# ELMA BPM Platform

## System Administrator's Guide

Business Process
Management Software

# Contents

Introduction....5
Chapter 1. Installing and registering ELMA .... 5
Chapter 2. ELMA Configuration .... 6
2.1 Location of the configuration .... 6
2.2 Configuration folder .... 7
2.3 Configuration File .... 8
2.3.1. Firebird database connection parameters.... 8
2.3.2. MS SQL database connection parameters .... 9
2.3.3. PostgreSQL database connection parameters .... 10
2.3.4. Oracle database connection parameters .... 10
2.3.5. Configuring file storage .... 11
Chapter 3. Licensing....12
3.1 License Information ....14
3.2 Licenses types....17
3.2.1. ELMA BPM License .... 17
3.2.2. Component License.... 17
3.2.3. Component License + user licenses .... 17
3.2.4. Component License + all system licenses .... 18
3.2.5. User Licenses.... 18
3.3 System Activation....20
3.4. Reset system activation....22
Chapter 4. Administering web server ....23
4.1 Internal ELMA Server (Cassini Web Server)....25
4.2 IIS web server ....27
4.2.1. .Net Framework version .... 28
4.2.2. Application Pool Identity .... 28
4.3 Migrating from Cassini to IIS....30

4.4 Changing ELMA web server port ..... 35
4.4.1. Changing IIS port ..... 35
4.4.2. Changing port when using Cassini ..... 37
4.5 Configuring Windows firewall ..... 37
Chapter 5. Working with databases ..... 44
5.1 Backing up the ELMA database ..... 44
5.1.1. Firebird DBMS ..... 46
5.1.2. MS SQL DBMS ..... 48
5.1.3. PostgreSQL DBMS ..... 53
5.1.4. Oracle DBMS ..... 57
5.2 Restoring databases ..... 58
5.2.1. Firebird DBMS ..... 58
5.2.2. MS SQL DBMS ..... 60
5.2.3. PostgreSQL DBMS ..... 62
5.2.4. Oracle DBMS ..... 64
Chapter 6. Configuring ELMA test server ..... 65
6.1 Setting up test environment ..... 65
6.2 Exporting and Importing Configuration ..... 71
6.3 Example: How to transfer a part of configuration ..... 73
Chapter 7. System Update ..... 79
7.1 Package update of the system ..... 81
7.2 Manual update (transferring system modules) ..... 83
Chapter 8. System settings ..... 84
8.1 Outgoing mail settings ..... 84
8.2 Configuring SMS notifications ..... 86
8.3 Configuring integration with LDAP ..... 87
Chapter 9. System Diagnostics ..... 88
9.1 Standard system diagnostics ..... 88

9.1.1. Performance report ..... 89
9.1.2. Report about current system activity ..... 99
9.2 Process execution queue ..... 101
9.3 Error logs (information logging) ..... 102
9.3.1. ELMA BPM log ..... 102
9.3.2. ELMA Designer Logs ..... 104
9.3.3. Web server logs ..... 104
9.4 Database diagnostic tools ..... 106
9.4.1. MS SQL DBMS diagnostic tools ..... 107
9.4.2. Firebird DBMS diagnostic tools ..... 111
9.4.3. PostgreSQL DBMS diagnostic tools ..... 114
9.5 Recommendations for improving performance ..... 117
Chapter 10. System recovery after a failure ..... 120
Typical errors when starting the ELMA server ..... 120
10.1 120
Chapter 11. Submitting a request to Support ..... 125
Chapter 12. Useful References ..... 127

# Introduction

This book is intended for users who master ELMA BPM on their own and for specialists who plan to maintain ELMA BPM. It describes ways and methods of successful system administration and maintenance. The book is a reference guide for solving the problems that may arise when starting the system and during its operation. Similarly, it explains how to update the system, ensure reliable data storage and configure other settings.

A short list of the main topics covered in this guide:

- Licensing and activation of the system
- Configuring the Web server
- Working with databases
- Migrating the system to another server
- System update
- System settings
- System Diagnostics and Recovery
- Submitting requests to tech support

The guide is intended for both inexperienced users, and for professionals who administer and maintain various systems on a daily basis. The book describes the most frequently asked questions. Step-by-step instructions are provided with comments and images, to help system users quickly solve the problems that may arise.

You can find the full description of the ELMA BPM functions in ELMA Help. ELMA Help is provided with the system; it is also available in the ELMA knowledge base: https://kb.elma-bpm.com/help

Solutions for many technical issues are provided in the ELMA knowledge base: https://kb.elma-bpm.com. The knowledge base is constantly updated by the company's specialists.

If you want to report any technical issue, please visit the website of ELMA tech support http://support.elma-bpm.com.

# Chapter 1.Installing and registering ELMA

Before you start working with ELMA BPM, you must install and register it. Please, contact our sales representatives to get the link to the software installation package. Read how to install and register ELMA BPM in ELMA BPM Platform user manual.

If there are any difficulties when installing ELMA or when starting the system for the first time, contact our sales representatives or the ELMA technical support site (**Chapter 11. Tech Support Request**).

# Chapter 2. ELMA Configuration

**Configuration of ELMA** includes basic system settings, object model, organizational structure, business processes, document flow settings and organization data, which is used in the ELMA Designer and in the ELMA Web Application.

## 2.1 Location of the configuration

By default, all configuration files are located in the **UserConfig** folder, which can be found in the ELMA directory. The path to the directory is specified when the system is installed and is written in the **connection.config** file (located in the **Web** folder of the ELMA directory). The value of the **connectionString** attribute specifies the path to the currently used configuration.

**Connection.config**

```
<?xml version="1.0"?>
  <connectionStrings>
    <add name="ConfigurationFile" connectionString="C:\ELMA3-
Standart\UserConfig\configuration.config"/>
  </connectionStrings>
```

## 2.2 Configuration folder

If you select Firebird as the DBMS, by default, the configuration folder will contain the database file **ELMA3-EXPRESS.FDB**, and the *.fbk files (backup copies of the database). If you select MS SQL as the DBMS, the folder will contain **ELMA3-EXPRESS.MDF** (main database) and **ELMA3-EXPRESS_log.LDF** (transaction log). The location of the database files may be different and will be specified in the **configuration.config** file in the *<connectionStrings>* section.

The configuration folder stores the following files:

- **configuration.config** – the main configuration file;
- **configuration.packages** – a list of the system modules and their versions.

The configuration structure includes the following directories:

- **Files** – ELMA file storage, binary files of all items uploaded to the system (documents, photos, etc.). The path to the folder can be changed in the configuration file;
- **FullTextIndex** – The database of full-text search providers. Lucene is the default provider available for all ELMA editions. It does not require a separate installation of the index server and a setup. ElasticSearch requires the installation of a separate indexing server and connection setup. Not available in the Express edition;
- **Notifications** – system notification templates;
- **Packages** – activated system modules;
- **Previews** –view files which display information (data visualization) in the web application in the preview mode;
- **ProductionShedule** – the business calendar;
- **Templates** – templates of the approval sheet, acquaintance sheet and other templates.

Depending on the system edition and installed modules, there may be additional files and folders.

To create a backup of the ELMA configuration folder simply copy this folder.

## 2.3 Configuration File

**The configuration.config file** is an XML file, which by default contains the declaration string and one root element **configuration.** By default, the configuration file is stored in the **UserConfig** folder, located in the ELMA directory.

You can find the description of the XML markup language and XML basics here.

The **configuration.config** file contains information about the database connection, file storage connection and other system settings. The value of the **connectionString** attribute of the **add** element (a nested element of the **connectionStrings**) contains information about the connection to the database. For different DBMS, the value will be different.

### 2.3.1. Firebird database connection parameters

The following is a part of the configuration file when using the Firebird DBMS:

**Configuration.config**

```
<connectionStrings>
        <add name="MainDB" connectionString="Data Source=127.0.0.1;Initial
Catalog={CONFIGDIR}\elma3-express.fdb;User
ID=sysdba;Password=masterkey;Port=3056;Dialect=3;ServerType=0"/>
</connectionStrings>
<main connectionStringName="MainDB" type="EleWise.ELMA.Extensions.Firebird.FirebirdProvider,
EleWise.ELMA.Extensions.Firebird" backupPath=""/>
```

**Data source** – the name and the address of the database server. If the Firebird server is located on the same machine as the ELMA application server, the string will be: **127.0.0.1**, (**local**) or **localhost**. If the database server is located on a remote machine, then in this field you should specify the IP address or the network name of the machine. For example, **Data source = 192.168.0.58**.

**Initial Catalog** – specifies the full path to the database file **(*.fdb)** or the database alias. By default, it looks like: **Initial Catalog = {CONFIGDIR} \ elma3-express.fdb.**

**User ID** – specifies the user name to access the database. The most commonly used is the default **sysdba**.

**Password** – specifies the user's password. The default password for the **sysdba** is **masterkey**.

**Port** – specifies the port for the Firebird server.

The **backupPath** attribute is used to set up automatic database backups. For more information, see Chapter 5.

### 2.3.2. MS SQL database connection parameters

The following is a part of the configuration file when using the MS SQL DBMS:

**Configuration.config**

```
<connectionStrings>
  <add name="MainDB" connectionString="Data Source=(local);Initial
Catalog=ELMA3_Express;Integrated Security=true;"/>
</connectionStrings>
<main connectionStringName="MainDB" type="EleWise.ELMA.Extensions.MSSQL.MSSQLProvider,
EleWise.ELMA.Extensions.MSSQL" backupPath=""/>
```

**Data source** – looks like **ServerName\Instancename**. **ServerName** – the name or the address of the DB server; **Instancename** – the DB server instance. If the instance is not specified, the default instance will be used. The default instance of the MS SQL server for the Express edition is **SQLEXPRESS**.

**Initial Catalog** – specifies the database name of the selected directory of the MS SQL server instance, for example, **ELMA3_Express**.

You can determine the location of the database files through **MS SQL Management Studio** by opening the properties of the database and clicking on the **Files** tab.

**Integrated Security** – set to **True** if you want to use Windows authentication (current user on whose behalf the pool is running in IIS or Cassini). If you set this parameter to **False**, authentication will be performed at the SQL server level and you will be required to enter the login **User ID** and the password **Password** of the user who has full access to the described database. Note that if you set the parameter to **True** and simultaneously specify **User ID** and **Password**, single sign-on will be enabled and the user's login and password will be ignored.

The **backupPath** attribute is used to set up automatic database backups. For more information, see Chapter 5.

### 2.3.3. PostgreSQL database connection parameters

The following is a part of the configuration file when using the PostgreSQL DBMS:

**Configuration.config**

```
<connectionStrings>
  <add name = "MainDB" connectionString = "Host=127.0.0.1;Port=5433;Database=ELMA3;User Id=postgres;Password=;Unicode=true;"/>
</connectionStrings>
<main connectionStringName="MainDB" type="EleWise.ELMA.Extensions.PostgreSQL.PostgreSQLProvider, EleWise.ELMA.Extensions.PostgreSQL" backupPath=""/>
```

**Host** – If the PostgreSQL server is located on the same machine as the ELMA application server, the string will be: **127.0.0.1**, (**local**) or **localhost**. If the database server is located on a remote machine, then in this field you should specify the IP address or the network name of the machine. For example, **Data source = 192.168.0.58**

**Port** – specifies the port for the PostgreSQL server (the default port is **5432**).

**Database** – the database name. When creating a new database via the ELMA installer, the default name will be **ELMA3.** You can change this name manually.

**User ID** – specifies the user name to access the database. The most commonly used name is the default **postgres**.

**Password** – specifies the user's password. When creating a new database via the ELMA installer, the password is set up at one of the installation steps (by default it is empty).

### 2.3.4. Oracle database connection parameters

The following is a part of the configuration file when using the Oracle DBMS:

**Configuration.config**

```
<connectionStrings>
   <add name="MainDB" connectionString="Data Source=(DESCRIPTION=(ADDRESS=(PROTOCOL=tcp)(HOST=65.207.106.193)(PORT=1521))(CONNECT_DATA=(SID=ORATEST)));User Id=ivanovivan;Password=bdfyjdbx;Enlist=false;" />
</connectionStrings>
 <main connectionStringName="MainDB" type="EleWise.ELMA.Extensions.Oracle.OracleProvider, EleWise.ELMA.Extensions.Oracle" backupPath=""  backupEnabled="false" sysUser="sys" sysPassword="Sd68Jkwwq" />
```

**HOST** – the name and the address of the database server.

**PORT** – the port for the Oracle Listener (by default it is 1521).

**SID** – When creating a new database, the SID is similar to the name of the database (you can change it manually).

**User ID** – the user's name (Oracle object privilege).

**Password** – the user's password.

**sysUser** – the user's name (Oracle object privilege).

**sysPassword** – the user's password.

The ELMA application server does not perform an automatic backup for the Oracle database. To manually create a backup, you need to perform a number of settings. For more information, read the Knowledge Base article Backing Up the Oracle Database.

### 2.3.5. Configuring file storage

The next part of the configuration file contains the file storage settings:

**Configuration.config**

```
<fileStore defaultProvider="FSProvider">
        <providers>
                <clear/>
                <add name="FSProvider"
type="EleWise.ELMA.Runtime.Providers.Impl.FileSystemFileStoreProvider, EleWise.ELMA.SDK"
filesPath="Files" previewsPath = "E:\Previews"/>
        </providers>
</fileStore>
```

**filesPath** – sets the path to the storage of files uploaded to ELMA. By default, the value "**Files**" sets the following path for storing files **C:\ELMA3-Standart\UserConfig\Files**. You can specify the path relatively to the **UserConfig** folder, or set a complete new path: **filesPath= "D:\myfiles\files"**. When using a network path as a file storage, you need to specify the full network path to the folder, for example, **\\server\folder**. Make sure that the user under whose name the ELMA server is started has permissions to access the specified path.

**previewsPath** – this attribute sets the path to the storage of preview files generated during the system operation. If the attribute is not specified the system stores files in **C:\ELMA3-Standart\UserConfig\Previews**.

# Chapter 3. Licensing

The **ELMA BPM** Platform (Fig. 1) provides basic functions that allow you to model and implement business processes in the organization. The ELMA product family includes a set of platform-based applications: **ELMA ECM+** (electronic document management), **ELMA CRM+** (customer relationship management), **ELMA Projects+** (Project Management), **ELMA KPI** (KPI Management).

To use **ELMA BPM Platform**, you have to purchase licenses. All the platform-based applications are licensed separately.

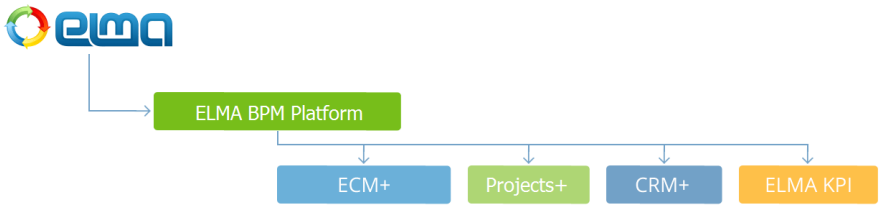



*Fig. 1. ELMA product family*

Similarly, you have to purchase separate licenses for the additional platform modules, such as Integration with 1C, Barcoding and etc., and for the external applications, for example ELMA for IPAD, ELMA for SharePoint, etc.

You can find up-to-date and detailed information about all the distributed system components at the ELMA Store: https://store.elma-bpm.com (Fig. 2).

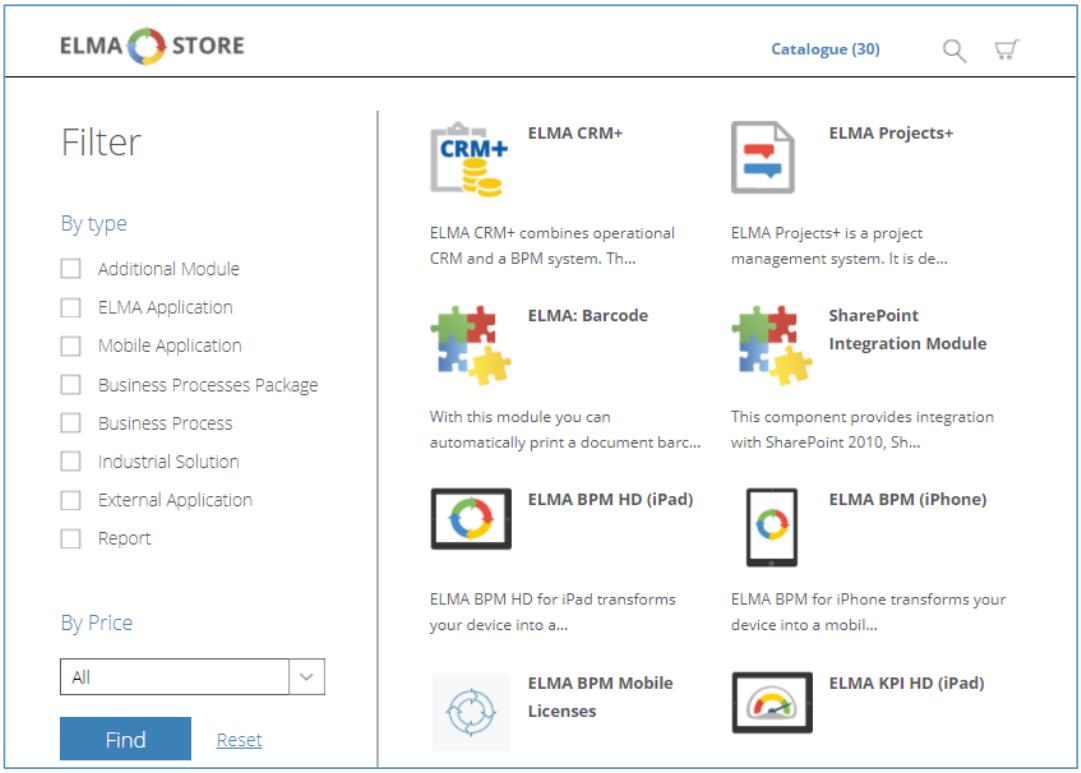



*Fig. 2. ELMA Store Componenets*

## 3.1 License Information

To find general information about licenses go to ***ELMA web application > Administration > License Information*** (Fig. 3).

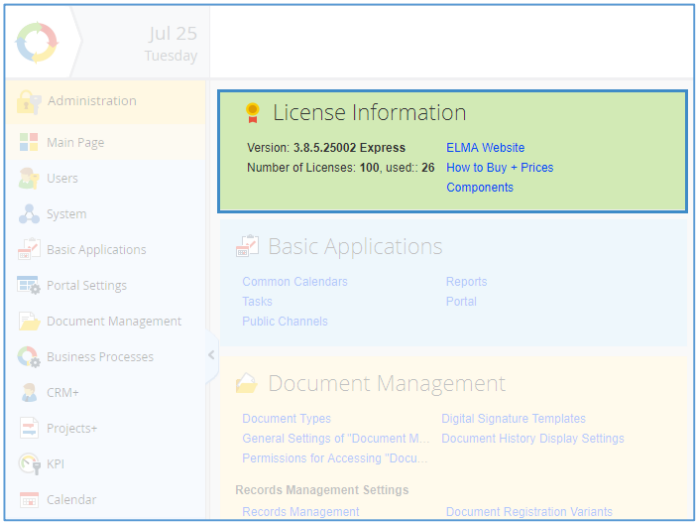



*Fig. 3. Administartion > License Information*

To obtain the detailed information about the activated licenses go to *Administration > System > Components* (Fig. 4).

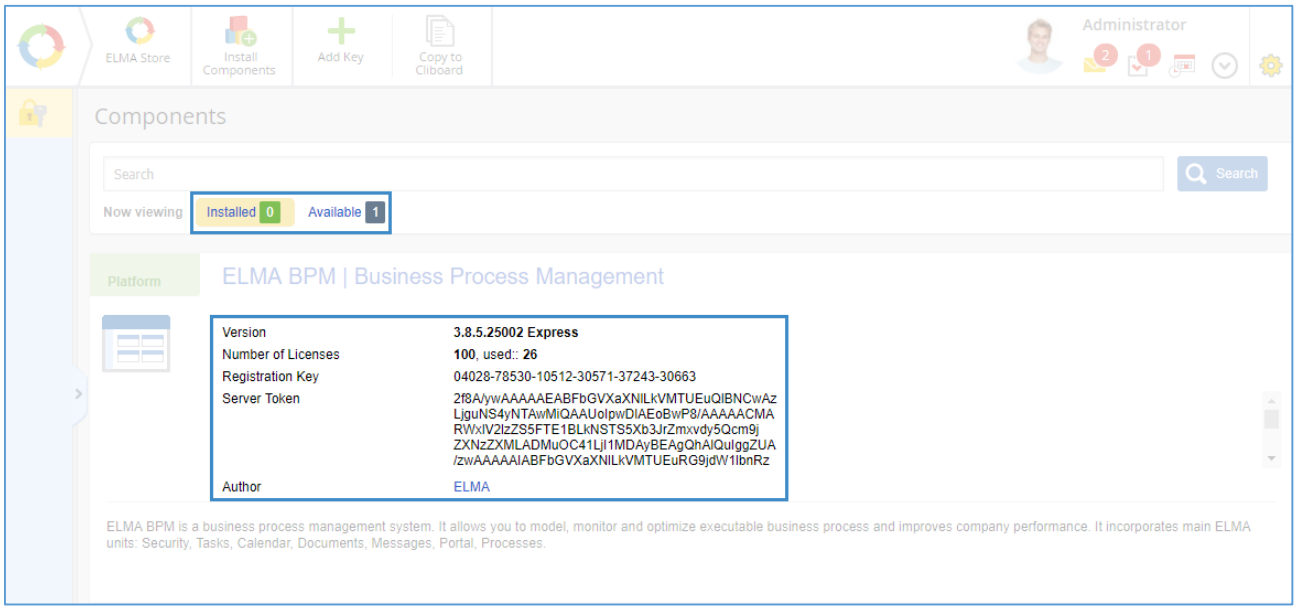



*Fig. 4. Administration > System > Components*

This page also shows information about ELMA components, their statuses (installed/activated) and the number of activated and free licenses for each module. Here you can find the following details about the **ELMA BPM** platform:

- **System Version** – the system version and edition;
- **Number of Licenses** – the number of activated and occupied user licenses;
- **Registration Key** – a thirty-digit code to generate the activation key for ELMA and additional modules. This unique code is generated when you install the system for the first time and is bound to your hardware;
- **License Expiry Date** – this field is displayed only if a time-limited key was activated (trial version of the system);
- **Author** – the author of the component;
- **Server Token** – a set of numbers and symbols of English alphabet that encrypts the number of activated ELMA modules and applications. The server token is used to generate an activation key for additional modules and ELMA licenses.

To see the summary about the activated modules and system licenses go to *Administration > System > Components* > in the upper menu click *Copy to Clipboard.* A pop-up window (Fig. 4) opens with the information about the activated modules and licenses. Click the **Copy** button and then insert the information into any text editor.

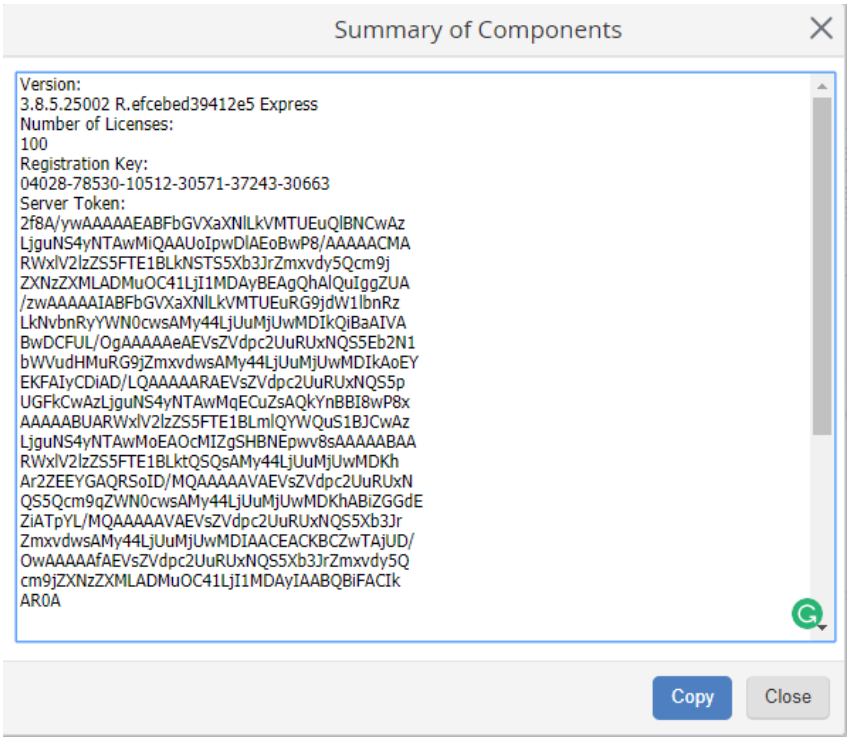



*Fig. 5. Summry about activated components*

## 3.2 Licenses types

There are two types of licenses in ELMA: component licenses and user licenses. Component licenses activate a particular system module. User licenses allow users to access the system or a particular system module.

### 3.2.1. ELMA BPM License

This is a basic license required to start using ELMA. Additionally, you have to purchase user licenses. The default admin account does not require an additional user license.

### 3.2.2. Component License

To be able to install a component to the server, you have to purchase a component license. The additional user licenses are not required. Once the component is installed, it becomes available to all the system users.

This is applicable to:

- ELMA CRM+ (customer relationship management) and some other applications;
- Additional modules that extend capabilities of ELMA: Integration with 1C, Integration with Bitrix24, Integration with SharePoint, Barcoding;
- Process packages, for example, "Document Management", "Power of Attorney".

### 3.2.3. Component License + user licenses

To be able to use a component, you must purchase a component license and a number of user licenses. The component will be available only for the users with the respective access permissions. You do not have to purchase user licenses for all the ELMA BPM platform users.

To check out users who occupy licenses and have access to the component, click **Access settings** link in the description section of the respective component (read more in p. 2.3.5).

This licensing scheme is applicable to the following applications:

- **ELMA Projects+** (Project Management),
- **ELMA KPI** (KPIs Management).

### 3.2.4. Component License + all system licenses

For some components you have to purchase the component license and as many user licenses as you have purchased for the ELMA BPM Platform. Once the component is activated, it will be available to all the system users. The ELMA ECM+ (electronic document management) is an example of such component.

### 3.2.5. User Licenses

There are two types of user licenses: named licenses and concurrent licenses.

A **Named license** limits the number of unlocked users. Lock a user to make a license available (fig.6).

Locked users will not be able to authorize in the system. Their names are not included in the drop-down lists in the task forms.

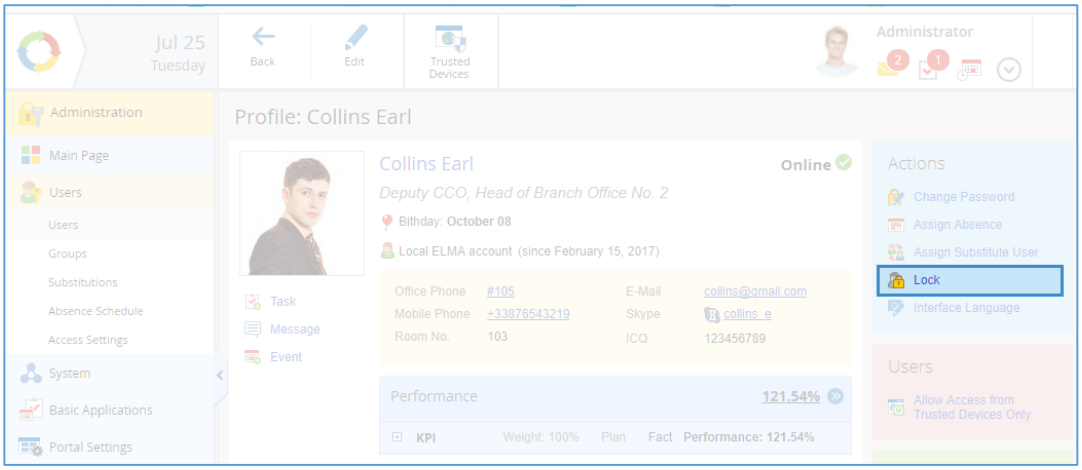



*Fig. 6. "Administration – Users". User´s Profile*

You can purchase a **Concurrent Licenses** for the Standard and Enterprise editions. This type of license limits the number of users who simultaniously work in the system. There are standard concurrent licenses and privileged concurrent liceses.

Standard concurrent licenses are ocpupied by users who have at least one active session (*Administration > Users > Active Usres*) and who are not in the group of users "Privileged sign in to ELMA".

Privileged concurrent liceses are ocpupied by users included in the group "Privileged sign in to ELMA". The number of users in this group cannot exceed the number of named licenses.

When calculating the number of occupied licenses, the global System Administrator is not taken into account.

To view the information about the number of occupied/unoccupied, named and concurrent licenses, go to the *Administration > System > Components* (Fig. 4).

The number of occupied/unoccupied licenses is displayed for each application, which requires licensing (Fig. 7).

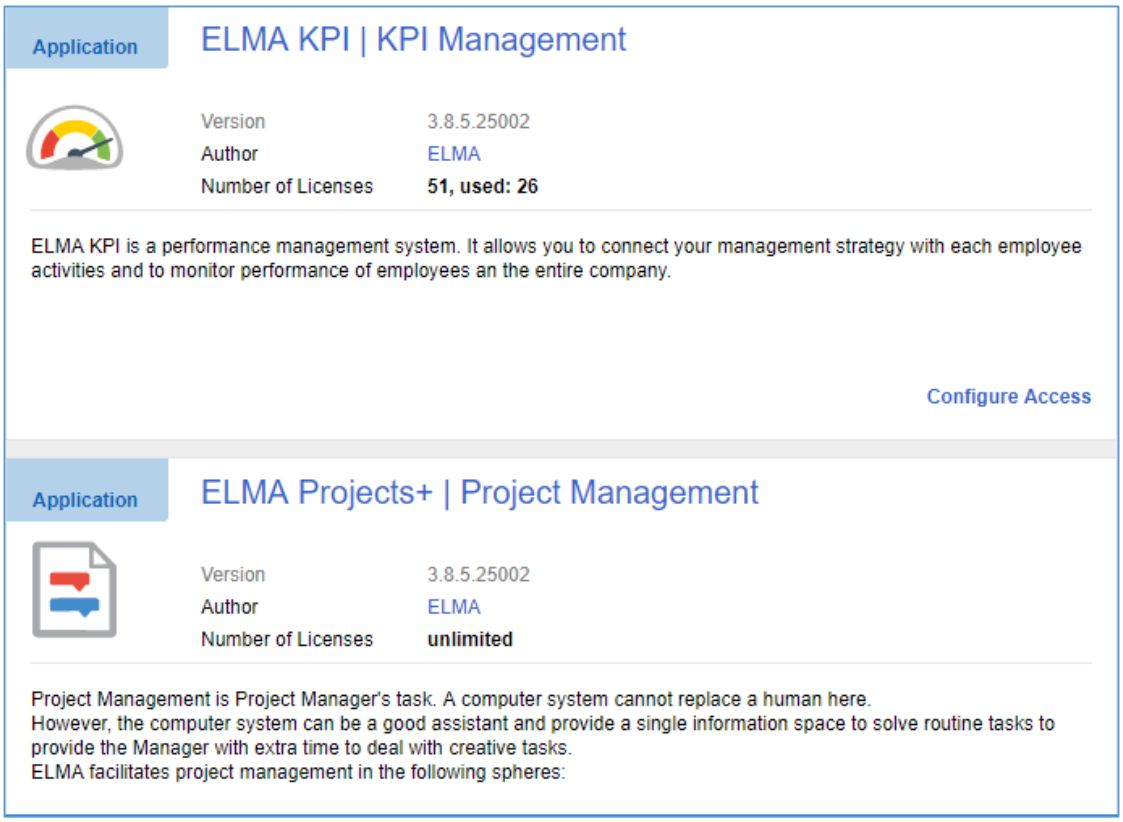



*Fig. 7. User license for a component*

## 3.3 System Activation

To start using the system, you must activate it. Read the detailed description of how to install and register ELMA in the ELMA BPM Platform User Manual.

Once the platform is activated, you might need to activate additional modules. It is required when additional modules are purchased or the number of licenses is extended.

To obtain a new activation key, you need to perform the following steps.

Open ***Administration > System > Components*** and click the **Copy to Clipboard** button in the upper menu (see 3.1 License Information). Contact your dealer company where you purchased the software and send them the information from the clipboard, the name of the additional modules, and the required number of licenses. They will calculate the total cost of the licenses. In addition, you can send a similar request to ELMA technical support.

Once you have paid the licenses, you will be sent an additional activation key, generated according to the data you provided. Please, register the key.

To do this, go to ***Administration > System > Components*** (Fig. 4) and click the **Add Key** button (Fig. 8) in the upper menu.

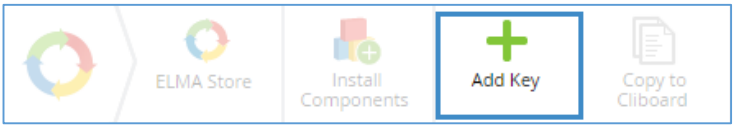



*Fig. 8. Administration > System > Components. Adding the key*

In the emerged window (Fig. 9), enter the new activation key and click the **Add** button. To activate a new module, restart the web server (read more in Chapter 4).

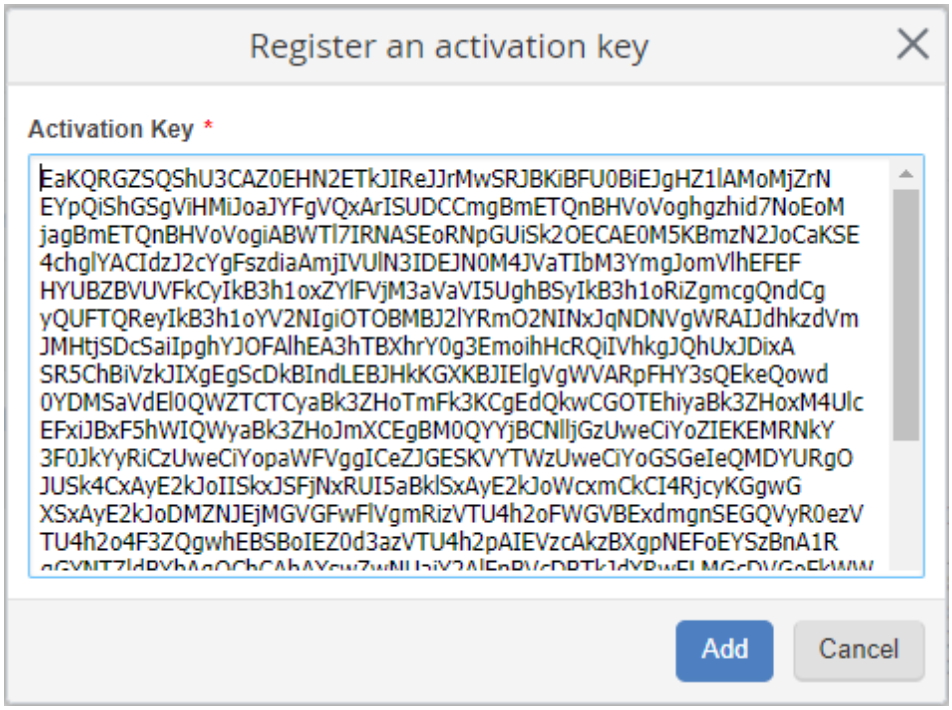



*Fig. 9. Administration > System > Components. Key registration window*

## 3.4. Reset system activation

Sometimes you might need to reset the system activation. For example, if by mistake you have activate a wrong module or additional licenses. The activation information is stored in the system folder, as well as in the Windows registry.

To reset the activation of ELMA, proceed as follows:

1. Stop the **IIS** service or the internal **Cassini** web server (see Chapter 4 for details).
2. To remove keys from the registry, use the **elmaresetlicense.exe**, which you can download from the Knowledge Base, or do it manually, by deleting the License folder in the Registry Editor:
   - In the branch **HKEY_CURRENT_USER\Software\EleWise\ELMA\License**;
   - In the branch **HKEY_LOCAL_MACHINE\Software\EleWise\ELMA\License**;
   - for 64 bit OS: **HKEY_LOCAL_MACHINE\SOFTWARE\Wow6432Node\EleWise\ELMA\License**;
   - in the **HKEY_USERS** branch track **Software\EleWise\ELMA\License** in all user folders.
3. Open the website folder **<ELMA folder>\Web\App_Data\License** and remove the **License** directory.
4. Start the **IIS** service or the internal **Cassini** web server (for more details, Chapter 4).
5. Enter the activation key, when it is required.

# Chapter 4. Administering web server

The **ELMA web server** is an application server for processing user requests in a web browser. ELMA BPM uses an **IIS server** or an **internal ELMA server** (the **Cassini** web server). IIS is the preferred option, because it provides faster and more stable operation, and supports not only the HTTP protocol, but also the HTTPS protocol.

If when installing ELMA, IIS 7.0 or higher is already installed on your machine, you will be able to select between Cassini and IIS (Fig. 10).

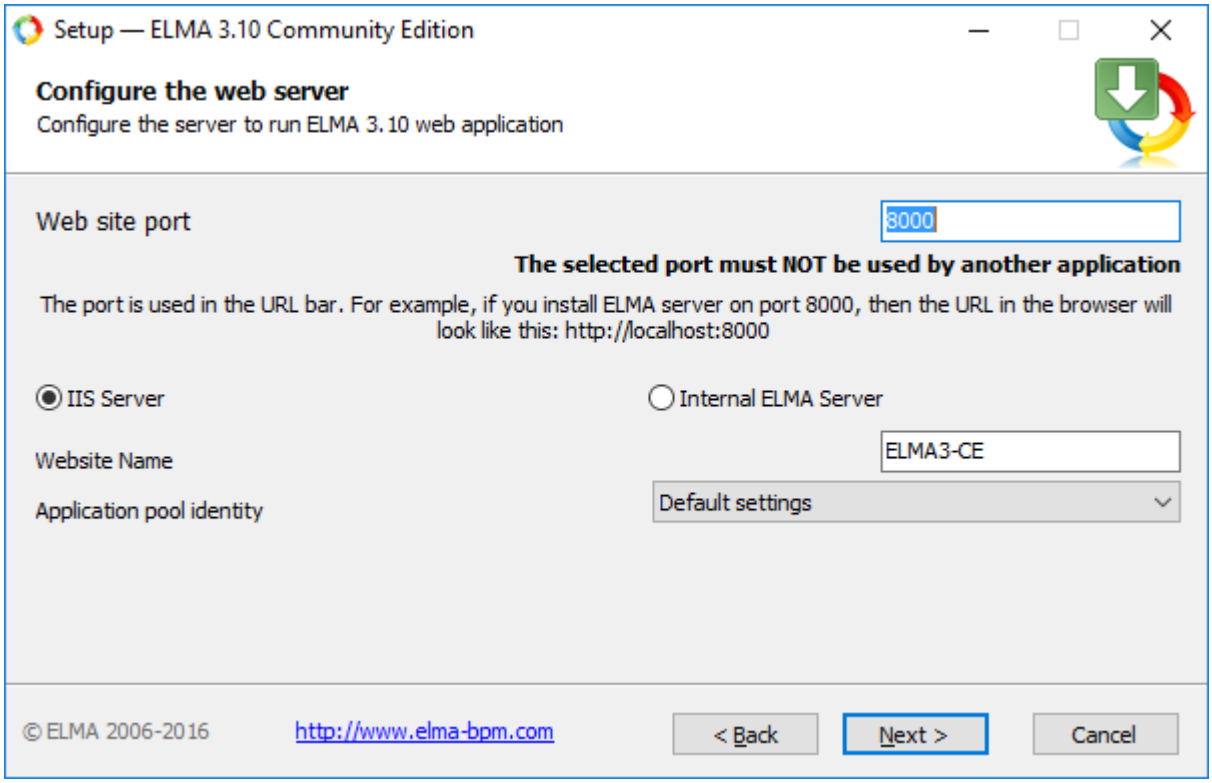



*Fig. 10. Selecting a web server when isntalling the system*

You can find a systematic instruction on how to install IIS in the Knowledge Base. To migrate from Cassini (internal application server) to IIS, read Section 4.3 of this manual. The installation of ELMA is described in the ELMA BPM Platform User Manual.

