Intel Data Migration Software powered by Acronis
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1 Introduction

1.1 What is Intel® Data Migration Software?

Intel® Data Migration Software provides a set of powerful and easy-to-use hard disk utilities. The Clone Disk Wizard will transfer all contents from one drive to another and make Windows bootable on your new drive, and the Add New Disk Wizard will help you to add a new drive to your computer.

1.2 System requirements and supported media

1.2.1 Minimum system requirements

Data Migration Software requires the following hardware:

- Intel SSD
- Processor Pentium 1 GHz.
- 1 GB RAM.
- 1.5 GB of free space on a hard disk.
- CD-RW/DVD-RW drive or USB flash drive for bootable media creation.
- Screen resolution is 1152 x 720.
- Mouse or other pointing device (recommended).

1.2.2 Supported operating systems

Data Migration Software has been tested on the following operating systems:

- Windows XP SP3
- Windows 7 SP1 (all editions)
- Windows 8 (all editions)
- Windows 8.1 (all editions)
- Windows 10
- Windows Home Server 2011

1.2.3 Supported file systems

- FAT16/32
- NTFS
- Ext2/Ext3/Ext4 *
- ReiserFS *
- Linux SWAP *

If a file system is not supported or is corrupted, Data Migration Software can copy data using a sector-by-sector approach.
1.3 Installing Data Migration Software

Installing Data Migration Software

To install Data Migration Software:
1. Run the setup file.
2. Click Install.
   Data Migration Software will be installed on your system partition (usually C:).
3. When the installation is complete, click Start application.

Recovering from an Data Migration Software error

If Data Migration Software ceased running or produced errors, its files might be corrupted. To repair this problem, you first have to recover the program. To do this, run Data Migration Software installer again. It will detect Data Migration Software on your computer and will ask you if you want to repair or remove it.

Removing Data Migration Software

To remove Data Migration Software components:
1. Open the list of installed programs and applications.
   - Select Start -> Settings -> Control panel -> Add or remove programs.
   - If you use Windows Vista, select Start -> Control panel -> Programs and Features.
   - If you use Windows 7, select Start -> Control Panel -> Uninstall a program.
   - If you use Windows 8 or Windows 10, click the Settings icon, then select Control Panel -> Uninstall a program.
2. Select the component to be removed.
3. Depending on your operating system, click Remove or Uninstall.
4. Follow the instructions on the screen.

You may have to reboot your computer afterwards to complete the task.

1.4 Technical Support

Support for Intel® Data Migration Software users is provided by Intel. Please visit Intel’s Support page at http://www.intel.com/go/ssdsupport/.
2 Disk cloning and migration

This operation copies the entire contents of one disk drive to another disk drive. This may be necessary, for example, when you want to clone your operating system, applications, and data to a new, larger capacity disk.

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2.1 General information

You might find that your hard disk does not have enough space for the operating system and installed applications, preventing you from updating your software or installing new applications. In this case, you have to transfer the system to a higher-capacity hard disk.

To transfer the system, you must first install the new disk in the computer. If your computer doesn't have a bay for another hard disk, you can temporarily install it in place of your CD drive. If that is not possible, you can clone a hard disk by creating a disk image and recovering it to a new hard disk with larger partitions.

Warning! If you clone a disk with Windows to an external USB hard drive, you will not be able to boot from it. Windows does not support booting from external USB hard drives. Please clone to internal SSD or HDD instead.

For best results, install the target (new) drive where you plan to use it and the source drive in another location, e.g. in an external USB enclosure. This recommendation is especially important for laptops.

On program screens, damaged partitions are marked with a red circle and a white cross inside in the upper left corner. Before you start cloning, you should check such disks for errors and correct the errors using the appropriate operating system tools.

To clone a disk:
- Click Clone disk on the Tools and utilities tab of the Home screen.
- Follow the Disk Clone Wizard steps.

2.1.1 Clone Disk wizard

Before you start, we recommend that you read general information about Disk cloning utility (p. 5).

To clone a disk:
1. On the sidebar, click Tools, and then click Clone disk.
2. On the Clone Mode step, choose a transfer mode.
   - Automatic—Recommended in most cases.
   - Manual—Manual mode will provide more data transfer flexibility. Manual mode can be useful if you need to change the disk partition layout.

If the program finds two disks, one partitioned and another unpartitioned, it will automatically recognize the partitioned disk as the source disk and the unpartitioned disk as the destination disk. In such case, the next steps will be bypassed and you will be taken to the cloning Summary screen.
3. On the **Source Disk** step, select the disk that you want to clone.

4. On the **Destination Disk** step, select the destination disk for the cloned data.

   If the selected destination disk contains partitions, you will need to confirm deletion of the partitions. Note that the real data destruction will be performed only when you click **Proceed** on the last step of the wizard.

   *If any disk is unpartitioned, the program will automatically recognize it as the destination and bypass this step.*

5. [This step is only available in the manual cloning mode]. On the **Move method** step, choose a data move method.

   - **As is**—a new partition will be created for every old one with the same size and type, file system and label. The unused space will become unallocated.
   - **Proportional**—the new disk space will be proportionally distributed between cloned partitions.
   - **Manual**—you will specify a new size and other parameters yourself.

6. [This step is only available in the manual cloning mode]. On the **Change disk layout** step, you can edit settings of the partitions that will be created on the destination disk. Refer to Manual partitioning (p. 8) for details.

