Based on the CUDA™ architecture codenamed “Fermi”, the Tesla™ M-class GPU Computing Modules are the world’s fastest parallel computing processors for high performance computing (HPC). Tesla GPU’s high performance makes them ideal for seismic processing, biochemistry simulations, weather and climate modeling, signal processing, computational finance, CAE, CFD, and data analytics.

The Tesla 20-series GPU Computing Processors are the first to deliver greater than 10X the double precision horsepower of a quad-core x86 CPU and the first GPUs to deliver ECC memory. Based on the Fermi architecture, these GPUs feature up to 665 gigaflops of double precision performance, 1 teraflops of single precision performance, ECC memory error protection, and L1 and L2 caches.

The Tesla M-class GPU modules are integrated into GPU-CPU servers from OEMs. This gives data center IT staff much greater choice in how they deploy GPUs, with a wide variety of rack-mount and blade systems and with remote monitoring and management capabilities – enabling large data center, scale-out deployments.

**TECHNICAL SPECIFICATIONS**

<table>
<thead>
<tr>
<th></th>
<th>Tesla M2090</th>
<th>Tesla M2070</th>
<th>Tesla M2050</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peak double precision floating point performance</td>
<td>665 Gigaflops</td>
<td>515 Gigaflops</td>
<td>515 Gigaflops</td>
</tr>
<tr>
<td>Peak single precision floating point performance</td>
<td>1331 Gigaflops</td>
<td>1030 Gigaflops</td>
<td>1030 Gigaflops</td>
</tr>
<tr>
<td>CUDA cores</td>
<td>512</td>
<td>448</td>
<td>448</td>
</tr>
<tr>
<td>Memory size (GDDR5)</td>
<td>6 GigaBytes</td>
<td>6 GigaBytes</td>
<td>3 GigaBytes</td>
</tr>
<tr>
<td>Memory bandwidth (ECC off)</td>
<td>177 GBytes/sec</td>
<td>150 GBytes/sec</td>
<td>148 GBytes/sec</td>
</tr>
</tbody>
</table>

*Note: With ECC on, 12.5% of the GPU memory is used for ECC bits. So, for example, 3 GB total memory yields 2.625 GB of user available memory with ECC on.*
**Features** | **Benefits**
--- | ---
**HUNDREDS OF CUDA CORES** | Delivers up to 665 Gigaflops of double-precision peak performance in each GPU, enabling servers from leading OEMs to deliver more than a teraflop of double-precision performance per 1 RU of space. Single precision peak performance is over one Teraflop per GPU.

**ECC MEMORY ERROR PROTECTION** | Meets a critical requirement for computing accuracy and reliability in datacenters and supercomputing centers. Internal register files, L1/L2 caches, shared memory, and external DRAM all are ECC protected.

**UP TO 64G OF GDDR5 MEMORY PER GPU** | Maximizes performance and reduces data transfers by keeping larger data sets in local memory that is attached directly to the GPU.

**SYSTEM MONITORING FEATURES** | Integrates the GPU subsystem with the host system’s monitoring and management capabilities such as IPMI or OEM-proprietary tools. IT staff can thus manage the GPU processors in the computing system using widely used cluster/grid management solutions.

**L1 AND L2 CACHES AS PART OF THE NVIDIA PARALLEL DATACACHE™** | Accelerates algorithms such as physics solvers, ray-tracing, and sparse matrix multiplication where data addresses are not known beforehand.

**NVIDIA GIGATHREAD™ ENGINE** | Maximizes the throughput by faster context switching that is 10X faster than previous architecture, concurrent kernel execution, and improved thread block scheduling.

**ASYNCHRONOUS TRANSFER WITH DUAL DMA ENGINES** | Turbocharges system performance by transferring data over the PCIe bus while the computing cores are crunching other data.

**FLEXIBLE PROGRAMMING ENVIRONMENT WITH BROAD SUPPORT OF PROGRAMMING LANGUAGES AND APIS** | Choose C, C++, OpenCL, DirectCompute, or Fortran to express application parallelism and take advantage of the innovative "Fermi" architecture.

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**SOFTWARE AND DRIVERS**

- Tesla M-class GPU computing modules are supported for both Linux and Windows 64-bit
  - Drivers – NVIDIA recommends that users get drivers for M-series products from their System OEM to ensure that driver is qualified by the OEM on their system. Latest drivers can be downloaded from [http://www.nvidia.com/drivers](http://www.nvidia.com/drivers)

To learn more about NVIDIA Tesla, go to [www.nvidia.com/tesla](http://www.nvidia.com/tesla)