

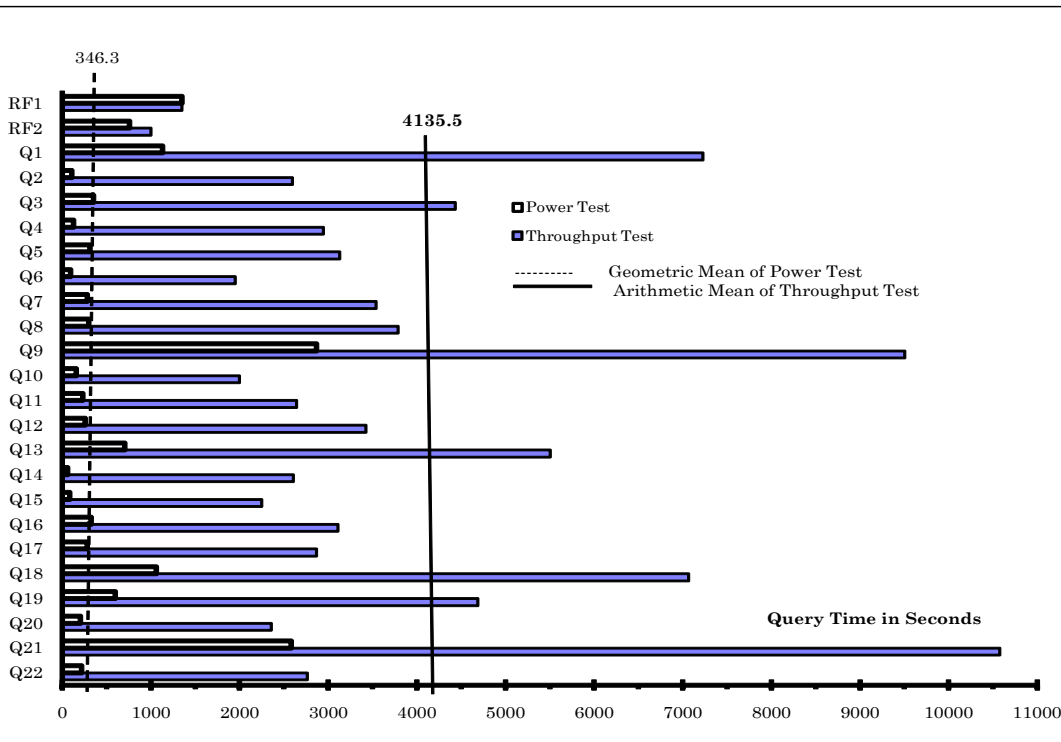


# ES7000 Model 7600R Enterprise Server (16s)

TPC-H Rev. 2.8.0  
TPC Pricing 1.4

Report Date  
February 17, 2009

<b>Total System Cost</b>		<b>Composite Query per Hour Rating</b>		<b>Price Performance</b>	
\$1,518,988 USD		80,172.7 QpH @ 1000GB		\$18.95 / QpH @ 1000GB	
<b>Database Size</b>	<b>Database Manager</b>	<b>Operating System</b>	<b>Other Software</b>	<b>Availability Date</b>	
10000 GB*	Microsoft SQL Server 2008 Enterprise Edition (64-bit)	Microsoft Windows Server 2008, Datacenter Edition (64-bit)	Visual Studio Standard 2005	February 17, 2009	



Database Load Time = 54:59:51    Load included backup: Y    Total Data Storage / Database Size = 8.81

RAID (Base tables): N    RAID (Base tables and Auxiliary Data Structures): N    RAID (All): N

System Components		System Total	Per Node
Nodes		1	n.a.
Processors/Cores/Threads: (4 of 6 cores used/processor) Intel® Hex Core Xeon™ X7460 2.66GHz w/ 16MB L3 Cache		16/64/64	16/64/64
Memory (in GB)		512	512
Inbuilt 1Gb Eth. Contrls. (1 used)		8	8
Disk Controllers	PCIe Fibre Channel	36	36
	PCI SAS RAID (boot)	1	1
Disk Drives	73GB FC 15K rpm	555	555
	146GB FC 15K rpm	373	373
	73GB SAS 10K rpm (boot media)	3	3
Total Disk Storage - formatted capacity		88,082 GB	88,082 GB

\* Database size includes only raw data (eg, no temp, index, redundant storage space, etc.)



