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Gidas Database Management

User manual

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1. Introduction

Gidas is the database used to store the data acquired and processed by LSI Lastem instruments.

Gidas database requires the presence of the *Microsoft SQL Server 2005* or superior in the user's computer or in a network location. Alternatively, you can install *SQL Server 2005 Express* or *SQL Server 2008 R2 Express* directly from the *Gidas* setup program. Express editions of SQL Server are free.

This document describes the basic features of SQL Server product and key management operations and maintenance of the Gidas database.

For more information about SQL Server 2005 please see the Microsoft site (<u>http://www.microsoft.com/sqlserver/2005/en/us/express.aspx</u>) For more information about SQL Server 2008 R2 please see the Microsoft site (<u>http://technet.microsoft.com/en-us/sqlserver/ff398089</u>)

2. Requirements and Gidas database creation

2.1.1. SQL Server

Gidas database requires the presence of the Microsoft SQL Server 2005 or superior.

Microsoft SQL Server is a Microsoft product able manage SQL database; it is available in different versions depending on the complexity of databases and business processes to manage. In particular, the *Express* version is a free version.

SQL Server is installed as a service and its role is to act as a bridge between applications and databases. Each service can handle multiple SQL database, and multiple services can be installed on each computer. Different SQL Server services are distinguished by their names. A service of SQL Server is also named instance of SQL Server.

The name of an instance of SQLServer has the following format:

servername\instancename

where *servername* is the network name of the computer where SQL Server is installed: for the local computer can be used either the local computer name, the term *local* or a simple point.

The *Gidas* database can be installed on any version of SQL Server 2005 or superior available both locally and on the network.

2.1.2. System Requirements for SQL Server 2005

The complete list of hardware and software requirements is available at this link <u>http://www.microsoft.com/sqlserver/2005/en/us/system-requirements.aspx</u>

Major hardware requirements

- Pentium III-compatible processor or higher minimum: 500 MHz (recommended: 1 GHz)
- Memory RAM recommended 512 MB or more.

Supported Operating Systems

- Windows 2000 SP4
- Windows XP SP2
- Windows Server 2003 SP4
- Windows Vista (*) except Windows Vista Starter
- Windows Server 2008 (**)
- Windows Seven

(*) requires SQL Server 2005 SP1 (**)requires SQL Server 2005 SP2

SQL Server 2005 Express cannot be installed on 64-bit systems.

Main limitations of the Express version

• Database maximum size 4 GB

2.1.3. System Requirements for SQL Server 2008 R2

The complete list of hardware and software requirements is available at this link <u>http://technet.microsoft.com/en-us/library/ms143506(v=sql.105).aspx</u>

Major hardware requirements

- Pentium III-compatible processor or higher minimum: 1 GHz (recommended: 2 GHz)
- Memory RAM recommended 1 GB or more.

Supported Operating Systems

- Windows XP SP3
- Windows Server 2003 SP2
- Windows Vista SP2
- Windows Server 2008
- Windows Seven

SQL Server 2008 R2 Express installed by the Gidas setup program on 64-bit systems run in WOW64 mode.

Main limitations of the Express version

• Database maximum size 10 GB

2.1.4. Creation of Gidas database through guided procedure

The guided procedure starts automatically after the installation of *GidasViewer* program, or you can alternatively start the guided procedure from the menu *Tools* \rightarrow *Create Gidas database*.

The first screen of the procedure allows user to create a new database Gidas or to connect to an existent one.

If the user decides to create a new database Gidas the second screen of the procedure determines whether the database will be created locally or in a networked environment. In this case it is assumed that in the corporate network is already configured a SQL Server 2005 service or superior.

The next screen will depend on the choices made by the user and the guided procedure ends with the creation of the database file in the selected instance of SQL Server.