To allow local network users to access the application server, in the Windows firewall, open the site port, which you specified when installing ELMA BPM. To learn how to configure Windows firewall, read Section 4.5 of this manual. To provide access from the Internet, you should set up this port on a router.

## 4.1 Internal ELMA Server (Cassini Web Server)

**Cassini** is a free open source Microsoft web-server. You can select Cassini as a web server, when installing ELMA BPM.

To start/stop the web server, use the respective Windows service: **Control Panel > All Control panel Items > Administrative Tools > Services** (Fig. 11).

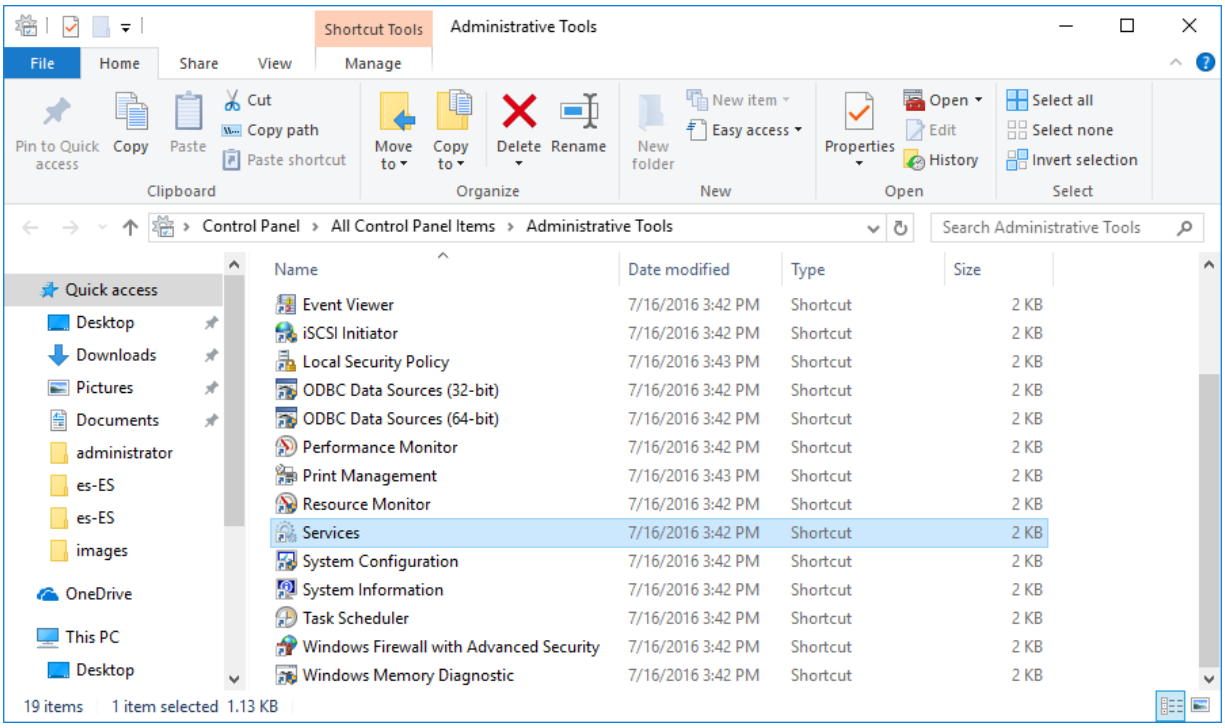



*Fig. 11. Server Managing Service*

In the list of services, find "ELMA 3.x <Edition>", where x is the number of the ELMA version. After installation, the service "ELMA 3.x <Edition>" starts under the system account **LocalSystem**. We do not recommend changing this parameter. Note that the account, which is used to start the service, must have permissions of the Windows Administrator. If you need to provide increased security, you should consider migrating from Cassini to IIS.

Right-click on the service to open a context menu and select the required option – **Start**, **Stop**, **Pause, Restart,** etc. (Fig. 12).

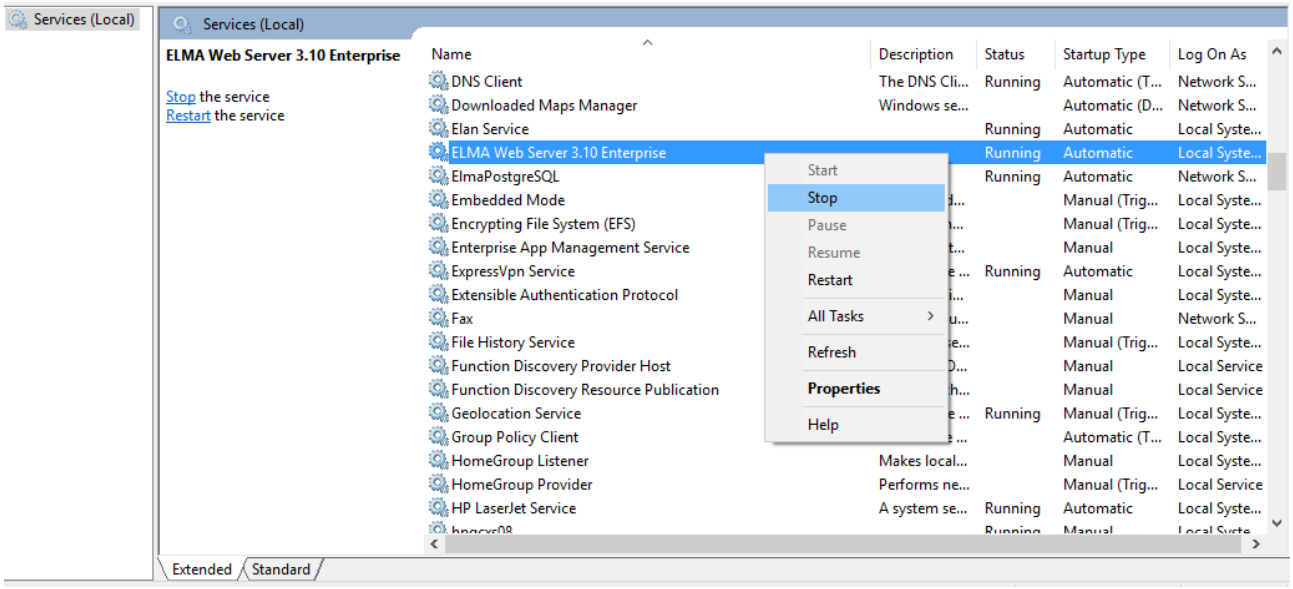



*Fig. 12. Services. ELMA internal web service*

The **Service** folder of the ELMA directory stores the web server files. The configuration file **EleWise.ELMA.WebServer.config** is used for the web server setup.

## 4.2 IIS web server

**IIS (Internet Information Services)** – is a Microsoft proprietary web server.

The advantages of using the IIS web server are as follows:

- official support from Microsoft;
- fast and stable work;
- supports the HTTP and HTTPS protocols;
- an application farm can be deployed;
- single sign-on can be used;
- a pool can be run on behalf of the built-in IIS account.

This manual is not intended to provide description of initial IIS installation. For more information, please read this Knowledge Base article. Note that you must install IIS before installing ELMA BPM.

To open the IIS manager (Fig. 13), click **Windows Control Panel > Administrative Tools.**

If you need to restart the ELMA server, the preferable way to do it, is to restart the application pool (Fig. 13). Select the required pool from the list and click **Recycle** in the right menu.

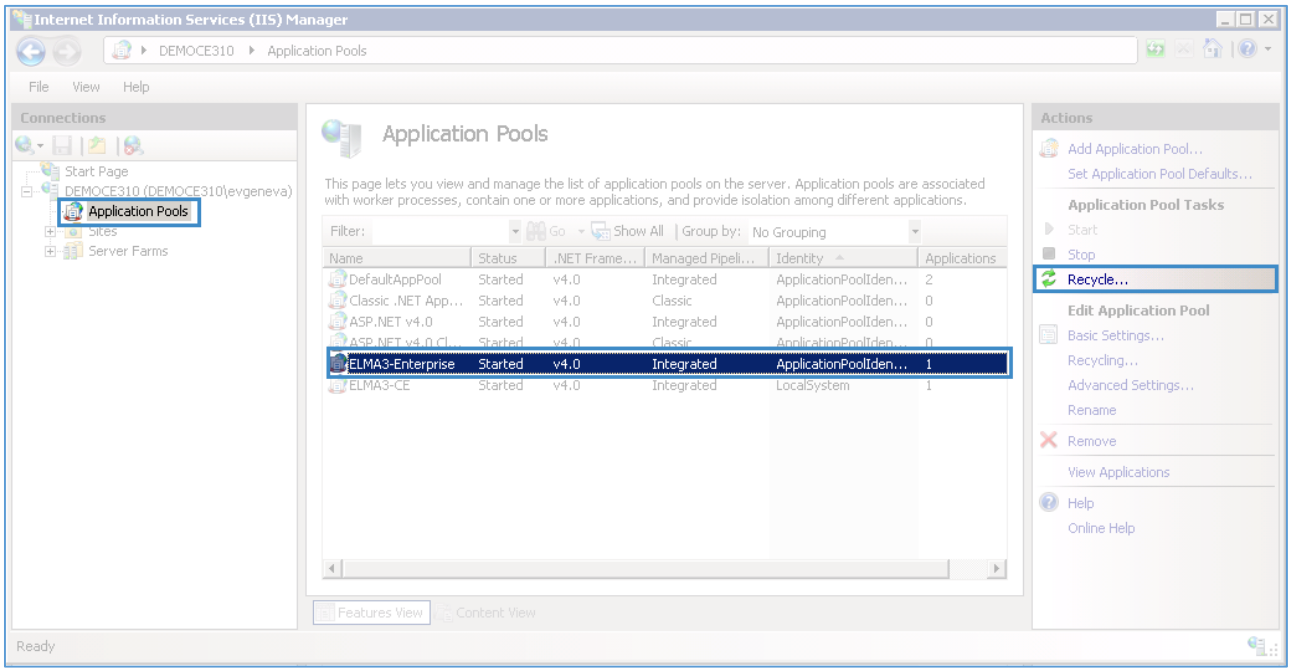



*Fig. 13. IIS Manager. Restarting application pool*

### 4.2.1. .Net Framework version

For the correct operation of the ELMA application server, make sure to specify the correct version of the .NET Framework in the application pool settings. You must use .NET Framework v 4.0. To check and change the version (Fig. 14), double-click on a pool or on the **Basic Settings** link in the right menu.

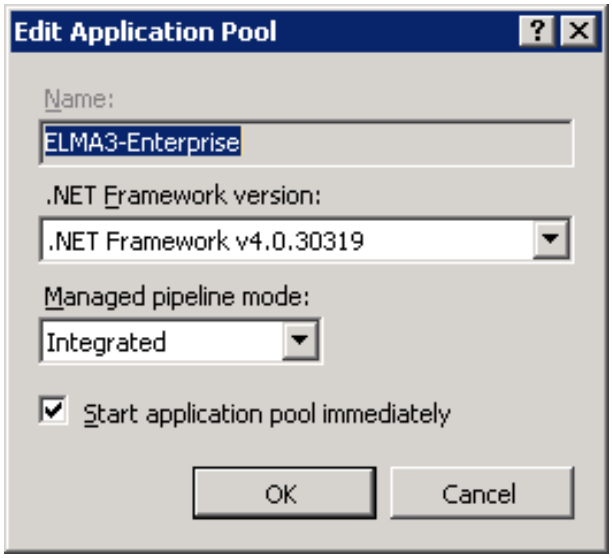



*Fig. 14. Configuring application pool. The .Net Framework version*

### 4.2.2. Application Pool Identity

To start the application pool, select a user with permissions to read/write the ELMA folder.

To configure the identity of the application pool, go to the **Application Pools** tab, in the list of application pools, select the pool used by the ELMA website. After selecting the necessary pool, in the right menu, click on the **Advanced Settings** ... In the opened window, in the **Process Model** panel, check the **Identity** field (Fig. 15). The **ApplicationPoolIdentity** is the most secure identity.

In some cases, you need to run the application pool once under the **LocalSystem** identity account.

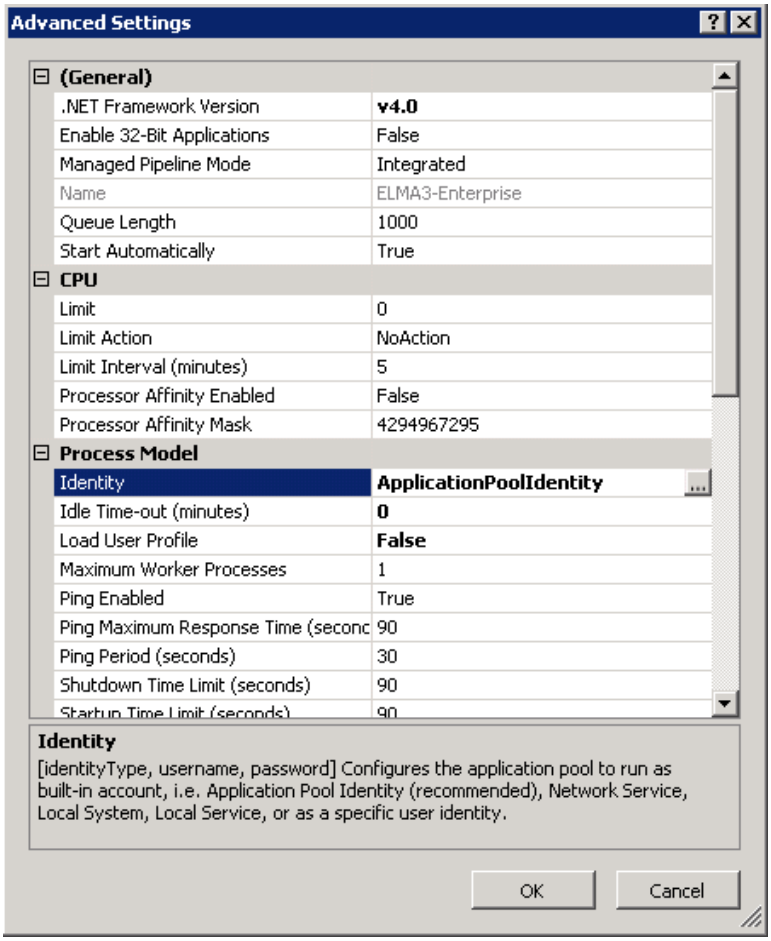



*Fig. 15. Configurinf Application Pool. The Pool Identity*

To change the identity, click the button ....

## 4.3 Migrating from Cassini to IIS

If necessary, you can migrate from the Cassini web server to IIS. To do this, stop the internal server and set up the service startup type at **Manual** or **Disabled**. For more information about configuring the server service, see section **4.1**.

Install IIS. Then, in the **IIS Manager >** on the start page > in the left panel, select the server and in the context menu, select the **Add Web Site**... (Fig. 16).

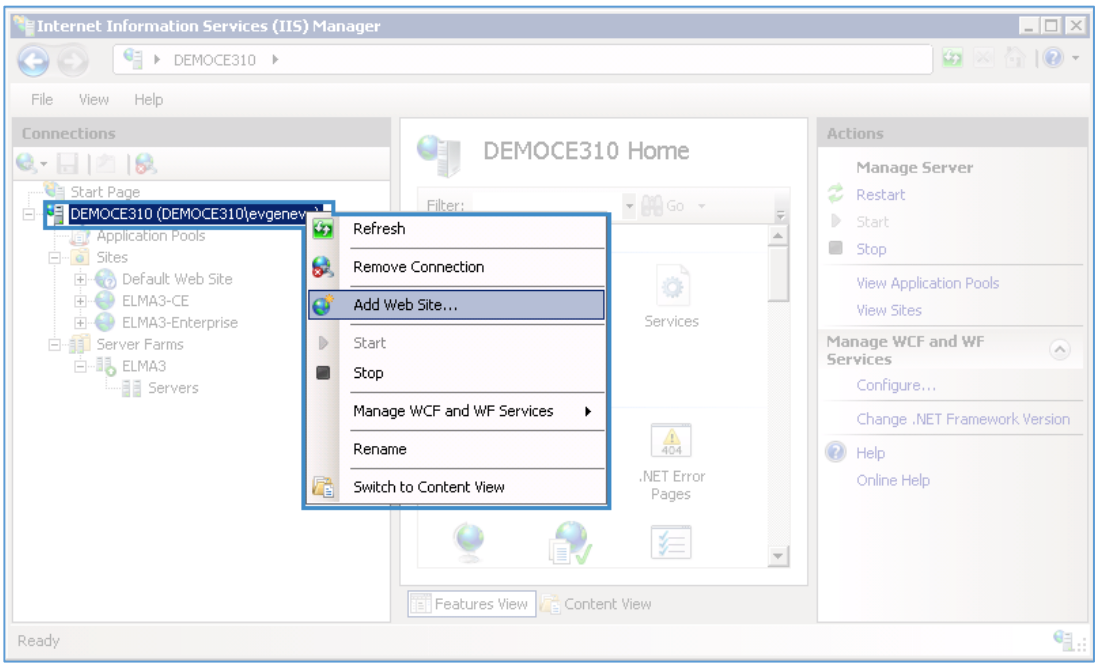



*Fig. 16. Configuring IIS. Adding a web site*

In the emerged window, specify the web site attributes (Fig. 17);

- **Site name** – specify the site name (in our case **ELMA3-Enetrprise**);
- **Application Pool** – by default, the same as the name of the web site, and in most cases it does not need to be changed.

**Content Directory:**

- **Physical Path** – a physical path to the web site folder. Can be filled out manually or selected by clicking on the browse button ... . The ELMA web site is located at ../**ELMA3-xx/Web**, where **xx** is the edition of ELMA BPM (Community, Standard, Enterprise);

- **Connect as…** – set up path credentials for an account of a specific user to access the resource via the physical path. Otherwise, use the default parameter **Application user (pass-through authentication);**
- **Test Settings…** – allows you to check the availability of the Web server files at the specified path and with the path credentials.

The **"Binding"** section contains the following fields to connect to the web site: **Type, IP address, Port, Host name**.

As a rule, the **HTTP** protocol is sufficient for working in the local network. To change the binding type, or add another binding, in **right menu > Actions** > click **Bindings**.

- **IP address –** the name of the server bound to the web site. The default value "**All Unassigned**" will work for most cases;
- **Port –** indicates the web server which port address will receive requests;
- **Host name** – specify the name of the web site if the connection is established through the host name rather than the IP address.

**Start Web site immediately** –allows you to start the web site immediately. It is necessary to deselect this checkbox.

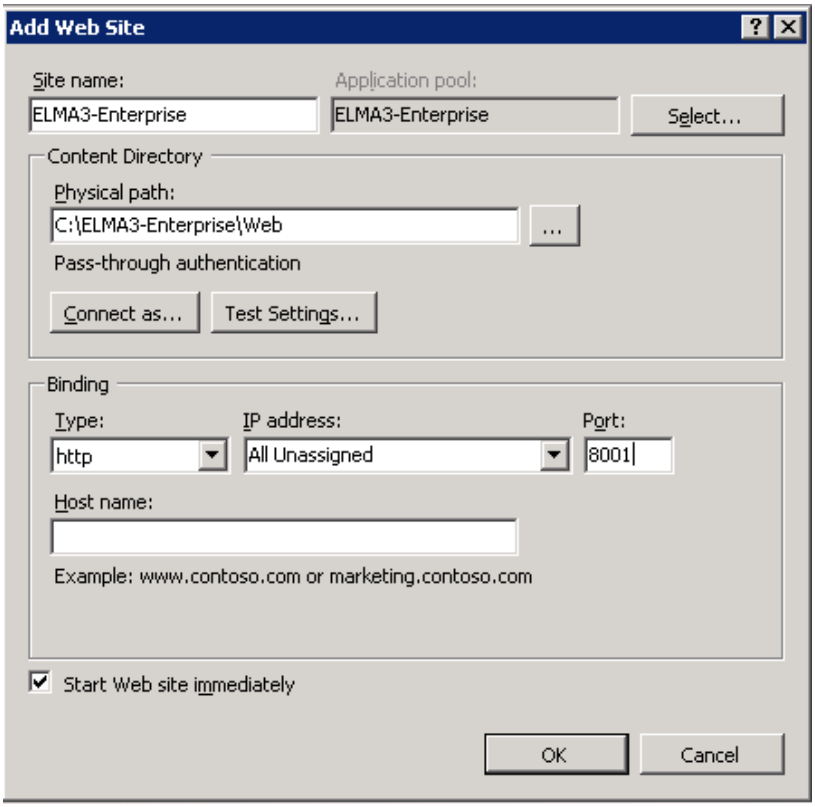



*Fig. 17. Configuring IIS. Adding web site*

Once you have filled out all the fields and saved the settings, it is necessary to change access settings of the folder, which stores ELMA. The default path to the folder: **C:\ELMA3-xx,** where **xx** – is the ELMA edition (Community, Standard, Enterprise).

To change access settings, right-click on the folder and select **Properties**. In the emerged window (Fig. 18), go to the **Security** tab and click **Edit…**.

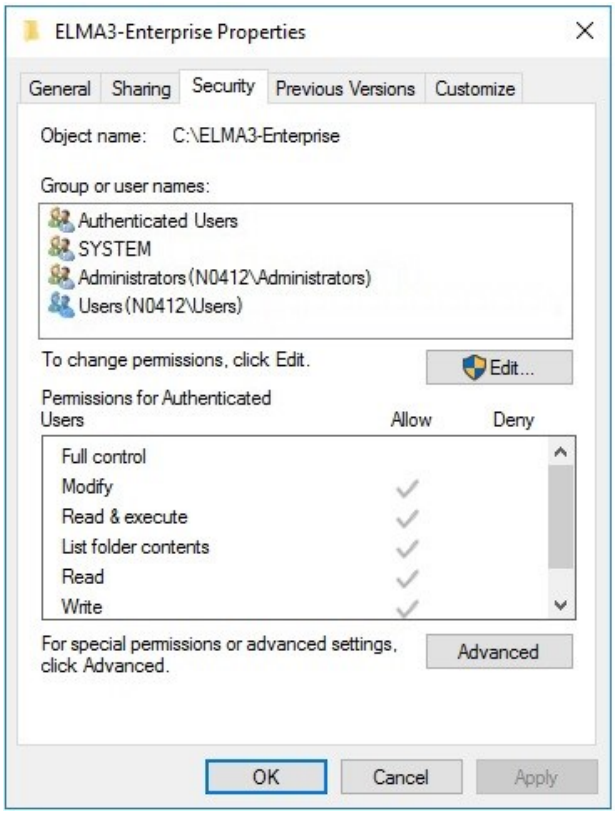



*Fig. 18. Setting access to the folder. The "Security" tab*

Then click Add and enter the following object name **IIS AppPool\Elma3- xx** in the respective field (Fig. 19), where **Elma3- xx** is the name of the pool.

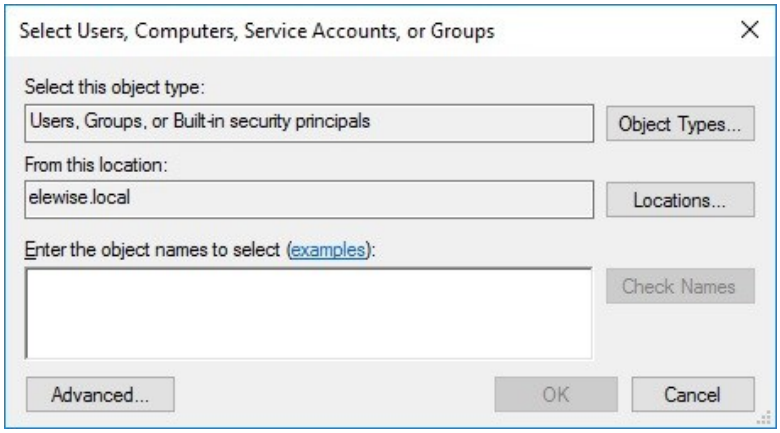



*Fig. 19. Configuring access to the folder. The window "Select Users, Computers, Service Accounts, or Groups"*

Click **OK** to save changes and continue.

Then in the "**Permissions for ELMA3- xx**" window, in the **Allow** row, select **Modify.**

Similarly, you have to set up access to the **C:\Windows\Temp** folder, because ELMA Designer uses this folder to compile the script code.

The next step is to check the .Net Framework version and the identity of the application pool (see sections **4.2.1** and 4.2.2 of this manual).

Once these steps are complete, open the **IIS Manager** and start ELMA web site. To do this in the left menu, select the required site and in the right menu click the Start button (Fig. 20).

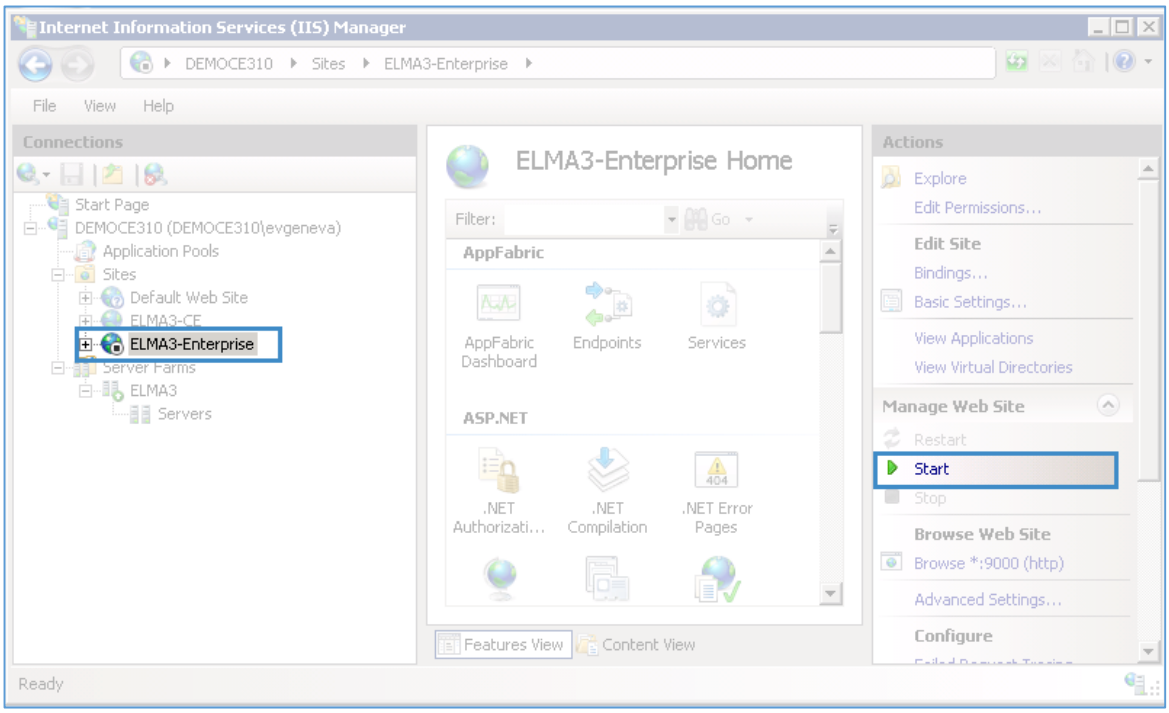



*Fig. 20. Starting IIS web server*

Once it is done, restart the application pool, by selecting the required pool in the list of **Allocation pools** and clicking the **Recycle** button. The system is ready for operation.

## 4.4 Changing ELMA web server port

The connection port is specified when the system is installed. By default, ELMA uses the 8000 port. If necessary, you can change this port.

Before changing the port, make sure that the port is open in the firewall and is specified in the router. Otherwise, the server will be unavailable from other computers.

### 4.4.1. Changing IIS port

To change the port of ELMA BPM which is run on the IIS web server, go to **Start > Control Panel > Administrative Tools > IIS Manager**. In the emerged window > in the left menu > in the Sites section select the required site (Fig. 21).

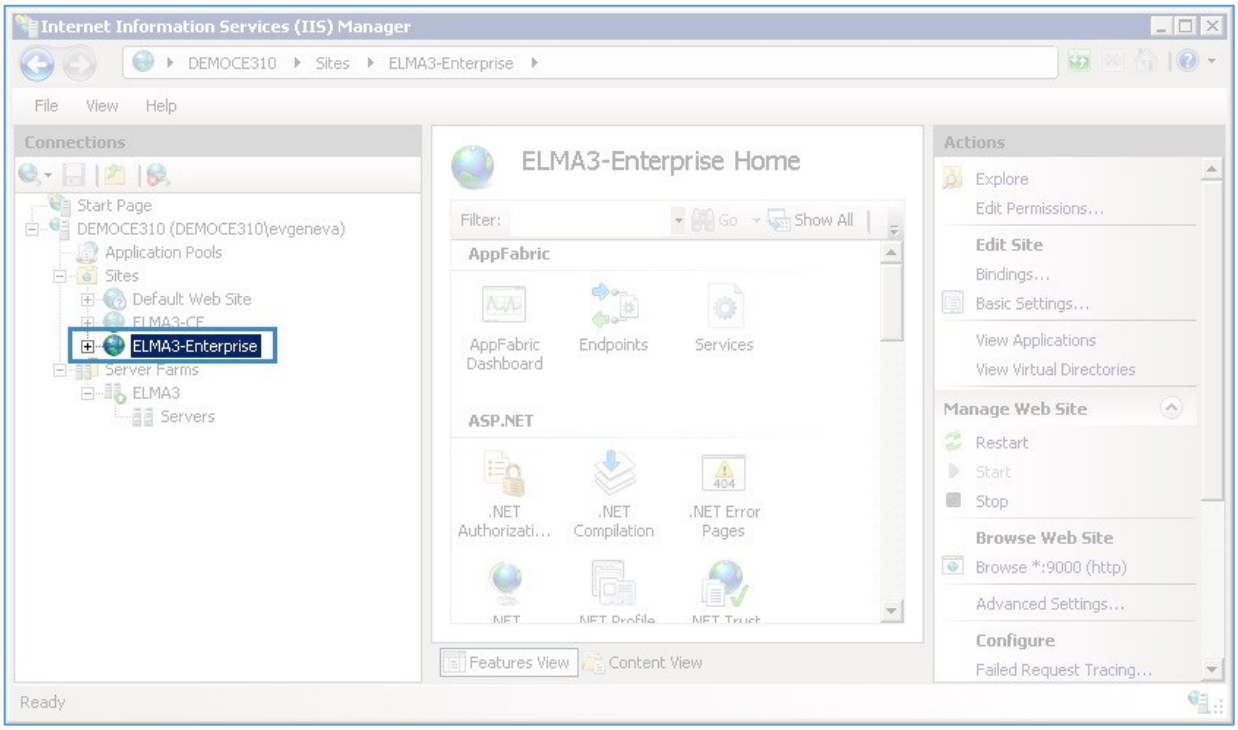



*Fig. 21. IIS Manager. Selecting web site*

Right-click on the web site name and in the context menu select **Edit Bindings …** (Fig. 22).

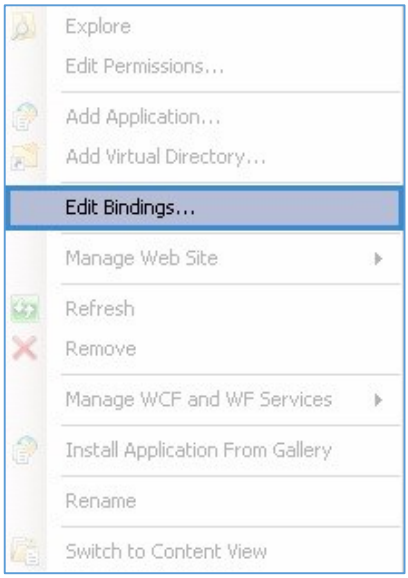



*Fig. 22. IIS Manager. Context menu item*

In the window that opens, select the binding and click **Edit**. Then enter the data (Fig. 23): specify the new port and click **OK**. Note that the specified port must be free.

*Fig. 23."Editting web site binding" window*

**Type** – select the required protocol (**http** or **https**) from the drop-down list to bind a site. In our case, the **http** protocol is used.

**IP Address** – The IP address used to access this site. By default, select **All Unassigned**.

**Port** – server port used to listen to requests addressed to this site. The port specified in this field must be free. In our case, port **8000** is used for the test

environment. By default, an exception may not be configured for this port, so to access from the outside of the local network, create a new exception in Windows Firewall.

**Host name** – the name of the host. In our case, this field is empty.

After that, restart the application pool.

### 4.4.2. Changing port when using Cassini

To change the port of ELMA, which runs on the internal Cassini server, go to **Start > Control Panel > Administrative Tools > Services**. In the list find the "**ELMA Web Server 3.x <Edition>**" service and in the context menu select **Stop**.

Then, in the ELMA directory, go to the **Service** folder and open the **EleWise.ELMA.WebServer.config** file. In the line "<Port> 7000 </ Port>", change the value "7000" to a new one. The specified port must be unoccupied.

After that, save changes and start the "ELMA Web Server 3.x<Edition>" service.

## 4.5 Configuring Windows firewall

Configure Windows Firewall to enable computers of the local network to connect to the application server and, if necessary, to the ELMA Designer.

First, you need to specify which port to open. If you use the internal Cassini web server, you should open the file **…\<Shared folder with system files>\Service\EleWise.ELMA.WebServer.config** (Fig. 24)/

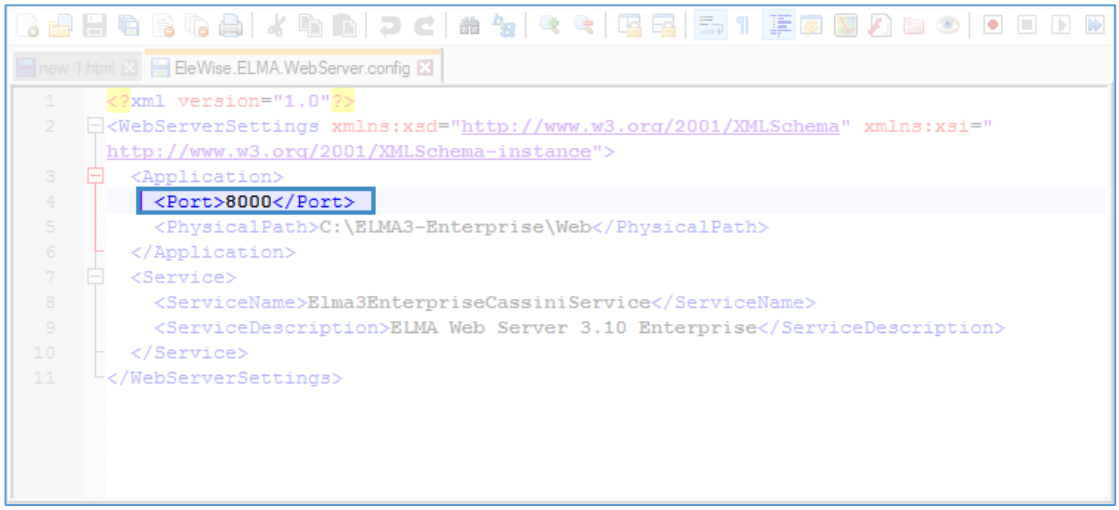



*Fig. 24. Specifying the port of the Cassini server*

If you use IIS, please read the section **4.4.1** of this manual to find out information about the port.

To check or change the port of ELMA Designer, in the **ELMA web application > go to Administration > System > System settings**. In the **General Settings** block, you will see the Designer connection port (Fig. 25). To change the port, click the icon in the upper right corner of the block.

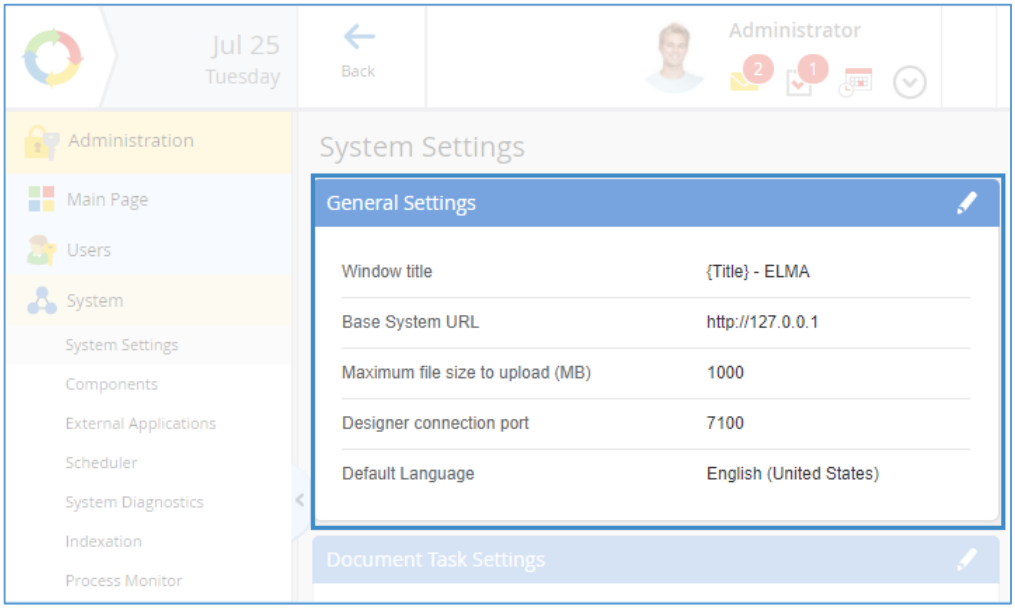



*Fig. 25. "Administration – System – System Settings". The "General Settings" block.*

Once you have found out the port numbers that must be unoccupied, go to **Start > Control Panel > All Control Panel Items > Windows Firewall**, in the open window in the left menu, select **Advanced Settings** (Fig. 26).

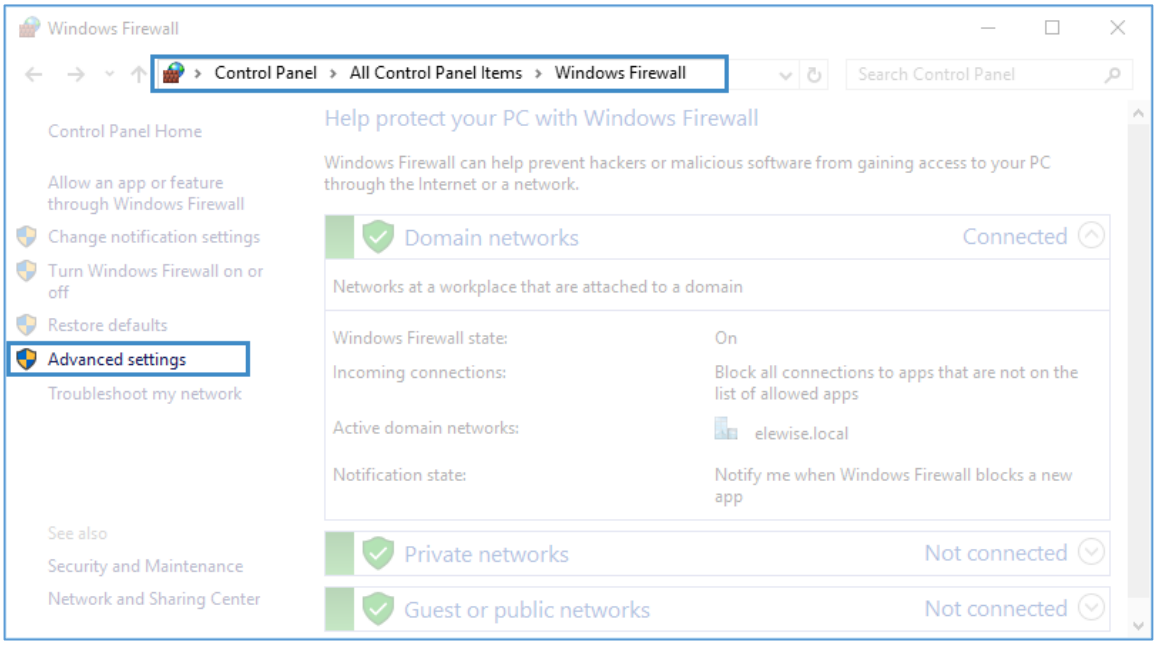



*Fig. 26. Control panel. Windows Firewall.*

In the emerged window (Fig. 27), in the left menu select **Inbound Rules**, then in the right menu click **New Rule…**.

