



# Configuring HP Elite, EliteBook, and Z220 systems for Intel Smart Response Technology

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# Overview

Hard disk drives (HDDs) can be a bottleneck for storage-intensive operations due to the long access times inherent in their design. The lower latency and higher bandwidth of solid-state drives (SSDs) make them the preferred storage medium when high performance is a priority, although they incur a higher cost per bit than HDDs. With both storage technologies exhibiting advantages and drawbacks, using hybrid storage can be the optimum solution.

Select HP Elite, EliteBook, and Z220 series systems support a new feature called Intel Smart Response Technology. Intel Smart Response Technology is a faster access and caching feature of the Intel Rapid Storage Technology storage driver. Intel Smart Response Technology accelerates system response by placing frequently used blocks of disk data on a solid state drive (SSD) or mSATA drive.

In comparison to an HDD-only system, Intel Smart Response Technology provides the following benefits:

- **Improved performance**—Accelerates regular HDD performance through SSD or mSATA drive input.
- **Increased system response times**—Accelerates system boot, application startup, and multitasking functions.

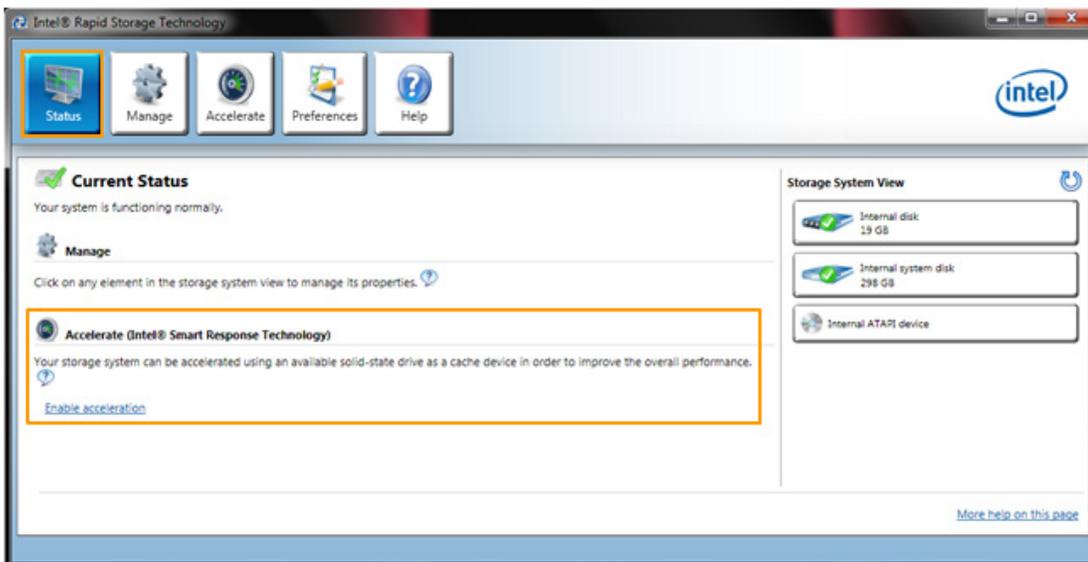
The percentage of performance increase depends on one of the following acceleration modes.

- **Enhanced mode** (default)—acceleration optimized for data protection. This mode uses the write-through method, which writes data to both the HDD and the cache device simultaneously. There is no risk of data loss if either device becomes inaccessible.
- **Maximized mode**—acceleration optimized for I/O performance. This mode uses the write-back method, which writes data to the HDD only at intervals. There is a chance for data loss if the HDD or cache device becomes inaccessible.

The graphical user interface (GUI) of the Intel Rapid Storage Technology utility allows user control of the above modes and provides additional information on choosing the appropriate mode through the Help button. The Intel Rapid Storage Technology utility is accessed through one of the following paths:

- Start → Intel → Intel Rapid Storage Technology.
- Control Panel → Hardware and Sound → Intel Rapid Storage Technology

The following image displays the Status tab in the Intel Rapid Storage Technology GUI.



## System requirements

Disk caching with Intel Smart Response Technology is supported on the following HP systems:

- HP Elite 8300 Business PCs
- HP EliteBook 8470, 8570, and 8770 Mobile Workstations
- HP Z220 CMT and SFF Workstations

The above systems must also meet the following hardware and software requirements:

- System BIOS with SATA mode set to RAID or RAID+AHCI
- 2nd Generation Intel Core or Xeon processor, or later
- Intel Series 7 or C216 bchipset or later
- Single hard disk drive (HDD) or multiple HDDs in a single RAID volume
- mSATA module or 2.5" SATA solid state drive (SSD) with a minimum capacity of 18.5 GB
- Intel Rapid Storage Technology software:
  - For HP Business PCs, version 11.0
  - For HP Workstations, version 11.5
- Microsoft Windows 7 operating system—32-bit or 64-bit

## How to enable Intel Smart Response Technology

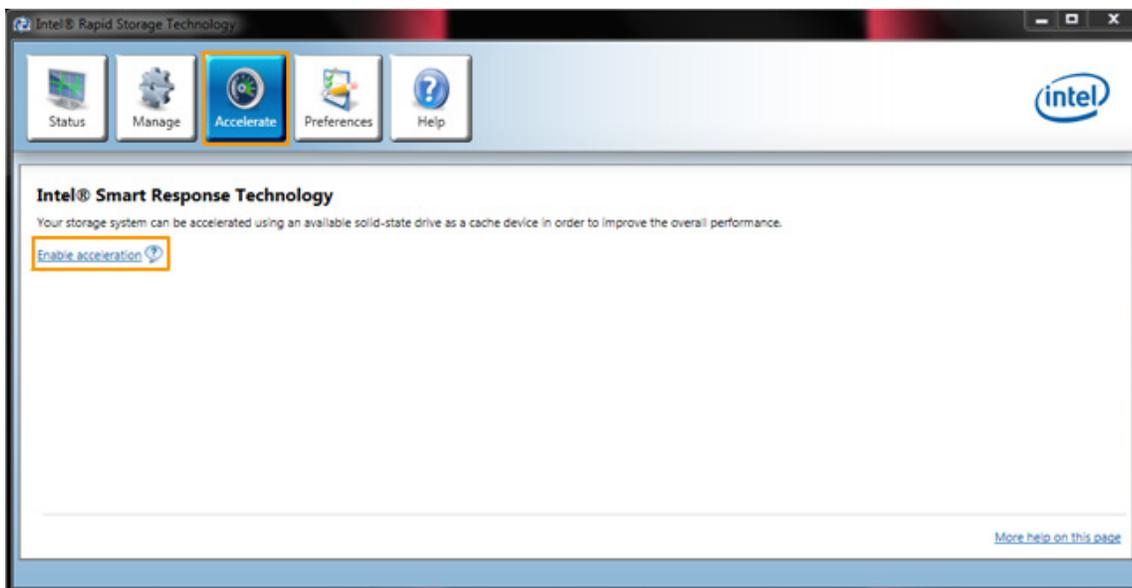
To enable Intel Smart Response Technology, use the following procedure.

