SDS 17.0

User guide

softthinks™

TECHNOLOGIES

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Welcome to the SoftThinks Deployment Suite (SDS) 17.0 User Guide!

SDS is a unified, modular and multiplatform (Windows, macOS (BETA), iOS, Android, Windows Phone) solution for deployment, maintenance and repair.

WARNING: This product, being scalable and customizable, some features described in this document may not be available in your version of the product and the screenshots may not exactly match your workflow. Also, some customizations of your product version may not be described in this document.

For SDS 16.0 users, this update mainly brings the following changes:

1. Full support for Windows 10 up to the Creator Update (Redstone 2)
2. macOS support (BETA): capture & deployment, secure wipe, diagnostics
3. Drivers analyzation tool to identify and remove duplicate drivers
4. HDD & SSD enhanced diagnostics
5. Windows 10 Recovery through the installation of SoftThinks Backup And Recovery (SBAR) solution during deployment
6. License management simplification
7. Wipe report generator
8. Various fixes, enhancements and optimizations:
    a. Better support of compact images
    b. Network check before image copy to the server
    c. Integration of the « asset tag » for traceability purposes (serial number or service tag inconsistent)
    d. Better management of logical partitions
    e. Optimization of the Nomad Disks boot time

We also developed a Dashboard (web portal) to which you can push all operations made on your SDS server(s), make them accessible to whomever you want with specific rights in a very convenient and customizable graphical way. You can also export statistics very easily with many filters and criteria (See SDS Dashboard User Guide).

If you created bootable USB sticks with an older version you will need to update them (See Create Deployment USB stick).

It is mandatory to update your WinPE image(s) to the latest version (build 10586 at the latest) for full compatibility with all Windows versions and the support of the latest enhancements, bring to Bitlocker for example, but also for the hardware diagnostics.

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Glossary

Definitions, Acronyms and Abbreviations used in this user guide

Term	Explanation
ADF	**A**utomatic **D**eployment **F**ile: Similar to the Profile in that it is linked to specific hardware. The difference is that it also is named with a unique identifier for the model being deployed such as the Motherboard Part Number
Boot key / stick	Bootable USB key you can use to boot a computer without PXE boot
BTO	**B**uilt **T**o **O**rder: These are PCs that are built as they are ordered by the customer with a specific hardware configuration
CRC	**C**yclic **R**edundancy **C**heck: Error correction method
CTO	**C**onfigured **T**o **O**rder: These are PCs that are installed with a specific set of software as ordered by the customer
Factory Image	First complete system backup made in Factory to restore the system to its Factory state.
FAT	**F**ile **A**llocation **T**able: File System managing files up to 4GB
INF	This refers to the text files that permits the installation of peripheral, those files are using the extension .INF (mymodem.INF)
LAN	**L**ocal **A**rea **N**etwork
MBR	**M**aster **B**oot **R**ecord
Nomad Disk	Instead of using a server, you install the software on an external hard drive.
NTFS	**N**ew **T**echnology **F**ile **S**ystem: file system was introduced originally in Windows NT. It has been used in all versions since Windows 2000. NTFS is reliable, fast, and virtually incorruptible and can recognize and format large hard disks
OOBE	**O**ut-**O**f-**B**ox **E**xperience
PnP	**P**lug a**n**d **P**lay: system that enables the installation of peripherals without any manual operation on the hardware (I.e. Jumpers)
PnP ID	Plug a**n**d **P**lay **ID**entifier: strings returned by PnP hardware when enumerated by the operating system
POST	**P**ower **O**n **S**elf **T**est: Sequence of test that happens while a PC is cold-booting (i.e. RAM count)
Preset	Predefined setup of options that can be applied to any unit (not linked to any specific hardware) in order to deploy Generic Images
Profile	Predefined setup of options linked to specific hardware and so which it can only be used to deploy Static Images to a specific model of computer
PXE	**P**reboot e**X**ecution **E**nvironnement
RIS	**R**emote **I**nstallation **S**ervices
Smart Image	Small update to the base image that is applied to the same hardware that captured from. The system will apply the base image and then the smart images
WinPE / WinRE	**Win**dows **P**reinstallation **E**nvironment: lightweight version of Windows used for the deployment of workstations and servers or troubleshooting an operating system while it is offline
WinRE	**Win**dows **R**ecovery **E**nvironment: used primarily to help save or salvage your Windows operating system

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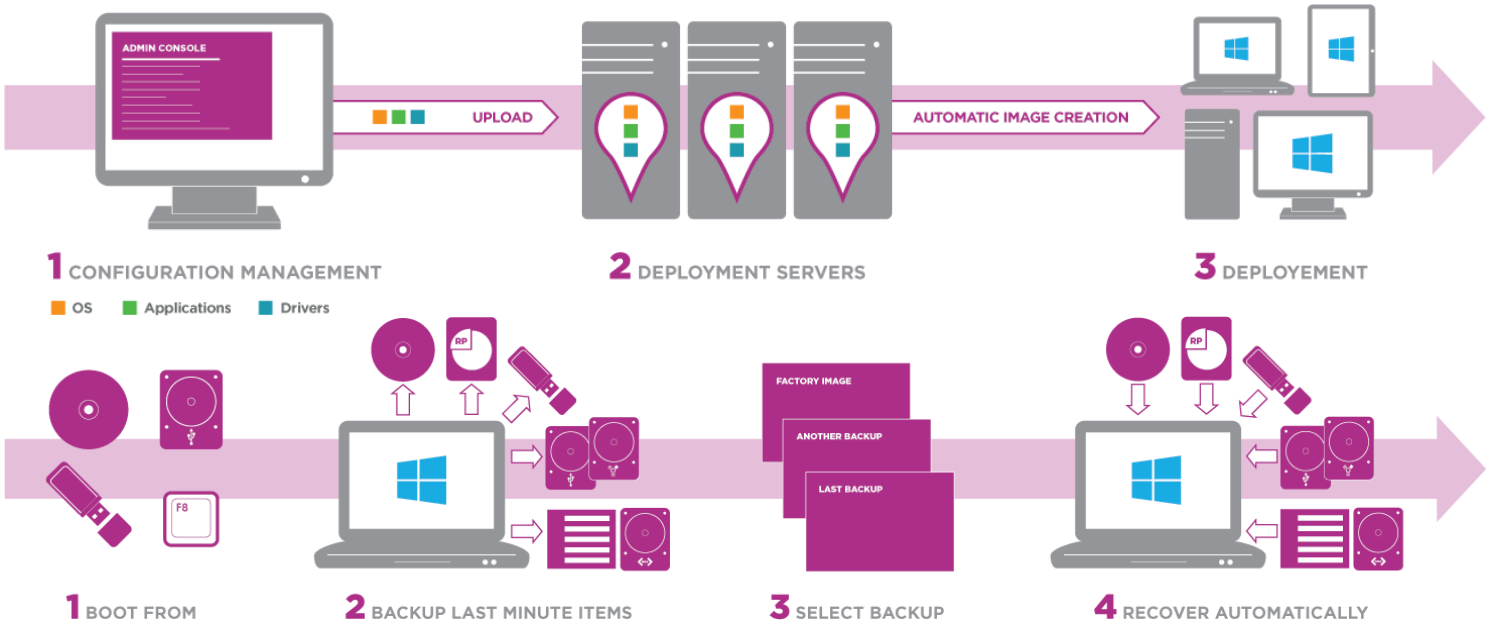
Presentation

SDS is a solution dedicated to operating systems and applications deployment.
Designed for your computer, SDS allows you to effectively manage the process of PC repair.



SDS: industrialization to reduce repair and production costs

- Automatic deployment solution:
  - Deploy according to BOM, hardware PNP, ...
  - Full BTO/CTO support
- One controlled process:
  - Entire process managed by using a powerful script
  - Embedded automatic decision maker
- More services for more profitability:
  - Each module by service, can be activated on an as needed basis
  - High added value branded services for end-user support and maintenance
  - On-site and off-site availability

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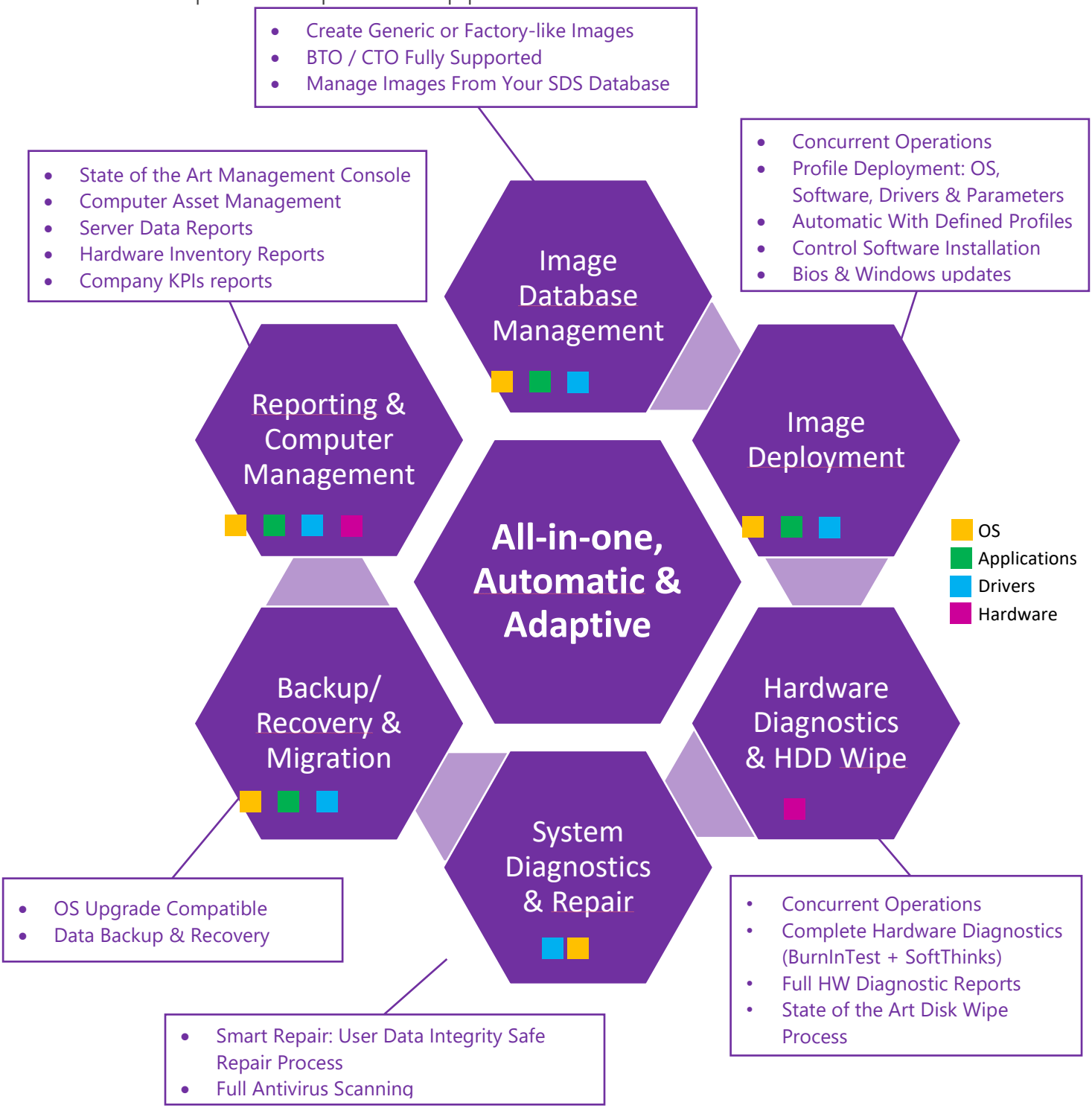
SDS: Unique Computer Support Solution



All-In-One : The Most Complete Deployment, Maintenance & Refurbishing Package Available
Automatic : Capable of Being Automated and Can Run Features Simultaneously
Adaptive : Modify up to 20 Features for Manufacturing Original Equipment, Managing Computer Repair Centers, Running Refurbishing Activities, Maintaining Computers, Running Small Repair Businesses

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Dynamic Technology Overview

This chapter aims to give you a broad picture of what is SoftThinks Dynamic Preload and Recovery Technology using the example of a BTO/CTO PC manufacturer.
Of course, all parts briefly covered in this Technology Overview will be thoroughly detailed throughout this manual as we go along with the different processes involved. However, reading this overview should help you understand the more technical issues you will face during the implementation of the technology as described in the manual. You will also be ready to prepare your company's production and recovery strategies.

BTO/CTO PC Manufacturing Industry production facts

Consider the following example:

- A PC manufacturer produces **BTO** PCs using the 17 following devices which require specific set-up during production such as driver integration within the operating system preinstalled before shipment of the PC:
  - 4 x Motherboards
  - 5 x Graphic cards and their bundle software
  - 3 x Sound Cards and their bundle software
  - 2 x Modems and their bundle software
  - 3 x Network devices

Note: Although there can be some other hardware specifications like cases, CPUs, hard disks, we do not take them into consideration in our example, as they do not affect the pre-installation process in production nor the restore of the PC after a crash at end user level.

Only considering the different hardware configurations, the "OEM" already has a potential of 4 x 5 x 3 x 2 x 3 = **360** different PCs that can leave the production line (BTO).

- "OEM" is also doing **CTO** PCs, and therefore technicians in production could have to preinstall 1, 2 or 3 different applications (or none) on their PCs according to each client requirements.

Therefore, you can now multiply the BTO PCs figure by the 9 (= 3 x 3) combination of applications "OEM" could ship with its equipment (plus one when no software is shipped):

360 x 10 = **3600** different PCs or with different software configurations (BTO/CTO).

Problem:

In our example, - quite common in the BTO/CTO industry -, it is obviously almost impossible to create as many different static images prepared to fit all or even part of these configurations for a fully unattended preload process in production. This means that, even though "OEM" can prepare a few static images for some PCs, the technician would very often have to complete the pre-installation of most PCs produced manually.

Answer:

SoftThinks offers with the Dynamic Technology to pre-install all PCs in production with a unique and universal Master Image per operating system and language deployed through the network or with a hard disk using a replication platform or a cloning software.

Problem:

It also seems almost impossible to provide the end user with a recovery device that could restore the PC to at least factory level without any manual integration of drivers, bundle software or applications.

Answer:

SoftThinks Backup and Recovery is a full Recovery Program which can be preinstalled on hard drive.

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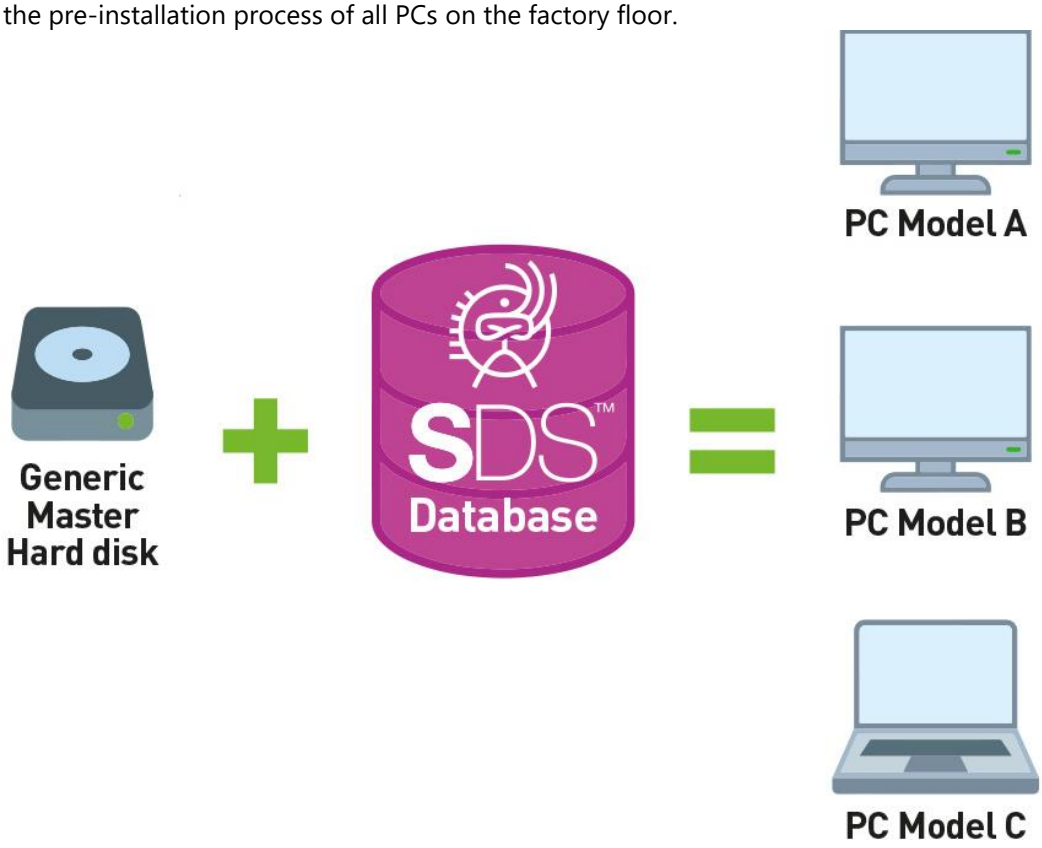
How does SoftThinks Dynamic Technology handle the BTO/CTO situation?

Basic principle

The Dynamic Technology basic principle is to merge a Generic Master common to the entire production with a database of all items that affect the pre-installation process of all PCs on the factory floor.



During deployment, all components of the Target PC are automatically recognized, and dynamically installed/configured with the items found in the database. The entire database being placed on the same Master, there is no need to create several images for different PCs.
The BTO deployment process is universal and unattended!
The same items are provided to the End User within SoftThinks Backup & Recovery system allowing a full restore of the PC in case of a crash.

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Installation & Configuration

Hardware Minimum Requirements

- ✓ CPU: Intel Xeon E3/ Core i5
- ✓ RAM: 8GB min
- ✓ Storage: A disk for the OS (ideally a 128GB or more SSD) and a disk for the database (ideally 2xHDD in RAID)
- ✓ Network: 2 gigabit network cards

Software Prerequisites

- ✓ Windows Server US native with language pack if needed (Latest version recommended or at least Windows Server 2012 R2)
- ✓ Active Directory domain services and DNS Server DNS installed and configured
- ✓ DHCP Server DHCP installed and configured with the DHCP lease time set to 1h or 2h
- ✓ Windows Deployment Services (WDS) installed and configured
- ✓ WDS remote installation folder shared with Full Control for Everyone and labelled "RemoteInstall"
- ✓ Latest Windows Assessment Deployment Kit (Windows ADK) installed (download from https://developer.microsoft.com/en-us/windows/hardware/windows-assessment-deployment-kit)
- ✓ SQL server configured on the server where you want to store usage statistics (not required if you want to use SDS Dashboard)

Please refer to How to configure Windows Server to configure your server step-by-step in order to match the prerequisites above.

Note: It is technically possible, but not recommended, to install SDS on a non-Server Edition of Windows but with the following limitations:

- No PXE boot (but you can boot from a bootable USB key plugged on an Ethernet + USB ←→ USB adaptor)
- No native DHCP (See How to configure DHCP on a non-server edition of Windows)

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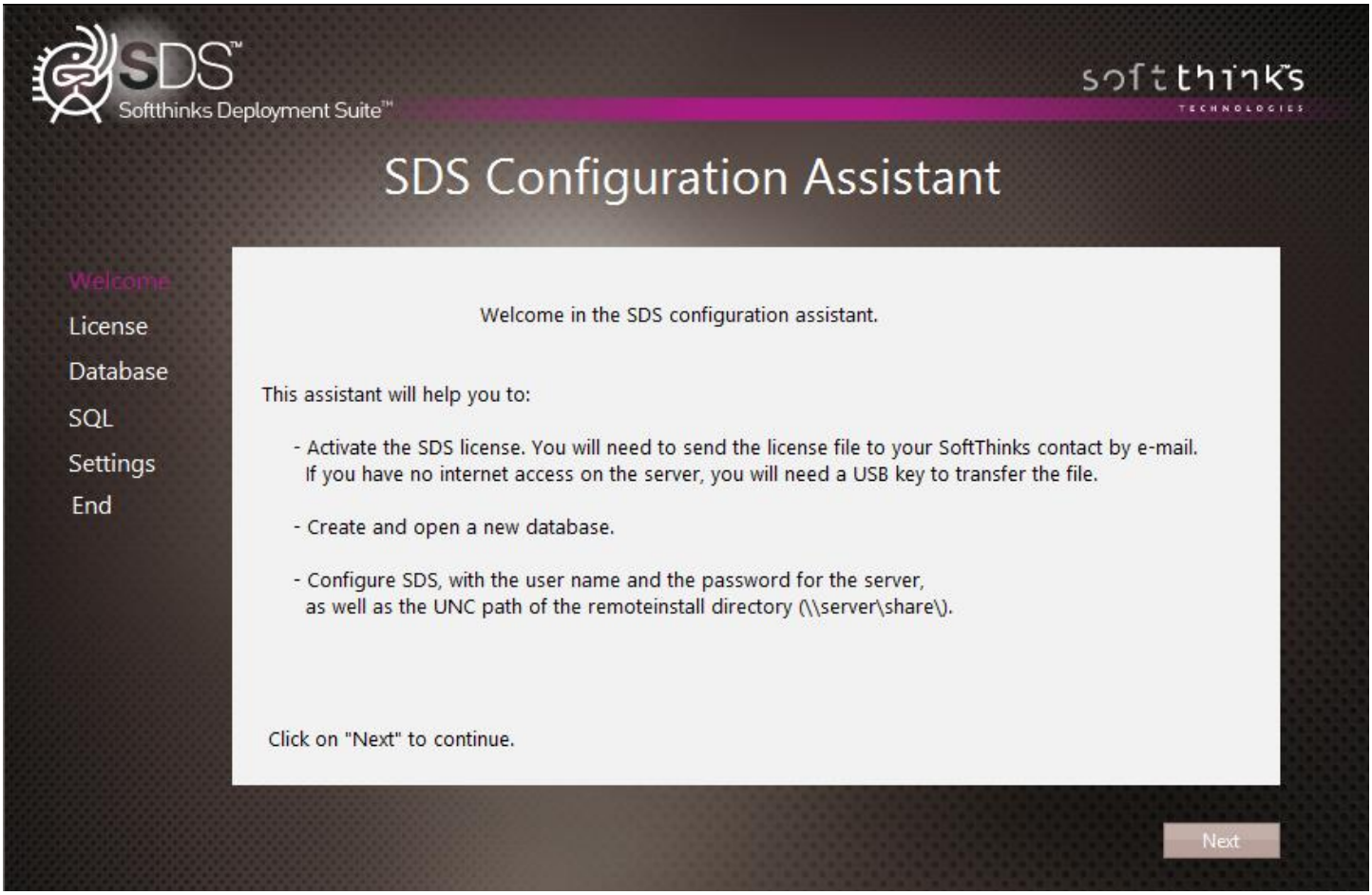
SDS Installation

Once you have ensured that all the hardware and software prerequisites are matched, you can launch the SDS installer (setup.exe in the installation folder) and follow the on-screen steps.

At the end of the process, the SDS configuration wizard will be automatically launched.

SDS Configuration and activation



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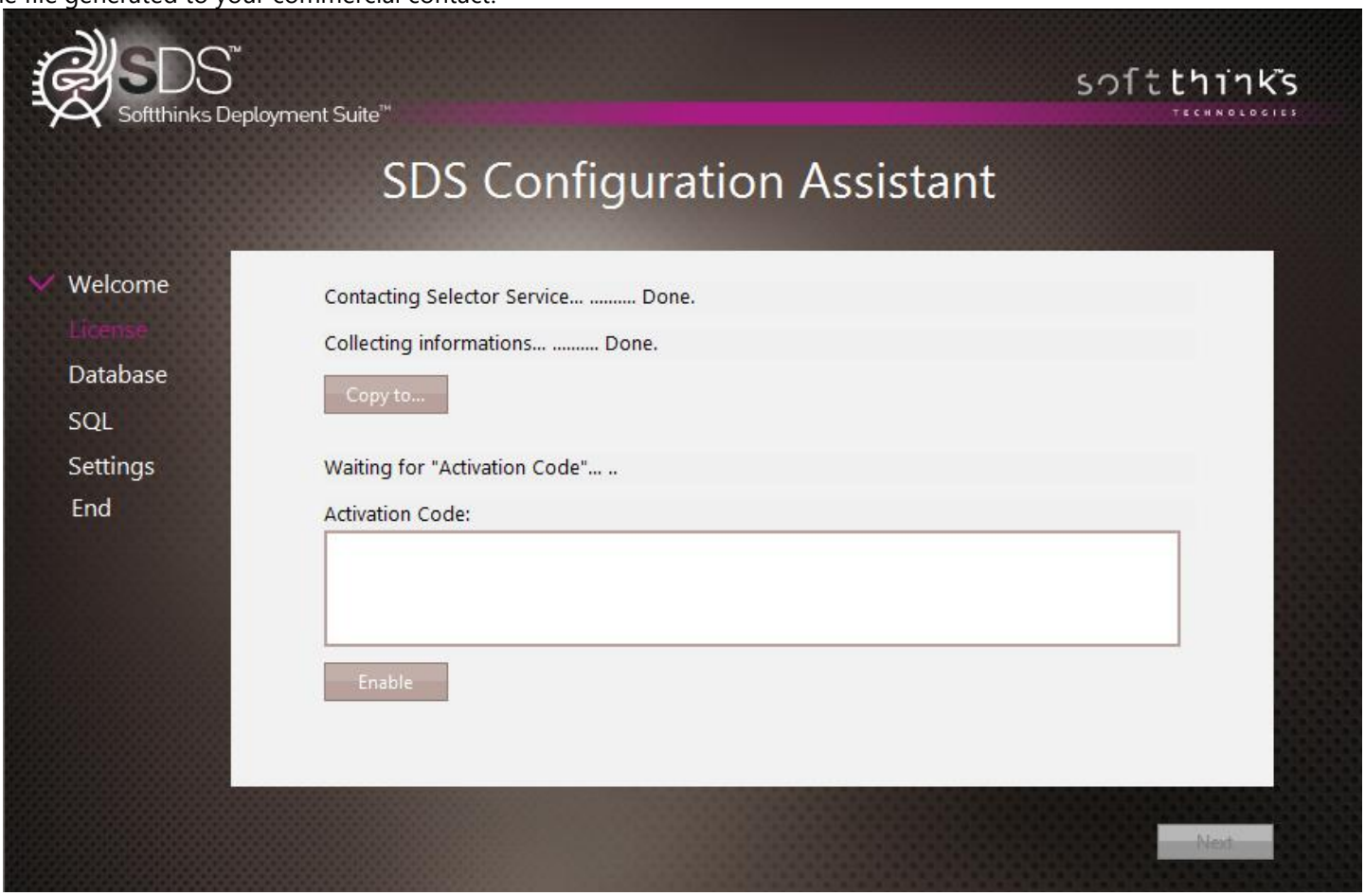
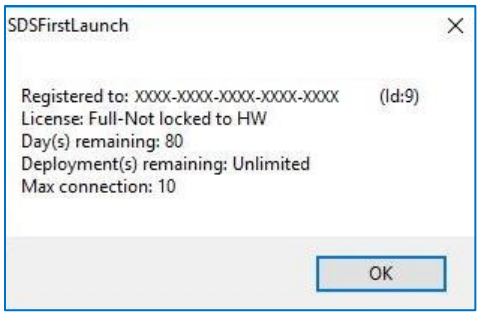
License

Enter the activation code which has been provided to you. If you don't have it please click on the button "Copy to…" and send the file generated to your commercial contact:



Once the activation code is successfully verified, a message box will indicate you that your product has been activated, as well as the license type, the days remaining, the deployments remaining and the maximum number of simultaneous connections allowed:



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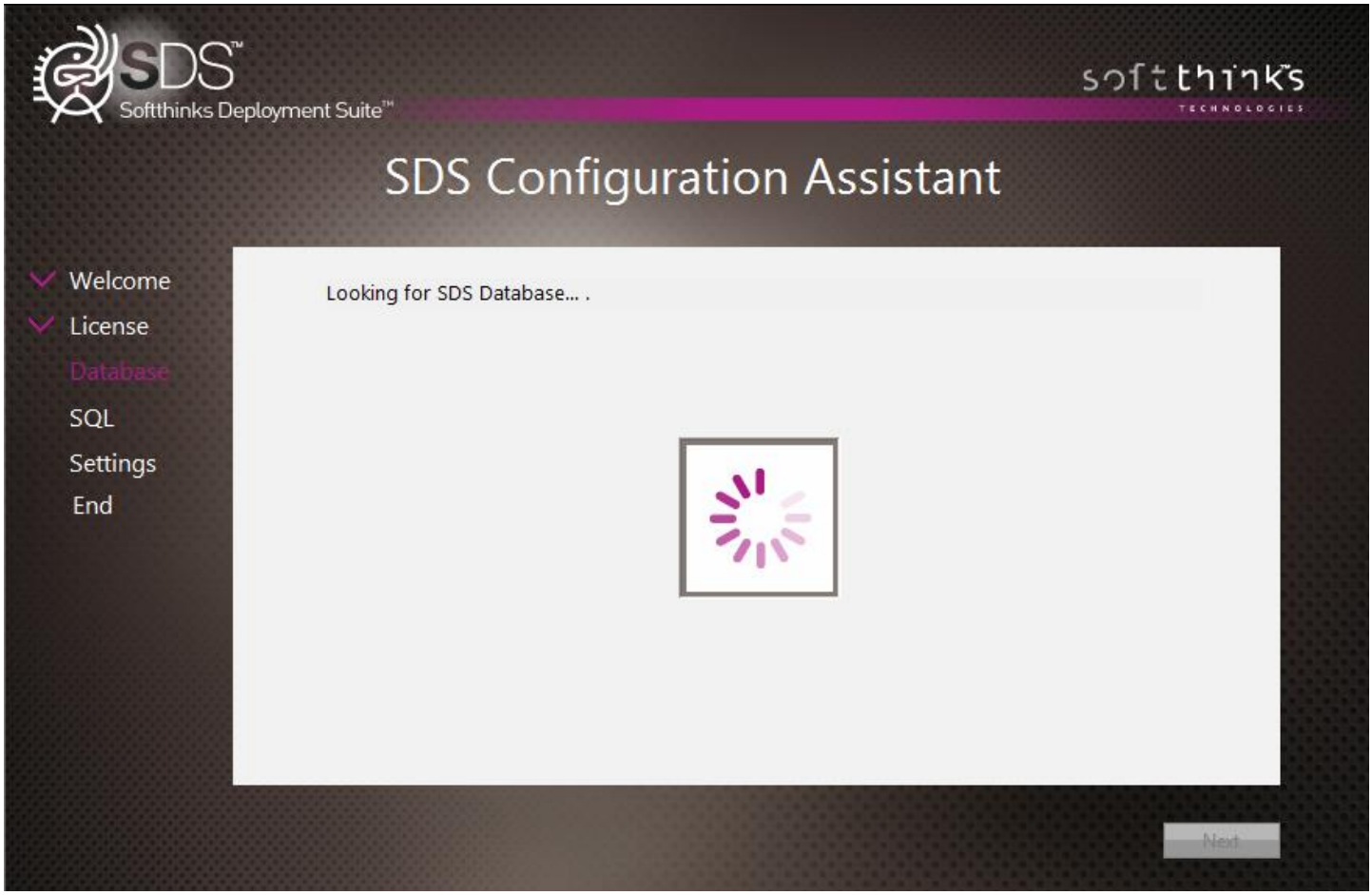
Database



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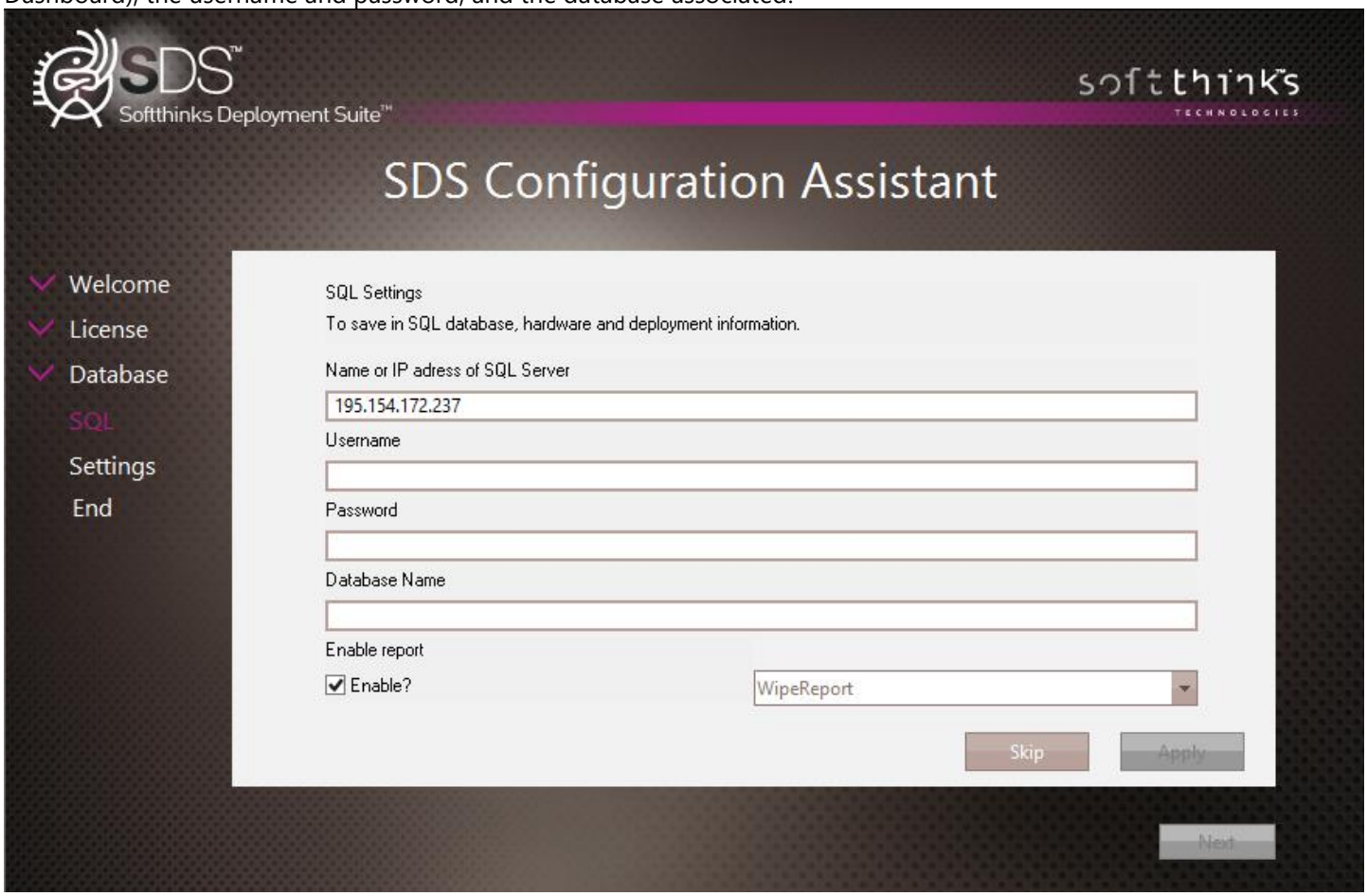
SQL Configuration

Type the IP address of the server where you want to store the usage statistics (195.154.172.237 if you want to use SDS Dashboard), the username and password, and the database associated:



If you want wipe reports, check the option “Activate?” and select “WipeReport” in the dropdown list.

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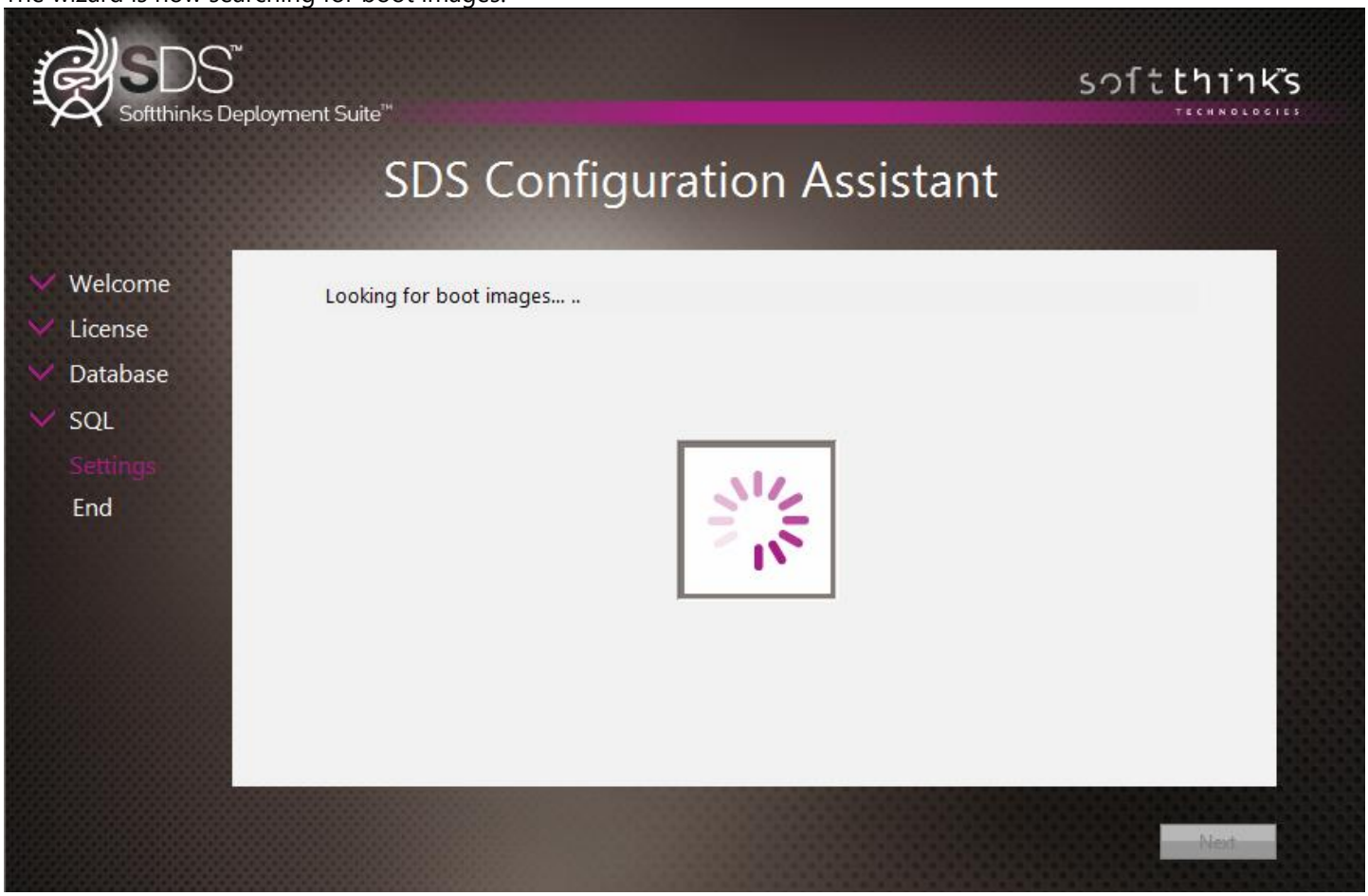
Parameters

The wizard is now searching for boot images:



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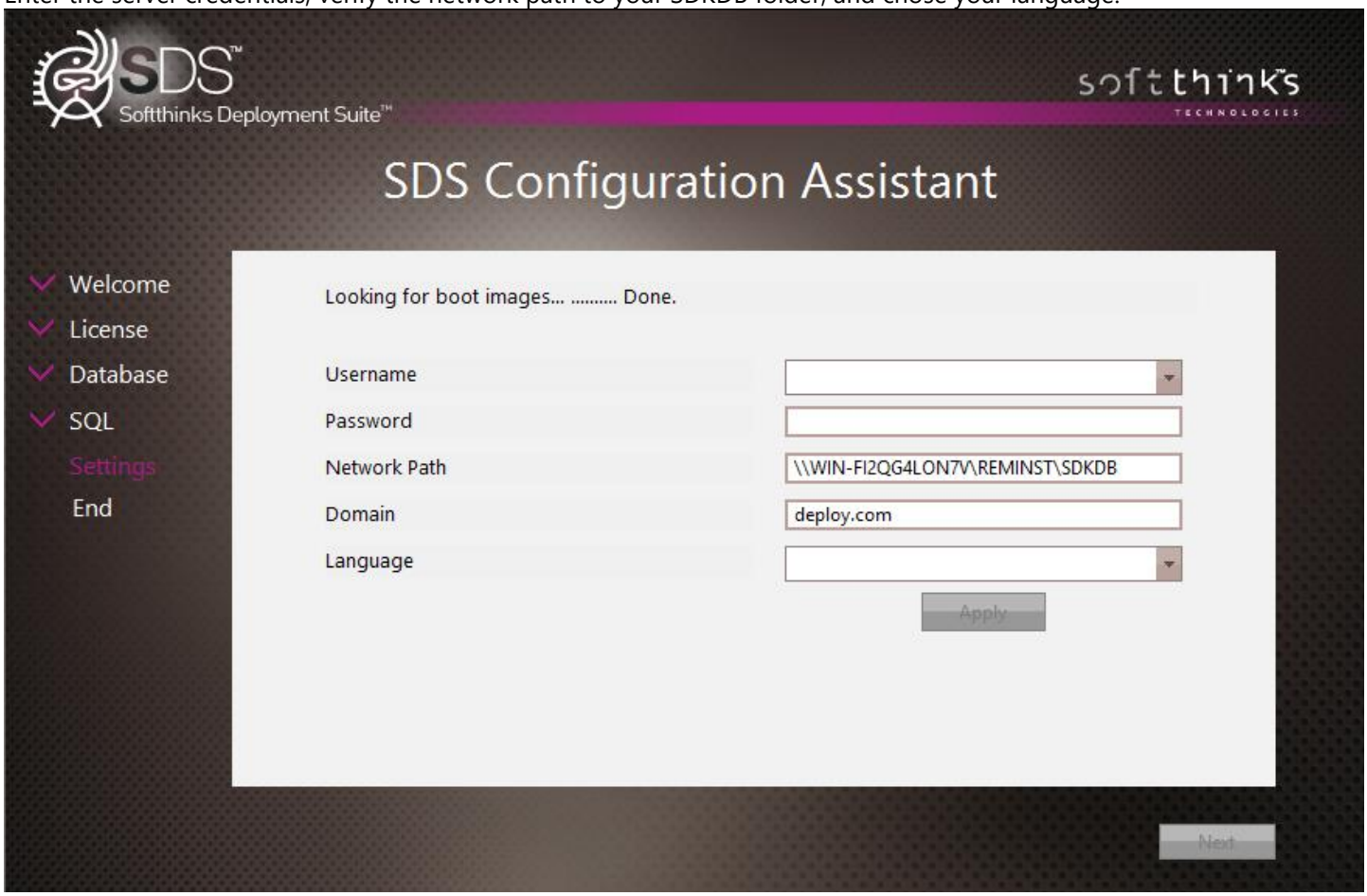
Enter the server credentials, verify the network path to your SDKDB folder, and chose your language:



Click on “Apply” to configure the boot images and then click on “Next”.

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After the installation is completed, the SDKDB Folder will be present in the D:\RemoteInstall Folder. The folders inside the SDKDB Folder and their purpose are listed below:

General presentation of the folders composing the folder SDKDB

The SDKDB folder is present in the folder specified during installation of the server version of SDS, the folders that compose it are the ones below :

ADF: Automatic Deploy File

APPS: Folder containing the applications and informations about the software, in this folder, the folders APP00 *** are present (containing applications) and the DTA folder (file identification softwares).

Bios: Folder containing the Bios.

Bootdisk: Folder that allows the implementation of a recovery partition.

Deploy / Deploy64: Folder containing the files that will be used to deploy the images on the client. It contains the necessary files for the operation of SDS tools. There is a folder for 32-bit versions and one for 64bit.

DIFF: Folder containing the smartimages.

DRV: Folder containing the drivers. Subfolders in it are sorted by categories (USB, video, network, etc. ..).

Env_files: Specific folder for the OS.

Hotline: Folder containing the hotline tools.

Presets: Folder containing the deployment profiles (Hardware recognition).

Profils: Folder containing the profiles.

Report: Folder containing the report files on the client machine. (a report can be generated at the end of an operation performed by the server SDS).

RIS: Folder containing the images in various formats:

- Casper : SoftThinks™ method to capture file by file.
- VD : Sectorial method capture.
- Wim : Microsoft® method to capture file by file.

Selector: Folder containnig the license management.

Temp: Folder containing the log files.

Update: Folder containing the executable "asexec" (the software which will launch the setup at the boot).

You will find on your desktop a shortcut to the SDS administration console named « SDS Console »:

The SDS Console can also be installed on another PC through its standalone installer.

The SDS server is now ready to have any device booted to it.

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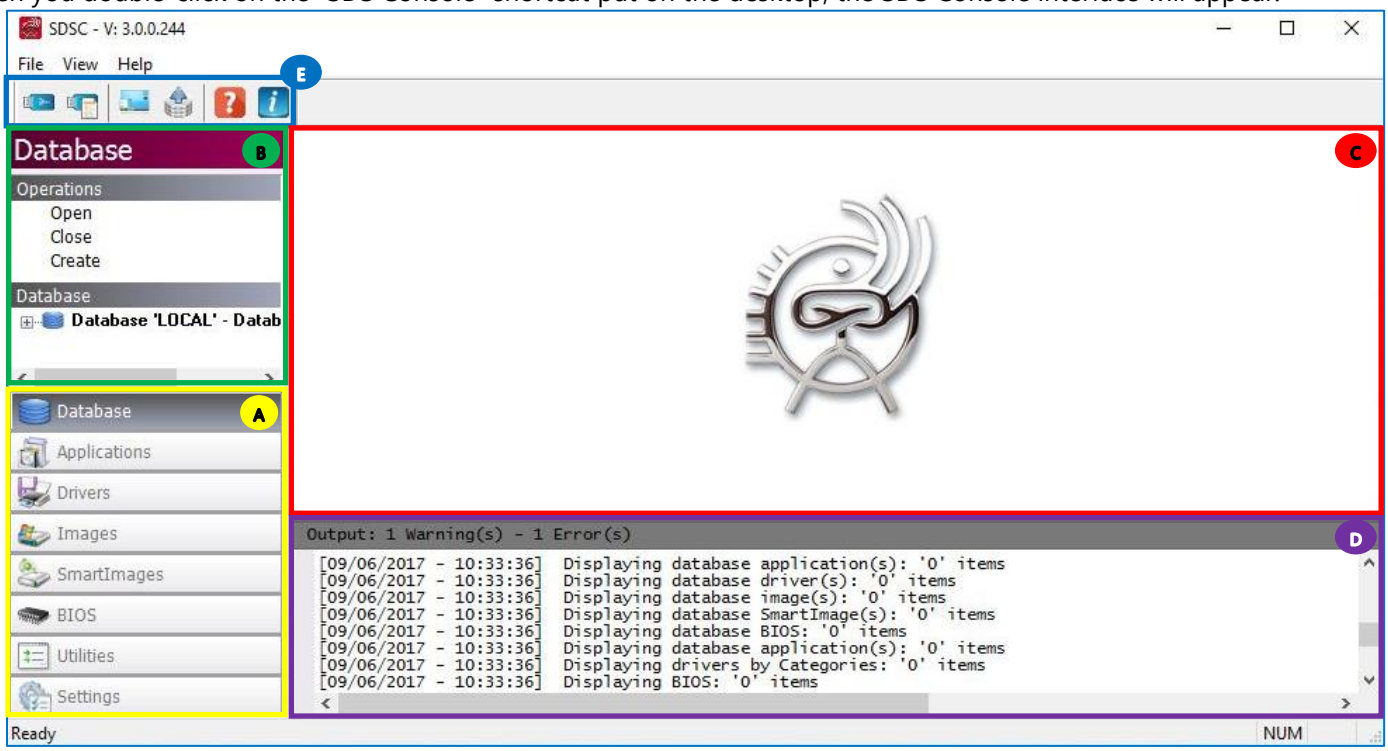
SDS Console (SDSC)

The SDS console allows you to administer and configure your SDS database, including the images, drivers, applications, and offers some useful tools.

- Multithreaded Interface – Accomplish other tasks while waiting for slow processes to complete.
- Visible Logging Console – View logs in real-time and track processes as they occur.
- Workflow-based Configurations – Each process uses a consistent workflow so no dependent steps can be omitted.

When you double-click on the "SDS Console" shortcut put on the desktop, the SDS Console interface will appear:



This user interface is split into different areas:

- The main menu A on the bottom left which allows you to select a set of tools to use. Each tool is tied to a specific task, such as Database, Applications, Drivers, Images, SmartImages, BIOS, utilities or other Settings. Click on a tool to select it and bring up more options.

- The sub menu B above is dynamically updated depending on the item chosen in the main menu and will offer you the operations that can be performed with this element ("Open", "Close" and "Create" for the Database as shown in the screenshot above). Select an option here to open a workflow tab in the main window.

- The main window or Operations Workflow Screen C on the right. Each operation in use receives a separate tab on this screen allowing multiple tasks to be completed simultaneously. Once a Tool Operation or Object has been selected, a screen opens to allow the System Administrator to perform other actions through a workflow

- The output area D on the bottom right where all status messages will be logged. The information contained here can be printed, exported, copied to the clipboard or cleared. Right click in the window for all possible options.

- The toolbar E

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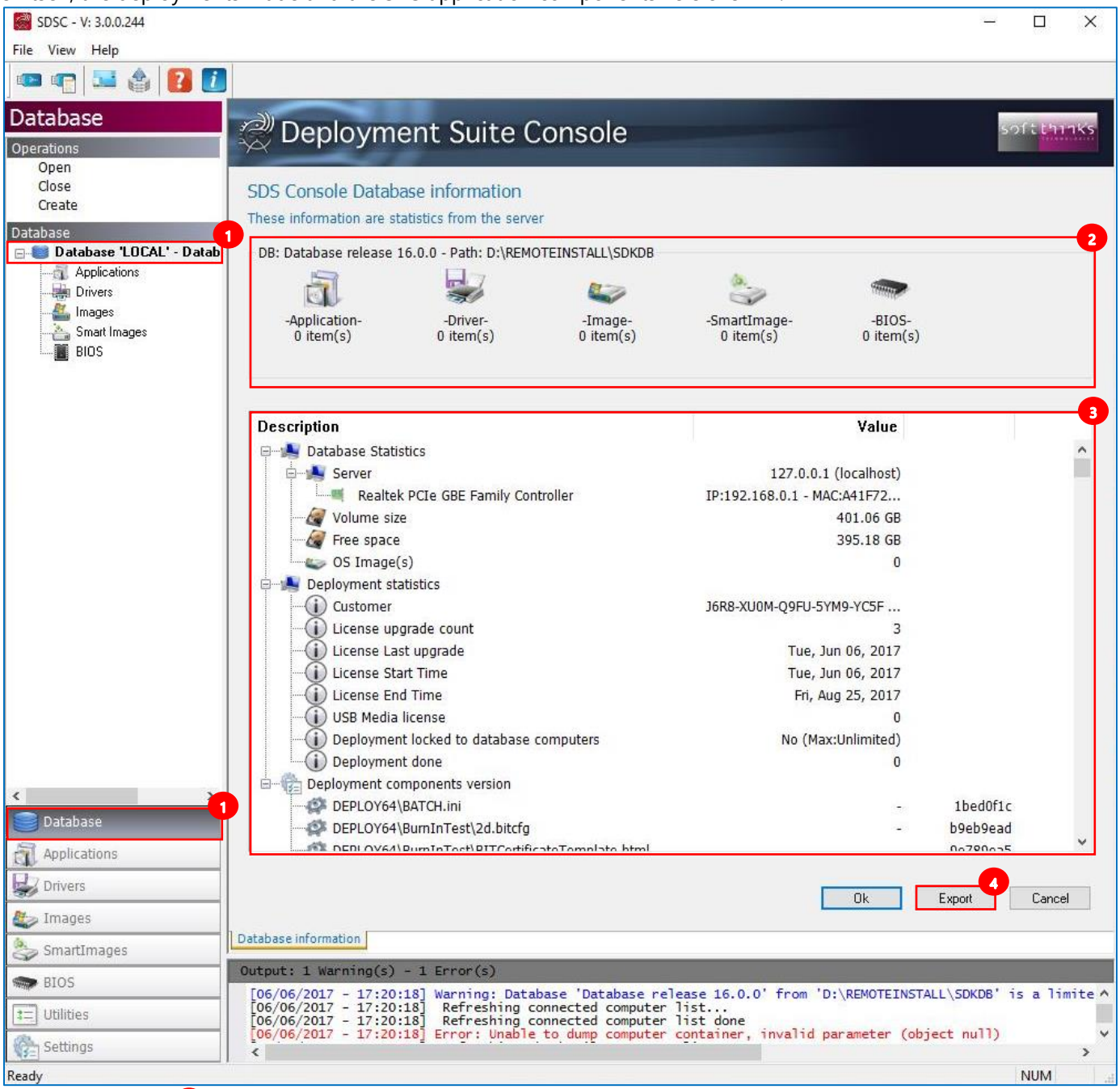
Database

When you select "Database" 1 (from the tab or from the submenu tree-view), you will get its statistics, meaning how many applications, drivers, images, smart images and BIOS are stored in the database 2, as well as other information about the server itself, the deployments made and the SDS application components versions 3:



The « Export » button 4 allows you to export this information into an HTML or XML file.

Hint – SDS allows more than one database to be open during a session.

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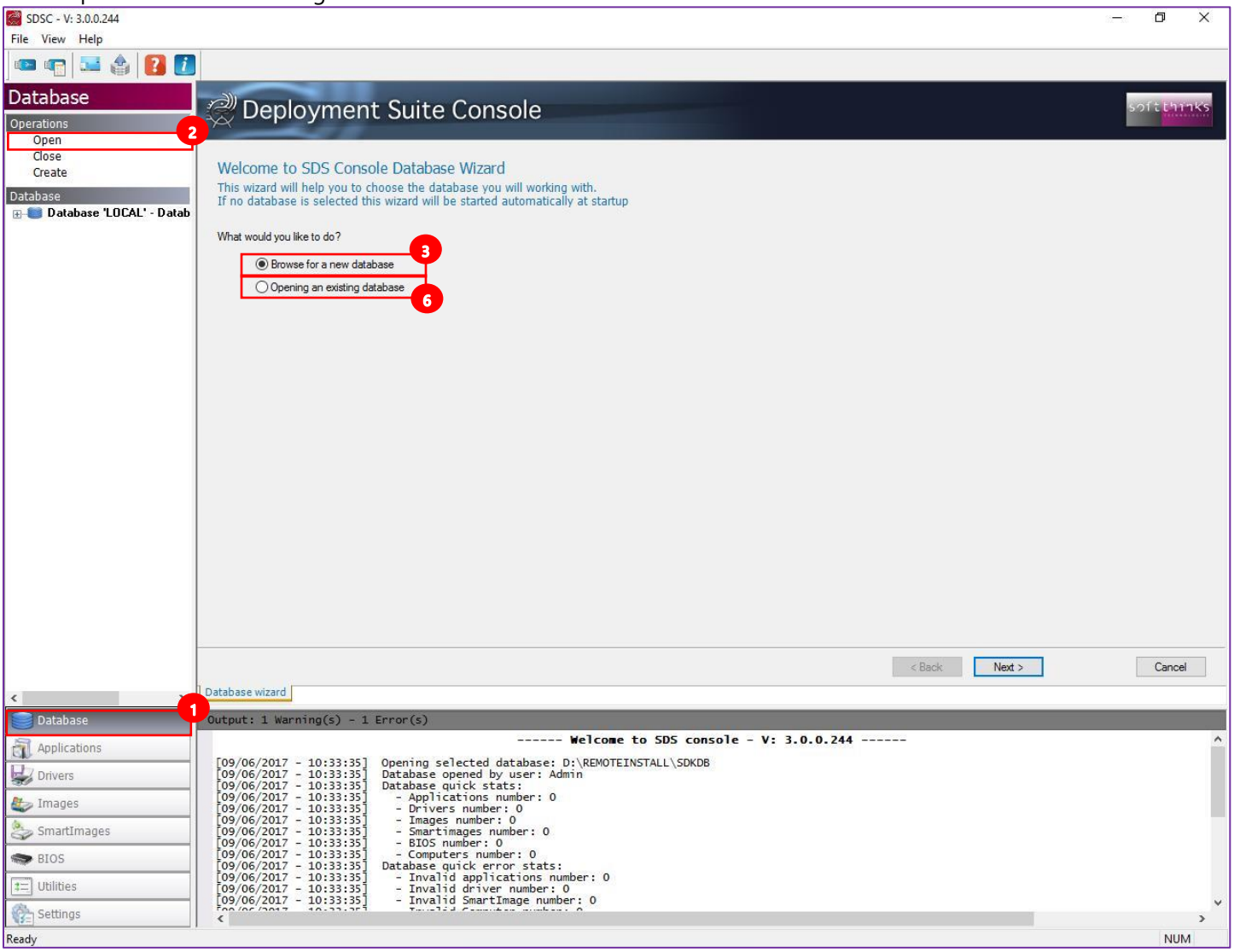
Opening a database (“Open” operation)

After having installed and configured SDS, the first step will consist of opening the database created during the installation.

Browse for a new database

1. Click on « Database » tab (1), then on the « Open » operation (3), and select the « Browse for a new database » option (3) before clicking on the « Next > » button:



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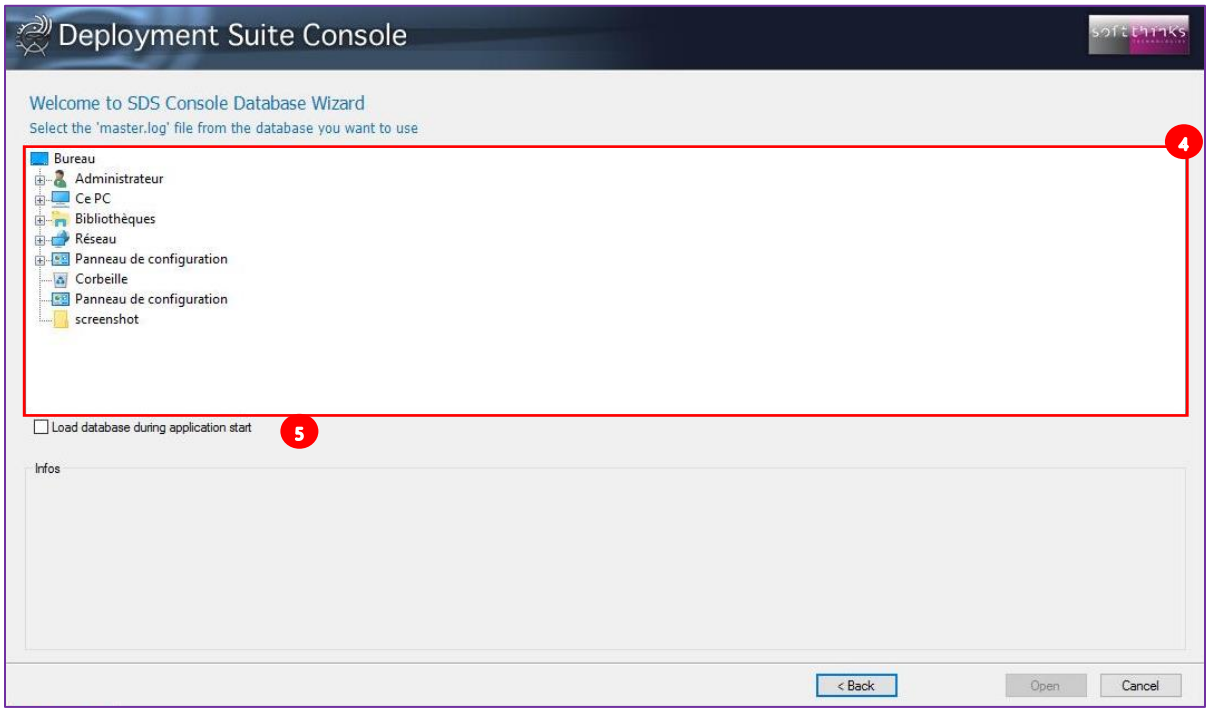
2. Browse for the MASTER.LOG file in the D:\REMOTEINSTALL\SDKDB installation folder in the tree-view (4):

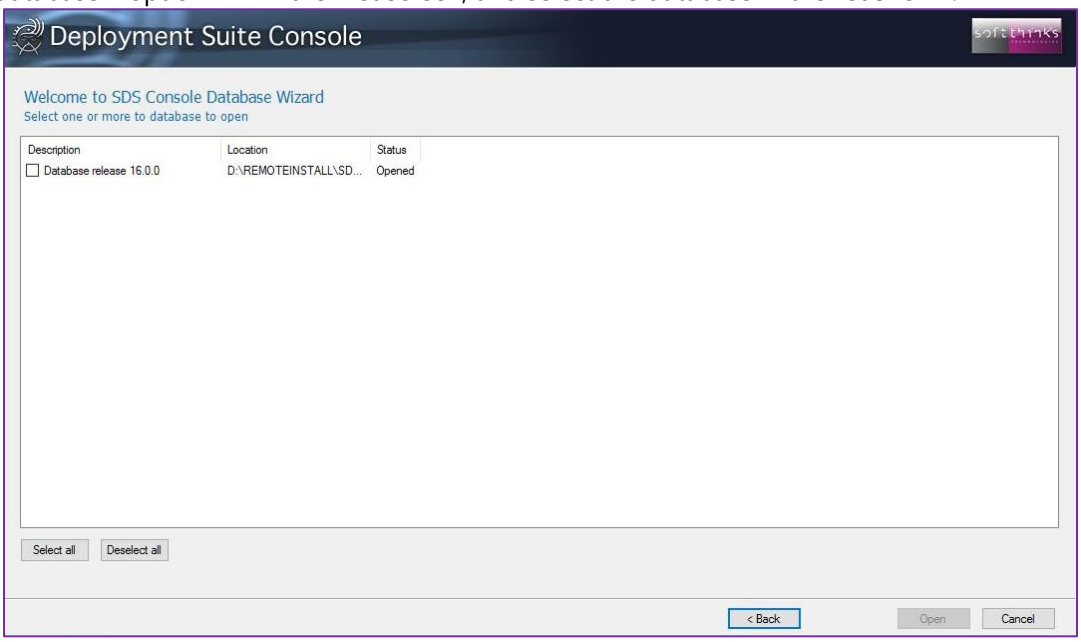


3. Check the « Load database during application start » option (5) to automatically open this database during the console startup, and then click on the « Open » button.

Note: Only databases that have not previously been opened by this installation of SDS should be opened with this option. Afterward, the location will be remembered in the history kept by SDS and will appear in the Open an Existing Database list.

Open an Existing Database

If you want to open a database that has been previously opened by this installation of SDS, use the "Opening an existing database » option (6) in the first screen, and select the database in the list shown:



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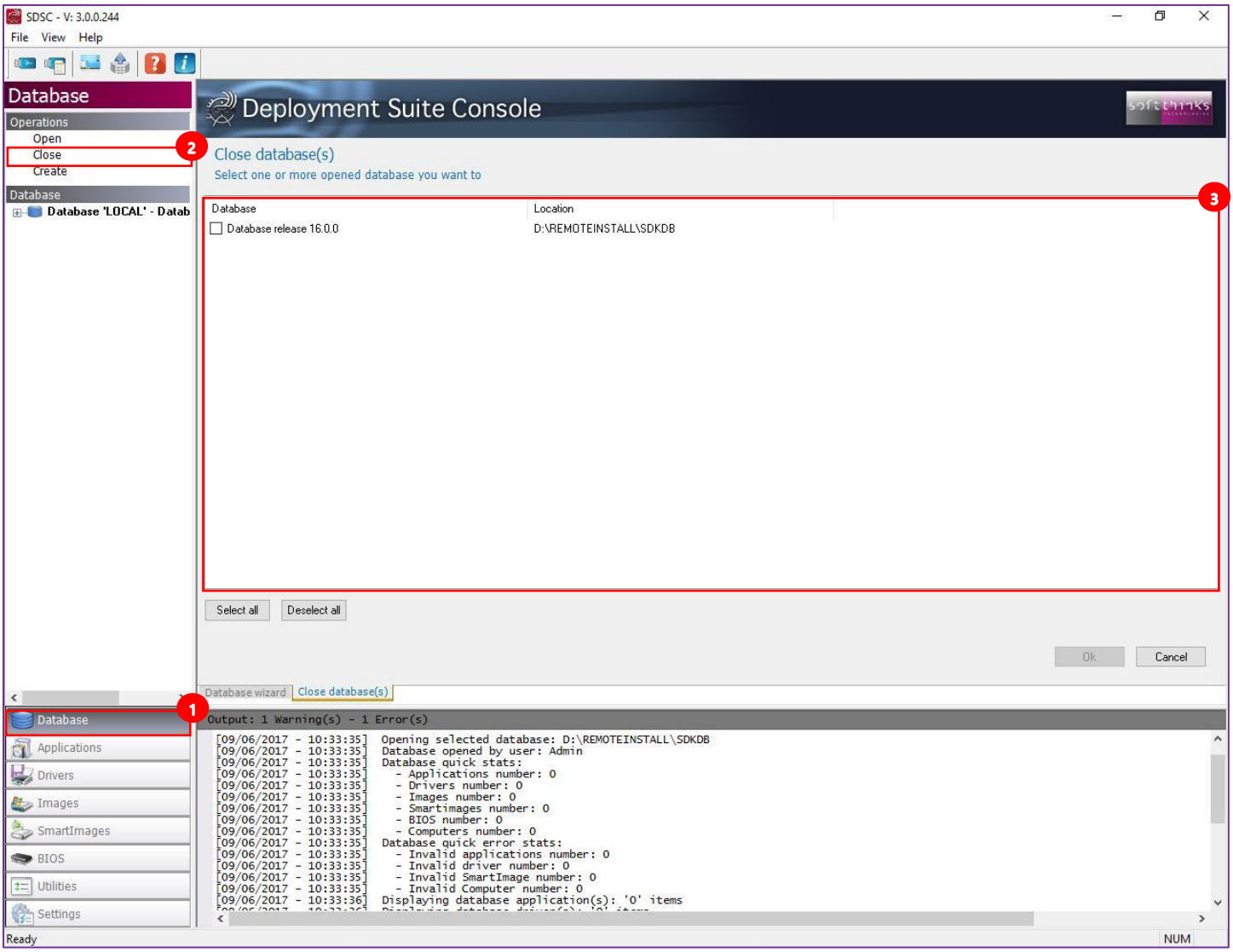
Closing a database (“Close” operation):

In order to close a database, click on the “Database” tab 1, then on the “Close” operation 2, and select the database you wish to close 3:



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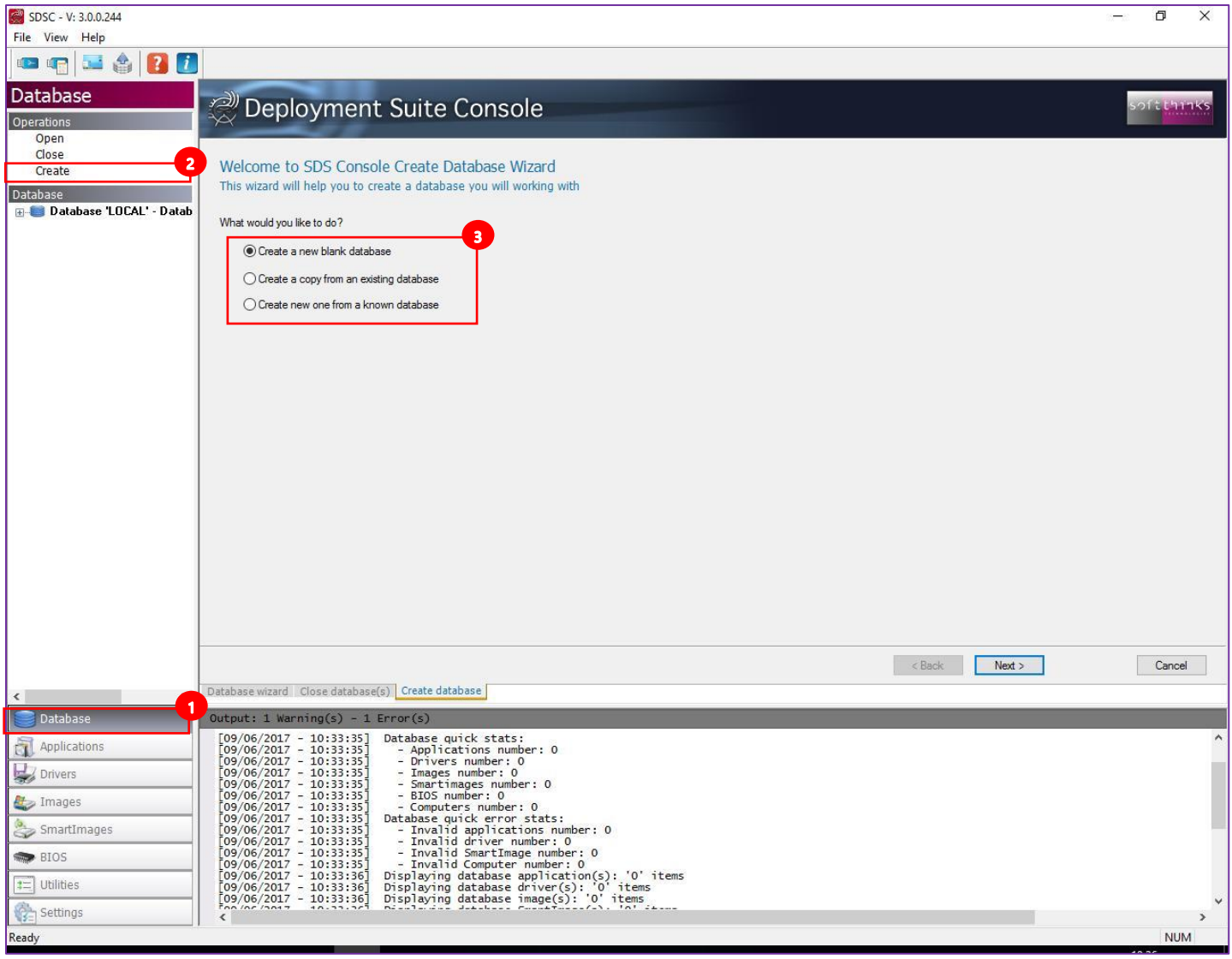
Creating a database (“Create” operation):

To create a database, click on the « Database » tab (1), then on the « Create » operation (2), and select one of the options offered (3) :



There are several ways to create a database for use with SDS:

- **Create a new blank database:** Only use this feature if you are starting completely fresh – there is no need to do this if you have converted a database from the previous release of SDS.
- **Create a copy from an existing database:** This allows the System Administrator to browse for an existing database and copy it to this instance of SDS.
- **Create new one from a known database:** This allows the System Administrator to make a copy of a database from an entry in the database history, and copy it as a new database to work with. This only works for databases which have previously been opened by SDS.

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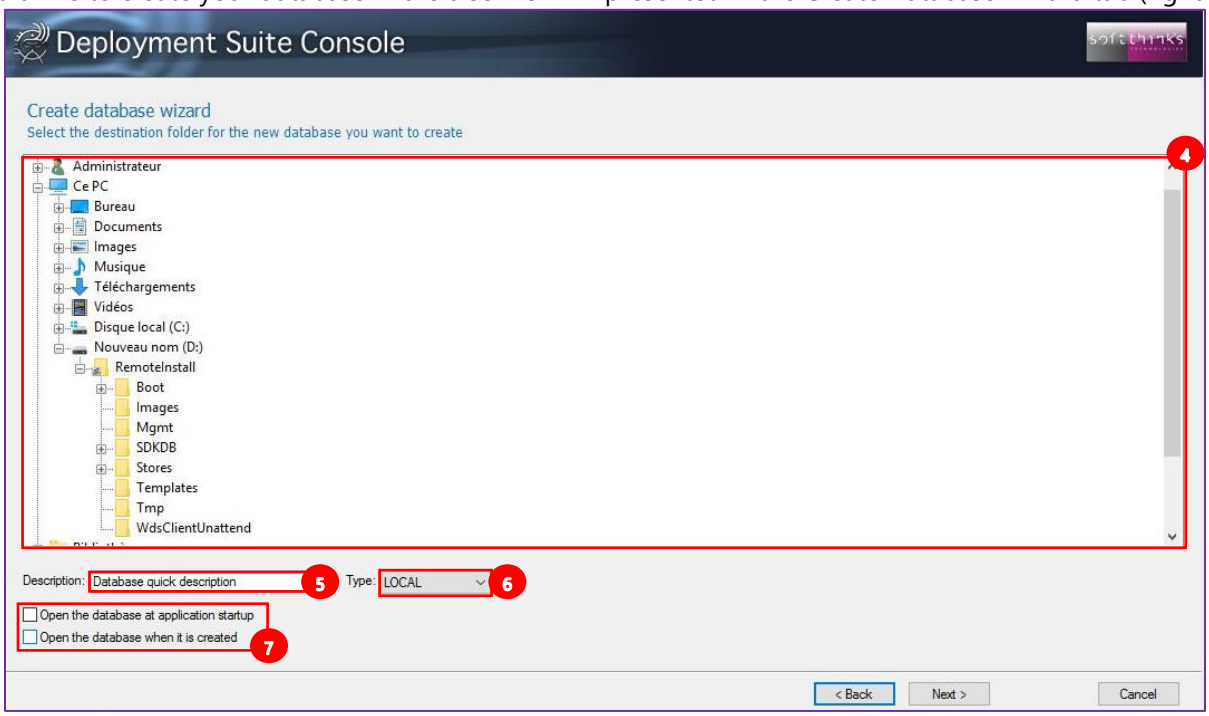
Creating a blank database

1. After having selected "Create a new blank database" and clicked on "Next >", select the "root location" where you would like to create your database in the tree-view 4 presented in the Create Database Wizard tab (right pane):



2. Specify a description 5 for the database in order to identify it.

3. Indicate the type of database 6. This can either be Local or Server.

4. Two options exist for how the database can be opened 7: during launch of the application or after creation of the database. The database will automatically be created in a subdirectory called SDKDB in the location you choose. For example, you can map a drive letter to a network share which will hold the database (in this example, X:) and SDS will create the necessary files and folder structures under X:\SDKDB.

Hint – Large databases take a long time to load. If you are pointing to a server database this may increase the load time due to network traffic and connection speed. It may be desirable to turn off the option "Open the database at application startup" in these situations.

5. When the database is created successfully, the new database will be shown (See Database screenshot) in the "Database" portion of the interface (left side, Database object view) when it is loaded.

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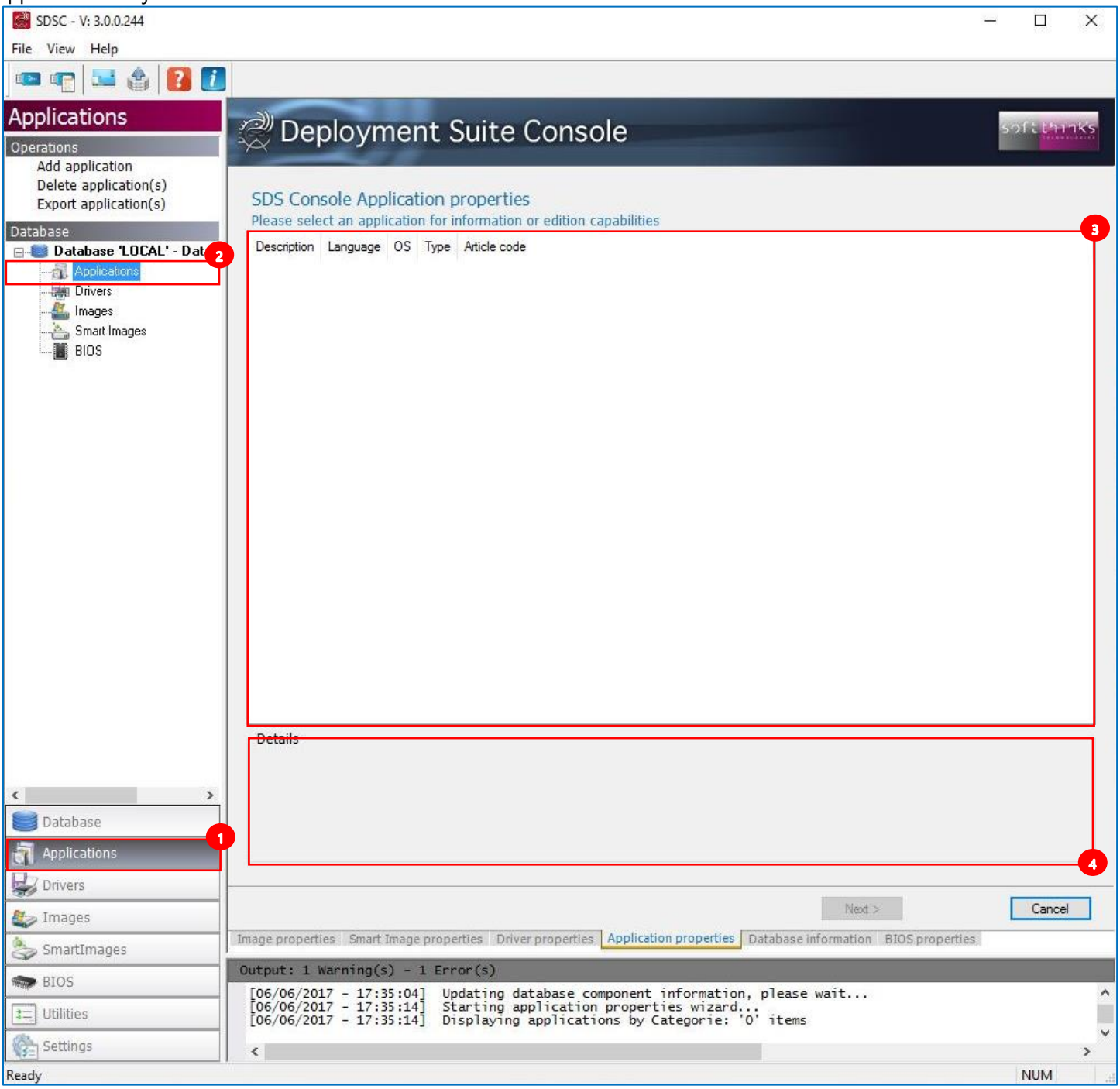
Applications

You can explore the applications you have added or imported by clicking on the “Applications” tab 1, or directly on the “Applications” object in the tree-view 2:



For the moment, this list is empty since we haven’t yet added any applications into our database but if you select an application in the list 3 you will see all of its details below 4.

You can also edit, delete and export applications.

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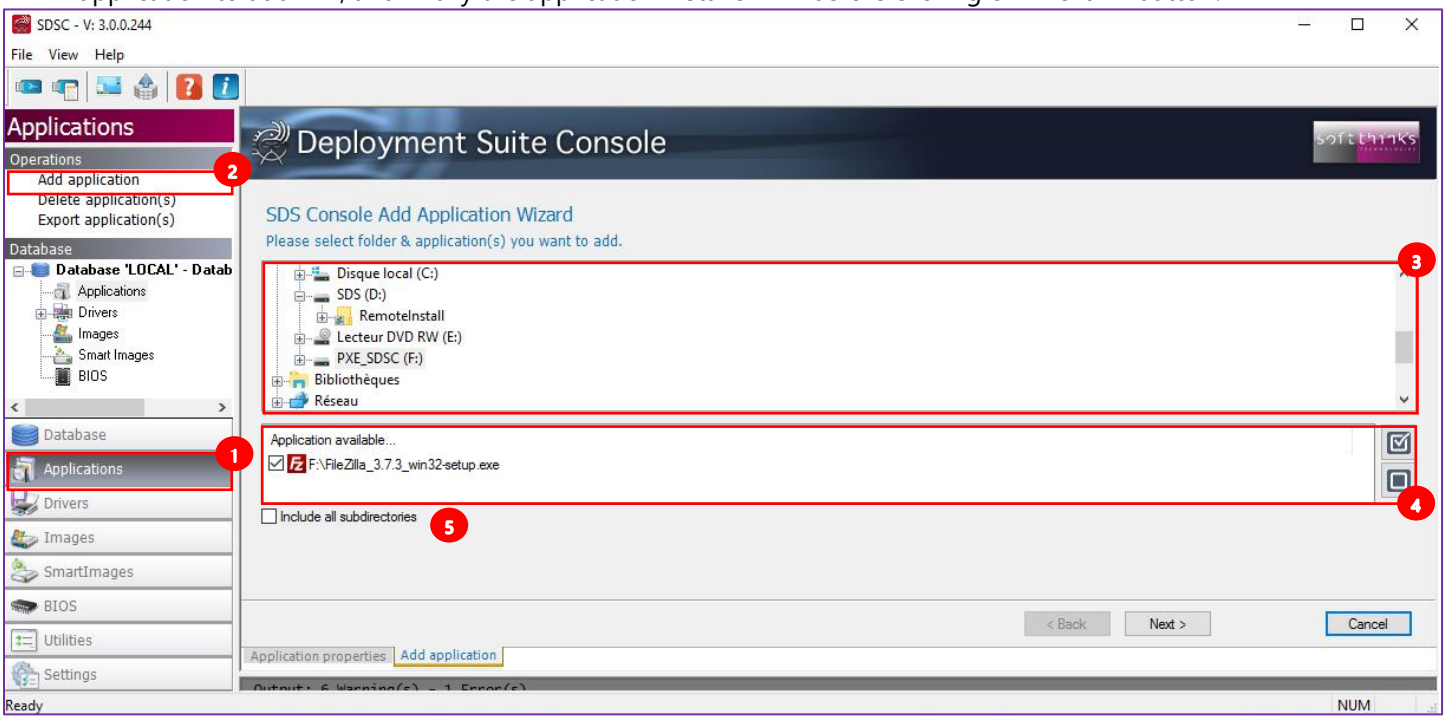
Adding applications (“Add application” operation)

Adding an application into the SDS database allows you to selectively install it onto a system being deployed with SDS. **There should be only 1 application per folder.**

1. Click on « Applications » tab (1) and then on « Add application » (2) operation, select the folder containing the application to add (3), and finally the application installer (4) before clicking on “Next >” button:



Hint: If there are subfolders inside your source folder that are required by the application, be sure to check “Include all subdirectories”(5).

Hint: The list may contain several files, for example, if the application is a two-part install, there may be additional executables in the list which may be selected.

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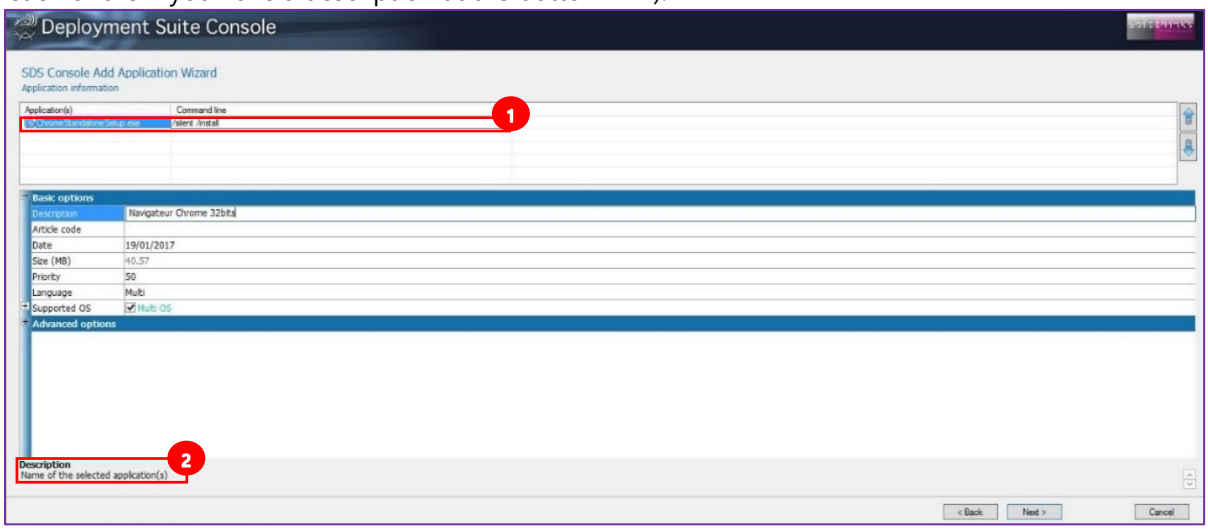
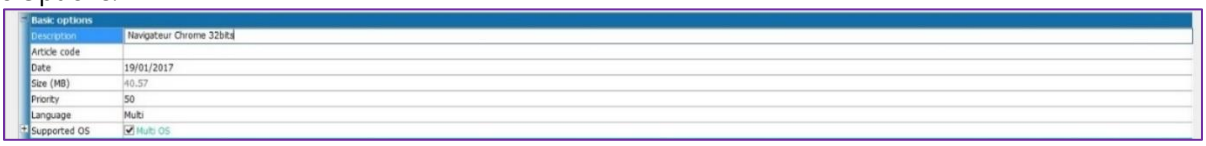
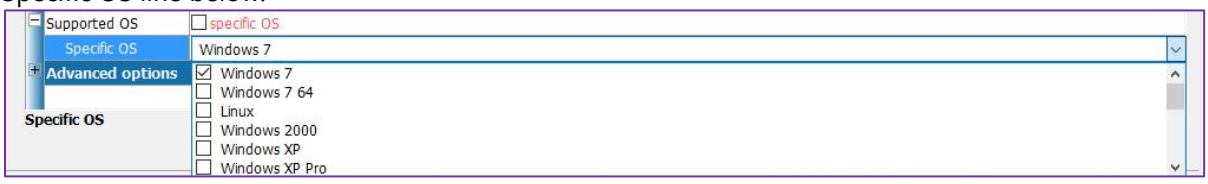
2. Specify the command line arguments to install your application silently (Check the installation instructions and read-me files for the applications to find the application specific Silent Install switches) 1 and fill the other fields below (for each of them you have a description at the bottom 2):



Basic Options:



- **Description:** Name of the selected application that you want to display during the applications selection (by default this is filled with the name of the folder containing the application). You can change this name to whatever you want.
- **Article code:** Unique identifier used to identify the application component / the part number used in the SPL file to designate the application. (This is not commonly used.)
- **Date:** Can be the date when the application is added into the database (so the current date by default) or the release date of the application.
- **Size:** Size of the application calculated from the file size.
- **Priority:** Allows you to install applications in a specific order (between 0 for the highest priority to 99 for the lowest one).
- **Language:** Language of the application ("Multi" to allow the application to be used for multiple languages, or else the name of the language supported).
- **Supported OS:** Either "Multi OS" (by default) to allow the application to work on all platforms, or else specific OS. When you uncheck "Multi OS", you can check all the OS supported in the dropdown list appearing in Specific OS line below:



Note: Make sure to uncheck Windows 7 if it is not going to be included as a supported OS as it is checked by default when you uncheck "Multi OS".

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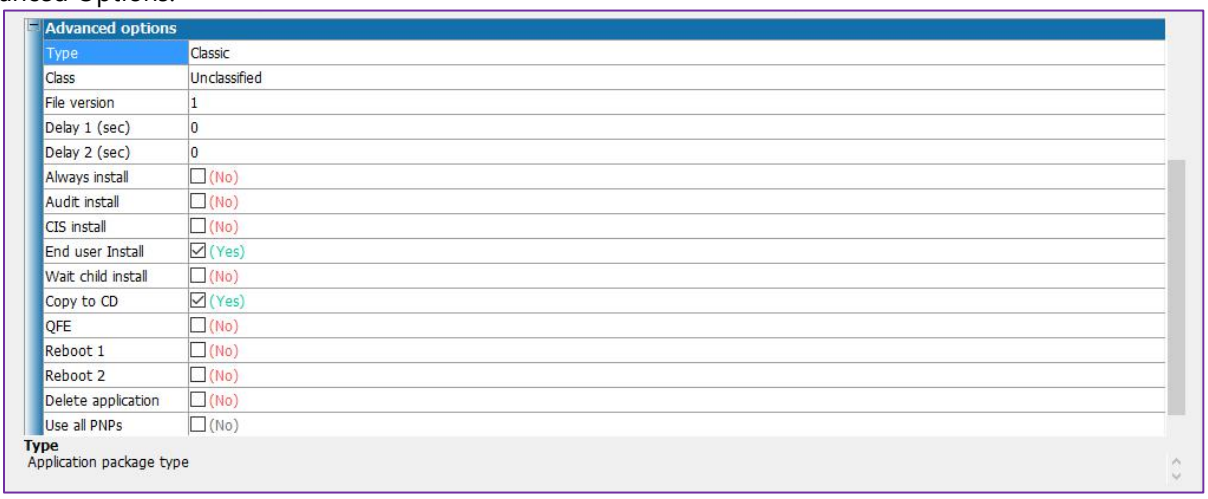
Advanced Options:



- **Type:** Application package type (Undefined by default). Can be "Undefined", "Classic", "Driver", "Bundle", "Microsoft KB". The list of categories can be modified in Application settings.
- **Class:** Application class in which the application could be classified (Undefined by default). Can be "Undefined", "Communication devices & system components", "Input devices", "Printer and Scanners", "Display devices", "Sound devices", "Others". This list can be modified in Application settings.
- **File version:** Used to denote the version of the application package (1 by default)
- **Delay 1 (sec):** Wait time measured in seconds before the application will execute (0 by default). This is useful for padding the application startup.
- **Delay 2 (sec):** Wait time measured in seconds after executing the application and continuing to the next one (0 by default). This is useful for padding the application termination if some process are slow to complete after the application exits.
- **Always install:** Always install this application and automatically include in all downloads ("No" by default).
- **Audit install:** Turn on to install the application in audit mode otherwise it will be performed during mini-setup ("No" by default).
- **CIS install:** Application can be installed for Custom Image Solutions style images/downloads ("No" by default).
- **End user install:** Application is displayed in the Apps and Drivers Recovery interface ("Yes" by default).
- **Wait for child install:** Prevents ASEXEC from executing the parent process and proceeding if there are still child processes active. This is required for some installer engines that use child processes ("No" by default).
- **Copy to CD:** Copy the application to the Apps and Drivers Recovery CD. Choose this option if the application will be delivered to customer with original installation media ("Yes" by default).
- **QFE:** If the application being installed is a QuickFixEngineering application (aka Hotfix), use this option ("No" by default). This option adds 1000 added to the Priority value (normally 0-99) ensuring that QFEs are grouped at the very end of application installation order. All QFEs are installed in the same grouping ordered by priority after all standard applications have been installed.
- **Reboot 1:** Force a reboot after the application is installed by ASEXEC during factory installation or full system recovery ("No" by default)
- **Reboot 2:** Force a reboot after the application is installed using Apps and Drivers Recovery interface ("No" by default)
- **Delete applications:** Delete the application package once installed ("No" by default)
- **Use all PNPs:** Tie an application to hardware device(s) ("No" by default). If the specified hardware is not present, the application will not be installed.