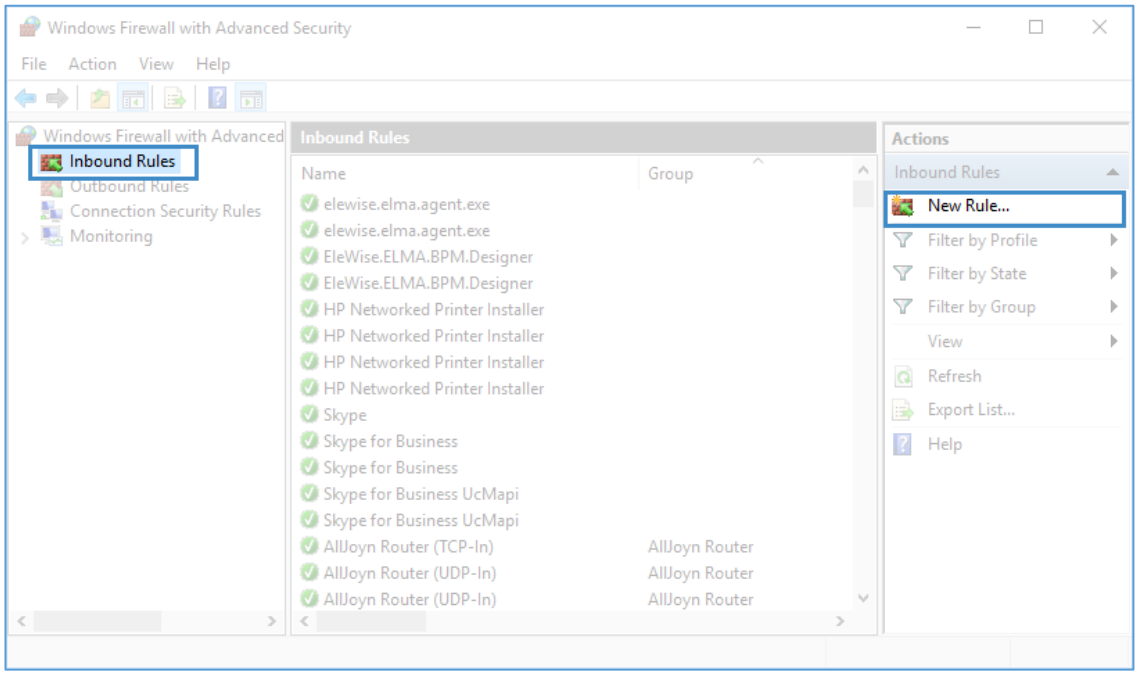



*Fig. 27. Control Panel. Windows Firewall. The "New Rule…" link*

Further actions are shown in the figures below (Fig. 28 – Fig. 32). To switch between the wizards' steps, use the **Next** and **Back** buttons.

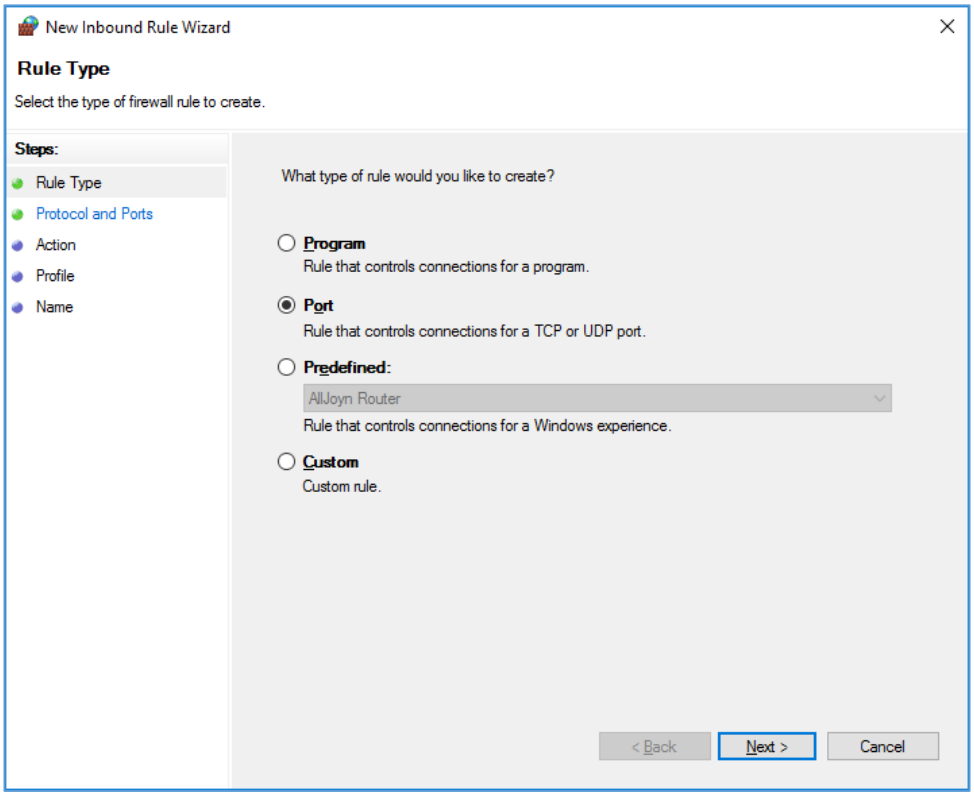



*Fig. 28 New Inbound Rule Wizard. Step 1*

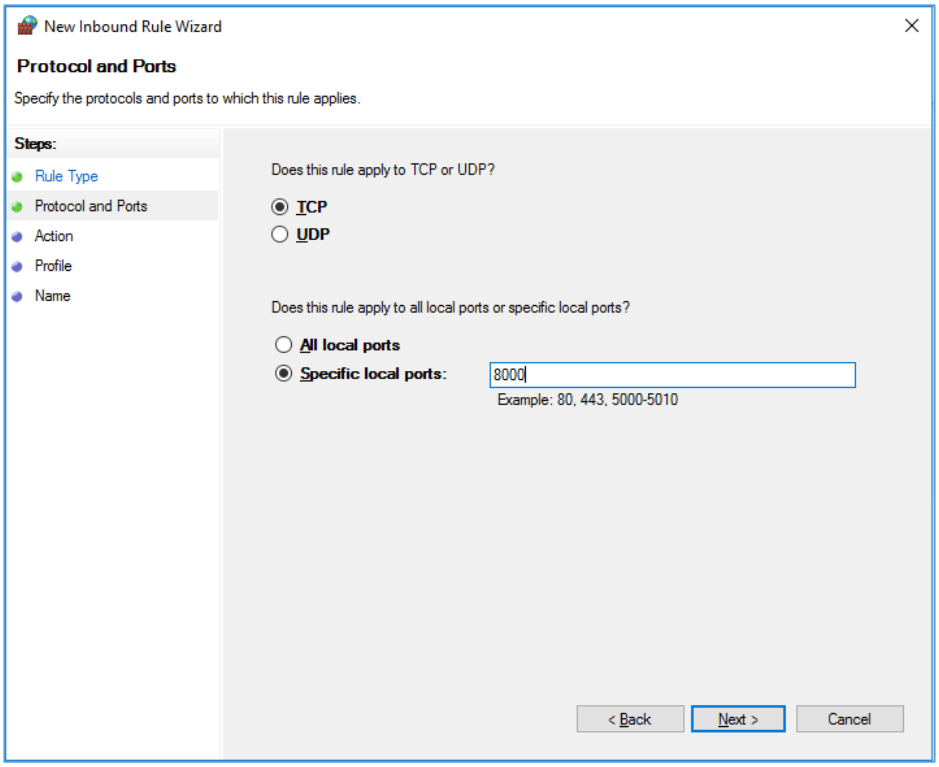



*Fig. 29 New Inbound Rule Wizard. Step 2*

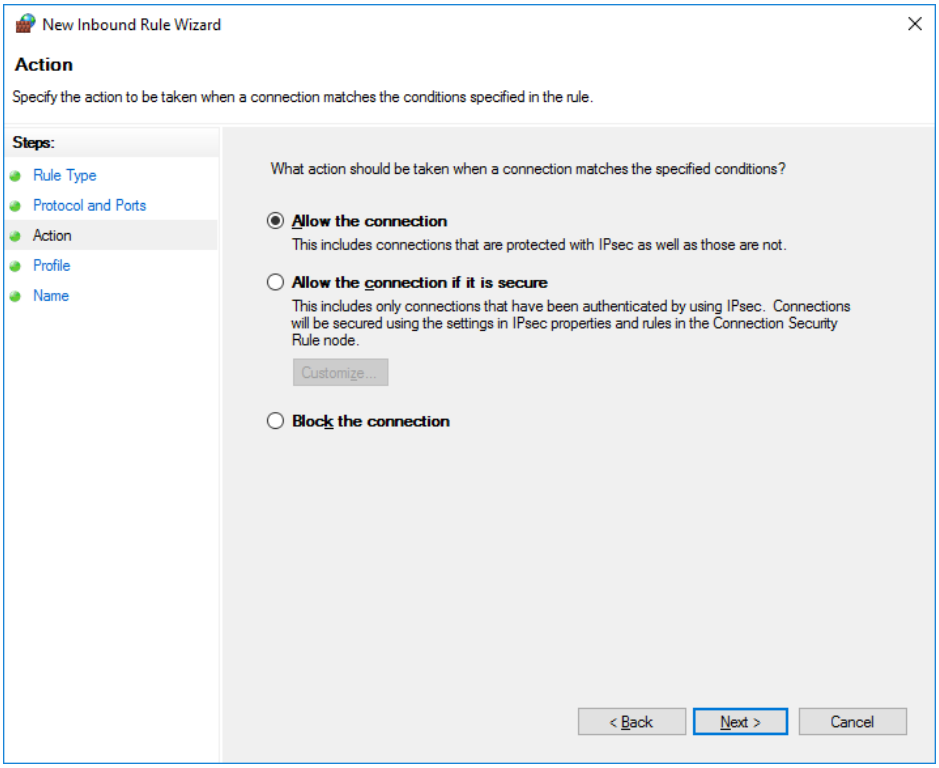



*Fig. 30 New Inbound Rule Wizard. Step 3*

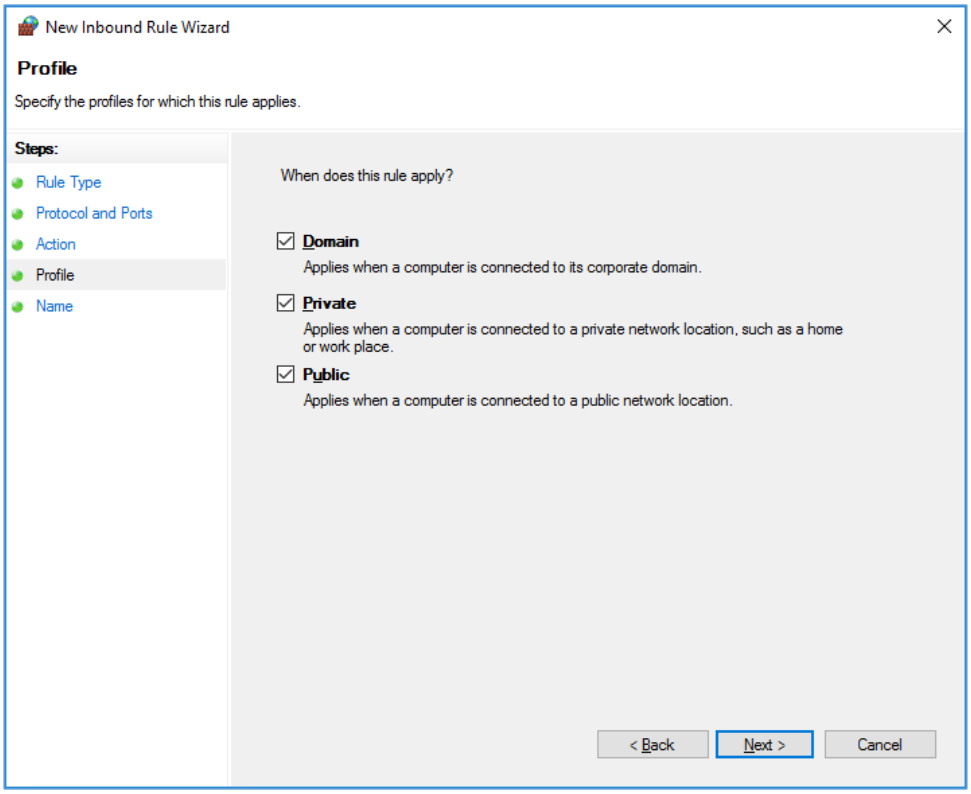



*Fig. 31 New Inbound Rule Wizard. Step 4*

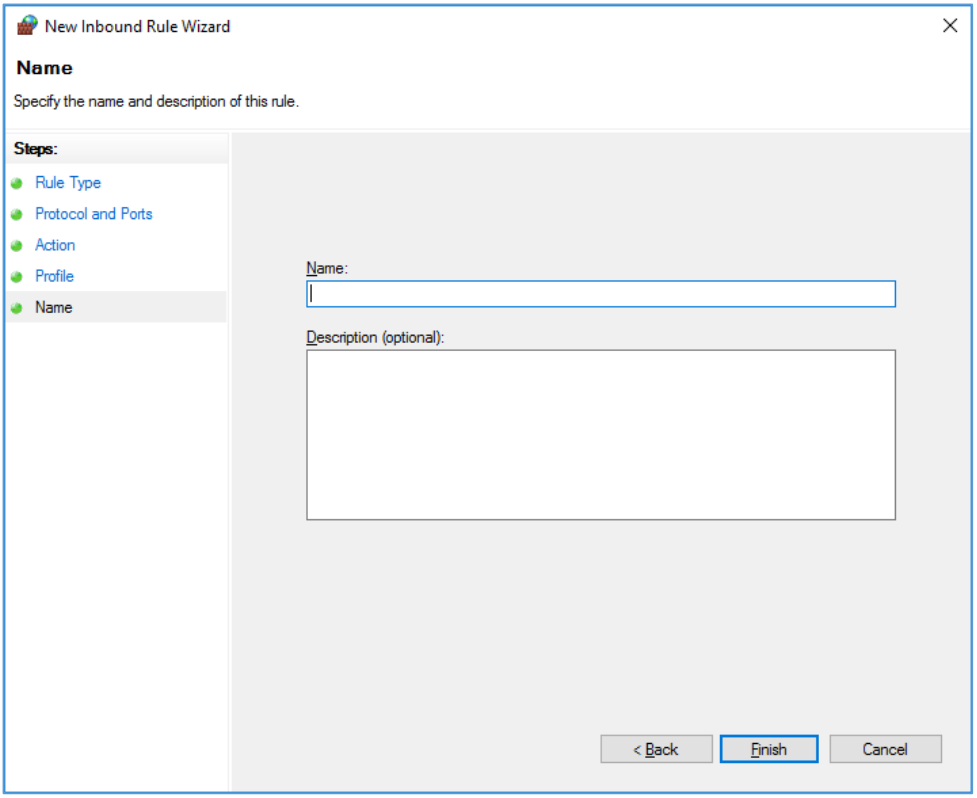



*Fig. 32 New Inbound Rule Wizard. Step 5*

To create a rule, click **Finish**. Similarly, you can create a rule for the ELMA Designer port (the default port is 7100).

# Chapter 5. Working with databases

A database is one of the main ELMA components. **ELMA Express** uses the Firebird DBMS (version 2.5 and version 3.0 for ELMA 3.9.0 and higher) and PostgreSQL (version 9.5 and higher). For **ELMA Standard**, the following DBMS are available Firebird, PostgreSQL and Microsoft SQL Server (version 2008, 2012 and 2014 in compatibility mode with 2012). **ELMA Enterprise** uses Firebird, PostgreSQL, Microsoft SQL Server or Oracle Database (10, 11, and 12).

You can select the DBMS when installing ELMA. To create **the ELMA database backup you must use the DBMS tools**. The employees who maintain the IT infrastructure of the company are responsible for creating backups of the DBMS, configuration directory and file storage, selecting the schedule, checking performance of the backup tools.

## 5.1 Backing up the ELMA database

Regular database backups with mandatory integrity check guarantees stable and trouble-free operation.

You can determine the type, name and access attributes of the database by opening the configuration file **configuration.config** (for more details, see section 2.3). By default, this file is stored at the path **C:\ELMA3-xx\UserConfig**, where **xx** is the system edition (**Express, Standard, Enterprise**), and **UserConfig** is the name of the ELMA configuration folder.

In the configuration file **configuration.config**, you need to find a line starting with the **<main>** tag (Fig. 33). In the **type** field, the FirebirdProvider, PostgreSQLProvider, MSSQLProvider, or OracleProvider class is specified. The class name corresponds to the type of the database used.

To determine the name of the database, in the same file, find the **<connectionStrings>** tag. The **Data Source** parameter contains information about the path to the server (its address). The value of the **Initial Catalog** attribute shows the name of the database file.

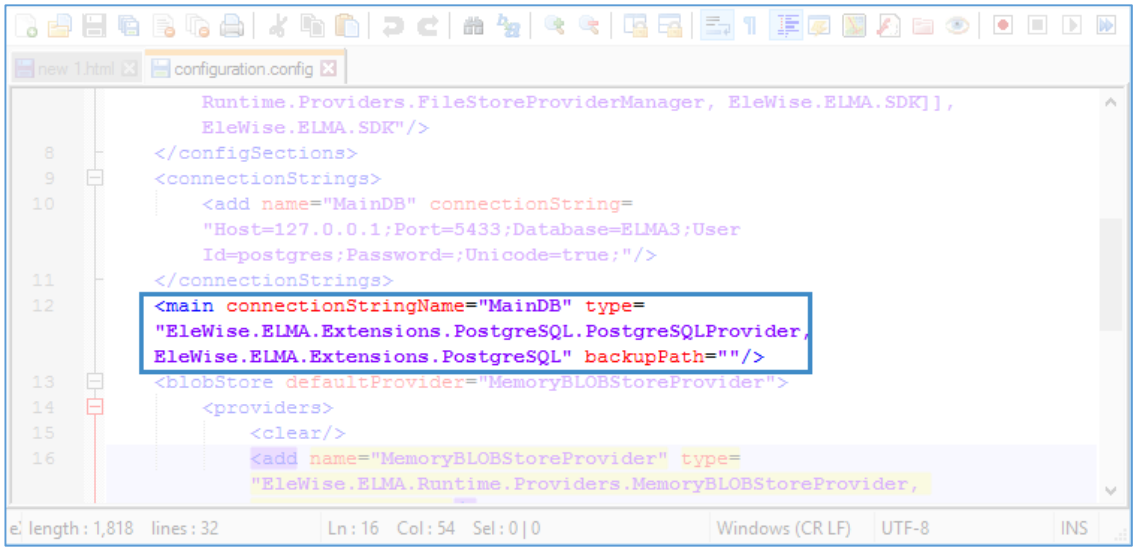



*Fig. 33. Determining the database type and the conncetion sting*

You can find examples of the configuration files in the following sections:

- Firebird database connection parameters
- ;
- MS SQL database connection parameters;
- Oracle database connection parameters;
- PostgreSQL database connection parameters.

Please note that a copy of the database is created when the backup procedure is started. To ensure that all data is backed up, you must close all active database connections before starting the backup. To do this, you need to stop the ELMA application server, this procedure is described in Chapter 4.

For the Firebird, PostgreSQL and MS SQL DBMS, ELMA automatically creates a database backup when the database structure is changed (initiated after the system update). To set up this feature, use the configuration file. Below you can see a part of the XML file:

| Configuration.config with enabled backup |
| --- |
| <main connectionStringName="MainDB" type="EleWise.ELMA.Extensions.MSSQL.MSSQLProvider, EleWise.ELMA.Extensions.MSSQL" backupPath=""/> |

| Configuration.config with disabled backup |
| --- |
| <main connectionStringName="MainDB" type="EleWise.ELMA.Extensions.MSSQL.MSSQLProvider, EleWise.ELMA.Extensions.MSSQL" backupEnabled="False"/> |

The **backupEnabled** attribute is responsible for the backup. It can have different values:

- If the value is **False,** the backup will not be created. When the backup is disabled, the **backupPath** attribute (the path of the backup files) can be omitted;
- If the attribute is changed to **backupPath** (the attribute **backupEnabled** is omitted, the default value is **True**), the backup is created. The **backupPath** parameter specifies the path to the backup files. If this field is left blank, then the backup will be created in the same place where the main database is located. The file name is generated automatically and contains the name of the database file, the date and time when the backup was created.

### 5.1.1. Firebird DBMS

If many users work in **ELMA Express** on the Firebird server, with time they can experience decrease in the system performance. In the ELMA Knowledge Base, you can find one of the possible solutions for this problem.

You can create a backup for the Firebird DBMS in various ways. For example, you can use the **gbak** utility and the bat file to automatically create regular database backups. Read more in this article.

If you want to manually create a copy of the database, use the **IBExpert** utility for administering the **InterBase** and **Firebird** databases. In this Knowledge Base article, you can learn how to install the program, set up the connection to the database, and find the description of the basic features.

Once you have installed the **IBExpert** and created the connection to the DB, in the left menu select the ELMA database (Fig. 34), and then go to the menu **Service – Backup Database** (Fig. 35).

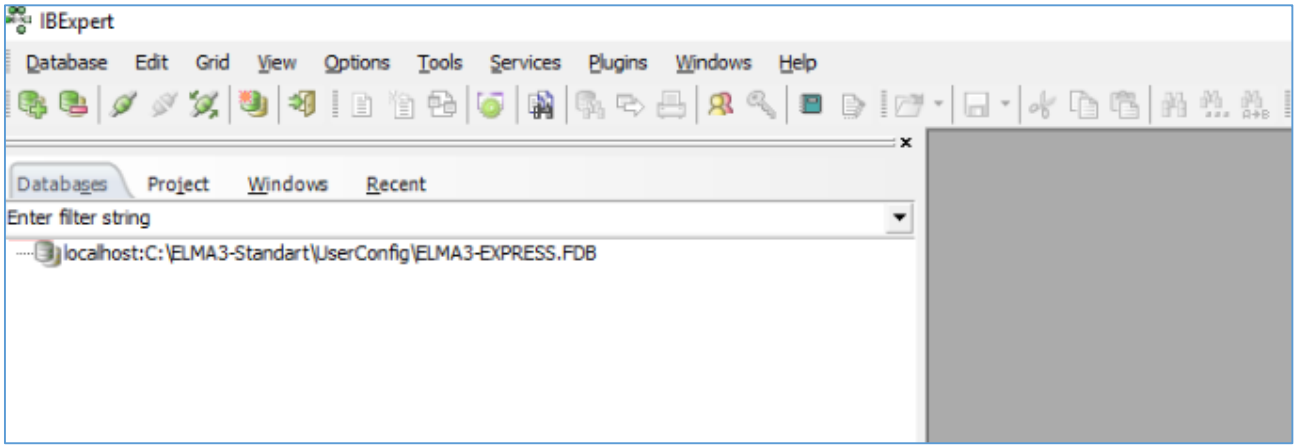



*Fig. 34. IBExpert. Selecting the database*

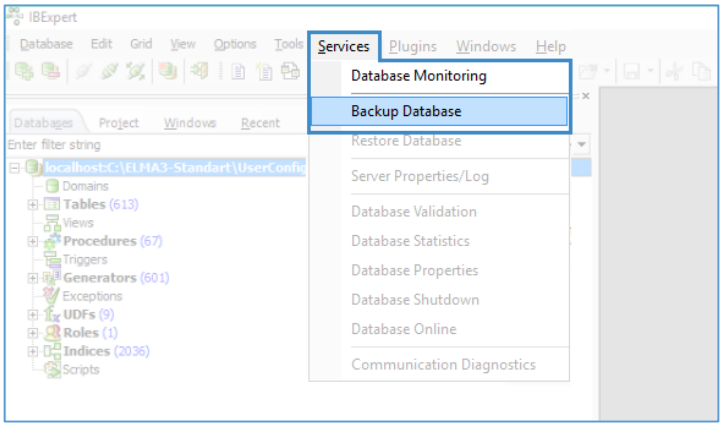



*Fig. 35. IBExpert. Creating a backup*

The **Database Backup** (Рис. 36) window will open. In the **Backup Files** tab, some of the required values will be already specified. The Firebird database backup file will have a **.fbk** extension and by default will be located in the same folder as the database. The location of the database will be specified in the **File Name** field. At the bottom of the window, in the **Output** section, select **On Screen** from the drop-down list to display the copy of the protocol.

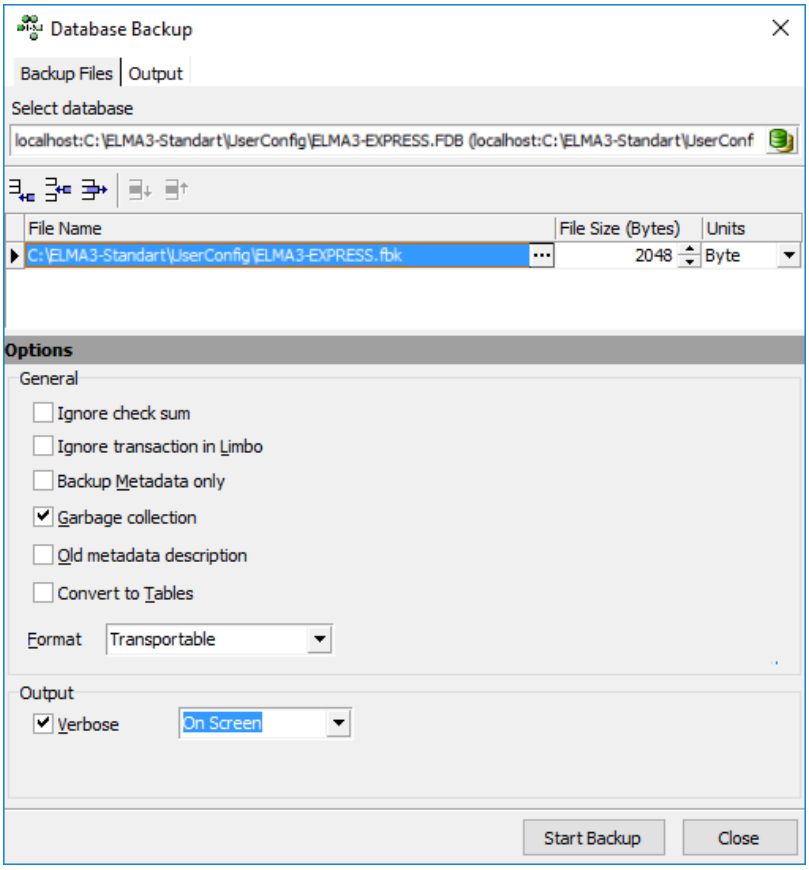



*Рис. 36. IBExpert. Creating a backup. Settings*

To start the database backup, click **Start Backup**. The **Output** tab will open displaying all the copying messages.

### 5.1.2. MS SQL DBMS

There are several ways to create a backup of the MS SQL database. Further, we will describe how to create a backup in the **MS SQL Management Studio**.

Start **MS SQL Management Studio,** in the **Connect to Server** dialog box (Fig. 37), fill in the following attributes:

- **Server Type** – the **Database Engine** component is used;
- **Server Name** – The server instance for the connection is specified in the **Data Source** attribute of the configuration file;
- **Authentication –** There are two authentication modes for the **Database Engine:**
  - **Windows Authentication** – allows a user to connect through a Windows user account (single sign-on);

- **SQL Server Authentication -** the SQL account is used. In the **Login** field, you must specify a name in the following format: **ELEWISE\test_user**, where **ELEWISE** is the domain name, **test_user** is the user account. In the **Password** field, specify the password for this account.

*Fig. 37. MS SQL.Database Connection*

Click **Connect**.

After successfully connecting to the database server, select the database specified in the **Initial Catalog** attribute of the configuration file (Fig. 38). Read how to verify the required database in the section **5.1**.

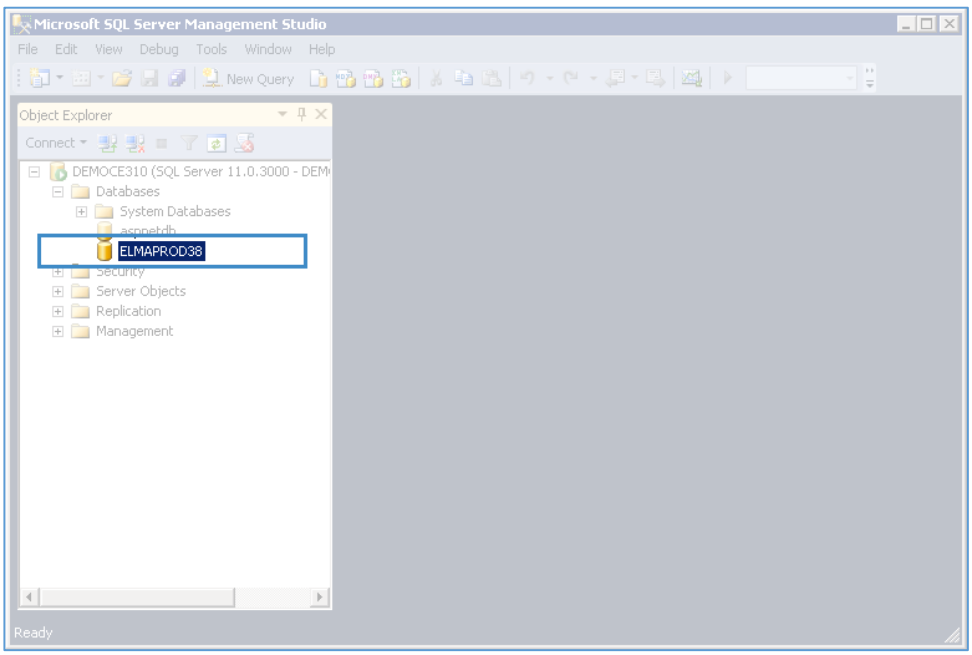



*Fig. 38. MS SQL. Selecting database*

Right click on the sql database which you want to back up. In the context menu, select **Tasks** –**Back up**… (Fig. 39).

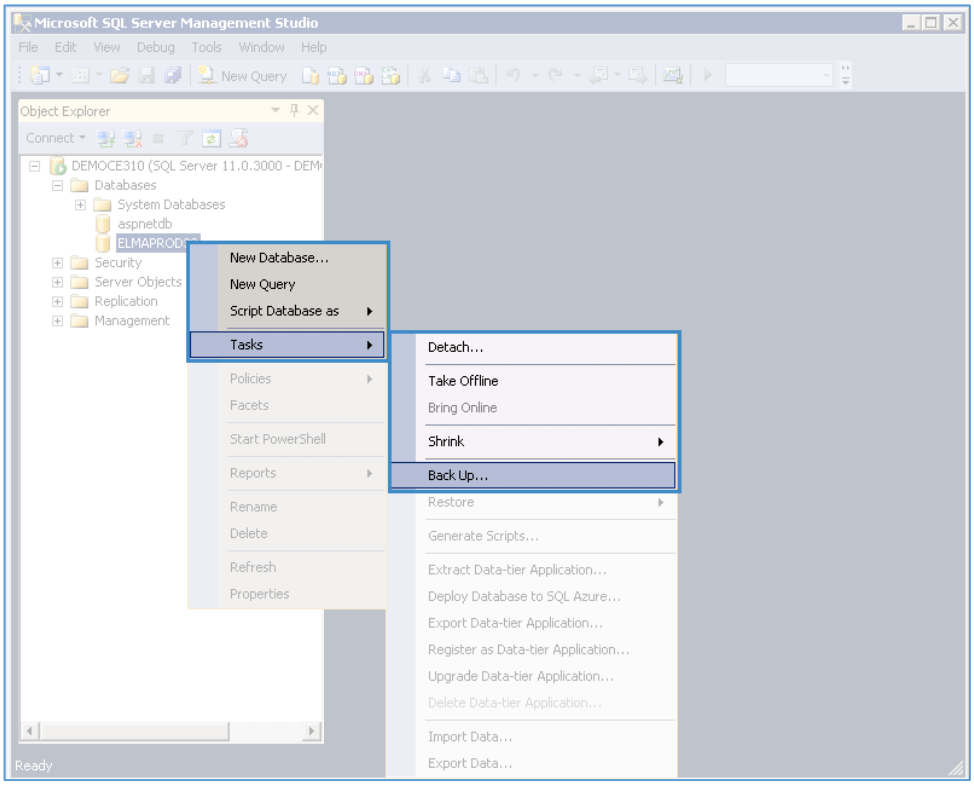



*Fig. 39. MS SQL. Backin up*

The **Back up Database window** opens (Fig. 40), where you have to specify the required data.

In the **General** tab, you can select the source type. If you select the **Copy-only Backup** parameter, you will take a SQL Server backup that is independent of the sequence of conventional SQL Server backups. Usually, taking a backup changes the database and affects how later backups are restored. However, occasionally, it is useful to take a backup for a special purpose without affecting the overall backup and restore procedures for the database. Copy-only backups serve this purpose.

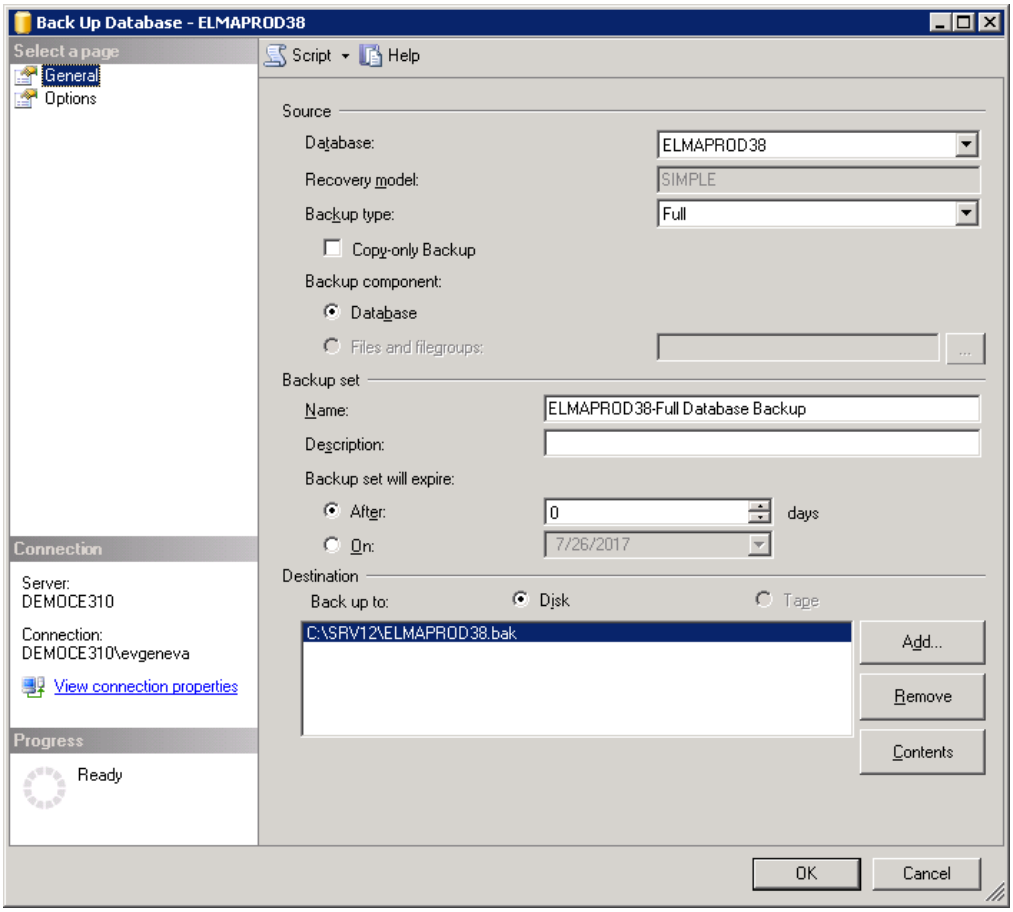



*Fig. 40. MS SQL. Backing up DB. The "General" Tab*

In the **Destination** section of the **General** tab, select the file or backup device for the backup destination. By default the database backup will be located in the *C:\Program Files\Microsoft SQL Server\MSSQL12.MSSQLSERVER\MSSQL\Backup* (the name of the file will match the name of the database with the **.bak** extension). Please note that one file can store several backups of different databases. If you click on the **Content** button, you will see a list of backups of all databases (Fig. 41), stored in the file with detailed information about them.

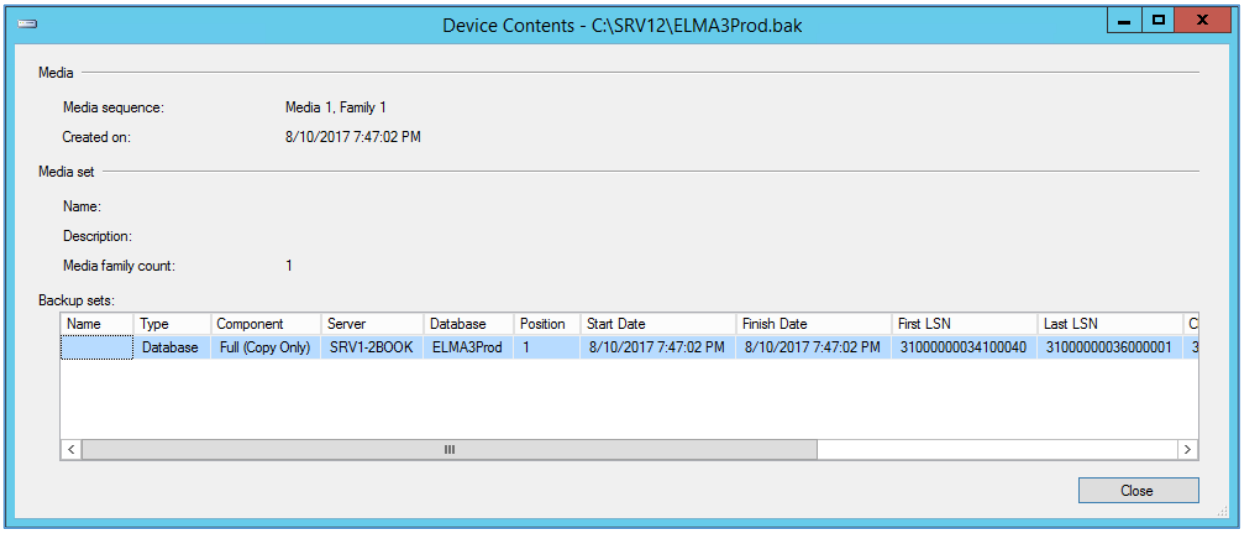



*Fig. 41. MS SQL. The file with the database backups*

If you want to change the backup path or file, first click the **Remove** button, then click **Add** and in the window that opens (Fig. 42) specify the full path and file name, or click the ... button and select a new path to the file and the file name. You should also add a **.bak** extension at the end of the file name.