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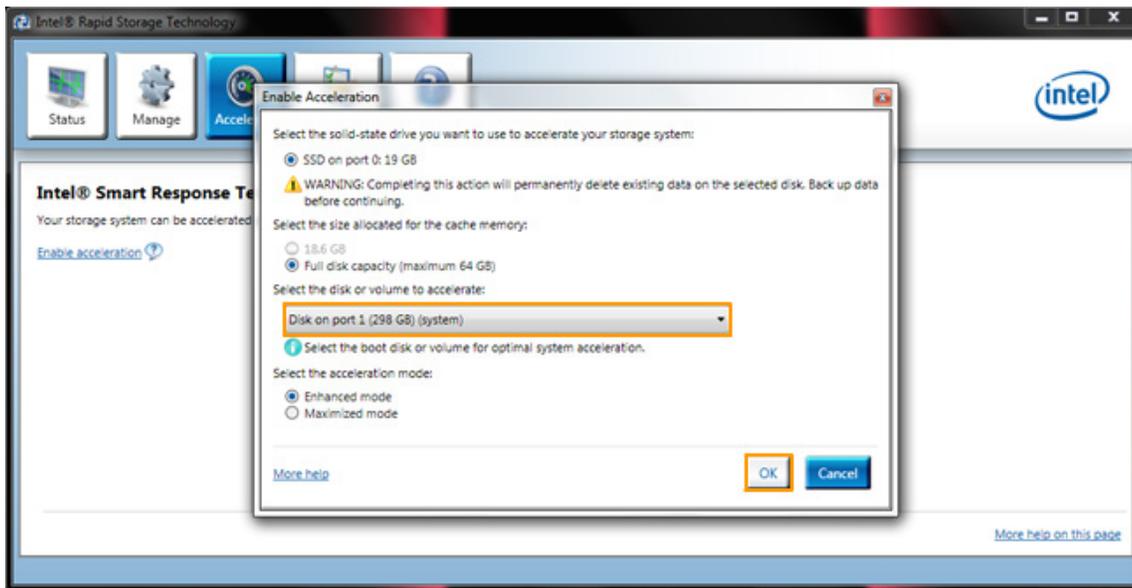
**NOTE:** To use Intel Smart Response Technology on a system with RAID, you must create the RAID volume first.

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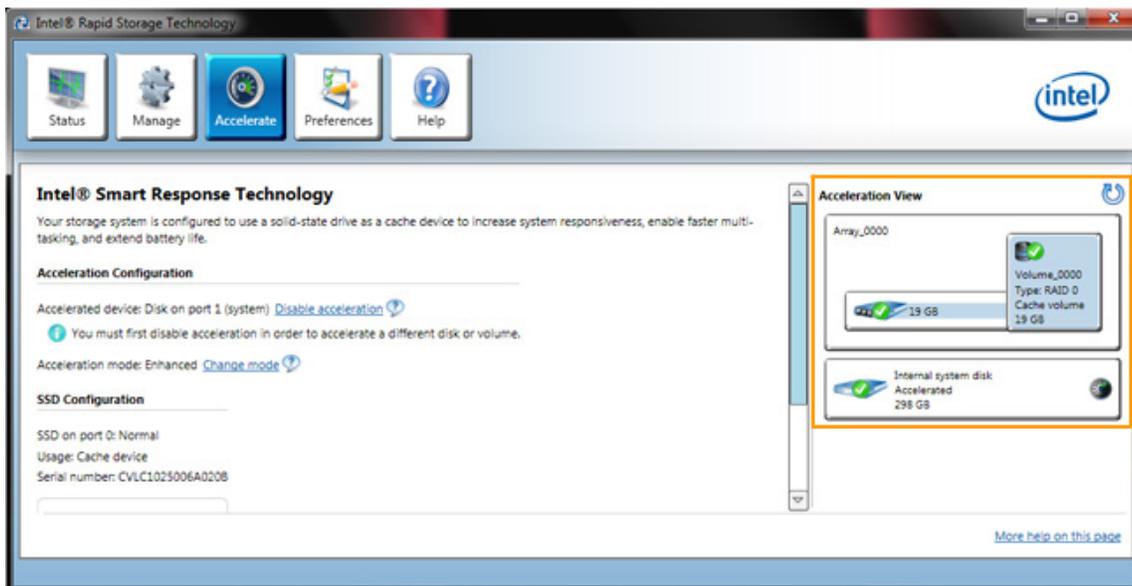
1. In the Acceleration tab, click the **Enable acceleration** link.



2. The Enable Acceleration dialog box appears. Select **Disk on port1 (298 GB) (system)** item, and then click the **OK** button if you choose to enable Intel Smart Response Technology.



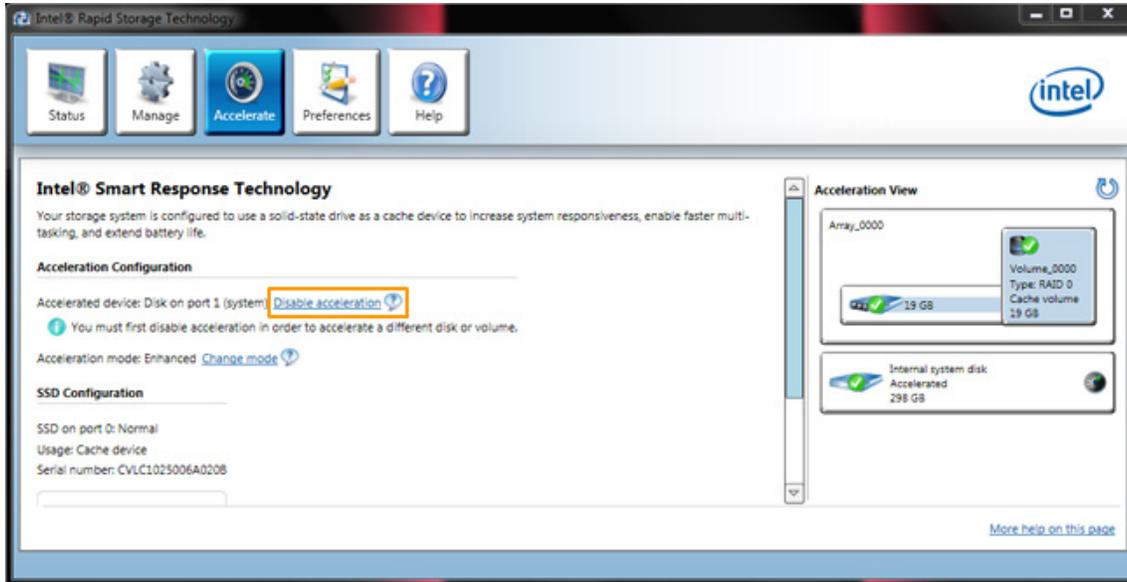
3. The Acceleration View section confirms that the acceleration feature has been enabled.