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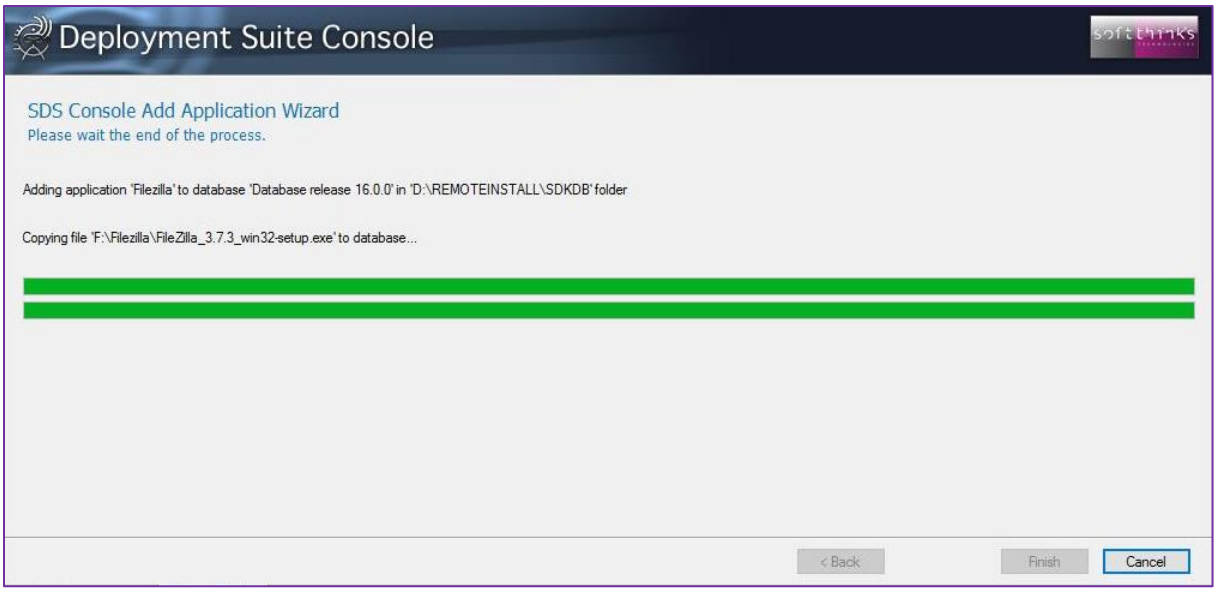
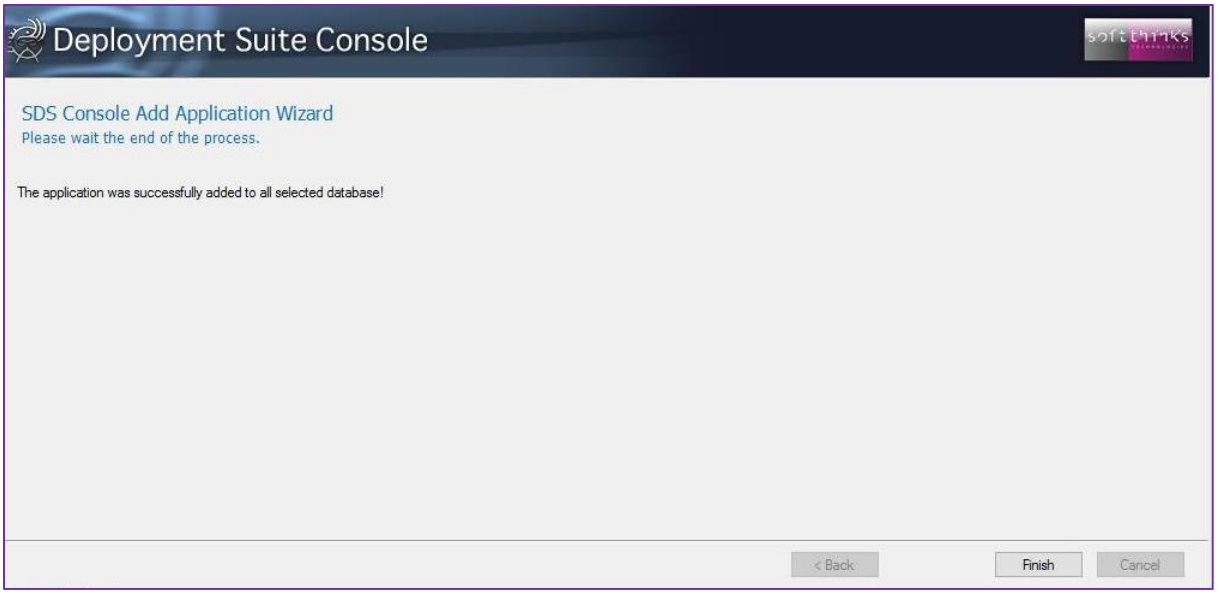
3. Once you have specified all the information you can click on “Next >” button and the console will copy the application folder contents:



4. A message will indicate you that the application has successfully been added to the database at the end of the process:



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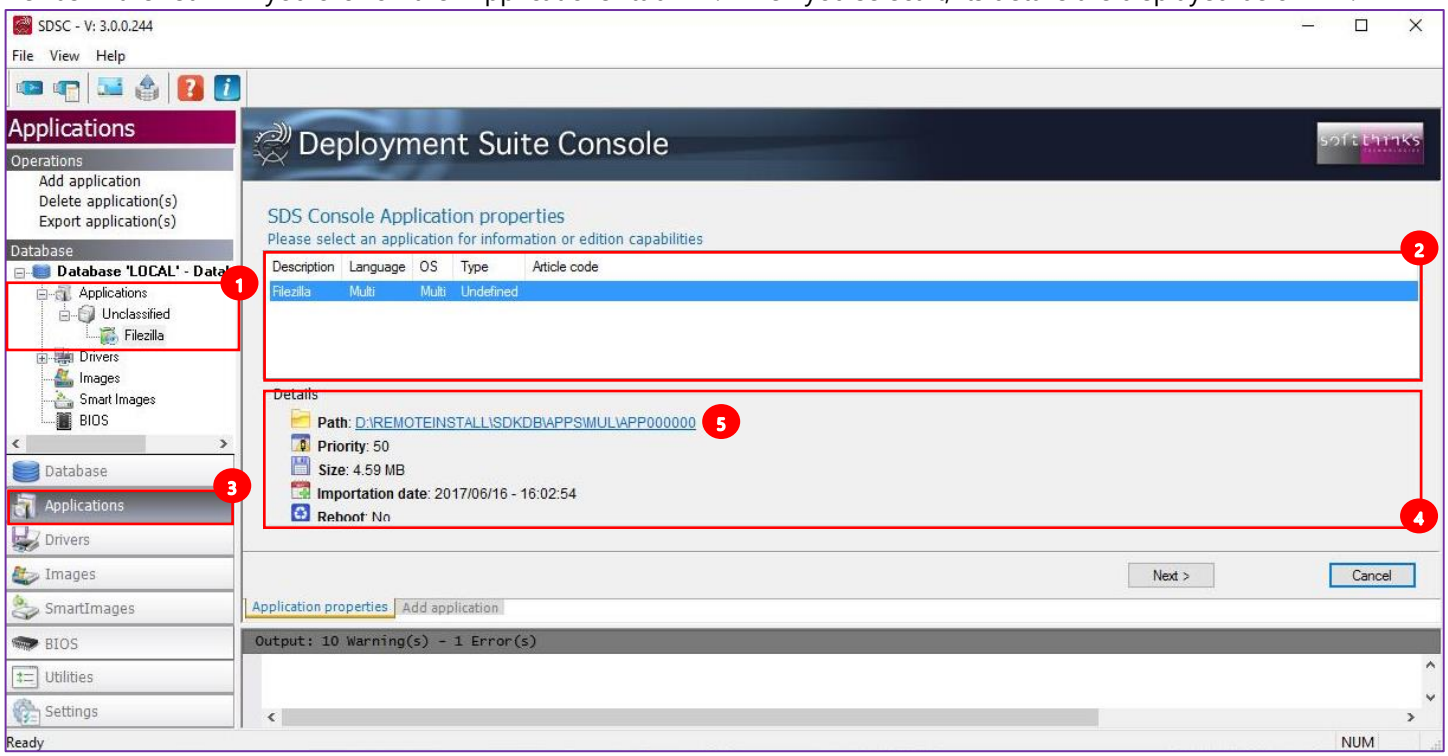
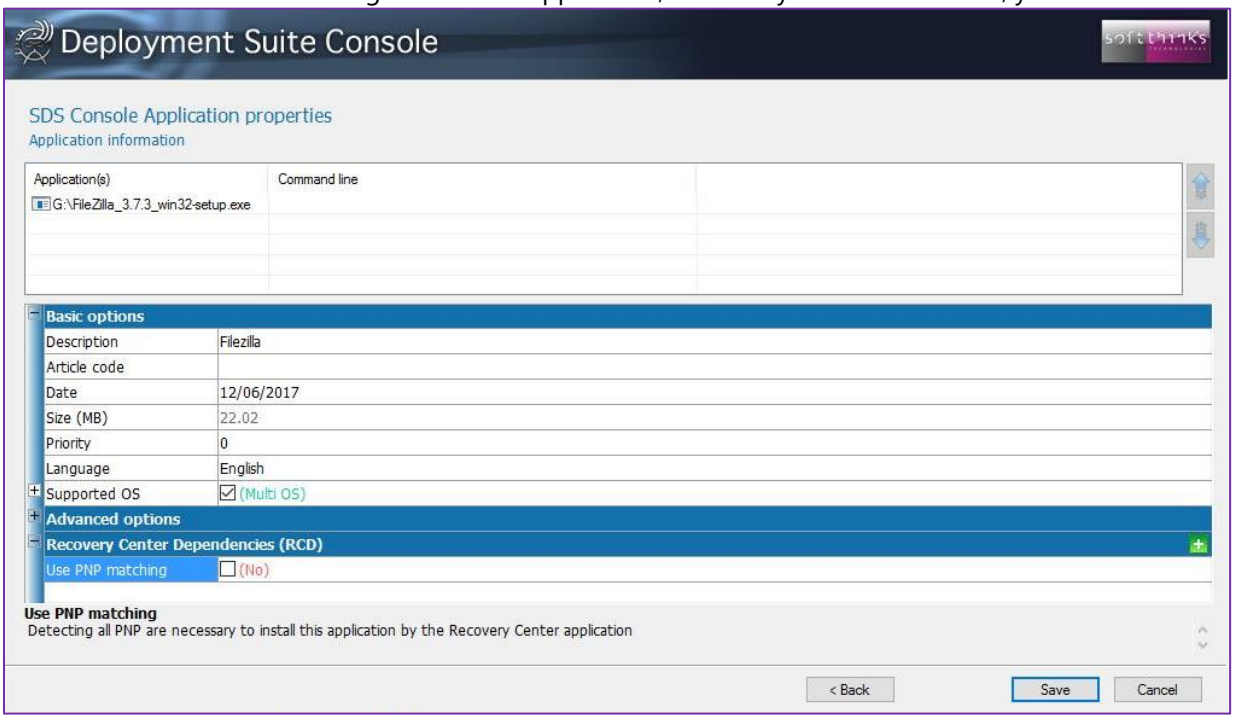
Editing an application

Once you have added an application, it appears in the tree-view on the left under the "Applications" database object (1), as well as in the list (2) if you click on the "Applications" tab (3). When you select it, its details are displayed below (4):



Hint: You can open the folder containing the application by clicking on the "Path" link (5).

If you click on "Next >" button after having selected an application, or directly double-click on it, you will be able to edit it:



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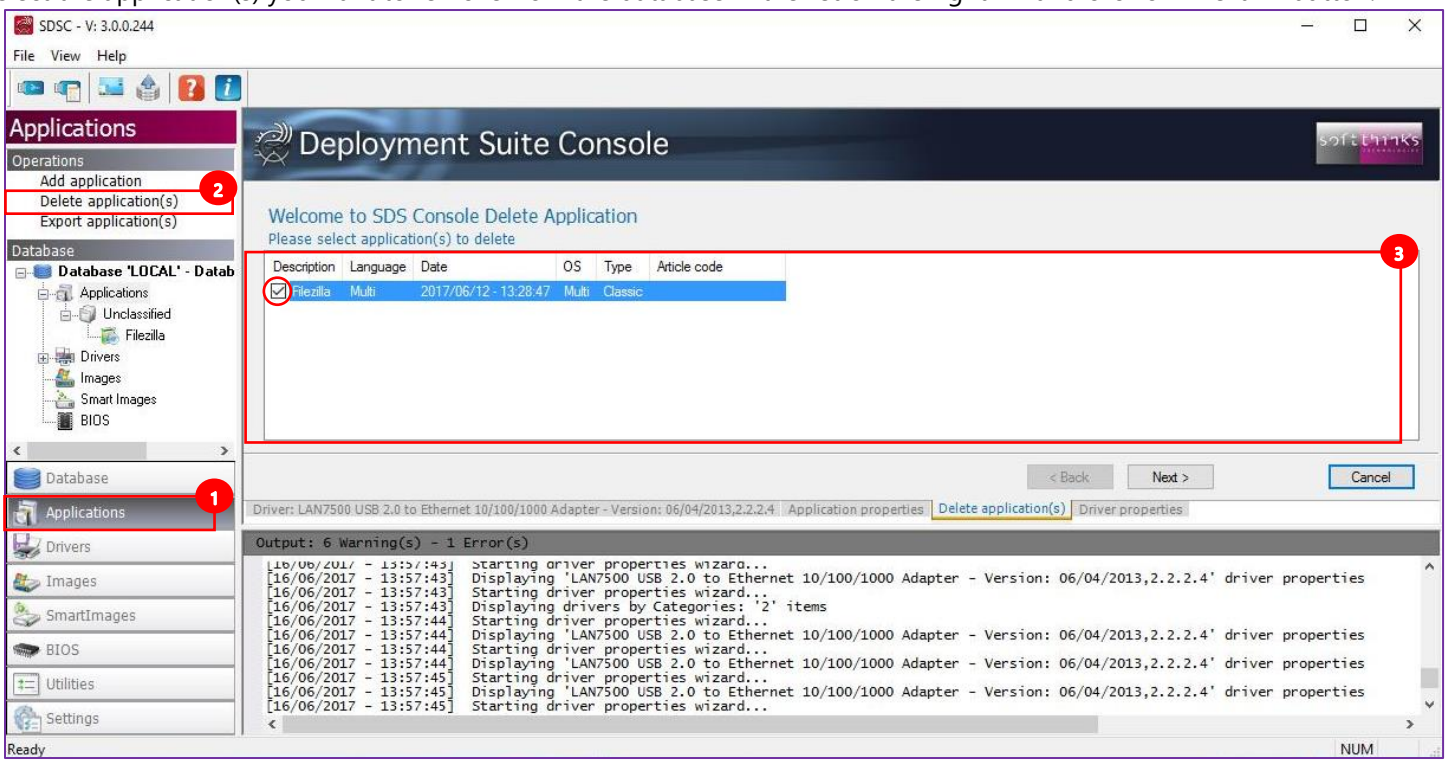
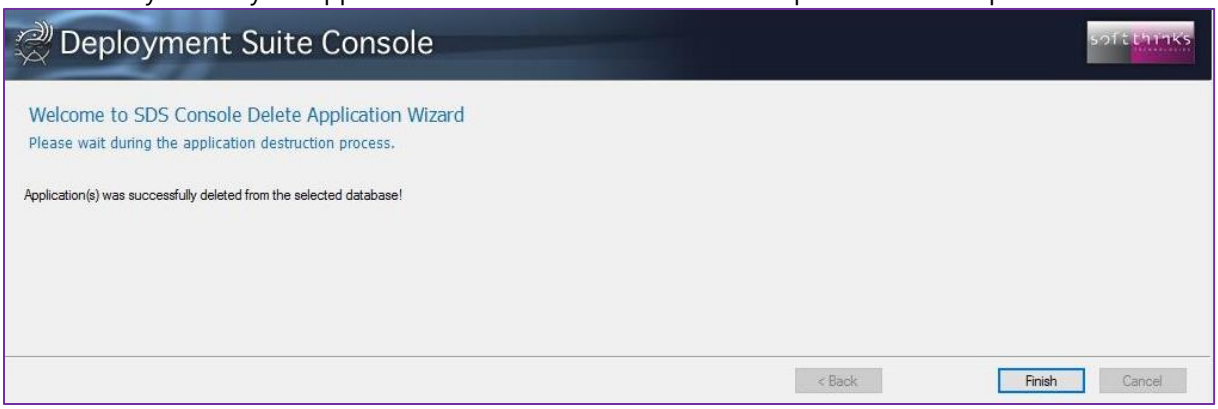
Deleting application(s) (“Delete application(s)” operation)

In order to delete one or more applications, click on “Applications” tab 1 and then “Delete application(s)” operation 2, select the application(s) you want to remove from the database in the list on the right 3 and click on “Next >” button:



The wizard will confirm you that your applications have been deleted once the process has completed:



Note: Deletion is permanent. There is no method to undo a delete. Be careful when selecting applications for deletion and review them before continuing.

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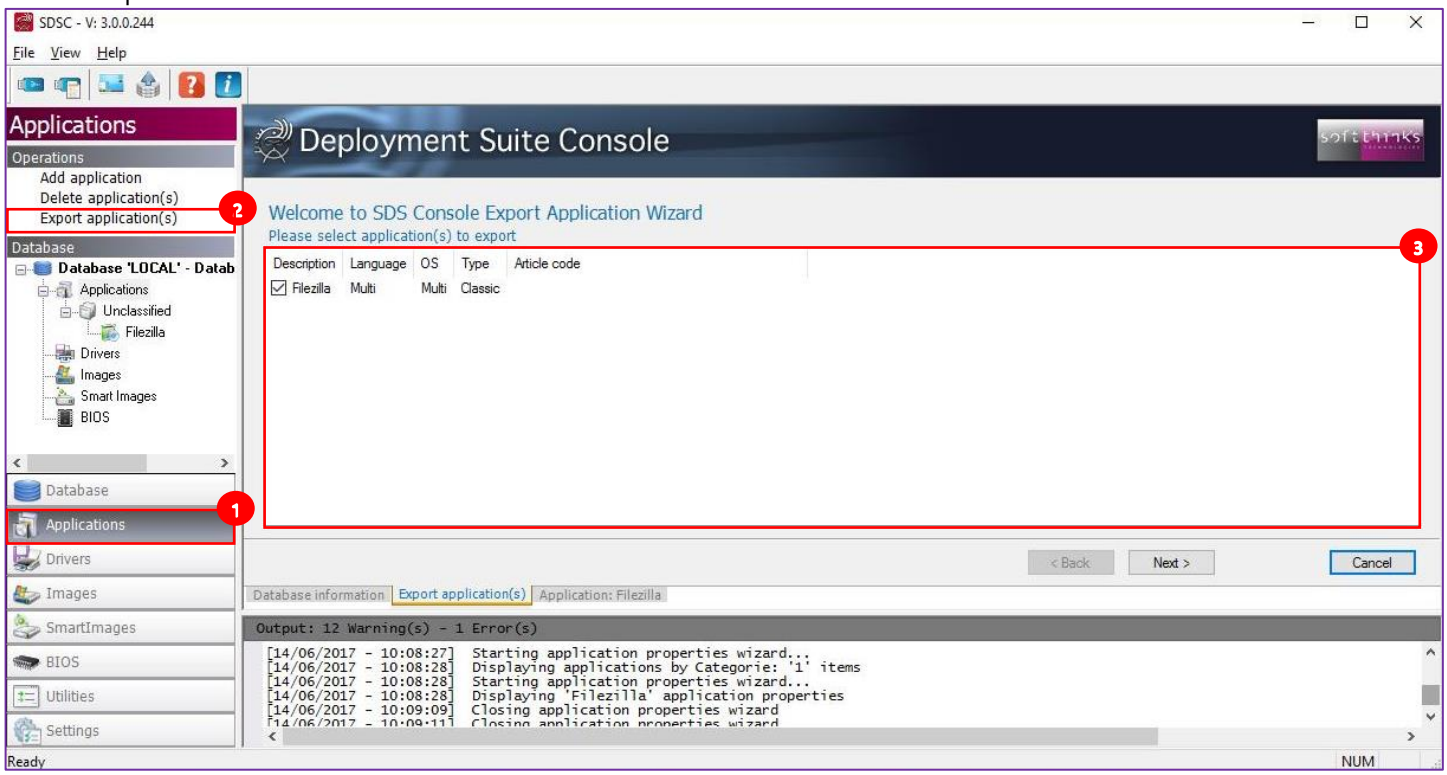
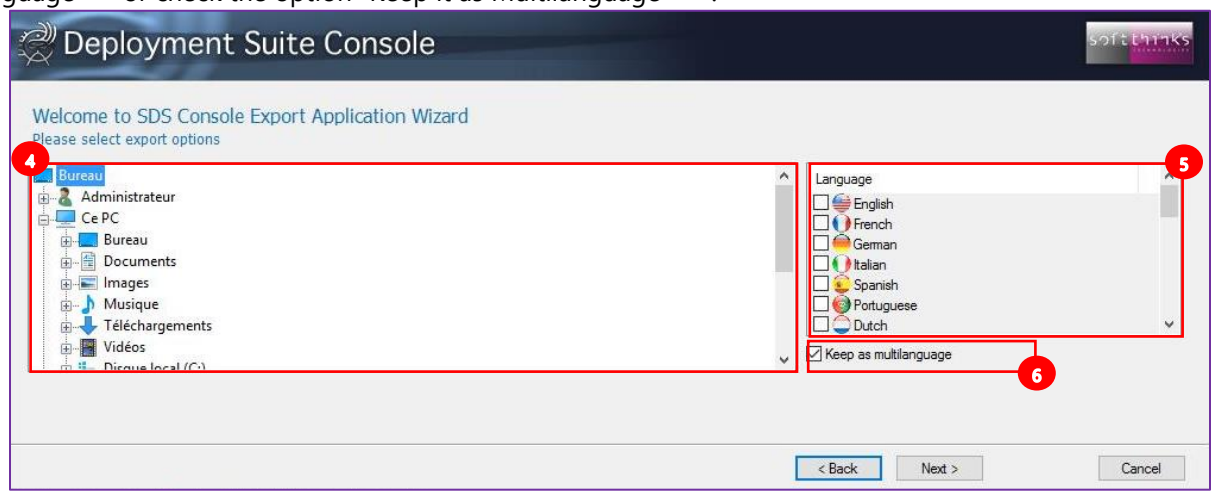
Exporting applications (“Export application(s)” operation)

In order to copy applications you added here to another server database, you have the ability to export applications.
If you need to copy applications to another database on the same server we strongly recommend you use drag & drop between the 2 databases you have opened.

1. Click on “Applications” tab (1) and then “Export application(s)” operation (2), select the applications you want to export (3) and click on “Next >” button:



2. Specify the target folder (4) where the selected application will have to be exported in a ZIP file, and specify the language (5) or check the option “Keep it as Multilanguage” (6):



Hint: Please note that in order to avoid corruption during copy USB keys are not allowed as a target and don’t appear in the tree-view.

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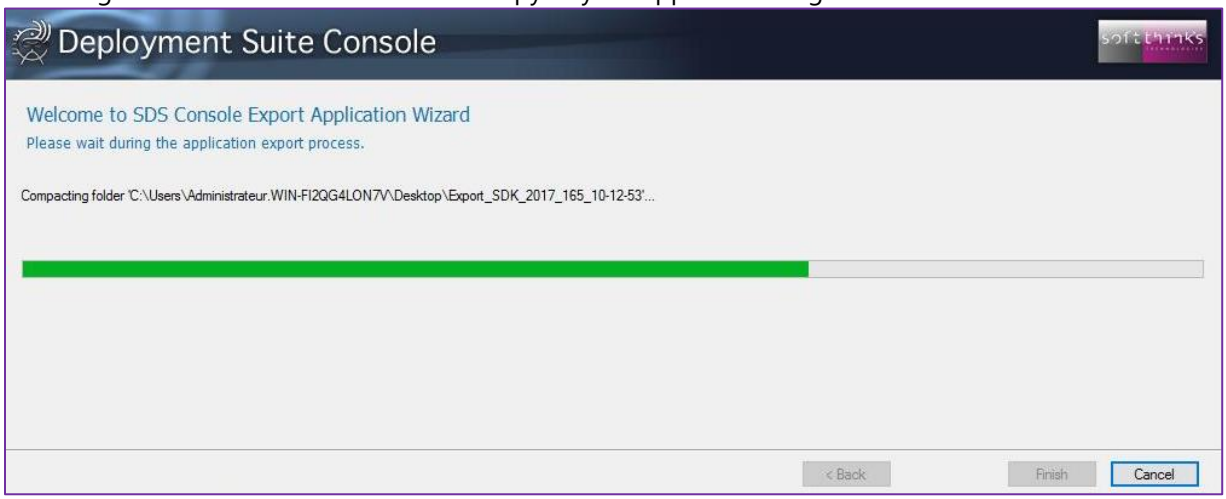
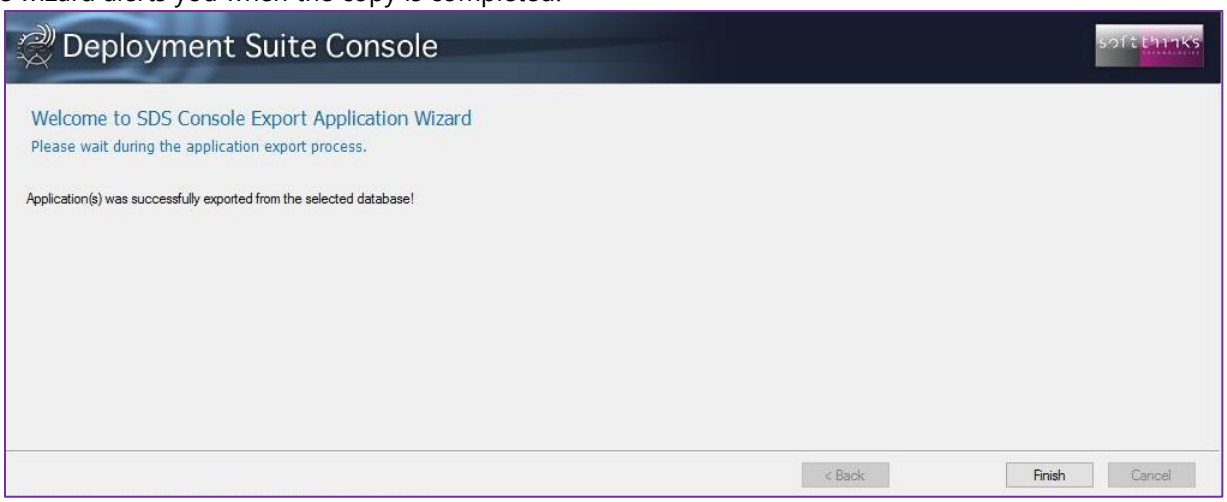
3. After having clicked on “Next >” button the copy of your application begins:



4. The wizard alerts you when the copy is completed:



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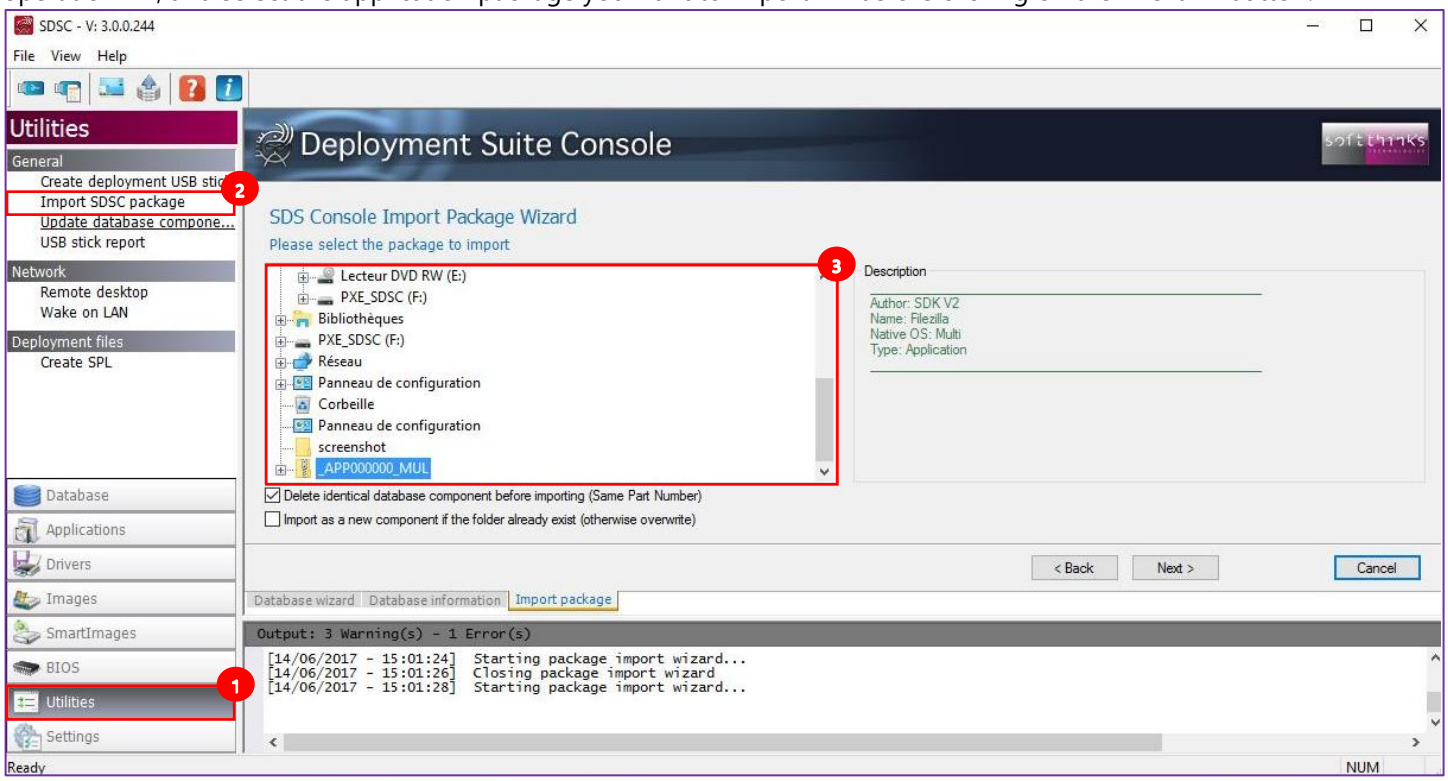
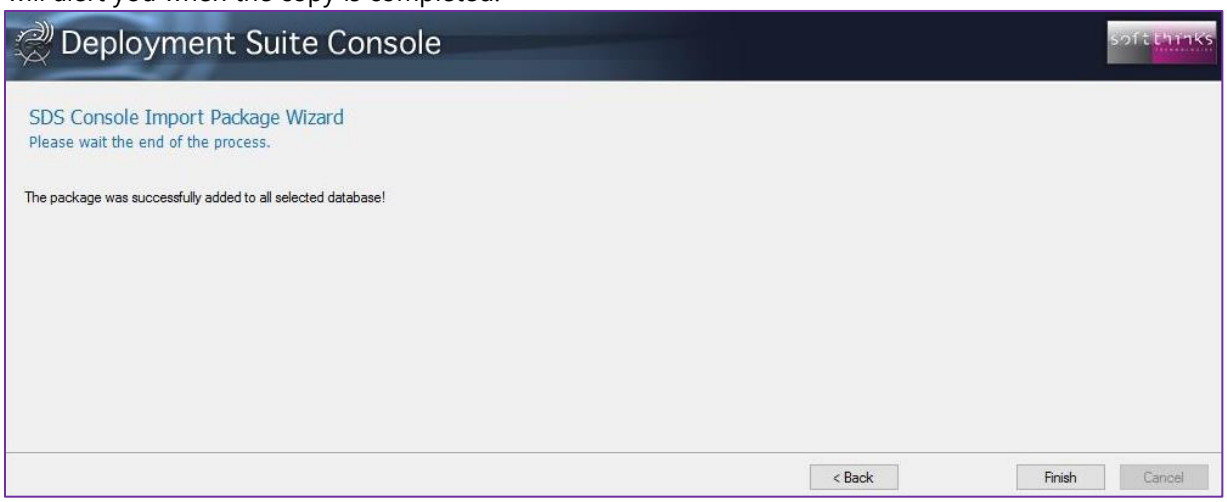
Importing application(s) (“Utilities\Import SDSC Package”)

To import an application package that was previously created, click on « Utilities » tab (1), then on « Import SDSC Package » operation (2), and select the application package you want to import (3) before clicking on the “Next >” button:



The wizard will alert you when the copy is completed:



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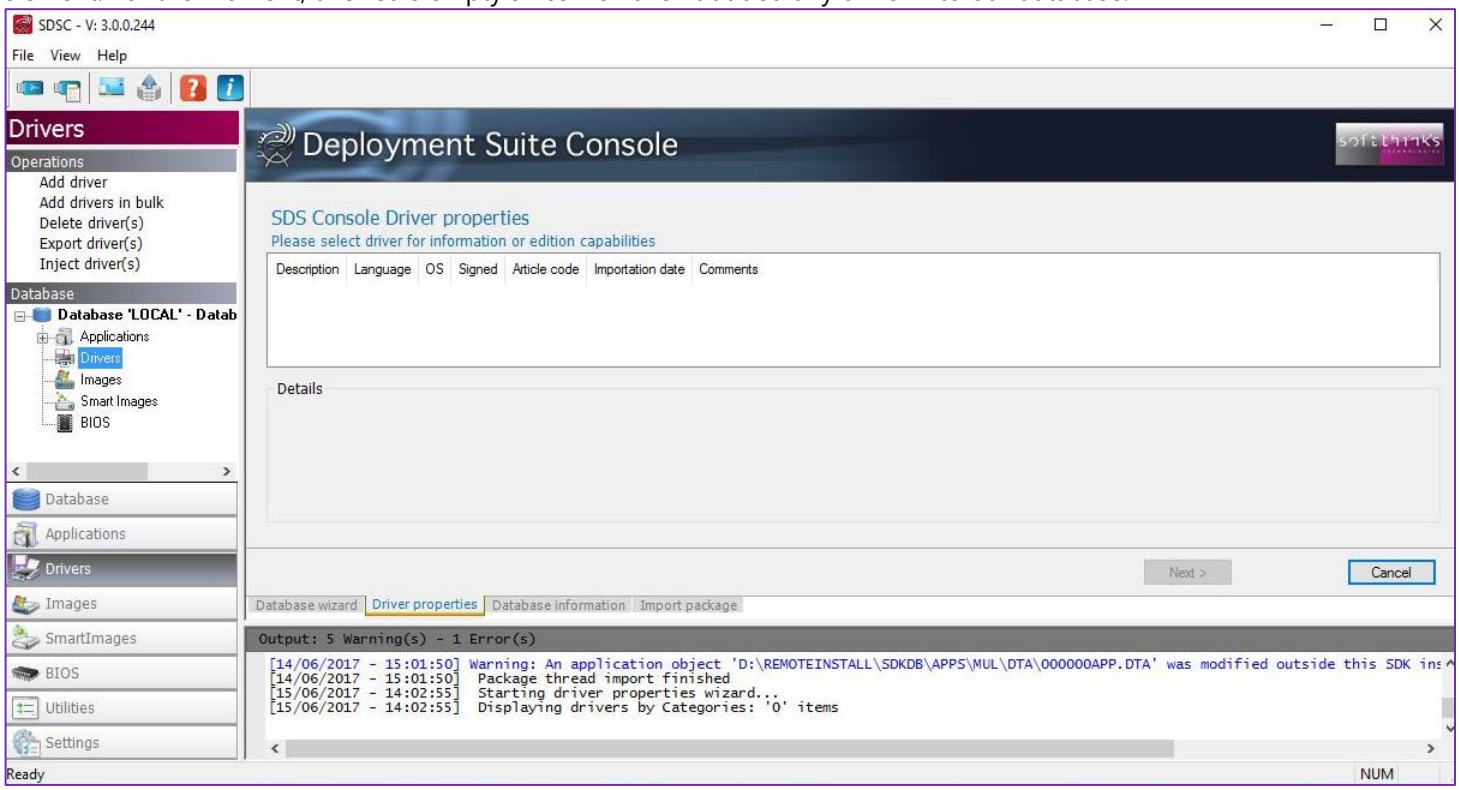
Drivers

In the same way as for Applications, you can explore the drivers you have added or imported through the “Drivers” database element. For the moment, this list is empty since we haven’t added any driver into our database:



You can also add, edit, delete, export and inject drivers.

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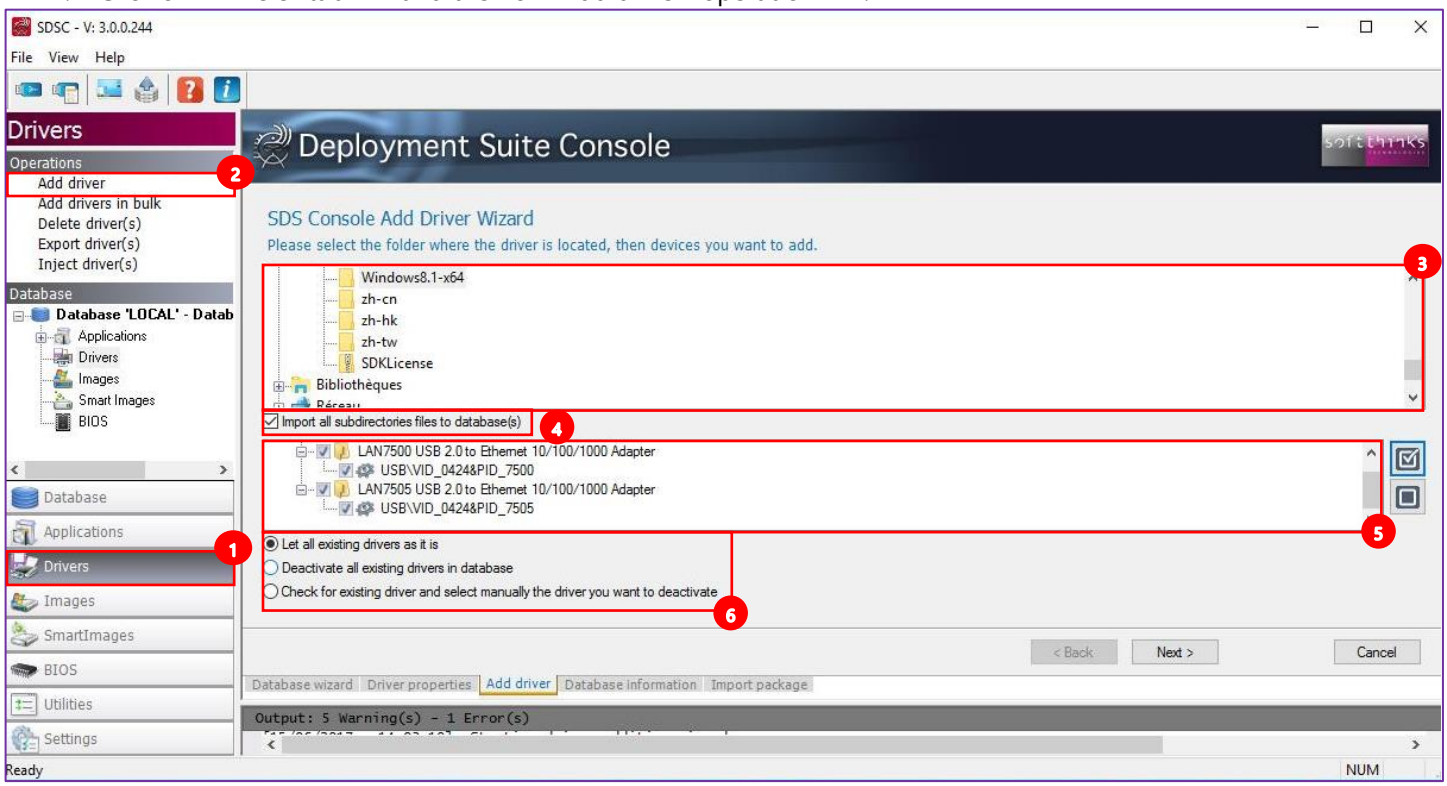
Adding a driver ("Add driver" operation)

To add a driver to the database, for example a network driver required to boot on a specific platform, you first need a folder containing the driver INF, CAT and other associated files for the driver. If the driver is packaged in a compressed format, it must be expanded first.
If you need to add several drivers at a one time, you should use the operation "Add drivers in bulk" instead.

1. Click on "Drivers" tab (1) and then on "Add driver" operation (2):



2. Select the folder where the driver you want to add is located (3):

   Hint – It is important to make sure that the option "Include Subdirectories" (4) is checked if the source folder contains subdirectories that are required to install the driver properly. Some vendors create their driver packages with the INF file in the root directory and binaries under a subfolder based on the compatible OS name of the driver.

3. Select the individual PnP IDs with which to associate the driver (or the topmost value to include all of the IDs) you want add (4).

4. Choose what you want to do with existing drivers matching the selected PnP IDs (6):
   - **Let all existing drivers as it is:** This option adds this driver and keeps any existing drivers using the same PnPIDs.
   - **Deactivate all existing drivers in database:** The new driver supercedes the existing drivers with the same PnP IDs.
   - **Check for existing driver and manually select the driver you want to deactivate**: This option allows the Administrator to selectively replace the driver on a PnP ID basis.

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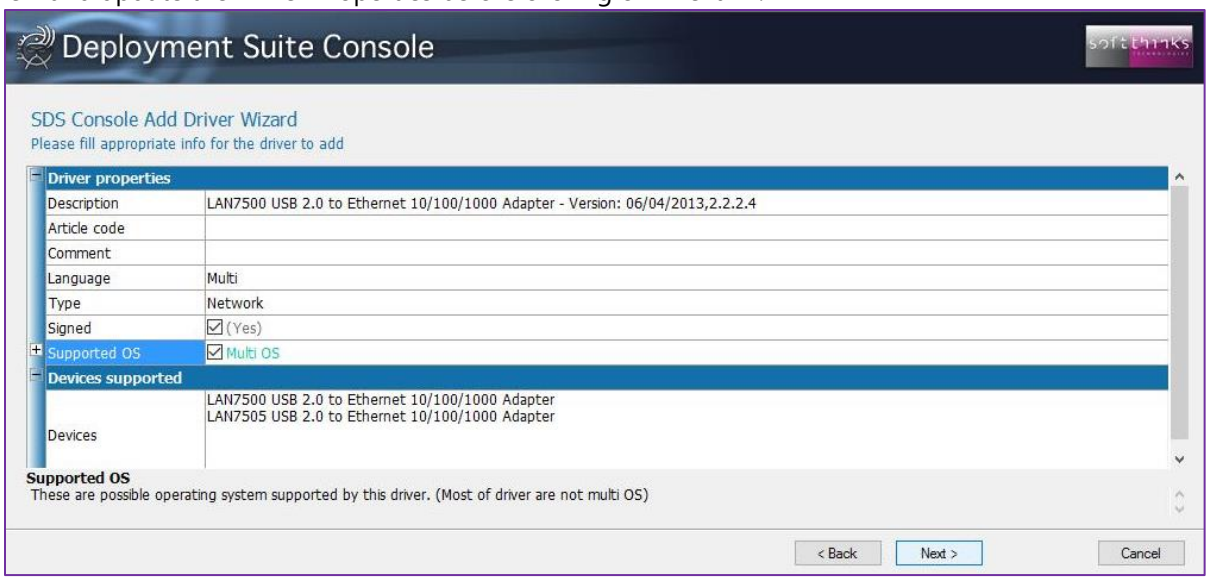
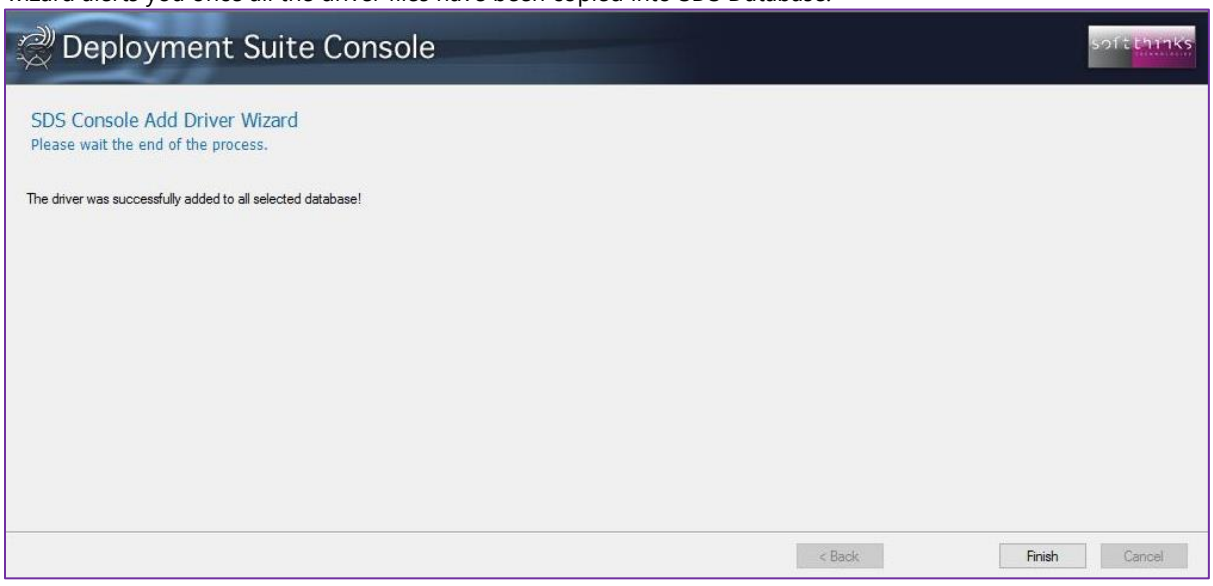
5. Review and update the Driver Properties before clicking on "Next >":



- **Description:** A text description of the driver that will be displayed in the database and by the Apps and Drivers Recovery interface. You can modify this as needed.
- **Article Code:** The part number used in SPL files to designate the driver. (Not commonly used)
- **Comment:** Additional field to provide info on the driver.
- **Type:** The class of the driver (mass storage, network, video, etc) from a list created in the Settings tool.
- **Signed:** Check this box if the driver is digitally signed. Note: If the driver is not already signed, checking this box will not sign it.
- **Supported OS:** Multi OS allows the driver to be used in any OS or a list of specific OS's can be used selected.
- **Devices Supported:** Shows the description of the devices from the INF file.

6. The wizard alerts you once all the driver files have been copied into SDS Database:



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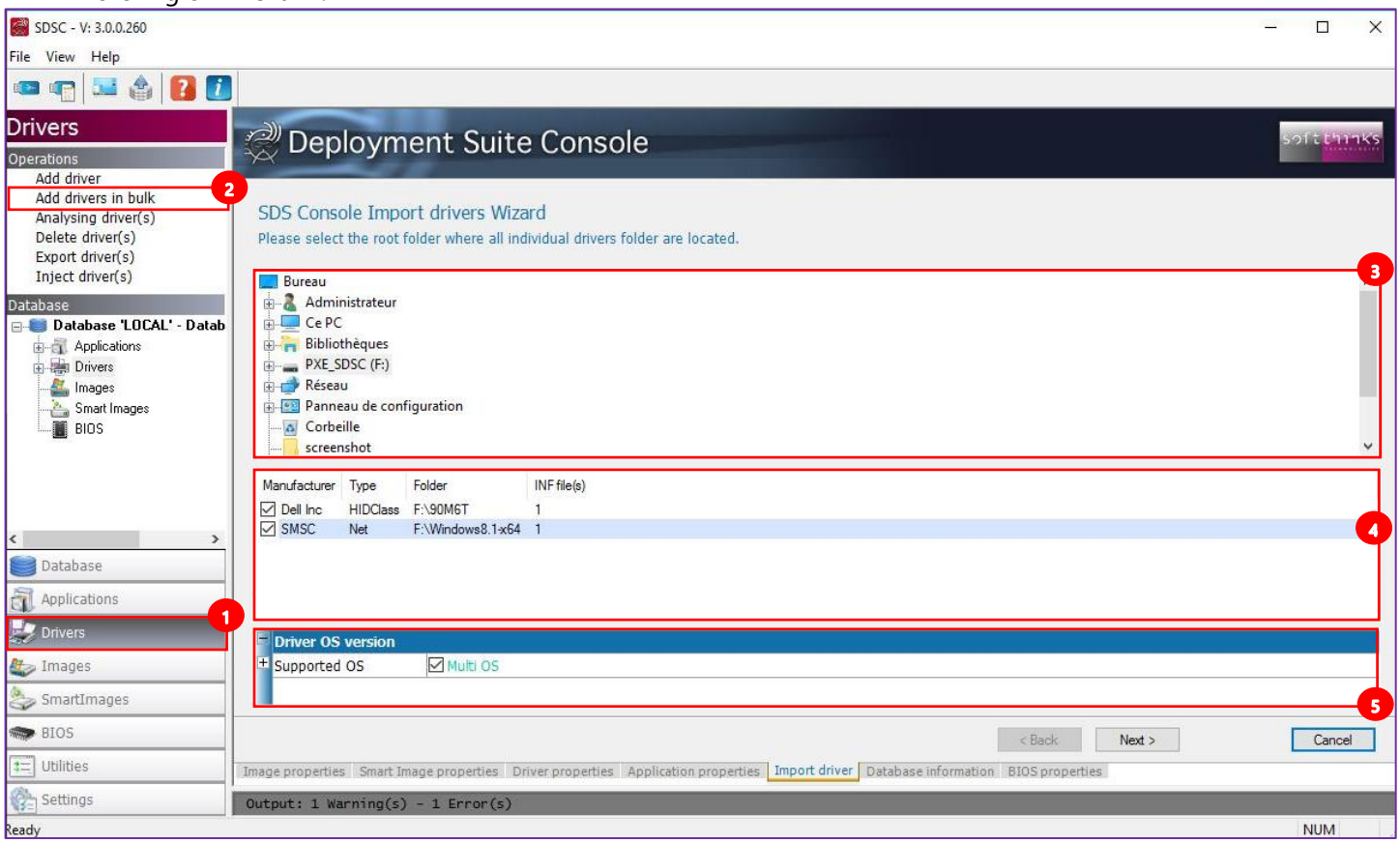
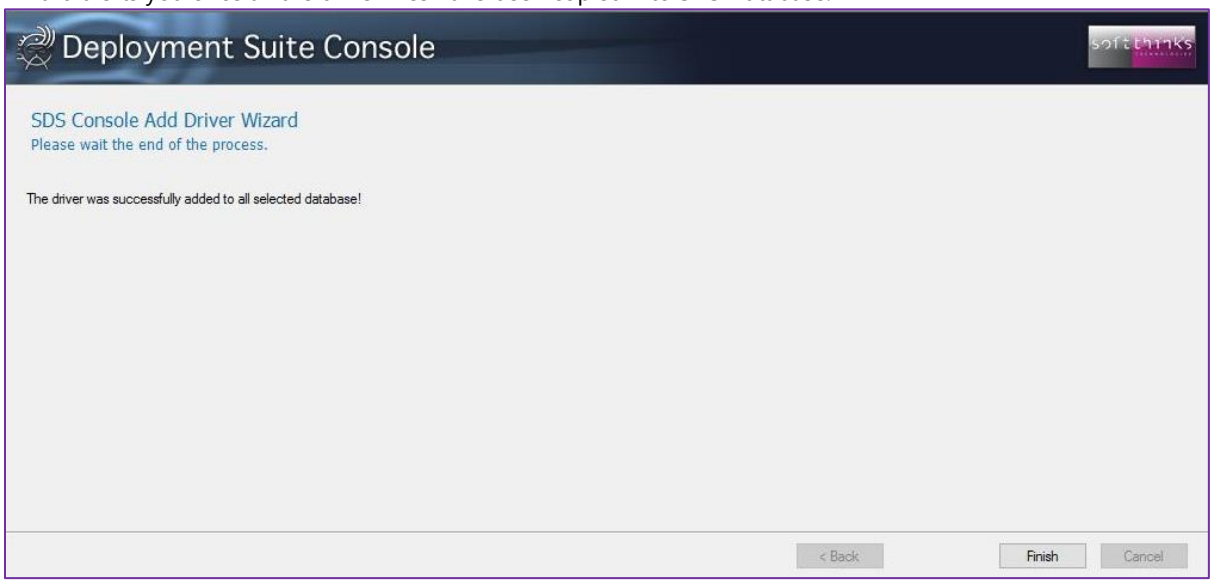
Adding several drivers (“Add drivers in bulk” operation)

You can also add all of the drivers in at one time.

1. Click on “Drivers” tab (1) and then “Add drivers in bulk” operation (2), select the root folder where all individual drivers folders are located (3) and then which ones you want to import (4), and the driver OS version (5) before clicking on “Next >”:



2. The wizard alerts you once all the driver files have been copied into SDS Database:



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Adding Driver Packs

Driver packs are recent addition to our software that will deploy a small database of drivers that matches the model of the unit. This will prevent any driver version mismatch issues.

Driver packs are setup as special application in the system. During the deployment process, once the system reaches the point of doing driver injection, it will check to see if there is a driver pack that matches the model. If there is, it will use the driver pack rather than the normal driver database.

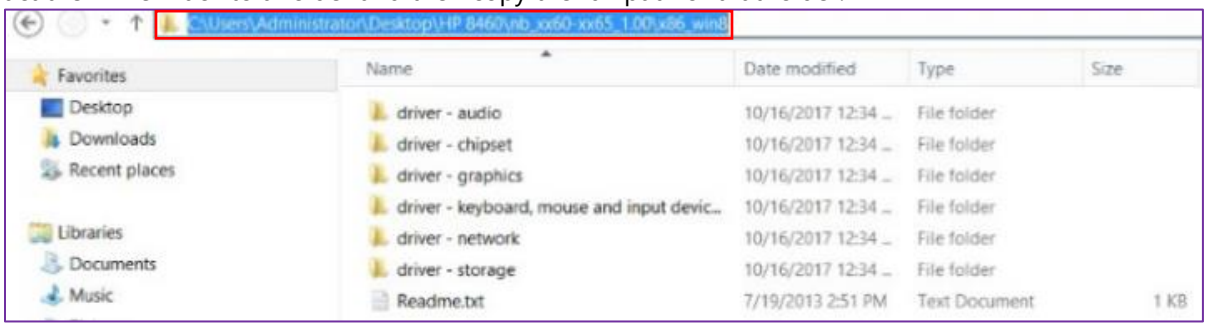
Certain Manufacturers provide driver packs for their computers. Dell, HP and Lenovo do for sure and these can be reached by clicking on the following links:

- **Dell** : http://en.community.dell.com/techcenter/enterprise-client/w/wiki/2065.dell-command-deploy-driver-packs-for-enterprise-client-os-deployment
- **HP** : http://ftp.hp.com/pub/caps-softpaq/cmit/HP_Driverpack_Matrix_x86.html (32 Bit)
  http://ftp.hp.com/pub/caps-softpaq/cmit/HP_Driverpack_Matrix_x64.html (64 Bit)
- **Lenovo** : https://support.lenovo.com/us/en/documents/ht074984

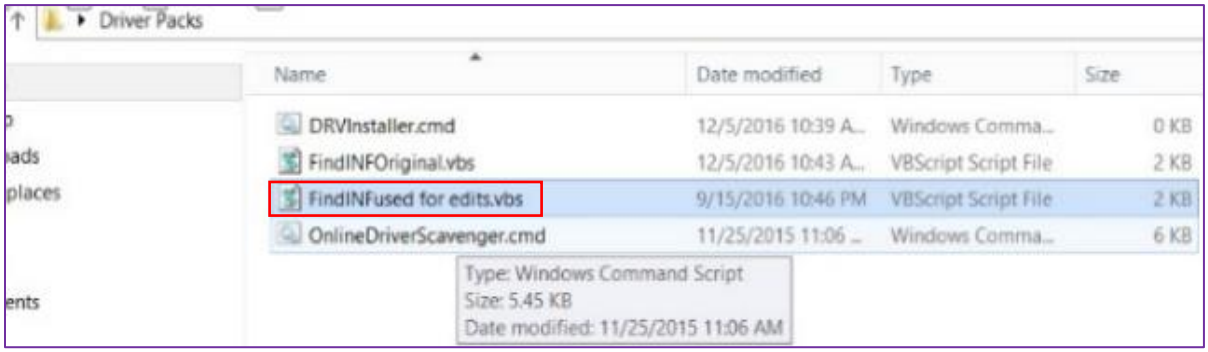
Here are the steps to add driver packs to the SDS database:

1. Find the model of computer that you are looking for and download that driver to a folder on your server.

2. Extract the Driver Pack to a folder and then copy the full path of that folder:



3. You will be given a driver pack folder with files that are needed for creating driver packs. Open that folder and right click on FindINFused for edits.vbs and select EDIT:



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4. Paste the address that you copied for the Extracted Driver Pack Folder into the First line of FindINFused for edits.vbs that says Const startDir = "...:

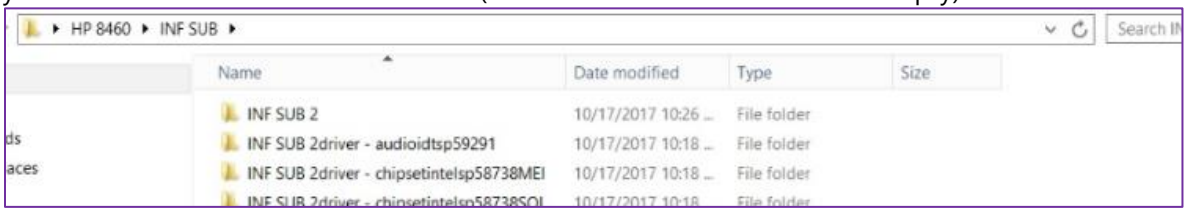
```
Const startDir = "C:\Users\Administrator\Desktop\HP 8460\nb_xx60-xx65_1.00\x86_win8"
Const endDir = ""
Set oFSO   = CreateObject("Scripting.FileSystemObject")
```

5. In the folder that you extracted your Driver Pack, create a folder called INF SUB and then inside there, create a folder called INF SUB 2. Then copy the path of INF SUB 2 and paste it into the Second line of FindINFused for edits.vbs that says Const endDir ="...:

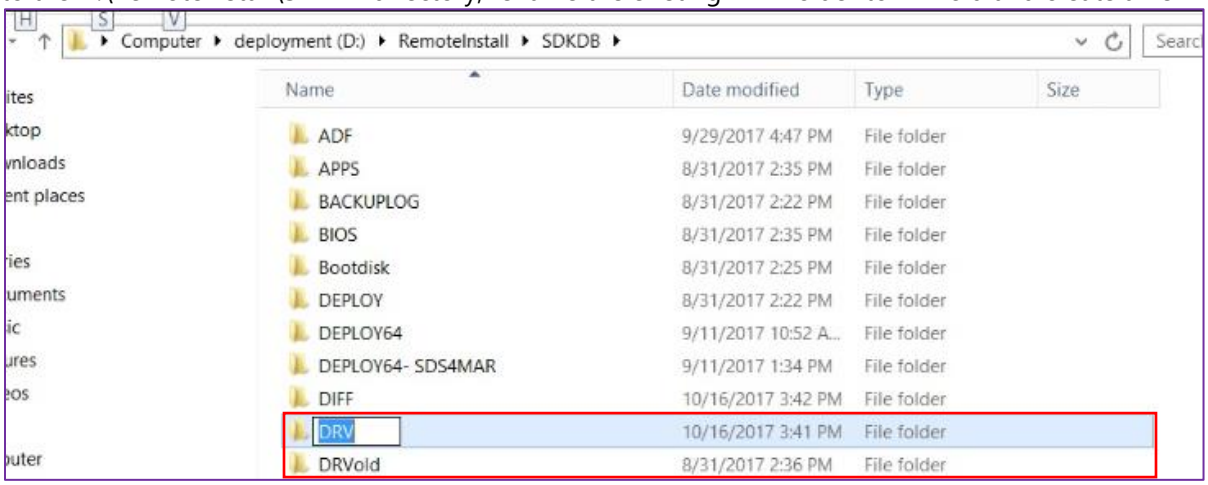
```
Const startDir = "C:\Users\Administrator\Desktop\HP 8460\nb_xx60-xx65_1.00\x86_win8"
Const endDir = "C:\Users\Administrator\Desktop\HP 8460\INF SUB\INF SUB 2"
Set oFSO   = CreateObject("Scripting.FileSystemObject")
```

6. Save and Close the FindINFused for edits.vbs file then double-click on it to run it.

7. Verify that the files are in the folder INF SUB. (The INF SUB 2 Folder will remain empty):



8. Go to the D:\RemoteInstall\SDKDB directory, rename the existing DRV folder to DRVold and create a new DRV folder:



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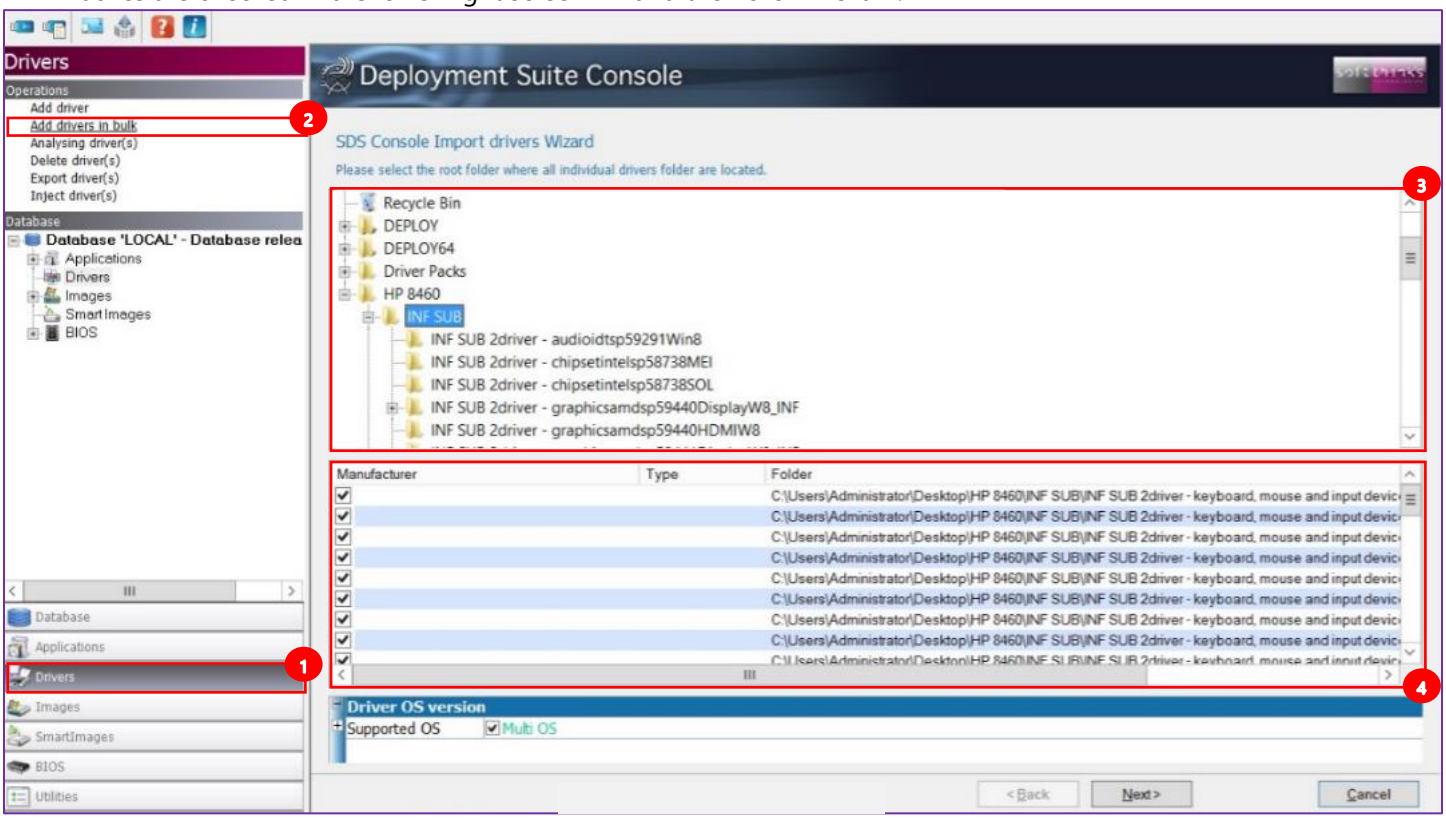
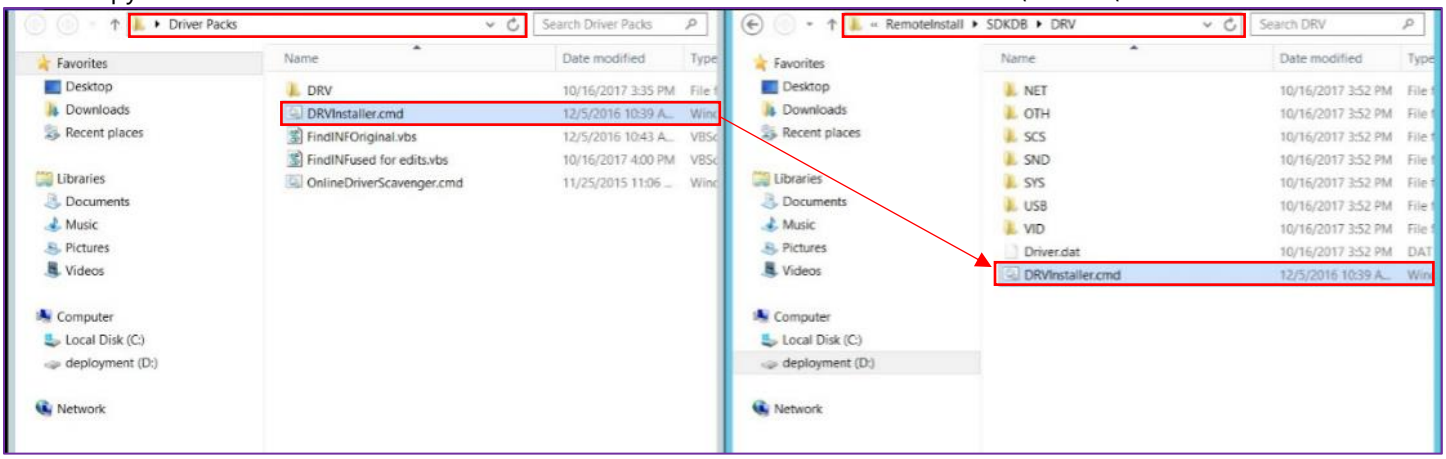
9. Open the SDS Management Console. Select "Drivers" in the Lower Menu on the left (1), then click on "Add drivers in Bulk" in the Top left menu (2). Browse to the INF SUB folder that you created and click on it (3). Make sure all of the boxes are checked in the lower right screen (3) and then click "Next>":



10. When the process is complete click the Finish Button in the lower right corner.

11. Copy the DRVInstaller.cmd file from the Driver Packs folder to the RemoteInstall\SDKDB\DRV folder:



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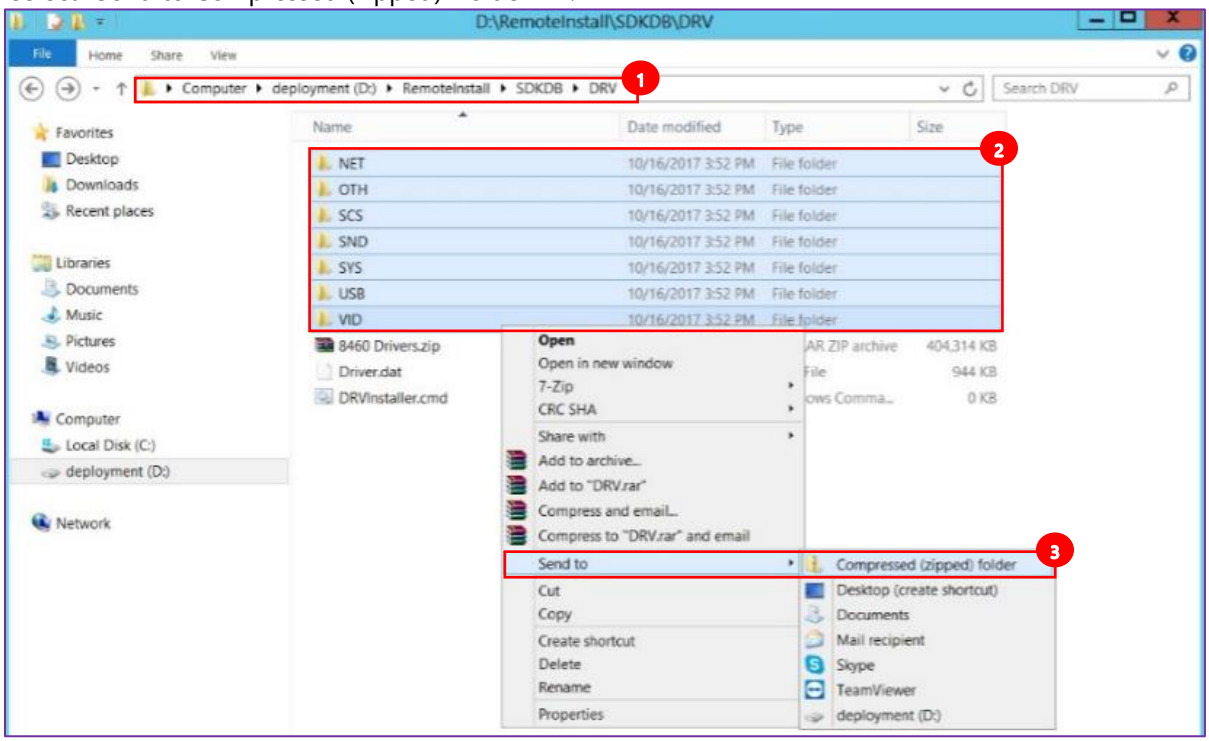
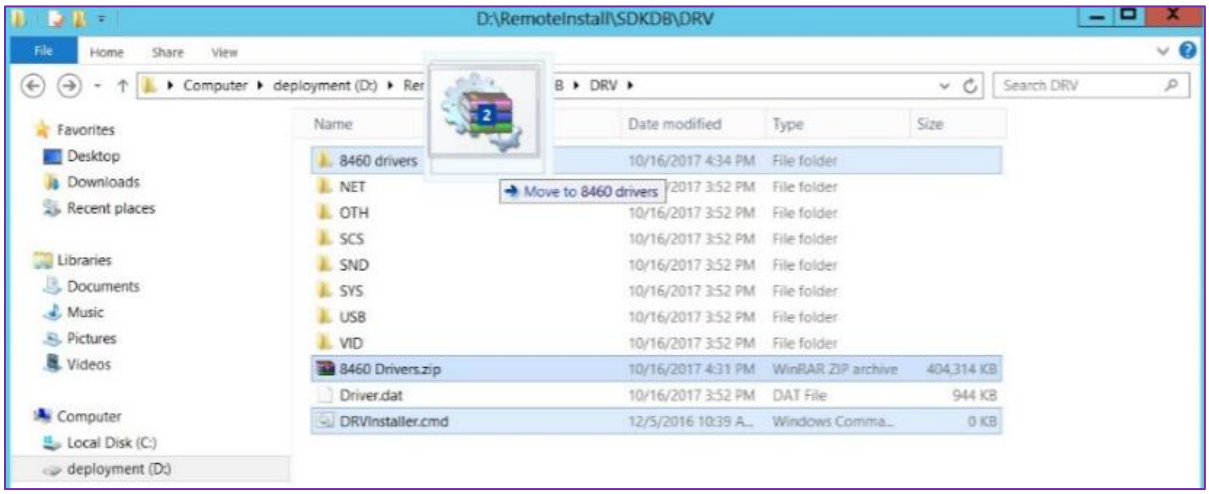
12. Select all of the folders in the RemoteInstall\SDKDB\DRV folder[1]. Right click on them while they are highlighted[2] and select “Send to Compressed (zipped)” folder[3]:



13. Create a new folder in the DRV Folder (name it whatever you like) and move the compressed file and the DRVInstaller.cmd file to it:



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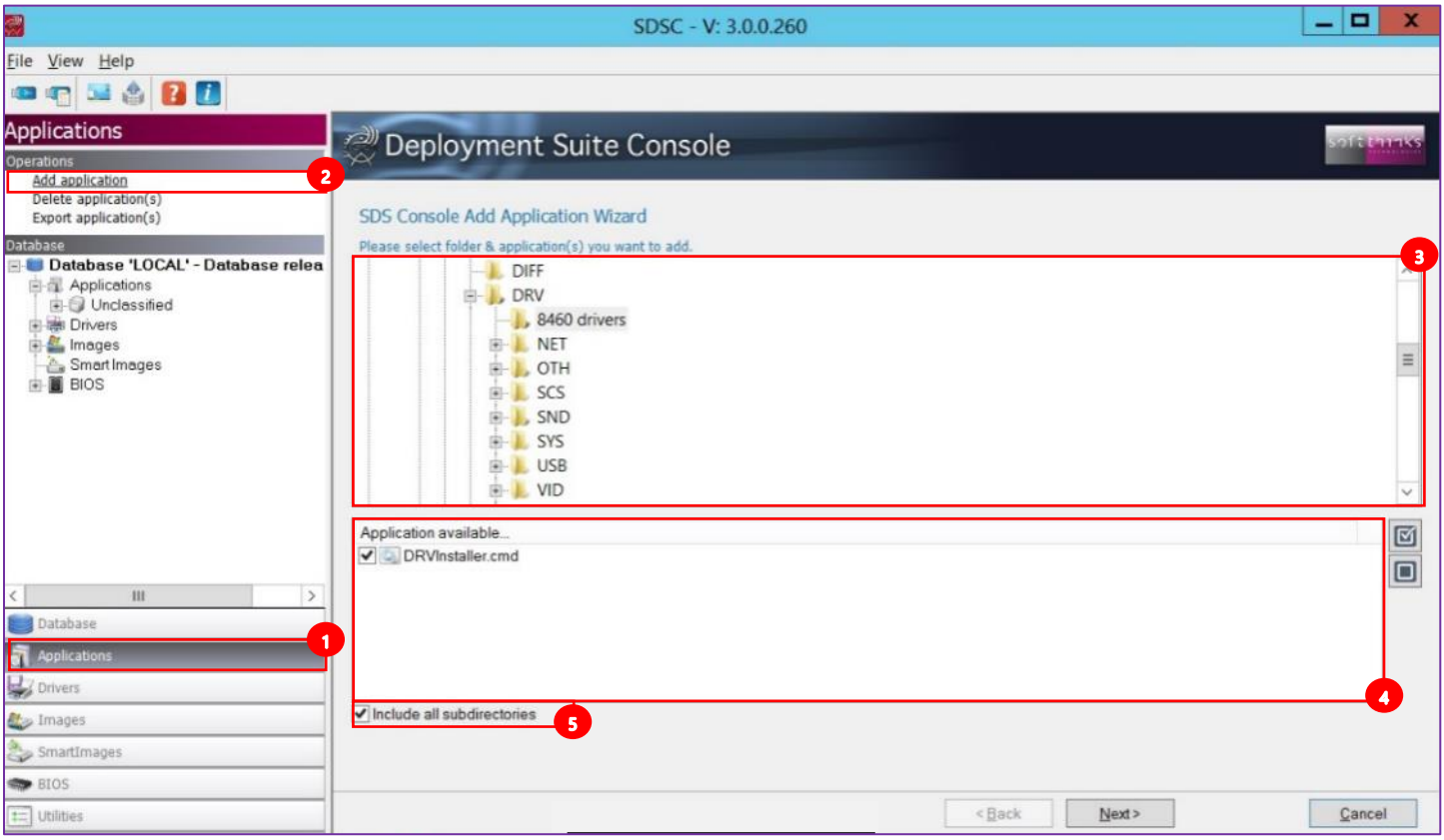
14. Go back to the SDS Console and in the lower left menu click on “Applications”(1). Then in the upper left menu click on “Add Application”(2). Browse to and select the folder you created in the DRV folder(3). Put a check in the box next to the DRVInstaller.cmd(4) and make sure the box next to “Include all subdirectories” is checked as well(5). Click on “Next >” button:



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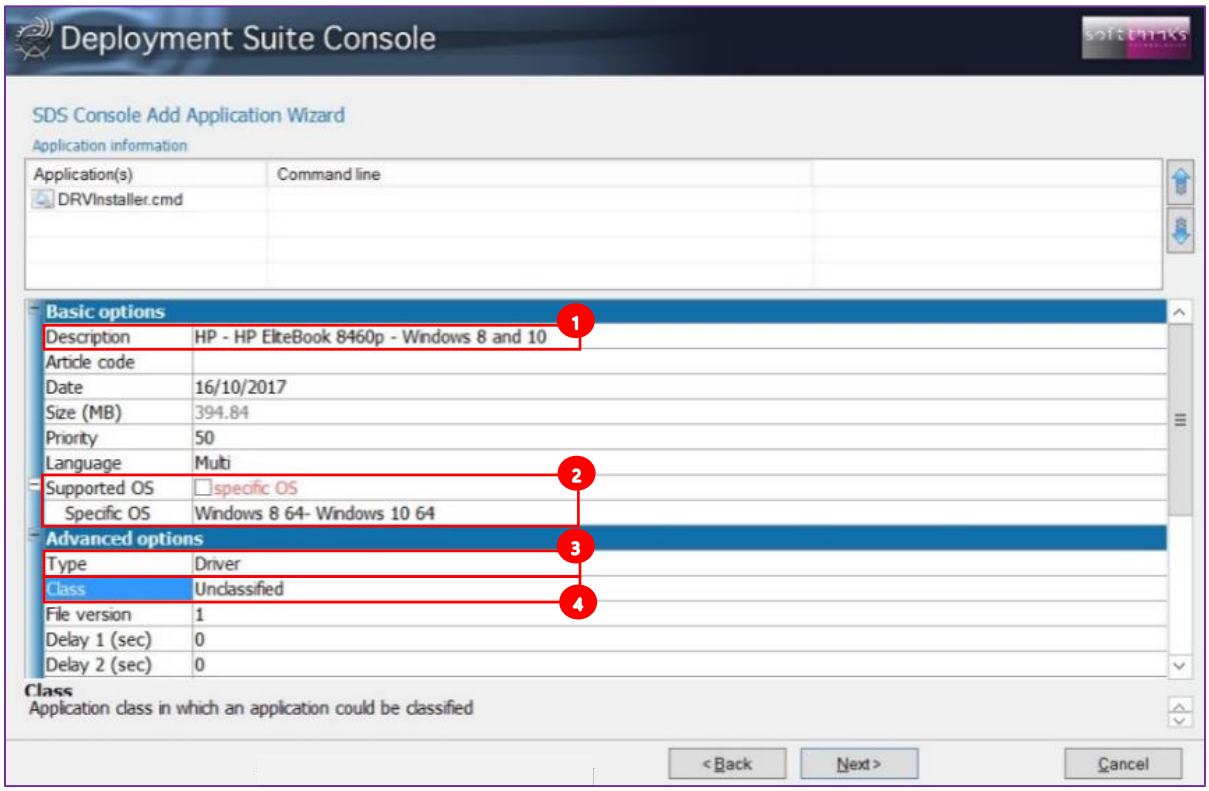
15. The naming convention for the Driver Packs is "Manufacturer – Model – Operating System". The manufacturer and Operating system are for you. The model is what is used by the system to find and install the driver pack. Type the name in the "Description" field[1]. Uncheck the box that says "Multi OS" next to "Supported OS" then in "Specific OS" select the Operating systems that the driver pack is for (Windows 7 is selected by default and will need to be unchecked if it is not needed)[2]. Under Type select "Driver"[3] and for Class select "Unclassified"[4] then click on "Next >" button:



Note: In order to get the correct name, you will need to boot the model of the computer for which you are creating the Driver Pack then go to SDKDB\Temp and open the Temp folder for that computer[1]. Select the file ending with _Flow.xml[2] and right click to edit it. Go to the line that says "PRODUCT:" and copy the model name of the computer[3]. Paste that name in the Middle part of the description. (for this example it would be HP – HP Elitebook 8460p – Windows 8 and 10 64 bit.):

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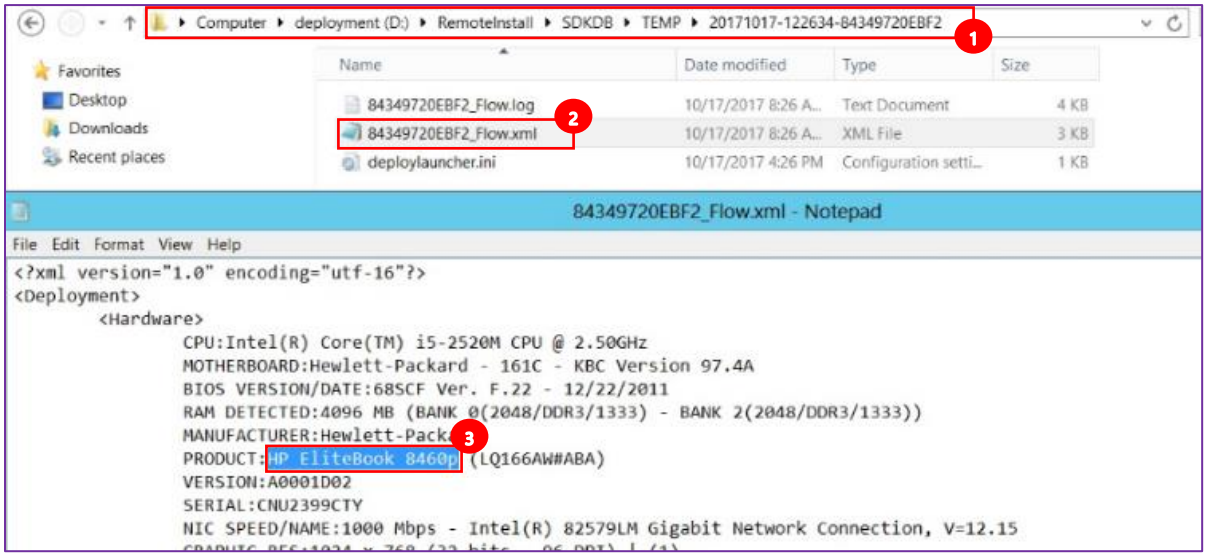
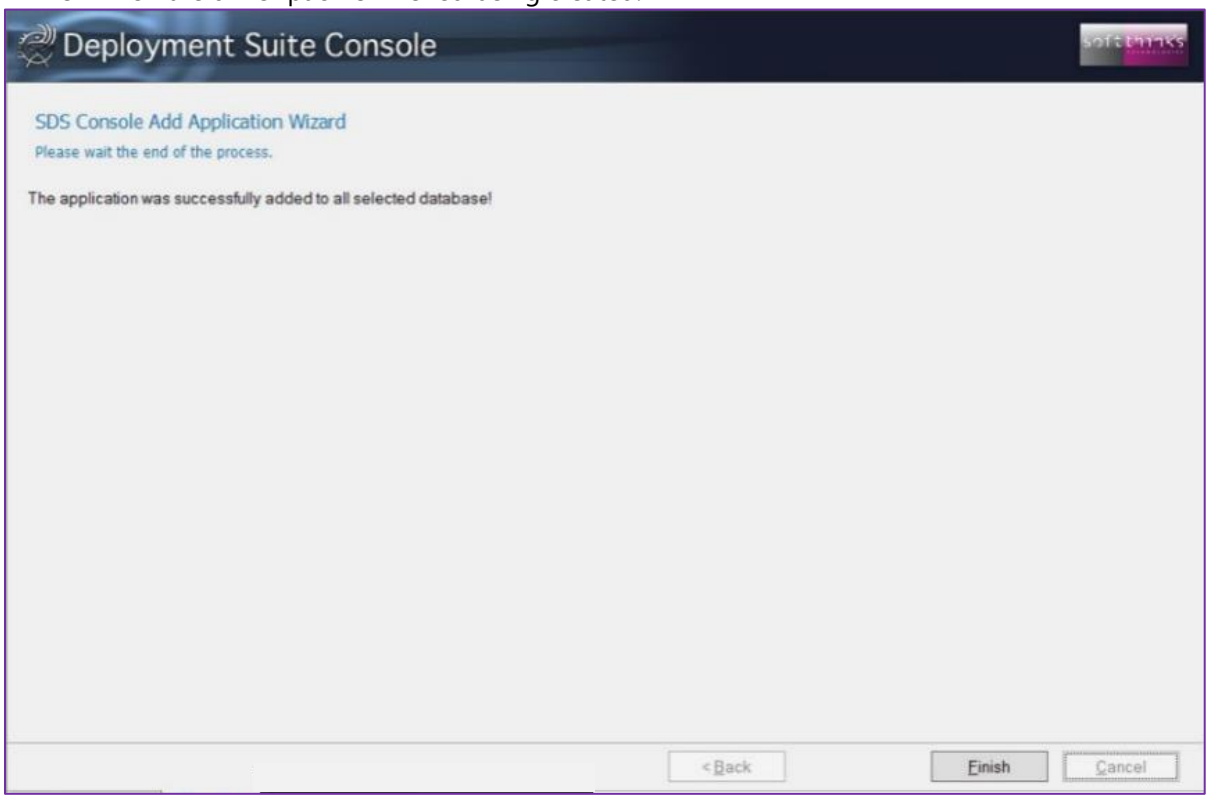


16. Click Finish when the driver pack is finished being created:



17. The new driver pack will be listed in your Applications:

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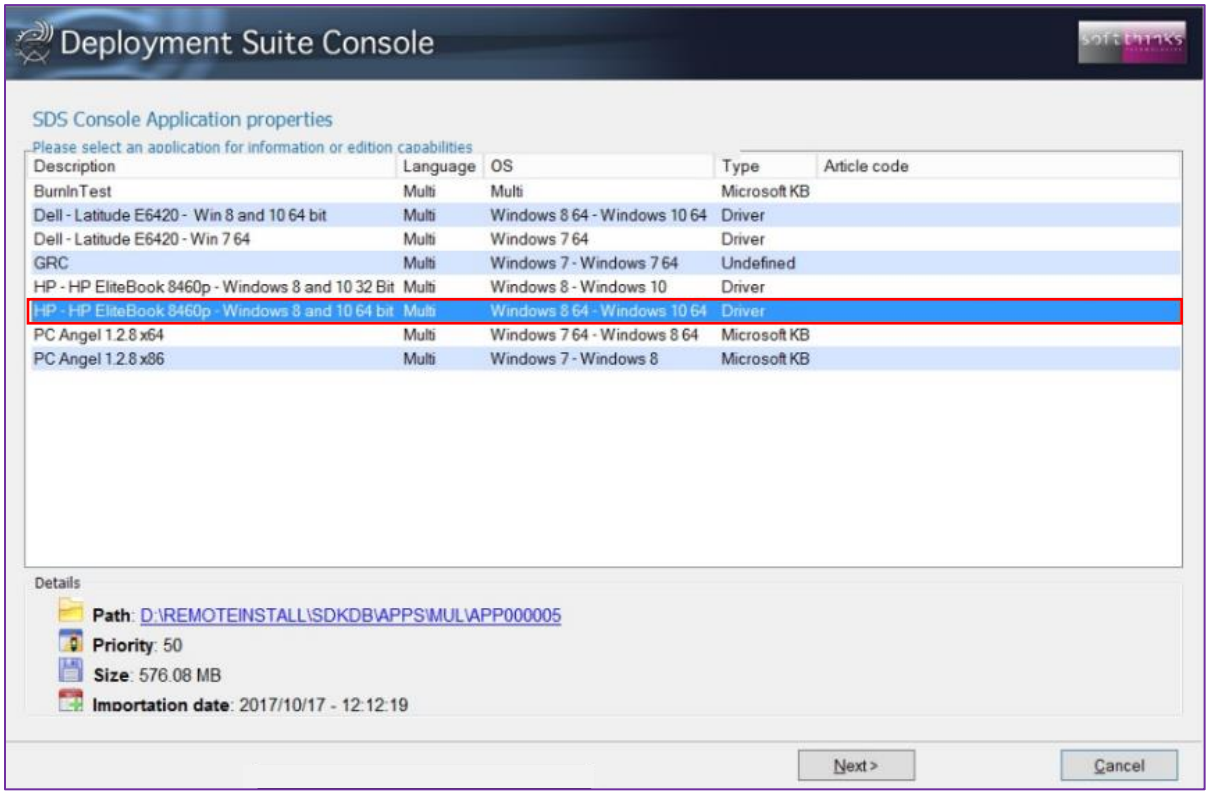

Note: if the model name and the OS match, the Driver Pack will be selected automatically by the system. It does not have to be manually selected by the technician.

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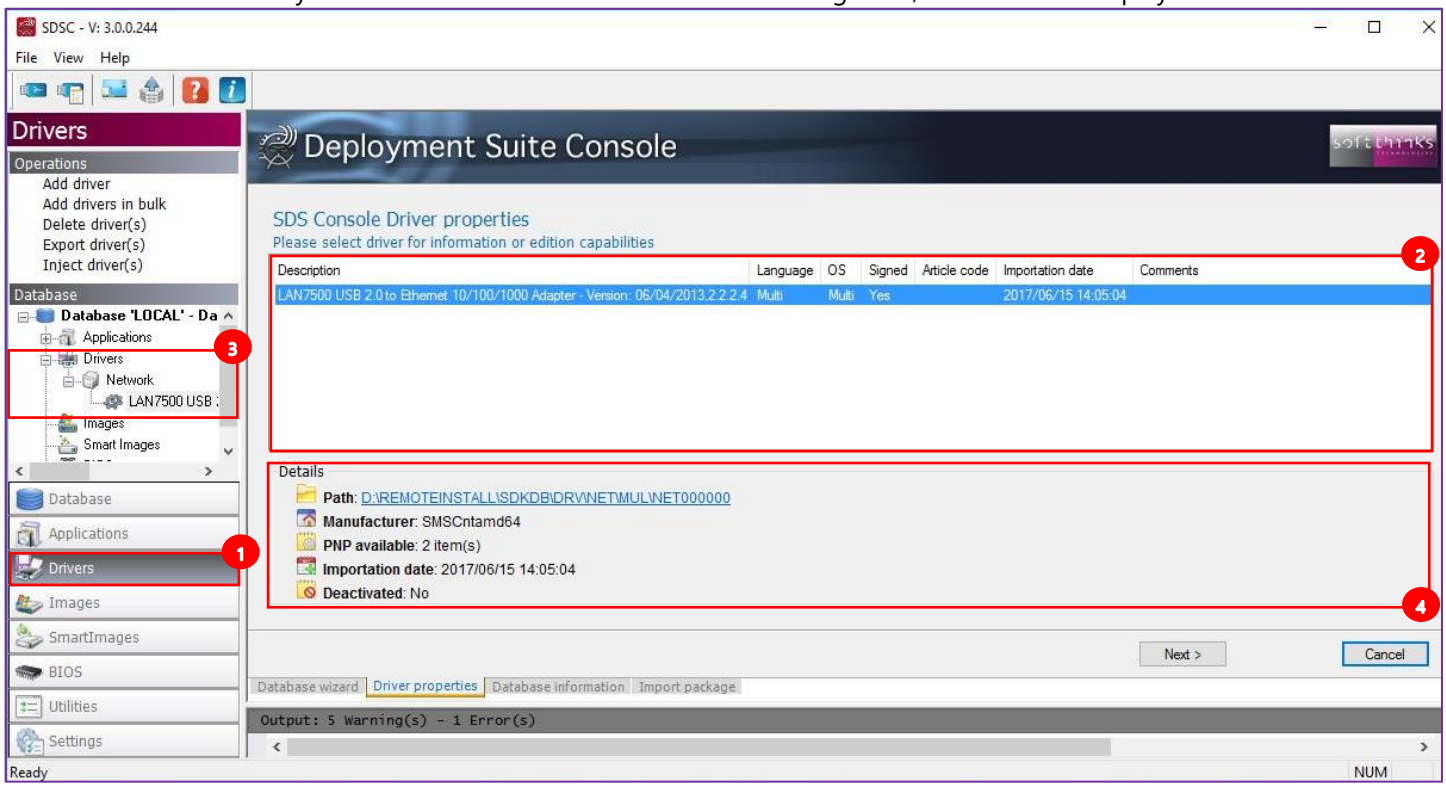
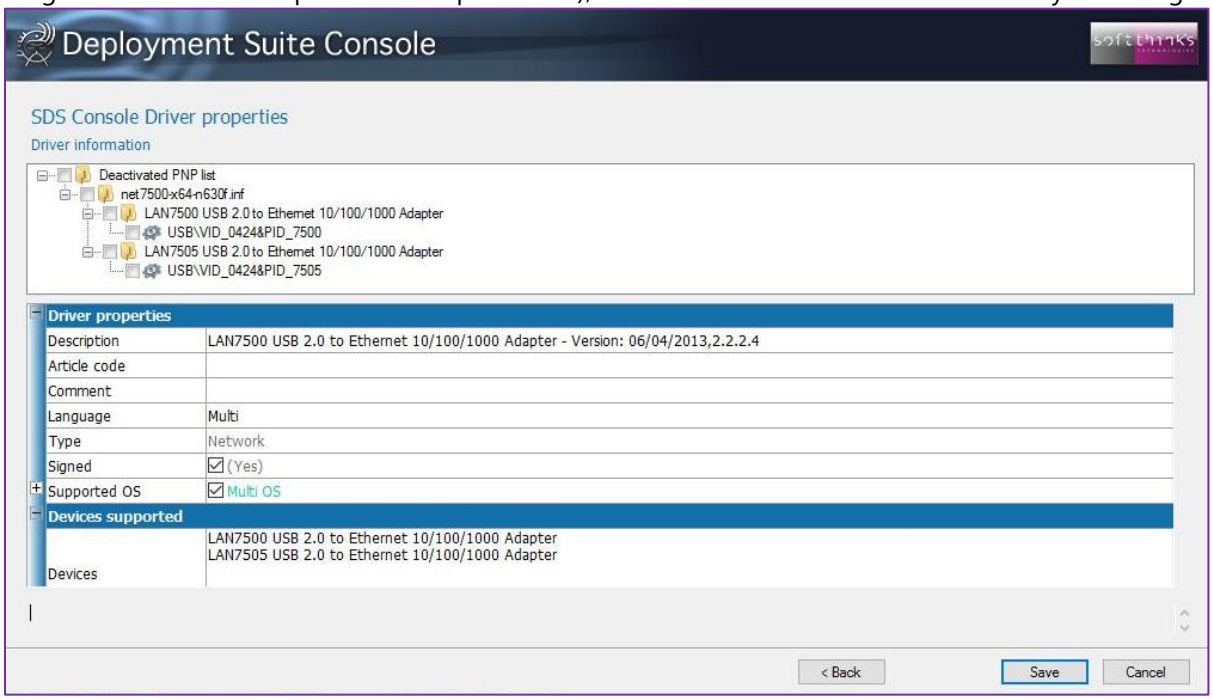
Editing a driver

Once you have added a driver, it appears in the list 2 displayed when you click on the "Drivers" tab 1, and in the tree-view on the left under the "Drivers" database item 3.

1. Select the driver you want to edit in the main window on the right 2, its details are displayed below 4:



2. Click on the "Next >" button or double-click on the driver to edit its properties, from when you added the driver (see "Adding Drivers" for a description of each parameter), and click on the "Save" button to save your changes:



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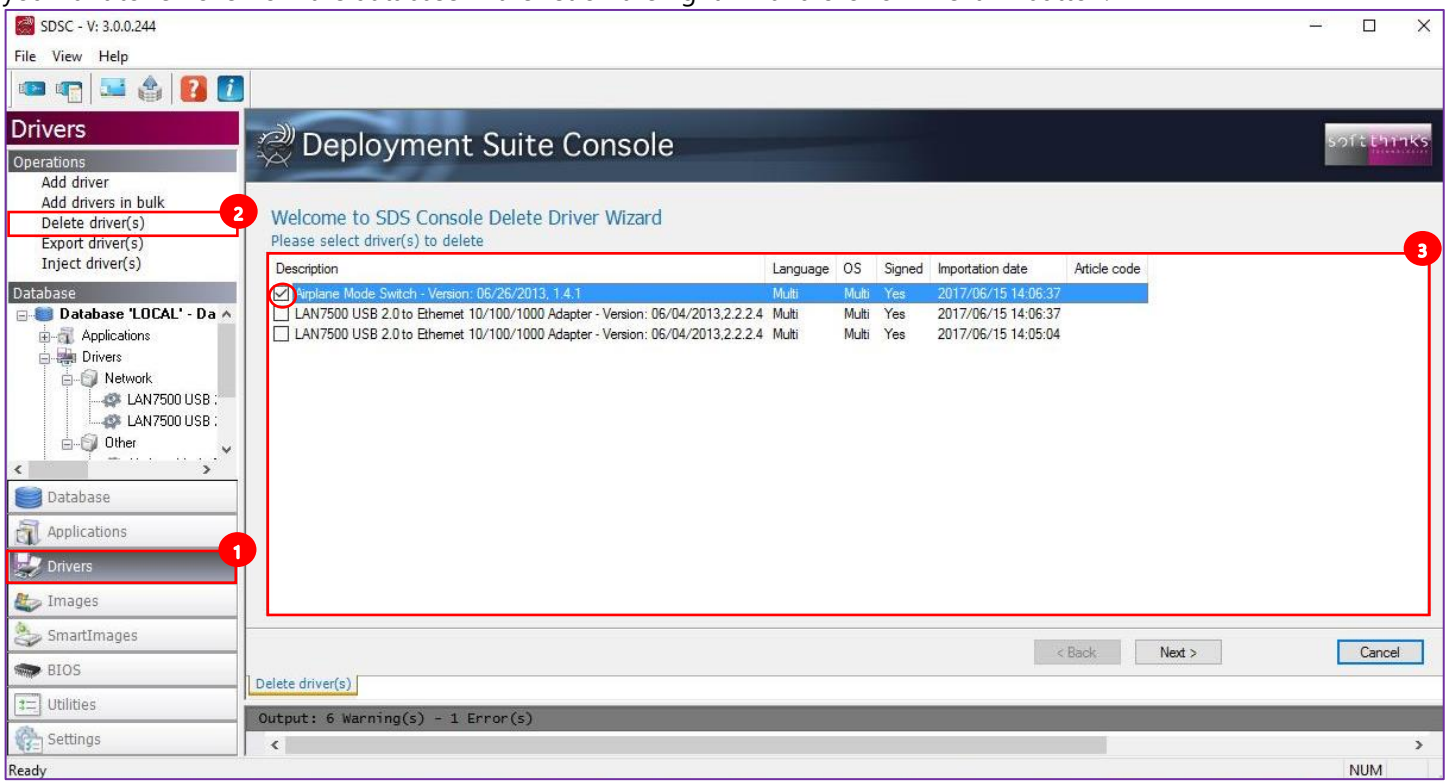
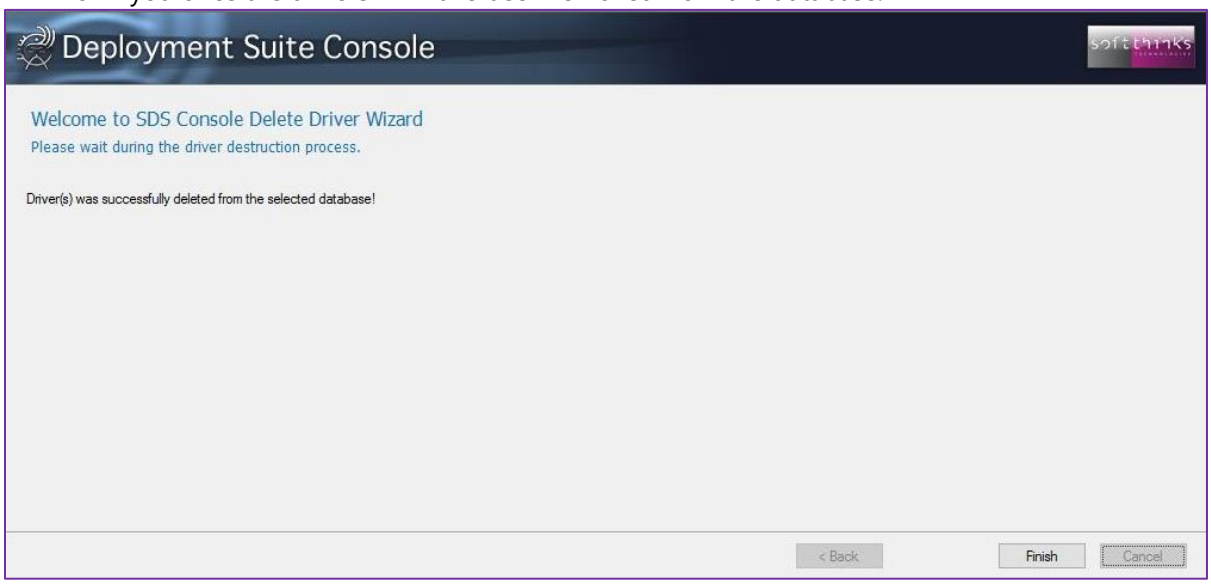
Note : You can uncheck some PNPs in order to avoid the download of this driver during deployment in automatic mode.