2.1.5. Creating the database in a network service

To create the database in a SQL Server service network it is necessary to specify the connection parameters to that service. The connection parameters should be required to the database administrator and are set in the following screen:

Gid	as Data	abase	Confi	gurati	on Wiz	ard										<
																5
	reation	of the	e datal	base fil	e on a	networ	k serve	er					LSI La	astem.	CART Same	E 111
6																
	Cont	tact you	ur datab	ase adm	ninistrato	r to get ti et deteba	he conn	ection s	ettings to riabts) be use	d to con	nect to t	he netv	vork SQI	L Server	
	Jeiv	100.00	mection	n setting	is reque:			nistrator	ngrits.							
																_
	sai	Server	Instan	-0-										dvance	-A	
		100110	odowo z	uthontic	tion									2010100		
		100 SU	l Garva	r authar	tication											
	0.	196 201	LJEIVE	i aurier	iucauon								_			
			Use	E.												
			Pas	sword:												
																_
	Conr	nection	test:			1										

To create the database file is necessary that the user connecting to the SQL Server service has administrator rights on that service.

2.1.6. Creating the database on the local computer

The creation of the database *Gidas* on the local computer varies depending on whether your computer has already installed a SQL Server service or not.

If the local computer has no SQL Server service installed, the wizard will install *SQL Server 2005 Express* or *SQL Server 2008 R2 Express*, both are free version. The SQL Server is installed as an instance named LSIDB.

It is recommended that you install *SQL Server 2005 Express* for older computers and databases that do not store data continuously but store data for applications such as *GidasTEA*. *SQL Server 2005 Express* manages database with a maximum of 4 GB in size.

It is recommended that you install *SQL Server 2008 R2 Express* for recent computers and databases that store data continuously. *SQL Server 208 R25 Express* manages database with a maximum of 10 GB in size. By choosing to install SQL Server 2008 R2 Express, you can also choose to install the management tools of SQL Server, in particular the Microsoft SQL Server Management Studio 2008 R2, this option is recommended only for advanced users in the management of SQL Server database.

D	ownloa	nd SQL Server 2005 Express Installer	
	?	To start the installation of SQL Server 2005 Express, you must select th This file is present on the DVD of the LSI LASTEM products in the folde [Install\Support\SQLServer2005\EN]. Alternatively you can download i FTP site.	e installation setup file. er: t from the LSI LASTEM
	۲	Insert the LSI Products DVD and select the DVD drive:	D:\ 💌
	0	Download the setup file from LSI LASTEM ftp site	
	0	Browse the computer to find the SQL Server setup file:	
			Cancel

The file to install *SQL Server 2005 Express* is located in the DVD of LSI products Lastem in this path:

Install\Support\SQLServer2005\sqlexpr.en.exe

The file to install *SQL Server 2008 R2 Express* is located in the DVD of LSI products Lastem in this path:

Install\Support\SQLServer2008R2\sqlexpr2008r2.en.exe

The file to install *SQL Server 2008 R2 Express* and the management tools is located in the DVD of LSI products Lastem in this path:

Install\Support\SQLServer2008R2\sqlexpr2008r2WT.en.exe

Alternatively you can download it from the LSI Lastem FTP site.. After installation, you can complete the procedure by creating the database file;

if the local computer already has one or more SQL Server services, the procedure shows a summary screen where the user can choose which instance to use to manage the *Gidas* database; depending on the user's choice, could be necessary to specify the connection parameters to the selected service.

1000	Datab	ase Con	mgurati	on Wiz	zard										
Crea	ation o	f the da	tabase fi	le on ti	he local	compu	ıter					LSI La	stem		
F	To crea databa: SQL Se	ate the da se. Selec erver Serv	itabase file t an item fr vices instal	on the li om the li led on th	local com ist to con ne local c	nputer it i tinue. Se computer	s neces elected i	sary to s tem is th	elect the e preferr	e SQL S ed selec	erver Se	rvice to	which o	connect th	e
	Servi	ce Name		Sql	Server E	dition			More I	nfo					
	M	SSQLSE	RVER	SQL	Server 2	005 Dev	veloper E	Edition							
		all a new L Server	instance o	of SQL S	Gerver Ex	press re:	served to	o the LS	l Lastem	applica	ition (it is	necess	ary to ir	istall	

WARNING

The setup of SQL Server Express versions has disabled remote connections by default: it means that database isn't visible from a networked host. In order to enable the remote connections for SOL Server 2005 Express follow the instructions this document: in http://support.microsoft.com/kb/914277/en-us for superior versions follow .; (http://msdn.microsoft.com/en-us/library/ms179383(v=sql.105).aspx)

2.1.7. Selection of the initial size of the database

When you create a new database Gidas is possible to determine the initial size of the data file. The size of the database Gidas automatically grows by 10% to fit the size of the data content. The choice of an initial size too small will not cause data loss but in the long term can degrade the performance of the database.

