



Express Bay – Performance in the Front of the Box

Mike James

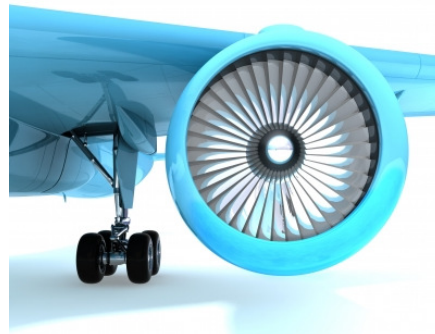
Board Member, SCSI Trade Association

Engineering Director, SanDisk

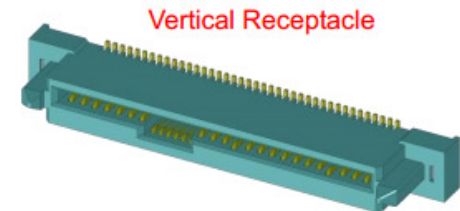
Express Bay Components



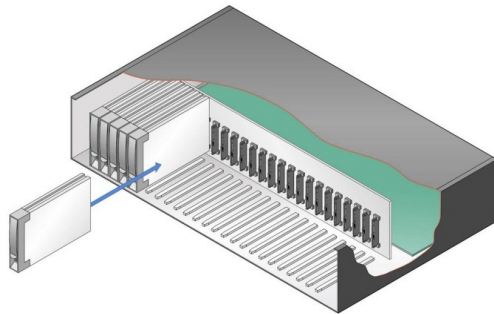
25W Power



