

## VMware® VMmark® V2.5 Results

Vendor and Hardware Platform: HP ProLiant DL980 G7  
 Virtualization Platform: VMware ESX 4.1.0 U3 Build 800380  
 VMware vCenter Server: VMware vCenter Server 5.0.0 Build 455964

**VMmark V2.5 Score =  
31.80 @ 30 Tiles**

Number of Hosts: 2

Uniform Hosts [yes/no]: yes

Total sockets/cores/threads in test: 16/160/320

Tested By: Hewlett-Packard

Test Date: 05-25-2013

Performance Section

[Performance](#)

Configuration Section

[Configuration](#)

Notes Section

[Notes for Workload](#)

### Performance

	mailserver			olio			dvdstoreA			dvdstoreB			dvdstoreC			
TILE_0	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	325.88	0.99	92.25	4617.20	0.99	212.73	3363.85	1.53	93.32	2458.68	1.62	98.32	1777.67	1.68	100.52	1.33
p1	324.57	0.98	102.00	4590.20	0.99	240.51	3253.00	1.48	99.72	2438.80	1.61	105.77	1800.47	1.70	106.74	1.31
p2	323.57	0.98	128.35	4607.05	0.99	230.69	3244.80	1.48	100.15	2408.97	1.59	107.96	1871.20	1.77	107.61	1.32
TILE_1	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	325.82	0.99	92.25	4643.70	1.00	215.55	3346.05	1.52	94.36	2443.53	1.61	99.13	1766.22	1.67	101.81	1.32
p1	326.00	0.99	98.50	4613.60	0.99	227.12	3316.35	1.51	95.80	2591.05	1.71	100.07	1917.25	1.81	102.37	1.36
p2	330.20	1.00	104.00	4600.88	0.99	229.43	3270.03	1.49	98.73	2365.60	1.56	105.29	1790.53	1.69	107.77	1.31
TILE_2	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	325.27	0.98	104.25	4627.57	1.00	214.80	3304.85	1.50	97.16	2487.62	1.64	102.32	1823.22	1.72	104.22	1.33
p1	323.10	0.98	113.75	4616.48	0.99	226.57	3217.65	1.46	101.61	2420.38	1.59	107.14	1847.15	1.75	109.60	1.32
p2	326.05	0.99	134.00	4556.27	0.98	247.28	3190.47	1.45	103.12	2345.03	1.54	106.83	1677.55	1.59	111.36	1.28
TILE_3	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	325.10	0.98	70.30	4624.90	1.00	210.62	3257.62	1.48	99.59	2469.80	1.63	103.42	1893.25	1.79	105.28	1.33
p1	323.15	0.98	84.00	4596.77	0.99	237.31	3179.07	1.45	104.10	2327.25	1.53	108.73	1737.88	1.64	112.86	1.29
p2	332.80	1.01	100.40	4611.82	0.99	229.68	3142.15	1.43	106.91	2361.85	1.56	112.28	1629.72	1.54	118.38	1.28
TILE_4	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	324.88	0.98	75.08	4634.80	1.00	214.11	3262.50	1.48	99.31	2379.22	1.57	104.24	1791.20	1.69	107.98	1.31
p1	328.02	0.99	93.75	4634.45	1.00	237.17	3268.28	1.49	98.88	2477.15	1.63	102.74	1820.90	1.72	104.36	1.33
p2	325.20	0.98	114.00	4599.85	0.99	251.13	3218.55	1.46	101.57	2440.00	1.61	105.83	1798.50	1.70	106.54	1.31
TILE_5	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
p0	329.40	1.00	68.78	4615.32	0.99	230.04	3312.97	1.51	96.31	2408.65	1.59	101.61	1769.65	1.67	101.46	1.32
p1	324.95	0.98	63.00	4610.02	0.99	253.87	3296.65	1.50	96.75	2476.85	1.63	102.78	1827.28	1.73	103.50	1.33