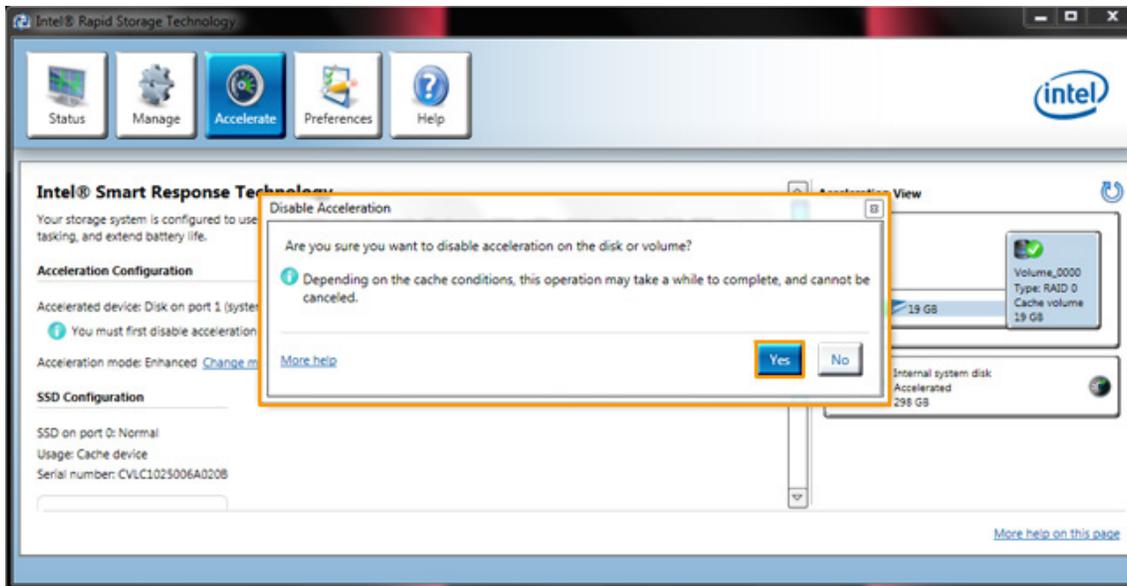
# How to disable Intel Smart Response Technology

To disable Intel Smart Response Technology, use the following procedure.

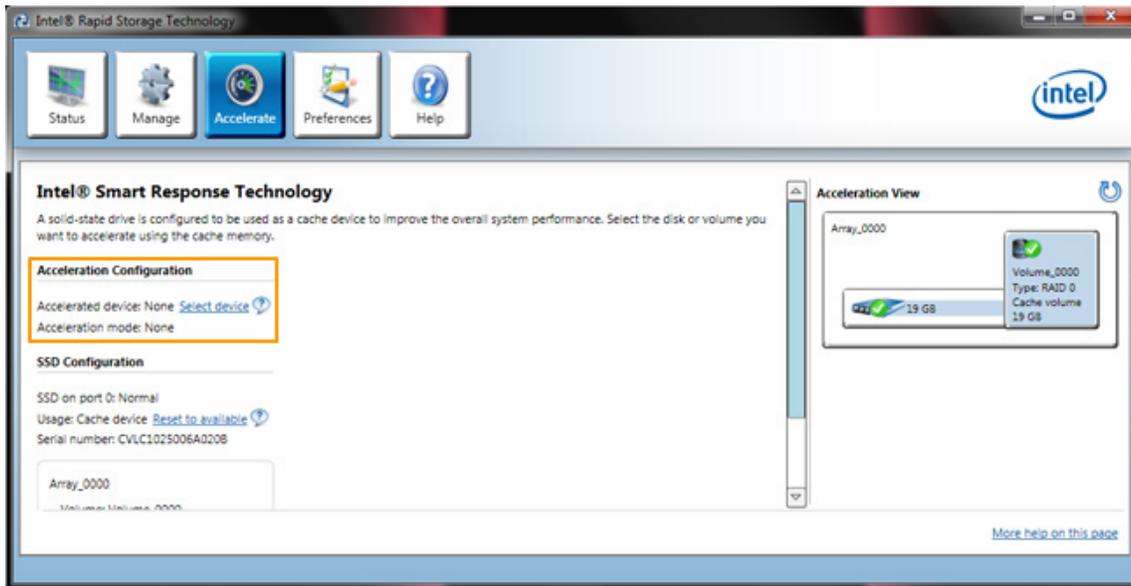
1. In the Acceleration tab under the Acceleration Configuration section, click the **Disable acceleration** link.



2. The Disable Acceleration confirmation box appears. Click the **Yes** button to disable Intel Smart Response Technology.



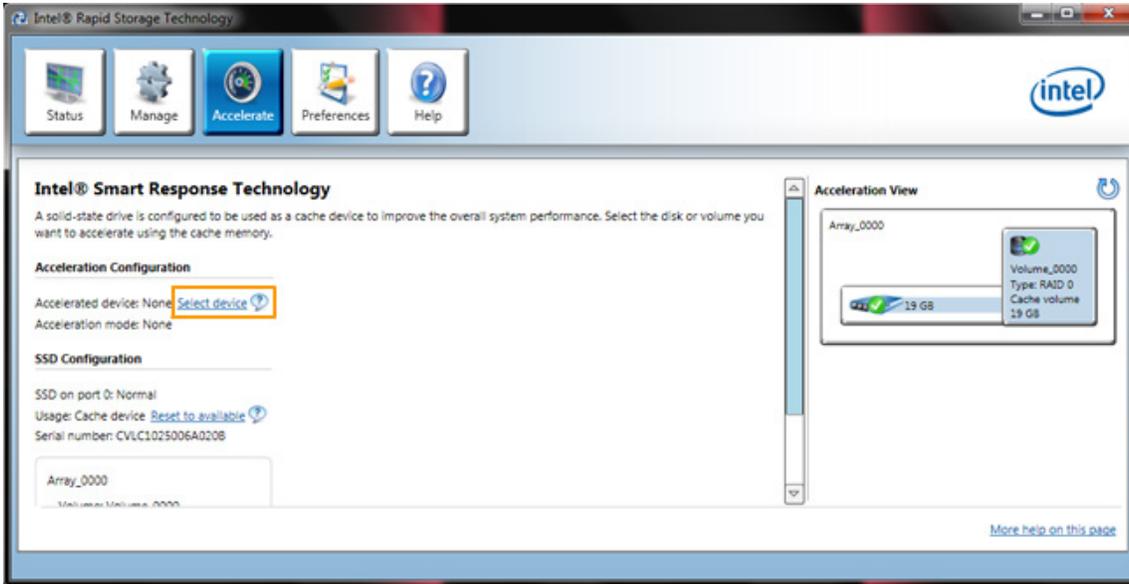
3. The Acceleration Configuration section confirms that the acceleration feature has been disabled.
- NOTE:** The cache volume will not be available for other uses unless the device is “Reset to available”. Refer to the [How to reset the cache device](#) section for more details.