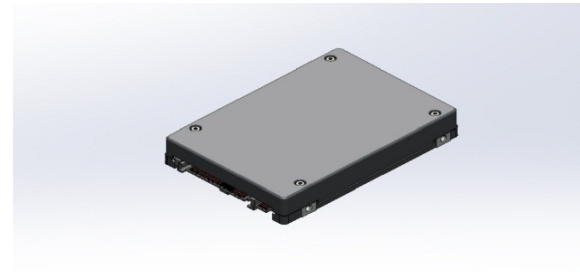
Cooling



Multifunction
Connector



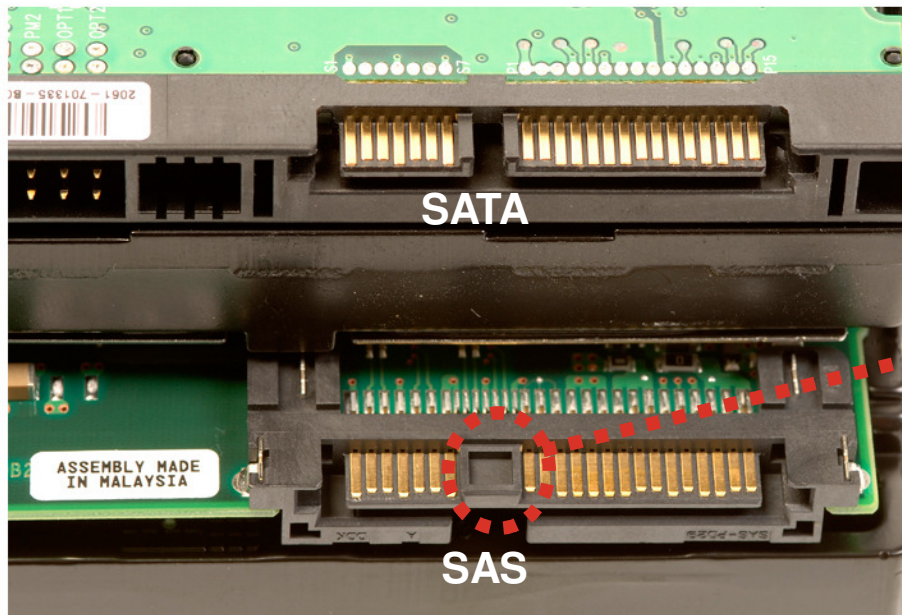
Accessibility /
Serviceability



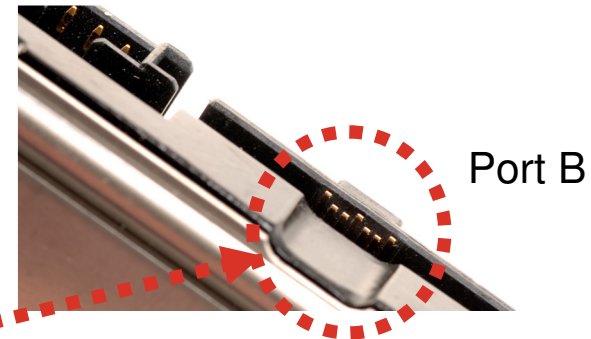
Traditional Drive
Form Factor

Refresher: SAS/SATA Compatibility

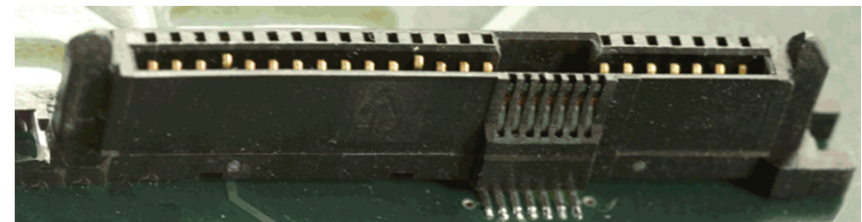
Disk Drive Connectors