Deleting drivers (“Delete Driver(s)” operation)

In order to delete one or more drivers, click on “Drivers” tab 1 and then “Delete driver(s)” operation 2, select the driver(s) you want to remove from the database in the list on the right 3 and click on “Next >” button:



The wizard will inform you once the drivers will have been removed from the database:



Note: Deletion is permanent. There is no method to undo a delete. Be careful when selecting drivers for deletion and review them.

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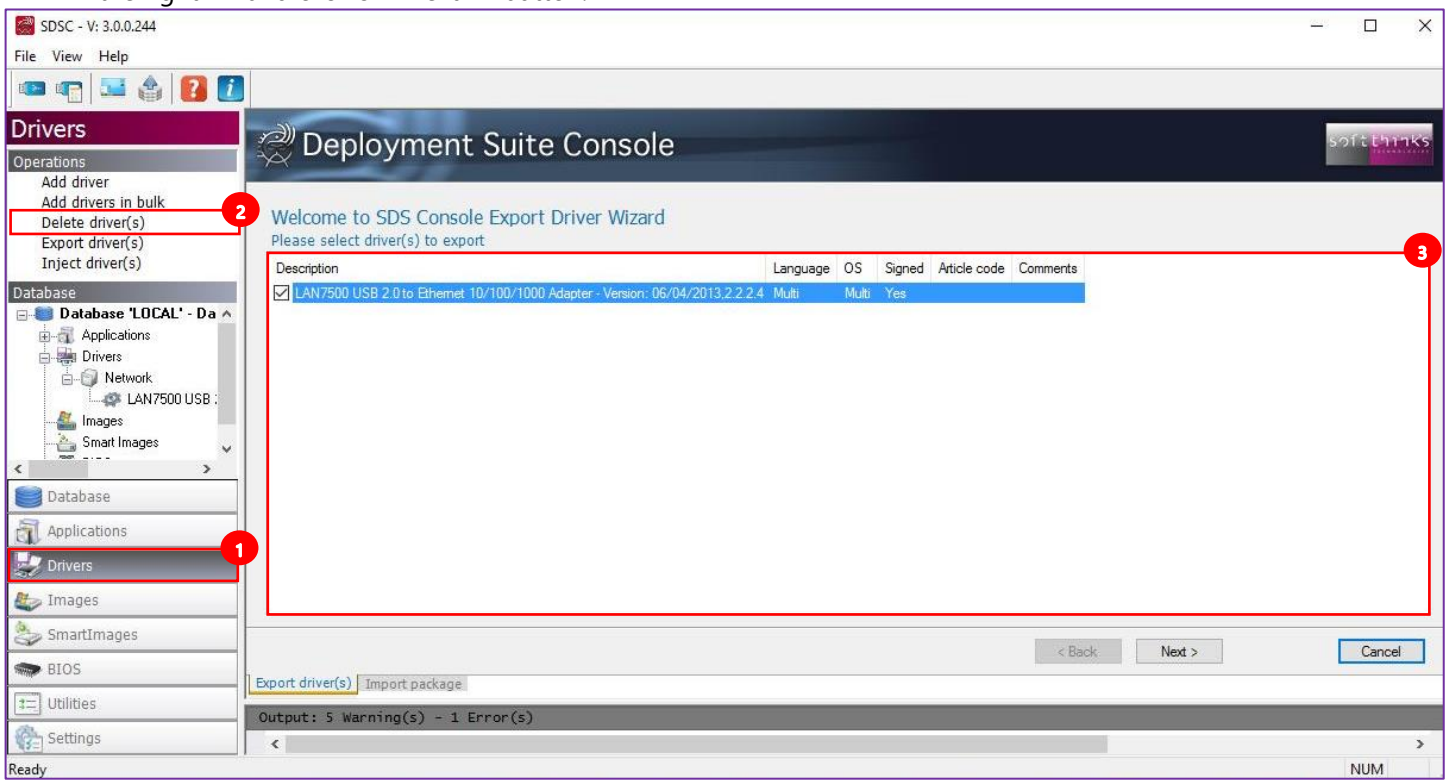
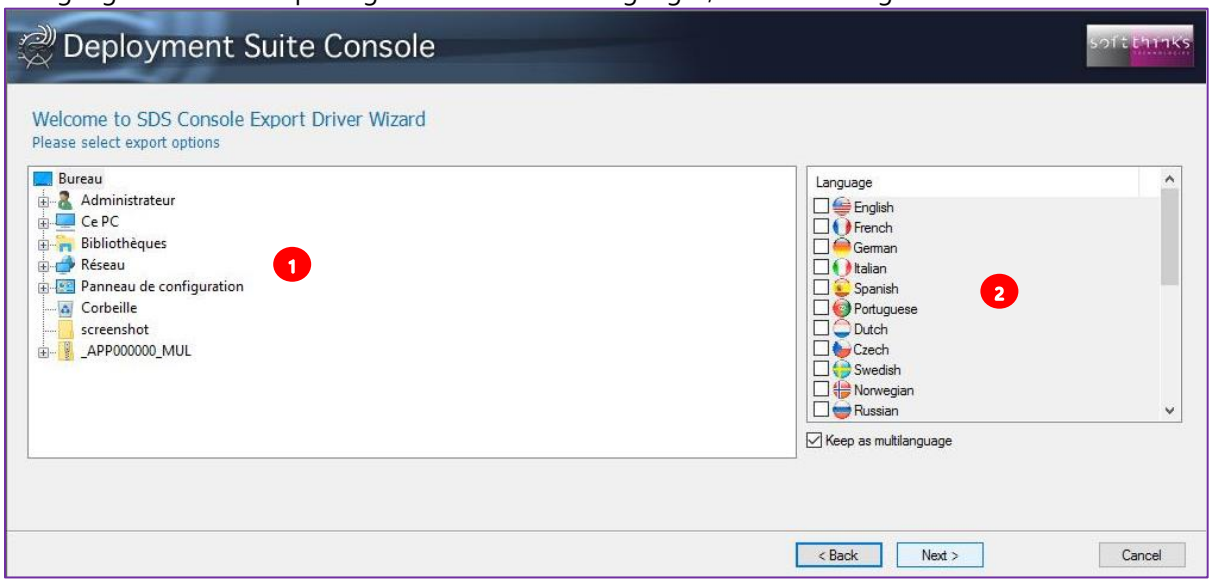
Exporting a driver (“Export Driver(s)” operation)

In order to export one or more drivers:

1. Click on “Drivers” tab (1) and then “Export driver(s)” operation (2), select the driver(s) you want to export in the list on the right (3) and click on “Next >” button:



2. Select the destination folder where the ZIP files will be created (1), and the languages (2), or check “Keep as Multilanguage” to allow the package to work with all languages, before clicking on the « Next > » button :



3. The wizard will display a progress screen and then a confirmation screen when the driver(s) are successfully exported:

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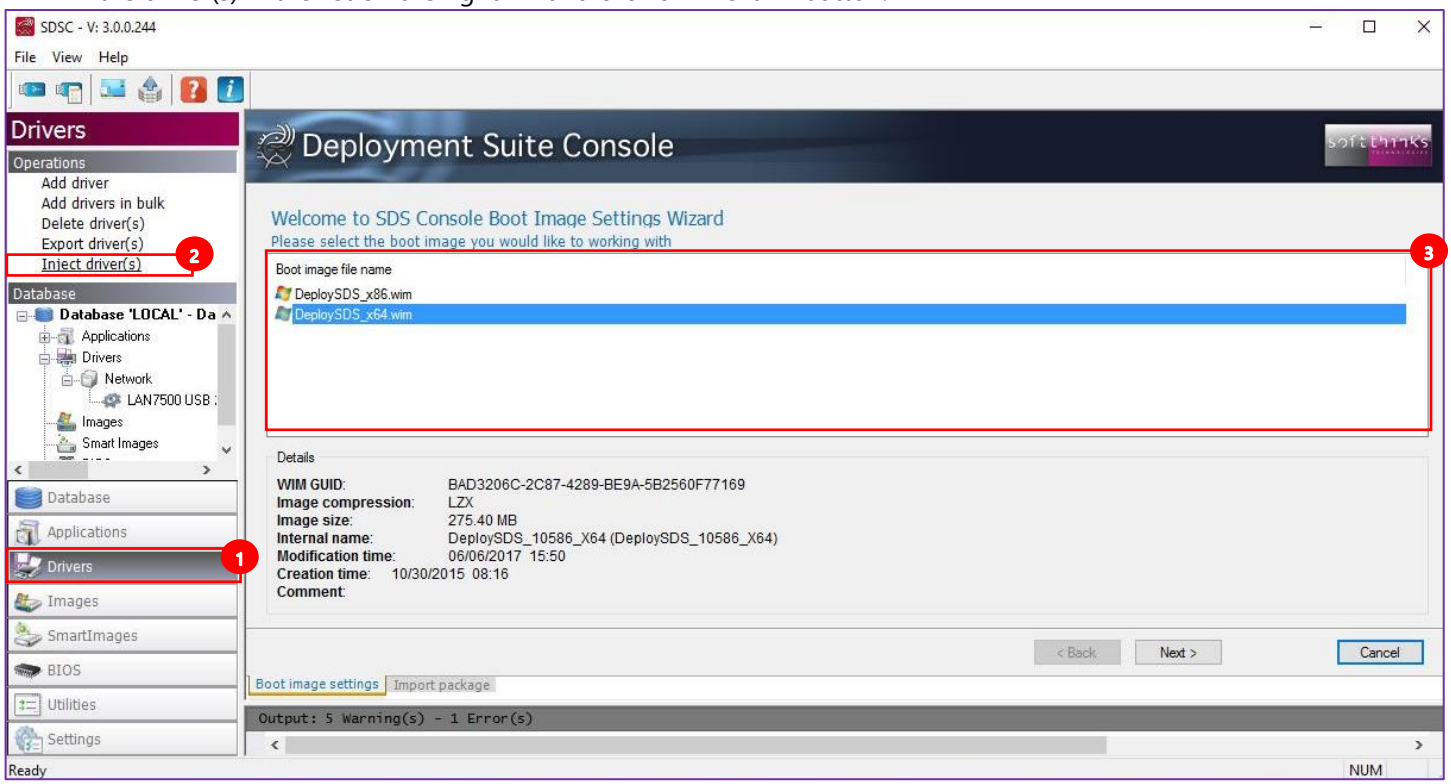
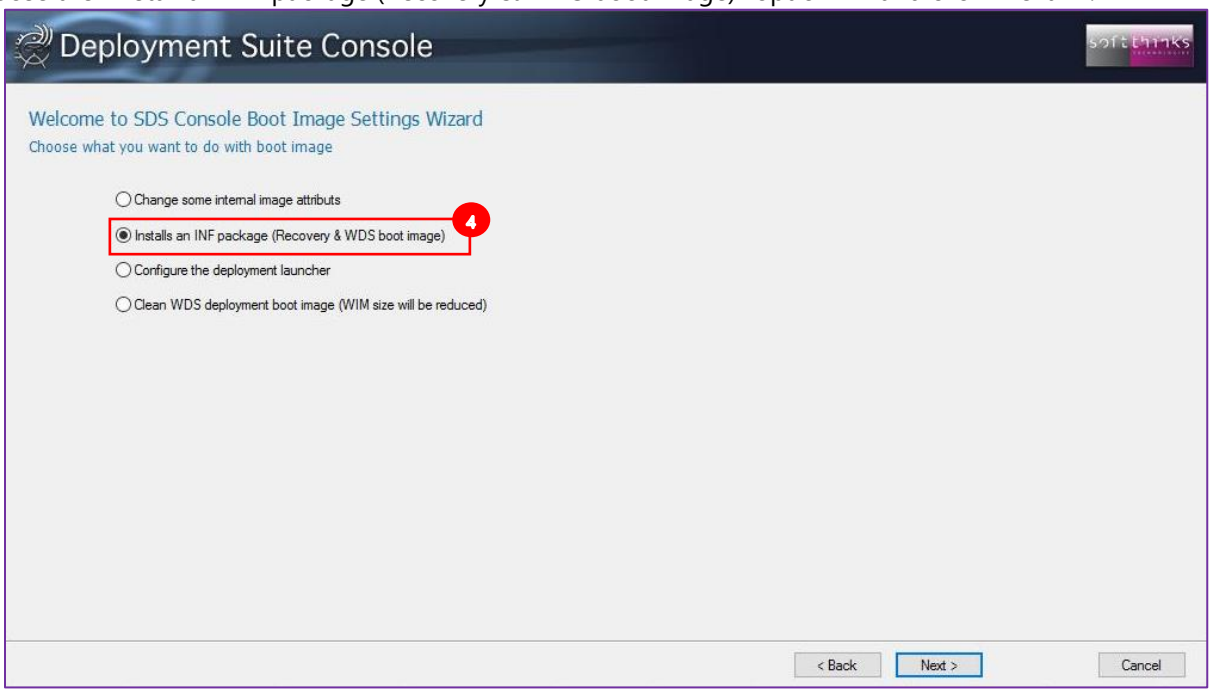
Injecting drivers (“Inject Driver(s)” operation)

1. Click on “Drivers” tab (1) and then “Inject driver(s)” operation (2), select the boot image into which you want to inject the driver(s) in the list on the right (3) and click on “Next >” button:



2. Choose the “Install an INF package (Recovery & WDS boot image)” option (4) and click “Next >”:



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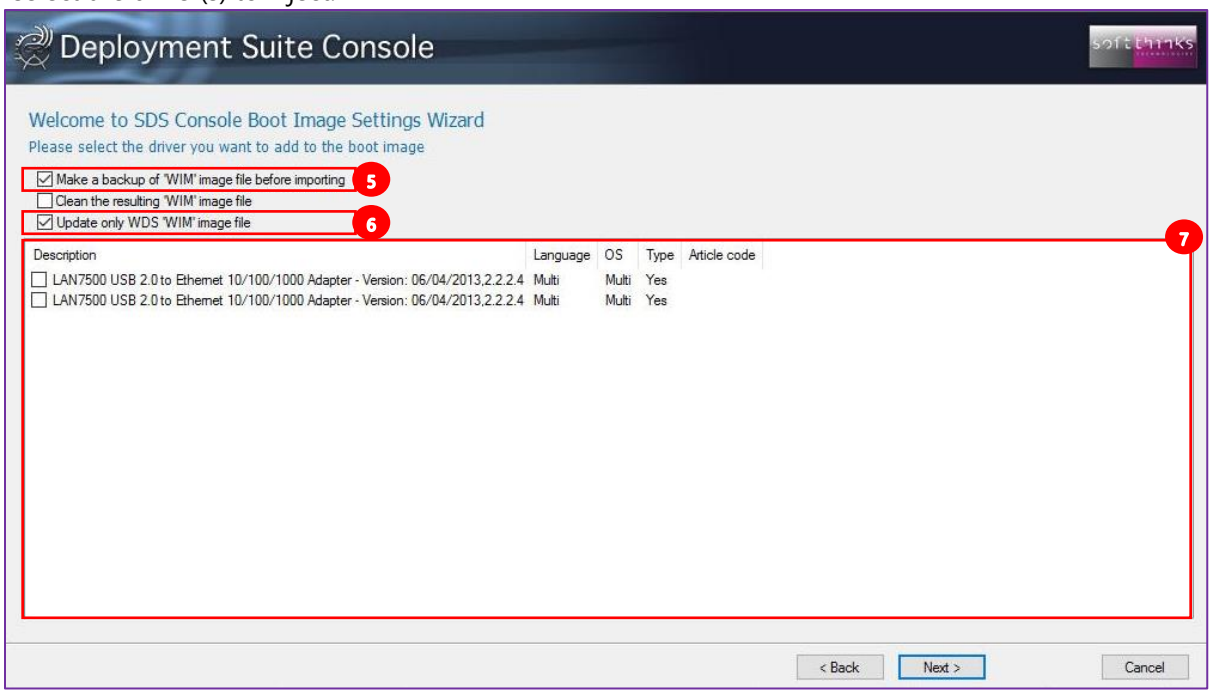
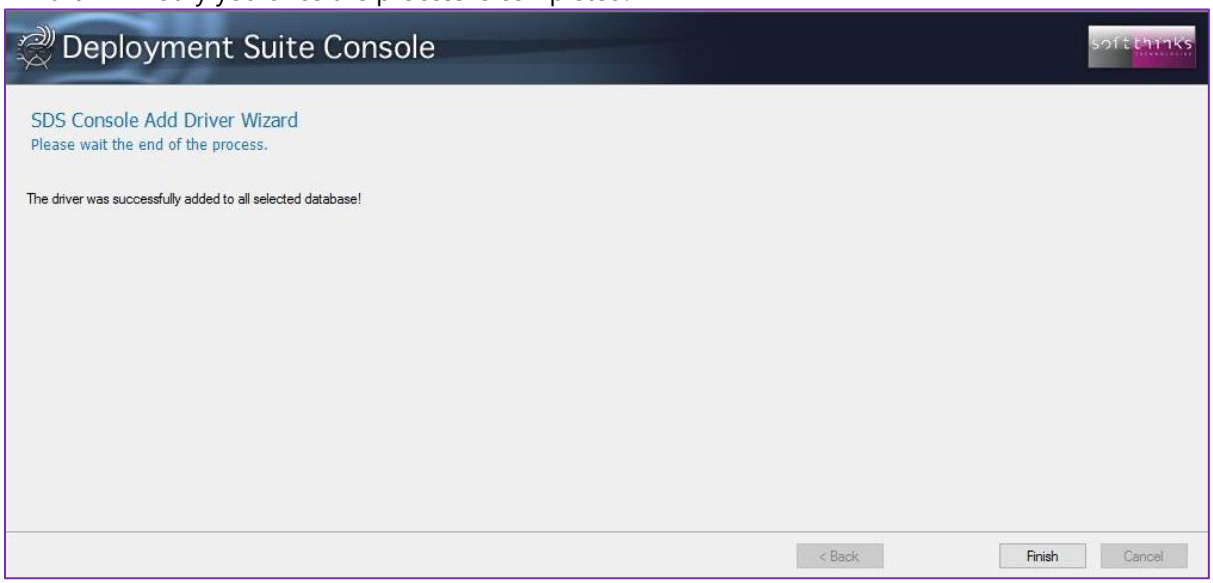
3. Check the options “Make a backup of ‘WIM’ image file before importing” and “Update only WDS ‘WIM’ image file, and select the driver(s) to inject:



4. The wizard will notify you once the process is completed:



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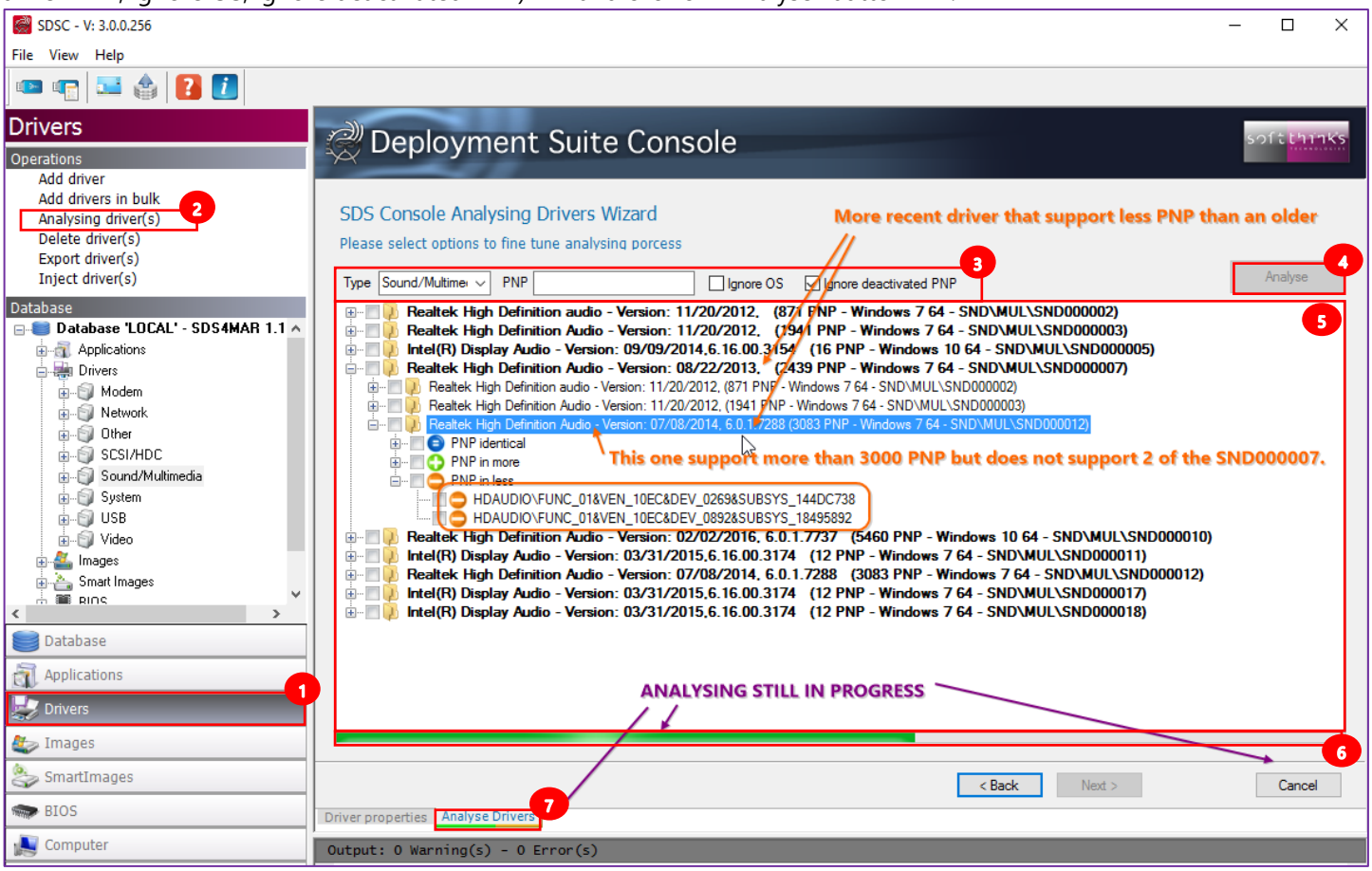
Analyzing drivers (“Analyze driver(s)” operation)

This tool provides an easy way to identify and remove duplicate drivers, typically drivers that support the same PNP IDs but are of different description or names in the database.

Click on “Drivers” tab (1) and then “Analysing driver(s)” operation (2), select the options to fine tune the analysis (driver type, driver PNP, ignore OS, ignore deactivated PNP) (3) and click on “Analyse” button (4):



The drivers are listed (5) while they are parsed and the progress bar (6) shows the current status. If you switch to another view you will still be able to see the progress in the view tab (7). You can stop the analysis at any moment by clicking on the « Cancel » button.

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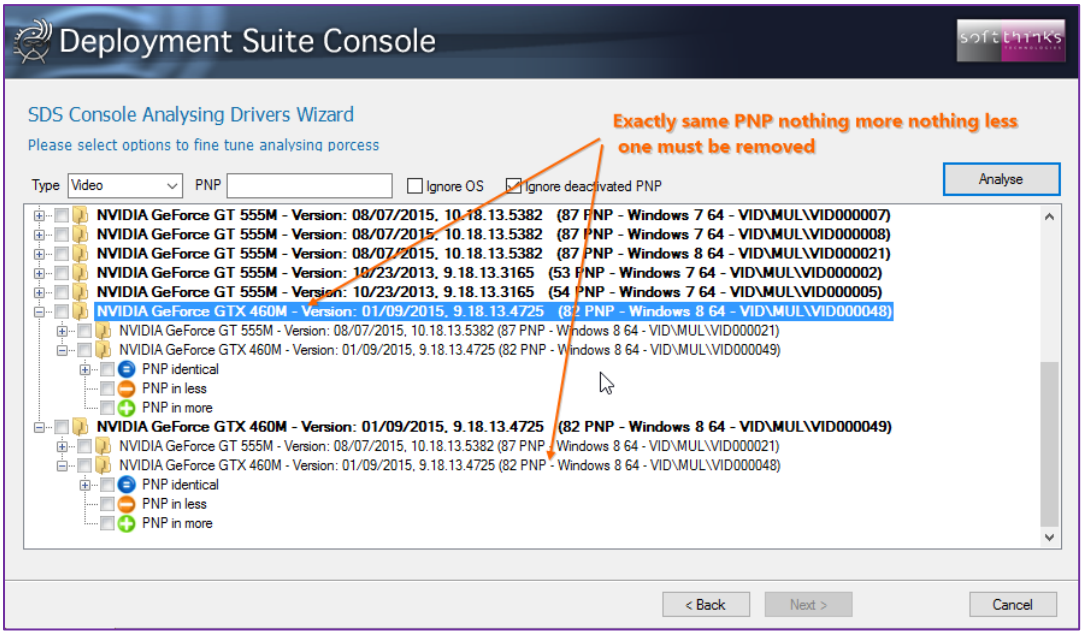

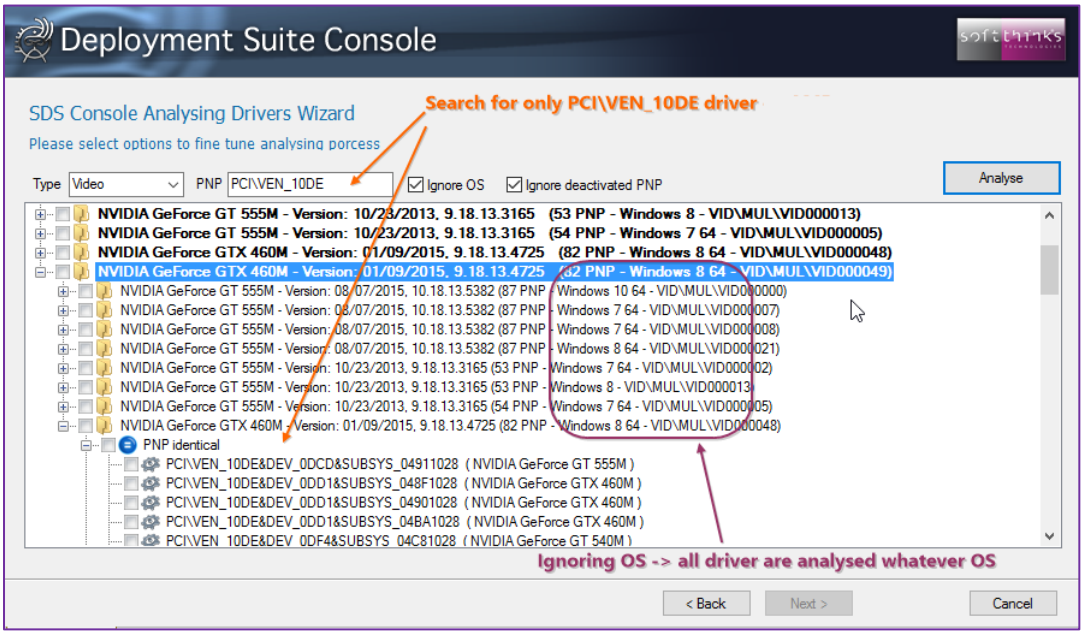

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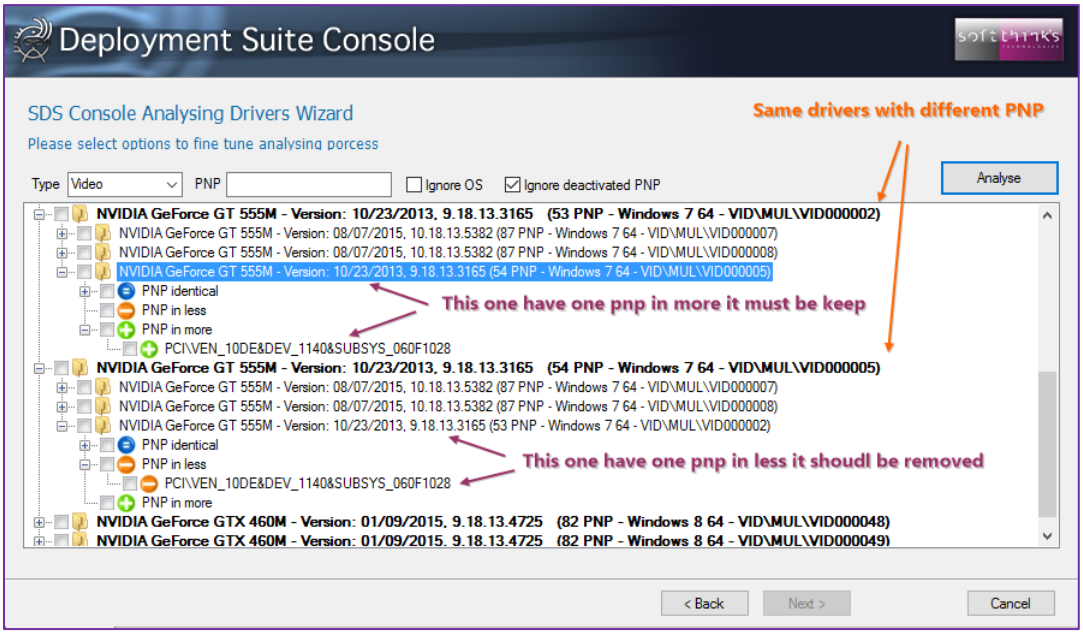

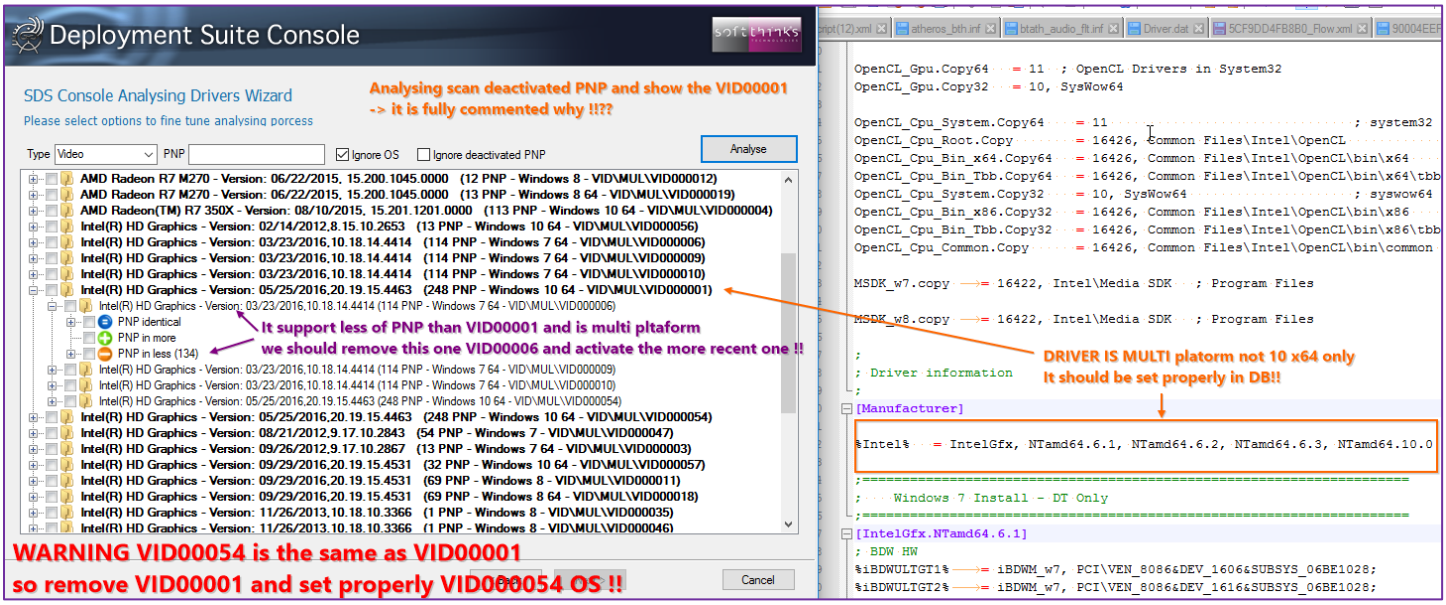

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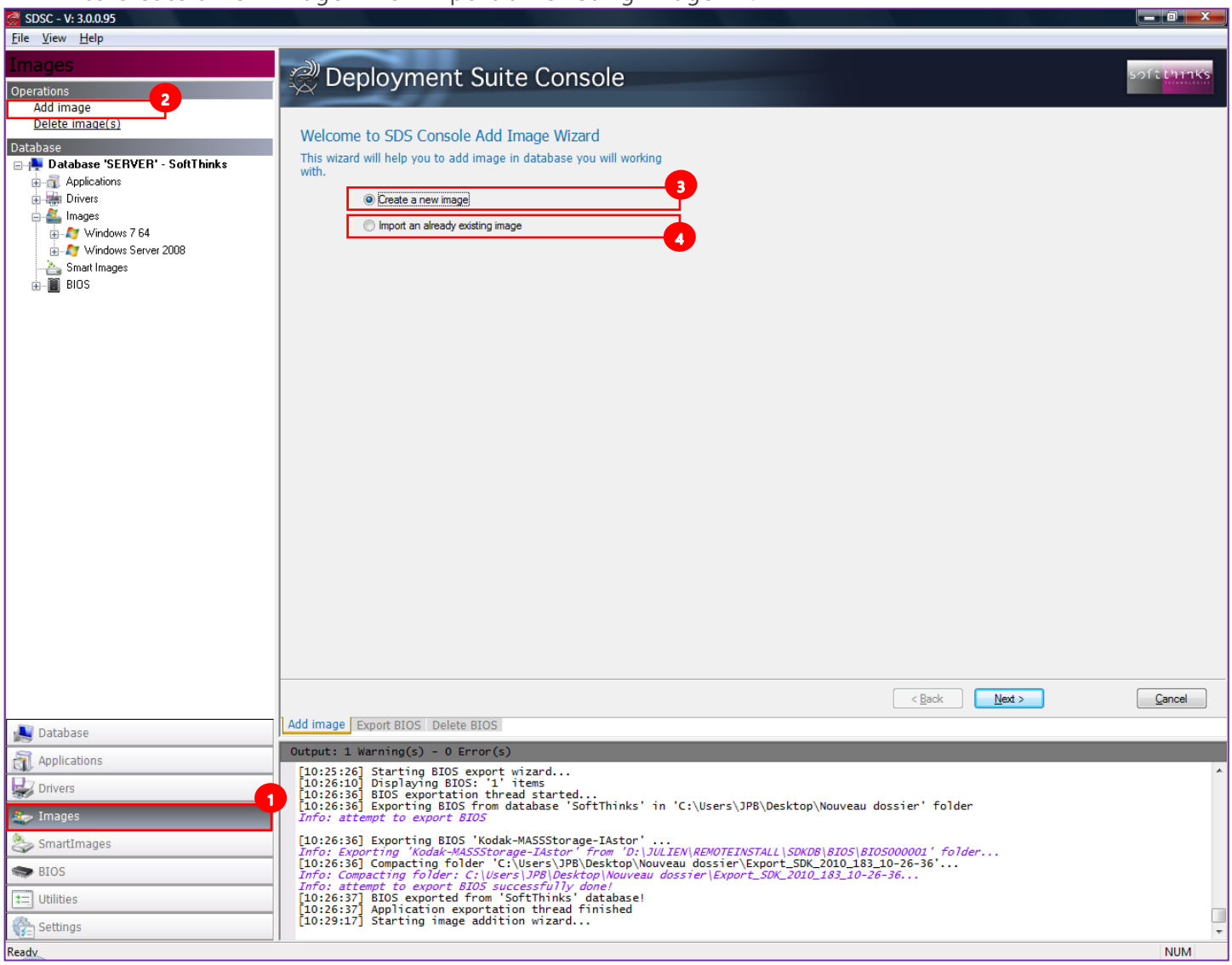
Images

Adding images

(**Note**: Most of the time images will be created directly from the computer with the source image on it through the Welcome Screen and the Image Creation page and not the Console. These instructions are for information purposes only.)

1. Click on the "Images" tab (1) on the left side bar, then on the "Add Images" operation (2), and choose if you want to create a new image (3) or import an existing image (4):



2. Select the "Create New Image" option (3) if you will be adding a new image from a disk that has been prepared with Master Hard Disk Creator.

   Hint: The hard disk should be attached to the system via a USB 2.0 or adapter before you start the image creation process.

3. Select the "Import an already existing image" option (4) if you wish to import an image that was created with the previous release of SDS (INP image format).

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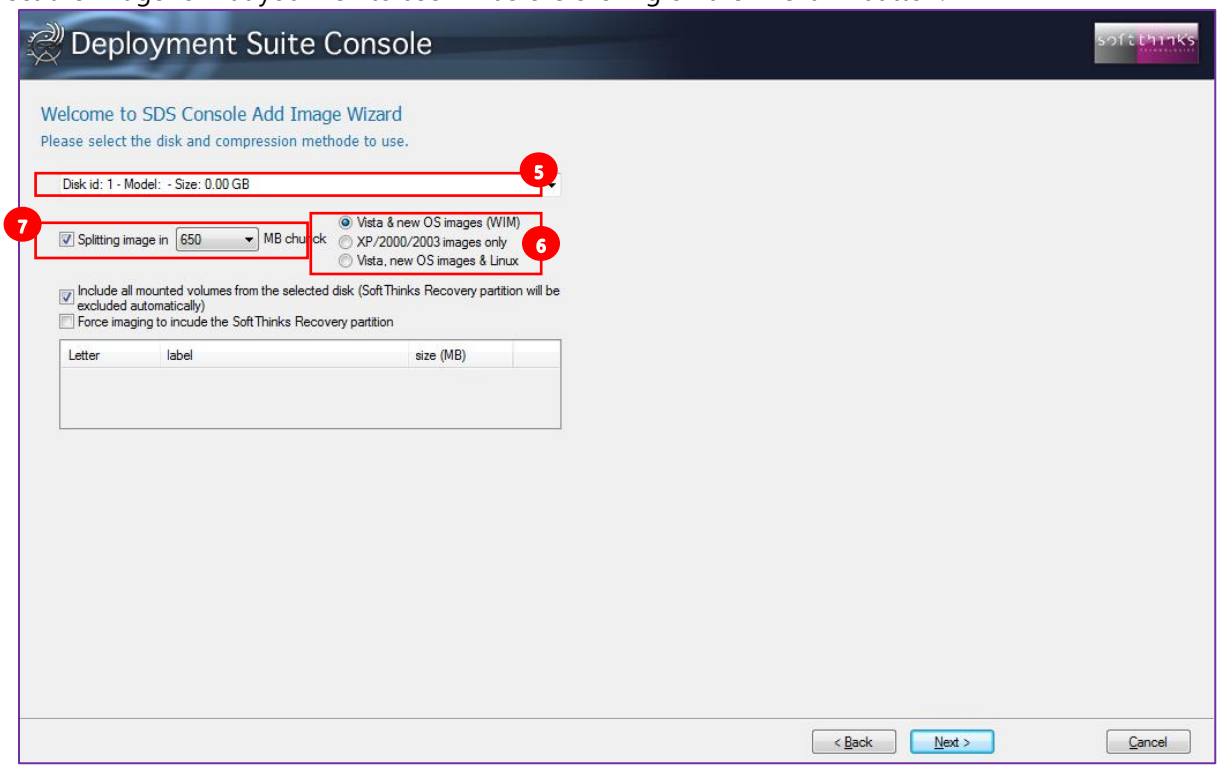
4. From the pull-down menu 5, select the volume letter corresponding to the hard disk that will be imported, and then select the image format you wish to use 6 before clicking on the "Next >" button:



- **Vista & new OS images (WIM) :** Microsoft's Windows Image format. File based image format compatible with Windows Vista and newer OS. WIM files modified using standard Microsoft OPK Tools and by SDS. This is the format of the WinPE boot image.

- **XP/2000/2003 images only:** Casper, the SoftThinks standard format used in current releases of SDS, very reliable, robust and time tested. The contents of these files cannot be modified post creation.

- **VD:** Virtual Disk, a format from SoftThinks which can be used for static images and has very good speed advantages. The contents cannot be modified.

  Hint: The option for Splitting Image in 650MB chunks 7 is for use with WIM format – if this option is chosen, the WIM file can no longer be modified – a limitation imposed by Microsoft. However, smaller file sizes will reduce the network traffic and allow any type of optical media to be used to create backups. It is recommended that the smaller size be used.

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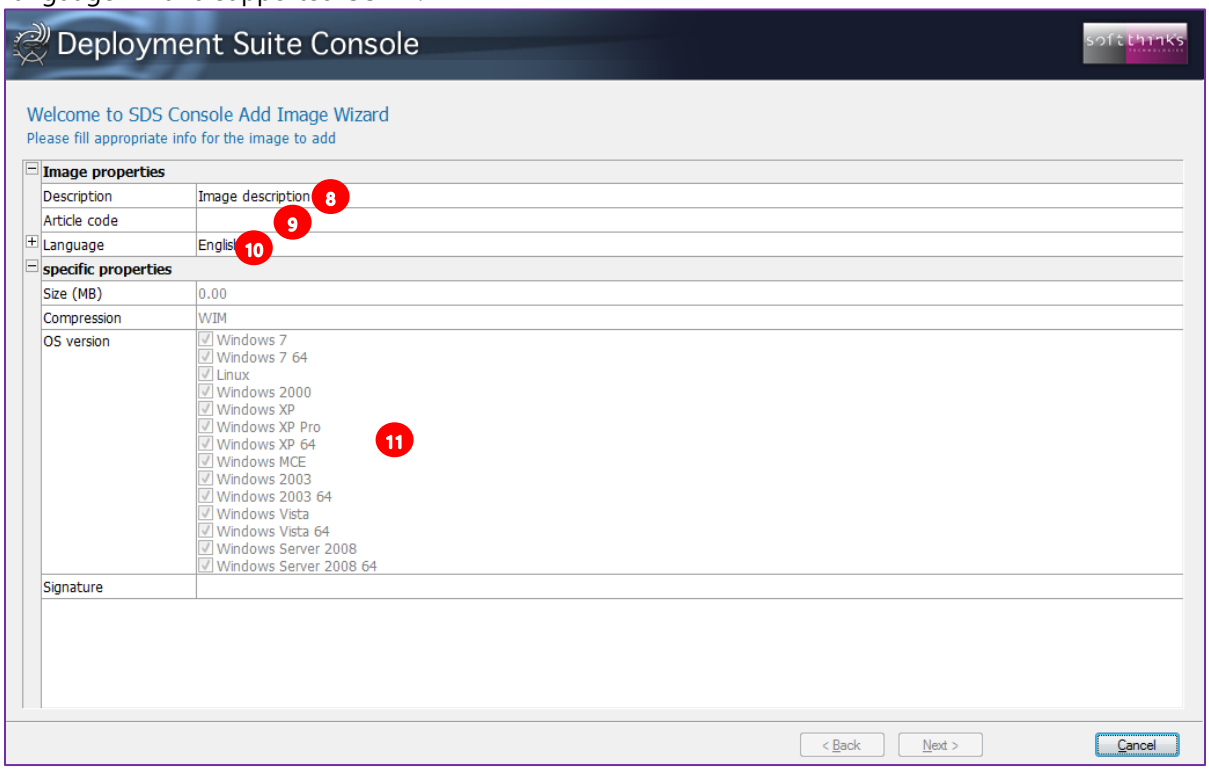
5. Enter a description for your image (8), an article code (not commonly used) to associate with this image (9), and specify the language (10) and supported OS (11):



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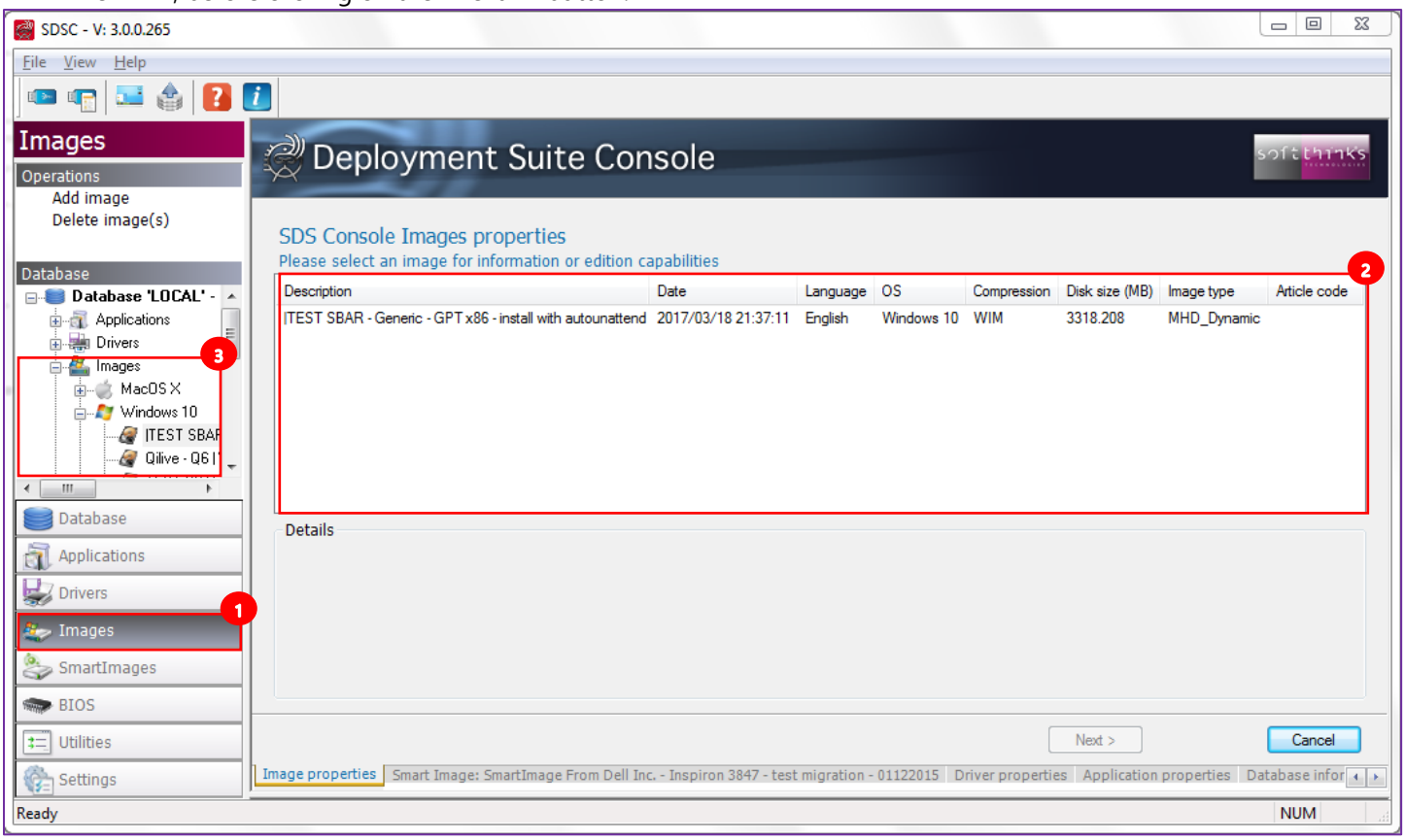
Editing an image

1. Click on the « Images » tab (1) and select the image you wish to edit in the list (2), or directly select it from the tree-view (3), before clicking on the "Next >" button:



Hint: You can also edit an image by double-clicking on it in the list.

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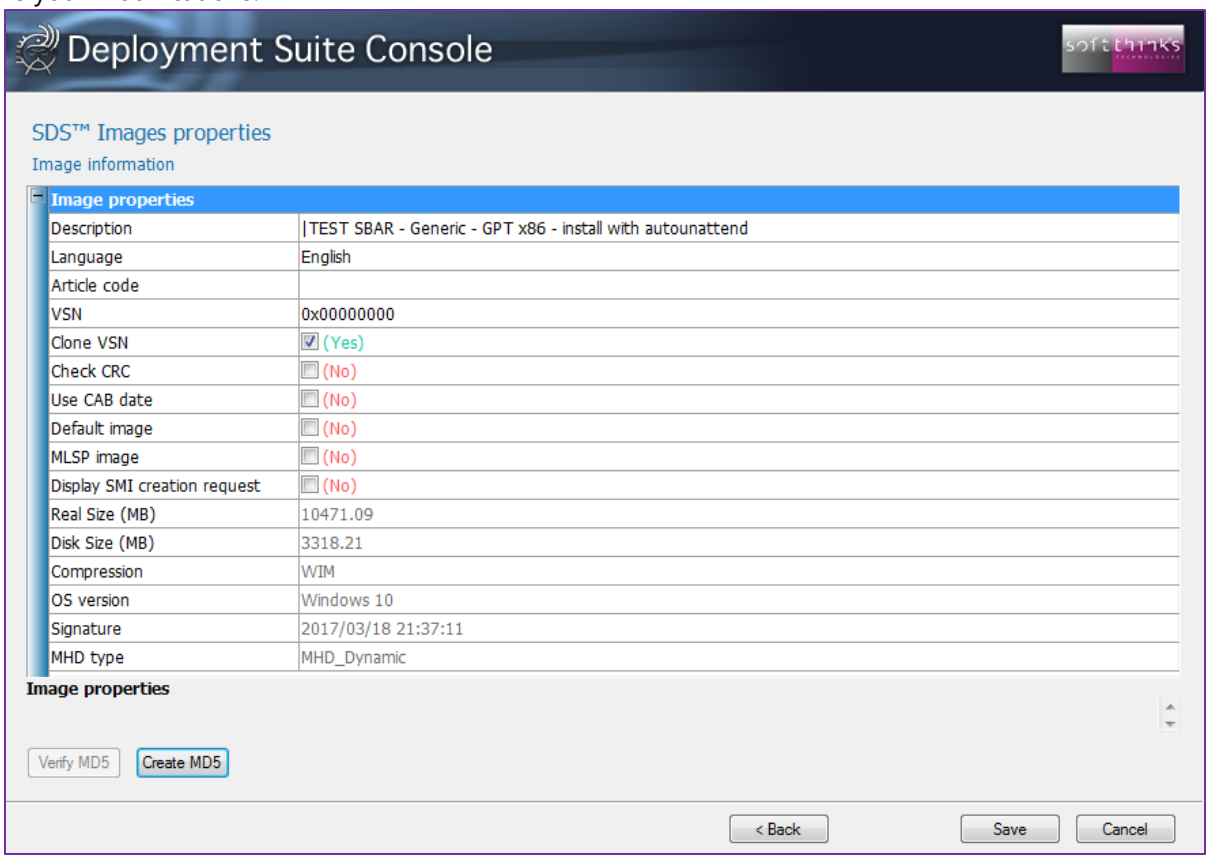
2. Modify the image properties as its description to add more details (specific revision …) and click on the “Save” button to save your modifications:



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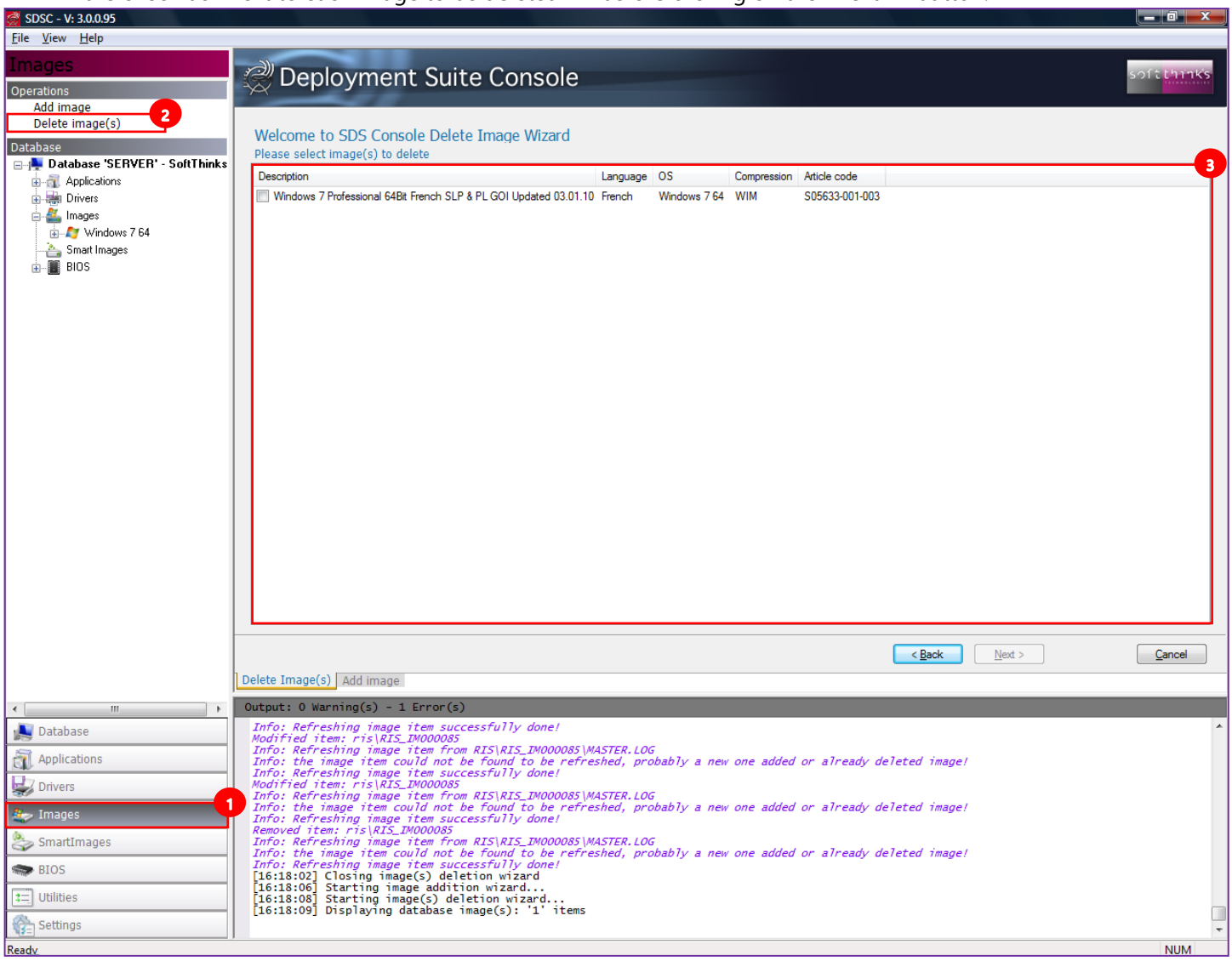
Deleting images

1. Click on the “Images” tab (1), then on the “Delete image(s)” operation (2), and select the images to delete by clicking the check box next to each image to be deleted (3) before clicking on the “Next >” button:



Note: Deletion is permanent. There is no method to undo a delete. Be careful when selecting images for deletion and review them.

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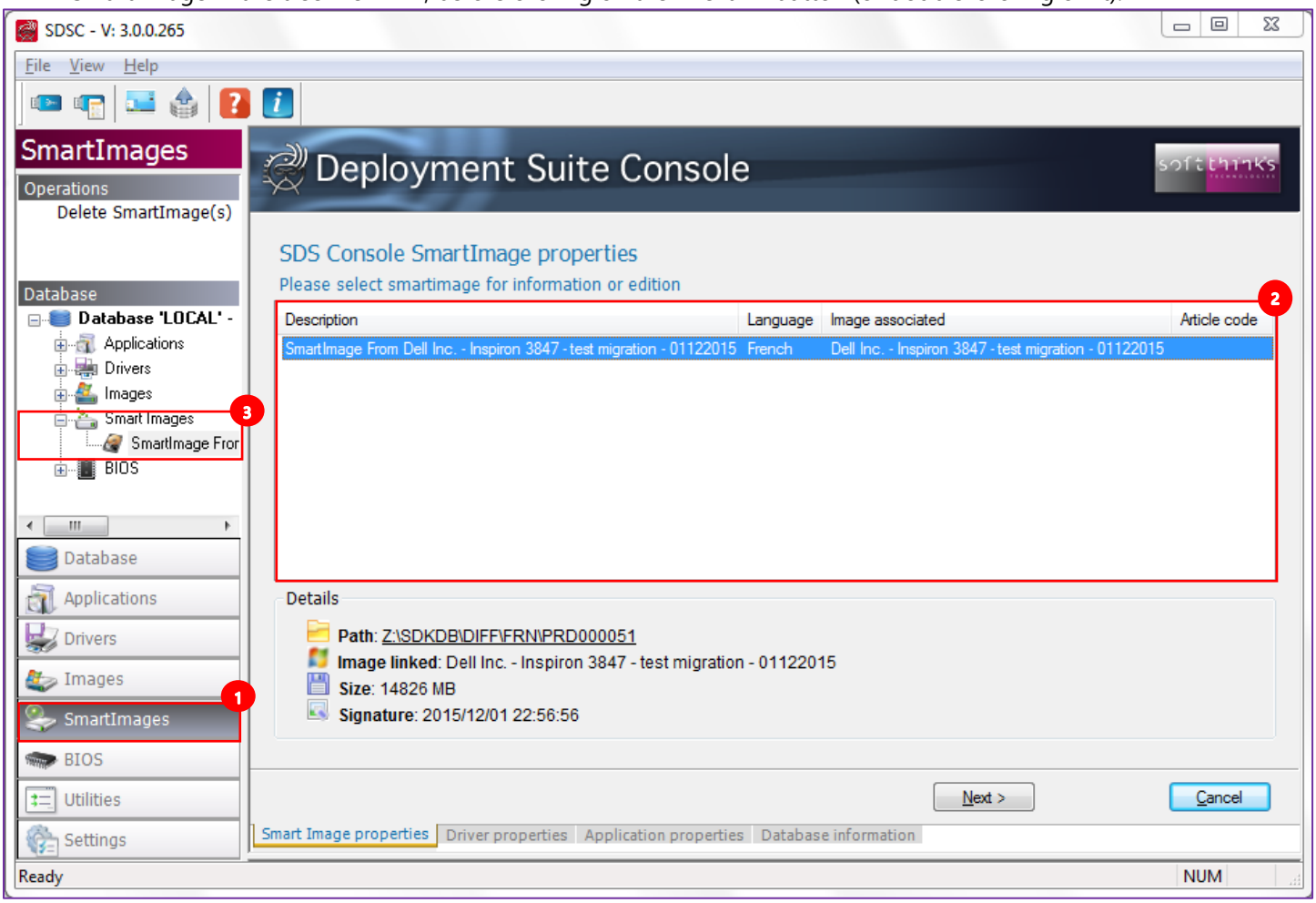
Smart Images

SmartImages are differential images which reflect the difference between the basic Windows installation on a Generic Master and the fully configured target device. In general, they contain all items that were added on top of the basic Windows installation: PC-specific drivers, bundle software and applications.

SmartImages are fast to set up and can be very useful for installing configurations that change very rarely; i.e. notebooks or PCs with all-in-one motherboards.

1. Click on the « SmartImages » tab (1) and select the Smart Image you want to edit in the list (2), or directly on the Smart Image in the tree-view (3), before clicking on the "Next >" button (or double-clicking on it):



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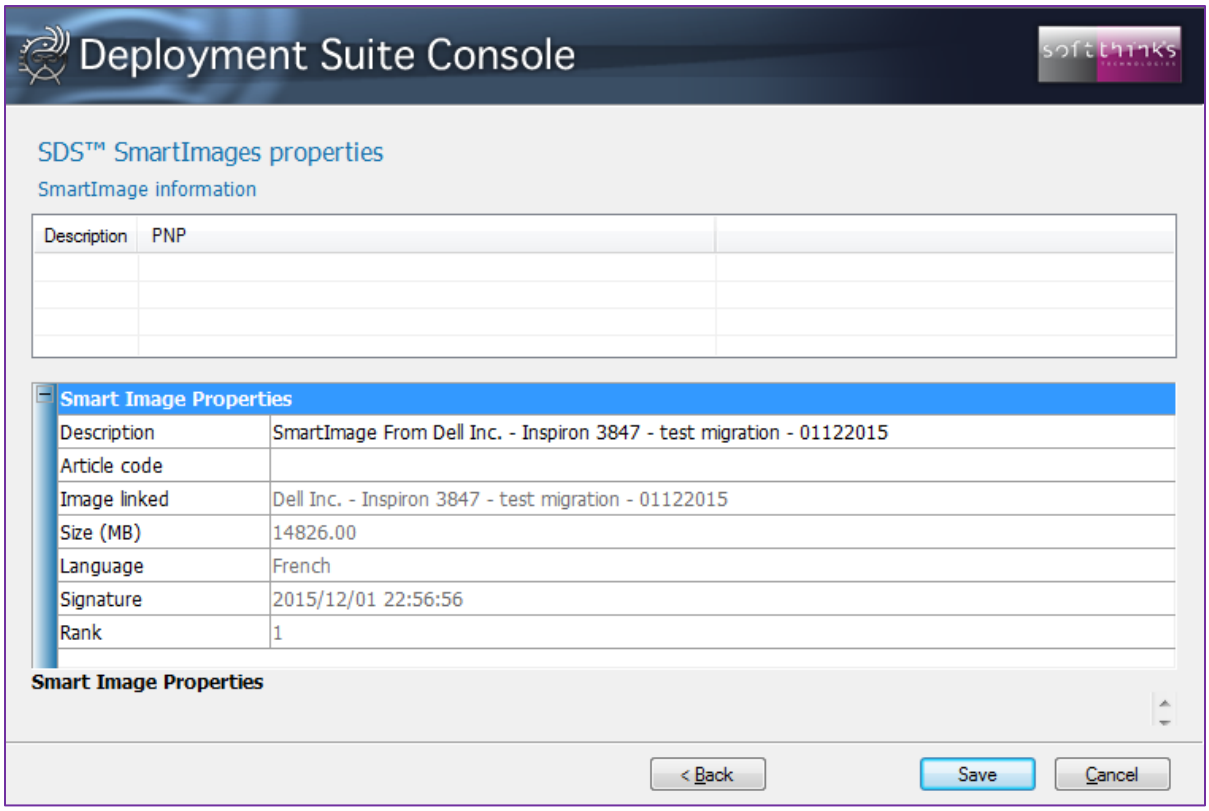
Modify the Smart Image properties as its description to add more details (specific revision …) and click on the “Save” button to save your modifications:



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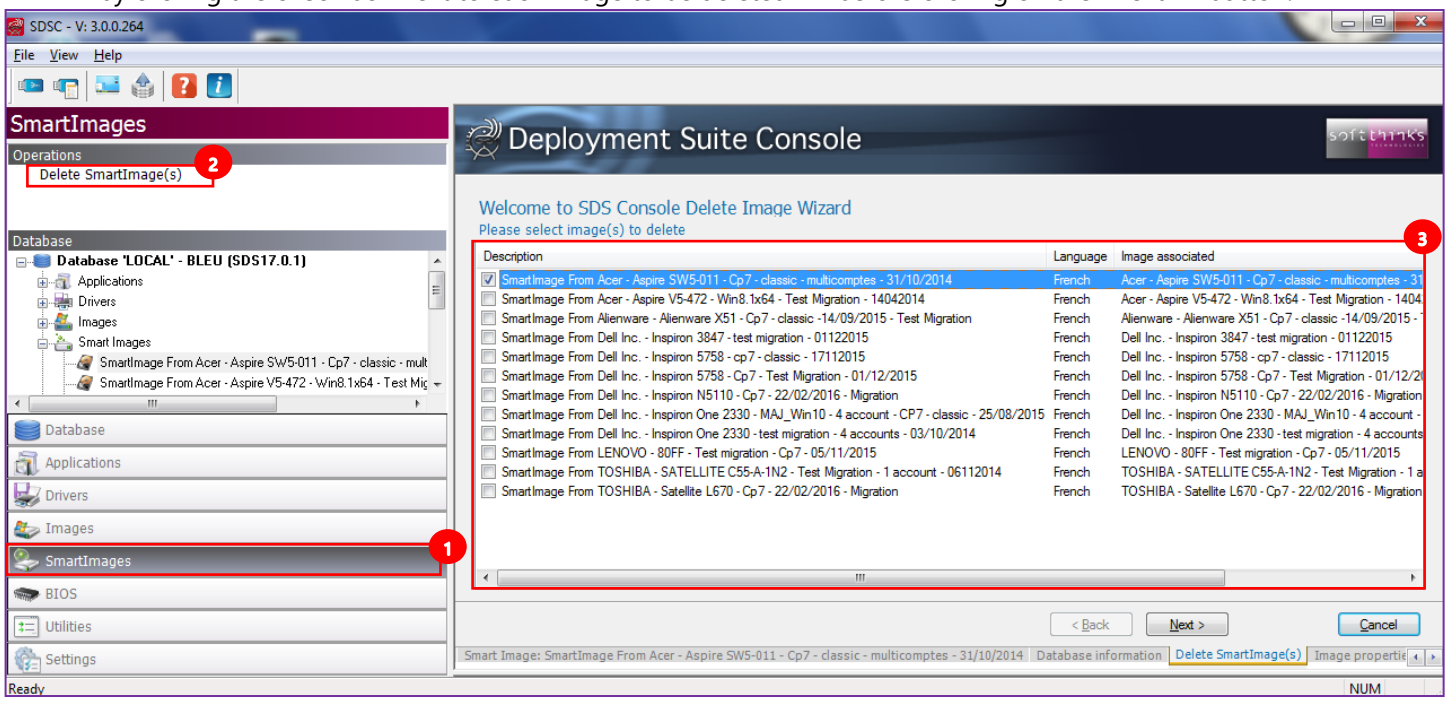
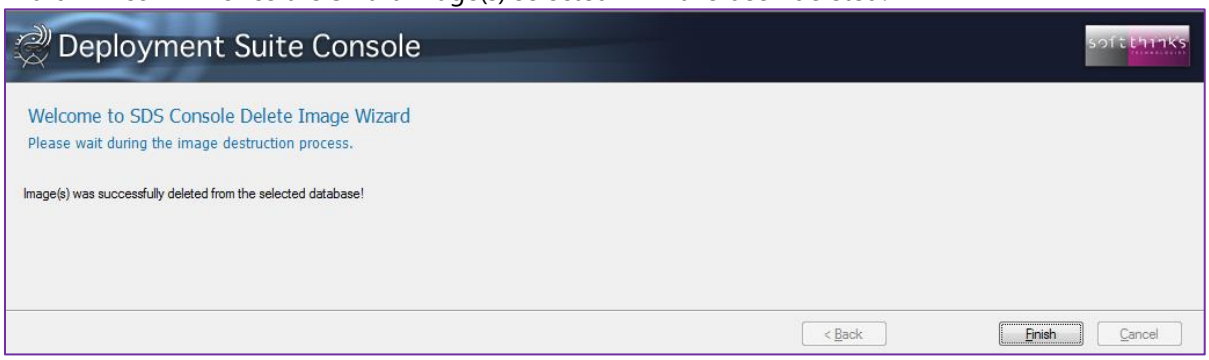
Deleting SmartImage(s)

1. Click on the "SmartImages" tab (1), then on the "Delete SmartImage(s)" operation (2) and select the images to delete by clicking the check box next to each image to be deleted (3) before clicking on the "Next >" button:



Note: Deletion is permanent. There is no method to undo a delete. Be careful when selecting SmartImages for deletion and review them.

2. The wizard will confirm once the Smart Image(s) selected will have been deleted:



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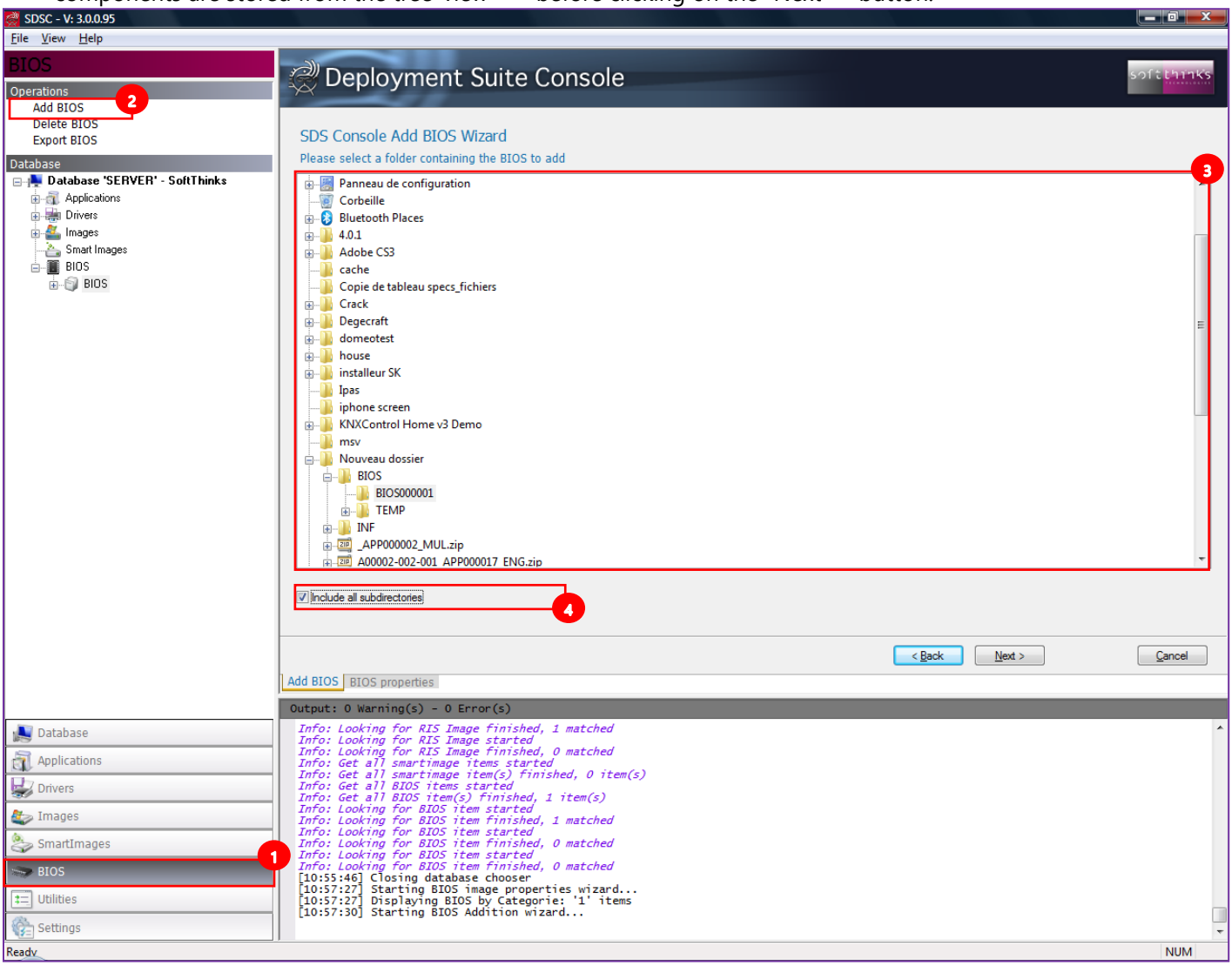
BIOS

BIOS components are similar to application packages except that they are executed when the system is first booted to the deployment server and DeployJB is launched.

If DeployJB finds any components that are designated in the <profile>.selector.ini file, those components are executed prior to deployment or factory diagnostics. The BIOS components must be 32 bit applications and must be compatible with the WinPE environment. Any operation that must occur before the beginning of deployment could be accomplished using this feature. It was primarily designed to allow electronic assembly (BIOS flash, DMI flash, firmware updates) prior to factory diagnostics and deployment.

Adding a BIOS component

1. Click on the "BIOS" tab (1), then on the « Add BIOS » operation (2), and select the location where your BIOS components are stored from the tree-view (3) before clicking on the "Next >" button:



Hint: If the "Include all subfolders" option (4) is unchecked only the folder selected in tree-view will be read. Check this box if there are subfolders inside your source folder that are required by the BIOS component.

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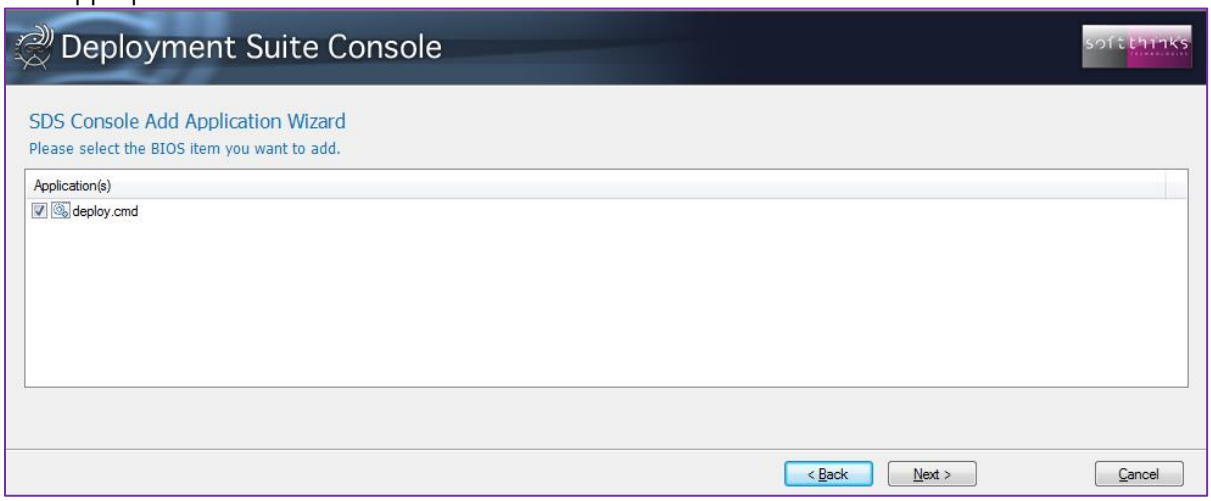
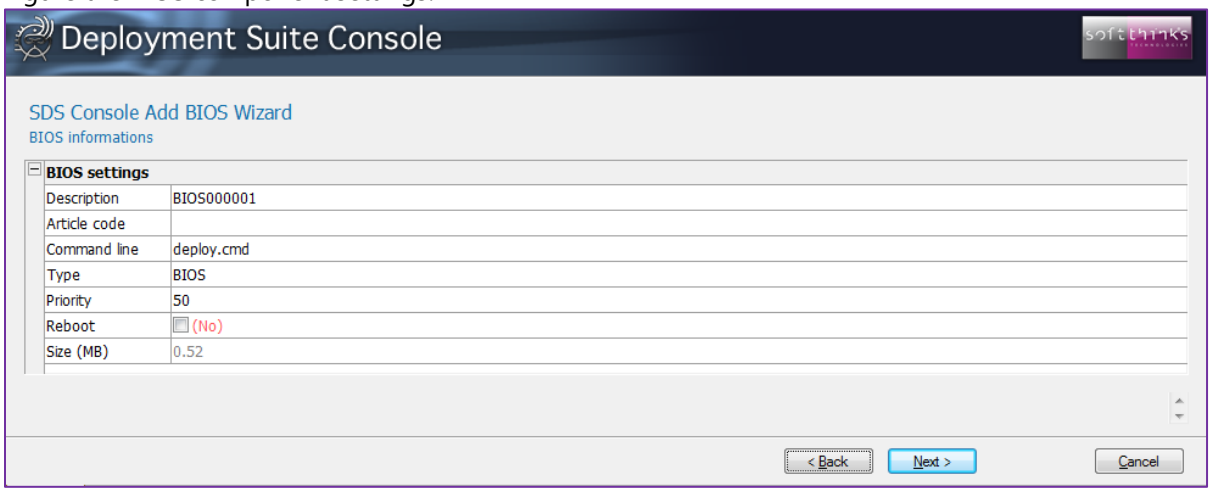
2. Pick the appropriate file from the list of executable files and click “Next>”:



3. Configure the BIOS component settings:



- **Description :** A text description of the BIOS component.
- **Article Code:** The part number used in the SPL file to designate the BIOS component. (Not commonly used.)
- **Command Line:** Contains the executable and command line switches. **Note**: This differs from the application interface where executable and command line were different fields.
- **Type:** Category of the BIOS component (BIOS, Firmware, DMI utility, etc). The list of categories is configured using the Settings tool (See BIOS settings)
- **Priority:** Ranging from 0 to 99, all applications are arranged in <profile>.selector.ini file and execute them in ascending priority value. The lowest number, 0, goes first. Useful if more than one BIOS version is required to be installed.
- **Reboot:** Select this setting to reboot the computer after the component is executed. If there are additional BIOS components at a lower priority, they will be executed after the system boots back to the deployment server.

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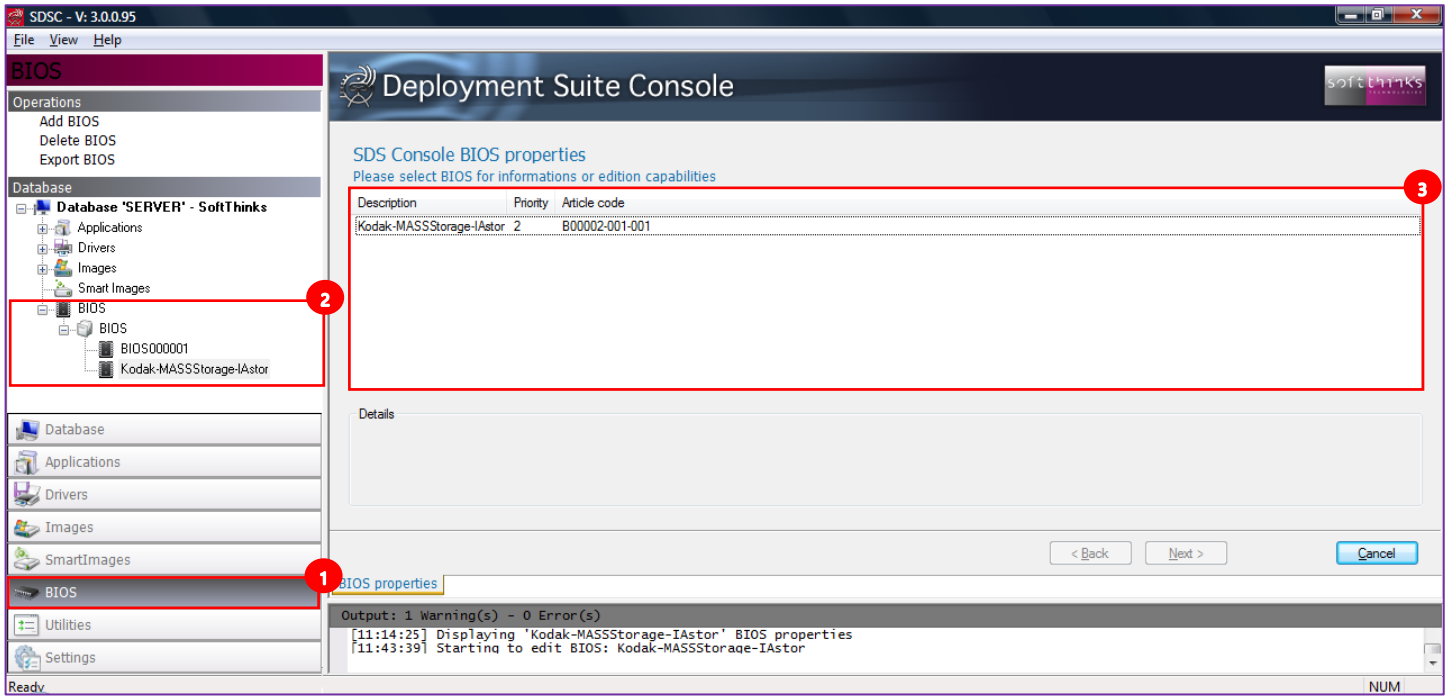
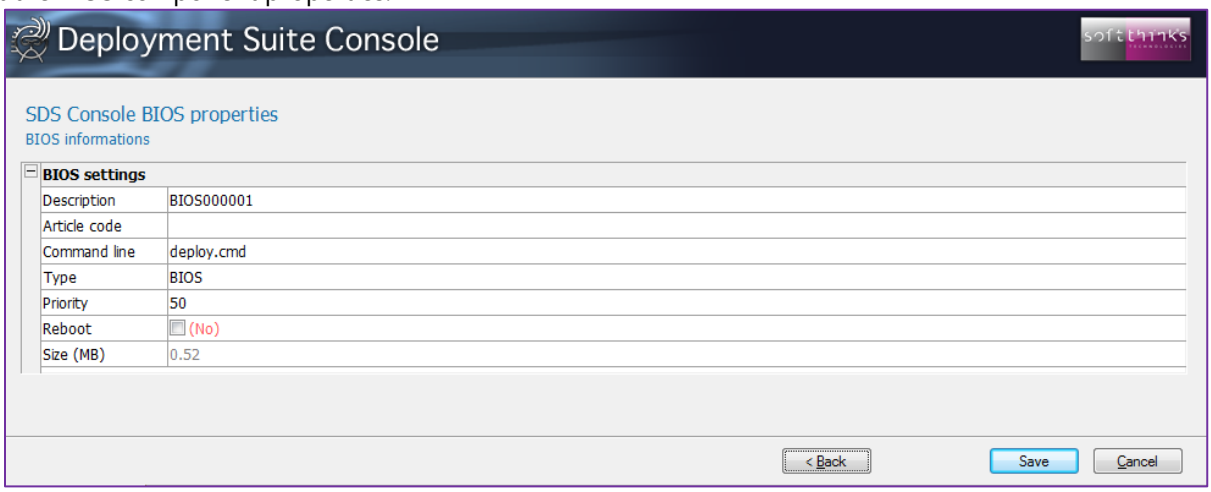
Editing a BIOS component

1. Click on the "BIOS" tab (1) and select the BIOS component to edit in the list (3), or expand the tree-view (2) and drill down into the specific Type and specific Class of the BIOS Component, and click on the "Next >" button or double-click on it:



2. Edit the BIOS component properties:



The same interface is available for editing a BIOS Component as was available when you added the BIOS Component (See Adding a BIOS component for a description of each parameter)

3. Click on the "Save" button to complete the changes

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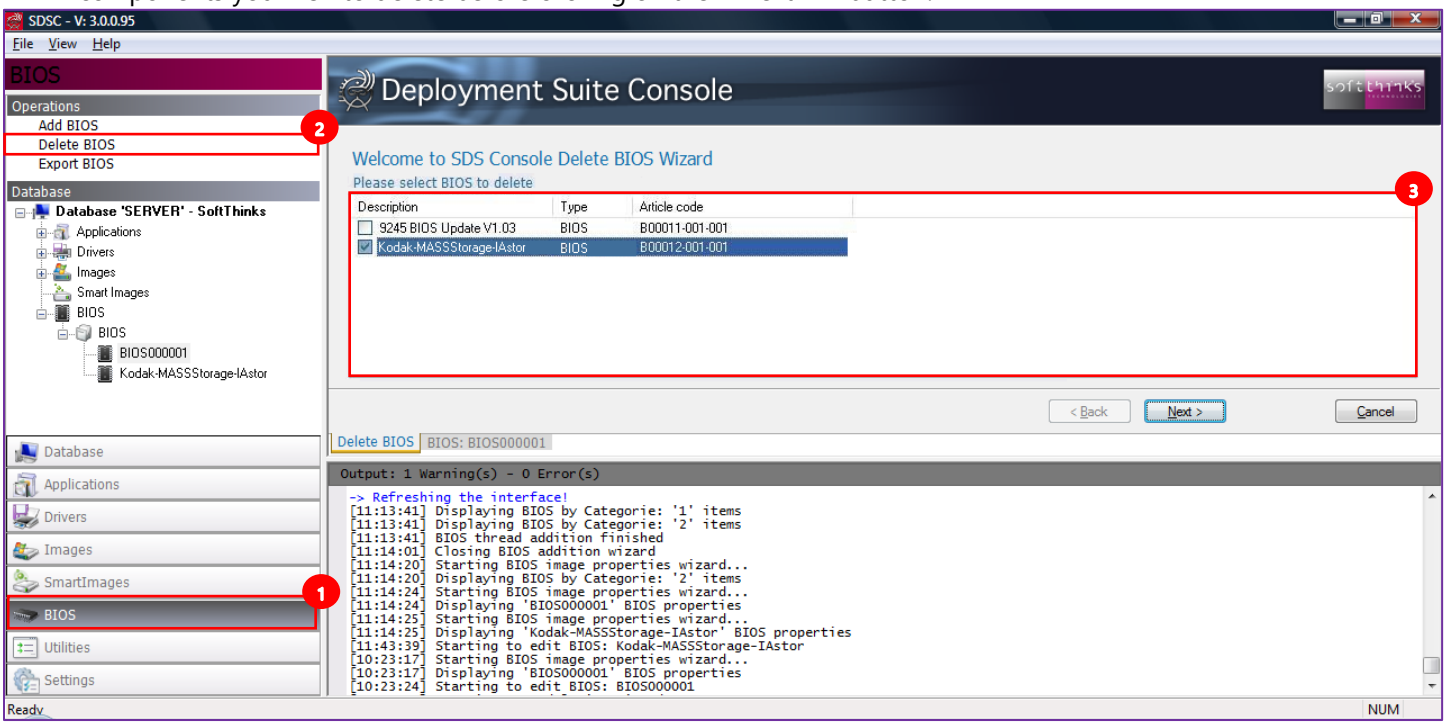
Deleting BIOS components

1. Click on the "BIOS" tab (1), then on the « Delete BIOS » operation (2), and place a checkmark next to each of the components you wish to delete before clicking on the « Next > » button:



Note: Deletion is permanent. There is no method to undo a delete. Be careful when selecting BIOS components for deletion and review them.

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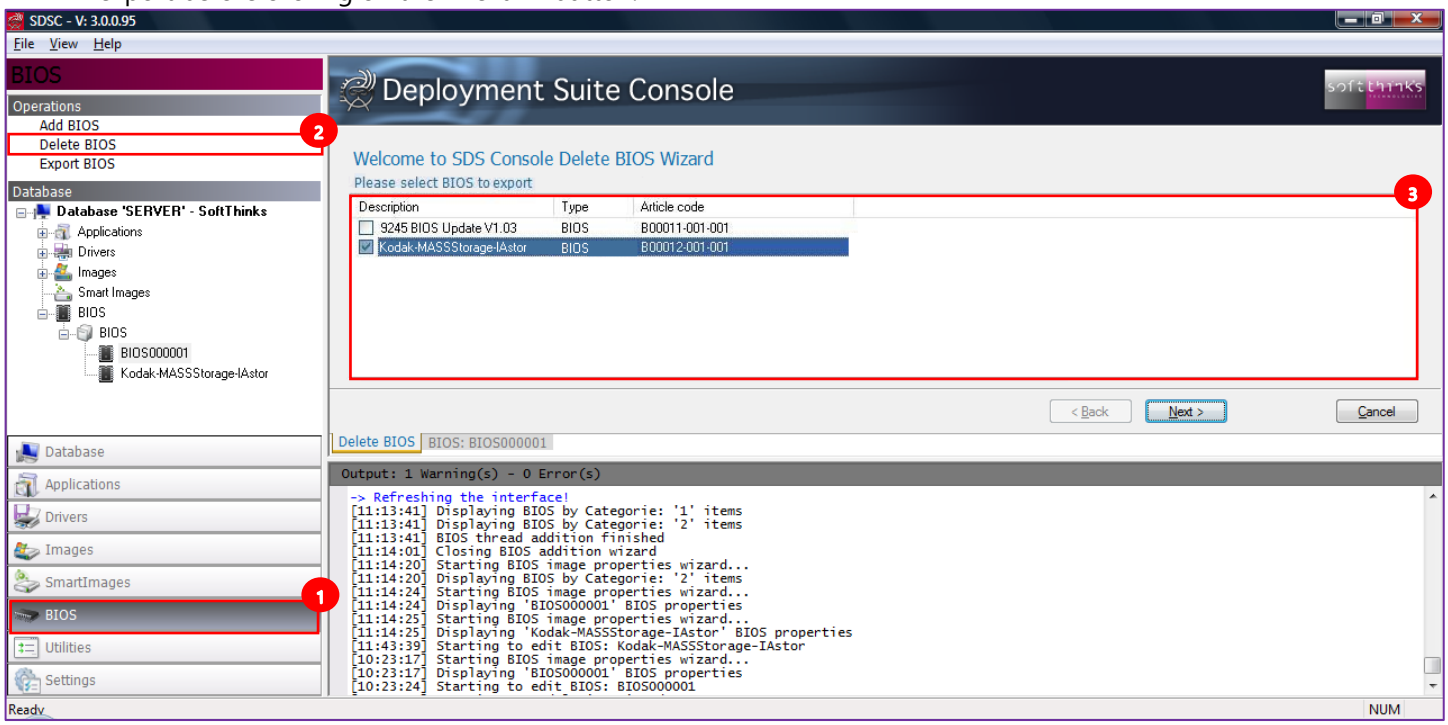
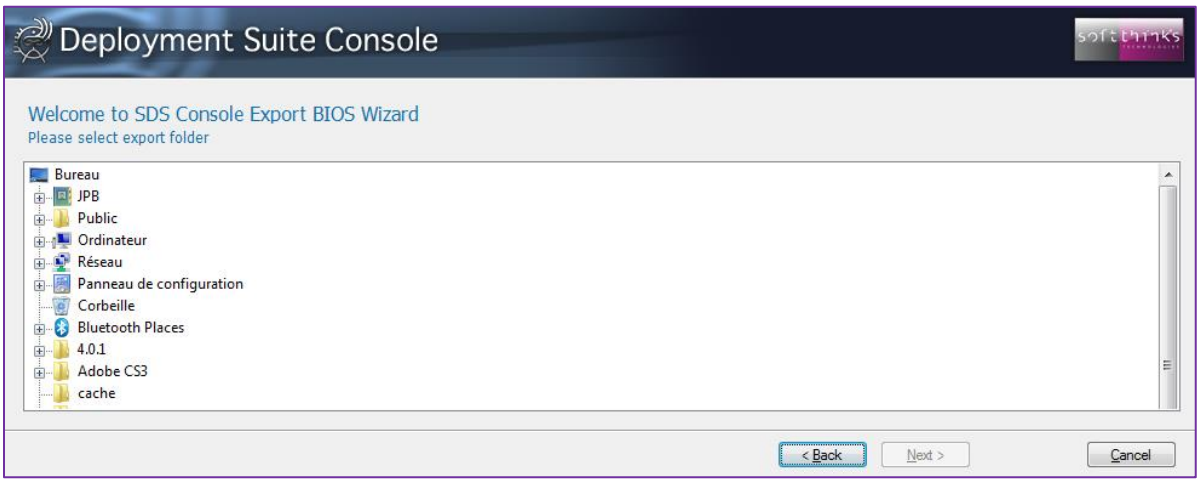
Exporting BIOS components

1. Click on the "BIOS" tab (1), then on the « Export BIOS » operation (2), and select the BIOS components you wish to export before clicking on the "Next >" button:



2. Select the destination folder where the ZIP files will be created and click on the "Next >" button:



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Utilities

General

Create Deployment USB stick

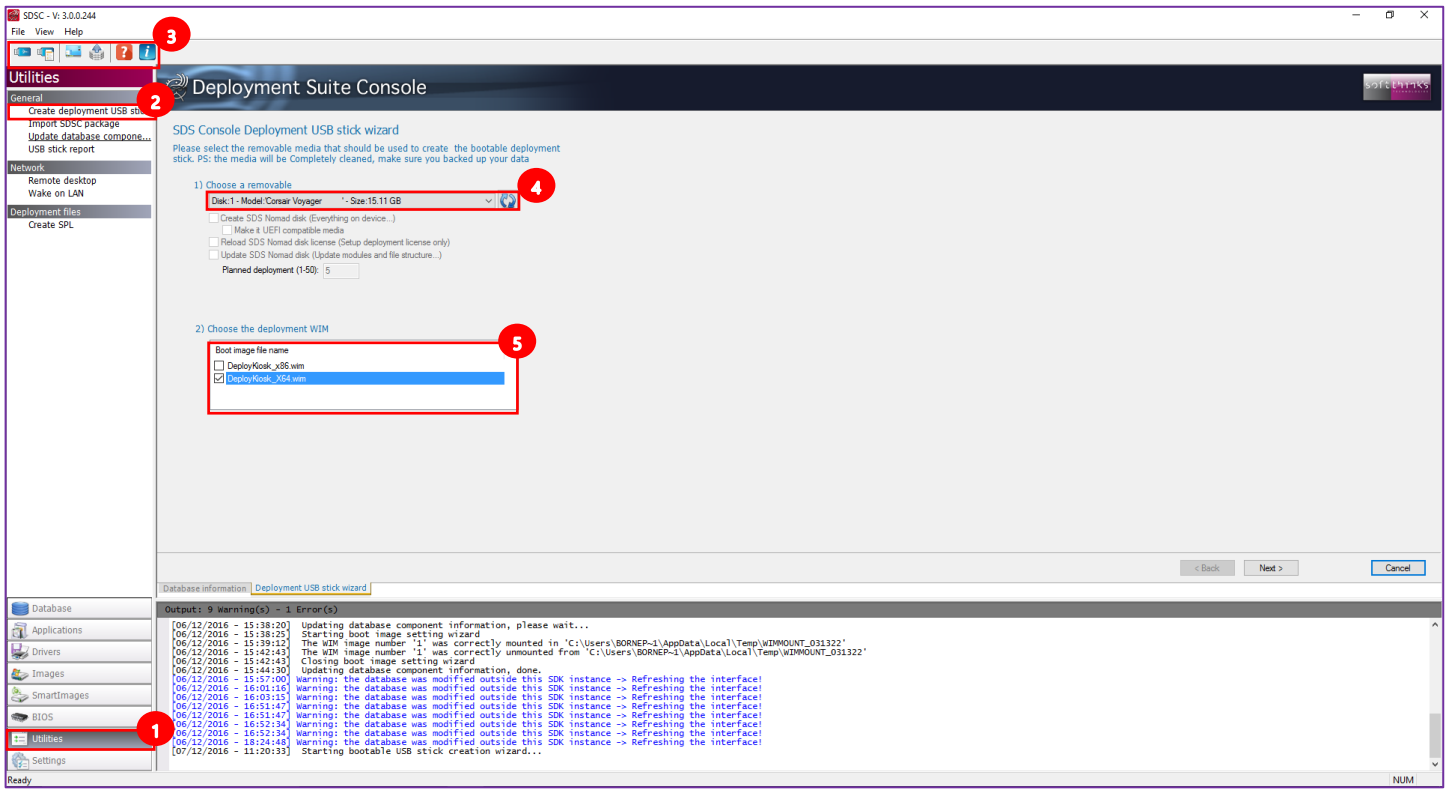
This tool offers you the ability to create a bootable deployment USB stick. If you already created one with a previous version of SDS, you will have to update it in order to benefit from all of the new SDS features and to be compliant with latest OS version.

