Sobol
Version 4

Sobol Software

Administrator Guide

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List of abbreviations

API	Application Programming Interface
BIOS	Basic Input/Output System
IC	Integrity Check
M.2	PCI Express M.2 (Type 2230-D4-A-E)
Mini PCIe	Mini PCI Express
Mini PCIe Half	Mini PCI Express Half
NVRAM	Nonvolatile Random Access Memory
PCIe	PCI Express
RNG	Random Number Generator
SMBIOS	System Management BIOS
UEFI	Unified Extensible Firmware Interface

Introduction

This document is designed for administrators of Hardware Trusted Boot Module Sobol, Version 4 (hereinafter Sobol). It contains information about setup and operation of Sobol software.

Outline

This administrator guide has the following structure:

- **Chapter 1** provides an overview of Sobol software (its purpose and the system requirements);
- **Chapter 2** describes the setup and operation procedures of Sobol software for Windows;
- **Chapter 3** describes the setup and operation procedures of Sobol software for Linux;
- **Appendix** contains information about **scheck** tool operation.

Additional information

Web- site. Information about Security Code products can be found on https://www.securitycode.ru.

Training. You can learn more about hardware and software products of Security Code in authorized education centers. List of the centers and information about learning environment can be found on https://www.securitycode.ru/. You can contact company representative for more information about organization of teaching process by email: education@securitycode.ru.

Chapter 1
Overview

Purpose

Sobol software configures the IC mechanism and performs additional operations while working with Sobol.

Note. The Sobol IC mechanism starts before an OS is loaded and ensures that software and hardware components of a protected computer cannot be modified without permission.
For detailed information about the IC mechanism, see [**1**].

Sobol software contains the following components:

- IC template management program;
- API library (snellock.dll) for Sobol driver.

The IC template management program allows you to:

- create and modify the list of objects that will be checked for integrity violations, and save these lists to files — IC templates;
- modify original IC templates — add/remove objects and restore original files;

  Note. Original IC templates are created during Sobol software installation. If you do not need to modify the original IC templates, to configure the IC mechanism, calculate reference checksums while initializing Sobol (see [**1**]).
- create reports about controlled objects;
- create a file to export the Sobol log;
- create a file to save UEFI Option ROM.

Using the IC template management program in Windows you can configure IC for the following objects:

- files;
- hard drive sectors;
- registry items;
- PCI devices;
- SMBIOS structures.

Using the IC template management program in Linux you can configure IC for files and hard drive sectors. In CentOS 7.3, you can also configure IC for PCI devices and SMBIOS structures.

System requirements

Sobol software is compatible with the FAT16, FAT32, NTFS, EXT2, EXT3, EXT4 file systems and the following operating systems:

MS Windows	• 10 x64; • 8.1 x64; • 8 x64; • 7 x64 Edition; • Server 2012 R2; • Server 2016
Linux	• ALT Linux SP 8.2; • ALT Linux SP 8; • OS Lotos 2; • RED OS MUROM 7.2; • Astra Linux Special Edition 1.6; • Astra Linux "Smolensk" 1.5; • Astra Linux "Smolensk" 2.12.14; • CentOS 7.6.1810; • Continent OS 4.2; • Debian 9.9; • RHEL 7.6; • ROSA Enterprise Linux Desktop; • Ubuntu 18.04 LTS; • VMware vSphere ESXi 6.0 up2; • VMware vSphere ESXi 6.5 a **Note.** Sobol software is compatible with other operating systems within Linux family. For detailed information, contact the service department (https://www.securitycode.ru/services/).

System hard drive must be a GPT structure and contain at least 50 MB of free space.

While creating IC templates and before running reference checksum calculation, remove all USB Mass Storage devices (CD, DVD, flash drives, etc.) from your computer.

Chapter 2
Sobol software for Windows

Installation

To install the IC template management program:

The Installation Wizard appears.

1. Read the information and click **Next >**.

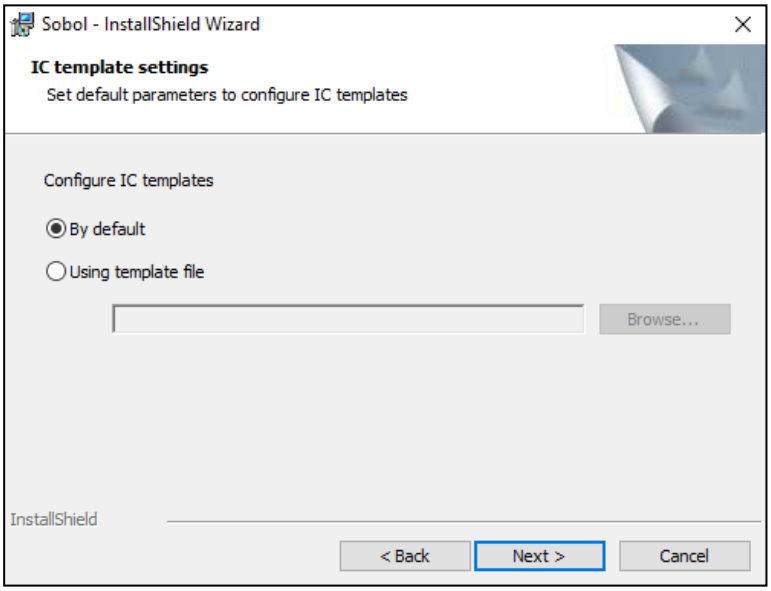
   The dialog box containing the text of the license agreement appears.

2. Read the license agreement, click **I accept the terms in the license agreement**, then click **Next >**.

   The dialog box prompting you to specify the destination folder appears.

3. Click **Next>**.

   The dialog box prompting you to select the file containing the list of objects for integrity check appears:



You can select another file. To do so:
- select **Using template file** option button and click **Browse**;
- select the required file;
- click **Open**.

4. Click **Next >**.

   The dialog box prompting you to start the installation appears.

5. Click **Install**.

   The Installation Wizard starts to deploy Sobol software. On the progress bar, you can see the progress of the installation.

- to update system files without restarting the computer, close the listed programs, then click Retry;
- to continue the installation immediately, click **Ignore**. In this case, when the installation is completed you may receive a message prompting you to restart the computer.

The Installation Wizard registers Sobol card driver and creates IC templates.

When the installation is completed, the respective dialog box appears. To run the IC template management program, select the run the Run IC template management program check box.

6. Click **Finish**.

Uninstallation

To uninstall Sobol software, use the Installation Wizard or Windows Explorer.

To uninstall Sobol software using the Installation Wizard:

1. Insert the installation disk into DVD/CD-ROM, run **Setup.exe**.
   The Installation Wizard appears.
2. Click **Next >**.
   The **Program Maintenance** dialog box appears.
3. Select **Remove** and click **Next >**.
   The **Remove the Program** dialog box appears.
4. Click **Remove**.
   When the installation is completed, the respective dialog box appears.
5. Click **Finish**.

If Sobol card was not removed from the computer after the uninstallation of Sobol software, you may receive a message about the detection of an unknown device when you start the computer.

Update

To update the IC template management program:

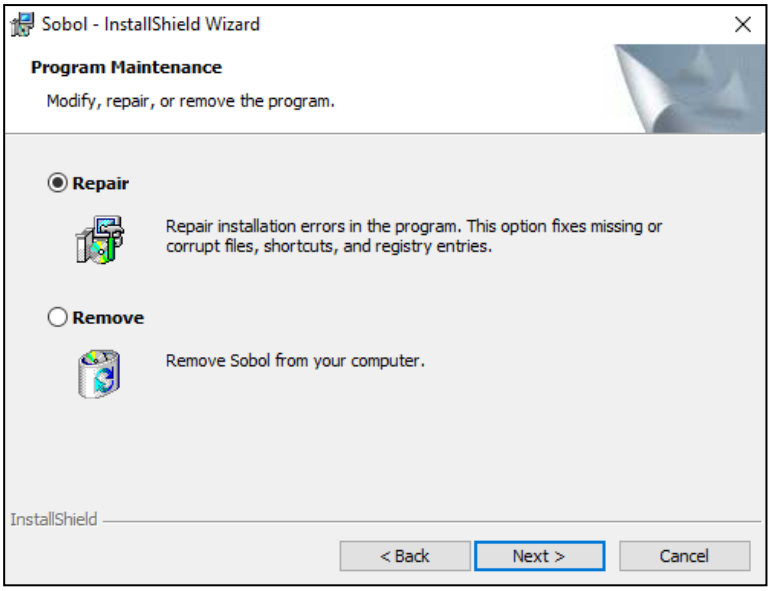
After that the dialog box prompting you to continue Sobol software update appears.

1. Click **Yes**.
2. Read the information and click **Next >**.
   The Installation Wizard starts to update the IC template management program. On the progress bar, you can see the progress of updating.
   When the update is completed, the respective dialog box appears.
3. Click **Finish**.

Repair

To repair IC the template management program:

1. Insert the installation disk into DVD/CD-ROM, run **Setup.exe**
   The Installation Wizard appears.
2. Click **Next >**
   The **Program Maintenance** dialog box appears:



3. Select **Repair** and click **Next >**.

   The **Ready to Repair the Program** dialog box appears.

4. Click **Install**.

   You can see the progress of the installation on the progress bar. When the operation is complete, the respective dialog box appears.

5. Click **Finish**.

IC data model

The parameters that define Sobol IC operation and are configured using the IC template management program for Windows are combined into a data model.

The IC data model is a hierarchical description of objects and relations between them. The model uses 5 categories of objects:

Object	Description
Resource	A file, a disk sector, a registry item, a PCI device, a SMBIOS structure. It is defined by the location and type of the resource
Resource group	Multiple descriptions of the same type resources (files, disk sectors, registry items, PCI device, SMBIOS structures). It is defined by the type of the resources included into the group
Task	A set of resource groups of the same or different types, e.g. a task can include a group of system files and sectors at the same time
Job	A set of tasks and resource groups to be controlled
Control actors	A computer protected by Sobol

Objects of one category are subordinate or superior in relation to objects of another category. Thus, resources are subordinate to resource groups, the latter — to tasks. Combining resources to groups, resource groups to tasks, tasks to jobs is called object linking. As a result control actors assign jobs.

Configuring IC

To configure IC using the IC template management program for Windows, take the following steps:

1. Modify IC templates (see p. **12**).
2. Enable IC if it was disabled (see [**1**], **Integrity check**).
3. Calculate the reference checksums (see p. **26**).

Additionally, the IC template management program allows you to:

- generate reports about the controlled objects (see p. **26**);
- save, import and export data models (see p. **27**);
- create files export logs (see p. **28**) and save the UEFI/BIOS extension code (see p. **29**).

Run the IC template management program

According to the OS version:

- for Windows 10/8.1/8/Server 2012 R2 —in the **Start** menu, go to **Sobol** and run **IC template management**;
- for Windows 7 — in the **Start** menu, go to **All Programs** | **Sobol** | **IC template management**.

A window appears as in the figure below:

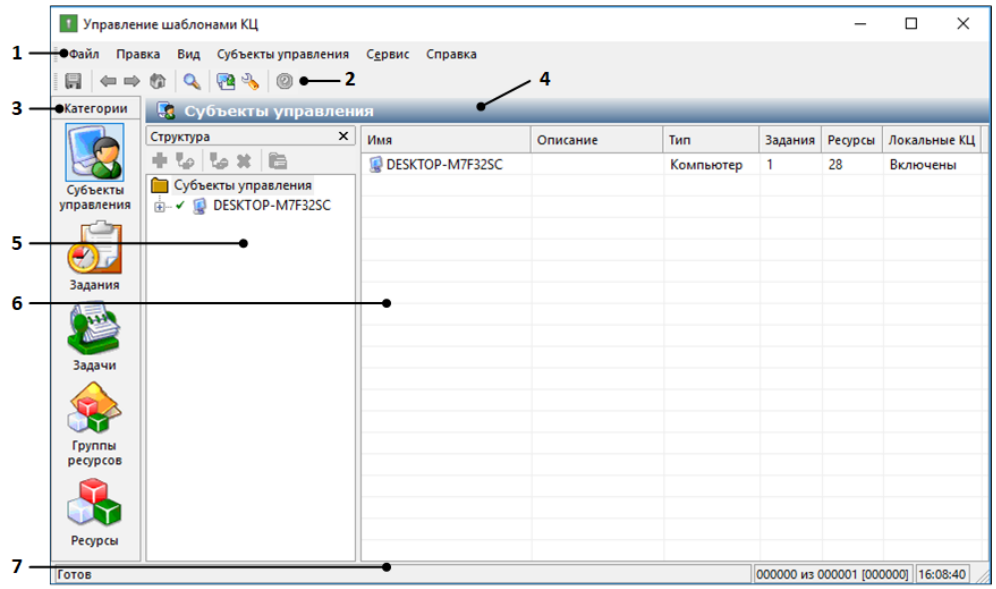


Fig. 1 The main window of the IC template management program for Windows

The main window contains the following interface elements:

(1) Menu
Contains program management commands
(2) Toolbar
Contains shortcut buttons for management commands and software tools
(3) Categories (Категории)
Contains object categories (shortcuts of commands in the **View (Вид)** tab). To display the object of the required category, click its shortcut e.g. to display the task list, click **Tasks (Задания)**. If there is not enough space to display all shortcuts, scroll buttons appear at the top and/or bottom of the panel. Use these buttons to move to the required shortcut
(4) Heading
Displays the heading of the selected object category