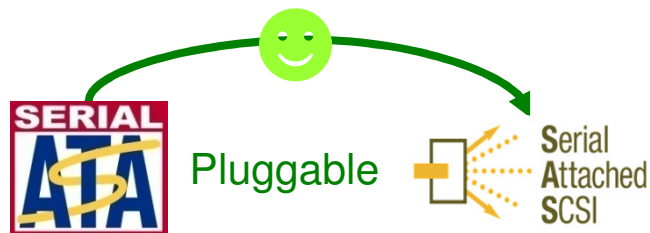
SAS Connector Flip Side



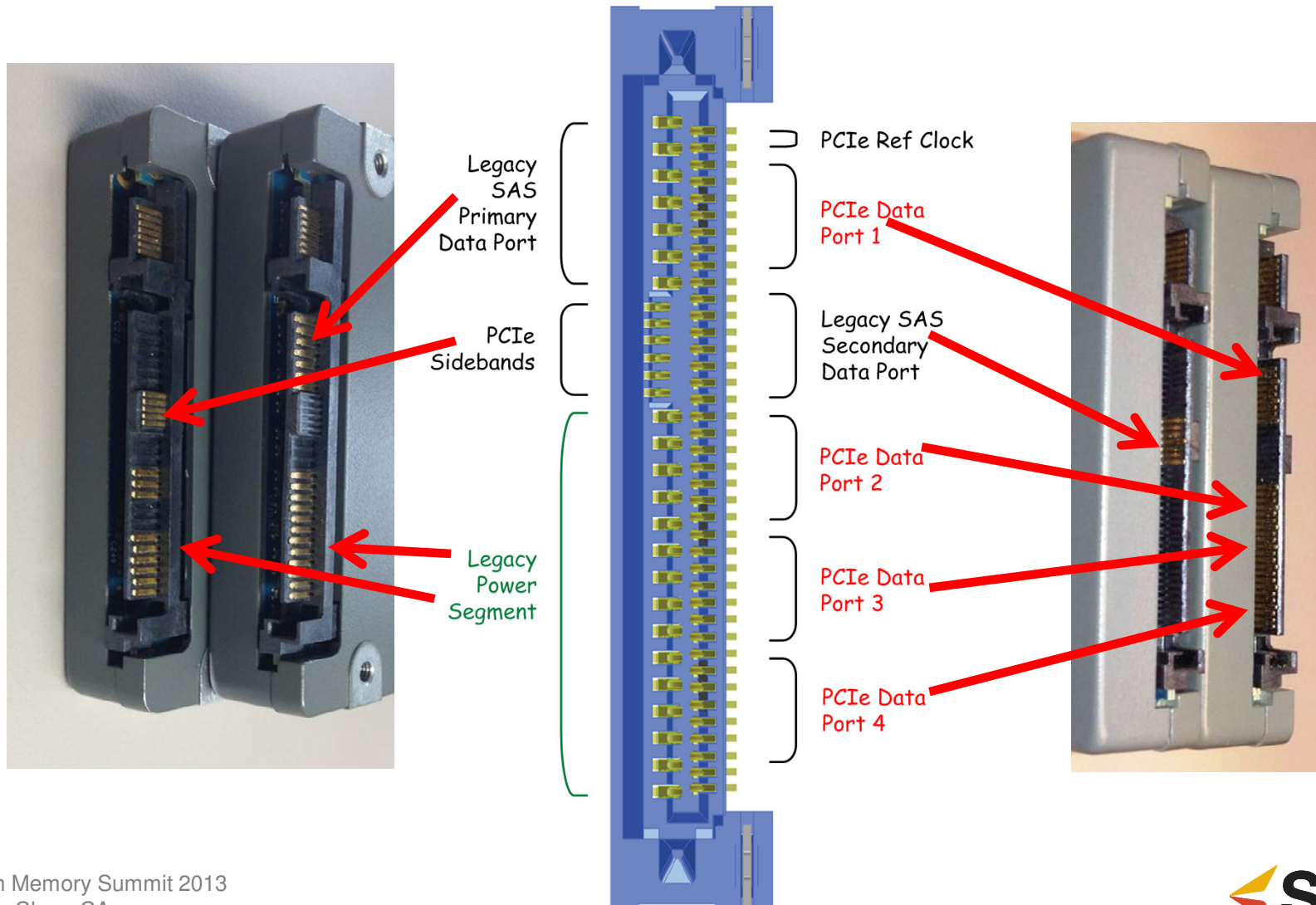
SAS Backplane Connector



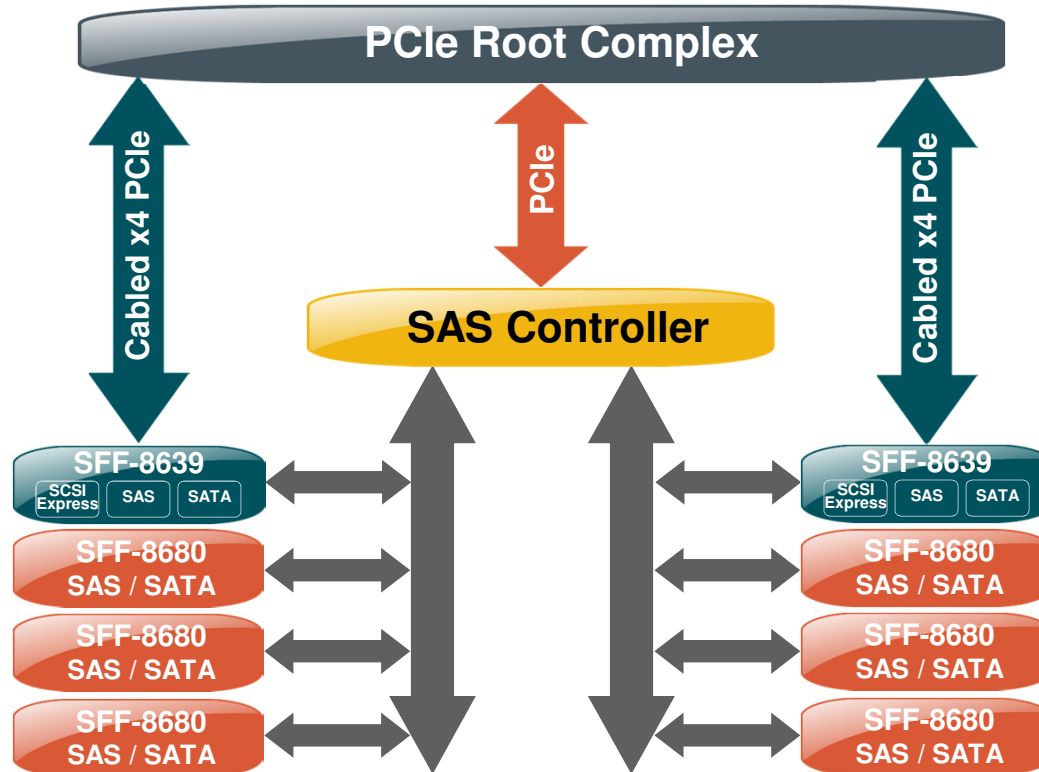
*Accommodates both
SAS & SATA Drives*



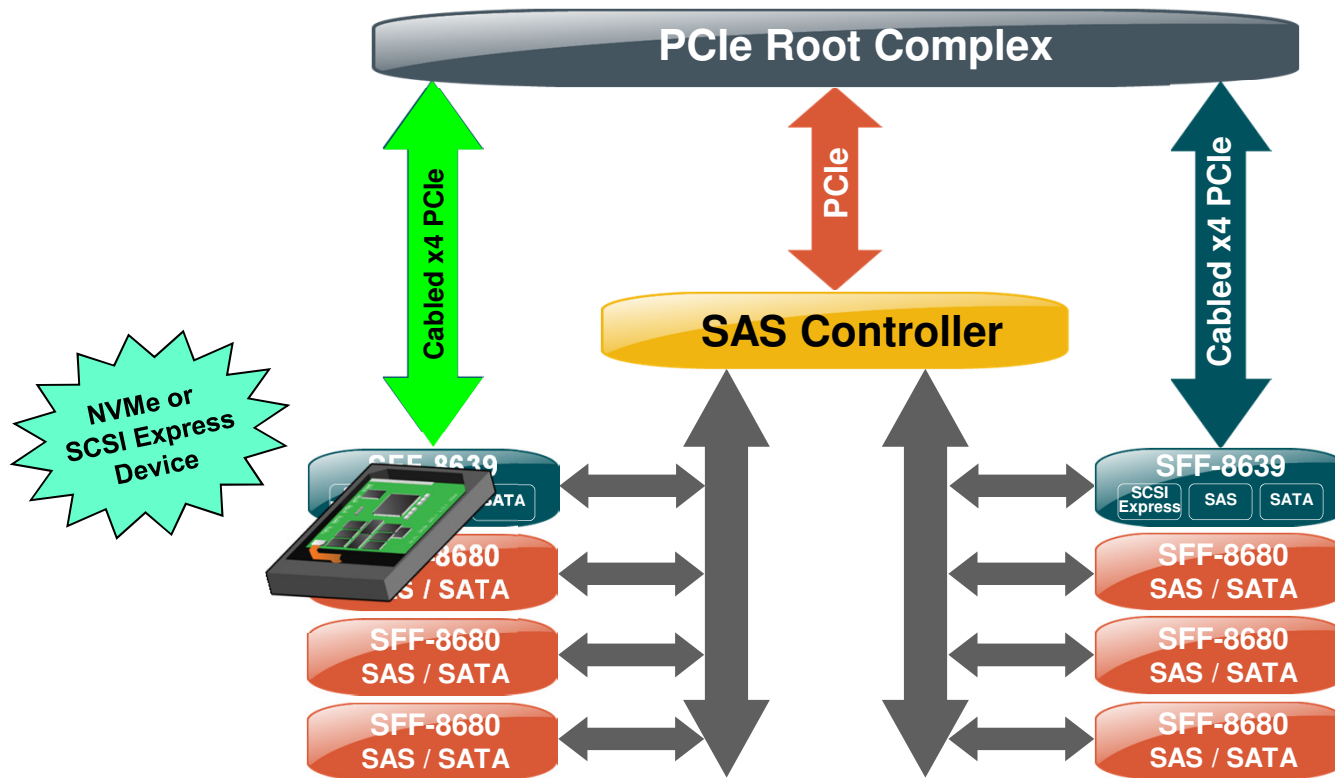
SFF-8639 Dual-port SAS and PCIe x4 Connectors