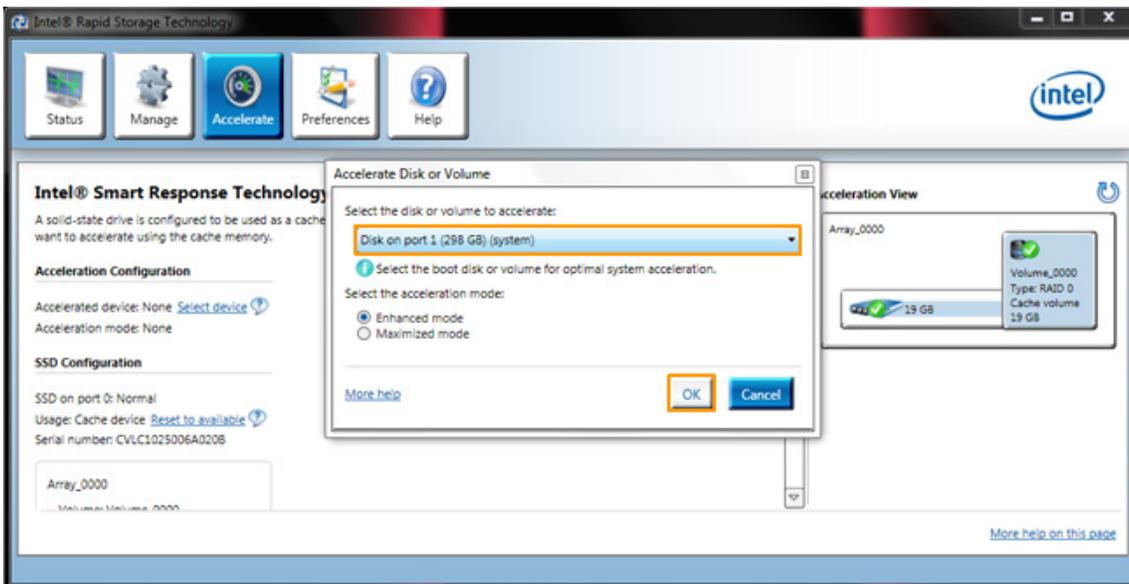
# How to re-enable Intel Smart Response Technology

To re-enable Intel Smart Response Technology after it has been disabled, use the following procedure.

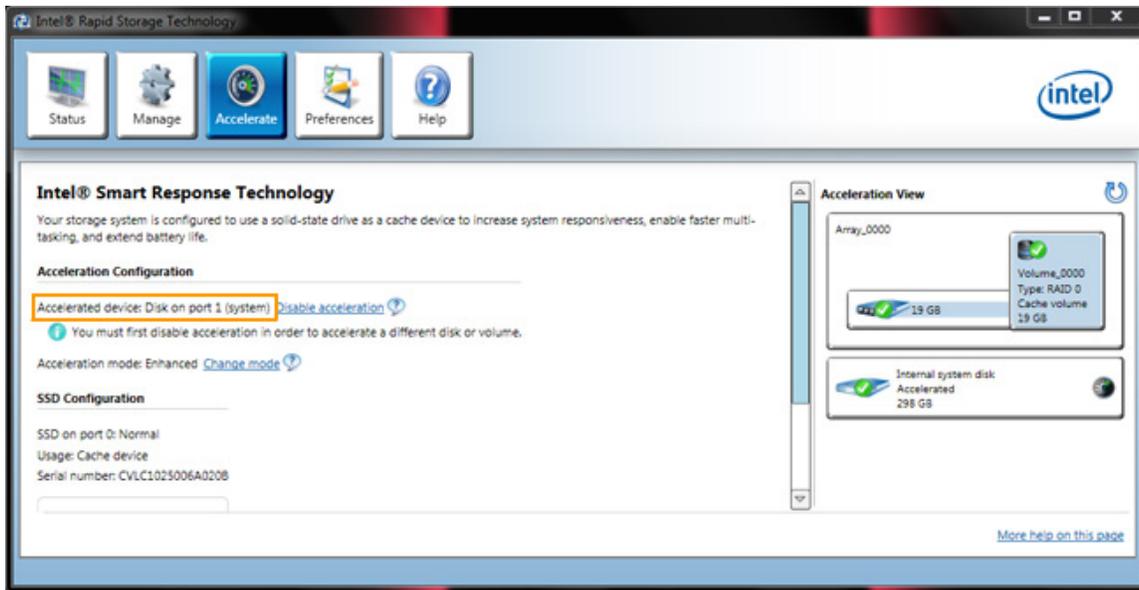
1. In the Acceleration Configuration section, click the **Select device** link.



2. The Accelerate Disk or Volume dialog box appears. Select the **Disk on port 1 (298 GB) (system)** item, and then click the **OK** button if you choose to re-enable Intel Smart Response Technology.



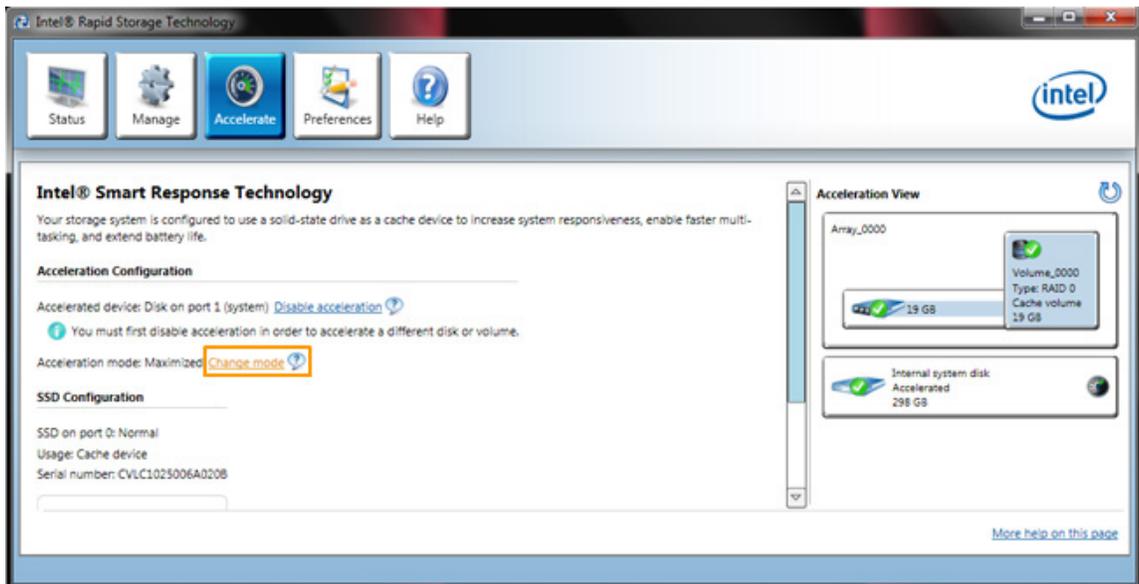
3. The Acceleration Configuration section confirms that the selected disk is now accelerated.