7. [Optional step] On the **What to exclude** step, you can specify files and folders that you do not want to clone. Refer to Excluding items from cloning (p. 9) for details.
8. On the Finish step, ensure that the configured settings suit your needs, and then click Proceed.

If the cloning operation is stopped for some reason, you will have to configure and start the procedure again. You will not lose your data, because Intel Data Migration Software does not alter the original disk and data stored on it during cloning.

Cloning a disk containing the currently active operating system will require a reboot. In that case, after clicking Proceed, you will be asked to confirm the reboot. Canceling the reboot will cancel the entire procedure. By default, Data Migration Software shuts down the computer after the clone process finishes. This enables you to change the position of master/subordinate jumpers and remove one of the hard drives.
2.1.2 Manual partitioning

The manual transfer method enables you to resize partitions on the new disk. By default, the program resizes them proportionally.

To edit a partition:
1. Select the partition, and then click Edit. This will open the Partition Settings window.

2. Specify the following settings for the partition:
   - Size and position
   - File system
- Partition type (available only for MBR disks)
- Partition letter and label

Refer to Partition settings (p. 24) for details.

3. Click Accept.

⚠️ Be careful! Clicking any previous wizard step on the sidebar in this window will reset all size and location changes that you’ve selected, so you will have to specify them again.

### 2.1.3 Excluding items from cloning

If you do not want to clone specific files from a source disk (for example, when your target disk is smaller than the source one), you can opt to exclude them in the **What to exclude** step.

*We do not recommend excluding hidden and system files when cloning your system partition.*

---

You have two ways to exclude files and folders:

- **Exclude by files and folders** - this tab allows you to select specific files and folders from the folder tree.
- **Exclude by masks** - this tab allows you to exclude a group of files by mask or an individual file by name or path.

To add an exclusion criterion, click **Add**, type a file name, a path or a mask, and then click **OK**. You can add as many files and masks as you like.

**Examples of exclusion criteria:**

- You can enter explicit file names:
  - `file.ext` - all such files will be excluded from cloning.
  - `C:\file.ext` - the file.ext file on the C: disk will be excluded.
- You can use wildcard characters (* and ?):
  - `*.ext` - all files with a .ext extension will be excluded.
- `??name.ext` - all files with a `.ext` extension, having six letters in their names (starting with any two symbols `??`) and ending with `name`, will be excluded.
- You can enter path to a folder:
  - `C:\my pictures - my pictures` folder on the C: disk will be excluded.

You can edit and remove exclusion criteria using the corresponding buttons on the right pane.

### 2.2 Preparing for migration

Solid state disks have become quite common. Many users decide to replace their system hard disk with an SSD to enhance the disk system performance. Such a replacement may raise a number of questions.

First of all, make sure that Data Migration Software detects your new SSD both in Windows and under the Intel rescue media. If there is a problem, see What to do if Data Migration Software does not recognize your SSD (p. 10).

#### SSD size

Because SSDs are still somewhat expensive, the size of your new SSD will usually be less than that of your old hard disk. This may cause a problem if your hard disk contains the operating system, programs and data.

We presuppose that before purchasing the SSD you estimated the approximate space occupied by your operating system and applications and that you selected an SSD that has a reasonable reserve capacity.

If the occupied space on your old hard disk exceeds the size of your SSD, you will need to free up space on the system disk to make migration possible. See What to do if your SSD does not have enough space for all HDD content.

#### SSD alignment

Another question concerns the alignment of SSDs. To get the optimum performance from an SSD and to prolong its life, the partition offset must meet certain criteria. In most cases you do not need to check or manually fix the alignment, the program will do it automatically.

In any event, we recommend that you perform the following:

- Make sure the destination SSD does not contain partitions (the disk space is unallocated). Note that if your SSD is new and has never been used before, it does not contain partitions.

For more information see SSD support.

#### Which migration method to choose

If your system disk consists of a single partition (not counting the hidden System Reserved partition existing in many installations of Windows 7), you can try to migrate to the SSD using the Clone tool. For more information see Cloning a hard disk (p. 5).

### 2.2.1 What to do if Data Migration Software does not recognize your SSD

Sometimes Data Migration Software may not recognize an SSD.

In such a case, check whether the SSD is recognized in BIOS.
If the BIOS of your computer does not show the SSD, verify that the power and data cables are properly connected. You may also try to update the BIOS and SATA drivers. If these suggestions do not help, contact the Support of your SSD manufacturer.

If the BIOS of your computer does show the SSD, you can try the following procedure:

For Windows Vista/Windows 7 type `cmd` in the Search field and press Enter.

For Windows XP, type `cmd` in the Run field and press Enter.

At the command line prompt type:

```
diskpart
```

**list disk** The screen will show the disks connected to your computer. Find out the disk number for your SSD. Use its size as the reference.

**select disk N** Here N is the disk number of your SSD.

**clean** This operation removes all information from the SSD and overwrites the MBR with the default one.

**exit**

**exit**

Start Data Migration Software and check whether it detects the SSD. If it detects the SSD, use the Add new disk tool to create a single partition on the disk occupying the entire disk space. When creating a partition, check that the free space before partition is 1 MB. For more information, see Adding a new hard disk (p. 22).

The next step is to check whether your Intel bootable rescue media recognizes the SSD.

1. Boot from the rescue media.
2. Select **Tools & Utilities -> Add New Disk** in the main menu and the **Disk selection** screen will show the information about all hard disks in your system.
3. If the screen shows your SSD, just click **Cancel**.