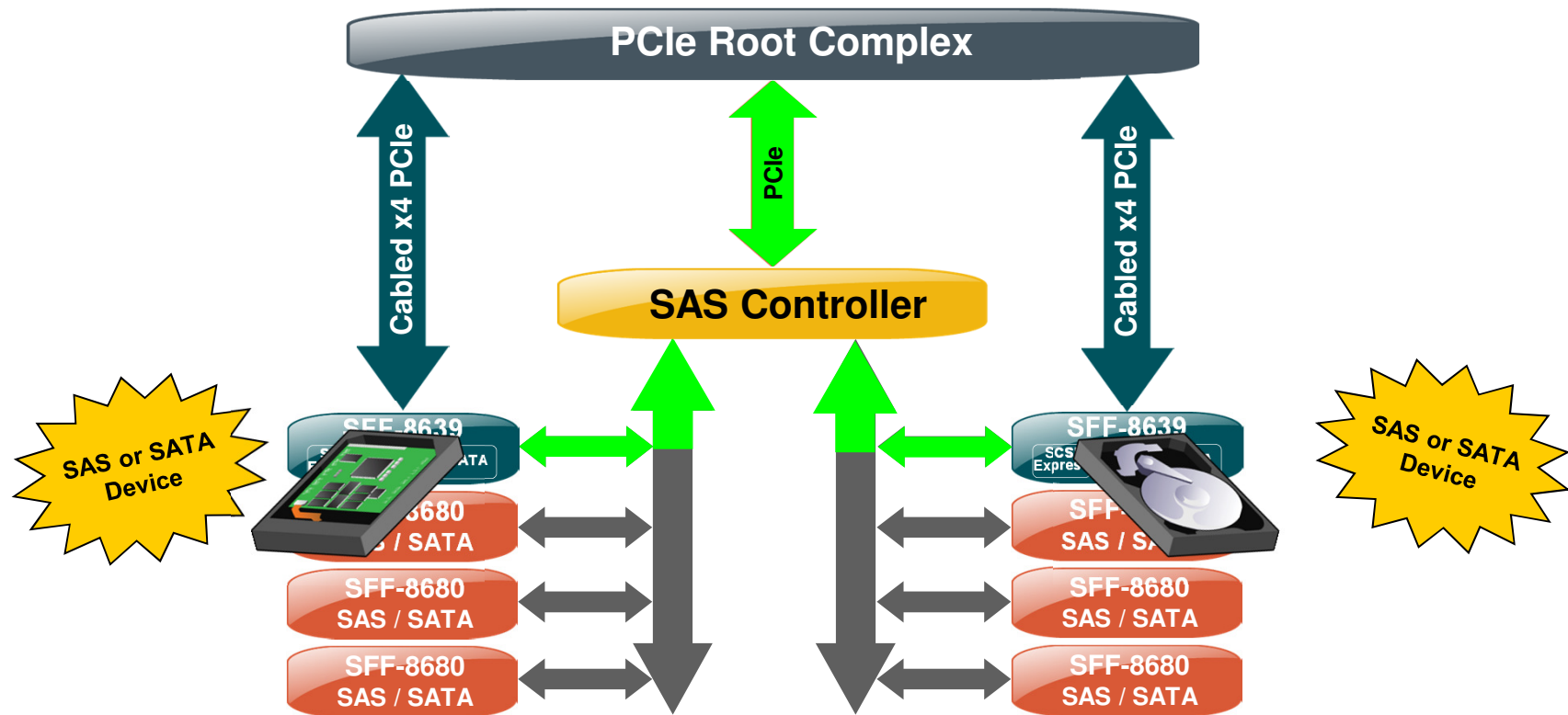
Connecting Through the Backplane