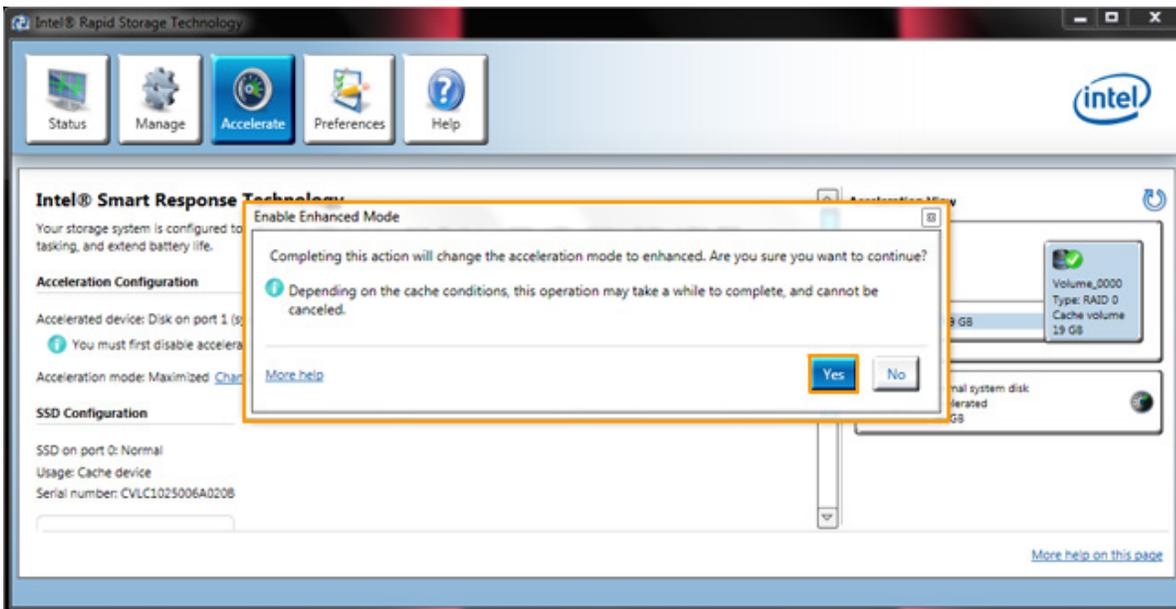
## How to change the Intel Smart Response Technology mode

To change the Intel Smart Response Technology mode, use the following procedure.

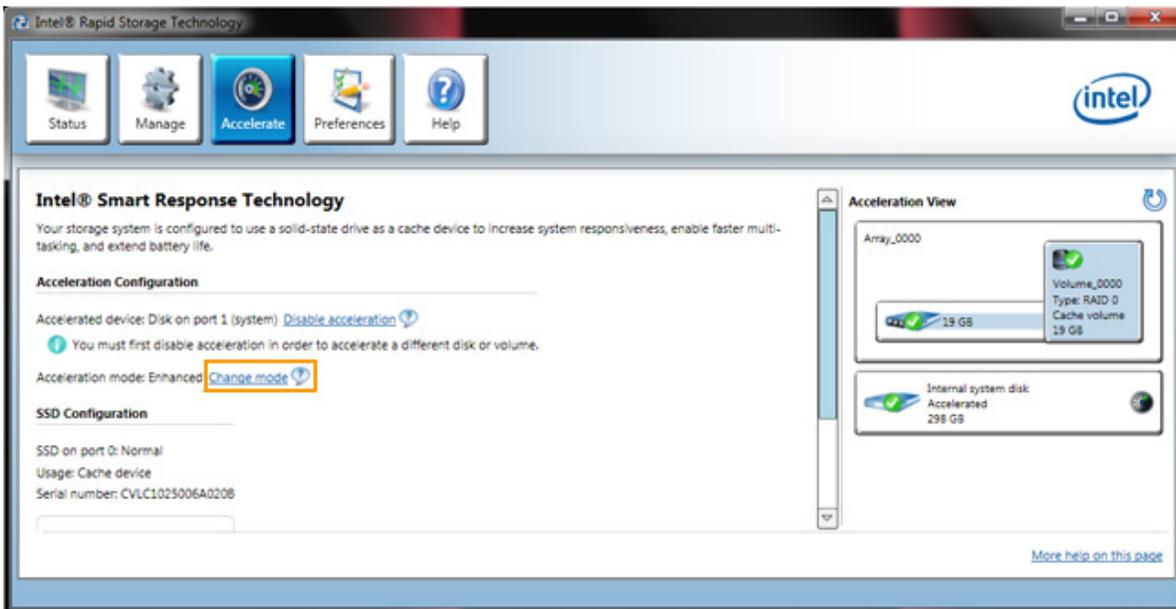
1. To change the acceleration mode, click the **Change mode** link.



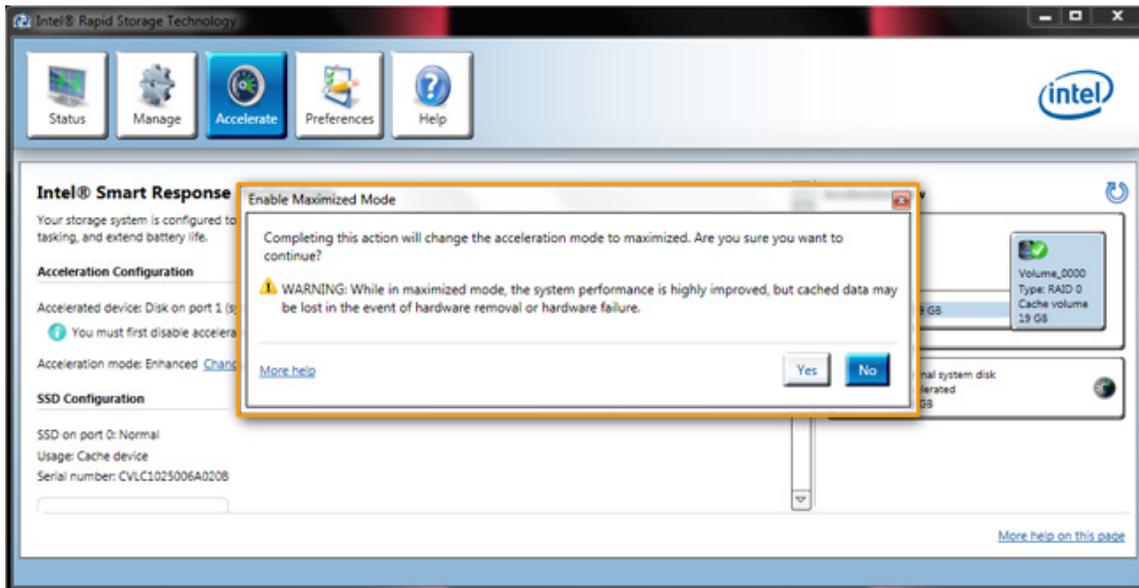
- The Enable Enhanced Mode confirmation box appears. Click the **Yes** button if you choose to change the acceleration mode to the Enhanced option.