<b>p2</b>	326.90	0.99	69.30	4585.55	0.99	284.72	3304.72	1.50	96.24	2490.43	1.64	101.62	1918.10	1.81	102.44	1.34
<b>TILE_6</b>	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
<b>p0</b>	323.00	0.98	64.00	4628.85	1.00	215.76	3291.35	1.50	97.28	2393.85	1.58	103.16	1729.78	1.63	105.39	1.30
<b>p1</b>	329.73	1.00	65.50	4604.38	0.99	236.78	3173.62	1.44	104.14	2472.78	1.63	109.27	1823.78	1.72	112.28	1.32
<b>p2</b>	326.43	0.99	71.75	4592.55	0.99	245.45	3160.88	1.44	105.20	2288.30	1.51	111.74	1729.92	1.64	114.25	1.28
<b>TILE_7</b>	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
<b>p0</b>	328.52	0.99	74.00	4632.07	1.00	216.08	3368.00	1.53	93.08	2560.70	1.69	96.60	1863.50	1.76	99.82	1.35
<b>p1</b>	325.60	0.99	93.50	4624.30	1.00	229.88	3281.47	1.49	97.78	2495.80	1.64	100.90	1900.95	1.80	103.84	1.34
<b>p2</b>	323.77	0.98	110.25	4631.15	1.00	223.69	3200.12	1.46	102.97	2365.78	1.56	105.64	1685.38	1.59	110.86	1.29
<b>TILE_8</b>	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
<b>p0</b>	323.48	0.98	74.00	4622.45	1.00	213.32	3293.18	1.50	96.96	2582.55	1.70	100.93	1906.67	1.80	103.59	1.35
<b>p1</b>	324.93	0.98	75.80	4596.52	0.99	236.03	3251.95	1.48	99.70	2360.88	1.55	105.74	1773.53	1.68	109.66	1.30
<b>p2</b>	328.48	0.99	100.20	4604.93	0.99	237.77	3235.07	1.47	100.34	2363.78	1.56	105.10	1712.88	1.62	107.20	1.30
<b>TILE_9</b>	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
<b>p0</b>	325.15	0.98	80.00	4626.73	1.00	215.92	3354.62	1.53	93.82	2525.60	1.66	98.97	1929.22	1.82	101.34	1.35
<b>p1</b>	329.60	1.00	74.00	4623.50	1.00	231.62	3227.40	1.47	101.16	2323.25	1.53	108.72	1689.62	1.60	109.74	1.29
<b>p2</b>	324.93	0.98	75.75	4570.25	0.98	252.67	3288.80	1.50	97.52	2455.38	1.62	104.45	1817.12	1.72	104.64	1.32
<b>TILE_10</b>	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