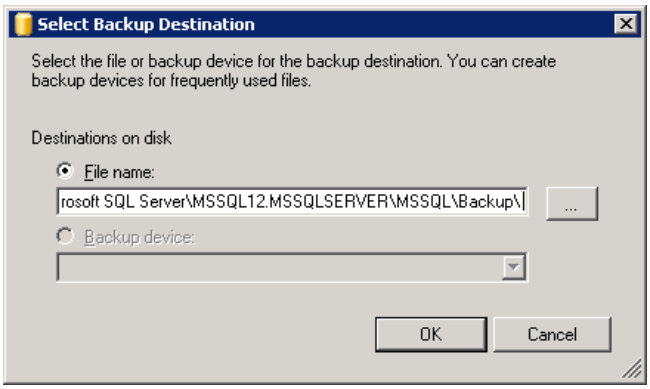



*Fig. 42. MS SQL.Selecting the file or backup device for the backup destintaion*

In the **Options tab** you can select **Set backup compressions** to shrink the amount of storage space used by your backup files.

Once you have configured all the options, a dialog box opens, informing you about the successful backup.

### 5.1.3. PostgreSQL DBMS

There are several ways to back up a **PostgreSQL** database. Below we will describe the backup option in the **pgAdmin III** application (this utility for database administration is installed by default together with the DBMS).

Start **pgAdmin III**, in the **Object browser** find the required DB server (Fig. 43).

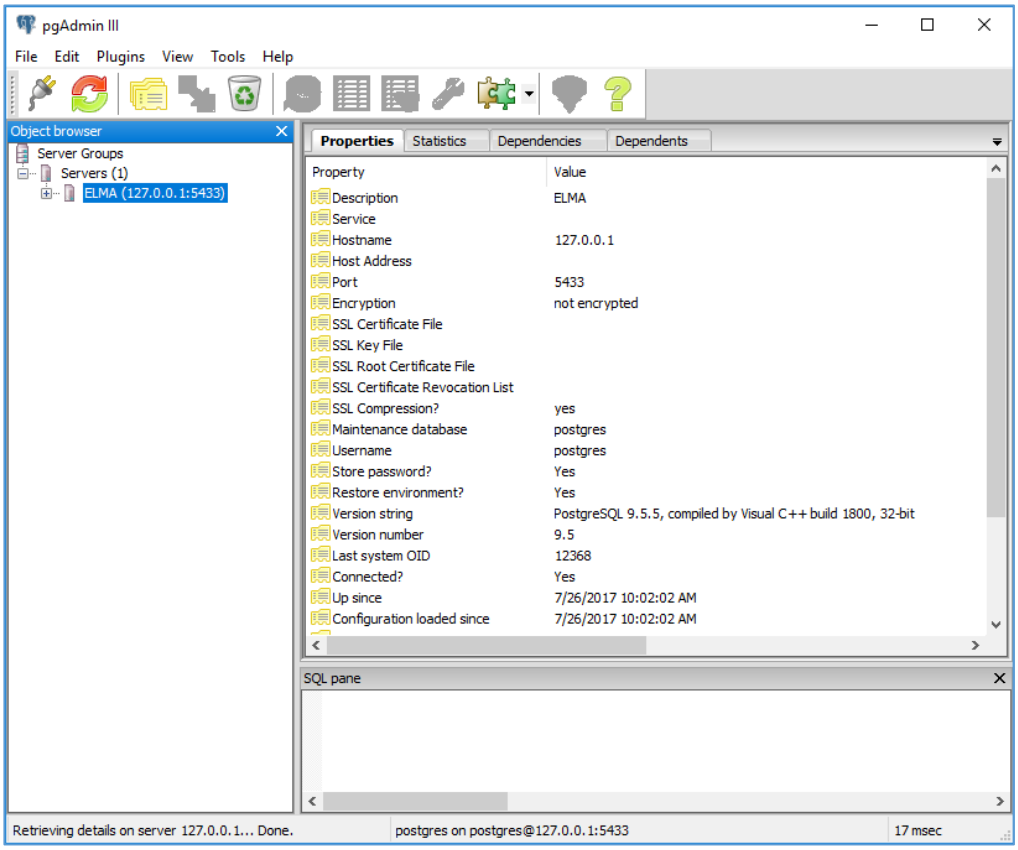



*Fig. 43. pgAdmin III application*

If the server does not exist, establish a new connection **File > Add Server...** menu (the first icon in the toolbar).

Enter the details to connect to the database in the New Server Registration window. (Fig. 44):

- **Name** – enter a name for this connection to distinguish it from the others (you can select any name);
- **Host** – enter a name of the server where your hosting account is located;
- **Port** – The port number specified when installing the database (by default **5432**);

- **Service** – The name of the service configured in the file **pg_service.conf** (by default leave this field empty);
- **Maintenance DB –** this is a system database to which all users and applications are connected by default. In PostgreSQL 8.1, it is **Postgres**, and on earlier versions, it is **template1.**

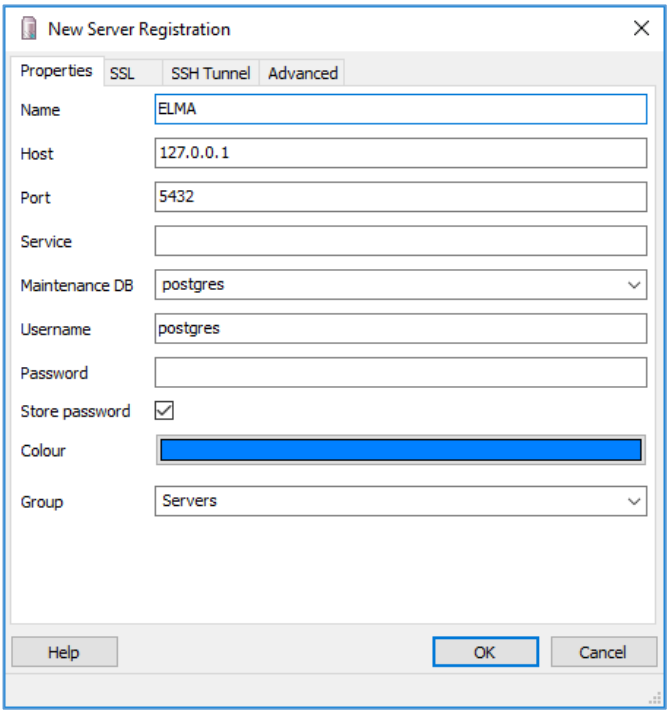



*Fig. 44 PostgreSQL. Registering a new server*

After successfully connecting to the database server, select the database specified in the **Database** attribute of the configuration file. Read how to verify the required database in the section **5.1**.

Next, in the context menu, select the **Backup** option ... (Fig. 45).

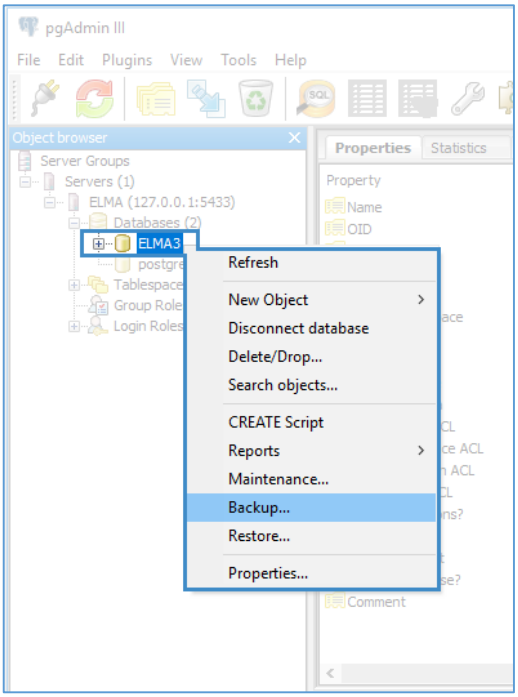



*Fig. 45. pgAdmin III application. The DB context menu.*

The **Backup database "DB name"** window opens (Fig. 46).

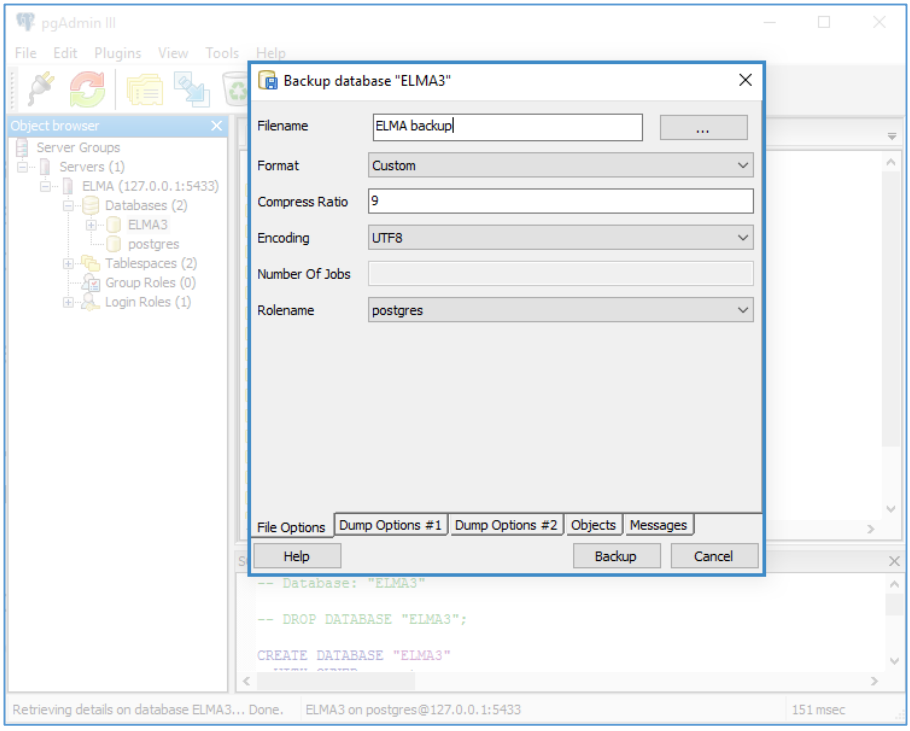



*Fig. 46. pgAdmin III appliaction. Backup parametrs*

Specify the following parameters:

- **Filename** – Enter the name of the backup file in the Filename field. Optionally, select the Browser icon (...) to the right to navigate into a directory and select a file that will contain the archive;
- **Format** – select the format of the backup. The following options are available:
    - **Custom** – This format allows you to select which database objects to restore from the backup file. Custom archive format is recommended for medium to large databases as it is compressed by default;
    - **Tar** – Select Tar to generate a tar archive file that you can restore with pg_restore. The tar format does not support compression. If you use the tar format, when you restore, you will not be able to change the relative order of data items;
    - **Plain** – the Plain format is normally recommended for smaller databases. The **pgAdmin** utility does not support the recovery of backups from this format;
    - **Directory** – This file format creates a directory with one file for each table and blob being dumped, plus a *Table of Contents* file describing the dumped objects in a machine-readable format that *pg_restore* can read. This format is compressed by default;
- **Compress Ratio** – Use the Compress Ratio field to select a compression level for the backup. Specify a value of zero to mean use no compression; specify a maximum compression value of 9. Please note that Custom format is compressed better than Directory and Plain. Tar archives do not support compression;
- **Encoding** – Use the Encoding drop-down listbox to select the character encoding method that should be used for the archive. By default, it is **UTF8**;
- **Rolename** – Use the dropdown listbox next to Rolename to specify the role that owns the backup. By default, it is **postgres**.

All additional parameters are left by default. Click on the **Backup** button. The **Messages** tab displays a list of all operations performed with the exit code. If the backup is successful, the Messages tab will display: "Process returned exit code 0". In the **Messages** tab, you can also check how to run this operation from the command line.

### 5.1.4. Oracle DBMS

The detailed description of how to back up the **Oracle DB** see in the Knowledge base. Please remember that when updating ELMA, a copy of the Oracle database is not created automatically, unlike the **Firebird** and **MS SQL** databases.

## 5.2 Restoring databases

Restoring a database is one of the DBMS functions. The restored database will be in the state it had at the time when the backup was created. The **Firebird** backup files have the **.fbk** extension. The **MSSQL** backup files have the **.bak** extension, and the PostgreSQL files - **.backup**. To restore the database, first stop the web server on which ELMA is running. For more information, see **Chapter 1**.

### 5.2.1. Firebird DBMS

Consider the procedure for restoring a database in IBExpert. Select **Services - Restore Database** (Fig. 47).

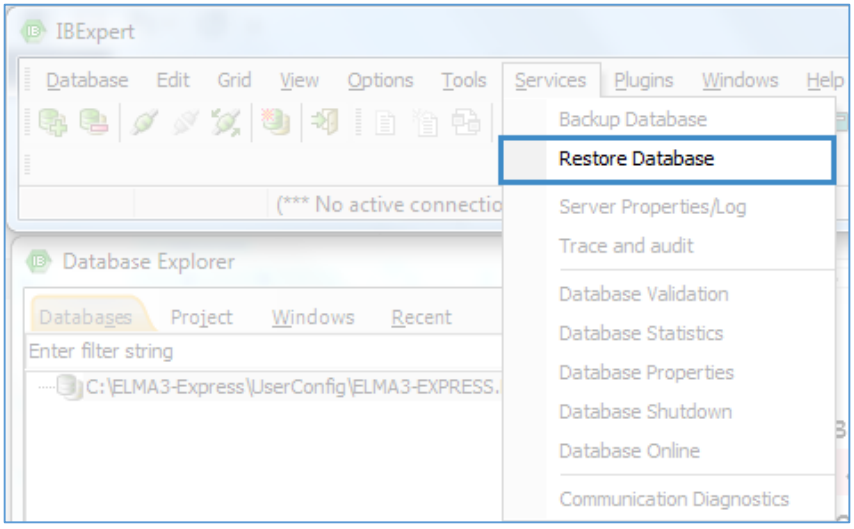



*Fig. 47. IBExpert. Restoring database*

You can restore the backup to an existing database, or to a new one. To restore the backup to a new database, in the **Files** tab (Fig. 48), select the **New database** option in the **Restore into** drop-down list (Figure 48). To restore to the existing database, select **Existing Database**. In the **Database File** field, enter the full path to the new (or existing) database file. In the **File Name** field, enter the path to the backup file or use the Browse button to select the file.

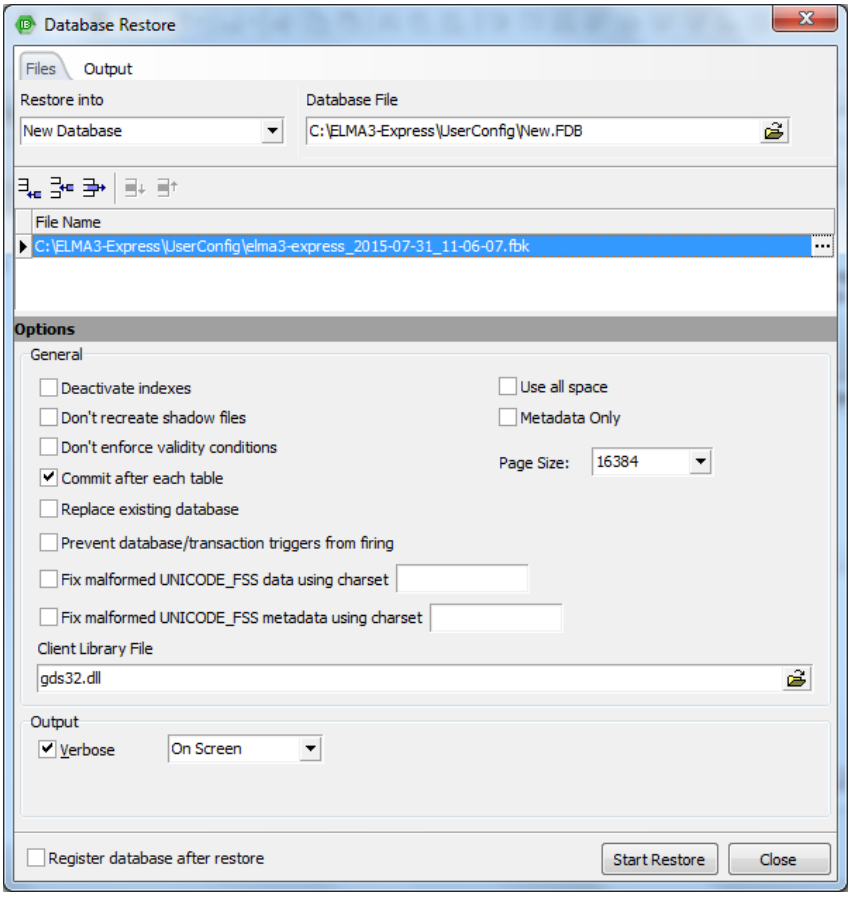



*Fig. 48. IBExpert. Restorung database*

You can also change the size of the database page by selecting it from the **Page Size** drop-down list. The database performance depends on the size of the page. The database file is divided into pages of a fixed size; the server reads information from the disk and writes it to the disk page by page. To increase performance, it is recommended to set the page size to **16384** bytes.

Recommendations for choosing the page size:

- for the disk drives with NTFS file system - **4096** bytes. Make sure that the NTFS disk cluster size is set to **4096** bytes;
- for the disk drives with FAT32 – **8192** or **16384** bytes.

Click the **Start Restore** button. In the window that open, enter the user name and password. You can restore the database as a **SYSDBA** user (the default password is **masterkey**). The database will be restored from the backup.

### 5.2.2. MS SQL DBMS

In this section, we will describe how to restore the database in the **MS SQL Management Studio**.

In the Object Explorer, select the database you want to restore and in the context menu select **Task > Restore > Database** (Fig. 49).

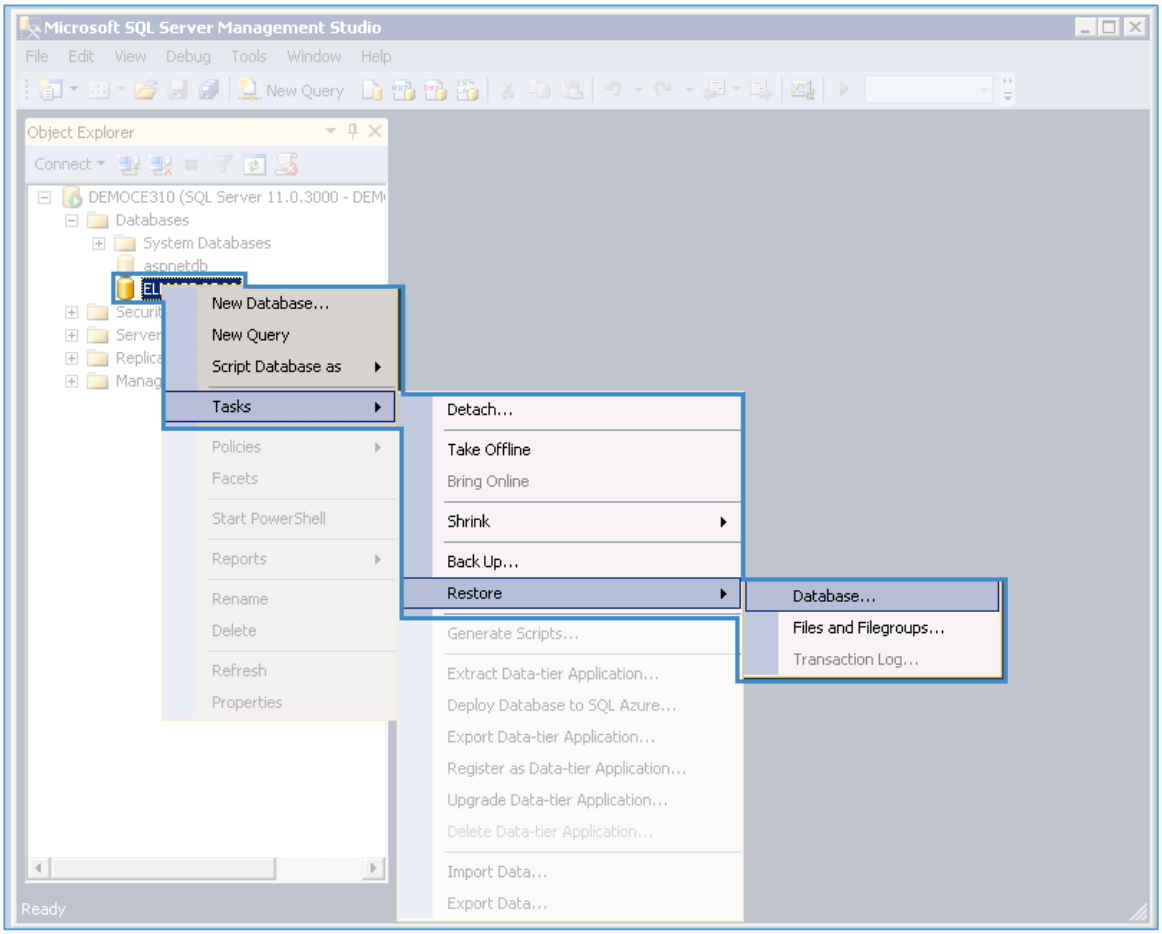



*Fig. 49 MS SQL. The database context menu.*

In the emerged window (Fig. 50) select the database restoring options.

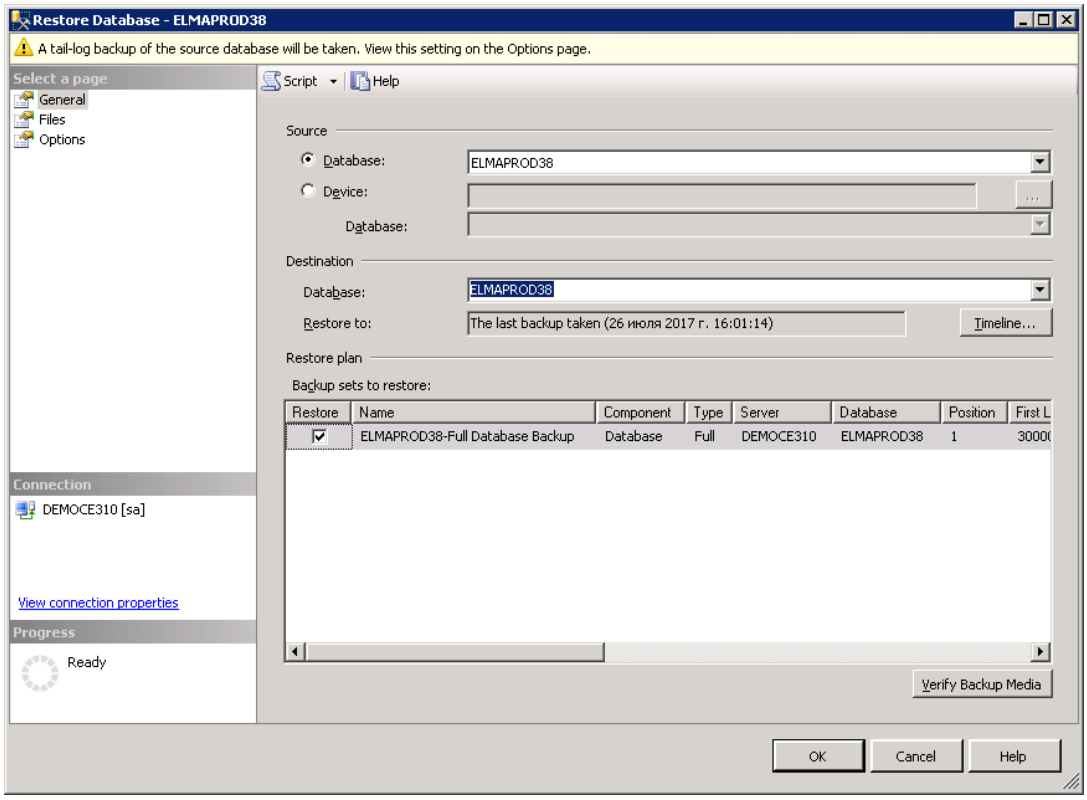



*Fig. 50 MS SQL. Selecting Database Restoring Options*

In the **General** tab, specify the **Destination for Restore**:

- **Database** – Select the database to restore. You can enter a new database or select an existing one from the drop-down list;
- **Restore to (a point in time)** – Restore the most recent backup of the database or a backup created at a certain point in time. Default Value: **Most recent possible**.

The **Source for Restore** settings determine the location of the backup sets for the database and the specific backup set that you want to restore:

- **From database** – Select the database from the list. This list contains only databases that have been backed up in accordance with the msdb backup log;
- **From device** – Select logical or physical backup devices (tapes or files) that contain the required backup or backups for recovery.

In the **Options** tab select the restore options:

- **Overwrire the existing database** – allows you to overwrite the files of the database that is currently using the database name specified by you.

**Attention! This option is recommended only after a thorough analysis of the possible consequences!**

- **Preserve the replication settings** – Select to restore backups of replicated databases. A published database can be restored to a server other than the server where the database was created. This is relevant only to full backups and if the database was part of a replication implementation.
- **Prompt before restoring each backup** – Select this option if you wish to be prompted between each restore operation. This is not usually necessary unless the database is large and you wish to monitor the status of the restore operation. The option is especially useful when you need to change tapes in the device, for example, if there is only one tape device on the server.
- **Restrict access to the restored database** – Select this option to make the restored database accessible only to the following roles **db_owner**, **dbcreator** or **sysadmin**.

To specify the database recovery state after the restore operation, you must select one of the options in the **Recovery state** section. For more information, see the MS SQL Management Studio Help.

Once you have seleceted all the necessary options, click **OK**. After that, the recovery operation starts. The progress of the operation is displayed as a percentage in the left part of the dialog box. When the operation is complete, the dialog box displays the execution status.

### 5.2.3. PostgreSQL DBMS

Below we will describe how to restore a database in **pgAdmin III**. Select an existing database or create a new one, right-click on it and select **Restore**… from the context menu (Fig. 51).

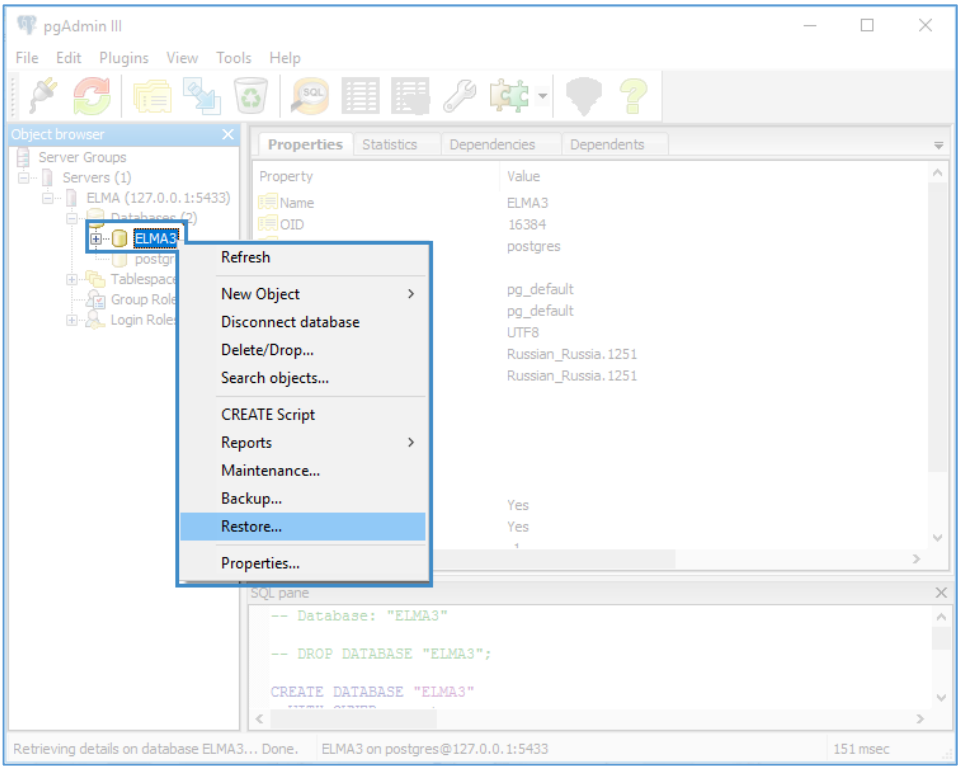



*Fig. 51. PostgreSQL. Restoring a database*

In the window that opens (Fig. 52), in the **File Options** tab fill in the following fields:

- **Format** – Select the backup format;
- **Filename** – When selecting the **Custom** or **Tar** format, specify the path to the backup file, in case of using the **Directory** format, specify the path to the corresponding backup folder;
- **Number of jobs** – Use this filed to instruct the server to use multiple concurrent jobs for the restore. This option allows you to reduce the recovery time of a large database when the server is running on a multiprocessor computer. The optimal value for this option depends on the hardware setup of the server, of the client, and of the network. As the initial value, you can specify the number of cores on the server, but by increasing this value, you can make the recovery faster. If the value is too high, performance will decrease due to overload. This option is supported only by the **Custom** and **Directory** archive formats. You can leave this field empty, in this case the restore operation will be carried out in the normal mode;

- **Role name** – Use the Rolename field to specify the name of the role that will be used when invoking pg_restore. By default, **postgres**.

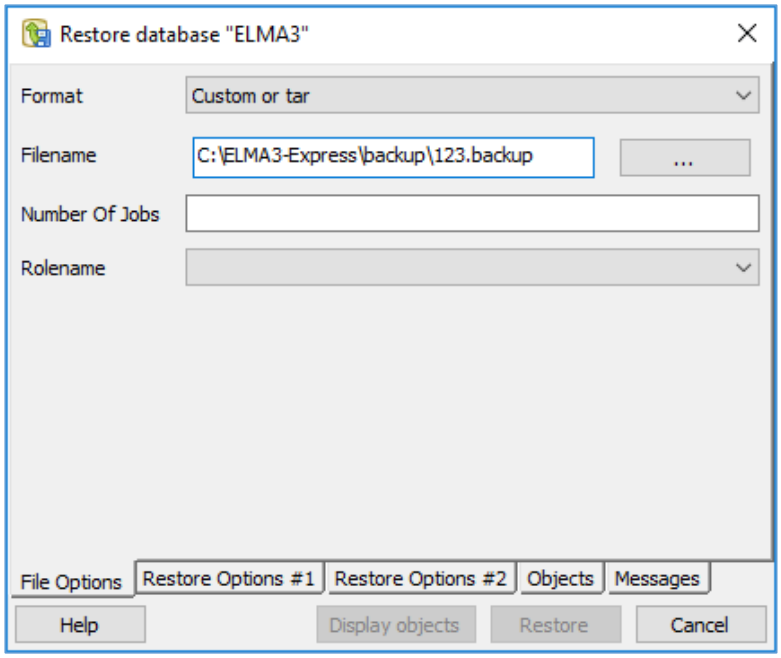



*Fig. 52. PostgreSQL. Restoring a DB*

Do not change other options on the remaining tabs, to perform the complete database restore. Generally, additional options are set up if partial recovery of the database is required (for example, without certain tables, data).

Click on the **Restore** button. The **Messages** tab displays a list of all operations performed with the exit code. If restore is successful, the Messages tab will display: Process returned exit code 0. In the **Messages** tab, you can also check how to run this operation from the command line.

### 5.2.4. Oracle DBMS

A detailed description of how to restore an Oracle database is given in the Knowledge Base article.

# Chapter 6. Configuring ELMA test server

When working in ELMA, you often need to make some improvements: streamline business processes, improve object model, interfaces, etc. Thus, it's important to provide possibility to implement changes and at the same time ensure continuous operation of the system. The best solution is to create an ELMA test server, where you will be able to improve and test new features. Then tested features can be transferred to the ELMA production server (see Section **6.2**).

## 6.1 Setting up test environment

Below you will find the recommended steps to set up a test server.

1. Install the same version of ELMA as on the production server. The version of the system is displayed in the right bottom corner of any page of the web application, as well as in the header of the ELMA Designer window (for details on the version numbering see Section **0**). To find out the full version of the ELMA installation file, right-click the installation file and select **Properties**. In the opened window (Fig. 53), you must go to the **Details** tab.

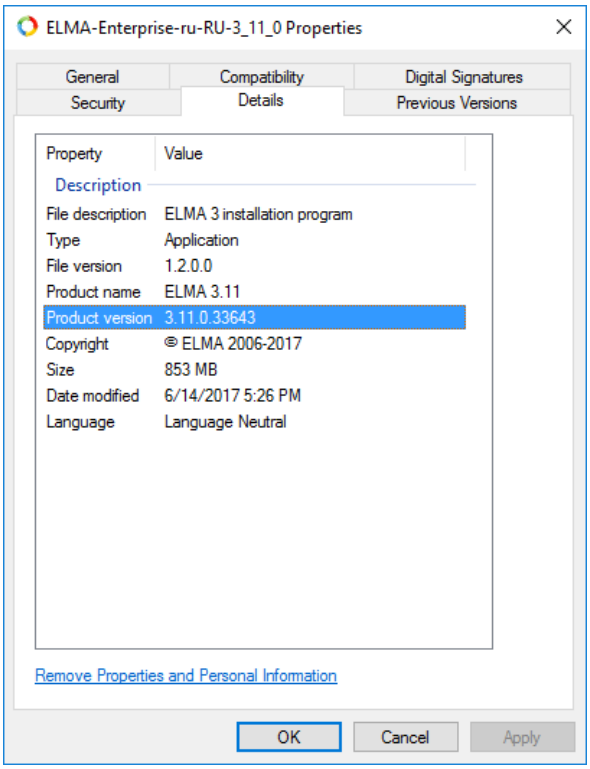



*Fig. 53. Determining the version of the ELMA installation file*

Read a step-by-set description of how to install and register ELMA in the ELMA BPM Platform User Manual. Please note that an activation key is always required to start using ELMA on a new server. However, we can provide a trial license with the limited number of users and period of use for implementing improvements and debugging. For more details, see section 3.2.5.

2. Stop the ELMA test server (read more in Chapter 4).
3. Create a database backup on the production server and restore it on the test server (read more in Section 5.1).
4. Copy configuration folder **UserConfig** on the production server and replace it on the test server.
5. Copy the folder with the binary system data from the production server and transfer it to the test server. By default, it is the **Files** folder in the **UserConfig** folder.
6. If necessary, reset user passwords and remove e-mails - to get full access to the system and prevent user's alerts through e-mail.

You can perform these steps by connecting to the restored database in **MS SQL Management Studio**, **pgAdmin** or **IBExpert** (depending on the database used) and executing the SQL query below:

**MS SQL DBMS, if you do not use LDAP integration**

```
UPDATE "UserSecurityProfile"
SET
   "UserSecurityProfile"."Password" = 'd41d8cd98f00b204e9800998ecf8427e',
   "UserSecurityProfile"."Salt" = NULL,
   "UserSecurityProfile"."ForcedChangePassword" = NULL,
   "UserSecurityProfile"."CountFailedLogon" = NULL;
UPDATE "User"
SET "User"."EMail" = ' '
```

**Firebird DBMS, if you do not use LDAP integration**

```
UPDATE USERSECURITYPROFILE
SET
   "Password" = ' ',
   FORCEDCHANGEPASSWORD = NULL,
   COUNTFAILEDLOGON = NULL,
   SALT = NULL
```

```
UPDATE "User"
SET EMAIL = ' '
```

**PostgreSQL DBMS, if you do not use LDAP integration**

```
UPDATE "usersecurityprofile"
SET
   "Password" = 'd41d8cd98f00b204e9800998ecf8427e',
   salt = NULL,
   forcedchangepassword = NULL,
   countfailedlogon = NULL;
UPDATE "User"
SET Email = ' '
```

**MS SQL DBMS, if you use LDAP integration**

```
UPDATE "UserSecurityProfile"
SET
    "UserSecurityProfile"."Password" = 'd41d8cd98f00b204e9800998ecf8427e',
    "UserSecurityProfile"."Salt" = NULL,
    "UserSecurityProfile"."ForcedChangePassword" = NULL,
    "UserSecurityProfile"."CountFailedLogon" = NULL;
UPDATE "User"
SET
    "User"."EMail" = ' ',
    "User"."AuthProviderGuid" = '00000000-0000-0000-0000-000000000000'
```

**Firebird DBMS, if you use LDAP integration**

```
UPDATE USERSECURITYPROFILE
SET
   "Password" = ' ',
   FORCEDCHANGEPASSWORD = NULL,
   COUNTFAILEDLOGON = NULL,
   SALT = NULL
```

```
UPDATE "User"
SET
   EMAIL = ' ',
   AUTHPROVIDERGUID = ' '
```

**PostgreSQL DBMS, if you use LDAP integration**

```
UPDATE "usersecurityprofile"
SET
   "Password" = 'd41d8cd98f00b204e9800998ecf8427e',
   salt = NULL,
   forcedchangepassword = NULL,
   countfailedlogon = NULL;
UPDATE "User"
SET
   Email = ' '
```

```
    authproviderguid = '00000000-0000-0000-0000-000000000000'
```

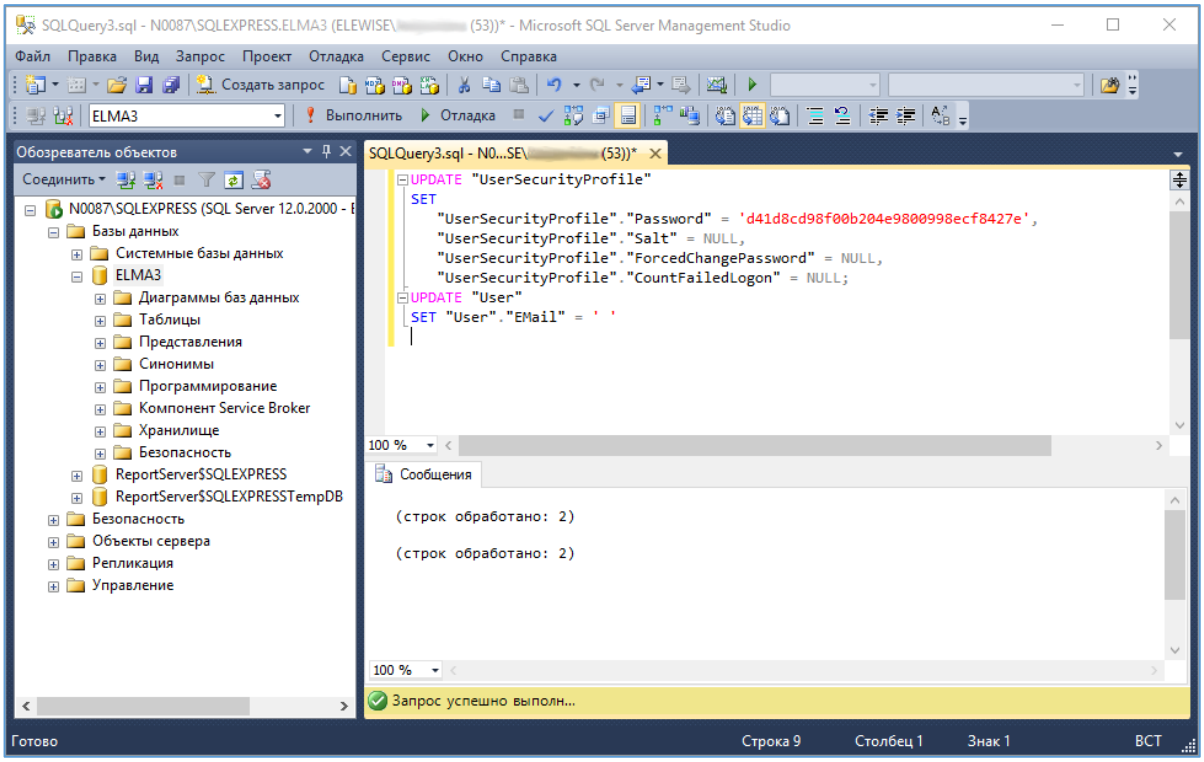



*Fig. 54. Example of query execution in MS SQL*

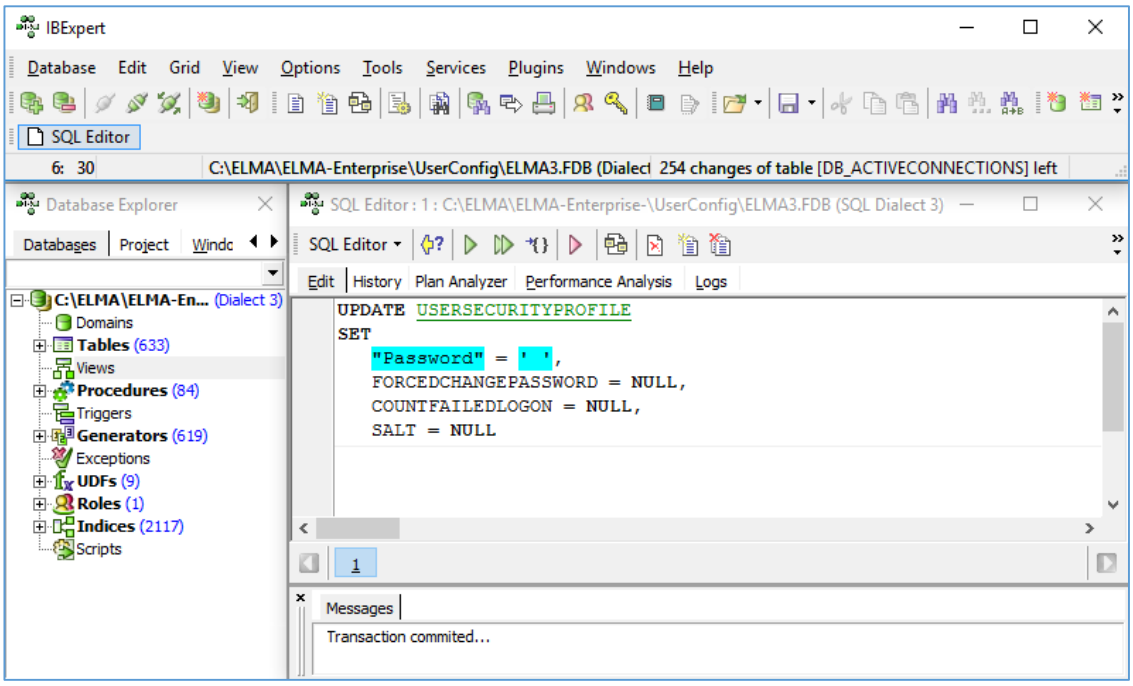



*Fig. 55. Example of query execution in IBExpert*

7. Disable e-mail/SMS notifications, so that users do not receive alerts about events that occur on the test server. To do this use the respective database query.