- The Acceleration Configuration section confirms that the Enhanced mode is enabled. To change the acceleration mode to the Maximized option, click the **Change mode** link



4. The Enable Maximized Mode confirmation box appears with a WARNING. Click the **Yes** button if you choose to change the acceleration mode to the Maximized option in spite of the warning. Click the **No** button to heed the warning and make no changes.

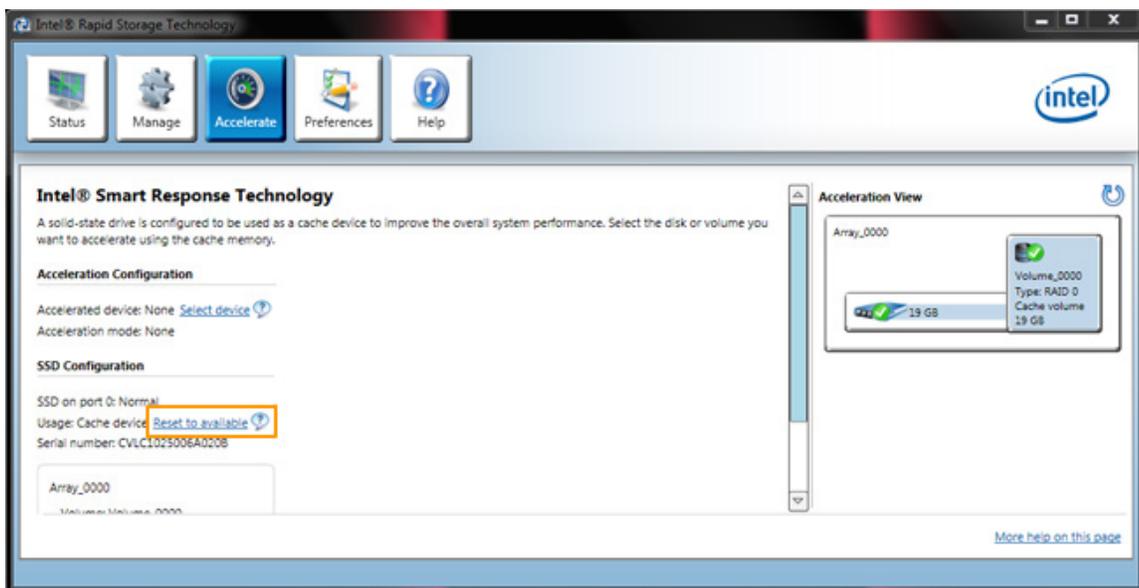


## How to reset the cache device

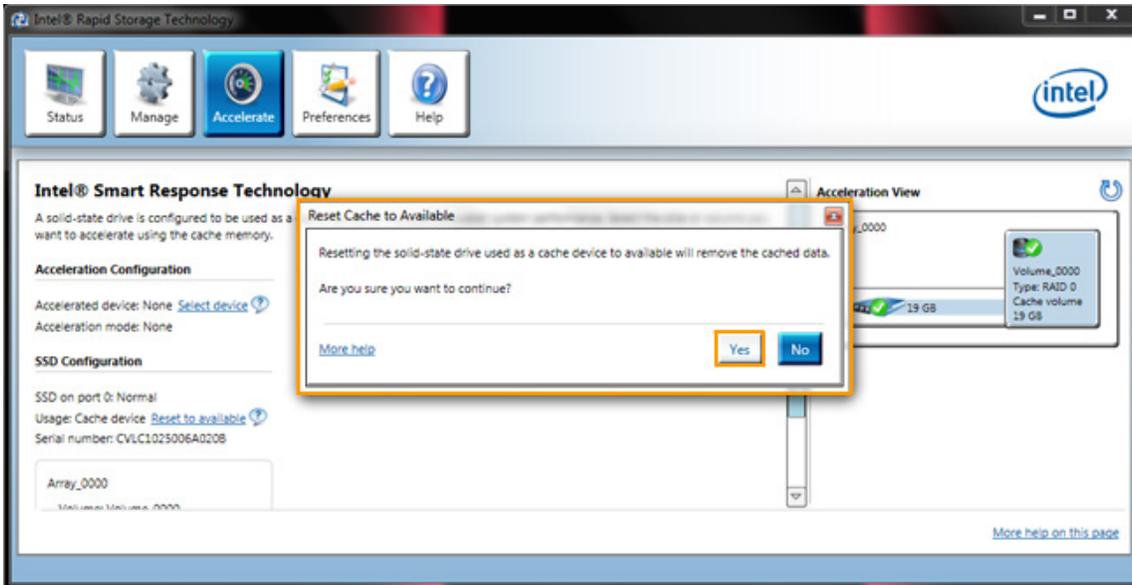
Resetting the cache device to “available” allows the device to be visible to the OS. To reset the cache device using the Accelerate tab, use the following procedure.