(5) Structure (Структура)
Contains a hierarchical list of objects. The root element of the hierarchy is the selected category. To create the structure of objects, create nested objects or link objects of different categories. The shortcuts of objects that require the link with other objects have special signs: • (the lower half of the circle is red) — the object does not include other objects; • (the upper half of the circle is colored red) — the object is not included in other objects; • — the object is not linked to any other objects; • ✔ — the object has all the required links to other objects. At the top of the section, there is the Quick Access Toolbar
(6) Objects
Displays the list of objects included in the object selected in **Structure (Структура)**. Information about the objects is presented in the table. Table rows have different color: • if the object has all the required links to other objects — the row is white; • if the object requires a link but the link is missing — the row is pink; • if the resource is not controlled — the row is gray
(7) Status bar
Contains service messages of the program. In the right part of the status bar, there are zones containing the following information (from left to right respectively): • the sequence number of the selected object, the total number of objects, the number of selected objects in the object list; • the current time

Modifying IC templates

To modify IC templates using the IC templates management program for Windows, take the following steps:

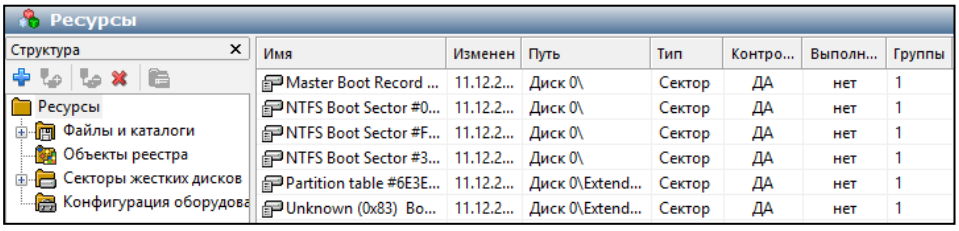
- create new objects for IC:
  - create single resources (see p. **12**);
  - create resource groups: groups of files (see p. **14**), disk sectors (see p. **19**), registry items (see p. **20**);
- add resource groups to the IC job for Sobol (see p. **24**);
- remove objects that do not require IC (see p. **25**).

Create single resources

To create a single resource (a file, a disk sector, a registry item, a PCI device, a SMBIOS structure):

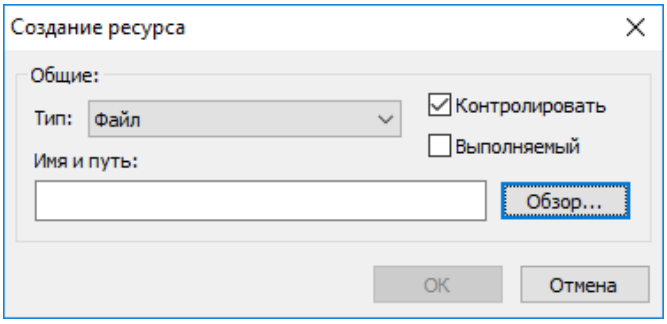
1. In **Categories (Категории)** (see Fig. 1 on p. **11**), go to **Resources (Ресурсы)**.

   You will see the list of resources as in the figure below:



2. In **Structure (Структура)**, click **Add new (Добавить новый)**.

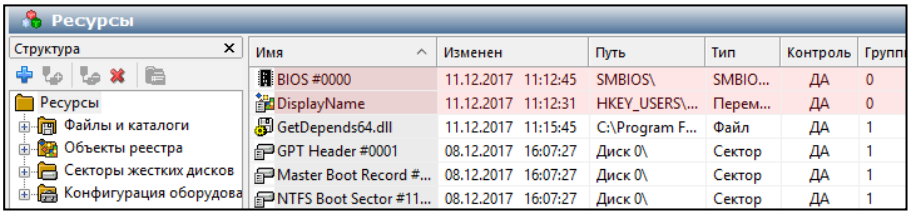
   The **Create resource (Создание ресурса)** dialog box appears:



3. Take the following steps:
   - In the **Type (Тип)** drop-down list, select the required resource: **File (Файл)** / **Registry variable (Переменная реестра)** / **Registry key (Ключ реестра)** / **Disk sectors (Секторы диска)** / **Device configuration (Конфигурация оборудования)**.
   - Click **Browse (Обзор)**.
   - In File Explorer, select the required resource and click **Open (Открыть)/OK**.

     In the **Name and path (Имя и путь)** field, you will see the path to the selected resource.
   - Click **OK**.

     You will see the list of resources as in the figure below:



4. Add the selected single resources to resource groups. To do so:
   - In **Categories (Категории)**, go to **Resource groups (Группы ресурсов)**.
   - In **Structure (Структура)**, click **Add new (Добавить новый)**.

     The **Create resource group (Создание группы ресурса)** dialog box appears.

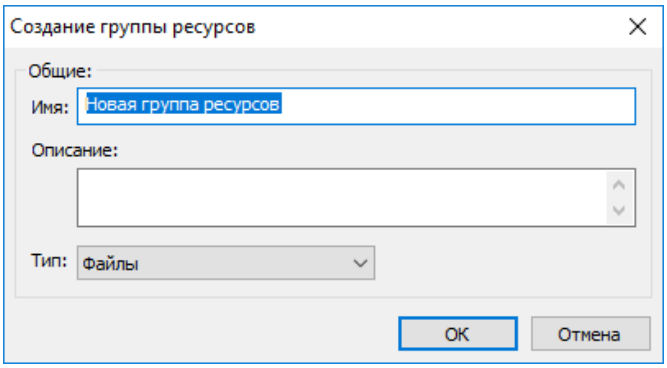
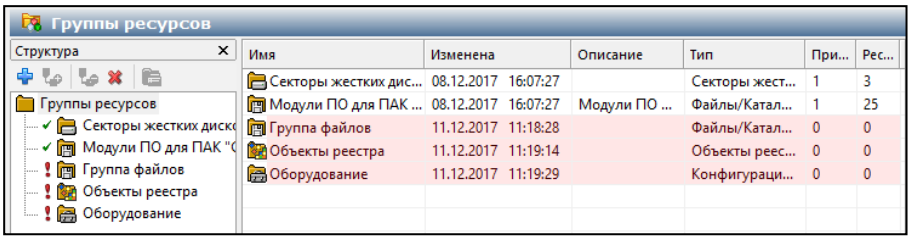


Fig. 2 Resource group creation dialog box

   - Take the following steps:
     - in the **Name (Имя)** and **Decription (Описание)** fields, enter the required name and a group description if necessary;

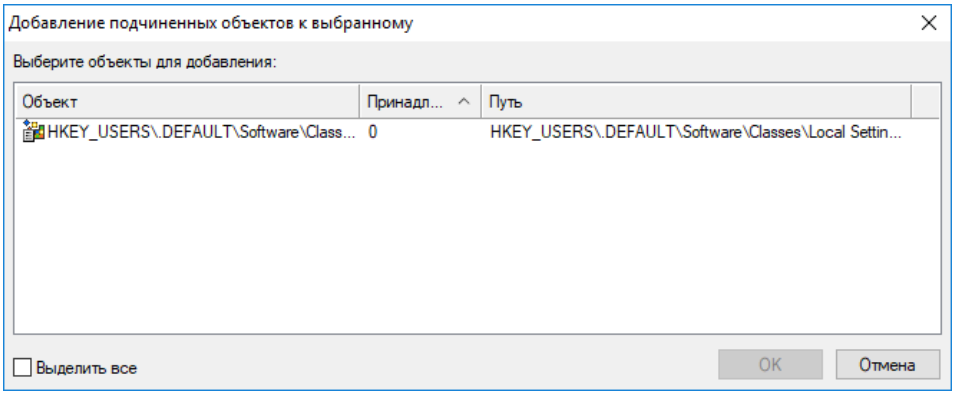
- in the **Type (Тип)** drop-down list, select: **File (Файл)** / **Registry variable (Переменная реестра)** / **Registry key (Ключ реестра)** / **Disk sectors (Секторы диска)** / **Device configuration (Конфигурация оборудования)**;
- click **OK**.

You will see the list of resource groups as in the figure below.



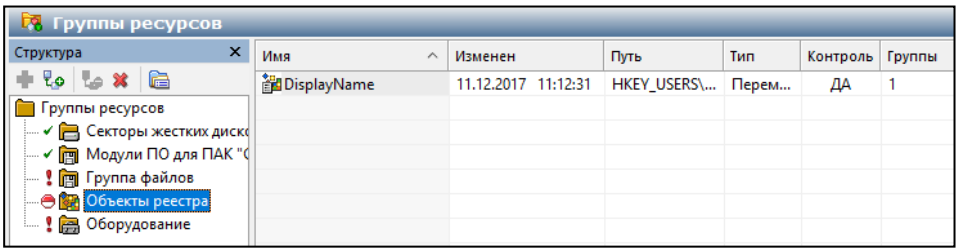
5. In **Structure (Структура)**, right-click the created folder select **Add resources (Добавить ресурсы)** and click **Existing (Существующие)**.

   A dialog box appears as in the figure below.



6. Select the required reource and click **OK**.

   In **Structure (Структура)** and the list of objects, the selected objects appear.



Create a resource group

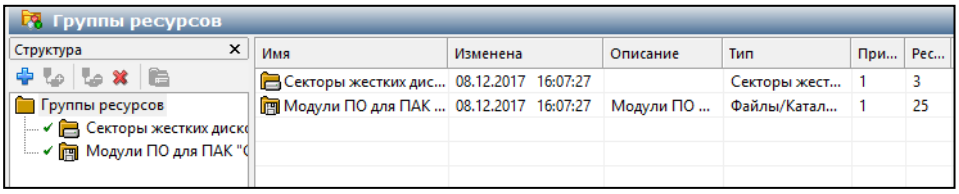
You can create resource groups using task generator or the following commands:

- **By directory (По каталогу)**;
- **Manually (Вручную)**.

To create a resource group (By directory (По каталогу)):

1. In **Categories (Категории)** (see Fig. 1 on p. **11**), go to **Resource groups (Группы ресурсов)**.

   You will see the list of resource groups as in the figure below.



2. In **Structure (Структура)**, right- click the **Resource groups (Группы ресурсов)** folder, select **Create group (Создать группу)** and click **By directory (По каталогу)**.

   The File Explorer appears.

3. Select the required directory and **OK**. In the **IC templates management (Управление шаблонами КЦ)** dialog box click **OK**.

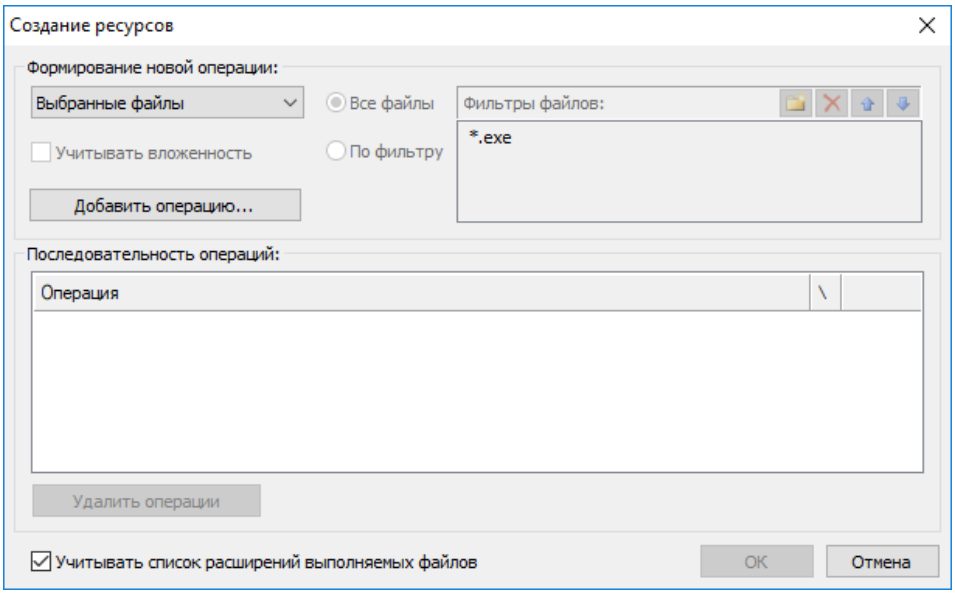
To create a resource group (Manually (Вручную)):

1. In **Categories (Категории)** (see Fig. 1 on p. **11**), go to **Resource groups (Группы ресурсов)**. In **Structure (Структура)**, click **Add new (Добавить новый)**

   The Resource group creation dialog box (see Fig. 2 on p. **13**) appears.

2. Take the following steps:
   - in the **Name (Имя)** and **Decription (Описание)** fields, enter the required name and a group description if necessary;
   - in the **Type (Тип)** drop-down list, select **Files (Файлы)**;
   - click **OK**.

3. In **Structure (Структура)**, right-click the created folder select **Add resources (Добавить ресурсы)** and click **Multiple new (Несколько новых)**.



The **Create resources (Создание ресурсов)** dialog box consists of two parts:

- the **Generate new operation (Формирование новой операции)** group of fields allows you to specify an option for selecting resources and setting additional conditions. You can set several conditions for one option. Adding resources by an option and an additional condition is called an operation. Multiple operations can be performed for one option.