<b>p0</b>	326.07	0.99	64.00	4617.57	0.99	225.29	3318.97	1.51	95.99	2414.93	1.59	101.49	1821.53	1.72	104.01	1.32
<b>p1</b>	324.10	0.98	68.50	4616.57	0.99	237.42	3226.32	1.47	101.22	2377.38	1.57	104.34	1713.92	1.62	107.48	1.29
<b>p2</b>	330.12	1.00	74.00	4612.90	0.99	244.91	3119.57	1.42	107.91	2348.97	1.55	113.23	1784.40	1.69	116.81	1.30
<b>TILE_11</b>	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
<b>p0</b>	327.12	0.99	64.00	4635.80	1.00	230.64	3367.15	1.53	93.25	2452.75	1.62	98.81	1762.47	1.67	101.90	1.32
<b>p1</b>	325.80	0.99	64.00	4619.32	1.00	236.11	3307.25	1.50	96.25	2496.78	1.64	101.05	1823.60	1.72	103.72	1.33
<b>p2</b>	327.88	0.99	64.00	4612.55	0.99	240.17	3197.88	1.45	102.98	2327.88	1.53	108.49	1745.70	1.65	112.57	1.29
<b>TILE_12</b>	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
<b>p0</b>	324.43	0.98	63.48	4637.62	1.00	209.97	3324.03	1.51	96.20	2412.65	1.59	101.93	1751.05	1.65	103.70	1.31
<b>p1</b>	325.73	0.99	64.00	4624.57	1.00	225.70	3271.32	1.49	99.18	2434.05	1.60	106.74	1873.90	1.77	107.35	1.33
<b>p2</b>	326.80	0.99	70.50	4592.65	0.99	250.45	3316.72	1.51	96.14	2410.40	1.59	101.69	1755.55	1.66	103.02	1.31
<b>TILE_13</b>	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
<b>p0</b>	328.88	1.00	64.00	4648.12	1.00	211.79	3374.97	1.53	93.41	2552.78	1.68	97.27	1866.28	1.76	99.96	1.35
<b>p1</b>	325.12	0.98	64.00	4629.05	1.00	221.29	3312.75	1.51	96.67	2419.97	1.59	101.49	1819.42	1.72	104.77	1.32
<b>p2</b>	324.35	0.98	68.50	4600.32	0.99	233.64	3327.10	1.51	95.72	2422.22	1.60	101.10	1755.22	1.66	103.16	1.31
<b>TILE_14</b>	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
<b>p0</b>	327.48	0.99	64.00	4623.20	1.00	223.57	3346.55	1.52	94.44	2521.50	1.66	99.78	1929.40	1.82	101.62	1.35
<b>p1</b>	329.62	1.00	64.00	4594.68	0.99	239.00	3271.20	1.49	98.48	2410.03	1.59	101.78	1720.20	1.63	106.29	1.31