If the rescue media does not recognize the SSD and the SSD controller mode is ACHI, you can try to change the mode to IDE (or ATA in some BIOS brands) and see whether this solves the problem.

**Attention! Do not start Windows after changing the mode; it may result in serious system problems. You must return the mode to ACHI before starting Windows.**

If after changing the mode the rescue media detects the SSD, you may use the following procedure for cloning under rescue media:

1. Shut down the computer.
2. Boot to BIOS, change the mode from AHCI to IDE (or ATA in some BIOS brands).
3. Boot from Intel rescue media.
4. Recover or clone the disk.
5. Boot to BIOS and change IDE back to AHCI.
Creating bootable rescue media

You can run Data Migration Software from a bootable media on a bare-metal system or a crashed computer that cannot boot. You can even back up disks on a non-Windows computer, copying all its data into the backup by imaging the disk in the sector-by-sector mode. To do so, you need bootable media that has a copy of the standalone Data Migration Software version installed on it.

How you can obtain bootable media:

- Use the installation CD, DVD, or USB flash drive of the boxed product.
- Make a media bootable with Intel Media Builder (p. 12):
  - Blank CD
  - Blank DVD
  - USB flash drive
    - Note: The data it may contain will not be modified.
  - Create an .iso image file to burn it afterwards onto a CD or DVD.
  - Create WinPE-based media with the Intel plug-in.
  - Create WinRE-based media with the Intel plug-in.

3.1 Intel Media Builder

Intel Media Builder allows you to make a USB flash drive or a blank CD/DVD bootable. In case Windows cannot start, use the bootable media to run a standalone version of Intel Data Migration Software and recover your computer.

You can create several types of bootable media:

- Intel bootable rescue media
  This type is recommended for most users.
- WinPE-based media with the Intel plug-in
  Running Data Migration Software in the preinstallation environment may provide better compatibility with your computer’s hardware because the preinstallation environment uses Windows drivers.
  We recommend that you create this type of media, when Intel bootable rescue media did not help you boot your computer.
  To use this option, you need one the following components to be installed:
    - Windows Automated Installation Kit (AIK).
      This component is required for creating WinPE 3.0.
    - Windows Assessment and Deployment Kit (ADK).
      This component is required for creating WinPE 4.0, WinPE 5.0, and WinPE 10.0.
- WinRE-based media with the Intel plug-in
  This type of rescue media is similar to WinPE-based media, but it has an important advantage—you do not need to download WADK or WAIK from the Microsoft website. Windows Recovery Environment is already included in Windows Vista and later versions of Windows. Data Migration Software just uses these files from your system to create WinRE-based media. Similar to WinPE-based media, you can add your drivers for better compatibility with your hardware. On the other hand, WinRE-based media can be used only on the computer where it was created or on a computer with the same operating system.
Notes

- We recommend that you create a new bootable media after each Data Migration Software update.
- If you use non-optical media, the media must have FAT16 or FAT32 file system.
- Intel Media Builder supports only x64 WinPE 3.0, WinPE 4.0, WinPE 5.0, and WinPE 10.0.
- Your computer must have:
  - For WinPE 3.0—at least 256 MB RAM
  - For WinPE 4.0—at least 512 MB RAM
  - For WinPE 5.0—at least 1 GB RAM
  - For WinPE 10.0—at least 512 MB RAM
- If Intel Media Builder does not recognize your USB flash drive, you can try using the procedure described in an Intel Knowledge Base article at http://kb.acronis.com/content/1526.
- When booting from the Rescue Media, you cannot perform backups to disks or partitions with Ext2/Ext3/Ext4, ReiserFS, and Linux SWAP file systems.
- When booting from the rescue media and using a standalone version of Data Migration Software you cannot recover files and folders encrypted with use of the encryption available in Windows XP and later operating systems. For more information, see File-level security settings for backup. On the other hand, backups encrypted using the Data Migration Software encryption feature can be recovered.

3.1.1 Creating bootable media

To create bootable media:
1. Plug in a USB flash drive, or insert a blank CD or DVD.
2. Start Data Migration Software.
3. In the Tools section, click Rescue Media Builder.
4. Choose a creation method:
   - Simple—This is the easiest option. Intel Data Migration Software will choose the optimal media type for your computer. If you use Windows 7 or a later version, WinRE-based media will be created. For users of Windows XP, Intel Data Migration Software checks if WAIK or WADK is installed on your computer, and if so, then WinPE-based media will be created. Otherwise, Intel Media Builder will create a Linux-based media.
   - Advanced—This option allows you to choose a media type, therefore you can create the rescue media not only for your computer, but for a computer running a different Windows version. Refer to Intel Media Builder (p. 12) for details.

If you select a Linux-based media, then choose Intel components to be placed on the media. Please ensure that the components that you select are compatible with the target computer architecture. Refer to Removable media settings for details.

If you select a WinRE-based or WinPE-based media, then:
   - Select an architecture type of the media—32-bit or 64-bit. Note that 32-bit rescue media can work only on 32-bit computers, and 64-bit media is compatible with both 32-bit and 64-bit computers.
   - Select a toolkit that you want to be used for the rescue media creation. If you choose WAIK or WADK and you do not have the selected kit installed on your computer, then you first need to download it from the Microsoft website, and then install the required
components—Deployment Tools and Windows Preinstallation Environment (Windows PE).

If you already have WinPE files on your computer and they are stored in a non-default folder, then just specify their location and the Intel plug-in will be added to the existing WinPE image.

- For better compatibility with your hardware, you can select drivers to be added to the media.