  To perform an operation, select an option, set additional conditions and click **Add operation (Добавить операцию)**.

- the **Sequence of operations (Последовательность операций)** group of fields displays the sequence of the performed operations.

You can find the parameters used for adding new files for IC in the table below:

Parameter	Description
Resource selection option	Two options are available: • **Selected files (Выбранные файлы)** (standard file selection procedure; no additional conditions available); • **Files by directory (Файлы по каталогу)** (files included in the specified directory are added; nesting is taken into account; you can use a filter)
Consider the nested structure. **All files.** **By filter**	Parameters available only if the **Files by directory (Файлы по каталогу)** option

4. Configure resource selection parameters.

   Then, proceed to one of the following steps depending on the selected option:

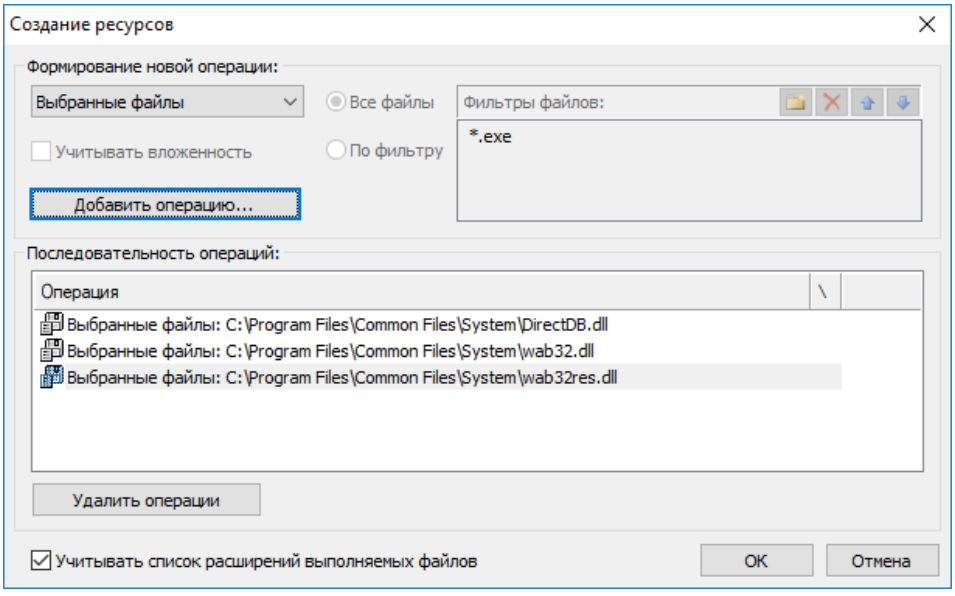
If you selected...	...proceed to step:
Selected files (Выбранные файлы)	**5**
Files in folder (Файлы по каталогу)	**7**

5. Click **Add operation (Добавить операцию)**.

   Windows Explorer appears.

6. Select the required files.

   The new operations are added to the list in the **Operation sequence (Последовательность операций)** section.



   Each file has the respective operation.

   Note. If you need to delete operations, select them in the list and click **Delete operations (Удалить операции)**.

   Then:

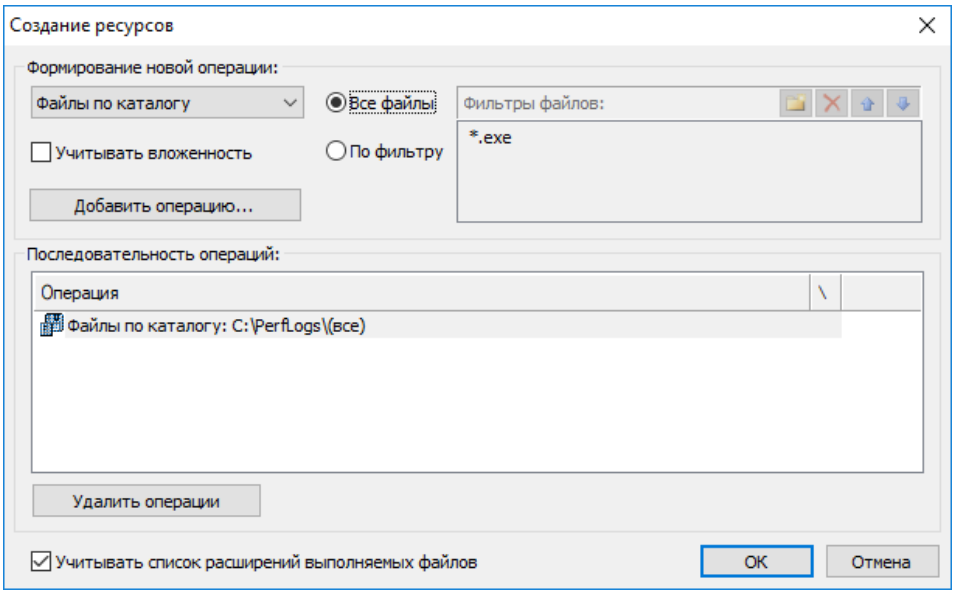
   - if you do not need to add other resources, proceed to step **9**.
   - if you need to add other resources, return to step **4**.

7. Configure additional parameters (to use the filter, double-click a line in the **File filters (Фильтры файлов)** list) and click **Add operation (Добавить операцию)**.

   Windows Explorer appears.

8. Select the required folder and click **OK**.

   The new operation is added to the list in the **Opeation sequence (Последовательность операций)** section.

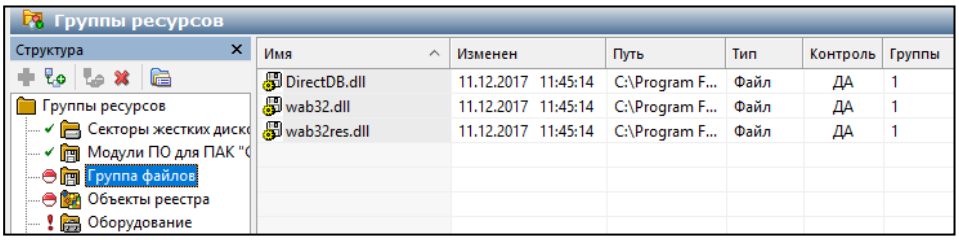


   Then:

   - if you do not need to add other resources, proceed to step **9**.
   - if you need to add other resources, return to **4**.

9. Make sure that you added all the required resources. Click **OK**.

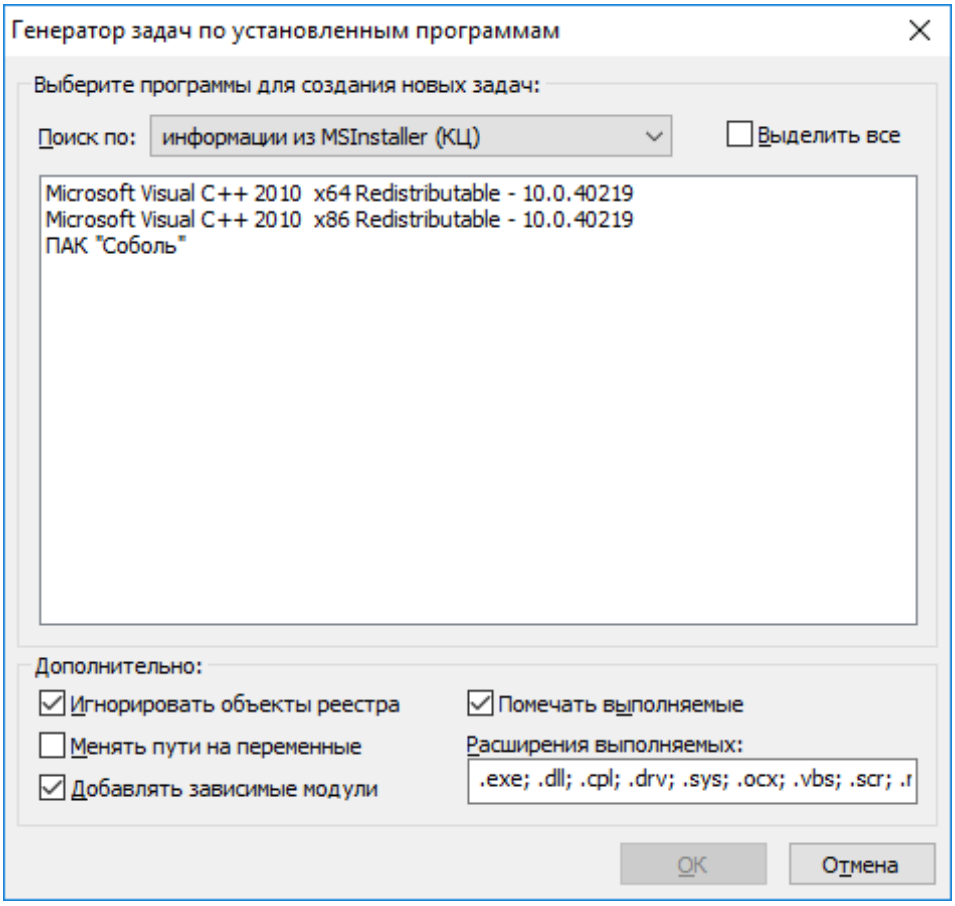
   The **Create resources (Создание ресурсов)** dialog box is closed. The new resouces are added to the data model.



To create a group of files (using Task generator):

1. In the **Categories (Категории)** section (see Fig. 1 on p. **11**), select **Resource groups (Группы ресурсов)**. In the menu, select **Service | Task generator (Сервис I Генератор задач)**.

   A dialog box appears as in the figure below.



2. In the **Search by (Поиск по)** drop-down list, select a source to search for programs.
3. Select the required programs in the list and, in the **Advanced (Дополнительно)** section, set the additional conditions (see the table below).

Tip. To select multiple programs, use **<Ctrl>**. To select all objects in the list, select the **Select all (Выделить все)** check box.

Condition	Description
Ignore regsitry items	Registry items are not added to tasks
Replace paths with variables	Absolute paths to files and folders are replaced with Windows environment variables
Add dependence modules	Dependent modules are added to a resource group where the source file is located. Dependent modules are files that determine source file execution. For example, drivers and libraries that are not parts of applications run directly by user but without these drivers and libraries the application cannot run.
Mark executables	File with extensions specified in the **Executing (Выполняемый)** field are marked

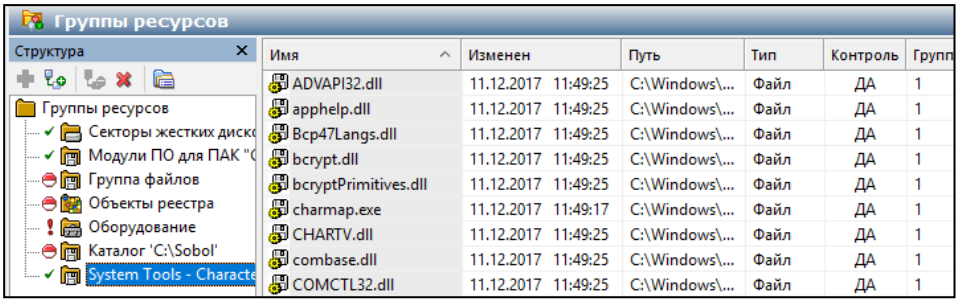
Note. If you select **data from MSInstaller (информации из MSInstaller)** in the **Search by (Поиск по)** drop-down list, you can configure all the additional conditions listed above.
If you select **shortcuts in the Start menu (ярлыкам из меню "Пуск")** in the **Search by (Поиск по)** drop-down list, you can set only the **Replace path with variables (Менять пути на переменные)** and **Mark executables (Помечать выполняемые)** conditions.

4. Click **OK**.

When the generation process is completed, you receive the respective message.

5. Click **OK**.

   The new resources are added to the data model.



Create a sector group

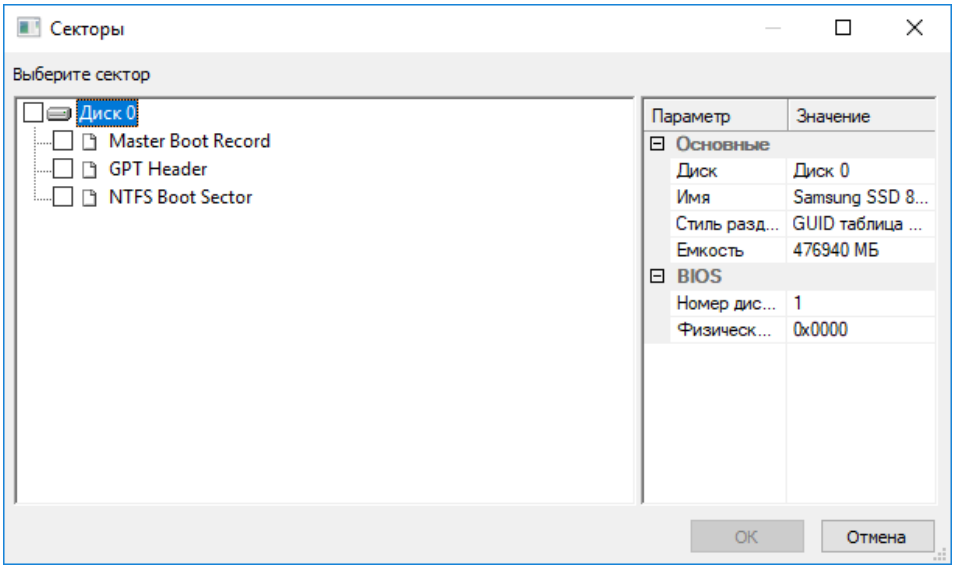
To create a hard drive sector group:

1. In the **Categories (Категории)** section, click **Resource groups (Группы ресурсов)**.
2. In **Structure (Структура)** , right- click **Resource groups (Группы ресурсов)** and select **Create group | Manually (Создать группу I Вручную)**.