<b>p2</b>	327.02	0.99	71.50	4604.88	0.99	249.01	3148.97	1.43	106.49	2383.30	1.57	110.71	1731.05	1.64	114.74	1.29
<b>TILE_15</b>	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
<b>p0</b>	326.85	0.99	64.00	4628.52	1.00	208.39	3304.50	1.50	97.17	2396.40	1.58	103.24	1810.53	1.71	105.88	1.32
<b>p1</b>	324.80	0.98	69.25	4643.10	1.00	211.75	3242.75	1.47	100.50	2351.03	1.55	106.56	1706.70	1.61	108.76	1.29
<b>p2</b>	330.62	1.00	74.00	4610.60	0.99	240.66	3226.60	1.47	101.43	2430.32	1.60	105.05	1867.08	1.76	108.22	1.33
<b>TILE_16</b>	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
<b>p0</b>	328.30	0.99	73.00	4630.43	1.00	212.31	3295.45	1.50	98.15	2378.82	1.57	104.58	1719.75	1.63	106.99	1.30
<b>p1</b>	330.90	1.00	73.30	4615.25	0.99	234.13	3212.88	1.46	102.25	2405.80	1.58	108.90	1754.55	1.66	111.83	1.31
<b>p2</b>	327.68	0.99	73.22	4596.57	0.99	265.03	3238.18	1.47	100.78	2327.15	1.53	108.98	1762.12	1.67	110.99	1.30
<b>TILE_17</b>	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
<b>p0</b>	331.40	1.00	85.50	4638.57	1.00	208.69	3333.88	1.52	95.05	2424.62	1.60	100.93	1741.65	1.65	104.67	1.32
<b>p1</b>	325.70	0.99	78.25	4622.27	1.00	229.53	3280.12	1.49	98.05	2461.72	1.62	104.01	1877.42	1.77	107.26	1.33
<b>p2</b>	324.90	0.98	74.00	4616.70	0.99	232.63	3289.95	1.50	97.46	2379.95	1.57	104.02	1728.55	1.63	105.66	1.30
<b>TILE_18</b>	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
<b>p0</b>	327.35	0.99	72.78	4653.02	1.00	201.85	3288.22	1.50	98.36	2460.53	1.62	104.52	1796.67	1.70	107.26	1.33
<b>p1</b>	329.52	1.00	67.97	4613.02	0.99	215.69	3261.95	1.48	99.40	2375.50	1.56	104.82	1786.75	1.69	107.99	1.31
<b>p2</b>	331.88	1.00	69.15	4625.75	1.00	232.88	3205.80	1.46	103.10	2331.88	1.54	108.35	1661.42	1.57	113.87	1.29
<b>TILE_19</b>	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
<b>p0</b>	326.10	0.99	81.25	4640.88	1.00	210.99	3281.40	1.49	98.45	2477.82	1.63	102.96	1895.62	1.79	105.01	1.34
<b>p1</b>	330.30	1.00	74.00	4628.85	1.00	221.75	3170.78	1.44	105.03	2301.82	1.52	110.94	1642.25	1.55	115.95	1.28
<b>p2</b>	327.98	0.99	74.00	4635.38	1.00	224.69	3169.85	1.44	104.94	2390.47	1.57	110.01	1730.28	1.64	114.54	1.30
<b>TILE_20</b>	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
<b>p0</b>	325.85	0.99	74.00	4639.98	1.00	216.29	3272.90	1.49	99.12	2376.80	1.57	104.88	1804.78	1.71	106.70	1.31
<b>p1</b>	328.85	1.00	74.00	4634.30	1.00	228.75	3198.55	1.45	103.12	2324.50	1.53	108.93	1683.15	1.59	110.90	1.29
<b>p2</b>	325.27	0.98	74.00	4615.95	0.99	254.51	3161.20	1.44	105.43	2461.97	1.62	110.66	1830.53	1.73	111.86	1.32
<b>TILE_21</b>	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
<b>p0</b>	327.62	0.99	74.00	4653.48	1.00	218.63	3290.70	1.50	97.76	2386.70	1.57	103.81	1742.50	1.65	104.65	1.31
<b>p1</b>	325.57	0.99	74.00	4618.57	1.00	238.45	3255.57	1.48	99.50	2444.88	1.61	105.45	1801.85	1.70	106.41	1.32
<b>p2</b>	326.57	0.99	74.00	4598.73	0.99	266.25	3273.57	1.49	98.26	2453.28	1.62	104.41	1889.12	1.79	105.38	1.33
<b>TILE_22</b>	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
<b>p0</b>	324.07	0.98	73.00	4632.70	1.00	204.52	3305.53	1.50	97.00	2405.70	1.58	102.35	1738.38	1.64	104.83	1.31
<b>p1</b>	329.75	1.00	64.00	4648.82	1.00	228.70	3181.80	1.45	103.99	2463.20	1.62	109.88	1824.38	1.72	112.47	1.32
<b>p2</b>	331.25	1.00	71.25	4587.73	0.99	243.75	3181.57	1.45	103.96	2305.82	1.52	110.28	1738.35	1.64	113.70	1.29
<b>TILE_23</b>	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
<b>p0</b>	325.85	0.99	74.00	4643.38	1.00	196.39	3321.53	1.51	95.45	2519.22	1.66	99.71	1835.78	1.74	102.72	1.34
<b>p1</b>	330.12	1.00	69.25	4626.75	1.00	224.73	3247.20	1.48	100.03	2448.53	1.61	105.02	1866.35	1.76	107.67	1.33