You can either create a Boot Key or a Nomad Disk.

Boot key

Create a boot key when you want to use SDS on a computer that doesn't support PXE boot.

1. After having clicked on "Utilities" tab (1) and then « Create deployment USB stick » operation (2) or on button in the toolbar (3):



2. Insert a blank USB stick (See How to format a USB Flash Drive before converting it to a SDS USB Flash Drive to format it) or the USB stick previously created.
3. Select the USB stick in the list (4)
4. Select the deployment image to use (5)
5. Click on "Next >" button:

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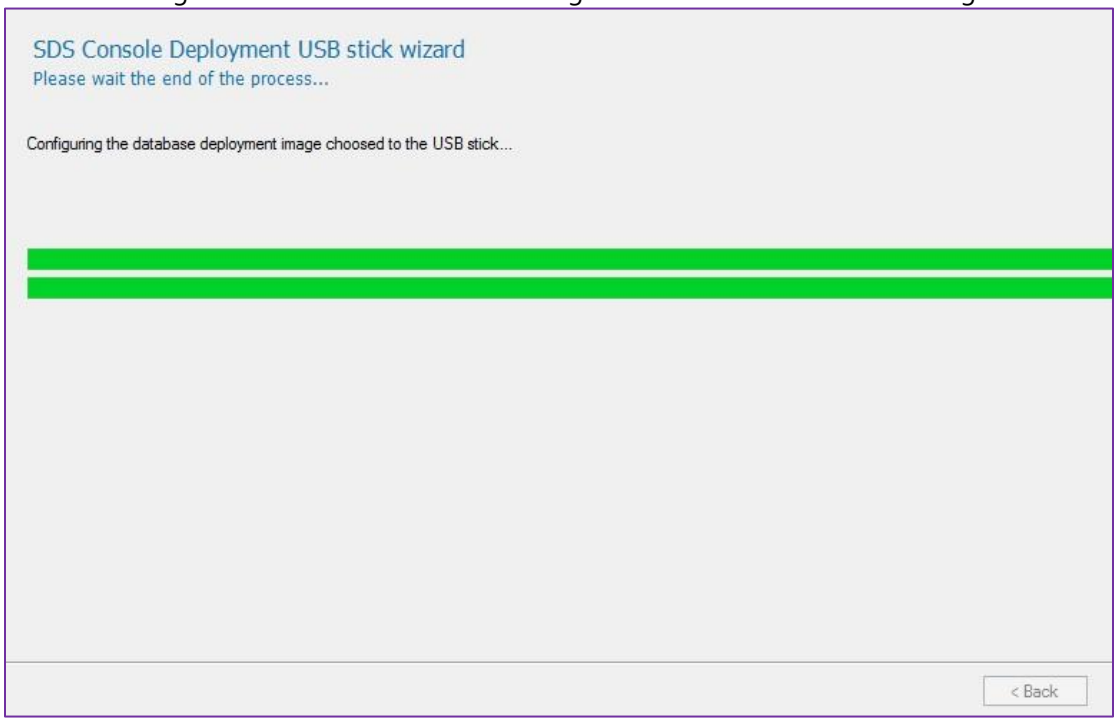
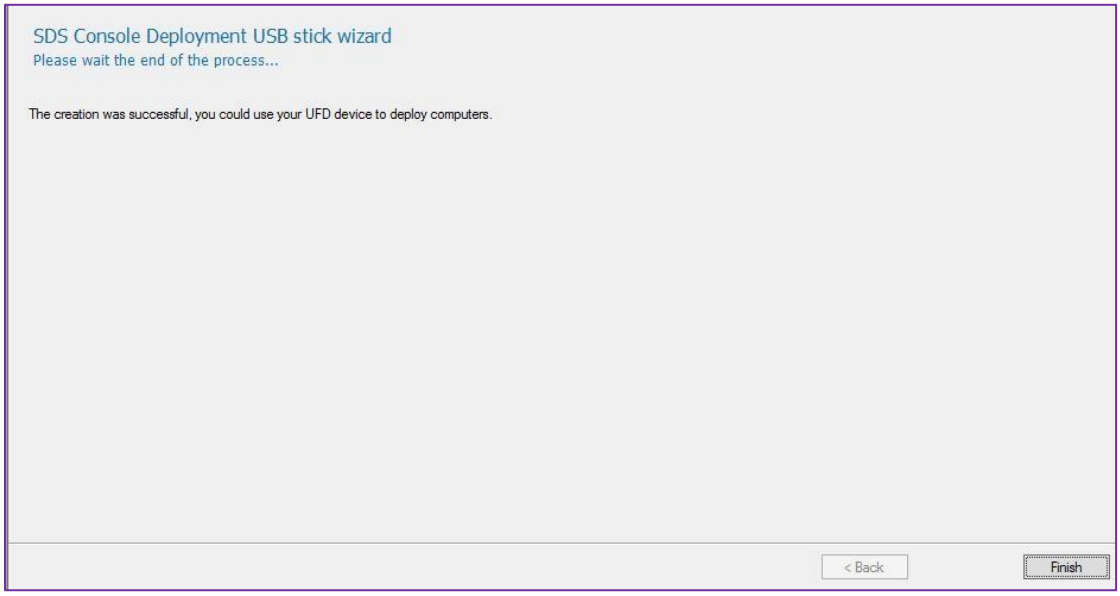
6. The process of creating the bootable flash drive can range from 2 to 10 minutes on average:



7. Once completed, click on « Finish » button:



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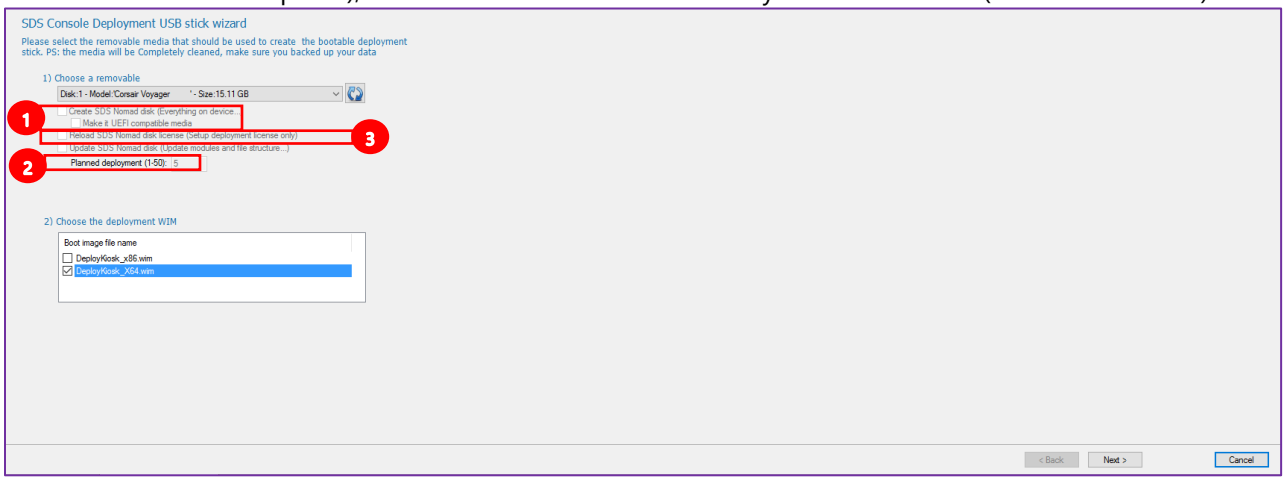
Nomad disk

Instead of using a server, you install the software on an external hard drive that we call a Nomad Disk.

1. To create your Nomad Disk, follow the same process as for the Boot Key, except that you have to check the options « Create a SDS Nomad disk (Everything on device…) » and « Make a UEFI compatible device » (if needed since all USB media are not UEFI compliant), and enter the number of licenses you want installed (between 1 and 50):

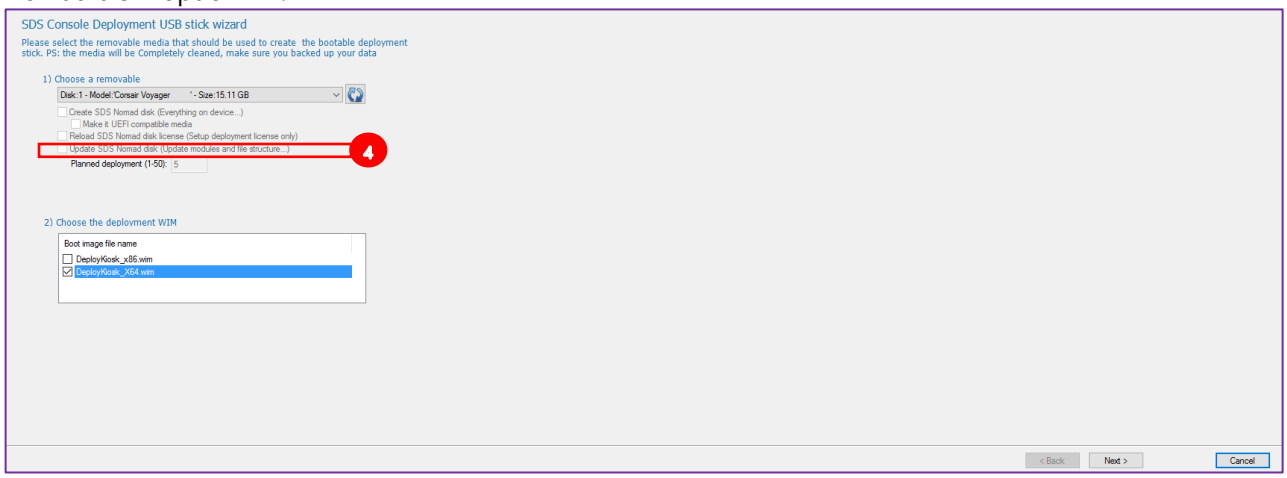


Note: Do not use USB Hard Drive larger than 2TB.

2. When you will have reached the deployments limit on a **nomad disk**, you will get the message below and will be able to add more licenses by choosing "Reload SDS Nomad disk license"[3].

Note: You can check the number of deployment available by plugging your USB Stick into the server and selecting « **USB Stick Report** » (See USB stick report).

3. You can also update the components (in case of new SDS version) in your Nomad Disk through the "Update SDS Nomad disk" option[4]:



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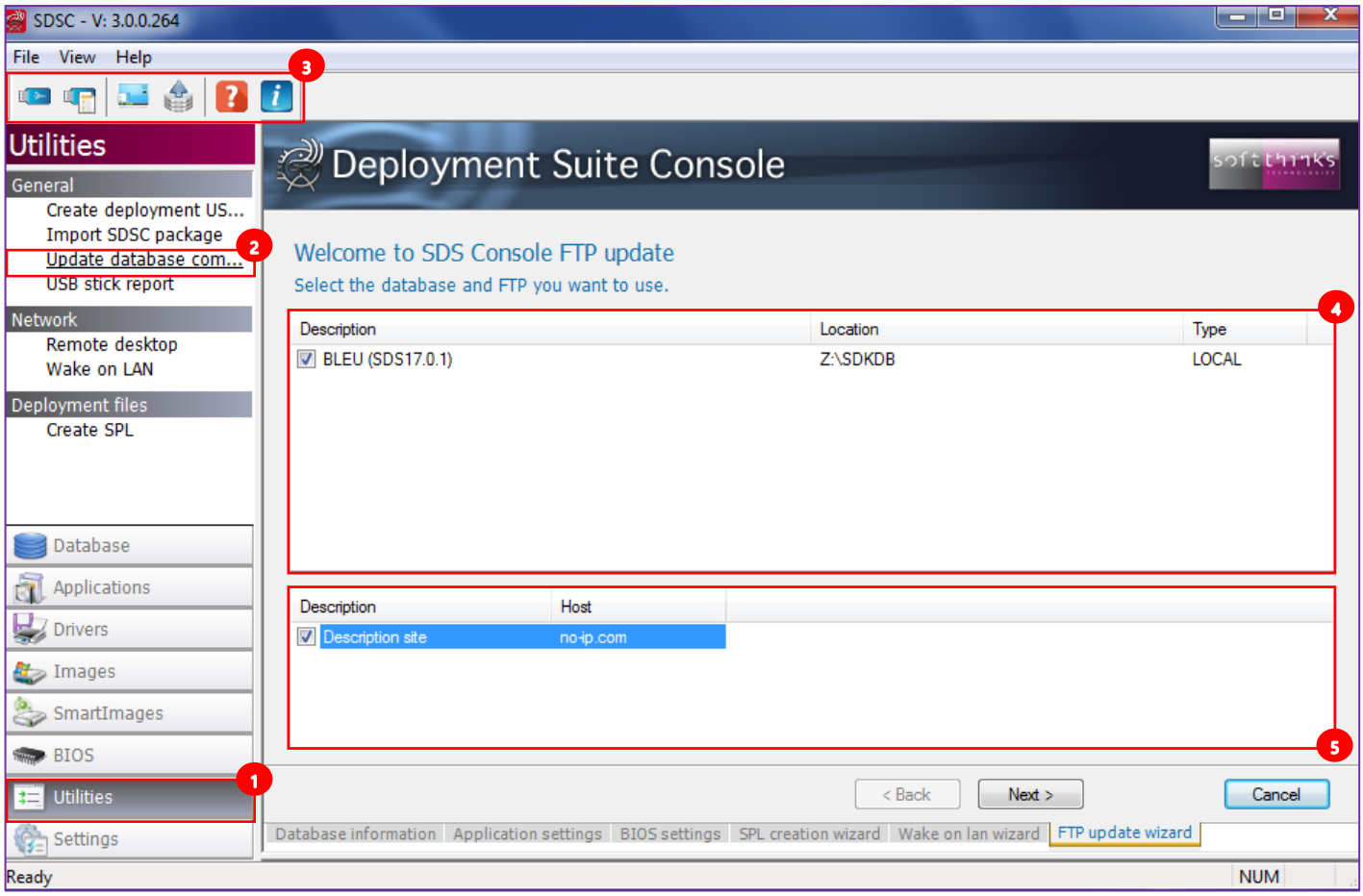
Import SDSC package

This feature offers you the ability to import a package (applications and drivers packages typically) into the database. Please see Importing application(s) ("Utilities\Import SDSC Package").

Update database components

This utility will update your database components from a FTP containing the reference database (See How to prepare the database for the "Update database components" feature).

1. Click on the "Utilities" tab (1), then on the "Update database components" operation (2), or directly on the button located in the toolbar (3):



2. Choose the database you wish to update (4)
3. Select the FTP site where you put the reference database (5)

   Hint: The FTP sites are configured in Database settings

4. Click on the "Next >" button

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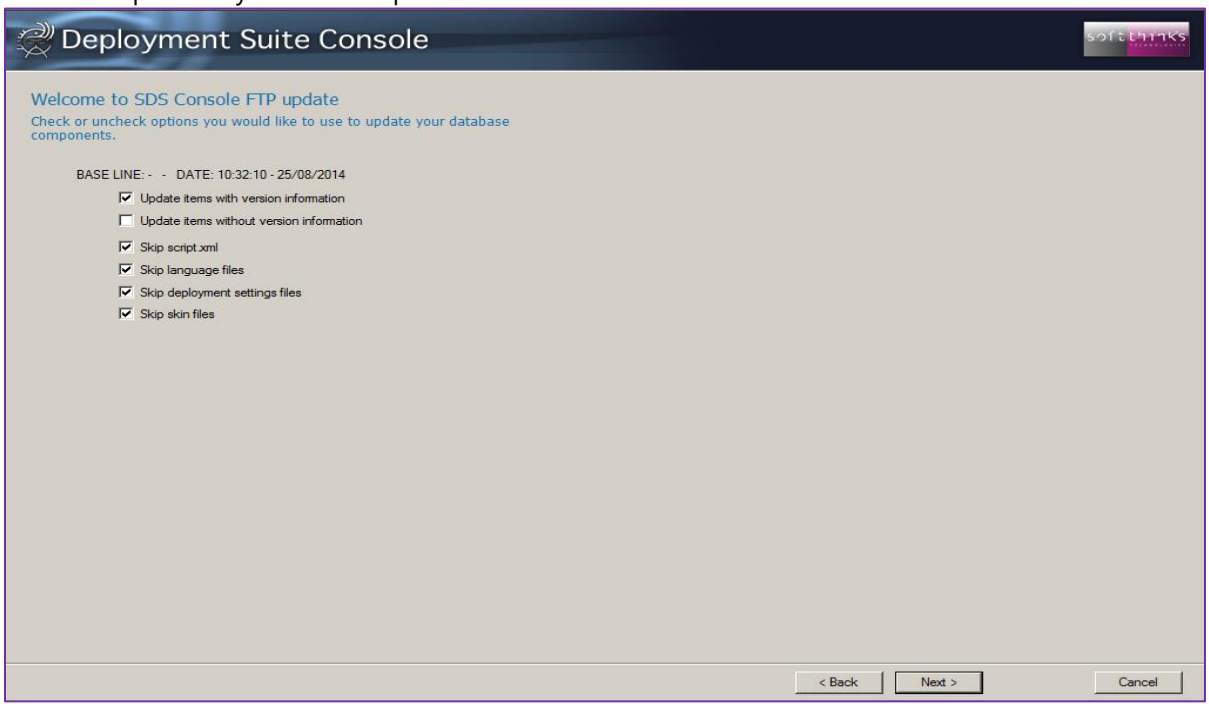
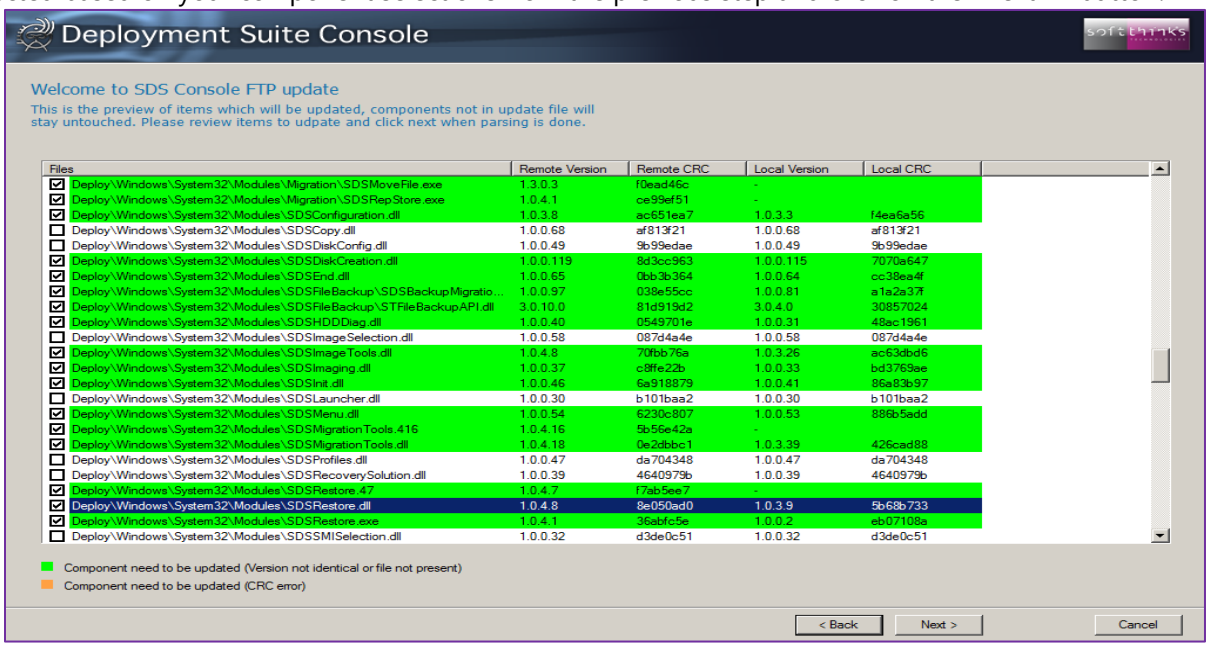
5. Select the components you wish to update:



6. Review and modify the files if necessary (checked and displayed with green background) which have been pre-selected based on your component selections from the previous step and click on the "Next >" button:



Files	Remote Version	Remote CRC	Local Version	Local CRC
Deploy\Windows\System32\Modules\Migration\SDSMoveFile.exe	1.3.0.3	f0ead46c	-	
Deploy\Windows\System32\Modules\Migration\SDSRepStore.exe	1.0.4.1	ce99ef51	-	
Deploy\Windows\System32\Modules\SDSConfiguration.dll	1.0.3.8	ac651ea7	1.0.3.3	f4ea6a56
Deploy\Windows\System32\Modules\SDSCopy.dll	1.0.0.68	af813f21	1.0.0.68	af813f21
Deploy\Windows\System32\Modules\SDSDiskConfig.dll	1.0.0.49	9b99edae	1.0.0.49	9b99edae
Deploy\Windows\System32\Modules\SDSDiskCreation.dll	1.0.0.119	8d3cc963	1.0.0.115	7070a647
Deploy\Windows\System32\Modules\SDSEnd.dll	1.0.0.65	0bb3b364	1.0.0.64	cc38ea4f
Deploy\Windows\System32\Modules\SDSFileBackup\SDSBackupMigratio...	1.0.0.97	038e55cc	1.0.0.81	a1a2a37f
Deploy\Windows\System32\Modules\SDSFileBackup\STFileBackupAPI.dll	3.0.10.0	81d919d2	3.0.4.0	30857024
Deploy\Windows\System32\Modules\SDSHDDDiag.dll	1.0.0.40	0549701e	1.0.0.31	48ac1961
Deploy\Windows\System32\Modules\SDSImageSelection.dll	1.0.0.58	087d4a4e	1.0.0.58	087d4a4e
Deploy\Windows\System32\Modules\SDSImageTools.dll	1.0.4.8	70fbb76a	1.0.3.26	ac63dbd6
Deploy\Windows\System32\Modules\SDSImaging.dll	1.0.0.37	c8ffe22b	1.0.0.33	bd3769ae
Deploy\Windows\System32\Modules\SDSInit.dll	1.0.0.46	6a918879	1.0.0.41	86a83b97
Deploy\Windows\System32\Modules\SDSLauncher.dll	1.0.0.30	b101baa2	1.0.0.30	b101baa2
Deploy\Windows\System32\Modules\SDSMenu.dll	1.0.0.54	6230c807	1.0.0.53	886b5add
Deploy\Windows\System32\Modules\SDSMigrationTools.416	1.0.4.16	5b56e42a	-	
Deploy\Windows\System32\Modules\SDSMigrationTools.dll	1.0.4.18	0e2dbbc1	1.0.3.39	426cad88
Deploy\Windows\System32\Modules\SDSProfiles.dll	1.0.0.47	da704348	1.0.0.47	da704348
Deploy\Windows\System32\Modules\SDSRecoverySolution.dll	1.0.0.39	4640979b	1.0.0.39	4640979b
Deploy\Windows\System32\Modules\SDSRestore.47	1.0.4.7	f7ab5ee7	-	
Deploy\Windows\System32\Modules\SDSRestore.dll	1.0.4.8	8e050ad0	1.0.3.9	5b68b733
Deploy\Windows\System32\Modules\SDSRestore.exe	1.0.4.1	36abfc5e	1.0.0.2	eb07108a
Deploy\Windows\System32\Modules\SDSSMISelection.dll	1.0.0.32	d3de0c51	1.0.0.32	d3de0c51

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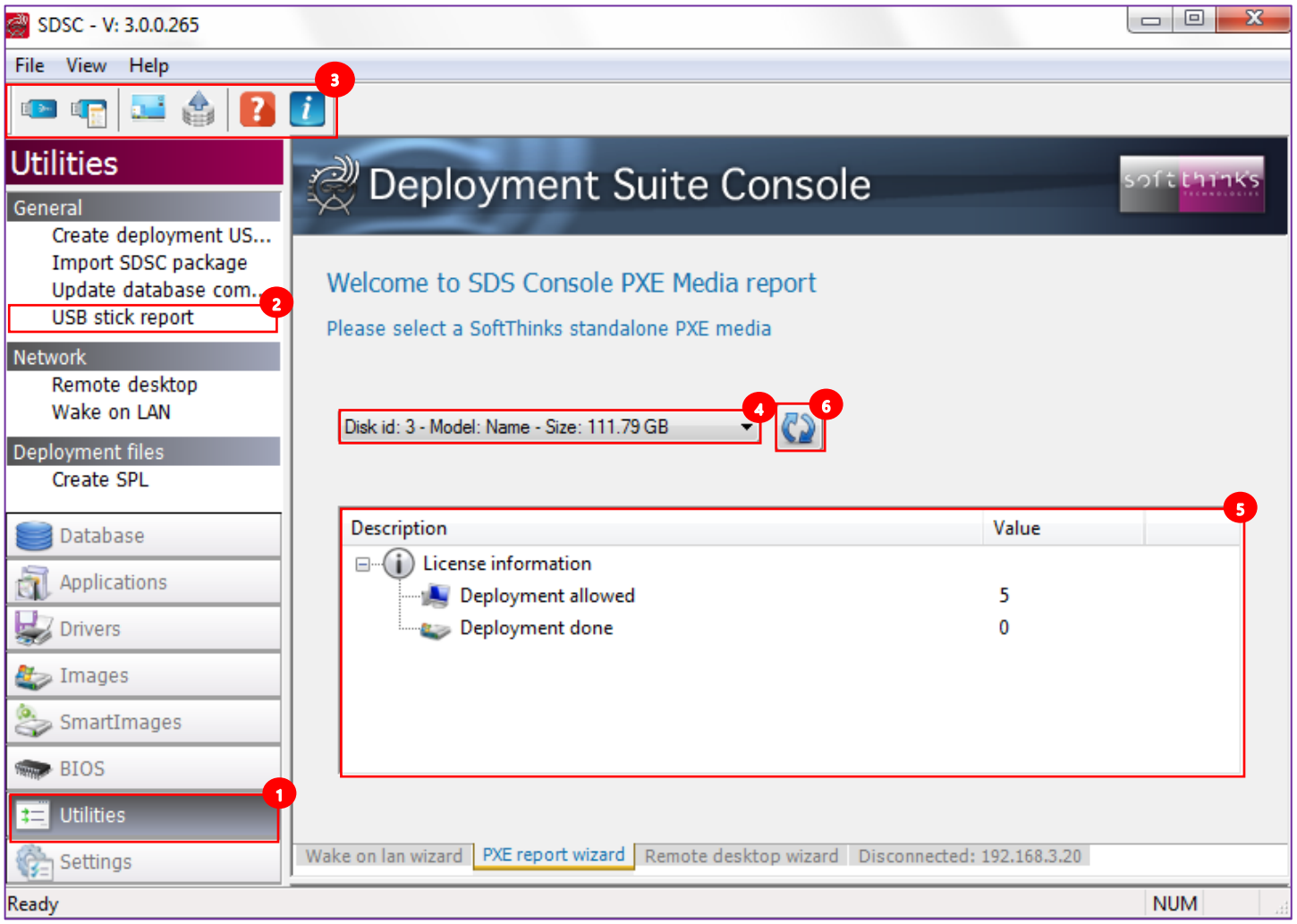
USB stick report

Use this utility to check the number of deployments available on a Nomad Disk.

1. Click on the "Utilities" tab (1) and then on the "USB stick report" operation (2), or directly on the button in the toolbar (3):



2. Insert your Nomad Disk, if it is not yet the case, and select it in the list (4) in order to obtain license information (5).

   Hint: If your Nomad Disk doesn't appear in the list, click on the button (6) to refresh the list.

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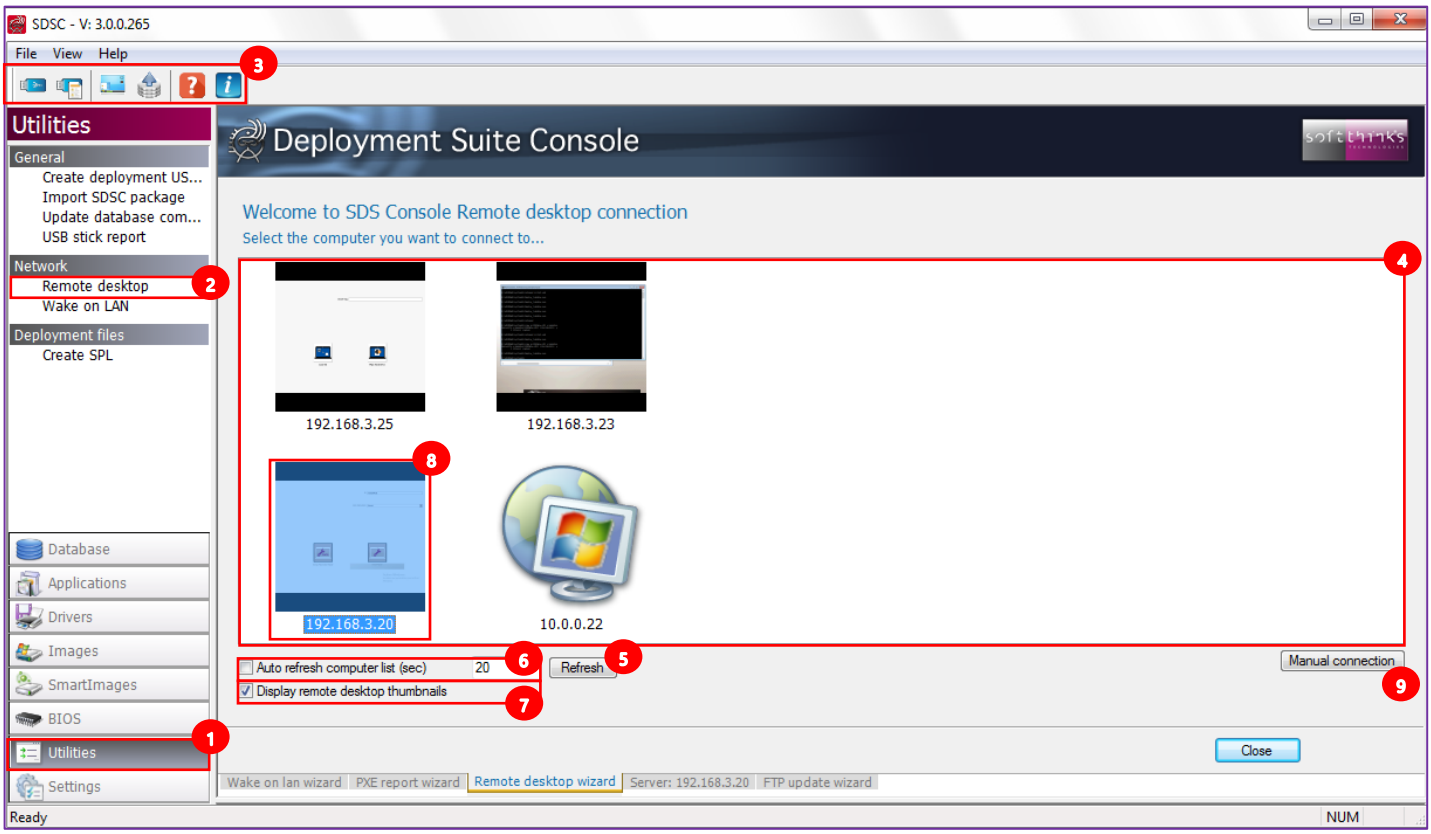
Network

Remote Desktop

This utility gives you the ability to view the activity on all of the devices connected to the server and to remotely manage them.

1. Click on the "Utilities" tab (1), then on the "Remote desktop" operation (2), or directly on the button located in the toolbar (3), and you will see the desktop of all the devices (4):



Hint: You can refresh this view (4) on demand by clicking on the "Refresh" button (5), or automatically every x seconds (6), and choose to display or not display the thumbnails (7).

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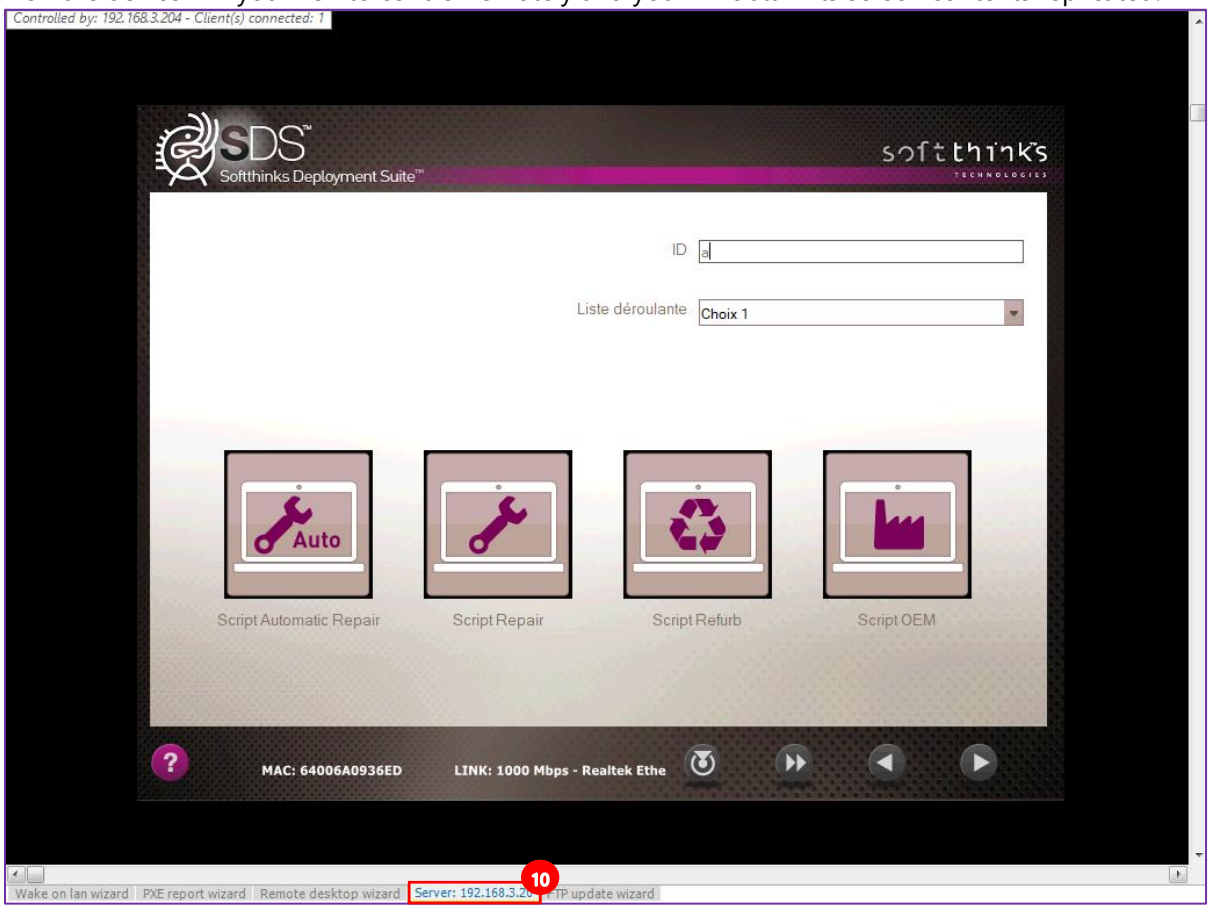
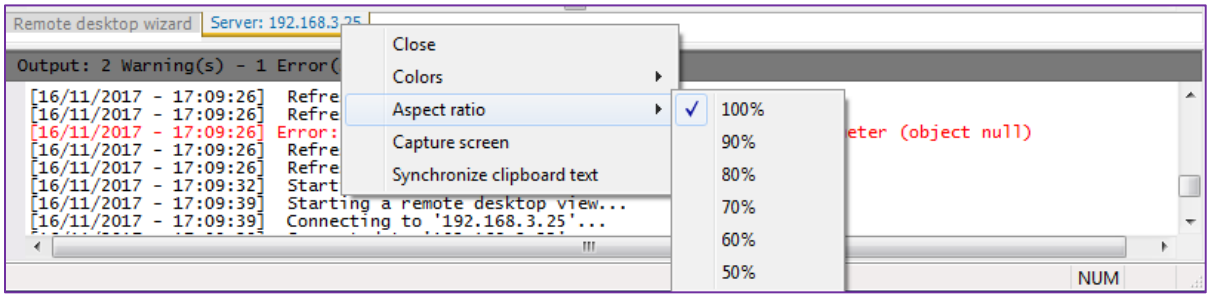
2. Click on the device 8 you wish to control remotely and you will obtain its screen contents replicated:



Hint: Right click on the remote display tab 10 to display a popup menu which allows you to choose a more appropriate aspect ratio, change the colors depth (16 / 256 / 64K / 16M), capture the screen and synchronize clipboard text:



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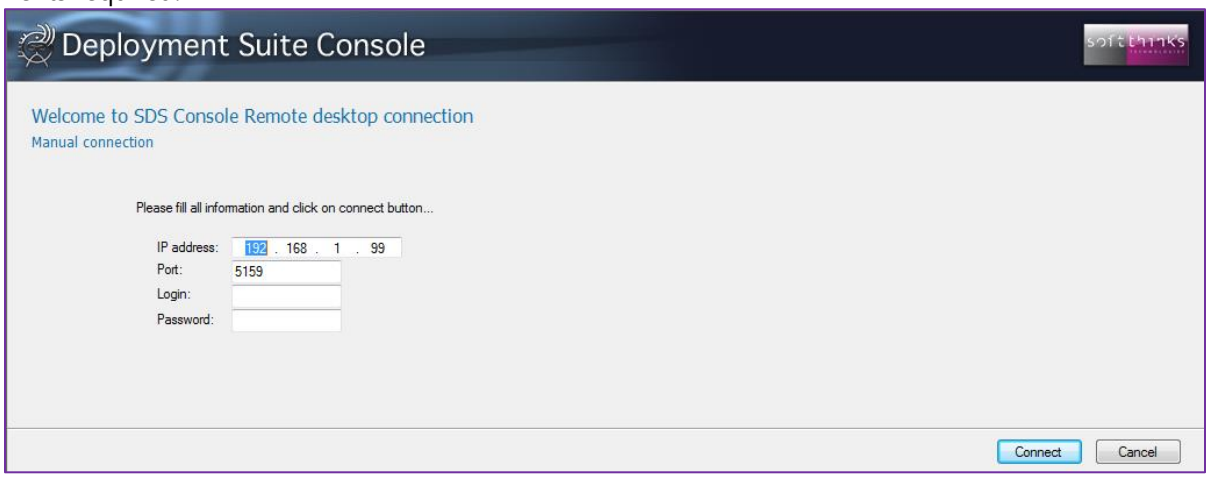
3. You can also connect to a device manually by clicking on the « Manual connection » button 8 and entering the elements required:



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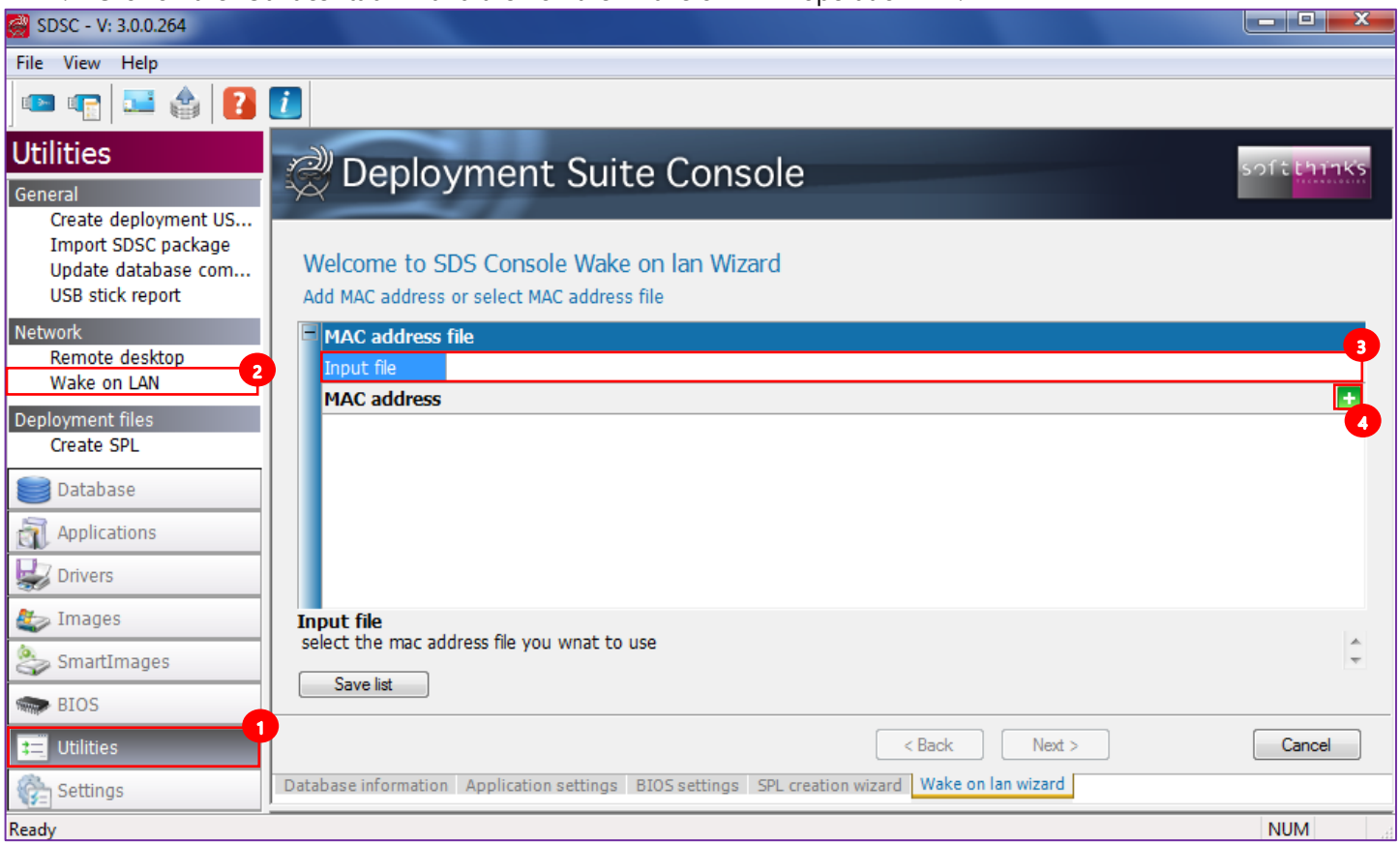
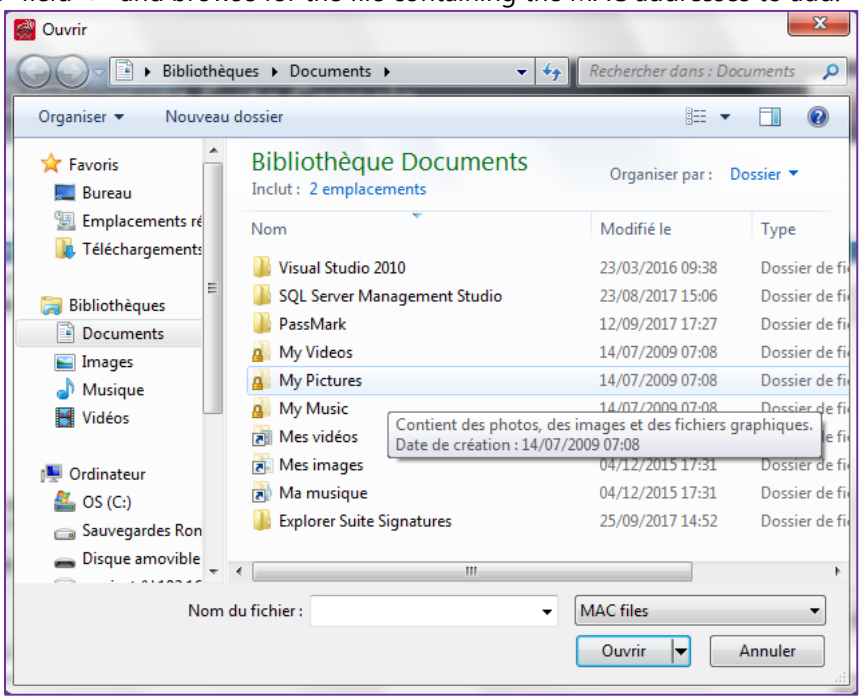
Wake on LAN

Use this utility to manage the Wake on LAN feature for devices which support it.

1. Click on the "Utilities" tab (1) and then on the "Wake on LAN" operation (2) :



2. Click on the "Input File" field (3) and browse for the file containing the MAC addresses to add:



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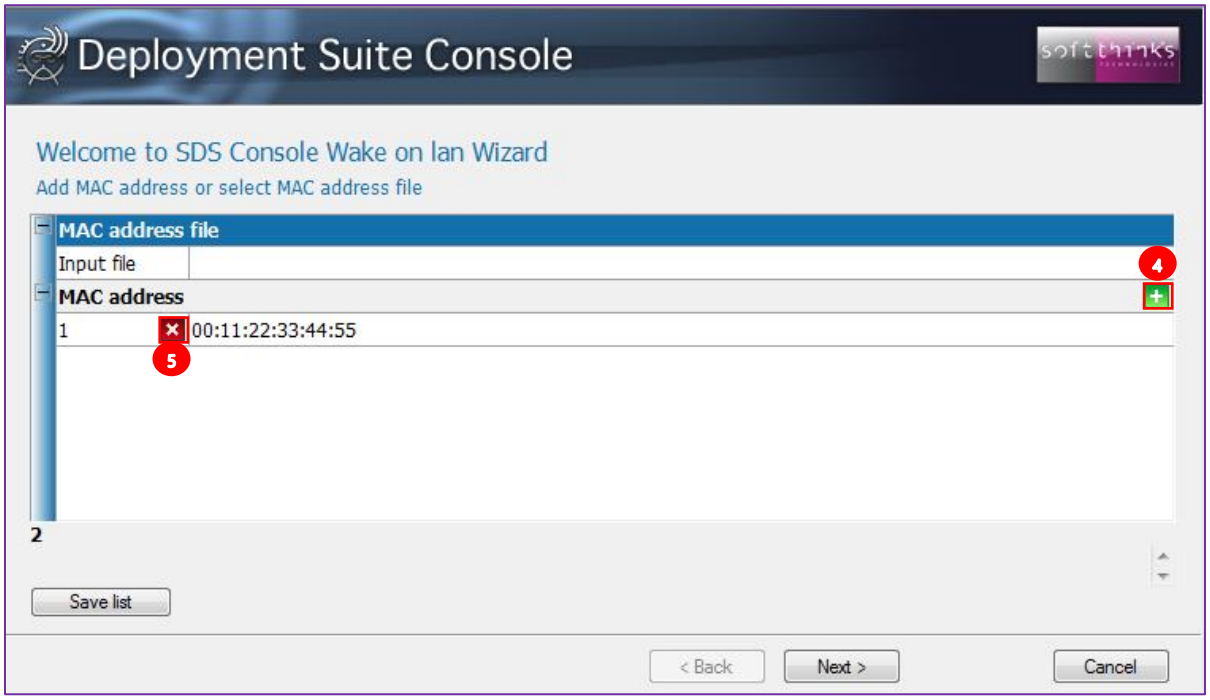
3. Or click on the button (4) and edit the MAC address:



Hint: Click on the button (5) in front of the MAC address you wish to delete.

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Deployment Files

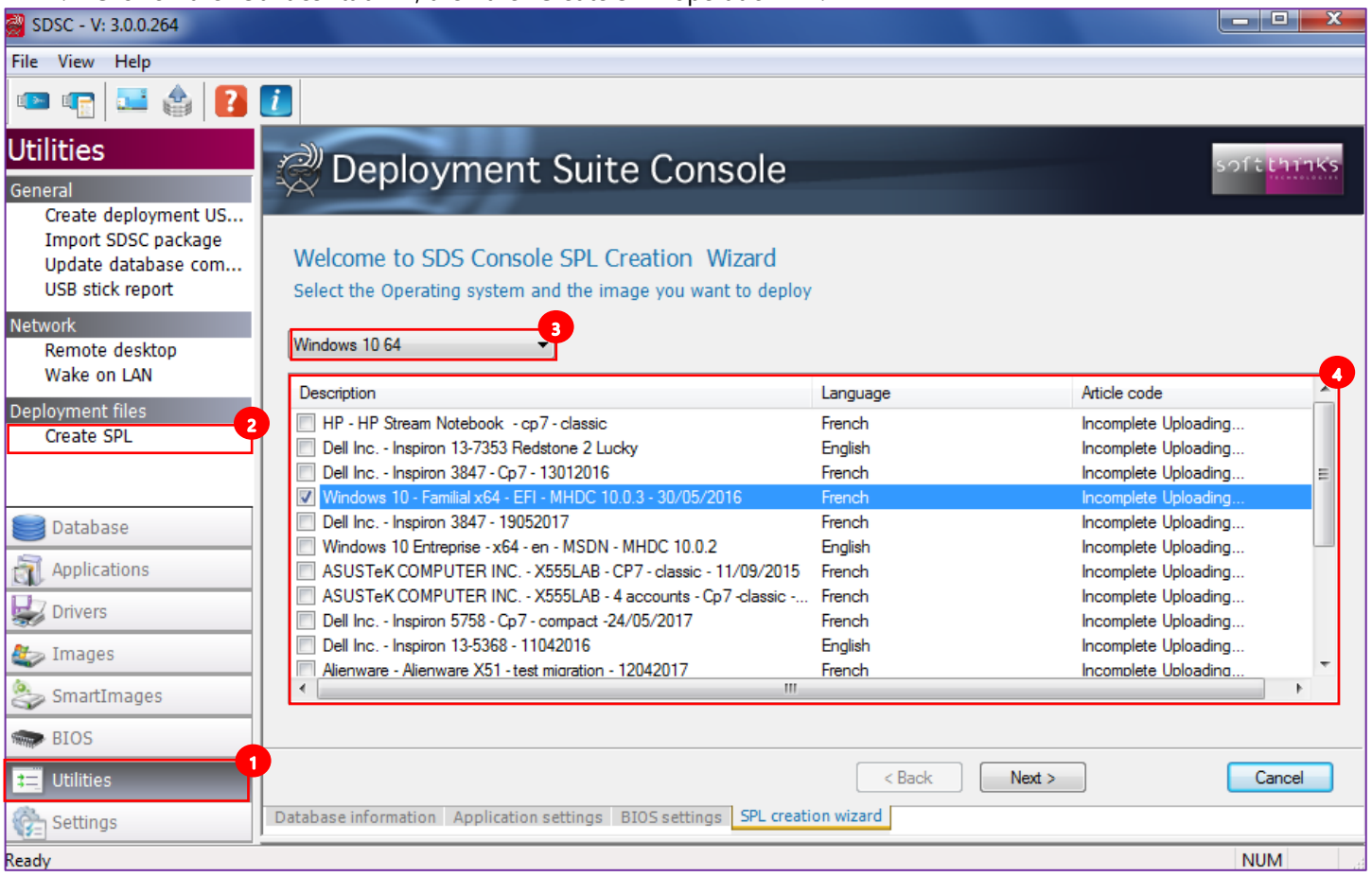
Create SPL

Note: SPLs are not commonly used any longer. They have been replaced with the ADF, Profile, and Preset files which are easily created directly from the source computers.

This utility generates SPL files containing information about what to automatically deploy to a specific model of computer. The SPL files are used for the automatic deployment of:

- Partition scheme,
- Tools used for enabling/disabling SDK features,
- Operating System,
- Smart Image,
- Applications,
- Drivers,
- Bundles,
- Security patches and updates,
- Tests to be run.

1. Click on the "Utilities" tab (1), then the "Create SPL" operation (2):



2. Select the Operating System (3)

3. Select the image you want to deploy in the list (4) (filtered by the OS you selected)

4. Click on the "Next >" button

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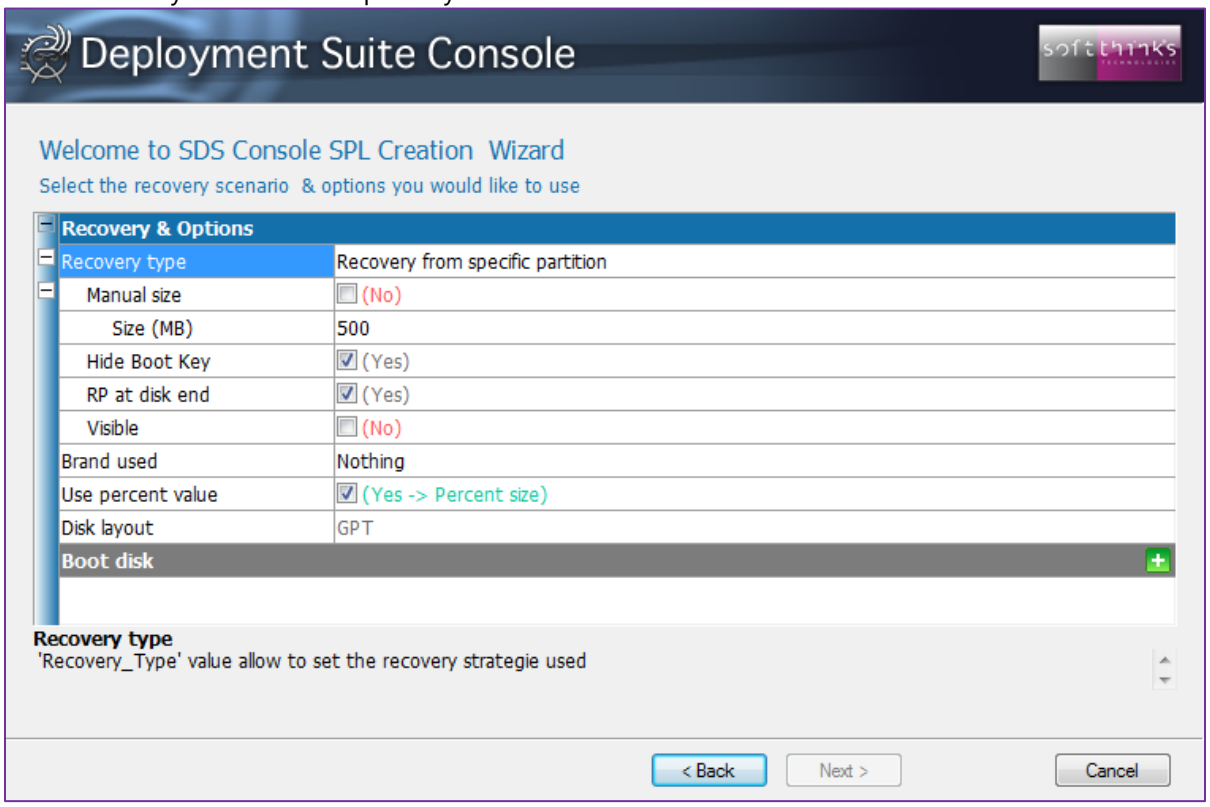
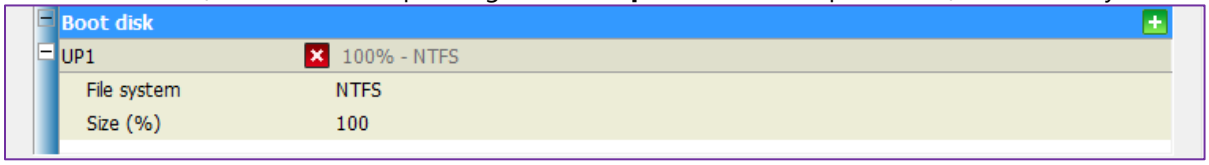
5. Select the recovery scenario and options you would like to use:



- **Recovery type:** Recovery scenario
  - « No recovery »
  - « Recovery from specific location »
  - « Recovery from user partition »
  - « No Recovery solution, use only original image disk typology »

  If you choose the « Recovery from specific location » scenario you will have to set the parameters relevant to the Recovery Partition (RP):
    - **Manual Size:** « Yes » to force the size of the Recovery Partition to the « **Size (MB)** » value (else the size is dynamically estimated)
    - **Hide Boot Key:** « Yes » to hide the message about the RP boot key
    - **RP at disk end:** « Yes » to create the RP at the end of the disk
    - **Visible:** « Yes » to make the RP visible
- **Brand used:** Customizes the interface of the restore solution for a brand (logo…). Default « nothing » in the absence of specific customization.
- **Use percent value :** « Yes » to set the relative size (%) / « No » for absolute size (not relevant for the « No Recovery solution, use only original image disk typology » scenario)
- **Disk Layout:** Layout (MBR/GTP) of the disk. Depends on the image selected and cannot be modified.

You can specify the partitions to create on the target disk during deployment by clicking on the button and by settings for each partition added its size (in % or in MB depending on « **User percent value** » parameter) and its file system:



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On the RIS Server, the newly created SPL file must be placed in the following location:

- X:\SPL***S**XXXXXXXXX.SPL

Note: This transfer to the server can be an automated process. The transfer MUST be completed prior to deploying (PXE booting on the RIS server) the image to the PC.

After the SPL has been placed in the above location on the RIS server, the selectorSRV service will translate the file and output to the following locations based on the following conditions:

- Success:
  - X:\SPL\Success\SXXXXXXXXX.SPL
  - X:\SPL\Success\SXXXXXXXXX.SDK
  - X:\Deploy\XXXXXXXXX.Selector.ini (Used for deployment)
  - X:\Deploy\XXXXXXXXX.RSSelect.ini (Used for deployment)
- Error:
  - X:\SPL\Error\S000000000.SPL

The following outlines the deployment process:

1. Create SPL file.
2. Transfer SPL file to the RIS server.
3. Start RIS deployment (PXE boot).
4. Deployment tools will read DMI field and find matching deployment .ini files.
5. Display “Software List” for download with confirmation screen.
6. Deploy software image to recovery partition (RP).
7. Disconnect from server.
8. Deploy from RP to UP.
9. Test.
10. Shutdown.

Please refer to How to edit SPL Files for more details on SPL files contents.

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Settings

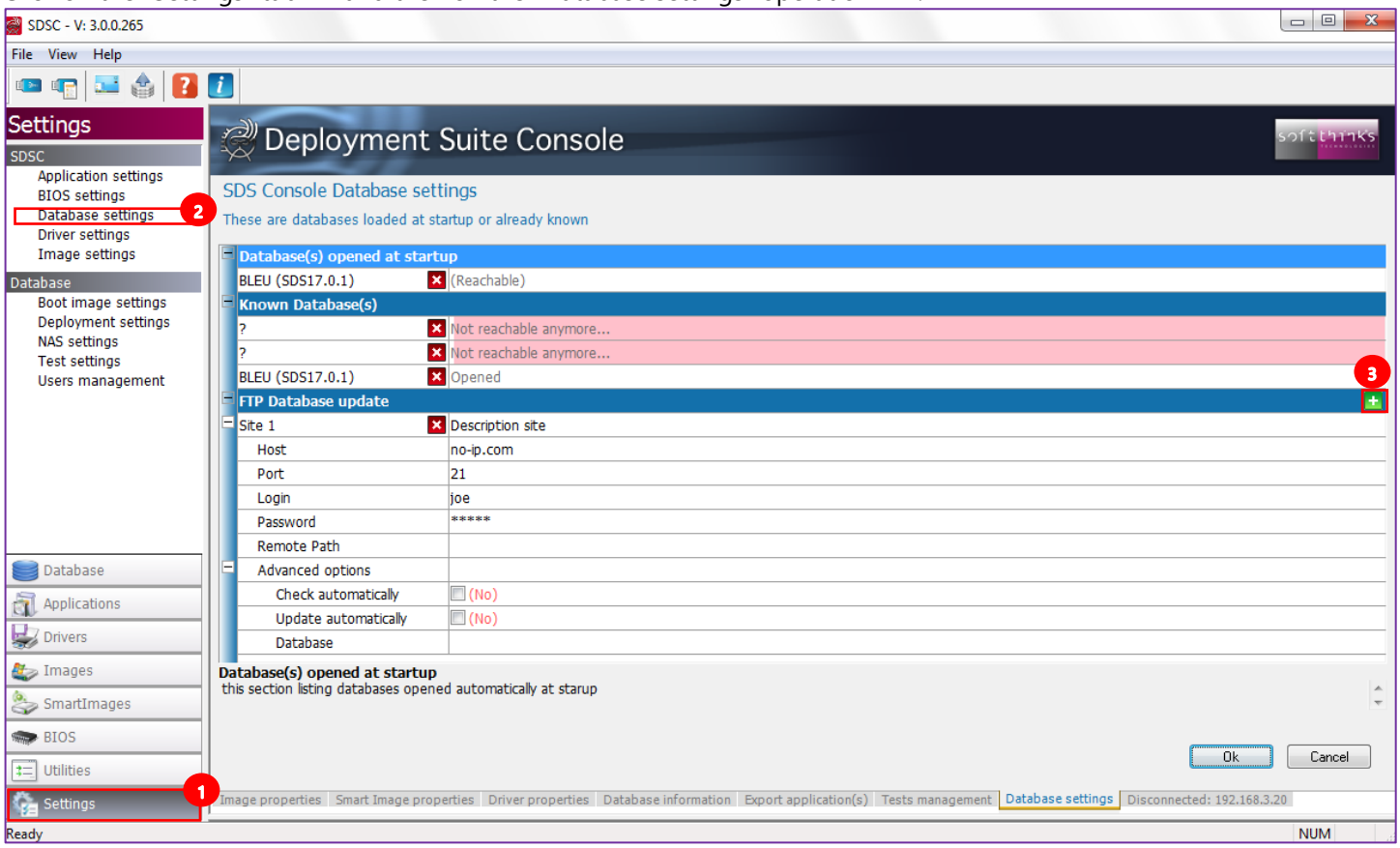
SDSC

Database settings

You will find the database settings below:

- Database(s) opened at startup
- Known Database(s)
- FTP Database update (See Update database components)

Click on the "Settings" tab 1 and then on the "Database settings" operation 2 :



FTP Database update

You can enter several FTP sites for the database update feature by clicking on the + button 3 and filling in those fields:

- **Site <x>:** FTP description
- **Host :** FTP address (domain name or IP)
- **Port:** FTP port (21 by defaut)
- **Login/Passwor:** FTP credentials
- **Remote path:** Remote path where is located the master database
- **Advanced options**
  - **Check automatically:** « Yes » to automatically check for a new update
  - **Update automatically:** « Yes » to apply automatically an update
  - **Database:** Database to update

To remove an FTP site, click on the ✕ button in front of it.

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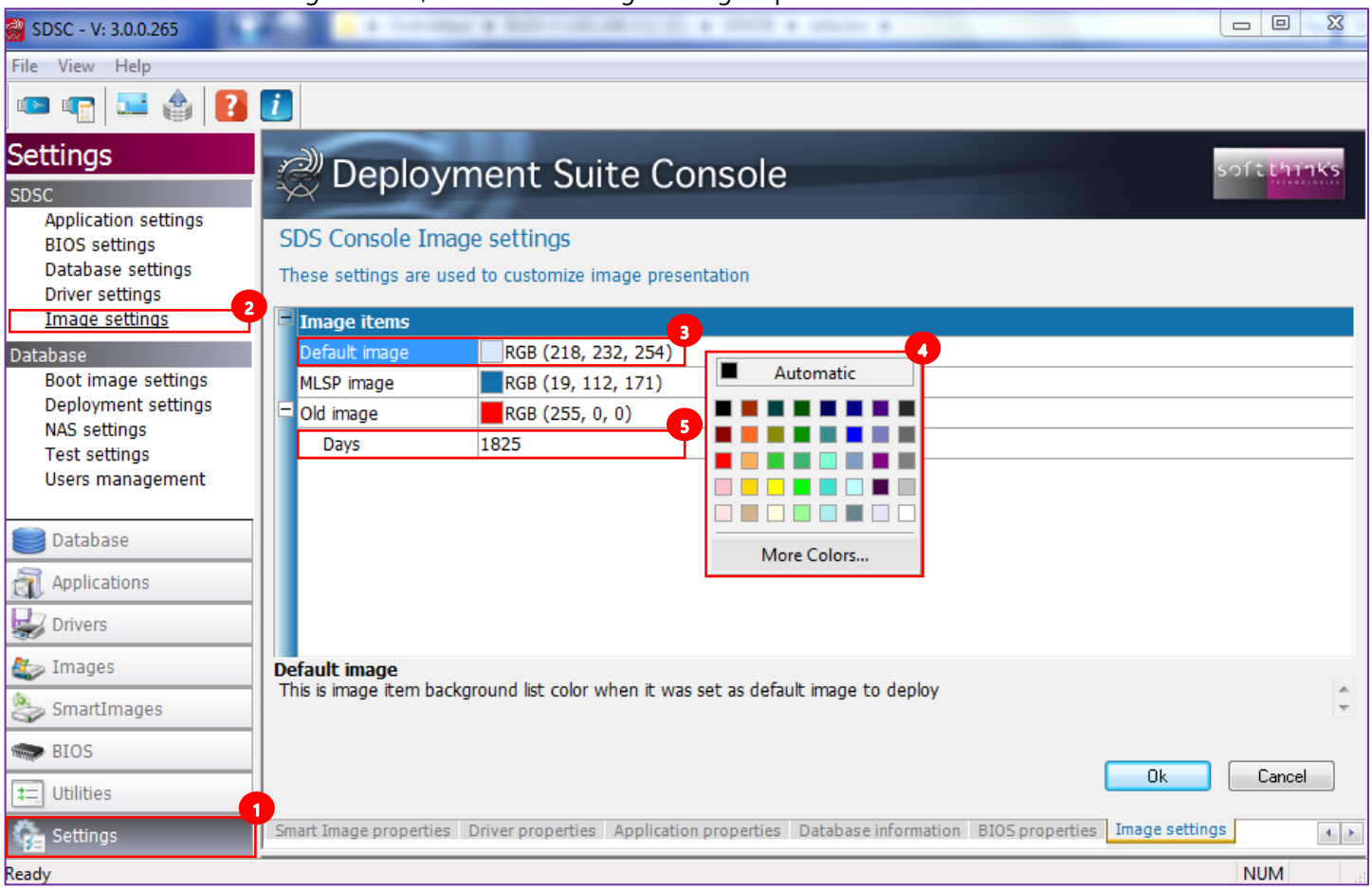
Image settings

When you look at the images list you might notice that some of those images have a specific background color. Those different background colors allow you to quickly identify which ones are default deployment images, which ones are multilingual and which ones are old.

You can customize those colors as well as the number of days after which you consider an image as old.

1. Click on the “Settings” tab (1), then on the “Image settings” operation (2):



2. Click on the image type for which you want to change the background color (Default image in our screenshot) (3) and select the new color (4).

3. Indicate the number of days after which you consider an image as old (5).

4. Click on the “OK” to apply your changes.

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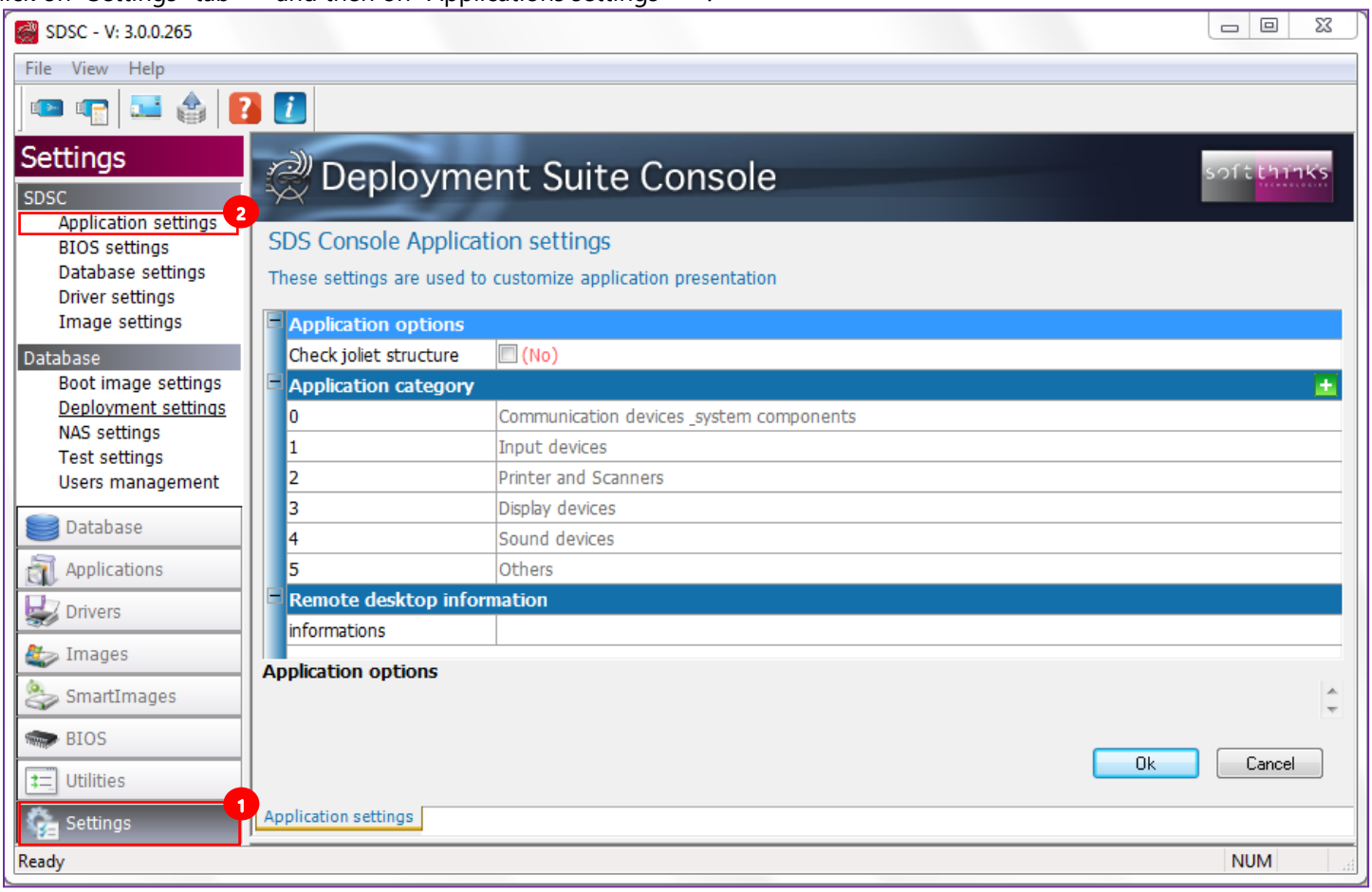
Application settings

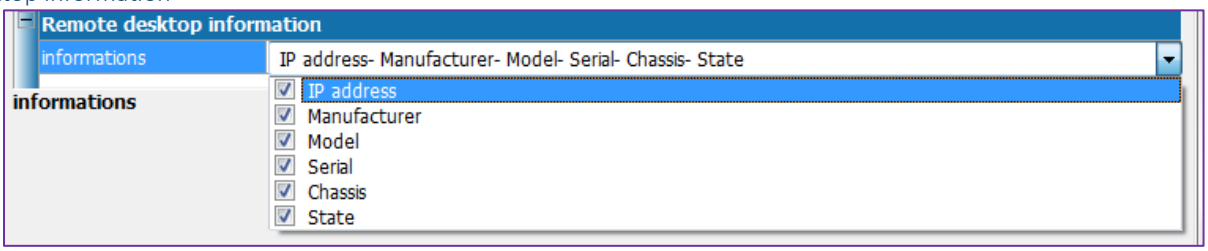
Click on "Settings" tab (1) and then on "Applications settings" (2):



Application options

Check the « Check Joliet structure » option to ensure that the directories containing applications are compliant to ISO9660 + Joliet. This is helpful when applications are stored on optical media.

Remote desktop information



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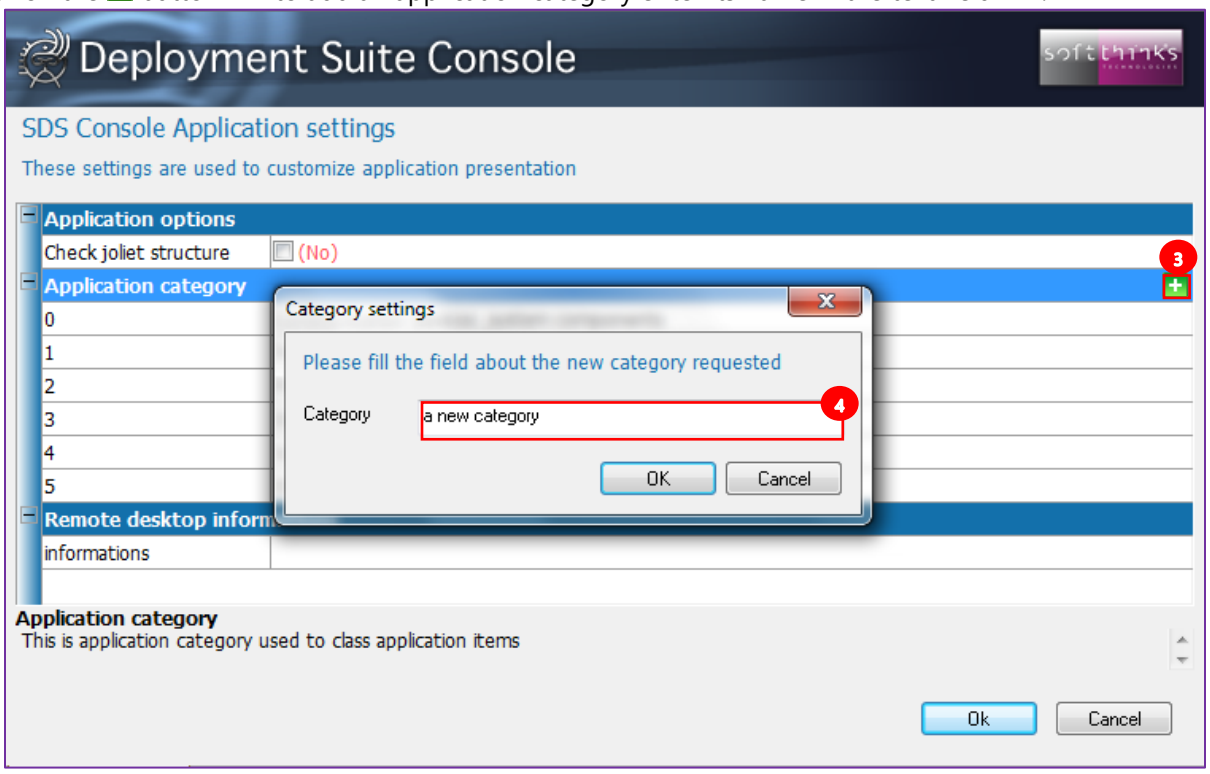
Application categories

An application category is used to define the type of application in the database. This is useful for organizing the database and makes sorting and searching by category easier. You may add new categories to the Application type and these will be available when creating or editing an application in the database.

1. Click on the + button (3) to add an application category enter its name in the text field (4):



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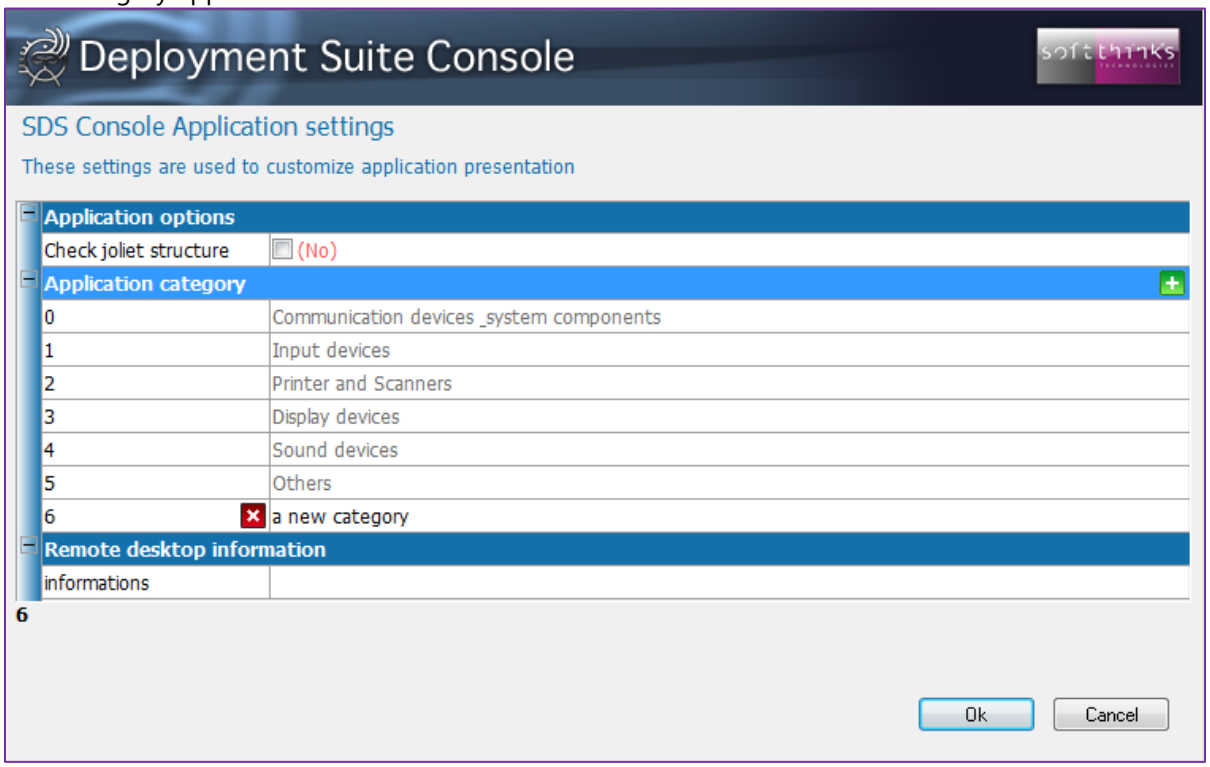
2. The new category appears at the end of the list:



Hint: Click on the button in front of a category you added to delete it (you cannot remove predefined application categories).

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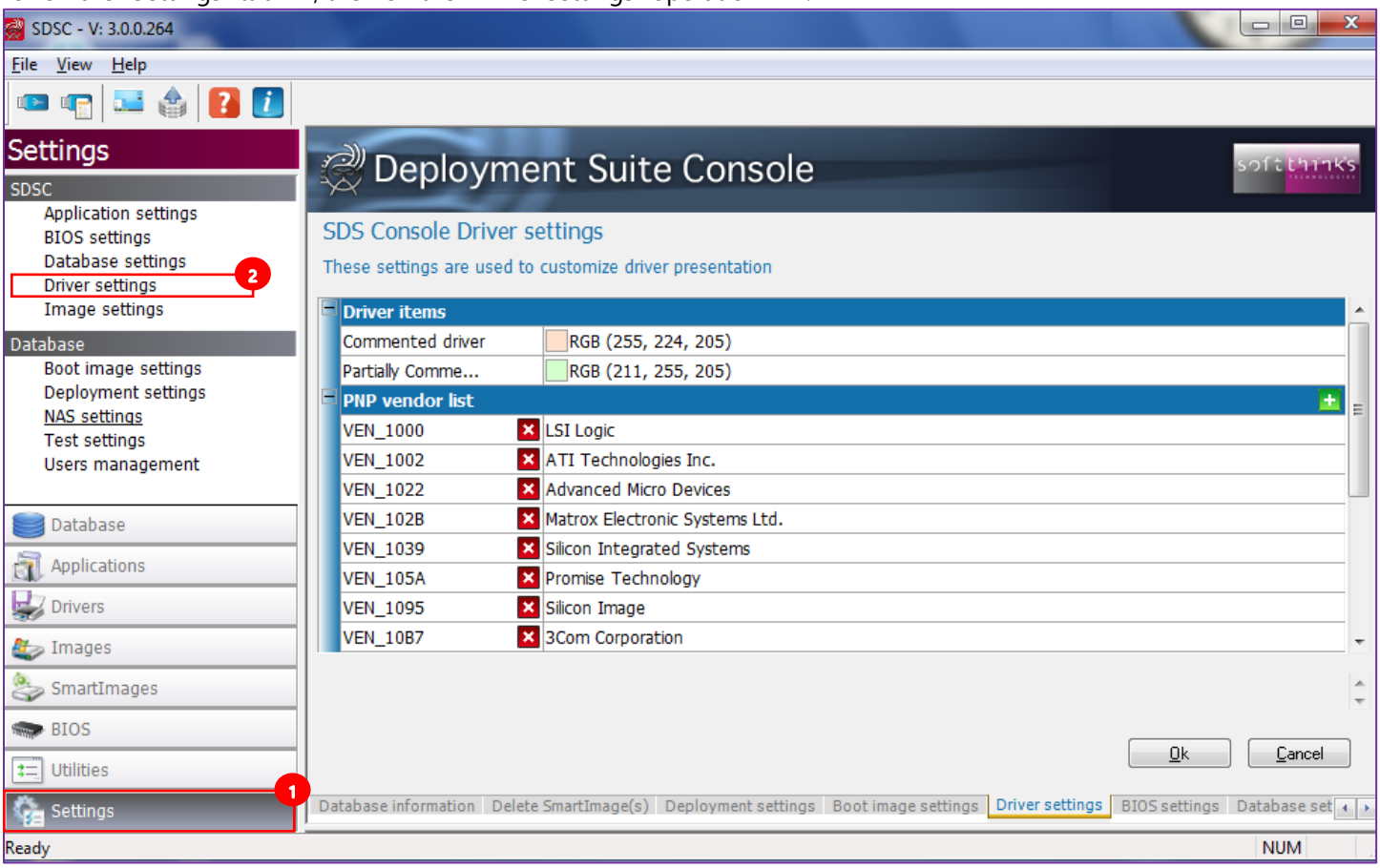
Driver settings

The driver settings are used to customize driver presentation.

Click on the “Settings” tab (1), then on the “Driver settings” operation (2) :



Driver items

You can customize the background color of the drivers depending if they are commented or partially commented.

PNP vendor list

A vendor category is used to define the type of drivers in the database. This is useful for organizing the database and makes sorting and searching by category easier. You may modify, add and remove categories and these will be available when creating or editing a driver in the database.

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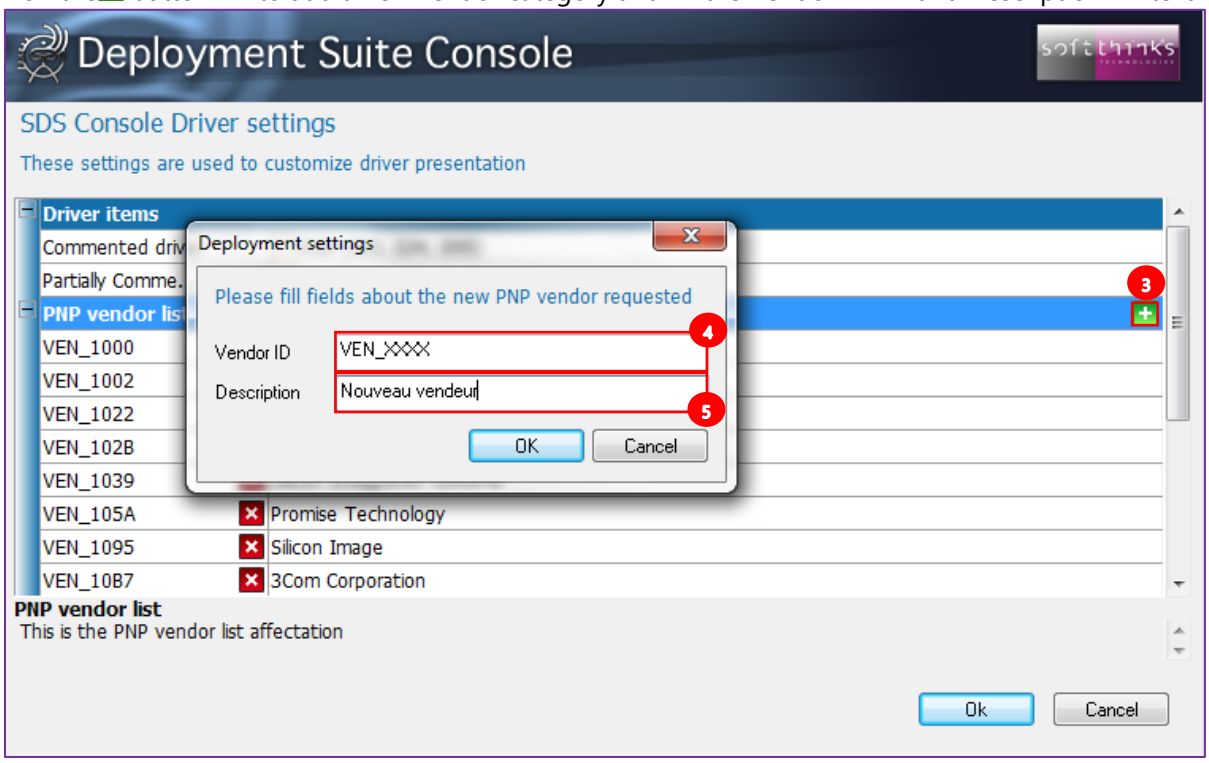
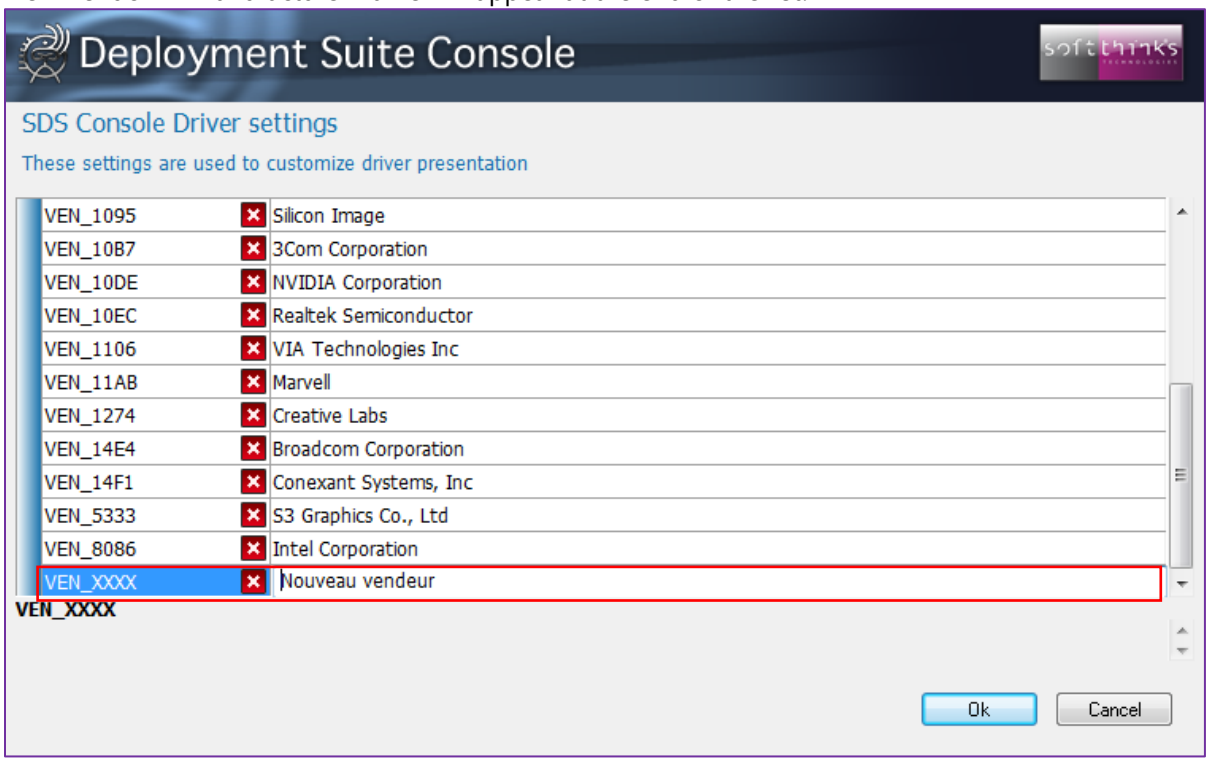
1. Click on the button (3) to add a new vendor category and fill the Vendor ID (4) and Description (5) text fields:



2. The new Vendor ID manufacturer name will appear at the end of the list:



Hint: Double-click on an item to edit it and click on the button in front of a category to delete it.

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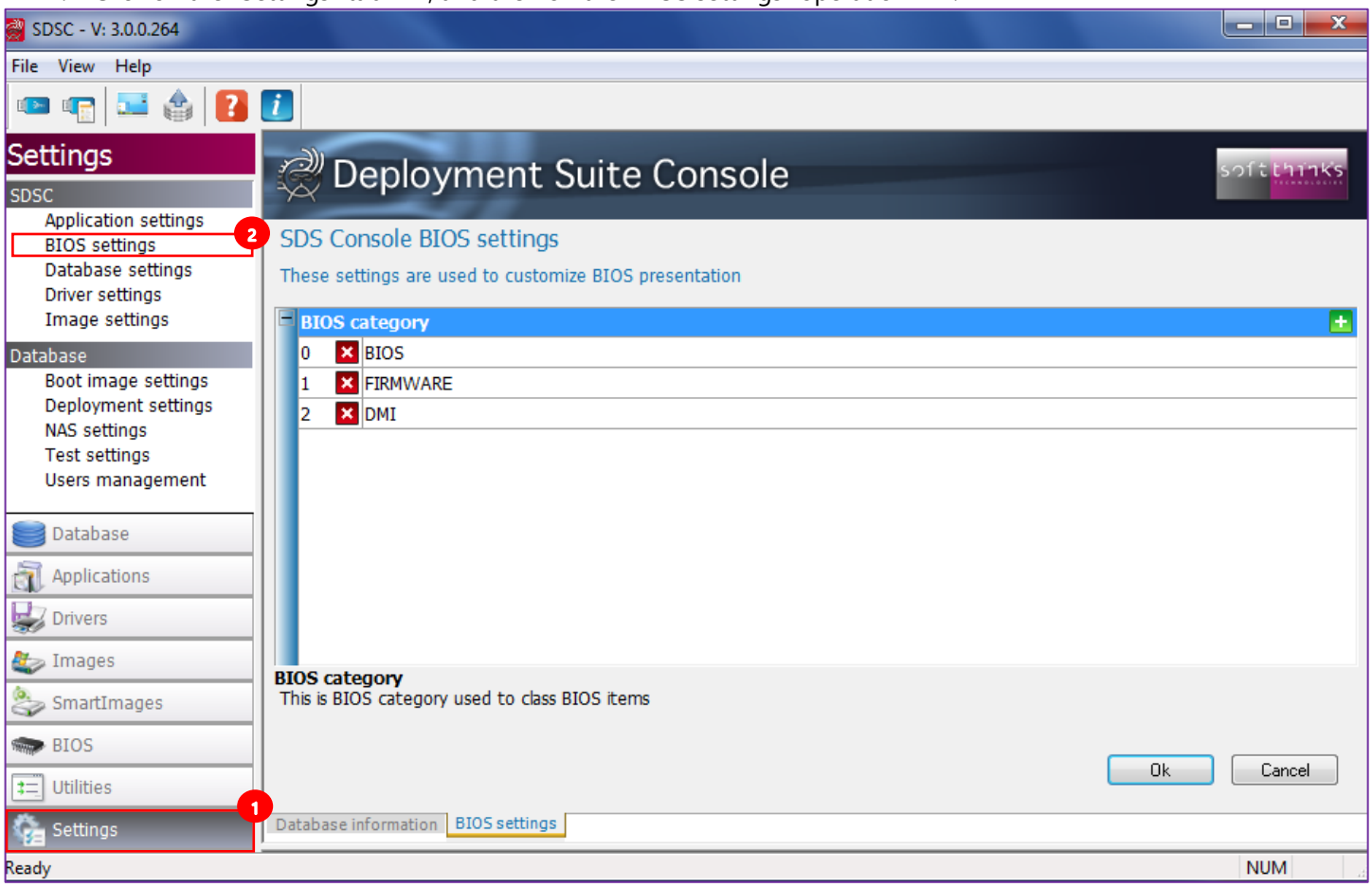
BIOS settings

A BIOS category is used to define the type of BIOS component in the database. This is useful for organizing the database and makes sorting and searching by category easier. You may add new categories to the BIOS component type and these will be available when creating or editing BIOS components in the database.

1. Click on the "Settings" tab (1), and then on the "BIOS settings" operation (2):



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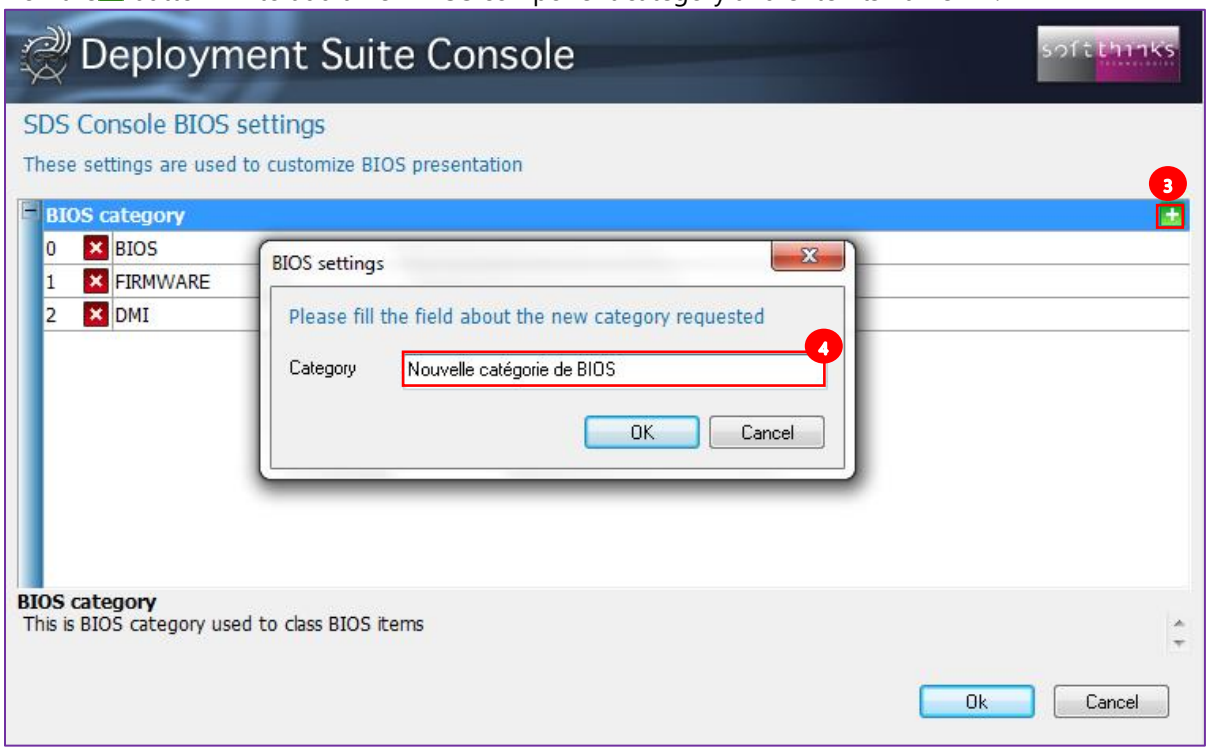
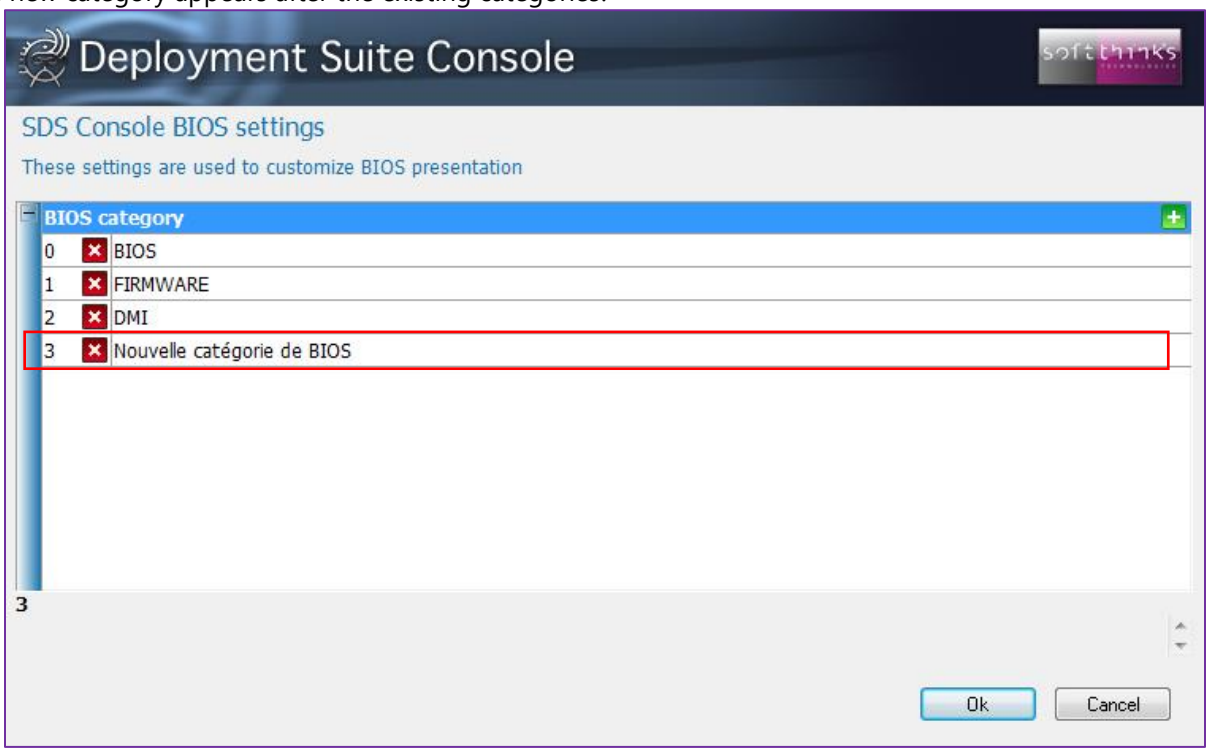
2. Click on the button (3) to add a new BIOS component category and enter its name (4):



3. The new category appears after the existing categories:



Hint: Click on the button in front of a category to remove it.