Gidas D	atabase C	onfigura	tion W	izard										
Sele	ection of	the Gida	s file d	limensio	on							LSI La	stem	
}	The size o size too sn	f the data nall will no	base Gio t cause	das auto data loss	matically s but in t	y grows l the long	by 10% t term car	to fit the n degrad	size of ti le the pe	he data (erformano	content.	The cho databas	vice of a se.	an initial
	 Normal (100 MB) for applications that do not store data continuously Medium (500 MB) for applications that store data continuously 													
	Big (1)	GB and m Select dat	iore) for abase d	applicati limensior	ions that n (GB):	t store da	ata conti	inuously 1	for a lor	ig period	of time			
	ATTENTION: if you are installing Gidas on a SQLServer Express version remember that the maximum database size is 4 GB for SQL Server 2005 Express and 10 GB for SQL Server 2008 R2 Express.													
							<	Previou	s	Next >		<u>F</u> inish		<u>C</u> ancel

Remember that if you are installing Gidas on a Express version of SQL Server there is a limit on the size of the data file:

- 4 GB is the maximum for SQL Server 2005 Express
- 10 GB is the maximum for SQL Server 2008 R2 Express

3. SQL Server Express

3.1. Features

SQL Server 2005 Express is the free version of the product Microsoft SQL Server 2005. As the free version has some limitations, the main of which are reported in this list:

- Number of CPUs Supported: 1
- Maximum usable RAM: 1 GB
- Maximum database size: 4 GB
- Absence of the SQL Server Agent service (required to schedule recurring tasks)

For a complete list of differences between the various versions of SQL Server 2005 may consider the following document: <u>http://www.microsoft.com/sqlserver/2005/en/us/compare-features.aspx</u>

SQL Server 2008 R2 Express is the free version of the product Microsoft SQL Server 2008 R2. As the free version has some limitations, the main of which are reported in this list:

- Number of CPUs Supported: 1
- Maximum usable RAM: 1 GB
- Maximum database size: 10 GB
- Absence of the SQL Server Agent service (required to schedule recurring tasks)

For a complete list of differences between the various versions of SQL Server 2008 R2 may consider the following document: <u>http://msdn.microsoft.com/it-it/library/cc645993(v=sql.105).aspx</u>

3.2. Installing SQL Server

3.2.1. Installing using the Gidas Viewer guided procedure

If during the *Gidas* database creation through the wizard you are prompted to create the database on the local computer and the local computer does not contain any instance of SQL Server, the wizard starts the installation of SQL Server 2005 Express or SQL Server 2008 R2 Express.

The installation creates an instance named LSIDB with mixed authentication modes.

3.2.2. Installing using the installer from Microsoft

It is possible to install SQL Server 2005 Express using the installer provided by Microsoft. You can find this program:

- on the LSI Lastem products DVD in the path: Install\Support\SQLServer2005\sqlexpr.en.exe;
- on the LSI Lastem FTP site;
- directly from the Microsoft site at <u>http://www.microsoft.com/express/sql/previous/register.aspx</u>.

It is possible to install SQL Server 2008 R2 Express using the installer provided by Microsoft. You can find this program:

- on the LSI Lastem products DVD in the path: Install\Support\SQLServer2008R2\sqlexpr2008r2.en.exe; or Install\Support\SQLServer2008R2\sqlexpr2008r2WT.en.exe; (to install also the management programs)
- on the LSI Lastem FTP site;
- directly from the Microsoft site at http://www.microsoft.com/en-us/download/details.aspx?id=30438

During the installation you must indicate the name of the instance you are installing and choose the authentication mode. By default SQL Server Express is installed on an instance named SQLEXPRESS.

