

VMware® VMmark™ V1.1.1 Results

Vendor and Hardware Platform: HP ProLiant BL620c G7
Virtualization Platform: VMware ESX 4.0 Update 2 (build 261974)

VMmark V1.1.1 Score =
37.92 @ 28 Tiles

Tested By: HP

Test Date: 10-04-2010

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Performance

	webserver		javaserver		mailserver		fileserver		database		
TILE_0	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1604.45	1.57	18123.72	1.09	1533.20	1.40	16.71	1.30	2358.07	1.58	1.38
p1	1615.83	1.59	18126.78	1.09	1598.92	1.46	16.10	1.26	2373.80	1.59	1.38
p2	1612.90	1.58	18122.58	1.09	1476.35	1.35	15.97	1.24	2379.25	1.59	1.36
TILE_1	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1650.60	1.62	18147.50	1.09	1240.83	1.13	16.06	1.25	2375.12	1.59	1.32
p1	1614.42	1.58	18127.05	1.09	1276.15	1.16	15.51	1.21	2384.72	1.60	1.31
p2	1600.35	1.57	18143.03	1.09	1285.30	1.17	15.46	1.21	2386.65	1.60	1.31
TILE_2	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1686.97	1.66	18147.45	1.09	1408.38	1.28	16.65	1.30	2359.35	1.58	1.37
p1	1649.40	1.62	18160.12	1.09	1242.22	1.13	16.02	1.25	2373.15	1.59	1.32
p2	1620.38	1.59	18162.90	1.09	1120.15	1.02	15.93	1.24	2387.50	1.60	1.29
TILE_3	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1678.55	1.65	18168.83	1.09	1512.92	1.38	16.02	1.25	2386.65	1.60	1.38
p1	1642.70	1.61	18145.83	1.09	1614.60	1.47	15.86	1.24	2390.40	1.60	1.39
p2	1628.00	1.60	18130.78	1.09	1540.50	1.40	15.64	1.22	2393.78	1.60	1.37
TILE_4	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1685.17	1.65	17697.65	1.07	1412.83	1.29	16.54	1.29	2364.90	1.58	1.36
p1	1659.22	1.63	18151.05	1.09	1574.33	1.44	16.28	1.27	2377.72	1.59	1.39
p2	1631.08	1.60	18143.10	1.09	1479.20	1.35	15.84	1.23	2387.07	1.60	1.36
TILE_5	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1675.33	1.64	17708.83	1.07	1478.53	1.35	16.17	1.26	2381.82	1.60	1.37
p1	1627.70	1.60	18126.92	1.09	1529.65	1.39	15.56	1.21	2387.22	1.60	1.36
p2	1625.08	1.59	18130.60	1.09	1523.10	1.39	15.60	1.22	2391.82	1.60	1.36
TILE_6	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM