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Description	Part Number	Price Source	Unit Price	Qty.	Extended Price	3-yr.Maint. Price	
<b>Server Hardware:</b>							
ES7000 Model 7600R with 32GB with 32GB	ES7763163-100	1	\$135,003	1	\$135,003	\$6,768	
Memory Initial 8GB with 4 GB DIMMs	FAC7102403-ICA	1	\$1,378	4	\$5,512		
Memory Expansion - 8GB	FAC7102403-8GB	1	\$585	56	\$32,760		
Emulex Lpe12002	NU9233231-IOD	1	\$3,986	36	\$143,496		
Boot Drive (Mirrored Drives)	FAC7760361-IDK	1	\$2,083	1	\$2,083		
73 GB SAS Disk	NU9413332-IOD	1	\$606	1	\$606		
RCK:KBRD/MOUSE/17"MON	ES70006-UIF	1	\$675	1	\$675		
Ethernet Cable 50 ft	GCPO888950-BK	1	\$6	1	\$6		
PCIe 3U x 5 Slot I/O Expansion Rack	IER9320521-JAS	1	\$5,129	12	\$61,548		
Expansion rack cable	CBL9120151-CAT	1	\$232	12	\$2,784		
<b>Server Subtotal</b>					<b>\$384,473</b>	<b>\$6,768</b>	
<b>Storage Hardware:</b>							
Dual RAID Controller for Log	RTS422880-T2	1	\$15,490	2	\$30,980		
AC Power Cord	RTS400740-CBL	1	\$11	124	\$1,364		
73GB Disk Drive	RTS4307315-4FH	S	\$484	555	\$268,620		
146GB Disk Drive (ea)	RTS4314615-4FH	1	\$660	359	\$236,940		
146GB Disk Drives for Log 1 (15 Pack)	RTS4314615-P15	1	\$18,695	1	\$18,695		
Battery Backup for RAID Controllers	RTS420020-BAT	1	\$330	2	\$660		
Optical Transceiver - 60 Pack	RTS400150-P60	1	\$6,321	1	\$6,321		
Optical Transceiver - ea	RTS400150-SFP	1	\$110	4	\$440		
RAID Controller 1x1 - Style 1	RTS422880-1X1	1	\$10,102	7	\$70,714		
RAID Controller 1x1 - Style 1 -15 Pack	RTS4228801-P15	1	\$104,277	2	\$208,554		
RAID Controller 1x1 - Style 2	RTS422880-T1	1	\$10,102	3	\$30,306		
RAID Controller 1x1 - Style 2 - 5 Pack	RTS4228802-P05	1	\$45,459	1	\$45,459		
RAID Controller 1x1 - 15 Pack	RTS4228802-P15	1	\$106,071	1	\$106,071		
Snap in 1U Filler	RCK4219421-1UP	1	\$20	5	\$100		
Snap in 3 U Filler	RCK4219421-3UP	1	\$22	7	\$154		
42U Rack	RCK4219421-SC2	1	\$462	1	\$462		
Power Strip	PWR4243001-SD	1	\$323	1	\$323		
Power Strip	PWR4243001-SVD	1	\$332	2	\$664		
42U 19" Rack	RCK4219421-FSS	1	\$2,769	1	\$2,769		
42U Rack - No Doors	RM421940-FRM	1	\$1,286	6	\$7,716		
8 Outlet Power Strip	SFR9-PWR	1	\$170	19	\$3,230		
Power Cord	USE1936-LC6	1	\$90	19	\$1,710		
Fiber Channel Cables 10M - 64 Pack	GCFAZLLM10-M	3	27.50	64	\$1,760		
<b>Storage Subtotal</b>					<b>\$1,044,010</b>	<b>\$0</b>	
<b>Server Software:</b>							
Windows 2008 Svr, DC x64 Edtn	WDX286416-NPR	1	\$47,984	1	\$47,984		
Windows 2008 Server, DC LmtD Sbscrptn, 1yr.	DUS2200316-LI	1	\$8,400	2	\$16,800		
SQL Server 2008 Enterprise Edition (25 CALS)	810-07578	2	\$8,318	1	\$8,318		
SQL Server 2008 Client License	359-01912	2	\$156	65	\$10,140		
Visual Studio Standard 2005	127-00012	2	\$250	1	\$250		
Microsoft Problem Resolution Svc	N/A	2	\$245	1	\$245	245	
<b>Software Subtotal</b>					<b>\$83,492</b>	<b>\$245</b>	
Unisys Product Pricing (List Pricing) - Michael Heifner (215)-986-4757 (where Price Source = 1 or S)					<b>Total USD</b>	<b>\$1,511,975</b>	<b>\$7,013</b>

**Notes:**

1. \* 10% or minimum 2 spares are added in place of onsite service.
2. HW & SW maintenance at 24 x 7 w/ 4 hr. max. response time for spares.
3. Price Source: 1 = Unisys Product Price, Unisys Maintenance Price  
2 = Microsoft 3 = GoCables
- S. One or more components of the measured configuration have been substituted in the Pricing Configuration. See the FDR for details.