   The **Create resource group (Создание группы ресурсов)** dialog box appears (см. Fig. 2 on p. **13**).
3. Take the following steps:
   - in the **Name (Имя)** and **Description (Описание)** text boxes, enter the group name and some additional information, if necessary;
   - in the **Type (Тип)** drop-down list, select **Hard drive sectors (Секторы жестких дисков)**;
   - click **OK**.
   - In **Structure (Структура)**, right-click a folder of the group created earlier and select **Add | New resources (Добавить ресурсы I Несколько новых)**.

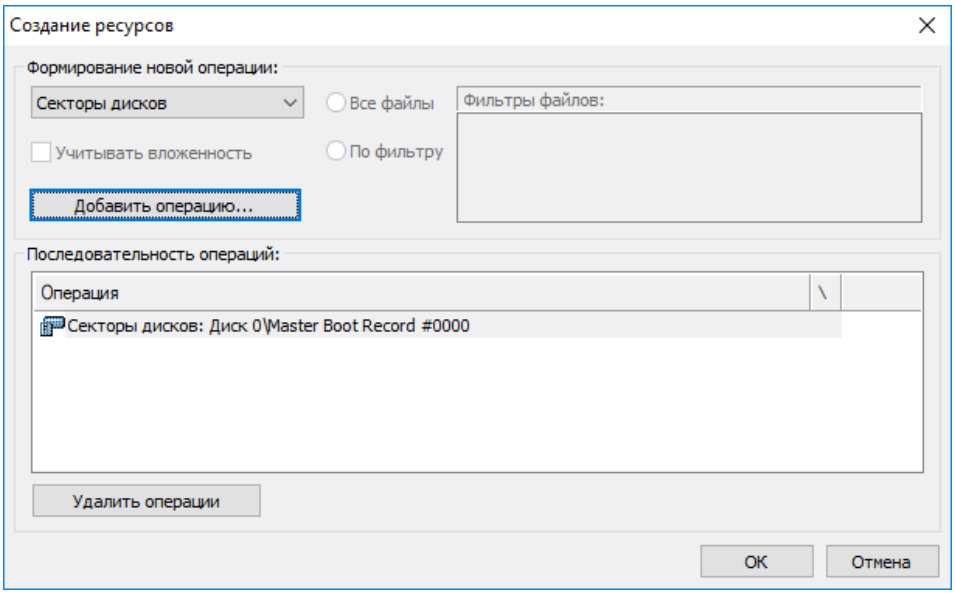
   The **Create resources (Создание ресурсов)** dialog box appears.
4. Click **Add operation (Добавить операцию)**.

   A dialog box appears as in the figure below.



5. Select the required sectors and click **OK**.

The selected operation is added to the list in the **Operation sequence (Последовательность операций)** section.



Note. If you need to delete operations, select them in the list and click **Delete operations (Удалить операции)**.

6. Click **OK**.

   The **Create resources (Создание ресурсов)** dialog box is closed.

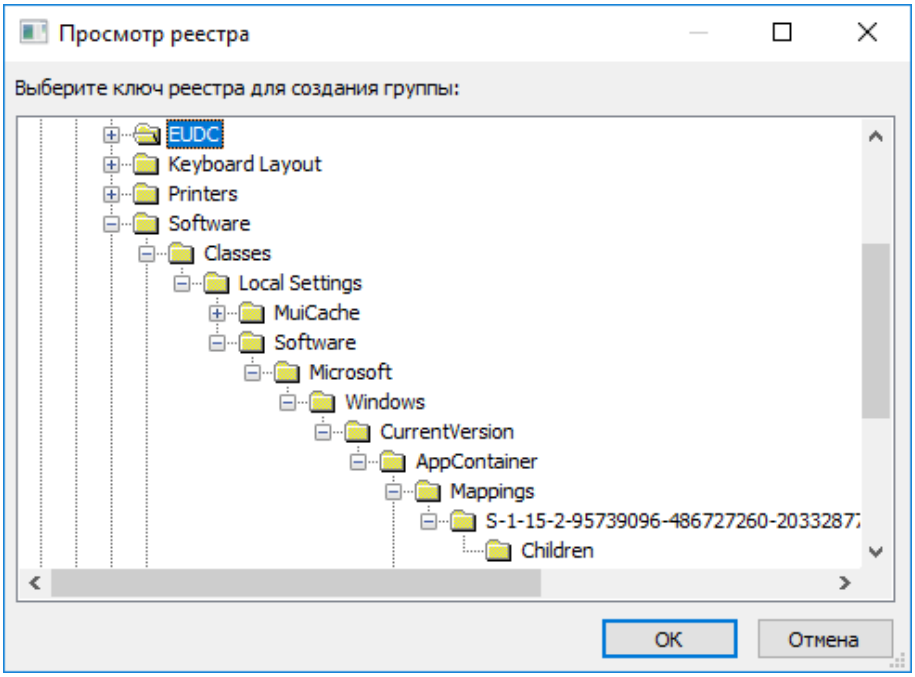
Creating a group of registry items

IC template management program allows you to create the following groups of registry items: registry keys with variables (using the **By registry key (По ключу реестра)** and **Manually (Вручную)** commands) and registry items with variables.

To create a group of registry keys with variables (the By registry key (По ключу реестра) command):

1. In the **Categories (Категории)** section, click **Resource groups (Группы ресурсов)**.
2. In **Structure (Структура)** , right- click **Resource groups (Группы ресурсов)** and select **Create group | By registry key (Создать группу I По ключу реестра)**.

   The **Registry (Просмотр реестра)** dialog box appears as in the figure below.



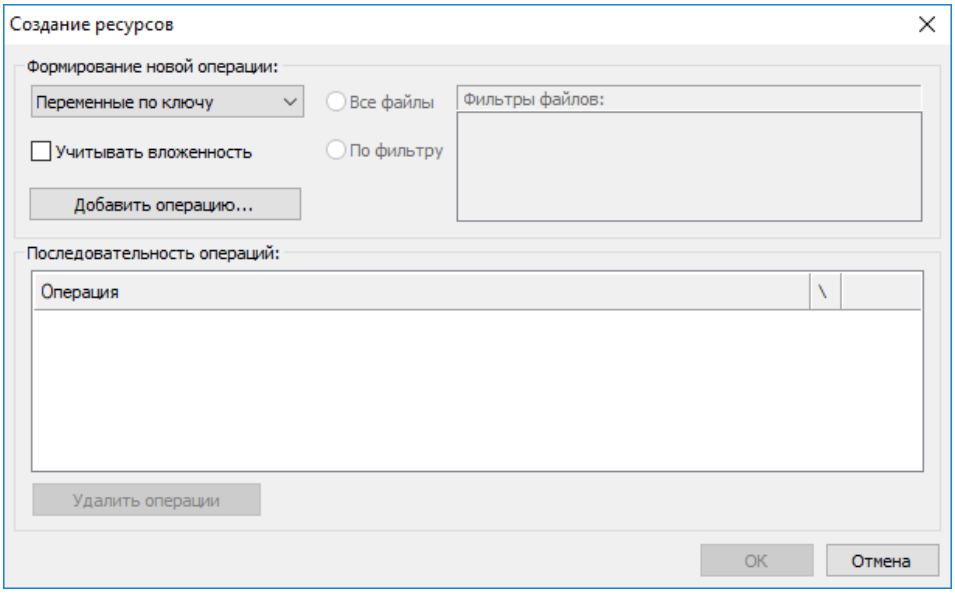
3. Select the required registry item and click **OK**. In the appeared dialog box, click **OK**.

To create a group of registry keys with variables (the Manually (Вручную) command):

1. In the **Categories (Категории)** section (see Fig. 1 on p. **11**), click **Resource groups (Группы ресурсов)**.
2. In **Structure (Структура)**, right- click **Resource groups (Группы ресурсов)** and select **Create group | Manually (Создать группу I Вручную)**.

   The **Create resource (Создание группы ресурсов)** group dialog box appears (see Fig. 2 on p. **13**).
3. Take the following steps:
   - in the **Name (Имя)** and **Description (Описание)** text boxes, enter the group name and some additional information, if necessary;
   - in the **Type (Тип)** drop-down list, select **Registry items (Объекты реестра)**;
   - click **OK**.
4. In **Structure (Структура)**, right-click a folder of the created group and select **Add | New Resources (Добавить ресурсы I Несколько новых)**.

   The **Create resources (Создание ресурсов)** dialog box appears as in the figure below.

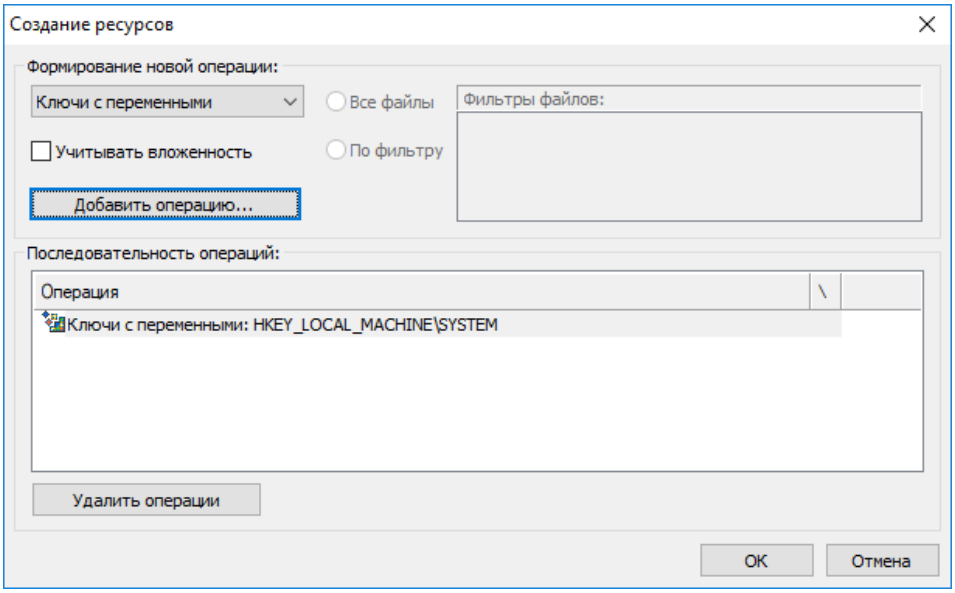


5. In the **Create new operation (Формирование новой операции)** drop-down list, select **Keys with variables (Ключи с переменными)**. Click **Add Operation (Добавить операцию)**.

   The **Registry (Просмотр реестра)** dialog box appears.

6. Select the required registry items and click **OK**.

   The new operation is added to the list in the **Opeation sequence (Последовательность операций)** section.



7. Click **OK**.

   The **Create resources (Создание ресурсов)** dialog box is closed.

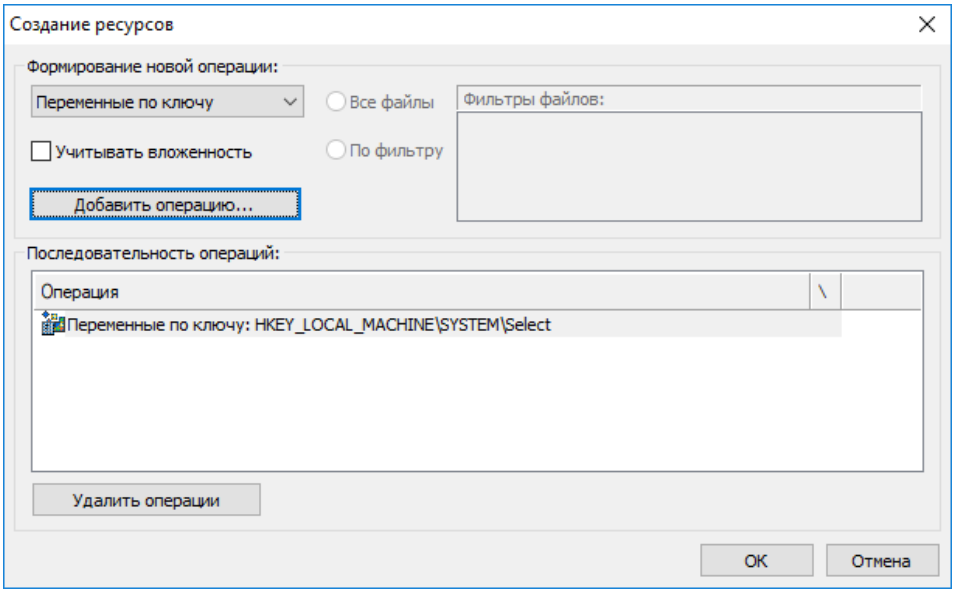
To create a group of registry key variables:

1. Take steps **1–4** of the previous procedure.
2. In the **Create new operation (Формирование новой операции)** drop-down list, Select **Variables by key (Переменные по ключу)**. Click **Add operation (Добавить операцию)**.

