

VMware® VMmark™ V1.1 Results

Vendor and Hardware Platform: HP ProLiant DL580 G5
Virtualization Platform: VMware ESX 3.5.0 Update 2 build 110268

VMmark V1.1 Score =
18.56 @ 14 Tiles

Tested By: Hewlett Packard

Test Date: 9/19/2008

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Performance

| | webservers | | javaserver | | mailserver | | fileserver | | database | | |
|---------------|------------|-------|------------|-------|------------|-------|------------|-------|----------|-------|------|
| TILE_0 | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | GM |
| p0 | 1541.05 | 1.51 | 17777.85 | 1.07 | 1509.72 | 1.38 | 16.59 | 1.29 | 2051.80 | 1.37 | 1.32 |
| p1 | 1560.95 | 1.53 | 17854.88 | 1.07 | 1483.17 | 1.35 | 16.47 | 1.28 | 2052.70 | 1.38 | 1.31 |
| p2 | 1522.10 | 1.49 | 17877.20 | 1.08 | 1288.05 | 1.17 | 16.06 | 1.25 | 2045.47 | 1.37 | 1.26 |
| TILE_1 | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | GM |
| p0 | 1636.03 | 1.61 | 17389.50 | 1.05 | 1652.17 | 1.51 | 15.98 | 1.25 | 2049.55 | 1.37 | 1.34 |
| p1 | 1582.40 | 1.55 | 17838.78 | 1.07 | 1619.03 | 1.48 | 16.11 | 1.26 | 2050.88 | 1.37 | 1.34 |
| p2 | 1555.67 | 1.53 | 17836.30 | 1.07 | 1568.60 | 1.43 | 16.15 | 1.26 | 2035.20 | 1.36 | 1.32 |
| TILE_2 | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | GM |
| p0 | 1625.10 | 1.59 | 17854.92 | 1.07 | 1746.10 | 1.59 | 16.61 | 1.29 | 2041.30 | 1.37 | 1.37 |
| p1 | 1572.25 | 1.54 | 17869.88 | 1.08 | 1514.47 | 1.38 | 16.02 | 1.25 | 2067.80 | 1.39 | 1.32 |
| p2 | 1587.35 | 1.56 | 17837.22 | 1.07 | 1509.55 | 1.38 | 16.39 | 1.28 | 2059.70 | 1.38 | 1.32 |
| TILE_3 | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | GM |
| p0 | 1624.70 | 1.59 | 17738.15 | 1.07 | 1554.35 | 1.42 | 16.37 | 1.28 | 2122.53 | 1.42 | 1.34 |
| p1 | 1587.15 | 1.56 | 17801.40 | 1.07 | 1538.55 | 1.40 | 16.12 | 1.26 | 2128.70 | 1.43 | 1.33 |
| p2 | 1588.58 | 1.56 | 17819.08 | 1.07 | 1559.20 | 1.42 | 16.30 | 1.27 | 2092.60 | 1.40 | 1.33 |
| TILE_4 | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | GM |
| p0 | 1602.75 | 1.57 | 17931.38 | 1.08 | 1574.95 | 1.44 | 16.41 | 1.28 | 2063.07 | 1.38 | 1.34 |
| p1 | 1579.33 | 1.55 | 17940.42 | 1.08 | 1513.95 | 1.38 | 15.95 | 1.24 | 2059.05 | 1.38 | 1.32 |
| p2 | 1559.10 | 1.53 | 17897.22 | 1.08 | 1463.10 | 1.33 | 16.13 | 1.26 | 2037.78 | 1.37 | 1.30 |
| TILE_5 | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | GM |
| p0 | 1554.65 | 1.53 | 17395.25 | 1.05 | 1632.42 | 1.49 | 16.30 | 1.27 | 2045.03 | 1.37 | 1.33 |
| p1 | 1568.03 | 1.54 | 17847.85 | 1.07 | 1519.78 | 1.39 | 16.27 | 1.27 | 2058.78 | 1.38 | 1.32 |
| p2 | 1547.22 | 1.52 | 17907.12 | 1.08 | 1480.05 | 1.35 | 16.33 | 1.27 | 2044.88 | 1.37 | 1.31 |
| TILE_6 | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | GM |
| p0 | 1543.08 | 1.51 | 17410.28 | 1.05 | 1560.10 | 1.42 | 17.08 | 1.33 | 2027.50 | 1.36 | 1.32 |
| p1 | 1600.33 | 1.57 | 17867.05 | 1.08 | 1629.75 | 1.49 | 16.45 | 1.28 | 2023.42 | 1.36 | 1.34 |
| p2 | 1597.88 | 1.57 | 17838.35 | 1.07 | 1490.33 | 1.36 | 16.36 | 1.27 | 2038.20 | 1.37 | 1.32 |
| TILE_7 | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | GM |