5. Select a destination for the media:

- CD
- DVD
- USB flash drive
  
  If your drive has an unsupported file system, Intel Data Migration Software will suggest formatting it to FAT file system.

  **Warning! Formatting permanently erases all data on a disk.**

- ISO image file

  You will need to specify the .iso file name and the destination folder.

  When the .iso file is created, you can burn it onto a CD or DVD. For example, in Windows 7 and later, you can do this using a built-in burning tool. In File Explorer, double-click the created ISO image file, and then click **Burn**.

- WIM image file (available only for WinPE-based media)

  Intel Data Migration Software adds the Intel plug-in to the .wim file from Windows AIK or Windows ADK. You will need to specify a name for the new .wim file and the destination folder.

  To create a bootable media by using a .wim file, you first need to convert it to an .iso file.

  Refer to Creating an .iso file from a .wim file (p. 16) for details.

6. Click **Proceed**.

### 3.1.2 Bootable media startup parameters

Here, you can set bootable media startup parameters in order to configure rescue media boot options for better compatibility with different hardware. Several options are available (nousb, nomouse, noapic, etc.). These parameters are provided for advanced users. If you encounter any hardware compatibility problems while testing boot from the rescue media, it may be best to contact the product’s support team.

**To add a startup parameter**

- Enter a command into the **Parameters** field.
- Having specified the startup parameters, click **Next** to continue.

**Additional parameters that can be applied prior to booting Linux kernel**

**Description**

The following parameters can be used to load Linux kernel in a special mode:

- **acpi=off**
Disables ACPI and may help with a particular hardware configuration.

- **noapic**

Disables APIC (Advanced Programmable Interrupt Controller) and may help with a particular hardware configuration.

- **nousb**

Disables loading of USB modules.

- **nousb2**

Disables USB 2.0 support. USB 1.1 devices still work with this option. This option allows using some USB drives in USB 1.1 mode, if they do not work in USB 2.0 mode.

- **quiet**

This parameter is enabled by default and the startup messages are not displayed. Deleting it will result in the startup messages being displayed as the Linux kernel is loaded and the command shell being offered prior to running the Intel program.

- **nodma**

Disables DMA for all IDE disk drives. Prevents kernel from freezing on some hardware.

- **nofw**

Disables FireWire (IEEE1394) support.

- **nopcmcia**

Disables PCMCIA hardware detection.

- **nomouse**

Disables mouse support.

- **[module name]=off**

Disables the module (e.g. *sata_sis=off*).

- **pci=bios**

Forces to use PCI BIOS, and not to access the hardware device directly. For instance, this parameter may be used if the machine has a non-standard PCI host bridge.

- **pci=nobios**

Disallows use of PCI BIOS; only direct hardware access methods are allowed. For instance, this parameter may be used if you experience crashes upon boot-up, probably caused by the BIOS.

- **pci=biosirq**

Uses PCI BIOS calls to get the interrupt routing table. These calls are known to be buggy on several machines and they hang the machine when used, but on other computers it is the only way to get the interrupt routing table. Try this option, if the kernel is unable to allocate IRQs or discover secondary PCI buses on your motherboard.

- **vga=ask**

Gets the list of the video modes available for your video card and allows selecting a video mode most suitable for the video card and monitor. Try this option, if the automatically selected video mode is unsuitable for your hardware.
3.1.3 Adding drivers to an existing .wim image

Sometimes a basic WinPE disk with Intel Plug-in does not have drivers for your specific hardware, for example, for storage device controllers. The easiest way to add them is to select the Advanced mode in Rescue Media Builder (p. 13) and specify the drivers to add. You can add the drivers manually to an existing .wim file before creating an ISO file with Intel Plug-in.

Attention! You can only add drivers which have the .inf filename extension.

The following procedure is based on an MSDN article that can be found at http://technet.microsoft.com/en-us/library/dd799244(WS.10).aspx

To create a custom Windows PE image, proceed as follows:

1. If you don’t have the .wim file with the Intel plug-in, start Rescue Media Builder and create it by choosing WIM file as a destination for the WinPE-based media. Refer to Creating bootable media (p. 13) for details.

2. Depending on your version of Windows AIK or Windows ADK, do one of the following:
   - In the Start menu, click Microsoft Windows AIK, right-click Windows PE Tools Command Prompt, and then select Run as administrator.
   - In the Start menu, click Microsoft Windows AIK, right-click Deployment Tools Command Prompt, and then select Run as administrator.
   - In the Start menu, click Windows Kits, click Windows ADK, right-click Deployment and Imaging Tools Environment, and then select Run as administrator.

3. Run the Copype.cmd script to create a folder with Windows PE files. For example, from a command prompt, type:
   ```
copype amd64 C:\winpe_x64
   ```

4. Copy your .wim file, for example, to folder C:\winpe_x64. By default, this file is named IntelBootablePEMedia.wim.

5. Mount the base image to a local directory by using the DISM tool. To do this, type:
   ```
   Dism /Mount-Wim /WimFile:C:\winpe_x64\IntelBootablePEMedia.wim /index:1 /MountDir:C:\winpe_x64\mount
   ```

6. Add your hardware driver, by using the DISM command with the Add-Driver option. For example, to add the Mydriver.inf driver located in folder C:\drivers, type:
   ```
   Dism /image:C:\winpe_x64\mount /Add-Driver /driver:C:\drivers\mydriver.inf
   ```

7. Repeat the previous step for each driver that you need to add.

8. Commit the changes by using the DISM command:
   ```
   Dism /Unmount-Wim /MountDir:C:\winpe_x64\mount /Commit
   ```

9. Create a PE image (.iso file) from the resulting .wim file. Refer to Creating an .iso file from a .wim file for details.

