Micron Solutions Guide
for High-Performance Computing Applications

While supercomputing systems enable research that is vital to national security, industry, science, and technology, they are also at the forefront of requiring high-performance, low-energy data movement capabilities. With these systems moving into the exascale era, memory technology must undergo significant changes to meet the continued demand for power efficiency, performance, resiliency, and bandwidth.

Why Micron for HPC?
We are an industry leader in providing innovative memory solutions—including several new memory architectures that specifically meet the needs of high-performance computing (HPC):

• Hybrid Memory Cube
• Enterprise-Class Solid State Drives
• NVDIMMs
• Phase Change Memory

Industry-Leading, Award-Winning Technology

• April 2013 – *Hybrid Memory Cube, Ultimate Memory Product of the Year*, EE Times/EDN
• Dec. 2012 – *Micron, Top 100 Global Innovators*, Thomson Reuters
• Aug. 2012 – *C400 msATA SSD, Best of Show*, Flash Memory Summit
• 2011 – *Hybrid Memory Cube, Best Technology of 2011*, The Linley Group Analysts’ Choice Awards
• 2011 – *Micron, Most Innovative Flash Memory Technology*, Flash Memory Summit

Micron HPC Products

<table>
<thead>
<tr>
<th>Product</th>
<th>Density</th>
<th>Key Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>DDRL3-RS RDIMM</td>
<td>16GB</td>
<td>• Low standby current for reduced power in low-duty cycle applications</td>
</tr>
<tr>
<td>LRDIMM</td>
<td>32GB, 64GB</td>
<td>• High density</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• High performance</td>
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<tr>
<td>NVDIMM</td>
<td>4GB with 8GB NAND, 8GB with 16GB NAND</td>
<td>• Support for persistent in-memory data, server RAID caching, deduplication, database applications, and data-logging applications</td>
</tr>
<tr>
<td>RLDRAM® 3</td>
<td>576Mb</td>
<td>• Ideal high-speed SRAM replacement with very low ‘RC’</td>
</tr>
<tr>
<td>Hybrid Memory Cube</td>
<td>2GB, 4GB</td>
<td>• Highest bandwidth and power-efficiency</td>
</tr>
</tbody>
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Memory Solutions
### Memory Solutions (continued)

<table>
<thead>
<tr>
<th>Product</th>
<th>Density</th>
<th>Key Features</th>
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<tbody>
<tr>
<td>SLC and MLC NAND Flash</td>
<td>2–64GB</td>
<td>* Ideal for enabling custom solutions</td>
</tr>
</tbody>
</table>
| NOR Flash | SPI NOR : 4Mb–1Gb Parallel NOR: 16Mb–1Gb | * High reliability for code storage applications  
* Simple to design in |
| Phase Change Memory | 32–128MB | * Bit alterability  
* High endurance |
| DDR4 | 4GB | * First DDR4 offering available  
* Up to 50% improved performance over DDR3 (up to 3200 Mb/s)  
* Higher capacity with up to eight-die stacking  
* Improved power savings for enterprise applications |

### Storage Solutions

<table>
<thead>
<tr>
<th>Product</th>
<th>Interface</th>
<th>Capacity</th>
<th>Key Features</th>
</tr>
</thead>
</table>
| P320h Half-Height, Half-Length (HHHL) SSD | x8 PCIe Gen2 | 350GB, 700GB | * Outstanding performance for frequent, intensive read/write access  
* Enterprise-grade SLC for long drive life  
* Easy NAND management software to optimize drive workload and lifespan |
| P320h 2.5-Inch SSD | SATA | 175GB, 350GB | * Ultra-high performance for transaction-based applications  
* Hot-swap capability to service/add drives without interrupting the host  
* Lower total cost of ownership |
| P400m SSD | SATA | 100GB, 200GB, 400GB | * Next-generation MLC for balanced workloads and high endurance  
* Advanced data-protection and reliability features |
| P400e SSD | SATA | 50GB, 100GB, 200GB, 400GB | * Read-focused, MLC drive with data-path protection |
| M500 SSD | SATA | 120GB, 240GB, 480GB, 960GB | * Cost-effective, high-capacity MLC NAND  
* Encryption features |

### Virtualization Solutions

<table>
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<tr>
<th>Product</th>
<th>Interface</th>
<th>Capacity</th>
<th>Key Features</th>
</tr>
</thead>
</table>
| P320h SSD | PCIe | 175GB, 350GB, 700GB | * Consolidation and virtualization of networks and storage connectivity—including Ethernet network adapters (NICs), networked storage adapters (HBAs), and direct-attached disk storage (DAS)—saving space, equipment costs, and power costs  
* Compatible with any PCIe-connected resource |
| P420m SSD | PCIe | 1.4TB, 350GB, 700GB | * Consolidation and virtualization of networks and storage connectivity—including Ethernet network adapters (NICs), networked storage adapters (HBAs), and direct-attached disk storage (DAS)—saving space, equipment costs, and power costs  
* Compatible with any PCIe-connected resource |

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**Path to Unprecedented Performance**

Your path to performance begins with Micron. Visit [micron.com](https://micron.com) to learn more about our high-performance computing solutions.

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