p0	1683.22	1.65	17680.10	1.06	1412.50	1.29	16.80	1.31	2362.68	1.58	1.36
p1	1631.25	1.60	18122.67	1.09	1611.60	1.47	16.11	1.26	2378.85	1.59	1.39
p2	1618.80	1.59	18125.70	1.09	1566.25	1.43	16.08	1.25	2384.85	1.60	1.38
TILE_7	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1657.65	1.63	17720.40	1.07	1339.47	1.22	15.97	1.24	2382.30	1.60	1.33
p1	1630.92	1.60	18156.35	1.09	1580.38	1.44	15.61	1.22	2390.55	1.60	1.37
p2	1627.85	1.60	18157.40	1.09	1646.53	1.50	15.46	1.20	2396.25	1.61	1.38
TILE_8	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1660.22	1.63	18114.62	1.09	1412.30	1.29	16.56	1.29	2365.70	1.59	1.36
p1	1626.75	1.60	17678.72	1.06	1576.03	1.44	15.93	1.24	2380.32	1.59	1.37
p2	1613.60	1.58	18128.75	1.09	1496.08	1.36	15.72	1.23	2389.85	1.60	1.36
TILE_9	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1679.08	1.65	17707.85	1.07	1552.38	1.42	15.94	1.24	2386.15	1.60	1.38
p1	1628.80	1.60	18145.45	1.09	1538.53	1.40	15.72	1.23	2389.45	1.60	1.37
p2	1607.38	1.58	18140.00	1.09	1504.92	1.37	15.61	1.22	2389.10	1.60	1.36
TILE_10	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1633.35	1.60	17665.88	1.06	1409.72	1.29	16.25	1.27	2377.15	1.59	1.35
p1	1470.00	1.44	18120.20	1.09	1501.92	1.37	15.85	1.24	2382.03	1.60	1.34
p2	1513.03	1.48	18122.83	1.09	1444.97	1.32	15.79	1.23	2384.57	1.60	1.33
TILE_11	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1643.72	1.61	17712.53	1.07	1354.35	1.23	16.55	1.29	2376.88	1.59	1.34
p1	1616.30	1.59	18179.00	1.09	1466.33	1.34	15.82	1.23	2389.38	1.60	1.36
p2	1629.33	1.60	18136.70	1.09	1568.67	1.43	15.74	1.23	2396.60	1.61	1.38
TILE_12	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1665.30	1.63	17736.70	1.07	1336.25	1.22	16.09	1.25	2378.05	1.59	1.34
p1	1624.17	1.59	18160.78	1.09	1491.30	1.36	15.51	1.21	2383.38	1.60	1.36
p2	1623.67	1.59	18198.20	1.10	1582.62	1.44	15.64	1.22	2383.43	1.60	1.37
TILE_13	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1631.33	1.60	18116.17	1.09	1314.85	1.20	16.62	1.30	2371.85	1.59	1.34
p1	1609.53	1.58	17698.40	1.07	1491.47	1.36	16.06	1.25	2378.05	1.59	1.35
p2	1402.97	1.38	18156.00	1.09	1493.30	1.36	15.91	1.24	2387.30	1.60	1.32
TILE_14	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1637.75	1.61	18127.53	1.09	1424.47	1.30	15.94	1.24	2378.95	1.59	1.35
p1	1607.80	1.58	17668.17	1.06	1524.42	1.39	15.76	1.23	2380.35	1.60	1.36
p2	1604.67	1.57	18123.47	1.09	1508.85	1.38	15.62	1.22	2384.80	1.60	1.36
TILE_15	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM

p0	1531.25	1.50	17702.58	1.07	1289.28	1.18	16.48	1.28	2379.85	1.59	1.31
p1	1566.65	1.54	18167.65	1.09	1556.83	1.42	16.17	1.26	2389.40	1.60	1.37
p2	1512.35	1.48	18162.30	1.09	1519.88	1.39	15.79	1.23	2395.65	1.61	1.35
TILE_16	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1675.00	1.64	18143.65	1.09	1301.30	1.19	15.93	1.24	2381.15	1.60	1.33
p1	1610.17	1.58	17677.65	1.06	1532.62	1.40	15.39	1.20	2379.18	1.59	1.35
p2	1624.53	1.59	18125.42	1.09	1513.15	1.38	15.59	1.22	2385.65	1.60	1.36
TILE_17	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1596.70	1.57	17712.85	1.07	1240.53	1.13	16.76	1.31	2366.78	1.59	1.31
p1	1598.28	1.57	18125.83	1.09	1485.38	1.35	16.05	1.25	2376.38	1.59	1.36
p2	1616.00	1.59	18115.97	1.09	1486.45	1.36	15.87	1.24	2387.18	1.60	1.36
TILE_18	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1674.35	1.64	17695.00	1.07	1285.50	1.17	16.12	1.26	2377.30	1.59	1.33
p1	1631.92	1.60	18125.47	1.09	1517.22	1.38	15.54	1.21	2379.22	1.59	1.36
p2	1624.78	1.59	18123.55	1.09	1623.65	1.48	15.50	1.21	2382.55	1.60	1.38
TILE_19	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1643.60	1.61	18166.70	1.09	1304.85	1.19	15.90	1.24	2385.70	1.60	1.33
p1	1638.47	1.61	18178.50	1.09	1578.42	1.44	15.71	1.22	2385.82	1.60	1.38
p2	1606.58	1.58	17708.90	1.07	1599.10	1.46	15.46	1.20	2391.00	1.60	1.36
TILE_20	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1628.75	1.60	18128.05	1.09	1238.10	1.13	16.45	1.28	2363.88	1.58	1.32
p1	1599.72	1.57	18121.80	1.09	1496.15	1.36	16.14	1.26	2372.43	1.59	1.36
p2	1597.55	1.57	17666.65	1.06	1505.83	1.37	15.75	1.23	2379.85	1.59	1.35
TILE_21	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1638.08	1.61	18164.80	1.09	1274.20	1.16	15.96	1.24	2378.38	1.59	1.32
p1	1605.20	1.58	18156.75	1.09	1546.97	1.41	15.42	1.20	2382.22	1.60	1.36
p2	1606.10	1.58	18116.50	1.09	1618.17	1.48	15.62	1.22	2385.72	1.60	1.38
TILE_22	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1575.10	1.55	18173.00	1.09	1238.17	1.13	16.27	1.27	2369.65	1.59	1.31
p1	1605.50	1.58	17677.53	1.06	1479.28	1.35	15.68	1.22	2377.12	1.59	1.35
p2	1604.67	1.57	18155.55	1.09	1426.92	1.30	15.63	1.22	2390.03	1.60	1.34
TILE_23	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1646.30	1.62	18133.03	1.09	1194.05	1.09	16.11	1.26	2394.95	1.60	1.31
p1	1614.25	1.58	18118.03	1.09	1506.70	1.37	15.57	1.21	2393.53	1.60	1.36
p2	1627.72	1.60	18167.38	1.09	1457.22	1.33	15.66	1.22	2395.82	1.61	1.35
TILE_24	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM

p0	1667.42	1.64	18163.15	1.09	1178.40	1.07	16.62	1.30	2384.50	1.60	1.32
p1	1642.20	1.61	18142.50	1.09	1466.83	1.34	16.05	1.25	2393.47	1.60	1.36
p2	1611.08	1.58	18147.47	1.09	1514.58	1.38	15.95	1.24	2405.90	1.61	1.37
TILE_25	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1324.75	1.30	18171.22	1.09	1241.65	1.13	16.59	1.29	2372.55	1.59	1.27
p1	1317.67	1.29	18164.92	1.09	1526.97	1.39	16.07	1.25	2385.53	1.60	1.32
p2	1369.80	1.34	18143.60	1.09	1478.80	1.35	15.69	1.22	2389.82	1.60	1.31
TILE_26	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1597.28	1.57	18107.80	1.09	1125.40	1.03	16.25	1.27	2365.68	1.59	1.29
p1	1597.72	1.57	18096.50	1.09	1415.78	1.29	16.00	1.25	2377.10	1.59	1.34
p2	1600.30	1.57	18099.40	1.09	1581.88	1.44	15.62	1.22	2385.32	1.60	1.37
TILE_27	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
p0	1651.85	1.62	18182.10	1.09	1177.83	1.07	15.94	1.24	2387.82	1.60	1.31
p1	1635.20	1.60	18164.08	1.09	1421.92	1.30	15.74	1.23	2393.10	1.60	1.35
p2	1599.28	1.57	18148.88	1.09	1491.05	1.36	15.59	1.21	2394.70	1.60	1.35
p0_score:	37.37										
p1_score:	38.02										
p2_score:	37.92										
Unreviewed_VMmark_Score:	37.92										

Configuration

Server and Network	
Server Manufacturer and Model	HP ProLiant BL620c G7
Processor Vendor and Model	Intel Xeon X7560
Processor Speed (GHz)	2.27 GHz
Total Sockets/Total Cores/Total Threads	2 Sockets / 16 Cores / 32 Threads
Primary Cache	32KB I + 32KB D on chip per core
Secondary Cache	256KB per core
Other Cache	24MB L3
BIOS Version	09/24/2010
Memory Size (in GB, Number of DIMMs)	256GB (32x8GB)
Memory Type and Speed	1333MHz dual rank Registered ECC DDR3
Disk Subsystem Type	Direct attach SATA for operating system, FC SAN for VMs