| | | | | | | | | | | | |
|---------------------------------|---------|-------|----------|-------|---------|-------|--------|-------|---------|-------|------|
| p0 | 1612.90 | 1.58 | 17365.10 | 1.05 | 1595.38 | 1.45 | 16.20 | 1.26 | 2140.12 | 1.43 | 1.34 |
| p1 | 1584.03 | 1.55 | 17905.17 | 1.08 | 1582.85 | 1.44 | 16.29 | 1.27 | 2143.40 | 1.44 | 1.35 |
| p2 | 1551.67 | 1.52 | 17891.90 | 1.08 | 1536.30 | 1.40 | 16.08 | 1.25 | 2156.62 | 1.45 | 1.33 |
| TILE_8 | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | GM |
| p0 | 1602.38 | 1.57 | 17359.85 | 1.04 | 1549.95 | 1.41 | 16.40 | 1.28 | 2052.22 | 1.38 | 1.32 |
| p1 | 1550.47 | 1.52 | 17869.22 | 1.08 | 1605.45 | 1.46 | 16.91 | 1.32 | 2061.05 | 1.38 | 1.34 |
| p2 | 1555.50 | 1.53 | 17850.55 | 1.07 | 1552.17 | 1.42 | 16.20 | 1.26 | 2066.05 | 1.38 | 1.32 |
| TILE_9 | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | GM |
| p0 | 1565.25 | 1.54 | 17480.17 | 1.05 | 1509.00 | 1.38 | 16.36 | 1.28 | 2062.30 | 1.38 | 1.31 |
| p1 | 1596.78 | 1.57 | 17909.20 | 1.08 | 1414.03 | 1.29 | 16.51 | 1.29 | 2061.32 | 1.38 | 1.31 |
| p2 | 1553.65 | 1.52 | 17919.72 | 1.08 | 1501.72 | 1.37 | 16.35 | 1.27 | 2068.57 | 1.39 | 1.32 |
| TILE_10 | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | GM |
| p0 | 1570.70 | 1.54 | 17967.20 | 1.08 | 1482.85 | 1.35 | 16.59 | 1.29 | 2034.97 | 1.36 | 1.32 |
| p1 | 1534.85 | 1.51 | 17881.40 | 1.08 | 1676.40 | 1.53 | 16.28 | 1.27 | 2034.15 | 1.36 | 1.34 |
| p2 | 1583.53 | 1.55 | 17909.72 | 1.08 | 1580.53 | 1.44 | 16.29 | 1.27 | 2044.60 | 1.37 | 1.33 |
| TILE_11 | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | GM |
| p0 | 1628.10 | 1.60 | 17790.75 | 1.07 | 1432.80 | 1.31 | 16.42 | 1.28 | 2119.72 | 1.42 | 1.32 |
| p1 | 1592.67 | 1.56 | 17382.17 | 1.05 | 1507.85 | 1.37 | 16.12 | 1.26 | 2132.82 | 1.43 | 1.32 |
| p2 | 1595.65 | 1.57 | 17883.90 | 1.08 | 1537.55 | 1.40 | 16.20 | 1.26 | 2126.05 | 1.42 | 1.34 |
| TILE_12 | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | GM |
| p0 | 1601.35 | 1.57 | 17765.40 | 1.07 | 1385.40 | 1.26 | 16.49 | 1.29 | 2051.10 | 1.37 | 1.30 |
| p1 | 1575.08 | 1.55 | 17792.50 | 1.07 | 1599.08 | 1.46 | 16.50 | 1.29 | 2034.80 | 1.36 | 1.33 |
| p2 | 1554.88 | 1.53 | 17764.97 | 1.07 | 1617.62 | 1.47 | 15.99 | 1.25 | 2042.00 | 1.37 | 1.33 |
| TILE_13 | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | Actual | Ratio | GM |
| p0 | 1593.97 | 1.56 | 17814.62 | 1.07 | 1214.88 | 1.11 | 16.33 | 1.27 | 2075.30 | 1.39 | 1.27 |
| p1 | 1659.45 | 1.63 | 17846.12 | 1.07 | 1442.20 | 1.31 | 16.07 | 1.25 | 2065.78 | 1.38 | 1.32 |
| p2 | 1611.33 | 1.58 | 17815.58 | 1.07 | 1576.50 | 1.44 | 16.09 | 1.25 | 2050.95 | 1.37 | 1.33 |
| p0_score: | 18.56 | | | | | | | | | | |
| p1_score: | 18.59 | | | | | | | | | | |
| p2_score: | 18.47 | | | | | | | | | | |
| Unreviewed_VMmark_Score: | 18.56 | | | | | | | | | | |

