**TPC-C Report**

**IBM® eServer™ xSeries® 460**

**Microsoft® SQL Server 2005 (SP1)**

<table>
<thead>
<tr>
<th>Total System Cost</th>
<th>TPC-C Throughput</th>
<th>Price/Performance</th>
<th>Availability Date</th>
</tr>
</thead>
</table>

**Database Server Processors/Cores/'Threads**

<table>
<thead>
<tr>
<th>Number</th>
<th>Of Users</th>
</tr>
</thead>
<tbody>
<tr>
<td>16/32/64</td>
<td>400,000</td>
</tr>
</tbody>
</table>

**Database Manager**

**Operating System**

**Other Software**

**Microsoft SQL Server 2005 Enterprise x64 Edition (SP1)**

**Microsoft Windows Server 2003 Datacenter x64 Edition**

**Microsoft Visual C++ Standard Edition**

**Microsoft COM+**

**System Component**

<table>
<thead>
<tr>
<th>Qty</th>
<th>Server</th>
<th>Qty</th>
<th>Each of 16 Clients</th>
</tr>
</thead>
<tbody>
<tr>
<td>16/32/64</td>
<td>Intel Xeon Processor 7040 3.00GHz</td>
<td>2/2/2</td>
<td>AMD Opteron 2.6GHz</td>
</tr>
<tr>
<td>Cache</td>
<td>2x2MB L2</td>
<td>1</td>
<td>1MB L2 Cache</td>
</tr>
<tr>
<td>Memory</td>
<td>8 (2x4GB) PC2-3200</td>
<td>4</td>
<td>512MB PC-3200</td>
</tr>
<tr>
<td>Disk Controllers</td>
<td>NetApp® FAS3050</td>
<td>17</td>
<td>36.4GB 10K SAS Drive</td>
</tr>
<tr>
<td>Disk Drives</td>
<td>NetApp 72GB 15K Drive</td>
<td>1,344</td>
<td>36.4GB 15K U320</td>
</tr>
<tr>
<td>Total Storage</td>
<td>1</td>
<td>56</td>
<td>36.4GB 15K Drive</td>
</tr>
</tbody>
</table>

**Diagram:**

- 16 RTEs emulating 400,000 users
- 4 x 1Gb/s Ethernet Switch
- 1 x IBM eServer xSeries 460 and 3 x MXE-460
- 16 x Intel Xeon Processor 3.00GHz/2x2MB L2
- 256GB Memory
- 16 x TotalStorage DS4000 Host Bus Adapter
- 1 x Emulex LightPulse FC HBA
- 4 x 36.4GB 10K SAS Drive
- 17 x NetApp FAS3050
- 1,344 x 72GB 15K Drive
- 56 x 144GB 15K Drive

**Equipment List:**

- 16 x IBM eServer 326m
- 32 x AMD Opteron 2.6GHz
- 4 x 1Gb/s Switch Ethernet
- 1 x IBM eServer xSeries 460 and 3 x MXE-460
- 16 x Intel Xeon Processor 256GB Memory
- 2/2/2 x 2MB L2 Cache
- 8 (2x4GB) PC2-3200 Memory
- IBM TotalStorage DS4000 HBA
- Emulex LightPulse HBA
- 36.4GB 10K SAS Drive
- NetApp 72GB 15K Drive
- NetApp 144GB 15K Drive
- 96820.31GB Total Storage
### IBM Corporation and Network Appliance, Inc.

#### IBM® eServer™ xSeries® 460

#### Microsoft® SQL Server 2005 (SP1)

#### Pricing, 1-3 Year Cost of Ownership (USD)

<table>
<thead>
<tr>
<th>Pricing</th>
<th>Number of Processor Cores</th>
<th>1 Year</th>
<th>2 Years</th>
<th>3 Years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>1</td>
<td>$1,041,295</td>
<td>$434,381</td>
<td>$13,752</td>
</tr>
<tr>
<td>Service Discount</td>
<td></td>
<td>108,595</td>
<td>2,768,666</td>
<td>542,976</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>3,138,060</td>
<td>4,593,086</td>
<td>704,649</td>
</tr>
</tbody>
</table>

#### Specification Report

**Report Date:** 11/22/05

**TPC-C Rev. 5.5**

**Pricing:**

- **1-3 Year Cost of Ownership (USD):** $3,138,060

**Unit Price:**

- **$ USD per unit:** $6.37

**Three-Year Cost of Ownership:**

- **$ USD per unit:** $482,307

**Details:**

- **Pricing used in TPC benchmarks reflect the actual prices a customer would pay for a one-time purchase of the listed components. Individually negotiated discounts are not permitted.**
- **All discount prices based on assumpions about past or future purchases are not permitted.**
- **For complete details, see the pricing sections of the TPC benchmark specifications.**

