



# ES7000/one Enterprise Server (16P)

TPC-H Rev. 2.3.0

Report Date  
July 18, 2006

**Total System Cost**

**Composite Query per Hour Rating**

**Price Performance**

**\$1,135,354 USD**

**30,013.4 QphH @ 3000GB**

**\$37.83 / QphH @ 3000GB**

**Database Size**

**Database Manager**

**Operating System**

**Other Software**

**Availability Date**

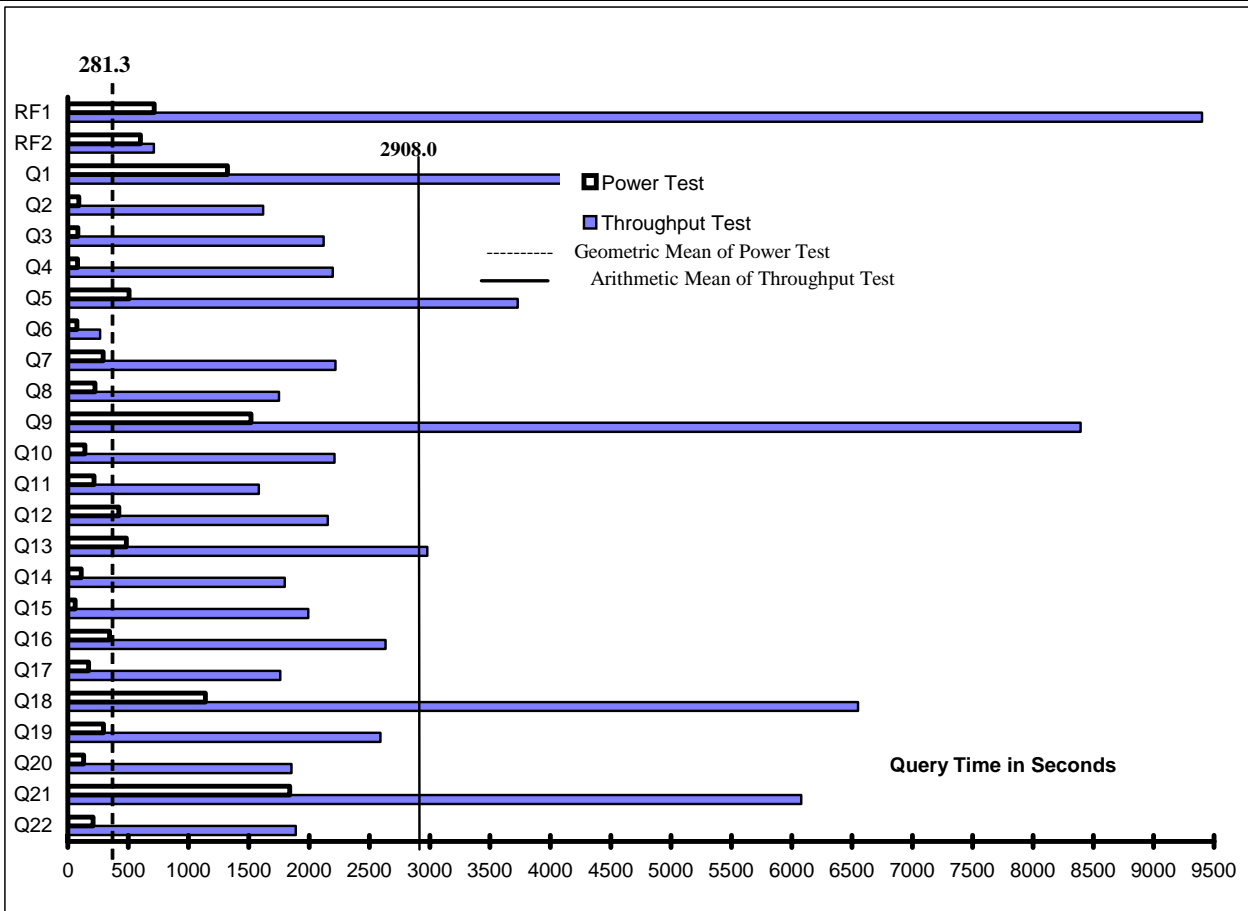
**3000 GB\***

Microsoft SQL Server  
2005 Enterprise  
Itanium Edition, SP1

Microsoft Windows  
Server 2003, Datacenter  
Edition for Itanium Sys

Visual C++  
Visual Studio

**September 8, 2006**



**Database Load Time = 60:45:42**

**Load included backup: Y**

**Total Data Storage / Database Size = 9.49**

**RAID (Base tables): N**

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

**RAID (All): N**

**System Configuration**

Processors/Cores/Threads	16/32/64	Intel® Dual Core Itanium2™ 9040 1.6GHz w/ 18MB L3 Cache
Memory	256 GB	Main Memory
Disk Controllers	40	PCI Fibre Channel
	1	PCI SAS RAID (boot)
Disk Drives	546	36GB FC 15K rpm
	143	73GB FC 15K rpm
	2	36GB SAS 10K rpm (boot media)
Total Disk Storage	28,483	GB

