

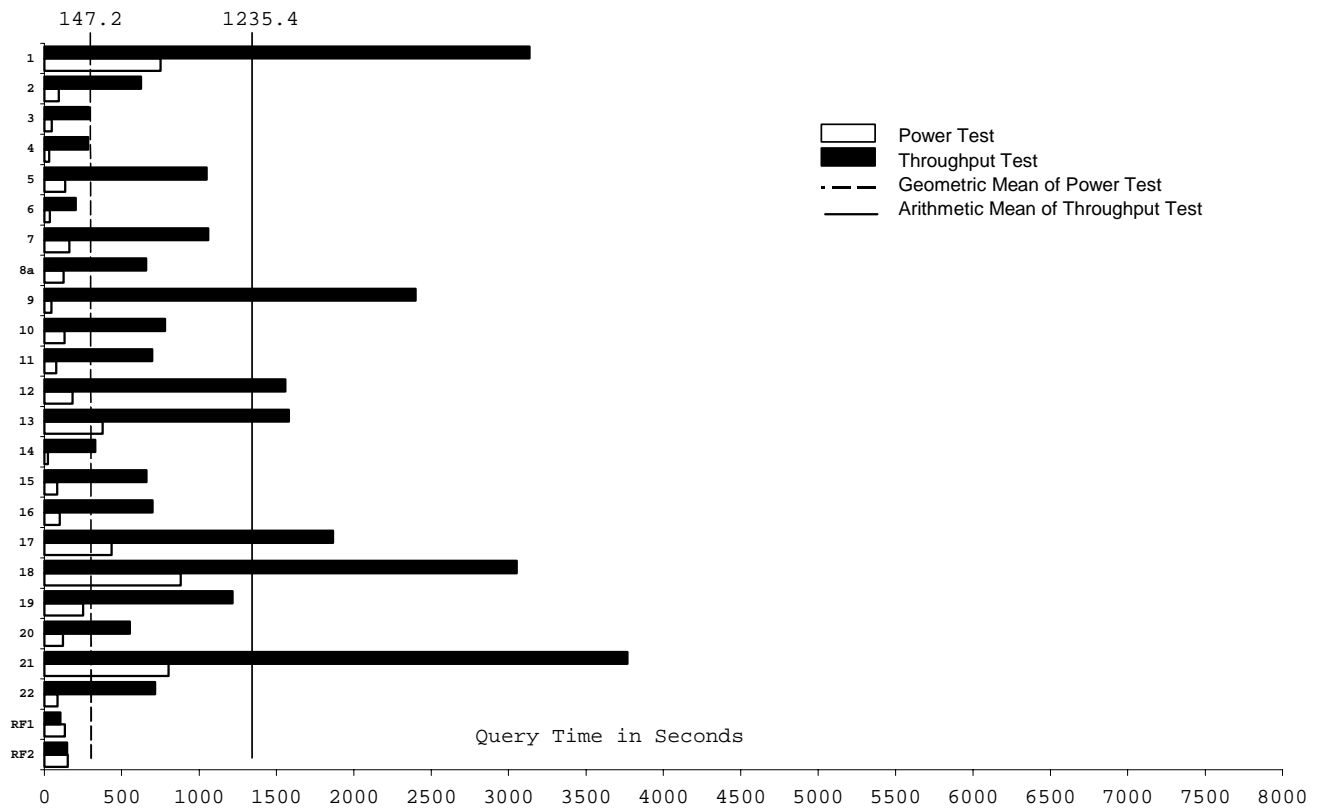


# HP AlphaServer ES45 Cluster Using Oracle9i Release 2 with Real Application Clusters

TPC-H Rev. 2.0

Report Date:  
November 18, 2002

Total System Cost		Composite Query per Hour Metric		Price / Performance	
<b>\$2,390,963</b>		<b>5976.7</b> QphH@300GB		<b>\$400.05</b> \$/QphH@300GB	
Database Size	Database Manager	Operating System	Other Software	Availability Date	
300GB	Oracle9i Enterprise Edition Release 2 with Real Application Clusters	HP Tru64 UNIX V5.1A/IPK	None	June 1, 2002	



Database Load Time = 2:04:44	Load Included Backup: N	Total Data Storage / Database Size = 36.01
RAID (Base tables only): N	RAID (Base tables and auxiliary data structures): N	RAID (All): Y

**System Configuration:** (4 Node Cluster Aggregate)  
**Processors:** 16 Alpha EV 68/1000 MHz CPUs with 8 MB cache  
**Memory:** 128 GB memory  
**Disks:** 640 Drives  
**Total Disk Storage:** 10,803.52 GB