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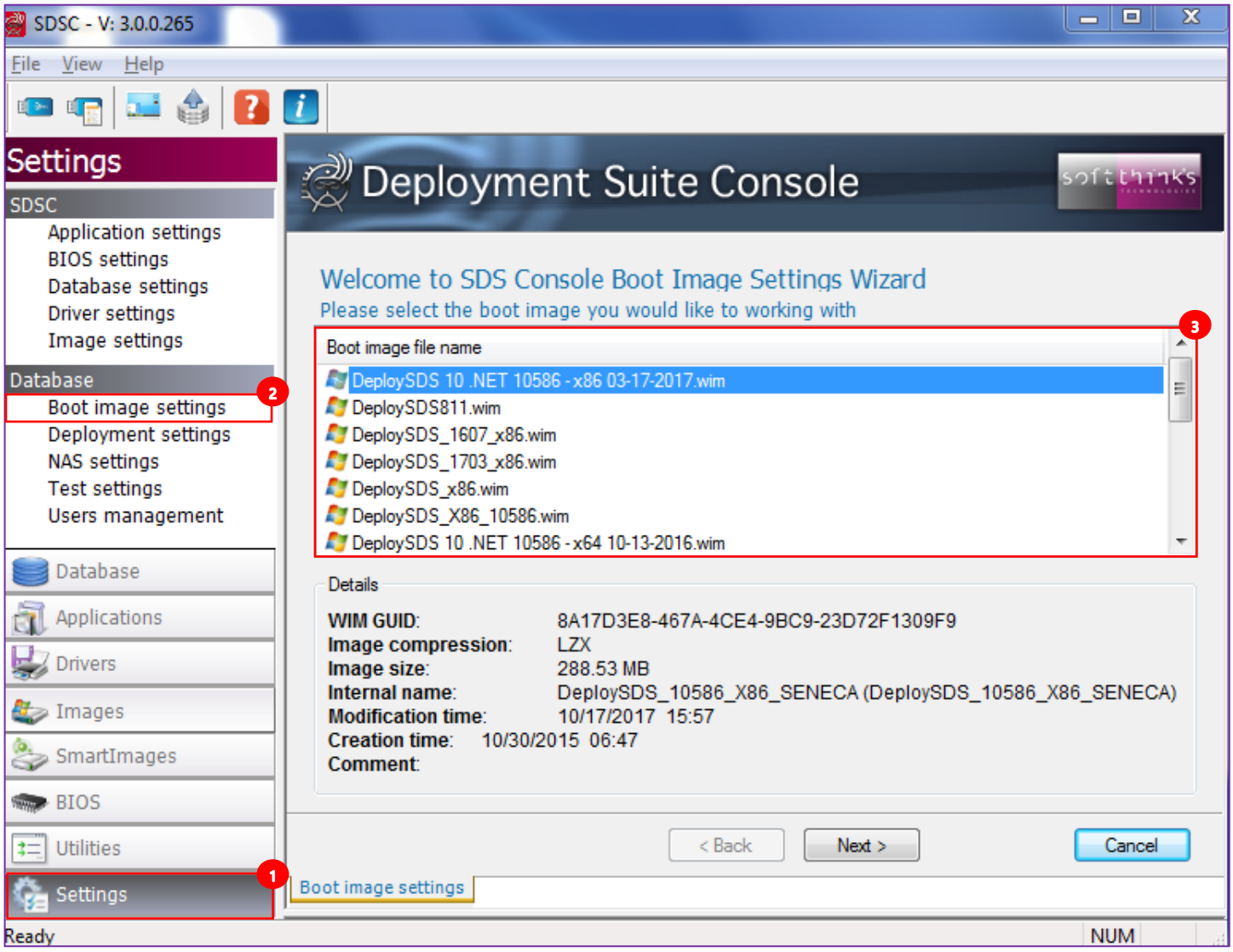
Database

Boot Image settings

The SDS Console Boot Image Settings Wizard allows you to perform several operations on boot images:

- Modifying some internal attributes
- Injecting driver(s) to a boot image
- Configuring the deployment launcher: domain, username, password…
- Cleaning up WDS Boot Image (image size will be reduced)

1. Click on the "Settings" tab (1), then on the "Boot image settings" operation (2), and select the boot image you would like to work with (3):



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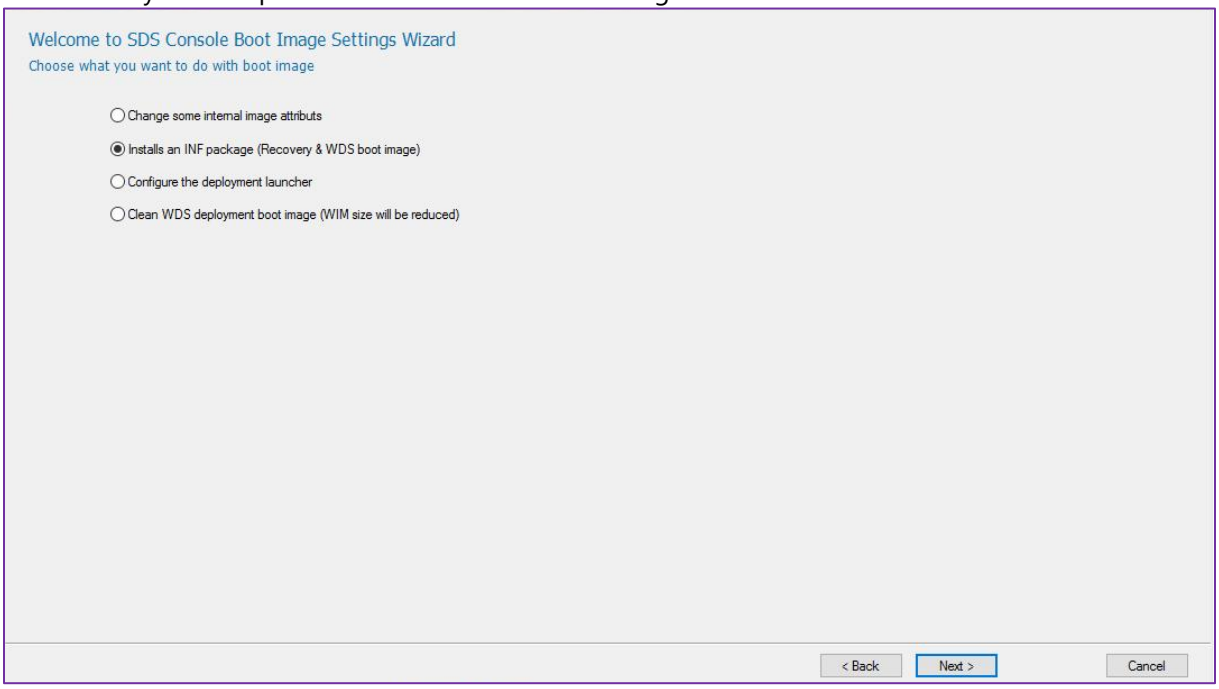
2. Choose the action you want perform on the selected boot image:



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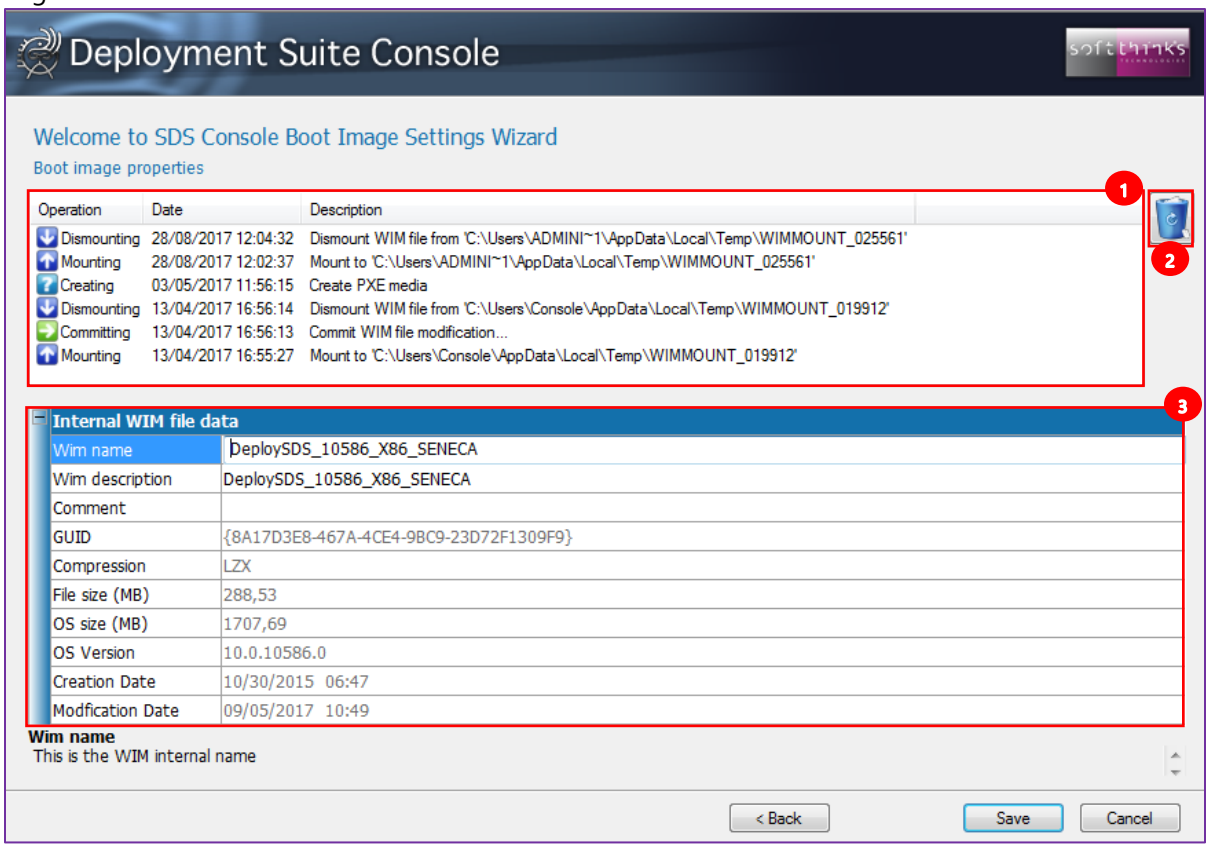
- Change some internal image attributes

  By selecting this option, you can view the last activities made on the selected boot image (1) and purge this history by clicking on the button (2) :



  You can also view the boot image properties (2) and modify some of them (the first three):

  - **Wim name:** Boot image name
  - **Wim description:** Boot image description
  - **Comment:** Optional comment
  - **GUID:** Boot image ID
  - **Compression:** Compression method (LZX...)
  - **File Size (MB):** Boot image size (compressed)
  - **OS Size (MB):** Boot image contents size (uncompressed)
  - **OS Version:** Version of the boot image OS
  - **Creation Date:** Boot image creation date
  - **Modification Date:** Boot image last modification date

- Installs an INF package (Recovery & WDS boot image)

  Please refer to Injecting a driver ("Inject Driver(s)" operation).

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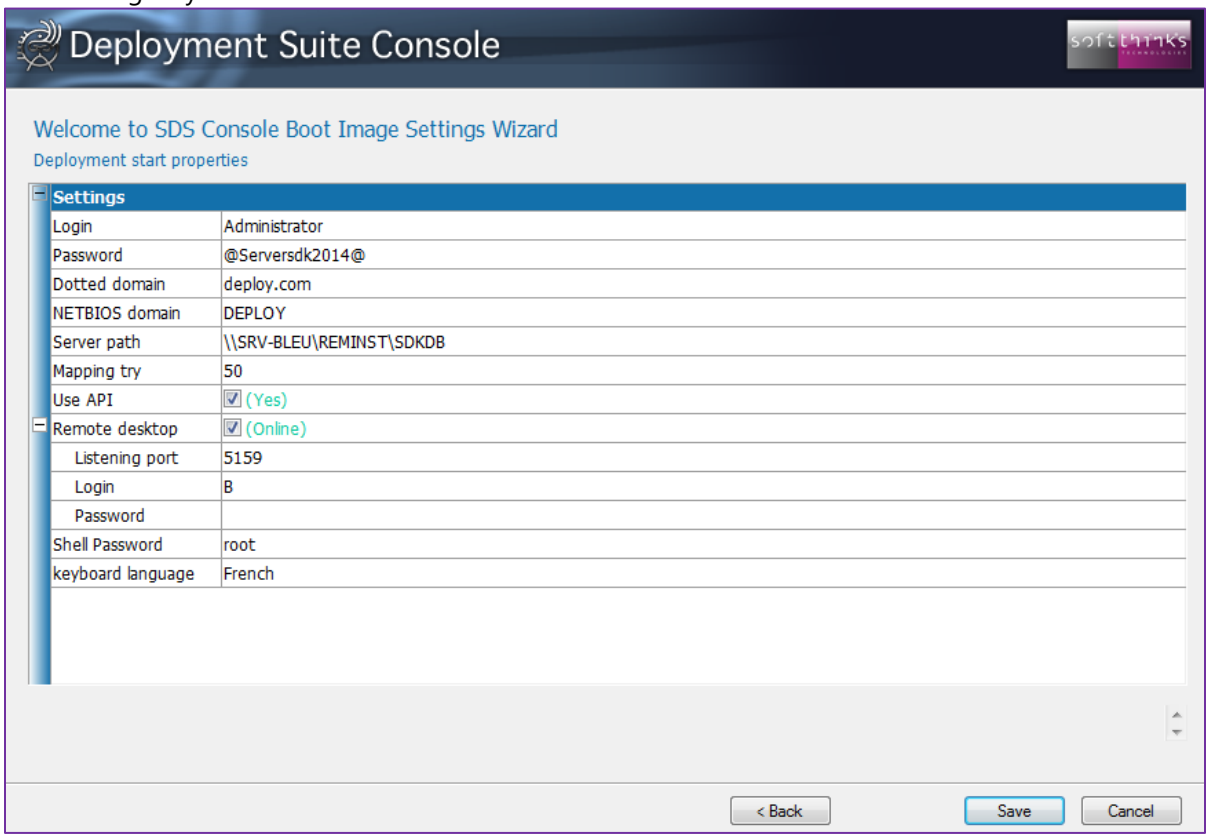
- Configure the Deployment launcher

  Change attributes related to networking so a network connection can be established during deployment to transfer data to the target system:



- **Login / Password:** Network credentials to use when mapping the "N:" drive on the deployment server
- **Dotted domain:** Fully qualified Windows Server domain name of the deployment server
- **NETBIOS domain:** Domain name of the deployment server used by systems before Windows 2000
- **Server path:** UNC path to the database on the server
- **Mapping try:** Number of times to retry if mapping fails
- **Use API:** Use the Microsoft connect API if a standard 'net use' failed to connect to server (leave it checked unless you encounter connection issues)
- **Remote desktop:** « Yes » to activate remote desktop feature
  - **Listening port :** Port used to listen for incoming connection
  - **Login / Password:** Credentials to open a remote session
- **Shell password:** Password required to launch the shell. Leave it empty unless you want to enter credentials.
  Keyboard language: Keyboard layout

Note: If you change the Administrator password on the server, don't forget to update it here or else the devices will no longer be able to connect to the server.

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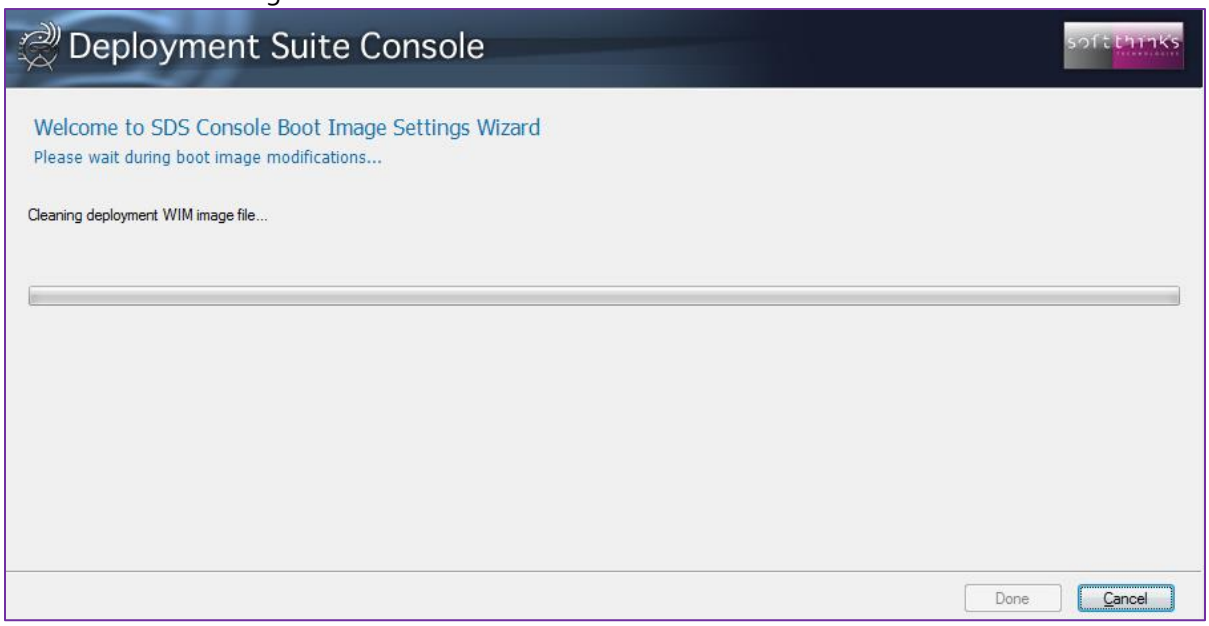
- Clean WDS deployment boot image

  Each time you update the boot image its size increases, because instead of replacing the old version of a modified file, it adds the new version to the image. This option will remove all the previous versions of the modified files and so will decrease the boot image size:



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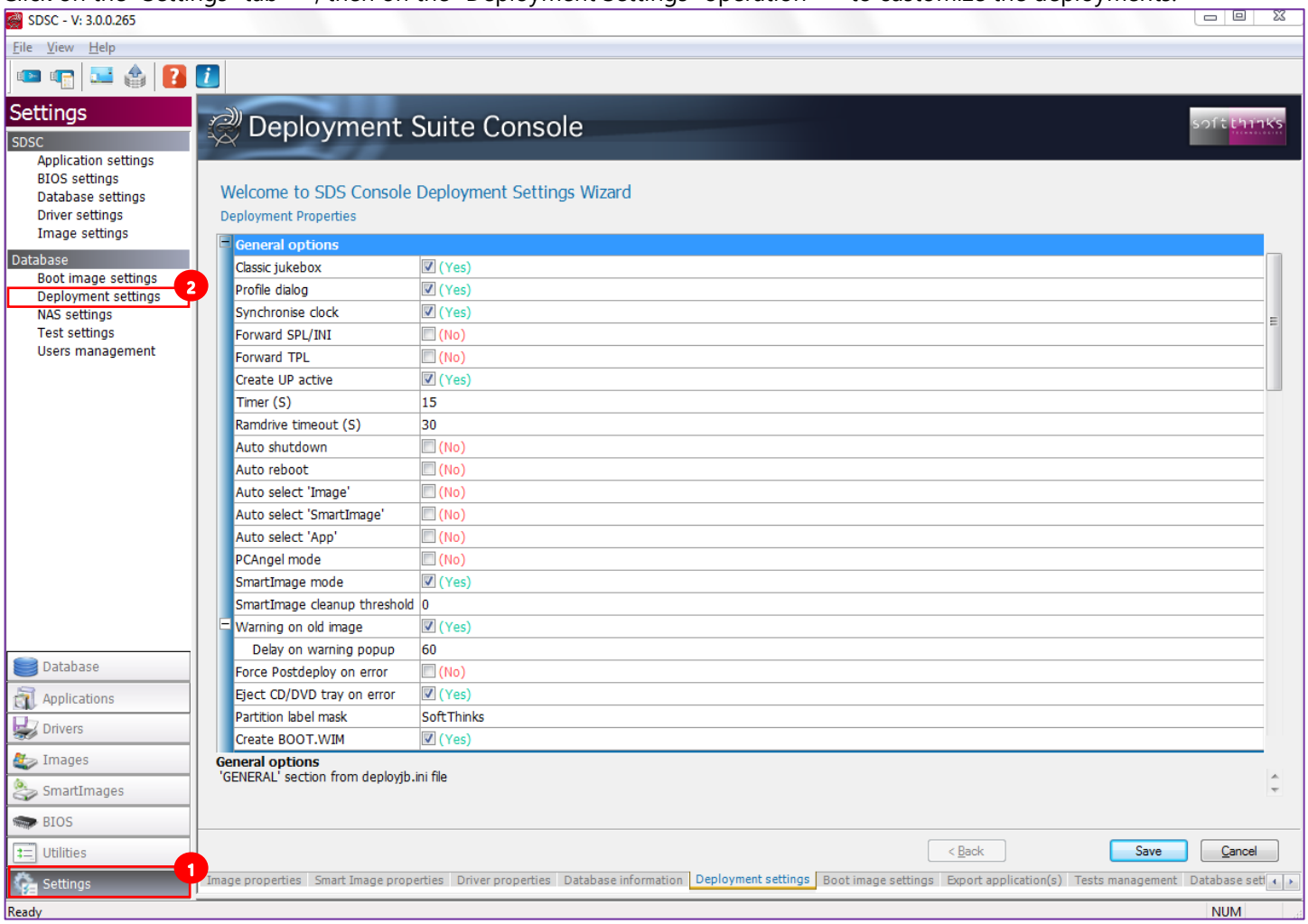
Deployment settings

Click on the "Settings" tab (1), then on the "Deployment Settings" operation (2) to customize the deployments:



General options

- **Classic Jukebox:** Present a skip button on profile dialogue box if no preset is found for the jukebox mode
- **Profile Dialog:** Show the Profile Dialog box otherwise going directly to the jukebox mode
- **Synchronize Clock :** Synchronize the target device CMOS clock with the date and time from the server
- **Forward SPL/INI:** Copy SPL and deployment INI files to UserPartition:\Windows\Options folder
- **Forward TPL:** Forwards the TPL file to the deployment server after deployment completes
- **Create UP Active:** Ensure that the user partition is set to active
- **Timer (S):** Time before deployment begins and before a reboot occurs after deployment completion
- **Ramdrive timeout:** The time to wait to retry accessing the Ramdrive
- **Auto shutdown:** Automatically shutdown the device at the end of a successful deployment
- **Auto reboot:** Automatically reboot the device at the end of a successful deployment
- **Auto select 'Image':** Automatically select the image during the deployment
- **Auto select 'SmartImage':** Automatically select the SmartImage that is compliant with the image if available
- **Auto select 'App' :** Automatically selected applications during deployment
- **PCAngel mode:** Kept for compatibility. Do not modify
- **SmartImage mode:** « Yes » to create a Smart Image based on plugged disk
- **SmartImage cleanup threshold:** Delete the previous SmartImage when creating a new one

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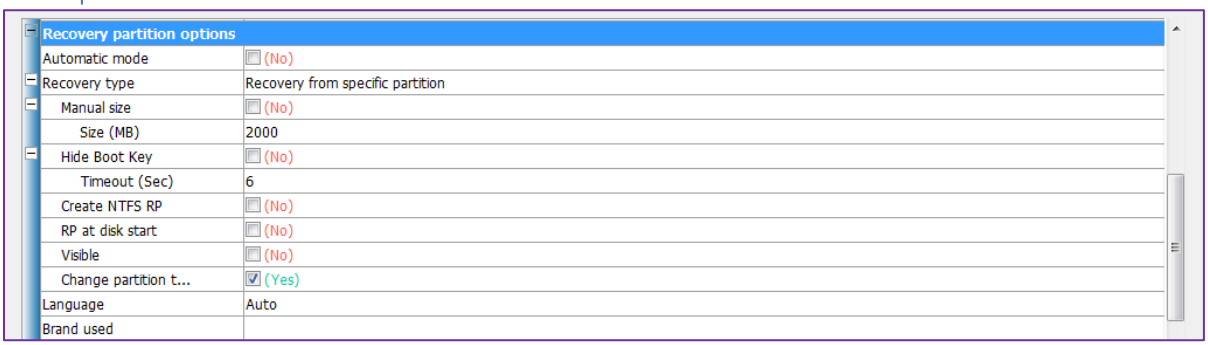
- **Warning on old image:** Display a message when the image selected is older than « **Delay on warning popup** » days if no SmartImage has been selected
- **Force PostDeploy on error:** Force PostDeploy on error
- **Eject CD/DVD tray on error:** Eject optical device tray on error
- **Partition label mask:** User partition label mask
- **Create BOOT.WIM:** Create the boot image for the recovery solution

Recovery partition options

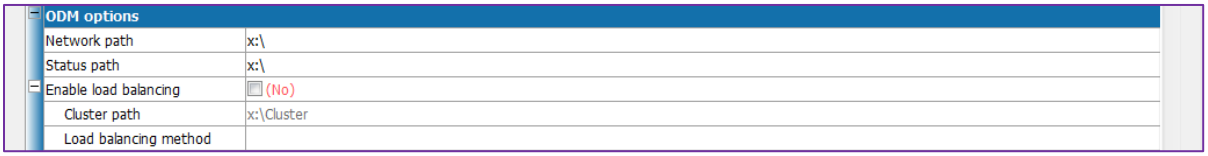


- **Automatic mode:** Bypass recovery options at run time
- **Recovery type:** System recovery scenario:
    - "No recovery"
    - "Recovery from specific location"
    - "Recovery from user partition"
    - "No Recovery solution, use only original image disk typology"

  If you select the "Recovery from specific location" option you have to fill those settings:
    - **Manual Size:** "Yes" to force the Recovery Partition size to the "**Size (MB)**" value (else it will be estimated dynamically)
    - **Hide Boot Key:** "No" to show the message inviting the user to press a key to boot into the RP during "**Timeout (Sec)**"
    - **Create NTFS RP:** "Yes" to format the RP in NTFS filesystem
    - **RP at disk start:** "Yes" to create the RP at the start of the disk
    - **Visible:** "Yes" to make the RP visible (in Windows explorer for example)
    - **Change partition type:** "Yes" to change the partition type
- **Language:** Recovery solution language ("Auto" to let it dynamically detected)
- **Brand used:** To customize the recovery solution interface to as specific brand (logo…)

Note: Windows 10 does not allow for a separate Recovery Partition. The two viable options for Windows 10 are "No recovery" and "No Recovery solution, use only original image disk typology".

ODM option



- **Network Path:** Drive letter where the root of the deployment files is located
- **Status Path:** Path where deployment status will be saved. Depending on pass or fail status, different info will be saved here
- **Enable Load Balancing:** Allows DeployJB to map to a different server if primary server is too busy
    - **Cluster path:** Path where network cluster is located
    - **Load Balancing method:** Trigem or Quanta Load balancing method

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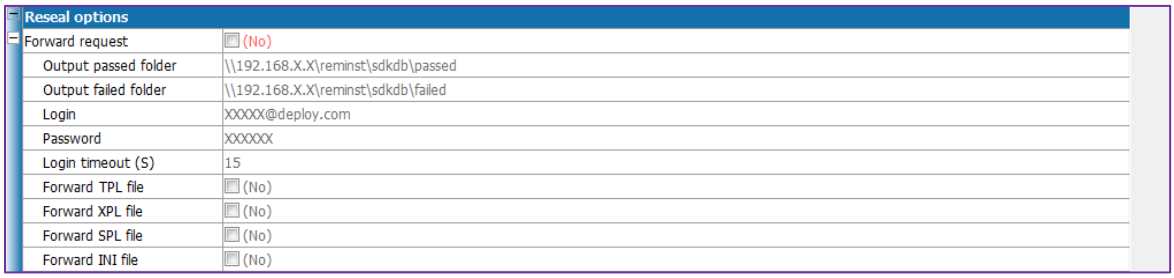
Updating master options

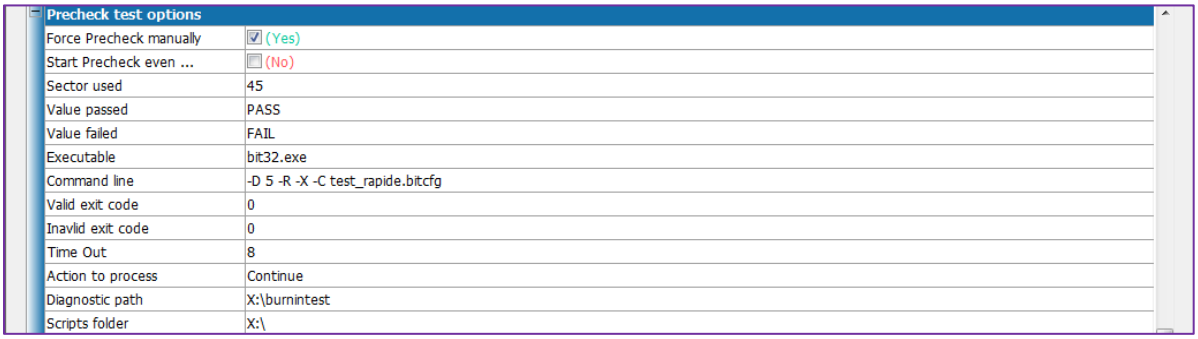
- **Use Computer PNP:** Use all PNP that can be detected on the PC. If no, use only the driver from selector.ini
- **New Format:** Leave this setting set to 1. Changing this will remove the benefit of the new database format

Reseal options



- **Forward request:** Send reseal information to the server
  - **Output passed folder:** Storage location for machine-specific info from target system after reseal occurs in audit mode successfully
  - **Output Failed folder:** Storage location for machine specific info from target system after reseal occurs in audit mode with failure
  - **Login / Password:** Credentials to log onto server
  - **Login timeout:** Time to wait before retry to login
  - **Forward TPL file:** Include TPL file as part of info to send to server
  - **Forward XPL file:** Include XPL file as part of info to send to server
  - **Forward SPL file:** Include SPL file as part of info to send to server
  - **Forward INI file:** Include INI file as part of info to send to server

Precheck test options



- **Force Precheck manually:** Allow to start Precheck test manually
- **Start Precheck even if a disk is absent:** Start Precheck even if is a disk is not plugged to the device
- **Sector used:** Sector on the HDD where is stored the test status
- **Value passed:** Value written to the sector when the diagnostics pass
- **Value failed:** Value written to the sector when the diagnostics fail
- **Executable:** Executable to launch for the diagnostic tests
- **Command Line:** Switches for the executable
- **Valid Exit Code:** Exit code for "PASS" condition of the diagnostics
- **Invalid Exit Code:** Exit code for "FAIL" condition of the diagnostics
- **Action to Process:** If test passes, continue deployment
- **Diagnostic path:** Location of the files used for diagnostics
- **Scripts folder:** Location of the diagnostics scripts

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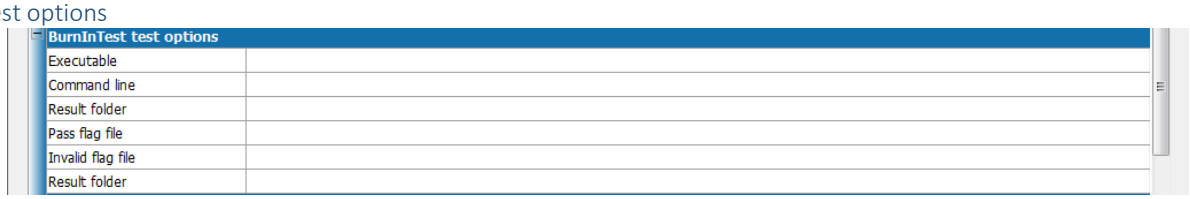
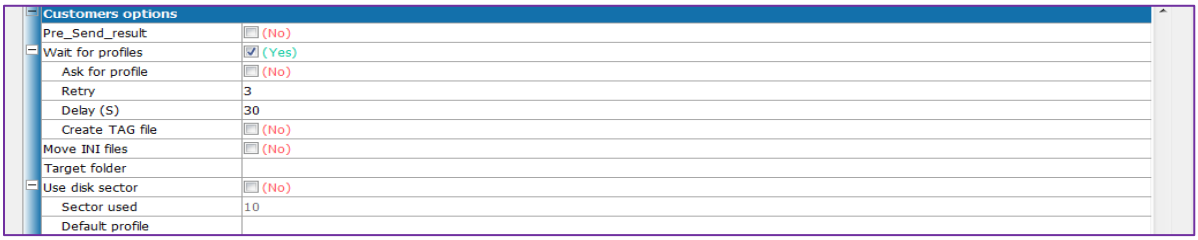
BurnInTest test options



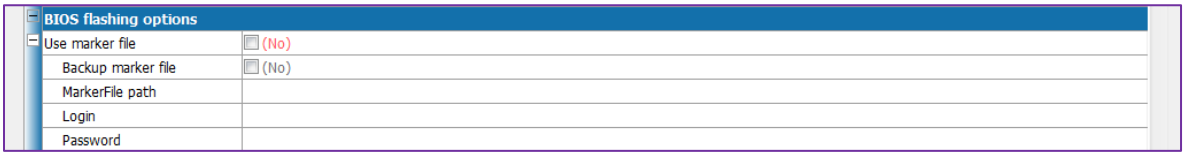
- **Executable:** BurnInTest executable to launch
- **Command Line:** BurnInTest executable command line arguments
- **Result Folder:** Location where BurnInTest results are stored
- **Pass flag file:** Flag file created for pass condition
- **Invalid flag file:** Flag file created for fail condition
- **Result Folder:** Folder where previous flags file will be present

Customer options



- **Pre_Send_Result:** Send info to server during reseal operation. Oemreset can now duplicate S<serial>.log file in TP/TF folder for pass/fail results
- **Wait for profiles:** Wait for deployment INI files to becoming available
  - **Ask for profile:** Ask for the profile to use at run time through a popup (ex: if DMI is not set correctly)
  - **Retry:** Retry attempt before failing
  - **Delay (S):** Retry delay between each try
  - **Create TAG file:** Create serial number tag file if the profile is not present at startup to ask to a third party soft to give it available
- **Move INI files:** Move Selector.ini & Rsselect.ini to the « **Target folder** » location after deployment (this target folder must be a local path on the RIS)
- **Use disk sector:** Use a disk sector with the DMI to validate the profile to use
  - **Sector Used:** Sector id where to check for the serial or model number (9 to 62)
  - **Default profile:** Default profile to use if the signature does not match

BIOS flashing options



- **User Marker File:** Force the use of a marker file instead of the disk itself to log BIOS flashing. The file is located in BIOS\TEMP\BIOSxxxxx.TBIF
  - **Back up Marker File:** Move the TBIF file into a sub folder "DONE" for backup purposes when all flashing operations have processed. These files will overwrite if a collision occurs
  - **Marker file path:** Marker file path
  - **Login / Password:** Credentials to access to the Marker file path above

PC Angel

No longer used.

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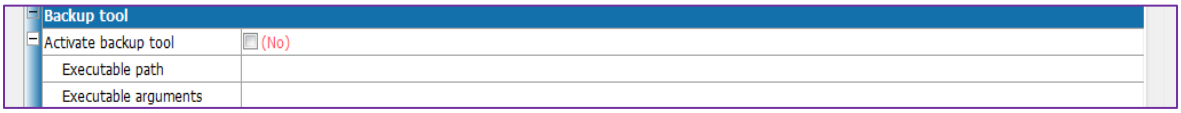
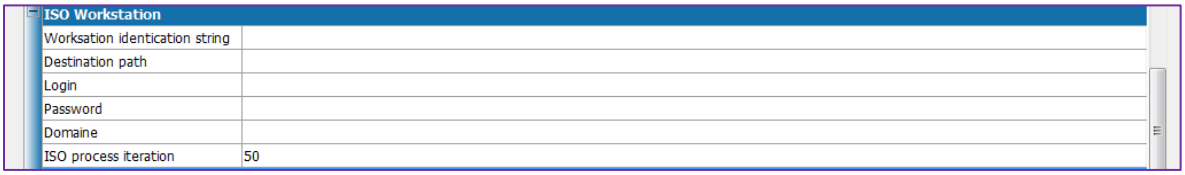
Backup tool



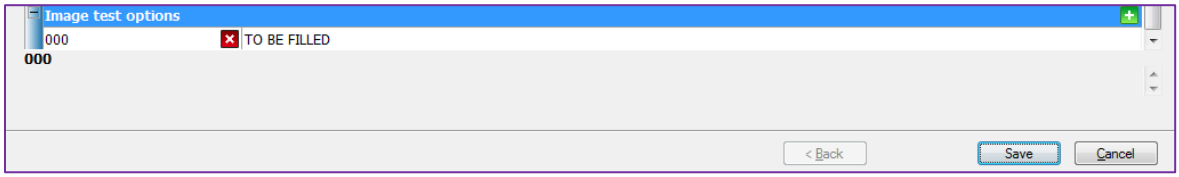
- **Activate backup tool:** Enable the possibility to launch a backup tool before deploying an image
  - **Executable path:** Backup tool executable path
  - **Executable arguments:** Backup tool executable command line arguments

ISO Workstation



No longer used.

Image test options



No longer used.

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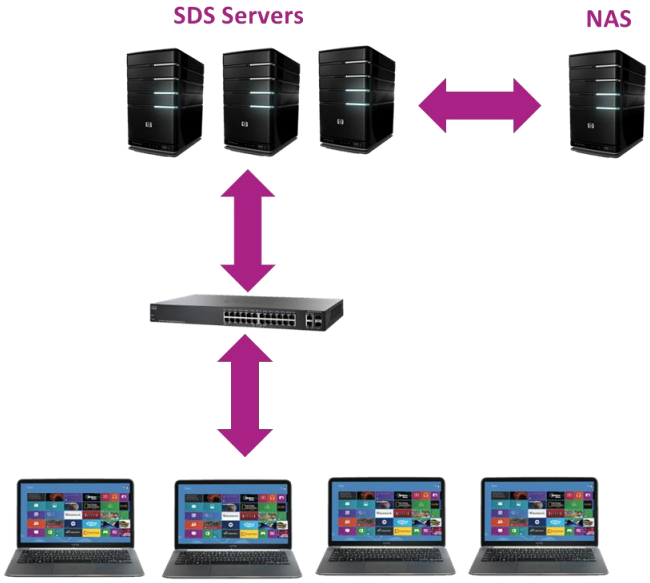
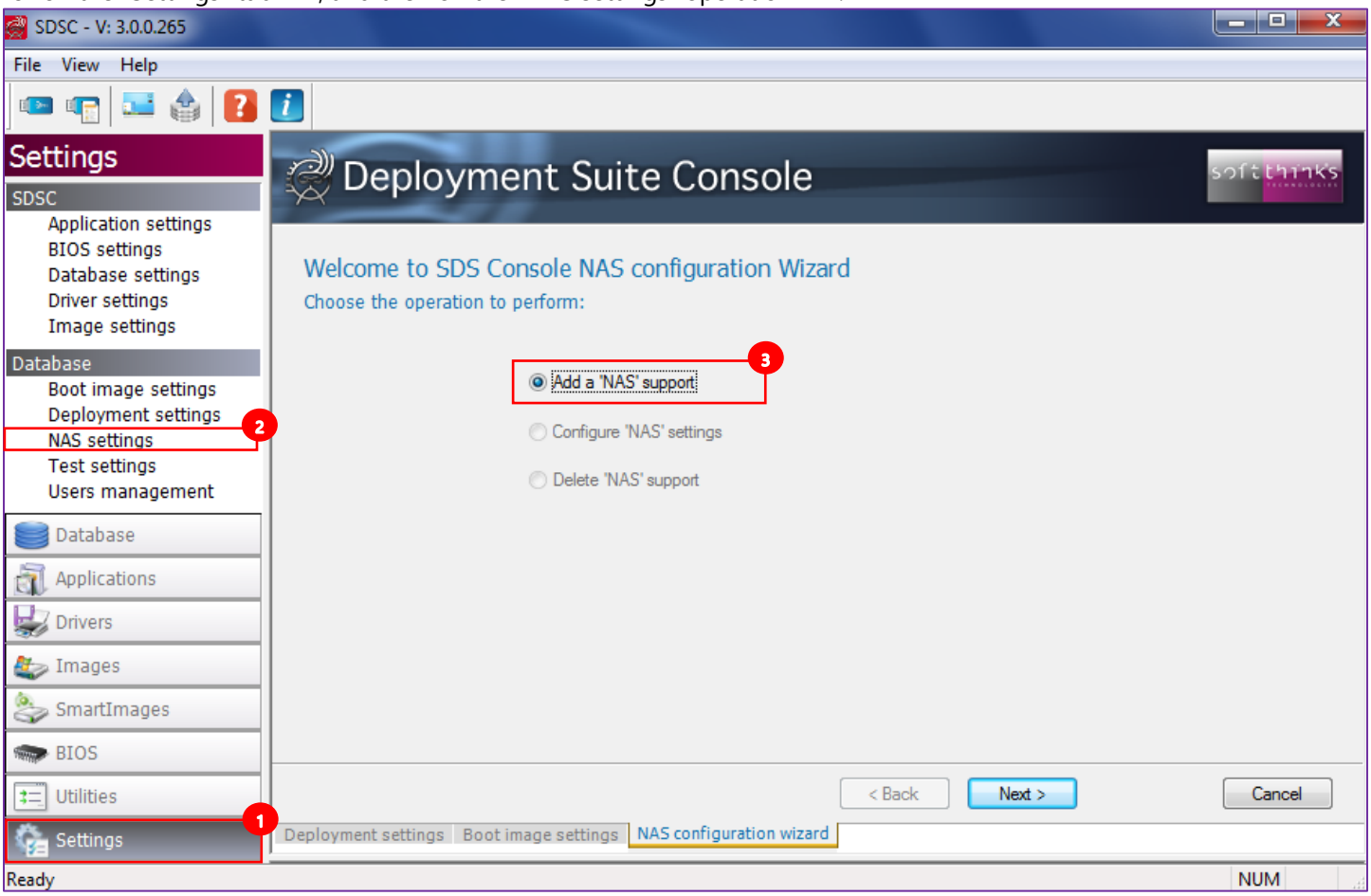
NAS settings

Potential NAS Configuration. Setup can vary depending on your needs:



Click on the “Settings” tab (1), and then on the “NAS settings” operation (2):



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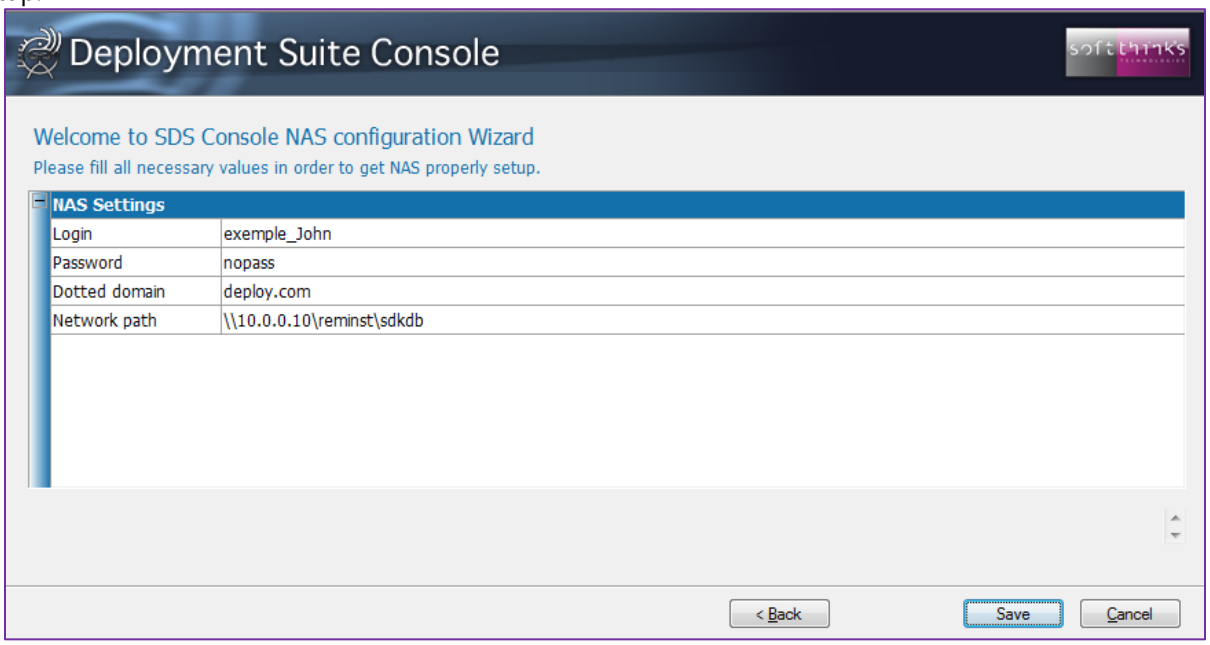
Add a 'NAS' support

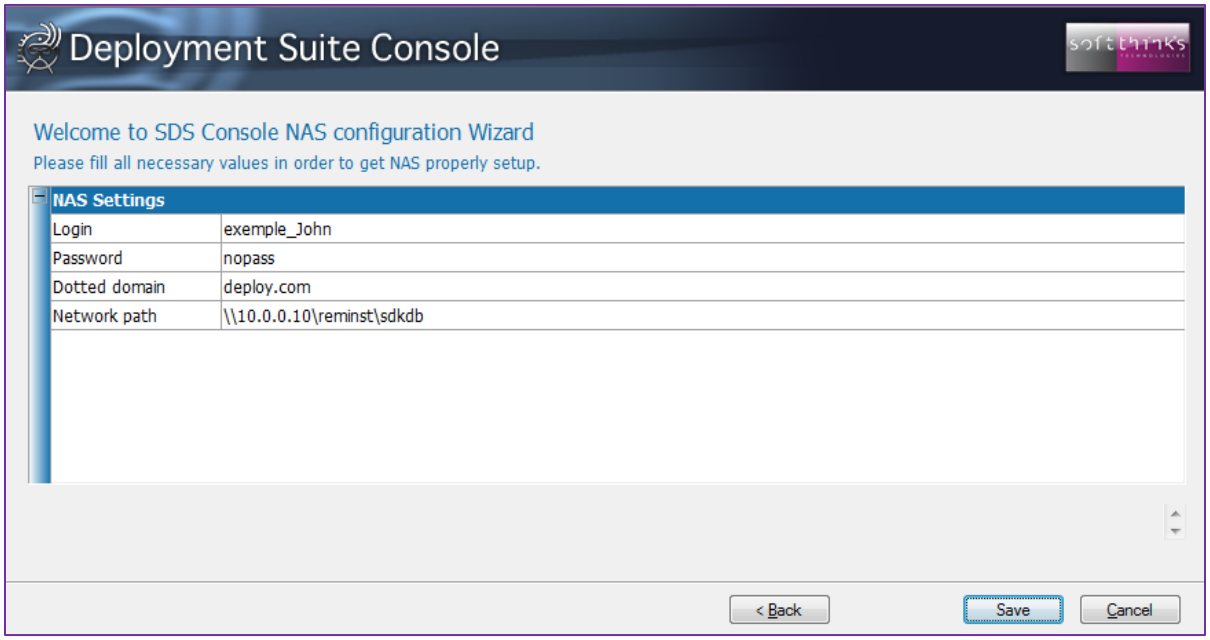
Since you can configure only 1 NAS, only the option "Add a 'NAS' support" 3 is available initially. After having selected this option and clicked on the "Next >" button, you will be able to fill in all of the necessary information required to get the NAS properly setup:



- **Login / Password:** Credentials to connect to the NAS
- **Dotted domaine:** Dotted domain name where the network share is
- **Network path:** Sharing UNC path used to deploy (please use IP address only)

Configure 'NAS' settings

Once a NAS has been setup you can choose the option "Configure 'NAS' settings" in order to review or edit its settings as in the previous screenshot:



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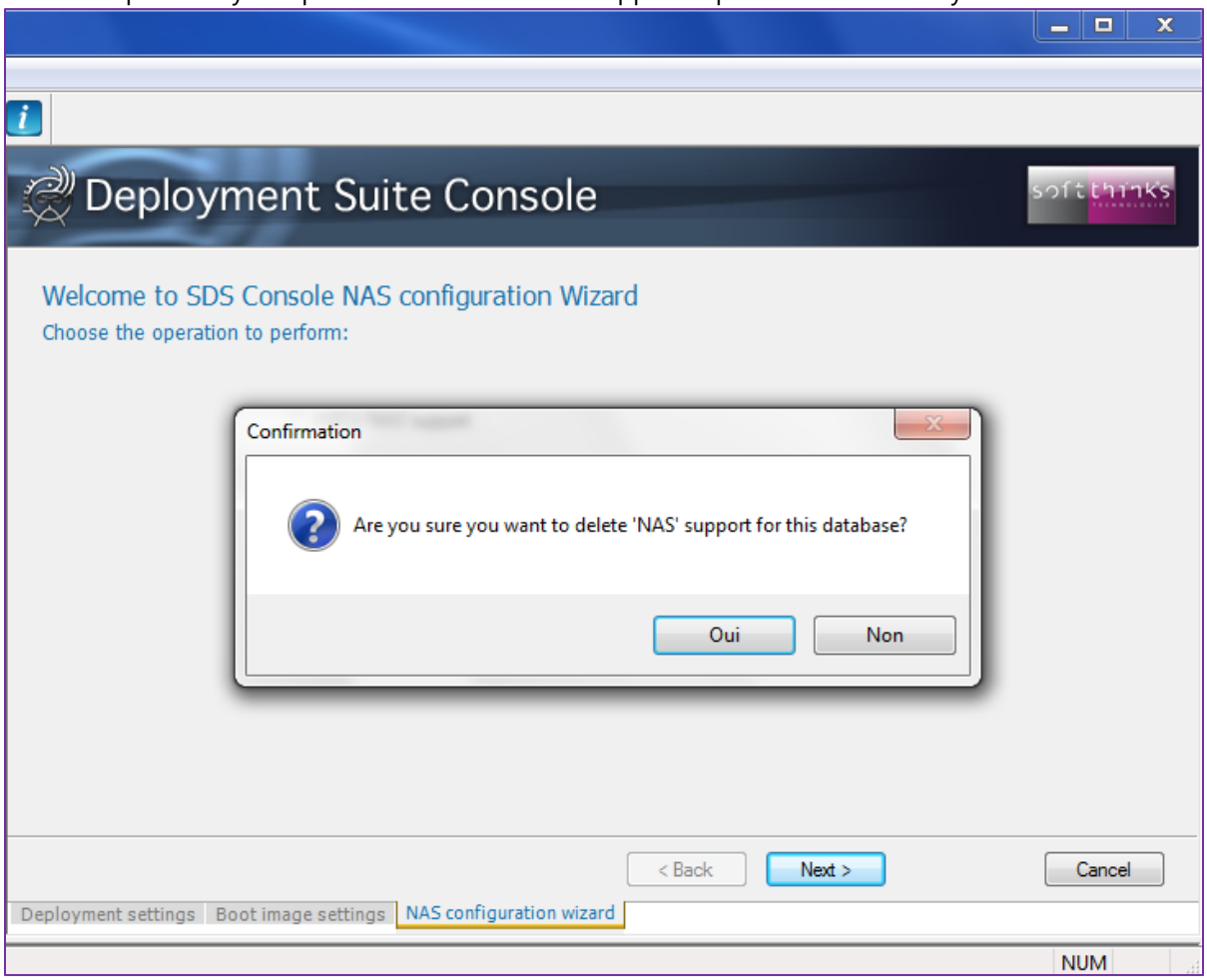
Delete 'NAS' support

You can delete a NAS previously setup with the "Delete 'NAS' support" option which will ask you to confirm:



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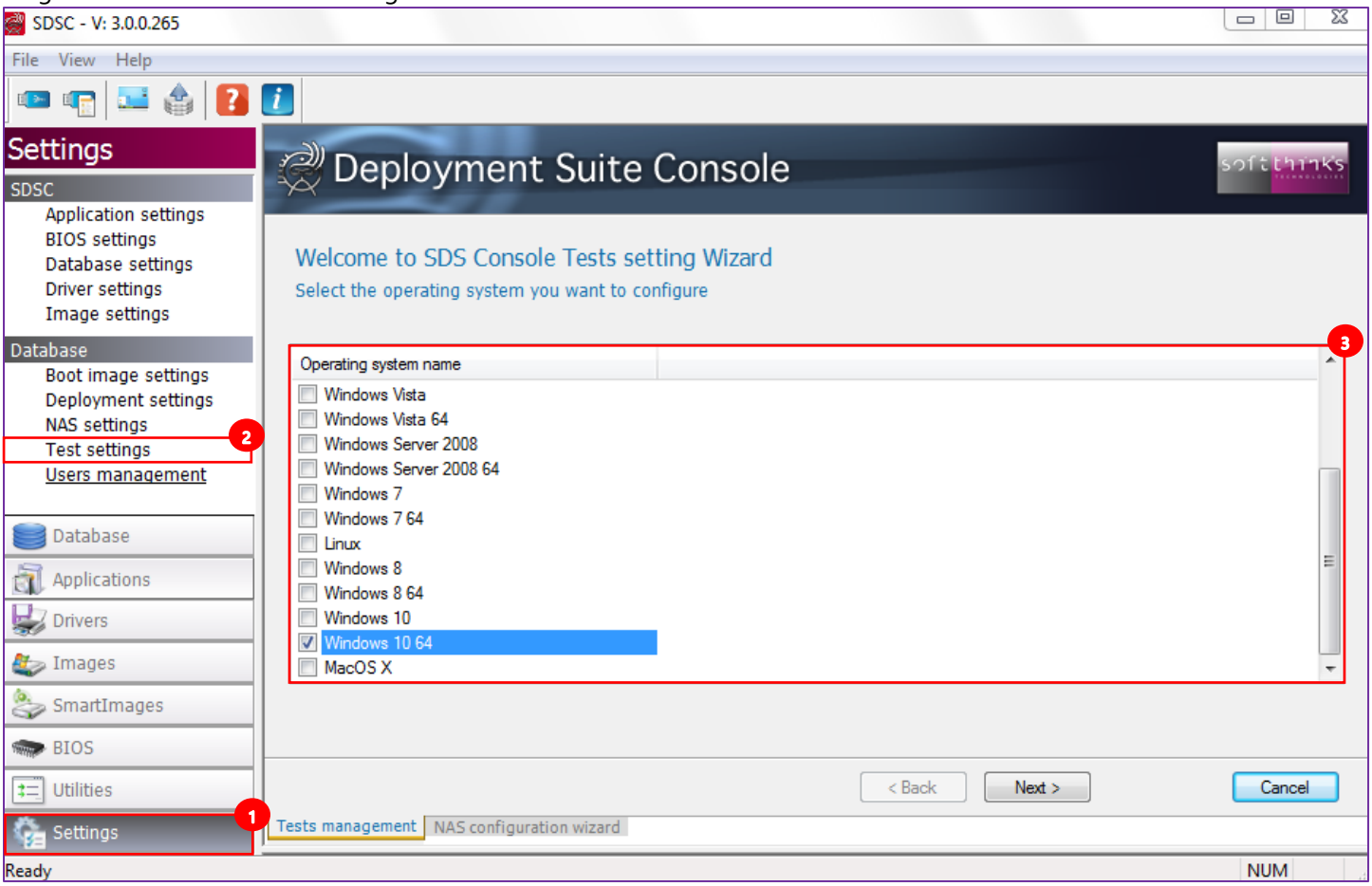
Test settings

The SDS Console Tests settings wizard allows you to customize the tests run during the Quality Check depending on the operating system.

Click on the “Setting” tab 1, then on the “Test settings” item 2, and select the operating system for which you want to configure the tests 3 before clicking on the “Next >” button:



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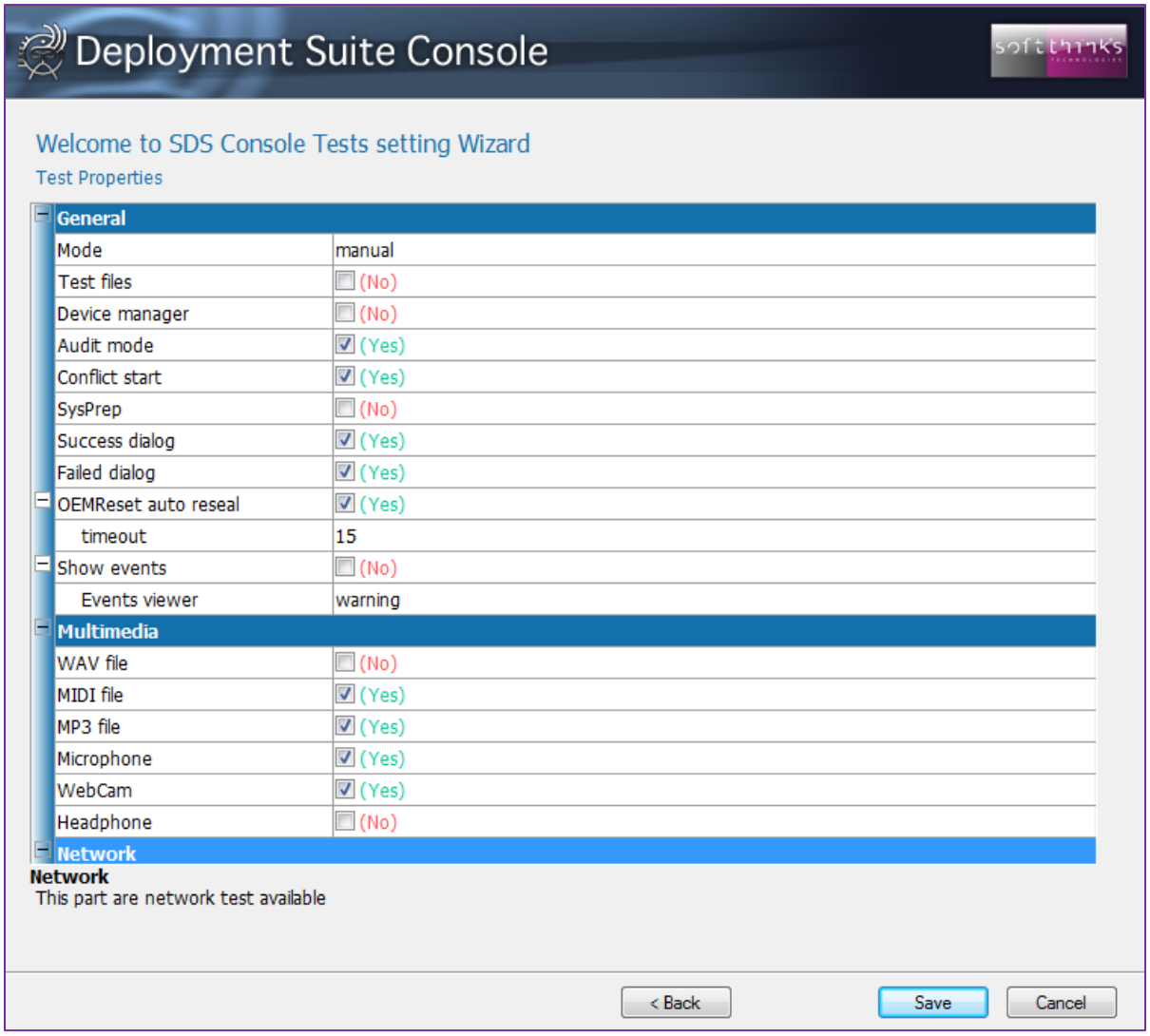

General

- **Mode:** "manual" to configure the tests at run time, or "auto" to run all tests automatically
- **Test files:** "Yes" to check the drivers signature ("No" by default)
- **Device manager:** "Yes" to open the device manager if an error is detected ("No" by default)
- **Audit mode:** "Yes" (by default) to start the tests in audit mode
- **Conflict start:** "Yes" (by default) to start the tests if conflicts are detected
- **Sysprep:** "Yes" to show Microsoft Sysprep button (No longer used. Do not check)
- **Success / Failed dialog:** Show a report dialog if test succeeded / failed
- **OEMReset auto reseal:** Automatically reseal the device at the end of the tests after "**timeout**" (Deprecated)
- **Show events:** Open the event viewer with the filter specified by the "**Events viewer**" value ("information" / "warning" / "error")

Multimedia

- **WAV files:** Test WAV file
- **MIDI files:** Test MIDI file
- **MP3 files:** Test MP3 file
- **Microphone:** Test the microphone
- **Webcam:** Test the webcam
- **Headphone:** Test the headphone

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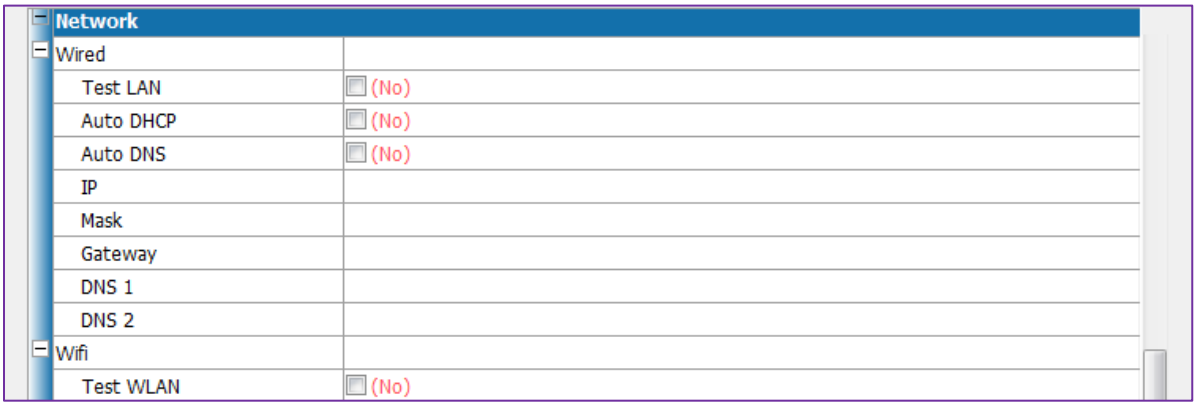
Network



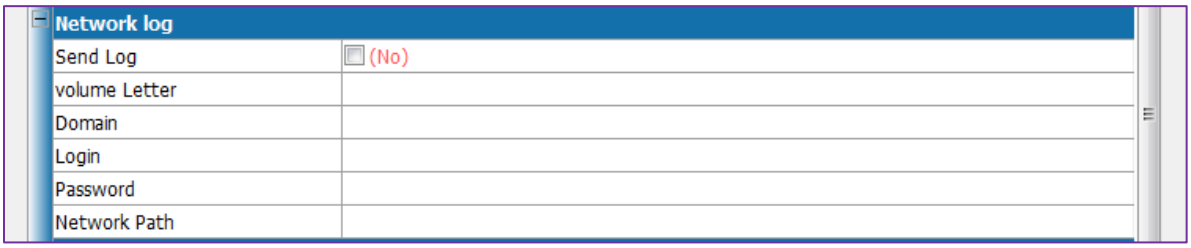
wired

- **Test LAN:** "Yes" to test the wired connection
- **Auto DHCP:** "Yes" if using DHCP server
- **Auto DNS:** "Yes" if using DNS server
- **IP:** IP address to set if you don't use DHCP
- **Mask:** Subnetwork mask to set if you don't use DHCP
- **Gateway:** Gateway to set if you don't use DHCP
- **DNS 1:** Primary DNS server to set if you don't use DHCP
- **DNS 2:** Secondary DNS server to set if you don't use DHCP

Wifi

- **Test WLAN:** "Yes" to test the WiFi connection

Network log



- **Send log:** "Yes" to send the logs to the SDS server
- **Volume letter:** Letter to which is mapped the SDS server share folder where logs have to be sent
- **Domain:** SDS Server domain name (Ex: « deploy.com »)
- **Login / Password:** Credentials to access the shared folder
- **Network path:** UNC path where logs have to be sent (Ex: \\192.16.0.17\remisnt\SDKDB\Logs)

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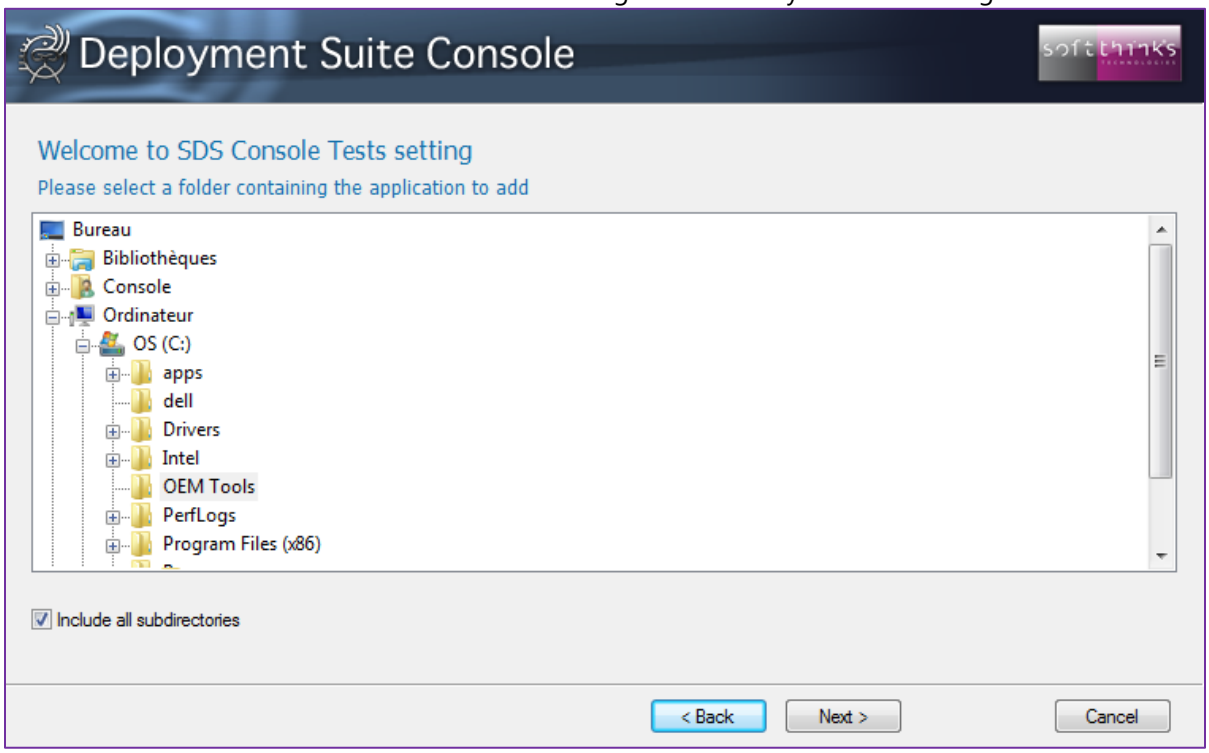
OEM

You can add your own tests here:

1. Click on the button 4 and select the folder containing the test tool you want to integrate:



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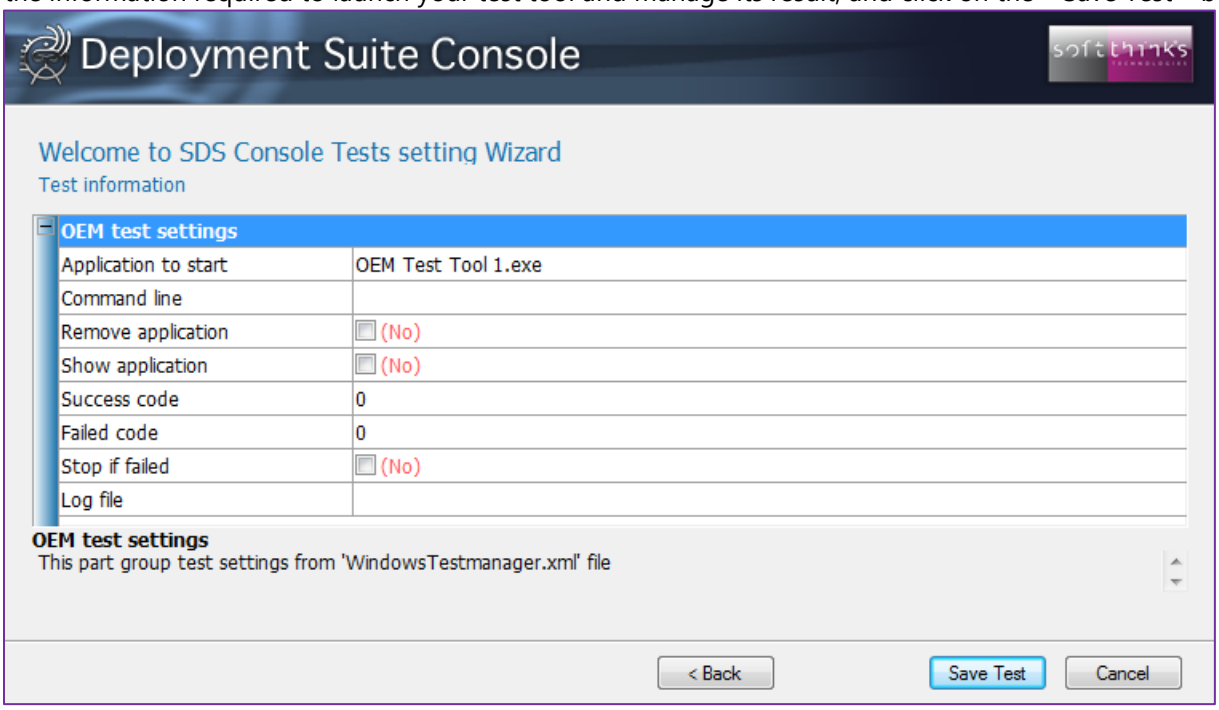
2. Fill the information required to launch your test tool and manage its result, and click on the « Save Test » button:



- **Application to start:** Executable to launch (.bat, .cmd or .exe)
- **Command line:** Executable command line arguments
- **Remove application:** "Yes" to remove the test tool after its execution
- **Show application:** "Yes" to show the test tool UI
- **Success code:** Value returned by the test tool in case of success
- **Failed code:** Value returned by the test tool in case of failure
- **Stop if failed:** "Yes" to stop the process if the test tool returned a failure
- **Log file:** Path where the test tool log is generated (will be sent with other logs if the "send log" option is checked)

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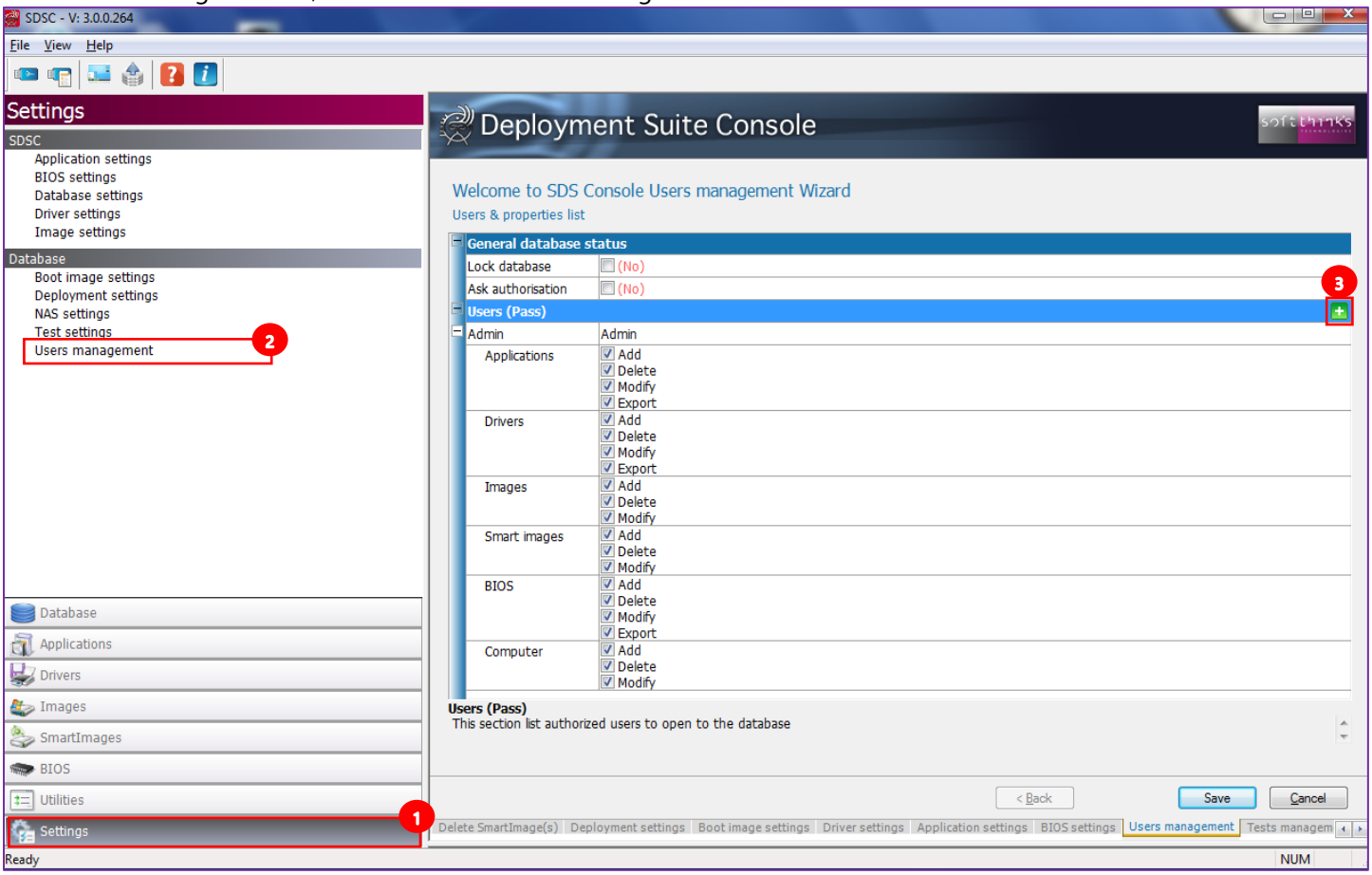
Users management

This wizard allows you to restrict access to a database.

Click on the "Settings" tab (1), and then on the "User management" (2):



General database status

- **Lock database:** Restrict the access to the database to the administrator only
- **Ask authorization:** Restrict the access to the database to selected users

Users (Pass)

You can add a user by pressing the + button (3) and then define the user's rights for Add, Delete, Modify and Export database components for each component category (Images, Smart Images, Applications, Drivers, BIOS).

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Launching SDS on the device to be processed

The first step in the process for using SoftThinks Deployment Suite will be to PXE boot a unit (Laptop, Desktop or Server) to the SoftThinks Server. In order to do this, you will have to go to the unit's BIOS or Startup Menu and set or select Network Interface or NIC as the boot option.

You can also use a bootable USB stick as an alternative to PXE booting (See How to boot from Bootable USB Flash Drive with USB Ethernet adapter).

Once the unit has booted you will see the SDS Welcome screen. This screen can be fully customized (See How to customize welcome menu).

Typical refurbishing Welcome Screen:

Note: This is just one of an almost unlimited number of configurations that are possible with the software. The Welcome Page can be modified to fit your specifications exactly to make it as easy as possible for your technicians.

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From this Welcome Screen you can choose from: Audit/Diagnostics, Imaging, Repair, and Wipe Only

- **Audit/Diagnostics:**
  This selection brings you to a menu where you can select from: Audit Only, Audit with Diagnostics, and Audit with Diagnostics W/O HDD.

- **Imaging:**
  This selection brings you to a menu where you can select from: Create, Deploy/Wipe/Diagnostics, and Deploy Only
  - **Create:**
    This will take you Image Capture page and allow you to capture either a Windows Generic or a model specific Static Image for Windows or MAC.
  - **Deploy/Wipe/Diagnostics:**
    This selection will take you through a series of screens to make your choices for deploying an image to a computer and do the diagnostics and hard drive wiping along with it.
  - **Deploy Only:**
    This selection will take you through a series of screens to make your choices for deploying an image only.

- **Repair:**
  This selection brings you to a menu where you can select from: Auto-Repair, Smart Repair, Hardware Check and OS Tools.
  - **Auto-Repair:**
    Will attempt to fix boot issues of a computer, if that fails it will prompt you to back up the user's data, reimage the computer, and then restore the user's data.
  - **Smart Repair:**
    Will attempt to fix the boot issues of a computer.
  - **Hardware Check:**
    Gives you the options to check various systems of the computer.
  - **OS Tools:**
    This selection brings you to a menu where you can select from: Un-delete, Create Migration and data backup, and Apply Migration and data backup.
    - **Undelete:**
      Allows you to restore a previously deleted file or folder.
    - **Create Migration and data backup:**
      Will allow you to create a backup of a user's files and settings
    - **Apply Migration and data backup:**
      Will restore a previously created backup to a user's computer.
- **Wipe Only:**
  This selection brings you to a menu where you can select from: Wipe – 1 Pass, Wipe – 1 Pass with Diagnostics, Wipe – 3 Pass, Wipe 3 – Pass with Diagnostics.
    - **Wipe – 1 Pass:**
      Allows you perform SoftThinks Adisa Certified Basic 0 Wipe on any hard drive found in a computer, server, or wipe-array.
    - **Wipe – 1 Pass with Diagnostics:**
      Allows you perform SoftThinks Adisa Certified Basic 0 Wipe on any hard drive found in a computer, server, or wipe-array, and do the diagnostics of the hard drive(s) and the hardware of the computer that it is in.
    - **Wipe – 3 Pass:**
      Allows you to perform the U.S. Standard, DoD 5220.22-M 3-Pass Wipe on any hard drive found in a computer, server, or wipe-array.
    - **Wipe – 3 Pass with Diagnostics:**
      Allows you to perform the U.S. Standard, DoD 5220.22-M 3-Pass Wipe on any hard drive found in a computer, server, or wipe-array, do the diagnostics of the hard drive(s) and the hardware of the computer that it is in.

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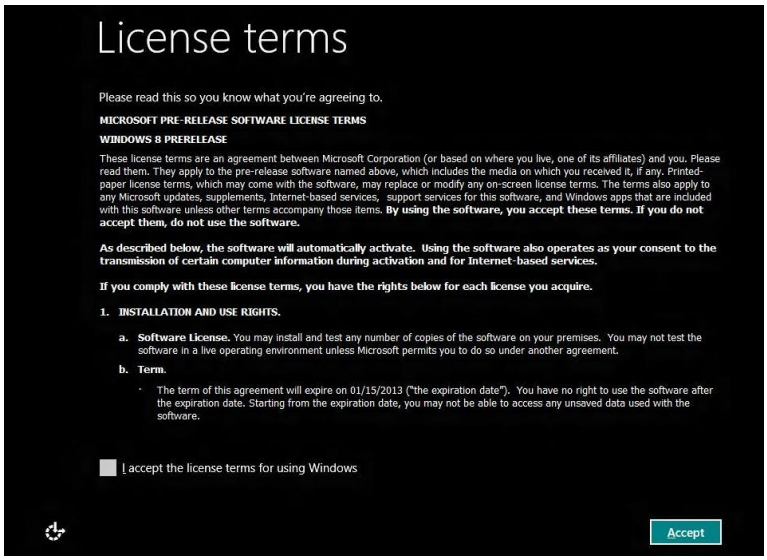
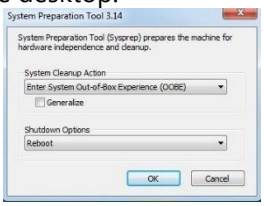
Preparing an image

Static Windows Image preparation (Factory Image)

1. Reload a known good system completely via factory recovery discs, recovery partition, or new in the box – power on/reboot and let the unpacking process proceed to Windows welcome / license screen (might defer depending on Windows version):



2. While in this screen, press simultaneously SHFT+F10 and a command prompt will appear. Go to the C:\Windows\Panther directory and check to see if there is a unattend.xml or an unattend folder. If there is rename them to unattend_bak.xml and unattend_bak respectively. Exit the command prompt after checking the panther folder. At this point, simultaneously press SHFT+CRTL+F3 (You may need to press the Fn key as well for the Function Keys depending on the system). The system will proceed to reboot into MS Windows Audit Mode and System Preparation Tool (« Sysprep ») will appear on the desktop:



If you receive an error message (below) when attempting to go to Audit mode, you will need to follow these steps :

a. Press the keys SHIFT+F10 to open a command prompt.
b. Change the directory to C:\Windows\System32\Sysprep and run the sysprep.exe.
c. Choose the option for Enter System Out-of-box Experience (OOBE).
d. Leave the generalize box empty and select OK. The system will reboot to the OOBE screen. You will need to complete OOBE at this point.
e. Once you are in user mode, to the C:\Windows\System32\Sysprep directory again and run Sysprep.exe.
f. Select "System Enter Audit Mode" and again leave the generalize box empty.
g. Select OK and it should reboot into Audit mode at this point.
h. Open Control Panel, User Accounts and delete the user you created during OOBE process. Make sure to delete the user data as well.
i. Now the system should stay in OOBE mode.

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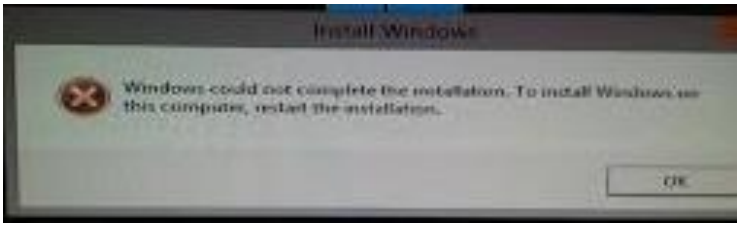
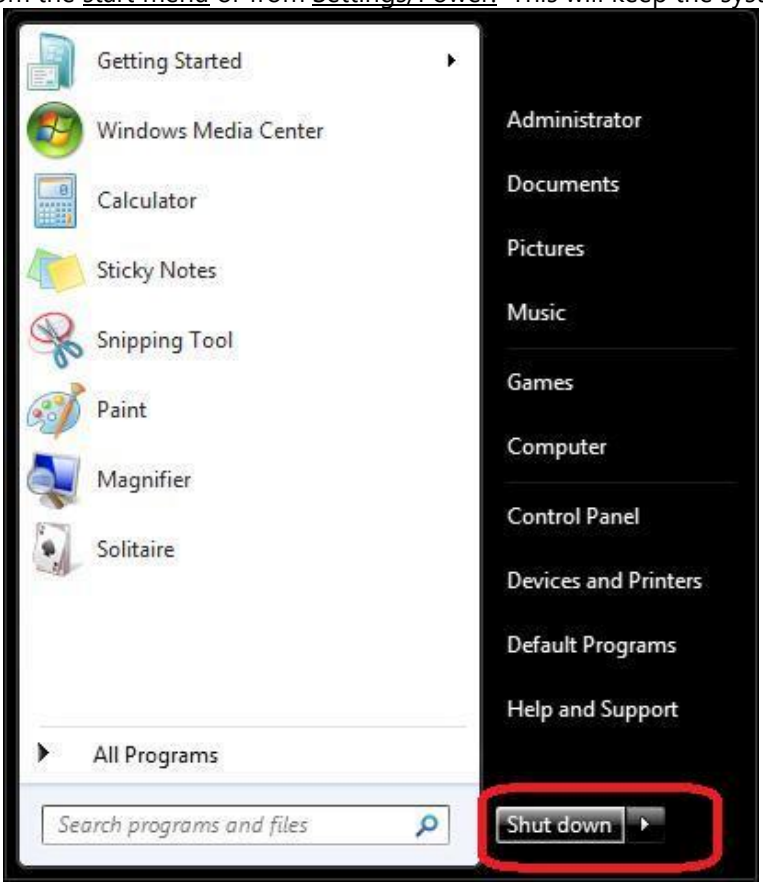
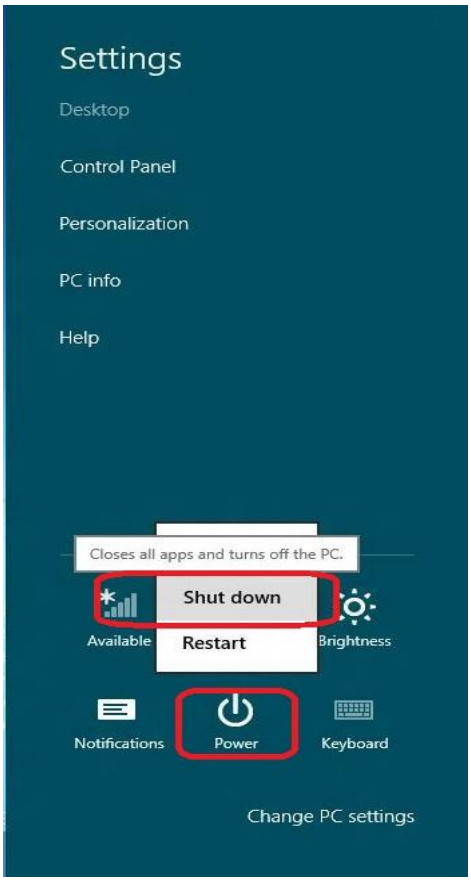


3. Close the sysprep Windows by using the "X" in the corner. Open a command prompt and run the command "slmgr /upk". The command will clear the current product key from the registry and inactivate Windows. Shutdown system from the start menu or from Settings/Power. This will keep the system in Audit Mode.





Note: Do not use the SYSPREP tool.

4. The image is ready to be captured. Please follow the steps in the *Image Capture Section.*

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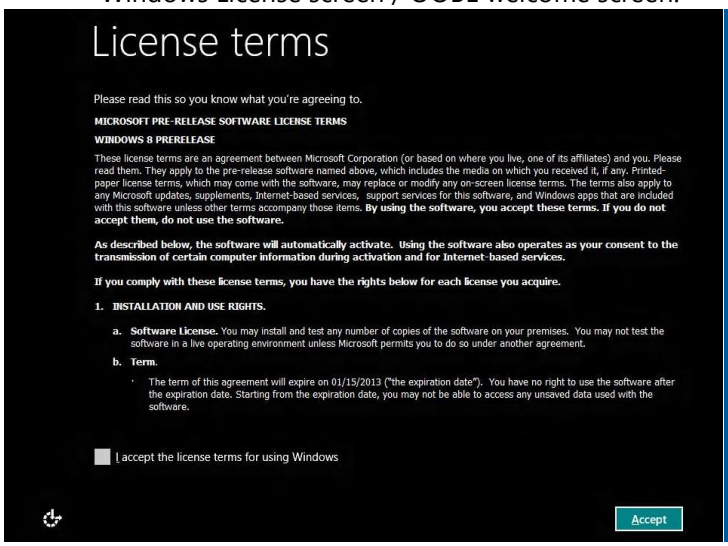
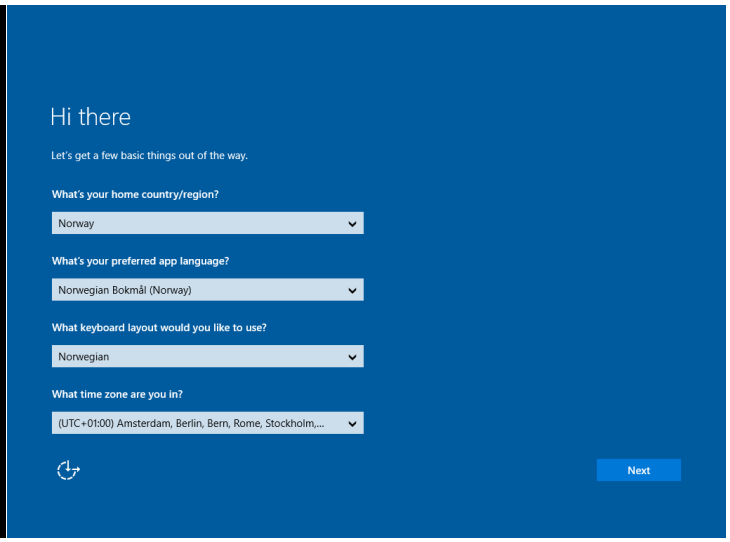
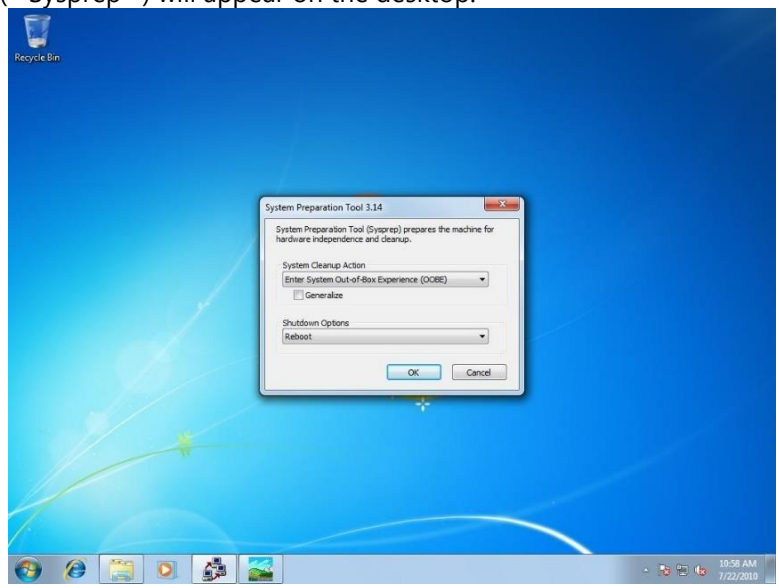
Generic Windows Image preparation

1. Reload a known good system completely via Windows install media. After installation is complete, it should be at the Windows License screen / OOBE welcome screen:





2. Enter in Audit mode by simultaneously pressing CTRL+SHFT+F3 (you may need to press the Fn key as well for the Function Keys depending on the system). The system will proceed to reboot into MS Windows Audit Mode and the System Preparation Tool (« Sysprep ») will appear on the desktop:



3. At this point, you can install Windows Updates or any other applications you want added to the image. For Windows 7, you can use Windows updates to update the operating system. For Windows 8 and 10, you would have to use PowerShell to update the operating system.

   Note: Only install applications that should be a part of the base image, and so pushed to every device deployed with this image (ex: Microsoft Office, Anti-virus programs, etc…). Applications that would need to be installed as part of a special order can be deployed during the deployment process.