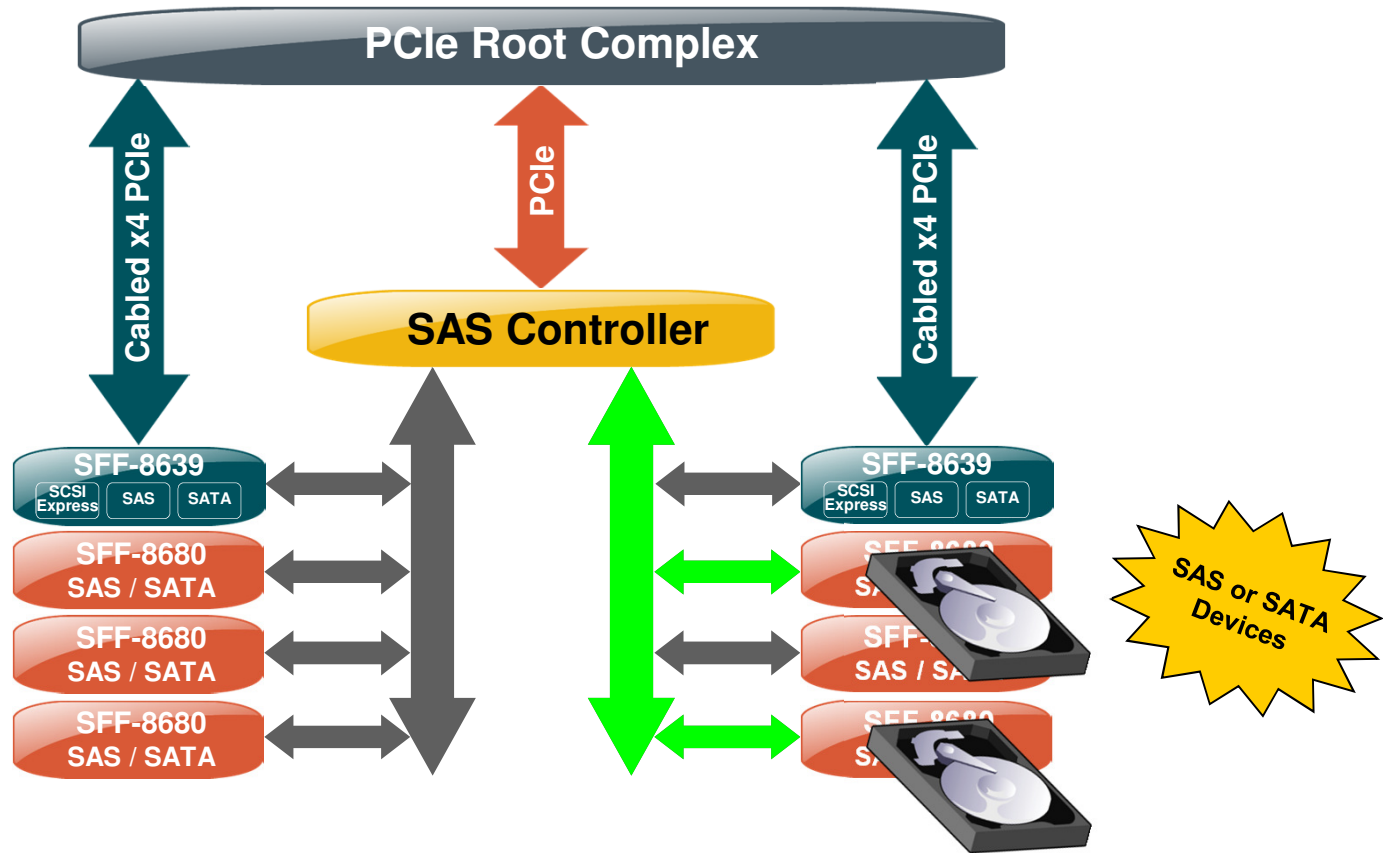
Connecting a Single SFF PCIe-connected Device