<b>p2</b>	327.35	0.99	74.00	4596.40	0.99	246.80	3181.15	1.45	104.06	2338.28	1.54	107.10	1682.12	1.59	111.13	1.28
<b>TILE_24</b>	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
<b>p0</b>	327.12	0.99	83.55	4647.12	1.00	201.77	3265.72	1.48	99.37	2452.40	1.61	104.61	1880.10	1.78	106.56	1.33
<b>p1</b>	327.00	0.99	83.10	4597.70	0.99	233.57	3281.95	1.49	97.78	2471.93	1.63	103.00	1800.55	1.70	106.28	1.32
<b>p2</b>	329.73	1.00	84.00	4593.82	0.99	249.05	3237.70	1.47	100.14	2371.97	1.56	104.64	1707.40	1.61	107.86	1.30
<b>TILE_25</b>	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
<b>p0</b>	324.70	0.98	73.38	4650.68	1.00	210.60	3318.45	1.51	96.22	2405.62	1.58	102.06	1826.03	1.73	104.09	1.32
<b>p1</b>	330.25	1.00	74.00	4610.90	0.99	225.06	3256.12	1.48	99.47	2437.68	1.61	106.05	1702.50	1.61	108.89	1.31
<b>p2</b>	326.98	0.99	74.00	4619.75	1.00	230.94	3262.20	1.48	99.15	2438.50	1.61	106.05	1870.47	1.77	107.14	1.33
<b>TILE_26</b>	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
<b>p0</b>	329.88	1.00	74.00	4652.23	1.00	195.16	3320.43	1.51	96.03	2409.95	1.59	101.83	1739.17	1.64	104.74	1.32
<b>p1</b>	332.68	1.01	74.00	4612.38	0.99	220.71	3214.05	1.46	102.11	2427.18	1.60	106.55	1768.17	1.67	109.90	1.31
<b>p2</b>	325.60	0.99	74.00	4623.62	1.00	230.40	3140.60	1.43	106.83	2347.88	1.55	113.40	1791.60	1.69	115.95	1.30
<b>TILE_27</b>	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
<b>p0</b>	323.57	0.98	73.78	4658.20	1.00	194.69	3330.95	1.51	95.69	2409.70	1.59	102.17	1744.70	1.65	104.31	1.31
<b>p1</b>	328.57	0.99	73.00	4606.27	0.99	241.72	3281.15	1.49	98.30	2546.00	1.68	103.70	1861.20	1.76	108.21	1.34
<b>p2</b>	325.50	0.99	73.00	4624.12	1.00	229.25	3203.72	1.46	102.65	2334.60	1.54	108.11	1712.97	1.62	113.80	1.29
<b>TILE_28</b>	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
<b>p0</b>	328.82	1.00	73.75	4650.32	1.00	206.92	3301.53	1.50	97.36	2473.75	1.63	103.45	1793.20	1.69	107.58	1.33
<b>p1</b>	323.70	0.98	73.17	4620.27	1.00	236.80	3245.90	1.48	100.42	2412.18	1.59	108.01	1844.65	1.74	109.98	1.32
<b>p2</b>	328.35	0.99	74.00	4579.77	0.99	266.49	3257.72	1.48	99.69	2356.80	1.55	106.24	1711.35	1.62	108.36	1.30
<b>TILE_29</b>	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	Actual	Ratio	QoS	GM
<b>p0</b>	323.98	0.98	81.00	4645.00	1.00	186.93	3351.12	1.52	94.89	2597.40	1.71	100.13	1903.47	1.80	104.19	1.36
<b>p1</b>	330.50	1.00	74.00	4610.45	0.99	238.58	3285.50	1.49	98.35	2394.40	1.58	103.53	1793.00	1.69	107.85	1.32
<b>p2</b>	328.12	0.99	74.00	4590.00	0.99	246.03	3261.62	1.48	99.78	2352.75	1.55	106.62	1702.35	1.61	109.00	1.29
<b>p0_score:</b>	39.82															
<b>p1_score:</b>	39.47															
<b>p2_score:</b>	39.08															