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



## ES7000/one Enterprise Server (16P)

TPC-H Rev. 2.3.0  
TPC Pricing 1.0.1

Report Date  
July 18, 2006

Description	Part Number	Price Source	Unit Price	Qty.	Extended Price	3-yr.Maint. Price
<b>Server Hardware:</b>						
SYS: ES7000/one, 16x 9040/1.6GHz, 32GB Mem. Service Processor & Server Mngmt SW	ES7121165-700 Included		\$370,500	1	\$370,500	\$14,400
MEM: 4GB ES7/one Memory, 2GB DIMMs	FAC7102201-ICA		\$2,280	8	\$18,240	
MEM: 32GB ES7/one Memory, 2GB DIMMs	FAC7116201-32G		\$11,552	6	\$69,312	
CTRL: Fibre Channel HBA, 2Gb, 2-Port PCI	FCH752323-PCX		\$2,138	37	\$79,106	
CTRL: Fibre Channel HBA, 4Gb, 2-Port PCI	FCH6440231-PCX		\$1,899	3	\$5,697	
KIT: 1x RAID Cntrlr, 1x 36GB Disk (boot media)	FAC7120361-IDK		\$779	1	\$779	
DISK: 1x 36GB 10Krpm SAS (boot media)	HDX4036101-X25		\$428	1	\$428	
I/F: Monitor, 17-inch LCD, Kybrd, Mse & Cable	ES70004-UIF		\$665	1	\$665	
CBL: Ethernet, Cat5e, RJ45 Conn's, 4m	DSH600004-TBT		\$19	1	\$19	
CAB: 40U x 19" x 42" Open Front Cabinet	RCK4019421-FSS		\$2,470	1	\$2,470	
CAB: 40U Open Front Trim Kit	RCK4019421-OTK		\$238	1	\$238	
ACC: Installation/Maintenance Materials	MNT1000-INS		\$166	1	\$166	
ACC: ES7000/one Call Home Service	ECH716400-CH		\$0	1	\$0	
<b>Server Subtotal</b>					<b>\$547,620</b>	<b>\$14,400</b>
<b>Storage Hardware:</b>						
DISK: 73GB, 15Krpm, 2Gb FC *	CXR7315-UGF		\$1,207	33	\$39,831	Spared
CTRL: DPE, 2 RAID Cntrl, 1GB Cache ea., 0 Disk	CXU300-DPE		\$13,300	1	\$13,300	\$1,008
RCK: DAE Storage Enclosure, FC 2Gb Optical I/F	CXP2-UFD		\$5,605	1	\$5,605	\$432
SYS MGT: Storage, Navisphere Manager	CXN300-WRK		\$2,138	1	\$2,138	\$1,008
DISK: 3.0TB Pkg, 84x 36GB, 15Krpm FC *	JBD203615-P84		\$36,086	7	\$252,602	Spared
DISK: 6.0TB Pkg, 84x 73GB, 15Krpm FC *	JBD207315-P84		\$63,503	1	\$63,503	Spared
DISK: 1.0TB Pkg, 14x 73GB, 15Krpm FC *	JBD207315-P14		\$14,772	1	\$14,772	Spared
DISK: 73GB Drive, 15Krpm FC *	JBD207315-2F		\$1,088	10	\$10,880	Spared
RCK: Storage Enclosure, FC 2Gb Optcl/Optcl I/F	JBD2020-SA		\$3,958	45	\$178,110	\$28,080
RCK: Rack Mount Kit, Disk Enclosure	JBD2001-RMK		\$190	45	\$8,550	
DISK: 36GB, 15Krpm, 4Gb FC *	IQD403615-4F		\$426	16	\$6,816	Spared
DISK: 73GB, 15Krpm, 4Gb FC *	IQD407315-4F		\$596	17	\$10,132	Spared
RCK: Storage Enclosure, FC 4Gb Optical/Optical I/F	IQS4000-BAS		\$5,447	2	\$10,894	\$1,728
RCK: Rack Mount Kit, Disk Enclosure	IQS4000-RMK		\$256	2	\$512	
RCK: SFP Transceiver, 4Gb LC Optical	IQS4010-IF		\$204	2	\$408	\$60
CBL: FC, Optical, LC->LC Conn's, 10m *	GCFAZLLM10-M		\$48	87	\$4,176	Spared
PWR: Distribution Strip, 8-Socket, 220V	PWR82430-STV		\$404	13	\$5,252	
CAB: 40U x 19" x 42" Open Front Cabinet	RCK4019421-AUX		\$1,805	4	\$7,220	
CAB: 40U Open Front Trim Kit	RCK4019421-OTK		\$238	4	\$952	
<b>Storage Subtotal</b>					<b>\$635,653</b>	<b>\$32,316</b>
<b>Server Software:</b>						
O/S: Windows 2003 Srvr, DC Edtn, 16P, 1yr Lsub.	WND6416-TSP		\$35,112	1	\$35,112	\$17,424
O/S: Windows 2003 Server, DC Lmt'd Sbscrptn, 1yr.	DUS200316-TSP		\$3,173	2	\$6,346	
APP: Microsoft SQL Srvr 2005 Ent. Itanium Edtn.	810-04779		\$8,318	1	\$8,318	** Inc. below
APP: Microsoft SQL Server 2005 Client License	359-01911		\$156	55	\$8,580	** Inc. below
ACC: Microsoft Visual C++ .Net Standard 2003	254-00170		\$109	1	\$109	** Inc. below
ACC: Microsoft Visual Basic .Net Standard 2003	046-00856		\$109	1	\$109	** Inc. below
SRVC: Microsoft Problem Resolution Services **			\$245	1	\$245	\$245
<b>Software Subtotal</b>					<b>\$58,574</b>	<b>\$17,669</b>
Computer Resolutions Inc. 14% Volume Cash Discount (Ext.Price where Price Source=1)					(\$170,878)	
<b>Total USD</b>					<b>\$1,070,969</b>	<b>\$64,385</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. respon 3 = GoCables
3. Price Source: 1 = CRI Product Price, Unisys Maintenance Price  
2 = Microsoft 3 = GoCables

