

Technical Disclosure Commons

Defensive Publications Series

October 2021

Visual Identification of Inactive Hard Disk Drives

N/A

Follow this and additional works at: https://www.tdcommons.org/dpubs_series

Recommended Citation

N/A, "Visual Identification of Inactive Hard Disk Drives", Technical Disclosure Commons, (October 29, 2021)

https://www.tdcommons.org/dpubs_series/4681



This work is licensed under a [Creative Commons Attribution 4.0 License](https://creativecommons.org/licenses/by/4.0/).

This Article is brought to you for free and open access by Technical Disclosure Commons. It has been accepted for inclusion in Defensive Publications Series by an authorized administrator of Technical Disclosure Commons.

Visual Identification of Inactive Hard Disk Drives

ABSTRACT

This disclosure describes the use of a thermally sensitive (thermochromic) tape on a hard disk drive for easy visual identification of disks in a data center that are designated for a repair action. The tape is provided on a user facing side of each HDD in a tray on each rack of the data center. The thermochromic tape is selected such that its color is different for different surface temperatures of the HDD within the expected operating temperature range of the HDD. When a disk designated for repair is spun down (de-energized) in preparation for repair action, its surface temperature is lower in comparison with that of adjacent HDDs. The color of the tape enables easy in-place visual identification of such a disk.

KEYWORDS

- Disk temperature
- HDD temperature
- Heat sensitive tape
- Thermochromic tape
- Datacenter maintenance
- Datacenter repair

BACKGROUND

Hard disk drives (HDDs) are commonly employed in data center server racks for data storage and retrieval. HDDs are typically arranged on trays that are then placed in shelves (racks) that are placed within the data center.

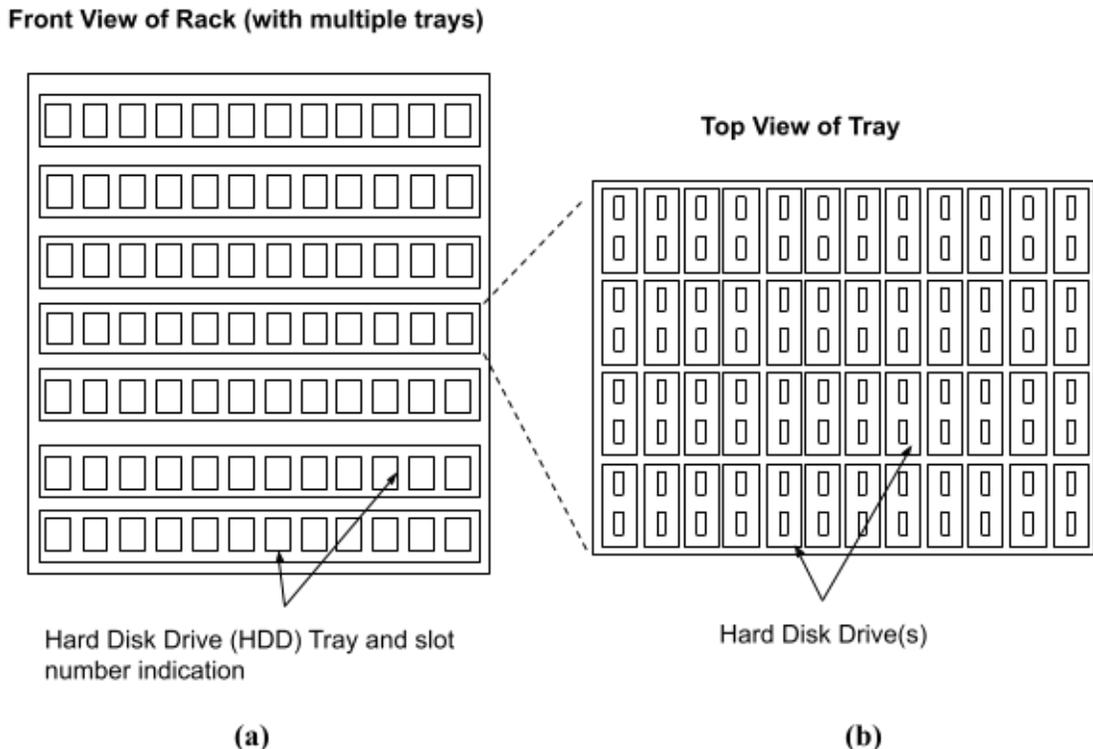


Fig. 1: HDD Racks and Tray containing HDDs

Fig. 1 depicts an example data center rack that includes multiple trays of HDDs. As depicted in Fig. 1(a), which illustrates a front view of a data center rack (shelf), the rack includes multiple trays that can each be pulled out. Each tray includes a set of mounted hard disk drives (HDD). The front of each tray includes markings (labels) that indicate a tray identifier (number) and a slot identifier (number) that indicate the specific location of each HDD. Fig. 1(b) depicts an example top view of a tray that illustrates rows of HDDs packed together.