3.2.2.1. Authentication Mode

To connect to the SQL Server service you must authenticate. There are two types of authentication:

- Windows authentication
- SQL Server authentication

When you install the SQL Server service you can select the type of access that can also be mixed (recommended).

Windows authentication

Windows Authentication mode allows a user to connect through a Windows user account.

SQL Server authentication

In SQL Server it is possible to define users with different properties and premises. In this case the service connection is through one of these users. Choosing the SQL Server authentication you will be asked to enter user-id and password. The password for the database administrator user (*sa*) is defined during the installation process.

3.2.3. How to configure SQL Server 2005 to allow remote connections

By default, SQL Server Express Edition do not allow remote connections. To configure SQL Server to allow remote connections, complete all the following steps:

- Open the SQL Server Configuration Manager (Programs -> Microsoft SQL Server 2008 -> Configuration Tools -> SQL Server Configuration Manager)
- Expand the SQL protocol node and select the desired instance
- Enable TCP/IP protocol by right-click -> Enable
- Right-click TCP/IP and click on IP-Address tab and scroll down to "IPAll". Ensure that the Dynamic Ports contains a BLANK an add a port like 1433 (default) to IP-Port
- Click to the SQL Server Service node and restart your SQL Server instance
- Configure the firewall to allow network traffic that is related to SQL Server and to the SQL Server Browser service.

For SQL Server 2005 Express users read this document http://support.microsoft.com/kb/914277

3.2.4. Uninstall an existing instance of SQL Server

To remove a SQL Server Instance:

- To begin the uninstall process, on the Microsoft Windows desktop click **Start**, click **Control Panel**, and then double-click **Add or Remove Programs**.
- Select the SQL Server component to uninstall, and then click **Remove**. This will start the SQL Server Installation Wizard.
- On the **Component Selection Uninstall** page, select the instance and any server and/or shared components to remove. To continue, click **Next**.
- On the **Confirmation Uninstall** page, review the list of components and features that will be removed. To continue, click **Next**.
- The Setup Progress page will display Setup status.
- On the **Completing Setup** page, click **Finish** to exit the Installation Wizard.

4. SQL Server Management Studio Express

SQL Server Management Studio Express is an easy and efficient management tool for SQL Server Express.

4.1. How to install SQL Server Management Studio Express

4.1.1. SQL Server 2005 Express

To install the product launch the installer file sqlserver2005_ssmsee.en.msi in the Installsqlserver2005 folder in the LSI LASTEM products DVD.

You can also get the installer from the link:

http://www.microsoft.com/downloads/details.aspx?FamilyID=c243a5ae-4bd1-4e3d-94b8-5a0f62bf7796&DisplayLang=en

4.1.2. SQL Server 2008 R2 Express

To install the product launch the installer file sqlexpr2008r2WT.en.exe in the Install\Support\SQLServer2008R2 folder in the LSI LASTEM products DVD.

You can also get the installer from the link:

http://www.microsoft.com/en-us/download/details.aspx?id=30438

The installer is the same as installing the database engine. Select the option to add features to an existing installation. In the Installation Type screen, select "New installation or add shared features"

In the *Feature Selection* screen, uncheck *Database Engine Services* and select *Management Tools* basis.

The following paragraphs are a brief guide to database management using SQL Server Management Studio Express. We advise not expert users to use the program help in case of doubt of any kind on the procedures described below.

4.2. Run the program and connect to SQL Server Service

When you start the program you must select the instance of SQL Server to connect to:

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🛃 Connect to Server		×
SQL Serve	Windows Server System 2005	stem
Server <u>type:</u>	Database Engine	*
<u>S</u> erver name:	STEFANOGNB	~
<u>Authentication:</u>	Windows Authentication	~
<u>U</u> ser name:	LSINET\stefanog	~
<u>P</u> assword:		
	Remember password	
Connect	Cancel Help Options >	>

Please note that:

- The list of Server type usually does not show network instances;
- The authentication should be done with a user with administrator privileges to at least the database *Gidas*. Use Windows Authentication if you use the same user who installed the service and the database, or use the SQL Server Authentication login by entering a password provided by the database administrator. To access the LSIDB instance created by the guided procedure you can use SQL Server authentication by inserting:

```
User name: sa
Password: LSIgidas01#
```

- If you have enabled the remote connection (3.2.3) you can connect to any instance of SQL Server on the networking;
- The program allows managing multiple services simultaneously.