**Three Year Cost of Ownership: \$1,135,354 USD**  
**QpH @3000GB: 30,013.4**  
**\$/ QpH@3000GB: \$37.83 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. Thank You.

## Numerical Quantities Summary

### Measurement Results

Scale Factor	3000 GB
Total Data Storage / Database Size	9.49
Start of Database Load	7/3/2006 14:28:32
End of Database Load	7/6/2006 3:14:14
Database Load Time	60:45:42
Query Streams for Throughput Test	8
TPC-H Power	38395.9
TPC-H Throughput	23460.9
Composite Query per Hour Rating (QphH@3000GB)	30013.4
Total System Price Over 3 Years	\$1,197,918 USD
TPC-H Price Performance Metric	\$37.83 USD

### Measurement Intervals

Measurement Interval in Throughput Test (Ts)	81019.7 seconds
--	-----------------

### Duration of Stream Execution:

	Seed	Query Start Date/Time	RF1 Start Date/Time	RF2 Start Date/Time	
		Query End Date/Time	RF1 End Date/Time	RF2 End Date/Time	Duration
Stream 0	706031414	7/7/06 17:07:12 7/7/06 19:50:14	7/7/06 16:55:15 7/7/06 17:07:11	7/7/06 19:50:15 7/7/06 20:00:18	03:05:03
Stream 1	706031415	7/7/06 20:00:21 7/8/06 14:45:19	7/7/06 20:00:21 7/8/06 15:13:51	7/8/06 15:13:53 7/8/06 15:24:41	19:24:20
Stream 2	706031416	7/7/06 20:00:23 7/8/06 13:23:02	7/8/06 15:24:46 7/8/06 15:37:33	7/8/06 15:37:35 7/8/06 15:47:58	19:47:35
Stream 3	706031417	7/7/06 20:00:25 7/8/06 13:38:04	7/8/06 15:48:04 7/8/06 16:01:40	7/8/06 16:01:43 7/8/06 16:12:48	20:12:24
Stream 4	706031418	7/7/06 20:00:27 7/8/06 13:08:35	7/8/06 16:12:56 7/8/06 16:26:43	7/8/06 16:26:46 7/8/06 16:38:42	20:38:16
Stream 5	706031419	7/7/06 20:00:29 7/8/06 12:38:21	7/8/06 16:38:51 7/8/06 16:53:13	7/8/06 16:53:17 7/8/06 17:05:19	21:04:50
Stream 6	706031420	7/7/06 20:00:32 7/8/06 12:59:46	7/8/06 17:05:31 7/8/06 17:20:12	7/8/06 17:20:20 7/8/06 17:32:04	21:31:32
Stream 7	706031421	7/7/06 20:00:35 7/8/06 14:39:12	7/8/06 17:32:15 7/8/06 17:47:41	7/8/06 17:47:46 7/8/06 18:00:58	22:00:23
Stream 8	706031422	7/7/06 20:00:39 7/8/06 15:01:34	7/8/06 18:01:13 7/8/06 18:16:27	7/8/06 18:16:42 7/8/06 18:30:40	22:30:02

