

## VMware® VMmark™ V1.1.1 Results

**Vendor and Hardware Platform: Fujitsu RX600 S5**  
**Virtualization Platform: VMware ESX 4.0 Update 2 (build 261974)**

**VMmark V1.1.1 Score =**  
**55.88 @ 39 Tiles**

**Tested By: Fujitsu**

**Test Date: 10-01-2010**

**Performance Section**  
[Performance](#)

**Configuration Section**  
[Configuration](#)

**Notes Section**  
[Notes for Workload](#)

### Performance

	webserver		javaserver		mailserver		fileserver		database		
<b>TILE_0</b>	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
<b>p0</b>	1800.88	1.77	18147.35	1.09	1485.72	1.35	17.94	1.40	2178.18	1.46	1.40
<b>p1</b>	1750.85	1.72	18147.65	1.09	1470.38	1.34	18.09	1.41	2175.90	1.46	1.39
<b>p2</b>	1762.00	1.73	18126.38	1.09	1423.38	1.30	18.03	1.41	2180.00	1.46	1.38
<b>TILE_1</b>	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
<b>p0</b>	1898.55	1.86	18142.22	1.09	1716.72	1.57	18.68	1.46	2209.88	1.48	1.47
<b>p1</b>	1912.42	1.88	18151.17	1.09	1680.60	1.53	18.49	1.44	2215.12	1.48	1.46
<b>p2</b>	1906.30	1.87	18117.97	1.09	1555.85	1.42	18.17	1.42	2222.03	1.49	1.44
<b>TILE_2</b>	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
<b>p0</b>	1937.30	1.90	18120.38	1.09	1636.97	1.49	18.46	1.44	2207.55	1.48	1.46
<b>p1</b>	1892.78	1.86	18131.10	1.09	1667.72	1.52	17.97	1.40	2206.65	1.48	1.45
<b>p2</b>	1900.05	1.86	18121.10	1.09	1716.53	1.57	17.76	1.38	2210.80	1.48	1.46
<b>TILE_3</b>	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
<b>p0</b>	1957.15	1.92	17715.92	1.07	1730.75	1.58	18.53	1.44	2196.45	1.47	1.47
<b>p1</b>	1936.00	1.90	18160.50	1.09	1613.17	1.47	18.04	1.41	2197.55	1.47	1.45
<b>p2</b>	1941.80	1.91	18172.72	1.09	1647.30	1.50	18.11	1.41	2207.40	1.48	1.46
<b>TILE_4</b>	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
<b>p0</b>	1932.20	1.90	17663.55	1.06	1629.72	1.49	18.04	1.41	2207.90	1.48	1.44
<b>p1</b>	1892.20	1.86	18126.42	1.09	1578.78	1.44	18.30	1.43	2202.88	1.48	1.44
<b>p2</b>	1897.35	1.86	18115.88	1.09	1636.40	1.49	18.21	1.42	2210.10	1.48	1.45
<b>TILE_5</b>	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
<b>p0</b>	1887.45	1.85	18110.65	1.09	1612.50	1.47	18.61	1.45	2213.30	1.48	1.45
<b>p1</b>	1907.30	1.87	17659.15	1.06	1586.78	1.45	18.32	1.43	2213.05	1.48	1.44
<b>p2</b>	1904.95	1.87	18121.12	1.09	1578.95	1.44	18.50	1.44	2216.22	1.49	1.44