<b>Infrastructure_Operations_Scores:</b>	vmotion	svmotion	deploy
<b>Completed_Ops_PerHour</b>	17.50	10.00	4.50
<b>Avg_Seconds_To_Complete</b>	26.16	36.12	420.23
<b>Failures</b>	0.00	0.00	0.00
<b>Ratio</b>	1.09	1.11	1.12
<b>Number_Of_Threads</b>	1	1	1

<b>Summary</b>	Run_Is_Compliant	Turbo_Setting:0
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	Number_Of_Compliance_Issues(0)*	Median_Phase(p1)
<b>Unreviewed_VMmark2_Applications_Score</b>	39.47	
<b>Unreviewed_VMmark2_Infrastructure_Score</b>	1.11	
<b>Unreviewed_VMmark2_Score</b>	31.80	

## Configuration

Virtualization Software	
Hypervisor Vendor, Product, Version, and Build / Availability Date (MM-DD-YYYY)	VMware ESX 4.1.0 U3 Build 800380 / 08-30-2012
Datacenter Management Software Vendor, Product, Version, and Build / Availability Date (MM-DD-YYYY)	VMware vCenter Server 5.0.0 Build 455964 / 08-24-2011
Supplemental Software	none
Servers	
Quantity	2
Server Manufacturer and Model	HP ProLiant DL980 G7
Processor Vendor and Model	Intel Xeon E7-4870
Processor Speed (GHz)	2.40
Total Sockets/Total Cores/Total Threads	8 Sockets / 80 Cores / 160 Threads
Primary Cache	32 KB I + 32 KB D on chip per core
Secondary Cache	256 KB I+D on chip per core
Other Cache	30 MB I+D on chip per chip L3
BIOS Version	P66 6/24/2011
Memory Size (in GB, Number of DIMMs)	1024 GB, 64 x 16GB DIMMs
Memory Type and Speed	Quad rank 1066 MHz Registered ECC DDR3

Disk Subsystem Type	FC SAN
Number of Disk Controllers	1
Disk Controller Vendors and Models	HP Smart Array P410i
Number of Host Bus Adapters	2
Host Bus Adapter Vendors and Models	HP 82Q PCIe Dual Port 8Gb FC HBA
Number of Network Controllers	3
Network Controller Vendors and Models	1 x HP NC375i Quad Port Gigabit Server Adapter 2 x Intel X520-SR2 Dual Port Server Adapter
Other Hardware	none
Other Software	none
Hardware Availability Date (MM-DD-YYYY)	03-26-2013
Software Availability Date (MM-DD-YYYY)	04-02-2013
<b>Network</b>	
Network Switch Vendors and Models	1 x HP ProCurve Switch 5406zl 2 x HP ProCurve 6120XG Blade Switch
Network Speed	HP ProCurve 5406zl: 24 x 10GbE ports HP ProCurve 6120XG: 16 x internal 10Gb downlinks, 8 x External SFP+ 10Gb uplinks
<b>Storage</b>	
Array Vendors, Models, and Firmware Versions	2 x Fusion-io ION Data Accelerator, FW 2.0.1
Fibre Channel Switch Vendors and Models	1 x HP StorageWorks SAN Switch 8/40
Disk Space Used	11532 GB
Array Cache Size	N/A
Total Number of Physical Disks Used	8 HDDs (2 per SUT OS, 2 per ION OS), 6 PCI-e Flash
Total Number of Enclosures/Pods/Shelves Used	2
Number of Physical Disks Used per Enclosure/Pod/Shelf	Internal: 2 HDDs per host Enclosure: 2 HDDs for ION OS, 3 x PCI-e Flash
Total Number of Storage Groups Used	0
Number of LUNs Used	20

LUN Size and Number of Disks Per LUN	All LUNs spread across 3 x Fusion-io PCIe cards under the control of the Fusion-io ION Data Accelerator Details in section Storage Notes
RAID Type	SUT OS: RAID1 ION OS: RAID1 PCI-e Flash: RAID0
Number of Members per RAID Set	RAID1: 2 RAID0: 3
Disk Vendors, Models, and Speeds	4 x HP 72GB SAS 15K SFF (P/N 512545-B21) 4 x HP 146GB SAS 15K SFF (P/N 652605-B21) 6 x Fusion-io 2.4TB ioDrive2 Duo

#### Datacenter Management Server

System Model	HP ProLiant DL360 G5
Processor Vendor and Model	Intel Xeon X5450
Processor Speed (GHz)	3.0
Total Sockets/Total Cores/Total Threads	2 Sockets / 8 Cores / 8 Threads
Memory	8 GB
Network Controller(s) Vendors and Models	2 x HP NC373i embedded Gigabit adapters
Operating System, Version, Bitness, and Service Pack	Microsoft® Windows® 2008 Enterprise SP2(64-bit)
Other Hardware	none
Other Software	none