Number of Disk Controllers	1
Disk Controller Vendors and Models	HP Smart Array P410i/256 MB Controller
Number of Host Bus Adapters	1
Host Bus Adapter Vendors and Models	1 QLogic QMH2452 4Gb Fibre Channel HBA for c-Class Blade System
Number of Network Controllers	2
Network Controller Vendors and Models	2 x NC553i Dual Port Flex-10 Converged Network Adapter
Network Switch Vendors and Models	HP ProCurve 3400cl-48G
Network Speed	10Gb/s and 1Gb/s for VM's, 1Gb/s for COS
Other Hardware	<ul style="list-style-type: none"> • 1 x HP BladeSystem C7000 enclosure • 1 x HP 10GbE Pass-Thru module • 1 x HP 1Gb Pass-Thru module • 2 x HP 4Gb Fibre Channel Pass-Thru module
Other Software	None.
Hardware Availability Date (MM-DD-YYYY)	11-30-2010
Software Availability Date (MM-DD-YYYY)	06-10-2010

Virtualization Software

Vendor, Product, Version, and Build	VMware ESX 4.0 Update 2 (build 261974)
Virtualization Type	Hardware
Supplemental Software	vmware-esx-drivers-net-be2net_400.2.102.440.0-1vmw.2.17.249663.292682.iso
Virtualization Software Availability Date	06-10-2010

Storage

Array Vendors, Models, and Firmware Versions	HP StorageWorks MSA 2000, firmware version J200P16
Fibre Channel Switch Vendors and Models	HP StorageWorks SAN Switch 4/32
Disk Space Used	1.71TB for VM's
Array Cache Size	1GB
Total Number of Physical Disks Used	180
Total Number of Enclosures/Pods/Shelves Used	15
Total Number of Physical Disks per Enclosures/Pods/Shelves	12

Used	
Total Number of Storage Groups Used	15
Number LUNs Used	15
LUN Size and Number of Disks Per LUN	1.6TB per LUN, 12 disks per LUN
RAID Type	RAID 0 for VMs, none for O/S
Number of Members per RAID Set	12
Disk Vendors, Models, and Speeds	180 HP 146GB 15K RPM SAS drive for VMs, 1 HP 120GB SATA SSD for O/S
Clients	
Number of Clients	28
System Model(s)	HP ProLiant DL360G5
Processor Vendor(s) and Model(s)	Intel Xeon E5440
Processor Speed(s) (GHz)	2.83GHz
Total Sockets/Total Cores/Total Threads	2 Sockets / 8 Cores / 8 Threads
Memory per Client	3.25 GB
Network Controller Vendors and Models	HP NC373i Gigabit adapter
Operating System, Version, and Service Pack	Microsoft Windows Server 2003 Enterprise Edition, Service Pack 2
Other Hardware	None
Other Software	None

Notes for Workload

Server and Network Notes

- Server BIOS settings:
 - Intel Turbo Boost up to 2.67 GHz (default enabled)
 - HP Power Profile set to Maximum Performance (default Balanced Performance)
 - Collaborative Power Control disabled (default enabled)
 - Thermal Configuration set to Increased Cooling (default Optimal Cooling)

- vSwitch Configuration:
 - vSwitch0 for the Service Console was assigned to vmnic3 at 1Gb/s
 - vSwitch1 was assigned to vmnic2 at 10Gb/s
 - vSwitch1 was configured with two separate Virtual Machine Port Groups
 - The first Port Group on vSwitch1 contained for webserver VMs 0, 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26