   The **Registry (Просмотр реестра)** dialog box appears.

3. Select the required registry items and click **OK**.

   The new operation is added to the list in the **Opeation sequence (Последовательность операций)** section.



4. Click **OK**.

   The **Create resources (Создание ресурсов)** dialog box is closed.

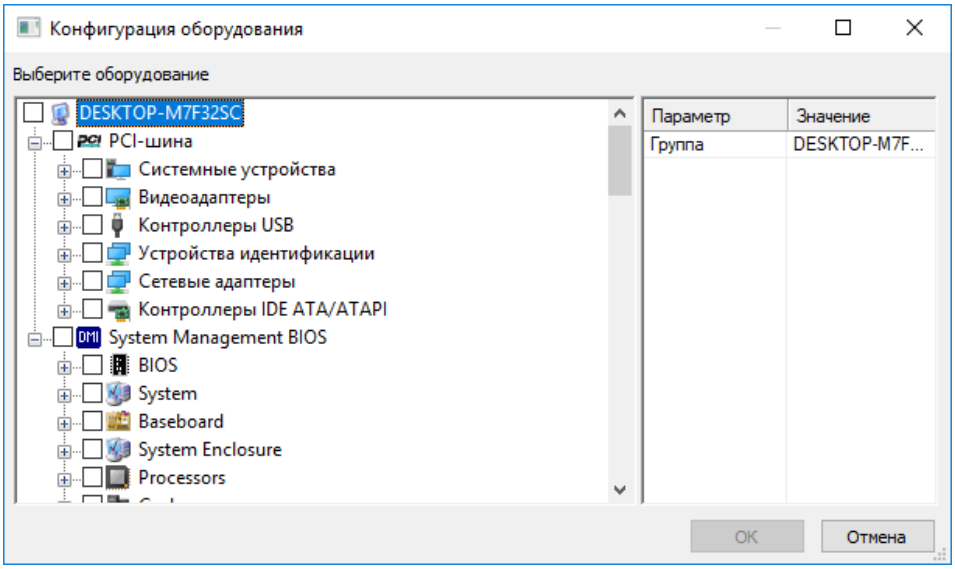
To create a group of PCI devices and SMBIOS structures:

1. In the **Categories (Категории)** section (see Fig. 1 on p. **11**), click **Resource groups (Группы ресурсов)**.
2. In **Structure (Структура)**, right- click **Resource groups (Группы ресурсов)** and select **Create group | Manually (Создать группу I Вручную)**.

   The **Create resource group (Создание группы ресурсов)** dialog box appears (см. Fig. 2 on p. **13**).
3. Take the following steps:
   - in the **Name (Имя)** and **Description (Описание)** text boxes, enter the group name and some additional information, if necessary;
   - in the **Type (Тип)** drop- down list, select **Device configuration (Конфигурация оборудования)**;
   - Click **OK**.
4. In **Structure (Структура)**, right-click a folder of the created group and select **Add | New resources (Добавить ресурсы I Несколько новых)**.

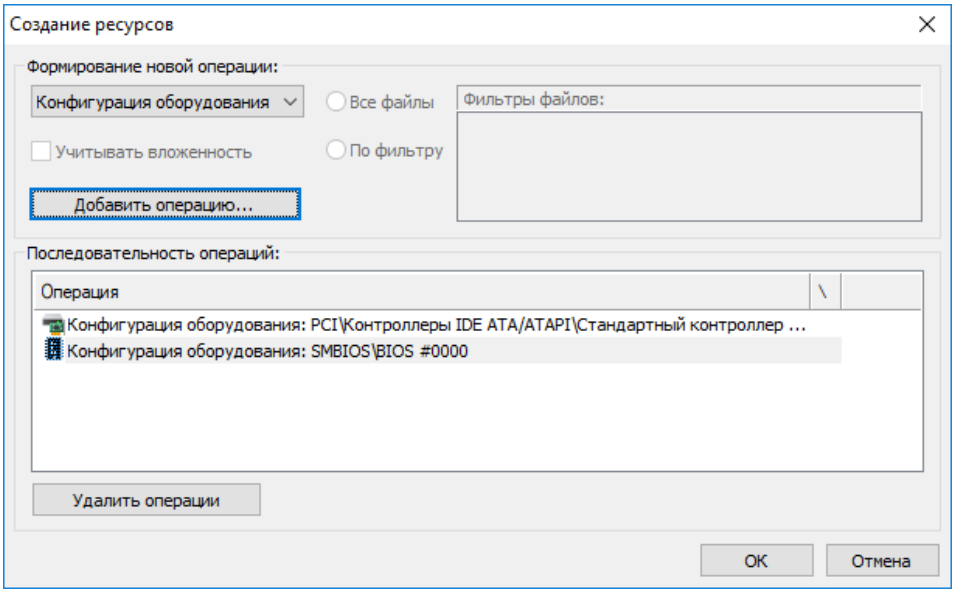
   The **Create resources (Создание ресурсов)** dialog box appears.
5. Click **Add operation (Добавить операцию)**.

   A dialog box appears as in the figure below.



6. Select the required resources and click **OK**.

   The new operations are added to the list in the **Opeation sequence (Последовательность операций)** section.



Note. If you need to delete operations, select them in the list and click **Delete operations (Удалить операции)**.

7. Click **OK**.

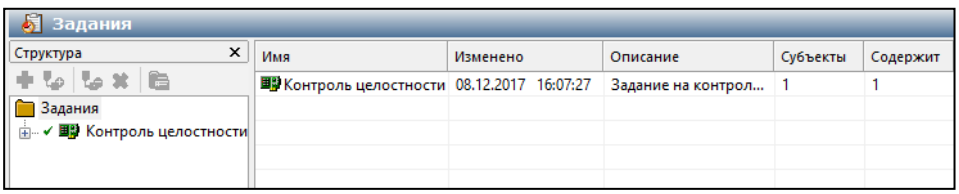
   The **Create resources (Создание ресурсов)** dialog box is closed.

Add objects to a job

To add objects:

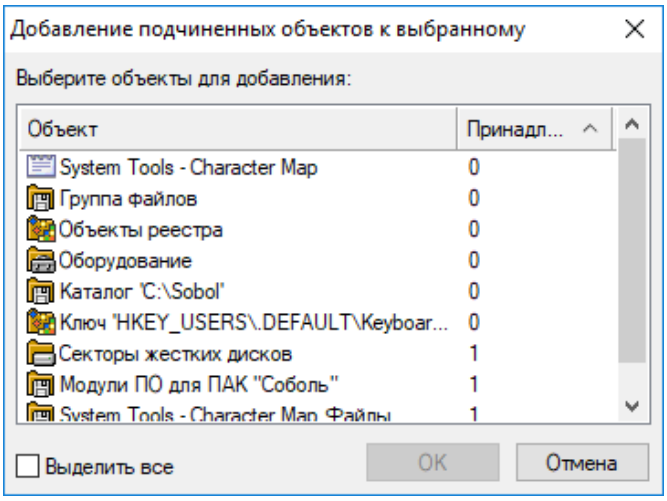
1. In the **Categories (Категории)** section, click **Jobs (Задания)**.

   The **Jobs (Задания)** panel appears as in the figure below.



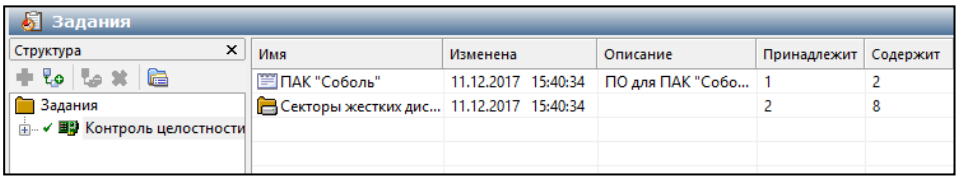
2. In Structure (Структура), right- click **Integrity check (Контроль целостности)** and select **Add tasks/groups | Existing (Добавить задачи/группы I Существующие)**.

   A dialog box appears as in the figure below.



3. Select objects to be added an click **OK**.

   The new objects are added to **Structure (Структура)** and to the list of objects.



Removing objects from a job

You can either remove objects softly or remove them permanently.

To soft remove objects:

1. In the **Categories (Категории)** section (see Fig. 1 on p. **11**), select **Jobs (Задания)**.
2. In **Structure (Структура)** or in the list of objects, right-click the object folder to be soft removed. For a resource group, select **Remove from | Task/Job (Исключить из I Задачи/Задания)**; for a task, select **Remove from | Job (Исключить из I Задания)**.

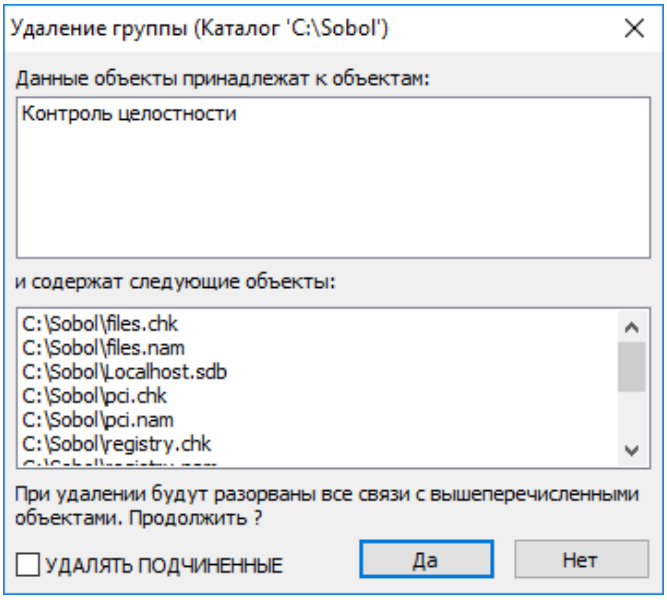
   A dialog box prompting you to confirm the procedure appears.
3. Click **Yes (Да)**.

   The object is removed from the job.
4. To restore the object, perform steps **2** and **3** of the **Add objects to job (Добавление объектов в задание на КЦ)** procedure (see p. **24**).

To remove objects permanently:

1. In the **Categories (Категории)** section (see Fig. 1 on p. **11**), select **Jobs (Задания)**.
2. In **Structure (Структура)** or in the list of objects, right-click the required object and click **Remove (Удалить)**.

   A dialog box appears as in the figure below.



3. Click **Yes (Да)**.

   The object is removed from the job.

Calculate reference checksums

After you configured and saved the IC list, you must calculate reference checksums.

Attention! Before calculating reference checksums, remove all USB Mass Storage devices from your computer (USB, CD, DVD and removable drives, etc.).

To calculate reference checksums:

1. Restart your computer and log on to the system as Sobol administrator (see [**1**]).
2. Enable the IC mechanism (see [**1**]).
3. In the administrator menu, go to **Integrity Check**, in the **Calculate checksums** section, select **Start**.

   Reference checksums are being calculated. A window that displays the calculation progress appears.

   To cancel the calculation, either press **<Esc>** or select **Cancel**. If an error occurs, the calculation will be stopped and you will receive the respective message. Read the message and, to continue, press any key.

Reference checksums are calculated successfully if no errors occurred during the calculation (the Errors field has 0 value).

If an error occurs, determine and fix the problem. For detailed information about error messages, see [**1**] or p. **43**.

Create a report about controlled objects

The IC template management program allows you to create an rtf file that contains the list of controlled objects. The list also contains paths to each added object.

To create a report:

1. Run the IC template management program. In Menu (see Fig. 1 on p. **11**), select **Service | Reports | Computer resources (Сервис | Отчеты | Ресурсы рабочей станции)**.
2. In the **Computer resources (Ресурсы рабочей станции)** dialog box, if necesary, change the report file name and its destination folder. To configure report view parameters, click **Advanced (Дополнительно)**.
3. Click **Create (Построить)**.

Saving, importing and exporting a data model

Replace environment variable

To ensure proper operation of a data model that was moved from one computer to another and while exporting specific resources, tasks and jobs, you might need to replace absolute paths with environment variables.

This procedure is performed on a computer from which a data model (or its items) is moved.

Replacing environment variables with absolute paths is a reverse procedure that is performed to restore absolute paths.

To replace environment variables:

1. In a data model, right- click the required resource and click **Environment variables (Переменные окружения)**.

   A dialog box that contains the list of existing environment variables appears.
2. Selected the objects to be replaced:
   - To replace absolute paths with environment variables, keep the default option.
   - To replace environment variables with absolute paths, select **Environment variable names with path values in files and folders (Имена переменных окружения на значение путей в файлах и папках)**.
3. Select the required variables in the list.
4. Click **OK**.

Save a data model

You can save any changes in a data model's configuration performed during IC template management program operation.

To save a data model:

Take one of the following actions:

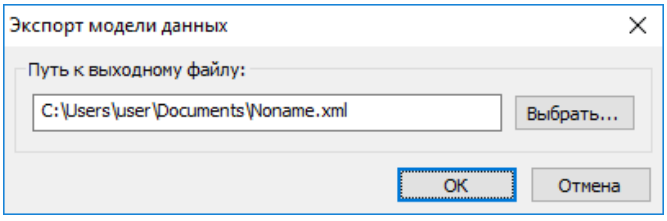
- on the toolbar, click  **(Сохранить модель)**;
- press **<Ctrl>+<S>**;
- in the **File (Файл)** menu, click **Save (Сохранить)**.