#### Clients

Total Number of Clients / Total Physical Clients / Total Virtual Client Hosts	31 / 1 / 15
System Model(s)	HP ProLiant DL360 G5 (prime client) HP ProLiant BL460c G6 (virtual client hosts)
Processor Vendor(s) and Model(s)	Prime client: Intel Xeon X5450 Physical Clients: Intel Xeon E5520
Processor Speed(s) (GHz)	Prime Client: 3.00 Physical Clients: 2.27
Total Sockets/Total Cores/Total Threads	Prime Client: 2 Sockets / 8 Cores / 8 Threads Physical Clients: 2 Sockets / 8 Cores / 8 Threads
Memory per Physical Client	Prime Client: 8 GB Physical Clients: 32 GB
Network Controller(s) Vendors and Models	Prime Client: 2 x HP NC373i embedded Gigabit adapters Physical Clients: 1 x HP NC532i Dual Port Flex-10 10GbE Multifunction Server Adapter

Operating System, Version, Bitness, and Service Pack	Prime Client: Microsoft® Windows® 2008 R2 Enterprise SP2 (64-bit) Physical Clients: VMware ESXi 4.1.0 U2 Build 502767 Virtual Clients: Microsoft® Windows® 2008 R2 Enterprise (64-bit)
Number of Virtual Clients	30
Number of vCPUs Per Virtual Client	4
Number of vMem (GB) Per Virtual Client	4
Virtual Client Networking Notes	none
Virtual Client Storage Notes	none
Other Hardware	none
Other Software	none

## Notes for Workload

### Virtualization Software Notes

- All VMs used virtual hardware V7
- Ethernet adapter type set to vmxnet3 for all VMs (default vmxnet2)
- Logging was disabled for all VMs (default enabled)
- IDE & floppy devices were removed on all VMs (default enabled)
- Firewall was disabled in the console OS (default enabled)
- All mailserver VMs used Hard Disk 1 on LSI Logic SAS controller, Hard Disk 2 on paravirtual controller
- All Linux VMs used Hard Disk on paravirtual controller
- Cluster DRS Automation Level set to Fully Automated
- DrsMigrationThreshold set to level 2
- Logical CPU layout changed for all multi-cpu VMs to 1 socket w/ multiple cores. (default Single core per socket)

#### Advanced Settings:

- Cpu.CoschedCrossCall = 0 (default 1)
- Cpu.HaltingIdleMsecPenalty = 0 (default 800)
- Disk.SchedNumReqOutstanding = 256 (default 32)
- Mem.BalancePeriod = 0 (default 15)
- Mem.SamplePeriod = 0 (default 60)
- Mem.ShareScanGHz = 0 (default 4)
- Mem.VMOverheadGrowthLimit = 0 (default 4294967295)
- Misc.TimerMaxHardPeriod = 4000 (default 100000)
- Misc.TimerMinHardPeriod = 2000 (default 100)
- Net.MaxNetifRxQueueLen = 500 (default 100)
- Net.MaxNetifTxQueueLen = 1000 (default 500)
- Net.NetTxCompletionWorldlet = 0 (default 1)
- Net.NetTxWordlet = 0 (default 2)



- Numa.AutoSplitVM = 0 (default 1)
- Numa.LTermFairnessInterval = 0 (default 5)
- Numa.MigThreshold = 4 (default 2)
- Numa.PreferHT = 1 (default 0)
- Numa.RebalancePeriod = 60000 (default 2000)
- Numa.SwapLoadEnable = 0 (default 1)
- Numa.SwapLocalityEnable = 0 (default 1)
- Vmkernel.netNetqueueEnabled = "FALSE" (default TRUE)
- Vmkernel.pageSharing = "FALSE" (default TRUE)

#### Driver Options:

- /vmkernel/module/qla2xxx.o/options = "ql2xmaxqdepth=256 ql2xintrdelaytimer=2 ql2xenablesi=1 " (default 32, 0, and 0)
- /vmkernel/module/ixgbe.o/options = "VMDQ=1,1,1,1 InterruptThrottleRate=2000,2000,2000,2000 " (default 8, 16000)

