D solid isoparametric element, ST45. The mesh size and the number of master degrees of freedom are varied for the different cases. The procedures used in the analysis are the Guyan Reduction Procedure followed by the Householder Extraction Procedure.

Name	No. of Elements	No. of Nodes	Active Degrees of Freedom	Maximum Wavefront	Master Degrees of Freedom	RMS Wavefront	Disk Requirement MB
LM1	1,000	2,222	5,960	720	100	671	50
LM2	2,000	4,422	11,860	1,420	200	1,326	200
LM3	3,000	6,622	17,760	2,120	300	1,981	400
LM4	4,000	8,822	23,660	2,820	400	2,636	600

MODAL ANALYSIS TIMING RESULTS (SECONDS)			LM1		LM2		LM3		LM4		
COMPUTER	MODEL	OS	CPU	ELAPSED	CPU	ELAPSED	CPU	ELAPSED	CPU	ELAPSED	COMMENT
ALLIANT	FX/2800 1CE	CONCENTRIX	618	645	4279	4373	13682	13900	31577	31939	
ALLIANT	FX/2800 4CE	CONCENTRIX	302	321	1416	1565	4014	4227	8778	9145	
CONVEX	C3210	CONVEX UNIX	261	267	1760	2148	5710	5857	13260	13629	one processor
CONVEX	C3220	CONVEX UNIX	261	235	1757	1546	5720	4997	13295	11616	two processors
CONVEX	C3240	CONVEX UNIX	262	220	1772	1436	5750	4615	13388	10720	four processors
CONVEX	C3810	CONVEX UNIX	117	119	745	761	2500	2550	5909	6022	
CRAY	Y-MP 8/128	UNICOS	65	70	330	355	949	999	2110	2176	one processor - LDCache
CYBER	990 VECTOR	NOS VE	284	303	1794	1844	5590	5832	12615	13189	
DEC	VAX 6510 Vector	VMS	500	703	2923	3700	9061	10646	20694	23536	
DEC	VAX 9210 Vector	VMS	196	406	1169	1929	3639	5365	8314	11165	
DEC	VAX 9210 Vector	VMS	199	199	1176	1181	3651	3672	N/A	N/A	Turbo Cache/Turbo Disk
FPS	511 Vector	FPX	520	527	3289	3363	10175	10377	23496	23843	
FUJITSU	VP100E Vector	MSP/VPCF V10L	84	221	392	839	1103	2042	2397	4024	
HP9000	710	HP-UX	455	528	3700	3974	13110	13707	N/A	N/A	8K blk/1K frag file sys
HP9000	710	HP-UX	448	494	3676	3834	13051	13398	N/A	N/A	32K blk/4K frag file sys
HP9000	720	HP-UX	339	415	2243	2529	7516	8143	N/A	N/A	8K blk/1K frag file sys
HP9000	720	HP-UX	335	375	2228	2364	7485	7779	N/A	N/A	32K blk/4K frag file sys

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5/21/92

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STATIC ANALYSIS TIMING RESULTS (SECONDS)			LS1		LS2		LS3		LS4		LS5		
COMPUTER	MODEL	OS	CPU	ELAPSED	CPU	ELAPSED	CPU	ELAPSED	CPU	ELAPSED	CPU	ELAPSED	COMMENT
DEC	VAX 9210 Vector	VMS	99	100	383	385	1007	1013	N/A	N/A	N/A	N/A	Turbo Cache/Turbo Disk
FPS	510 Scalar	FPX	1003	1027	6729	6803	21700	21898	50413	50910	48771	49419	
FPS	511 Vector	FPX	154	159	545	561	1349	1448	2789	3029	2832	3160	
FUJITSU	VP100E Vector	MSP	55	195	175	595	405	1255	789	2308	836	2586	
HP9000	710	HP-UX	182	243	979	1230	3248	3767	7860	8786	7247	8342	8K blk/1K frag file sys
HP9000	710	HP-UX	177	205	957	1084	3204	3484	7784	8285	7154	7751	32K blk/4K frag file sys
HP9000	720	HP-UX	151	215	732	989	2160	2703	4883	5842	4776	5926	8K blk/1K frag file sys
HP9000	720	HP-UX	148	174	719	828	2131	2370	4833	5264	4721	5229	32K blk/4K frag file sys
HP9000	730	HP-UX	116	151	561	702	1657	1971	3761	4303	3668	4340	8K blk/1K frag file sys
HP9000	730	HP-UX	114	132	550	628	1633	1810	3725	4035	3622	3993	32K blk/4K frag file sys
HP9000	750	HP-UX	113	140	564	695	1668	1979	3826	4362	3702	4367	8K blk/1K frag file sys
HP9000	750	HP-UX	110	120	551	623	1647	1814	3786	4094	3654	4026	32K blk/4K frag file sys
IBM	3090-180J	MVS/ESA	237	242	1626	1645	5220	5315	12112	12310	11210	11927	one processor
IBM	3090-180J Vector	MVS/ESA	65	68	281	287	774	804	1623	1660	1613	1877	one processor
IBM RISC	System/6000 320H	AIX	187	187	886	998	2526	2841	5450	6243	5394	6418	
IBM RISC	System/6000 530	AIX	175	184	819	892	2330	2815	5001	6051	4960	6277	
IBM RISC	System/6000 540 / 340	AIX	146	147	677	680	1903	2023	4139	4656	4094	4800	
IBM RISC	System/6000 550 / 350	AIX	107	107	491	491	1391	1734	3002	3487	2945	3616	
IBM RISC	System/6000 560	AIX 3.2	88	91	413	414	1179	1670	2570	3104	2489	3221	
PC486	ALR EISA 33MHZ	DOS 5.0	1604	1604	10090	10090	32411	32411	N/A	N/A	N/A	N/A	EISA Cache/4 MB
SGI	CRIMSON	IRIX 4.0.4	306	330	2301	2483	7664	9932	17279	18368	17058	18223	
Sun SPARC	490 Server	SunOS	1150	1173	8002	8093	26118	26984	61027	63022	59022	61776	
Sun SPARC	670 MP Server	SunOS 4.1.2	1108	1132	7610	7830	24935	25390	59621	60392	55901	56837	one processor