3.1.4 Creating an .iso file from a .wim file

To create a bootable media by using a .wim file, you need to convert it to an .iso file first.

To create a PE image (.iso file) from the resulting .wim file:

1. Depending on your version of Windows AIK or Windows ADK, do one of the following:
   - In the Start menu, click Microsoft Windows AIK, right-click Windows PE Tools Command Prompt, and then select Run as administrator.
- In the **Start** menu, click **Microsoft Windows AIK**, right-click **Deployment Tools Command Prompt**, and then select **Run as administrator**.
- In the **Start** menu, click **Windows Kits**, click **Windows ADK**, right-click **Deployment and Imaging Tools Environment**, and then select **Run as administrator**.

2. Run the **Copype.cmd** script to create a folder with Windows PE files. For example, from a command prompt, type:

   ```
copype amd64 C:\winpe_x64
   ```

3. Replace the default boot.wim file in your Windows PE folder with the newly created .wim file (for example, IntelBootablePEMedia.wim). If the IntelBootablePEMedia.wim file is located on c:\, then:

   For WinPE 3.0, type:
   ```
copy c:\IntelBootablePEMedia.wim c:\winpe_x64\ISO\sources\boot.wim
   ```

   For WinPE 4.0, WinPE 5.0 or WinPE 10.0, type:
   ```
copy "c:\IntelBootablePEMedia.wim" c:\winpe_x64\media\sources\boot.wim
   ```

4. Use the **Osccdimg** tool. To create an .iso file, type:

   ```
osccdimg -n -bc:\winpe_x64\etfsboot.com c:\winpe_x64\ISO
   c:\winpe_x64\winpe_x64.iso
   ```

   Alternatively, to make the media bootable on both BIOS and UEFI computers, type:
   ```
osccdimg -m -o -u2 -udfver102
   -bootdata:2#p0,e,bc:\winpe_x64\fwfiles\etfsboot.com#pEF,e,bc:\winpe_x64\fwfiles\efisys.bin c:\winpe_x64\media c:\winpe_x64\winpe_x64.iso
   ```

5. Burn the .iso file to a CD by using a third-party tool, and you will have a bootable Windows PE disc with Data Migration Software.

### 3.2 Making sure that your rescue media can be used when needed

To maximize the chances of your computer's recovery, you must test that your computer can boot from the rescue media. In addition, you must check that the rescue media recognizes all your computer's devices, such as the hard drives, the mouse, the keyboard, and network adapter.

**To test the rescue media**

*If you use external drives for storing your backups, you must attach the drives before booting from the rescue CD. Otherwise, the program might not detect them.*

1. Configure your computer to enable booting from the rescue media. Then, make your rescue media device (CD-ROM/DVD-ROM drive or USB stick) the first boot device. See Arranging boot order in BIOS.
2. If you have a rescue CD, press any key to start booting from the CD, when you see the prompt "Press any key to boot from CD". If you do not press a key within five seconds, you will need to restart the computer.
3. After the boot menu appears, choose **Intel Data Migration Software**.

*If your wireless mouse does not work, try to replace it with a wired one. The same recommendation applies to the keyboard.*

*If you do not have a spare mouse or keyboard, contact Intel Support. They will build a custom rescue CD that will have drivers for your models of the mouse and keyboard. Please be aware that finding the*
appropriate drivers and making the custom rescue CD may take some time. Furthermore, this may be impossible for some models.

4. When the program starts, we recommend you try recovering some files from your backup. A test recovery allows you to make sure that your rescue CD can be used for recovery. In addition, you will check that the program detects all the hard drives you have in your system.

   *If you have a spare hard drive, we strongly recommend that you try a test recovery of your system partition to this hard drive.*

**How to test recovery, as well as check the drives and network adapter**

1. If you have file backups, start Recovery Wizard by clicking **Recovery -> File Recovery** on the toolbar.

   *If you have only disk and partition backup, Recovery Wizard also starts and the recovery procedure is similar. In such a case, you need to select **Recover chosen files and folders** at the **Recovery Method** step.*

2. Select a backup at the **Archive location** step and then click **Next.**
3. When recovering files with the rescue CD you are able to select only a new location for the files to be recovered. Therefore just click Next at the Location selection step.

4. After the Destination window opens, check that all your drives are shown under My Computer.

   If you store your backups on the network, you should also check that you can access the network.

   If no computers are visible on the network, but the Computers Near Me icon is found under My Computer, specify network settings manually. To do this, open the window available at Tools & Utilities → Options → Network adapters.

   If the Computers Near Me icon is not available under My Computer, there may be problems either with your network card or with the card driver provided with Data Migration Software.

5. Select the destination for the files and then click Next.
6. Select several files for recovery by selecting their check boxes and then click **Next**.

7. Click **Proceed** on the Summary window to start recovery.

8. After the recovery finishes, exit the standalone Intel Data Migration Software.

Now you can be reasonably sure that your rescue CD will help you when needed.

### 3.2.1 Selecting video mode when booting from the rescue media

When booting from the rescue media the optimal video mode is selected automatically depending on the specifications of your video card and monitor. However, sometimes the program can select the wrong video mode, which is unsuitable for your hardware. In such case you can select a suitable video mode as follows:

1. Start booting from the rescue media. When the boot menu appears, hover the mouse over **Data Migration Software** item and press the F11 key.
2. When the command line appears, type "vga=ask" (without quotes) and click OK.