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## Numerical Quantities

**Measurement Results:**

Database Scale Factor	= 300
Total Data Storage / Database Size	= 36.01
Start of Database Load	= 2002-04-21 00:45:40
End of Database Load	= 2002-04-21 02:50:24
Database Load Time	= 02:04:44
Query Streams for Throughput Test	= 6
TPC-H Power	= 7338.8 @300GB
TPC-H Throughput	= 4867.4 @300GB
TPC-H Composite Query-per-Hour Metric ( <u>QphH@Size</u> )	= 5976.7 @300GB
Total System Price Over 3 Years	= \$2,390,963
TPC-H Price/ Performance Metric ( <u>\$/QphH@Size</u> )	= \$400.05

**Measurement Intervals:**

Measurement Interval in Throughput Test (Ts)	= 28,289.0 seconds
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**Duration of Stream Execution:**

Stream ID	Seed	Start Date	Start Time	End Date	End Time	Duration
Stream 0:	421025024	4/21/2002	2:57:01	4/21/2002	4:32:05	1:35:04
Stream 1:	421025025	4/21/2002	4:32:08	4/21/2002	12:15:10	7:43:02
Stream 2:	421025026	4/21/2002	4:32:08	4/21/2002	12:15:10	7:43:02
Stream 3:	421025027	4/21/2002	4:32:08	4/21/2002	11:37:39	7:05:31
Stream 4:	421025028	4/21/2002	4:32:08	4/21/2002	12:07:23	7:35:15
Stream 5:	421025029	4/21/2002	4:32:08	4/21/2002	12:15:11	7:43:03
Stream 6:	421025030	4/21/2002	4:32:08	4/21/2002	12:00:07	7:27:59
Refresh		4/21/2002	12:15:11	4/21/2002	12:40:17	0:25:06



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

	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8a	Q9	Q10	Q11	Q12
<b>Stream 00</b>	751.5	92.8	46.9	30.9	135.8	35.8	161.0	124.3	486.1	130.2	76.7	182.8
<b>Stream 01</b>	2765.5	635.4	400.5	55.0	876.7	242.9	1695.3	598.1	2278.0	954.7	779.1	1243.6
<b>Stream 02</b>	3504.6	611.5	182.7	462.4	1187.4	75.0	1037.2	821.6	2530.4	936.8	771.9	1579.0
<b>Stream 03</b>	2912.0	559.9	422.9	176.8	626.6	179.6	812.9	566.7	2529.5	600.0	908.3	1047.1
<b>Stream 04</b>	3342.2	468.1	321.5	87.1	742.0	308.0	799.2	597.5	2140.1	1021.5	1000.2	1874.9
<b>Stream 05</b>	3060.8	791.1	219.1	572.6	1575.3	260.0	1262.3	698.4	2198.5	609.3	310.0	2424.5
<b>Stream 06</b>	3223.2	686.2	181.0	356.6	1275.6	162.4	743.3	676.7	2723.0	561.8	411.1	1175.7
<b>Minimum</b>	2765.5	468.1	181.0	55.0	626.6	75.0	743.3	566.7	2140.1	561.8	310.0	1047.1
<b>Average</b>	3134.7	625.4	287.9	285.1	1047.3	204.6	1058.4	659.8	2399.9	780.7	696.8	1557.5
<b>Maximum</b>	3504.6	791.1	422.9	572.6	1575.3	308.0	1695.3	821.6	2723.0	1021.5	1000.2	2424.5

	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q20	Q21	Q22	RF1	RF2
<b>Stream 00</b>	376.5	23.5	84.0	101.6	434.7	881.7	251.9	121.8	801.9	85.5	132.0	152.0
<b>Stream 01</b>	1827.8	307.9	862.7	674.4	1735.8	3476.3	1090.8	377.1	4005.5	899.3	103.0	146.0
<b>Stream 02</b>	1791.8	326.1	857.7	758.0	1877.9	3027.9	1358.5	761.6	2779.7	542.0	103.0	145.0
<b>Stream 03</b>	1432.0	599.6	619.1	462.4	2089.6	2302.6	995.2	616.1	4254.9	817.8	108.0	158.0
<b>Stream 04</b>	1082.3	448.7	710.5	555.4	1833.8	3458.2	1749.8	436.5	3722.6	615.4	102.0	153.0
<b>Stream 05</b>	1407.5	85.2	474.5	774.9	1938.6	2792.2	1260.2	644.3	3994.4	429.3	104.0	144.0
<b>Stream 06</b>	1941.1	210.0	438.9	972.8	1710.9	3259.9	845.2	485.0	3842.4	996.5	104.0	136.0
<b>Minimum</b>	1082.3	85.2	438.9	462.4	1710.9	2302.6	845.2	377.1	2779.7	429.3	102.0	136.0
<b>Average</b>	1580.4	329.6	660.6	699.6	1864.4	3052.9	1216.6	553.4	3766.6	716.7	104.0	147.0
<b>Maximum</b>	1941.1	599.6	862.7	972.8	2089.6	3476.3	1749.8	761.6	4254.9	996.5	108.0	158.0