

# VMware® VMmark™ V1.1 Results

**Vendor and Hardware Platform: HP ProLiant BL495cG5**  
**Virtualization Platform: VMware ESX 3.5 Update 3 (Build 123630)**

**VMmark V1.1 Score =**  
**11.23 @ 8 Tiles**

**Tested By: Hewlett Packard**

**Test Date: 12/14/2008**

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## Performance

|               | webservers |       | javaserver |       | mailserver |       | fileserver |       | database |       |      |
|---------------|------------|-------|------------|-------|------------|-------|------------|-------|----------|-------|------|
| <b>TILE_0</b> | Actual     | Ratio | Actual     | Ratio | Actual     | Ratio | Actual     | Ratio | Actual   | Ratio | GM   |
| <b>p0</b>     | 1721.90    | 1.69  | 18156.40   | 1.09  | 1799.95    | 1.64  | 17.96      | 1.40  | 2179.57  | 1.46  | 1.44 |
| <b>p1</b>     | 1695.08    | 1.66  | 18179.47   | 1.09  | 1791.17    | 1.63  | 17.47      | 1.36  | 2173.38  | 1.46  | 1.43 |
| <b>p2</b>     | 1686.40    | 1.66  | 18141.88   | 1.09  | 1757.00    | 1.60  | 17.55      | 1.37  | 2169.80  | 1.45  | 1.42 |
| <b>TILE_1</b> | Actual     | Ratio | Actual     | Ratio | Actual     | Ratio | Actual     | Ratio | Actual   | Ratio | GM   |
| <b>p0</b>     | 1767.97    | 1.74  | 18171.85   | 1.09  | 1682.72    | 1.53  | 18.77      | 1.46  | 2113.90  | 1.42  | 1.43 |
| <b>p1</b>     | 1773.53    | 1.74  | 18172.03   | 1.09  | 1764.80    | 1.61  | 18.75      | 1.46  | 2092.05  | 1.40  | 1.44 |
| <b>p2</b>     | 1743.03    | 1.71  | 18176.67   | 1.09  | 1779.03    | 1.62  | 18.48      | 1.44  | 2083.30  | 1.40  | 1.44 |
| <b>TILE_2</b> | Actual     | Ratio | Actual     | Ratio | Actual     | Ratio | Actual     | Ratio | Actual   | Ratio | GM   |
| <b>p0</b>     | 1736.40    | 1.70  | 18185.35   | 1.09  | 1660.60    | 1.51  | 17.92      | 1.40  | 2201.10  | 1.47  | 1.42 |
| <b>p1</b>     | 1703.20    | 1.67  | 18175.22   | 1.09  | 1641.78    | 1.50  | 17.62      | 1.37  | 2200.25  | 1.47  | 1.41 |
| <b>p2</b>     | 1694.42    | 1.66  | 18166.33   | 1.09  | 1806.60    | 1.65  | 17.26      | 1.35  | 2187.80  | 1.47  | 1.43 |
| <b>TILE_3</b> | Actual     | Ratio | Actual     | Ratio | Actual     | Ratio | Actual     | Ratio | Actual   | Ratio | GM   |
| <b>p0</b>     | 1782.33    | 1.75  | 18134.83   | 1.09  | 1512.28    | 1.38  | 17.90      | 1.40  | 2174.50  | 1.46  | 1.40 |
| <b>p1</b>     | 1778.78    | 1.75  | 18140.55   | 1.09  | 1581.33    | 1.44  | 17.75      | 1.38  | 2168.97  | 1.45  | 1.41 |
| <b>p2</b>     | 1748.40    | 1.72  | 18136.30   | 1.09  | 1705.35    | 1.55  | 17.38      | 1.35  | 2163.45  | 1.45  | 1.42 |
| <b>TILE_4</b> | Actual     | Ratio | Actual     | Ratio | Actual     | Ratio | Actual     | Ratio | Actual   | Ratio | GM   |
| <b>p0</b>     | 1712.75    | 1.68  | 18129.90   | 1.09  | 1435.62    | 1.31  | 17.96      | 1.40  | 1734.75  | 1.16  | 1.31 |
| <b>p1</b>     | 1685.20    | 1.65  | 17677.85   | 1.06  | 1674.38    | 1.53  | 17.68      | 1.38  | 1676.97  | 1.12  | 1.33 |
| <b>p2</b>     | 1676.20    | 1.65  | 18128.83   | 1.09  | 1679.67    | 1.53  | 17.44      | 1.36  | 1660.67  | 1.11  | 1.33 |
| <b>TILE_5</b> | Actual     | Ratio | Actual     | Ratio | Actual     | Ratio | Actual     | Ratio | Actual   | Ratio | GM   |
| <b>p0</b>     | 1775.90    | 1.74  | 17734.35   | 1.07  | 1496.10    | 1.36  | 18.35      | 1.43  | 2102.32  | 1.41  | 1.39 |
| <b>p1</b>     | 1773.65    | 1.74  | 18162.17   | 1.09  | 1671.40    | 1.52  | 18.55      | 1.45  | 2072.70  | 1.39  | 1.42 |
| <b>p2</b>     | 1748.00    | 1.72  | 18140.20   | 1.09  | 1670.03    | 1.52  | 18.34      | 1.43  | 2058.05  | 1.38  | 1.41 |
| <b>TILE_6</b> | Actual     | Ratio | Actual     | Ratio | Actual     | Ratio | Actual     | Ratio | Actual   | Ratio | GM   |
| <b>p0</b>     | 1790.67    | 1.76  | 17720.00   | 1.07  | 1331.33    | 1.21  | 18.50      | 1.44  | 2121.57  | 1.42  | 1.36 |
| <b>p1</b>     | 1774.45    | 1.74  | 18151.38   | 1.09  | 1566.80    | 1.43  | 18.19      | 1.42  | 2093.53  | 1.40  | 1.40 |
| <b>p2</b>     | 1749.92    | 1.72  | 18164.97   | 1.09  | 1685.22    | 1.54  | 18.28      | 1.42  | 2081.53  | 1.39  | 1.42 |
| <b>TILE_7</b> | Actual     | Ratio | Actual     | Ratio | Actual     | Ratio | Actual     | Ratio | Actual   | Ratio | GM   |
| <b>p0</b>     | 1715.92    | 1.68  | 18128.35   | 1.09  | 1302.28    | 1.19  | 18.56      | 1.45  | 2176.45  | 1.46  | 1.36 |