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### Server Hardware

- **Part Number:**
  - IBM: 8872-8EU
  - NetApp: FAS3050-HAS-IB-SYS
  - Microsoft: SQL Server 2005 (SP1)
  - CDW.com: Intel Xeon Processor 7040 3.00GHz/2x2MB L2
  - IBM: 210R842
  - IBM: 1374909
  - IBM: 40K2450
  - IBM: 26K5864
  - IBM: 24R9990
  - Emulex: LP9002L-F2
  - IBM: 96F2688

- **Unit Price:**
  - IBM: 50,779
  - IBM: 5,999
  - IBM: 16,569
  - IBM: 299
  - IBM: 15,499
  - IBM: 849
  - IBM: 419
  - IBM: 1,485
  - IBM: 1,195
  - IBM: 3,395
  - IBM: 3,395

- **Quantity:**
  - IBM: 1
  - IBM: 12
  - IBM: 32
  - IBM: 16
  - IBM: 32
  - IBM: 48
  - IBM: 16
  - IBM: 1
  - IBM: 1
  - IBM: 200

- **Extended Price:**
  - IBM: 50,779
  - IBM: 71,998
  - IBM: 49,707
  - IBM: 1,794
  - IBM: 495,968
  - IBM: 3,396
  - IBM: 1,676
  - IBM: 23,760
  - IBM: 3,585
  - IBM: 13,560

- **Subtotal:**
  - IBM: 704,649

### Network Components

- **Part Number:**
  - IBM: 37500
  - IBM: 63147N
  - IBM: 73P2620
  - IBM: 69P4699
  - IBM: 3319183

- **Unit Price:**
  - IBM: 7
  - IBM: 1
  - IBM: 1
  - IBM: 1
  - IBM: 1

- **Quantity:**
  - IBM: 1
  - IBM: 12
  - IBM: 1
  - IBM: 1
  - IBM: 90

- **Extended Price:**
  - IBM: 57,707

- **Subtotal:**
  - IBM: 57,707

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**Note:** Audited by Bradley J. Askins, Infosizing, Inc.
### Numerical Quantities Summary

**MQTh, Computed Maximum Qualified Throughput:** 492,307 tpmC

<table>
<thead>
<tr>
<th>Response Times (in seconds)</th>
<th>90th Percentile</th>
<th>Average</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Order</td>
<td>1.50</td>
<td>0.57</td>
<td>8.09</td>
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<tr>
<td>Payment</td>
<td>1.46</td>
<td>0.55</td>
<td>8.11</td>
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<tr>
<td>Delivery</td>
<td>1.02</td>
<td>0.33</td>
<td>3.33</td>
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<tr>
<td>Stock Level</td>
<td>1.72</td>
<td>0.77</td>
<td>5.06</td>
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<tr>
<td>Order Status</td>
<td>1.48</td>
<td>0.57</td>
<td>6.52</td>
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<tr>
<td>Delivery (Deferred)</td>
<td>0.16</td>
<td>0.12</td>
<td>5.11</td>
</tr>
<tr>
<td>Menu</td>
<td>1.00</td>
<td>0.33</td>
<td>3.98</td>
</tr>
</tbody>
</table>

**Response Time Delay Added for Emulated Components:** 0.1 Seconds

<table>
<thead>
<tr>
<th>Transaction Mix (in percent of total transactions)</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Order</td>
<td>44.95</td>
</tr>
<tr>
<td>Payment</td>
<td>43.02</td>
</tr>
<tr>
<td>Delivery</td>
<td>4.01</td>
</tr>
<tr>
<td>Stock Level</td>
<td>4.01</td>
</tr>
<tr>
<td>Order Status</td>
<td>4.01</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Keying/Think Times (in seconds)</th>
<th>Minimum</th>
<th>Average</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Order</td>
<td>18.00 / 0.00</td>
<td>18.00 / 12.04</td>
<td>18.02 / 120.31</td>
</tr>
<tr>
<td>Payment</td>
<td>3.00 / 0.00</td>
<td>3.00 / 12.04</td>
<td>3.02 / 120.31</td>
</tr>
<tr>
<td>Delivery</td>
<td>2.00 / 0.00</td>
<td>2.00 / 5.04</td>
<td>2.02 / 50.31</td>
</tr>
<tr>
<td>Stock Level</td>
<td>2.00 / 0.00</td>
<td>2.00 / 5.04</td>
<td>2.02 / 50.31</td>
</tr>
<tr>
<td>Order Status</td>
<td>2.00 / 0.00</td>
<td>2.00 / 10.04</td>
<td>2.02 / 100.31</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Test Duration</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Ramp-up Time</td>
<td>85 minutes 41 seconds</td>
</tr>
<tr>
<td>Measurement Interval</td>
<td>120 minutes</td>
</tr>
<tr>
<td>Number of Checkpoints</td>
<td>4</td>
</tr>
<tr>
<td>Checkpoint Interval</td>
<td>30 minutes</td>
</tr>
<tr>
<td>Number of transactions (all types) completed in measurement interval</td>
<td>136,699,824</td>
</tr>
</tbody>
</table>