**MS SQL DBMS**

```
UPDATE [SYSTEMSETTINGS]
SET [SETTINGVALUE] = 'False'
WHERE [SETTINGKEY] = 'Enabled'
AND [MODULEUID] IN ('D13E29C4-3419-41FA-B86B-3BF88E7A3B71',
'1B5CEBDA-1A63-42E2-8B6A-6E875C05B136')
```

**Firebird DBMS**

```
UPDATE systemsettings
SET systemsettings.settingvalue = 'False'
WHERE systemsettings.settingkey = 'Enabled'
AND systemsettings.moduleuid IN (char_to_uuid('C4293ED1-1934-FA41-B86B-3BF88E7A3B71'),
char_to_uuid('DAEB5C1B-631A-E242-8B6A-6E875C05B136'))
```

**PostgreSQL DBMS**

```
UPDATE SYSTEMSETTINGS
SET SETTINGVALUE = 'False'
WHERE SETTINGKEY = 'Enabled'
AND MODULEUID IN ('D13E29C4-3419-41FA-B86B-3BF88E7A3B71',
'1B5CEBDA-1A63-42E2-8B6A-6E875C05B136')
```

8. If there are processes that start on a schedule (for example, integration with external systems), then it is recommended to unpublish such processes in order to prevent conflicts with the production server.

See below how to unpublish the “Leave request” process. Similarly, you can cancel publication of any other process.

**MS SQL DBMS**

```
UPDATE [PROCESSHEADER]
SET [PUBLISHED] = Null
WHERE [NAME] = 'Leave request'
```

**Firebird DBMS**

```
UPDATE processheader
SET processheader.published = Null
WHERE processheader.name = 'Leave request'
```

**PostgreSQL DBMS**

```
UPDATE PROCESSHEADER
SET PUBLISHED = Null
WHERE "Name" = 'Leave request'
```

9. If you want to clean a database from started processes and incomplete tasks transferred from the production server, you can interrupt them with a query. An example is given below.

**Attention! Perform this operation only if you are sure of what you are doing.**

**MS SQL DBMS, interrupting active tasks in the "Leave Request" process**

```
UPDATE [TASKBASE]
set [STATUS] = 'fd7993c6-99c7-4b23-83cc-0f576a63c144',
[ENDWORKDATE] = CURRENT_TIMESTAMP
WHERE [WORKFLOWBOOKMARK] IN
  (SELECT [ID] FROM WORKFLOWBOOKMARK WHERE INSTANCE IN
    (SELECT [ID] FROM [WORKFLOWINSTANCE] WHERE [STATUS] = 1 AND [PROCESS] IN
      (SELECT [ID] from [WORKFLOWPROCESS] WHERE [HEADER] IN
        (SELECT [ID] from [PROCESSHEADER] WHERE [NAME] = 'Leave request'))))
AND ENDWORKDATE is null
```

**MS SQL DBMS, interrupting active instances of the "Leave Request" process**

```
UPDATE [WORKFLOWINSTANCE]
SET [STATUS] = 4
where [PROCESS] IN
  (SELECT [ID] FROM [WORKFLOWPROCESS] WHERE [HEADER] IN
      (SELECT [ID] FROM [PROCESSHEADER] WHERE NAME = 'Leave request'))
AND [STATUS] = 1
```

**PostgreSQL DBMS, interrupting active tasks in the "Leave Request" process**

```
UPDATE TASKBASE
set STATUS = 'fd7993c6-99c7-4b23-83cc-0f576a63c144',
ENDWORKDATE = CURRENT_TIMESTAMP
WHERE WORKFLOWBOOKMARK IN
  (SELECT ID FROM WORKFLOWBOOKMARK WHERE INSTANCE IN
    (SELECT ID FROM WORKFLOWINSTANCE WHERE STATUS = 1 AND PROCESS IN
      (SELECT ID from WORKFLOWPROCESS WHERE "Header" IN
        (SELECT ID from PROCESSHEADER WHERE "Name" = 'Leave request'))))
AND ENDWORKDATE is null
```

**PostgreSQL DBMS, interrupting active instances of the "Leave Request" process**

```
UPDATE WORKFLOWINSTANCE
SET STATUS = 4
where PROCESS IN
  (SELECT ID FROM WORKFLOWPROCESS WHERE "Header" IN
      (SELECT ID FROM PROCESSHEADER WHERE "Name" = 'Leave request'))
AND STATUS = 1
```

**Firebird, DBMS, interrupting active tasks in the "Leave Request" process**

```
update taskbase tb
set tb.status = char_to_uuid('C69379FD-C799-234B-83CC-0F576A63C144'),
tb.endworkdate = current_timestamp
where tb.workflowbookmark in
  (select id from workflowbookmark wfb where wfb.instance in
    (select id from workflowinstance wfi where wfi.status = 1 and wfi.process in
      (select id from workflowprocess wfp where wfp.header in
        (select id from processheader ph where ph.name = 'Заявка на отгул'))))
and tb.endworkdate is null
```

**Firebird DBMS, interrupting active instances of the "Leave Request" process**

```
update workflowinstance wfi
set wfi.status = 4
where wfi.process in
  (select id from workflowprocess wfp where wfp.header in
      (select id from processheader ph where ph.name = 'Заявка на отгул'))
and wfi.status = 1
```

10. Start test server.

## 6.2 Exporting and Importing Configuration

The **ELMA Designer** application is installed on the user's computer and provides a convenient interface for modeling processes, describing the company's organizational structure, and creating configurations. You can read more about the ELMA Designer features in ELMA BPM Platform User Manual. Here are some specific features of ELMA Designer:

1. To work in ELMA Designer, a user must have special permissions. For more information, see ELMA Help.
2. When editing context of objects, document types and processes, it is not recommended to change and delete property names after initial publication. If for some reason one of the context variables is no longer needed, it is recommended to hide this variable in the forms, and also to change the display name, adding "(not used)" at the end of the name.
3. If several users work in ELMA Designer simultaneously, then it is necessary to adhere to the following rules:
   - Every user must work under his/her account;
   - Several users should avoid editing the same ELMA object simultaneously.
4. When transferring data from the test server to the production server in the export file, it is recommended to include only the modified objects.

The import and export procedure is generally used:

- for transferring configurations from server to server, incl. from test and production servers in both directions;
- to install process packages from the ELMA Store.

Below you will find the complete list of system objects you can transfer from one ELMA server to another. Note that depending on the activated ELMA applications, the list can contain fewer objects:

- organizational structure;
- user groups;
- system objects that can store data;

- system enumeration;
- document types and record cards;
- project types;
- business processes;
- custom extensions;
- reports;
- pages and portlets;
- Razor's views;
- KPIs, goal maps, goals, data sources, scheduler tasks;
- message queues;
- global modules.

To get more information, please refer to ELMA help or the Knowledge Base article.

## 6.3 Example: How to transfer a part of configuration

Suppose a company's business analyst has had to make changes in the "Purchase request" business process (Fig. 56) to bring the business process into compliance with the new regulations. Let's assume that both test and production servers are already set up.

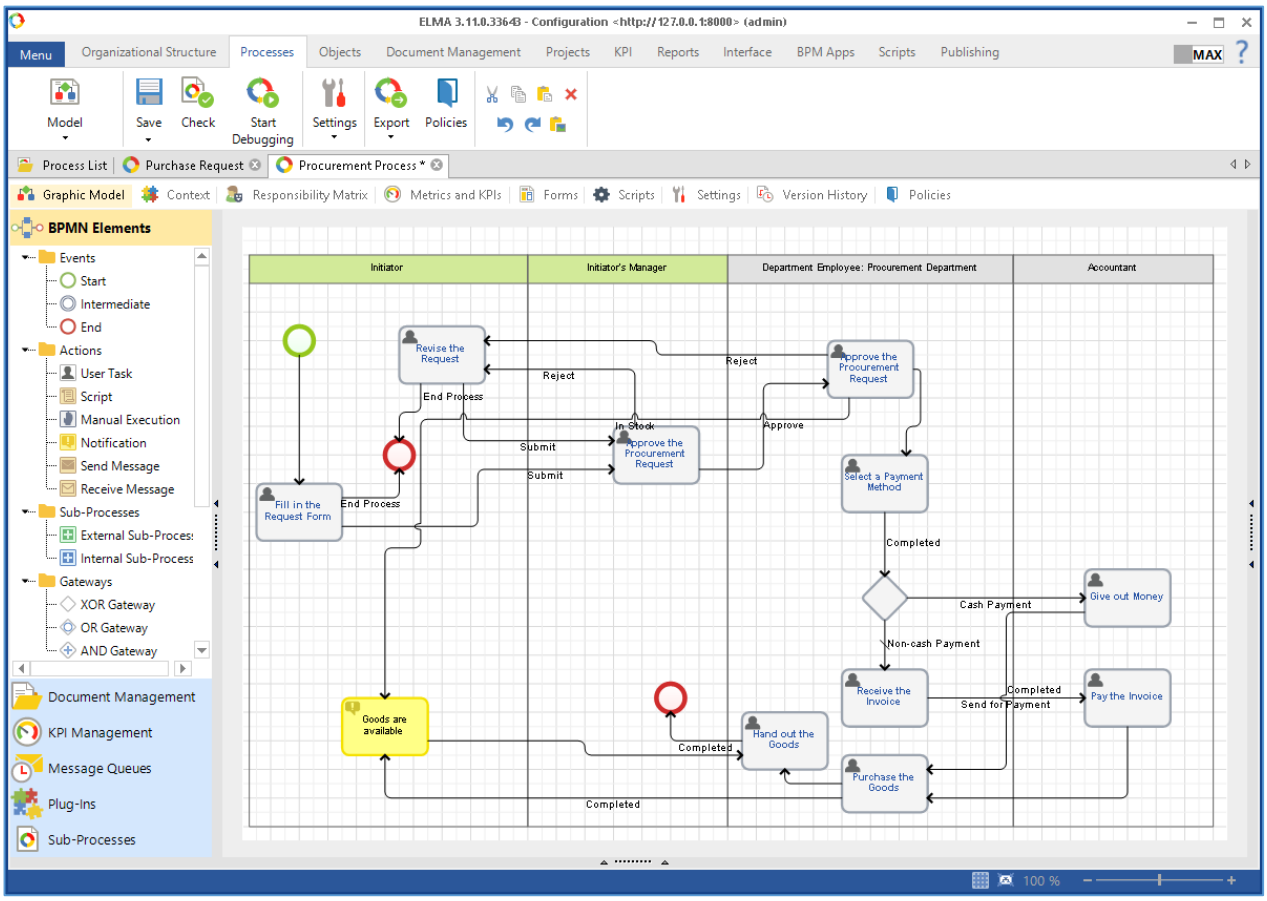



*Fig. 56. ELMA Designer. The "Procurement request" business process. Version 1*

You need to perform these steps:

1. Start ELMA Designer on the test server, enter the login and password of a user with access permissions to ELMA Designer. By default, once the system is installed, it is **admin** with a blank password.

2. In accordance with the new regulations, a user must complete the task "Pay the invoice" in 5 days. If a user does not keep the deadline, the process Initiator must be notified. Change the business process to meet new regulations and publish it (Fig. 57). Read more how to

publish a process in section **5.1.11** of the ELMA BPM Platform User Manual.

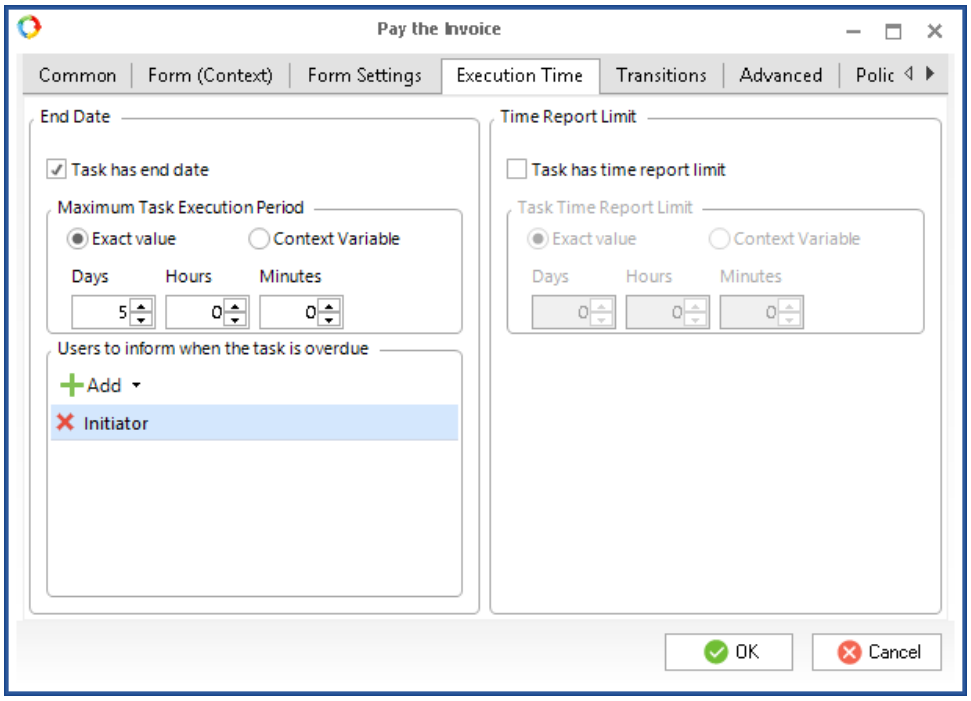



*Fig. 57. ELMA Designer. The " Procurement request" business process. Version 2*

3. The next important step is to test business processes. Start the process on the test server various times with different input data and make sure that the process logic is correct. You may also use the debugging feature to detect errors and fix bugs. Read more about the debugging in the section 5.1.10 of the ELMA BPM Platform User Manual.

4. Once all the tests are performed, transfer the streamlined business process to the production server. To do this, in the **ELMA Designer**, open the **Menu** tab **> Configurations > Export Configuration**, specify the folder and the name of the export file that will store the exported information (Fig. 58).

Since in this example you only modify one business process, it is not required to export other objects. Click **Next** to proceed to the **Processes** step.

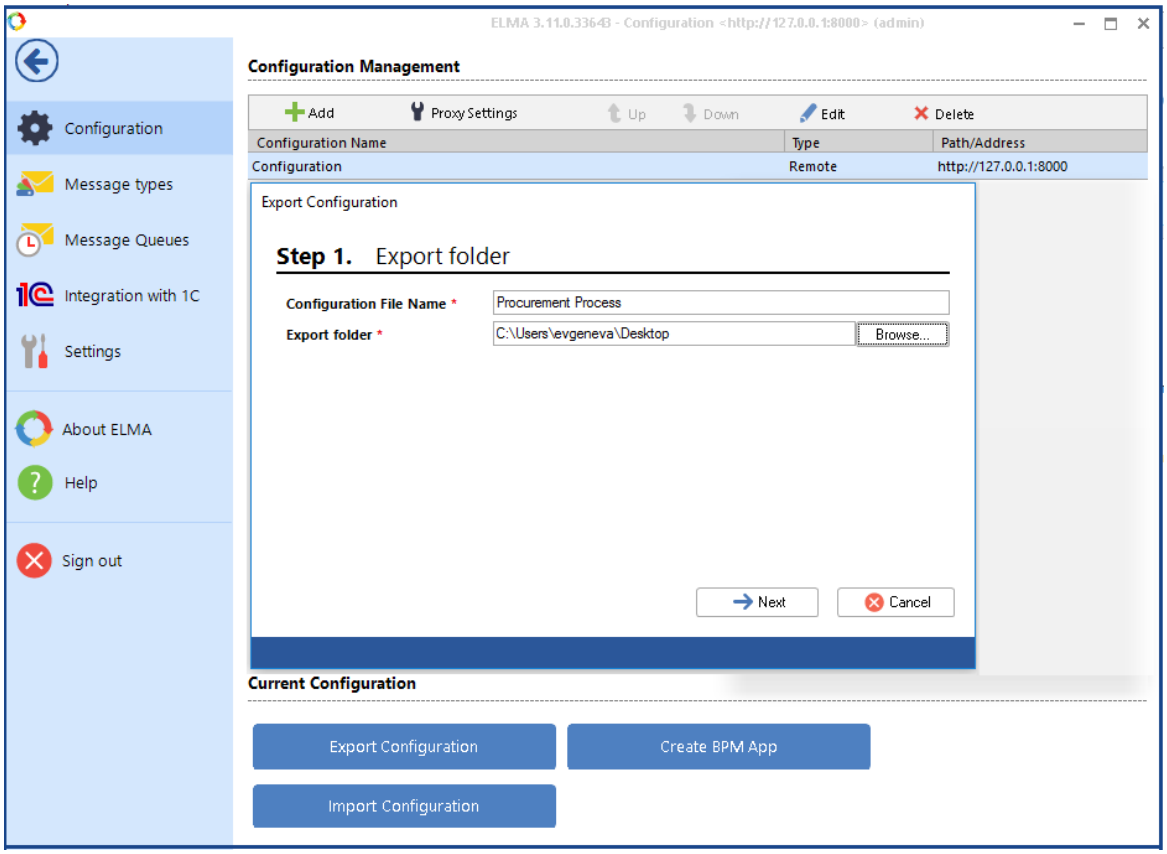



*Fig. 58. ELMA Designer. The " Procurement request" business process. Exporting. Step 1*

5.

eckbox, dow will (

6. Fig. 59). ELMA always checks related objects and suggests including them in the exported package.

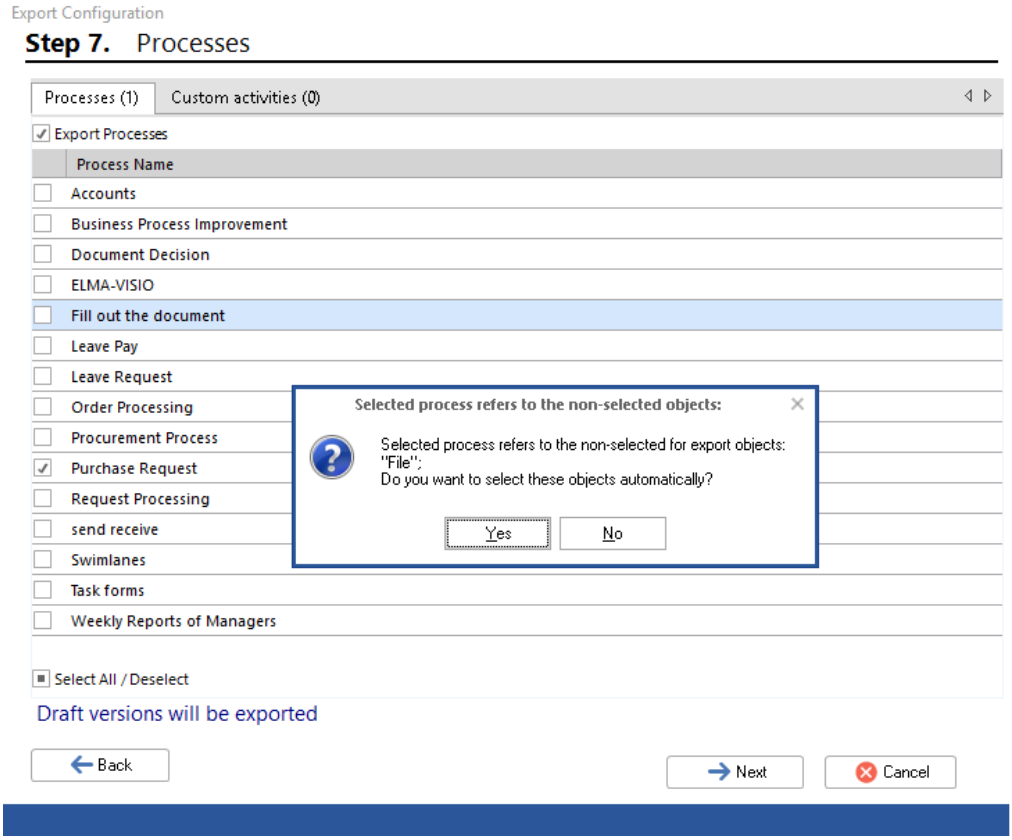



*Fig. 59. ELMA Designer. The " Procurement request" business process. Exporting. Step 7*

**Note that only the last published version of the process, object or document type is exported**. In our example, we have changed only one of the process tasks, while the object "file" remains unchanged, so we will not to include this object in the export of the configuration. Note that in ELMA it is possible to export not only the objects created by users, but also object instances.

7. Upload the exported file "**Procurement request 26.07.2017.elma3**" to the production server and run ELMA Designer. You can upload several ELMA configurations and run them on one computer. Read more about how to do this in **2.3** ELMA BPM Platform User Manual.

8. Then go to **Menu - Configuration – Import Configuration**, specify the folder and the name of the exported file (Fig. 60).

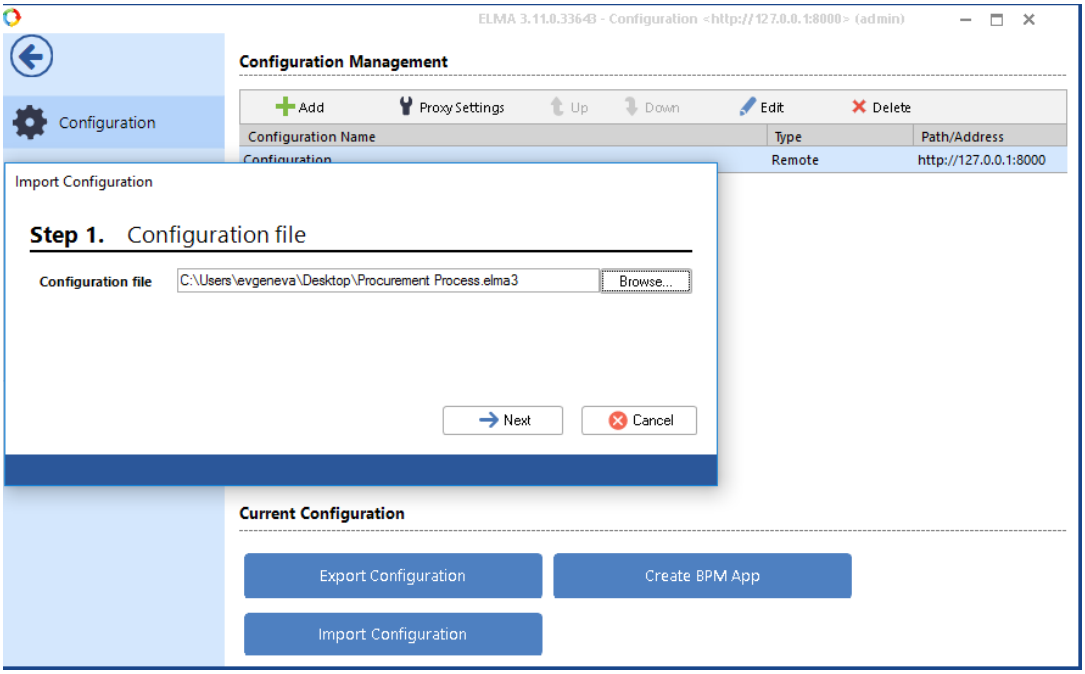



*Fig. 60. ELMA Designer. The " Procurement request" business process. Importing. Step 1*

*In the next step, ELMA checks the configuration file and opens the information window (Fig. 61. ELMA Designer. The " Procurement request" business process. Importing. Step 2*

9.), click the **Continue Import** button.

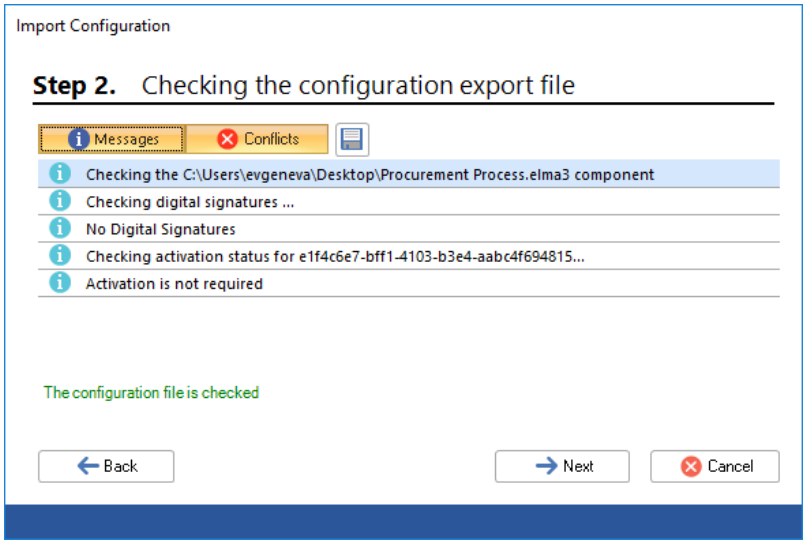



*Fig. 61. ELMA Designer. The " Procurement request" business process. Importing. Step 2*

10. Once the import is completed, you will be prompted to restart ELMA Designer (you do not need to stop or restart the ELMA web server in this case). You will need to restart the server if you add or modify system object (database structure). After restarting ELMA Designer, go to the **Processes** tab and publish the current draft of the Procurement process. Read more about process publication in the Section **5.1.11** ELMA BPM Platform User Manual.

11. Once the business process is published, all new process instances will be executed in accordance with the new policies. By default, these changes will not apply to the process instances started before the publication.

# Chapter 7. System Update

We constantly evolve and develop ELMA BPM, in new versions we add new sections, components and features or improve the existent ones. We also continuously improve system performance. Each new version is tested before being released. Along with the version release, we publish critical changes in the Knowledge Base under Critical Change Lists. In the example below, we explain what each digit stands for in the version number (Fig. 62).

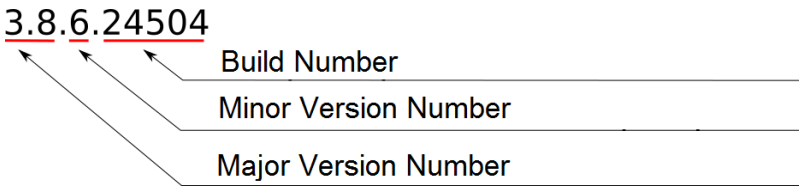



*Fig. 62. ELMA version number*

**Major version number** – Increases only when important changes are made to the system.

**Minor version number** – The number of the release with small changes, bug fixes.

**Build number** (further "build" or "revision") – The serial number of the system build as part of the version number. Generally, a version of ELMA has one build number available for download.

You can download ELMA installation files form the member area at http://www.elma-bpm.com /. When selecting the system version for update, it's necessary to consider two rules:

1. You can update a minor system version to a higher version, for example, from version 3.7.4 to version 3.7.8.
2. Select the latest minor version, if you want to update to a major system version, for example, update from version 3.7.4 to version 3.8.9 (provided that version 3.8.9 is the latest version available for download).

Read more system update in the respective Knowledge base article. Update can take considerable time; during the update, the system will be unavailable for users.

If you use the test server to configure the system, it is recommended first to update the test server, check the overall functionality of the system and the performance of the business processes, and only then update the production sever. All triggers, indexes, foreign keys and stored procedures added by the system administrator, will be deleted during the update. It will be necessary to create them again by running a previously generated SQL script in the database manager.

Before the system update, you should:

- Stop the web server;
- Create a backup copy of the database;
- Create a backup copy of the configuration folder.

The first launch of ELMA after the update may take longer than usual. This is due to the database processing (changing the structure), creation of the database backup.

You may also need to update some of the system components or install new ones. There are two update options: manual update and package update. **Manual update** is carried out by transferring the necessary files to the system directory. **Package update** allows you to automate the update process. Use the manual update option, if the package update cannot be performed via the web interface.

## 7.1 Package update of the system

**Packages** allow installing, updating and deleting components and modules of ELMA by using packages, i.e. files of a certain format that contain the module description, the compiled code of the module, and also the module source code, if necessary.

Package update procedure:

1. Place the packages with the **nupkg** extension in the **Packages** subfolder which is stored in the ELMA folder.
2. Restart the ELMA web-server.
3. Go to the page **Administration – System– Components**.
4. Click the upper menu button **Install Components** (Fig. 63).

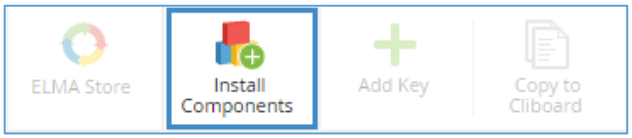



*Fig. 63 Page "Administration – System– Components". The "Install Components" button.*

5. Then select components that you need to install/update (Fig. 64).

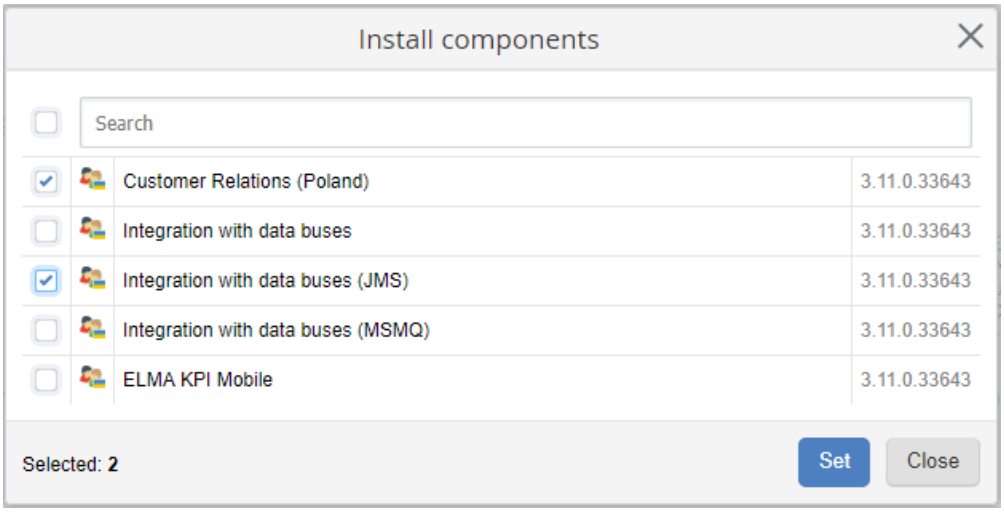



*Fig. 64 Select components for installation*

6. In the dialog box that opens (Fig. 65), you will see a warning about the server restart. Click **Yes** to continue the installation. During the installation of the components, the server will not be available.

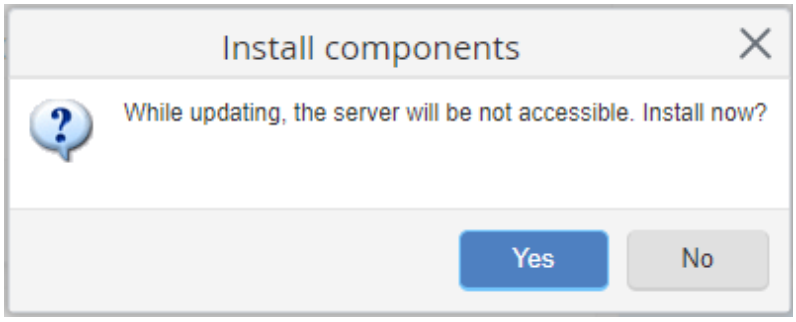



*Fig. 65 Warning about server unavailability*

7. Once the server is restarted, the component becomes available for users.

## 7.2 Manual update (transferring system modules)

If the package update was not performed correctly and the modules were not installed/updated, you can update the system manually.

**Warning! Manual update carries some risks. You must create copies of the deleted files before updating the system.**

The module consists of two files with the **.nupkg** extension. For examples, the files **EleWise.ELMA.Factory.Web.1.0.0.12.nupkg** and **EleWise.ELMA.Factory.1.0.0.12.nupkg**. To install the module manually it's necessary:

1. Stop the ELMA web-server.
2. By using the archiver, open the file **EleWise.ELMA.Factory.Web.1.0.0.12.nupkg**. Open the folder **EleWise.ELMA.Factory.Web.1.0.0.12.nupkg\ELMA\WebModule** and copy the folder **EleWise.ELMA.Factory.Web** to the folder..**\<Shared folder with ELMA files>\Web\Modules**.
3. By using the archiver, open the file **EleWise.ELMA.Factory.1.0.0.12.nupkg**. Open the folder **EleWise.ELMA.Factory.1.0.0.12.nupkg\lib\net40** and copy the file **EleWise.ELMA.Factory.dll** to the folder **..\<Shared folder with ELMA files>\Web\bin** and **..\<Shared folder with ELMA files >\Designer**.
4. Start the ELMA web-server.

If the module has not been installed (updated), then delete all files in the folder**..\<Shared folder with ELMA files>\Web\App_Data\ Dependencies.** You must delete files when the web server is stopped.

# Chapter 8. System settings

To configure installed system modules, go to the **Administration > System> System Settings** (Fig. 66).

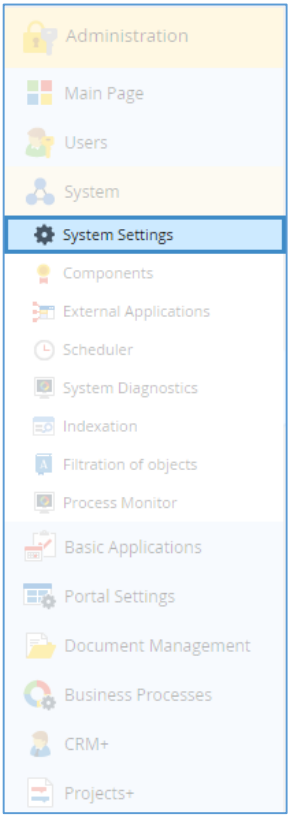



*Fig. 66 Administration > System > System Settings*

In this section, you can configure parameters of the system modules: messages, tasks, calendar, CRM, etc. Parameters of the modules are grouped in blocks with blue headings. The set of blocks depends on the set of the installed ELMA modules. Below are examples of the most common system settings.

## 8.1 Outgoing mail settings

In the **Outgoing mail settings** section, you can configure settings for outgoing messages to the system users via e-mail. Here you can configure the outgoing mail server (SMTP), the encoding of the messages, the sender's mailbox, and some settings for the email template. For a detailed description, see ELMA help.

Please note that IMAP access to a custom mailbox must be enabled on the mail server. You can learn how to check the settings, by contacting technical support of the mail server.

## 8.2 Configuring SMS notifications

In the **SMS Notifications Settings**, you can configure connection settings with SMS service provider.

This service allow you to integrate ELMA with the short messages service. If a user has specified their phone number in the user profile, they will receive an SMS alert each time they are assigned a high propriety task. It is required to register on the website of the SMS provider and pay for an sms package. Once it is done, proceed to the module settings.

## 8.3 Configuring integration with LDAP

ELMA allows integrating with the directory service using the LDAP protocol. With LDAP, you can import users to ELMA. Please note that users synchronized via LDAP authorize through the directory service server, so even the ELMA administrator is not able to change the password. Once the module is configured, users are imported manually.

You can read more about integration with LDAP settings in ELMA help, learn more about user import here.

# Chapter 9. System Diagnostics

It is important to carry out system diagnostics to detect poor performance or system malfunction. There are both internal tools for diagnosing the system, and third-party tools (Firebird, SQL, etc.).

## 9.1 Standard system diagnostics

By default, this option is disabled. When system diagnostics is enabled, it will record information about events, errors and performance of ELMA. Recording information slightly reduces system performance. That is why you should select this option only when needed. The diagnostics almost does not affect page-loading speed. To enable this options go to **Administration > System > System Diagnostics**. This section allows you to configure:

1. **Generate reports automatically –** the following settings are available:
   - **Report Generation Period** – Specify the time when the system starts collecting statistics, as well as select the interval at which the new reports will be generated;
   - **Statistics Reset Period** – If this parameter is not set, the system shows statistics for the entire diagnostics period.
2. **Log enabled/disabled** – A file, which contains detailed information about ELMA performance. The log detalization level is determined in the system diagnostics settings. Please note that the enabled log can significantly reduce system performance, and as a result, it is recommended to use this diagnostic tool carefully.
3. **Use performance counters** – Enables built-in Windows performance counters. You can use three performance counters:
   - Average runtime of background tasks;
   - Average time for executing Web queries;
   - The number of SQL queries for the time interval.

For quick system diagnostics, you need set up **Report generation period** to "**Every hour**", **Statistics Reset Period** to "**After every report export**" (see Fig.67).

Analyze the obtained statistics, by comparing reports with each other and with the user reports about slow system performance.