**3-Year Cost of Ownership: \$1,518,988 USD**  
**QpH @ 10000GB: 80,172.7**  
**\$/ QpH@10000GB: \$18.95 USD**

Benchmark results and test methodology audited by Lorna Livingtree of Performance Metrics, Inc.

Prices used in TPC benchmarks reflect the actual prices a customer would pay for a one-time purchase of the stated components. Individually negotiated discounts are not permitted. Special prices based on assumption about past or future purchases are not permitted. All discounts reflect standard pricing policies for the listed components. For complete details, see the pricing sections of the TPC benchmarks specifications. If you find that the stated prices are not available according to these terms, please inform the TPC at [pricing@tpc.org](mailto:pricing@tpc.org). Thank You.



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### Numerical Quantities Summary

**Measurement Results**

Scale Factor	10000 GB
Total Data Storage / Database Size	8.81
Start of Database Load	1/25/2009 1:56:15
End of Database Load	1/27/2009 8:56:06
Database Load Time	54:59:51
Query Streams for Throughput Test	9
TPC-H Power	103,956.1
TPC-H Throughput	61,830.5
Composite Query per Hour Rating (QphH@1000GB)	80,172.7
Total System Price Over 3 Years	\$1,518,988 USD
TPC-H Price Performance Metric (\$/QphH@1000GB)	\$18.95 USD

**Measurement Intervals**

Measurement Interval in Throughput Test (Ts) 115283 seconds

**Duration of Stream Execution:**

	Seed	Query Start Date/Time		RF1 Start Date/Time		RF2 Start Date/Time		Duration
		Query End Date/Time	RF1 End Date/Time	RF2 End Date/Time				
Stream 0	127085606	1/29/2009 13:09:48	1/29/2009 12:47:17	1/29/2009 16:35:32	1/29/2009 16:48:10	3:25:44		
		1/29/2009 16:35:32	1/29/2009 13:09:48					
Stream 1	127085607	1/29/2009 16:48:10	1/30/2009 18:56:37	1/30/2009 19:17:06	1/30/2009 19:33:51	25:39:20		
		1/30/2009 18:27:30	1/30/2009 19:17:06					
Stream 2	127085608	1/29/2009 16:48:10	1/30/2009 19:33:51	1/30/2009 19:56:21	1/30/2009 20:12:41	26:08:26		
		1/30/2009 18:56:36	1/30/2009 19:56:21					
Stream 3	127085609	1/29/2009 16:48:10	1/30/2009 20:12:42	1/30/2009 20:35:05	1/30/2009 20:51:58	25:33:20		
		1/30/2009 18:21:30	1/30/2009 20:35:04					
Stream 4	127085610	1/29/2009 16:48:10	1/30/2009 20:51:59	1/30/2009 21:14:21	1/30/2009 21:30:32	26:07:30		
		1/30/2009 18:55:40	1/30/2009 21:14:21					
Stream 5	127085611	1/29/2009 16:48:10	1/30/2009 21:30:32	1/30/2009 21:52:57	1/30/2009 22:09:45	25:17:09		
		1/30/2009 18:05:19	1/30/2009 21:52:57					
Stream 6	127085612	1/29/2009 16:48:11	1/30/2009 22:09:45	1/30/2009 22:32:50	1/30/2009 22:49:26	25:26:22		
		1/30/2009 18:14:33	1/30/2009 22:32:50					
Stream 7	127085613	1/29/2009 16:48:11	1/30/2009 22:49:26	1/30/2009 23:12:39	1/30/2009 23:29:02	26:06:47		
		1/30/2009 18:54:58	1/30/2009 23:12:39					
Stream 8	127085614	1/29/2009 16:48:11	1/30/2009 23:29:03	1/30/2009 23:51:48	1/31/2009 0:09:55	22:51:09		
		1/30/2009 15:39:19	1/30/2009 23:51:47					
Stream 9	127085615	1/29/2009 16:48:11	1/30/2009 0:09:55	1/31/2009 0:33:17	1/31/2009 0:49:33	24:16:56		
		1/30/2009 17:05:07	1/31/2009 0:33:17					



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**TPC-H Timing Intervals (in seconds):**