<b>TILE_6</b>	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
<b>p0</b>	1947.22	1.91	18142.15	1.09	1672.88	1.53	18.55	1.45	2209.15	1.48	1.47
<b>p1</b>	1924.40	1.89	18145.00	1.09	1753.67	1.60	18.16	1.42	2214.85	1.48	1.47
<b>p2</b>	1908.97	1.87	18126.90	1.09	1620.80	1.48	18.18	1.42	2223.80	1.49	1.45
<b>TILE_7</b>	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
<b>p0</b>	1958.22	1.92	18120.12	1.09	1692.35	1.54	18.83	1.47	2211.32	1.48	1.48
<b>p1</b>	1938.60	1.90	18116.85	1.09	1739.40	1.59	18.57	1.45	2217.62	1.49	1.48
<b>p2</b>	1942.67	1.91	18115.20	1.09	1655.08	1.51	18.43	1.44	2224.05	1.49	1.46
<b>TILE_8</b>	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
<b>p0</b>	1954.55	1.92	18118.33	1.09	1643.42	1.50	18.60	1.45	2198.28	1.47	1.46
<b>p1</b>	1935.22	1.90	18122.08	1.09	1727.28	1.57	18.16	1.42	2199.05	1.47	1.47
<b>p2</b>	1942.15	1.91	18120.92	1.09	1598.53	1.46	18.21	1.42	2210.03	1.48	1.45
<b>TILE_9</b>	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
<b>p0</b>	1940.12	1.90	18114.80	1.09	1659.83	1.51	18.77	1.46	2209.88	1.48	1.47
<b>p1</b>	1895.95	1.86	18114.83	1.09	1664.35	1.52	18.46	1.44	2216.60	1.49	1.46
<b>p2</b>	1905.33	1.87	17665.08	1.06	1629.58	1.49	18.28	1.42	2224.07	1.49	1.44
<b>TILE_10</b>	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
<b>p0</b>	1939.45	1.90	18116.00	1.09	1513.12	1.38	18.72	1.46	2215.38	1.48	1.44
<b>p1</b>	1898.10	1.86	18120.10	1.09	1345.83	1.23	18.35	1.43	2213.95	1.48	1.40
<b>p2</b>	1905.75	1.87	17666.25	1.06	1369.03	1.25	18.42	1.44	2218.38	1.49	1.40
<b>TILE_11</b>	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
<b>p0</b>	1884.60	1.85	18135.00	1.09	1369.25	1.25	18.11	1.41	2198.90	1.47	1.39
<b>p1</b>	1905.15	1.87	18128.08	1.09	1310.88	1.20	18.28	1.42	2197.53	1.47	1.39
<b>p2</b>	1899.58	1.86	18126.60	1.09	1353.12	1.23	18.22	1.42	2209.10	1.48	1.39
<b>TILE_12</b>	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
<b>p0</b>	1961.40	1.92	18113.58	1.09	1553.10	1.42	17.98	1.40	2200.90	1.47	1.44
<b>p1</b>	1938.67	1.90	18116.30	1.09	1702.95	1.55	18.21	1.42	2201.72	1.48	1.46
<b>p2</b>	1943.90	1.91	18117.17	1.09	1582.90	1.44	18.11	1.41	2205.22	1.48	1.44
<b>TILE_13</b>	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
<b>p0</b>	1892.62	1.86	18123.15	1.09	1326.47	1.21	18.88	1.47	2215.03	1.48	1.40
<b>p1</b>	1911.08	1.88	18117.88	1.09	1416.17	1.29	18.58	1.45	2213.55	1.48	1.41
<b>p2</b>	1904.10	1.87	18111.38	1.09	1408.20	1.28	18.43	1.44	2218.22	1.49	1.41
<b>TILE_14</b>	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
<b>p0</b>	1957.42	1.92	18117.72	1.09	1056.10	0.96	18.28	1.42	2209.53	1.48	1.34
<b>p1</b>	1933.88	1.90	18115.30	1.09	1036.25	0.94	18.48	1.44	2206.00	1.48	1.33
<b>p2</b>	1938.50	1.90	18120.17	1.09	1021.48	0.93	18.51	1.44	2210.35	1.48	1.33