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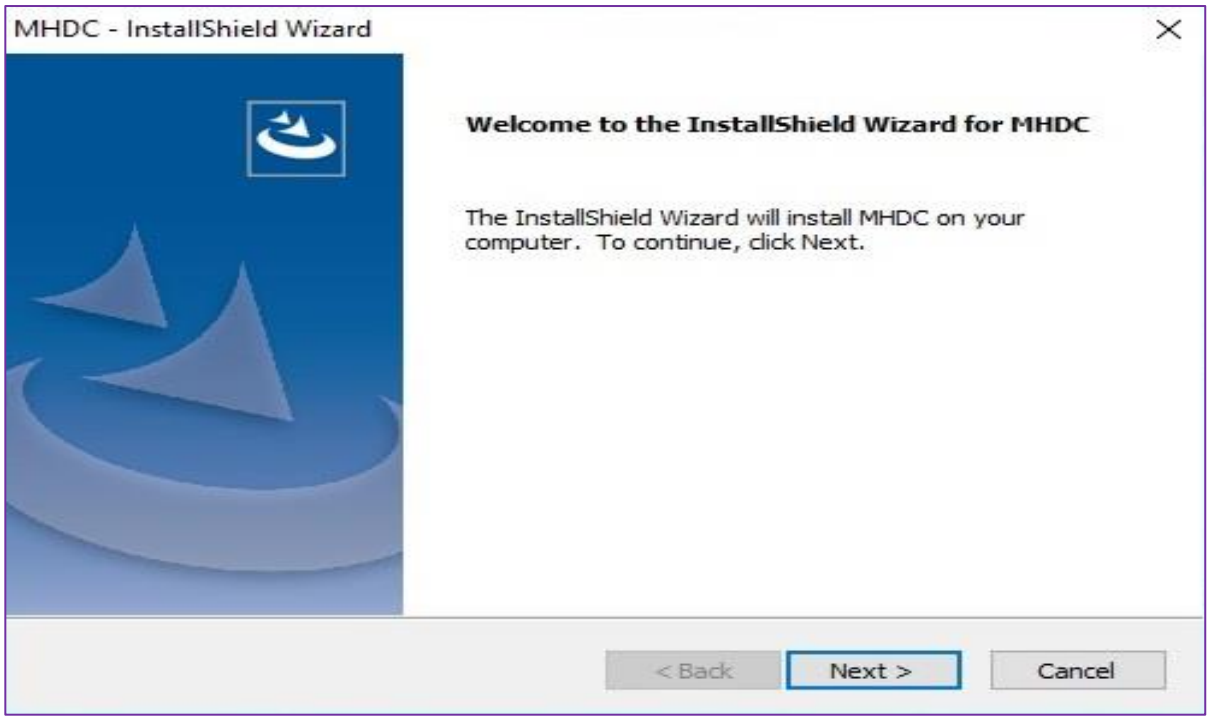
4. Since the OS has been updated and the necessary applications are installed, the system is ready to have Master Hard Disk Creator (SoftThinks provided software for Generic Image preparation) installed. Follow the prompts to install and run it to begin the process. At the end, the system will be shut down:



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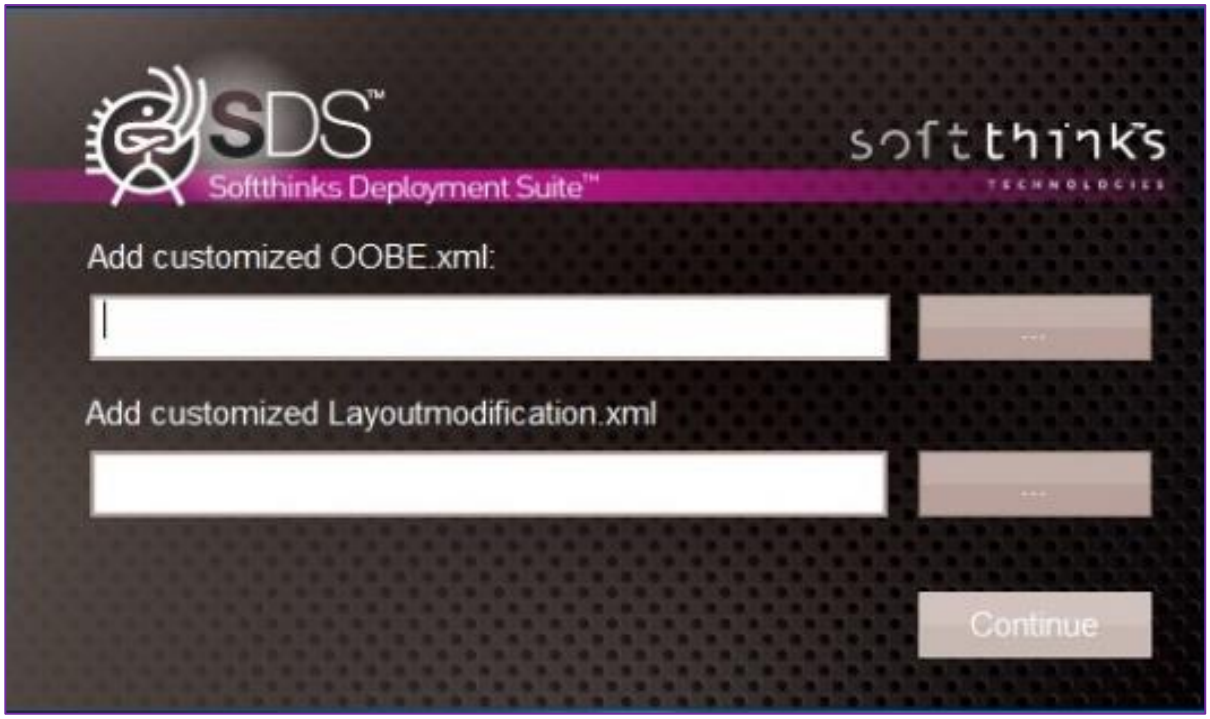

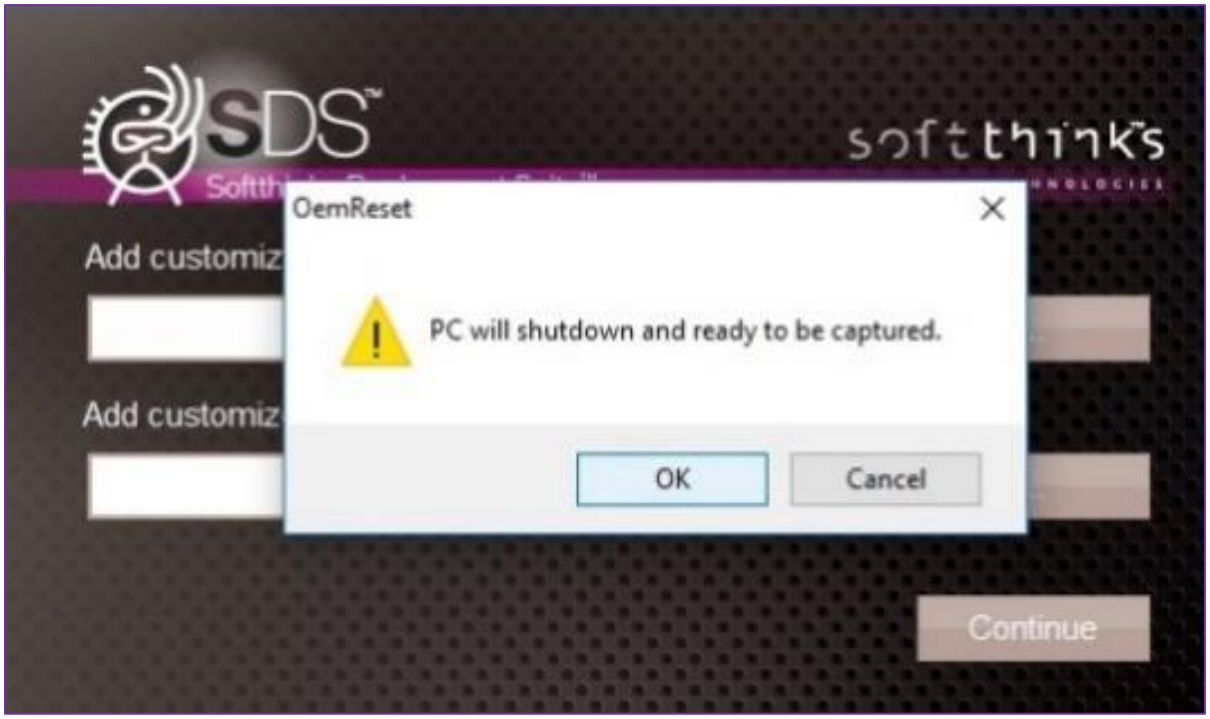

Note: You have to provide your own unattend.xml to fully configure your image (by default, all localization parameters are set to EN-US).

5. The image is now ready to be captured, please follow the steps in the image capture section.

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Static Image built from a Generic preparation

1. Deploy the required Windows Image to a known good system. During the deployment process, install **SoftThinks Backup and Recovery** (SoftThinks provided Recovery Solution software) if needed. The Image should be configured exactly how you would want it deployed for the final version.

2. Once the image has been deployed to the system, verify that everything is installed as requested and that drivers have been installed. Also verify that the recovery is working as expected.

3. Once everything has been verified, shut down the system using normal Windows functions. Do not use the OEMReset that is showing in the right corner of the screen.

4. The image is ready to be captured, please follow the steps in the image capture section.

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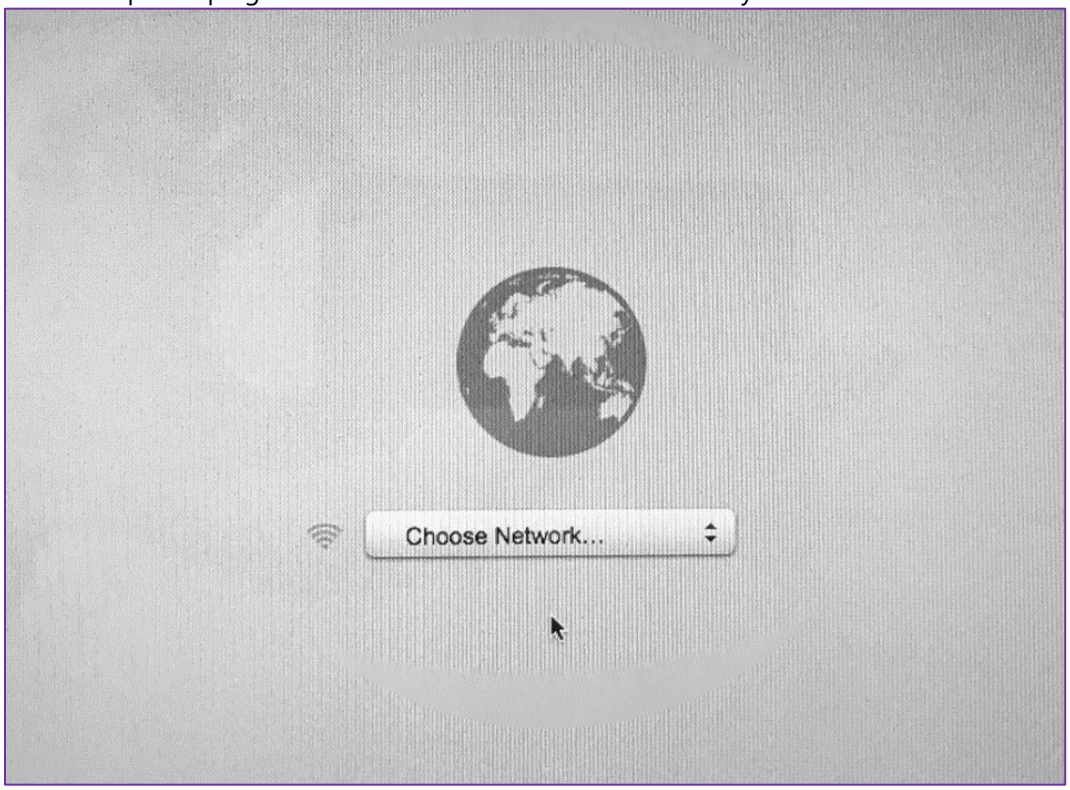
macOS Image Preparation

Setup Recovery over Internet

1. Boot the Mac in recovery mode: Press Option-Command-R or Shift-Option-Command-R, or press the option to display boot menu. Sometimes the internet recovery is displayed natively, depending on the BIOS.

2. Choose a Wi-Fi hotspot or plug in a network cable to initiate the recovery:



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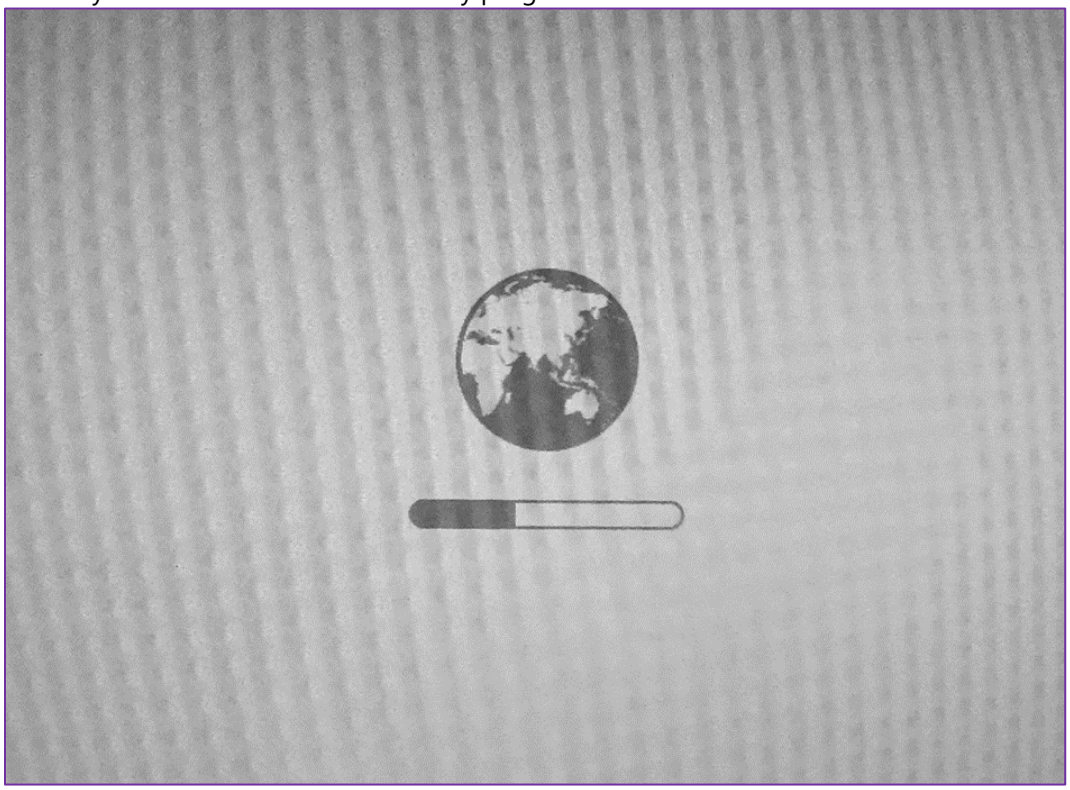
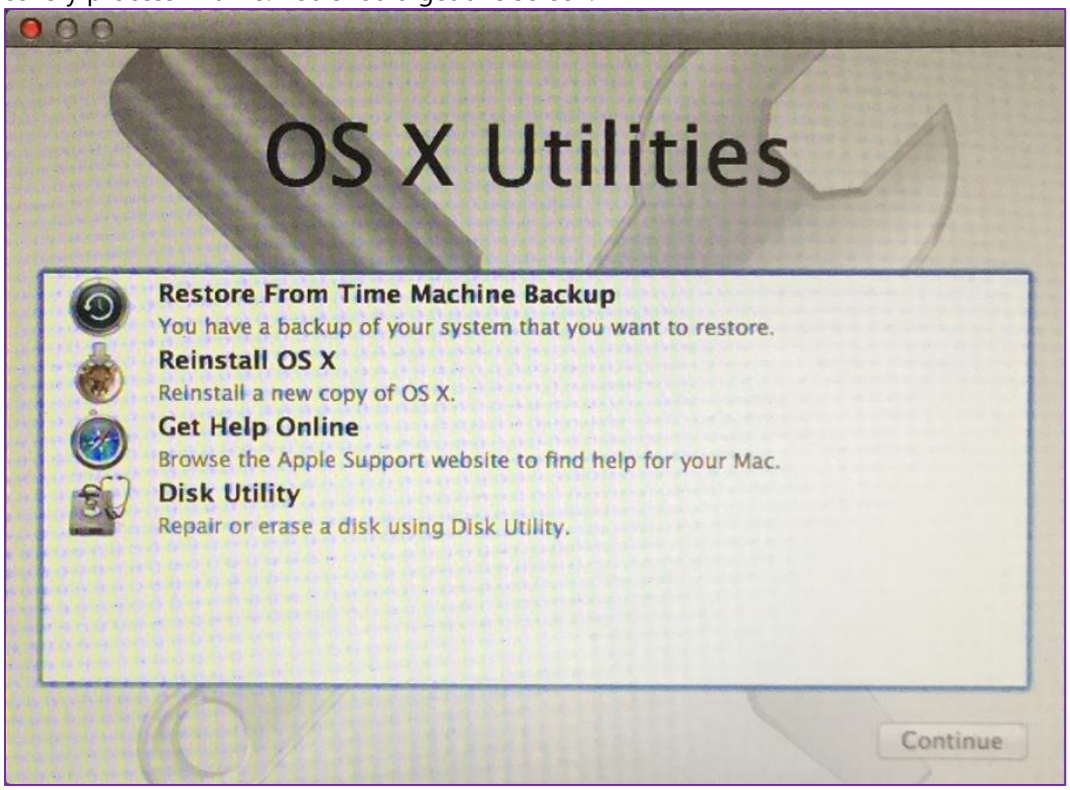
3. It will immediately start to download the recovery program:



4. Let the recovery process finalize. You should get this screen:



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Partition the macOS system disk

5. Launch the Terminal from the "Utilities" menu:

6. Plug your SDS PXE boot key with the partitionDisk.sh script attached below that you will have been put on it, then navigate to the volume inserted and execute the script to setup the system disk size (we recommend to set the size to 32GB, knowing that the smaller will be the size, the faster will be that capture process):

- For a single disk

```
./partitionDisk.sh -single 32 "Mac OS X" 1
```

- For a Fusion drive

```
./partitionDisk.sh -fusion 32 "Mac OS X" 2
```

Note: On a Mac with a fusion drive, each disk will be setup with 32GB, so the logical container will be 64GB but it does not matter since the 2 disks will be captured.

Note: You can create two images on a Mac with Fusion Drive:

- One with the fusion drive (2 disks) to deploy on Macs with Fusion Drive
- One with only the first disk (SSD) to deploy on Macs without Fusion Drive

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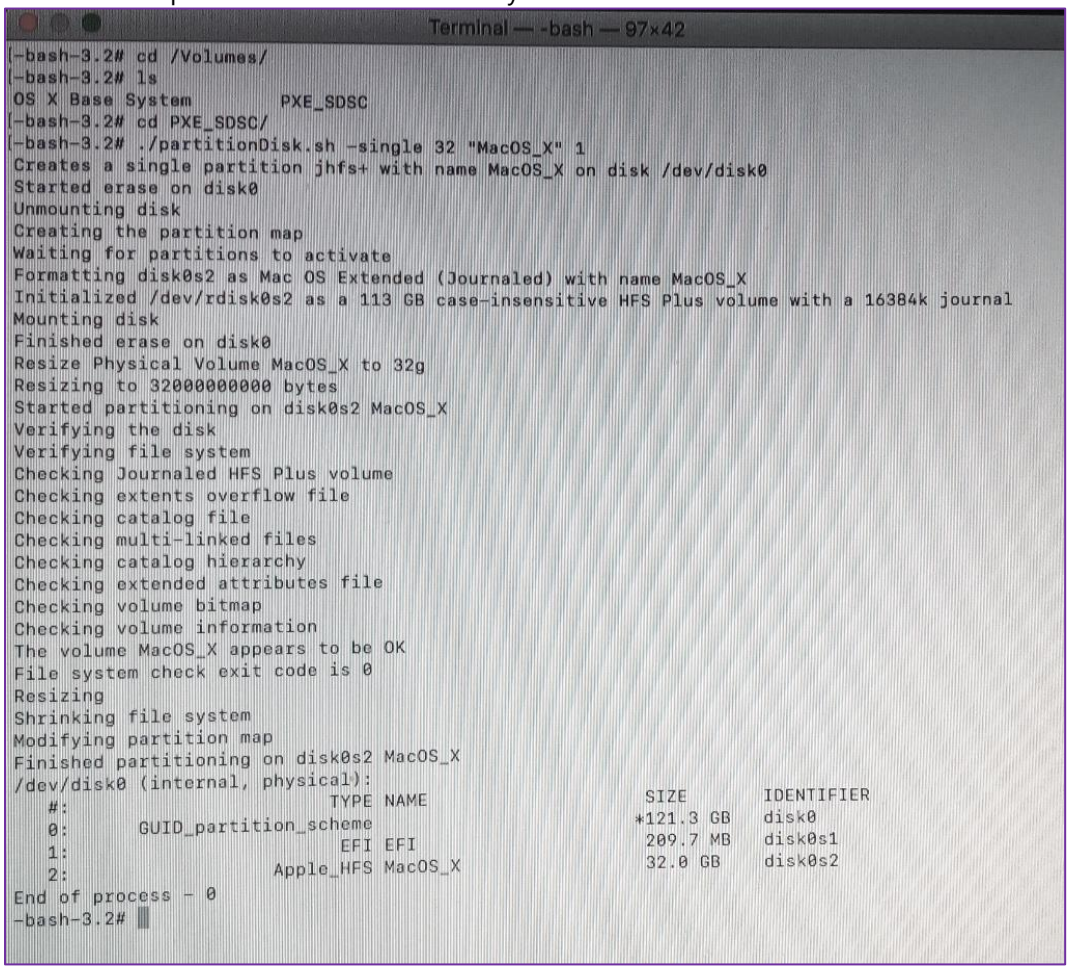
7. The partitionDisk.sh script will create the volume for you:



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Install macOS

8. Select the option to reinstall:

9. Select the volume previously created:

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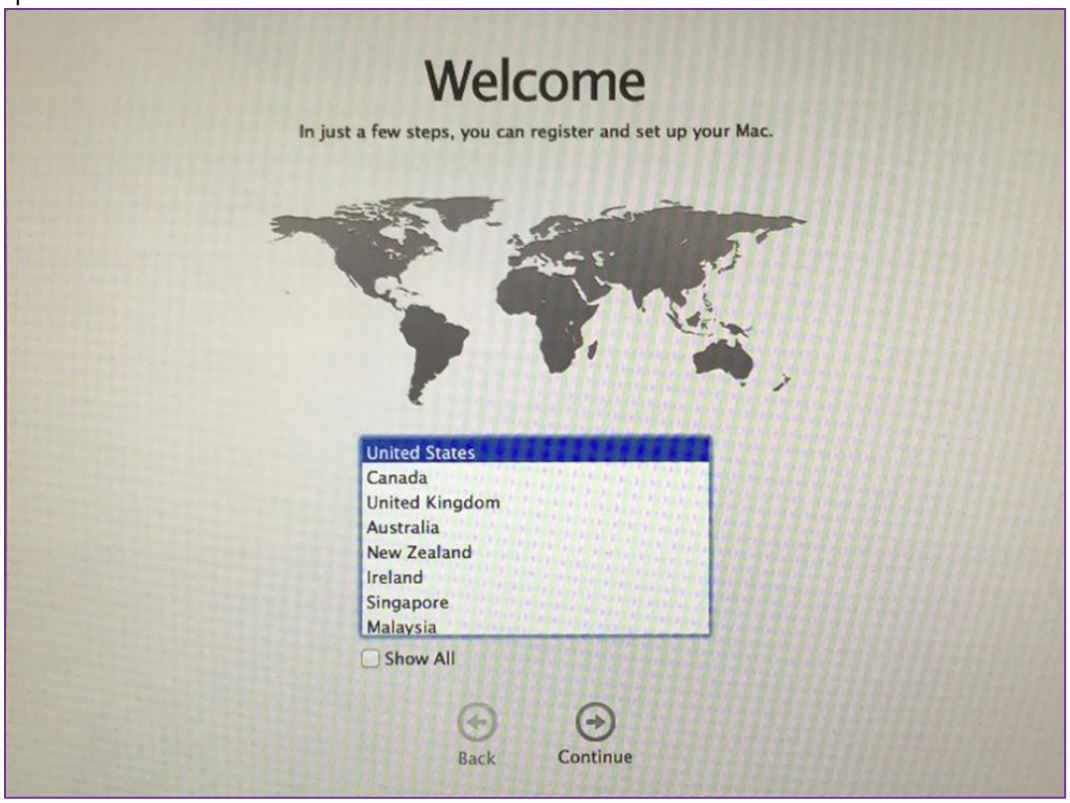
10. After some minutes or hours depending on your connection speed (about 5 GB to download), the computer will stop in the setup assistant welcome screen:



DO NOT CONTINUE this assistant or you will need to redo the whole process from the beginning.

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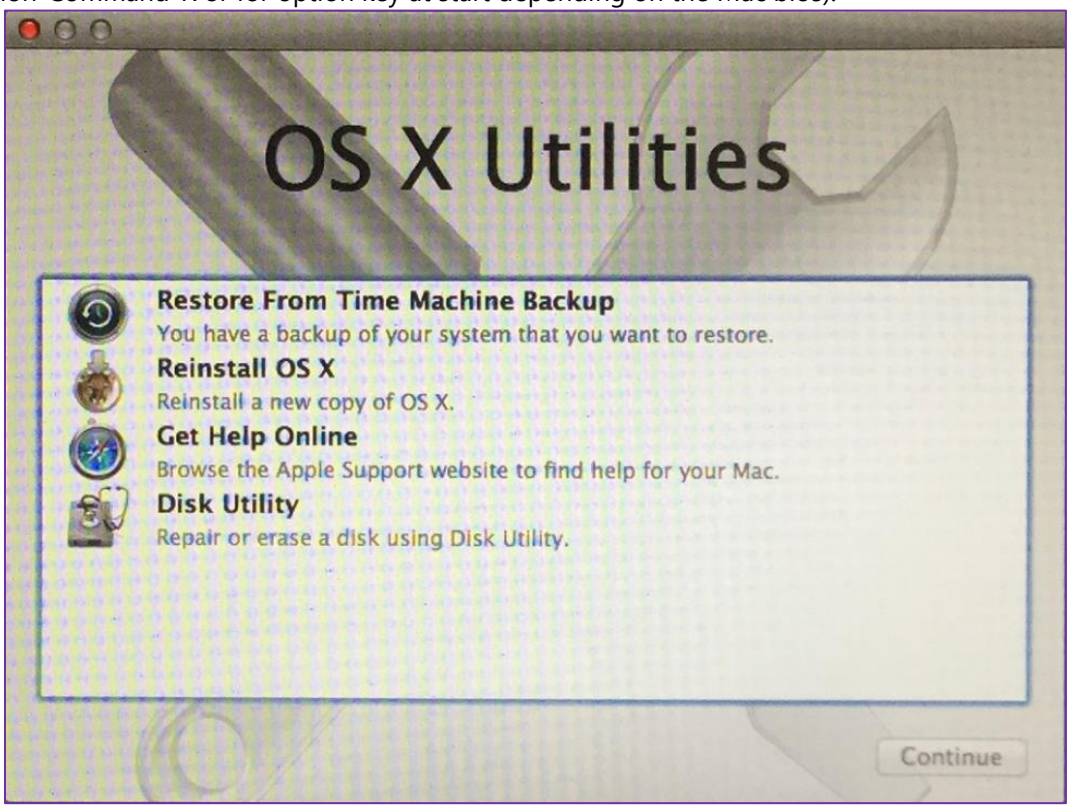
Resize macOS partition

11. To complete the master creation, we need to install a resizing script. So, reboot to recovery (Option-Command-R or Shift-Option-Command-R or for option key at start depending on the Mac bios):



12. Open the terminal:

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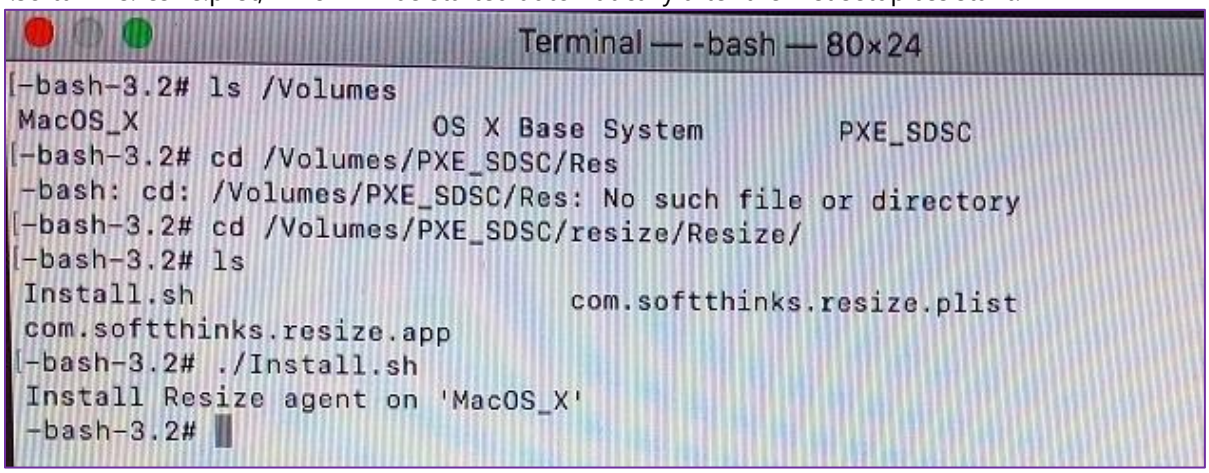
13. Execute the install.sh script from the “Resize” folder you had previously extracted from the archive below to your SDS PXE boot key:

```
./install.sh
```

14. The script will copy the Automator com.softthinks.resize.app onto the Mac OS System Volume and install the service com.softthinks.resize.plist, which will be started automatically after the first setup assistant:



15. Now Switch off the Mac, the image preparation is done.

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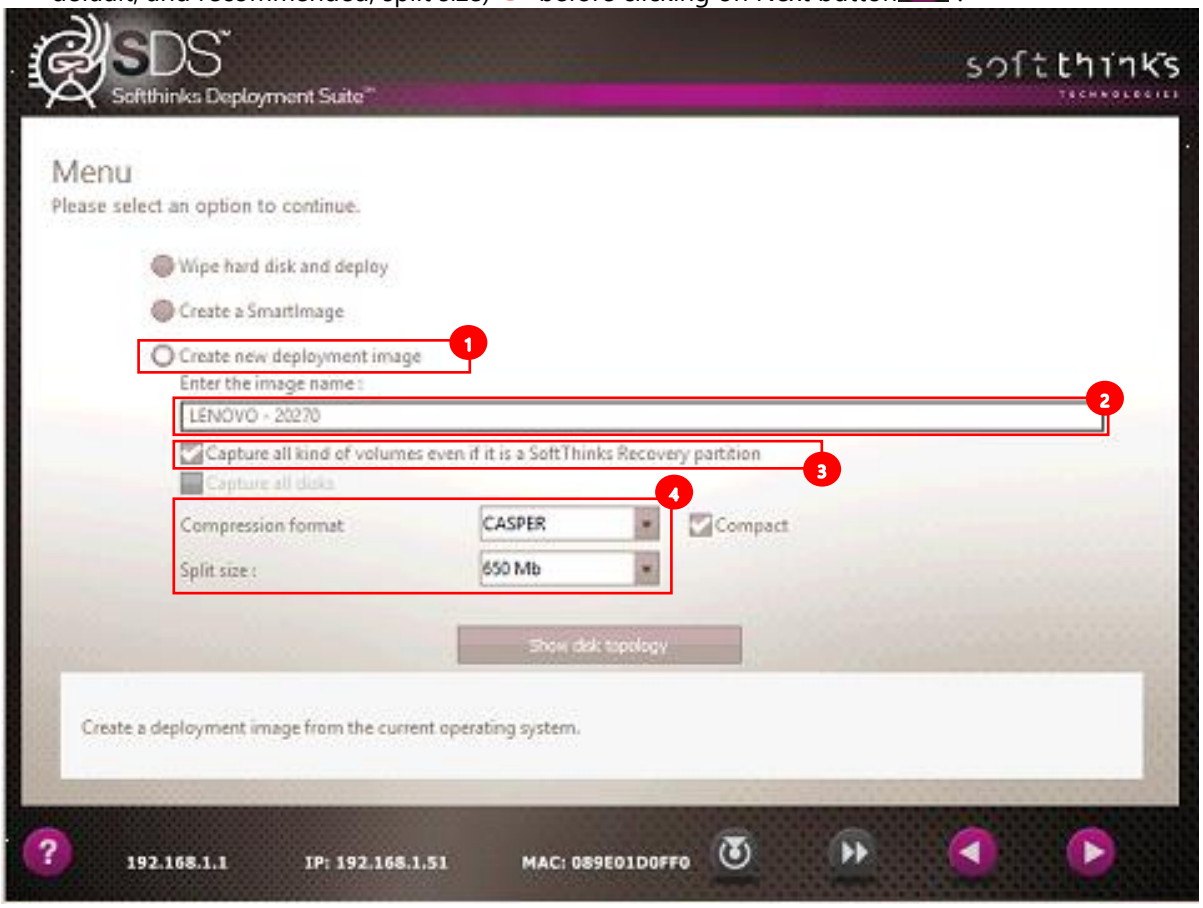
Capturing an image

Windows Image

1. PXE boot the computer to the SDS server (If needed, enable BIOS network boot option) or use bootable USB Flash drive with USB Ethernet adapter (See How to boot from Bootable USB Flash Drive with USB Ethernet adapter).

2. From the Welcome screen, select "Imaging" then on the next page select "Create Image".

3. Select the "Create new deployment image" option 1 (the radio button will turn from grey to white) and enter the name of the image 2 (there is no naming convention required).
   a. To create a **Static Image**, check the option "Capture all kinds of volumes even if it is a Softthinks Recovery Partition" 3 and select your compression format and Split size (WIM is the default format and 650 MB is the default, and recommended, split size) 4 before clicking on Next button :



   b. To create a **Generic Image**, uncheck the option "Capture all kinds of volumes even if it is a Softthinks Recovery Partition" 3 and the compression format will automatically change to WIM (there is still the option to change the image split size) 4 before clicking on Next button .

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4. The image capture will proceed automatically (screens may differ):

Note: If there is any failure, the process will stop.

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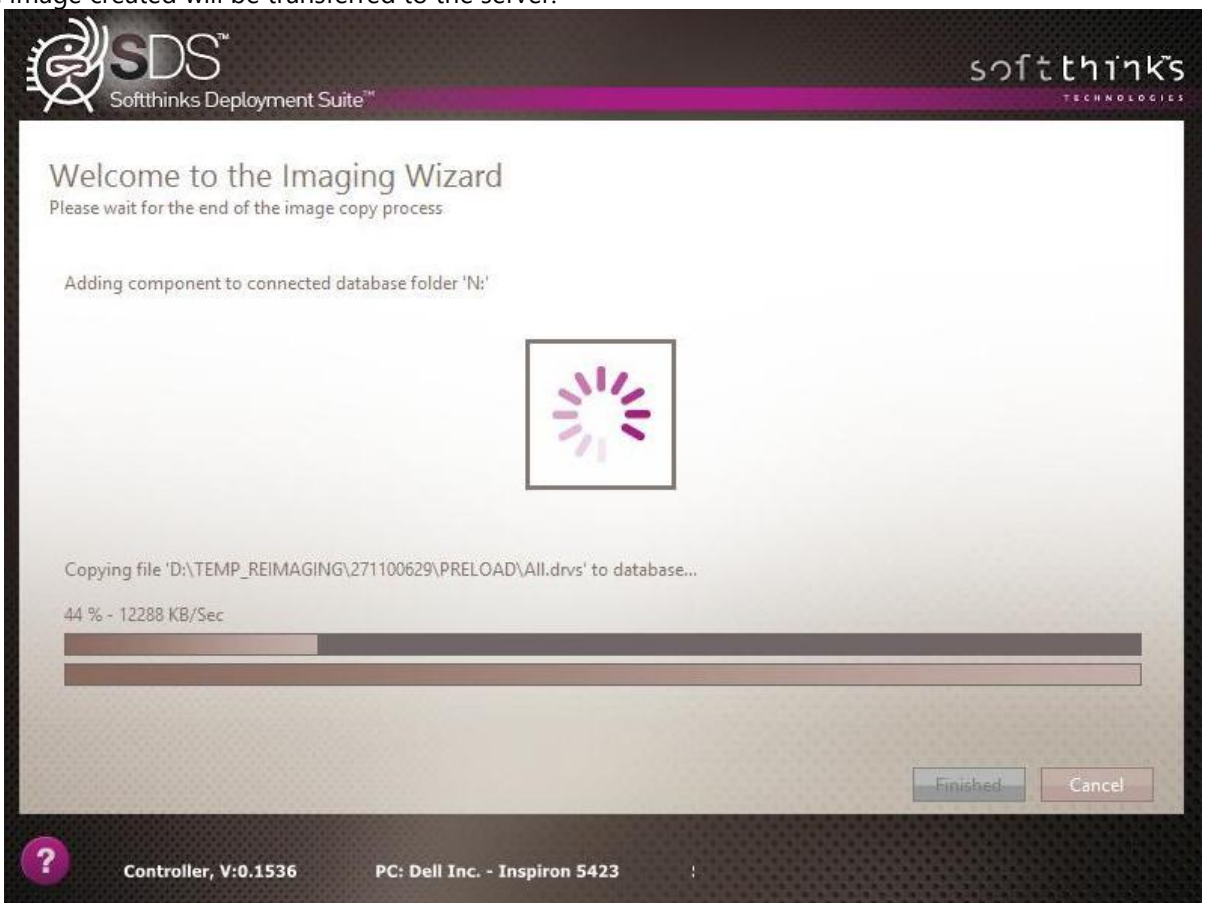
5. The image created will be transferred to the server:



Note: If there is any failure, the process will stop.

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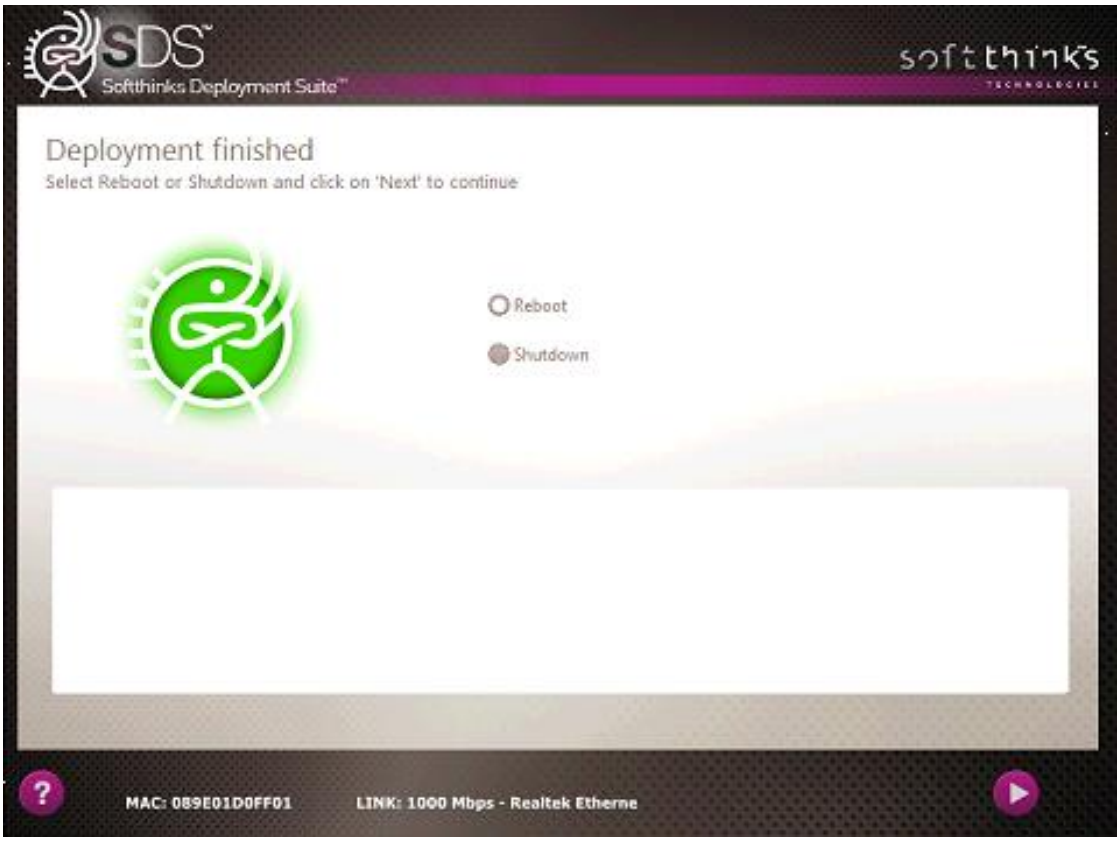
6. You will be notified that the process finished with no issues and you can choose to reboot or shutdown, or manually power down the device:



7. After the Image Capture is completed, it will be added automatically to the SDS Database and will be available to be deployed (See Adding images).

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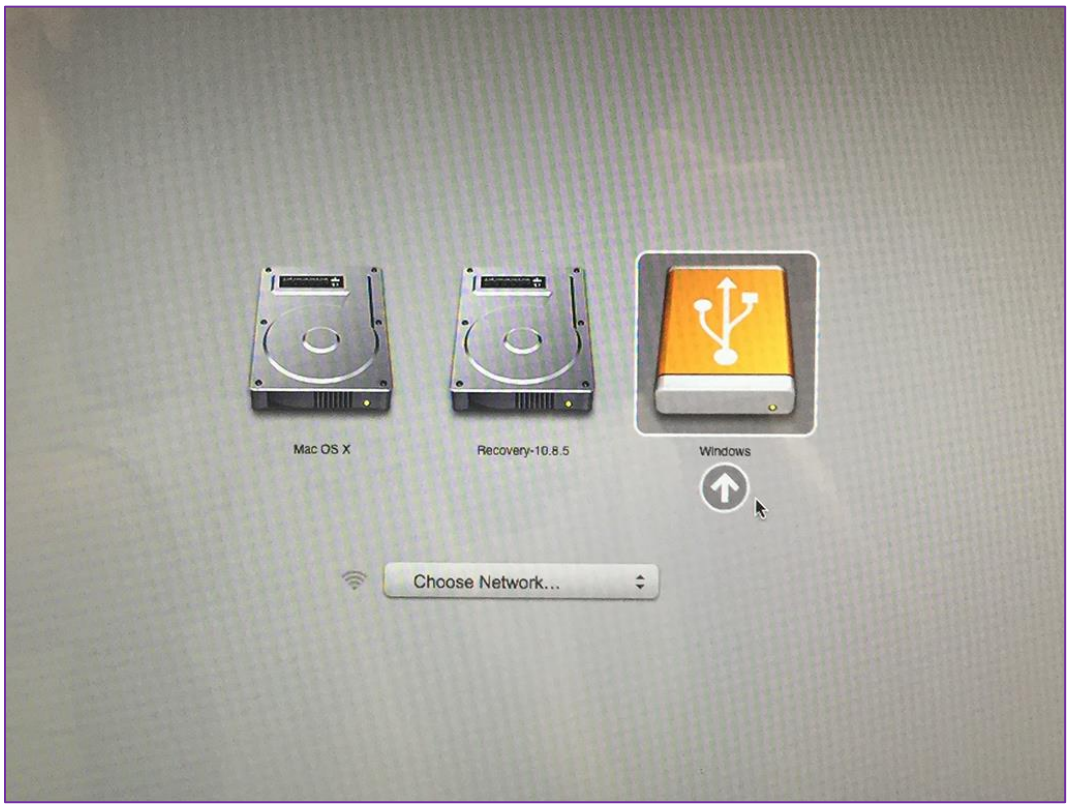
macOS Image

1. You will first need to restart into SDS environment. Plug the SDS PXE boot key and press Option key and Select your Windows PXE boot key. Sometimes you will get two entries Windows + Windows EFI. Start with 'Windows' then 'Windows EFI' if the first one did not work:



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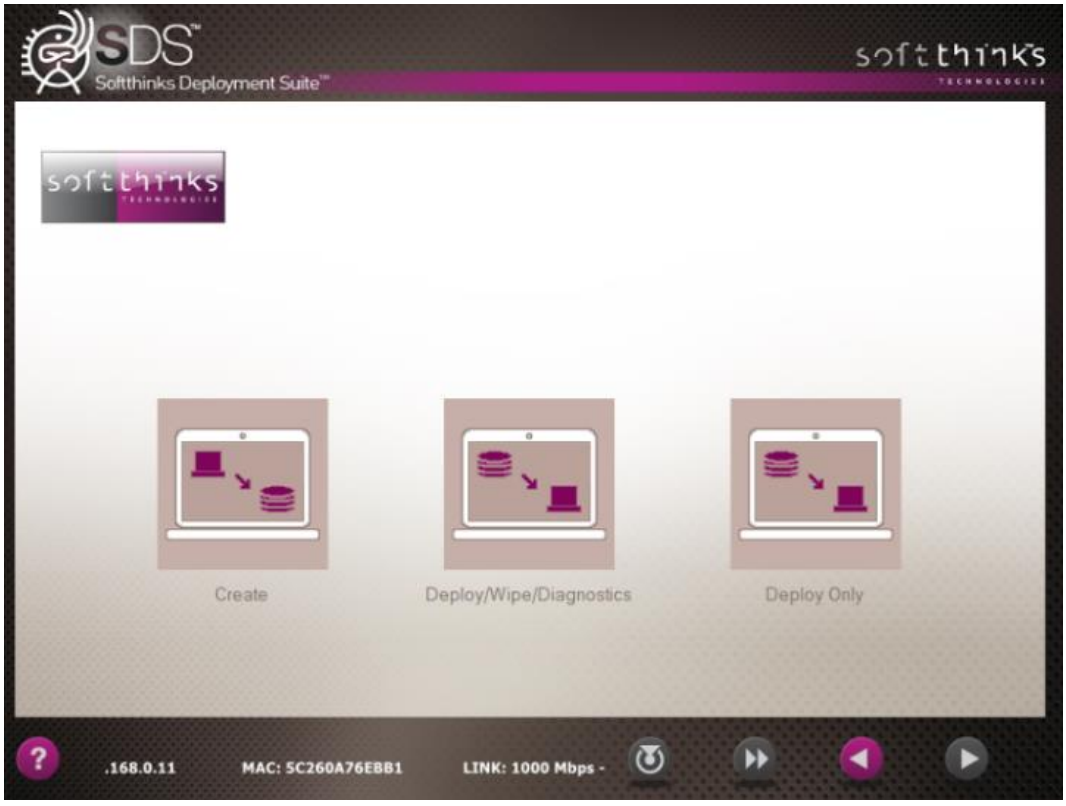
2. Select “Imaging” and click Next button:

3. Select “Create” and click Next button:



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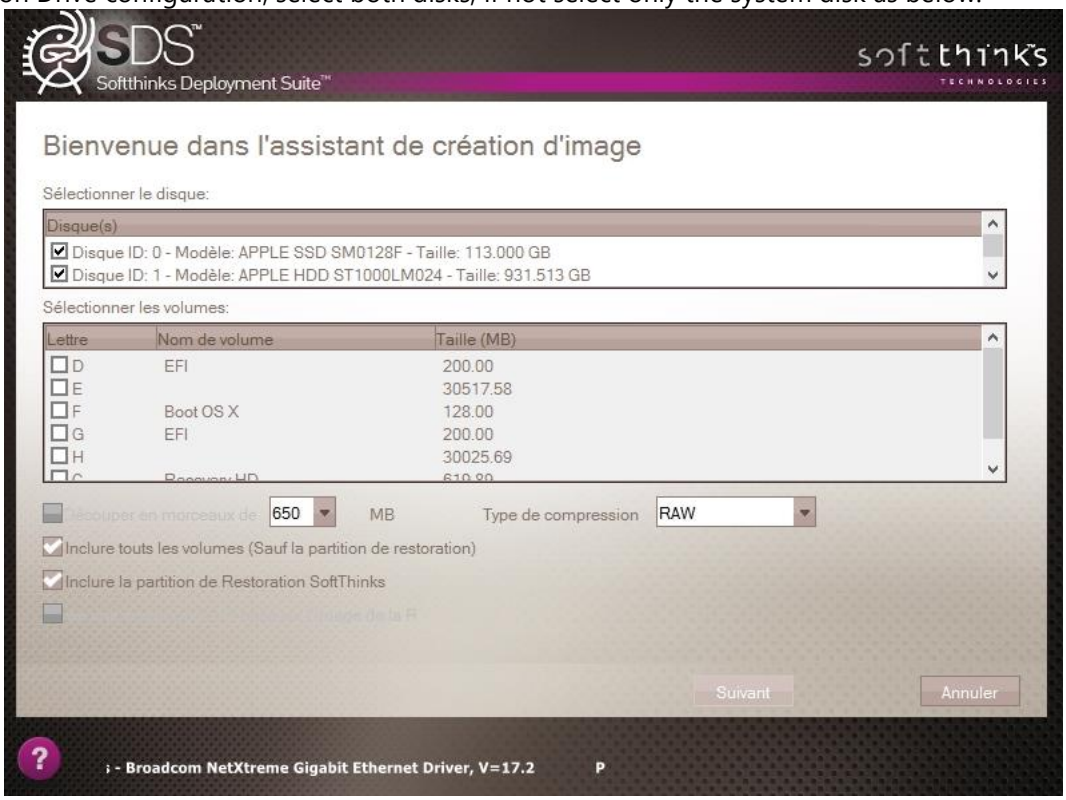
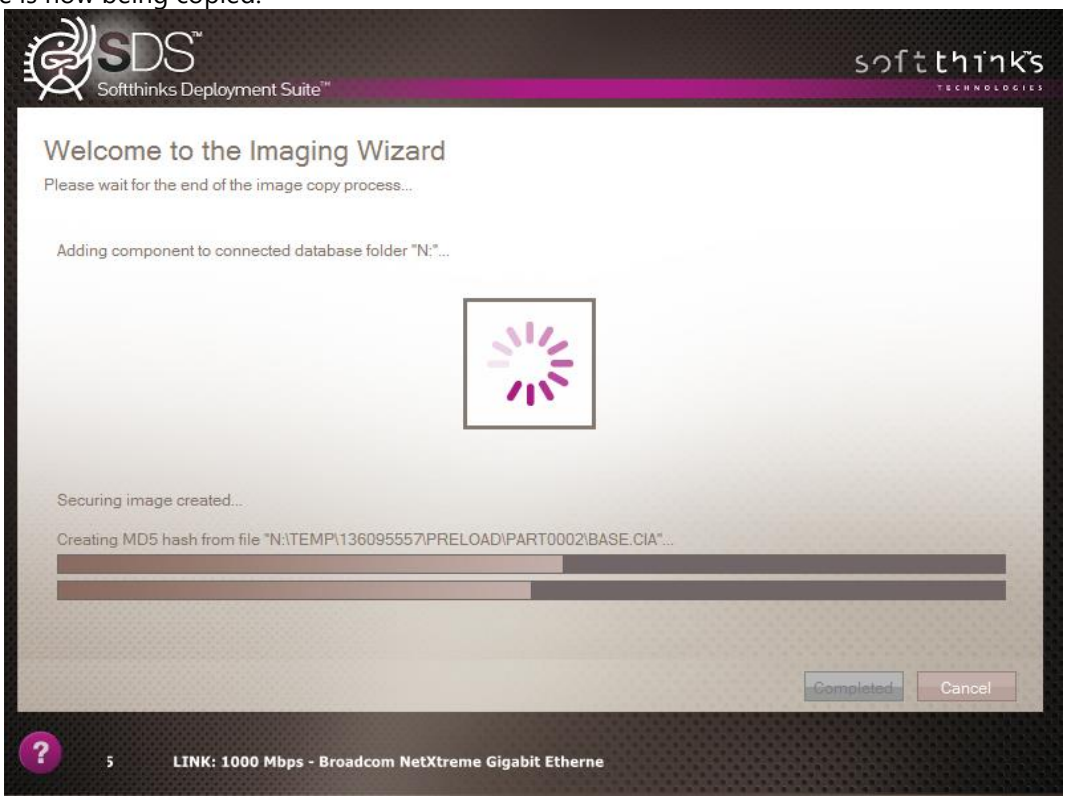
If the SDSimaging module is set to work manually you will get additional screens as follows.

4. On a Fusion Drive configuration, select both disks, if not select only the system disk as below:



5. The image is now being copied:



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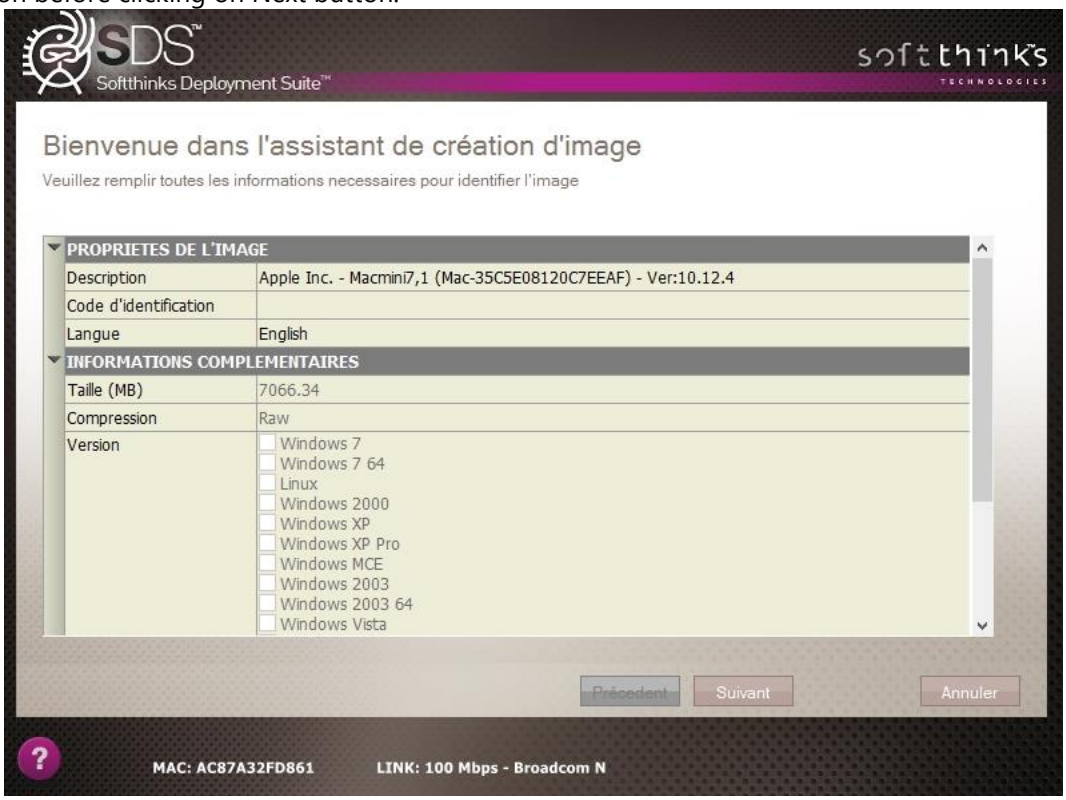
6. Once the copy is finished, indicate the macOS version in the image description and adjust other properties and information before clicking on Next button:



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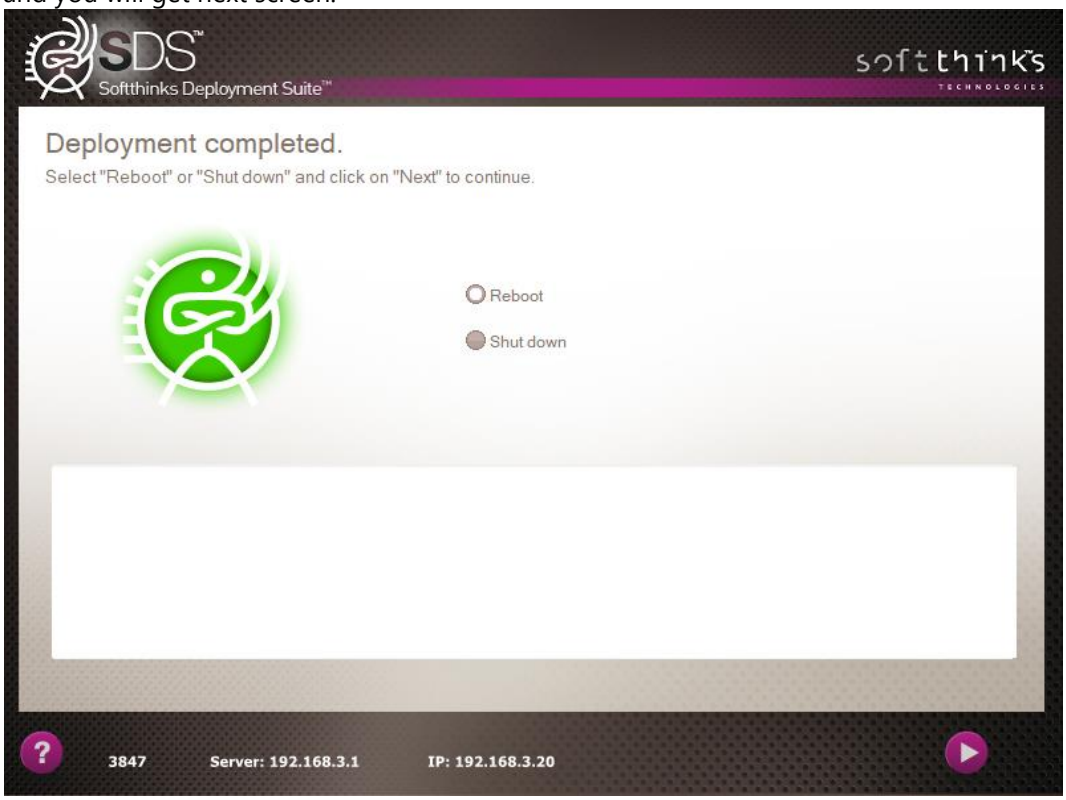
7. After these pages in Manual Mode, and also in automatic mode, the image will be automatically added to the database and you will get next screen:



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Deploying an image

Windows Image

SDS solution give you the ability to deploy the images you created either manually or automatically. This chapter will first describe you the manual process, but you can go directly to Automatic deployment if you want more details on how to automate this process.

1. Boot your Windows device to the server and select the Imaging option from the Welcome Page.

2. If no ADF file is found you will proceed to the Profile, Preset screen:

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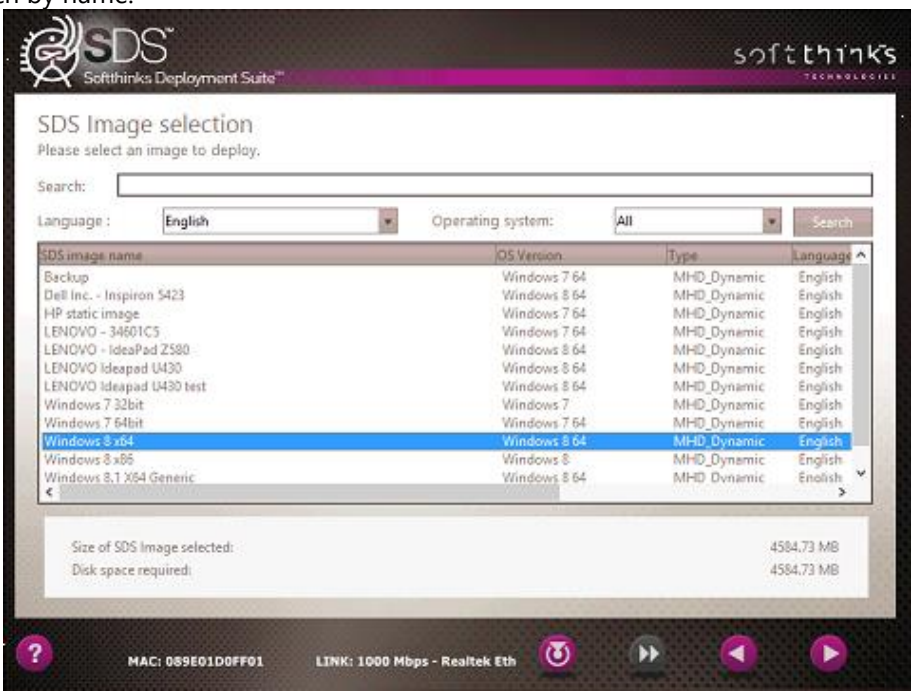
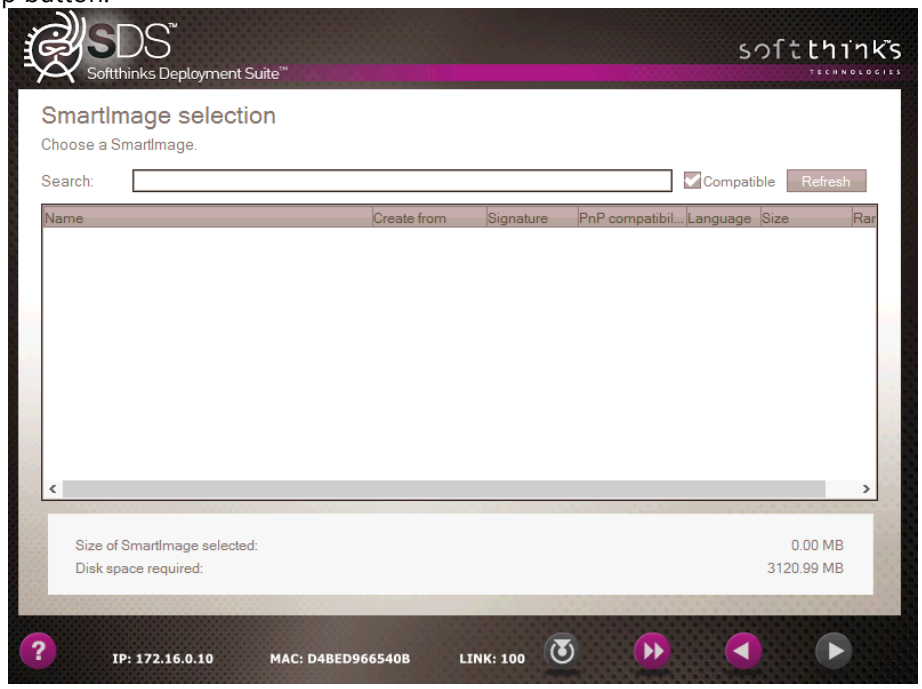
Manual Deployment

3. If you want to deploy an image manually (or have not yet setup a Profile, Preset, or ADF file), click on the Skip button in the "Profile, Preset" screen.

4. You will be taken to the SDS Image Selection Page and there you will select the image to be applied to the hardware that is connected. You can select the image you want from the full list (filtered by Language and/or Operating System) or search by name:



5. If you have created a Smart Image for the computer model you are deploying then you can select it at this screen, or else click on Skip button:



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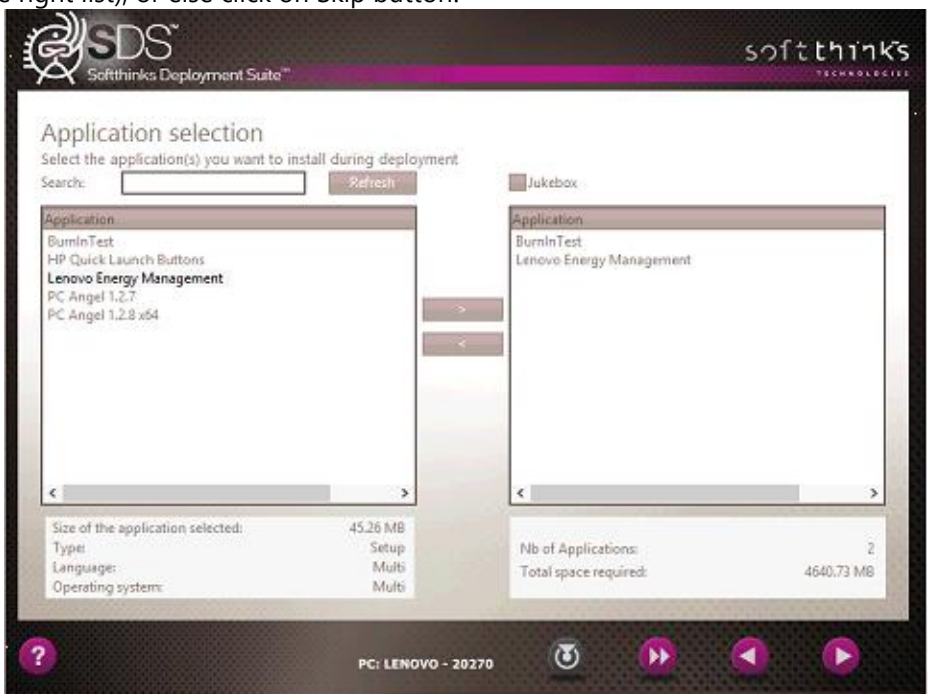
6. Select the applications to be installed during the deployment (choose them in the left list and click on '>' button to add them to the right list), or else click on Skip button:



7. Choose the recovery solution option:

Note: For a Windows 10 image, there is no "Recovery Solution on additional partition (dedicated recovery partition)" option. Select "No recovery solution" (restore user partition only)" for a Generic Image. You can install the SoftThinks Backup and Recovery (SBAR) solution as an application (please contact your commercial contact). For a Static image select "Keep original disk topology".

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8. Configure the disk topology (the default disk layout can be changed if required, otherwise nothing needs to be selected):

Note: Additional User Partitions can be created by changing the Size (%) of UP1 to a smaller amount and then clicking the green « + » symbol on the right side of the Boot Disk line. The new partition will be created with the space that was made available.

9. Review the options that were selected for the deployment. After the countdown (15 seconds) or when you click on next button the deployment process will begin:

If anything is incorrect you can hover over the Left Purple Arrow and thumbnails of all the screens will show up. You can go back as far as you need to, but hurry as you only have 15 seconds to make your choice or it will advance to the next screen.

If you wish to create a new preset with the choices you made, click the "Create a Preset" button highlighted below. Please keep in mind the delay is only 15 seconds before the deployment starts automatically in order to click this button.

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10. Once the countdown is finished, the process will begin based on your script and the choice you made from the Welcome Page.

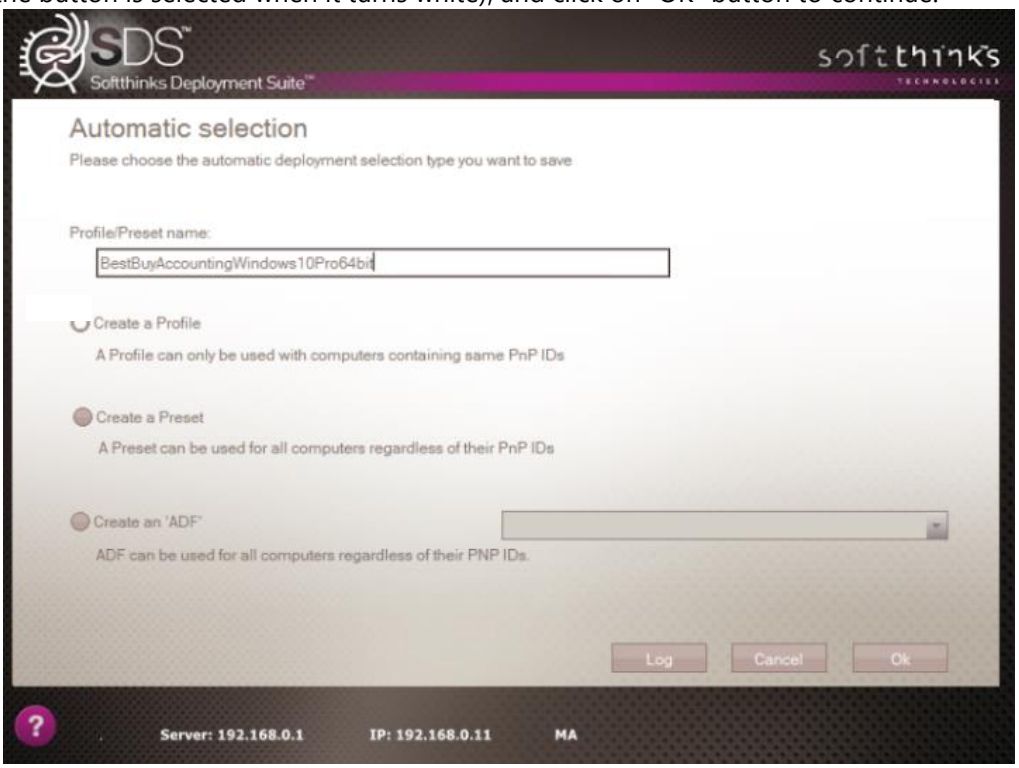
Automatic Deployment

Automatic image deployments are what set SDS apart from other methods on the market. Three types of the Automatic Deployments (Preset, Profile, and ADF) are available to be created depending on what is being deployed. Once an Automated File is selected, all of the choices that were made will be set for the computer and the screens will blink all the way through to the Summary page.

Profile

A Profile is linked to the hardware of a model of computer, but does not have a unique identifier in the name. Profiles are useful when you have multiple images of the same OS for the same model of computer (i.e. computers for schools or other organizations that have different images for different departments). A profile needs to be selected from the Profile/Preset Page in order to run.

To create a Profile, click on the "Create a Profile" button and give it a name without spaces or symbols related to the image (note: the button is selected when it turns white), and click on "OK" button to continue:



Your profile has now been created and will be available to use on future deployments.

Note: You will get this error if you try to put a space between words in the name:

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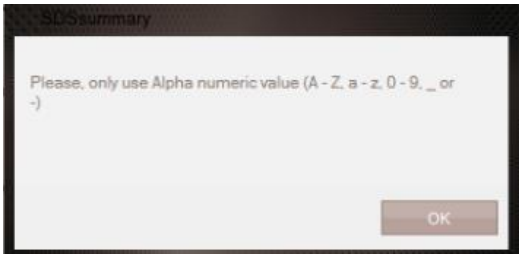
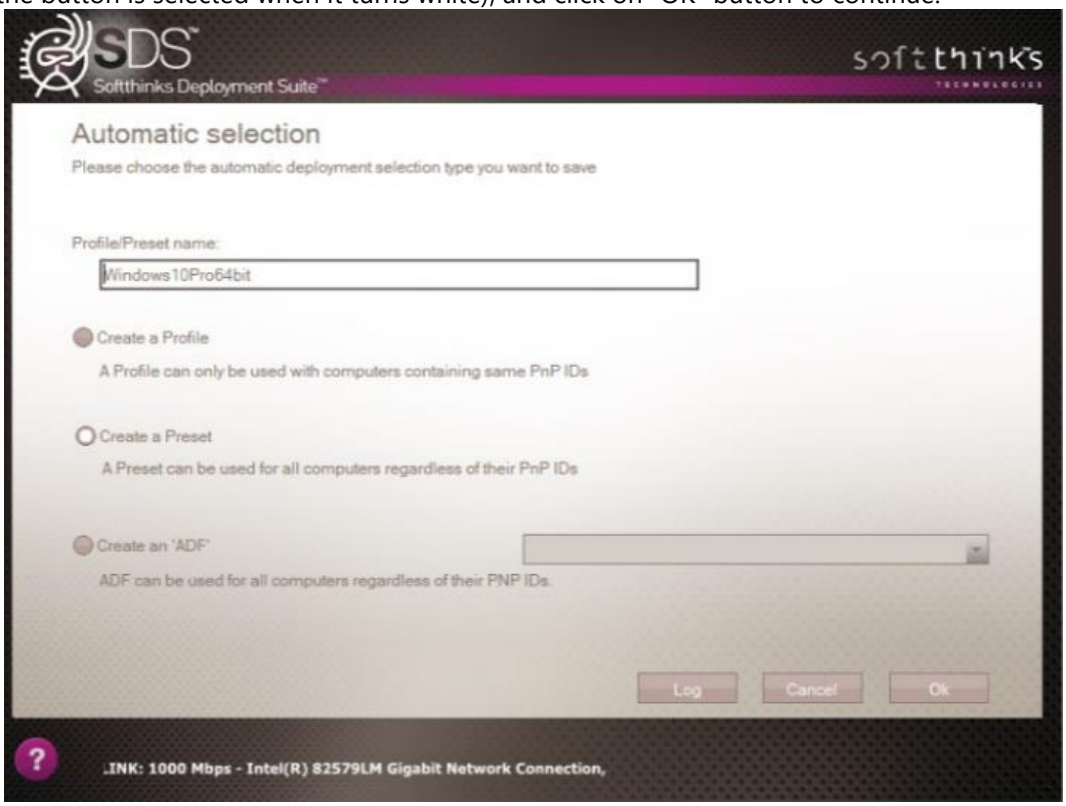


Preset

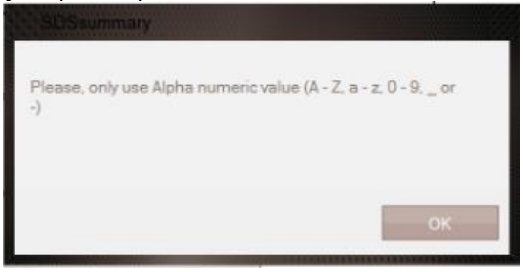
A Preset is not linked to any hardware and does not have a Unique Identifier in the name. It is used to deploy Generic Images to any model of computer with the same choices. A preset needs to be selected from the Profile/Preset Page in order to run.

To create a Preset, click on the “Create a Preset” button and give it a name without spaces or symbols related to the image (note: the button is selected when it turns white), and click on “OK” button to continue:



Your profile has now been created and will be available to use on future deployments.

Note: You will get this error if you try to put a space between words in the name



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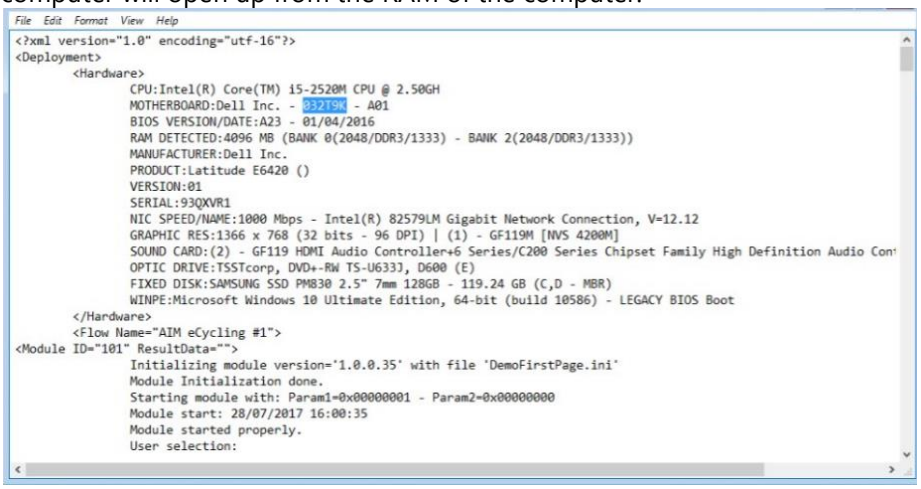
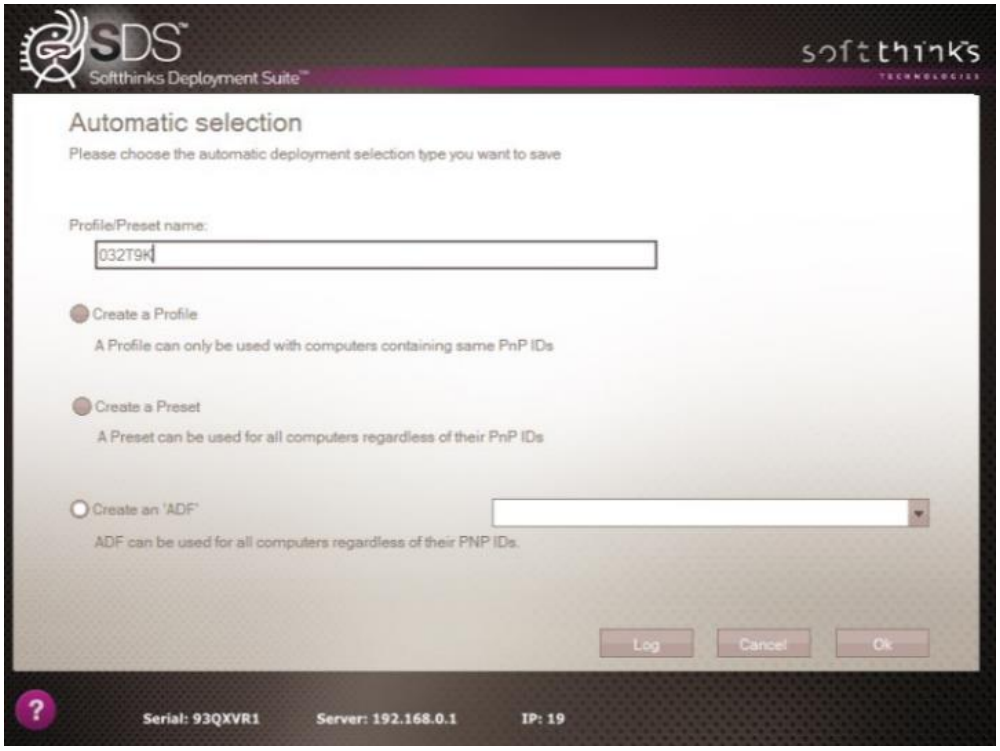
ADF (Automated Deployment File)

An ADF is linked to the hardware of a model of computer, and uses a unique identifier in the name. An ADF does not need to be selected to run. If the hardware of a computer matches the hardware of the ADF and the Unique Identifier also matches, then the system will automatically run the ADF as soon as Deploy or any variation of Deploy is selected. ADF are useful if you only have one image for an Operating System for a specific model of computer.

To create an ADF, click on the Create an ADF button. In most cases the name for the ADF will be the Motherboard Part Number (sometimes the computer model number will have to be used.)
To get the Motherboard Part Number, click the Log button near the bottom of the screen and the Log file for the deployment of that computer will open up from the RAM of the computer:



The Motherboard Part number (if listed in the BIOS of the computer) will be in the hardware list of the computer in the top section of the log file. Highlight it and Copy the Name. Then close the log and paste the name into the Profile/Preset name box:



Your ADF has now been created and will be available to use on future deployments.

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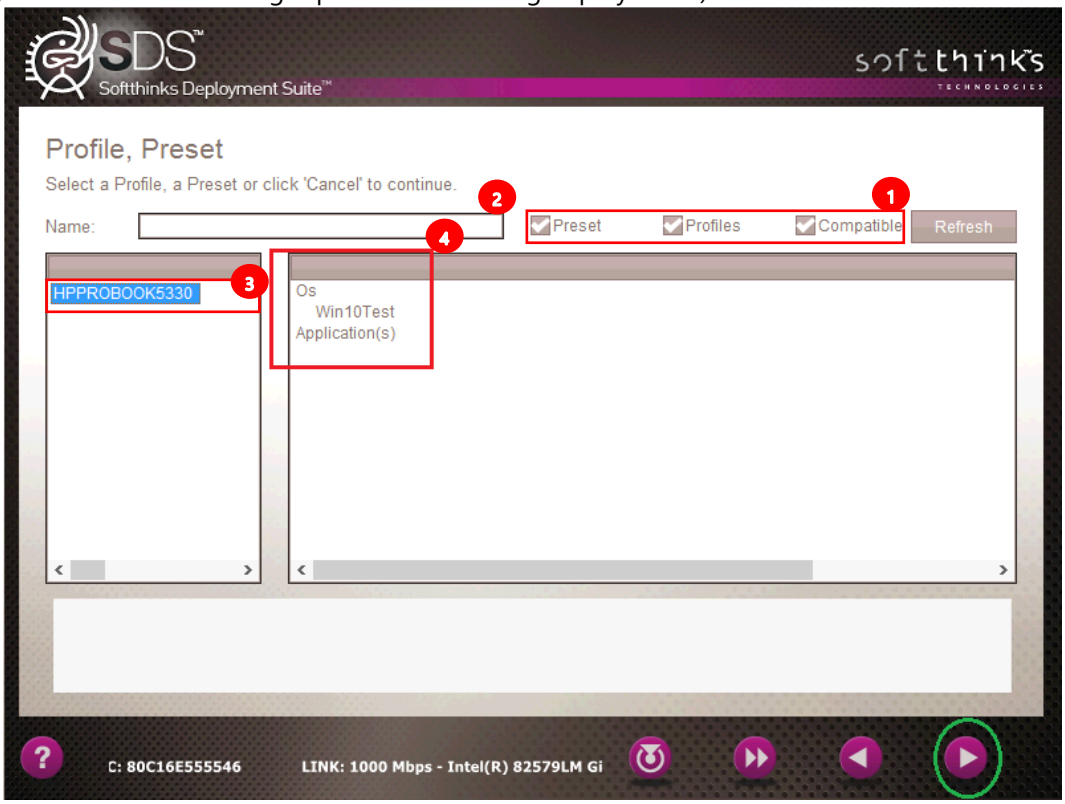
1. If the current device doesn't match an existing ADF file, select a Profile / Preset (See Definitions, Acronyms and Abbreviations used in this user guide) to deploy **automatically**. You can filter them 1 and search for specific profile/preset/ADF name 2, and if one is matching your need in the list 3 ("HPPROBOK5330" in our example), select it (you will notice on the right panel the OS being deployed 4) and click on Next button:



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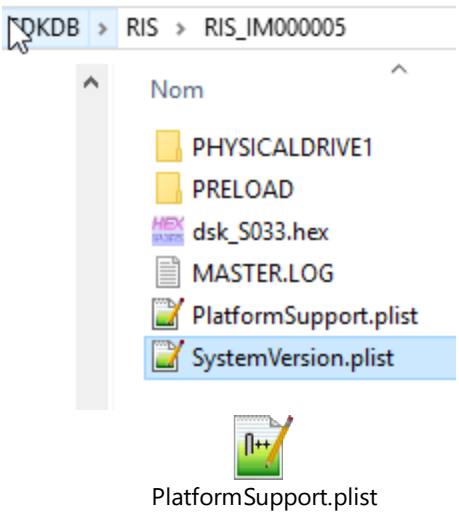
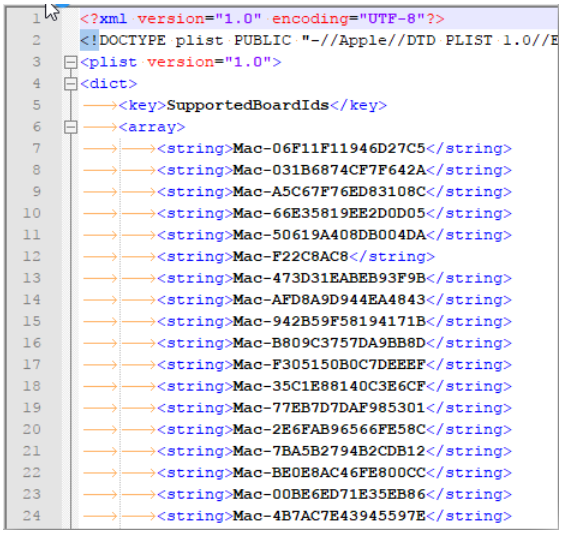
macOS Image

Once an image is added to the SDS database, it will be possible to apply it to any Mac, usually the same Model that you captured the image from. However, some other models could use the same image.
A Mac can be identified in BIOS with a hardware ID.
For example, in red.

CPU:Intel(R) Core(TM) i5-4308U CPU @ 2.80GHz
MOTHERBOARD:Apple Inc. - **Mac-35C5E08120C7EEAF - Macmini7,1**
BIOS VERSION/DATE:MM71.88Z.0220.B14.1702161608 - 02/16/2017
RAM DETECTED:8192 MB (BANK 0(0/DDR3/1600) - BANK 1(0/DDR3/1600))
MANUFACTURER:Apple Inc.
PRODUCT:Macmini7,1 (System SKU#)
VERSION:1.0
SERIAL:C0KT800UGF1T
NIC SPEED/NAME:100 Mbps - Broadcom NetXtreme Gigabit Ethernet Driver, V=17.2
GRAPHIC RES:1024 x 768 (32 bits - 96 DPI) | (1) - Haswell-ULT Integrated Graphics Controller
SOUND CARD:(2) - Haswell-ULT HD Audio Controller+8 Series HD Audio Controller
OPTIC DRIVE:
FIXED DISK:APPLE SSD SM0128F - 113.00 GB (- GPT)
APPLE HDD ST1000LM024 - 931.51 GB (- GPT)

If you look closer at the recovery in the RIS folder of the image you will find 2 *.plist files which identify the Mac OS version and the platforms supported by the OS version:





You can check this file to see what other Mac plaforms can use this same image. Some Mac mini could have different hardware but this image could probably support other Mac. You have to check in those files.
If you have an old MacBook Pro 10.8.5 like this one: 'Apple Inc. – MacBook Pro 9.2 (Mac-6F01561E16C75D06)' you will notice that the image captured is supporting my MacBook Pro so you can download it directly without update through ITunes.

Since we are using a Bootcamp driver to mount HFS+ partition only reading is possible.
To download a Mac OS image in SDS you will need an adapted script. Since volumes are read-only no modules are able to add anything to the image deployed under WinPE environment.

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Adapt your SDS script. It is identical for the capture, only the download was adjusted as follow:

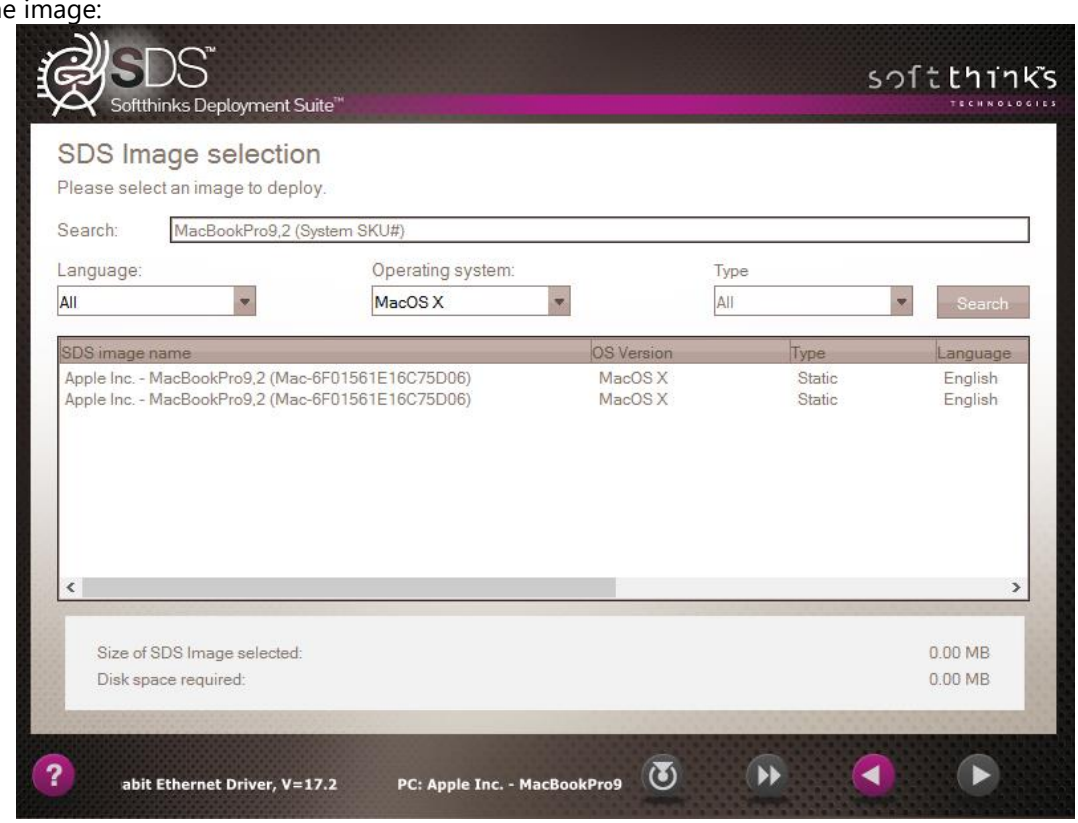
```
<!-- if mac, only restore ...-->
        <SETVAR MACOS="%OS%"></SETVAR>     → DETECTING IF WE HAD SELECTED A MACOS IMAGE
        <IF MACOS="20">
                <Module Id="115" ConfigFile="" Param1="1" Param2="6" FullScrn="0"></Module>
                <SEND_LOGS></SEND_LOGS>
                <SETVAR RESTORE="RESULT"></SETVAR>

                <IF CREATE="0" OP="&" RESTORE="1">
                        <Module Id="119" ConfigFile="" Param1="0x1" Param2="0" FullScrn="0"></Module>
                </IF>
                <ELSE>
                        <SEND_LOGS Source="X:\windows\system32\*.log" Destination="R:\" ></SEND_LOGS>
                        <Module Id="119" ConfigFile="" Param1="0x2" Param2="0" FullScrn="0"></Module>
                </ELSE>
        </IF>
```

script.xml

1. Select image deployment option

2. Select the image:



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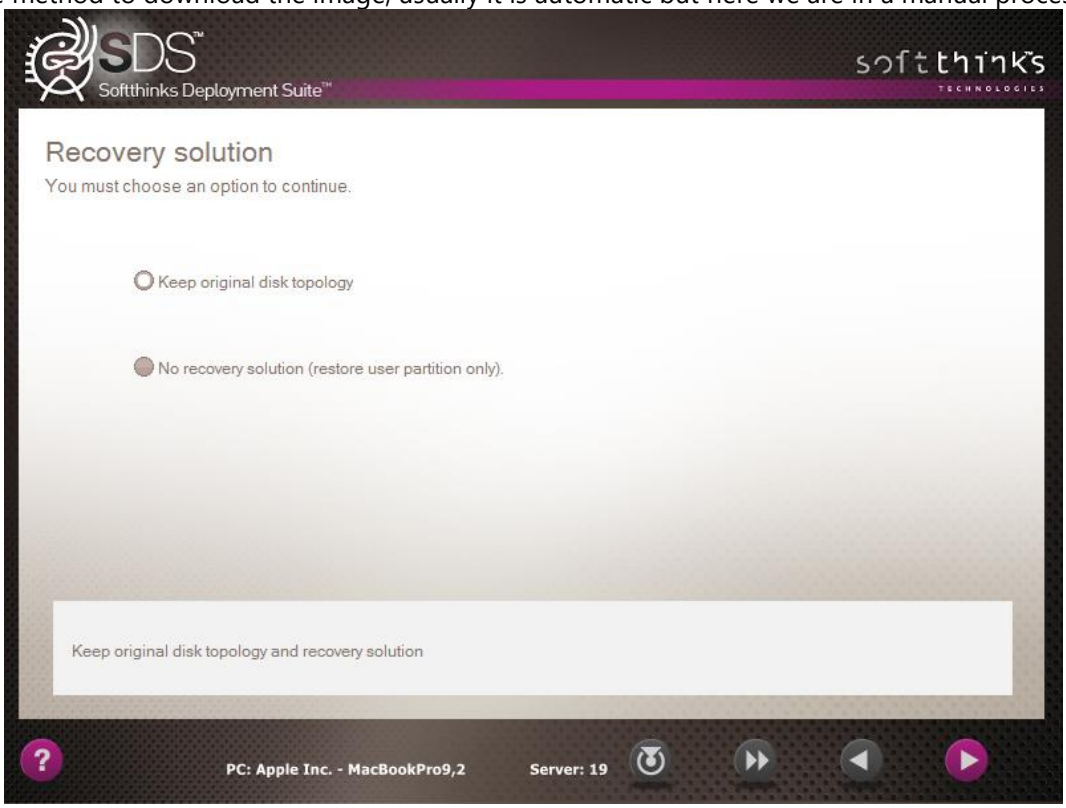
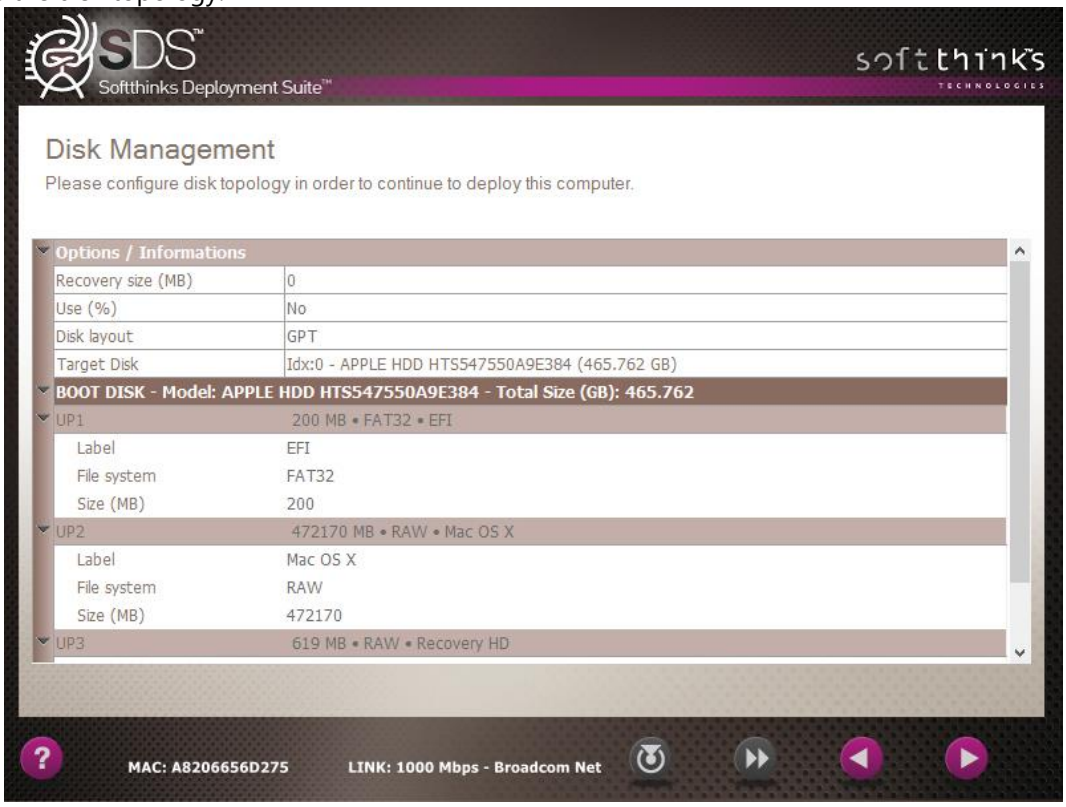
3. Select the method to download the image, usually it is automatic but here we are in a manual process:



4. Configure the disk topology:



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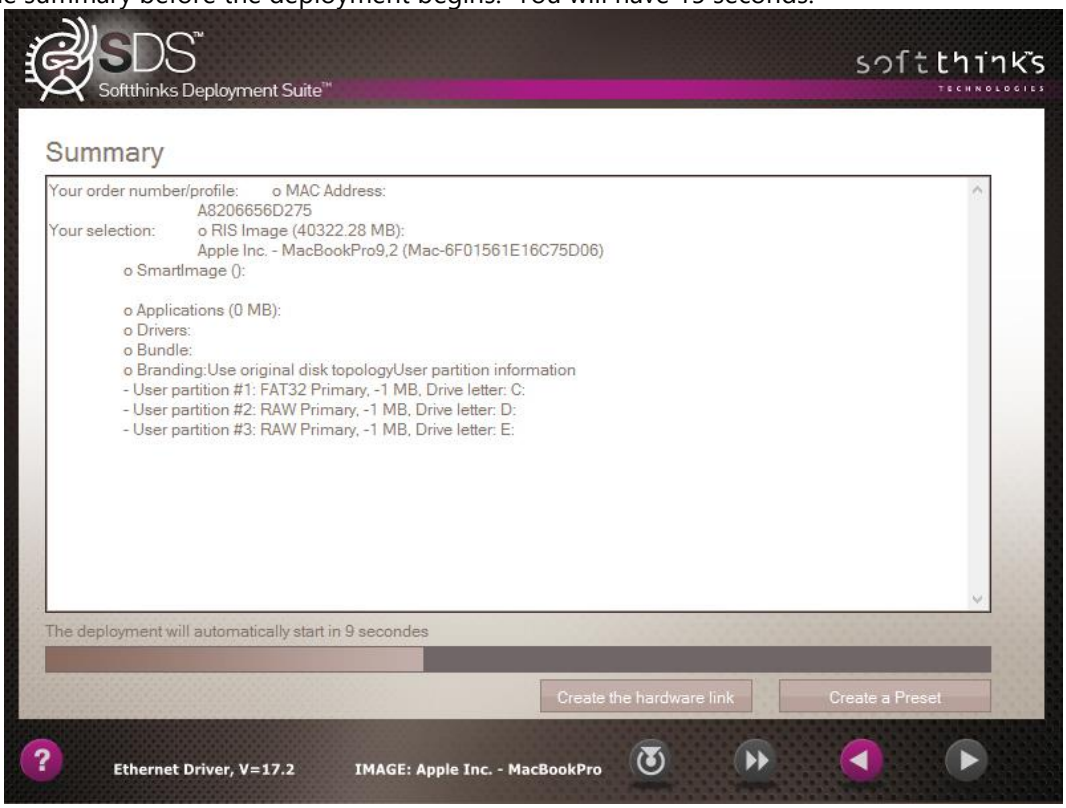
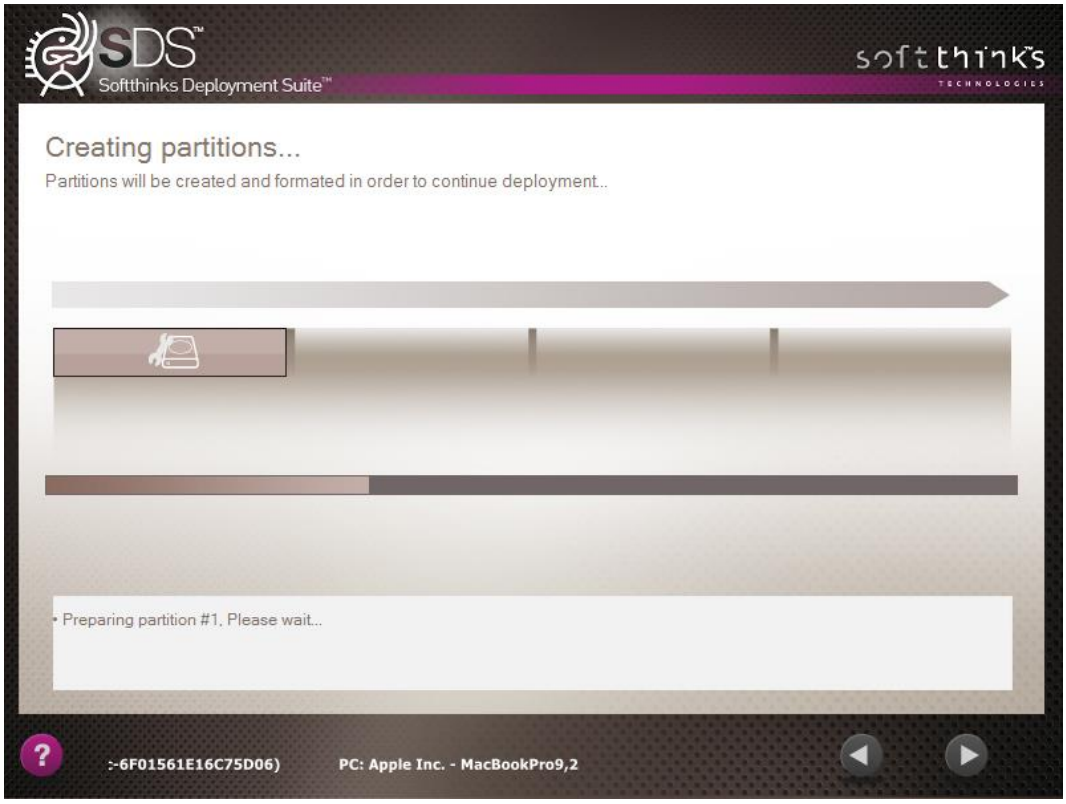
5. Review the summary before the deployment begins. You will have 15 seconds:



6. Partition creation:



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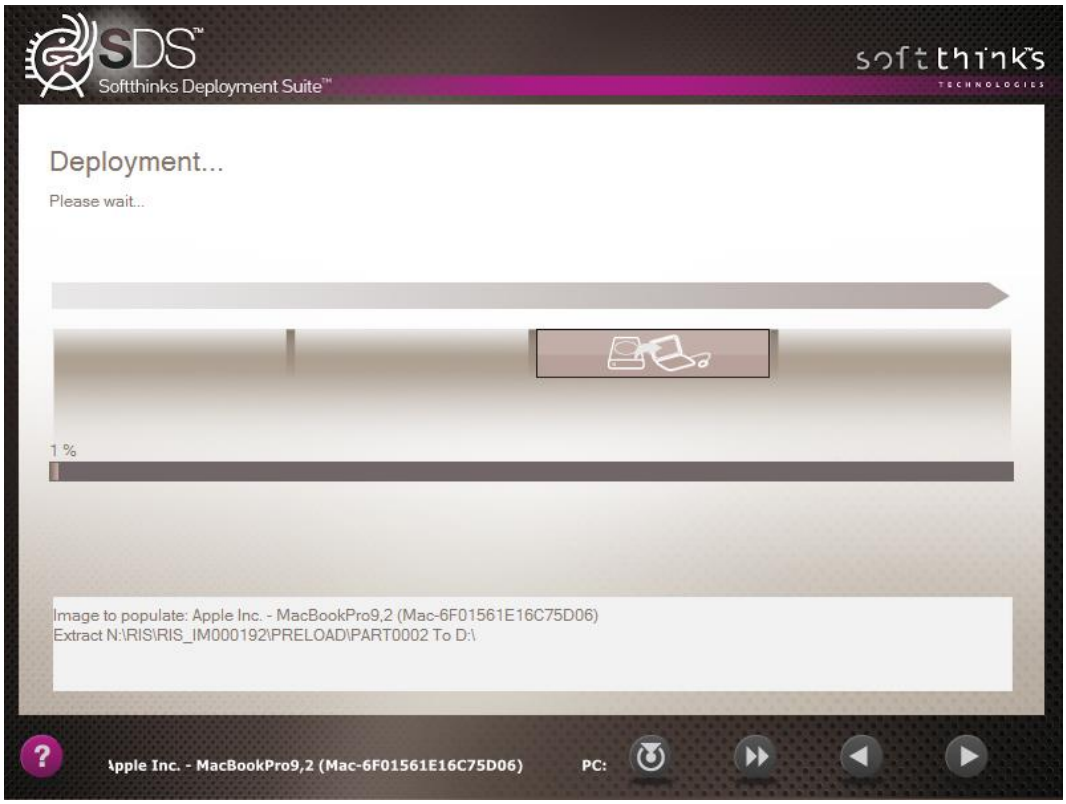
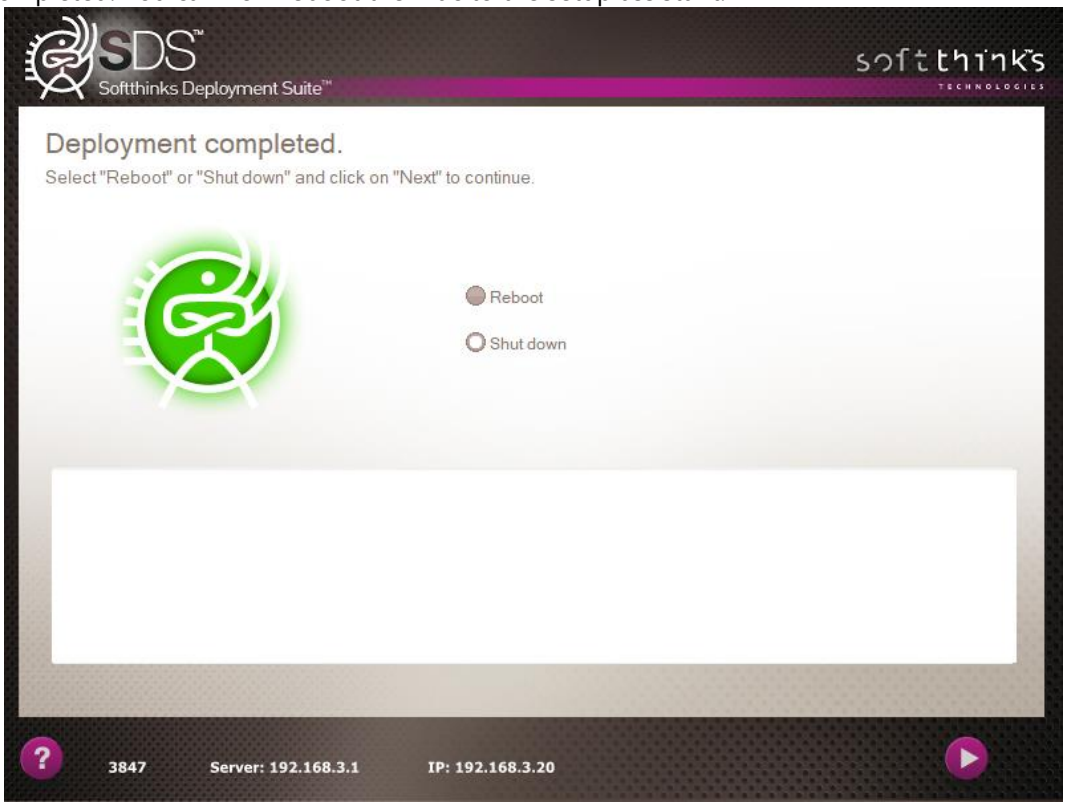
7. Image restoration:



8. Process completed. You can now reboot the Mac to the setup assistant:



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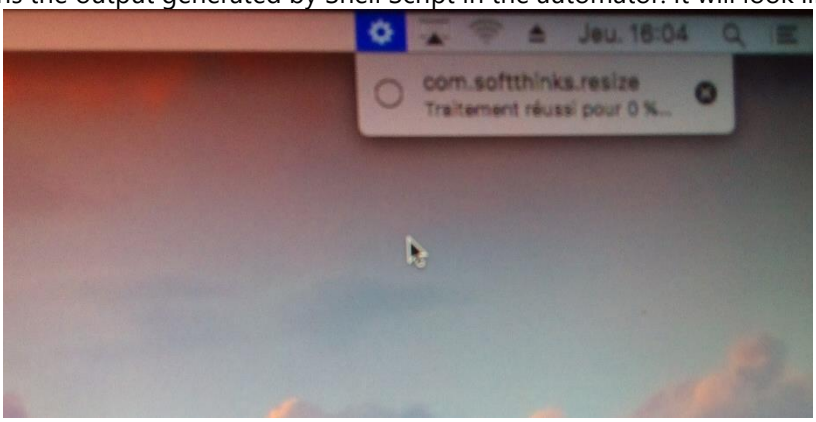
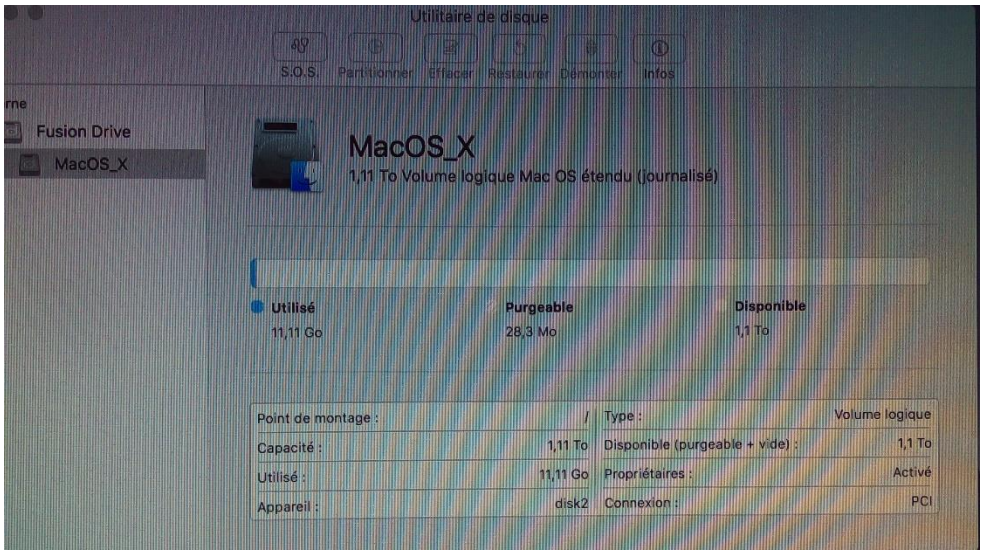
9. On first boot, once the user has setup his account, the setup assistant will be executed and the System Volume will be extended to its maximum size available. A file ResultResize.txt will be created in Library folder of the current user (~/Library). It contains the output generated by Shell Script in the automator. It will look like those 2 pictures:





You can see that our image of 32GB by disk is expanded to the whole disk capacity of 1.1TB.