## Server Notes

#### Server BIOS settings:

- HP Power Regulator: HP Static High Performance Mode (default: Balanced Performance)
- Memory Power Capping: Disabled (default: Enabled)
- Thermal configuration: Increased Cooling (default: Optimal Cooling)
- HW Prefetcher: Disabled (default: Enabled)
- Adjacent Sector Prefetch Disabled (default: Enabled)
- Intel(R) SATA Controller #1 Disabled (default: Enabled)
- Intel Turbo Boost Technology up to 2.8 GHz (default: Enabled)

## Networking Notes

- vSwitch0 for the Service Console on vmnic0 at 1 Gb/s
- vSwitch2 defined as vmkernel vMotion connection on vmnic5 (sut1 and sut2) at 10 Gb/s
- vSwitch1 for all VMs of tiles 0 1 6 7 12 13 18 19 24 25 on vmnic6(sut1 and sut2) at 10 Gb/s
- vSwitch3 for all VMs of tiles 2 3 8 9 14 15 20 21 26 27 on vmnic7(sut1 and sut2) at 10 Gb/s
- vSwitch4 for all VMs of tiles 4 5 10 11 16 17 22 23 28 29 and deploy VMs on vmnic4(sut1 and sut2) at 10 Gb/s

## Storage Notes

- ESX was installed on two disks configured as RAID1 in the internal server storage bay
- All LUNs were striped across three 2.4 TB Fusion-io ioDrive2 Duo PCI-e Flash cards in RAID0 within one of two DL380p Gen8 running Fusion-io ION Data Accelerator software
- Physical Configuration for Fusion-io ION Data Accelerator:
  - HP DL380p Gen8
    - 2 x Intel Xeon E5-2690 2.9 GHz processors
    - 256GB Memory(16 x 16 GB Dual Rank PC3-12800 Registered DDR3 / 1600 MHz DIMMs)
    - 3 x 2.4TB Fusion-io ioDrive2 Duo PCI-e Flash Cards configured in RAID0
    - 2 x HP 82Q PCIe dual port 8Gb Fibre HBAs
    - 1 x HP Smart Array P420i Controller for ION OS
    - 2 x 146GB SAS 15K RPM SAS SFF HDDs for ION OS
- Virtual Configuration for Fusion-io ION Data Accelerator #1

- 7 x 700GB volumes, each hosting 2 tiles except for the standby VMs
- 1 x 700GB volume, hosting 1 tile except for the standby VM
- 1 x 200GB volume, for all the standby VMs
- 1 x 20GB volume, for SVMotion Target
- Virtual Configuration for Fusion-io ION Data Accelerator #2
  - 7 x 700GB volumes, each hosting 2 tiles except for the standby VMs
  - 1 x 700GB volume, hosting 1 tile except for the standby VM
  - 1 x 20GB volume, for DeployTemplate
  - 1 x 20GB volume, for Deploy Target

## **Datacenter Management Server Notes**

- None

## **Operating System Notes**

- All mailserver VMs running Microsoft® Windows® 2008 R2 Enterprise (64-bit)
- All standby VMs running Microsoft® Windows® 2003 Enterprise SP2 (32-bit)
- All Linux VMs running SUSE® Linux Enterprise Server 11 SP2 (64-bit)

## **Software Notes**

- Microsoft® Exchange Server 2007 Enterprise SP3 (64-bit) was installed on each mailserver VM

## **Client Notes**

- Prime client functionality was split from the client0 driver and was run on a non-virtualized copy of Microsoft® Windows® 2008 R2 Enterprise SP2 (64-bit)
- Prime client was running VMware vSphere PowerCLI 4.1 U1 build 332441
- All client drivers were run on virtual machines that were each defined with 4 virtual CPUs, 4GB of memory, 1 vmxnet3 network, and 32GB of disk space
- All client operating systems were updated via Windows Update

## **Other Notes**

None

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