Export a data model

To export a data model:

1. In the **File (Файл)** menu, click **Export model to XML (Экспорт модели в XML)**.

   The **Export data model (Экспорт модели данных)** dialog box appears.



2. In the **Output file path (Путь к выходному файлу)** text box, enter the full file name (its path and its name). You can also use Windows Explorer. To open Windows Explorer, click **Browse (Выбрать)**.
3. Click **OK**.

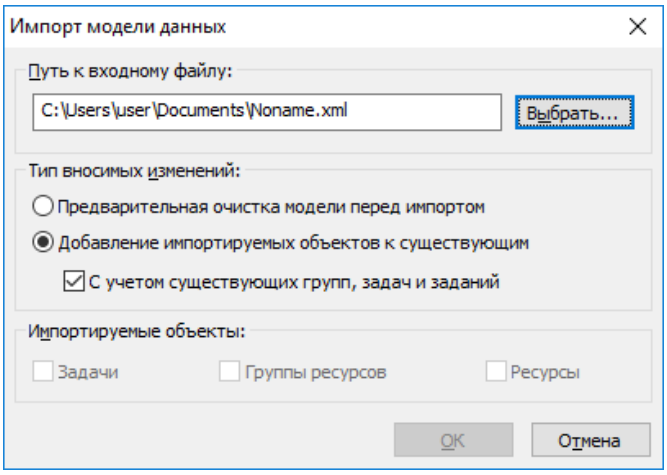
   When the export is completed, you receive the respective message.
4. Click **OK**.

Import a data model

To import a data model:

1. In the **File (Файл)** menu, click **Import model from XML (Импорт модели из XML)**.
2. If you have not saved changes performed earlier, you will receive the respective warning message. Click **Yes (Да)**.

   The **Import data model (Импорт модели данных)** dialog box appears.



3. In the **Input file path (Путь к входному файлу)** text box, enter the path and the full name of the file that contains data about the model object. You can also use Windows Explorer. To open Windows Explorer, click **Browse (Выбрать)**.
4. In the **Change type (Тип вносимых изменений)** section, select the required import option. To do so, select one of the following:

Clear model before the import **Предварительная очистка модели перед импортом**
All objects of the current data model are deleted. When the import is completed, the data model contains only the objects that were added from the imported file
Add new objects to existing ones **Добавление импортируемых объектов к существующим**
The data model contains both the imported objects and the objects from the previous data model. Some objects can be duplicated during the import if you have selected the **Keep existing groups, tasks and jobs (С учетом существующих групп, задач и заданий)** or the data model already contained objects with the same names. For **Tasks (Задачи)** and **Resource groups (Группы ресурсов)**, the objects are duplicated and the duplicate object has the following name format: **object_name<N>** where **N** is the sequence number of the duplicate object. For **Resources (Ресурсы)**, the objects are not duplicated

5. In the **Objects for import (Импортируемые объекты)** section, select the required object types. If the selected file does not contain data about object of some type, the respective check box will be disabled.
6. Click **OK**.

   When the objects are imported, you receive the respective message.
7. Click **OK**.

Create a file to export the Sobol log

Sobol software allows you to create a file to export the event log with the specific number of events.

To create a file to export log:

1. In the main menu (see Fig. 1 on p. **11**), select **Service | Additional files (Сервис I Дополнительные файлы)**.

   The **Additional files (Создание дополнительных файлов)** dialog box appears.

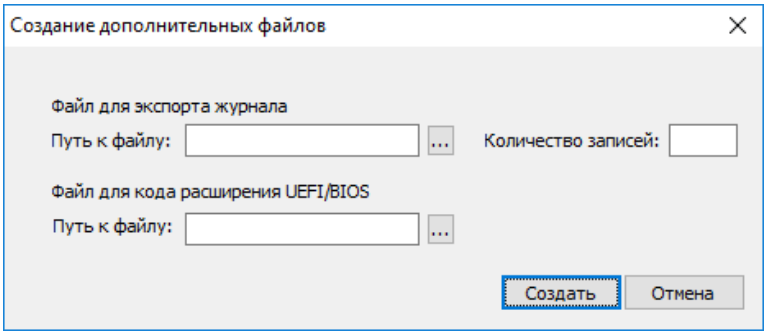


Fig. 3 The Additional files dialog box

2. Enter the full file name (the path and the name):
   - either type the full name in the **Path to file (Путь к файлу)** text box;
   - or use Windows Explorer, click ..., select a destination folder and enter a name for the file.

Note. The file must be in the csv format.

3. In **the Number of events (Количество записей)** text box, specify the required number of events to be exported.
4. Click **Create (Создать)**.

   The file is created in the specified destination folder.

Note. If you create less than two files at the same time, you receive the error message. Click **OK**, then, in the **Additional files (Создание дополнительных файлов)** dialog box, click **Cancel (Отмена)**. The specified files will be created anyway. .

Create a file to save UEFI Option ROM

Sobol software allows you to create a file to save UEFI Option ROM.

To create a file to save UEFI Option ROM:

1. In the main menu (see Fig. 1 on p. **11**), select **Service | Additional files (Сервис I Дополнительные файлы)**.

   The **Additional files (Создание дополнительных файлов)** dialog box appears.
2. Enter the full file name (the path and the name):
   - either type the full name in the **Path to file (Путь к файлу)** text box;
   - or use Windows Explorer, click ..., select a destination folder and enter a name for the file.

Note. The file must be in the bin format.

3. Click **Create (Создать)**.

   The file is created in the specified destination folder.

Note. If you create less than two files at the same time, you receive the error message. Click **OK**, then, in the **Additional files (Создание дополнительных файлов)** dialog box, click **Cancel (Отмена)**. The specified files will be created anyway. .

Chapter 3
Sobol software for Linux

Installation

The IC template management program is installed using vib/rpm/deb packages respectively to a Linux distribution.

To install Sobol software on VMware vSphere ESXi 6:

1. Power off all VMs on the server controlled by VMware vSphere ESXi 6 (hereinafter ESXi system).
2. To copy an installation package to the server, run the following command:

   ```
   scp sobol.vib root@<ip>
   ```

   where <ip> — the IP address of the server.
3. Connect to the server via SSH. To do so:
   - run the ESXi system;
   - press **<F2>**;
   - enter the administrator password (the password is set during ESXi system installation);
   - run **Troubleshooting Options l Enable SSH**;
   - connect to the server using a SSH client:

     ```
     ssh <ip> -l root
     ```

     where <ip> — IP address of a VM.
4. Switch the server to **maintenance mode**:

   ```
   vim-cmd hostsvc/maintenance_mode_enter
   ```
5. Install the vib package with Sobol software:

   ```
   esxcli software vib install --no-sig-check -v /sobol.vib
   ```
6. Disable **maintenance mode**:

   ```
   vim-cmd hostsvc/maintenance_mode_exit
   ```

Sobol software is installed on the server.

To install Sobol software on other operating systems within Linux family:

1. Insert the installation disk. Run a terminal emulator. Go to a program installation directory for the respective Linux distribution.
2. According to the selected distribution and the architecture (see on p. 30) run the following command:
   - for rpm packages:

     ```
     rpm -ivh <PACKAGE NAME>
     ```
   - for deb packages:

     ```
     dpkg -i <PACKAGE NAME>
     ```

Sobol software is installed on the computer and the default list of IC templates is created.

Uninstallation

You can use different commands to uninstall Sobol software respectively to the distribution and the architecture (see on p. 30).

To uninstall Sobol software on VMware vSphere ESXi 6:

1. Power off all VMs on the server.
2. Switch the server to **maintenance mode**:

```
vim-cmd hostsvc/maintenance_mode_enter
```

3. Delete the vib package that contains Sobol software:

```
esxcli software vib remove --vibname=sobol
```

4. Disable **maintenance mode**:

```
vim-cmd hostsvc/maintenance_mode_exit
```

The IC template management program is uninstalled.

To uninstall Sobol software on other operating systems:

1. For rpm packages, run the following command:

```
rpm –e sobol
```

2. For deb packages, run the following command:

```
dpkg --purge sobol
```

The IC template management program is uninstalled.

Integrity check configuration

You can configure the IC mechanism in Linux using either the graphical interface or the command line.

To configure the IC mechanism, perform the following procedures:

1. Modify the lists of IC objects (see p. **32**, p. **35**, p. **37**, p. **38**).

Attention! After modifying the lists of IC objects, calculate reference checksums (see step **3**).

2. Enable the IC mechanism if it was disabled (see [**1**], **Integrity Check**).
3. Calculate reference checksums (see p. **39**).

Attention! If you modified hard drive sectors (for example, using fdisk) when the IC mechanism is enabled, restore original IC templates and calculate reference checksums.

The IC template management program also allows you to:

- create reports about controlled objects (see p. **34**);
- create a file to export Sobol logs (see p. **39**);
- create a file to save UEFI Option ROM (see p. **40**).

Configuring the IC mechanism using the graphical interface

Run the IC template management program

To run Sobol software:

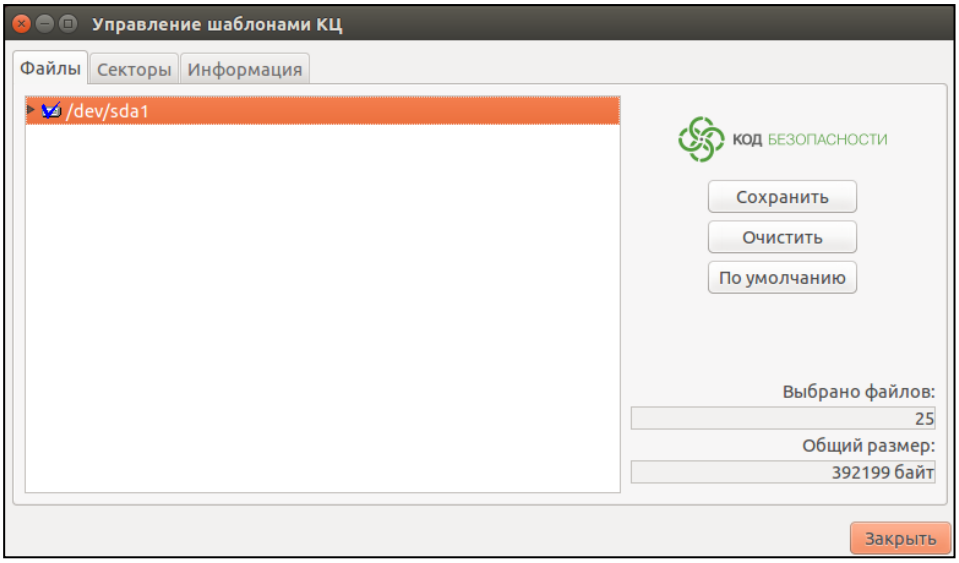
1. Run the IC template management program. To do so:
   - either use the **IC template management** shortcut;
   - or run **gtk-scheck** file from terminal emulator using the following command:

```
/usr/bin/gtk-scheck
```

Note. If IC template management program cannot run, the previous session is not ended yet. Make sure that **gtk-scheck** file is in **/var/log** directory. Delete the file and run the program again.

2. In the appeared dialog box, enter the administrator password and press **<Enter>**.

   A dialog box appears as in the figure below.



Note. The provided screenshots are taken in Ubuntu 14.04 LTS Desktop with Unity graphical shell.

If Sobol card is not attached to a computer, you receive the respective warning message. To continue working with the program, click **OK**.

Modify the lists of IC objects

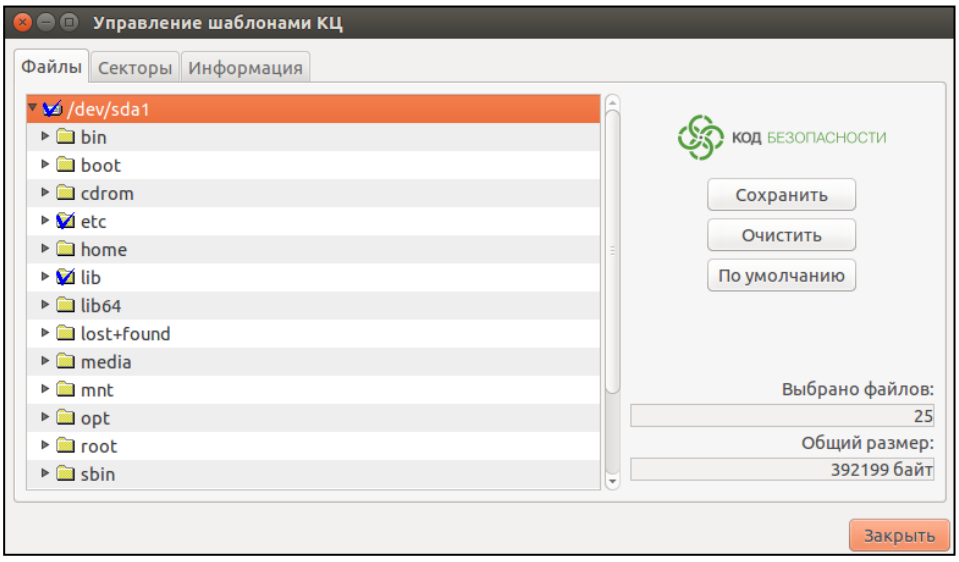
The original lists of files and sectors are created after Sobol software is installed. You can add/remove IC objects to/from these lists.