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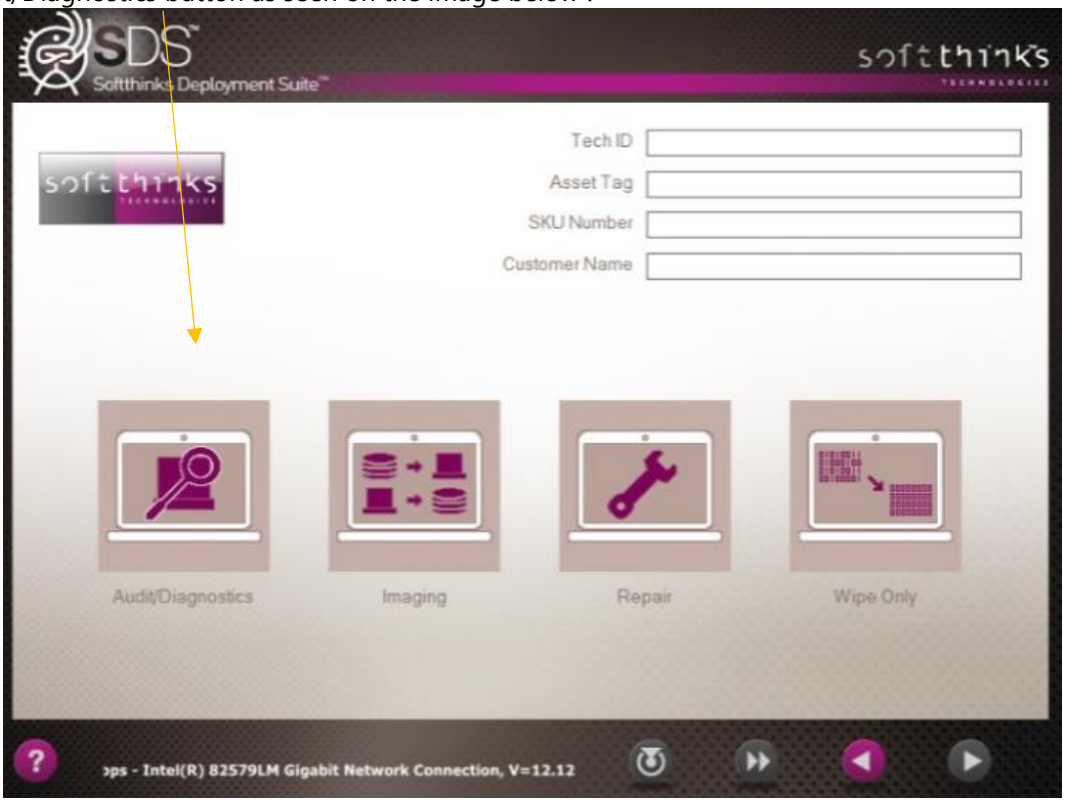
Auditing and/or Diagnosing a Windows or Mac OS device

1. Click the Audit/Diagnostics button as seen on the image below :



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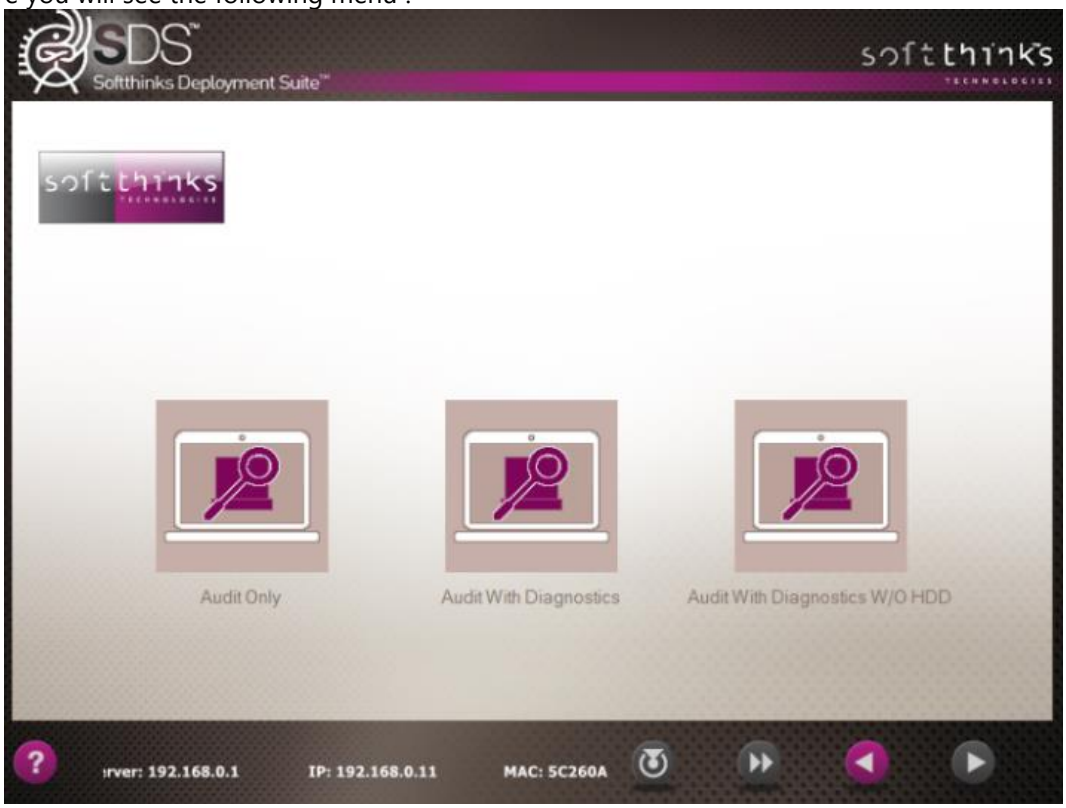
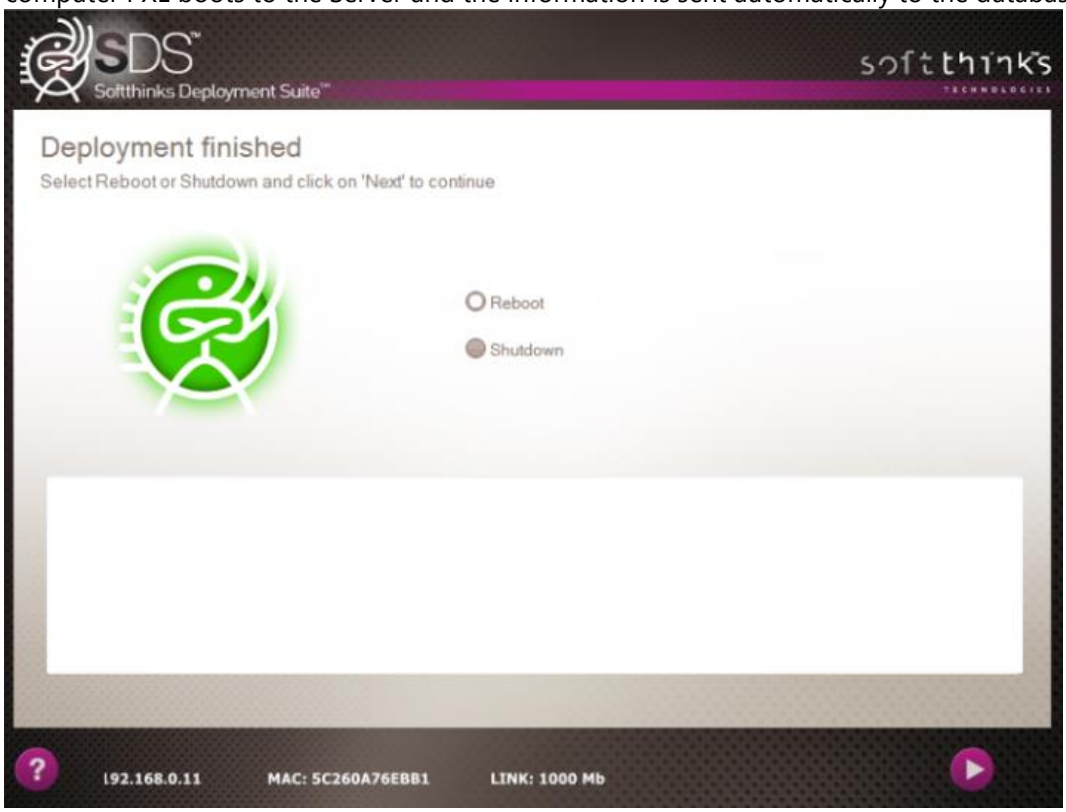
2. From there you will see the following menu :



3. Clicking on the Audit Only button will take you to the Deployment Finished screen as the Audit is acutally completed when the computer PXE boots to the Server and the information is sent automatically to the database:



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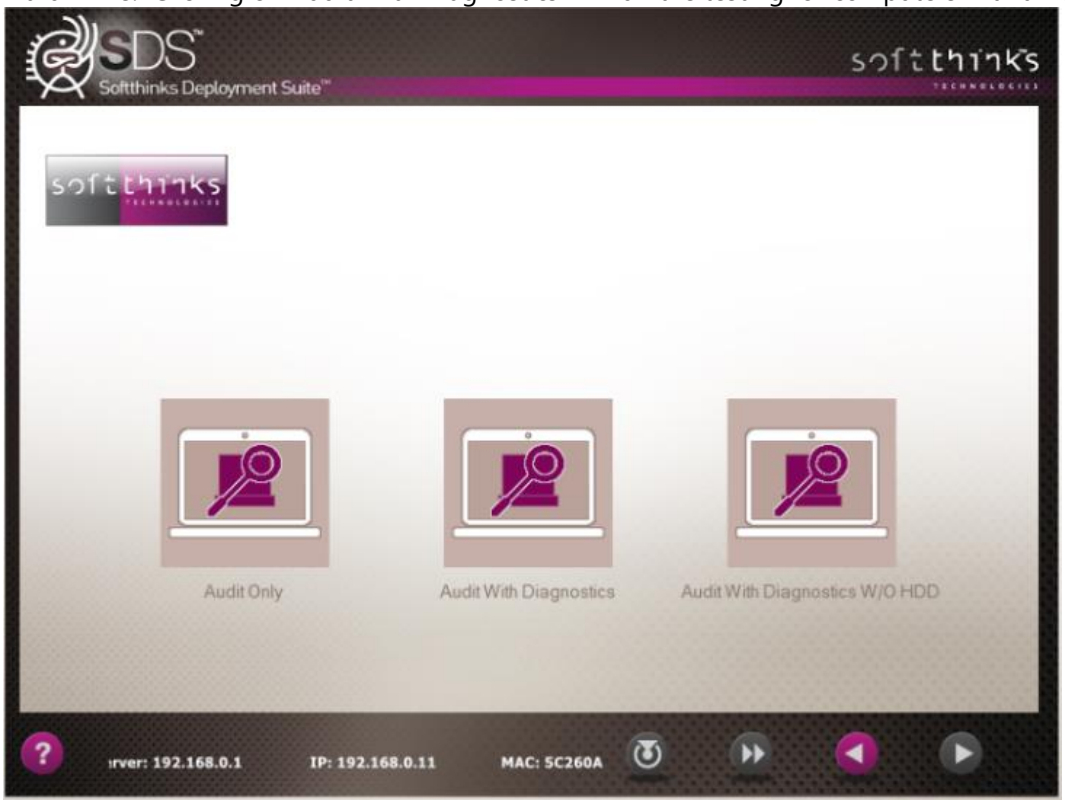
4. You do not need a Hard Drive in the computer to run the SDS software on it. You can diagnose a computer with or without a Hard Drive. Clicking on Audit With Diagnostics will run the testing for computers with a Hard Drive.



5. The first test will be a SMART test for the Hard Drive if the SMART Technology is present in the Hard Drive. If SMART Technology is not available on the Hard Drive, it will perform a random 5% Read/Write sampling of the Drive.

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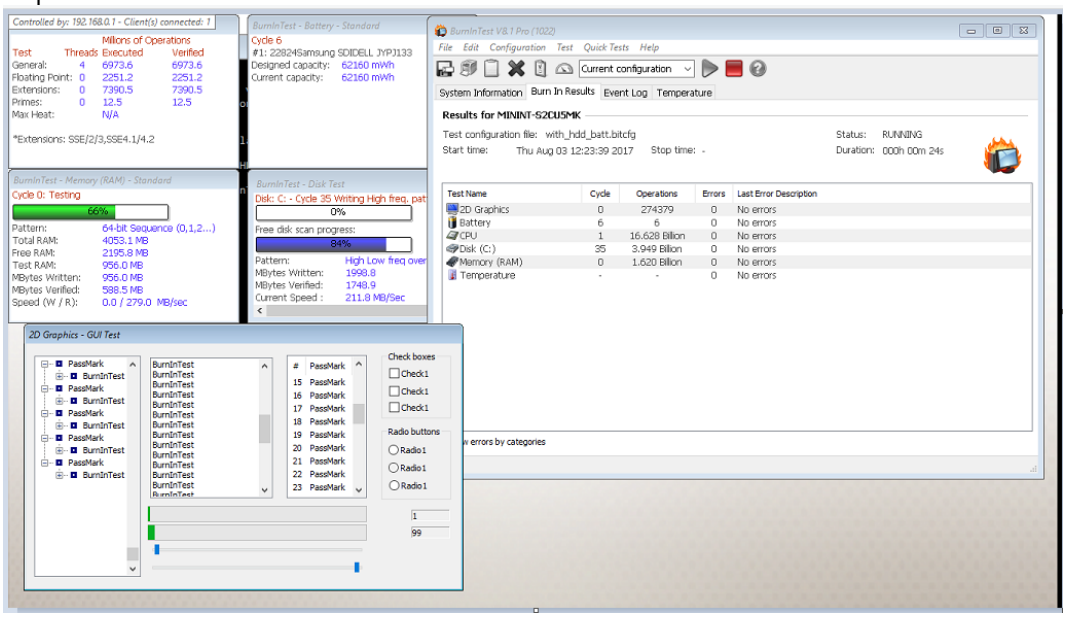
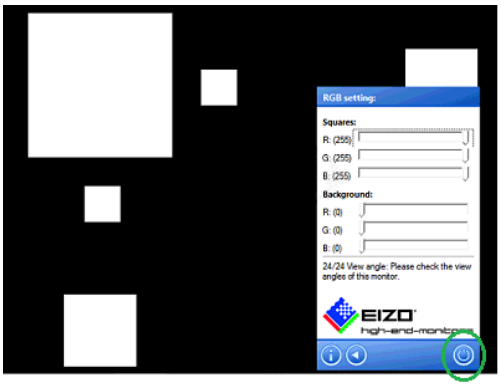
6. Once the SMART testing is completed, then the BurnInTest will start. These tests will run simultaneously and independently from the technician. This can be modified to test any component that is not driver related (CPU, RAM, Hard Drive, Battery, Temp, 2D Graphics, Keyboard, etc.), and will run for as long as you want with as much stress as you want to put on it.



7. Tests not shown above that can be run before the simultaneous testing begins include the Eizo Monitor test :

To perform this test, select the play arrow in the lower right corner. This will start a series of display tests such as color display and dead pixel identification, and etc.
On the final screen below you will select the “close” button highlighted below to move to the next set of testing.



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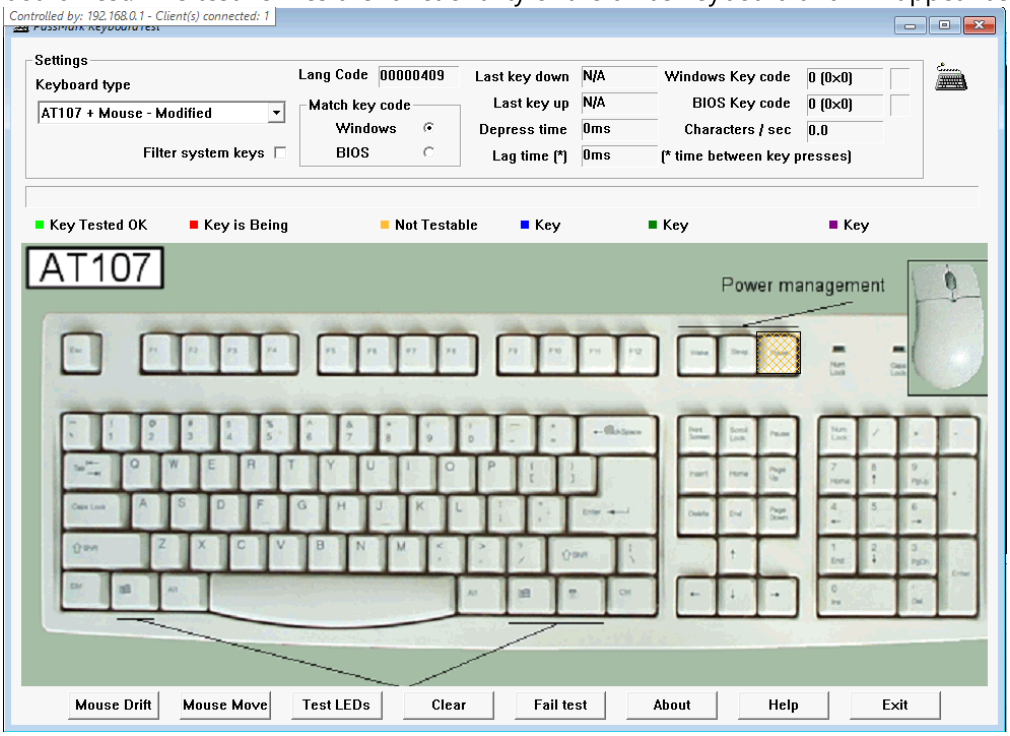
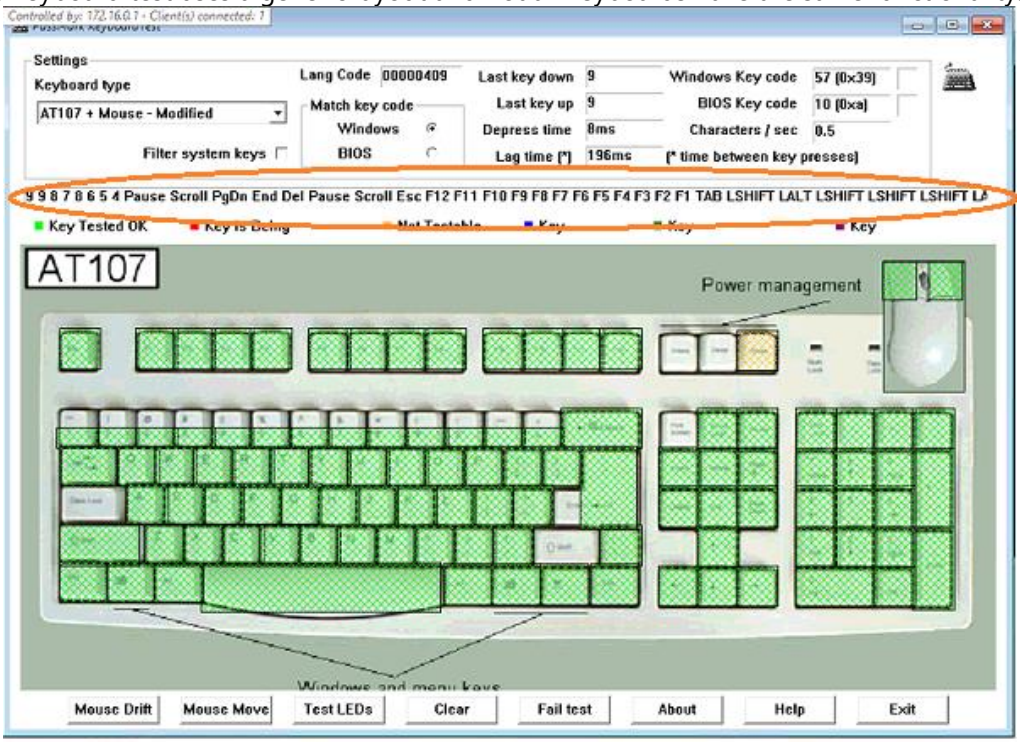
8. And the Keyboard Test. This test verifies the functionality of the unit's keyboard and will appear as the image below:



For this test you will click the touchpad buttons and press all keyboard keys and watch the screen for a response to the corresponding keystroke. You will also be able to see the keystroke in the area of the test circled in the next image. This image is an example of a passed keyboard. Notice that not all keys are highlighted in Green. This is because the keyboard test uses a generic layout and not all keyboards have the same functionality.



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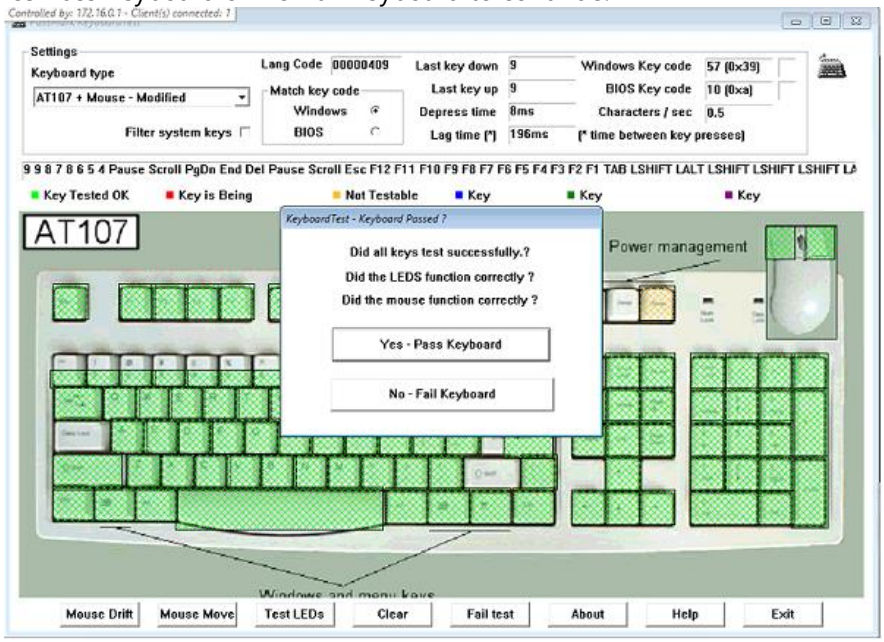
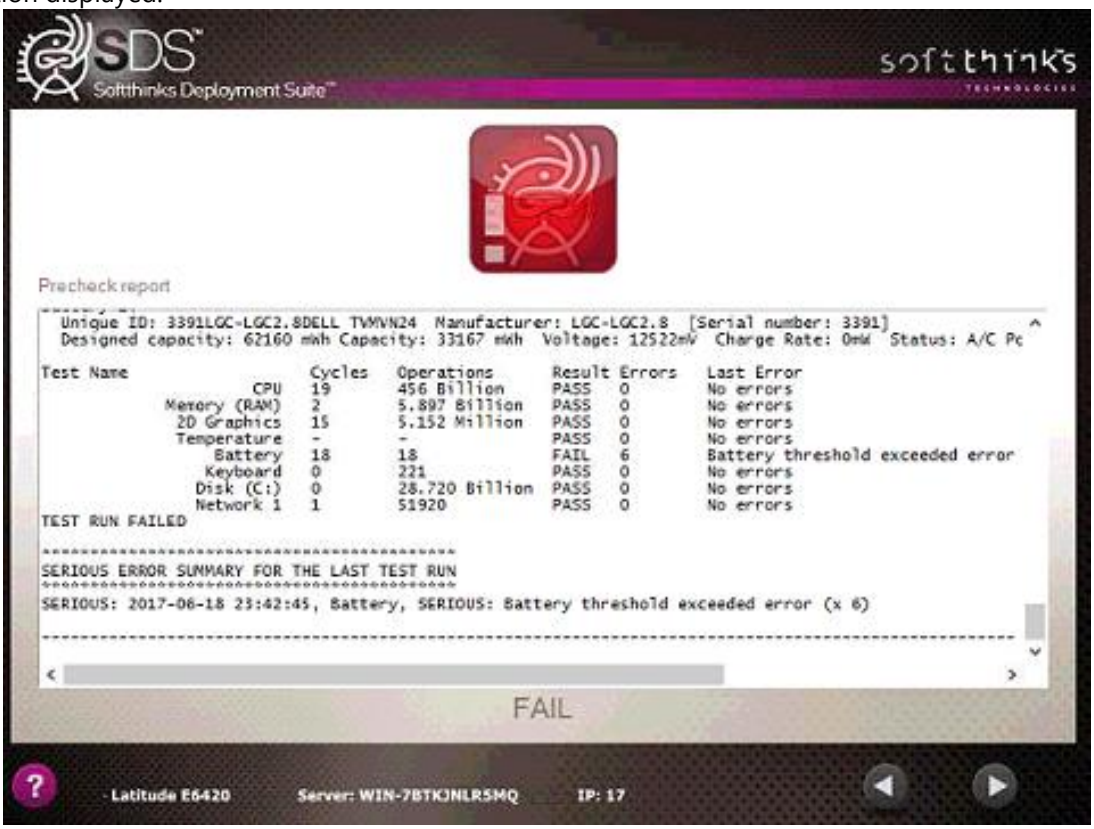
Once the Keyboard test has been completed select EXIT in the lower right corner on the screen. This will bring up the following: Select Yes-Pass Keyboard or No-Fail Keyboard to continue.



9. After the testing is completed, if a test fails you will see a screen similar to the one below: The one below is for a Battery that failed for not being able to charge past 75% of its battery threshold.
   At this point the system will not continue. You will have to shut down the unit manually after you review the information displayed.



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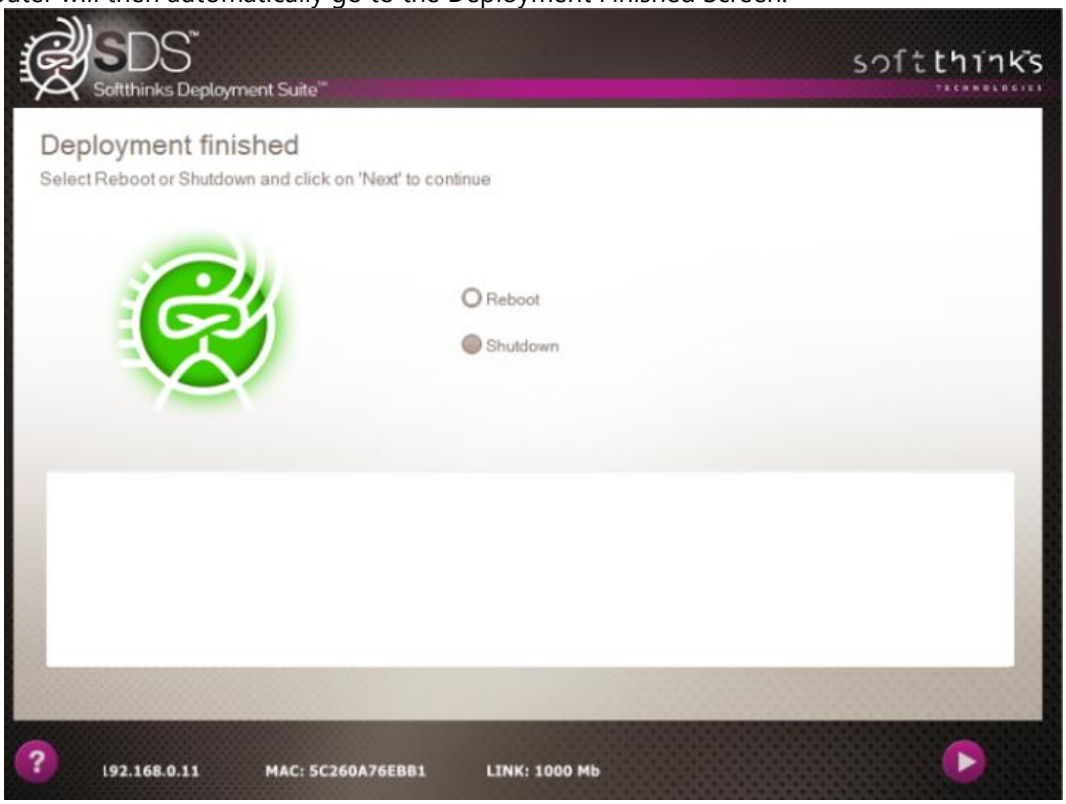
10. If the unit passes all tests the following screen will be displayed:

11. The computer will then automatically go to the Deployment Finished Screen:



You can then choose to Reboot or Shutdown the computer at this point.

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Wiping a device

SDS wiping process is certified by ADISA:

16 Wiping Protocols Available

0 - Basic 0
1 - Basic random character
2 - U.S. Standard, DoD 5220.22-M
3 - U.S. Standard, DoD 5220.22-M (e)
4 - U.S. Standard, DoD 5220.22-M (ECE)
5 - US Army AR380-19
6 - Peter Gutmann
7 - Bruce Schneier
8 - German VSITR
9 - Russian GOST P50739-95
10 - NAVSO P-5239-26 (RLL)
11 - NAVSO P-5239-26 (MFM)
12 - Canadian RCMP TSSIT OPS-II
13 - US Air Force 5020
14 - U.S. Standard, DoE M205.1-2
15- Delete Partitions

1004 Units	Time in mn (1TB SATA)
Min	29
Max	149
average	137

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1. Select the Wipe Only Button from the Welcome Screen:

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2. Once this button is selected the computer will advance to the screen below. Here you will have a choice to make: SoftThinks ADISA Certified Single-Pass Basic 0 wipe, or the 3-Pass U.S. Standard, DoD 5220.22-M wipe. You will also have the choice to do the wiping with or without hardware testing of the computer or Array that the Hard Drives are in.

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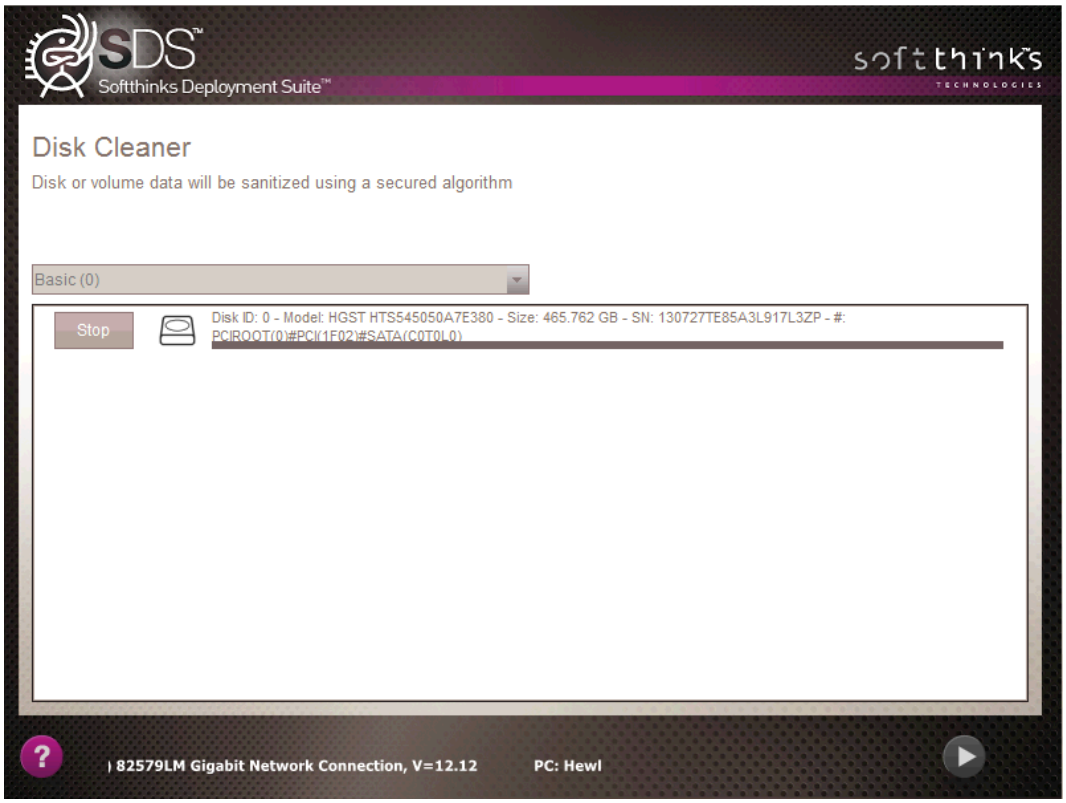
11. This screen displays the Hard Drive information and progress of the wipe. Any Hard Drive that is found in the computer will be wiped with the same protocol and listed below. The STOP button will cancel the wipe in progress. If successful, a screen will pop up with a “green” pass symbol. If the wipe fails for any reason the “red” fail symbol will display.



12. The exception to this screen is if you are using one of our 24-port Wipe Arrays (compliant CSMI). The Wipe Arrays can be purchased from SoftThinks or we can tell you the components needed to build them yourself.

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Quality Check with Windows Test Manager

Windows Test Manager will allow you to conduct tests on the computers. It replaces devlog.exe and dev.ini
You can check if the devices drivers are installed and signed. Test your network, multimedia... and you can also add custom tests.

WinTEST can be automated and perform the tests automatically if they don't require user interaction.

Windows check

This window will check your device manager if all the devices drivers are signed and if there are no error:

In case you have an error, the device manager will open:

- To check if the drivers are signed. To get more details click on "Display logs"
- To check if there are no error in the event viewer. To get more details click on "Display the event viewer"

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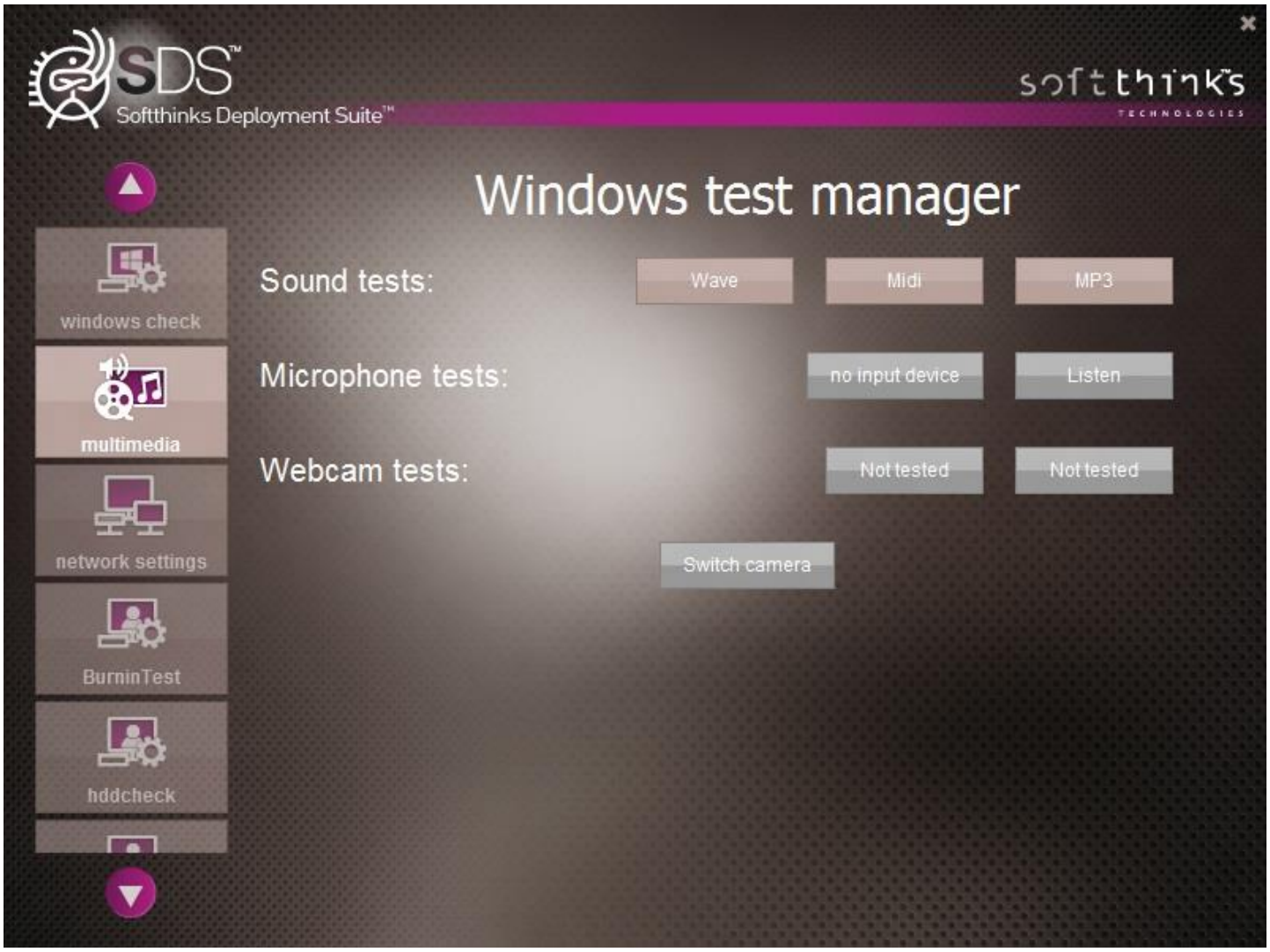
Multimedia

In this window, you will check the multimedia test.

- Sound : wave, midi, mp3
- Mic : record and listen to it
- Webcam: record and watch it.



In manual mode, you need to test EVERYTHING to go to the next step

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Network Settings

In this window, you will check the networks.

- The available wireless networks
- All other networks

You can also click on « **Edit** » if you need to enter the security key

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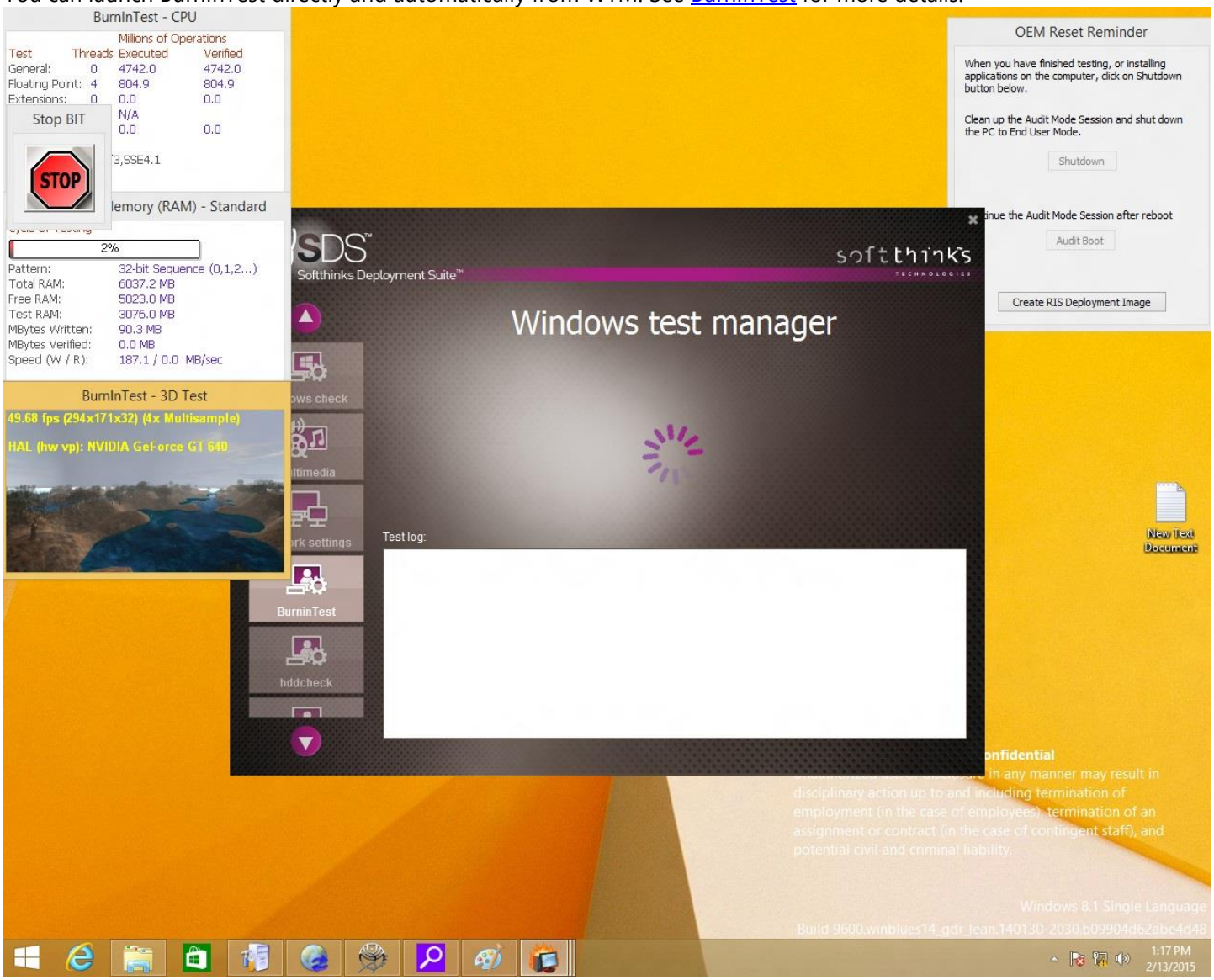
BurnInTest (as OEM tests for example)

You can launch BurnInTest directly and automatically from WTM. See BurnInTest for more details.



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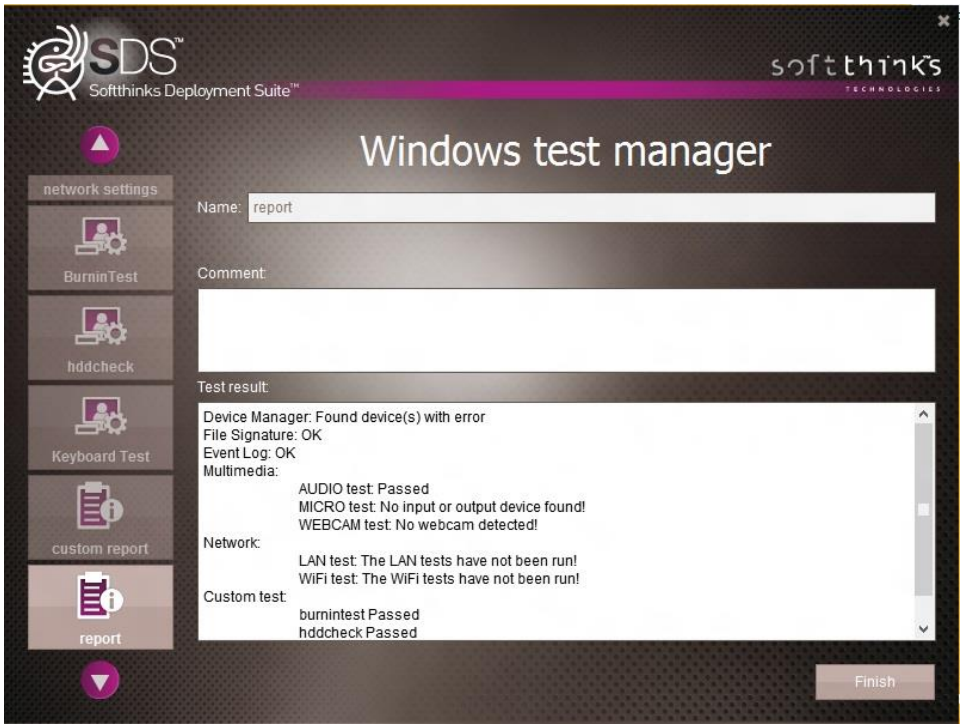
At the end of the test, the process generates a log file.

Reports



In this window you have to name the report that was created. You can also add a comment.

If you click on “finish”, a report (**WindowsTestManager log.xml**) will be created and sent to the server.

In auto mode all windows are switched automatically and this windows is automatically filled and logs are uploaded on server .

Please consult How to manually edit WTM configuration files in order to customize your tests manually.

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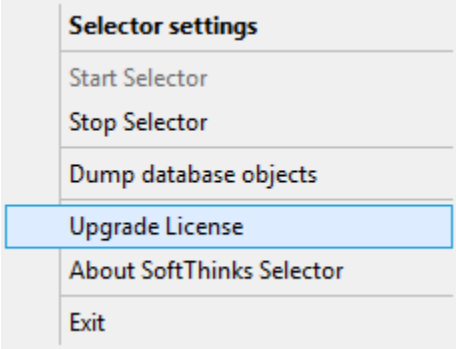
License reactivation

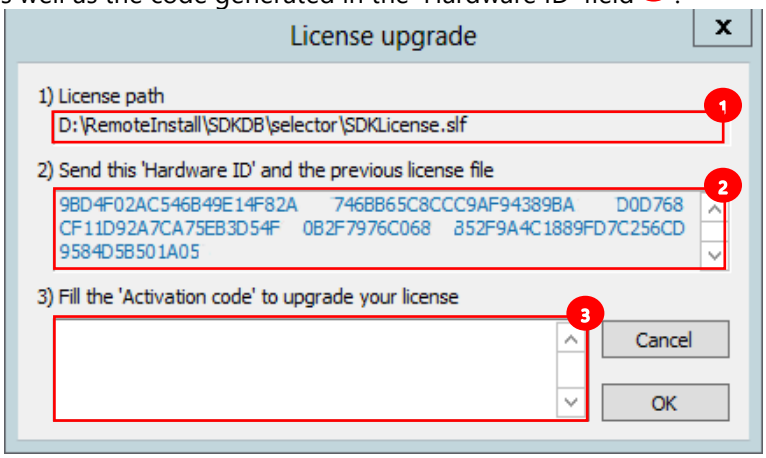
Once your license has expired, you can reactivate it by following the instructions below:

1. Click on the icon in the system tray of the Windows taskbar. If this icon is not present, double-click on SelectorSRVG.exe executable located in D:\remoteInstall\SDKDB\selector and wait for the icon to appear before clicking on it.

2. In the contextual menu appearing, click on “Upgrade license”:



3. Send an email to your account manager with the SDKLicense.slf file located in the ‘License path’ (1) indicated in the dialog screen below, as well as the code generated in the ‘Hardware ID’ field (2):



4. Enter the code which will be sent to you in the ‘Activation code’ field (3).

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Troubleshoot guide

Symptom	Potential root cause	Solution
Network error during the deployment to a device	Network driver missing in the boot image	1. Ensure that the driver for the network card you are using is in SDS Database. If not, please add it (See Adding a driver ("Add driver" operation)). 2. Then, please inject it in your boot image (See Injecting a driver ("Inject Driver(s)" operation))
Error connecting to WDS server share while booting on a device	Server credentials might have changed	1. Review and update if needed the server credentials as described in Configure the Deployment launcher
Nomad Disk not recognized		1. Open the SDS Console 2. Click on the « Utilities » tab 3. Click on « USB stick report » 4. Scan the disks

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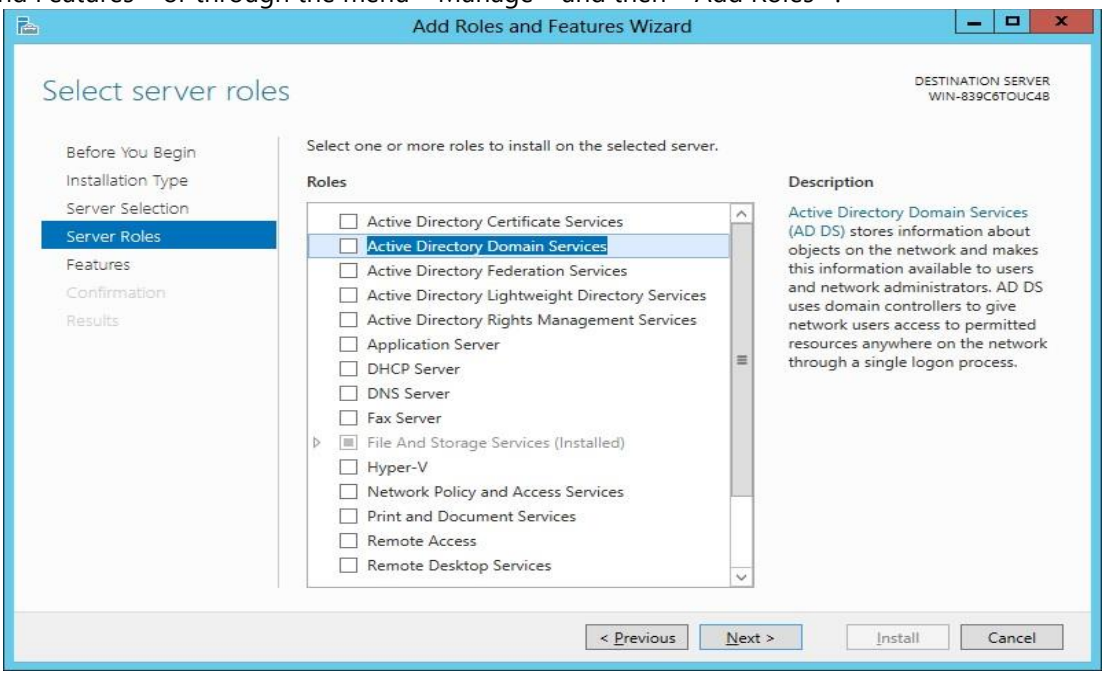
Appendix

How to configure Windows Server

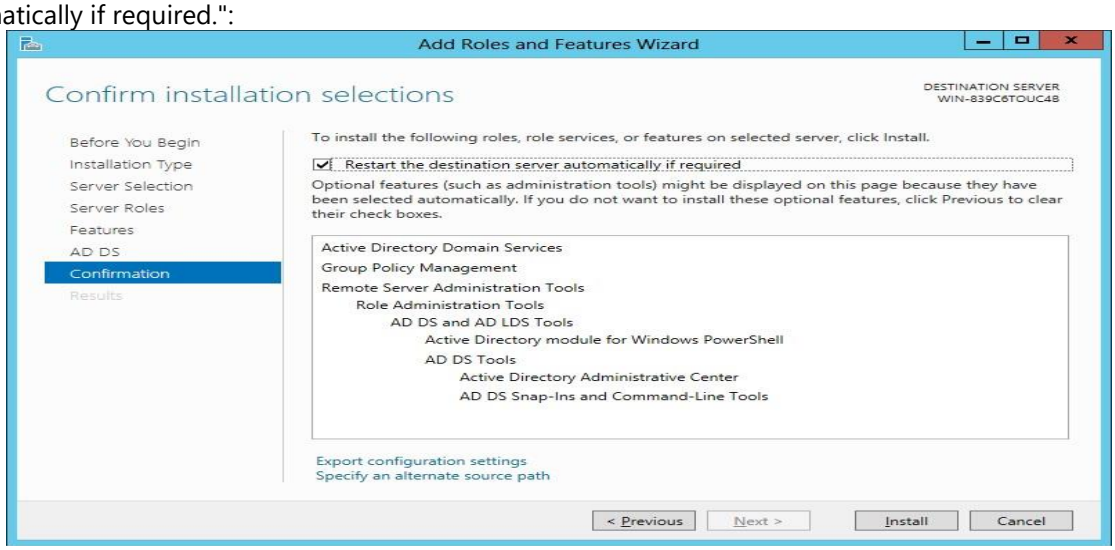
The screenshots below might change depending on the Windows Server version used.

Active Directory domain services

1. Open the Server Manager Dashboard, install « AD DS Services » or « Active Directory domain services » by clicking on « Add Roles and Features » or through the menu « Manage » and then « Add Roles »:



2. Click on Next until reaching the Confirmation screen and put a Check in the box which says "Restart the Destination Server Automatically if required.":



3. Select Yes on the confirmation box, then click Install on the main screen. Click close when it has completed installing.

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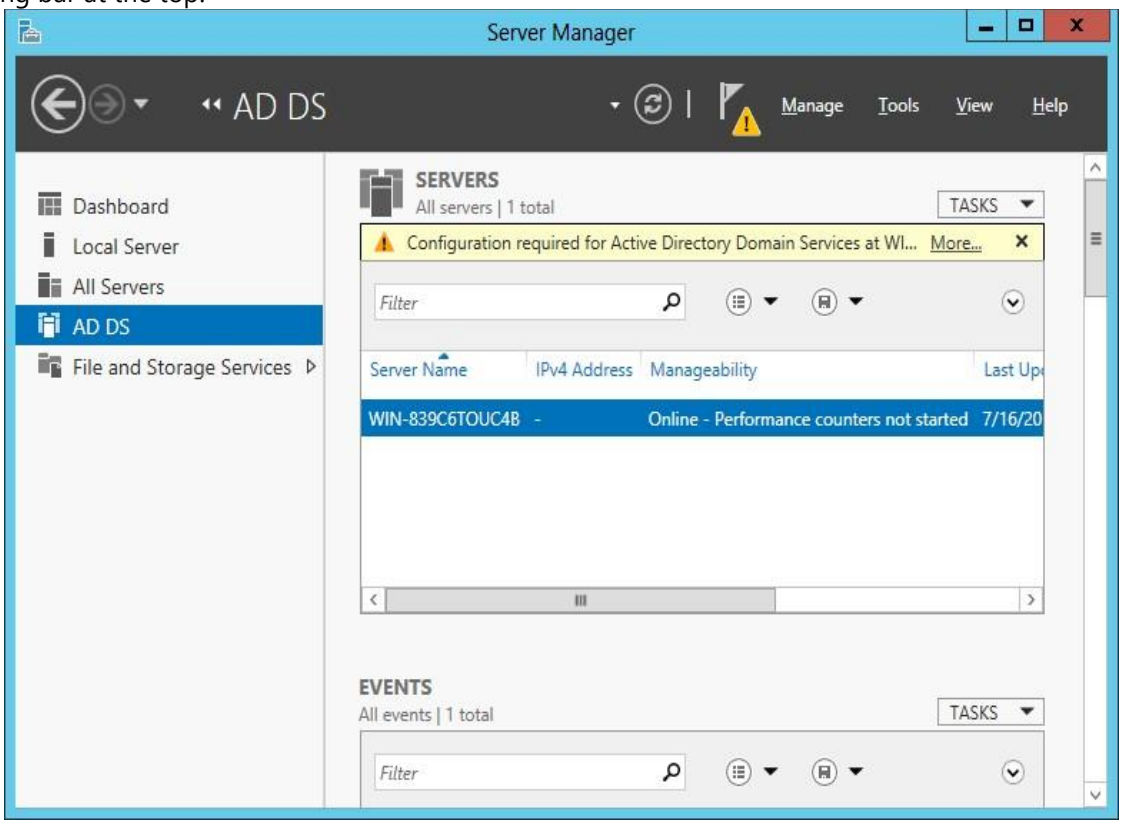
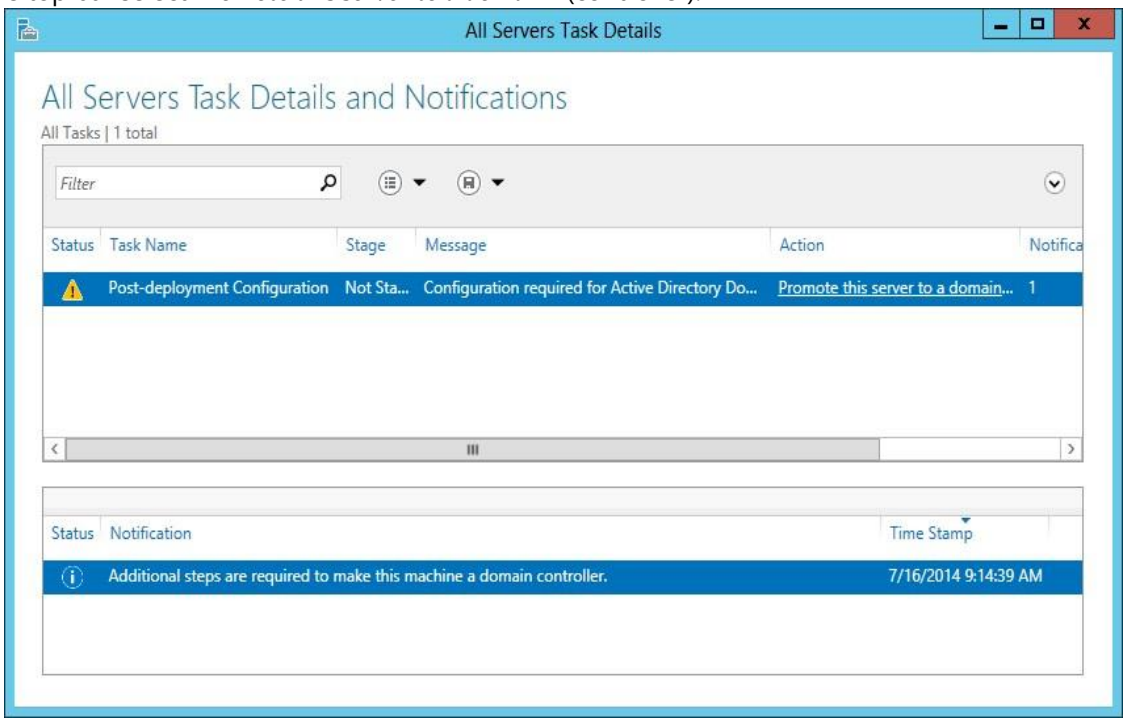
4. In Roles and Server Groups on the Server Manager Dashboard Click on the AD/DS box and Click *More* on the yellow warning bar at the top:



5. On the top bar select *Promote this server to a domain...*(controller):



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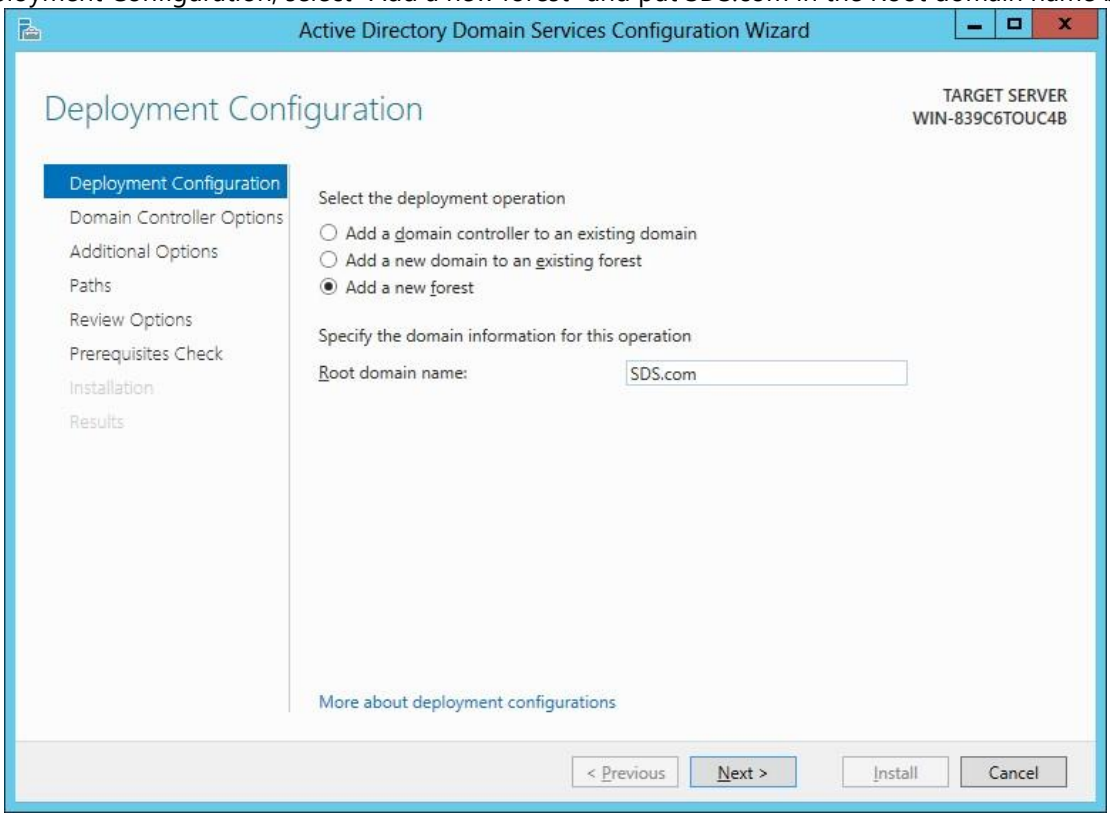
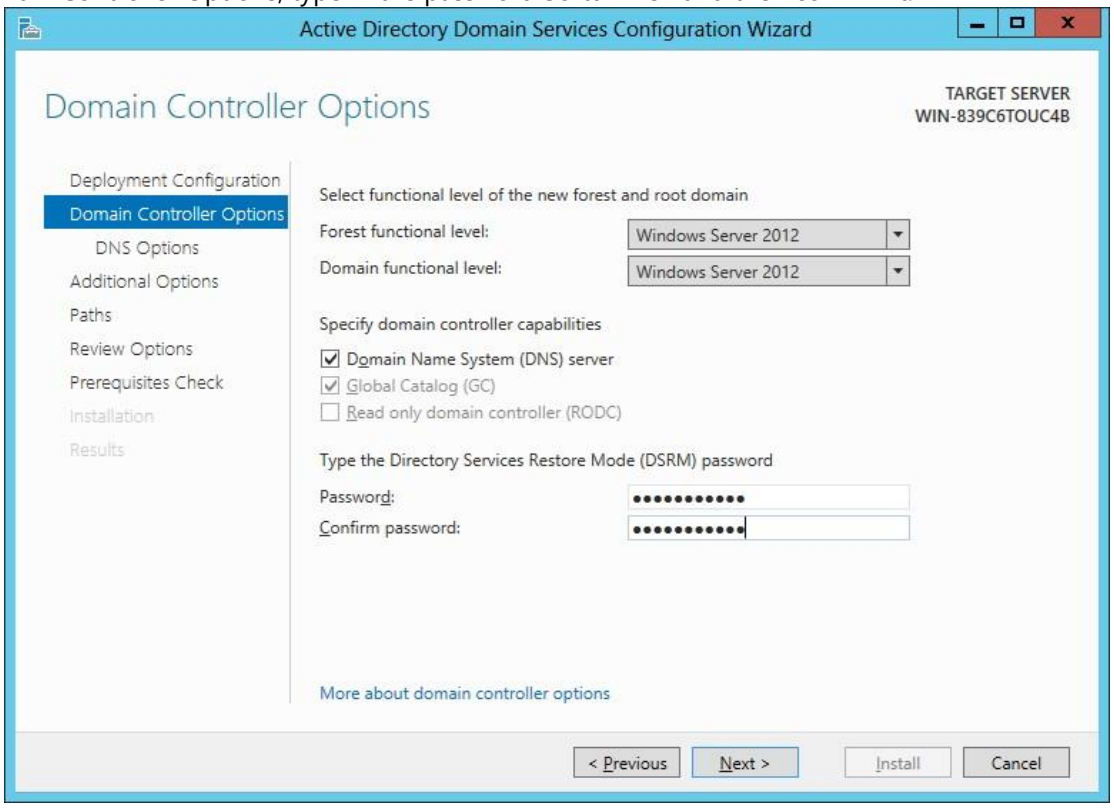
6. In Deployment Configuration, select “Add a new forest” and put SDS.com in the Root domain name box:



7. In Domain Controller Options, type in the password Softthinks1 and then confirm it:



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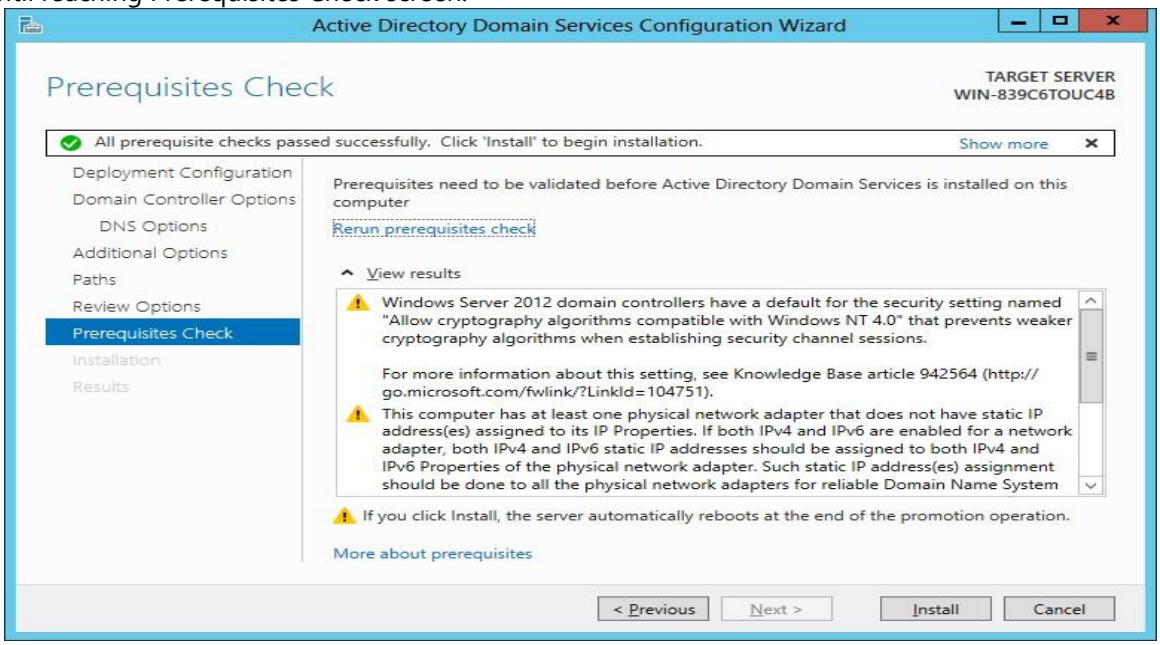
8. Click Next until reaching Prerequisites Check screen:



9. If all Prerequisite checks passed successfully then click Install. Note: You must have the NIC plugged into a switch or the TCP/IP check will fail.

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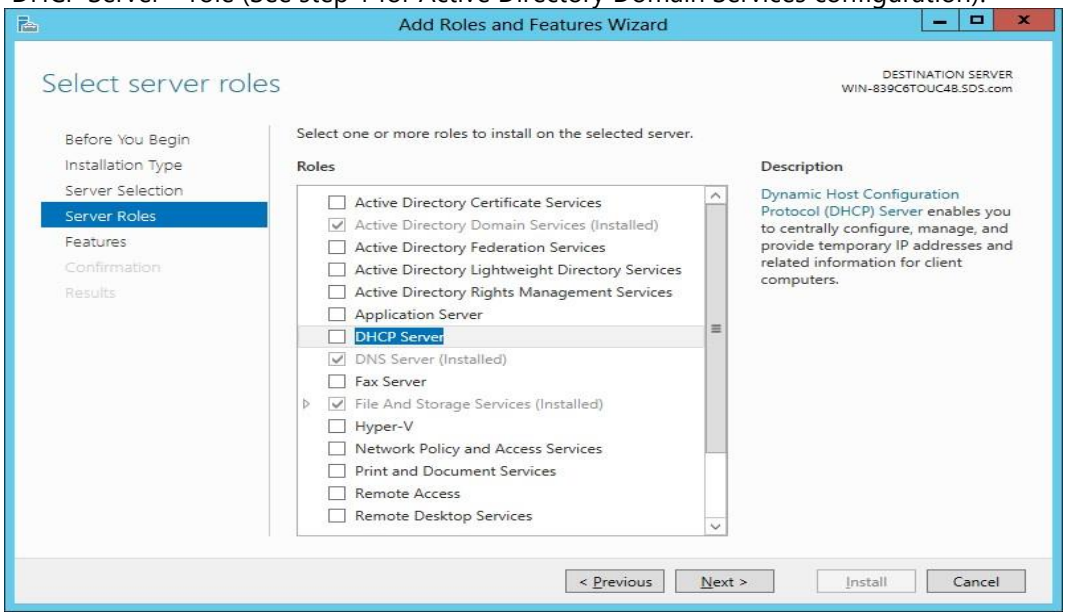
DHCP Server

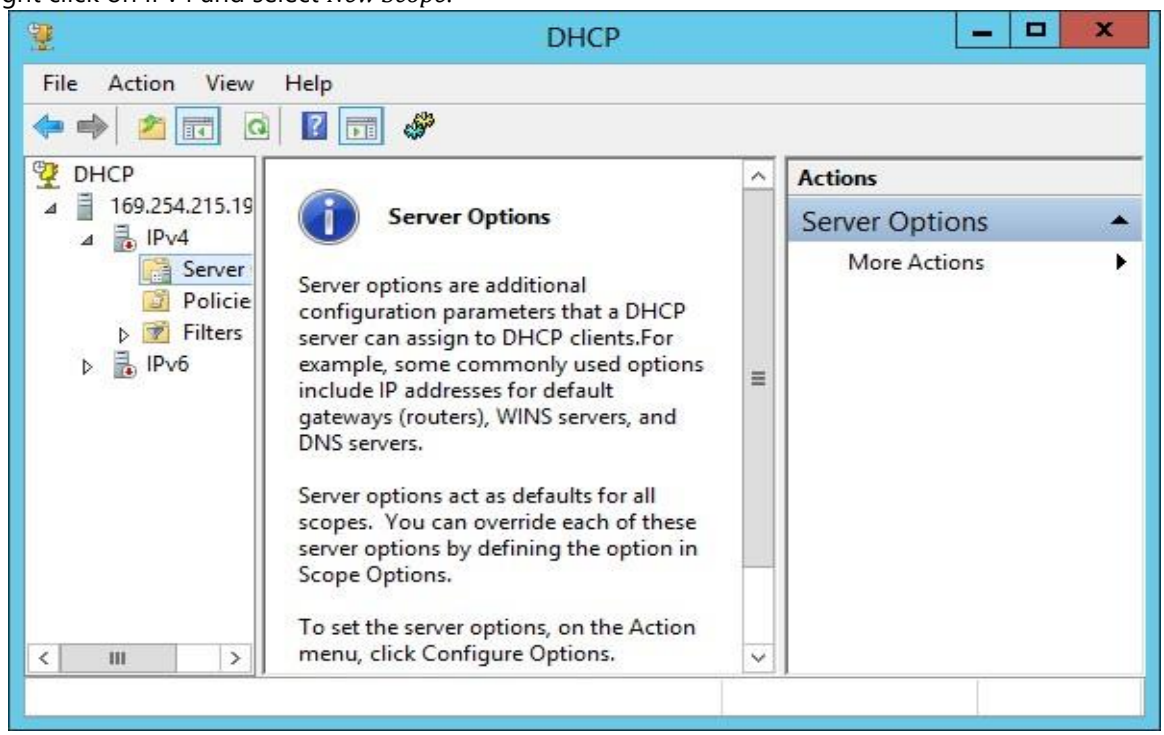
1. Ensure that the Ethernet connection is working

2. Add the « DHCP Server » role (See step 1 for Active Directory Domain Services configuration):



3. Follow the configuration wizard (let default values) and click on Install in the last screen after having checked the option "Restart the Destination Server Automatically if required."

4. From the Server Manager Dashboard Select Tools then *DHCP*, expand out the arrows for 169.254.xxx.xxx and then for IPv4. Right click on IPv4 and select *New Scope*:



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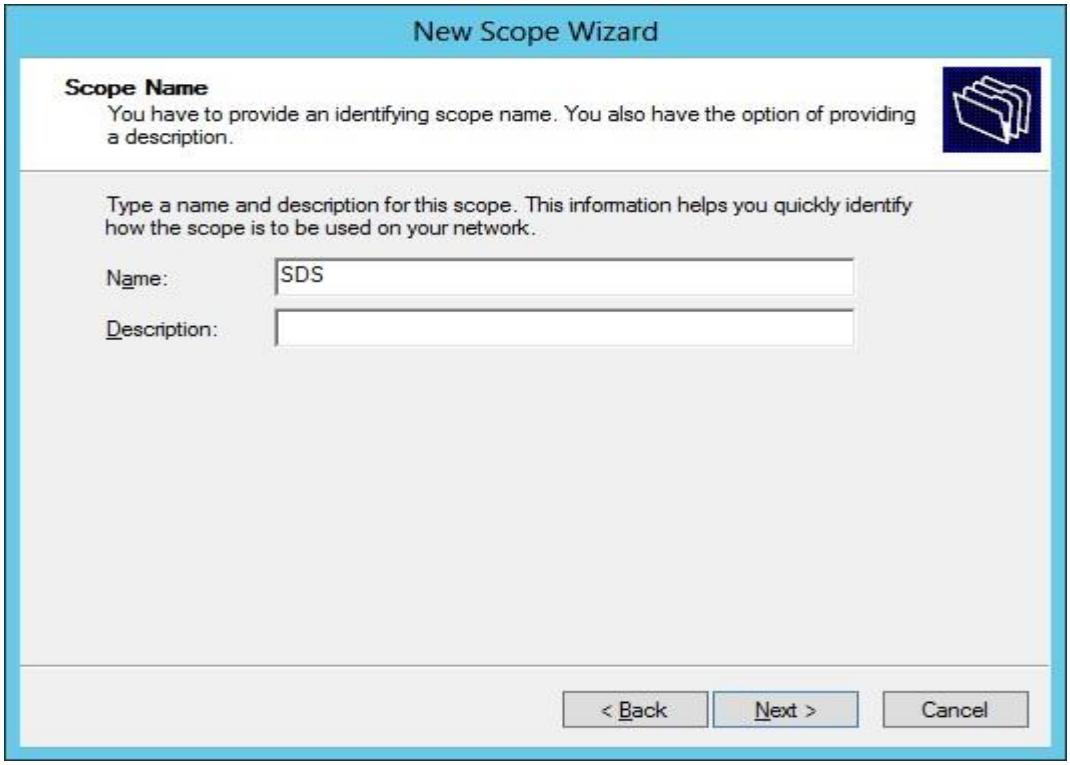
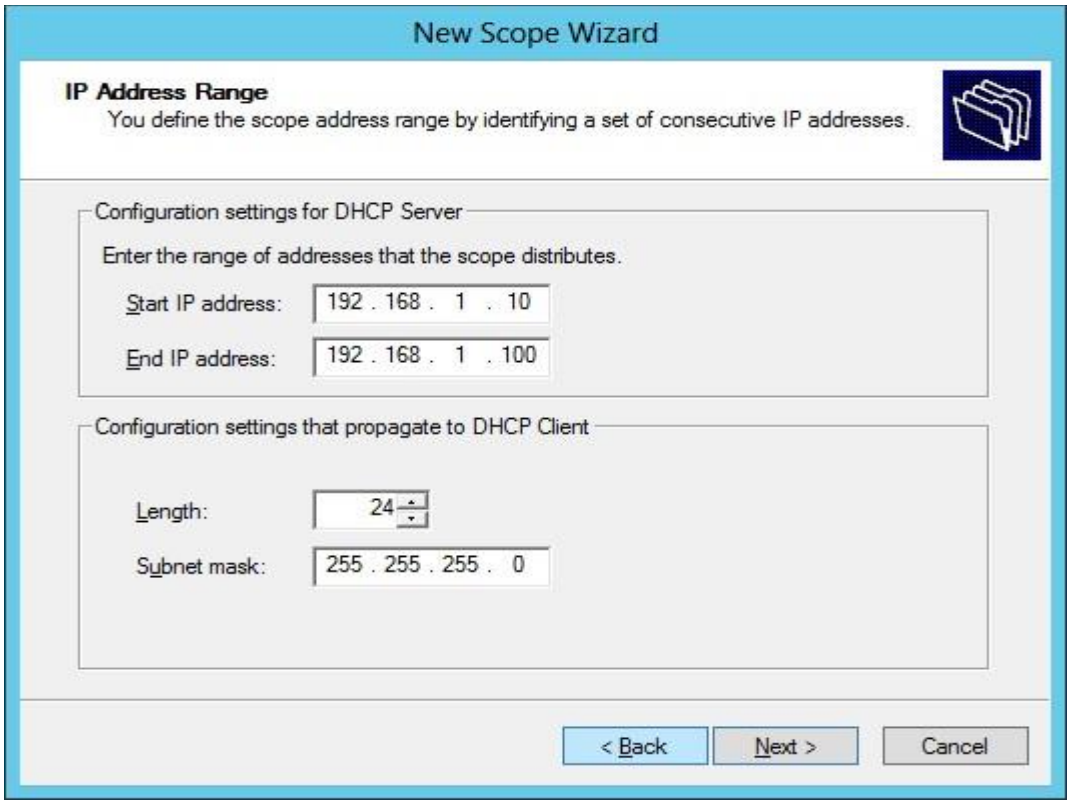
5. Type SDS in as the Name and click Next.



6. Type in Start IP address 192.168.1.10 and in End IP address 192.168.1.100:



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7. Click Next and Next Again and then set the Lease Duration to 4 hours

8. Click Next, Next, Next, Next, Next, Next, and then Finish. Close out of the DHCP Window.

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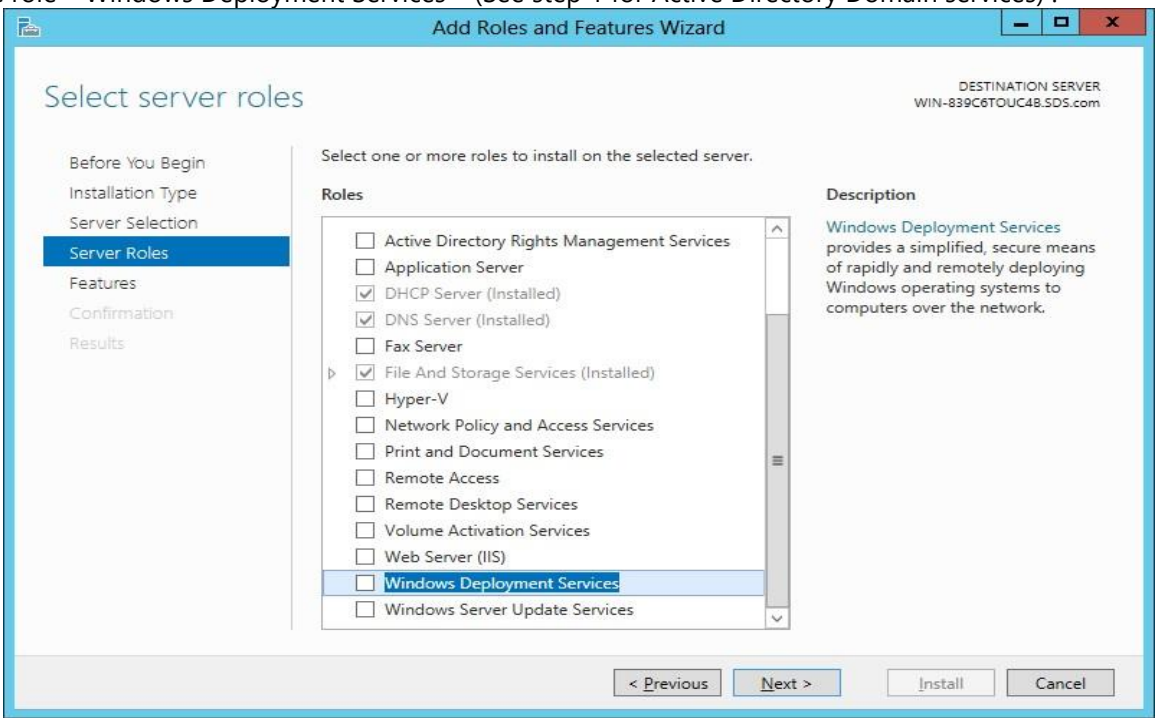
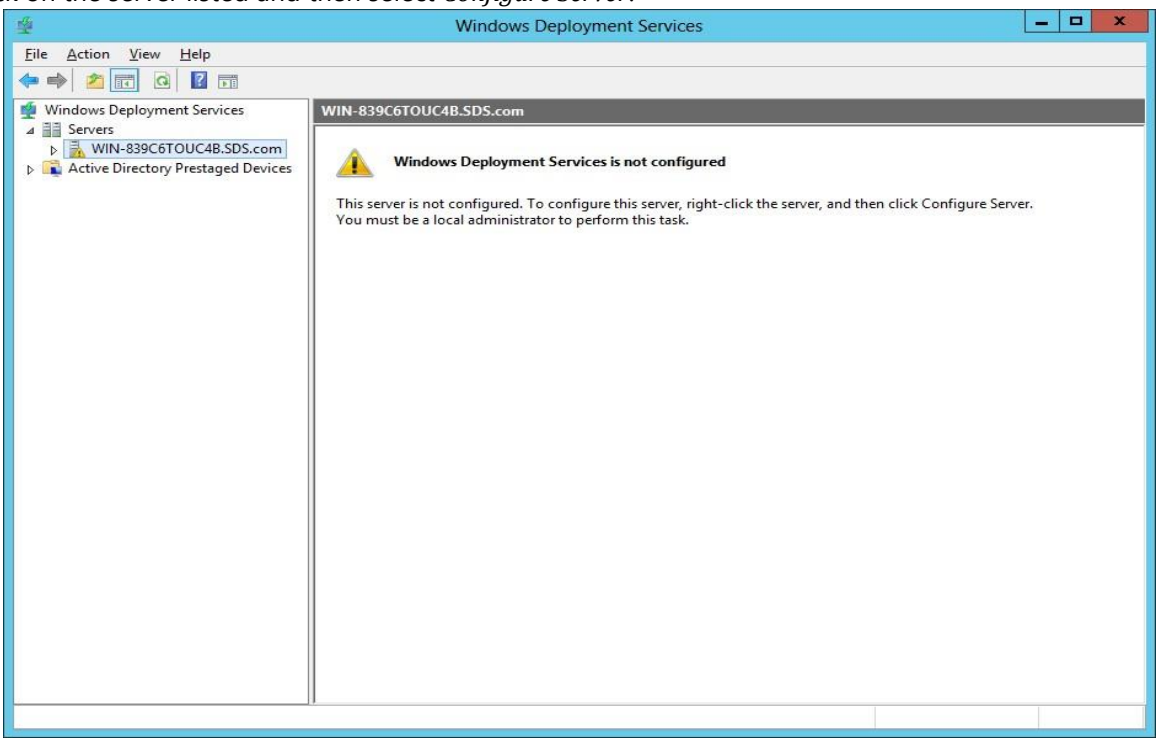
Windows Deployment Services

1. Add the role « Windows Deployment Services » (See step 1 for Active Directory Domain services) :



2. Follow the configuration wizard (let default values) and click on Install in the last screen after having checked the option "Restart the Destination Server Automatically if required."