<b>TILE_15</b>	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
<b>p0</b>	1937.90	1.90	18117.80	1.09	1189.08	1.08	18.74	1.46	2202.72	1.48	1.37
<b>p1</b>	1917.28	1.88	18114.62	1.09	1084.35	0.99	18.50	1.44	2204.07	1.48	1.34
<b>p2</b>	1900.53	1.87	18122.45	1.09	1059.85	0.97	18.59	1.45	2213.82	1.48	1.33
<b>TILE_16</b>	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
<b>p0</b>	1939.88	1.90	18119.08	1.09	1627.90	1.48	18.66	1.45	2209.78	1.48	1.46
<b>p1</b>	1891.58	1.86	18115.65	1.09	1535.00	1.40	18.46	1.44	2218.45	1.49	1.43
<b>p2</b>	1901.88	1.87	18114.95	1.09	1711.60	1.56	18.53	1.44	2222.53	1.49	1.47
<b>TILE_17</b>	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
<b>p0</b>	1889.65	1.85	18143.28	1.09	1569.45	1.43	18.55	1.45	2217.32	1.49	1.44
<b>p1</b>	1910.20	1.87	18124.12	1.09	1620.53	1.48	17.93	1.40	2216.85	1.49	1.44
<b>p2</b>	1903.90	1.87	18136.12	1.09	1571.83	1.43	18.02	1.40	2217.57	1.49	1.44
<b>TILE_18</b>	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
<b>p0</b>	1959.88	1.92	18123.83	1.09	1709.22	1.56	18.32	1.43	2211.45	1.48	1.47
<b>p1</b>	1934.67	1.90	18120.12	1.09	1650.20	1.50	18.03	1.41	2216.85	1.49	1.45
<b>p2</b>	1941.67	1.91	18120.58	1.09	1483.92	1.35	18.00	1.40	2224.05	1.49	1.43
<b>TILE_19</b>	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
<b>p0</b>	1951.85	1.92	18120.53	1.09	1457.28	1.33	17.56	1.37	2207.10	1.48	1.41
<b>p1</b>	1932.08	1.90	18119.12	1.09	1338.55	1.22	17.20	1.34	2203.65	1.48	1.38
<b>p2</b>	1911.35	1.88	18118.78	1.09	1430.17	1.30	16.99	1.32	2210.45	1.48	1.39
<b>TILE_20</b>	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
<b>p0</b>	1937.25	1.90	18122.85	1.09	1590.90	1.45	18.14	1.41	2210.88	1.48	1.44
<b>p1</b>	1891.03	1.86	18110.30	1.09	1531.92	1.40	18.03	1.41	2208.57	1.48	1.42
<b>p2</b>	1895.22	1.86	18118.03	1.09	1569.28	1.43	18.19	1.42	2214.95	1.48	1.44
<b>TILE_21</b>	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
<b>p0</b>	1958.28	1.92	18119.90	1.09	1563.03	1.43	18.54	1.45	2215.18	1.48	1.45
<b>p1</b>	1935.40	1.90	17664.22	1.06	1571.45	1.43	18.19	1.42	2221.28	1.49	1.44
<b>p2</b>	1941.15	1.91	18112.42	1.09	1586.40	1.45	18.24	1.42	2226.85	1.49	1.45
<b>TILE_22</b>	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
<b>p0</b>	1886.28	1.85	18146.35	1.09	1572.75	1.43	18.81	1.47	2203.03	1.48	1.44
<b>p1</b>	1908.72	1.87	18127.00	1.09	1625.45	1.48	18.51	1.44	2203.15	1.48	1.45
<b>p2</b>	1902.80	1.87	18148.53	1.09	1530.60	1.40	18.54	1.45	2213.95	1.48	1.44
<b>TILE_23</b>	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
<b>p0</b>	1890.22	1.86	18129.33	1.09	1524.20	1.39	18.67	1.46	2222.47	1.49	1.44
<b>p1</b>	1907.33	1.87	17670.78	1.06	1642.95	1.50	18.40	1.43	2219.03	1.49	1.45
<b>p2</b>	1905.92	1.87	18124.20	1.09	1687.47	1.54	18.41	1.43	2223.75	1.49	1.46