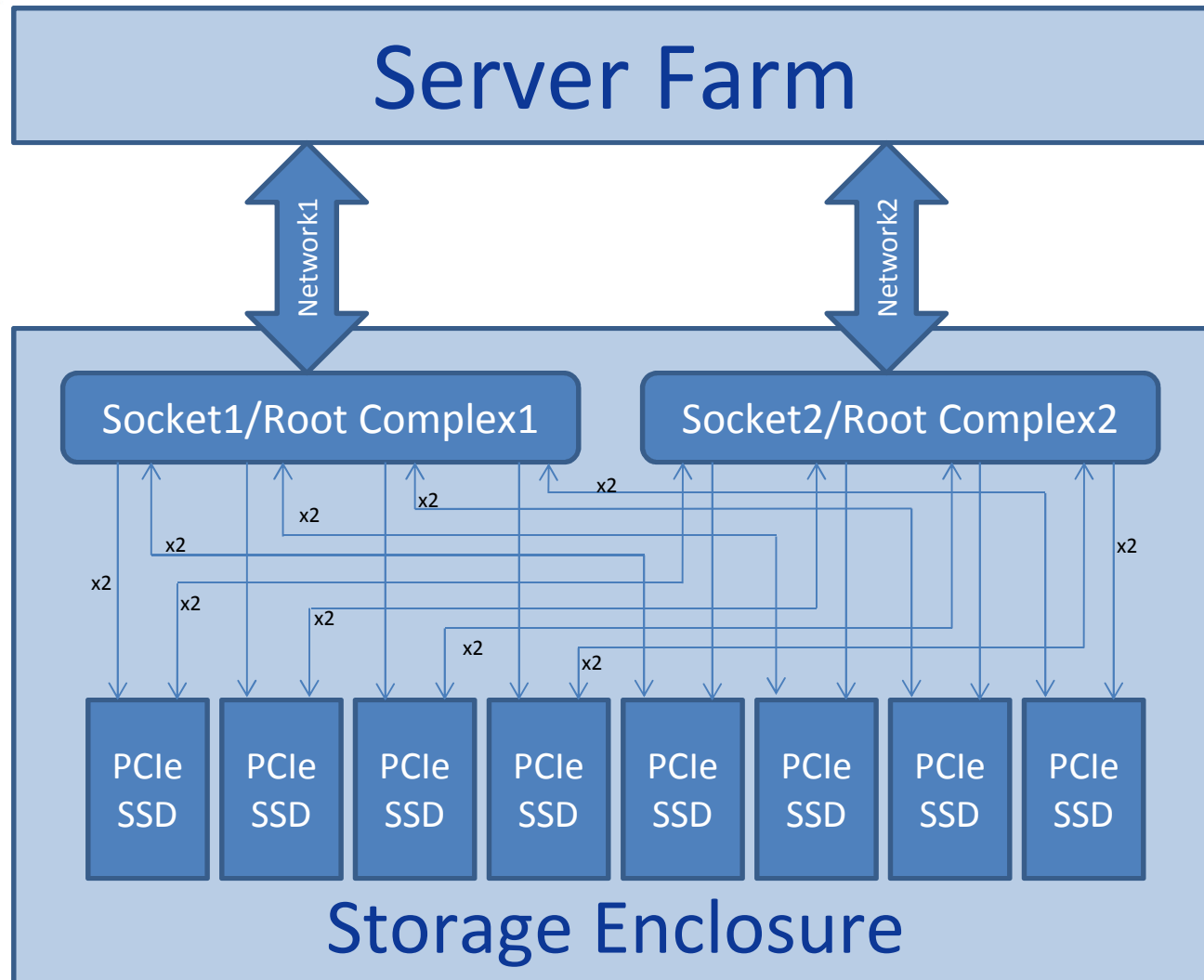
Connecting SAS or SATA Devices to Express Bay