3. Select Data Migration Software in the boot menu to continue booting from the rescue media. To see the available video modes, press the Enter key when the appropriate message appears.

4. Choose a video mode you think best suitable for your monitor and type its number in the command line. For instance, typing 338 selects video mode 1600x1200x16 (see the below figure).

5. Wait until Data Migration Software starts and make sure that the quality of the Welcome screen display on your monitor suits you.

To test another video mode, close Data Migration Software and repeat the above procedure.

After you find the optimal video mode for your hardware, you can create a new bootable rescue media that will automatically select that video mode.

To do this, start Intel Media Builder, select the required media components, and type the mode number with the "0x" prefix (0x338 in our instance) in the command line at the "Bootable media startup parameters" step, then create the media as usual.
4 Adding a new hard disk

If you do not have enough space for your data, you can either replace the old disk with a new higher-capacity one, or add a new disk only to store data, leaving the system on the old disk.

To add a new hard disk:
1. Shut down your computer, and then install the new disk.
2. Turn on your computer.
3. Click the Start button —> Intel (product folder) —> Data Migration Software —> Tools and Utilities —> Add New Disk.
4. Follow the wizard steps.
5. On the Finish step, ensure that the configured disk layout suits your needs, and then click Proceed.

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4.1 Selecting a hard disk

Select the disk that you have added to the computer. If you have added several disks, select one of them and click Next to continue. You can add the other disks later by restarting the Add New Disk Wizard.

If there are any partitions on the new disk, Data Migration Software will warn you that these partitions will be deleted.
4.2 Selecting initialization method

Data Migration Software supports both MBR and GPT partitioning. GUID Partition Table (GPT) is a new hard disk partitioning method providing advantages over the old MBR partitioning method. If your operating system supports GPT disks, you can select the new disk to be initialized as a GPT disk.

- To add a GPT disk, click Initialize disk in GPT layout.
- To add an MBR disk, click Initialize disk in MBR layout.

*If you use a 32-bit version of Windows XP, the GPT initialization method will be unavailable and the Initialization options step will be absent.*

After selecting the required initialization method click **Next**.

4.3 Creating new partitions

To use the space on a hard disk, it must be partitioned. Partitioning is the process of dividing the hard disk’s space into logical divisions which are called partitions. Each partition may function as a separate disk with an assigned drive letter, its own file system, etc.

To create a new partition:

1. On the **Partition creation** step of the wizard, select the unallocated space, and then click **Create new partition**.
2. Specify the following settings for the partition being created:
   - Size and position
   - File system
   - Partition type (available only for MBR disks)
   - Partition letter and label

Refer to Partition settings (p. 24) for details.
3. Click Accept.

4.3.1 Partition settings

Size

To resize the partition, perform one of the following:

- Point to the partition border. When the pointer becomes a double-headed arrow, drag the pointer to enlarge or reduce the partition size.
- Type the desired partition size in the Partition Size field.

To relocate the partition, perform one of the following:

- Drag the partition to a new position.
- Type the desired size in either the Free space before or Free space after field.

*When you create partitions, the program may reserve some unallocated space for system needs in front of the created partitions.*

File System

You can either leave the partition unformatted, or choose between the following file system types:

- **NTFS** is a Windows NT, Windows 2000, Windows XP, Windows Vista, and Windows 7 native file system. Choose it if you use these operating systems. Note, that Windows 95/98/Me and DOS cannot access NTFS partitions.
- **FAT 32** is an improved 32-bit version of the FAT file system that supports volumes up to 2 TB.
- **FAT 16** is a DOS native file system. Most operating systems recognize it. However, if your disk drive is more than 4 GB, it is not possible to format it in FAT16.
- **Ext2** is a Linux native file system. It is fast enough, but it is not a journaling file system.
- **Ext3** – officially introduced with Red hat Linux version 7.2, Ext3 is a Linux journaling file system. It is forwards and backwards compatible with Linux Ext2. It has multiple journaling modes, as well as broad, cross platform compatibility in both 32-bit and 64-bit architectures.

- **Ext4** is a new Linux file system. It has improvements in comparison to ext3. It is fully backward compatible with ext2 and ext 3. However, ext3 has only partial forward compatibility with ext4.

- **ReiserFS** is a journaling file system for Linux. Generally it is more reliable and faster than Ext2. Choose it for your Linux data partition.

- **Linux Swap** is a swap partition for Linux. Choose it if you want to add more swap space using Linux.

**Partition letter**

Select a letter to be assigned to the partition. If you select Auto, the program assigns the first unused drive letter in alphabetical order.

**Partition label**

Partition label is a name, assigned to a partition so that you can easily recognize it. For example, a partition with an operating system could be called System, a data partition — Data, etc. Partition label is an optional attribute.

**Partition type (these settings are available only for MBR disks)**

You can define the new partition as primary or logical.

- **Primary** - choose this parameter if you are planning to boot from this partition. Otherwise, it is better to create a new partition as a logical drive. You can have only four primary partitions per drive, or three primary partitions and one extended partition.

  Note: If you have several primary partitions, only one will be active at a time, the other primary partitions will be hidden and won’t be seen by the OS.

- **Mark the partition as active** - select this check box if you are planning to install an operating system on this partition.