<b>TILE_24</b>	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
<b>p0</b>	1890.92	1.86	18147.20	1.09	1431.95	1.31	18.60	1.45	2211.35	1.48	1.42
<b>p1</b>	1909.80	1.87	18159.05	1.09	1545.47	1.41	17.84	1.39	2206.20	1.48	1.43
<b>p2</b>	1904.03	1.87	17711.00	1.07	1532.88	1.40	18.08	1.41	2213.10	1.48	1.42
<b>TILE_25</b>	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
<b>p0</b>	1951.33	1.92	18124.65	1.09	1389.62	1.27	18.75	1.46	2204.78	1.48	1.42
<b>p1</b>	1928.83	1.89	17683.88	1.06	1697.20	1.55	18.64	1.45	2204.18	1.48	1.46
<b>p2</b>	1911.20	1.88	18138.33	1.09	1621.65	1.48	18.45	1.44	2215.15	1.48	1.45
<b>TILE_26</b>	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
<b>p0</b>	1962.70	1.93	18122.08	1.09	1464.75	1.34	18.40	1.43	2205.25	1.48	1.43
<b>p1</b>	1937.05	1.90	18118.30	1.09	1662.03	1.52	18.08	1.41	2201.90	1.48	1.46
<b>p2</b>	1940.90	1.90	18121.42	1.09	1680.40	1.53	17.95	1.40	2215.68	1.48	1.46
<b>TILE_27</b>	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
<b>p0</b>	1933.17	1.90	18163.38	1.09	1458.85	1.33	18.45	1.44	2219.35	1.49	1.43
<b>p1</b>	1889.35	1.85	18136.55	1.09	1590.33	1.45	18.12	1.41	2215.38	1.48	1.44
<b>p2</b>	1896.83	1.86	18144.85	1.09	1653.45	1.51	18.08	1.41	2218.97	1.49	1.45
<b>TILE_28</b>	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
<b>p0</b>	1894.30	1.86	18129.22	1.09	1446.10	1.32	17.98	1.40	2212.60	1.48	1.41
<b>p1</b>	1914.70	1.88	18122.47	1.09	1590.30	1.45	18.24	1.42	2211.75	1.48	1.44
<b>p2</b>	1906.95	1.87	18159.25	1.09	1639.53	1.49	18.22	1.42	2217.18	1.49	1.45
<b>TILE_29</b>	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
<b>p0</b>	1940.28	1.90	18149.97	1.09	1404.67	1.28	17.94	1.40	2206.82	1.48	1.41
<b>p1</b>	1896.20	1.86	18127.55	1.09	1585.25	1.45	18.20	1.42	2204.72	1.48	1.44
<b>p2</b>	1901.53	1.87	18135.58	1.09	1647.35	1.50	18.26	1.42	2216.88	1.49	1.45
<b>TILE_30</b>	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
<b>p0</b>	1953.67	1.92	18119.22	1.09	1362.38	1.24	18.04	1.41	2225.57	1.49	1.40
<b>p1</b>	1930.67	1.89	18110.62	1.09	1594.88	1.45	18.26	1.42	2220.28	1.49	1.45
<b>p2</b>	1912.12	1.88	18114.35	1.09	1695.17	1.55	18.02	1.40	2224.35	1.49	1.46
<b>TILE_31</b>	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
<b>p0</b>	1956.92	1.92	18136.40	1.09	1375.78	1.25	18.75	1.46	2218.18	1.49	1.42
<b>p1</b>	1932.12	1.90	17670.10	1.06	1617.55	1.47	18.49	1.44	2213.18	1.48	1.45
<b>p2</b>	1912.70	1.88	18119.70	1.09	1640.92	1.50	18.47	1.44	2218.40	1.49	1.46
<b>TILE_32</b>	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
<b>p0</b>	1962.33	1.93	17671.00	1.06	1380.53	1.26	18.69	1.46	2209.55	1.48	1.41
<b>p1</b>	1938.30	1.90	18109.88	1.09	1479.38	1.35	18.40	1.43	2206.75	1.48	1.43
<b>p2</b>	1941.55	1.91	18112.78	1.09	1571.90	1.43	18.34	1.43	2217.35	1.49	1.45