**NOTE:** Intel Smart Response Technology must be disabled before the cache device can be reset.

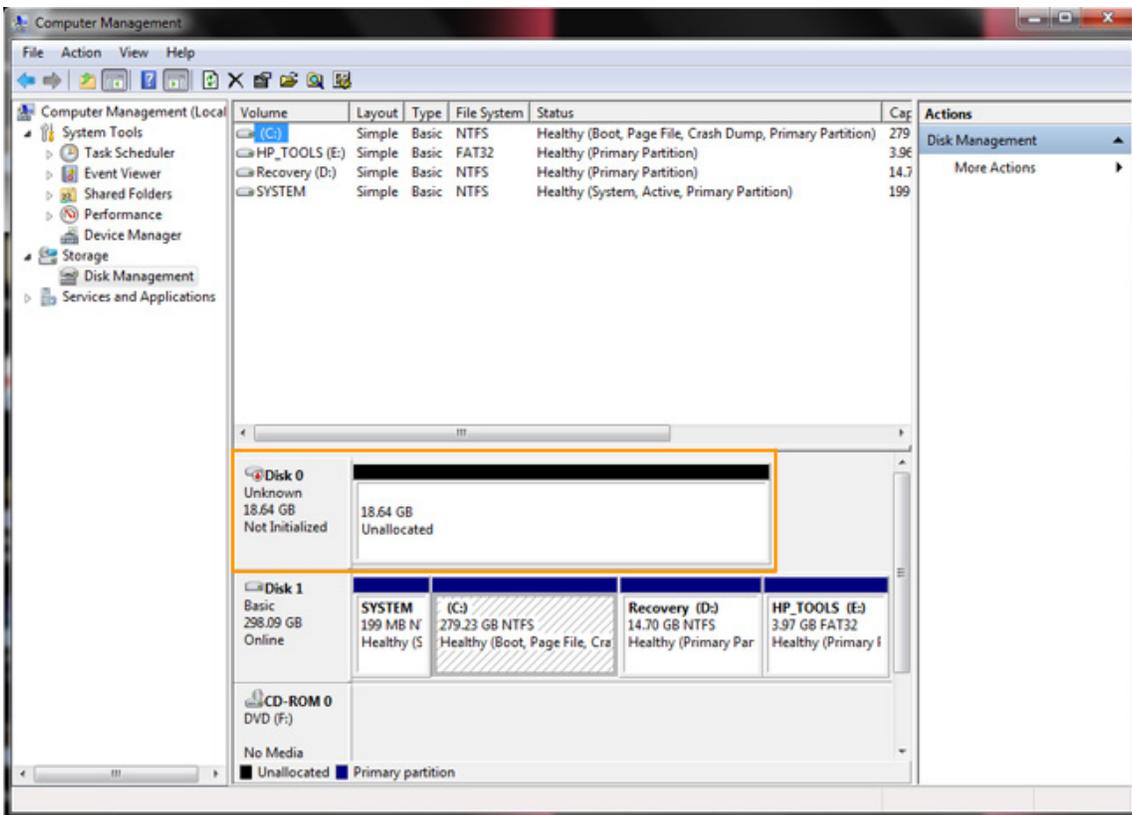
1. In the SSD Configuration section, click the **Reset to available** link.



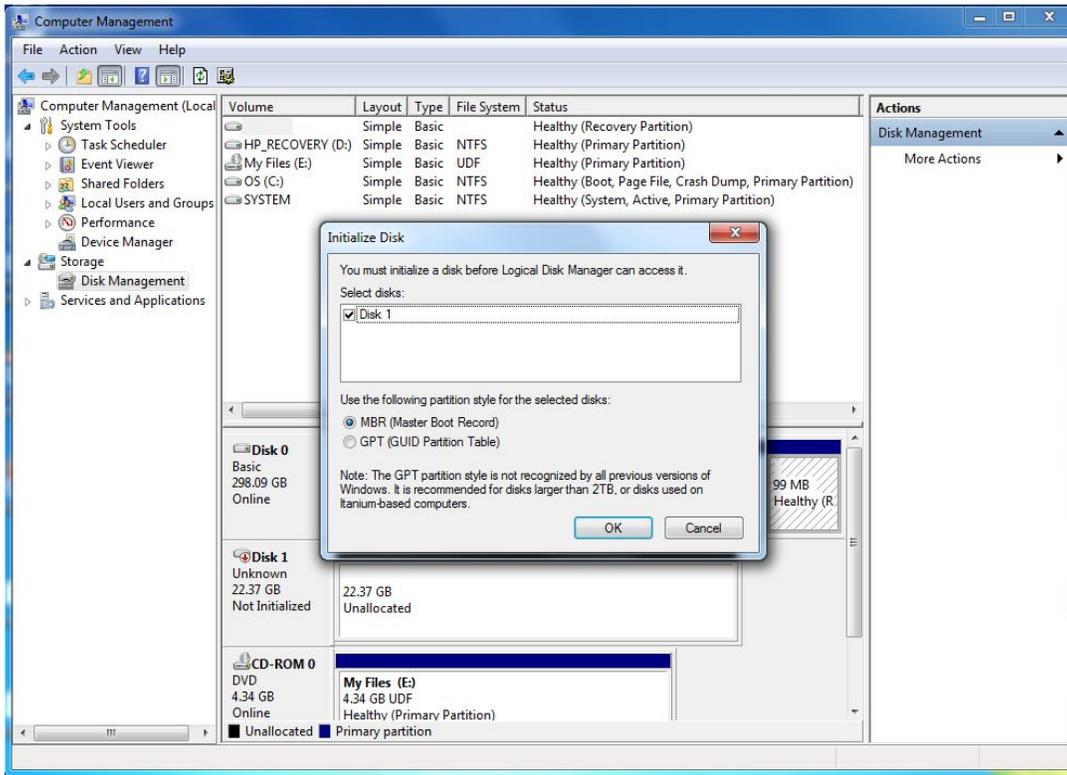
2. The Reset Cache to Available confirmation box appears. Click the **Yes** button if you choose to reset the cache device.



3. After the process is completed, a cache device will be shown and marked as Unallocated.



Once a cache device has been set to being available, a restart of the computer management/storage/disk management utility will result in the OS displaying a popup message (shown below) allowing you to partition the drive if it is to be used as a separate drive.



## Configuring Intel SRT using the Option ROM

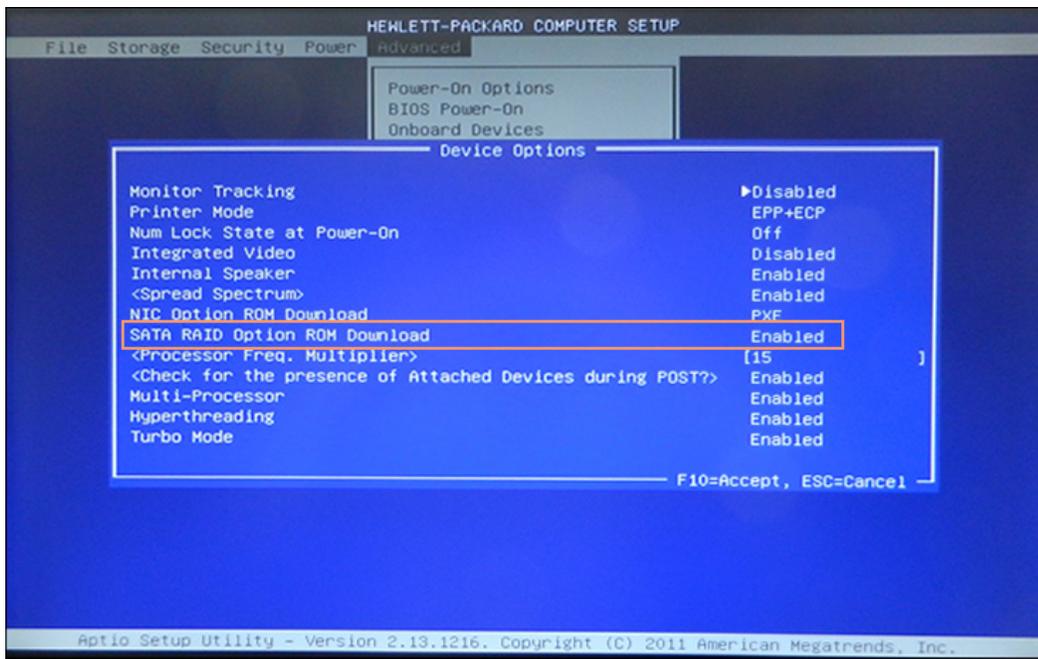
The option to configure the Intel Smart Response Technology using the option ROM (OROM) user interface (UI) is intended for service purposes **only**. This option is available **only** when an SSD/mSATA drive is used as cache.