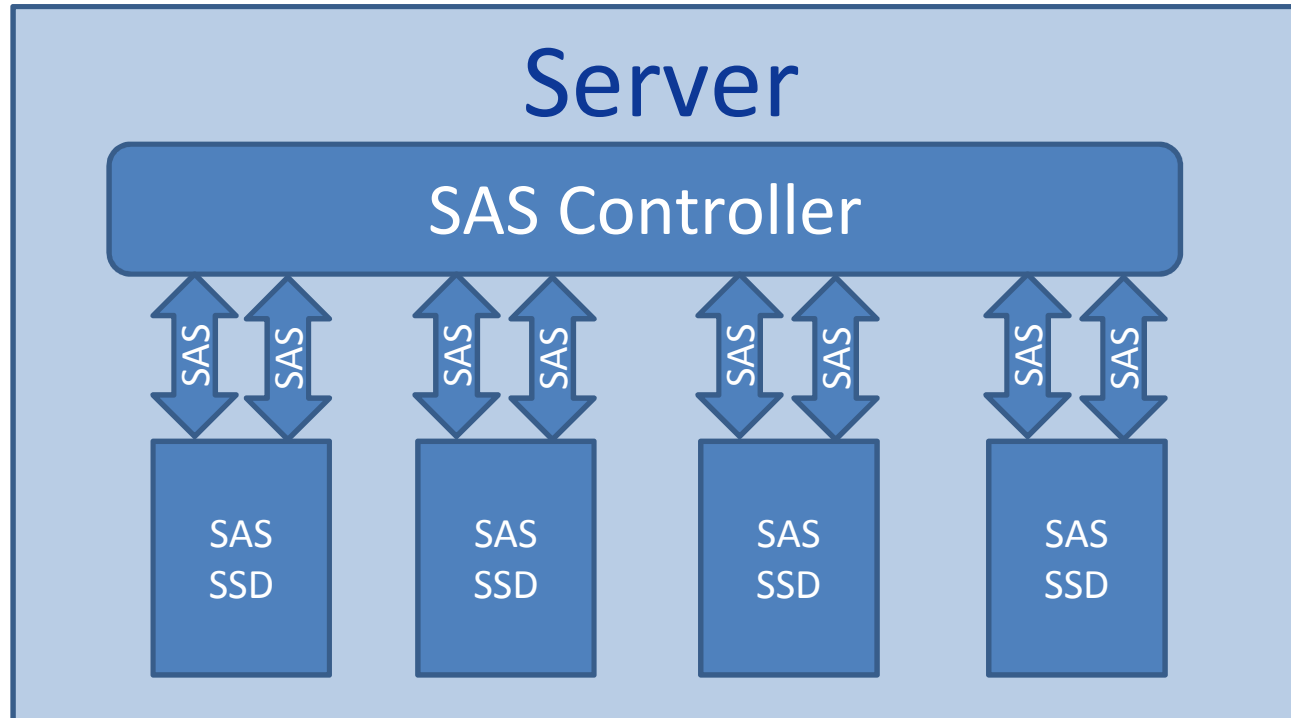
Connecting SAS or SATA Devices to Traditional Bay