3. From the Server Manager Dashboard Select Tools then *Windows Deployment Services*. Expand the arrow by Servers, right click on the server listed and then select *Configure Server*:



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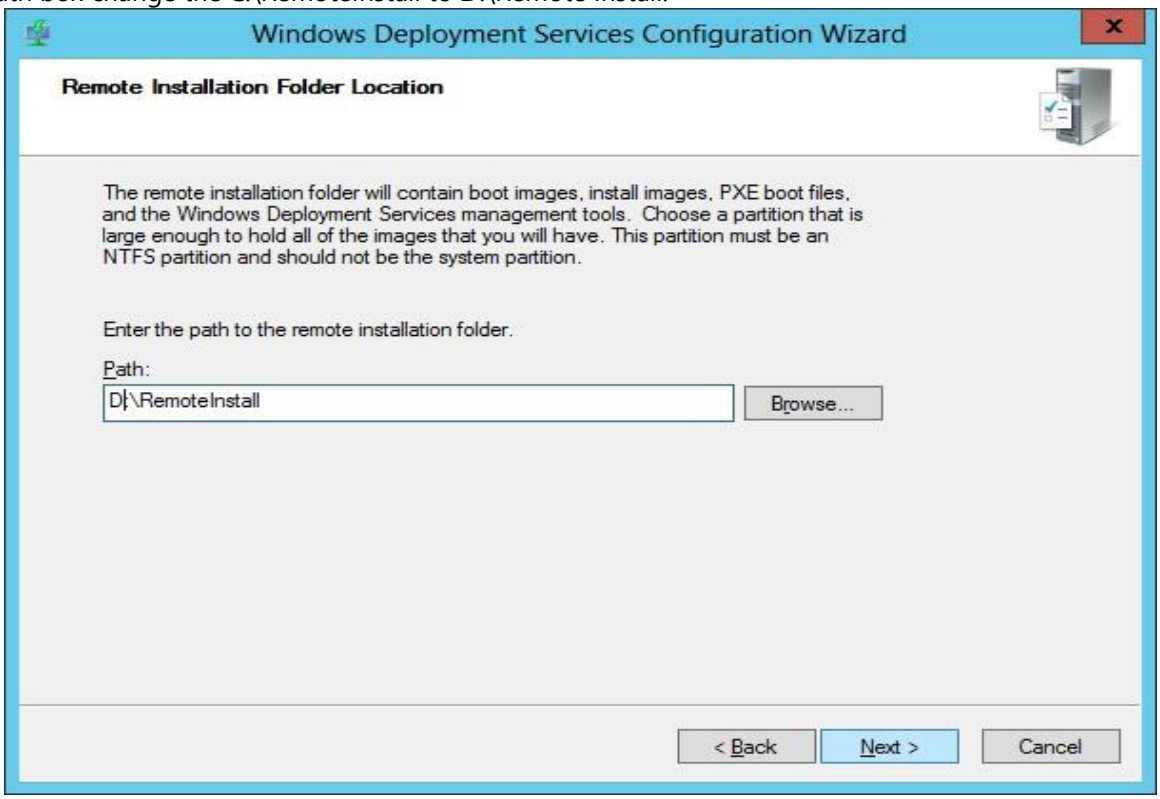
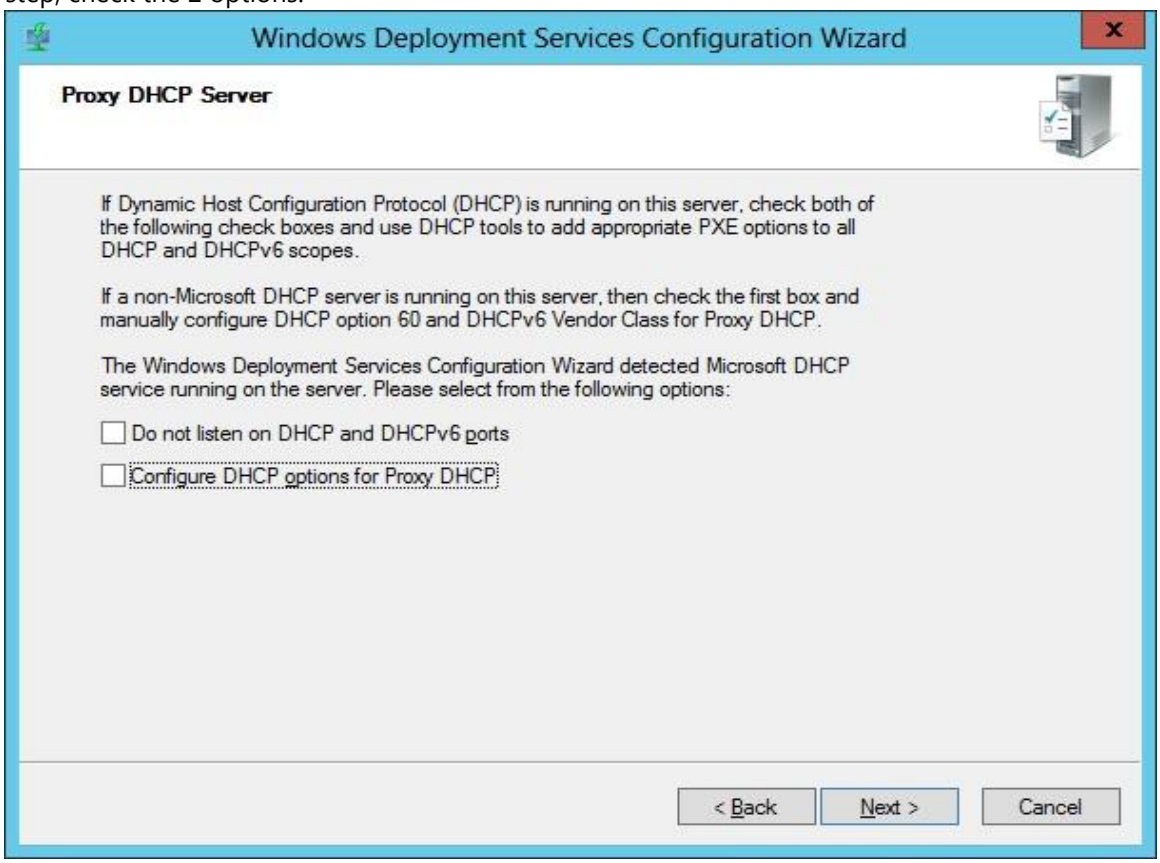
4. In the Path box change the **C**:\RemoteInstall to **D**:\Remote Install:



5. On next step, check the 2 options:



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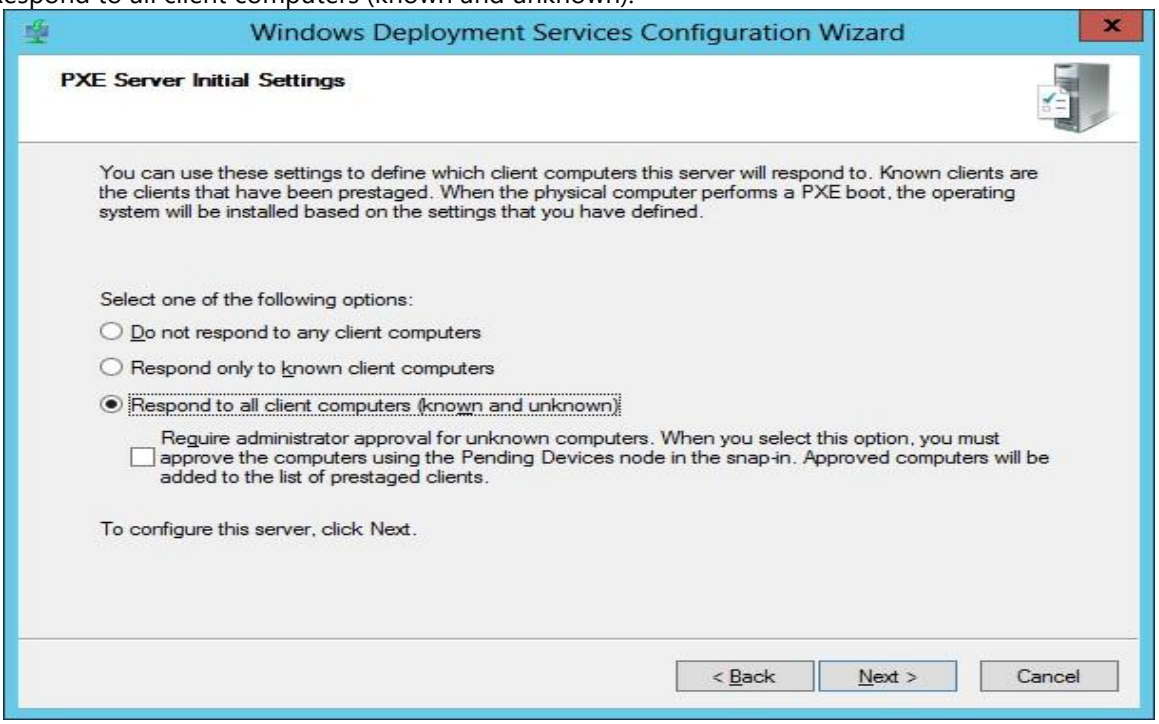
6. Select Respond to all client computers (known and unknown):



7. Close out of the Windows Deployment Services Window when it completes.

8. Ensure that the remote installation folder set in step 4 is shared as « reminst » with Full Control to « Everyone »

9. Verify that PXE is working with a test PC. If so, execute SDS installer (launch setup.exe in installer folder).

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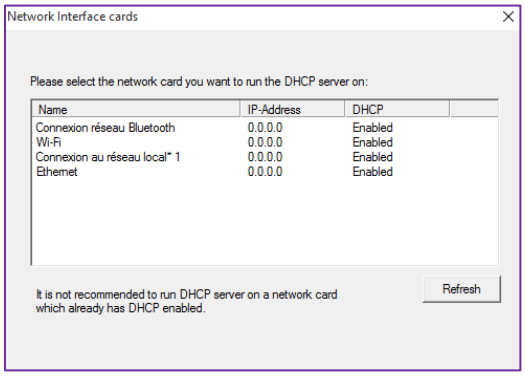
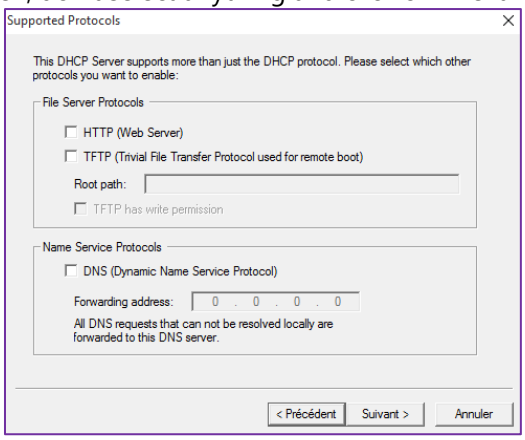
How to configure DHCP on a non-server edition of Windows

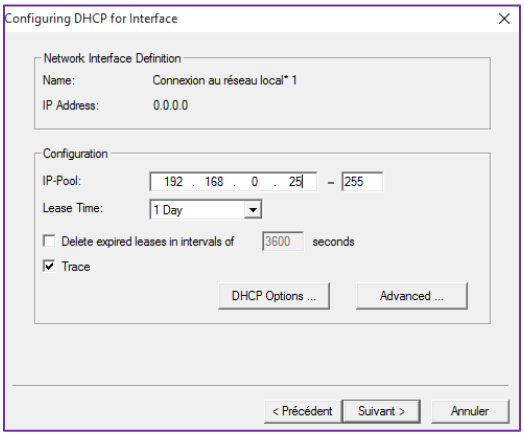
1. Download DHCP Server from http://www.dhcpserver.de/cms/
2. Copy the folder dhcpsrv2.5.2 to remoteinstall folder
3. Launch dhcpwiz.exe
4. Click on “Next >” button
5. Select your LAN card, and click on “Next >” button:



6. In the “Supported Protocols” screen, don’t select anything and click on “Next >” button:



7. Select you IP range and click on “Next” button:



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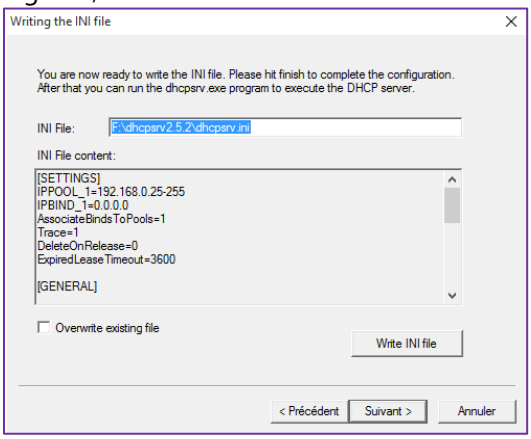
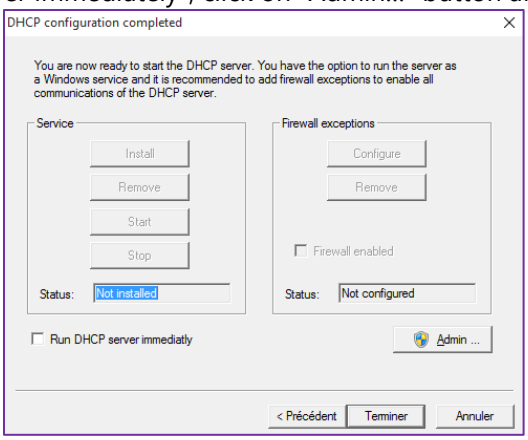
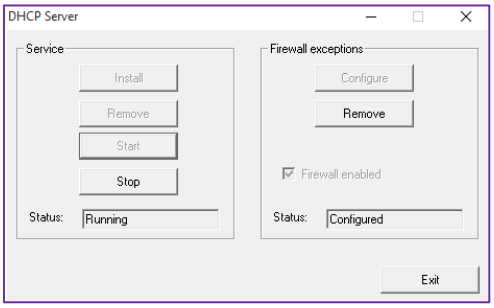
8. Check the option “Overwrite existing file”, click on “Write INI file” and then click on “Next >” button:



9. Check the option “Run DHCP server immediately”, click on “Admin…” button and then on “Finish” button:



10. The DHCP service is now running:



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How to customize the SDS script

<TODO: Put modules list and default script>

“Init” node
ShowOptDlg attribute:
shows an options dialog allowing the user to select a specific script (in fact “Item node”) inside the same script file (you have to change the “license” attribute since it’s the script ID and change the name that will be displayed in the combo box)
<TODO: Get a screenshot and corresponding script example>

UseCaption
UserSeparator:
Logo attribute:
BackImg: background image
…
Language: Default language

Component_List node
List of the components loaded at startup

“Item” node
This is the script node. By default, you have 1 script and so 1 item node but you can add other scripts, meaning other Item nodes.

“Module” node
“Id” attribute:

<SETVAR PROCESS=”RESULT”></SETVAR>: You set the result of the current module in the variable “PROCESS”

<IF PROCESS=”1”> ; If result_code=1 in .ini file

<SENDLOGS><SENDLOGS>; To send the logs to the server

OP attributes = ‘&’ for AND, ‘|’ for OR opearator

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How to customize the welcome menu

Script.xml

Initially we need to declare the module SDSWelcome in the « Components list »:

```
<Components_List>
<!-- Modules loaded at startup...-->
        <component Name="Welcome" Path="MODULES\SDSwelcome.dll" Id="101">
        </component>
```

Then, we have to call the module:

```
<Item Name="Example" ... >
        <!-- SDSWelcome -->
        <Module Id="101" ConfigFile="Xxxx.ini" Param1="0" Param2="0" FullScrn="0">
</Module>
```

There is no parameter for SDSWelcome module but we need to declare it for the module call.

SDSWelcome.ini

In the section « General » you define the main settings:

Mode is the user interface you want (radio buttons, check box, combo box)

Nb_Btn_Top = Number of buttons on top of the screen.
Nb_Btn_Down = Number of buttons in the main part.

Btn_Top_1 = first button on top.
We can define the buttons type (on top) we want, text field (Edit control -> 0) or combo box (Combo control -> 1).

In this example, we define a specific rule.
The « button » is **a text field** that accepts only numeric characters and having a max length of 9.
To validate you need **9 characters**. The digit is **divided in 2** parts. The first part is only one **numeric character and has to be 0**. The second part contains **8 numeric characters** (no other rules).

Type_Btn=0 -> **text field**
; 0 -> Edit control
; 1 -> Combo control

Btn_Text=IDS_TEXT_1

Nb_Part=2 **-> divided in 2 parts**

Nb_Digit_Part_1=1 ***-> The digit part 1 length is 1***
; x > 0 Length part = x; x = -1 No limit

Type_Digit_Part_1=0|0 -> **the first character has to be numeric and equal to 0**
; 0 -> Numeric
; 1 -> Alpha

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; 2 -> AlphaNumeric
; | char (digit must be char)

Nb_Digit_Part_2=8
Type_Digit_Part_2=0 -> **8 numeric characters**

Min_Length=9
; x > 0 string length must be sup or equal to x; x = -1 no min

Max_Length=9 **->*the* string length is equal to 9**
; x > 0 string length must be inf or equal to x; x = -1 no max

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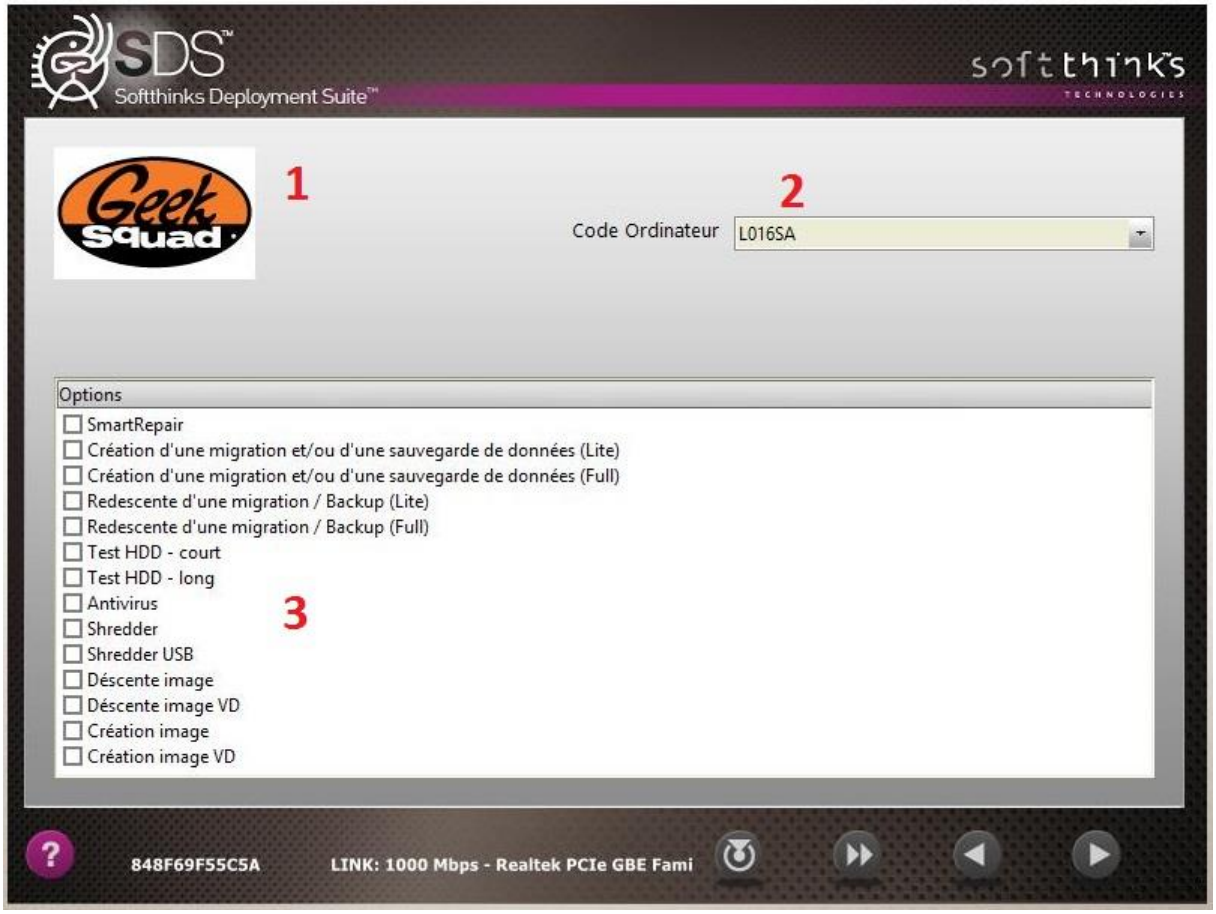
Example



Please note that ";" in the beginning of the line means that you are commenting.
In this example, we have the following settings:

[General]
; 0 -> radio button
; 1 -> CheckBox
; 2 -> Button
Mode=2 **-> The main menu will be a buttons menu**

Nb_CustomAction=0

; 0 -> No logo
; 1 -> show logo
; logo file has to be named logo.png and put in Windows\System32
Logo=1

; max 4
Nb_Btn_Top=2 ; 2 buttons

; mode = 0 -> 5 max | mode = 1 -> 12 max | mode = 2 -> 10 max
Nb_Btn_Down=4

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;HardwareCheck=x -> 0 no check, 1 check and display dialog, 2 check and exit
;No more used. Kept for compatibility
HardwareCheck=0

DODCheck=0 ; To know if wipe ran correctly. In case of refurbishing it can be useful. SDSWelcome if DOD flag is present you will have a button to continue

BatteryCheck=0 ; Check the battery level defined in section BattLevelcheck. If battery level is too low you will get a pop up warning. If 0 we check if the device is plugged to AC power

[BattLevelcheck]
Platform= ; names separated by ';'
BatteryLevel= ; Percentage

[Logo]
JPG=Logo.jpg

[Btn_Top_1]
; 0 -> Edit control
; 1 -> Combo control
Type_Btn=0 ; Edit control
Btn_Text=IDS_TEXT_1 ; Text in front of the control ("ID" in our example)
Nb_Part=1 ; Useful to split the contents of the control (for example an field with ...). Here we have 1 part which is the default value

; TO DEFINE Edit field mask
; x > 0 Length part = x; x = -1 No limit
Nb_Digit_Part_1=-1

; 0 -> Numeric
; 1 -> Alpha
; 2 -> AlphaNumeric
; | char (digit must be char)
Type_Digit_Part_1=2 ; 1st block contains only letters, no numbers
Nb_Digit_Part_2=6 ; 2nd block contains 6 letters or numbers
Type_Digit_Part_2=2

; x > 0 string length must be sup or equal to x; x = -1 no min
Min_Length=1

; x > 0 string length must be inf or equal to x; x = -1 no max
Max_Length=-1

[Btn_Top_2]
; 0 -> Edit control
; 1 -> Combo control
Type_Btn=1 ; Dropdown combo box

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Btn_Text=IDS_TEXT_2

Nb_Entries=2

Entry_1=IDS_COMBO_1_DEMO
Entry_2=IDS_COMBO_2_DEMO

[Btn_Down_1]
Result_Code=1
Btn_JPG=Repair_auto.png
Btn_Text=IDS_BTN_1

[Btn_Down_2]
Result_Code=2
Btn_JPG=Repair.png
Btn_Text=IDS_BTN_2

[Btn_Down_3]
Result_Code=3
Btn_JPG=Refurb.png
Btn_Text=IDS_BTN_3

[Btn_Down_4]
Result_Code=4
Btn_JPG=OEM.png

SDSWelcome.xml

For each button defined previously in the .ini file, we need to write the corresponding text and translation.

<string ID= « IDS_MON_BOUTON_1 »>
<en-US> My translation </en_US>
<fr-FR> My button 1 </fr_FR>

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How to customize the repair screen

We are still in the SDSWelcome module. In SDSWelcome.ini we have Result_code=2 and in script.xml if we have result_code=2 we relaunch SDSWelcome module.

SmartRepair
User data and settings backup
Appy user data and settings backup
SDS image or SmartImage creation
SDS image deployment
Updates and Report
Hardware Check
Windows Diagnostics

Repair.ini
You can preselect some options by default (the user cannot uncheck them).
You can also link some options to others, meaning that if the user selects an option the wizard will automatically select another option that we will have linked (MultiLink section).

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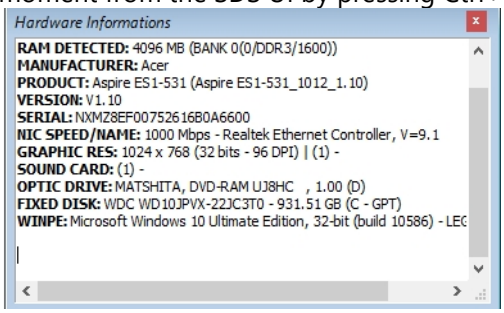
How to get hardware information from SDS UI

You can get hardware information at any moment from the SDS UI by pressing Ctrl+I:



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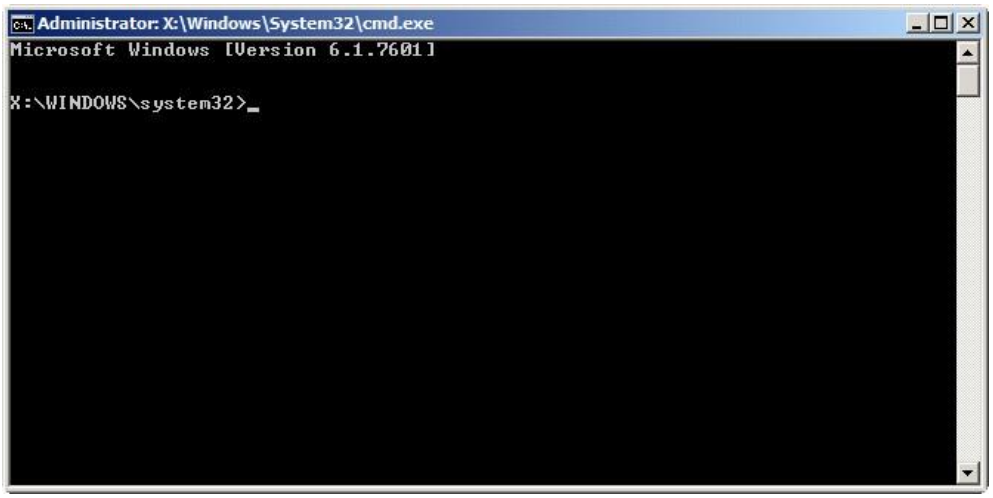
How to get logs required for support purpose

When an error occurs during any process, it is important to grab the logs which will be very helpful in order to diagnose the issue and solve it.

On client side, the logs from the RAMDrive R: are temporary and used to diagnostic a deployment in case of troubles.
They are duplicated on the server in reminst\sdkdb\temp. It means that the temp folder will have a folder with all deployment log for each computer booting in WinPE environment
Some logs are generated by SDS product and others from the Microsoft WinPE boot process.
The XML

1. Press Ctrl + Alt + D to open a command prompt (press Ctrl + Alt + D). If a dialog box appears to ask you a password, type "sds" and click on “OK” button:



2. Plug a USB key and make note of the letter which is assigned to it. You can launch notepad.exe and select ”Open” command to see all the drive letters:

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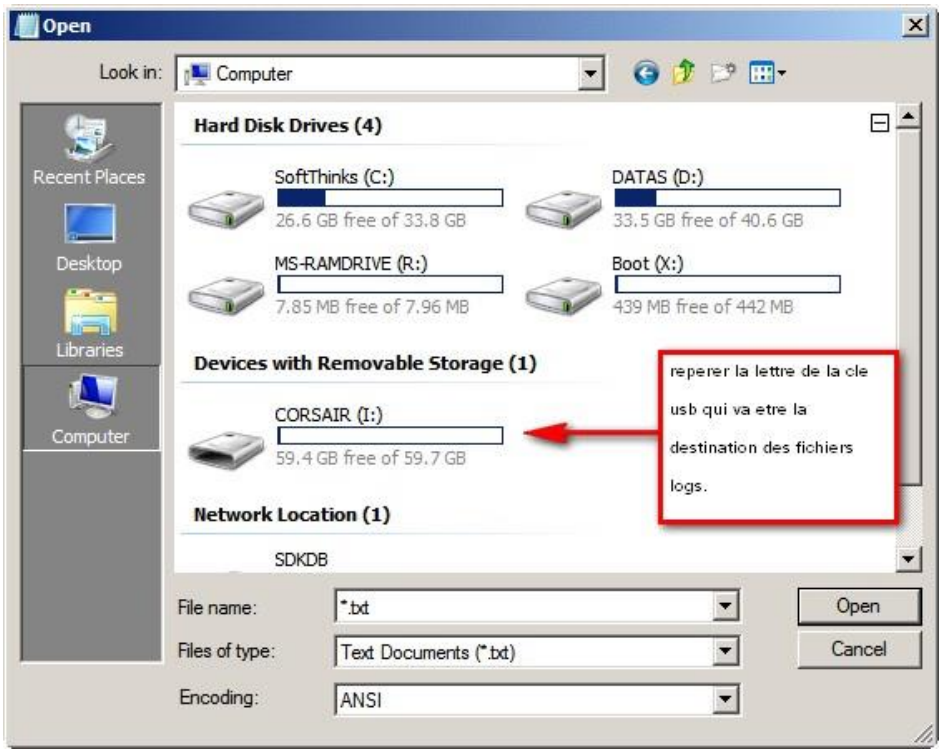
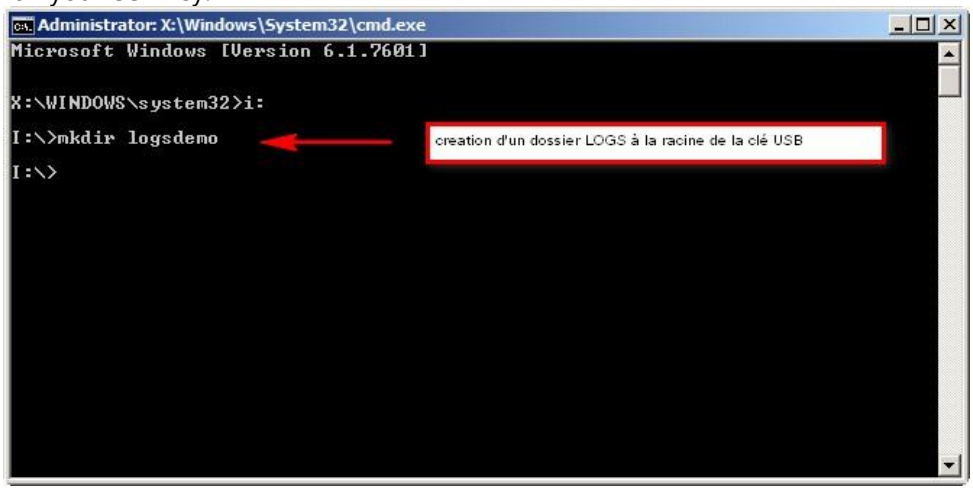


3. Create a folder on your USB key:



4. Go to the RAM Drive R:

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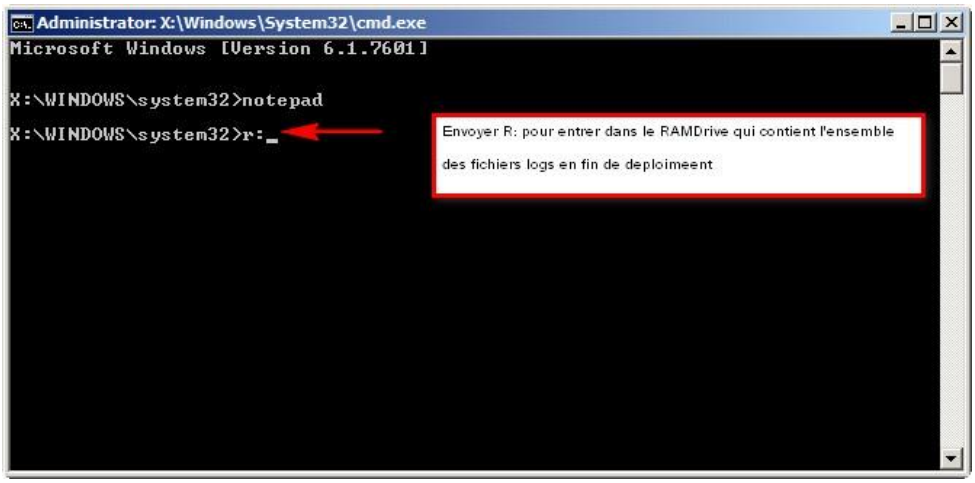

5. Copy all the files from the RAM Drive to your USB Key:

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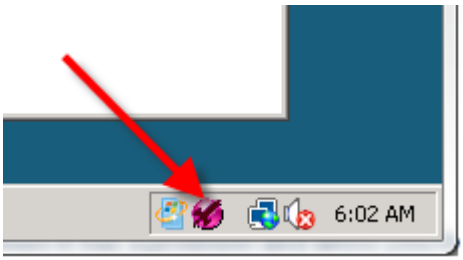
How to update the license

Please do the following steps to send us the licensing code for the server and we can send you back an activation code.

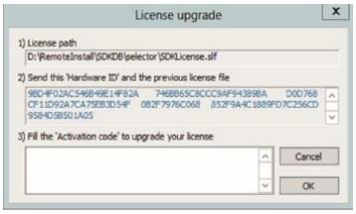
1. Go to the desktop of the server.

2. Look for a small icon will by your clock that is purple/pinkish and says SoftThinks Selector Service when you do a mouse over.
    a. If that Icon is not there, Navigate to the Remoteinstall\SDKDB\Selector Directory and run SelectorSRVG.exe and the Icon will appear.
    b. You may have to click the arrow next to the clock to show all the running icons.



3. Right Click on this icon and select Upgrade License :

4. The License Upgrade Dialog box will open :



5. Send us the text from Step 2 in the License Upgrade Screen, and the SDKLicense.slf file from the RemoteInstall\SDKDB\Selector directory.

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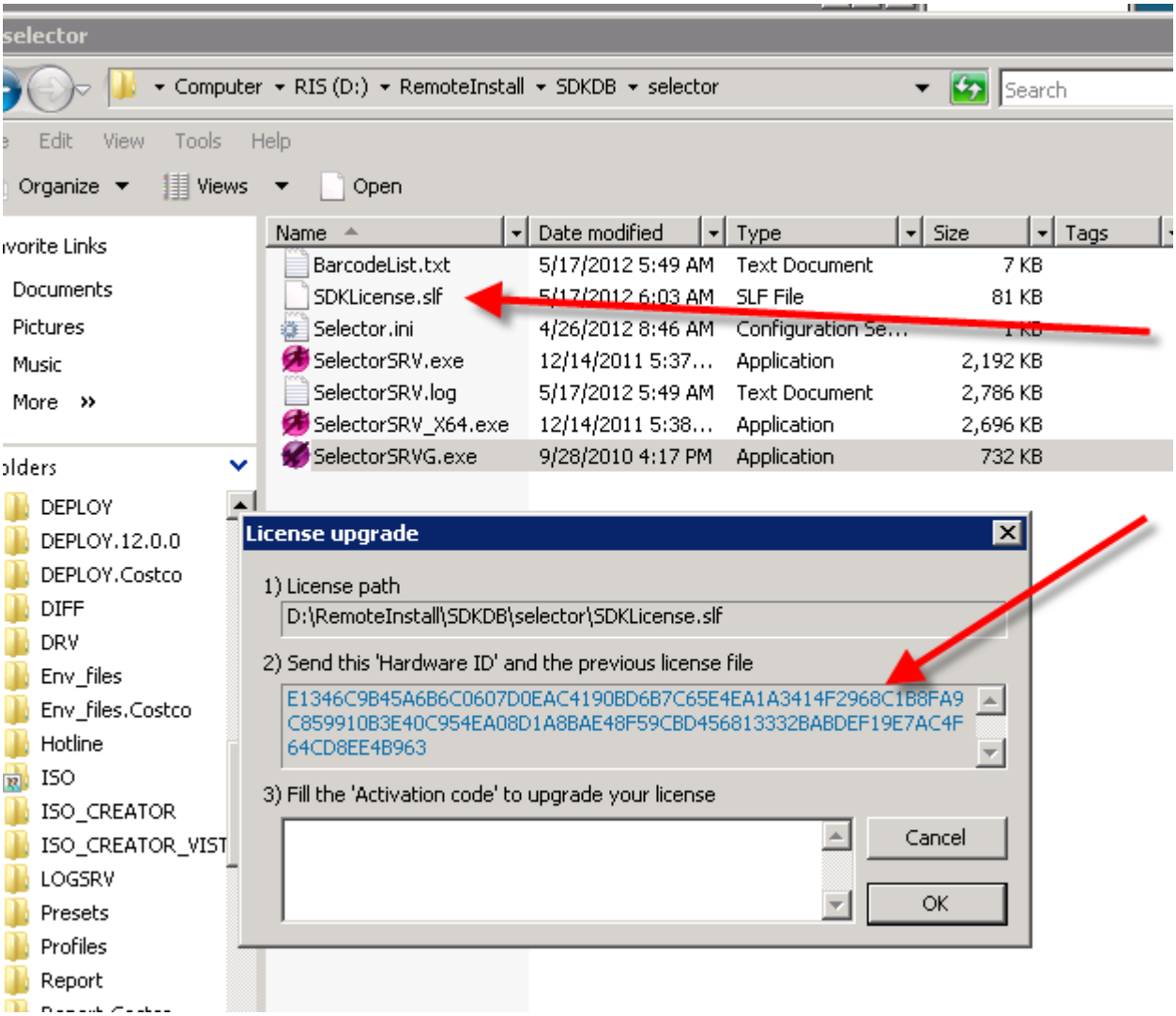

6. Once we have that we can send you back the upgrade key that you will paste into the "Fill the 'Activation code' to upgrade your license field, then click OK to renew the license.

NOTE: Do not close the License Upgrade window until you get the Activation code from us.

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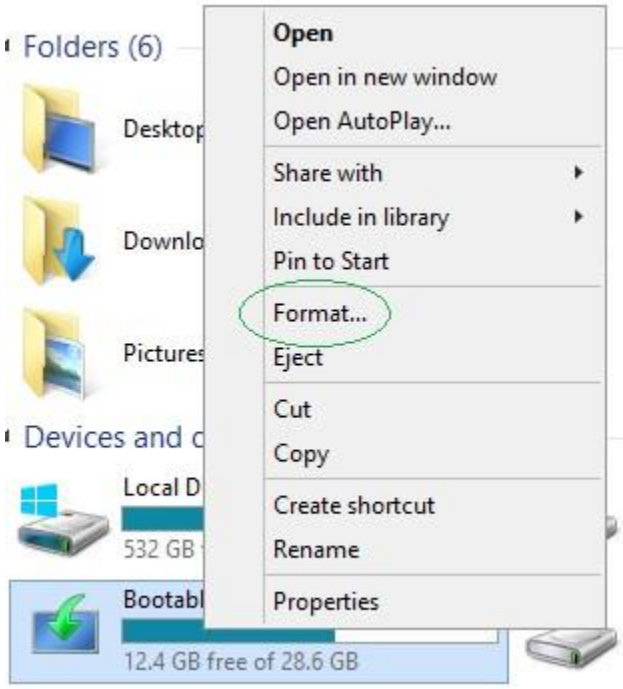
How to format a USB Flash Drive before converting it to a SDS USB Flash Drive

Formatting USB Flash Drive
1. Plug flash drive of at least 8GB into USB port on server.

2. Open File Explorer and locate the flash drive

3. Right click on the flash drive and select “Format”.



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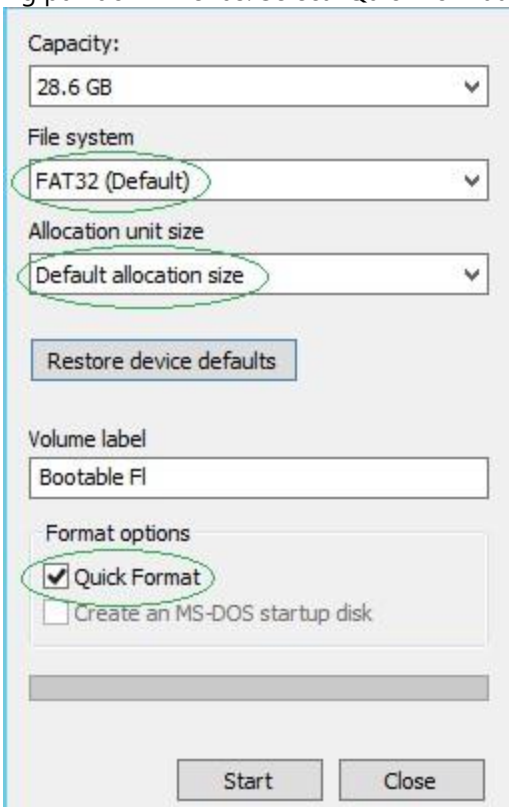
4. Select Restore Device default. In most cases this will set the format to “FAT32” and “Default Allocation Size”. If it does not, select these options from the corresponding pull down menus. Select “Quick Format” check box.



8. Click Start.

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How to boot from Bootable USB Flash Drive with USB Ethernet adapter

The Bootable USB Flash Drive will allow a unit that does not have an Ethernet port onboard to connect to the SDS Server using a USB Ethernet Adapter.

1. Ensure the device, laptop, desktop or tablet PC is able to boot to USB in the units BIOS.
2. Plug Bootable USB Flash Drive into an available USB port.
3. Plug USB Ethernet adapter into USB port and connect to network via Ethernet cable.
4. Power on the device and it should boot to the USB drive as default.

Note: Most brands of USB Ethernet Adapters are supported by the Bootwim on the USB Flash Drive or have drivers built into the adapter. On rare occasions the Bootwim will not have the driver needed for the USB Ethernet Adapter. These can be added to the Bootwim through the SDS (See Injecting drivers ("Inject Driver(s)" operation)).

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How to prepare the database for the “Update database components” feature

1. Define the baseline (the deploy folder, and deploy64 selector) with all files updated.
2. Open the console by selecting the master.log from the reference database
3. Export into xml and rename it to update.xml (this file will be required on the FTP to accelerate the comparison between the base used and the baseline).
4. Prepare an sdkdb_update folder containing the deploy64, deploy, and selector folders from the baseline + update.xml. It is mandatory that the update.xml file corresponds to the deploy, deploy54 and selection contents in terms of files (version & CRC) and if there is any difference the update.xml file must be regenerated.

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How to edit SPL Files

SPL File Naming Convention

The existing sales order system and manufacturing process should be considered when deciding the naming convention to allow for a seamless integration.
The SPL file name must begin with “S” and not exceed 11 characters including “S”.
Example: S1234567890.SPL or SModelx.SPL.
Do NOT use any characters other than Alphanumeric ones (NO spaces, dashes, punctuation, etc.).

Dynamic SPL Naming Convention

Here are some examples that can be used to create a dynamic SPL per system:

- S%SerialNumber%.SPL
- S%SalesOrderNumber%.SPL

Static SPL Naming Convention

Here is an example that can be used to create a static SPL for multiple systems:

- S%ProductName%.SPL

System DMI Requirements

Here are the pre-defined System DMI field requirements for deployment using an SPL file. The chosen DMI field must match the name of the SPL file naming convention.

System DMI Serial Number Field

An Original Equipment Manufacturer (OEM) or an Original Design Manufacturer (ODM) may choose to use the system DMI serial number field (Type1 or Record1):

- Serial Number (SS): %SerialNumber%
- Serial Number (SS): %SalesOrderNumber%

System DMI Product Name Field

An OEM or ODM may choose to use the system DMI product name field (Type1 or Record1):

- Product Name (SP): %ProductName%

The DMI field name must not begin with (S) and not exceed 10 characters.
Ex: 1234567890 or Modelx. Do NOT use any characters other than Alpha/Numeric (NO spaces, dashes, etc.).

Note: The OEM or ODM is responsible for creating the SPL file. This will require development efforts to setup and maintain a translation program. The translation program will need to convert the existing part numbers to the SDK part number format and generate the SPL file.

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SDK Part Number Format

The format used for part number scheme and revision control is the following:

- XXXXXX-XXX-XXX

Here are the pre-defined part number format requirements for deployment.

- A = Applications
  Ex: A00001-001-001
  Applications using silent installs, MSI, Installshield, etc.
- D = Drivers (Required if PnP is not used)
  Ex: D00001-001-001
  Device drivers using a PnP enumeration via .inf files.
- Q = QFE
  Ex: Q00001-001-001
  Security patches and updates.
- B = Bundle
  Ex: B00001-001-001
  Applications tied to hardware (link to PnP device ID).
- S = OS
  Ex: S00001-001-001
  Operating System.
- I = Smart Image
  Ex: I00001-001-001
  Smart Image may contain combination of hardware and software.
- P = Partition Scheme (hard coded)
  Ex: P00001-001-001
  Partition scheme based on hard coded numbers.
- T = Tools
  Ex: T00001-001-001
  Tools used for enabling/disabling SDK features (See SDK switches section).
- Z = Tests
  Ex: Z00001-001-001
  Optional deployment tests as specified by the OEM/ODM (See SDK switches section).

Definable Partition Number (Recommended)

- P0111D-p01-100-1 ; User partition, Windows primary, NTFS format, drive letter assigned, use 100% of total hard disk space.
- P 0111D-p01-050-1 ; User partition, Windows primary, NTFS format, drive letter assigned, use 50% of total hard disk space.
- P0112D-p01-100-1 ; User partition, Windows primary, FAT32 format, drive letter assigned, use 100% of total hard disk space.
- P0112D-p01-050-1 ; User partition, Windows primary, FAT32 format, drive letter assigned, use 50% of total hard disk space.
- P0211E-p01-050-1 ; Partition 2, Windows primary, NTFS format, drive letter assigned, use 50% of total hard disk space.
- P0212E-p01-050-1 ; Partition 2, Windows primary, FAT32 format, drive letter assigned, use 50% of total hard disk space.
- P0212E-p01-025-1 ; Partition 2, Windows primary, FAT32 format, drive letter assigned, use 25% of total hard disk space.
- P0311E-p01-025-1 ; Partition 3, Windows primary, NTFS format, drive letter assigned, use 25% if total hard disk space.
- P0312E-p01-025-1 ; Partition 3, Windows primary, FAT32 format, drive letter assigned, use 25% of total hard disk space.

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Hard Coded Partition Number

- P00001-000-000 ; No recovery solution.
- P00001-510-000 ; Create system recovery folder, hidden and protected.
- P00001-534-950 ; Create recovery partition at start of disk, hide recovery partition, hide F10 boot key, swap partition table, auto-sizing + 500 MB reserved.
- P00001-536-950 ; Create recovery partition at start of disk, hide recovery partition, show F10 boot key, swap partition table, auto-sizing + 500 MB reserved.
- P00001-537-900 ; Create recovery partition at start of disk, show recovery partition, show F10 boot key, swap partition table, auto-sizing + 1000 MB reserved.
- P00001-537-950 ; Create recovery partition at start of disk, show recovery partition, show F10 boot key, swap partition table, auto-sizing + 500 MB reserved.
- P00001-537-400 ; Create recovery partition at start of disk, show recovery partition, show F10 boot key, swap partition table, 4000 MB Absolute RP size.
- P00001-538-950 ; Create recovery partition at end of disk, hide recovery partition, hide F10 boot key, swap partition table, auto-sizing + 500 MB reserved.
- P00001-541-950 ; Create recovery partition at end of disk, hide recovery partition, show F10 boot key, swap partition table, auto-sizing + 500 MB reserved.
- P00001-540-950 ; Create recovery partition at end of disk, show recovery partition, hide F10 boot key, swap partition table, auto-sizing + 500 MB reserved.
- P00001-539-900 ; Create recovery partition at end of disk, show recovery partition, show F10 boot key, swap partition table, auto-sizing + 1000 MB reserved.
- P00001-539-950 ; Create recovery partition at end of disk, show recovery partition, show F10 boot key, swap partition table, auto-sizing + 500 MB reserved.
- P00001-539-400 ; Create recovery partition at end of disk, show recovery partition, show F10 boot key, swap partition table, 4000 MB absolute recovery partition size.

SDK Switches

- T00003-700-001 ; Do no production management.
- P00001-000-000 : No recovery solution.
- Z00001-600-001 ; Run no tests.
- T00012-001-001 ; Disable PnP over SPL selection.

SPL files example

- P0111D-p01-100-1 ; User partition, Windows primary, NTFS format, drive letter assigned, 100% use of remaining hard disk space
- A00061-001-001 ; Branding in Windows (wallpaper)
- T00001-001-001 ; Branding in recovery UI
- S00029-001-001 ; XP Home SP2 English v.1, Windows XP (English)
- A00219-001-001 ; Roxio
- A00226-001-001 ; Application
- A00224-001-001 ; .net Framework
- D00003-002-001 ; Intel 845 G Chipset System 5.0.2.1003
- D00006-001-001 ; Intel 865 Integrated Video Driver
- D00026-001-001 ; RealTek LAN driver 5.606.811.2003

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How to edit Data Backup configuration file

You can customize the Data Backup behavior by manually editing the SDSBackupMigration.ini file located in \SDSDB\Deploy\Windows\System32\modules\SDSFileBackup.

There are 3 types of Data Backup which can be set through this configuration file:

- **Backup** **:** Users files backup
- **Light Migration** **:** Users files & Settings and OS settings backup
- **Full Migration** **:** Users files & Settings, Applications settings and OS settings backup

```
[SDSFileBackup]
; AutomaticBackup : 0 for Automatic / 1 for Manual
AutomaticBackup=0

; UseAV: Scan the files to back up with the antivirus
useav=0
AVJustNotify=0

CountDown=500

; ArchiveName: Backup name that will appear in Data Backup UI if UseNameType is set to 0
ArchiveName=My Backup

; Backup destination (combination of <NAME> <S/N> and <MAC>)
ArchiveDestination=W:\<NAME>\<NAME>_<S/N>_Backup

; UserNameType: 0 to use the Backup name / 1 to use the MAC Address / 2 to use the Serial Number /3 to use
; the result of a module (requires to specify the module ID and the value to read in NameType3)
; In the example below, we will use the Account Number value set by module SDS Welcome (121)
UseNameType=3
Nametype3=<121>< Account number: >

ArchivePassword=
CapturePhoto=1
CaptureAudio=1
CaptureVideo=1
CaptureDoc=1
CaptureEmail=1
CaptureFinancial=1
CaptureOthers=0

; Map: 1 if you wish to store data backups in a folder outside of SDKDB structure or another device
Map=1
; If Map is set to 1 you need to specify the following information for the data backup target location:
MapDrive=W
Login=
Password=
Domain=
```

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; UncPath=\\<Server IP address>\<shared folder >
UncPath=\\192.168.x.x\x
UncPath2=\\192.168.x.x\x
UncPath3=\\192.168.x.x\Migration

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How to manually edit WTM configuration files

The SDSconsole for WTM settings use the following files in SDKDB\ENV_FILES\WINVISTA_10_64 or winvista_10:

- WindowsTestManager.xml
- WindowsTestManager_Btn.xml

WindowsTestManager.xml

WindowsTestManager.xml lets you configure all the settings (and also the custom tests) with the SDSconsole Test part

```
<root>
	<Settings>
		<mode>auto</mode>	//manual or auto
		<sigverif>on</sigverif>	//Check if drivers are signed or not
		<devmanager_on_error>on</devmanager_on_error>	//Device manager
		<eventviewer_error_report>warning</eventviewer_error_report>
		<Start_in_Audit>off</Start_in_Audit>
		<Start_If_Conflict>on</Start_If_Conflict>
		<ShowSysPrepBTN>off</ShowSysPrepBTN>
		<Rapport_If_Success>on</Rapport_If_Success>
		<Rapport_If_Failed>on</Rapport_If_Failed>
		<ShowEvent>off</ShowEvent>
	</Settings>
	<Multimedia>
		<Test_WAVE>on</Test_WAVE>  //Define all the multimedia tests you want
		<Test_MIDI>on</Test_MIDI>
		<Test_MP3>on</Test_MP3>
		<Test_MIC>on</Test_MIC>
		<Webcam_chk>on</Webcam_chk>
		<Test_HeadPhone>off</Test_HeadPhone>
	</Multimedia>
	<Network>
		<LAN>  //Define all LAN tests you want
			<TestLan>on</TestLan>
			<AutoDHCP>on</AutoDHCP>
			<AutoDNS>on</AutoDNS>
			<IP>192.168.X.X</IP>
			<MASK>255.255.255.0</MASK>
			<GATEWAY>192.168.X.X</GATEWAY>
			<DNS1>X.X.X.X</DNS1>
			<DNS2>X.X.X.X</DNS2>
		</LAN>
		<WLAN> //If you want to test a specific WLAN
			<TestWLan>on</TestWLan>
			<SSID>TEST</SSID>
			<AUTH>open</AUTH>	> // Open, shared, wpa, wpa2, wpapsk, wpa2psk
			<ENC>WEP</ENC // none,wep, tkip, aes
			<KEY>XXXXXXX</KEY>
		</WLAN>
				← cf. end document for Wifi Configuration→
	</Network>
	<Oemreset>
		AutoReseal=on
		Time=15
	</Oemreset>
	<Custom_test>
		<name>hddcheck</name> //add HDD Check
		<FilePath>C:\WinTEST\HDcheck\hddcheck.cmd</FilePath> //Path of hddcheck.cmd
		<Args></Args>
		<Auto_remove>on</Auto_remove> //Removed automatically after being used
		<Show>on</Show>
```

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```
            <Succes_Code>0</Succes_Code>
            <Stop_on_fail>off</Stop_on_fail>
            <LogFile>C:\WinTEST\HDcheck\diagerror.log</LogFile> //change with the real path
      </Custom_test>
      <Custom_test_1>
            <name>BurninTest</name>
            <FilePath>C:\WinTEST\BurnInTest8\bit.exe</FilePath>//Path of bit.exe
-           <Args>-L 0,0,0,0 -D 1 -R -X -C CPU+RAM+3D.bitcfg</Args> //Arguments (see doc Console_-
   _BurningTest Integration Audit Mode for Generic Image)
            <Auto_remove>on</Auto_remove> //Removed automatically after being used
            <Succes_Code>666</Succes_Code>
            <Show>on</Show>
            <LogFile>C:\WinTEST\BurnInTest8\burnsdiag.log</LogFile>  //same path defined in your .bitcfg
      </Custom_test_1>
                        ← cf. end document to send burnin test logs to the server→

      <Custom_test_2>
            <name>Smart_Info</name>
            <FilePath>C:\WinTEST\InfoSmart\Info_Smart.exe</FilePath>//Path of Info_Smart.exe
            <Args>%DEPLOY_LOG%</Args>
            <Auto_remove>on</Auto_remove> //Removed automatically after being used
            <Show>on</Show>
            <Succes_Code>0</Succes_Code>
            <Stop_on_fail>off</Stop_on_fail>
            <LogFile> </LogFile>
      </Custom_test_2>
      <Custom_test_3>
            <name>Keyboard Test</name>
            <FilePath>C:\WinTEST\KeyboardTest\KeyboardTest.exe</FilePath> //Path of KeyboardTest.exe
            <Args></Args>
            <Auto_remove>on</Auto_remove> //Removed automatically after being used
            <Show>on</Show>
            <Succes_Code>0</Succes_Code>
            <Error_Code>1</Error_Code>
            <Stop_on_fail>off</Stop_on_fail>
            <LogFile></LogFile>
      </Custom_test_3>
      <Custom_Report>
            <Status>on</Status>
        <Check_nb>10</Check_nb> //Number of buton you define in WindowsTestManager_CustomReport.xml
      </Custom_Report>
      <Network_Log> //Setup this part to send the logs back to the server
            <Letter>N</Letter>
            <Domain>XX.com</Domain> //Your domain
            <Login>XXXXXX</Login>  //You login
            <Pass>XXXX</Pass> //Your password
            <Path>\\xxx.xxx.x.x\reminst\sdkdb</Path> //Your IP or your Server name
            <SendLog>on</SendLog> // Send logs to the server when exists
      </Network_Log>
</root>
```

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WindowsTestManager_Btn.xml

The **WindowsTestManager_Btn.xml** file that you can find in the WinTEST root, allows you to modify your main menu (add, remove items)
Enter the same as you did previously in WindowsTestManager.xml.

```
<root>
	<Btn>
		<Custom_test>
			<name>windows_check</name>
		</Custom_test>

		<Custom_test>
			<name>multimedia</name>
		</Custom_test>

		<Custom_test>
			<name>network_settings</name>
		</Custom_test>

		<Custom_test>
			<name>BurninTest</name>
		 </Custom_test>

		<Custom_test>
			<name>hddcheck</name>
		</Custom_test>

		<Custom_test>
			<name>Keyboard Test</name>
		</Custom_test>

		<Custom_test>
			<name>custom_report</name>
		</Custom_test>

		<Custom_test>
			<name>report</name>
		</Custom_test>

	</Btn>
</root>
```

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Examples

WIFI configuration:

AUTH	ENC
WPA WPAPSK	TKIP
WPA2 WPA2PSK	AES
OPEN	NONE WEP
SHARED	WEP

Examples for the Wi-Fi

```
<WLAN>
	<TestWLan>on</TestWLan>
	<SSID>TEST</SSID>
</WLAN>

<WLAN>
	<TestWLan>on</TestWLan>
	<SSID>TEST</SSID>
	<AUTH> WPA2</AUTH>
	<ENC>AES</ENC>
	<KEY>XXXXXXX</KEY>
</WLAN>

<WLAN>
	<TestWLan>on</TestWLan>
	<SSID>TEST</SSID>
	<AUTH>open</AUTH>
	<ENC>WEP</ENC>
	<KEY>XXXXXXX</KEY>
</WLAN>
```

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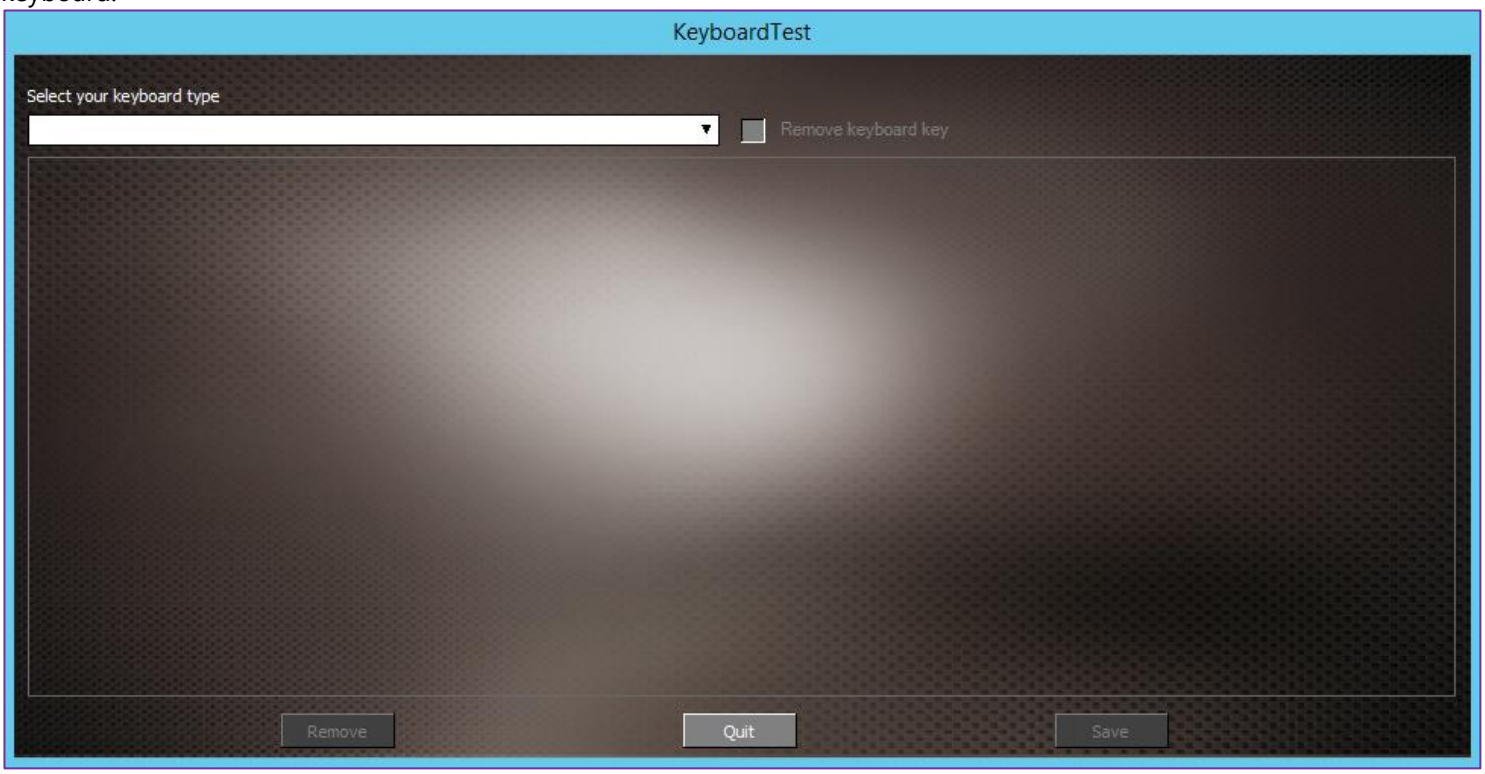
How to manage keyboard layouts for keyboard test

Launch "**`KeyboardTest.exe /edition`**" to manage the keyboard layouts that are offered when you test the keyboard:



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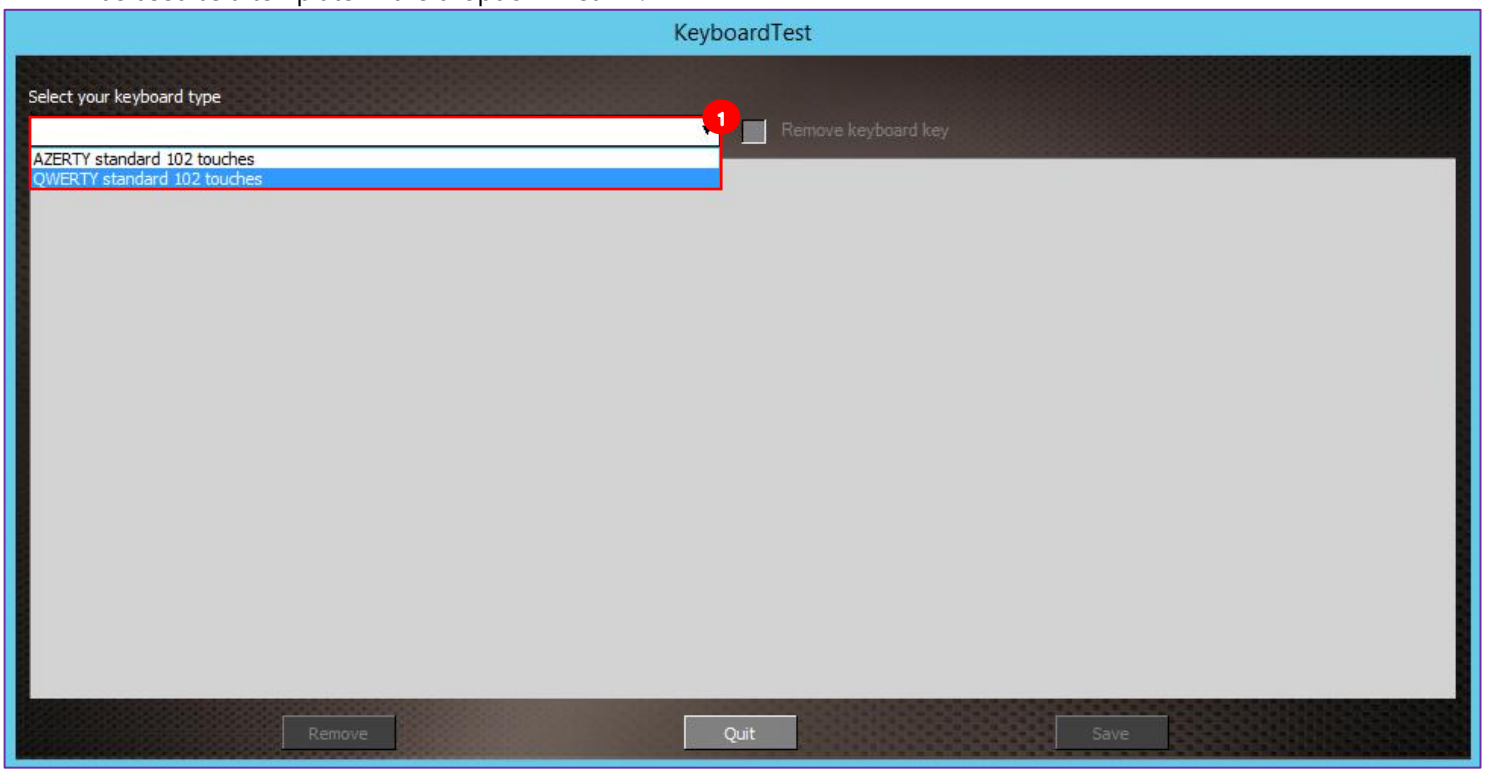
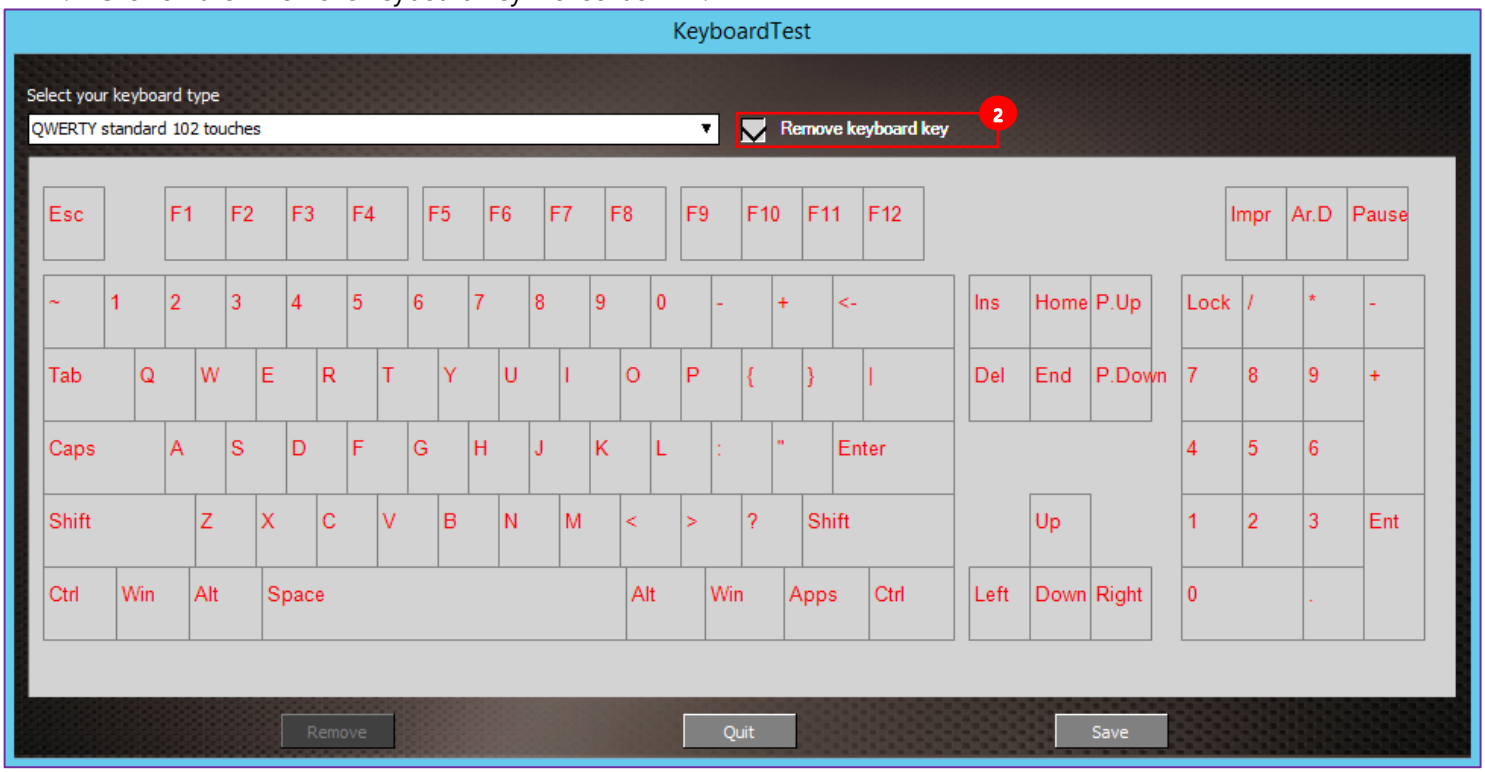
Adding a new keyboard layout

1. Select a pre-defined keyboard layout (“AZERTY standard 102 touches” / “QWERTY standard 102 touches”) which will be used as a template in the dropdown list 1:



2. Click on the « Remove keyboard key » checkbox 2:



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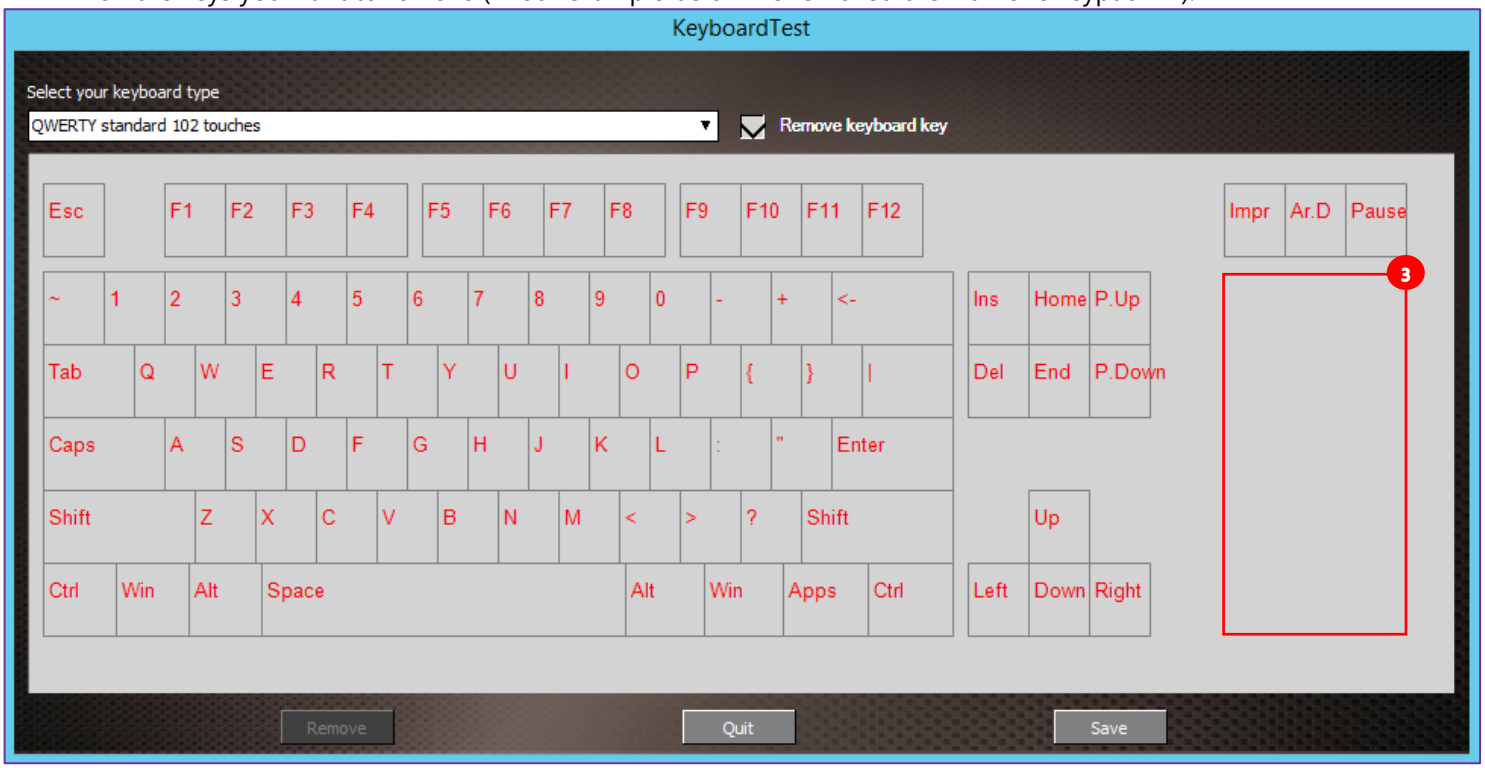
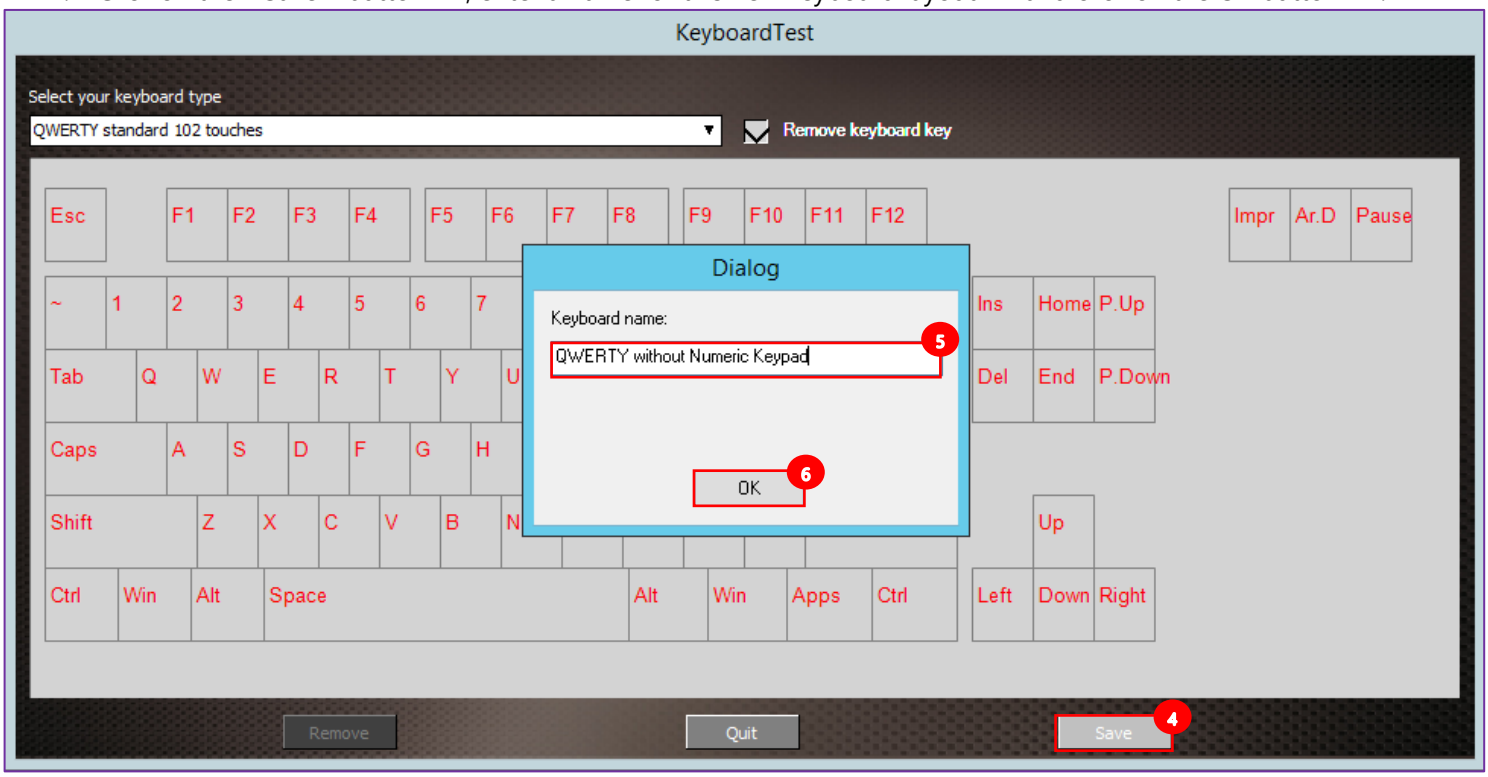
3. Since the pre-defined keyboard layouts contain the maximum number of keys, you will have to click with your mouse on the keys you want to remove (in our example below we removed the Numeric keypad 3):



4. Click on the « Save » button 4, enter a name for this new keyboard layout 5 and click on the OK button 6:



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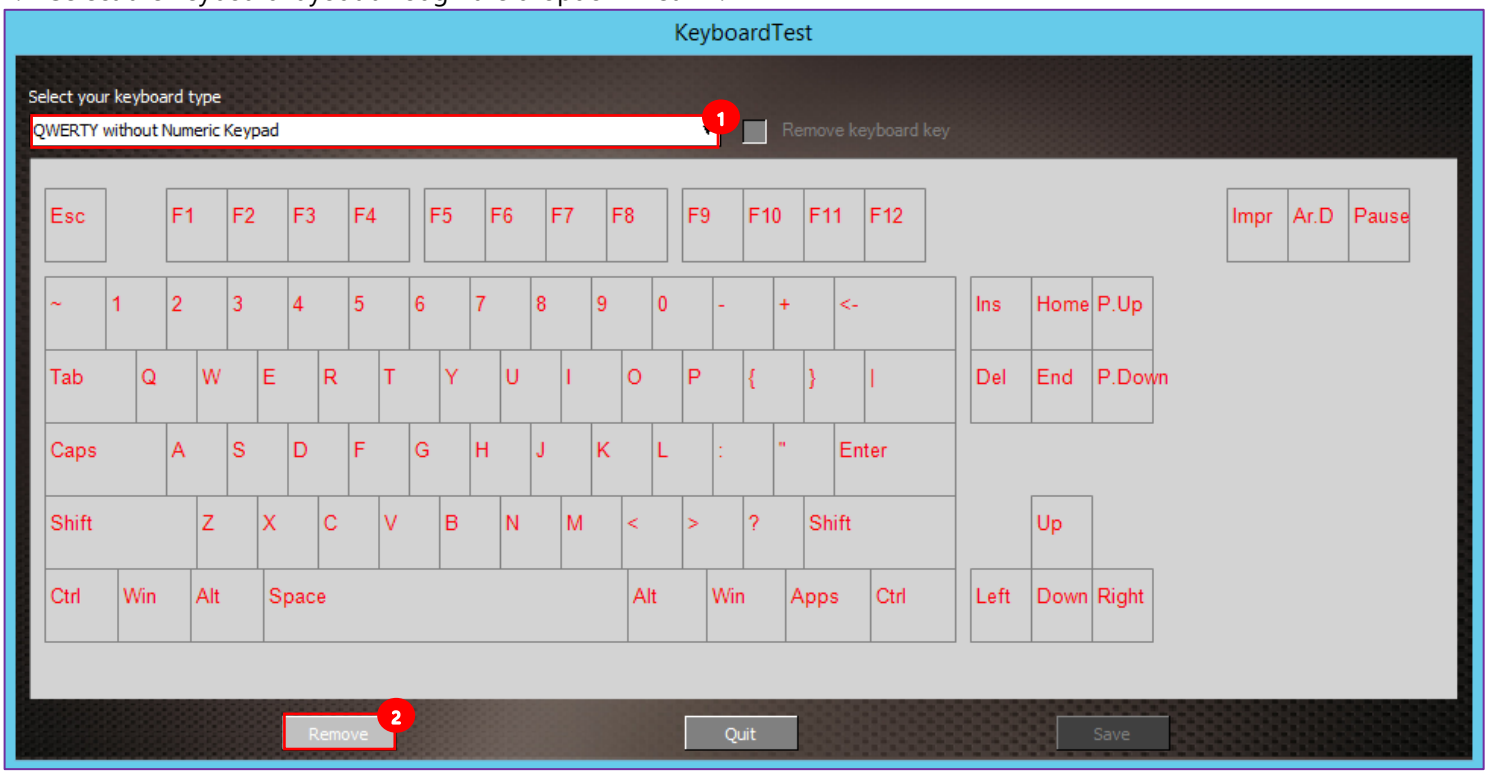
Removing a keyboard layout

You can remove only a keyboard you added (not the predefined ones).

1. Select the keyboard layout through the dropdown list (1):



2. Click on the “Remove” button (2) at the bottom

Editing a keyboard layout

You cannot edit directly a keyboard layout you added. You have to remove it and then recreate it as described above.

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BurnInTest

BurnInTest Disk Test Suite

This suite contains a number of tests that exercise the mass storage units (hard disk or otherwise) connected to the computer.

These tests can be on the File System (e.g. NTFS disk volume C:) or directly to the physical disk (e.g. physical disk 1, not using a file system like NTFS).

The physical disk test is available on unformatted disks and formatted disks that do not contain Windows installations or paging files.

On WinPE environment, only unformatted disks are supported for the physical disk test.

By default drive C: is used for the hard disk but this can be changed from the Preferences Dialog and up to 50 drives can be selected for simultaneous testing. From this 50 it is possible to select combinations of available floppy disks, hard disks and flash drives.

Drives can be connected via the IDE bus, SATA, eSATA, SCSI, USB, Firewire or any other method supported by Windows.

You can select one of the following test modes or choose to automatically cycle between the patterns. This selection is done in the preferences window. Possible test modes are:

- Default (Cyclic)
- Sequential data pattern (0,1,2...255)
- Random data with random seeking
- High Low frequency data overwrite (10101 then 00001)
- Butterfly seeking
- Binary data pattern 1 (10101010)
- Binary data pattern 2 (01010101)
- Zeros data pattern (00000000)
- Ones data pattern (11111111)
- Random data pattern
- User defined test pattern
- Quick physical drive test
- Physical drive read test

During each test cycle (except Butterfly seeking and Quick physical drive test) a file is created and verified on the disk.

For the physical disk test there is no file system (e.g. NTFS) to write 'visible' files. As such BurnInTest will create 'virtual' files directly to the disk. This will destroy any data on the disk. The physical drive test in general will be much faster than the formatted drive test and provide better results.

The only exception is the Physical drive read test which will only read directly from the physical disk, and hence will not overwrite any data on the disk.

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The size of the file is equal to a certain percentage of the disks capacity and all files are created in the root directory of the drives selected. The default file size is 1.0% of the disk size. For small capacity drives, like floppy disks, there is a minimum file size of 32KB. It is possible to change the default file size percentage from the preferences window.

Each test file is filled with a coded number sequence (a Pattern) that is used to verify the correct operation of the disk when the file is verified (read). Files are created in the free space on the disk until the disk is at least 94%* full (we'll refer to this as the 'full' level). When the disk has reached this limit, all the test files are deleted and the test starts again.
(*) 94% is used on disks that have a swap file or a Windows directory. A limit of 94% is used to ensure that some space is kept for use by other applications (including the windows swap file). On disks that do not have a swap file or a Windows directory, between 99.5% and 100% of the disk will be used.

A number of test modes perform additional testing to that described above. These are described below:
Random data with Random seeking consists of 2 repeating steps, (1) Writing, reading and verifying a test file with random data and (2) Seeking two random locations in the test files and reading or writing data blocks at this location.

(1) BurnInTest generates 7 unique blocks of random data for each disk under test (the block size is determined by the User preferences settings e.g. 16KB). BurnInTest sequentially writes a file using the first block of random data, followed by the second, third , forth, fifth, sixth and seventh and then the first etc, until the file size specified is reached (e.g. 0.1% of the disk size). After writing this test file with the random test data, the data is read sequentially and verified against the test data written.

(2) Following the writing and verifying of each file, the random seek part of the test starts. BurnInTest will select a test file at random (1..n, where n is the number of the test file that has already been written to disk). It will then select a random block within that test file (i.e. an offset into the file of, block number x block size, eg. 10 * 16KB = 160KB). BurnInTest will seek to this position in the test file and take an action. BurnInTest, at random, will either (i) read and verify a block at this position in the file or (ii) write a block at this position in the file. This process is repeated the number of times specified by the user in the disk preferences "seek count" field.

Steps (1) and (2) are repeated until the disk full level is reached. At this point, all the test files written to disk will be deleted and the process will be repeated.

The Random seeking mode is not supported when the Raw disk test mode is selected.

High Low frequency data overwrite works by first writing a file with a high frequency pattern with each byte set to 0xAA (1010 1010 1010 1010...), then overwriting this with a low frequency pattern 0x08 0x42 0x10 0x84 0x21 (1000 0100 0010 0001 0000 1000 0100 0010 0001) and then verifying that the low frequency pattern has been fully and correctly written. Note: This test pattern will write more data than it reads/verifies, this is the reason the MB Written and MB verified shown on the disk test window may not be equal.

Butterfly seeking works by detecting the hard disk geometry (number of cylinders etc) and then seeking between cylinder 0 and cylinder X and back to cylinder 0. This is repeated the user specified 'seek count' times, before X is incremented by 1. This is repeated until the last cylinder on the Volume is reached. The number of operations reported refers to the number of combined Seek/Read operations.

Note: (1) that this test is only supported in Windows XP and above on non-Floppy, non-optical drives.

(2) Performing a seek in many cases does not move the disk driver head, to ensure the disk drive head is moved to the seek position, a small read (of the Sector size) is done at each seek position. Also, incremental offsets of the sector size are used for the 'X ' seek and the return to '0' seek, to ensure that the disk drive cache is overflowed and physical disk seeks consistently occur (once the disk cache has overflowed).

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(3) Disk drive geometry may be faked or translated by hard disks/device drivers and may not be the actual drive geometry.

(4) The Cylinders, track and sector size used are typically logical values provided by the hard disk.

(5) Up to 8 different physical extents per Volume (or Drive letter) are supported in the butterfly seeking test.

(6) As with other disk tests, if a physical disk is partitioned into multiple volumes (drives) and testing is simultaneously carried out on these volumes, the nature of the test will change. In the case of Butterfly seeking, the movement of the physical disk drive head will not reflect butterfly seeking, but something between butterfly seeking and random seeking, as the seeks for volume 1 go from its logical cylinder 0 to X and the seeks for volume 2 go from its logical cylinder 0 to Y are mixed in time.

(7) Some disk drive device drivers do not support the supply of disk geometry information that is needed for this test.

(8) The Raw disk test option does not support the Butterfly seeking test mode and will be skipped. Error reporting may be configured not to report “Butterfly seeking test not supported for this disk” errors. This can be achieved by editing the Error Classifications file (BITErrorClassifications.txt) for Error Number 160 to NONE. For example, changing the line from:

160,"Butterfly seeking test not supported for this disk", INFORMATION,

to

160,"Butterfly seeking test not supported for this disk", NONE,

The default setting is to cycle between the patterns. In this case a new pattern will be selected each time the disk has reached the BurnInTest ‘full’ level. Where the disk drive is a floppy, CD, DVD, or the operating system is Vista (and later) and the user is not running BurnInTest with 'elevated' administrator privileges, then Butterfly seeking will be skipped in the Cyclic testing and a log message reported.

The Quick physical drive test works by writing, reading and verifying virtual test files to the start of the disk, the end of the disk and a random selection in between. This provides for much quicker disk testing.

The Physical disk read test, tests that all sectors on the physical disk can be read. This can be useful for a number of reasons including testing that a disk is the size that it reports it is (we have seen disks and USB Flash Drives that have this issue).

You can chose to log SMART (Self-Monitoring Analysis and Reporting Technology) errors.

Each of the following settings: Slow drive warning threshold, File size, Test pattern and the logging of SMART errors may be configured differently for each disk drive. The disk drive Duty Cycle setting will be used for all drives when the Duty Cycle Override entry is set blank (no value). If a different duty cycle is required for a particular disk drive, a value may be entered in the Duty Cycle Override entry.

The following settings can be configured differently for each drive: Slow drive warning threshold, File size, Test Pattern and Log SMART errors. To use the general disk drive Duty cycle for each disk just set the Duty Cycle override value to blank (no value), otherwise set the required value per disk. If an error is detected in the coded number sequence then the error count is incremented. The numbers of bytes written and read from the disk are displayed in the test window. The addition of these two values is displayed in the main window.

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BurnInTest Disk Self-Test

The Disk Self-Test (DST) is a set of built-in routines implemented by the vendor to perform failure diagnostics on the disk. The execution of the DST and the retrieval of the test results are defined by the ATA industry standard. Most drives that conform to this standard implements this set of built-in routines.

If the "SMART" option is selected for the disk test, then the DST is run before the standard BurnInTest disk test. If the "-f" command line parameter is also specified, then an extended disk self-test is also run. If the DST is not supported by the disk, a message will be logged and the DST skipped.

Disclaimer: It has been observed that some drives that claim to support the Disk Self-Test (DST) standard do not in fact fully support the specification. Some drives report the percentage progress incorrectly, and some drives report their status incorrectly.

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BurnInTest CPU test

The CPU test exercises and verifies a wide range of CPU instructions, at user specified loads. The user selectable sub-categories of the CPU test are:

General purpose instructions (x86) Floating Point Unit (FPU) instructions (x87) CPU extension instructions (x86 extensions).

The specific extension instructions may be selected:
MMX, 3DNow!, SSE, SSE2, SSE3, SSE4.1, SSE4.2 and SSE4a.

Prime number test

Maximum heat test

The numbers displayed in the test window for this test represent how many millions of CPU operations have been performed and verified. Each different CPU test is run for half a second. After all tests have been run the cycle count is incremented. The duty cycle and the CPU speed determine how many operations can be processed during the half second period. Note however that if only the Maximum heat test is selected, then the duty cycle is set to 100% and a single cycle is defined to be 1 trillion CPU operations.

By default, a CPU test is run on each CPU core. The number of CPU tests running a particular subcategory is shown in the test window in the "Threads" column.

The number of CPUs (Packages x cores x threads) that can be tested is up to 256 (where supported by the Operating System). That is, CPUs across multiple "processor groups" can be tested (see Note 2 below).

It is possible to raise an error on a user defined CPU temperature threshold being exceeded. It is also possible to automatically stop testing in this scenario.

The sub-categories of this test are described below:

General purpose instructions: This test exercises and verifies correct operation of CPU instructions from the following groups: Integer mathematics (e.g. add, subtract, multiply and divide)
Data transfer instructions (e.g. pushing/popping data to/from the stack)
Bitwise logical instructions (e.g. bitwise and/or/xor) Shift and rotate instructions (e.g. shift data left x number of bits) Logical instructions (e.g. equals)
Control transfer instructions (e.g. jump on x greater than y)
String instructions (eg. copy a text string)

Known and random data sets are used to exercise and verify correct operation. On 32-bit systems, 32-bit data sets are used. On 64-bit systems, 64-bit data sets are used. The random numbers are generated regularly to provide a larger data set, as well as ensure that the CPU caches overflow and that this mechanism is tested.

Floating Point Unit (FPU) instructions:

This test exercises and verifies correct operation of CPU instructions from the following groups:

Floating Point math (e.g. add, subtract, multiply and divide)
Transcendentals (e.g. sine, cosine)
Load constants (e.g. load Pi)

Known and random data sets are used to exercise and verify correct operation. On 32-bit systems, 32-bit floating point data sets are used. On 64-bit systems, 64-bit floating point data sets are used. The random numbers are generated regularly to provide a larger data set, as well as ensure that the CPU caches overflow and that this mechanism is tested.

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Extension instructions (x86 extensions):

This test exercises extensions to the x86 CPU instruction set for a variety of applications, such as multimedia.

!: This test exercises and verifies correct operation of CPU 3DNow! instructions, including a sample of moving 3DNow! registers, adding, subtracting, and multiplying. Known and random data sets are used to exercise and verify correct operation. Data sets are pairs of 32-bit floats (eg. x,y), where x and y are 32-bit floats.

MMX: As above, but for MMX instructions. Instructions include moving MMX registers, adding, subtracting, and multiplying.

Data set: 64-bit data sets are used. SSE : As above, but for SSE instructions. Instructions include moving SSE registers, adding, subtracting, and multiplying.

Data set: groups of 4 x 32-bit floats (e.g. a,b,c,d) where a,b,c and d are 32-bit floats.

SSE2: As for the SSE test, but for SSE2 instructions. Data set: pairs of 64-bit floats (e.g. x,y) where x,y are 64-bit floats.

SSE3: As for the SSE2 test, but for SSE3 instructions. Data set: pairs of 64-bit floats.

SSE4.1: As for the SSE3 test, but for SSE4.1. Instructions include a sample of mov ing registers and multiplication. Data set: pairs of 64-bit integers.

SSE4.2: As for the SSE4.1 test, but for SSE4.2 instructions. Instructions include CRC helper functions. Data set: pairs of 32-bit integers.

SSE4a: As for the SSE4.1 test, but for SSE4.a instructions. Instructions include data extraction functions. Data set: pairs of 64-bit unsigned integers.

AES: A test using the AES instructions.

Notes:
1. MMX stand for "Multimedia Extensions".
2. SSE stand for "Streaming SIMD extensions".
3. SIMD stands for "Single Instruction Multiple Data."
4. Tests are only performed if the CPU supports that test. For example, SSE3 tests will only be performed if the CPU supports SSE3.
5. Known and random data sets are used to exercise and verify correct operation
6. The random test data is generated regularly to provide a larger data set, as well as ensure that the CPU caches overflow and that this mechanism is tested.
7. AES stands for Advanced Encryption Standard.

Prime number:

This test exercises and verifies correct operation of CPU through the use of a prime number generation algorithm.

Maximum heat:

Based on PassMark Software testing of a set of CPU algorithms for different systems, a test has been produced that aims to generate the highest CPU temperature possible by BurnInTest. This test is aimed at checking that the cooling system is capable of doing its job with the system CPU under extreme load, especially when the CPU has been overclocked.

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Notes:
(1) Some CPU operation tests are only supported in the 32-bit version of BurnInTest. These are: 3DNow!, MMX, Push/Pop stack operations, Transcendental's and Load constants.
(2) A normal software application only has access to a single "processor group". BurnInTest has been designed to test CPUs across multiple processor groups and hence test more than 64 logical processors. For more information on a "processor groups" see Microsoft's website, an extract is included below:

> "The 64-bit versions of Windows 7 and Windows Server 2008 R2 support more than 64 logical processors on a single computer. This functionality is not available on 32-bit versions of Windows.
> Systems with more than one physical processor or systems with physical processors that have multiple cores provide the operating system with multiple logical processors. A logical processor is one logical computing engine from the perspective of the operating system, application or driver. A core is one processor unit, which can consist of one or more logical processors. A physical processor can consist of one or more cores. A physical processor is the same as a processor package, a socket, or a CPU.
> Support for systems that have more than 64 logical processors is based on the concept of a processor group, which is a static set of up to 64 logical processors that is treated as a single scheduling entity. Processor groups are numbered starting with 0. Systems with fewer than 64 logical processors always have a single group, Group 0."

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BurnInTest Memory Test

The Memory test, tests the reliability of the RAM installed in the computer. As BurnInTest runs within windows some of the available RAM is being used by windows and any other applications running. Any memory that is not already in active use will be tested by the Memory test.
The Memory test works by writing a pattern numbers in the RAM, then verifying the numbers read from the RAM match this sequence. The pattern used can change automatically from one cycle to the next.
Possible test patterns are,
1. Sequence (0,1,2...)
2. Binary 1 (10101010...)
3. Binary 2 (01010101...)
4. Zeros (00000000...)
5. Ones (11111111...)
6. Cell adjacency test

The Test pattern may be selected to be one of the above test patterns. Alternatively, the default (Cyclic) setting will cycle through each of the test patterns.
The total amount of free RAM is displayed in the Memory Test Window. Some memory is always left available to avoid Out of Memory Errors, and disk thrashing caused by Windows swapping to disk. The MBs Written and MBs Verified fields on the Memory Test Window are cumulative since the start of the test and can be greater than the size of the installed RAM.
For the Memory test, a cycle is defined to be the number of times the above 3 step sequence is completed. The 'operations' count represents the number of bytes read or written.
It should be noted that not all RAM faults will be detected by this test. This is especially the case if Windows or the Windows cache is using a large proportion of the available RAM. RAM faults may show up as system crashes or disk errors however. RAM fault detection is improved by running a RAM pretest, available with the Standard memory test. See RAM test preferences.
How the tests work:
There are 3 steps that the Sequence, Binary 1, Binary 2, Zeros, and Ones (11111111...) tests goes through. These are:
1/ Memory allocation. The test will dynamically allocate and release memory depending on how much is currently available. The amount that has been allocated and is under test is displayed in the Test Ram field.
2/ Writing the test data from the low address to the high address.
3/ Verifying the test data from the low address to the high address.
The Cell adjacency test aims to find the RAM problem of adjacent memory cells being incorrectly changed when writes occur to a memory cell. A known 8-bit data pattern is written to memory from the high address range to the low address range. Then starting at the low address and testing towards the high address, each byte is checked that it was not altered by an adjacent write in the prev ious writing of memory and a new 8-bit data pattern is written. A final pass is then made starting at the high address and testing towards the low address, with each byte is checked that it was not altered by an adjacent write in the previous writing of memory.

- ***Standard memory test***

The standard memory is the normal test for testing memory. See the description in the RAM test preferences window for more details.

- ***Torture test (Memory over-allocation & disk swapping test) (BurnInTest Professional only)***

The torture test is a multi-process memory test. Multiple processes are started in their own virtual address space and each process allocates and tests a block of RAM. This avoids the problem of virtual memory fragmentation which the standard test can experience trying to allocate a single large block of RAM. Each process runs asynchronously, so writing and reading of various memory blocks will take place at the same time in different processes. The other advantage over the standard test is the possibility to over-allocate the RAM. (The standard test attempts to prevent this to avoid disk swapping). Over-allocation takes place when more RAM is used by the torture test than is currently available in the system. This then results in Windows disk swapping memory blocks into a paging file on the disk. This continual swapping to and from the disk places a very heavy load on the system. The I/O activ ity on the disk will increase dramatically but CPU load can actually decrease as more and

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more time is spent waiting for the paging activity to complete. Depending on the level of over-allocation Windows may need to extend the paging file or may even fail as it runs out of available RAM.

- ***Addressing Windows Extension (AWE) memory test (32-bit BurnInTest Professional only)***

The Addressing Windows Extension (AWE) memory test allows a larger area of memory to be tested on 32-bit versions of Windows. It requires some additional administrator user rights. It will also only work in Window XP. See the description in the RAM test preferences window for more details. The advanced memory test is only available in the Professional version of the software.

END OF DOCUMENT

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