The option to display the OROM prompt during POST is disabled by default. The OROM prompt is displayed **only** in the following cases.

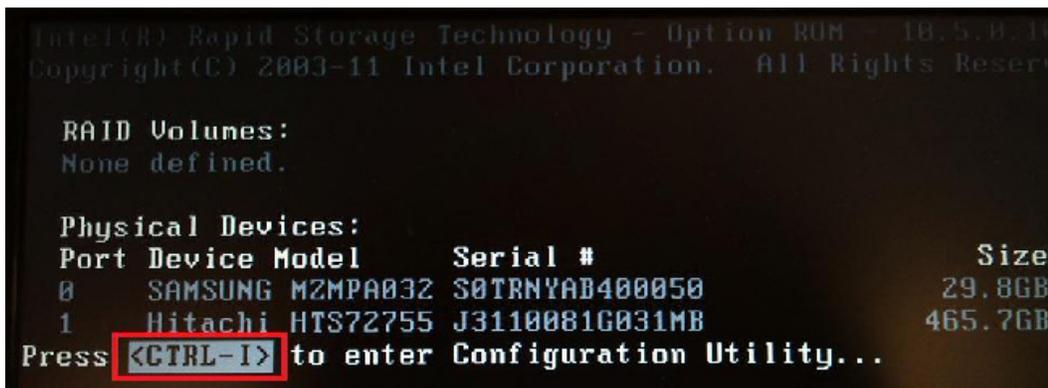
- When the RAID or Intel Smart Response Technology configuration differs from the last boot; for example, when the mSATA drive is removed from the system.
- When the end user has enabled the OROM in the F10 BIOS Setup Utility.

The following procedure enables the user to configure Intel Smart Response Technology using the OROM.

1. The OROM UI can be enabled through the BIOS F10 Setup Utility. The following image displays the OROM UI item in the BIOS Setup Utility (the actual BIOS display may vary depending on platform). NOTE: The SATA emulation mode must be set to RAID or RAID+AHCI.



2. After the system boots, when the OROM GUI displays, press **CTRL+I**.
3. The following image displays the CTRL-I instruction in the OROM GUI.



## Replacing the cache device

The cache device can be replaced using one of the following procedures.

### Replacing the cache device with another cache device pre-configured as RAID (cache) or storage mode

To replace the cache device with another cache device that is pre-configured as RAID (cache) or storage mode, follow these steps:

1. Disable the Intel Smart Response Technology acceleration feature using the Accelerate tab, or the OROM UI.  

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**NOTE:** If this step is not performed, the OS will not boot from the hard drive.

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2. Shut down the system, and replace the cache device.
3. Power on the system. The OROM displays the new cache device as one of the following options, and then continues the boot sequence:  
**Disable**—If the new cache device is pre-configured as the RAID (cache) mode  
**Non-RAID disk**—If the new cache device is pre-configured as the storage mode
4. Access the **Intel Rapid Storage Technology** GUI, and enable Intel Smart Response Technology by following these steps:
  - a. In the RAID (cache) mode scenario, select **Disassociate** in the Accelerate tab, and then re-enable Intel Smart Response Technology.
  - b. In the storage mode scenario, select **Enable acceleration** in the Accelerate tab, and then re-enable Intel Smart Response Technology.

### Replacing the cache device without disabling Intel Smart Response Technology

To replace the cache device without disabling Intel Smart Response Technology, follow these steps;

1. In the OROM prompt, the main HDD will be displayed as **Disabled**, and the boot sequence could **not** be continued.
2. Enter the OROM UI by using **CTRL+I**, and select **R** to disable the acceleration feature.
3. Exit the OROM UI, and continue to boot the system into Windows. Access the Intel Rapid Storage Technology interface, and enable Intel Smart Response Technology.

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**NOTE:** The cache device will **not** be visible to the end user if Intel Smart Response Technology is enabled.

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## Frequently asked questions

**Q:** Does the user have to configure the Enhanced—Write through, or the Maximized—Write back, Intel Smart Response Technology mode every time when booting up the system?

**A:** No. At reboot the system displays the Acceleration mode that was enabled when the system was shut down. The user can then choose whether they want to change the mode.

**Q:** Does Intel Smart Response Technology save the last-state actions before the user turns off the system?

**A:** Yes. At reboot, the system displays all the enabled features and actions that were saved when the system was shut down

**Q:** After replacing the cache device or HDD, should any drive synchronization be required to make sure the system can return to the original state?

**A:** After replacing the cache device or HDD, the user has to reset the configurations for Intel Smart Response Technology. The system then automatically performs the drive synchronization

**Q:** After replacing the cache device or HDD, how does Intel Smart Response Technology prompt the user to start using the Enhanced—Write through, or the Maximized—Write back mode?

**A:** The OROM prompts the user to configure the Enhanced—Write through, or the Maximized—Write back mode.

**Q:** Does Intel Smart Response Technology diagnose, display, or report any errors when the user executes the Enhanced—Write through, or the Maximized—Write back mode? If yes, which reports are displayed?

**A:** Intel Smart Response Technology checks and displays information on the Acceleration modes without notifying the user of the status of the modes. No reports are provided.

**Q:** Should the user remove the cache device before performing a system recovery on the system?

**A:** Yes. Users are advised not to install a system image on the cache device.

**Q:** If I add a larger capacity SSD/msata device and configure the entire device for Smart Response Technology, will I get better performance?

**A:** Intel's Smart Response Technology is designed to work with a minimum cache size of 20 gigabytes. Increasing the capacity of the device will not necessarily result in a performance increase for most office environments but may benefit workstation users with heavier workloads. The Rapid Storage utility gives you the option to configure all or part of the Device for caching.

**Q:** How do I upgrade to a newer version of the Rapid Storage Technology driver if I have Smart Response technology enabled?

**A:** You must disable acceleration prior to upgrading the driver. After the new driver is installed and loaded, you can re-enable Smart Response Technology using the accelerate button in the utility.

**Q:** Is there a way to automate the creation of SRT configurations?

**A:** Creation of custom images that have SRT enabled will require the Intel "rstcli" utility. Please contact your HP pre-sales support engineer for more information.

## For more information

To learn more about RAID configuration for desktop products refer to the white paper "[AHCI and RAID on HP Compaq Elite 8000, 8100, 8200 and 8300 Business PCs.](#)"

To learn more about configuring Intel SRT on HP workstations refer to the white paper "[Technical Review and Configuration Details of Intel Smart Response Technology on HP Workstations.](#)"

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### Get connected

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Current HP driver, support, and security alerts delivered directly to your desktop

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