When a problem is detected/reported regarding a particular HDD, a technician commonly carries out a repair action at the rack location where the particular HDD is located. In a typical repair action, a technician reaches the rack and visually identifies the particular HDD. Visual identification is performed by first identifying the particular tray in the rack (shelf) and the slot in the tray using labels provided on the trays. The machine tray number and slot number of the

HDD that needs attention are provided to the technician, e.g., via a software notification. Due to the large number of HDDs in each rack, visual identification of the HDD that is experiencing a problem can be difficult.

DESCRIPTION

This disclosure describes techniques for easy visual identification of hard disk drives in a data center that are designated for a repair action. Per techniques of this disclosure, a thermally sensitive (thermochromic) tape is provided on a user facing side of each HDD. The thermochromic tape is typically coated with pigment(s) that are responsive to surface temperature with the color exhibited by the tape being based on its surface temperature. The thermochromic tape is designed for the expected operating temperature range of the HDD.

HDDs designated for repairs are usually spun down (de-energized) in preparation for repair action. This results in a lower temperature of the HDD surface when compared to adjacent HDDs (that are energized). In such a case, the color of the thermally sensitive (thermochromic) tape affixed to the HDD is indicative of the (lower) surface temperature of the HDD. The thermally sensitive tape provides an inexpensive and effective way to enable a technician to visually identify a de-energized HDD that is ready for the repair action.

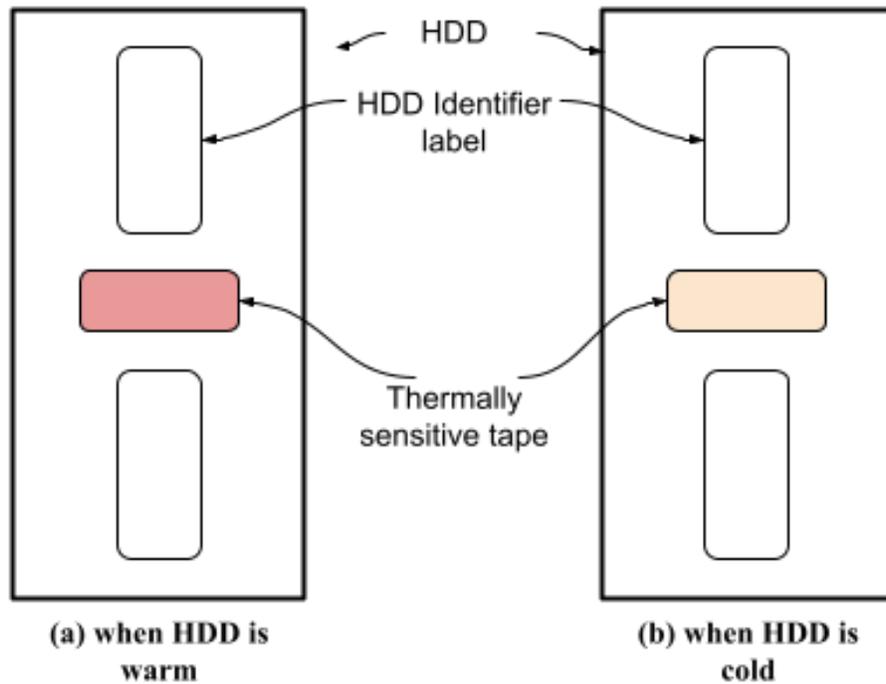


Fig. 2: Thermochromic tape is applied to the surface of a HDD

Fig. 2 depicts an example of use of thermochromic tape for visual indication of temperature of a HDD in a data center, per techniques of this disclosure. Thermochromic tape is affixed to the HDD at a suitable location. The color-change properties of the tape are selected based on a temperature profile of surface temperatures of the HDD when energized and de-energized. As seen in Fig. 2, the color of the tape when the HDD is warm is different from that when the HDD is cold. Colors in Fig. 2 are for illustration-only, suitable colors can be chosen in the actual use. The difference in color enables easy visual identification by the technician of the HDD to be repaired. The color identification can be performed without the need for extra LED lights mounted on the HDD that require associated PCB boards, wiring, etc.

CONCLUSION

This disclosure describes the use of a thermally sensitive (thermochromic) tape on a hard disk drive for easy visual identification of disks in a data center that are designated for a repair action. The tape is provided on a user facing side of each HDD in a tray on each rack of the data center. The thermochromic tape is selected such that its color is different for different surface temperatures of the HDD within the expected operating temperature range of the HDD. When a disk designated for repair is spun down (de-energized) in preparation for repair action, its surface temperature is lower in comparison with that of adjacent HDDs. The color of the tape enables easy in-place visual identification of such a disk.