4.3. Starting and Stopping the SQL Server service

By default when you install SQL Server Express, the service is started in automatic mode and is activated every time you start your computer.

To start or stop the SQL Server service:

- From the Start menu, right-click My Computer, and then click Manage.
- In Computer Management, expand Services and Applications, and then click Services.
- In the list of services, double-click SQL Server.
- In the SQL Server Browser Properties window, click Start or Stop.
- Once the service starts or stops, click **OK**.

4.4. Basic operations on the database Gidas

4.4.1. Verification of the presence

To check if the Gidas database has been successfully installed follow this procedure:

- Run the program and connect to the SQL Server instance to check.
- Select the item **Databases** on the left window (**Object Explorer**).
- Check if the *Gidas* item is present.



4.4.2. Locating data file

To locate the path and file names that contain the data of the Gidas database do the following:

- Run the program and connect to the SQL Server instance.
- Select the item **Databases** on the left window (**Object Explorer**).
- Right-click on the *Gidas* database, and then click **Properties**.
- On the tab Select a page select Files:

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🥫 Database Properties - Gi	das	
Select a page	🔊 Script 👻 🌇 Help	
Files Filegroups	Database <u>n</u> ame: Gidas	
Permissions	Owner: LSINET\stefanog	
Mirroring	Use full-text indexing	
_	Database nes:	File Na
	Gidas C:\Programmi\Microsoft SQL Server\MSSQL1\MSSQL\DATA	Gidas.
	Gidas_log C:\Programmi\Microsoft SQL Server\MSSQL.1\MSSQL\DATA	Gidas_
Connection		
Server		
STEFANOGNB		
Connection: LSINET\stefanog		
View connection properties		
Progress		
Ready	<	Nemove
	ОК	Cancel

Warning

The Gidas database has two files of data and should always be operated in pairs:

- Gidas.mdf: contains the actual data.
- Gidas_log.ldf: contains log data.

To get data file dimensions:

• On the tab **Select a page** select **General**:

Select a page	Script 👻 🃭 Help	
General General		
Thes Report of the second seco		
Change Tracking	Backup	
	Last Database Backup	03/07/2013 09:35:01
Extended Properties	Last Database Log Backup	None
	Database	
	Name	master
	Status	Normal
	Owner	\$a
	Date Created	08/04/2003 09:13:36
	Size	10010,00 MB
	Space Available	6623,40 MB
	Number of Users	4
	Maintenance	
	Collation	SQL_Latin1_General_CP850_CI_AS
Connection Server: VRT-ENVISTA2012 Connection:		
Connection Server: VRT-ENVISTA2012 Connection: LSINET\Administrator		
Connection Server: VRT-ENVISTA2012 Connection: LSINETVAdministrator I View connection properties		
Connection Server: VRT-ENVISTA2012 Connection: LSINETVAdministrator View connection properties Progress		
Connection VRT-ENVISTA2012 Connection: LSINET-Vdministrator View connection properties View connection properties	Name The name of the database.	

Please note that the item Size of the file is NOT the same as the size of the data, in other words in a database file may be plenty of free space. To obtain an estimate of the actual size of the data in

order to assess the achievement of the limitations of the Express editions of SQL Server consider the item *Space Available*.

4.4.3. Delete Gidas database

To delete *Gidas* database do the following:

- Run the program and connect to the SQL Server instance with administrative rights.
- On the left window (**Object Explorer**) select the item **Databases**.
- Right-click on the *Gidas* database, and then select:
 - **Delete**: permanently delete the database (results in loss of data).
 - Tasks → Detach: detaching a database removes it from the instance of the Microsoft SQL Server Database Engine but leaves intact the database, with its data files and transaction log files. After detaching a SQL Server 2005 database, you can reattach it to the same or another instance of SQL Server 2005 using the Tasks → Attach menu.

