Intelligent Storage for Blade Servers

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Blade Server Summit
Agenda

- Introduction to iVivity
- Past & Future Market Trends
- The Power of Blade Servers
- Where Blade Servers Fail to Deliver
- The iVivity iDiSX Solution
- Summary & Conclusion
Introduction to iVivity

<table>
<thead>
<tr>
<th>Founded</th>
<th>November 2000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Background</td>
<td>Storage management &amp; systems</td>
</tr>
<tr>
<td>Total Funding</td>
<td>$50.1 M</td>
</tr>
<tr>
<td>Location</td>
<td>Atlanta, GA</td>
</tr>
<tr>
<td>Employees</td>
<td>44</td>
</tr>
<tr>
<td>Vision</td>
<td>Simplified storage &amp; SAN system design</td>
</tr>
<tr>
<td>Mission</td>
<td>Leader in intelligent storage processors</td>
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<tr>
<td>USP</td>
<td>iDiSX® silicon &amp; technology</td>
</tr>
<tr>
<td>Business</td>
<td>Chip, PCB adapter, &amp; software</td>
</tr>
<tr>
<td>Sales Channel</td>
<td>OEM/OSM</td>
</tr>
</tbody>
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Venture Capital
- Grotech Capital Group
- J K & B Capital
- Mellon Ventures
- Commonwealth Capital
- Kinetic Ventures
- HIG Capital
- Cordova Ventures

Corporate Investment
- LSI Logic
- Adaptec
## iVivity Target Market Problems

<table>
<thead>
<tr>
<th>Target Market</th>
<th>Problems</th>
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<tbody>
<tr>
<td>Modular Storage Controller</td>
<td>• Complexity</td>
</tr>
<tr>
<td>Storage Networking Intelligent Switch</td>
<td>• Performance</td>
</tr>
<tr>
<td>Storage Networking Appliance</td>
<td>• Cost</td>
</tr>
<tr>
<td>Server &amp; Blade Server</td>
<td>• Flexibility</td>
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Introducing the iDiSX®-2000

- Industry’s 1st purpose-built flexible silicon for all types of storage systems
  - Works w/both SPAID & Standard I/O pathing software
- Only ISP embedded RISC processor & micro engines
  - Eliminates external processing requirement
  - Allows proprietary software to be ported to the chip
    - PXE Boot
    - iSCSI to FC conversion
      - Or SAS/SATA/P-SCSI
- RAID stacks
- Storage services
- Replication apps

- Adaptable
  - Works for core processing
  - Works for co-processing
    - Offload
Past & Future Trends...

- **TCP/IP LAN**
- **Network Attached Storage**
  - Parallel SCSI
  - RAID etc.
  - NAS - Filers
- **Networked Storage**
  - FC or iSCSI on GigE
- **2004 & Beyond**
  - Convergence & Virtual Infrastructure
  - Compute
  - Storage

- **Mainframes**
- **Blade Servers**
- **IA Servers & Rack Mount Servers**

- **BLOCK & FILE Optimized Access**

- **Past & Future Trends**
  - ILM, Application Aware Access & Management
  - Content Access Storage, Archival
  - Compliance to SEC, Federal, State Regulations
  - Privacy & Security

- **Convergence & Virtual Infrastructure**
The Power of Blade Servers

- This becomes…

Productive connectivity

Non-productive connectivity

FC SAN

IP LAN

March 2005
The Power of Blade Servers

• …this!
• Cable to chassis
  – Not blades
• Much lower TCO
  – Fewer cables
  – Fewer FC switches
  – Fewer IP switches
  – Boot OS
    • External storage
    • No internal storage
    • Simpler maintenance
      – Pop in new blade
      – Point @ LUN
      – No configuration
Where Blade Servers Fail to Deliver

- Although it reduces some SAN infrastructure
- It does nothing to simplify storage
- Internal storage is still DAS
  - PATA, PSCSI, or SATA (SAS coming)
- External storage is SAN
  - Same problems w/SANs
  - FC storage requires blade FC HBAs
    - Or iSCSI to FC gateways
    - Both are expensive
  - SAN switchblade in chassis
- No virtualized mgmt meaning
  - Server based volume mgmt
  - Or Array based
- Boot OS for iSCSI
  - Requires PXE boot
    - Or BootIP server
  - Either way, 1 or 2 blades are wasted
The iVivity iDiSX-2000 Cost Effective Solution

• iDiSX-2000 is designed from the ground up to solve these issues
• Blade server storage and/or SAN virtualization
  – SPAID (split path acceleration of independent datastreams)
    • Solves & simplifies storage virtualization & management
    • Can be used for SAN virtualization & routing as well
• iSCSI to FC Gateway
  – Dual SPI4.2 interfaces for up to 40Gbps of throughput
    • (1 to 10Gbps) iSCSI to (1, 2, 4 to 10Gbps) FC gateway
• Boot OS from an iSCSI SAN
  – 1.4GHz of embedded processing for software processing
    • Software porting is simple utilizing standard Linux OS & compilers
    • Can be used as the PXE boot or BootIP server
Why iDiSX Architecture

- Low power, high integration, fewer components, lower cost
  - Ideal for blade design
- Designed for aggregated 10Gbps throughput
  - Architecture supports multiple servers/hosts simultaneously
- Providing infrastructure for
  - Virtualized storage & SANs
  - iSCSI to FC gateways
    - Or, iSCSI to SAS/SATA/P-SCSI
  - Boot OS for iSCSI
    - All within the Blade Server chassis
iDiSX Virtualized Storage & SANs Example

• Benefits include:
  – Simpler storage management
    • Fewer mgmt touch points
  – Lower OpEx
  – Fewer application disruptions
  – Lower storage CapEx
    • Commoditizes storage
iDiSX Storage Virtualization Blade

- Consolidation Features
  - Extent based Virtualization
    - Supports application specific storage
      - Access control, security, RAS customized to Application
  - Allocated Pool:
    - Dedicated, secure storage for each Enterprise App
      - Running Physical or Virtual Server
  - Single Available Pool
    - Feature specific storage pools available for dynamic growth
    - Better storage utilization, instead of fragmented disk space/server
- Reliability & Performance: RAID 0, 1, 5, 6, 50, 60
- Support for DR: Storage WAN/MAN extensions
- Extensions for File/NAS Support
iDiSX iSCSI to FC Gateway

- Blades utilizes low cost Gbps NICs
- Embedded GigE switch card
  - iDiSX on GigE switch card
  - iDiSX connects to FC Mac
- iDiSX converts iSCSI to FCP
  - Connects to FC switches
  - Utilizes standard FC storage
- Benefits include
  - Lower blade costs
    - Eliminates FC HBA cost
  - Lowers chassis costs
    - Eliminates embedded FC switches
    - Utilizes lower cost Ethernet switches
iDiSX Boot OS for iSCSI

- Similar to iSCSI to FC gateway connections
  - PXE boot or BootIP server embedded in chassis on Ethernet switch blade
- Eliminates need for dedicated PXE boot or BootIP servers
- Reduces TCO
  - Eliminates server blade onboard storage
  - Provides same capabilities as FC boot OS w/o the high cost

Server Blades use PXE boot from chassis embedded iDiSX

Server Blades boot OS from external storage
Summary & Conclusion

• Blade Servers hold great promise
• They reduce server, cable, & infrastructure costs
• Today they come up short in doing all that they can do
• iVivity w/iDiSX 2000 fixes those shortcomings
  – Reducing complexity
  – Reducing TCO
  – Increasing functionality
  – Increasing performance