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

Query	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8
Stream 0	1324.1	90.2	83.7	81.8	509.7	76.5	294.6	224.0
Stream 1	5452.9	256.1	2600.7	162.6	4685.9	211.5	3464.0	3090.6
Stream 2	5718.9	2315.9	1168.3	1107.8	2180.1	382.3	2368.1	2332.3
Stream 3	4053.1	363.7	285.5	953.0	6481.2	293.5	1851.3	852.8
Stream 4	5979.5	4007.0	3929.3	3644.6	2543.1	247.3	3731.3	1519.7
Stream 5	4981.0	2218.4	2021.4	1245.6	3253.9	347.5	2132.6	979.9
Stream 6	5253.9	247.2	4582.5	3718.5	5109.7	193.2	2361.6	1715.6
Stream 7	3858.5	620.2	1395.8	3794.5	1676.8	162.8	642.3	1909.0
Stream 8	9487.8	2919.2	968.3	2944.7	3901.5	299.9	1203.7	1598.3
Min Qi	3858.5	247.2	285.5	162.6	1676.8	162.8	642.3	852.8
Max Qi	9487.8	4007.0	4582.5	3794.5	6481.2	382.3	3731.3	3090.6
Avg Qi	5598.2	1618.5	2119.0	2196.4	3729.0	267.3	2219.4	1749.8
Query	Q9	Q10	Q11	Q12	Q13	Q14	Q15	Q16
Stream 0	1518.7	140.5	217.2	422.3	485.7	110.1	60.5	347.4
Stream 1	8459.6	4521.0	1215.7	1167.1	2571.0	1066.0	1330.0	4895.5
Stream 2	6170.6	994.7	976.6	4264.0	1355.7	3952.3	2907.6	1569.4
Stream 3	9377.6	2941.6	1250.3	1702.8	1277.2	883.3	3959.4	5713.9
Stream 4	4142.1	2303.0	1564.3	3804.2	981.1	1656.3	732.5	1429.9
Stream 5	5794.4	2243.4	2003.7	916.6	4802.1	624.5	2539.0	2381.8
Stream 6	7030.2	2929.8	1769.8	2561.3	2151.6	780.4	603.0	2330.4
Stream 7	17358.1	295.9	3678.3	569.8	6780.5	125.4	169.4	748.4
Stream 8	8823.7	1464.7	219.1	2264.0	3921.7	5298.5	3714.1	2010.0
Min Qi	4142.1	295.9	219.1	569.8	981.1	125.4	169.4	748.4
Max Qi	17358.1	4521.0	3678.3	4264.0	6780.5	5298.5	3959.4	5713.9
Avg Qi	8394.5	2211.8	1584.7	2156.2	2980.1	1798.3	1994.4	2634.9
Query	Q17	Q18	Q19	Q20	Q21	Q22	RF1	RF2
Stream 0	173.3	1141.7	295.5	132.5	1839.9	211.2	716.8	602.4
Stream 1	1188.9	8538.7	1342.4	1685.2	5300.1	4292.7	69210.8	647.5
Stream 2	3368.6	5817.2	2571.3	2817.3	7563.8	656.5	767.0	622.4
Stream 3	1254.2	8275.8	1360.9	3156.8	5148.5	2023.4	816.1	665.1
Stream 4	703.2	6839.8	1542.8	3006.1	6232.8	1148.6	827.2	715.9
Stream 5	2564.8	6771.4	4260.7	689.7	5238.1	1860.8	861.6	721.8
Stream 6	687.9	4141.8	3099.7	1470.6	6547.1	1868.8	881.2	704.0
Stream 7	695.0	10545.8	2258.0	1014.6	7293.5	1524.2	925.8	792.4
Stream 8	3617.6	1468.3	4295.8	990.7	5305.8	1737.9	913.7	838.5
Min Qi	687.9	1468.3	1342.4	689.7	5148.5	656.5	767.0	622.4
Max Qi	3617.6	10545.8	4295.8	3156.8	7563.8	4292.7	69210.8	838.5
Avg Qi	1760.0	6549.9	2591.5	1853.9	6078.7	1889.1	9400.4	713.5