Configuration

| Server and Network | |
|------------------------------------|---|
| Server Manufacturer and Model | HP ProLiant DL580 G5 |
| Processor Vendor and Model | Six-Core Intel Xeon X7460 |
| Processor Speed (GHz) | 2.66GHz |
| Number of Sockets/Cores per Socket | 4Sockets / 6Cores per Socket (24 Cores Total) |
| Primary Cache | 32KB(I)+32KB(D) on chip, per core |
| Secondary Cache | 9MB I+D on chip - 3MB per core pair |

| | |
|---------------------------------------|---|
| Other Cache | 16MB I+D L3 on chip |
| Memory | 96GB |
| Disk Subsystem Type | Direct attach SAS for operating system, FC SAN for VM's |
| Number of Disk Controllers | 1 |
| Number of Host Bus Adapters | 2 dual-port HBA'a |
| Host Bus Adapter Vendors and Models | QLogic 2462 |
| Number of Network Controllers | 3 dual port, 1 dual-port embedded |
| Network Controller Vendors and Models | HP NC360T, embedded HP NC371i |
| Network Switch Vendors and Models | HP ProCurve 2900, HP ProCurve 5304 |
| Network Speed | 1000BT |
| Other Hardware | none |
| Other Software | none |
| Hardware Availability Date | 09/15/2008 |
| Software Availability Date | August 2008 |

Virtualization Software

| | |
|---|-------------------------|
| Vendor, Product, Version, and Build | VMWare ESX 2.5 Update 2 |
| Virtualization Type | Hardware Virtualization |
| Supplemental Software | None |
| Virtualization Software Availability Date | August 2008 |

Storage

| | |
|---|---|
| Array Vendor, Model, and Firmware Version | HP StorageWorks MSA 2000, Storage Controller Firmware J200P16, Management Controller Firmware W420R30 |
| Fibre Channel Switch Vendors and Models | HP StorageWorks SAN Switch 4/32 |
| Disk Space Used | 945.84 GB for VM's |
| Array Cache Size | 1GB |
| Number and Size of LUNs | 14 @ 1.60TB ea |
| RAID Type | 0 |
| Number of Members per RAID Set | 12 drives per set |
| Disk Vendor, Model, and Speed | HP 146GB 15K SAS drives |