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*** ANSYS® LARGE SCALE BENCHMARK TIMING RESULTS ***

Swanson Analysis Systems has provided a set . ANSYS benchmark data to hardware vendors. The dat s designed to demonstrate how well large ANSYS problems perform on computer systems. The data contains five static analysis and four mode-frequency examples. Times reported are the best times made available to SASI for each make/model of computer. Elapsed times are reported when the ANSYS job was the only job running.

DESCRIPTION OF THE STATIC ANALYSIS LARGE SCALE BENCHMARK PROBLEMS

THESE EXAMPLES WERE DELIBERATELY SET WITH A POOR WAVEFRONT TO STRESS THE COMPUTER SYSTEMS.
(FOR EXAMPLE, LS4 DEFINED OPTIMALLY (WAVEFRONT OF 78) RUNS IN 126 SEC. INSTEAD OF 609 SEC. ON THE Y-MP 8/128.)

The static analysis examples represent a cantilevered plate with one element through the thickness. The mesh size is varied for the different cases. A force loading is applied to the plate at the free end. The ANSYS 3-D solid isoparametric element, STIF45, is used in the static examples.

Name	No. of Elements	No. of Nodes	Active Degrees of Freedom	Maximum Wavefront	RMS Wavefront	Disk Requirement MB
LS1	1,000	2,222	6,060	618	573.3	100
LS2	2,000	4,422	12,060	1,218	1,131.9	200
LS3	3,000	6,622	18,060	1,818	1,690.5	400
LS4	4,000	8,822	24,060	2,418	2,249.0	600
LS5	6,000	12,642	36,120	1,818	1,754.1	700

STATIC ANALYSIS TIMING RESULTS (SECONDS)			LS1		LS2		LS3		LS4		LS5		
COMPUTER	MODEL	OS	CPU	ELAPSED	CPU	ELAPSED	CPU	ELAPSED	CPU	ELAPSED	CPU	ELAPSED	COMMENT
ALLIANT	FX80/1	CONCENTRIX	694	709	2755	2805	7318	7420	15669	15840	15484	15683	
ALLIANT	FX80/2	CONCENTRIX	540	570	1803	1894	4369	4574	8891	9246	9168	9589	
ALLIANT	FX80/4	CONCENTRIX	469	499	1347	1442	2948	3149	5598	5931	6107	6506	
ALLIANT	FX80/8	CONCENTRIX	444	496	1174	1260	2364	2560	4218	4562	4907	5313	
ALLIANT	FX/2800 1CE	CONCENTRIX	255	260	1266	1273	3790	3853	8408	8601	8116	8372	
ALLIANT	FX/2800 4CE	CONCENTRIX	207	226	644	696	1493	1784	2884	3381	3120	3839	
Apollo	DN10000	DOMAIN	483	491	3138	3268	10230	10527	23868	24414	22729	23393	
CONVEX	C210S	CONVEX UNIX	114	117	569	579	1702	1728	3797	3886	3629	3725	
CONVEX	C3210	CONVEX UNIX	99	102	483	495	1424	1457	3172	3252	3045	3149	one processor
CONVEX	C3220	CONVEX UNIX	99	80	482	317	1418	855	3170	1831	3032	1848	two processors
CONVEX	C3240	CONVEX UNIX	101	68	491	233	1442	571	3216	1149	3079	1234	four processors
CONVEX	C3810	CONVEX UNIX	47	48	213	220	619	633	1393	1446	1343	1376	
CRAY	CRAY-2	UNICOS	60	72	166	184	350	381	647	699	720	786	
CRAY	Y-MP 8/128	UNICOS	42	43	130	131	303	303	609	618	631	657	one processor - LDCache
CRAY	XMS	UNICOS	451	571	1413	1817	3258	4023	N/A	N/A	N/A	N/A	
CYBER	990 Vector	NOS VE	127	146	585	643	1717	1871	3701	4373	3584	4303	
DEC	VAX 6510 Vector	VMS	251	436	958	1596	2540	3938	5352	7773	5339	8192	
DEC	VAX 9210 Vector	VMS	99	334	378	1139	998	2568	2098	4908	2108	5251	

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