For Data Centers

Host Bus Adapter (HBA)

Communicate between storage devices and
systems using different protocols

Application note

Host Bus Adapter (HBA)

1. What is a Host Bus Adapter (HBA)?

An HBA is an adapter located among the Peripheral Component Interconnect Express (PCIe) bus, disk, storage system and storage network switch that connects two devices with different protocols for communication. Additionally, some HBAs support a Redundant Array of Independent Disks (RAID) configuration and some are implemented using DRAM memory as a cache to improve performance.

Generally, an HBA can be categorized by protocol (Serial Advanced Technology Attachment [SATA], Serial-Attached SCSI [SAS], Fibre Channel [FC], Ethernet, etc.) with a corresponding connector. The basic role of the controller in an HBA is as a mediator, enabling the server chipset to communicate with the storage devices or storage system by supporting protocol transformation between the PCIe and the device protocol.

2. What factors do I need to consider when choosing an HBA?

In client PC usage, the solid-state drive (SSD) is connected to the I/O chipset (Platform Controller Hub [PCH]) and communicates with the host system. In a server application, however, storage devices are mostly connected to an HBA or expander connected to an HBA or expander and then to the I/O chipset to configure the RAID. Therefore, compatibility between storage devices and the HBA is very important and the user should consider the HBA interface and its bandwidth (SAS 3/6/12 G, FC 4/8/16 G) to maximize the performance of the storage devices.

3. How do I set up an HBA?

1. **Connect the SSDs to the HBA.**
2. **Check if the HBA recognizes the SSDs and configure the virtual drive to use the logical drive.**
   - If the HBA supports RAID, set the RAID configuration in the Basic Input/Output System (BIOS) or the HBA management software (RAID type, storage selection for RAID, stripe size [8/16/32/64 KB, etc.], the HBA cache policy, I/O policy, access policy, disk write cache policy, etc.).
   - An HBA that does not support RAID does not need any steps to configure the logical drive.

The options used to set the virtual drive have an effect on the stability and performance of the storage drives. Therefore, users should consider the workload when choosing the settings, as well as the battery backup unit (BBU) of the HBA and the sudden power off protection features.

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4. Samsung SSDs for data centers are

Samsung SSDs for data centers are compatible with the most used HBA and RAID controller card products. The table below describes the interoperable models. The compatibility list will be updated continuously.

Samsung SSD	HBA and RAID controller			
	Manufacturer	Product category		Model
845DC EVO	LSI	HBA	6Gb/s SATA + SAS HBA	LSI SAS 9206-16e LSI SAS 9207-4i4e/8i/8e LSI SAS 9205-8e LSI SAS 9212-4i4e LSI SAS 9201-16e/16i LSI SAS 9200-8e LSI SAS 9211-4i/8i
			12Gb/s SATA + SAS HBA	LSI SAS 9300-4i/4i4e/8i/8e LSI SAS 9311-4i4e (OEM) LSI SAS 9311-8i (OEM)
		RAID controller card (6Gb/s)		MegaRAID SAS 9240-4i/8i MegaRAID SAS 9286(CV)-8e/8eCC MegaRAID SAS 9270-8i MegaRAID SAS 9271-8i/8iCC/4i MegaRAID SAS 9285(CV)-8e MegaRAID SAS 9266-4i/8i MegaRAID SAS 9265-8i MegaRAID SAS 9280-24i4e/16i4e/8e/4i4e MegaRAID SAS 9260-16i/4i MegaRAID SAS 9260DE-8i MegaRAID SAS 9260CV-8i/4i MegaRAID SAS 9261-8i
		RAID controller card (12Gb/s)		MegaRAID SAS 9341-4i/8i MegaRAID SAS 9361-4i/8i
	Intel	RAID controller card (6Gb/s)		Intel® RAID Controller RS2WC080 Intel® RAID Controller RS2WC040 Intel® RAID Controller RS25NB008 Intel® RAID Controller RS2SG244SNGL Intel® RAID Controller RS2WG160 Intel® RAID Controller RS2PI008(DE/SNGL) Intel® RAID Controller RS2BL080 Intel® RAID Controller RS2BL040 Intel® RAID Controller RS2MB044 Intel® RAID Controller RS2VB080 Intel® RAID Controller RS2VB040

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