Clients

| | |
|------------------------------------|-------------------------------|
| Number of Clients | 14 |
| System Model(s) | HP ProLiant DL360 G5 |
| Processor Vendor(s) and Model(s) | Intel Xeon |
| Processor Speed(s) (GHz) | 2.83 |
| Number of Sockets/Cores per Socket | 1 Socket / 4 Cores per Socket |
| Memory | 2GB |

| | |
|--|---|
| Network Controller Vendor and Model | HP NC373i embedded |
| Operating System, Version, and Service Pack | Microsoft Windows Server 2003 Enterprise Edition, SP2 |
| Other Hardware | none |
| Other Software | none |

Notes for Workload

Server and Network Notes

Server BIOS Settings

- Second embedded BroadComm NIC disabled
- Embedded Serial Port disabled (default enabled)
- Virtual Serial Port disabled (default enabled)
- USB Ports disabled (default enabled)
- HW Prefetch disabled (default enabled)
- Adjacent Sector Prefetch disabled (default enabled)
- No-Execute Memory Protection disabled (default enabled)
- Defer All Transaction Mode disabled (default enabled)
- Intel Core Multi-Processing (CMP) enabled
- Intel Virtualization support enabled (default disabled)

QLogic HBA Settings

- Enable FC Tape Support disabled
- Data Rate set to 5
- Execution Throttle set to 256
- Operation Mode set to 5
- Interrupt Delay Timer set to 10

7 vSwitches were created (each vSwitch was set to 120 ports (default 56) except for vSwitch0 left at default):

- vSwitch0 on vmnic1 for the service console
- vSwitch1 on vmnic2 for webserver0, 13, 6, 9 & 3; javaserver12, 5, 8 & 2; and standby4,11,7,& 1
- vSwitch3 on vmnic3 for mailserv0-9 & 11-14
- vSwitch5 on vmnic0 for webserver1, 7, 4 & 11; javaserver6, 13, 0, 3 & 9; and standby2,5,8,& 12
- vSwitch2 on vmnic4 for fileserv0-9 & 11-14
- vSwitch4 on vmnic5 for database0-9 & 11-14
- vSwitch6 on vmnic6 for webserver2, 14, 5, 8 & 12; javaserver4, 11, 14, 1 & 7; and standby3,13,14,6,0& 9

Each LUN contained one VMFS3 volume:

- Storage0 (1) - (99.75GB) - All tile0 virtual machines
- Storage1 (1) - (99.75GB) - All tile1 virtual machines
- Storage2 – (1.6TB) - All tile2 virtual machines
- Storage3 – (1.6TB) - All tile3 virtual machines
- Storage4 – (1.6TB) - All tile4 virtual machines
- Storage5 – (1.6TB) - All tile5 virtual machines
- Storage6 – (1.6TB) - All tile6 virtual machines
- Storage7 – (1.6TB) - All tile7 virtual machines
- Storage8 – (1.6TB) - All tile8 virtual machines
- Storage9 – (1.6TB) - All tile9 virtual machines
- Storage10 – (1.6TB) - All tile11 virtual machines
- Storage11 – (1.6TB) - All tile12 virtual machines
- Storage12 – (1.6TB) - All tile13 virtual machines

- Storage13 – (1.6TB) - All tile14 virtual machines

Virtualization Software Notes

- Virtualized MMU was disabled on all Linux VMs (default Automatic)
- Logging was disabled for all VMs (default logging enabled)
- IDE and Floppy devices were removed on all VMs (default enabled) except for Mailserver14
- syncTime set to TRUE for all VM's except Mailserver11
- Ethernet Adapter type set to Enhanced vmxnet for all VMs
- Disk.Sched.NumRequestOutstanding set to 128 (default 32)
- Qlogic queue depth set to 64
- VMFS3.MaxHeapSizeMB set to 64 (default 16)
- Misc.RunningVCpuLimit set to 196 (default 128)
- VMkernel.Boot.force36BitMTRRMask set to disabled (default enabled)

Operating System Notes

Microsoft Windows Server 2003 virtual machines were updated to Service Pack2

Software Notes

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Client Notes

TCP TOE chimney was disabled on all clients (default enabled)

Other Notes

Microsoft Windows Server 2003 client machines were updated to Service Pack 2

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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