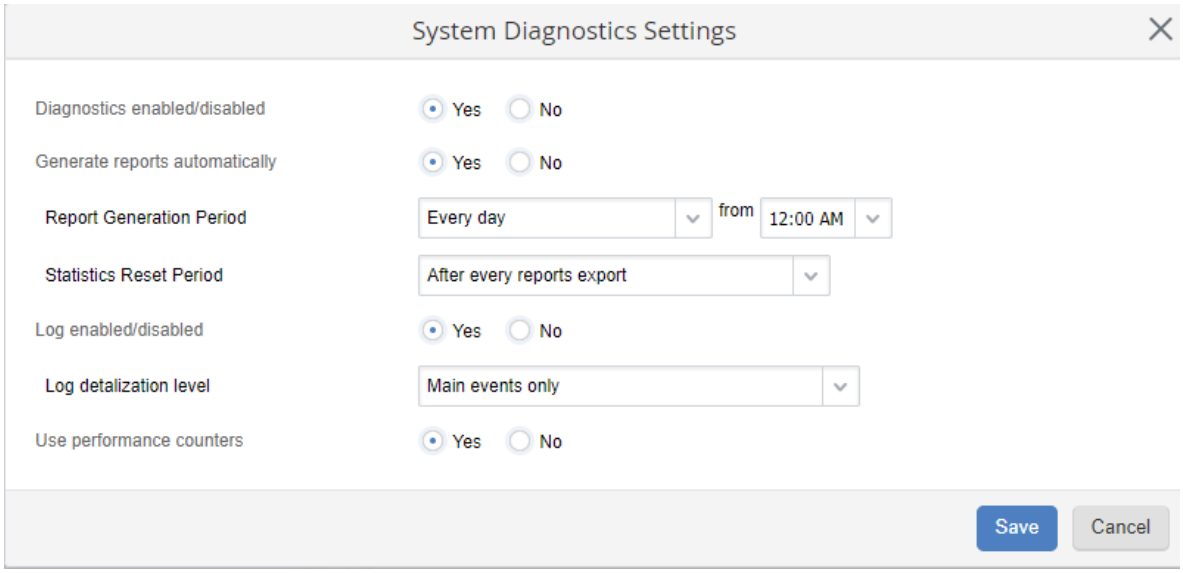



*Fig.67. Configuring system diagnostics*

Detailed information about the module configuration is available in the ELMA help.

### 9.1.1. Performance report

A system performance report can be generated automatically. Enable this option by selecting "**Generate reports automatically**" and configure it in accordance with the Help article. In this section, we describe how to analyze information contained in reports.

You can download the latest report, generated at the current period of time, in the **Administration > System > System Diagnostics > Reports** (Fig. 68), earlier versions of the reports can be found in the folder**..\<Shared folder with ELMA files> Web\logs\Diagnostics \ Reports.**

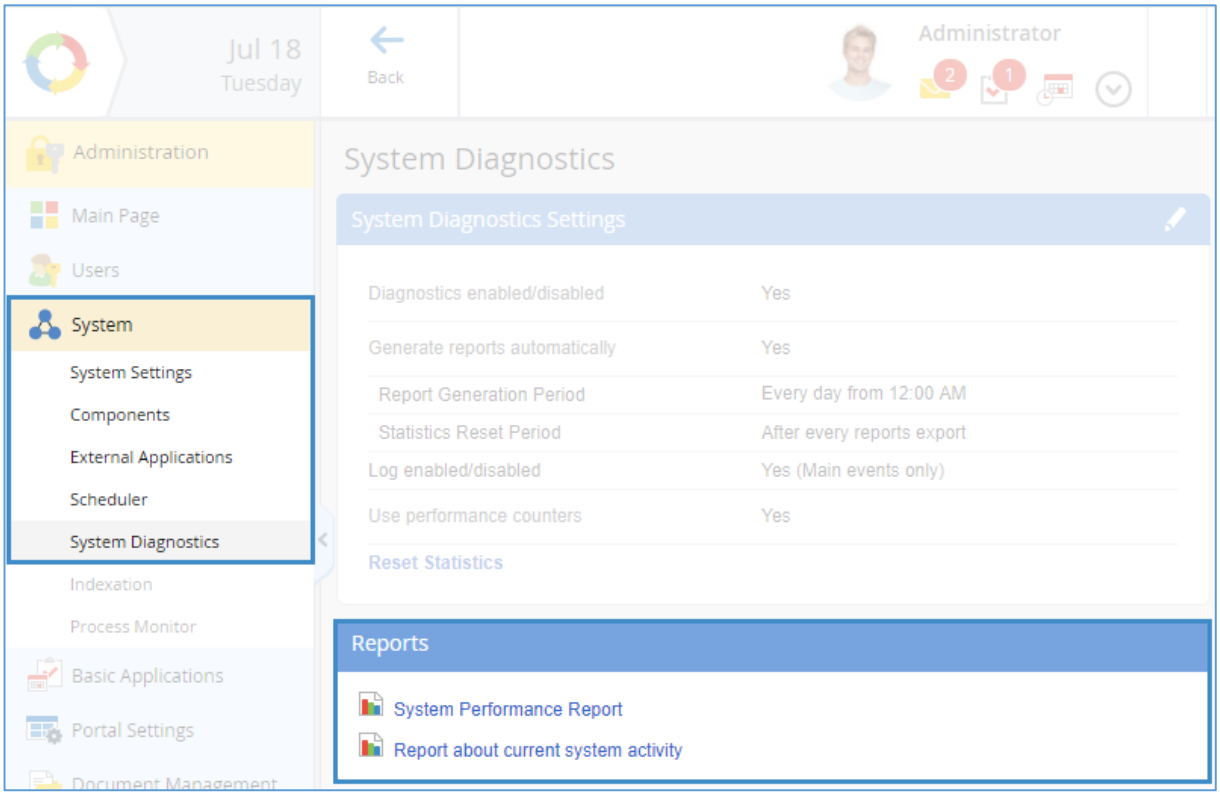


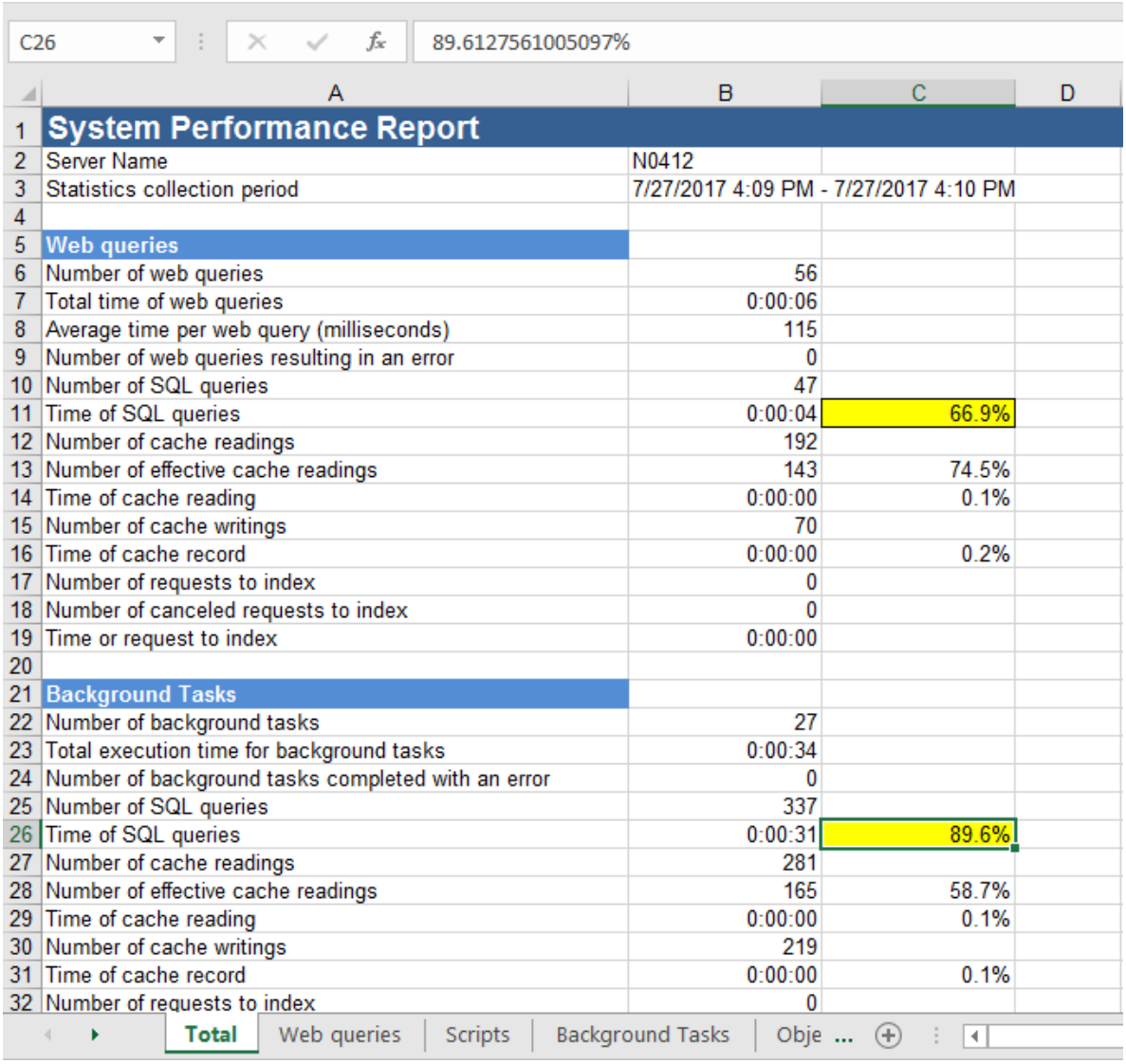

*Fig. 68 "Administration > System > System Diagnostics > Reports"*

The system performance report provides general information on system performance indicators, as well as more detailed information about web queries, scripts, background tasks, SQL queries, objects, and methods. In addition, this report shows summary information about the installed system (version number, build, system edition), and the DBMS. There are several tabs that show corresponding information. Below you will find the description of each tab.

Please note that it is extremely uninformative to consider the reports separately. To obtain objective information it is necessary to conduct analysis of reports for different periods of time, comparing the obtained statistics.

#### *9.1.1.1. "Total" tab*

The **Total** tab (Fig.69) contains general information on the system's indicators. In the second line, you can see the statistics collection period.



| | A | B | C | D |
|---|---|---|---|---|
| 1 | **System Performance Report** | | | |
| 2 | Server Name | N0412 | | |
| 3 | Statistics collection period | 7/27/2017 4:09 PM - 7/27/2017 4:10 PM | | |
| 4 | | | | |
| 5 | **Web queries** | | | |
| 6 | Number of web queries | 56 | | |
| 7 | Total time of web queries | 0:00:06 | | |
| 8 | Average time per web query (milliseconds) | 115 | | |
| 9 | Number of web queries resulting in an error | 0 | | |
| 10 | Number of SQL queries | 47 | | |
| 11 | Time of SQL queries | 0:00:04 | 66.9% | |
| 12 | Number of cache readings | 192 | | |
| 13 | Number of effective cache readings | 143 | 74.5% | |
| 14 | Time of cache reading | 0:00:00 | 0.1% | |
| 15 | Number of cache writings | 70 | | |
| 16 | Time of cache record | 0:00:00 | 0.2% | |
| 17 | Number of requests to index | 0 | | |
| 18 | Number of canceled requests to index | 0 | | |
| 19 | Time or request to index | 0:00:00 | | |
| 20 | | | | |
| 21 | **Background Tasks** | | | |
| 22 | Number of background tasks | 27 | | |
| 23 | Total execution time for background tasks | 0:00:34 | | |
| 24 | Number of background tasks completed with an error | 0 | | |
| 25 | Number of SQL queries | 337 | | |
| 26 | Time of SQL queries | 0:00:31 | 89.6% | |
| 27 | Number of cache readings | 281 | | |
| 28 | Number of effective cache readings | 165 | 58.7% | |
| 29 | Time of cache reading | 0:00:00 | 0.1% | |
| 30 | Number of cache writings | 219 | | |
| 31 | Time of cache record | 0:00:00 | 0.1% | |
| 32 | Number of requests to index | 0 | | |



*Fig.69. Performance report. The "Total" tab.*

This tab is divided into two sections:

- **Web queries** – User actions in the web browser when working with ELMA: task execution, document viewing, navigation through links, etc.;
- **Background task** – The activity of the system that does not depend directly on the users actions in the web browser: tasks execution triggered by timer, alerts, etc.

You should pay attention to the **Time of SQL queries** parameter.

**Time of SQL queries** is the time it takes to process SQL queries, compared to the entire time of processing other tasks, for example, web queries, background tasks, etc.

The value of this parameter should not be too high; the normal value is about 30%. If this percentage is too high (50% and higher), this means that the operation of DBMS takes too much time and possibly this causes low performance. If the percentage is small, but the system runs slow, then the possible cause may be insufficient resources of the application server (IIS, Cassini).

#### *9.1.1.2. "System Information" Tab*

The **Information about the server** tab (Fig.70) contains information and system characteristics.

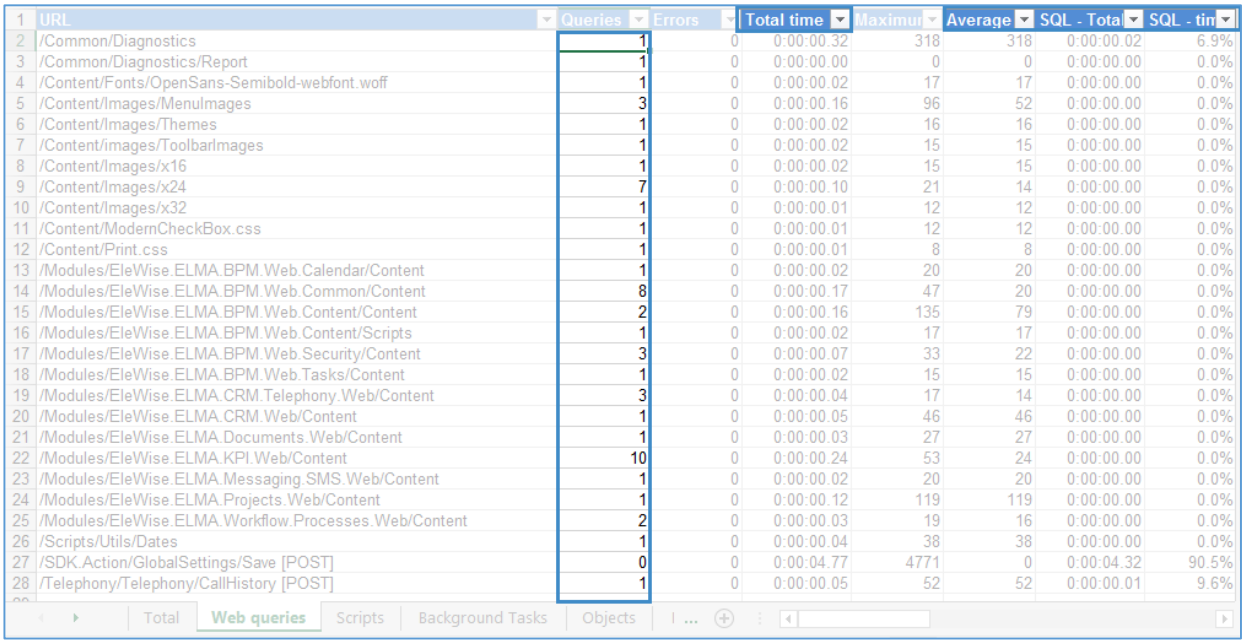
| | | |
|---|---|---|
| 1 | **ELMA v. 3.11.0.33643 R.7bed0a44ddebf7 Enterprise (PostgreSQL)** | |
| 2 | | |
| 3 | Application Version | ElmaCassiniService v.3.10.0.1 (64-bit) |
| 4 | Operation System | Microsoft Windows 10 Enterprise 2016 LTSB (64-bit Operating System 10.0.14393) |
| 5 | .Net Framework version | 4.7.02053 |
| 6 | CPU | Intel(R) Core(TM) i3-3217U CPU @ 1.80GHz |
| 7 | Memory | 0.738/3.708 Gb |
| 8 | HDD | C: (NTFS, 52,365/111Gb) |
| 9 | Application Directory | C:\ELMA3-Enterprise\Web |
| 10 | Configuration Directory | C:\ELMA3-Enterprise\UserConfig |
| 11 | | |
| 12 | | |
| 13 | | |

*Fig.70 Information about the server. Checking the version of the server*

This tab will be useful if you use ELMA with MS SQL DBMS. It allows you to make sure that the MS SQL server and the Windows server have the same architecture. It is recommended to use the MS SQL server x64, which allows using a large amount of RAM.

#### *9.1.1.3. "Web queries" tab*

As mentioned above, the **Web queries** tab contains information about the queries generated by users via the web interface of the system. Fig.71 shows the tab with the highlighted fields, which you should pay attention to.



| | URL | Queries | Errors | Total time | Maximum | Average | SQL - Total | SQL - tim |
|---|---|---|---|---|---|---|---|---|
| 2 | /Common/Diagnostics | 1 | 0 | 0:00:00.32 | 318 | 318 | 0:00:00.02 | 6.9% |
| 3 | /Common/Diagnostics/Report | 1 | 0 | 0:00:00.00 | 0 | 0 | 0:00:00.00 | 0.0% |
| 4 | /Content/Fonts/OpenSans-Semibold-webfont.woff | 1 | 0 | 0:00:00.02 | 17 | 17 | 0:00:00.00 | 0.0% |
| 5 | /Content/Images/MenuImages | 3 | 0 | 0:00:00.16 | 96 | 52 | 0:00:00.00 | 0.0% |
| 6 | /Content/Images/Themes | 1 | 0 | 0:00:00.02 | 16 | 16 | 0:00:00.00 | 0.0% |
| 7 | /Content/images/ToolbarImages | 1 | 0 | 0:00:00.02 | 15 | 15 | 0:00:00.00 | 0.0% |
| 8 | /Content/Images/x16 | 1 | 0 | 0:00:00.02 | 15 | 15 | 0:00:00.00 | 0.0% |
| 9 | /Content/Images/x24 | 7 | 0 | 0:00:00.10 | 21 | 14 | 0:00:00.00 | 0.0% |
| 10 | /Content/Images/x32 | 1 | 0 | 0:00:00.01 | 12 | 12 | 0:00:00.00 | 0.0% |
| 11 | /Content/ModernCheckBox.css | 1 | 0 | 0:00:00.01 | 12 | 12 | 0:00:00.00 | 0.0% |
| 12 | /Content/Print.css | 1 | 0 | 0:00:00.01 | 8 | 8 | 0:00:00.00 | 0.0% |
| 13 | /Modules/EleWise.ELMA.BPM.Web.Calendar/Content | 1 | 0 | 0:00:00.02 | 20 | 20 | 0:00:00.00 | 0.0% |
| 14 | /Modules/EleWise.ELMA.BPM.Web.Common/Content | 8 | 0 | 0:00:00.17 | 47 | 20 | 0:00:00.00 | 0.0% |
| 15 | /Modules/EleWise.ELMA.BPM.Web.Content/Content | 2 | 0 | 0:00:00.16 | 135 | 79 | 0:00:00.00 | 0.0% |
| 16 | /Modules/EleWise.ELMA.BPM.Web.Content/Scripts | 1 | 0 | 0:00:00.02 | 17 | 17 | 0:00:00.00 | 0.0% |
| 17 | /Modules/EleWise.ELMA.BPM.Web.Security/Content | 3 | 0 | 0:00:00.07 | 33 | 22 | 0:00:00.00 | 0.0% |
| 18 | /Modules/EleWise.ELMA.BPM.Web.Tasks/Content | 1 | 0 | 0:00:00.02 | 15 | 15 | 0:00:00.00 | 0.0% |
| 19 | /Modules/EleWise.ELMA.CRM.Telephony.Web/Content | 3 | 0 | 0:00:00.04 | 17 | 14 | 0:00:00.00 | 0.0% |
| 20 | /Modules/EleWise.ELMA.CRM.Web/Content | 1 | 0 | 0:00:00.05 | 46 | 46 | 0:00:00.00 | 0.0% |
| 21 | /Modules/EleWise.ELMA.Documents.Web/Content | 1 | 0 | 0:00:00.03 | 27 | 27 | 0:00:00.00 | 0.0% |
| 22 | /Modules/EleWise.ELMA.KPI.Web/Content | 10 | 0 | 0:00:00.24 | 53 | 24 | 0:00:00.00 | 0.0% |
| 23 | /Modules/EleWise.ELMA.Messaging.SMS.Web/Content | 1 | 0 | 0:00:00.02 | 20 | 20 | 0:00:00.00 | 0.0% |
| 24 | /Modules/EleWise.ELMA.Projects.Web/Content | 1 | 0 | 0:00:00.12 | 119 | 119 | 0:00:00.00 | 0.0% |
| 25 | /Modules/EleWise.ELMA.Workflow.Processes.Web/Content | 2 | 0 | 0:00:00.03 | 19 | 16 | 0:00:00.00 | 0.0% |
| 26 | /Scripts/Utils/Dates | 1 | 0 | 0:00:00.04 | 38 | 38 | 0:00:00.00 | 0.0% |
| 27 | /SDK.Action/GlobalSettings/Save [POST] | 0 | 0 | 0:00:04.77 | 4771 | 0 | 0:00:04.32 | 90.5% |
| 28 | /Telephony/Telephony/CallHistory [POST] | 1 | 0 | 0:00:00.05 | 52 | 52 | 0:00:00.01 | 9.6% |

Total | Web queries | Scripts | Background Tasks | Objects | ...

*Fig.71. Performance report. Web queries tab*

Sort the data in the **Average time per query** column, in order to get information about the most slowly running system queries. Next, check the **Queries** column. Do not worry if the number of queries is small and the average query execution time is long. It is due to the first page load takes longer than subsequent page loads. We recommend taking into account queries that repeat 10 times or more. Once you have identified frequently repeated queries with slow load, check the **URL column** to determine what query it is.

For example, consider these queries:

**/Workflow/WorkflowTask/Execute [POST] –** Execute task

**/Workflow/WorkflowTask/Execute –** Open task

**/Common/EntityHistory/History –** Object history

**/SDK.Action/DynamicForms/ProcessPropertyValueChanged [POST] –** Execution of dynamic forms

**/Documents/Document/View –** Document view

**/Docflow/Route/Info [POST] –** Get document routs

**/SDK.Action/Ping/Ping –** Service ping to check activity (does not affect performance)

**/ContentArea/Page/Home –** Home page

**/Processes/ProcessHeader/Start [POST] –** Start process

**/Processes/WorkflowInstance/Info –** Process information

**/Tasks/Task/ –** Work on tasks

The most frequently detected slow queries are loading pages, loading modified display forms, loading portlets, getting multiple routes, long history, and actions. In such cases, to improve performance, it is recommended:

- reduce the number of portlets on the page;
- enable asynchronous loading of portlets;
- do not place multiple lists on the page;
- limit the number of items in the view (max 15). If it is necessary to display more items (50, 100), display them on a separate page;
- when modifying display forms, do not overload them.

We also recommend you to pay attention to the **SQL columns: Total time of SQL queries** and **Time for SQL queries (in %)**. They show how much time is spent for the SQL query processing comparing to the total execution time. If the values are too large, you should refer to the SQL query tab for more information to identify the problem.

#### *9.1.1.4. "Scripts" tab*

The **Scripts** tab (Fig.72) shows all scripts that users create in the ELMA Designer. Script execution time depends on the quality of the script code and queries.

Read the information in the **Method** column as follows: **Process name_**Scripts.**Script name** (Process name).

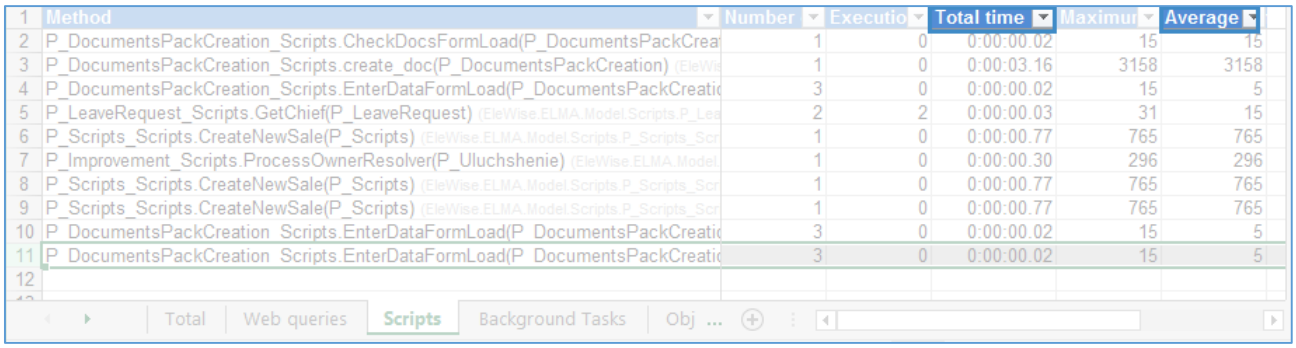



*Fig.72. Performance tab. The "Scripts" tab*

Above all, you should pay attention to the **Total Time** and **Average Time** columns. They show how much time it takes to execute a script. If the script execution

takes more than 20 seconds, provided that it works with the database, or changes the name of the document, or performs other similar simple operations, it is considered not optimal.

When analyzing performance reports, take into account that requests to external systems are performed longer than usual. For example, consider the **Count** script in the **Receiving faxes** and **Receiving incoming email** processes. It's average execution time is 4 seconds. Although the value is high, it is acceptable, because mail is received from an external server.

#### *9.1.1.5. "Background Tasks" tab*

The **Background tasks** tab (Fig.73) shows system tasks (for example, preview, start of processes according to schedule, execution queue, etc.), as well as tasks initiated by a user (for example, publishing a process, starting a process, etc.).

| | Task Name | Number | Executio | Total time | Maximur | Average |
|---|---|---|---|---|---|---|
| 2 | FeedMessageSave (EleWise.ELMA.Messages.Models.FeedModel) | 1 | 0 | 0:00:00.16 | 156 | 156 |
| 3 | MonitorCacheResolver (EleWise.ELMA.Workflow.Components.MonitorCacheSweep | 3 | 0 | 0:00:00.39 | 265 | 130 |
| 4 | ProcessItemInternal (EleWise.ELMA.Workflow.Managers.WorkflowQueueItemMana | 12 | 0 | 0:00:12.53 | 4205 | 1044 |
| 5 | ProcessWorkflowQueue (EleWise.ELMA.Workflow.Services.WorkflowQueueServi | 12 | 0 | 0:00:13.19 | 4220 | 1099 |
| 6 | Scheduler - ActiveUserSessionSweepHandler (EleWise.ELMA.Security.ActiveU | 29 | 0 | 0:00:00.38 | 62 | 12 |
| 7 | Scheduler - AsteriskConnectionScheduler (EleWise.ELMA.IntegrationAsterisk.C | 29 | 0 | 0:00:00.00 | 0 | 0 |
| 8 | Scheduler - CreateFilePreviewSweepHandler (EleWise.ELMA.Files.Previews.Cr | 29 | 0 | 0:00:01.72 | 703 | 59 |
| 9 | Scheduler - DiagnosticsReportSweepHandler (EleWise.ELMA.Diagnostics.Repo | 29 | 0 | 0:00:00.00 | 0 | 0 |
| 10 | Scheduler - LastObjectClearHandler (EleWise.ELMA.Common.Components.LastO | 29 | 0 | 0:00:01.59 | 703 | 54 |
| 11 | Scheduler - MemoryCacheCleaner (EleWise.ELMA.Cache.MemoryCacheCleaner) | 29 | 0 | 0:00:00.00 | 0 | 0 |
| 12 | Scheduler - MonitorCacheSweepHandler (EleWise.ELMA.Workflow.Components | 29 | 0 | 0:00:00.11 | 93 | 3 |
| 13 | Scheduler - NewProcessesChecker (EleWise.ELMA.Workflow.Listeners.NewPro | 29 | 0 | 0:00:01.58 | 703 | 54 |
| 14 | Scheduler - OktellConnectionScheduler (EleWise.ELMA.IntegrationOktell.Compor | 29 | 0 | 0:00:00.00 | 0 | 0 |
| 15 | Scheduler - OneNomenclatureModeChecker (EleWise.ELMA.Documents.Compo | 29 | 0 | 0:00:00.00 | 0 | 0 |
| 16 | Scheduler - PublicClientSessionSweepHandler (EleWise.ELMA.Security.Servic | 29 | 0 | 0:00:00.00 | 0 | 0 |
| 17 | Scheduler - PublishNomenclatureHandler (EleWise.ELMA.Documents.Schedulin | 29 | 0 | 0:00:01.86 | 703 | 64 |
| 18 | Scheduler - SettingsRefreshHandler (EleWise.ELMA.Diagnostics.DiagnosticsMan | 29 | 0 | 0:00:00.00 | 0 | 0 |
| 19 | Scheduler - StepSchedulerSweep (EleWise.ELMA.Scheduling.Impl.StepScheduler | 29 | 0 | 0:00:03.97 | 734 | 136 |
| 20 | Scheduler - TransactionalMessageSweepHandler (EleWise.ELMA.Messages.Ir | 29 | 0 | 0:00:01.99 | 703 | 68 |
| 21 | Scheduler - TranslateServiceSaveSweepHandler (EleWise.ELMA.Services.Tran | 29 | 0 | 0:00:00.00 | 0 | 0 |
| 22 | Scheduler - TrialLicenseChecker (EleWise.ELMA.Licensing.Impl.TrialLicenseChec | 29 | 0 | 0:00:00.02 | 15 | 0 |
| 23 | Scheduler - WorkflowQueueHandler (EleWise.ELMA.Workflow.Services.Workflo | 29 | 0 | 0:00:01.94 | 718 | 66 |
| 24 | Scheduler - WorkflowStartEventHandler (EleWise.ELMA.Workflow.Services.Wor | 29 | 0 | 0:00:00.02 | 15 | 0 |

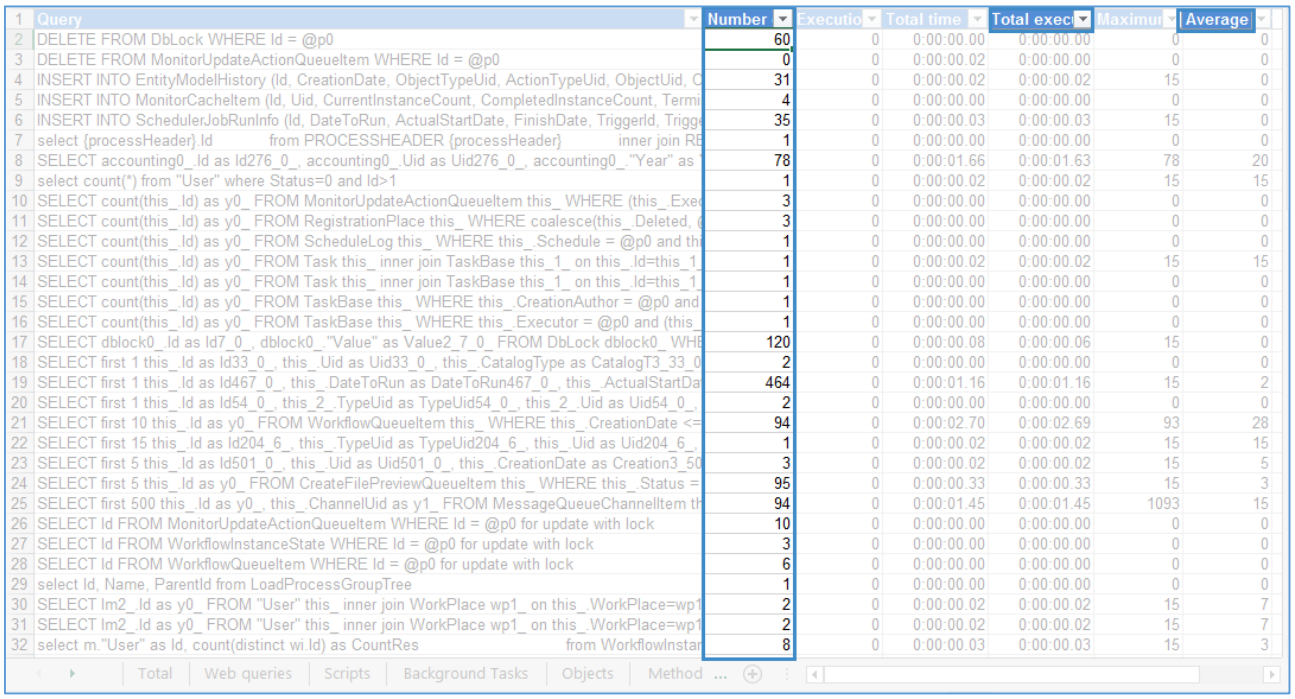
Total | Web queries | Scripts | **Background Tasks** | ...

*Fig.73. Perfomance report. The "Background tasks" tab*

It is important to pay attention to user queries. Check the **Average time per execution (milliseconds)** column to get information about the queries. For example, if a process was started by timer, the value in the column must not be high. If the value is too high, check whether any script runs after the process start, it can affect the execution time.

### 9.1.1.6. "SQL queries" tab

This tab (Fig.74) shows information about the time spent on the execution of the SQL queries. This information will be useful, if you think that SQL-queries negatively affect the system performance. In this case, values in the **Time for SQL queries (in %)** will be very high. We recommend analyzing the statistics for a few days, to make sure that the problem persists.



| | Query | Number | Executio | Total time | Total exec | Maximur | Average |
|---|---|---|---|---|---|---|---|
| 2 | DELETE FROM DbLock WHERE Id = @p0 | 60 | 0 | 0:00:00.00 | 0:00:00.00 | 0 | 0 |
| 3 | DELETE FROM MonitorUpdateActionQueueItem WHERE Id = @p0 | 0 | 0 | 0:00:00.02 | 0:00:00.00 | 0 | 0 |
| 4 | INSERT INTO EntityModelHistory (Id, CreationDate, ObjectTypeUid, ActionTypeUid, ObjectUid, C | 31 | 0 | 0:00:00.02 | 0:00:00.02 | 15 | 0 |
| 5 | INSERT INTO MonitorCacheItem (Id, Uid, CurrentInstanceCount, CompletedInstanceCount, Termi | 4 | 0 | 0:00:00.00 | 0:00:00.00 | 0 | 0 |
| 6 | INSERT INTO SchedulerJobRunInfo (Id, DateToRun, ActualStartDate, FinishDate, TriggerId, Trigg | 35 | 0 | 0:00:00.03 | 0:00:00.03 | 15 | 0 |
| 7 | select {processHeader}.Id from PROCESSHEADER {processHeader} inner join RE | 1 | 0 | 0:00:00.00 | 0:00:00.00 | 0 | 0 |
| 8 | SELECT accounting0_.Id as Id276_0_, accounting0_.Uid as Uid276_0_, accounting0_."Year" as | 78 | 0 | 0:00:01.66 | 0:00:01.63 | 78 | 20 |
| 9 | select count(*) from "User" where Status=0 and Id>1 | 1 | 0 | 0:00:00.02 | 0:00:00.02 | 15 | 15 |
| 10 | SELECT count(this_.Id) as y0_ FROM MonitorUpdateActionQueueItem this_ WHERE (this_.Exec | 3 | 0 | 0:00:00.00 | 0:00:00.00 | 0 | 0 |
| 11 | SELECT count(this_.Id) as y0_ FROM RegistrationPlace this_ WHERE coalesce(this_.Deleted, ( | 3 | 0 | 0:00:00.00 | 0:00:00.00 | 0 | 0 |
| 12 | SELECT count(this_.Id) as y0_ FROM ScheduleLog this_ WHERE this_.Schedule = @p0 and thi | 1 | 0 | 0:00:00.00 | 0:00:00.00 | 0 | 0 |
| 13 | SELECT count(this_.Id) as y0_ FROM Task this_ inner join TaskBase this_1_ on this_.Id=this_1 | 1 | 0 | 0:00:00.02 | 0:00:00.02 | 15 | 15 |
| 14 | SELECT count(this_.Id) as y0_ FROM Task this_ inner join TaskBase this_1_ on this_.Id=this_1 | 1 | 0 | 0:00:00.00 | 0:00:00.00 | 0 | 0 |
| 15 | SELECT count(this_.Id) as y0_ FROM TaskBase this_ WHERE this_.CreationAuthor = @p0 and | 1 | 0 | 0:00:00.00 | 0:00:00.00 | 0 | 0 |
| 16 | SELECT count(this_.Id) as y0_ FROM TaskBase this_ WHERE this_.Executor = @p0 and (this_ | 1 | 0 | 0:00:00.00 | 0:00:00.00 | 0 | 0 |
| 17 | SELECT dblock0_.Id as Id7_0_, dblock0_."Value" as Value2_7_0_ FROM DbLock dblock0_ WHE | 120 | 0 | 0:00:00.08 | 0:00:00.06 | 15 | 0 |
| 18 | SELECT first 1 this_.Id as Id33_0_, this_.Uid as Uid33_0_, this_.CatalogType as CatalogT3_33_0 | 2 | 0 | 0:00:00.00 | 0:00:00.00 | 0 | 0 |
| 19 | SELECT first 1 this_.Id as Id467_0_, this_.DateToRun as DateToRun467_0_, this_.ActualStartDa | 464 | 0 | 0:00:01.16 | 0:00:01.16 | 15 | 2 |
| 20 | SELECT first 1 this_.Id as Id54_0_, this_2_.TypeUid as TypeUid54_0_, this_2_.Uid as Uid54_0_, | 2 | 0 | 0:00:00.00 | 0:00:00.00 | 0 | 0 |
| 21 | SELECT first 10 this_.Id as y0_ FROM WorkflowQueueItem this_ WHERE this_.CreationDate <= | 94 | 0 | 0:00:02.70 | 0:00:02.69 | 93 | 28 |
| 22 | SELECT first 15 this_.Id as Id204_6_, this_.TypeUid as TypeUid204_6_, this_.Uid as Uid204_6_, | 1 | 0 | 0:00:00.02 | 0:00:00.02 | 15 | 15 |
| 23 | SELECT first 5 this_.Id as Id501_0_, this_.Uid as Uid501_0_, this_.CreationDate as Creation3_50 | 3 | 0 | 0:00:00.02 | 0:00:00.02 | 15 | 5 |
| 24 | SELECT first 5 this_.Id as y0_ FROM CreateFilePreviewQueueItem this_ WHERE this_.Status = | 95 | 0 | 0:00:00.33 | 0:00:00.33 | 15 | 3 |
| 25 | SELECT first 500 this_.Id as y0_, this_.ChannelUid as y1_ FROM MessageQueueChannelItem th | 94 | 0 | 0:00:01.45 | 0:00:01.45 | 1093 | 15 |
| 26 | SELECT Id FROM MonitorUpdateActionQueueItem WHERE Id = @p0 for update with lock | 10 | 0 | 0:00:00.00 | 0:00:00.00 | 0 | 0 |
| 27 | SELECT Id FROM WorkflowInstanceState WHERE Id = @p0 for update with lock | 3 | 0 | 0:00:00.00 | 0:00:00.00 | 0 | 0 |
| 28 | SELECT Id FROM WorkflowQueueItem WHERE Id = @p0 for update with lock | 6 | 0 | 0:00:00.00 | 0:00:00.00 | 0 | 0 |
| 29 | select Id, Name, ParentId from LoadProcessGroupTree | 1 | 0 | 0:00:00.00 | 0:00:00.00 | 0 | 0 |
| 30 | SELECT Im2_.Id as y0_ FROM "User" this_ inner join WorkPlace wp1_ on this_.WorkPlace=wp1 | 2 | 0 | 0:00:00.02 | 0:00:00.02 | 15 | 7 |
| 31 | SELECT Im2_.Id as y0_ FROM "User" this_ inner join WorkPlace wp1_ on this_.WorkPlace=wp1 | 2 | 0 | 0:00:00.02 | 0:00:00.02 | 15 | 7 |
| 32 | select m."User" as Id, count(distinct wi.Id) as CountRes from WorkflowInstan | 8 | 0 | 0:00:00.03 | 0:00:00.03 | 15 | 3 |

Total | Web queries | Scripts | Background Tasks | Objects | Method ...

*Fig.74 Performance report. "SQL queries" tab*

When analyzing the information in this tab, do not take into consideration lines with small number of queries, the basic information on the execution time is shown in the columns **Total time** and **Average time**. The time for executing simple queries with one table is considered optimal if it does not exceed 3 seconds. When executing complex queries that include many tables and columns, the time will be different, due to the large amount of processed information. An example of a complex query is a new report in the Report section or in Process monitor.