- **Logical** - choose this parameter if you don’t intend to install and start an operating system from the partition. A logical drive is part of a physical disk drive that has been partitioned and allocated as an independent unit, but functions as a separate drive.

---

5 Acronis DriveCleanser

Acronis DriveCleanser allows you to permanently destroy all data on selected hard disks and partitions. For the destruction, you can use one of the preset algorithms or create your own. Refer to Algorithm selection (p. 27) for details.

**Why do I need it?**

When you format your old hard drive before throwing it away, the information is not destroyed permanently and it can still be retrieved. This is a way that your personal information can end up in the wrong hands. To prevent this, we recommend that you use Acronis DriveCleanser when you:

- Replace your old hard drive with a new one and do not plan to use the old drive any more.
- Give your old hard drive to your relative or friend.
- Sell your old hard drive.
How to use Acronis DriveCleanser

To permanently destroy data on your disk:

1. Click the Start button —> Intel (product folder) —> Data Migration Software —> Tools and Utilities —> DriveCleanser.
   The Acronis DriveCleanser wizard opens.

2. On the Source selection step, select the disks and partitions that you want to wipe. Refer to Source selection (p. 26) for details.

3. On the Algorithm selection step, select an algorithm that you want to use for the data destruction. Refer to Algorithm selection (p. 27) for details.

4. [optional step] You can create your own algorithm. Refer to Creating custom algorithm for details.

5. [optional step] On the Post-wiping actions step, choose what to do with the partitions and disk when the data destruction is complete. Refer to Post-wiping actions (p. 29) for details.

6. On the Finish step, ensure that the configured settings are correct. To start the process, select the Wipe the selected partitions irreversibly check box, and then click Proceed.

Be aware that, depending on the total size of selected partitions and the selected data destruction algorithm, the data destruction may take many hours.

5.1 Source selection

On the Source selection step, select partitions and disks where you want to destroy data:

- To select partitions, click the corresponding rectangles. The red mark (x) indicates that the partition is selected.

- To select an entire hard disk, click the disk icon ( ).

Acronis DriveCleanser cannot wipe partitions on dynamic and GPT disks, so they will not be shown.
5.2 Algorithm selection

On the Algorithm selection step, perform one of the following:

- To use one of the preset algorithms, select the desired algorithm. Refer to Hard Disk Wiping Methods (p. 29) for details.
- [For advanced users only] To create a custom algorithm, select Custom. Then continue creating on the Algorithm definition step. Afterwards, you will be able to save the created algorithm to a file with *.alg extension.
- To use a previously saved custom algorithm, select Load from file and select the file containing your algorithm.

5.2.1 Creating custom algorithm

Algorithm definition

The Algorithm definition step shows you a template of the future algorithm.

The table has the following legend:

- The first column contains the type of operation (to write a symbol to disk; and to verify written).
- The second column contains the pattern of data to be written to disk.

Each line defines an operation that will be performed during a pass. To create your algorithm, add as many lines to the table that you think will be enough for secure data destruction.

To add a new pass:
1. Click **Add**. The Wiping Pass Adjustment window opens.

   ![Wiping Pass Adjustment window](image)

2. Choose an option:
   - **Write pattern**
     Enter a hexadecimal value, for example, a value of this kind: 0x00, 0xAA, or 0xCD, etc. These values are 1 byte long, but they may be up to 512 bytes long. Except for such values, you may enter a random hexadecimal value of any length (up to 512 bytes).

     *If the binary value is represented by the 10001010 (0x8A) sequence, then the complementary binary value will be represented by the 01110101 (0x75) sequence.*

   - **Write a random number**
     Specify the length of the random value in bytes.

   - **Write complementary to previous pass pattern**
     Intel Data Migration Software adds a complementary value to the one written to disk during the previous pass.

   - **Verify**
     Intel Data Migration Software verifies the values written to disk during the previous pass.

3. Click **OK**.

**To edit an existing pass:**

1. Select the corresponding line, and then click **Edit**.
   The Wiping Pass Adjustment window opens.

   *Note: When you select several lines, the new settings will be applied to all of the selected passes.*

2. Change the settings, and then click **OK**.

**Saving algorithm to a file**

To save the created algorithm to a file in order to use this algorithm afterwards:

1. On the **Saving custom algorithm** step, select **Save to a file**, and then click **Next**.
2. In the window that opens, specify the file name and location, and then click **OK**.
5.3 Post-wiping actions

In the Post-wiping actions window, you can select actions to be performed on the partitions selected for data destruction. Acronis DriveCleanser offers you three options:

- **No action** — just destroy data using the algorithm selected below
- **Delete partition** — destroy data and delete partition
- **Format** — destroy data and format partition (default).

5.4 Hard Disk Wiping methods

**What is the problem?**

Information removed from a hard disk drive by non-secure means (for example, by simple Windows delete) can easily be recovered. Utilizing specialized equipment, it is possible to recover even repeatedly overwritten information.

**Leakage mechanism**

Data is stored on a hard disk as a binary sequence of 1 and 0 (ones and zeros), represented by differently magnetized parts of a disk.

Generally speaking, a 1 written to a hard disk is read as 1 by its controller, and 0 is read as 0. However, if you write 1 over 0, the result is conditionally 0.95 and vice versa – if 1 is written over 1 the result is 1.05. These differences are irrelevant for the controller. However, using special equipment, one can easily read the «underlying» sequence of 1's and 0's.