<b>TILE_33</b>	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
<b>p0</b>	1961.30	1.92	18115.17	1.09	1278.28	1.17	18.40	1.43	2220.85	1.49	1.39
<b>p1</b>	1940.03	1.90	18110.95	1.09	1571.75	1.43	18.20	1.42	2223.72	1.49	1.44
<b>p2</b>	1945.00	1.91	18117.62	1.09	1698.53	1.55	18.33	1.43	2228.75	1.49	1.47
<b>TILE_34</b>	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
<b>p0</b>	1952.55	1.92	18130.05	1.09	1274.38	1.16	18.81	1.47	2228.85	1.49	1.40
<b>p1</b>	1930.62	1.89	18114.03	1.09	1517.45	1.38	18.67	1.46	2222.35	1.49	1.44
<b>p2</b>	1913.40	1.88	18116.28	1.09	1621.05	1.48	18.40	1.43	2225.20	1.49	1.45
<b>TILE_35</b>	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
<b>p0</b>	1933.30	1.90	18159.65	1.09	1236.25	1.13	18.39	1.43	2180.53	1.46	1.37
<b>p1</b>	1888.60	1.85	18130.80	1.09	1488.92	1.36	18.06	1.41	2183.32	1.46	1.41
<b>p2</b>	1902.30	1.87	18117.92	1.09	1615.12	1.47	18.20	1.42	2192.70	1.47	1.44
<b>TILE_36</b>	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
<b>p0</b>	1891.50	1.86	18158.15	1.09	1215.78	1.11	18.00	1.40	2223.10	1.49	1.36
<b>p1</b>	1910.08	1.87	18142.97	1.09	1576.40	1.44	18.23	1.42	2217.65	1.49	1.44
<b>p2</b>	1905.40	1.87	18139.83	1.09	1619.45	1.48	18.25	1.42	2222.18	1.49	1.45
<b>TILE_37</b>	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
<b>p0</b>	1954.78	1.92	18146.20	1.09	1141.80	1.04	18.57	1.45	2228.35	1.49	1.36
<b>p1</b>	1933.53	1.90	18159.28	1.09	1524.50	1.39	18.17	1.42	2230.95	1.49	1.44
<b>p2</b>	1913.70	1.88	17716.97	1.07	1667.85	1.52	18.18	1.42	2237.07	1.50	1.45
<b>TILE_38</b>	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	Actual	Ratio	GM
<b>p0</b>	1954.53	1.92	18112.95	1.09	1162.85	1.06	18.72	1.46	2232.07	1.50	1.37
<b>p1</b>	1936.70	1.90	18112.60	1.09	1384.10	1.26	18.50	1.44	2228.88	1.49	1.41
<b>p2</b>	1917.08	1.88	18104.58	1.09	1661.67	1.52	18.35	1.43	2231.57	1.50	1.46
<b>p0_score:</b>	55.49										
<b>p1_score:</b>	55.88										
<b>p2_score:</b>	56.01										
<b>Unreviewed_VMmark_Score:</b>	55.88										

## Configuration

<b>Server and Network</b>	
Server Manufacturer and Model	Fujitsu RX600 S5
Processor Vendor and Model	Intel Xeon E7540
Processor Speed (GHz)	2.0
Total Sockets/Total Cores/Total Threads	4 Sockets / 24 Cores / 48 Threads

Primary Cache	32KB I + 32KB D on chip per core
Secondary Cache	256KB I+D on chip per core
Other Cache	18MB I+D on chip per chip L3
BIOS Version	Aptio 3.6 R1.01.2870
Memory Size (in GB, Number of DIMMs)	1024GB, 64
Memory Type and Speed	16GB per DIMM, Quad Rank 1066MHz registered ECC DDR3
Disk Subsystem Type	FC SAN
Number of Disk Controllers	0
Number of Host Bus Adapters	1
Host Bus Adapter Vendors and Models	1 dual-channel Emulex LPe12002
Number of Network Controllers	3
Network Controller Vendors and Models	Two integrated Intel 82576NS dual port 1GbE adapter, one Intel 10 Gigabit X520-DA2 dual port server adapter
Network Switch Vendors and Models	4xBX600 GbE Switch Blade 30/12, 1xCISCO 4900M
Network Speed	10Gbps for all database, fileserver and webserver VMs, 1Gbps for all remaining VMs and SUT
Other Hardware	none
Other Software	none
Hardware Availability Date (MM-DD-YYYY)	09-24-2010
Software Availability Date (MM-DD-YYYY)	09-24-2010