- The second Port Group on vSwitch1 contained all fileserver VMs
- vSwitch2 was assigned to vmnic0 at 10Gb/s
- vSwitch2 was configured with two separate Virtual Machine Port Groups
- The first Port Group on vSwitch2 contained webserver VMs 1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27
- The second Port Group on vSwitch2 contained all database VMs on
- vSwitch3 for all javaserver, standby, and mailserver VMs was assigned to vmnic1 at 1Gb/s
- vSwitch3 configured for 120 ports (default 56)
- Storage Configuration:
 - database00_bl685g6 contains database VMs 0, 2, 4, 6, 8, 11, 13, 15, 17, 19, 20, 22, 24, 26
 - database01_bl685g6 contains database VMs 1, 3, 5, 7, 9, 10, 12, 14, 16, 18, 21, 23, 25, 27
 - storage0_bl685g6 contains mailserver0, fileserver0, webserver0, javaserver0, standby0, mailserver1, fileserver1, webserver1, javaserver1, standby1
 - storage1_bl685g6 contains mailserver2, fileserver2, webserver2, javaserver2, standby2, mailserver3, fileserver3, webserver3, javaserver3, standby3, fileserver26
 - storage2_bl685g6 contains mailserver4, fileserver4, webserver4, javaserver4, standby4, mailserver5, fileserver5, webserver5, javaserver5, standby5
 - storage3_bl685g6 contains mailserver6, fileserver6, webserver6, javaserver6, standby6, mailserver7, fileserver7, webserver7, javaserver7, standby7, javaserver26
 - storage4_bl685g6 contains mailserver8, fileserver8, webserver8, javaserver8, standby8, mailserver9, fileserver9, webserver9, javaserver9, standby9, mailserver26, standby26
 - storage5_bl685g6 contains mailserver11, fileserver11, webserver11, javaserver11, standby11, mailserver12, fileserver12, webserver12, javaserver12, standby12, webserver26
 - storage6_bl685g6 contains mailserver13, fileserver13, webserver13, javaserver13, standby13, mailserver14, fileserver14, webserver14, javaserver14, standby14
 - storage7_bl685g6 contains mailserver15, fileserver15, webserver15, javaserver15, standby15, mailserver16, fileserver16, webserver16, javaserver16, standby16
 - storage8_bl685g6 contains mailserver17, fileserver17, webserver17, javaserver17, standby17, mailserver18, fileserver18, webserver18, javaserver18, standby18, webserver27, standby27
 - storage9_bl685g6 contains mailserver19, fileserver19, webserver19, javaserver19, standby19, mailserver21, fileserver21, webserver21, javaserver21, standby21, javaserver27, fileserver27
 - storage10_bl685g6 contains mailserver22, fileserver22, webserver22, javaserver22, standby22, mailserver23, fileserver23, webserver23, javaserver23, standby23
 - storage11_bl685g6 contains mailserver24, fileserver24, webserver24, javaserver24, standby24, mailserver10, fileserver10, webserver10, javaserver10, standby10
 - storage12_bl685g6 contains mailserver20, fileserver20, webserver20, javaserver20, standby20, mailserver25, fileserver25, webserver25, javaserver25, standby25, mailserver27

Virtualization Software Notes

- virtual hardware upgraded from V4 to V7
- virtualized MMU was enabled for all VMs (default Automatic)
- ethernet adapter type set to vmxnet3 for all VMs
- logging was disabled for all VMs
- IDE & floppy devices were removed on all VMs (default enabled)
- firewall was disabled in the console os (default enabled)
- BufferCache.SoftMaxDirty=85 (default 15)
- Irq.RoutingPolicy = 0 (default 2)
- Mem.BalancePeriod = 0 (default 15)
- Mem.SamplePeriod = 0 (default 60)
- Mem.ShareScanGHz = 0 (default 4)
- Net.MaxNetifRxQueueLen = 300 (default 100)
- Net.MaxNetifTxQueueLen = 1000 (default 500)
- Net.TcpipHeapMax = 128 (default 64)
- Cpu.HaltingIdleMsecPenalty = 0 (default 100)
- Cpu.Quantum = 65 (default 50)
- Numa.PageMigEnable = 0 (default 1)
- The data partitions for mailserver26 and mailserver27 were expanded using the AutoPart utility

Operating System Notes

- Microsoft Windows Server 2003 virtual machines were updated to Service Pack 2
- Microsoft Windows Server 2003 virtual machines updated with KB933360
- All mailserver and standby VMs were updated with KB958644

- Javaser VMs 10-13 were updated with KB958644
- Fileserver and Webserver VMs were updated to SLES 10 SP2

Software Notes

None.

Client Notes

- Microsoft Windows Server 2003 client machines were updated to Service Pack 2
- TCP TOE chimney was disabled on all clients (default enabled)
- Microsoft Windows Server 2003 clients updated with KB933360

Other Notes

- The following delay parameters were used in VMMARK.CONFIG
- TILEDELAY=120 (default 600)
- MailServer/DELAYTIME=15 (default 5)
- JavaServer/DELAYTIME=10 (default 450)
- Standby/DELAYTIME=0 (default 540)
- WebServer/DELAYTIME=25 (default 180)
- Database/DELAYTIME=20 (default 360)
- Fileserver/DELAYTIME=0 (default 450)

This is a full disclosure report for a VMmark benchmark result. All published VMmark results must be from fully-compliant tests for which a full disclosure report is publicly available.

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