If you have detected some problematic areas in the report, you should refer to the **Query** column, where the SQL query is specified, and understand its purpose to analyze and reproduce it.

**Caution! The "Query" column often contains duplicate queries, as a rule, their average execution time is approximately the same. In addition, we draw your**

**attention to the fact that the queries do not contain data called from the system, direct copying to the database is impossible.**

Consider how to read similar queries, using the MS SQL database as an example. Look at the query in the Fig.74. In the first line, you can see the query SELECT, which runs on average 9.5 seconds, in the first column you can read it:

SQL query architecture

```
SELECT count(this_.Id) as y0_ FROM TaskBase this_ WHERE this_.CreationAuthor = @p0 and (this_.NotShowInLists is null or this_.NotShowInLists = @p1) and this_.EndDate < @p2 and this_.Status in (@p3, @p4, @p5, @p6, @p7, @p8, @p9, @p10)
```

In this example, it contains the following information:

- **TaskBase** – A table for fetching data;
- **CreationAuthor, NotShowInLists, EndDate, Status** – table columns;
- **@p0 – @p10** – Transmitted data.

Also queries can contain the TOP operator with the value 5, 15, 30, 50, etc., which indicates that the query is called from the page using the Grid (space divided into rows and columns), within ELMA - filters and document registers, process monitor, some portlets, task list, etc.

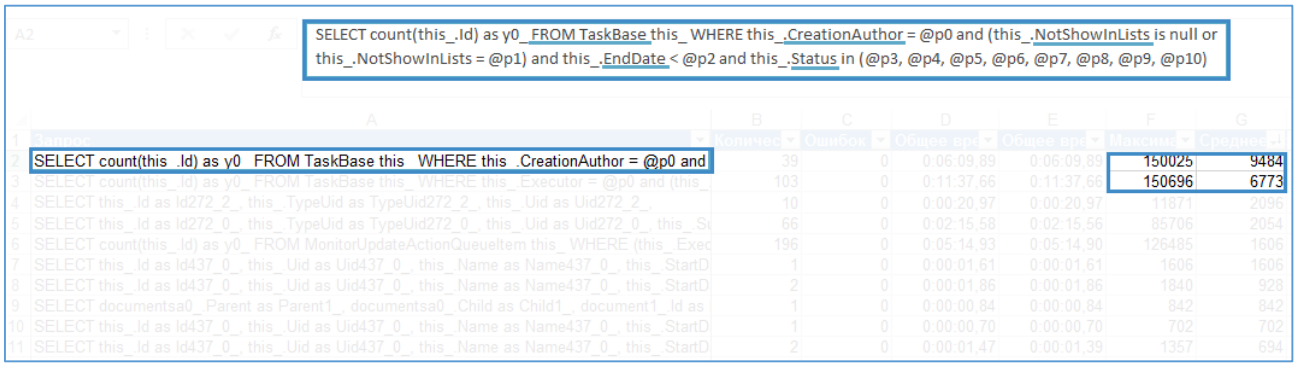
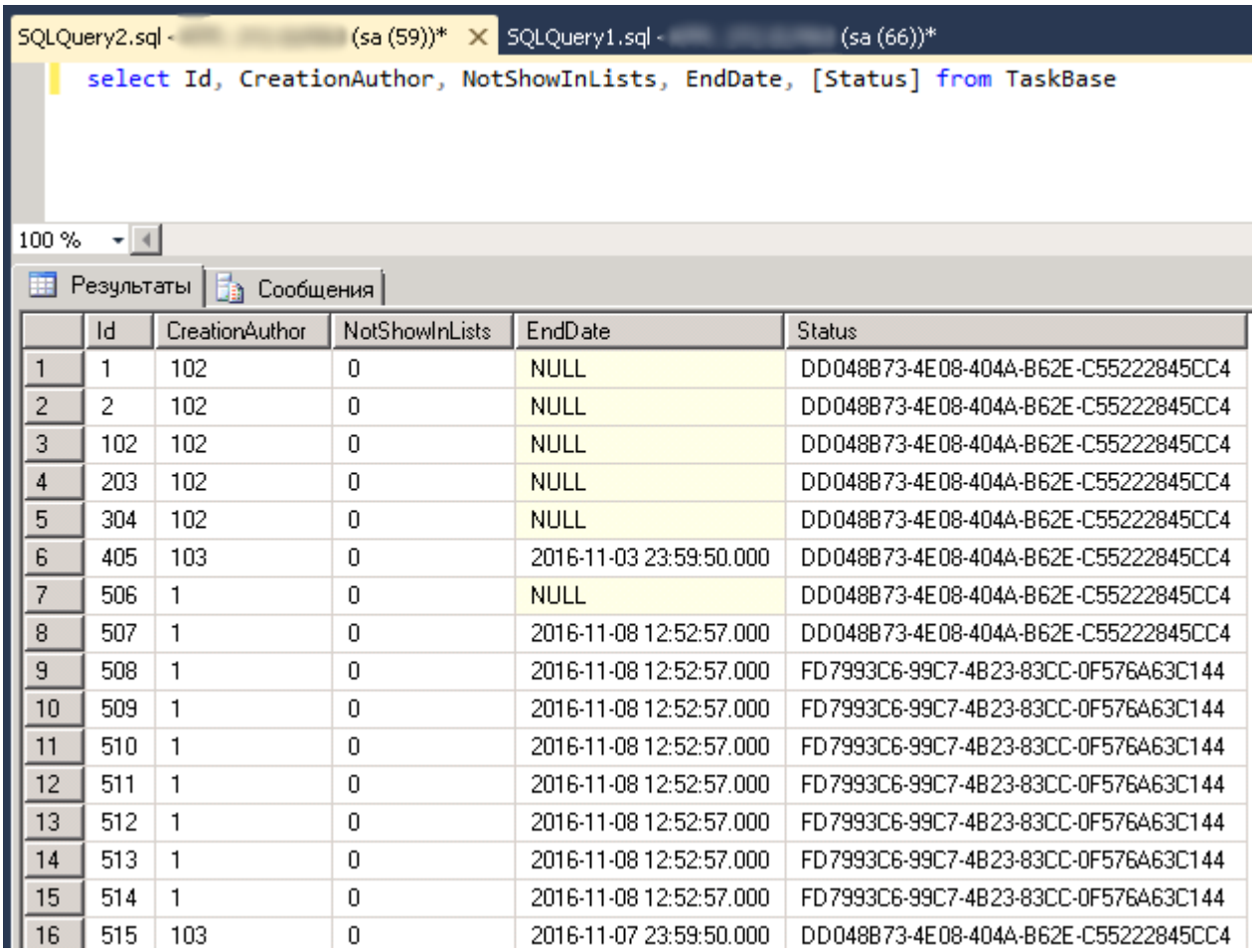



*Fig.75. Performance report. "SQL queries" tab*

It is impossible to completely reproduce the query, because it does not contain exact execution parameters. Using the query architecture, we can reproduce a similar query with different data. To do this, we indicate real values instead of variables **@p0 – @p10**. To find out the values, open **MS SQL management studio**, select the database and execute the following query:

```
select Id, CreationAuthor, NotShowInLists, EndDate, [Status] from TaskBase
```

The output will be as follows (Fig.76):




| | Id | CreationAuthor | NotShowInLists | EndDate | Status |
|---|---|---|---|---|---|
| 1 | 1 | 102 | 0 | NULL | DD048B73-4E08-404A-B62E-C55222845CC4 |
| 2 | 2 | 102 | 0 | NULL | DD048B73-4E08-404A-B62E-C55222845CC4 |
| 3 | 102 | 102 | 0 | NULL | DD048B73-4E08-404A-B62E-C55222845CC4 |
| 4 | 203 | 102 | 0 | NULL | DD048B73-4E08-404A-B62E-C55222845CC4 |
| 5 | 304 | 102 | 0 | NULL | DD048B73-4E08-404A-B62E-C55222845CC4 |
| 6 | 405 | 103 | 0 | 2016-11-03 23:59:50.000 | DD048B73-4E08-404A-B62E-C55222845CC4 |
| 7 | 506 | 1 | 0 | NULL | DD048B73-4E08-404A-B62E-C55222845CC4 |
| 8 | 507 | 1 | 0 | 2016-11-08 12:52:57.000 | DD048B73-4E08-404A-B62E-C55222845CC4 |
| 9 | 508 | 1 | 0 | 2016-11-08 12:52:57.000 | FD7993C6-99C7-4B23-83CC-0F576A63C144 |
| 10 | 509 | 1 | 0 | 2016-11-08 12:52:57.000 | FD7993C6-99C7-4B23-83CC-0F576A63C144 |
| 11 | 510 | 1 | 0 | 2016-11-08 12:52:57.000 | FD7993C6-99C7-4B23-83CC-0F576A63C144 |
| 12 | 511 | 1 | 0 | 2016-11-08 12:52:57.000 | FD7993C6-99C7-4B23-83CC-0F576A63C144 |
| 13 | 512 | 1 | 0 | 2016-11-08 12:52:57.000 | FD7993C6-99C7-4B23-83CC-0F576A63C144 |
| 14 | 513 | 1 | 0 | 2016-11-08 12:52:57.000 | FD7993C6-99C7-4B23-83CC-0F576A63C144 |
| 15 | 514 | 1 | 0 | 2016-11-08 12:52:57.000 | FD7993C6-99C7-4B23-83CC-0F576A63C144 |
| 16 | 515 | 103 | 0 | 2016-11-07 23:59:50.000 | DD048B73-4E08-404A-B62E-C55222845CC4 |

*Fig.76. MS SQL. Query to DB*

Now let us analyze the most common values in the columns and transfer them to the query that we have copied from the **Performance Report**.

Execute the query (Fig.77):

```
SELECT count(this_.Id) as y0_ FROM TaskBase this_ WHERE this_.CreationAuthor = 102 and (this_.NotShowInLists is null or this_.NotShowInLists = 0) and this_.EndDate is NULL and this_.Status in ('DD048B73-4E08-404A-B62E-C55222845CC4', 'FD7993C6-99C7-4B23-83CC-0F576A63C144', '85707EFE-806C-4EC6-8CD6-4D5E4EDD8B19', '34387AFA-6B70-476F-9D34-748732059003')
```

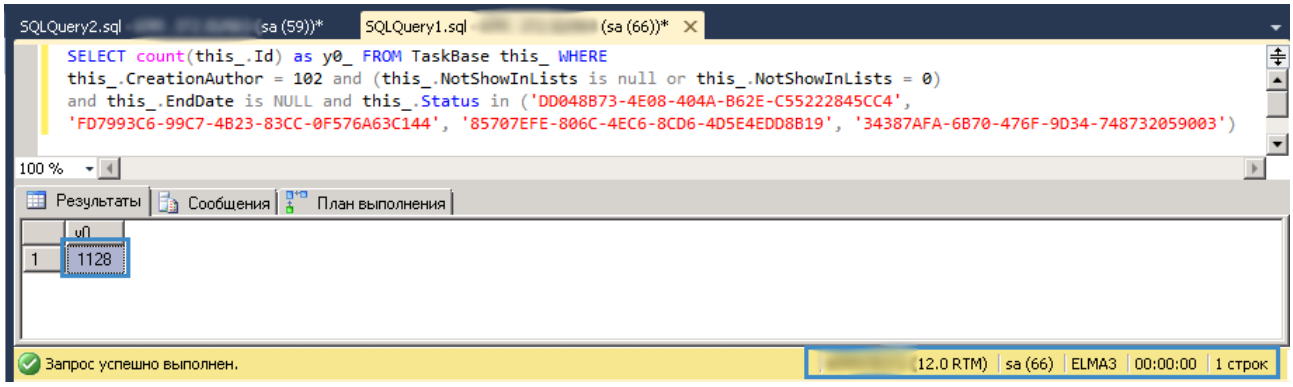



*Fig.77. MS SQL. Executed query*

As a result, 1128 items were found in 0 seconds, i.e. the problem was not confirmed. Note that we have repeated the query with sample data, and not exactly with the original data. Thus, by repeating the same query using possible values of the parameters **@p0-@p10**, we can compare them and get a complete picture.

The main reason for insufficient query performance is a suboptimal query execution plan. Therefore, based on the results of the query, it is recommended that you refer to the execution plan and analyze the query for using indexes. You can find more information about it in the next chapters.

When analyzing the SQL queries tab of the performance report, it is important to pay attention to long-running small queries (for example, fetching data from a table according to one parameter). As a rule, they indicate that the system indexes are incorrect. Often, large queries that fetch data across multiple tables and multiple columns are very difficult to optimize. Often low performance is associated with a large amount of data; you can solve this problem by optimizing the search engine, rather than restoring the indexes. It is also important to pay attention from which table the data is fetched. If this is a system table (for example, Users, TaskBase, etc.), and it is executed slower, compared to earlier periods, it is necessary to restore the indexes. If the data is fetched from a table created by a user (for example, the HomeInfo property in a new object "Real Estate Information" created in **ELMA Designer**), then most likely you need to create new indexes for it.

### 9.1.2. Report about current system activity

In this report, web queries and background tasks are highlighted in blue; the query execution stack (methods, SQL queries) is white. The first column displays

the date and time when the query or task was created, in the second column, the information in shown as follows (Fig.73):

| | | |
|---|---|---|
| 1 | 03.02.2017 16:13:32.502 | #132361 DesignerCall - ProcessHeaderDTOManager.PublishEmulation |
| 2 | 03.02.2017 16:13:32.517 | [CALL] ProcessHeaderDTOManager.PublishEmulation(ProcessHeaderDTO[]) |
| 3 | 03.02.2017 16:13:32.517 | [CALL] ProcessHeaderManager.PublishEmulation(IEnumerable<IProcessHeader>) |
| 4 | 03.02.2017 16:13:32.517 | [CALL] ProcessHeaderManager.PublishInternal(IEnumerable<IProcessHeader>, String, Boolean, Boolean) |
| 5 | 03.02.2017 16:13:32.517 | [CALL] BPMNProcessManager.Publish(IBPMNProcess, Int64, IWorkflowProcess, String, Boolean) |
| 6 | | |
| 7 | 03.02.2017 16:13:36.636 | #132363 Scheduler - NewProcessesChecker |
| 8 | 03.02.2017 16:13:36.760 | [CALL] WorkflowProcessManager.CheckNewPublishedProcessesInternal(Boolean) |
| 9 | 03.02.2017 16:13:36.760 | [SQL] SELECT this_.Id as Id388_2_, this_.Uid as Uid388_2_, this_.Name as Name388_2_, this_.CreationDate as Creation4_388 |
| 10 | | |
| 11 | 03.02.2017 16:14:05.277 | #132418 [UserId:405] [IP:192.168.200.117] [Web:GET] /Common/Diagnostics/Report/08dd1ffa-8f17-43bb-969d-59cd4b0418c |
| 12 | 03.02.2017 16:14:05.277 | [ACTION] DiagnosticsController.Report |

*Fig.78. Current activity report*

If it is a task:

*#internal sequence number in ELMA [User Id] [IP address] [Where the query came from]/query URL.*

If it is a query:

*# internal sequence number in ELMA/ query URL.*

If a string does not contain URL, it means that this is a background task.

This report will be useful in the following cases:

- the system has stopped responding as a result of any user actions (for example, the document was sent for agreement to 1000 users);
- the system has stopped responding as a result of the script execution;
- to prevent hangs in case of a significant decrease in system performance.

When the system stops responding, in the current activity report, at the very top, you will see the oldest query that slows down the system. You can also determine whether a query has hung by its creation time (for example, if the query was created 10 minutes ago from the current time, then you can say that it hung). Usually the current activity tab shows a small number of queries, which were created 0-3 minutes ago. If the system has become much slower to respond to user actions, then you will see a large number queued queries.

## 9.2 Process execution queue

The **Execution Queue** sub-section allows you to monitor the processes that are currently processed by the Process Execution Service, and track execution errors. If a process has failed in performing an operation, error logs will be displayed in this section. To open the section, go to **Processes > Execution Queue** (Fig. 79). By default, this section is only available to users who are members of the **Administrators** group.

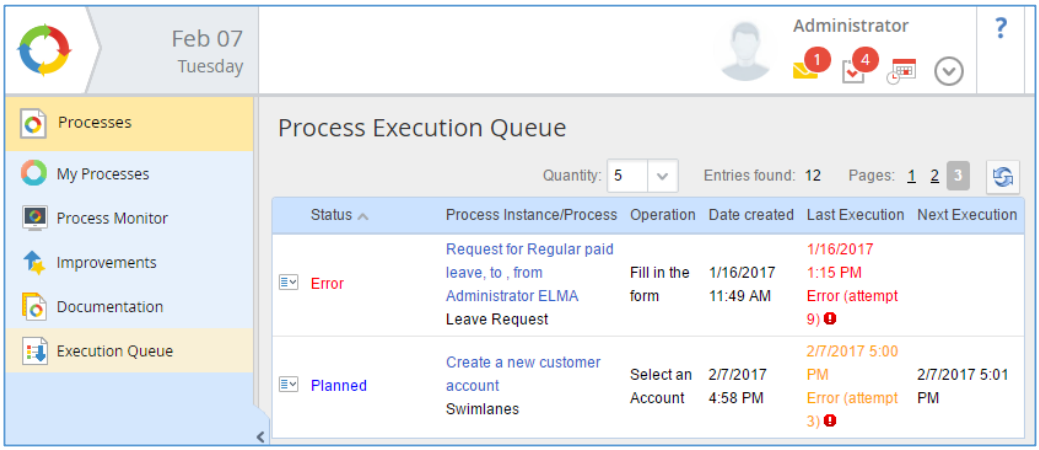



*Fig. 79. Diagnostics. Execution queue*

A detailed description of the **Execution Queue** is available in the section **5.3.4** of the ELMA BPM Platform user manual.

## 9.3 Error logs (information logging)

**Logging** is the most important, and sometimes the only available tool for analyzing system failures and problems. Simply put, any log contains information about the date, time, and event. The name of the log files usually contains the name and date. By default, all logs are saved daily: one day - one log file.

You can configure logging by setting up one of the following levels:

- **ALL** – all massages;
- **DEBUG** – debugging messages;
- **INFO** – informative messages;
- **WARN** – warnings;
- **ERROR** – error messages;
- **FATAL** – fatal error messages;
- **OFF** – logging is disabled.

If you select **ALL**, all system messages will be logged. If you change the level to **INFO**, the log will contain all messages except for debugging messages. Other levels work similarly. By setting up the level to **OFF**, you will disable logging. It is important to understand that high (detailed) levels of logging can cause a very significant slowdown of the system. In the section **9.3.1,** you can find an example of changing a logging level.

As a rule, system administrators use the default logging settings.

### 9.3.1. ELMA BPM log

All information about system events and errors are logged at **..\<Shared folder with ELMA files>\Web\logs**. The following are the logs directly related to the system diagnostic:

- **dbUpdate** – Database structure update log. A new log is added when the system version is updated or the object model changes;
- **Diagnostics** – The diagnostic log. A new log is added according to the settings configured in the System Diagnostics section;
- **Diagnostics\Reports** – System diagnostic reports that are generated when a user creates a report in the web application;
- **error** – System error log;
- **ImportLog** – Configuration import log;

- **integration1C** – 1C integration log;
- **workflow** – Business process execution log.

You can set up the logging level for the ELMA BPM Platform in the file **..\<Shared folder with ELMA files>\Web\Config\log4net.config**. Using this file, you can also configure other settings; however, in most cases additional setup is not required. To switch to a higher level of logging, follow the example of setting up NHibernate full data display. You should make the following changes to the configuration file (only a part of the file is shown here):

**log4net.config, DEBUG level for NHibernate**

```
  <appender name="ErrorOnly" type="log4net.Appender.RollingFileAppender">
    <encoding value="utf-8" />
    <file value="logs/error/error-log-"/>
    <appendToFile value="true"/>
    <maxSizeRollBackups value="100"/>
    <maximumFileSize value="100Mb"/>
    <rollingStyle value="Composite"/>
    <staticLogFileName value="false"/>
    <datePattern value="yyyyMMdd"/>
    <lockingModel type="log4net.Appender.FileAppender+MinimalLock"/>
    <filter type="EleWise.ELMA.Logging.Log4netAndFilter, EleWise.ELMA.SDK">
      <filter type="log4net.Filter.LevelRangeFilter">
        <levelMin value="DEBUG"/>
        <levelMax value="FATAL"/>
      </filter>
      <filter type="log4net.Filter.LoggerMatchFilter">
        <loggerToMatch value="NHibernate" />
        <acceptOnMatch value="false" />
      </filter>
    </filter>
    <layout type="EleWise.ELMA.Logging.PatternLayout">
      <conversionPattern value="%-5level %date [%thread] %logger - %message%newline"/>
    </layout>
  </appender>

…

  <logger name="NHibernate">
    <level value="DEBUG"/>
  </logger>

…

  <root>
    <level value="DEBUG"/>
   <!--<appender-ref ref="All"/>-->
    <!--<appender-ref ref="All-Location"/>-->
    <appender-ref ref="ErrorOnly"/>
    <!--<appender-ref ref="ErrorOnly-Location"/>-->
  </root>
```

### 9.3.2. ELMA Designer Logs

You can find ELMA Designer logs at **..\<Shared folder with ELMA files>\Designer\logs.** The following are the logs most frequently used in diagnostics:

- **all** – ELMA Designer events log;
- **error** – ELMA Designer error log.

You can set up ELMA Designer logging using the same syntax as shown in the previous paragraph. All settings are done in the configuration file..**\<Shared folder with ELMA files>\Designer\Config\log4net.config**.

### 9.3.3. Web server logs

When using the internal Cassini web server, the logs are located at..**\<Shared folder with ELMA files>\Service\logs**. Below are the logs:

- **all** – ELMA Designer events log;
- **error** – ELMA Designer error log.

To configure logging use the configuration file..**\< Shared folder with ELMA files >\Service\LogSettings.xml**.

**LogSettings.xml**

```
<?xml version="1.0" encoding="utf-8" ?>

<LogSettings>
  <logenabled value="true" level="ALL" query="0"/>
</LogSettings>
```

When using IIS as a web server, to configure logging, go to **Start > Control Panel > Administrative Tools > Internet Information Services Manager**. Next, go to the website and select **Logging** in the **IIS** group (Fig. 80).

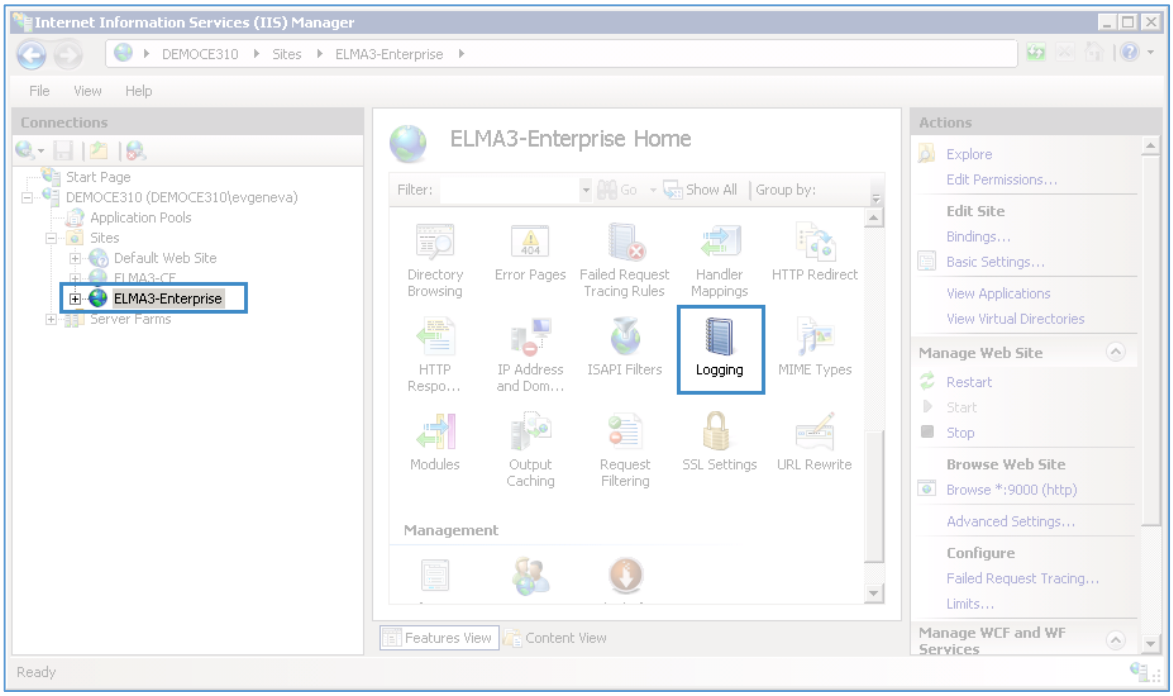



*Fig. 80. IIS. Configuring logging*

Note that the time of the web server logs is specified relatively to the zero time zone (UTC ± 00: 00).

## 9.4 Database diagnostic tools

**A transactions concept** is an integral part of any client-server database. A transaction is an indivisible sequence of data manipulation operators (read, delete, insert, modify), which results in one of two possible outcomes: either the sequence is executed if all the operators are correct, or the entire transaction is canceled if at least one of the operators cannot be executed successfully.

For example, in ELMA, a transaction refers to an operation of editing a page of a document, contractor, or other system objet. If a server fails to change at least one field edited in one operation, all the changes will not be applied. Execution of scripts is a transaction as well. In the case of an error, the entire script will not be executed; data cannot be changed partly before an error occurred. Committing changes (COMMIT operation) occurs after clicking the "Save" button, the transition buttons, execution of the script activity, etc.

When a transaction is performed, the server blocks data. A block is a temporary restriction on the execution of certain data processing operations. If the server did not use blocks, several transactions would change the same data. Users most often do not need to take any actions to manage blocks, but nevertheless, sometimes a hung blocked transaction can slow down the entire system. In this chapter, we describe methods for identifying and solving such problems.

One of the most important ways to achieve high performance of the database server is to use indexes. An index accelerates the query process by providing quick access to data rows in a table, similar to how a pointer in a book helps you quickly find the information you need. Indexes are created for the columns of tables and views. For example, if you create an index on a primary key and then search for a row with data using the primary key values, the database server will first find the index value, and then use the index to quickly find the entire row with the data.

Without an index, a complete scan of all table rows would be performed, which could significantly decrease performance. When installed, ELMA automatically creates all necessary indexes on the standard fields. New indexes may be required in case of using large custom extensions, creating new objects, or removing previously created basic indexes. Users create new indexes manually. It is important to be able to timely recognize the situation and take the necessary actions. In this guide, we will consider the methods for analyzing queries

mentioned in the section **9.1.1.6** in order to determine whether they were indexed.

### 9.4.1. MS SQL DBMS diagnostic tools

Use **MS SQL Management Studio** to work with MS SQL DBMS.

If the system hangs, you can use the standard **Management Studio** reports to retrieve data about the current ELMA transactions on the MS SQL server and see if there are any blocked transactions in the system.

To do this, we use the **All Blocking Transactions** report. Select the database and in the context menu go to **Reports** - **Standard report** - **All blocking transactions** (Fig.81).

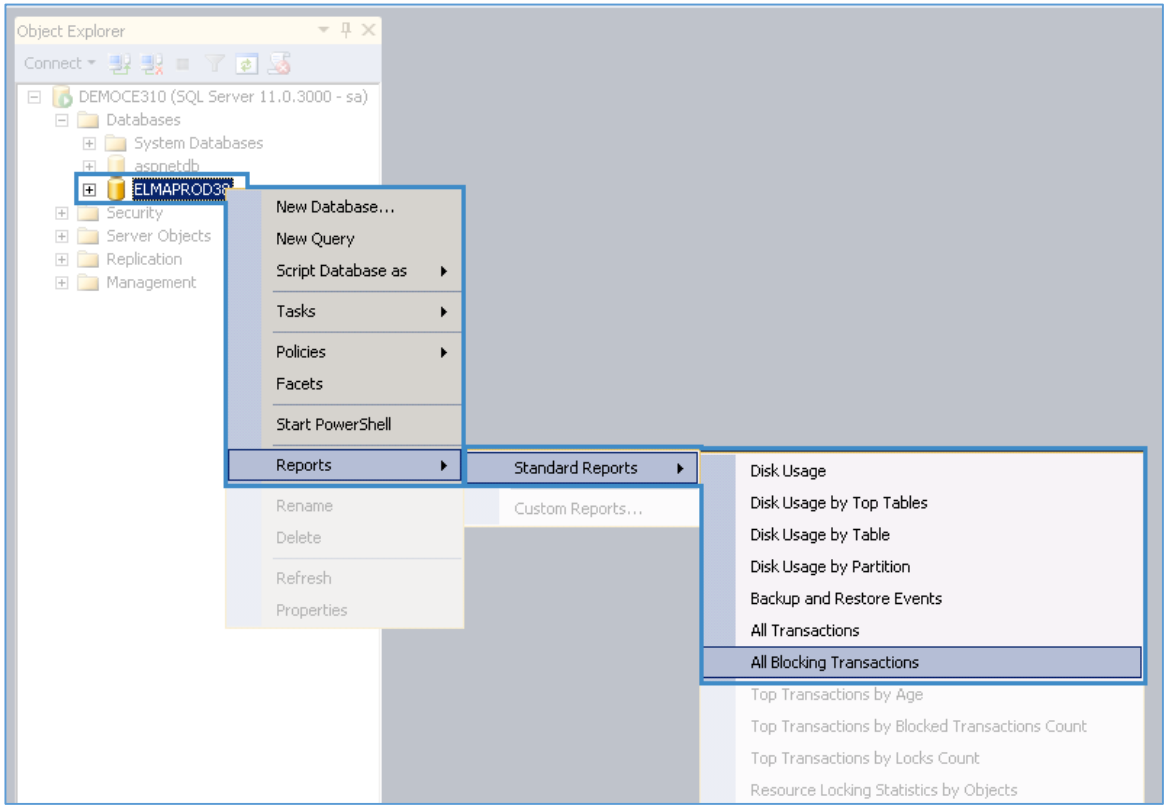



*Fig.81. MS SQL Manager. Blocked Transactions Report*

A window opens with active blocking transaction (Fig.82). In the first line, you can see a blocking transaction; in the next lines are queries that await to be unlocked.

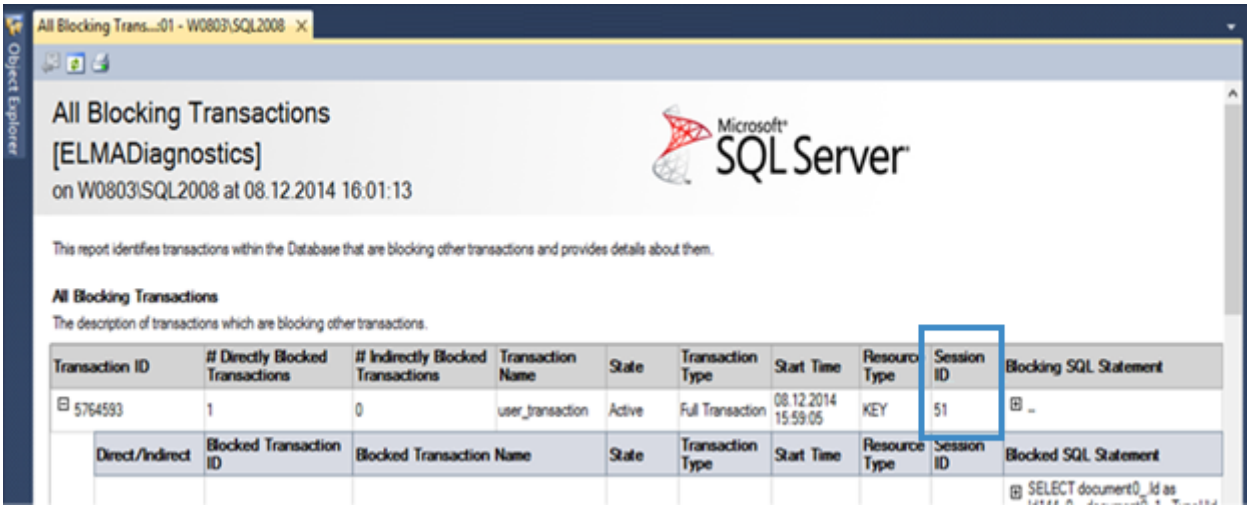



*Fig.82. MS SQL. Blocking transactions report*

If it is impossible to restart the server and you need to restore the system performance, you can force the required transaction to close. To do this, execute the **kill51** query in the database, where **51** is the session identifier. You can find the ID in the **Session ID** column of the report (Fig.82).

Once the query is executed, the transaction will be aborted; the changes stored in this transaction will not be applied.

Another tool for diagnosing MS SQL is the **Activity Monitor**. To open it, in Object Explorer, right click the MS SQL Server Instance and select **Activity Monitory** from the drop down list as shown in the figure below (Fig.81).

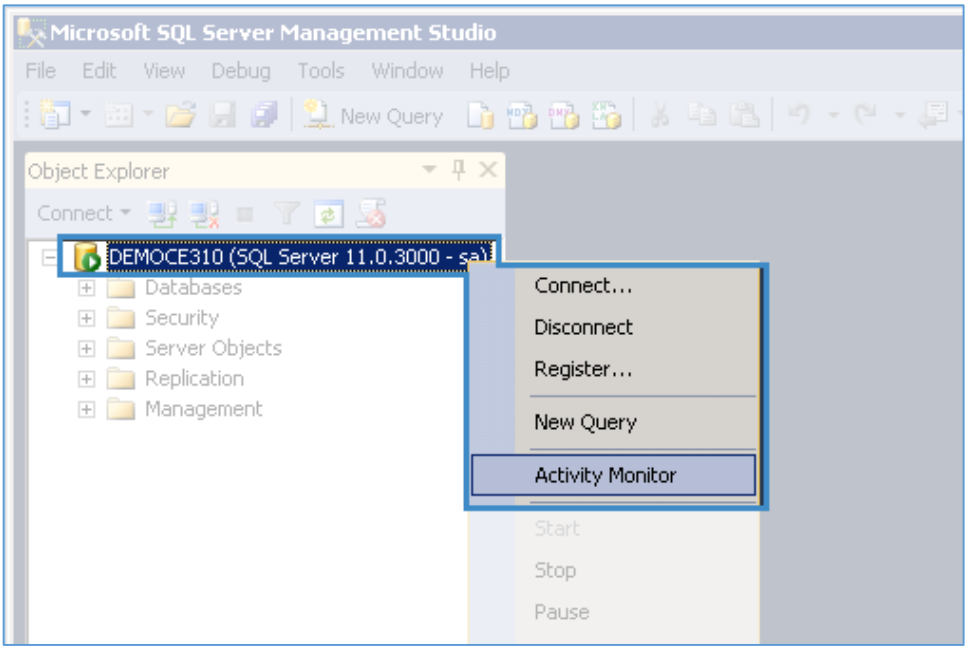



*Fig.83. MS SQL. Starting Activity Monitor*

In the window that opens (Fig.84), in the **Overview** section you can check the current system load.

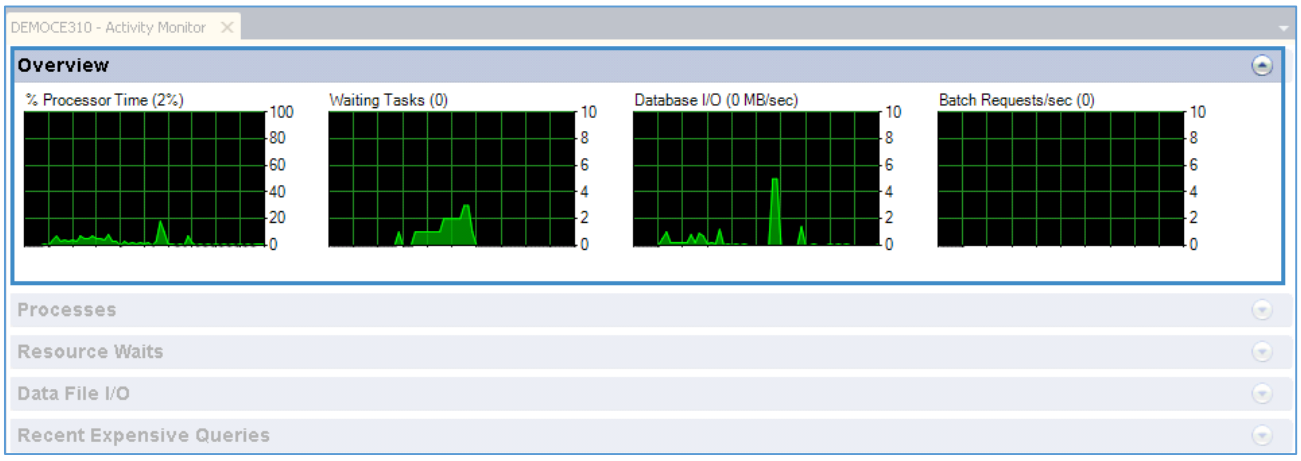



*Fig.84. MS SQL. Activity Monitor*

To view the execution plan and the indexes used, run the following SQL query (Fig. 85).

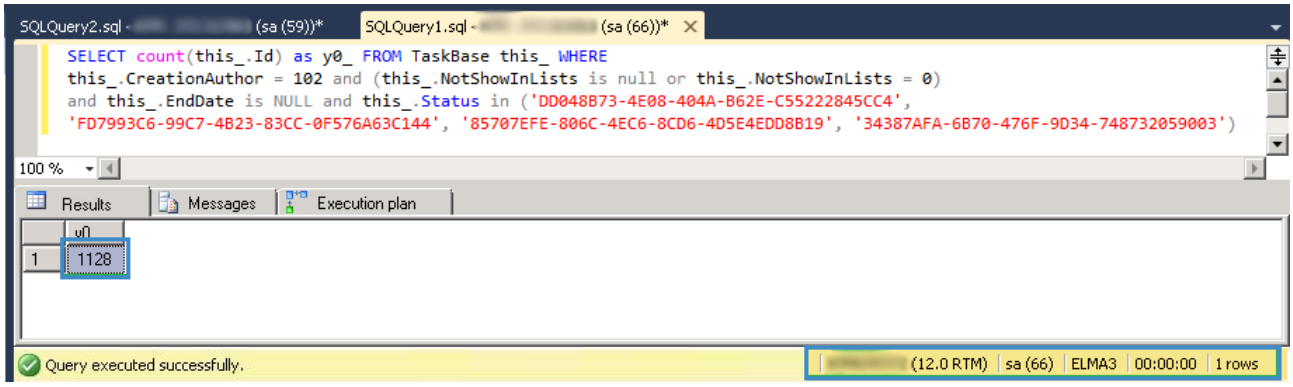



*Fig. 85 MS SQL. Executed query*

Next, in the window that opens, go to the **Execution Plan** tab (Fig.86). If this tab is not available, right-click on the free space in the SQL query section and select the **Enable actual execution plan** option in the menu that appears.

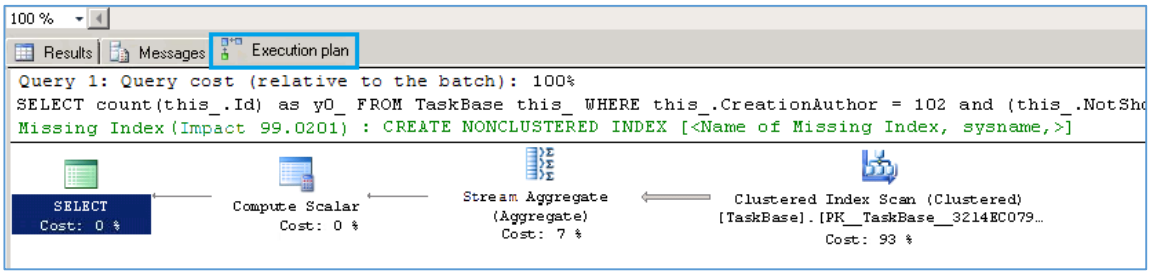



*Fig.86 MS SQL. Execution Plan*

The plan shows in % how many resources are spent on different operations. In Fig.86, 93% of resources are spent on CLUSTERED INDEX SCAN. In addition to the section/operation CLUSTERED INDEX SCAN, TABLE SCAN and INDEX SCAN operations shows that simple scanning is performed. Scanning does not always indicate a non-optimal operation of the query, but only if the following conditions are met:

- A table contains a large number of entries;
- A query returns a small number of entries.