Query	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8
Stream 0	1132.2	107.8	353.6	126.3	310.7	93.7	281.0	298.7
Stream 1	6075.5	840.1	2755.3	5806.4	2583.3	3216.6	5817.8	2938.5
Stream 2	5615.3	3928.4	5270.8	4747.9	2437.0	634.7	3266.8	2870.0
Stream 3	6839.8	1047.3	6796.8	2295.4	6857.7	1711.4	2881.0	2475.1
Stream 4	9473.3	1170.6	1209.0	1451.7	1686.6	1222.1	2671.6	2793.1
Stream 5	7206.8	3351.7	3614.6	2901.0	3736.5	3093.4	2026.1	5709.2
Stream 6	7316.5	2501.1	7831.0	2304.3	1515.3	823.6	6683.1	2393.6
Stream 7	5410.1	5157.3	3050.1	3632.5	5472.5	2998.4	4193.1	3212.2
Stream 8	11306.3	2025.1	6098.1	1456.9	2309.6	2049.9	1632.1	4315.4
Stream 9	5822.1	3343.1	3279.5	1915.0	1570.9	1824.6	2695.3	7385.2
Min Qi	5410.1	840.1	1209.0	1451.7	1515.3	634.7	1632.1	2393.6
Max Qi	11306.3	5157.3	7831.0	5806.4	6857.7	3216.6	6683.1	7385.2
Avg Qi	7229.5	2596.1	4433.9	2945.7	3129.9	1952.7	3540.8	3788.0
Query	Q9	Q10	Q11	Q12	Q13	Q14	Q15	Q16
Stream 0	2867.9	156.5	233.2	257.8	706.2	61.7	82.5	327.1
Stream 1	12811.3	2490.3	4571.2	2125.6	3969.8	2128.9	5246.1	2145.7
Stream 2	10490.4	2060.8	1931.9	6032.8	4980.1	2376.2	1129.6	3296.9
Stream 3	7299.3	2423.5	2405.0	2635.8	6021.6	1445.0	2044.9	3624.5
Stream 4	7946.3	2106.5	2779.7	2716.1	6315.1	2032.8	3698.0	3011.0
Stream 5	7582.3	1567.6	2236.4	3617.8	8234.4	2199.1	1687.1	2651.9
Stream 6	9143.6	729.6	1751.1	3786.2	5056.0	5204.0	1582.8	5684.0
Stream 7	10489.5	2032.0	4247.6	1408.7	5269.9	4519.5	287.4	1590.4
Stream 8	8299.4	2200.0	1809.3	3858.6	4739.2	1712.7	2528.4	2950.0
Stream 9	11480.3	2370.6	2066.8	4657.1	4946.5	1846.4	2036.7	3024.4
Min Qi	7299.3	729.6	1751.1	1408.7	3969.8	1445.0	287.4	1590.4
Max Qi	12811.3	2490.3	4571.2	6032.8	8234.4	5204.0	5246.1	5684.0
Avg Qi	9504.7	1997.9	2644.3	3426.5	5503.6	2607.2	2249.0	3108.8
Query	Q17	Q18	Q19	Q20	Q21	Q22	RF1	RF2
Stream 0	282.3	1061.5	598.2	203.4	2583.9	217.6	1351.2	757.8
Stream 1	2292.7	6507.6	4665.3	1348.4	8434.4	3589.5	1228.7	1004.9
Stream 2	6525.2	6151.2	4618.5	3970.8	9596.9	2174.0	1349.5	980.7
Stream 3	2796.5	10348.5	5387.8	1911.1	10457.8	2293.7	1342.7	1013.8
Stream 4	6121.3	8584.4	4665.7	693.5	15781.5	5920.2	1342.2	970.3
Stream 5	1710.6	9645.7	4333.6	3704.0	8334.6	1884.5	1345.3	1007.2
Stream 6	2270.2	5221.7	5378.0	4007.1	8264.7	2134.8	1384.6	995.7
Stream 7	1207.0	6434.3	4586.1	2479.4	13577.1	2752.3	1392.8	983.3
Stream 8	968.9	4807.7	2171.8	1692.4	11441.0	1895.9	1364.8	1087.4
Stream 9	1937.2	5886.6	6392.5	1417.2	9296.7	2221.9	1401.4	975.9
Min Qi	968.9	4807.7	2171.8	693.5	8264.7	1884.5	1228.7	970.3
Max Qi	6525.2	10348.5	6392.5	4007.1	15781.5	5920.2	1401.4	1087.4
Avg Qi	2870.0	7065.3	4688.8	2358.2	10576.1	2763.0	1350.2	1002.1