SBB 2.0 Specification Overview

What’s In It for Storage Developers?

Mark W. Hall
Chairman, SBB Working Group
Agenda

- What is the Storage Bridge Bay Working Group?
- SMB Storage Market Opportunity
- SBB 2.0 Overview and Benefits
- Real-world Proof Points
What is SBB?

- Founded in 2006 as a non-profit working group
- 52% growth in membership from 1.0 to 2.0
- 2.0 spec publically released on 28, January, 2008
- 8 members on voting board, 39 contributing members (47 total)
- Mission: to develop and distribute specifications standardizing portions of storage enclosures. Targeting storage system providers wanting faster time-to-market, lower development costs, and flexible storage solutions, the SBB Specification defines mechanical, electrical and internal interfaces between a storage enclosure and the electronics cards that give the subsystem its personality or function.
SNIA and SBB

- Both organizations are in full support of each other!
- The SNIA and the SBB Working Group see their efforts as complementary and non-overlapping
- Overall goal is to provide standards that help drive customer choice, reduce cost and improve interoperability
SMB Opportunity

**SMB market represents >$12B opportunity with CAGR of ~37%**

Source: IDC 2008
Challenges for SMB Storage Solutions

- Proprietary Form-factors
- New Technology Adoption
- Integration Flexibility
- Time to Market
- Total Cost of Ownership
Standardization of External Storage is Essential to SMBs

Increased Innovation

Adopting standards can add value and differentiate your SMB products
What is Storage Bridge Bay?

**SBB specification defines:**

- Physical dimensions of the storage controller canister
- Electromechanical characteristics of mid-plane and canister connectors
- Power and cooling to be provided to canisters that reside in SBB chassis
- Minimum enclosure management function to be provider by controllers
One to Many – Many to One

- One controller can be used in multiple chassis

- Multiple controllers can be used in a single chassis to change its “personality”

Note: Pictures are used to describe concept only. They are not intended to represent available SBB devices.
SBB 2.0 Standard Canister

- External sheet metal dimensions/details
- Common latching mechanism
- EMI suppression solution
- Backplate keep out area
- Mechanical keying
  - SAS vs. FC
  - SBB 1.0 canisters in SBB 2.0 enclosures
  - Anti-inversion
- Inlet and exhaust areas
# SBB 2.0 Canister Power Profiles

<table>
<thead>
<tr>
<th>Power Source</th>
<th>Voltage</th>
<th>Average Current</th>
<th>Power</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 V</td>
<td>+12V DC</td>
<td>5 – 16.66a</td>
<td>60 to 200 W</td>
</tr>
</tbody>
</table>

- Single Voltage to Canister
- Note: Drives still require +5V in addition to +12V DC

- P60
- P100
- P150
- P200

Representative power supply – form-factor not defined in SBB Spec
Airflow

- Spec provides airflow guidelines
  - Airflow vs Temperature
  - Impedance Curves
  - Vent configuration vs canister power
- Enclosure vent configuration defined in Midplane VPD
Enhanced Enclosure Management

- Hot-plug management
  - Canister compatibility checks
  - Shutdown algorithm for incompatible canisters

- Additional VPD information
  - Power profiles
  - Thermal profiles
  - Vent locations
  - Supported signals

- Power management
  - Power-up sequence
  - Staggered drive start-up

- GPIO usage models
Expansive Modular Connector

- SAS and FC signal profiles
- Support for up to 48 drives
- Additional inter-canister communication signals
- Signal usage options defined in Mid-plane VPD

<table>
<thead>
<tr>
<th>M1</th>
<th>M2</th>
<th>M3</th>
<th>M4</th>
<th>M5</th>
<th>M6</th>
<th>M7</th>
<th>M8</th>
<th>M9</th>
<th>M10</th>
<th>M11</th>
<th>M12</th>
<th>M13</th>
</tr>
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SBB 2.0

- SBB interconnects, management and control
  - Mechanical & Power
  - Disk Drive Signaling

*FC drive numbers shown in parenthesis
SBBMI - Signal

- Storage Bridge Bay Midplane Interconnect (SBBMI)
- 54 Position – 6 columns x 9 rows
- Midplane signal receptacle and Canister signal header
- High speed capability
- Multiple sources
SBBMI - Power

- SBBMI Canister Power Header and Midplane Power Receptacle
- Key change
  - SBB V1 – 5V & 12V
  - SBB V2 – 12V ONLY
- Driven by:
  - Canister maximum power increase to 200W
  - Avoidance of power boundaries for processor based systems
SBBMI-Guidance

- SBBMI Canister Guide Pin Receptacle and SBBMI Guide Pin
- Rotation angle of the Guide Pin determines the ‘Signal Profile’ of the Enclosure/Canister
  - 2 profiles currently defined
    - 2Gb/s & 4Gb/s FC
    - 3Gb/s SAS
Midplane VPD

- Dual EEPROMs – same data
- IPMI FRU information
  - Manufacturer part/serial number info
- SBB defined information
  - General canister data
  - Venting/Airflow data
  - Power capabilities & control
  - Drive port mapping
  - Signal & SGPIO usage definition
- SBB Canister scratch area
Higher Speed Signals

- New drive interfaces
  - 4G Fibre Channel
  - 6G SAS
    - To be included as an appendix after T10 ratification

- New Canister inter-communication interfaces
  - 4G Fibre Channel
  - 6G SAS (as above)
## SBB Features Summary

<table>
<thead>
<tr>
<th>Feature</th>
<th>Capability</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Physical Dimensions</strong></td>
<td>Common canister</td>
</tr>
<tr>
<td><strong>Power Profiles</strong></td>
<td>60 W, 100 W, 150 W, 200 W</td>
</tr>
<tr>
<td><strong>Drives Supported</strong></td>
<td>Up to 48</td>
</tr>
<tr>
<td><strong>Signal Speeds</strong></td>
<td>6 Gb/s SAS*, 4 G FC, PCIe gen2*</td>
</tr>
<tr>
<td><strong>Canister Interconnects</strong></td>
<td>17 full duplex lanes</td>
</tr>
<tr>
<td><strong>Interoperability Model</strong></td>
<td>Compatibility verification</td>
</tr>
</tbody>
</table>

*Note: 6Gb/s SAS and PCIe gen2 SBB requirements will be released as supplements to the SBB 2.0 specification.*
Xyratex Proof Points – OneStor™ Family

- Consistent API and interchangeable FRU reduce OEM test and qualification time
- A family of platforms shortens individual development programs
- Shortened development saves cost, reduces development risk, and enables quicker response to customer needs

SBB did the grunt work so you can focus on the cool stuff!
For More Information

- Thank You!

- Visit SBBWG.org
  - SBB Specification 2.0 available for free download
  - Presentations on SBB
  - Information on joining the SBB Working Group
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