Dual Port With PCIe for High Availability



Wide Port SAS for Increased Throughput

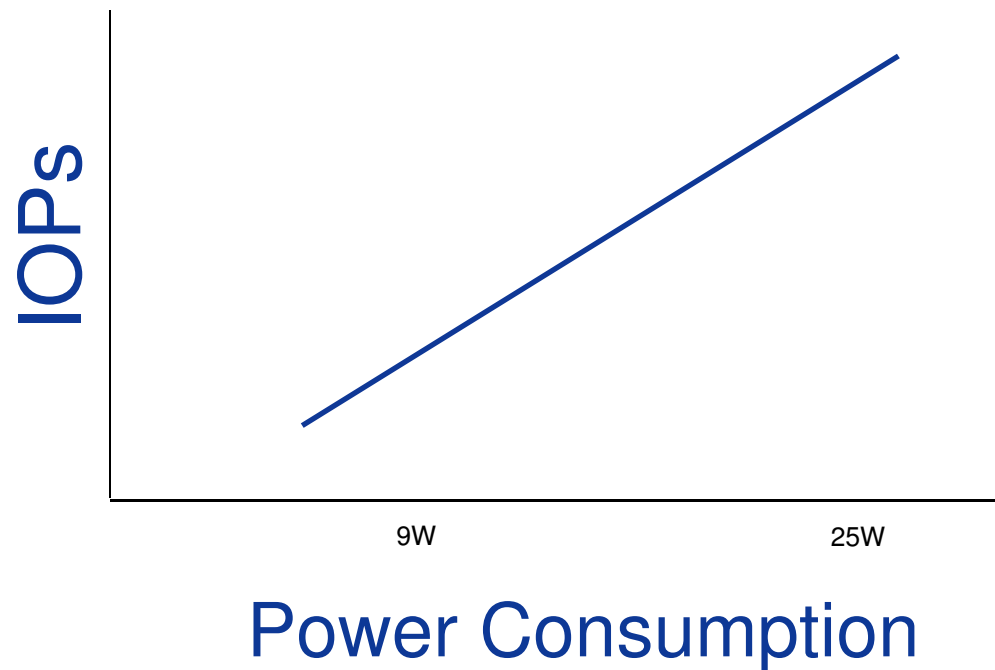


2.4 GB/s full-duplex per SSD

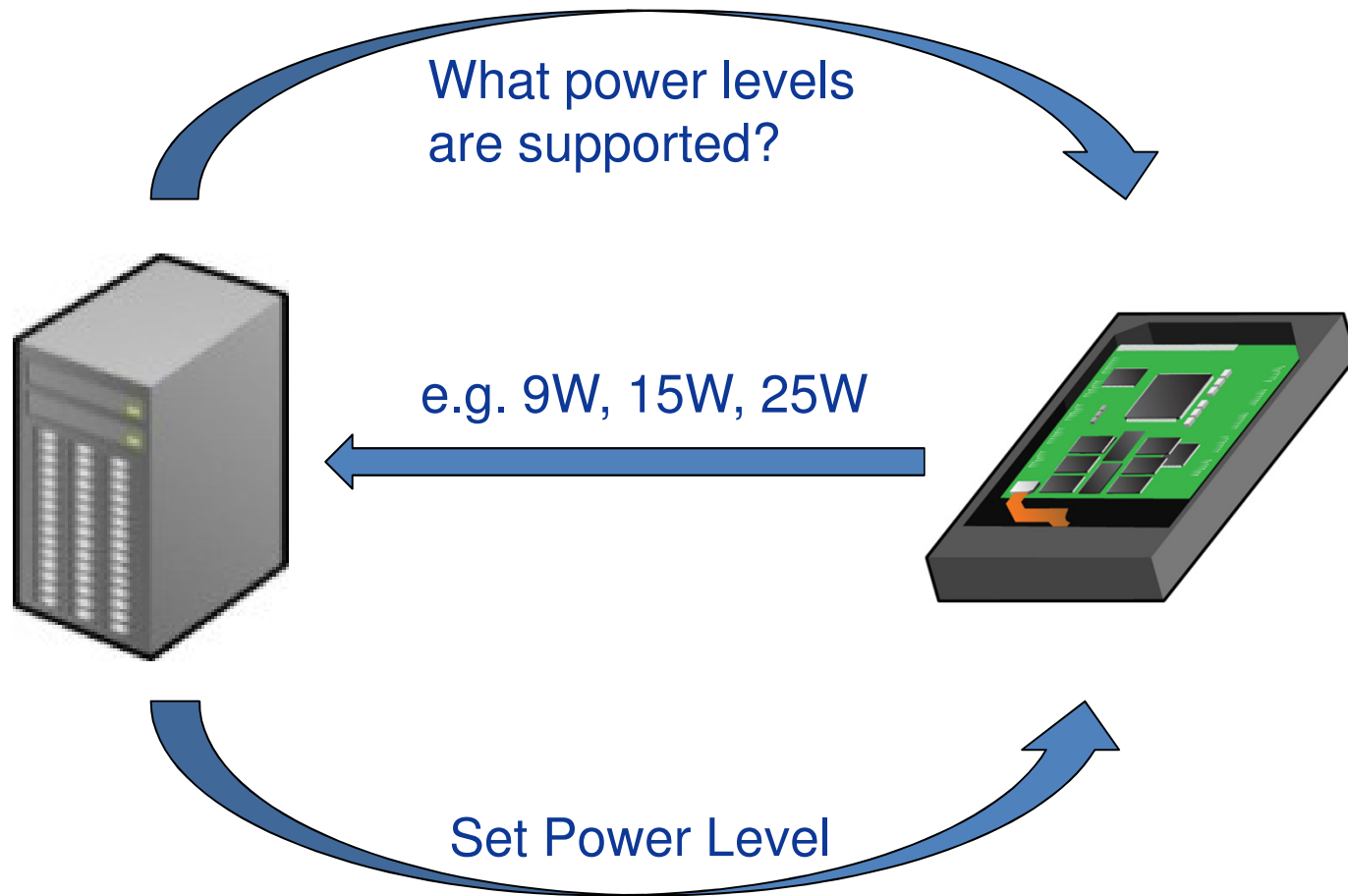


SSD Performance Scales with Power

$$P = P_{\text{base}} + P_{\text{I/O}} * \text{IOPs}$$



Power Limit Control



Bandwidth per Device Connected

	SATA	SAS	Wide-port SAS	PCIe
No of Ports / Lanes	1	1	2	4
Transfer Rate per Port/Lane	Half-duplex 6 Gb/s	Full-duplex 12 Gb/s	Full-duplex 12 Gb/s	Full-duplex 8 Gb/s
Max Bandwidth	0.6 GB/s	2.4 GB/s	4.8 GB/s	8 GB/s



Express Bay Summary

- Preserve the enterprise storage experience for PCI Express storage
- Meet SSD performance demands with PCIe, SAS, or SATA
- Serviceable, accessible bay offers configurability