These operations require the closure of existing connections, in the window that is enabled by the deletion of the database, select the check box *Close Existing Connections*; in the window that is activated for the operation of detach select the check box.

4.4.4. **Re-create the Gidas database file**

To recreate the Gidas database file without maintaining existing data do the following

- Run the program and connect to the SQL Server instance with administrative rights.
- Select the item **Databases** on the left window (**Object Explorer**).
- Right-click on the *Gidas* database, and then select **Delete**.
- Run the GidasViewer program and select the menu Tools \rightarrow Create Gidas Database.

To recreate the Gidas database file saving existing data do the following:

- Run the program and connect to the SQL Server instance with administrative rights.
- Select the item Databases on the left window (Object Explorer).
- Find the database files folder (4.4.2).
- Right-click on the *Gidas* database, and then select **Task** \rightarrow **Detach**.
- Make a copy of data files and log files and remove them from their position.
- Run the *GidasViewer* program and select the menu **Tools** \rightarrow **Create Gidas Database**.

4.4.5. Manually create the Gidas database file

To manually create the Gidas database file do the following:

- Run the program and connect to the SQL Server instance with administrative rights.
- Select the item **Databases** on the left window (**Object Explorer**).
- Select menu File → Open → File and load the script file:

```
C:\Documents and Settings\All Users\Dati applicazioni\LSI-
Lastem\GidasDatabaseInstaller\SQL\CreateDatabase.sql
```

- Change the text #SIZE# with the text 100MB (or 500MB) to fix database file initial dimension.
- Click on the **Execute** button to run the script: this script create the *Gidas* database and the Gidas user.

• Select menu File → Open → File and load the script file:

```
C:\Documents and Settings\All Users\Dati applicazioni\LSI-
Lastem\GidasDatabaseInstaller\SQL\CreateDatabaseObjects.sql
```

• Slick on the **Execute** button to run the script: this script create the *Gidas* objects (tables, stored procedures.)

4.5. Database Backup

It is very important to regularly back up the database in order to avoid loss of data, with SQL Server Express you can do this with ease even if you cannot plan it automatically.

In general, create a file backup means to make a simple copy. For SQL Server it will be impossible to create a simple copy of the database files while the service is running.

Using the mechanisms of native backup in SQL Server you can backup database files without interrupting the service. These mechanisms are quite articulate and allow you to make backup tailored to different situations.

The *Gidas* database consists of a data file and a log file. The log file is a very important component of the database and should never be deleted because it is used by SQL Server to maintain data integrity in write operations to the data file.

The size of the log file can grow with a size dependent on the recovery model used by the database. SQL Server supports three different recovery models:

- Simple.
- Full.
- Bulk Logged.

The Simple recovery model requires only the backup of the data file, the other two recovery models require also the backup of the log file: in this way the log file increases its size until it is backed up.

4.5.1. Database Backup

This procedure describes how to make a full backup of the database using the simple recovery model:

- Run the program and connect to the SQL Server instance with administrative rights.
- On the left window (*Object Explorer*) select the item *Databases*.
- Right-click on the *Gidas* database, and then select **Properties**.
- On the **Properties** windows select **Options** and change the recovery model to **Simple**.
- Right-click on the *Gidas* database, and then select $Task \rightarrow Backup$.
- On the *Backup database window* click the *Add* button to select the folder where to save Backup files:

🧊 Back Up Database - Gida	; 🔲 🗖 🔁 🖌
Select a page	🔄 Script 🝷 📑 Help
🚰 Options	Source
	Database:
	Recovery model: FULL
	Backup type:
	Backup component:
	⊙ Database
	Files and filegroups:
	Backup set
	Name: Gidas-Full Database Backup
	Description:
	Backup set will expire:
	⊙ Aft <u>e</u> r: 0 🔷 days
Connection	O <u>D</u> n: 2/ 5/2009 ✓
Server: PC-GUESTALSIDB	Destination
Connection:	Back up to: O Disk Tage
PC-GUEST\SynopTraining	C:\Synop Training\Training\GidasBackup
View connection properties	<u>R</u> emove
Progress	<u>C</u> ontents
Ready	
New Y	
	OK Cancel

• Click **Ok** to run the backup.