Scanning always indicates that there is no suitable index for the optimal query execution.

Also, this tab displays the Index Processor tips for adding missing indexes. Right-click and select **Information about missing indexes** to learn more about the processor's tips. The emerged window will contain a SQL query for adding an index and its description (Fig.87).

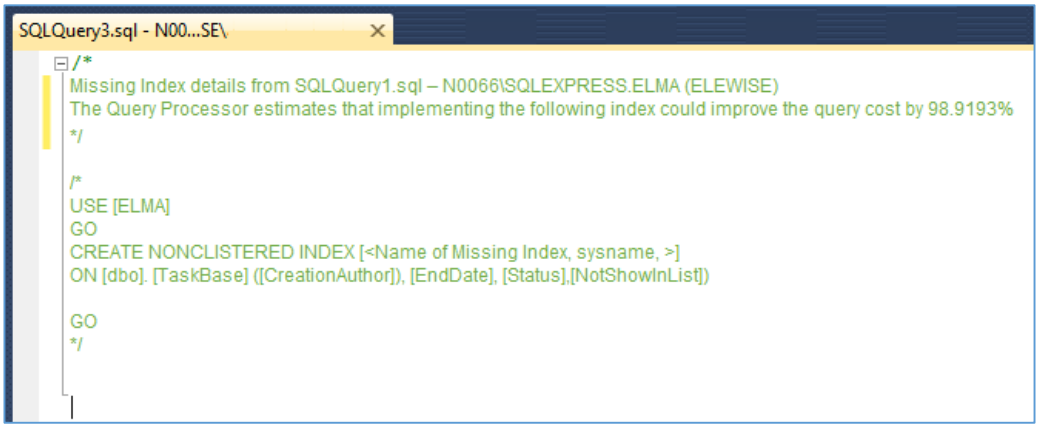



*Fig.87. MS SQL. Tips for adding missing indexes*

Please note that the processors tips are not always optimal and do not guarantee a performance increase, so it is very important not to create unnecessary indexes.

### 9.4.2. Firebird DBMS diagnostic tools

If the ELMA server is running on the **Firebird** DBMS, then it is possible to use the standard functionality of the **IBExpert - Database Statistics and Database Monitoring** to obtain statistical data. To do this, select the database, go to **Service-Database Statistics** and in the opened window click on the green triangle **Retrieve Statistics** (Fig. 88).

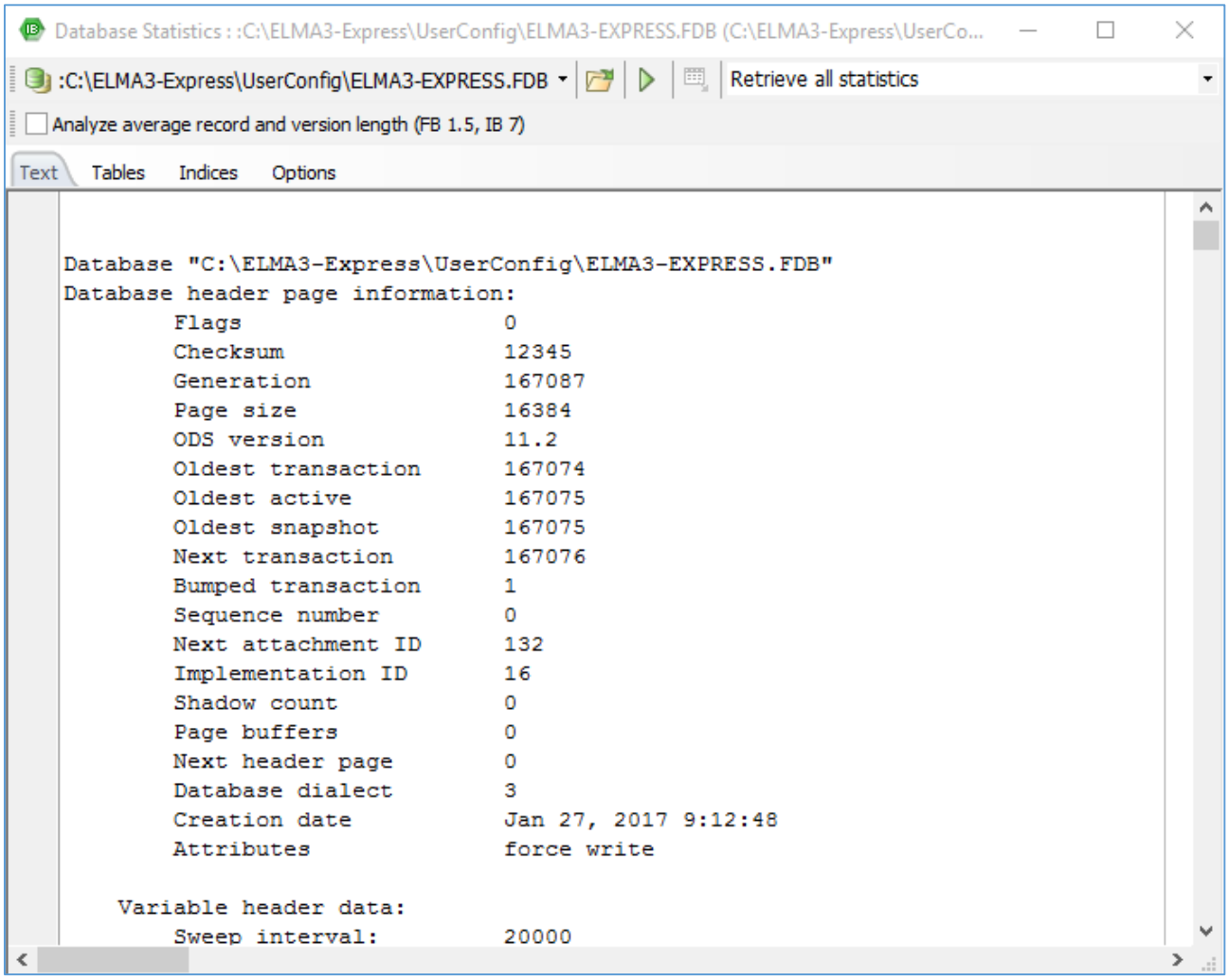



*Fig. 88 IBExpert. Database statistics*

The generated statistics are divided into four tabs:

- **Text** - contains summary information on the database in general and the used tables;
- **Tables** - information on the tables used;
- **Indices** - statistics on the indices used;
- **Option** - standard settings (as a rule, do not need to be changed).

If the system noticeably slows down, check whether you have an unclosed transaction somewhere in the database. You can see this by comparing values in the fields **Oldest active transaction** and **Next transaction** – the values should not differ significantly. The greater the difference between the oldest active and the next transaction, the greater the possibility of performance problems.

Another way to see the list of current transactions, including those blocked, is to use **Database Monitoring**. To do this, select the required database instance and open the **Services - Database monitoring** menu (Fig.89).

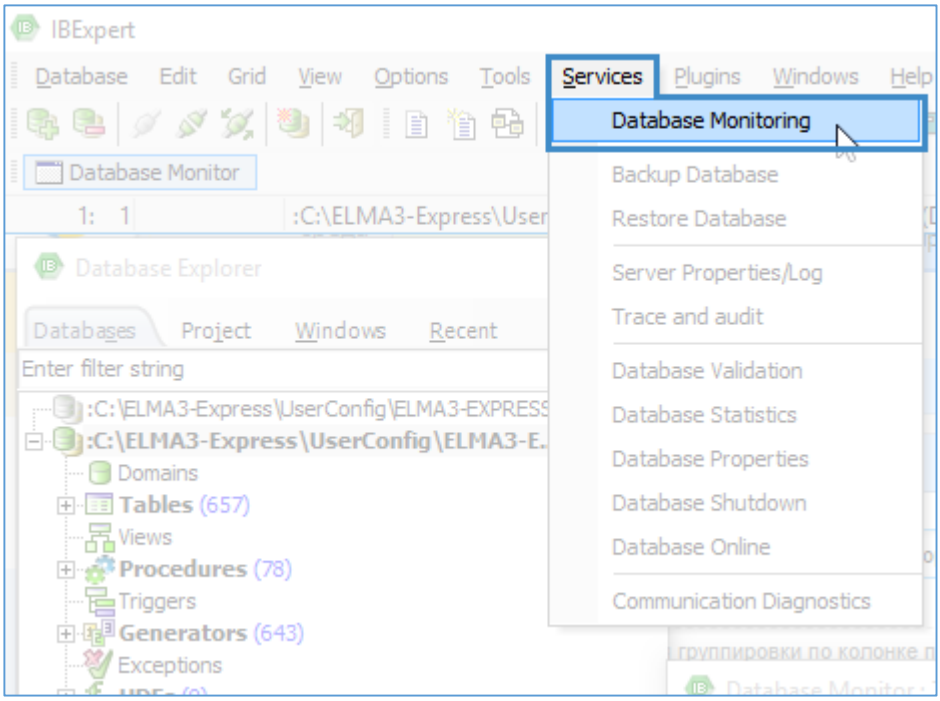



*Fig.89. IBExpert. Database monitoring*

The window (Fig.90) in the **Transactions** section contains a list of current transactions. To interrupt the transaction, select it and click the **Rollback Tr.# Transaction number**.

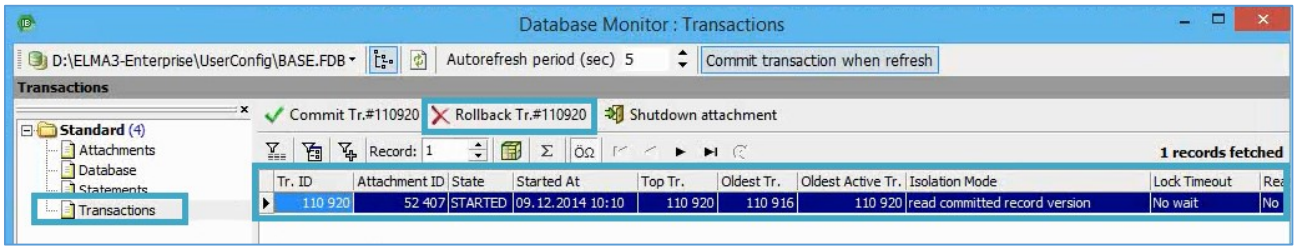



*Fig.90. IBExpert. DB Monitoring*

IBExpert displays the execution plan in the text form (Fig.84). To see the plan as a graphical summary (Fig.92), run the **SELECT** query to the database (see Section 6.1). The summary shows total number of executed queries, including the number of indexed and non-indexed queries, as well as updates, deletions and insertions. Then, after running the query, go to the **Performance Analysis** tab (Fig.92).

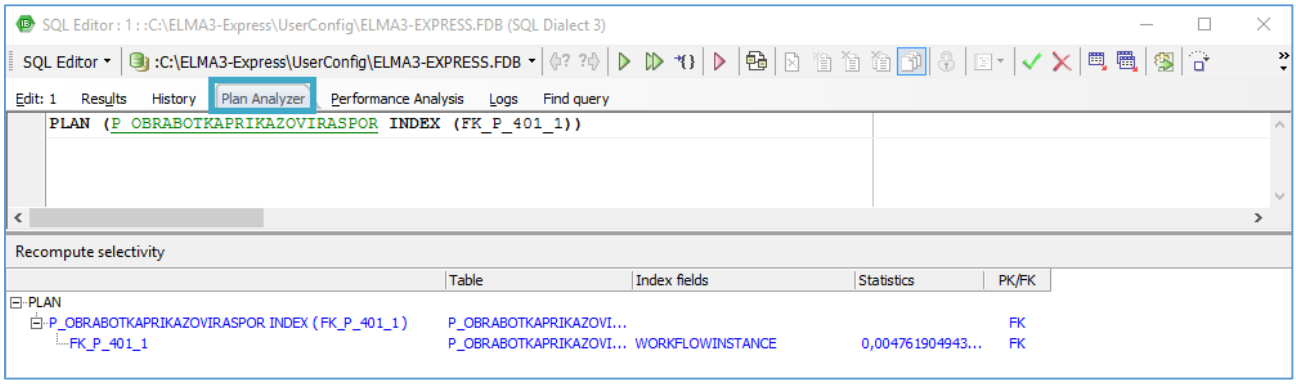



*Fig.91. IBExpert. Execution Plan*

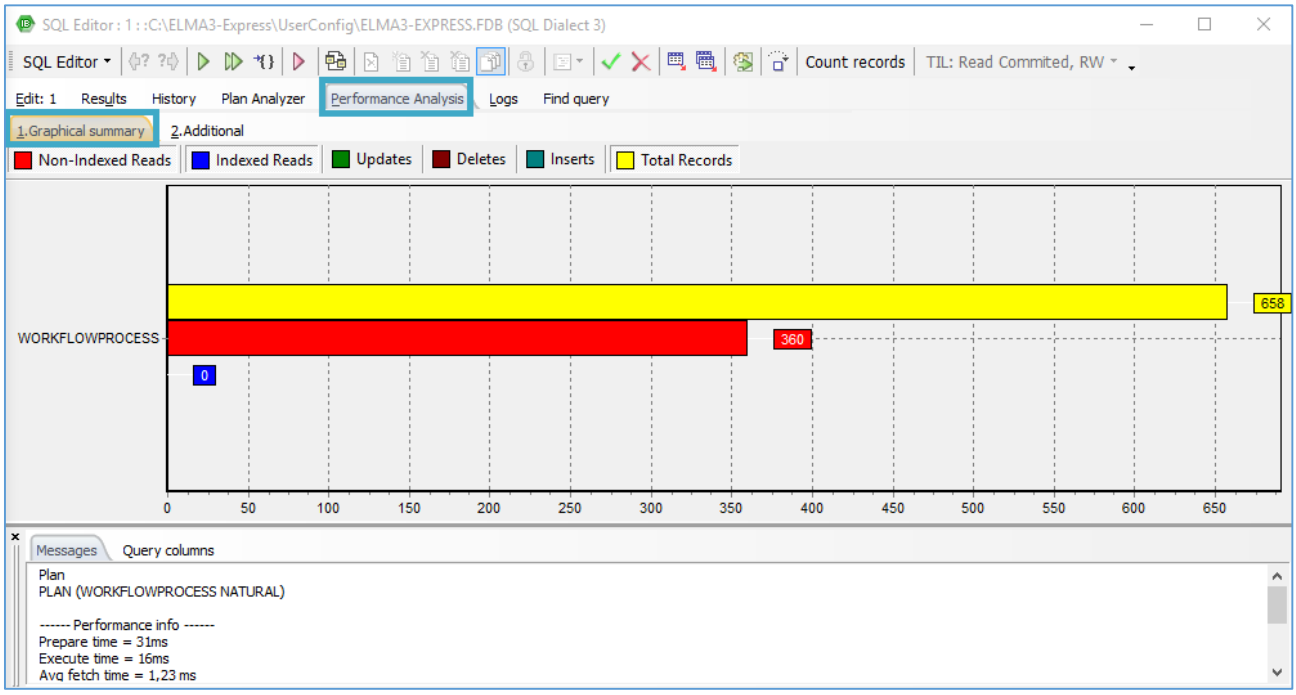



*Fig.92. IBExpert. SELECT query statistics*

### 9.4.3. PostgreSQL DBMS diagnostic tools

As a tool for diagnosing the database on the **PstgreSQL** server, you can use the utility **pgAdmin III**. Before using the utility, you have to enable logging. You can do this by setting up the appropriate parameters in the database configuration file **postgresql.conf** (the default path is **..\<Shared folder with ELMA files>\PostgreSQL\data\postgresql.conf**). Open the configuration file for editing, find the **logging_collector** parameter and set it to **on**. In this file in the **ERROR REPORTING AND LOGGING** section, you can configure various additional parameters for storing and collecting information, priority, etc. Check this link to find more information about the said parameters. It is important to check the

configuration parameter **lc_messages** - it should specify the encoding **Russian_Russia.UTF8**, because the database uses it by default. If the value is different, errors can occur later when viewing log files with **pgAdmin**.

Once logging is set up to display information about blocking and active processes in **pgAdmin**, go to the **Tools - Server Status** tab. The window shows a table with processes and a table with the existing database blocks (Fig. 93).

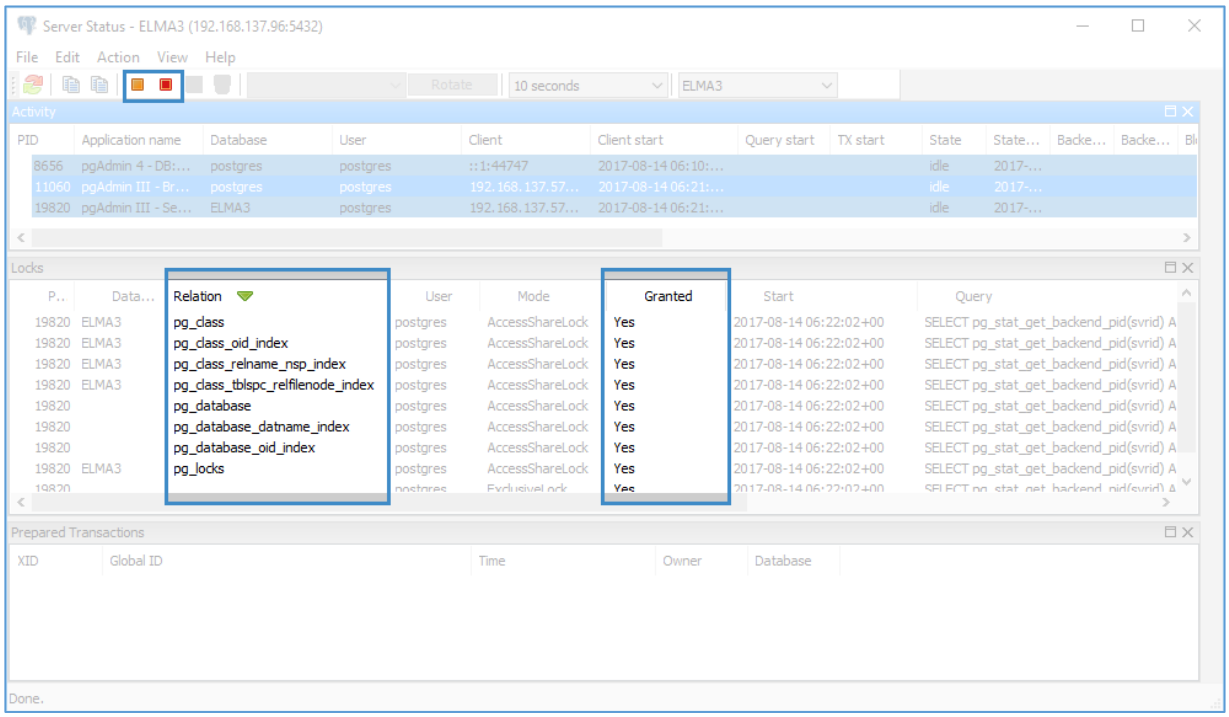



*Fig. 93 PostgreSQL. Blocking transaction report*

In the table, each blocking and blocked process is shown in a separate row. To determine which process is blocking other process, it is necessary to compare several rows and find rows with the same values in the **Relation** column and different values in the **Allow** column. To cancel the request or finish the selected process, click the respective buttons in the window. After completing any of the processes, you need to refresh the window and compare the rows to evaluate the result.

To make search more convenient and eliminate blocks, you can run other utilities, for example, free [pgSqlBlocks.]

To view the query execution plan in **pgAdmin**, open the **SQL query editor**, fill in your query and click on the **Build execution plan** button in the toolbar (Fig.94).

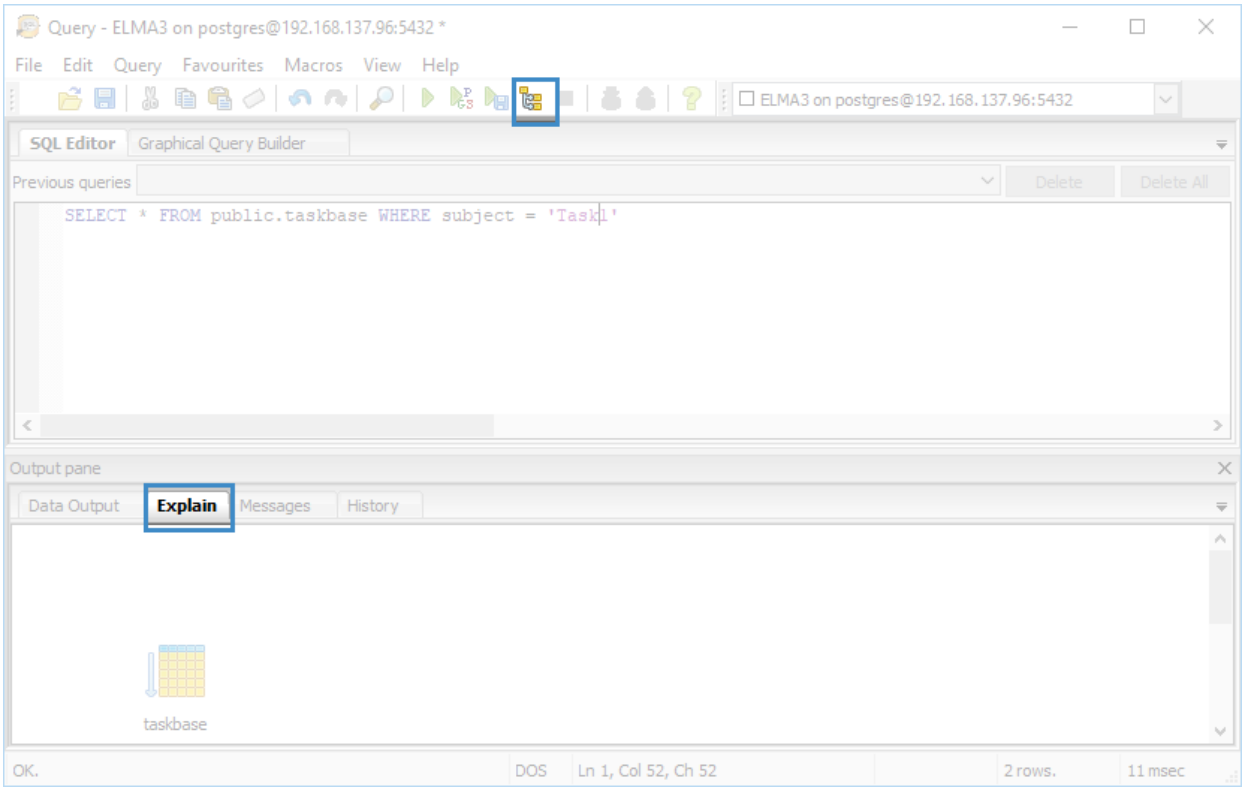



*Fig.94. PostgreSQL. Query execution plan*

## 9.5 Recommendations for improving performance

The following are recommendations to prevent problems that reduce the performance of ELMA:

1. Use a server with sufficient capacity. You can find the recommended system requirements for each of the ELMA editions on our website. It is advisable to allocate more resources than it is recommended and, after determining the server load, remove unused resources. In the opposite case, you might face the problem of the slow server operation and solving this problem will always be one of the priority tasks.
2. Keep track of the content, which is loaded on the user main pages. The loading time of the page can be significantly reduced. To do this, it is advisable:
    - Use asynchronous loading of portlets (see ELMA Help for configuring asynchronous loading);
    - Optimize performance of the Code portlets;
    - Reduce the number of displayed items in the list (for example, in dynamic tables);
    - If possible, limit the use of portlets, which are overloaded with data.
3. If portlets perform long-term calculations and load large data volumes, but are not frequently used, it is advisable to place these portlets on the separate pages. In case if these portlets are used frequently, customize them to load data directly from the database.
4. If several object instances are used simultaneously, use counters or timers, i.e. if possible, split a large script into a cycle of smaller operations (no more than 20 per cycle). Such operations include, for example, downloading and updating services objects, downloading one thousand documents at once, checking all active tasks in the system, sending alerts, etc. A map of such a process is given in Fig.95.

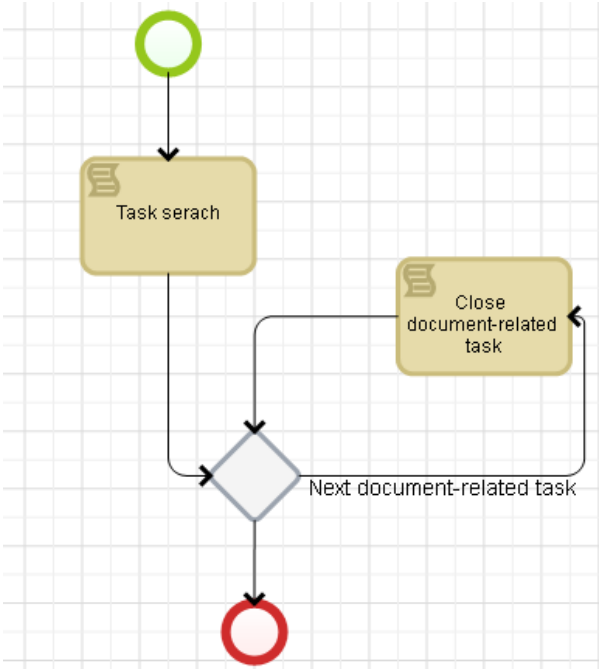



*Fig.95. An example of splitting a script into sevearl iterations.*

5. Simultaneous execution of several resource-intensive background tasks (loading of data from third-party resources, synchronization with other programs, analysis of indicators, calculations) can slow down the performance of the ELMA server. To prevent such problems, it is advisable to monitor the server load using the task scheduler (***ELMA web application in the Administration > System > Scheduler***), efficiently distribute tasks in time, and whenever possible, remove tasks with low priority
6. Disable auto update of the process monitor cache; schedule it for nighttime. Configure these settings in the ***Administration > System > Process Monitor Settings***.
7. Monitor the load of the SQL server and web server and optimize it.
8. Try not to use the FindAll () and similar methods in scripts that return all objects of a certain type, which can create a significant load on the system. Instead, we recommend using filters to return a narrower number of objects. Read more about filters here.
9. We do not recommended using the text field search. Much faster is to search by links to other objects, dates and numbers. For example, search a document with the attribute "Place of the conclusion of the contract" of the "Country" type by the object "Country", rather than use the name of the country with the type "Line" or "Text".

10. Use caching in frequently used objects, if the object data is rarely corrected. You can enable this setting in ELMA Designer on the Additional tab of the object (Fig. 96).

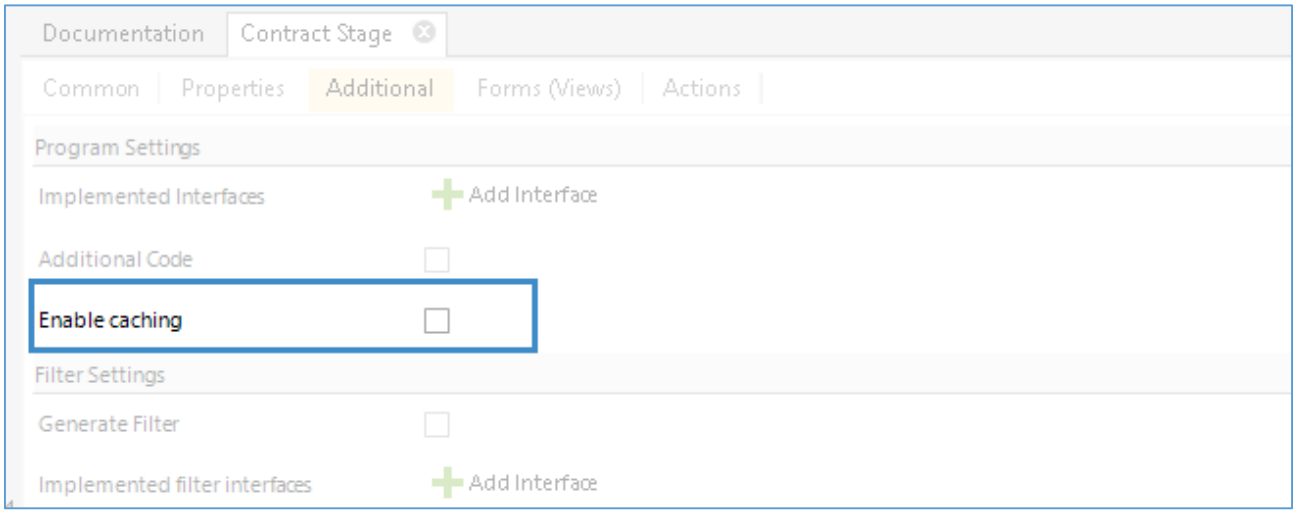



*Fig. 96 ELMA Designer. Object page. "Advanced" Tab*

Therefore, to evaluate the instantaneous load on the system, you should use the **Current Activity Report** in ELMA and the reports on blocking transactions in the database management environment. If you need a more detailed information on the system performance, please refer to the **Report on system performance** in ELMA, collected over a certain period of time.

# Chapter 10. System recovery after a failure

ELMA is quite resistant to failures. The stability of the system is higher; the less global changes are made to the system during its operation. However, it is still necessary to make changes to the system configuration (installing new modules, updating the system, working with direct requests to the database, scripts), which can result in ELMA failure. Therefore, it is important to make regular backups, to be able to restore the system. This chapter describes how to recover ELMA after various failures and explains the reasons of such failures.

## 10.1 Typical errors when starting the ELMA server

Below we describe common errors and methods for fixing them.

**Error:** Error initializing ELMA configuration ---> System.InvalidOperationException: Cannot check database exists ---> System.Data.SqlClient.SqlException: Failed to log in as user "IIS APPPOOL\Elma3-Standart".

- **Cause:** Authorization on the IIS server is done under a user account that does not have administrator permissions.
- **Solution:** If ELMA uses the IIS web server, to solve this problem go to **IIS Manager** (to open, click **Start > Administrative tools**). In the **Application Pools** tab, select **ELMA3-Standart pool** and in the drop-down menu select **Advanced Settings**. Then in the **Process Model** table, in the **Identity** field, specify the **LocalSystem** account or the actual account with the administrator permissions. Then restart the web server. Once the server is restarted, it is recommended to change the account name in the Identity field to **ApplicationPoolIdentity** (according to the section 4.2.2).
- **Alternative Cause:** Using single sign-on to log in to the system and log the system in to the DBMS simultaneously.
- **Solution:** Change the authorization type ELMA–DBMS to login-password authorization. To do this in the configuration file **configuration.config** in the string **connectionstring** add the field **User ID** and **Password**. See an example below:

**Configuration.config**

```
<connectionStrings>
    <add name="MainDB" connectionString="Data Source=TEST2; Initial Catalog=ELMA3; User ID=sa; Password=123qwe!@#; AttachDbFilename=C:\Program Files\Microsoft SQL Server\MSSQL12.MSSQLSERVER\MSSQL\DATA\ELMA3.mdf;"/>
</connectionStrings>
```

**Error:** The underlying connection was closed: An expected error occurred on a receive: Unable to read data from the transport connection: An existing connection was closed by the remote host.: An existing connection was closed by the remote host:.

- **Cause:** ELMA Server is started with insufficient access permissions.
- **Solution:** If the server uses the Cassini DB, press the Windows button + R and type services.msc. A service window will open. Find **ELMA web server**, right-click on it, select Properties, and select the Log-on tab. If the server uses IIS, press Windows + R and type **inetmgr**. The IIS manager window will open. In the **Connections** window find the **Application Pools** item and select it. A list of the current pool opens, which must contain an entry about the ELMA server. Also, you can right-click on the ELMA server and select **Advanced Settings**. In the **Identity** field, specify **LocalSystem** account or an actual account with administrator permissions. Then restart the server. Once the server is restarted, we recommend to change the Identity to **ApplicationPoolIdentity** (according to the Section 4.2.2).

**Error:** *System.UnauthorizedAccessException: Access to the path "C:\ELMA3-Express\UserConfig\configuration.packges" is denied.

- **Solution:** Delete the **.packages** file from the **UserConfig** folder.

**Error:** Error when creating the ELMA database backup.

- **Cause:** Not enough storage space.
- **Solution:** Clear space for a database backup.

**Error:** EleWise.ELMA.Runtime.Db.DbStructureException: Error updating a database structure ---> System.Data.DataException: Failed to execute the query DROP INDEX UK_principal_name ON sysdiagrams ---> System.Data.SqlClient.SqlException: An explicit DROP INDEX is not allowed on index "sysdiagrams.UK_principal_name". It is used to force the UNIQUE KEY constraint.

- **Cause:** **SQL Server Management Studio** must not have any tables in the **System Tables** section.

  **Solution:** Stop the ELMA server, open **SQL Server Management Studio**, find the required database and open the list of tables. The **System Tables** section must not contain any tables. If it does, delete them and then start the server.

**Error:** Error caused by active connections to the database

- **Cause:** When you restore a database from backup copies on the server with a different time zone, the server may store the information about the active connections that will not allow you to use it.
- **Solution:** Create a backup and execute a query to the database. The query text: **Delete from DB_ACTIVECONNECTION**.

**Error:** EleWise.ELMA.Runtime.Db.DbStructureException: Error updating database structure ---> NHibernate.TransactionException: Commit failed with SQL exception ---> FirebirdSql.Data.FirebirdClient.FbException: unsuccessful metadata update object INDEX is in use ---> FirebirdSql.Data.Common.IscException: unsuccessful metadata update

- **Cause:** Update error.

  **Solution:** Restore the database backup. The procedure for creating a backup is described in the section 5.1.

**Error:** *EleWise.ELMA.Runtime.Exceptions.ConfigurationInitializeException: Error initializing ELMA configuration ---> System.InvalidOperationException: Failed to connect to the database ---> FirebirdSql.Data.FirebirdClient.FbException: Unable to complete network

request to host "127.0.0.1". ---> FirebirdSql.Data.Common.IscException: Unable to complete network request to host "127.0.0.1".

- **Cause:** Error in the **configuration.config** file, in the string <add name="MainDB" connectionString="data source=127.0.0.1;initial catalog={CONFIGDIR}\base.fdb;user id=sysdba;password=masterkey;character set=UNICODE_FSS;dialect=3;server type=0" />.
- **Solution:** Make sure that in the line <add name="MainDB" connectionString="data source=127.0.0.1; initial catalog={CONFIGDIR}\base.fdb;user id=sysdba;password=masterkey;character set=UNICODE_FSS;dialect=3;server type=0" /> there are no typos and the character case is correct.

**Error:** *EleWise.ELMA.Runtime.Exceptions.ConfigurationInitializeException: Error initializing ELMA configuration ---> System.InvalidOperationException: Faild to connect to the database ---> System.Data.SqlClient.SqlException: Cannot open the ELMA database requested by the login. Sign-in failed. User Login Error "NT AUTHORITY\system".

- **Cause:** The authorization on the Cassini server is carried out under the user account that does not have Administrator permissions.
- **Solution:** You must start the ELMA server under the account that has the permissions of the Windows Administrator. To do this, go to *Control Panel > Administrative Tools > Services*, find the ELMA web server, right-click on it and select **Properties**. In the window that opens, go to the **Log On** tab, select **This account** and specify the account information.

**Error:** An error of the MS SQL 2008 server and higher Login failed for user 'NT AUTHORITY\system. Cause:The explicitly specified "ELMA" database could not be opened. [CLIENT: <local machine>]. Error: 18456, Severity: 14, status: 38.

- **Cause:** Authorization is correct, the server is started with Administrator permissions, but the database is not available (or there is no permission).
- **Solution:** In the SQL server, add the **sysadmin** role to the NT AUTHORITY\system group. To do this, in the **Microsoft SQL Server Management Studio,** open **Security** - **Login Names** and select the NT

AUTHORITY\system group properties. In the **Server Roles** menu, select the checkbox next to the **sysadmin** role.

**Error:** *EleWise.ELMA.Runtime.Exceptions.ConfigurationInitializeException: Error initializing ELMA configuration ---> System.InvalidOperationException: Failed to connect to the database ---> System.Data.SqlClient.SqlException: CREATE DATABASE permission is prohibited in the "master" database. Failed to add the "F:\ELMA3-Standart\UserConfig\ELMA3.mdf" file as a database "ELMA3".

- **Cause:** Error in the **configuration.config** file in the string AttachDbFilename={CONFIGDIR}\ELMA3.mdf;
- **Solution:** Delete the string "AttachDbFilename={CONFIGDIR}\ELMA3.mdf" in the configuration **configuration.config** file. Once the changes are made, save the file and restart the web server.

# Chapter 11. Submitting a request to Support

**The support website** is a specialized website located at http://support.elma-bpm.com. On this website, the representative of the Customer responsible for administration of the system (hereinafter referred to as the User) can communicate with the employees of the Contractor's company, post requests, and track the statuses of their requests. The website also provides access to the questions answers database, which contains information about system use cases. The Contractor grants access to the support website in the presence of a valid technical support agreement.

Any contact with a support representative is considered as a request. There five types of requests:

- **Questions about system operation.** Requests of this type require an explanation of the basic functionality of the system.
- **Bug reports.** Users can report about issues in the system that caused to produce an incorrect or unexpected result, or to behave in unintended ways. Exceptions:
  - issues related to incorrect functioning of the equipment or operating system that affect the functioning of the system are not considered as bugs;
  - issues related to incorrect functioning of the system in case of non-compliance with technical requirements are not considered as bugs.
- **Improvement suggestions**. Customer's suggestions to improve the system.
- **Consultation** (additional service). System setup performed by the specialists of technical support on behalf of the Customer. Examples of consultations: writing scripts, configuring forms, processes, reports, etc.
- **System Extension** (additional service). Extension of the basic functionality performed by an ELMA developer on behalf of the Customer (for example, new system module (modules).

When writing a request to technical support, the following should be considered:

- the request text must clearly describe the order of user actions that led to an error;
- it is important to provide screenshots. The screenshot should show the URL, date and time, user, current task (stage);
- the request should include log files for the period from the date the process or document was launched (created) until the error occurred on the web server, ELMA server.

If the problem is repeatable, then you should specify links to other requests, provide log files for the corresponding dates.

# Chapter 12. Useful References

Along with this user manual, the following sources describe the functions of **ELMA** applications:

- ELMA BPM Platform user manual
- ELMA Web Portal user manual
- ELMA ECM+ user manual
- ELMA Projects+ user manual
- ELMA KPI user manual
- ELMA High Load user manual

These manuals walk you through the key features of the system. You can find a more detailed description of ELMA functions in the system Help, available via the following link: https://kb.elma-bpm.com/help and included in software package.

ELMA HELP contains a wide range of articles that describe ELMA BPM Platform and its applications. All articles are grouped in three main sections: the User Guide, the Implementation Guide and the Administrator Guide Which allows you to quickly find the information you need.

General description and purchase conditions of the applications are available on ELMA website: http://www.elma-bpm.com. You can also **Ask a question** on this website, using a respective link.

An **Online Demo** http://demo.elma-bpm.com demonstrates the main functions and utilization of the applications.

We continuously develop **ELMA** and create platform-based components for solving specific tasks. You can find the list of these components and their purchase conditions at **ELMA Store**: http://store.elma-bpm.com/.

You may also find useful the articles in the ELMA Knowledge base if you develop your own system extensions. https://kb.elma-bpm.com/

If you are experiencing technical difficulties, please visit ELMA technical support website: http://support.elma-bpm.com.

If you need assistance with the system or have questions about partnership with the **ELMA** Company, contact us:

Luxemburg: + (352) 20-30-11-40 | http://www.elma-bpm.com/contacts/