|                                 |         |      |          |      |         |      |       |      |         |      |      |
|---------------------------------|---------|------|----------|------|---------|------|-------|------|---------|------|------|
| <b>p1</b>                       | 1692.62 | 1.66 | 18127.70 | 1.09 | 1525.03 | 1.39 | 18.47 | 1.44 | 2173.95 | 1.46 | 1.40 |
| <b>p2</b>                       | 1670.75 | 1.64 | 18126.50 | 1.09 | 1639.40 | 1.49 | 18.53 | 1.44 | 2157.93 | 1.45 | 1.41 |
| <b>p0_score:</b>                | 11.11   |      |          |      |         |      |       |      |         |      |      |
| <b>p1_score:</b>                | 11.23   |      |          |      |         |      |       |      |         |      |      |
| <b>p2_score:</b>                | 11.27   |      |          |      |         |      |       |      |         |      |      |
| <b>Unreviewed_VMmark_Score:</b> | 11.23   |      |          |      |         |      |       |      |         |      |      |

## Configuration

| <b>Server and Network</b>             |   |
|---------------------------------------|---|
| Server Manufacturer and Model         | HP ProLiant BL495cG5  |
| Processor Vendor and Model            | Quad-Core AMD Opteron 2384  |
| Processor Speed (GHz)                 | 2.7GHz  |
| Number of Sockets/Cores per Socket    | 2 Sockets / 4 Cores per Socket (8 Cores Total)  |
| Primary Cache                         | 64KB I + 64KB D on chip per core  |
| Secondary Cache                       | 512KB I + D on chip per core  |
| Other Cache                           | 6MB   |
| Memory                                | 64GB (8x8GB 533MHz DDR2)  |
| Disk Subsystem Type                   | Direct attach SATA SSD for operating system, FC SAN for VMs   |
| Number of Disk Controllers            | 1   |
| Number of Host Bus Adapters           | 1   |
| Host Bus Adapter Vendors and Models   | 1 QLogic QMH2462 dual port fibre channel HBA  |
| Number of Network Controllers         | 2   |
| Network Controller Vendors and Models | 1 x Embedded Dual Port Flex-10 10 Gigabit Ethernet Adapter, 1 x HP NC382m Dual Port 1GbE Multifunction BL-c Adapter |
| Network Switch Vendors and Models     | HP ProCurve 3400  |
| Network Speed                         | 1000BaseT   |
| Other Hardware                        | None  |
| Other Software                        | None  |
| Hardware Availability Date            | March 30, 2009  |
| Software Availability Date            | November 2008   |