4.5.2. Database restore

To restore Gidas database do the following:

- Run the program and connect to the SQL Server instance with administrative rights.
- Right-click on the item **Databases** on the left window (**Object Explorer**) and select **Restore Database**.

🧻 Restore Database - Gidas	;										
Select a page	_ Scr	ript 👻 📗	🖺 Help								
🚰 Options	Destir	Destination for restore									
	Se	Select or type the name of a new or existing database for your restore operation.									
	Tg	o databa	se:	Gidas				~			
	Ī	o a point	in time:	Most rec							
	Sourc	ce for res	tore								
				- (
	sp	peciry (ne	e source and location	or backup	o sets to restore						
	0	From d	atabase:					×			
	۲	From <u>d</u>	evice:	C:\S							
	Se	elect the	backup sets to restor	e:							
	R	lestore	Name		Component	Туре	Server	Database			
Connection			Gidas-Full Database	Backup	Database	Full	PC-GUEST\LSIDB	Gidas			
Lonnection	-		Gidas-Full Database	Backup	Database	Full	PC-GUESTALSIDB	Gidas			
Server: PC-GUEST\LSIDB											
Connection: PC-GUEST\SynopTraining											
View connection properties											
Progress											
Ready											
Weak and a second secon	<	1	<u> </u>					>			
							ОК	Cancel			

- On the *Restore Database* window select the Gidas and the option *From Device*.
- Click the button is to select the backup folder previously created.
- Click **Ok** to restore database.

4.6. Shrink the database

In SQL Server, each file within a database can be reduced to remove unused pages. Although the Database Engine will reuse space effectively, there are times when a file no longer needs to be as large as it once was; shrinking the file may then become necessary. Both data and transaction log files can be reduced, or shrunk. The database cannot be made smaller than the minimum size of the database chosen when the database was created. To shrink the database do the following:

- Run the program and connect to the SQL Server instance with administrative rights.
- Select the item **Databases** on the left window (**Object Explorer**).
- Right-click on the *Gidas* database, and then select Shrink \rightarrow Database.
- Do not change any settings in the dialog box and start compacting.

4.7. Optimizing the database

The main task of optimizing a database is the regular maintenance of the indexes on the tables of data. In the database *Gidas* the main table that needs to be optimized is the table *Core.RawValue*.

- Run the program and connect to the SQL Server instance with administrative rights.
- Expand the item **Databases** on the left window (**Object Explorer**), select and expand **Gidas** node, select and expand **Tables** node, select and expand the **Core.RawValue** table, select and expand the **Indexes** node.

- Right-click on an index and then select **Properties**.
- Select the **Fragmentation** page

📩 Index Properties - PK_RawVal	ue	- 8	×					
Select a page	Script 🗶 🖸 Help							
🚰 General								
Coptions Coptions Included Columns Storage Storage Spatial Spatial	Mew the index fragmentation data t	o determine if you need to reorganize the index.						
	Fragmentation							
	Page fullness	78,24 %						
Extended Properties	Total fragmentation	99,81 %						
	General							
	Average row size	526						
	Depth	1						
	Forwarded records	0						
	Ghost rows	0						
	Index type	CLUSTERED INDEX						
	Leaf-level rows	12						
	Maximum row size	563						
	Minimum row size	347						
	Pages	1						
	Partition ID	1						
Connection	Version ghost rows	0						
Server: VRT-ENVISTA2012 Connection: sa								
View connection properties								
	Average row size							
Progress	The average leaf-level row size.							
Ready	<u>R</u> eorganize index							
		OK Cancel	.					

On this page evaluate the values of **Total fragmentation** and **Page fulness**. An index is much more performant as its fragmentation is low and the fill level page is high. When the level of fragmentation exceeds 10% it is advisable to carry out the reorganization of the index by selecting the check box **Reorganize Index** at the bottom of the window. For large databases and very fragmented indexes this can be a long process that in some circumstances can block access to the database until its completion.