#### Virtualization Software

Vendor, Product, Version, and Build	VMware ESX 4.0 Update 2 (build 261974)
Virtualization Type	Hardware
Supplemental Software	ixgbe-Driver Version 2.0.62.4.8
Virtualization Software Availability Date (MM-DD-YYYY)	06-10-2010

#### Storage

Array Vendors, Models, and Firmware Versions	13xFujitsu ETERNUS DX80, Firmware version V10L20-0000
Fibre Channel Switch Vendors and Models	Brocade 5100
Disk Space Used	Total 3578GB: 2543GB for VMs, 11GB for Host-OS, 1TB for VM-config and swap
Array Cache Size	2GB
Total Number of Physical Disks Used	274

Total Number of Enclosures/Pods/Shelves Used	24
Total Number of Physical Disks per Enclosures/Pods/Shelves Used	12 except ETERNUS DX80[0] with only 4 disks and ETERNUS DX80[11] with only 6 disks
Total Number of Storage Groups Used	13
Number LUNs Used	Total 55: 53 LUNs for VMs, 1 LUN for Host-OS, 1 LUN for VM-config and swap
LUN Size and Number of Disks Per LUN	13x31GB/6 Disks (Database VMs), 20x18GB/12 Disks (Fileserver VMs), 20x89GB/12 Disks, 1x11GB/4 Disks, 1x1TB/4 Disks
RAID Type	0
Number of Members per RAID Set	ETERNUS DX80[0]: 2, ETERNUS DX80[1-10]: 2/2, ETERNUS DX80[11]: 1, ETERNUS DX80[12]: 3/3/3
Disk Vendors, Models, and Speeds	276xSeagate, ST3300656SS, 15krpm 4xSeagate, ST3450856SS, 15krpm
<b>Clients</b>	
Number of Clients	39
System Model(s)	BX620 S4
Processor Vendor(s) and Model(s)	Intel Xeon 5130
Processor Speed(s) (GHz)	2
Total Sockets/Total Cores/Total Threads	2 Sockets / 4 Cores / 4 Threads
Memory per Client	3GB
Network Controller Vendors and Models	Broadcom NetXtreme
Operating System, Version, and Service Pack	Microsoft(R) Windows(R) Server 2003 R2 Enterprise Edition, Service Pack 2
Other Hardware	none
Other Software	none

## Notes for Workload

### Server and Network Notes

- Server BIOS settings:
  - Turbo Boost Technology: Enabled (Intel Turbo Boost up to 2.27GHz, default enabled)
  - Serial 1: Disabled (default auto)
  - SATA Controller: Disabled (default Enabled)
  - SAS Controller: Disabled (default Enabled)
- Emulex HBA BIOS settings:
  - defaults

- vSwitch Configuration:
  - vSwitch0 for Service Console on vmnic1
  - vSwitch1 for all Standby VMs on vmnic0
  - vSwitch1 configured for 120 Ports (default 56)
  - vSwitch2 for all Mailserver VMs on vmnic2
  - vSwitch3 for all Javaser VMs on vmnic3
  - vSwitch4 for Database/Fileserver VMs on vmnic4
  - vSwitch4 configured for 120 Ports (default 56)
  - vSwitch5 for all Webserver VMs on vmnic5
  
- Storage Configuration:
  - ETERNUS DX80[0]
    - RAID set 0, LUN 0: Boot/Console OS
    - RAID set 0, LUN 1: VM-config and swap
  
  - ETERNUS DX80[1]
    - RAID set 0, LUN 1: Fileservers for tiles 0 and 2
    - RAID set 0, LUN 2: Javaser/Mailserver/Standby/Webserver for tiles 0 and 2
    - RAID set 1, LUN 3: Fileserver for tiles 1 and 3
    - RAID set 1, LUN 4: Javaser/Mailserver/Standby/Webserver for tiles 1 and 3
  