**Information wiping methods used by Intel**

The detailed theory of guaranteed information wiping is described in an article by Peter Gutmann. Please see "Secure Deletion of Data from Magnetic and Solid-State Memory" at [http://www.cs.auckland.ac.nz/~pgut001/pubs/secure_del.html](http://www.cs.auckland.ac.nz/~pgut001/pubs/secure_del.html).
<table>
<thead>
<tr>
<th>No.</th>
<th>Algorithm (writing method)</th>
<th>Passes</th>
<th>Record</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>United States Department of Defense 5220.22-M</td>
<td>4</td>
<td>1st pass – randomly selected symbols to each byte of each sector, 2 – complementary to written during the 1st pass; 3 – random symbols again; 4 – writing verification.</td>
</tr>
<tr>
<td>2.</td>
<td>United States: NAVSO P-5239-26 (RLL)</td>
<td>4</td>
<td>1st pass – 0x01 to all sectors, 2 – 0x27FFFFFF, 3 – random symbol sequences, 4 – verification.</td>
</tr>
<tr>
<td>3.</td>
<td>United States: NAVSO P-5239-26 (MFM)</td>
<td>4</td>
<td>1st pass – 0x01 to all sectors, 2 – 0x7FFFFFFF, 3 – random symbol sequences, 4 – verification.</td>
</tr>
<tr>
<td>4.</td>
<td>German: VSITR</td>
<td>7</td>
<td>1st – 6th – alternate sequences of: 0x00 and 0xFF; 7th – 0xAA; i.e. 0x00, 0xFF, 0x00, 0xFF, 0x00, 0xFF, 0xAA.</td>
</tr>
<tr>
<td>5.</td>
<td>Russian: GOST P50739-95</td>
<td>1</td>
<td>Logical zeros (0x00 numbers) to each byte of each sector for 6th to 4th security level systems. Randomly selected symbols (numbers) to each byte of each sector for 3rd to 1st security level systems.</td>
</tr>
<tr>
<td>6.</td>
<td>Peter Gutmann’s method</td>
<td>35</td>
<td>Peter Gutmann’s method is very sophisticated. It’s based on his theory of hard disk information wiping (see Secure Deletion of Data from Magnetic and Solid-State Memory).</td>
</tr>
<tr>
<td>7.</td>
<td>Bruce Schneier’s method</td>
<td>7</td>
<td>Bruce Schneier offers a seven-pass overwriting method in his Applied Cryptography book. 1st pass – 0xFF, 2nd pass – 0x00, and then five times with a cryptographically secure pseudo-random sequence.</td>
</tr>
<tr>
<td>8.</td>
<td>Fast</td>
<td>1</td>
<td>Logical zeros (0x00 numbers) to all sectors to wipe.</td>
</tr>
</tbody>
</table>
6 Troubleshooting

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6.1 Intel System Report

When you contact the product's support team, they usually need information about your system in order to resolve your problem. Sometimes getting the information is an inconvenient process and may take a long time. The Generate system report tool simplifies the procedure. It generates a system report containing all the necessary technical information and allows you to save the information to file. When it's necessary, you can attach the created file to your problem description and send it to the product's support team. This will simplify and speed up the search for a solution.

To generate a system report, perform one of the following:

- On the main program window click the question mark symbol, and select Generate system report.
- On the Windows Start menu, click All Programs -> Intel -> Data Migration Software -> Tools and Utilities -> Intel System Report.
- Press CTRL+F7. Note that you can use the key combination even when Data Migration Software is performing any other operation.

After the report is generated:

- To save the generated system report to file, click Save and in the opened window specify a location for the created file.
- To exit to the main program window without saving the report, click Cancel.
- When you create your bootable rescue media, the Intel System Report tool is automatically placed on the media as a separate component. This component allows you to generate a system report when your computer cannot boot. After you boot from the media, you can generate the report without running Data Migration Software. Simply plug in a USB flash drive and click the Intel System Report icon. The generated report is be saved on the USB flash drive.

Creating a system report from the command line prompt

1. Run Windows Command Processor (cmd.exe) as administrator.
2. Change the current directory to the Data Migration Software installation folder. To do so, enter:
   ```
   cd C:\Program Files (x86)\Intel\Data Migration Software
   ```
3. To create the system report file, enter:
   ```
   SystemReport
   ```
   File SystemReport.zip will be created in the current folder.
   If you want to create the report file with a custom name, type the new name instead of <file name>:
   ```
   SystemReport.exe /filename:<file name>
   ```
6.2 How to collect crash dumps

Because a crash of Data Migration Software or Windows can be caused by different reasons, each crash case must be investigated separately. Intel Customer Central would appreciate if you could provide the following information:

If Data Migration Software crashes, please provide the following information:
1. A description of the exact sequence of steps performed before you encountered the issue.
2. A crash dump. For information on how to collect such a dump, see the Intel Support Knowledge Base (KB) article at http://kb.acronis.com/content/27931.

If Data Migration Software causes a Windows crash:
1. A description of the exact sequence of steps performed before you encountered the issue.
2. A Windows dump file. For information on how to collect such a dump see the Intel Support KB article at http://kb.acronis.com/content/17639.

If Data Migration Software hangs:
1. A description of the exact sequence of steps performed before you encountered the issue.
2. A userdump of the process. See the Intel Support KB article at http://kb.acronis.com/content/6265.
3. The Procmon log. See the Intel Support KB article at http://kb.acronis.com/content/2295.

If you cannot access the information, contact Intel Customer Central for an FTP link for uploading files.

This information will speed up the process of finding a solution.
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