| <b>Virtualization Software</b>            |  |
|---|--|
| Vendor, Product, Version, and Build       | VMware ESX 3.5 Update 3 (build 123630) |
| Virtualization Type                       | Hardware Virtualization                |
| Supplemental Software                     | None                                   |
| Virtualization Software Availability Date | November 2008                          |

| <b>Storage</b>                            |   |
|---|---|
| Array Vendor, Model, and Firmware Version | HP StorageWorks MSA 1000, firmware version 4.48 |

|   |   |
|---|---|
| Fibre Channel Switch Vendors and Models | HP StorageWorks SAN Switch 4/32                                   |
| Disk Space Used                         | 685.5GB   |
| Array Cache Size                        | 256MB   |
| Number and Size of LUNs                 | 2 LUNs at 231.75GB (database VMs), 8 LUNs at 81GB (all other VMs) |
| RAID Type                               | RAID 0  |
| Number of Members per RAID Set          | 14 drives per RAID set  |
| Disk Vendor, Model, and Speed           | HP 36GB 15K RPM Ultra320 SCSI drive                               |

### Clients

|   |  |
|---|--|
| Number of Clients                           | 8  |
| System Model(s)                             | HP ProLiant DL360G5  |
| Processor Vendor(s) and Model(s)            | Intel Xeon   |
| Processor Speed(s) (GHz)                    | 2.83GHz  |
| Number of Sockets/Cores per Socket          | 1 Sockets / 4 Cores per Socket (4 Cores Total)                   |
| Memory                                      | 2GB  |
| Network Controller Vendor and Model         | 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 BIOS Settings:
  - Power Regulator: Static High Performance (default Dynamic Power Savings Mode)
  - Ultra Low Power State: disabled (default enabled)
  - Independent Memory Mode Enabled (default Ganged Memory Mode)
  - Internal disk write cache enabled (default disabled)
  
- QLogic HBA BIOS Settings:
  - Fibre Channel tape support disabled (default enabled)
  - Data rate option set to 1 (default 2)
  - Execution Throttle set to 64 (default 16)
  
- vSwitch Configuration:
  - vSwitch0 was configured for the Service Console on vmnic2
  - vSwitch5 was configured for all Webserver VMs on vmnic13 set to 120 ports (default 56)
  - vSwitch1 was configured for all other VMs on vmnic12 set to 120 ports (default 56)
  
- Storage Configuration:
  - database\_00 configured to store database0, database2, database4 and database6 VMs
  - database\_01 configured to store database1, database3, database5 and database7 VMs
  - datastore\_00 configured to store all VMs except the database for tile 0
  - datastore\_01 configured to store all VMs except the database for tile 1
  - datastore\_02 configured to store all VMs except the database for tile 2
  - datastore\_03 configured to store all VMs except the database for tile 3
  - datastore\_04 configured to store all VMs except the database for tile 4

- datastore\_05 configured to store all VMs except the database for tile 5
- datastore\_06 configured to store all VMs except the database for tile 6
- datastore\_07 configured to store all VMs except the database for tile 7

## Virtualization Software Notes

- firewall and iptables services were stopped prior to the run
- virtualized MMU was enabled for all VMs (default automatic)
- ethernet adapter type set to Enhanced vmxnet for all VMs
- logging was disabled for all VMs
- IDE & floppy devices were removed on Mailserver and Webserver VMs (default enabled)
- Disk.Sched.NumRequestOutstanding set to 64 (default 32)
- VMFS3.MaxHeapSizeMB set to 64 (default 16)
- IRQ.RoutingPolicy was set to 0 (default 2)
- BufferCache.SoftMaxDirty was set to 85 (default 15)
- QLogic queue depth set to 64

## Operating System Notes

- Microsoft Windows Server 2003 virtual machines were updated to Service Pack 2, as well as KB 933360
- Webserver virtual machines were updated to SLES 10 SP2

## Software Notes

On the web servers, FastCGI version 2.4.6 was used.

## Client Notes

- Microsoft Windows Server 2003 client machines were updated to Service Pack 2, as well as KB 933360
- TCP TOE chimney was disabled on all clients (default enabled)

## Other Notes

None.

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