  - ETERNUS DX80[2]
    - RAID set 0, LUN 1: Fileservers for tiles 4 and 6
    - RAID set 0, LUN 2: Javaser/Mailserver/Standby/Webserver for tiles 4 and 6
    - RAID set 1, LUN 3: Fileserver for tiles 5 and 7
    - RAID set 1, LUN 4: Javaser/Mailserver/Standby/Webserver for tiles 5 and 7
  
  - ETERNUS DX80[3]
    - RAID set 0, LUN 1: Fileservers for tiles 8 and 10
    - RAID set 0, LUN 2: Javaser/Mailserver/Standby/Webserver for tiles 8 and 10
    - RAID set 1, LUN 3: Fileserver for tiles 9 and 11
    - RAID set 1, LUN 4: Javaser/Mailserver/Standby/Webserver for tiles 9 and 11
  
  - ETERNUS DX80[4]
    - RAID set 0, LUN 1: Fileservers for tiles 12 and 14
    - RAID set 0, LUN 2: Javaser/Mailserver/Standby/Webserver for tiles 12 and 14
    - RAID set 1, LUN 3: Fileserver for tiles 13 and 15
    - RAID set 1, LUN 4: Javaser/Mailserver/Standby/Webserver for tiles 13 and 15
  
  - ETERNUS DX80[5]
    - RAID set 0, LUN 1: Fileservers for tiles 16 and 18
    - RAID set 0, LUN 2: Javaser/Mailserver/Standby/Webserver for tiles 16 and 18
    - RAID set 1, LUN 3: Fileserver for tiles 17 and 19
    - RAID set 1, LUN 4: Javaser/Mailserver/Standby/Webserver for tiles 17 and 19
  
  - ETERNUS DX80[6]
    - RAID set 0, LUN 1: Fileservers for tiles 20 and 22
    - RAID set 0, LUN 2: Javaser/Mailserver/Standby/Webserver for tiles 20 and 22
    - RAID set 1, LUN 3: Fileserver for tiles 21 and 23
    - RAID set 1, LUN 4: Javaser/Mailserver/Standby/Webserver for tiles 21 and 23



- ETERNUS DX80[7]
  - RAID set 0, LUN 1: Fileservers for tiles 24 and 26
  - RAID set 0, LUN 2: Javaser/Mailserver/Standby/Webserver for tiles 24 and 26
  - RAID set 1, LUN 3: Fileserver for tiles 25 and 27
  - RAID set 1, LUN 4: Javaser/Mailserver/Standby/Webserver for tiles 25 and 27
- ETERNUS DX80[8]
  - RAID set 0, LUN 1: Fileservers for tiles 28 and 30
  - RAID set 0, LUN 2: Javaser/Mailserver/Standby/Webserver for tiles 28 and 30
  - RAID set 1, LUN 3: Fileserver for tiles 29 and 31
  - RAID set 1, LUN 4: Javaser/Mailserver/Standby/Webserver for tiles 29 and 31
- ETERNUS DX80[9]
  - RAID set 0, LUN 1: Fileservers for tiles 32 and 34
  - RAID set 0, LUN 2: Javaser/Mailserver/Standby/Webserver for tiles 32 and 34
  - RAID set 1, LUN 3: Fileserver for tiles 33 and 35
  - RAID set 1, LUN 4: Javaser/Mailserver/Standby/Webserver for tiles 33 and 35
- ETERNUS DX80[10]
  - RAID set 0, LUN 1: Fileservers for tiles 36 and 38
  - RAID set 0, LUN 2: Javaser/Mailserver/Standby/Webserver for tiles 36 and 38
  - RAID set 1, LUN 3: Fileserver for tile 37
  - RAID set 1, LUN 4: Javaser/Mailserver/Standby/Webserver for tiles 37
- ETERNUS DX80[11]
  - RAID set 0, LUN 1: Database for tiles 36, 37 and 38
- ETERNUS DX80[12]
  - RAID set 0, LUN 1: Database for tiles 0, 4 and 8
  - RAID set 0, LUN 2: Database for tiles 12, 16 and 20
  - RAID set 0, LUN 3: Database for tiles 24, 28 and 32
  - RAID set 1, LUN 4: Database for tiles 1, 5 and 9
  - RAID set 1, LUN 5: Database for tiles 13, 17 and 21
  - RAID set 1, LUN 6: Database for tiles 25, 29 and 33
  - RAID set 2, LUN 7: Database for tiles 2, 6 and 10
  - RAID set 2, LUN 8: Database for tiles 14, 18 and 22
  - RAID set 2, LUN 9: Database for tiles 26, 30 and 34
  - RAID set 3, LUN 10: Database for tiles 3, 7 and 11
  - RAID set 3, LUN 11: Database for tiles 15, 19 and 23
  - RAID set 3, LUN 12: Database for tiles 27, 31 and 35