Attention! After modifying the lists, calculate reference checksums (see p. 39).

To modify the list of files:

1. Run the IC template management program (see above).
2. Select the **Files (Файлы)** tab.

   A hard drive (drives) file structure appears as in the figure below.



3. Select the files to be checked by the IC mechanism.

Attention! You cannot add the following files to the list:
- files of logical drives included in LVM volumes;
- files located in unsupported file systems;
- non-regular files;
- temporary files;
- files with names longer than 253 characters;
- file with names longer than 8 characters located in FAT sections.

To select/remove files:

- right-click ☐ (☑);

  Tip.
  - To select multiple files in a row, click the first file in the row. Then hold **<Shift>** and right-click ☐ (not the file name) next to the last file in the row. While removing multiple files in a row make sure that the last file in the row is marked with ☑.
  - To select/remove all the files of a hard drive or its section, right-click 🖴 (☑) or 📁 (☑) next to the required object in the list.
- to select/remove files located in a drive or directory and its subdirectories, right-click 🖴 (☑) or 📁 (☑) next to the required object in the list;
- to select files from the default IC template, click **Default (По умолчанию)** and, in the appeared dialog box, click **Yes (Да)**;
- to remove all the files, click **Clear (Очистить)** and, in the appeared dialog box, click **Yes (Да)**.

4. After you selected all the required files, click **Save (Сохранить)**.

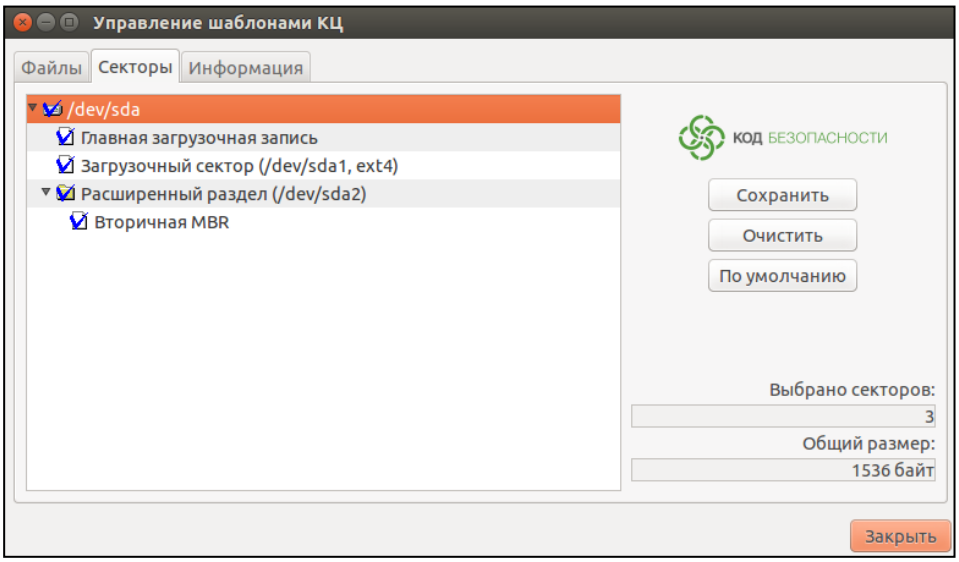
   In the appeared dialog box, click:
   - **Yes (Да)** — to save all changes and rewrite the template file;
   - **No (Нет)** — to discard all changes.
5. To exit the program, click **Quit (Закрыть)**.

The list of selected files is saved to **files.nam** file.

To modify the list of sectors:

1. Run the IC template management program (see p. **31**).
2. Select the **Sectors (Секторы)** tab.

   A hard drive (drives) structure appears as in the figure below.



3. Select the sectors to be checked by the IC mechanism.

   To select/remove sectors:
   - right-click ☐ (☑);

Tip.

- To select multiple sectors in a row, click the first one in the row. Then, hold **<Shift>** and right-click ☐ (not the sector name) next to the last sector in the row. While removing multiple sectors in a row make sure that the last sector in the row is marked with ☑.
- To select/remove all sectors of a hard drive or its section, right-click (☑) or (☑) next to the required object in the list.

- to restore the original template, click **Default (По умолчанию)** and, in the appeared dialog box, click **Yes (Да)**. All existing sectors will be selected;
- to remove all sectors, click **Clear (Очистить)** and, in the appeared dialog box, click **Yes (Да)**.

4. After you selected all the required sectors, click **Save (Сохранить)**

   In the appeared dialog box, click:

   - **Yes (Да)** — to save all changes and rewrite the template file;
   - **No (Нет)** — to discard all changes.

5. To exit the program, click **Quit (Закрыть)**.

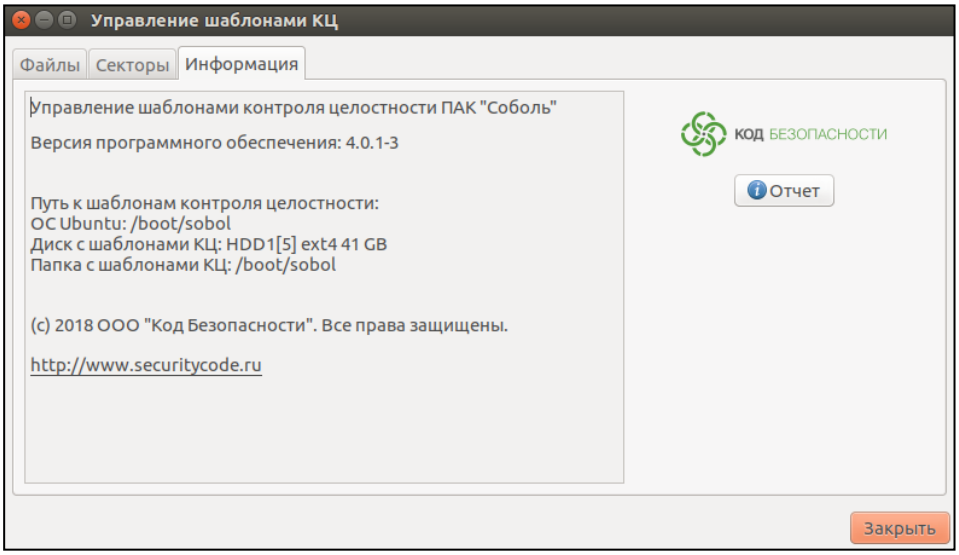
The list of selected sectors is saved to **sectors.nam** file.

Create a report about controlled objects

To create a report:

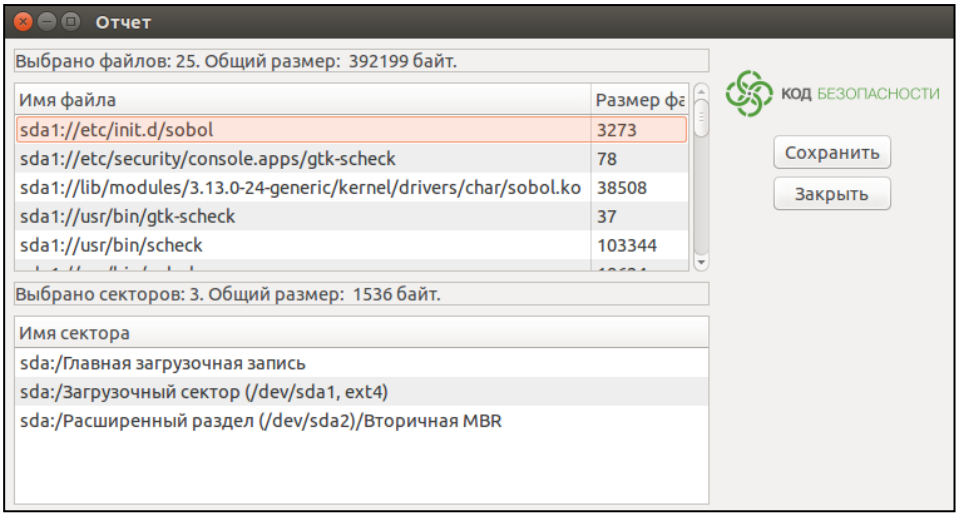
1. Run the IC template management program (see p. **31**).
2. Select the **Information (Информация)** tab.

   This tab contains information about the IC template management program.



3. Click **Report (Отчет)**.

   A dialog box appears as in the figure below.



4. To save the report to file, click **Save (Сохранить)**.
5. In the appeared dialog box, set a directory where the file will be saved, the file name and its format. Click **Save (Сохранить)**.
6. To exit the program, click **Quit (Закрыть)**.

Configuring the IC mechanism using the command line

To configure the IC mechanism in Linux using the command line, use **scheck** tool. It is designed to manage IC templates. For detailed information about **scheck** tool, see p. 41. Error messages that occur during **scheck** operation are described on p. 43.

Attention! Scheck command must be run by the root user.

Modify the list of controlled files

Scheck allows you to add/remove files to/from the IC list separately or as a list.

To add/remove a single file:

1. To add a file, run the following command:

   ```
   scheck --add-file <PATH><FILE>
   ```

   where **<PATH>** is the path to the file, **<FILE>** is the file name.

   Example 1. To configure IC for **sshd_config** file that is located in **bin** directory with **mnt** mount point, run the following command:

   ```
   scheck --add-file /mnt/bin/sshd_config
   ```

   or

   ```
   scheck --add-file sda3:/bin/sshd_config
   ```

2. To remove a file, run the following command:

   ```
   scheck --rm-file <PATH><FILE>
   ```

   where **<PATH>** is a path to the file, **<FILE>** is the file name.

   Example 2. To remove **sshd_config** file located in **bin** directory, **sda3** section with **mnt** mount point, run the following command:

   ```
   scheck --rm-file /mnt/bin/sshd_config
   ```

   or

   ```
   scheck --rm-file sda3:/bin/sshd_config
   ```

3. To remove a non-existing file, run the following command:

Note. A non existing file is a file that was deleted from the drive but not removed from the IC template.

```
scheck --rm-file <PATH><FILE>
```

where **<PATH>** is the path to the file with a logical drive, **<FILE>** is the name of a non existing file.

Example 3. To remove the non existing file **sshd_config** located in **bin** directory, on C drive of the computer, first, run the command that displays all files in the list:

```
scheck --ls-files
```

then, find the path to the file and remove it from the list:

```
scheck --rm-file C:/bin/sshd_config
```

To add/remove multiple files:

1. To add files, run the following command:

```
scheck --add-ls-files <PATH><FILE>
```

where **<PATH>** is the path to the file, **<FILE>** is the name of the file that contains the list of files for IC.

To create a list of files, set **<PATH><FILE>** in each line where **<PATH>** is the path to the file, **<FILE>** is the name of the file.

Example 4. Add a list of files located in **list_files.txt**, in **bin** directory, on C drive to the IC template. An example of **list_files.txt** contents:

```
sda4:/usr/share/locale/ru/LC_MESSAGES/gtk-scheck.mo
sda4:/usr/share/locale/ru/LC_MESSAGES/scheck.mo
sda4:/usr/share/gtk-scheck/images/folder_marked.png
```

To add the files, run the following command:

```
scheck --add-ls-files C:/bin/list_files.txt
```

2. To remove files, run the following command:

```
scheck --rm-ls-files <ПУТЬ><ФАЙЛ>
```

where <PATH> is the path to the file, <FILE> is the name of the file that contains a list of files to be removed.

A list of files to be removed is created the same way as the list of files to be added.

Example 5. Remove a list of files located in **list_files.txt**, in **bin** directory, on C drive from the IC template list.

To remove the files, run the following command:

```
scheck --rm-ls-files C:/bin/list_files.txt
```

Modify the list of controlled sectors

Scheck allows you to add/remove sectors to/from the IC list separately or as a list.

Attention! ESXi format has the following view:
t10.ATA_____WDC_WD5000AAKX2D001CA0_____WD2DWCAYUHH63857:0.

To add/remove a single sector:

1. To add a sector, run the following command:

```
scheck --add-sector <DEVICE>:<NUMBER>
```

where **<DEVICE>** is the name of the drive (or drive section) where the required sector is located, **<NUMBER>** is the number of the drive sector (or the number of sector inside the drive section). Sectors are numbered starting with 0.

Example 6. To add a boot sector of the **sda** device for IC, run the following command:

```
scheck --add-sector sda:0
```

2. To remove the sector run the following command:

```
scheck --rm-sector <DEVICE>:<NUMBER>
```

where **<DEVICE>** is the name of the drive (or drive section) where the required sector is located, **<NUMBER>** is the number of the drive sector (or the number of the sector inside the drive section). Sectors are numbered starting with 0.

Example 7. To remove a controlled sector 1 from the IC section **sda3**, run the following command:

```
scheck --rm-sector sda3:0
```

3. To remove a non existing sector, run the following command:

```
scheck --rm-sector <DEVICE>:<NUMBER>
```

where **<DEVICE>** is the hexadecimal number of the hard drive that contains the required sector, **<NUMBER>** is the number of the drive sector. Sectors are numbered starting with 0.

Example 8. To remove sector 1 from the non existing drive **0x81**, first, run the following command:

```
scheck --ls-sectors
```

then, find the required sector in the list and remove it form the IC template:

```
scheck --rm-sector 0x81:0
```

To add/remove multiple sectors:

1. To add sectors, run the following command:

```
scheck --add-ls-sectors <PATH><FILE>
```

where **<PATH>** is the path to the file, **<FILE>** is the name of the file that contains the list of sectors for IC.

