**Hard Disk Failure Resolution Technical Documentation**

**Purpose:** To equip trainees with the skills necessary to repair failed hard disks.

**1. Introduction**: This document provides a step-by-step guide for resolving hard disk failures. Hard disk drives are critical components of computer systems, and their failure can lead to data loss and system downtime. This procedure outlines the essential steps for identifying, replacing, and recovering from a hard disk failure, ensuring minimal disruption and data integrity.

**2. Purpose of Documentation**: The primary purpose of this documentation is to serve as a comprehensive resource for trainees learning the process of hard disk failure resolution. It aims to provide clear, concise instructions that enable individuals to confidently and effectively address this common hardware issue. This document also serves as a standardized procedure to ensure consistency and best practices are followed during hard disk replacement and data recovery.

**3. Target Audience**: This document is intended for individuals undergoing technical training in computer hardware maintenance and repair.

**The target audience includes:**

● IT technicians in training

● Computer maintenance personnel

● Individuals seeking to enhance their skills in hardware troubleshooting and repair It is assumed that the target audience has a basic understanding of computer hardware components and operating systems.

**4. Scope of the Document:**  This document covers the standard procedure for resolving hard disk failures, including:

● identifying a failing hard disk.

● Safely backing up data (if possible).

● Physically replacing a faulty hard disk drive.

● Initializing and formatting a new hard disk.

● Installing an operating system (if required).

● Restoring data from a backup.

This document focuses on internal hard disk drives in standard desktop or laptop computers. While the general principles may apply to other storage devices, specific instructions might vary

**5. Procedures for Hard Disk Failure Resolution**

The following procedures must be followed to effectively resolve a hard disk failure:

**A. Isolation of the Failing Hard Disk**

**1. Identify the failing hard disk:** Observe system behavior for signs of hard disk failure, such as slow performance, frequent crashes, unusual noises (clicking, grinding), or error messages related to disk access. Consult system logs and utilize built-in or third-party diagnostic tools to pinpoint the problematic drive.

**2. Safely power off the system**: Once the failing hard disk is identified, ensure all applications are closed and safely shut down the computer system to prevent further data corruption or hardware damage. Disconnect the power cable from the system

**B. Backup Data (if not done already)**

**1. Use appropriate backup tools**: If the failing hard disk is still partially functional and accessible, utilize reliable backup software or tools to copy all critical data to a secure external storage device (e.g., external hard drive, USB drive, network storage).

**2. Verify the integrity of the backup:** After the backup process is complete, verify that all essential files and folders have been copied successfully and are accessible on the backup medium. This step is crucial to ensure data recovery is possible.

**C. Replacement of the Hard Disk**

**1. Follow manufacturer guidelines:** Consult the computer or hard disk manufacturer's service manual for specific instructions on accessing and replacing the internal hard disk drive.

**2. Ensure proper grounding**: Before touching any internal components, ground yourself using an anti-static wrist strap connected to an unpainted metal part of the computer chassis. This prevents electrostatic discharge (ESD) which can damage sensitive electronic components.

**3. Physically replace the hard disk:** Carefully disconnect the data and power cables from the failed hard disk. Unscrew and remove the hard disk from its mounting bay. Install the new hard disk in the bay and secure it with screws. Reconnect the data and power cables to the new hard disk, ensuring a firm and proper connection.

**D. Initialization and Formatting**

**1. Power on the system:** Reconnect the power cable and turn on the computer.

**2. Access the system BIOS/UEFI:** During the startup process, press the designated key (usually Del, F2, F12, or Esc - refer to the motherboard or computer manual) to enter the BIOS/UEFI setup utility.

**3. Detect the new hard disk**: Navigate through the BIOS/UEFI menus to verify that the system has detected the newly installed hard disk.

**4. Initialize and format the new hard disk:** Use the BIOS/UEFI tools or boot from a Windows installation media or a dedicated partitioning tool to initialize (if necessary) and format the new hard disk with the desired file system (e.g., NTFS)

**E. Operating System Installation (if necessary)**

**1. Install the operating system**: If the hard disk failure necessitated a complete replacement of the system drive, you will need to install the operating system. Boot from the installation media (USB drive or DVD) and follow the on-screen prompts to install the operating system on the newly formatted hard disk.

**2. Apply necessary updates and patches**: Once the operating system is installed, connect to the internet and install all essential updates, drivers, and security patches to ensure system stability and security.

**F. Data Restoration**

**1. Restore data from the backup**: Connect the external storage device containing the data backup to the computer. Use the backup software or file explorer to copy the backed-up data to the appropriate locations on the new hard disk.

**2. Verify the integrity of the restored data**: After the restoration process, verify that all important files and applications have been successfully copied and are functioning correctly.

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