G-card® NVMe flash cards are designed to provide high reliability, high performance and large capacity for demanding enterprise and Internet datacenter applications. They combine Greenliant’s advanced controller and an array of NANDrive™ solid state drives organized in RAID groups, in a standard PCIe add-in card form factor. G-card’s advanced architecture supports Concurrent Read / Write operations with sustainable low latency, giving users a consistent performance experience. Dedicated power failure detection with backup power circuitry is built in to prevent data integrity issues due to sudden power interruptions.

Using 2-bits-per-cell (MLC) NAND flash equipped with the hardware RAID and intelligent error management algorithms that substantially improve the system-level endurance far beyond that of the NAND component, G-card offers modern datacenters a cost-effective and highly reliable tier-one primary storage solution.

**Key Features**

**Industry Standard PCIe Interface / Form Factor**
- PCI Express 2.0 x4 flash card
- Compatible NVMe 1.0d
- Full height, Half length
- Fits into x4, x8, x16 non-graphics card slots

**Large Storage Capacity**
- G7101: 900 GB (1.37 TB Raw)
- G7102: 1.8 TB (2.75 TB Raw)

**High Endurance**
- 10 Drive Writes Per Day (DWPD) for 5 years

**Boot Support**
- Bootable with major operating systems

**Energy Efficient**
- Active Mode: 25W (typical)
- Idle Mode: 12W (typical)

**Dedicated Power Interrupt Data Protection**
- Prevents data corruption when power is lost

**DataCore Ready**
- Compatible with SANsymphony-V10

**Fast Read/Write Performance**
- Concurrent Sequential Read/Write: 900 MB/s (typical)
- Sequential Read: 875 MB/s (typical)
- Sequential Write: 850 MB/s (typical)
- Random Read (4KB): 130K IOPS (typical)
- Random Write (4KB): 60K IOPS (typical)
- Supports TRIM command

**Ultra Low Read/Write Latency**
- Delivers sustainable, low latency for optimized performance
- Sequential Read/Write: 80µs/20µs (typical)
- Random Read/Write: 130µs/22µs (typical)

**Built-in Hardware RAID**
- Protects against uncorrectable errors
- Unrecoverable Bit Error Rate (UBER): 1 sector per 10^19 bits read

**Software Tools**
- Uses Greenliant’s G-command software for advanced PCIe card management
- Enables SMART command-based alerts indicating the remaining useful product life
- Allows users to update firmware and securely erase data
- Configures capacity based upon specific application usage models

**Supported Operating Systems**
- MS Windows Server 2008 R2 64-bit
- MS Windows Server 2012 R2 64-bit
- CentOS 5.5/ 5.8/ 5.10 64-bit
- CentOS 6.3/ 6.4/ 6.5 64-bit
- RHEL 6.0/ 6.1/ 6.2/ 6.3/ 6.4/ 6.5 64-bit
- Oracle Linux Server 6.5 64-bit
- vSphere ESXi 5.5, 5.5 U1/U2, 6.0 certified

**Ultra Low Power Consumption**
- Active Mode: 25W (typical)
- Idle Mode: 12W (typical)
- Operating Temperature: 0°C to +55°C with 200 Linear Feet per Minute (LFM) airflow

**Multiple Cards for Primary Storage**

With multiple cards installed inside a server for primary storage applications, G-card shows excellent scalability and outperforms other primary solutions in bandwidth, IOPS, latency, power consumption, footprint, initial cost and total cost of ownership.

<table>
<thead>
<tr>
<th>RAID0</th>
<th>Raw Capacity (TB)</th>
<th>Sequential Read** (typical)</th>
<th>Sequential Write** (typical)</th>
<th>Concurrent* Read / Write (typical)</th>
<th>4KB Random** Read (typical)</th>
<th>4KB Random** Write (typical)</th>
<th>Power (typical)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>G7101 / G7102</td>
<td>Bandwidth (GB/s)</td>
<td>Latency (µsec)</td>
<td>Bandwidth (GB/s)</td>
<td>Latency (µsec)</td>
<td>Bandwidth (GB/s)</td>
<td>IOPS (k)</td>
</tr>
<tr>
<td>2 cards</td>
<td>2.7 / 5.5</td>
<td>1.75</td>
<td>80</td>
<td>1.70</td>
<td>24</td>
<td>1.80</td>
<td>250</td>
</tr>
<tr>
<td>4 cards</td>
<td>5.5 / 11</td>
<td>3.50</td>
<td>80</td>
<td>3.40</td>
<td>24</td>
<td>3.60</td>
<td>500</td>
</tr>
<tr>
<td>8 cards</td>
<td>11 / 22</td>
<td>7.00</td>
<td>80</td>
<td>6.80</td>
<td>24</td>
<td>7.20</td>
<td>1000</td>
</tr>
</tbody>
</table>

* Concurrent with 90% Read and 10% Write  ** Performance measured with Queue Depth 256 per G-card and aggregated across all G-cards. Measurements performed on 80% logical block addressing (LBA) span of G-card storage to demonstrate the typical application usage model.

**Applications**

- Cloud Computing
- Enterprise Datacenter
- Online Transaction Processing (OLTP)
- Web / Applications Hosting
- Content Delivery Network (CDN)
- Computer Aided Design (CAD)
- High-Performance Database
- Virtual Desktop Infrastructure (VDI)
- Big Data Analytics

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