To create a list, set **<DEVICE>:<NUMBER>** in each line where **<DEVICE>** is the name of the drive (or drive section) where the required sector is located, **<NUMBER>** is the number of a drive (or the number of the sector inside the drive section).

Example 9. Add sectors located in the **list_sectors.txt** file, in the bin directory, on C drive. An example of **list_files.txt** contents:

```
sda:0
sda1:0
sda2:0
```

To add sectors to the IC template, run the following command:

```
scheck --add-ls-sectors C:/bin/list_sectors.txt
```

2. To remove sectors, run the following command:

```
scheck --rm-ls-sectors <PATH><FILE>
```

where **<PATH>** is the path to the file, **<FILE>** is the name of the file that contains the list of sectors for IC.

The list of sectors to be removed is created the same way as the list of added sectors.

Example 10. Remove sectors located in the **list_sectors.txt** file, in the bin directory, on C drive. (see **Example 9**).

To remove sectors from the IC template, run the following command:

```
scheck --rm-ls-sectors C:/bin/list_sectors.txt
```

Modify the list of controlled SMBIOS tables

Scheck allows you to add/remove SMBIOS tables to/from the IC list separately or as a list.

Attention! SMBIOS tables can be controlled by IC only using CentOS 7.3.

To add/remove all SMBIOS tables:

1. To add all SMBIOS tables, run the following command:

```
scheck --add-smbios SMBIOS
```

2. To remove all SMBIOS tables, run the following command:

```
scheck --rm-smbios SMBIOS
```

To add/remove a single SMBIOS table:

1. To add a specific SMBIOS table, run the following command:

```
scheck --add-smbios "<TABLE.NAME>"
```

where **<TABLE.NAME>** is the full name of the SMBIOS table.

Example 11. To add a table that contains BIOS information, first, run the following command:

```
scheck --ls-system-smbios
```

then, find the required table in the list and add it to the IS template:

```
scheck --add-smbios "SMBIOS\BIOS #0000"
```

2. To remove a specific SMBIOS table, run the following command:

```
scheck --rm-smbios "<TABLE.NAME>"
```

where **<TABLE.NAME>** is the full name of the SMBIOS table.

Пример 12. To remove a table that contains system board information, first, run the following command:

```
scheck --ls-smbios
```

then, find the required table in the list and remove it from the IC template:

```
scheck --rm-smbios "SMBIOS\System #0001"
```

To add/remove a specific SMBIOS table field:

1. To add a SMBIOS table field, run the following command:

```
scheck --add-smbios "<TABLE.NAME>\<FIELD>"
```

where **<TABLE.NAME>** is the full name of the SMBIOS table, **<FIELD>** is the name of the SMBIOS table field.

Example 13. To add the **Vendor** field from the table that contains BIOS information, first, run the following command:

```
scheck --ls-system-smbios
```

then, find the required **table/field** value and run the following command:

```
scheck --add-smbios "SMBIOS\BIOS #0000\Vendor"
```

2. To remove the SMBIOS table field, run the following command:

```
scheck --rm-smbios "<TABLE.NAME>\<FIELD>"
```

where **<TABLE.NAME>** is the full name of the SMBIOS table, **<FIELD>** is the name of the SMBIOS table field.

Example 14. To remove the **Family** field of the table that contains system board data, first, run the following command:

```
scheck --ls-smbios
```

then, find the required table/field value and run the following commands:

```
scheck --rm-smbios "SMBIOS\System #0001\Family"
```

Modify the list of controlled PCI devices

Scheck allows you to add/remove PCI devices to/from the IC list separately or as a list.

Attention! PCI devices can be controlled by IC only using CentOS 7.3.

To add/remove all PCI devices:

1. To add all PCI devices, run the following command:

```
scheck --add-pci PCI
```

2. To remove all PCI devices, run the following command:

```
scheck --rm-pci PCI
```

To add/remove a single PCI device:

1. To add a specific PCI device, run the following command:

```
scheck --add-pci "<DEVICE>"
```

where **<DEVICE>** is the name of the required PCI device.

Example 15. To add a specific Ethernet controller, first, run the following command:

```
scheck --ls-system-pci
```

then, find the required Ethernet controller in the list and add it to the IC template:

```
scheck --add-pci "Ethernet Connection (2) I219-V"
```

2. To remove a specific PCI device, run the following command:

```
scheck --rm-pci "<DEVICE>"
```

where **<DEVICE>** is the name of the required PCI device.

Example 16. To remove a specific USB controller, first, run the following command:

```
scheck --ls-pci
```

then, find the required USB controller in the list and remove it from the IC template:

```
scheck --rm-pci "Sunrise Point-H USB 3.0 xHCI Controller"
```

Calculate reference checksums

After you configured and saved the IC list, you must calculate reference checksums.

To calculate reference checksums:

1. Restart you computer (or VM server) and log on to the system as Sobol administrator (see [**1**]).
2. Enable the IC mechanism (see [**1**]).
3. In the administrator menu, go to **Integrity Check**, in the **Calculate checksums** section, select **Start**.

   Reference checksums are being calculated. The window that displays the calculation progress appears.

   To cancel the calculation, press **<Esc>**. If an error occurs, the calculation will be stopped and you will receive the respective message. Read the message and, to continue, press any key.

Reference checksums are calculated successfully if no errors occurred during the calculation (the **Errors** field has **0** value).

If an error occurs (the specified file or sector is not found, etc.), determine and fix the problem. For example, if specified files are not found, modify the IC template (remove these files from the IC template). After you fix all the problems, calculate reference checksums again. For detailed information about error messages, see [**1**] or p. **43**

Create a file to export the Sobol log

Sobol software allows you to create a csv file to export the event log with the specific number of events.

To create a file to export the log, run the following command:

```
scheck --create-csvfile <PATH><FILE> --record-count <N>
```

where **<PATH>** is the path to the file, **<FILE>** is the name of the file, **<N>** is the number of events in the log being exported.

Example 17. To create a file to export **sb_exp.csv** log with 1000 events located in the bin directory, run the following command:

```
scheck --create-csvfile /bin/sb_exp.log --record-count 1000
```

Create a file to save UEFI Option ROM

Sobol software allows you to create a bin file to save UEFI Option ROM.

To create a file to save UEFI Option ROM, run the following command:

```
scheck --create-romfile <PATH><FILE>
```

where **<PATH>** is the path to the file, **<FILE>** is the name of the file.

Example 18. To create **sobol_pcie.bin** file to save UEFI Option ROM located in **bin** directory, run the following command:

```
scheck --create-romfile /bin/sobol_pcie.bin
```

Appendix

Scheck format

Scheck has the following format: **scheck [key] [argument]**.

Key	Description	Argument	Comment
--help (-h)	Show Help	None	
--version (-V)	Show program version	None	
--verbose (-v)	Show messages about program operation	None	Does not function using VMware vSphere ESXi 6
--ls-path	Show paths to IC template files	None	
--ls-drives	Show information about used devices and sections	None	
--ls-files	Show the list of controlled files	None	
--ls-sectors	Show the list of controlled sectors	None	
--ls-smbios	Show controlled SMBIOS tables and fields	None	Functions only using CentOS 7.3
--ls-system-smbios	Show SMBIOS tables and fields included in current OS	None	Functions only using CentOS 7.3
--ls-pci	Show the list of controlled PCI devices	None	Functions only using CentOS 7.3
--ls-system-pci	Show all PCI devices connected to the current computer	None	Functions only using CentOS 7.3
--add-file	Add a file to the list of controlled files	**<PATH><FILE>**	**<PATH>** is the path to the file. **<FILE>** is the name of the file
--rm-file	Remove a file from the list of controlled files		
--add-sector	Add a sector to the list of controlled sectors	**<DEVICE>: <NUMBER>**	**<DEVICE>** is the drive (drive section) name where a sector being added/removed is located. **<NUMBER>** is the sector number on the drive (or the sector number inside the drive section)
--rm-sector	Remove a sector from the list of controlled sectors		
--add-ls-files	Add files of a specific text file to the list of controlled files	**<PATH><FILE>**	**<PATH>** is the path to the file. **<FILE>** is the name of the text file that contains the list of controlled files or sectors
--rm-ls-files	Remove files of a specific text file from the list of controlled files		
--add-ls-sectors	Add sectors of a specific text file to the list of controlled files		
--rm-ls-sectors	Remove sectors of a specific text file from the list of controlled files		

Key	Description	Argument	Comment
--add-smbios	Add SMBIOS tables to the list of controlled objects	**SMBIOS** or **<TABLE NAME>\ <FIELD>**	**SMBIOS** — add/remove all SMBIOS tables. **<TABLE NAME>** is the full name of the SMBIOS table being added/removed. Optional parameter. **<FIELD>** is the field being added/removed. Optional parameter. Functions only using CentOS 7.3
--rm-smbios	Remove SMBIOS tables from the list of controlled objects		
--add-pci	Add PCI devices to the list of controlled objects	**PCI** or **<DEVICE>**	**PCI** — add/remove all PCI devices connected to the computer. **<DEVICE>** is the name of the PCI device being added/removed. Optional parameter. Functions only using CentOS 7.3
--rm-pci	Remove PCI devices from the list of controlled objects		
--clear-files	Clear the list of controlled files	None	
--reset-files	Restore the default list of controlled files	None	
--clear-sectors	Clear the list of controlled sectors	None	
--reset-sectors	Restore the default list of controlled sectors	None	
--clear-smbios	Clear the list of controlled SMBIOS tables	None	Functions only using CentOS 7.3
--clear-pci	Clear the list of controlled PCI devices	None	Functions only using CentOS 7.3
--create-romfile	Create a file to save UEFI Option ROM	**<PATH><FILE>**	**<PATH>** is the path to the file. **<FILE>** is the name of the file
--create-csvfile	Create a file to export the log	**<PATH><FILE>** **--record-count**	**<PATH>** is the path to the file. **<FILE>** is the name of the file **--record-count** — the number of events (see below)
--record-count	The number of events to export within the log	**<N>**	**<N>** is the number of events. This key is an argument for the **--create-csvfile** key

Scheck error messages

The following messages will appear if an error occurs during **scheck** operation:

```
Only root can run this program
```

Cause: The command is run by a user without administrator privileges.

Solution: Run the command as the root user.

```
scheck: (null) is invalid option
```

Cause: The command does not contain the required key or the key is not valid.

Solution: Add a valid key. For detailed information about **scheck** commands, see p. 41.

```
Error adding file to integrity check templates:
file <PATH><FILE> is not found
```

Cause: The command might contain the invalid path or name of the required file, or the file is not supported by Sobol IC mechanism.

Solution: Determine the cause of the problem. Specify the full name of the file.

```
Error adding file to integrity check templates:
file <PATH><FILE> is already in templates
```

Cause: The command might contain a file that was added to the IC list earlier.

Solution: If necessary, add another file.

```
Error removing file from integrity check templates:
file <PATH><FILE> is not in templates
```

Cause: The command might contain the invalid path or name of the required file, or the file no longer exists.

Solution: Determine and fix the problem. If the file no longer exists, remove or from the IC list (see p. 35).

```
Error adding files list to integrity check templates:
file <PATH><FILE> is not found
```

Cause: The command might contain the invalid path or name of the required file with the list of controlled files.

Solution: Determine the cause of the problem. Specify the valid name of the file.

```
Error removing files list from integrity check templates:
file <PATH><FILE> is not found
```

Cause: The command might contain the invalid path or name of the file with the list of controlled files.

Solution: Determine the cause of the problem. Specify the valid name of the file.

```
Error adding sector to integrity check templates:
sector <DEVICE>:<NUMBER> is not found
```

Cause: The command might contain the invalid name of the drive (drive section) or sector number on the drive (the sector number within a section).

Solution: Determine the cause of the problem. Specify valid parameters.

```
Error adding sector to integrity check templates:
sector <DEVICE>:<NUMBER> is already in templates
```

Cause: The command might contain a sector that was added to the IC list earlier.

Solution: If necessary, add another sector.

```
Error adding sector to integrity check templates:
sector <DEVICE>:<NUMBER> is not found
```

Cause: The command might contain a sector that was added to the IC list earlier, or the sector does not exist.

Solution: Determine and fix the problem. If the required sector does not exist, remove it from the IC list (see p. 36).

```
Error adding sectors list to integrity check templates:
file <PATH><FILE> is not found
```

Cause: The command might contain the invalid path or name of the file with the list of controlled sectors.

Solution: Determine the cause of the problem. Specify the valid name of the file.

```
Error removing sectors list from integrity check templates:
file <PATH><FILE> is not found
```

Cause: The command might contain the invalid path or name of the file with the list of controlled sectors.

Solution: Determine the cause of the problem. Specify the valid name of the file.

```
scheck options error:
--record-count is not specified!
```

Cause: The command does not contain the number of events to be exported.

Solution: Create a file to export the log again and specify the number of events (see p. 39).

Documentation

1. Hardware Trusted Boot Module Sobol. Version 4. Administrator guide.
2. Hardware Trusted Boot Module Sobol. Version 4. Administrator guide. Sobol software.
3. Hardware Trusted Boot Module Sobol. Version 4. User guide.
4. Hardware Trusted Boot Module Sobol. Version 4. Getting Started.