## Virtualization Software Notes

- All VMs were upgraded to hardware version 7
- Virtualized MMU was set to full hardware support for all VMs (default automatic)
- Ethernet adapter type set to vmxnet3 for all VMs
- Logging disabled for all VMs (default enabled)
- Floppy and CDROM removed for all VMs (default enabled)
- Firewall disabled for the Console OS (default enabled)
- CPU.HaltingIdleMsecPenalty = 0 (default 100)

- CPU.Quantum = 60 (default 50)
- IRQ.RoutingPolicy = 0 (default 2)
- Mem.BalancePeriod was set to 0 (default 15)
- Mem.SamplePeriod was set to 0 (default 60)
- Mem.ShareScanGHz was set to 0 (default 4)
- Misc.TimerMaxHardPeriod was set to 4000 (default 2000)
- Misc.TimerMinHardPeriod was set to 2000 (default 100)
- Net.CoalesceRxQDepthCap=80 (default 40)
- Net.CoalesceTxAlwaysPoll=0 (default 1)
- Net.CoalesceTxQDepthCap=80 (default 40)
- Net.CoalesceTxTimeout=8000 (default 4000)
- Net.MaxNetifRxQueueLen=300 (default 100)
- Net.MaxNetifTxQueueLen=1000 (default 500)
- Net.vmxnetThroughputWeight=255 (default 0)
- Numa.LTermFairnessInterval was set to 0 (default 5)
- Numa.PageMigEnable was set to 0 (default 1)
- VGA buffer for all Windows VMs was set to 1310720 Bytes
- VGA buffer for all Linux VMs was set to 1572864 Bytes
- One dedicated LUN(ETERNUS DX80[0]/LUN 1) for the VM configuration/swap files
- /vmkernel/module/ixgbe.o/options = "VMDQ=1,1 InterruptThrottleRate=3000,3000" (defaults 8,8 / 16000,16000)
- /vmkernel/module/lpfc820.o/options = "lpfc\_lun\_queue\_depth=64 lpfc\_cr\_count=5 lpfc\_cr\_delay=1" (defaults 31,1,0)
- Used the VMmark AutoPart utility to expand all mailserver data partitions
- Used the new VMmark harness file 'fileservr\_functions.xml' from 02/16/2010

## Operating System Notes

- Microsoft Windows Server 2003 R2 VMs were updated with Service Pack 2
- Standby server and mail server were updated with KB955839

## Software Notes

- none

## Client Notes

- Microsoft Windows Server 2003 R2 Clients were updated with Service Pack 2 and KB955839

## Other Notes

- The following parameters were altered from their default values in VMMARK.CONFIG
  - Database/DELAYTIME=20 (default 360)
  - Fileservr/DELAYTIME=0 (default 450)
  - JavaServer/DELAYTIME=10 (default 540)
  - MailServer/DELAYTIME=15 (default 5)
  - Standby/DELAYTIME=0 (default 170)
  - TILEDELAY=192 (default 600)
  - WebServer/DELAYTIME=25 (default 180)

For information about VMmark and the rules regarding its usage visit [www.vmware.com/products/vmmark](http://www.vmware.com/products/vmmark).

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